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Title: OFFICIAL GAZETTE OF THE UNITED STATES PATENT AND TRADEMARK  
OFFICE. PATENTS.

Volume: 1182

Issues: 1 - 2  
PATENT: 5,479,658-5,483,636

Date: JANUARY 2 - JANUARY 9, 1996

UMI Number: 10426.00

Note:

REEL: 1

UMI  
300 North Zeeb Road  
Ann Arbor, MI 48103

UMI Number: 10426.00

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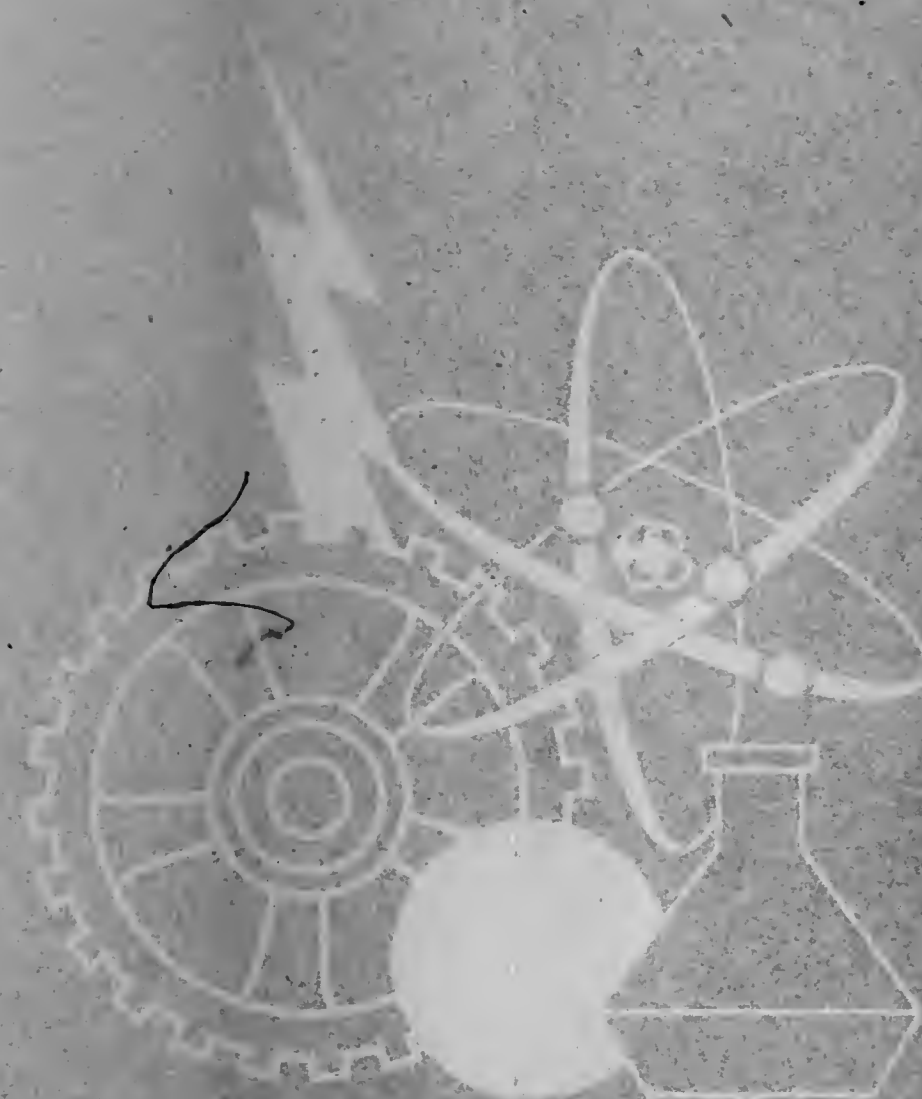
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OFFICIAL  
GAZETTE

of the  
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

January 2, 1996



DEPARTMENT  
OF COMMERCE

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and  
Trademark  
Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

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OFFICIAL GAZETTE of the  
UNITED STATES PATENT AND TRADEMARK OFFICE  
January 2, 1996 Volume 1182 Number 1

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CONSOLIDATED LISTING OF OFFICIAL GAZETTE NOTICES  
RE PATENT AND TRADEMARK OFFICE  
PRACTICES AND PROCEDURES  
PATENT NOTICES

The following is a compilation of the more important notices and rule changes which have been published in the Official Gazette from July 1, 1964 through December 31, 1995. These notices and rule changes are currently in effect unless otherwise noted.

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INFORMATION AND CORRESPONDENCE

(1) Change of Address for Patent Applications  
and Patent Related Papers

Effective immediately, correspondence in patent-related matters under the direction of the Assistant Commissioner for Patents should be addressed to:

Assistant Commissioner for Patents  
Washington, D.C. 20231

This change is being made to reflect the reorganization of the Patent and Trademark Office (PTO), and the integration of patent and trademark processing activities under the Assistant Commissioner for Patents and the Assistant Commissioner for Trademarks, respectively. The reorganization has been made to emphasize and facilitate better service to customers of the PTO.

This change will affect correspondence such as: patent applications, responses to notices of informality, requests for extension of time, notices of appeal, briefs in support of an appeal, requests for oral hearing, extensions of term of patent, requests for publication of Statutory Invention Registration (SIR), requests for reexamination, statutory disclaimers, petitions to the Assistant Commissioner for Patents, submission of information disclosure statements, petitions to institute a public use proceeding, petitions to revive abandoned patent applications, and other correspondence related to patent applications and patents which is processed by organizations reporting to the Assistant Commissioner for Patents. However, unless otherwise specified, correspondence not processed by organizations reporting to the Assistant Commissioner for Patents, such as communications with the Board of Patent Appeals and Interferences, patent services including certificates of correction, patent copy sales, assignments, library services, requests for lists of patents and SIRs in a subclass, requests for the status of maintenance fee payments, as well as patent practitioner enrollment matters including admission to examination, registration to practice, certificates of good standing, and financial service matters including establishing a deposit account should continue to be addressed to the Commissioner of Patents and Trademarks.

Special PTO mail boxes as currently listed in each issue of the Official Gazette should also be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Use of special box designations will facilitate the PTO's timely and accurate identification and processing of the designated correspondence.

All correspondence with the PTO, except for communications relating to pending litigation as specified in 37 CFR 1.1(g), may continue to be filed directly at the Attorney's Window located in Room 1B03 of Crystal Plaza Building 2, 2011 Jefferson Davis Highway, Arlington, Va.

In addition to the Office of the Solicitor, as specified in 37 CFR 1.1(g), the Office will now have three separate addresses. The addresses are as follows: 1) Assistant Commissioner for Patents for correspondence described above; 2) Assistant Commissioner for Trademarks for all trademark-related mail, except for trademark documents sent to the Assignment Branch for recordation and requests for certified and uncertified copies of trademark documents. See: *Change of Address For Trademark Applications and Trademark Related Papers*, 1163 Off. Gaz. Pat. Office 80 (June 28, 1994); and 3) Commissioner of Patents and Trademarks for all other correspondence that does not fall into the categories designated above.

Those who correspond with the PTO are requested not to mix correspondence which will have to be directed to different areas (e.g., Patents and Trademarks) of the Office in a single envelope. At the present time, use of the wrong mailing address will not affect the filing date assigned to any application or correspondence received in the PTO, except as specified in 37 CFR 1.1(g).

The Office is currently preparing a notice of proposed rule-making to formally change the address for patent-related correspondence. Sections 1.1, 1.8, 1.10 and 1.51 of Title 37 of the Code of Federal Regulations are waived to the extent that a certificate of mailing under section 1.8 or 1.10, for patent applications and related patent documents, may be addressed either to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, or to the Assistant Commissioner for Patents, Washington, D.C. 20231.

March 9, 1995

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

[1173 O.G. 13]

(2) Reserved

(3) Department of Commerce  
Patent and Trademark Office  
[Docket #: 950411100-5100-01]  
RIN 0651-XX01

Extension of the Use of Payor Numbers to Matters  
Involving Pending Patent Applications

Agency: Patent and Trademark Office, Commerce.

Action: Notice; Request for Comments.

Summary: The Patent and Trademark Office (PTO) requests written public comment on the advisability of the extension of the use of Payor Numbers to matters involving pending patent applications. Payor Numbers are currently used with respect to establishing a "fee address" for receipt of maintenance fee correspondence. The PTO is considering extending the Payor Number practice to matters involving patent applications. The use of such Payor Numbers would permit an attorney, agent or law firm to file a single paper containing a change of address, rather than a separate paper for each patent application affected by the change of address. The change of address in multiple patent applications through a single paper directed to the Payor Number would result in savings to both the attorney, agent or law firm and the PTO. Interested members of the public are invited to present written comments on any topic relating to the extension of the use of Payor Numbers.

Dates: Written comments on the topics presented in the supple-

mentary section of this notice will be accepted by the PTO until Aug. 16, 1995.

**Addresses:** Those interested in presenting written comments on the topics presented in the supplementary information, or any related topics, may mail their comments to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, marked to the attention of Box DAC. In addition, comments may also be sent by facsimile transmission to (703) 308-6916, with a confirmation copy mailed to the above address, or by electronic mail messages over the Internet to payor@uspto.gov.

Written comments should include the following information:

- name and affiliation of the individual responding;
- an indication of whether comments offered represent views of the respondent's organization or are the respondent's personal views; and
- if applicable, information on the respondent's organization, including the type of organization (e.g., business, trade group, university, non-profit organization).

**For Further Information Contact:** Robert W. Bahr by telephone at (703) 308-6906, by facsimile at (703) 308-6916, or Jeffery V. Nase by telephone at (703) 305-9285, or by mail marked to the attention of Box DAC, addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

#### Supplementary Information

#### I. Background

The PTO is considering extending the use of Payor Numbers to matters involving patent applications. Specifically, Payor Numbers are currently used with respect to establishing a "fee address" for receipt of maintenance fee correspondence, and the use of such Payor Numbers permit, *inter alia*, an attorney, agent or law firm to file a single change of address paper for the Payor Number, which change of address will be effective for every patent identified with the Payor Number, rather than requiring that separate change of address papers be filed for every patent affected by the change of address.

#### II. Issues for Public Comment

Any interested member of the public is invited to present written comments on any topic related to the extension of the use of Payor Numbers. The PTO is considering extending the Payor Number practice to matters involving patent applications to permit (1) the identification of the correspondence address of a patent application with a Payor Number such that a single change of address may be filed for the Payor Number, and thus every patent application identified with the Payor Number, and (2) the identification of a list of registered attorneys and/or agents with a Payor Number such that an applicant may in the Power of Attorney appoint those attorneys and/or agents associated with the Payor Number. The PTO requests written public comment on the advisability of this extension of the use of Payor Numbers, and the issues associated therewith.

Currently, when an attorney, agent or law firm changes correspondence address, a separate paper containing this change of address must be filed in every patent application affected by the change of address. 37 CFR 1.4(b). The identification of an application with a Payor Number will permit an attorney, agent or law firm to file a single paper containing this change of address, rather than a separate paper in each application, and this change of address paper will be applicable to all applications identified with the Payor Number. The identification of an application with a Payor Number will be optional, in that any application not identified with a Payor Number will not be affected by a change of address filed for a Payor Number, even if the correspondence address provided for such application is that of an attorney, agent, or law firm identified with a Payor Number. The change of address in multiple patent applications through a single paper directed to the Payor Number, rather than through individual letters directed to each application, would result in savings to both the attorney, agent or law firm and the PTO.

Currently, an applicant in the Power of Attorney must individually name those attorneys and/or agents to represent the applicant in a patent application. The association of a list of

attorneys and/or agents with a Payor Number will permit an applicant to appoint all of the attorneys and/or agents associated with the Payor Number merely by reference to the Payor Number in the Power of Attorney, i.e., without individually listing the attorneys and/or agents in the Power of Attorney. The addition and/or deletion of an attorney or agent from the list of attorneys and/or agents identified with a Payor Number will result in the addition or deletion of such attorney or agent from the list of persons authorized to represent any applicant who appointed all of the attorneys and/or agents identified with such Payor Number. This will avoid the necessity for the filing of additional papers in each application affected by a change in the attorneys and/or agents of the law firm prosecuting the application. The appointment of attorneys and/or agents identified with a Payor Number will be optional, in that any applicant may continue to individually name those attorneys and/or agents to represent the applicant in a patent application.

Currently, the PTO must individually enter into the Patent Application Location and Monitoring (PALM) system the registration number for each attorney and/or agent appointed to represent the applicant in a patent application. The change of persons authorized to represent applicants in multiple patent applications through a single paper directing the PTO to change its records concerning the Payor Number, which would require only a single entry into the PALM system, rather than through individual letters directed to each application, which would require a separate entry into the PALM system for each affected application, would significantly reduce the amount of data which must be entered into the PALM system, and would thus result in savings to the PTO. In addition, permitting a change of persons authorized to represent applicants in multiple patent applications through a single paper directing the PTO to change its records concerning the Payor Number would result in similar savings to the attorney, agent, or law firm.

As the PTO will not recognize more than one correspondence address (37 CFR 1.34(c)), any inconsistencies between the correspondence address resulting from a Payor Number being provided in an application for the correspondence address and any other correspondence address provided in that application would be resolved in favor of the correspondence address of the Payor Number. Where an applicant appoints all of the attorneys and/or agents associated with a Payor Number as well as a list of individually named attorneys and/or agents, such action would be treated as only an appointment of all of the attorneys and/or agents identified with a Payor Number due to the potential for confusion and data entry errors in entering registration numbers from plural sources. If an applicant wished to appoint attorneys and/or agents in addition to those associated with a Payor Number, the additional attorneys and/or agents could be appointed through the use of an associate Power of Attorney.

#### Examples:

1. The following language would be effective to appoint those attorneys and/or agents individually listed, and provide the correspondence address of Payor Number 99,999.

I hereby appoint the following practitioners to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

John Doe, Registration No. 99,991, Jane Doe, Registration No. 99,992 and Richard Doe, Registration No. 99,993.

Address all correspondence to: Payor Number 99,999.

2. The following language would be effective to appoint those attorneys and/or agents associated with, and provide the correspondence address of, Payor Number 99,999.

I hereby appoint the practitioners identified with the Payor Number provided below to prosecute this application and to

transact all business in the Patent and Trademark Office connected therewith, and direct that all correspondence be addressed to that Payor Number:  
Payor Number 99,999.

May 9, 1995

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

[1175 O.G. 92]

#### (4) Mailing of Papers to the PTO in Patent Interference Proceedings

Effective immediately, attorneys and agents are requested to address all papers mailed to the Patent and Trademark Office in connection with an interference proceeding, and any patent or application involved in an interference proceeding, as follows:

BOX INTERFERENCE  
Commissioner of Patents and Trademarks  
Washington, D.C. 20231

Use of this address will considerably assist the Board in its administration of patent interference proceedings.

Nov. 28, 1983

DONALD J. QUIGG  
Deputy Commissioner of  
Patents and Trademarks

[1037 OG 25]

#### (5) Establishment of a Special Box for Expedited Processing of Issue Fees

Effective immediately, the Patent and Trademark Office has established a special box designator for issue fees to allow expedited processing of the Issue Fee Transmittal (PTOL Form 85), and the order for advance copies.

In order to take advantage of this new service, the envelope should be addressed:

Box Issue Fees  
Commissioner of Patents and Trademarks  
Washington, D.C. 20231

Only the Issue Fee Transmittal (PTOL Form 85), advance copy orders and the fees associated with these two services are to be placed in the envelope. Including documents other than those specified will delay their reaching the area for which they were intended.

#### PLEASE USE THE NEW ISSUE FEE BOX.

Mar. 4, 1988

THERESA A. BRELSFORD  
Assistant Commissioner  
for Administration

[1088 OG 41]

#### (6) Establishment of Three Special Boxes for Expedited Processing

The Patent and Trademark Office has established three additional special boxes to allow expedited processing of non-fee amendments to patent applications, petitions for filing date and/or serial number information for patent applications, and issue fees.

In order to take advantage of these new expedited services, the envelope must be addressed:

For non-fee amendments to patent applications:

Box Non-Fee Amendments (Pats)  
Commissioner of Patents and Trademarks

Washington, D.C. 20231

For petitions under 37 CFR 1.182 and associated fees for obtaining filing date and/or serial number information for patent applications prior to receipt of the official "Filing Receipt", "Notice to File Missing Parts", or "Notice of Incomplete Application".

Box SN  
Commissioner of Patents and Trademarks  
Washington, D.C. 20231

For Issue Fee Transmittals (PTOL Form 85) and associated fees and corrected drawings:

Box Issue Fees  
Commissioner of Patents and Trademarks  
Washington, D.C. 20231

Only those documents specified for the special box are to be placed in the envelope addressed to that special box. Placing extraneous documents in an envelope marked for any special box will significantly delay their reaching the area for which they were intended.

Mar. 22, 1988

THERESA A. BRELSFORD  
Assistant Commissioner  
for Administration

[1089 OG 45]

#### (7) Changes in How Papers May be Filed in the Patent and Trademark Office

Beginning April 21, 1992, an improved service will be offered to people who wish to file papers directly with the Patent and Trademark Office (PTO) by extending the hours of operation for the Attorneys' Window located in Room 1B03 of Crystal Plaza Building 2, Arlington, Virginia. The current hours of operation are from 8:30 a.m. to 5:00 p.m., Monday through Friday, except Federal holidays within the District of Columbia. The change will extend the hours of operation until 12:00 midnight on Monday through Friday, except holidays, on a trial basis. If, after six months, usage does not warrant retaining operations until midnight, the hours of operation will be reduced.

This change will provide walk-up, personalized service to firms and individuals who are filing documents with the PTO. The PTO will continue to stamp postcard-type receipts to acknowledge the receipt of papers filed at the Attorneys' Window.

Also, effective on April 21, 1992, the PTO is discontinuing the use of drop boxes in the lobby of Crystal Plaza Building 3, Arlington, Virginia, and at the main entrance of the Department of Commerce Building, Washington, D.C. (37 CFR 1.6(c)) as means for receiving papers.

These changes will provide improved services with respect to receipt and processing of documents while, at the same time, overcoming problems with the present arrangement.

Problems encountered with the present arrangement for the drop boxes have occasionally made it difficult to determine the dates of actual deposit of papers. For example, there have been many incidents of papers being found outside of the drop boxes (e.g., on the floor of the main lobby of the Department of Commerce Building, on the guard's desk, on a nearby table, etc.). On occasion, the PTO and/or filers have been denied access to the drop box at the Department of Commerce by building security guards due to a special event taking place in the lobby.



Provisions are also available for filing papers through the use of the certificate of mailing (37 CFR 1.8) and the Express Mail (37 CFR 1.10) procedures.

March 17, 1992

HARRY F. MANBECK, Jr.  
Assistant Secretary and Commissioner  
of Patents and Trademarks

[1137 OG 7]

## (8) Relief in Certain Extraordinary Situations

This notice addresses the extraordinary situation in which a Patent and Trademark Office (PTO) customer has been intentionally deceived by his or her representative, resulting in a potential loss of intellectual property rights. In such a situation, the PTO will mitigate any such potential loss, to the extent possible within the PTO's statutory framework and the bounds of controlling law.

To mitigate any such loss, the Commissioner of Patents and Trademarks may suspend or waive certain regulations. When that is the case, the Commissioner will exercise his power to do so under 37 C.F.R. §§ 1.183 and 2.148 ("In an extraordinary situation, when justice requires," the Commissioner has the power to *sua sponte* suspend or waive any requirement of the regulations which is not required by statute.).

In advance of the occurrence of such an extraordinary situation, the Commissioner cannot determine what specific action justice will require. Such action, however, could include waiving of certain non-statutory fees, reviving an abandoned application, or granting an application filing date based on the PTO filing date of a copending document that has all the elements of a patent application required by law.

August 11, 1995

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

[1178 O.G. 42]

(9) Department of Commerce  
Patent and Trademark Office  
37 CFR Parts 1, 5 and 10  
[Docket No. 951006247-5247-01]  
RIN 0651-AA70

## Communications with the Patent and Trademark Office

Agency: Patent and Trademark Office, Commerce.

Action: Notice of Proposed Rulemaking.

Summary: The Patent and Trademark Office (Office) is proposing to amend the rules of practice in patent and trademark cases to: (1) require that patent-related mail be addressed to the Assistant Commissioner for Patents; (2) require that most trademark-related mail be addressed to the Assistant Commissioner for Trademarks; (3) specify a separate address for mail related to disciplinary proceedings pending before the Administrative Law Judge or the Commissioner in the Office of the Solicitor; (4) provide a definition of "Federal holiday within the District of Columbia"; and (5) delete the requirement for a certificate for "Express Mail" in section 1.10 and incorporate requirements for the resubmission of misplaced correspondence which parallel section 1.8.

Dates: Comments must be received by January 2, 1996. No hearing will be held.

Addresses: Address written comments to Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513, marked to the attention of Lynne G. Beresford. In addition, written comments may also be sent by facsimile transmission to (703) 308-7220 with a confirmation copy mailed to the above address, or by electronic mail messages over the Internet to mail-rule@uspto.gov.

Written comments will be available for public inspection on [Insert date 75 days after date of publication in the FEDERAL REGISTER], in the Assistant Commissioner for Trademarks' suite on the 10th floor of the South Tower Building, 2900

Crystal Drive, Arlington, Virginia 22202-3513.

For Further Information Contact: Lawrence E. Anderson (for patent-related matters) by telephone at (703) 305-9285, by electronic mail at landerso@uspto.gov, or by mail to his attention addressed to the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231; or Lynne G. Beresford (for trademark-related matters) by telephone at (703) 308-8900, extension 44, or by mail marked to her attention and addressed to the Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513.

Supplementary Information: Addresses for correspondence with the Office are proposed to be changed to reflect the creation of a mailroom site at the South Tower Building for processing most trademark-related mail; to distinguish correspondence intended for organizations reporting to the Assistant Commissioner for Patents from other correspondence; and to add a separate mailing address in the Office of the Solicitor for disciplinary matters.

The proposed rulemaking entitled "Changes in Requirements for Addressing Trademark Applications and Trademark-Related Papers" (0651-AA73) has been merged with this notice of proposed rulemaking.

The Office will now have three separate general mailing addresses: (1) Assistant Commissioner for Patents for correspondence processed by organizations reporting to the Assistant Commissioner for Patents; (2) Assistant Commissioner for Trademarks for all trademark-related mail, except for trademark documents sent to the Assignment Division for recordation and requests for certified and uncertified copies of trademark documents which should be addressed to the Commissioner of Patents and Trademarks; and (3) Commissioner of Patents and Trademarks for all other correspondence. Notwithstanding the above, it is proposed that there will be separate mailing addresses in the Office of the Solicitor for certain disciplinary matters and cases involving pending litigation.

Those who correspond with the Office are requested to use separate envelopes directed to the different areas.

Because patent-related mail will be sent to the Assistant Commissioner for Patents, the requirement to designate patent application correspondence as "PATENT APPLICATION" is proposed to be deleted from section 1.5(a).

In addition, it is proposed that "Federal holiday within the District of Columbia" be defined as including Official closings.

It is further proposed that a "Certificate of Mailing by Express Mail" (currently necessary to obtain the benefit of the date of deposit with the United States Postal Service (U.S.P.S.) as the filing date of the paper) no longer be required for correspondence actually received in the Office.

## PATENT-RELATED MAIL

Section 1.1 is proposed to be amended to provide for correspondence which is processed by organizations reporting to the Assistant Commissioner for Patents to be addressed to the "Assistant Commissioner for Patents, Washington, D.C. 20231." The Office first announced the new address for patent-related mail in a notice (Change of Address for Patent Applications and Patent Related Papers) published in the *Official Gazette* at 1173 Off. Gaz. Pat. Office 13 (April 4, 1995).

This change will affect correspondence such as: patent applications, responses to notices of informality, requests for extension of time, notices of appeal to the Board of Patent Appeals and Interferences (the Board), briefs in support of an appeal to the Board, requests for oral hearing before the Board, extensions of term of patent, requests for reexamination, statutory disclaimers, certificates of correction, petitions to the Commissioner, submission of information disclosure statements, petitions to institute a public use proceeding, petitions to revive abandoned patent applications, and other correspondence related to patent applications and patents which is processed by organizations reporting to the Assistant Commissioner for Patents. When patent-related documents are filed with a certificate of mailing, pursuant to section 1.8, the certificate of mailing should be completed with the new address: Assistant Commissioner for Patents, Washington, D.C. 20231.

Unless otherwise specified, correspondence not processed by organizations reporting to the Assistant Commissioner for Patents, such as communications with the Board, patent services including patent copy sales, assignments, requests for lists of

patents and SIRs in a subclass, requests for the status of maintenance fee payments, as well as patent practitioner enrollment matters including admission to examination, registration to practice, certificates of good standing, and financial service matters including establishing a deposit account should continue to be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231. Documents to be recorded with the Assignment Division, except those filed with new applications, should be addressed to: Box Assignment, Commissioner of Patents and Trademarks, Washington, D.C. 20231. Orders for certified and uncertified copies of Office documents should be addressed to: Box 10, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Special Office mail boxes as currently listed in each issue of the *Official Gazette* should continue to be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Use of special box designations will facilitate the Office's timely and accurate identification and processing of the designated correspondence.

Checks should continue to be made payable to the Commissioner of Patents and Trademarks.

## TRADEMARK-RELATED MAIL

Most trademark-related mail should be sent directly to the Trademark Operation at: Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513. When trademark-related documents are filed with a certificate of mailing, pursuant to section 1.8, the certificate of mailing should be completed with the new address: Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513. Use of the correct address will avoid processing delays. Trademark documents to be recorded with the Assignment Division, except those filed with new applications, should be addressed to: Box Assignment, Commissioner of Patents and Trademarks, Washington, D.C. 20231. Orders for certified and uncertified copies of trademark documents should be addressed to: Box 10, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

The Office announced the new address for trademark-related mail in a notice (Change of Address for Trademark Applications and Trademark Related Papers) published in the *Federal Register* at 59 FR 29275 (June 6, 1994) and in the *Trademark Office Official Gazette* at 1163 Off. Gaz. Trademark Office 80 (June 28, 1994) (republished in 1170 Off. Gaz. Pat. Office 303 (January 3, 1995)).

The Office will continue to maintain the special box designations and FEE/NO FEE indicators for trademark mail as currently listed in each issue of the *Official Gazette*. In addition to addressing trademark-related mail as set forth above, the boxes should also be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible.

Checks should continue to be made payable to the Commissioner of Patents and Trademarks.

Mail intended for the Trademark Trial and Appeal Board should be addressed to: Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513, including BOX TTAB/FEE or BOX TTAB/NO FEE, whichever is applicable.

## HAND-CARRIED CORRESPONDENCE

All correspondence with the Office, except for communications relating to pending litigation as specified currently in section 1.1(g), may continue to be filed directly at the Attorney's Window located in Room 1B03 of Crystal Plaza Building 2, 2011 South Clark Place, Arlington, Virginia. Trademark-related papers may also be filed at the "walk-up" window located on the third floor of the South Tower Building, 2900 Crystal Drive, Arlington, Virginia.

## FEDERAL HOLIDAYS WITHIN THE DISTRICT OF COLUMBIA

When the Patent and Trademark Office is officially closed for an entire day (for reasons due to weather or other causes), the Office will consider each such day a "Federal holiday within the District of Columbia" under 35 U.S.C. § 21. Any action

or fee due on such a day may be taken, or fee paid, on the next succeeding business day the Office is open.

Legal holidays considered "Federal holidays within the District of Columbia" are New Year's Day (January 1), Martin Luther King, Jr.'s Birthday (third Monday in January), Presidential Inauguration Day, Washington's Birthday (third Monday in February), Memorial Day (last Monday in May), Independence Day (July 4), Labor Day (first Monday in September), Columbus Day (second Monday in October), Veterans Day (November 11), Thanksgiving Day (fourth Thursday in November) and Christmas Day (December 25). In the past, the Office has published notices concerning unscheduled closings: See, e.g., "Closing of Patent and Trademark Office on Thursday, January 20, 1994 and Friday, February 11, 1994," 1161 Off. Gaz. Pat. Office 12 (April 5, 1994) (republished in 1170 Off. Gaz. Pat. Office 8 (January 3, 1995)) and "Filing of Papers During Unscheduled Closings of the Patent and Trademark Office," 1097 Off. Gaz. Pat. Office 53 (December 20, 1988) (republished in 1170 Off. Gaz. Pat. Office 8 (January 3, 1995)). The proposed rule change will further implement the existing policy.

## EXPRESS MAIL PROVISIONS

Section 1.10 is proposed to be amended by deleting the requirement for a "Certificate of Mailing by Express Mail" to obtain the benefit of the date of deposit with the United States Postal Service (U.S.P.S.) as the filing date of the paper. The title of section 1.10 is proposed to be revised and section 1.10 is also proposed to be amended to incorporate requirements for the resubmission of misplaced correspondence which parallel section 1.8.

Under the current rule, the filer is required to include a Certificate of Mailing by Express Mail, certifying the date of deposit as Express Mail. Some papers filed with the Office, although deposited as Express Mail with the U.S.P.S., have been denied the filing date of the date of deposit as Express Mail because the required Certificate of Mailing by Express Mail was omitted or deficient. The lost filing date for a significant number of these papers has resulted in the loss of substantive rights. For example, a trademark registration may be canceled if the required affidavit of continued use or excusable non-use is not filed by the end of the sixth year of registration. 15 U.S.C. § 1058.

In light of the problematic nature of the requirement for a Certificate of Mailing by Express Mail, inasmuch as the date of deposit has already been entered by a disinterested third party, the Office proposes to delete this requirement from section 1.10.

## MISCELLANEOUS CHANGES

Miscellaneous changes are proposed to change the word "communications" to "correspondence" for purposes of consistency. Also, since the certificate of mailing by "Express Mail" will no longer be a requirement of the proposed rules, the provisions of Part 10 relating to misconduct are proposed to be amended to delete reference to this requirement.

## DISCUSSION OF SPECIFIC RULES

If revised as proposed, the heading of section 1.1 will be changed to state that the section contains the addresses for correspondence to the Patent and Trademark Office.

Section 1.1 is proposed to be revised to set out all pertinent Office mailing addresses in paragraph (a) and in added paragraphs (a)(1), (a)(2), and (a)(3). It should be noted that the remaining paragraphs of section 1.1 contain directions for using box designations rather than addresses. Paragraph (a)(1) is proposed to be added to set out the new mailing address to which most patent-related documents should be sent. Paragraph (a)(2) is proposed to be added to set out the new mailing address to which most trademark-related documents should be sent. The Solicitor's mailing address, formerly set out in paragraph (g) of the section is moved to a new paragraph (a)(3). Paragraph 1.1(g) is proposed to be removed and reserved.

Sections 1.1 and 1.3 are proposed to be amended so that the word "communications" is changed to "correspondence."



Section 1.5(a) is proposed to be amended by removing the requirement of the words "PATENT APPLICATION" on letters concerning patent applications.

Section 1.8 (a) is proposed to be revised to state that papers and fees must be addressed as set out in section 1.1 (a). For the purposes of 1.8 (a) (1) (i) (A), first class mail is interpreted as including "Express Mail" and "Priority Mail" deposited with the U.S.P.S.

Section 1.9 is proposed to be amended to add a definition of "Federal holiday within the District of Columbia" to include Federal holidays and days when the Patent and Trademark Office is officially closed for the entire day (for reasons due to adverse weather or other causes).

Section 1.10 is proposed to be revised to state that "Express Mail" must be addressed as set out in § 1.1(a). The title of section 1.10 is proposed to be revised to reflect this change. Further, for all correspondence *actually received* in the Office, the Office will consider the correspondence filed on the date shown by the "date in" notation on the "Express Mail" label unless the "date in" is a Saturday, Sunday or Federal holiday within the District of Columbia. Because of the reliance on the "date in" marked by the Postal Service, correspondence should be deposited directly with a person at the United States Postal Service, rather than in a drop box, to ensure that the person making the deposit receives a copy of the "Express Mail" label at the time of making the deposit to verify that the "date in" is accurately and clearly written by the Postal Service employee. Persons using an Express mail receptacle (such as a drop box) do so at the risk of not receiving an accurate and legible copy of the Express mail label at the time of deposit from which the Office may determine the "Express mail" "date in," and, therefore, may not later argue that they should be entitled to the date on which they deposited the correspondence into a receptacle. Moreover, if the "date in" is found to be illegible or unclear, a person dealing directly with a Postal Service employee must take corrective action to ensure that a clear and accurate date is marked at the time of deposit. Persons choosing to use a receptacle (or the like) obviously do not oversee the marking by a Postal Service employee and thus may not later argue for the benefit of a section 1.10 filing date if the "date in" on the "Express Mail" label is improperly or not clearly marked. The determinative factor is when the Postal Service marks the "date in" and the mere deposit into a receptacle does not entitle one to an "Express Mail" "date in" under section 1.10.

Paragraph (b) of section 1.10 is proposed to be amended by deleting the requirement for a "Certificate of Mailing by Express Mail" currently necessary to obtain the benefit of the date of deposit with the United States Postal Service (U.S.P.S.) express mail service as the filing date of the paper.

Paragraph (c) of section 1.10 is proposed to be amended to set forth the requirements for the treatment of correspondence not received by the Office for which the "Express Mail" procedure was utilized. Correspondence not received by the Office will be considered filed in the Office on the date shown by the "date in" notation entered by the Postal Service if the party who forwards the correspondence:

- (1) Places the number of the "Express Mail" mailing label on the correspondence prior to the original mailing by "Express Mail."
- (2) Informs the Office of the previous deposit of the correspondence promptly after becoming aware that the Office has no evidence of receipt of the correspondence.
- (3) Supplies an additional copy of the previously deposited correspondence showing the number of the "Express Mail" label thereon.
- (4) Supplies a copy of the "Express Mail" label clearly displaying the "date in" entered by the United States Postal Service, and
- (5) Includes a statement which establishes, to the satisfaction of the Commissioner, the previous deposit and that the copies of the correspondence and "Express Mail" label are true copies of the original correspondence and "Express Mail" label. Such statement must be on the basis of personal knowledge, whenever possible, and must be a verified statement if made by a person other than a practitioner as defined in section 10.1(r) of this chapter.

In addition, although the requirement for a certificate of express mail has been proposed to be eliminated from section 1.10, applicants are strongly encouraged to continue using the certificate of express mail, as well as the placement of the Express Mail label number in the upper right corner of the first page of each separate piece of correspondence and to retain a clearly marked Express Mail label, to facilitate complying with the requirements of paragraph (c) if the correspondence is not received in the Office or if reliance on the U.S.P.S. "date in" is not possible. Moreover, paragraph (d) is proposed to be added so that additional evidence may be required if the Office so determines.

Section 5.33 (entitled "Correspondence") is proposed to be amended to change the correspondence address to "Assistant Commissioner for Patents (Attention: Licensing and Review), Washington, D.C. 20231."

Section 10.23(c)(9) is proposed to be revised to reflect the proposed change to section 1.10 that the certificate of mailing by "Express Mail" is no longer a requirement of the rules.

#### OTHER CONSIDERATIONS

The proposed rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Order 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.* Information collection requirements are not affected by the change of address. This proposed rule has been determined to not be significant for the purposes of Executive Order 12866.

The Office has determined that this proposed rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the proposed rule changes would not have a significant impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The proposed rule change has no effect on patent fees.

These proposed rule changes contain collections of information subject to the requirements of the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, which are currently approved by the Office of Management and Budget under Control No. 0651-0009 and 0651-0031. The public reporting burden for these collections of information for certificate of mailing is estimated to average six minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Office of System Quality and Enhancement Division, Patent and Trademark Office, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503. (ATTN: Paperwork Reduction Act Projects 0651-0009 and 0651-0031).

#### List of Subjects

##### 37 CFR Part 1

Administrative practice and procedure, Freedom of information, Inventions and patents, Reporting and record keeping requirements.

##### 37 CFR PART 5

Classified information, Foreign relations, Inventions and patents.

##### 37 CFR PART 10

Administrative Practice and procedure, Conflicts of interest, Courts, Inventions and patents, Lawyers.

For the reasons set forth in the preamble and under the authority granted to the Commissioner of Patents and Trade-

marks by 35 U.S.C. 6 and 15 U.S.C. 1123, 37 CFR Parts 1, 5 and 10 are proposed to be amended as follows:

#### PART 1—RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.1 is proposed to be amended by removing and reserving paragraph (g) and by revising the title and paragraph (a) to read as follows:

##### § 1.1 Addresses for correspondence with the Patent and Trademark Office.

(a) Except for those documents identified in paragraphs (1), (2) and (3) of this section, all correspondence intended for the Patent and Trademark Office must be addressed to "Commissioner of Patents and Trademarks, Washington, D.C. 20231." When appropriate, correspondence should also be marked for the attention of a particular office or individual.

(1) *Patent correspondence.* All correspondence concerning patent matters processed by organizations reporting to the Assistant Commissioner for Patents should be addressed to "Assistant Commissioner for Patents, Washington, D.C. 20231."

(2) *Trademark correspondence.* All correspondence concerning trademark matters, except for trademark-related documents sent to the Assignment Division for recordation and requests for certified and uncertified copies of trademark application and registration documents, should be addressed to "Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513." This includes correspondence intended for the Trademark Trial and Appeal Board.

(3) *Office of Solicitor correspondence.*

(i) Correspondence relating to pending litigation required by court rule or order to be served on the Solicitor shall be hand-delivered to the Office of the Solicitor or shall be mailed to: Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215; or such other address as may be designated in writing in the litigation. See §§ 1.302(c) and 2.145(b)(3) for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit.

(ii) Correspondence relating to disciplinary proceedings pending before an Administrative Law Judge or the Commissioner shall be mailed to: Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.

(iii) All other correspondence to the Office of the Solicitor shall be addressed to: Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

(iv) Correspondence addressed to the wrong Post Office Box will not be filed elsewhere in the Patent and Trademark Office and might be returned.

(g) [Reserved]

3. Section 1.3 is proposed to be revised to read as follows:

##### § 1.3 Business to be conducted with decorum and courtesy.

Applicants and their attorneys or agents are required to conduct their business with the Patent and Trademark Office with decorum and courtesy. Papers presented in violation of this requirement will be submitted to the Commissioner and will be returned by the Commissioner's direct order. Complaints against examiners and other employees must be made in correspondence separate from other papers.

4. Section 1.5(a) is proposed to be revised to read as follows:

##### § 1.5 Identification of application, patent, or registration.

(a) No correspondence relating to an application should be filed prior to when notification of the application number is received from the Patent and Trademark Office. When a letter directed to the Patent and Trademark Office concerns a previously filed application for a patent, it must identify on the top page in a conspicuous location, the application number (consisting of the series code and the serial number; e.g., 07/123,456), or the serial number and filing date assigned to that application by the Patent and Trademark Office, or the international application number of the international application. Any correspondence not containing such identification will be returned to the sender where a return address is available. The returned correspondence will be accompanied with a cover letter which will indicate to the sender that if the returned correspondence is resubmitted to the Patent and Trademark Office within two weeks of the mail date on the cover letter, the original date of receipt of the correspondence will be considered by the Patent and Trademark Office as the date of receipt of the correspondence. Applicants may use either the Certificate of Mailing or Transmission procedure under § 1.8 or the Express Mail procedure under § 1.10 for resubmissions of returned correspondence if they desire to have the benefit of the date of deposit in the United States Postal Service. If the returned correspondence is not resubmitted within the two-week period, the date of receipt of the resubmission will be considered to be the date of receipt of the correspondence. The two-week period to resubmit the returned correspondence will not be extended. If for some reason returned correspondence is resubmitted with proper identification later than two weeks after the return mailing by the Patent and Trademark Office, the resubmitted correspondence will be accepted but given its date of receipt. In addition to the application number, all letters directed to the Patent and Trademark Office concerning applications for patent should also state the name of the applicant, the title of the invention, the date of filing the same, and, if known, the group art unit or other unit within the Patent and Trademark Office responsible for considering the letter and the name of the examiner or other person to which it has been assigned.

5. Section 1.8(a)(1)(i)(A) is proposed to be revised to read as follows:

##### § 1.8 Certificate of mailing or transmission.

(a) \*\*\*

(1) \*\*\*

(i) \*\*\*

(A) Addressed as set out in § 1.1(a) and deposited with the U.S. Postal Service with sufficient postage as first class mail; or

\*\*\*\*\*

6. Section 1.9 is proposed to be revised by adding a new paragraph (h) to read as follows:

##### § 1.9 Definitions.

\*\*\*\*\*

(h) A "Federal holiday within the District of Columbia" as used in this chapter means any day, except Saturdays and Sundays, when the Patent and Trademark Office is officially closed for business.

7. Section 1.10 is proposed to be revised to read as follows:

##### § 1.10 Filing of correspondence by "Express Mail."

(a) Any correspondence received by the Patent and Trademark Office utilizing the "Express Mail Post Office to Addressee" service of the United States Postal Service will be considered filed in the Office on the date shown by the "date in" notation entered by the United States Postal Service on the "Express Mail" label, unless the "date in" is a Saturday, Sunday or Federal holiday within the District of Columbia. See § 1.6(a). This procedure can be used to file any correspondence in the Office.



(b) Any correspondence filed by "Express Mail" must be addressed as set out in § 1.1(a) and should be deposited directly with the United States Postal Service to ensure that the person depositing the correspondence receives a copy of the "Express Mail" label at the time of deposit with the "date in" clearly marked thereon. Persons dealing indirectly with the United States Postal Service (such as by deposit in an Express Mail drop box) do so at the risk of not receiving their copy of the "Express Mail" label with the "date in" clearly marked.

(c) Any correspondence mailed to the Patent and Trademark Office utilizing the "Express Mail Post Office to Addressee" service of the United States Postal Service, but not received by the Office, will be considered filed in the Office on the date shown by the "date in" notation entered by the United States Postal Service on the "Express Mail" label, unless the "date in" is a Saturday, Sunday or Federal holiday within the District of Columbia (see § 1.6(a)), if the party who forwarded such correspondence:

(1) Places the number of the "Express Mail" mailing label on the correspondence prior to the original mailing by "Express Mail,"

(2) Informs the Office of the previous deposit of the correspondence promptly after becoming aware that the Office has no evidence of receipt of the correspondence,

(3) Supplies a copy of the previously deposited correspondence showing the number of the "Express Mail" label thereon,

(4) Supplies a copy of the "Express Mail" label clearly displaying the "date in" entered by the United States Postal Service, and

(5) Includes a statement which establishes, to the satisfaction of the Commissioner, to the previous deposit and that the copies of the correspondence and "Express Mail" label are true copies of the original correspondence and "Express Mail" label. Such statement must be on the basis of personal knowledge, whenever possible, and must be a verified statement if made by a person other than a practitioner as defined in § 10.1(r) of this chapter.

(d) The Office may require additional evidence to determine if the correspondence was deposited as "Express Mail" with the United States Postal Service on the date in question.

#### Part 5 - SECRECY OF CERTAIN INVENTIONS AND LICENSES TO EXPORT AND FILE APPLICATIONS IN FOREIGN COUNTRIES

8. The authority citation for 37 CFR Part 5 continues to read as follows:

Authority: 35 U.S.C. 6, 41, 181-188, as amended by the Patent Law Foreign Filing Amendments Act of 1988, Pub. L. 100-418, 102 Stat. 1567; the Arms Export Control Act, as amended, 22 U.S.C. 2751 *et seq.*, the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 *et seq.*, and the Nuclear Non-Proliferation Act of 1978, 22 U.S.C. 3201 *et seq.*, and the delegations in the regulations under these acts to the Commissioner (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7).

9. Section 5.33 is proposed to be revised to read as follows:

#### § 5.33 Correspondence.

All correspondence in connection with this part, including petitions, should be addressed to "Assistant Commissioner for Patents (Attention: Licensing and Review), Washington, D.C. 20231."

#### Part 10 - REPRESENTATION OF OTHERS BEFORE THE PATENT AND TRADEMARK OFFICE

10. The authority citation for 37 CFR Part 10 continues to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

11. Section 10.23(c)(9) is proposed to be revised to read as follows:

#### § 10.23 Misconduct.

\*\*\*\*\*

(c) \*\*\*

\*\*\*\*\*

(9) Knowingly misusing a "Certificate of Mailing or Transmission" under § 1.8 of this chapter.

October 26, 1995

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

[1180 O.G. 122]

#### (10) Identifying Application Correspondence With Issue Batch Number

Applicants or their attorney or agent can facilitate matching incoming papers with the corresponding application file by indicating the Issue Batch Number on all papers filed in the Office after receiving the Notice of Allowance and before the time the Issue Fee Receipt is received.

The Issue Batch Number is printed on the Notice of Allowance form in Box 4 in the lower left-hand corner below the address. The Issue Batch Number consists of a capital letter followed by two digits, for example, "A03," "D18," "F42," "J79." Any lower case letters before the Issue Batch Number should be ignored since they are the typist's initials. Use of the Issue Batch Numbers is important since the allowed applications are filed by these numbers.

Any paper filed after receiving the Issue Fee Receipt should include the indicated patent number rather than the Issue Batch Number. At this time in the processing, the Issue Batch Number is no longer useful since the application has been removed from the batch at the time the patent number was assigned.

Jan. 16, 1976

RICHARD J. SHAKMAN  
Assistant Commissioner  
for Administration

[943 O.G. 519]

#### (11) Post Card Receipt Reminder

Applicants and the agents are reminded of the provision in Section 717.01(a) (now Section 503) of the Manual of Patent Examining Procedure relating to the use of post cards as "receipts" of papers filed in the Patent Office.

If a receipt for any paper filed in the Patent Office is desired, it may be had by enclosing with the paper a self-addressed post card identifying the paper. The Patent Office will stamp the receipt date on the card and place it in the outgoing mail.

The identifying data on the card should be so complete as to match the paper with the application or other document to which it is to be associated. For example, the document should be identified by the applicant's name(s), Serial No., filing date, appeal number, interference number, etc., and the paper should be identified by specifying the type thereof, viz, affidavit, amendment, appeal, application papers, brief, drawings, fees, motions, supplemental oath or declaration, petition, etc.

When papers for more than one document are filed under a single cover a return post card should be attached to the paper for each document for which a receipt is desired.

Nov. 21, 1968.

RICHARD A. WAHL  
Assistant Commissioner

[857 O.G. 667]

#### (12) Acknowledgement of Receipt of a Patent or Trademark Application

When early notification of the serial number of newly filed application papers is desired, a *stamped, self-addressed post card* should be submitted with each application. Immediately after the mail has been opened in the Patent and Trademark Office, the post card will be stamped with both the receipt date and the serial number, and then returned to the addressee.

Within recent months, hundreds of cards could not be successfully returned because of insufficient postage or incomplete or nonexistent forwarding addresses. Accurate and complete addresses, including ZIP codes, are necessary to ensure prompt acknowledgement of the receipt of patent and trademark applications.

To assist in easy identification once the post card has been returned, it is suggested that the post card include applicant's names and title of invention.

When more than one set of application papers is filed under one cover, a return post card should be attached to each set of papers for which a receipt is desired.

July 19, 1982

THERESA A. BRELSFORD  
Acting Assistant Commissioner  
for Administration

[1021 O.G. 96]

#### (13) Waiver of Certificate of Mailing Requirement Under 37 CFR 1.10

The Patent and Trademark Office (PTO) will propose to amend 37 CFR 1.10, regarding the "Filing of papers and fees by 'Express Mail' with certificate" by, among other things, deleting the requirement for a "Certificate of Mailing by Express Mail" currently necessary to obtain the benefit of the date of deposit with the United States Postal Service (U.S.P.S.) as the filing date of the paper.

#### Background of 37 CFR 1.10 and Rationale for Amendment

35 U.S.C. § 21 authorizes the Commissioner "by rule [to] prescribe that any paper or fee required to be filed in the Patent and Trademark Office will be considered filed in the Office on the date on which it was deposited with the United States

Postal Service." 37 CFR 1.10 was promulgated to implement this provision.

Pursuant to 37 CFR 1.6, papers are stamped with the date of receipt in the PTO. An exception is made for papers filed in accordance with 37 CFR 1.10, which provides for the filing of papers and fees by Express Mail with a certificate. However, in order to claim the benefits of 37 CFR 1.10, a party must comply with its specific requirements that the papers have the number of the Express Mail label placed thereon prior to mailing, be properly addressed to the PTO (see "Change of Address For Trademark Applications and Trademark Related Papers," 1163 TMOG 80 (June 28, 1994), which waived 37 CFR 1.10 to the extent that certain trademark related papers could be addressed to the Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Va. 22202-3513; and "Change of Address For Patent Applications and Patent Related Papers," 1173 OG 13 (April 4, 1995), which waived 37 CFR 1.10 to the extent that patent related papers could be addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231), and include a Certificate of Mailing by Express Mail which states the date of mailing and is signed by the person mailing the papers.

37 CFR 1.10 was promulgated in response to concerns that mail service was sometimes subject to delay and, except for hand-delivery, that there was no way to ensure the timely filing of time-critical documents with the PTO. "Express Mail" was chosen because, among other things, a person other than the filer, that is a disinterested third party working for the U.S.P.S., enters the date of deposit on the Express Mail label.

Under the current rule, the filer is required to include a Certificate of Mailing by Express Mail, certifying the date of deposit as Express Mail. Some papers filed with the PTO, although deposited as Express Mail with the U.S.P.S., have been denied the filing date of the date of deposit as Express Mail because the required Certificate of Mailing by Express Mail was omitted or deficient. The lost filing date for a significant number of these papers has resulted in the loss of substantive rights. For example, a trademark registration may be canceled if the required affidavit of continued use or excusable non-use is not filed by the end of the sixth year of registration. 15 U.S.C. § 1058.

In light of the problematic nature of the requirement for a Certificate of Mailing by Express Mail and its apparent redundancy in purpose, inasmuch as the date of deposit has already been entered by a disinterested third party, the PTO will propose to delete this requirement from 37 CFR 1.10.

This notice applies *only* to correspondence actually received (not to papers lost or misplaced by the U.S.P.S.) at the PTO via Express Mail Post Office to Addressee service where there is a clear indication of the "date in" on the Express Mail label by the U.S.P.S. Filers are encouraged to continue the practice of placing a Certificate of Mailing by Express Mail on papers filed in the PTO by Express Mail since, in some cases, the certificate may provide useful evidence.

#### Interim Waiver of 37 CFR 1.10 for Documents Filed without Certificate of Express Mail

Because a significant period of time will elapse before any final rule change can be promulgated, and because there appears to be no harmful consequence to any party, effective as of the publication date of this notice, the PTO will, sua sponte, waive 37 CFR 1.10 to the extent of granting a filing date as of the "date in" entered on the Express Mail label by the U.S.P.S. employee (unless the "date in" is a Saturday, Sunday or Federal holiday within the District of Columbia; see § 1.6(a)) for all papers actually received at the PTO via Express Mail, regardless of whether the requirement for a Certificate of Mailing by Express Mail has been met provided all other requirements of 37 CFR 1.10 are met.



For all papers filed prior to the date of this notice, which were not in compliance with the Certificate of Mailing by Express Mail requirements under 37 CFR 1.10, a petition to the Commissioner will be required to request that the date of deposit as shown by the "date in" entered on the Express Mail label be accorded as the filing date of the paper. The petition should include a copy of the Express Mail label showing the "date in" entered by the U.S.P.S. employee and a declaration attesting to the contents of the envelope to which the Express Mail label was attached. See 37 CFR 1.183 or 2.146.

#### Summary

In summary, the PTO is waiving, sua sponte, the requirement of 37 CFR 1.10 for a Certificate of Mailing by Express Mail and will propose to amend 37 CFR 1.10 to delete the requirement for a Certificate of Mailing by Express Mail. This waiver becomes effective upon the publication of this notice. For all documents filed by Express Mail prior to this notice, but not in compliance with the Certificate of Mailing by Express Mail requirement, a petition to the Commissioner under either 37 CFR 1.183 or 2.146 must be filed to request that the date of deposit as shown by the "date in" entered on the Express Mail label be accorded as the filing date of the paper.

PHILIP G. HAMPTON, II      EDWARD R. KAZENSKE  
Assistant Commissioner      Deputy Assistant Commissioner  
for Trademarks              for Patents

[1174 O.G. 92]

#### (14) Information in Oath/Declaration Necessary to Identify the Specification for an Application filed under 35 USC 111 in Accordance with 37 CFR 1.63

This notice supersedes the previous notice published at 1035 Off. Gaz. Pat. Office 3 on September 12, 1983, and is intended to make it easier for an applicant(s) to comply with the identification requirement of 37 CFR 1.63.

37 CFR 1.63 requires that an oath or declaration identify the specification to which it is directed. The declaration form suggested by the Office includes spaces for filling in the names of the inventors, title of invention, application number, filing date, foreign priority application information and United States priority application information. While this information should be provided, it is not essential that all of these spaces be filled in order to adequately identify the specification in compliance with 37 CFR 1.63(a)(2).

The following combinations of information supplied in an oath or declaration filed on the application filing date with a specification are acceptable as minimums for identifying a specification and compliance with any one of the items below will be accepted as complying with the identification requirement of 37 CFR 1.63:

- (1) name of inventor(s), and reference to an attached specification which is both attached to the oath or declaration at the time of execution and submitted with the oath or declaration on filing;
- (2) name of inventor(s), and attorney docket number which was on the specification as filed; or

- (3) name of inventor(s), and title which was on the specification as filed.

Filing dates are now granted on applications filed without an oath or declaration in compliance with 37 CFR 1.63, the oath or declaration being filed later with a surcharge. The following combinations of information supplied in an oath or declaration filed after the filing date are acceptable as minimums for identifying a specification and compliance with any one of the items below will be accepted as complying with the identification requirement of 37 CFR 1.63:

- (1) name of inventor(s), and application number (consisting of the series code and the serial number; e.g., 08/123,456);
- (2) name of inventor(s), serial number and filing date;
- (3) name of inventor(s) and attorney docket number which was on the specification as filed;
- (4) name of inventor(s), title which was on the specification as filed and filing date;
- (5) name of inventor(s), title which was on the specification as filed and reference to an attached specification which is both attached to the oath or declaration at the time of execution and submitted with the oath or declaration; or
- (6) name of inventor(s), title which was on the specification as filed and accompanied by a cover letter accurately identifying the application for which it was intended by either the application number (consisting of the series code and the serial number; e.g., 08/123,456), or serial number and filing date. Absent any statement(s) to the contrary, it will be presumed that the application filed in the PTO is the application which the inventor(s) executed by signing the oath or declaration.

Any specification that is filed attached to an oath or declaration on a date later than the application filing date will not be compared with the specification submitted on filing. Absent any statement(s) to the contrary, the "attached" specification will be presumed to be a copy of the specification and any amendments thereto which were filed in the Office in order to obtain a filing date for the application.

Any variance from the above guidelines will only be considered upon the filing of a petition for waiver of the rules under 37 CFR 1.183 accompanied by a petition fee (37 CFR 1.17(h)).

Further, an oath or declaration attached to a cover letter referencing an incorrect application may not become associated with the correct application and, therefore, could result in the abandonment of the correct application.

Supplemental oaths or declarations in accordance with 37 CFR 1.67 will be required in applications in which the oaths or declarations are not in compliance with the other requirements of 37 CFR 1.63 but contain sufficient information to identify the specifications to which they apply as detailed above.

A copy, such as a photocopy or facsimile transmission, of an originally executed oath or declaration is acceptable and may be filed. In the event that a copy of the original is filed, the original should be retained as evidence of authenticity. If a question of authenticity arises, the Patent and Trademark Office may require submission of the original. See 37 CFR 1.4(d)(2).

See MPEP § 1896 for the identification requirements for a declaration filed in a U.S. national stage application filed under 35 USC 371.

These changes will appear in MPEP § 601.01 in the next revision of the Manual.

July 13, 1995

STEPHIN G. KUNIN  
Deputy Assistant Commissioner  
for Patent Policy and Projects

[1177 OG 60]

#### (15) Handling of Status Inquiries

This notice is intended to supplement the discussion set forth in the *Official Gazette* Notice published at 893 *Official Gazette* 810 entitled "Status Inquires" (Dec. 21, 1971).

It has come to the attention of the Patent and Trademark Office (PTO) that its employees may have improperly released confidential information concerning pending applications. Specifically, issue date and patent number information assigned to pending applications may have been improperly released.

No information concerning pending or abandoned patent applications (except reissue applications and reexamination proceedings) may be given to the public by the PTO without the authorization of the applicant or the assignee or attorney or agent of record. 35 USC § 122 and 37 CFR § 1.14. Other exceptions are specified at 37 CFR § 1.14.

However, PTO employees will release information on the status of patent applications to the applicant or assignee or attorney or agent of record if the identity of the requestor can be adequately verified as set forth below.

Telephonic status inquiries should continue to be directed to the PTO clerical personnel. The PTO clerical personnel will obtain the caller's full name, the application serial number and the caller's telephone number. The PTO clerical personnel will ask the caller if there is an attorney or agent of record.

If there is an attorney or agent of record, the PTO clerical personnel will ask for his/her registration number. If the registration number is not known, the PTO clerical personnel will ask for the name of the attorney or agent of record. The PTO clerical personnel will inform the caller that an attorney or agent of record will be called after verification of his/her identity and that the requested status information concerning the application will be released to that attorney or agent.

If there is no attorney or agent of record, the PTO clerical personnel will ask the caller why he/she is entitled to information concerning the application. If the caller identifies himself/ herself as an applicant or an authorized representative of the assignee of record, the PTO clerical personnel will ask for the correspondence address of record. Then, the PTO clerical personnel will inform caller that his/her association with the application must be verified before any information concerning the application can be released, and that he/she will be called back. If the caller indicates that he/she is not an applicant or an authorized representative of the assignee of record, the PTO clerical personnel will inform caller that no information concerning that application will be released.

The PTO clerical personnel will then verify the identity of any caller claiming to be associated with the application by checking the Patent Application Locating and Monitoring (PALM) system or the application file.

If an attorney or agent is of record in the application, the PTO clerical personnel will release the status information concerning the application by calling the attorney's or agent's telephone number obtained from PALM or the application file.

If the applicant or an authorized representative of the assignee of record requests information, and there is no attorney or agent of record and the correspondence of record has been verified, the PTO clerical personnel will release the status information to the caller using the telephone number given by the caller. If the caller's association with the application cannot be verified, no information concerning the application will be released. However, the caller should be informed that the caller's association with the application could not be verified.

In handling an in-person status request, PTO clerical personnel will ask the requester to wait while verifying their identification as set forth above.

May 14, 1990

HARRY F. MANBECK, Jr.  
Assistant Secretary and Commissioner  
of Patents and Trademarks

[1115 O.G. 17]

#### (16) Change in Legal Holidays

The Commissioner's Notice of Sept. 25, 1979, "Change in Legal Holidays," is hereby rescinded, in view of Public Law 98-144, enacted Nov. 2, 1983, which amended the listing of

legal public holidays in 5 USC § 6103. That amendment took effect in 1986 and added a new legal holiday relating to the birthday of Martin Luther King, Jr. This new holiday is designated for the third Mon. in Jan.

Section 6103, as amended, reads as follows:

New Year's Day, Jan. 1.  
Birthday of Martin Luther King, Jr., the third Mon. in Jan.  
Washington's Birthday, the third Mon. in Feb.  
Memorial Day, the last Mon. in May.  
Independence Day, July 4.  
Labor Day, the first Mon. in Sept.  
Columbus Day, the second Mon. in Oct.  
Veterans Day, Nov. 11.  
Thanksgiving Day, the fourth Thurs. in Nov.  
Christmas Day, Dec. 25.

Each of the holidays enumerated will constitute a "Federal holiday within the District of Columbia," as referred to in Section 21, Title 35, United States Code. In accordance with 37 CFR 1.6(a) and 1.10(a), the Patent and Trademark Office will not receive papers on these holidays. Actions required to be taken on such days may be taken on the next succeeding day that the Office is open for business in accordance with 37 CFR 1.7.

July 15, 1986

DONALD J. QUIGG  
Assistant Secretary and  
Commissioner of Patents  
and Trademarks

[1069 OG 12]

#### (17) Closing of Patent and Trademark Office on Monday, Jan. 26, 1987

In view of the official closing of the Federal and District of Columbia government offices in the Washington, D.C. metropolitan area, including the Patent and Trademark Office, on Jan. 26, 1987, the Patent and Trademark Office will consider Jan. 26, 1987, a "federal holiday within the District of Columbia" under 35 U.S.C. § 21. Any action or fee due that day will be considered as timely for the purpose of, e.g., 35 U.S.C. §§ 119, 133 and 151, if the action is taken, or fee paid, on Jan. 27, 1987.

Jan. 28, 1987

DONALD W. PETERSON  
Acting Assistant Secretary  
and Commissioner of Patents  
and Trademarks

[1075 OG 29]

#### (18) Closing of Patent and Trademark Office on Monday, Feb. 23, 1987

In view of the official closing of the Federal and District of Columbia government offices in the Washington, D.C. metropolitan area, including the Patent and Trademark Office, on Feb. 23, 1987, the Patent and Trademark Office will consider Feb. 23, 1987, a "federal holiday within the District of Columbia" under 35 U.S.C. § 21. Any action or fee due that day will be considered as timely for the purposes of, e.g., 35 U.S.C. §§ 119, 133 and 151, if the action is taken, or fee paid, on Feb. 24, 1987.

Feb. 27, 1987

DONALD J. QUIGG  
Assistant Secretary and  
Commissioner of Patents  
and Trademarks

[1098 OG 548]



**(19) Closing of the Patent and Trademark Office on Friday, Jan. 20, 1989**

In view of the fact that Federal and District of Columbia government offices in Washington, D.C. metropolitan area, including the Patent and Trademark Office were officially closed on Jan. 20, 1989, the Patent and Trademark Office will consider Jan. 20, 1989, a "holiday within the District of Columbia" under 35 U.S.C. § 21. Any action or fee due that day will be considered as timely for the purposes of e.g. 35 U.S.C. §§ 119, 133 and 151, if the action is taken, or fee paid, on Jan. 23, 1989. Papers deposited in U.S. Department of Commerce District Offices on Jan. 20, 1989, will similarly be considered timely for the purposes of 35 U.S.C. §§ 119, 133 and 151.

Jan. 6, 1989

DONALD J. QUIGG  
*Assistant Secretary and  
Commissioner of Patents  
and Trademarks*

[1098 OG 548]

**(20) Closing of Patent and Trademark Office on Thursday, January 20, 1994 and Friday, February 11, 1994**

In view of the official closing of the Federal and District of Columbia government offices in the Washington, D.C. metropolitan area, including the Patent and Trademark Office, on January 20, 1994 and February 11, 1994, the Patent and Trademark Office will consider each of those days a "federal holiday within the District of Columbia" under 35 U.S.C. § 21. Any action or fee due on either of those days will be considered as timely for the purpose of, e.g., 35 U.S.C. §§ 119, 133 and 151, if the action is taken, or fee paid, on the next succeeding business day on which the Patent and Trademark Office was open (i.e., Friday, January 21, 1994, and Monday, February 14, 1994, respectively).

March 10, 1994

BRUCE A. LEHMAN  
*Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks*

[1161 OG 12]

**(21) Filing of Papers During Unscheduled Closings of the Patent and Trademark Office**

When the Patent and Trademark Office is officially closed by Executive Order of the President or by the Office of Personnel Management for an entire day because of some unscheduled event, such as adverse weather conditions, the Patent and Trademark Office will consider that day as a "federal holiday within the District of Columbia" under 35 U.S.C. § 21. Any action or fee due that day will be considered as timely for the purposes of, e.g., 35 U.S.C. §§ 119, 133 and 151, if the action is taken, or fee paid, on the next succeeding business day on which the Patent and Trademark Office is open.

When the Patent and Trademark Office is open for business during any part of a business day between 8:30 a.m. and 5:00 p.m., papers are due on that day even though the Office may be officially closed for some period of time during the business day because of an unscheduled event. The procedures of 37 CFR 1.8 or 1.10 may be used, as appropriate, for the filing of papers. On any day the Office is open for at least part of the day, papers may also be deposited up to midnight in any boxes which are provided by the Patent and Trademark Office under 37 CFR 1.6(c).

Information regarding whether or not the Office is officially closed on any particular day may be obtained by calling (703)-557-INFO.

Nov. 18, 1988

DONALD J. QUIGG  
*Assistant Secretary and  
Commissioner of Patents  
and Trademarks*

[1097 OG 53]

**(22) Iraqi Sanctions Regulations**

On January 18, 1991, the Department of the Treasury, Office of Foreign Assets Control (OFAC), published the Iraqi Sanctions Regulations (Regulations) (31 CFR Part 575). 56 Fed. Reg. 2112. The regulations implement Executive Orders 12722 (August 2, 1990) and 12724 (August 9, 1990) relating to certain property and transactions in which the Government of Iraq and persons in Iraq may have an interest.

It appears that the provisions of the Executive Orders and Regulations prohibit transactions relating to the filing or prosecution of applications for patents or for registration of trademarks, where an Iraqi interest is involved. The prohibited transactions, however, may be authorized by a specific license issued pursuant to the procedures described in Section 575.801 of Subpart H of the Regulations.

This notice is intended to alert practitioners and applicants to the prohibitions which may apply to matters before the Patent and Trademark Office, (PTO) if Iraqi interests are involved. This notice is further intended to advise that where such interests or potential interests come to the attention of the PTO, an appropriate specific license from OFAC may be required.

Jan. 29, 1991

HARRY F. MANBECK, Jr.  
*Commissioner of Patents  
and Trademarks*

[1123 OG 37]

**(23) United States Postal Service Interruption and Emergency in South Florida**

The United States Postal Service (USPS) has informed the Patent and Trademark Office (PTO) that an interruption in its service in South Florida was caused by Hurricane Andrew. Normal postal delivery and collection operations of the USPS were impacted by Hurricane Andrew throughout South Florida to varying degrees from Aug. 23, 1992, through Sept. 12, 1992. By Sept. 12, 1992, the USPS restored delivery and collection operations to all of South Florida with the exception of Homestead.

The PTO is designating the interruption in the service of the USPS in South Florida and the overall destruction caused by Hurricane Andrew as a postal service interruption and an emergency within the meaning of 35 U.S.C. 21(a). Any request to accept a paper or fee delayed by the Hurricane Andrew emergency should be directed to Jeffrey V. Nase, Director, Office of Petitions, (703) 305-9285, PK2-913, for patent-related matters and to Lynne G. Beresford, Trademark Legal Administrator, (703) 305-9464, PK2-910, for trademark-related matters.

Oct. 7, 1992

DOUGLAS B. COMER  
*Acting Assistant Secretary and Acting  
Commissioner of Patents and Trademarks*

[1144 OG 8]

**(24) UNITED STATES POSTAL SERVICE INTERRUPTION and EMERGENCY IN LOS ANGELES**

The January 17, 1994, Los Angeles earthquake has caused a service interruption in United States Postal Service (USPS) in the greater Los Angeles area. Normal postal delivery and

collection operations of the USPS were impacted by the earthquake throughout the greater Los Angeles area to varying degrees from January 17, 1994, through January 21, 1994.

The Patent and Trademark Office (PTO) is designating the interruption in the service of the USPS in the greater Los Angeles area and the overall destruction caused by the earthquake as a postal service interruption and an emergency within the meaning of 35 U.S.C. 21(a). Any request to accept a paper or fee delayed by this emergency should be directed to Jeffrey V. Nase, Director, Office of Petitions, (703) 305-9285, PK3-704, for patent-related matters, and to Lynne G. Beresford, Trademark Legal Administrator, (703) 305-9464, PK2-910, for trademark-related matters.

February 9, 1994

BRUCE A. LEHMAN  
*Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks*

[1160 OG 39]

**(25) United States Postal Service Interruption and Emergency in the State of California**

A service interruption in United States Postal Service (USPS) in the State of California occurred on June 29, 1995, due to the action of the UNABOM bomber. The USPS will maintain heightened security procedures for mail originating in the State of California. These procedures will be in effect until further notice and are as follows:

Mail destined for California is not affected by these procedures.

For Express Mail, Priority Mail, First-Class Mail, international air mail and military mail items weighing less than 12 ounces, normal collection, distribution, and transportation will remain in effect.

Mail weighing 12 ounces or more which has been placed into California collection boxes will be returned to the sender. Postal Service window clerks will not accept Express Mail, Priority Mail, First-Class Mail, international air mail or military mail weighing 12 ounces or more.

Postal Service marketing and sales managers will work with known shippers to accept mail pieces weighing 12 ounces or more, but this mail will not be transported on scheduled passenger airlines.

Parcel post and international surface mail originating in California are not affected by these procedures.

The Patent and Trademark Office (PTO) is designating the interruption in the service of the USPS in the State of California caused by the UNABOM bomber as a postal service interruption and an emergency within the meaning of 35 U.S.C. 21(a). Any request to accept a paper or fee delayed by this emergency should be directed to Jeffrey V. Nase, Patent Legal Administrator, (703) 305-9285, PK1-520, for patent-related matters, and to Lynne G. Beresford, Trademark Legal Administrator, (703) 308-8900, 10B10 ST, for trademark-related matters.

June 30, 1995

BRUCE A. LEHMAN  
*Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks*

[1176 OG 74]

**(26) Rules Concerning Conduct on Patent and Trademark Premises****1. Applicability**

These rules apply to all premises under the charge and control of the U.S. Patent and Trademark Office (PTO) through the General Services Administration and to all persons entering such premises.

**2. Admission to Property**

Patent and Trademark Office facilities are closed to the public outside of normal working hours. During normal working hours, a valid User Pass is required to enter PTO premises.

The individual's User Pass must be displayed at all times while on PTO premises.

**3. Preservation of Property/Conduct on PTO Premises**

The following activities are prohibited on PTO premises:

a. Improperly disposing of rubbish; willfully destroying or damaging property; theft of property; creating a hazard to persons or things; and placing Government documents or materials in storage lockers.

b. The willful and unlawful concealment, removal, mutilation, obliteration or destruction, or attempts to do so, or, with intent to do so, or taking and carrying away of any record, book, paper, document, or other things from the facilities shall result in a fine of not more than \$2,000 or imprisonment of not more than 3 years, or both. See 18 U.S.C. § 2071.

c. Removal of papers, materials, or other Government property from designated areas. Within a designated area, papers or other Government property must be returned to its proper location after use, unless otherwise posted.

d. Using PTO premises and facilities as a place of business. It is prohibited to reserve work areas, use PTO as a mailing address, use PTO stationery, or a PTO telephone number as a personal telephone number.

**4. Inspection**

Packages, briefcases, storage lockers and other containers in the possession of visitors, employees, or other persons arriving at, working at, visiting, or departing from the PTO are subject to inspection. See 41 CFR § 101-20.301.

**5. Disturbances**

Disorderly conduct or other conduct which creates a loud or unusual noise or a nuisance which impedes or disrupts the performance of official duties by Government employees or which prevents the public from obtaining the administrative services provided on the property in a timely manner is prohibited. See 41 CFR § 101-20.305.

**6. Conformity with signs and directions**

Persons on the PTO premises shall at all times comply with the official signs of a prohibitory, regulatory or directory nature and with the lawful direction of PTO employees.

No rude or abusive conduct to PTO employees and fellow users.

No food or beverages are permitted.

No smoking except in designated areas.

No mechanical or electronic equipment such as radios, televisions, typewriters, computers, or photographic equipment may be used without prior permission from the Assistant Commissioner for Administration.

No use of PTO telephone and office equipment, except as specifically designated for public use.



## 7. Penalties and other laws.

Nothing in these rules shall be construed to abrogate any other Federal laws or regulations or any State and local laws and regulations applicable to any area in which property under the charge and control of the PTO through the U.S. General Services Administration is situated. See 40 U.S.C. §§ 318(c) and 486(c).

41 CFR § 101-20.315 provides that whoever is found guilty of violating the rules of conduct on Federal property contained in 41 CFR § 101-20.3 while on any property under the charge and control of the U.S. General Services Administration is subject to a fine of not more than \$50, imprisonment of not more than 30 days, or both. See 40 U.S.C. § 318c.

Failure to follow these rules may result in immediate removal from the premises, suspension of user privileges, and/or enforcement of any criminal sanctions that may apply.

Aug. 30, 1991

THERSA A. BRELSFORD  
Assistant Commissioner for  
Administration

[1131 OG 7]

## (27) Filing of a Notice of Appeal to the Court of Appeals for the Federal Circuit in the Patent And Trademark Office

This notice supersedes a notice entitled Filing of a Notice of Appeal to the Federal Circuit and Service of Court Papers on the Commissioner of Patents and Trademarks published at 1079 Off. Gaz. Office 72 (June 30, 1987).

A notice of appeal to the Court of Appeals for the Federal Circuit may be filed in the Patent and Trademark Office in any one of the following ways:

A. By first-class mail addressed as follows, in which case the notice of appeal must actually reach the Patent and Trademark Office by the due date:

Box 8  
Commissioner of Patents and Trademarks  
Washington, D.C. 20231  
Attention: Office of the Solicitor

B. By "Express Mail" (U.S. Postal Service only) under 37 CFR § 1.10 addressed as follows, in which case the notice of appeal is deemed filed on the date of the Express Mail certificate:

Box 8  
Commissioner of Patents and Trademarks  
Washington, D.C. 20231  
Attention: Office of the Solicitor

C. By hand (on or before the due date) to the Office of the Solicitor. The Office of the Solicitor is located at:  
Crystal Park II  
Suite 918  
2121 Crystal Drive  
Arlington, Va.

D. By facsimile transmission to the Office of the Solicitor. The telephone number for accessing the Office of the Solicitor facsimile machine is (703) 557-9373. A notice of appeal will be deemed timely filed on the date the facsimile transmission is received by the Office of the Solicitor, provided an original notice of appeal is subsequently received in either of the following ways:

- (1) An original, signed copy of the notice of appeal is actually received in the Office of the Solicitor within five calendar days of the facsimile transmission; or,
- (2) An original, signed copy of the notice of appeal is mailed by "Express Mail" (U.S. Postal Service only) under 37 CFR § 1.10 on the day of the facsimile transmission.

The facsimile machine for receiving a notice of appeal is located in the Office of the Solicitor and is staffed during the business hours of 8:30 a.m. to 5:00 p.m., Monday through Friday, excluding holidays. Due to possible equipment failure or maintenance requirements, precautions must be taken when relying on the availability of this service near the end of the time for filing a notice of appeal.

Mar. 22, 1990

FRED E. McKELVEY  
Solicitor

[1113 O.G. 27]

## (28) Service of Court Papers on the Commissioner of Patents and Trademarks

Court papers other than a notice of appeal to the U.S. Court of Appeals for the Federal Circuit may be served on the Commissioner in either of the following ways:

A. By hand between 8:30 a.m. and 5:00 p.m. at the Office of the Solicitor, located in Crystal Park II, Suite 918, 2121 Crystal Drive, Arlington, Va.

B. By mail in an envelope addressed as follows:  
Office of the Solicitor  
P.O. Box 15667  
Arlington, Va. 22215

While the above mail service address may be supplemented to include the name of the particular attorney assigned to the court case, it must not be supplemented to refer to either the Commissioner of Patents and Trademarks or the U.S. Patent and Trademark Office (PTO).

Court papers mailed to an address other than the above mail service address and court papers delivered by hand are deemed to have been served on the Commissioner when actually received in the Office of the Solicitor.

Papers which are not court papers and are intended to be filed in the PTO in connection with an application or other proceeding pending in the Office shall not be mailed to the Solicitor's mail service address. Any such papers which are mailed to the Solicitor's mail service address will not be considered to have been filed in the PTO. Instead, all such papers will be returned. No exceptions will be made to this policy.

Mar. 22, 1990

FRED E. McKELVEY  
Solicitor

[1113 O.G. 28]

(29) DEPARTMENT OF COMMERCE  
Patent and Trademark Office  
37 CFR Parts 1, 2 and 3  
[Docket No. 910246-2140]  
RIN 0651-AA43

## Changes in Patent and Trademark Assignment Practice

Agency: Patent and Trademark Office, Commerce  
Action: Final Rule.

Summary: The Patent and Trademark Office (Office) is amending the rules of practice regarding assignments in patent and trademark cases to improve and clarify the rules, to codify changes in practice and to consolidate the rules. The Office has combined the assignment rules currently in Parts 1 and 2 into a new Part 3 directed to assignments.

Effective Date: Sept. 4, 1992. These rules will be applicable to all documents filed with the Office on or after the effective date.

For Further Information Contact: Trademark related matters: Lynne Beresford by telephone at (703) 305-9464 or by mail marked to her attention addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231. Patent related matters: Jeffrey V. Nase by telephone at (703) 305-9282 or by mail marked to his attention and addressed to

Commissioner of Patents and Trademarks, Box DAC, Washington, D.C. 20231.

Supplementary Information: In a Notice of Proposed Rulemaking published in the Federal Register on May 10, 1991 at 56 FR 21641 and in the Patent and Trademark Office "Official Gazette" of June 4, 1991 at 1127 O.G. 8-16, the Office proposed to amend the rules of practice in patent and trademark cases to revise, simplify, remove, or clarify existing assignment rules or to codify certain practices currently in effect. Changes were proposed for rules relating to the documents that will be recorded, to the requirements for recording a document, to the effect of recording, to new cover sheet requirements, to the appointment of domestic representatives; and to prosecution by assignees and issuance to assignees. While the existing rules do not require a cover sheet to accompany each document submitted for recording, typically a cover letter is submitted to ensure proper processing of the document.

The Office has encouraged the public to use a cover letter containing specific information concerning the document being submitted with each document submitted for recording. See "Helpful Hints", 1114 Official Gazette 77 (May 29, 1990). The public has adopted the suggested procedure to such an extent that most documents now submitted for recordation are accompanied by a cover letter which contains the suggested data. Documents submitted with these cover letters have enabled the Office to greatly improve the quality and efficiency of the recording process. To better ensure that the correct data is captured in recordation and recorded promptly, the Office is making a cover sheet mandatory. The cover sheet will contain all the information necessary for the Assignment Branch to properly and promptly process the document.

Written comments were submitted by 12 firms, 2 individuals, 4 corporations and 1 organization. No one testified at the oral hearing held on July 17, 1991.

The following includes a brief discussion of the rules being changed and the reasons for those changes, a detailed section-by-section analysis of the final rules, and an analysis of the comments received in response to the notice of proposed rulemaking.

Specific Rules to be Deleted or Added: The existing rules of practice in Parts 1 and 2 of Title 37 of the Code of Federal Regulations which are deleted are §§ 1.32, 1.331, 1.332, 1.333, 1.334, 2.185, 2.186 and 2.187. These rules are deleted in their entirety and rewritten and renumbered under a new Part 3. Table 1 is provided to assist readers in correlating previous rules with the new rules.

TABLE 1

Old Section	New Section
1.32	3.71 & 3.73
1.331(a)	3.11
1.331(b)	3.26
1.331(c)	3.21
1.332	3.51
1.333	3.56
1.334	3.81
2.185(a)	3.11
2.185(a)(1)	3.31
2.185(a)(2)	3.26
2.185(a)(3)	3.41
2.185(a)(4)	3.61
2.185(b)	3.31(b)
2.185(C)	3.51
2.186	3.71 & 3.73
2.187	3.85

Consideration was given to moving § 1.12 (Assignment records open to public inspection.) to Part 3. However, since this section primarily relates to records maintained by the Office and procedures for accessing those records, and no comments were received regarding the placement of § 1.12, this section remains under the general heading "Records and Files" of the Patent and Trademark Office.

Discussion of Specific Rules to be Changed or Added: Section 1.12(a) is revised to reflect the fact that all assignment records related to pre-1955 trademark records and pre-1957 patent records were transferred to the National Archives and Records Administration (NARA) during 1990. All assignments recorded

on or after January 1, 1955, for trademarks and May 1, 1957, for patents continue to be maintained by the Office. The pre-1955/1957 records have been transferred to NARA to allow for greater accessibility to the public, improvement of file integrity for the older records, and preservation of these materials. The pre-1955/1957 assignment cards, digest books, and libers were stored in four locations: the Assignment Search Room (ASR) at the Office, the Federal Records Center in Suitland, Maryland, the National Archives in downtown Washington, D.C., and the National Archives location in Alexandria, Virginia. Storage of information in these various locations made searching of old assignment records difficult. The materials located at the Federal Records Center could be ordered from the ASR. However, many times it took months to receive the materials.

All assignment records from 1837 to December 31, 1954, for trademarks and from 1837 to April 30, 1957, for patents are now maintained and are open for public inspection in the National Archives Research Room located at the Washington National Records Center Building, 4205 Suitland Road, Suitland, Maryland 20746. Assignments recorded before 1837 are maintained at the National Archives and Records Administration, 841 South Pickett Street, Alexandria, Virginia 22304.

All requests for abstracts of title continue to be provided by the Office upon request and payment of fees set forth in §§ 1.19 and 2.6. Requests for copies and certified copies of the pre-1955 records for trademarks and pre-1957 records for patents should be directed to NARA since those records are not maintained by the Office. Since these records are maintained by NARA, it is more expeditious to request copies directly from NARA, rather than the Office, which would then have to route the requests to NARA. Payment of the fees required by NARA should accompany all requests for copies.

Another change makes clear that separate assignment records are kept for patents and trademarks, and that an extra charge will be imposed by the Office on requests for copies of recorded assignments if the correct reel and frame number are not identified.

Sections 1.17 and 1.46 are amended to make reference to § 3.81, which replaces § 1.334, and delete reference to § 1.334. The amount of the fee for recording a document is not affected by this rule change.

Section 1.104(e) is amended to make reference to Part 3, which replaces § 1.331, and delete reference to § 1.331.

Section 3.1 is added to set out definitions of terms used in Part 3. Terms which are defined include "application," "assignment," "document," "Office" (meaning Patent and Trademark Office), "recorded document," and "registration." Definitions are provided to make clear the intended meanings of the terms used in Part 3. These definitions are intended to be applicable only to Part 3. For example, the term "application" is defined, for the purpose of Part 3, to mean a national application for patent, an international application for patent that designates the United States of America, or an application to register a trademark, unless otherwise indicated.

Section 3.11 replaces and modifies the practice set forth in § 1.331(a) and 2.185(a), which specify the documents the Office will record. This section specifies that assignments of patents and registrations will be recorded, as well as other documents which affect title to applications, registrations and patents. Section 3.11 requires that a completed cover sheet as specified in §§ 3.28 and 3.31 be submitted with the document to be recorded.

Section 3.16 is added to incorporate the limitation set out in 15 U.S.C. § 1060 proscribing the assignment of an intent-to-use trademark application prior to the filing of a statement of use, except as a part of the sale of an on-going business. Because the rules in Part 3 are intended to address all rules relating to assignments, it is appropriate to refer to the statutory requirements of an assignment of an intent-to-use trademark application.

Section 3.21 replaces and modifies the practice of § 1.331(c). Section 3.21 sets forth requirements for the identification of patents or patent applications in documents submitted for recording. An assignment relating to a patent must identify the patent by number. The name of the inventor, the issue date, and title of the invention as stated in the patent may also be given in the assignment to provide additional information on the patent being assigned. An assignment relating to a national



patent application must identify the national patent application by application number (consisting of the series code and the serial number, e.g., 07/123,456) or serial number and filing date. An assignment relating to an international patent application which designates the United States of America must identify the international application number (e.g., PCT/US90/01234). The name of the inventor, date of filing, and title of the invention as stated in the patent application may also be given in the assignment. If an assignment is executed concurrently with, or subsequent to, the execution of the patent application, but before the patent application is filed, it must identify the patent application by its date of execution, name of each inventor, and title of the invention so that there can be no mistake as to the patent application intended. Assignments submitted for recording that do not identify the patent or patent application as required by this section will not be recorded, but will be returned to the correspondence address that is required to be provided on the cover sheet by § 3.31(e).

Section 3.24 is added to set out formal document requirements to facilitate and expedite the recording process. This section requires that documents, either the original or a true copy of the original, submitted for recording be legible, using only one side of each page. The paper used should be flexible, white, durable, and preferably no larger than 21.6 x 33.1 cm. (8 x 14 inches), with a 2.5 cm. (one-inch) margin on all sides. Documents submitted in this form are camera-ready and can be recorded expeditiously with little additional handling required. Documents that fail to meet the legibility and single-sided paper requirements of this section will be returned as set forth in § 3.51.

Section 3.26 replaces and modifies the practice of §§ 1.331(b) and 2.185(a)(2). Section 3.26 provides that the Office will accept and record non-English documents provided they are accompanied by a verified English translation signed by the translator. Documents submitted that fail to meet the requirements of this section will be returned as set forth in § 3.51.

Section 3.27 is added to set out how documents submitted for recording should be addressed to the Office. To ensure prompt and proper processing, documents and their cover sheets should be addressed to the Commissioner of Patents and Trademarks, Box Assignments, Washington, D.C. 20231, unless they are filed together with new applications or with a petition under § 3.81(b). Petitions under § 3.81(b) should be addressed to the Commissioner of Patents and Trademarks, Box DAC, Washington, D.C. 20231. New applications and other petitions should be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Section 3.28 is added to set out the requirement that all documents submitted to the Office for recording be accompanied by at least one coversheet referring either to the patent applications and patents or to the trademark applications and registrations against which the document is to be recorded. Only one set of documents and cover sheets to be recorded should be filed. If a document to be recorded includes interests in, or transactions involving, both patents and trademarks, separate patent and trademark coversheets must be submitted. If a document to be recorded is not accompanied by a completed cover sheet, the document and any incomplete cover sheet will be returned to the correspondence address for proper completion of the cover sheet and resubmission of the cover sheet and document. While the previous rules did not require a cover sheet to accompany each document submitted for recording, typically a cover letter is submitted to ensure proper processing of the document. The Office is making a cover sheet mandatory in order to better ensure prompt and proper processing of all documents submitted for recording. The cover sheet contains all the information necessary for the Office to process the document.

Section 3.31 is added to set out the formal requirements of the cover sheet. Section 3.31 requires that each patent or trademark cover sheet must contain (1) the name of the party conveying the interest; (2) the name and address of the party receiving the interest; (3) a brief description of the interest conveyed or transaction to be recorded (e.g., assignment, license, change of name, merger, security agreement, etc.); (4) each application number, patent number or registration number against which the document is to be recorded, or an indication that the document is filed together with a patent application; (5) the name and address of the party to whom correspondence

concerning the document to be recorded should be mailed; (6) the number of applications, patents or registrations identified in the cover sheet and the total fee; (7) the date the document was executed; (8) an indication that the assignee of a trademark application or registration who is not domiciled in the United States has designated a domestic representative; (9) a statement by the party submitting the document that to the best of the person's knowledge and belief, the information contained on the cover sheet is true and correct, and (10) the signature of the party submitting the document. The term "party" as used in this rule means the person whose name appears on the documents to be recorded, that person's attorney or registered agent, or a corporate officer where a corporation's name appears on the document. Sample cover sheets for patent documents and for trademark documents are shown in Appendices A and B.

Section 3.34 is added to set out the procedure to correct obvious errors in a recorded cover sheet. This section requires that if a recorded cover sheet contains an error that is apparent when the cover sheet is compared with the recorded document, the error will be corrected only if a corrected cover sheet is filed for recordation. The corrected cover sheet must be accompanied by the originally-recorded document or a copy of the originally-recorded document and by a new assignment recording fee in the appropriate amount.

Section 3.41 replaces and consolidates practice under §§ 1.331(a) and 2.185(a)(3) regarding recording fees. Section 3.41 requires that all requests to record documents be accompanied by the appropriate fee. A fee is charged for each application, patent and registration identified in the cover sheet. The recording fee for patents and patent applications is specified in § 1.21(h). The recording fee for trademark registrations and applications is specified in § 2.6(q).

Section 3.51 replaces and modifies the practice of §§ 1.332 and 2.185(c). Section 3.51 sets the date of recording of a document as the date the document meeting the requirements for recording set forth in this Part is filed in the Office. A document which does not comply with the identification requirements of § 3.21 will not be recorded. For documents not accepted for recording, parties can petition under 37 CFR §§ 1.181 and 2.146(a). Other documents not meeting the requirements for recording, for example, a document submitted without a completed cover sheet, without the required fee, or without any required translation, will be returned for correction to the sender when a return address is available. The returned papers, stamped with the official date of receipt in the Office, will be accompanied by a letter indicating that if the returned papers are corrected and resubmitted to the Office within time specified in the letter, the Office will consider the original date of filing of the papers as the date of recording of the papers. Submitters can use the certificate procedure under either § 1.8 or § 1.10 for resubmissions of returned papers if they desire to have the benefit of the date of deposit in the United States Postal Service. If the returned papers are not corrected and resubmitted within the specified period, the date of filing of the corrected papers will be considered to be the date of recording of the papers. Extensions of time will not be available to extend the specified period to resubmit the returned papers.

Section 3.54 is added to set out the effect of recording a document. This section states that the recording of a document is not a determination by the Office of the validity of the document or the effect that document has on the title to an application, a patent, or a registration. The Office will determine, when necessary, what effect a document has, including whether a party has the authority to take an action in a matter pending before the Office. Examples of when the Office will need to determine whether a party has the authority to take an action in a matter pending before the Office include: (1) prosecution by the assignee as in § 3.71; (2) consent of an assignee to the filing of a reissue application as provided in § 1.172; and (3) execution of a disclaimer under § 1.321 by an assignee.

Section 3.56 replaces and modifies the practice of § 1.333. Section 3.56 provides that an assignment, which at the time of its execution is conditional on a given act or event, will be treated by the Office as an absolute assignment. This section serves as notification as to how a conditional assignment will be treated by the Office in any proceeding requiring a determination of the owner of an application, patent or registration.

Since the Office will not determine whether a condition has been fulfilled, the Office will treat the submission of such an assignment for recordation as signifying that the act or event has occurred.

Section 3.61 replaces and modifies the practice of § 2.185(a)(4). Section 3.61 sets forth that an assignee of a trademark application or registration not domiciled in the United States must designate a domestic representative in writing to the Office. Assignees of patent applications or patents may designate domestic representatives if the assignee is not residing in the United States. 35 U.S.C. § 293. The designation is required to state the name and address of a person residing within the United States on whom may be served process or notice of proceedings affecting the application, patent or registration or rights thereunder.

Section 3.71 replaces and modifies the practice of §§ 1.32 and 2.186. Section 3.71 sets forth that the assignee of record of the entire right, title and interest in an application for patent is entitled to conduct the prosecution of the patent application to the exclusion of the named inventor. Similarly, the assignee of an application for registration is entitled to conduct the prosecution of the trademark application to the exclusion of the applicant.

Section 3.73 is added to set out the procedure by which an assignee can establish the right to take action in an application, patent or registration. The inventor is presumed to be the original owner of a patent application and any patent that may issue therefrom, unless there is an assignment. The original applicant is presumed to be the original owner of a trademark application and any registration that may issue therefrom, unless there is an assignment. Any action before the Office with respect to an assigned patent application, patent, or reexamination may be taken by the assignee of the entire right, title, and interest, provided ownership is established to the satisfaction of the Commissioner. The assignee may establish ownership by submitting to the Office documentary evidence of a chain of title from the original owner to the assignee or by specifying (e.g., reel and frame number, etc.) where such evidence is recorded in the Office. Additionally, when a patent assignee is not represented by an attorney or registered agent, a statement signed by the assignee must also be submitted stating the evidence has been reviewed and certifying that, to the best of the party's knowledge and belief, title is in the party seeking to take the action. Documents submitted to establish ownership may be required to be recorded in the Office as a condition to permitting the requesting party to take action in a matter pending before the Office. Any action before the Office with respect to an assigned trademark registration, application or post-registration matter, may be taken by the assignee provided ownership is established to the satisfaction of the Commissioner by recording an assignment to the assignee or by submitting other proof of the assignment.

Section 3.81 replaces and modifies the practice of § 1.334. Section 3.81 sets forth the procedure for issuance of a patent to an assignee. If an assignment of the entire right, title, and interest is recorded before the issue fee is paid for a patent application, the patent may issue in the name of the assignee. If the assignee holds an undivided part interest, the patent may issue jointly to the inventor and the assignee. At the time the issue fee is paid, the name of the assignee must be provided if the patent is to issue solely or jointly to that assignee. If the assignment is submitted for recording after the date of payment of the issue fee, but prior to issuance of the patent, the assignee may petition that the patent issue to the assignee. Any such petition must be accompanied by the fee set forth in § 1.17(i)(1).

Section 3.85 replaces and modifies the practice of § 2.187. Section 3.85 sets forth the procedure for issuance of a registration to an assignee. The certificate of registration may be issued to the assignee of the applicant, or in a new name of the applicant, provided that the party files a written request in the trademark application record by the time the application is being prepared for issuance of the certificate of registration, and an appropriate document is recorded in the Office. If the assignment or name change document has not been recorded in the Office, then the written request must state that the document has been filed for recordation. The address of the assignee must be made of record in the trademark application file.

#### Response to Comments on the Rules

The comments received in response to the notice of proposed rulemaking have been given careful consideration and a number of the suggested modifications have been adopted. The comments and responses are discussed below.

In this discussion, "Patent and Trademark Office" is abbreviated as "Office" or "PTO".

**Comment:** Two comments were received addressed to the overall rule package. One comment expressed concern over the potential confusion of instituting a new Part 3. It was suggested that Parts 1 and 2 be amended to contain the necessary changes. Another comment was concerned that the rules and specifically the new cover sheet requirement would impede promptness and accuracy of the recordation process.

**Response:** The Office has determined that the new rules will result in greater efficiency and accuracy in the recordation process and improve the integrity of the records maintained by the PTO. Further, the PTO believes that a new Part 3, containing all rules relating to assignments, will be beneficial to the majority of patent and trademark system users.

**Comment:** Section 3.1 was proposed to define "application" as an application for patent or an application to register a trademark. One comment questioned whether international applications filed under the Patent Cooperation Treaty were included in the definition of the word "application."

Two comments were received concerning the definition of "assignment." As proposed, § 3.1 defines "assignment" of a trademark in terms of a "trademark application" or "registration." The comments suggested that because Section 10 of the Trademark Act, 15 U.S.C. § 1060, speaks in terms of a "registered mark" or a "mark for which application to register has been filed," which was reflected in previous trademark rule 2.186, the different terminology may be construed to permit assignment of a trademark without assignment of the underlying goodwill.

**Response:** The wording of § 3.1 has been changed to include both national applications for patent and international applications that designate the United States in the term "application."

Also to avoid any potential confusion over the definition of a trademark assignment, the Office adopted the suggestion to reflect Section 10 of the Trademark Act and to refer to a "registered mark" or a "mark for which application to register has been filed" in its definition of assignment.

**Comment:** As proposed, § 3.16 provides that an application to register a mark under 15 U.S.C. § 1051(b) cannot be assigned before a statement of use is filed except to a successor to an ongoing business of the original applicant. One comment suggested § 3.16 be further amended to correct a legislative oversight and permit assignment of the application after an amendment to allege use is filed.

One other comment suggested the PTO define the statutory language "successor to the business of the applicant."

**Response:** As proposed, Rule 3.16 merely restates the statute. To permit the filing of an assignment to a successor to an ongoing business before an amendment to allege use has been filed would make the rule inconsistent with the statute.

As to the definition of "successor to the business of the applicant," it has been determined that in the absence of any statutory definition, it is better left to case law to establish the meaning. A business, or portion thereof, can be transferred or assigned in a variety of ways, and the question of valid ownership might arise in a variety of circumstances. For the PTO to define what constitutes a successor may be duly restrictive.

Accordingly, the suggested modifications have not been adopted.

**Comment:** Section 3.21, as proposed, provides that an assignment of a patent or patent application must be identified by number. One comment requested a further amendment to allow the filing of a patent assignment after filing an application for patent but before knowing the application number by allowing identification by the execution date, inventors and title of the invention instead of the application number.

Another comment suggested that assignments relating to trademark applications and registrations should also be required to have the identifying serial and registration numbers within the body of the assignment document.



One comment questioned whether the patent identification number was required in the document or whether the number could just appear on the cover sheet.

**Response:** Providing the identifying number in the assignment document allows for greater efficiency and accuracy in recording assignments. However, unlike patents, trademarks can have an indefinite life. Assignments may be recorded years after an assignment has occurred to clear up the chain of title. It may not be possible to execute a new assignment to include identifying numbers in the document years later. Accordingly, it is preferable for the PTO to be more flexible in recording trademark assignments which may contain the identifying number in the cover sheet rather than in the document itself. Because of the nature of a patent, less flexibility is permitted. Patent rights, unlike trademark rights, do not exist apart from the issued patent. Accordingly, when an interest in a patent is transferred, the patent identifying number must be in the assignment document. This requirement only applies to assignments, not to documents other than assignments.

The PTO makes every effort to provide applicants with the application numbers for newly-filed patent applications as soon as possible. It is suggested, however, that assignment documents may be written to allow entry of the identifying number after the execution of the assignment. An example of acceptable wording is: "I hereby authorize and request my attorney, (Insert name), of (Insert address), to insert here in parentheses (Application number, filed) the filing date and application number of said application when known."

Accordingly, the suggested modifications have not been adopted.

**Comment:** Section 3.24, as proposed, provides the formal requirements for the documents which are to be recorded and the cover sheet. Three comments stated that the one-side only requirement was unreasonable in light of PTO's issuance of two-sided patent and trademark copies and of the practices of other governments and corporations over which the submitter would have no control.

One comment requested clarification of "bond weight paper" and suggested the language used in the rules setting out drawing requirements be adopted.

One comment stated that the document size requirements should only pertain to documents prepared and executed by parties who wish to convey title.

Two comments questioned whether the PTO would permit the filing of copies or true copies in lieu of the original documents for recording.

**Response:** The formal requirements set out in § 3.24 are related to PTO's ability to capture on film papers filed with the PTO. The requirements are not related to the other printing or photocopying services PTO provides. Micrographics reproduction requires that only one side of each page be used for efficiency. If the original document is two-sided or the wrong size, the practitioner can comply with this requirement by providing a true copy of the original document using only one side of each page on the correct size paper. The language in § 3.24 has been changed to clarify that true copies or originals are acceptable. Further, the language describing the type of paper to be used has been changed to be consistent with the drawing requirement rules.

**Comment:** Section 3.28, as proposed, provides that all requests to record a document must be accompanied by the document to be recorded and at least one cover sheet. One comment expressed confusion over whether the document must be accompanied by a cover letter as well as a request for recording. One comment stated the requirement for a cover sheet did not help the PTO with the documents which are filed with applications and the commenter did not see the need for an additional paper included among the papers for a new application.

**Response:** The first sentence has been rewritten to clarify that only the document and a cover sheet(s) must be submitted. A separate request for recording is not required or needed. Because the cover sheet provides all pertinent information in one place, it will greatly assist the processing of assignments by the PTO. For those applications which are filed with an assignment, the additional cover sheet required for the assignment aids the processing of the assignment.

**Comment:** Numerous comments were received on the proposed cover sheet requirements of § 3.31. One comment ques-

tions whether the form or the contents of the form are being required and cautioned that the cover sheet should not become a technical obstacle to recordation.

Two comments claimed the cover sheet requirement would be burdensome and the documents recorded should speak for themselves.

Two comments objected to the requirement for the characterization of the interest being conveyed. One of the commentors indicated it was not the best evidence of what the interest is and may be misleading while the second comment or was concerned practitioners would be subject to malpractice claims and be made parties to litigation involving the transfer.

One comment stated that requiring the assignee's address was burdensome and excessive. Three comments questioned the lack of consistency between proposed subsections (a) and (b) of § 3.31 which requires only the name of the conveyor but both the name and address of the receiver.

Two comments stated that the language of the rule was unclear as to whether the list of properties within the assignment document should be retyped on the cover sheet, which would be burdensome and fraught with potential errors.

One comment was received suggesting that properties be identified with as much information as possible (i.e., serial number, patent number, filing date, inventors, etc.).

Four comments stated that the requirement for an execution date of the document is excessive and burdensome. One of the comments stated that the execution date may not be as important as the effective date of the document. One suggested the effective date would be more accurate and another suggested the document should speak for itself. One additional comment stated that a nunc pro tunc assignment of the substantive rights of an assignee or assignor may be unduly affected by the requirement for recitation of the execution date.

Nine comments were received objecting to the language of the proposed verification. Some comments recommended that the verification statement be deleted. Other comments recommended that the verification statement be based on "information and belief." The comments indicated (1) practitioners did not want to be held responsible for the information entered on the cover sheet, (2) there was no purpose served by signing the cover sheet because the documents should speak for themselves and (3) under 37 C.F.R. § 10.18, a registered practitioner's signature indicates that the filing is correct.

One comment suggested that proposed § 3.31(i) does not recognize the right of some non-lawyers to practice in trademark matters before the PTO.

Additionally, many comments and suggestions were received on the layout of the sample cover sheets.

**Response:** The proposed purpose of the cover sheet is to provide a synopsis of the vital information contained in a recorded document. The cover sheet form itself is not required, only the information outlined in § 3.31 is required. Use of the sample cover sheet formats appearing as Appendices A and B to the rule package is encouraged. The Office will make paper copies of the sample cover sheets available for customer use. Persons wishing to obtain paper copies of the sample cover sheets should contact the Public Service Center at (703) 305-HELP. Questions regarding the sample cover sheets should be directed to the Assignment and Certification Services Division at (703) 308-9700.

As indicated in the proposed rule package, a majority of documents presently filed for recording are accompanied by a cover letter containing much of the information required in § 3.31. The PTO does not believe standardization of the information submitted is an undue burden. Standardization ensures easy reference to all critical information. Further, the parties or their representatives are in a better position to know or ascertain the nature of the interest involved than the PTO. The document will always speak for itself. However, a characterization assists in putting others on notice as to the nature of the transaction.

It was determined that a verification is not required. The language has been changed to a statement on the cover sheet based on "information and belief." Further, § 3.31(i) has been divided into two paragraphs, one for the statement that is required and one for the signature.

The address of the assignee or receiving party is vital information for maintaining complete assignment records. The original owner is the applicant, for which the Office has the address

of record. Each subsequent assignee address is then obtained under this requirement and is of record if the PTO or public needs to contact the present assignee. The execution date is required to determine whether an assignment has been recorded within three months provided in 35 U.S.C. § 261 and 15 U.S.C. § 1060.

When there is a listing of properties contained within a document, any listing may be copied and attached to the cover sheet to reduce the amount of typing necessary. A notation of this attachment can be made in lieu of entering every property identification number on the cover sheet. Should submitters provide information in addition to that required by § 3.31, it is always welcome, but not required.

The comments received on the layout of the sample cover sheets have all been considered and some modifications have been made. However, the sample cover sheet is not required and it is not part of the rules.

**Comment:** Section 3.34, as proposed, provides for correction of errors in a recorded cover sheet when the error is apparent by comparing the information on the cover sheet with the recorded document itself. One comment received expressed confusion regarding the correction procedure. Another comment suggested that corrections should not be limited to apparent errors.

**Response:** The PTO will not compare the cover sheet with the original documents during the recording process except to assure that application and patent numbers are present in patent assignments. Otherwise, it will only check to see that the cover sheet is complete. When a submitter discovers an obvious error on the recorded cover sheet, the PTO will consider a request to correct it when it receives: (1) the original recorded document (or a copy); (2) a corrected cover sheet; and (3) the appropriate fee for each property to be corrected. The PTO will then compare the cover sheet with the document to determine whether the error is apparent on its face. If the error is obvious, the corrected cover sheet will be recorded and the respective Office records corrected. If the error is not obvious, the procedure set forth in the Manual of Patent Examining Procedure, MPEP § 323 will govern for patents and the procedure set forth in *In re Abacab International Computers Ltd.* (Assignee of IHEC, Ltd.), 21 USPQ2d 1078 (Comm'r Pats. 1987), on reconsideration, 21 USPQ2d 1079 (Comm'r Pats. 1988) will govern for trademarks. Submitters may also petition under § 1.833 or § 2.146 for other corrections. Typographical errors made by the Office will be corrected without charge when brought to our attention.

Accordingly, the suggested modification has not been adopted. The rule has only been changed to correct a cross reference.

**Comment:** As proposed, § 3.51 provides that the date of recording is the date all of the required information is filed in the Office. Incomplete documents will be returned. If the returned documents are resubmitted timely, the document will retain the date on which it was received as incomplete. Two comments were received regarding the time period to be set by the PTO. One comment indicated that any delay may affect the requirements of 15 U.S.C. § 1060. It was therefore recommended that the PTO make some type of "conditional entry" in the records indicating an assignment has been submitted so interested members of the public could ascertain that there may be an effective recording date. The other comment suggested the time period for resubmission be long enough to allow communication with foreign parties, but it should be no longer than six months.

**Response:** After a review of the proposed rule, it was determined that the language of § 3.51 should be clarified to reflect that the originally-submitted papers with the official Office date stamp indicating the original receipt date in the Office must be returned in order to retain the original date. It is the intent of the PTO to set the time for response at one month from the date of mailing of the returned documents from the PTO. It is believed that most correctable errors will involve an incomplete cover sheet or the amount of the fee submitted, both of which can be corrected within one month.

Further, it is the policy of the PTO to make of record only those documents which meet the requirements for recording. It is not beneficial to cloud title to properties with potential transfers.

**Comment:** Section 3.56, as proposed, is a restatement of former § 1.333 and is made applicable to trademarks. It provides

that an assignment which is made conditional upon a condition subsequent will be regarded by the Office as an absolute assignment. One comment was received inquiring as to whether § 3.56 applied to security interests, another was received requesting a reference in the rules to recording of security agreements.

**Response:** Section 3.56 is applicable only to assignments, as they are defined by § 3.1, that is, a transfer of right, title and interest in a patent or a trademark. A security interest or a security agreement is in the nature of a lien, not an assignment. Accordingly, § 3.56 would not apply to security interests or security agreements which are also recordable. It applies to conditional assignments because the Office has no way of determining whether and when conditions are satisfied and therefore must address this type of assignment in a uniform manner. The reference to the recordability of security agreements is referred to here in the final rule package.

**Comment:** The second sentence of § 3.71, as proposed, provides: "[t]he assignee of record of the entire right title and interest in a trademark application or registration is entitled to conduct the prosecution of the trademark application or registration to the exclusion of the original applicant or previous assignee." One comment suggested, as had been recommended for the definitions in § 3.1, that language be adopted consistent with Section 10 of the Trademark Act, 15 U.S.C. § 1060, so there be no confusion as to what can be assigned in the trademark area and further, that the language requiring "entire right, title and interest" be deleted.

**Response:** As was the case with the PTO's review of § 3.1, the language in § 3.71 has also been modified to eliminate any confusion. Accordingly, § 3.71 now provides for assignments of registered marks or a mark for which an application for registration has been filed, making it consistent with § 3.1. While this change cannot prevent assignments from being made without the underlying goodwill, it may eliminate some confusion.

**Comment:** Section 3.73, as proposed, provided that a full assignee could take any action before the Office with respect to the assigned application, patent, or registration provide ownership is established to the satisfaction of the Commissioner. The rule further provided that ownership could be established by providing documentary evidence of the chain of title to the assignee. The assignee was also required to submit a verified statement stating the evidence had been reviewed and certifying to the best of the party's belief, title is in the party seeking to take the action. The Office reserved the right to require recordation of any ownership documents. One comment suggested the procedure was too "elaborate" and "confusing" to permit the submitting party to act rapidly. Another comment suggested the Office use the language of former § 2.186 which only required "the assignment has been recorded or that proof of the assignment has been submitted" to enable action by the assignee.

Another comment suggested that a simple statement identifying the documents thought to place ownership in a party should be sufficient. It was believed that no additional benefit accrued by having the party state that they believed they were entitled to take the action because whether or not a party can act is a determination the PTO must make.

Two comments suggested that a literal reading of the rule would require every paper filed on behalf of an assignee be accompanied by a proof of ownership. One comment suggested it was too harsh to preclude a party from taking action in a trademark matter until proof of ownership is established to the satisfaction of the Commissioner. Rather, it was suggested that a party be permitted to take action once documents establishing ownership are filed.

One comment received pointed to the proposed language of § 3.73 providing the statement must be signed by the party or its attorney or agent of record which was a greater requirement than § 1.34(a), if that was intended.

Another comment suggested that the proposed language be changed by deleting the provision that ownership must be established to the satisfaction of the Commissioner and substituting therefore "provided the assignee is owner of the entire right, title, and interest in the patent application, patent, registered-mark or mark for which an application for registration has been filed."

One final comment suggested that § 3.73 be changed to specifically set forth that it applied to secure Office acceptance



of a Section 8 or 15 affidavit or a Section 9 application, 15 U.S.C. §§ 1058, 1059, for trademark filings, and requested examples of the types of documents necessary to establish ownership.

**Response:** Ownership need only be established the first time the new party wants to act in patent and trademark cases, provided the appropriate documents are recorded. Section 3.73(b) is modified to provide that a statement of ownership need only be provided when a patent assignee wishes to act on a matter. For patents, the PTO believes it is appropriate for the patent assignee to review the documents it believes establishes its ownership prior to filing a paper signed by that assignee. Additionally, the statement will certify that to the best of the assignee's knowledge and belief, title is in that assignee. This will establish, to the satisfaction of the Commissioner, that the assignee knows of no other document establishing title in someone other than the assignee. The PTO will still make the determination of whether the assignee is entitled to take action after a review of the documents.

For trademarks the action sought to be taken can be submitted simultaneously by the party. The action will be examined as will the claim of ownership and the party will be notified whether it is satisfactory. As in the past, "any action" refers to post-registration documents as well.

#### Other Considerations

The rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 et seq.), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these rule changes will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these changes is to require that a cover sheet accompany each document submitted for recording. The rule change includes no additional or increased fees. Substantive rights to use trademarks and patents are not adversely affected.

The Office has determined that these rule changes are not a major rule under Executive Order 12291. The annual effect on the economy will be less than \$100 million. Because most of the changes reduce procedural burdens, there will be no major increase in costs or prices for consumers; individual industries; Federal, state or local government agencies; or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, or innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

These rule changes contain a collection-of-information requirement subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. The rule changes add a requirement for a cover sheet to be submitted with each document to be recorded that will expedite the recording process and improve quality. This collection of information requirement is cleared under OMB Control No. 0651-0011. The public reporting burden for this requirement is estimated to be one-half hour per filing, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collections of information.

The Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

#### List of Subjects

##### 37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Reporting and record-keeping requirement.

##### 37 CFR Part 2

Administrative practice and procedure, Courts, Lawyers, Trademarks.

#### 37 CFR Part 3

Administrative practice and procedure, Inventions and patents, Trademarks, Reporting and recordkeeping requirement.

For the reasons set out in the preamble and pursuant to the authority contained in 15 U.S.C. 1123 and 35 U.S.C. 6, parts 1, 2 and 3 of title 37 of the Code of Federal Regulations are amended as set forth below.

#### PART I - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.12 paragraphs (a) and (d) are revised to read as follows:

##### § 1.12 Assignment records open to public inspection.

(a) (1) Separate assignment records are maintained in the Patent and Trademark Office for patents and trademarks. The assignment records, relating to original or reissue patents, including digests and indexes, for assignments recorded on or after May 1, 1957, and assignment records relating to pending or abandoned trademark applications and to trademark registrations, for assignments recorded on or after January 1, 1955, are open to public inspection at the Patent and Trademark Office, and copies of those assignment records may be obtained upon request and payment of the fee set forth in §§ 1.19 and 2.6 of this Chapter.

(2) All records of assignments of patents recorded before May 1, 1957, and all records of trademark assignments recorded before January 1, 1955, are maintained by the National Archives and Records Administration (NARA). The records are open to public inspection. Certified and uncertified copies of those assignment records are provided by NARA upon request and payment of the fees required by NARA.

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(d) An order for a copy of an assignment or other document should identify the reel and frame number where the assignment or document is recorded. If a document is identified without specifying its correct reel and frame, an extra charge as set forth in § 1.21(j) will be made for the time consumed in making a search for such assignment.

3. Section 1.17 is amended by revising paragraph (i)(1) to read as follows:

##### § 1.17 Patent application processing fees.

\*\*\*\*

(i)(1) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph.....\$130.00

§ 1.12 — for access to an assignment record.

§ 1.14 — for access to an application.

§ 1.53 — to accord a filing date.

§ 1.55 — for entry of late priority papers.

§ 1.60 — to accord a filing date.

§ 1.62 — to accord a filing date.

§ 1.103 — to suspend action in application.

§ 1.177 — for divisional reissues to issue separately.

§ 1.312 — for amendment after payment of issue fee.

§ 1.313 — to withdraw an application from issue.

§ 1.314 — to defer issuance of a patent.

§ 1.666(b) — for access to interference settlement agreement.

§ 3.81 — for patent to issue to assignee, assignment submitted after payment of the issue fee.

\*\*\*\*

4. Section 1.32 is removed and reserved.

##### 1.32 [Reserved]

5. Section 1.46 is revised to read as follows:

##### § 1.46 Assigned inventions and patents.

In case the whole or a part interest in the invention or in the patent to be issued is assigned, the application must still be made or authorized to be made, and an oath or declaration signed, by the inventor or one of the persons mentioned in §§ 1.42, 1.43, or 1.47. However, the patent may be issued to the assignee or jointly to the inventor and the assignee as provided in § 3.81.

6. Section 1.104 is amended by revising paragraph (e) to read as follows:

##### § 1.104 Nature of examination; examiner's action.

\*\*\*\*

(e) Co-pending applications will be considered by the examiner to be owned by, or subject to an obligation of assignment to, the same person if:

(1) the application files refer to assignments recorded in the Patent and Trademark Office in accordance with Part 3 of this chapter which convey the entire rights in the applications to the same person or organization; or

(2) copies of unrecorded assignments which convey the entire rights in the applications to the same person or organization are filed in each of the applications; or

(3) an affidavit or declaration by the common owner is filed which states that there is common ownership and states facts which explain why the affiant or declarant believes there is common ownership; or

(4) other evidence is submitted which establishes common ownership of the applications.

In circumstances where the common owner is a corporation or other organization, an affidavit or declaration may be signed by an official of the corporation or organization empowered to act on behalf of the corporation or organization.

7. The undesignated center head above § 1.331 is revised to read as follows:

##### Arbitration Awards

8. Sections 1.331 through 1.334 are removed and reserved.

##### §§ 1.331-1.334 [Reserved]

#### PART 2 - RULES OF PRACTICE IN TRADEMARK CASES

9. The authority citation for 37 CFR Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

10. The undesignated center head § 2.185 is removed.

11. Sections 2.185 through 2.187 are removed and reserved.

##### §§ 2.185-2.187 [Reserved]

12. Part 3 is added to read as follows:

#### PART 3 - ASSIGNMENT, RECORDING AND RIGHTS OF ASSIGNEE

Sec.

##### 3.1 Definitions

#### DOCUMENTS ELIGIBLE FOR RECORDING

3.11 Documents which will be recorded.  
3.16 Assignability of trademarks prior to filing of use statements.

#### REQUIREMENTS FOR RECORDING

3.21 Identification of patents and patent applications.  
3.24 Formal requirements for documents and cover sheets.  
3.26 English language requirement.  
3.27 Mailing address for submitting documents to be recorded.  
3.28 Requests for recording.

#### COVER SHEET REQUIREMENTS

3.31 Cover sheet content.  
3.34 Correction of cover sheet errors.

#### FEES

3.41 Recording fees.

#### DATE AND EFFECT OF RECORDING

3.51 Recording date.  
3.54 Effect of recording.  
3.56 Conditional assignments.

#### DOMESTIC REPRESENTATIVE

3.61 Domestic representative.

#### PROSECUTION BY ASSIGNEE

3.71 Prosecution by assignee.  
3.73 Establishing right of assignee to prosecute.

#### ISSUANCE TO ASSIGNEE

3.81 Issue of patent to assignee.  
3.85 Issue of registration to assignee.

Authority: 15 U.S.C. 1123; 35 U.S.C. 6.

##### § 3.1 Definitions.

For purposes of this part, the following definitions shall apply:

Application means a national application for patent, an international application that designates the United States of America, or an application to register a trademark unless otherwise indicated.

Assignment means a transfer by a party of all or part of its right, title and interest in a patent or patent application, or a transfer of its entire right, title and interest in a registered mark or a mark for which an application to register has been filed.

Document means a document which a party requests to be recorded in the Office pursuant to § 3.11 and which affects some interest in an application, patent, or registration.

Office means the Patent and Trademark Office.

Recorded document means a document which has been recorded in the Office pursuant to § 3.11.

Registration means a trademark registration issued by the Office.

#### DOCUMENTS ELIGIBLE FOR RECORDING

##### § 3.11 Documents which will be recorded.

Assignments of applications, patents, and registrations, accompanied by completed cover sheets as specified in §§ 3.28 and 3.31, will be recorded in the Office. Other documents,



accompanied by completed cover sheets as specified in §§ 3.28 and 3.31, affecting title to applications, patents, or registrations, will be recorded as provided in this Part or at the discretion of the Commissioner.

### § 3.16 Assignability of trademark prior to filing of use statement.

No application to register a mark under 15 U.S.C. 1051(b) is assignable prior to the filing of the verified statement of use under 15 U.S.C. 1051(d) except to a successor to the business of the applicant, or portion thereof, to which the mark pertains, if that business is ongoing and existing.

## REQUIREMENTS FOR RECORDING

### § 3.21 Identification of patents and patent applications.

An assignment relating to a patent must identify the patent by the patent number. An assignment relating to a national patent application must identify the national patent application by the application number (consisting of the series code and the serial number, e.g., 07/123,456) or the serial number and filing date. An assignment relating to an international patent application which designates the United States of America must identify the international application by the international application number (e.g., PCT/US90/01234). If an assignment is executed concurrently with, or subsequent to, the execution of the patent application, but before the patent application is filed, it must identify the patent application by its date of execution, name of each inventor, and title of the invention so that there can be no mistake as to the patent application intended.

### § 3.24 Formal requirements for documents and cover sheets.

The document and cover sheet must be legible. Either the original document or a true copy of the original document, may be submitted for recording. Only one side of each page shall be used. The paper used should be flexible, strong, white, non-shiny, durable, and preferably no larger than 21.6 x 33.1 cm. (8 1/4 x 14 inches) with a 2.5 cm. (one-inch) margin on all sides.

### § 3.26 English language requirement.

The Office will accept and record non-English language documents only if accompanied by a verified English translation signed by the individual making the translation.

### § 3.27 Mailing address for submitting documents to be recorded.

Documents and cover sheets to be recorded should be addressed to the Commissioner of Patents and Trademarks, Box Assignments, Washington, D.C. 20231, unless they are filed together with new applications or with a petition under 3.81(b).

### § 3.28 Requests for recording.

Each document submitted to the Office for recording must be accompanied by at least one cover sheet as specified in § 3.31 referring either to those patent applications and patents, or to those trademark applications and registrations, against which the document is to be recorded. If a document to be recorded includes interests in, or transactions involving, both patents and trademarks, separate patent and trademark cover sheets must be submitted. Only one set of documents and cover sheets to be recorded should be filed. If a document to be recorded is not accompanied by a completed cover sheet, the document and any incomplete cover sheet will be returned pursuant to § 3.51 for proper completion of a cover sheet and resubmission of the document and a completed cover sheet.

## COVER SHEET REQUIREMENTS

### § 3.31 Cover sheet content.

(a) Each patent or trademark cover sheet required by § 3.28 must contain:

- (1) the name of the party conveying the interest;
- (2) the name and address of the party receiving the interest;
- (3) a description of the interest conveyed or transaction to be recorded;
- (4) each application number, patent number or registration number against which the document is to be recorded, or an indication that the document is filed together with a patent application;
- (5) the name and address of the party to whom correspondence concerning the request to record the document should be mailed;
- (6) the number of applications, patents or registrations identified in the cover sheet and the total fee;
- (7) the date the document was executed;
- (8) an indication that the assignee of a trademark application or registration who is not domiciled in the United States has designated a domestic representative (see § 3.61); and
- (9) a statement by the party submitting the document that to the best of the person's knowledge and belief, the information contained on the cover sheet is true and correct and any copy submitted is a true copy of the original document; and
- (10) the signature of the party submitting the document.

(b) A cover sheet may not refer to both patents and trademarks.

### § 3.34 Correction of cover sheet errors.

(a) An error in a cover sheet recorded pursuant to 3.11 will be corrected only if:

- (1) the error is apparent when the cover sheet is compared with the recorded document to which it pertains; and
- (2) a corrected cover sheet is filed for recordation.

(b) The corrected cover sheet must be accompanied by the originally recorded document or a copy of the originally recorded document and by the recording fee as set forth in § 3.41.

## FEES

### § 3.41 Recording fees.

All requests to record documents must be accompanied by the appropriate fee. A fee is required for each application, patent and registration against which the document is recorded as identified in the cover sheet. The recording fee is set in § 1.21(h) of this Chapter for patents and in § 2.6(q) of this Chapter for trademarks.

## DATE AND EFFECT OF RECORDING

### § 3.51 Recording date.

The date of recording of a document is the date the document meeting the requirements for recording set forth in this Part is filed in the Office. A document which does not comply with the identification requirements of § 3.21 will not be recorded. Documents not meeting the other requirements for recording, for example, a document submitted without a completed cover sheet or without the required fee, will be returned for correction to the sender where a correspondence address is available. The returned papers, stamped with the original date of receipt by the Office, will be accompanied by a letter which will indicate that if the returned papers are corrected and resubmitted to the Office within the time specified in the letter, the Office will consider the original date of filing of the papers as the date of recording of the document. The certification procedure under either § 1.8 or § 1.10 of this Chapter may be used for resubmissions of returned papers to have the benefit of the date of deposit in the United States Postal Service. If the returned patent was not corrected and resubmitted within the specified period, the date of filing of the corrected papers will be considered to be the date of recording of the document. The specified period to resubmit the returned papers will not be extended.

### § 3.54 Effect of recording.

The recording of a document pursuant to § 3.11 is not a determination by the Office of the validity of the document or the effect that document has on the title to an application, a patent, or a registration. When necessary, the Office will determine what effect a document has, including whether a party has the authority to take an action in a matter pending before the Office.

### § 3.56 Conditional assignments.

Assignments which are made conditional on the performance of certain acts or events, such as the payment of money or other condition subsequent, if recorded in the Office, are regarded as absolute assignments for Office purposes until cancelled with the written consent of all parties or by the decree of a court of competent jurisdiction. The Office does not determine whether such conditions have been fulfilled.

## DOMESTIC REPRESENTATIVE

### § 3.61 Domestic representative.

If the assignee of a trademark application or registration is not domiciled in the United States, the assignee must designate, in writing to the Office, a domestic representative. An assignee of a patent application or patent may designate a domestic representative if the assignee is not residing in the United States. The designation shall state the name and address of a person residing within the United States on whom may be served process or notice of proceedings affecting the application, patent or registration or rights thereunder.

## PROSECUTION BY ASSIGNEE

### § 3.71 Prosecution by assignee.

The assignee of record of the entire right, title and interest in an application for patent is entitled to conduct the prosecution of the patent application to the exclusion of the named inventor or previous assignee. The assignee of a registered trademark or a trademark for which an application to register has been filed is entitled to conduct the prosecution of the trademark application or registration to the exclusion of the original applicant or previous assignee.

### § 3.73 Establishing right of assignee to prosecute.

(a) The inventor is presumed to be the owner of a patent application, and any patent that may issue therefrom, unless there is an assignment. The original applicant is presumed to be the owner of a trademark application unless there is an assignment.

(b) When the assignee of the entire right, title and interest seeks to take action in a matter before the Office with respect to a patent application, trademark application, patent, registration, or reexamination proceeding, the assignee must establish its ownership of the property to the satisfaction of the Commissioner. Ownership is established by submitting to the Office documentary evidence of a chain of title from the original owner to the assignee or by specifying (e.g. reel and frame number, etc.) where such evidence is recorded in the Office. Documents submitted to establish ownership may be required to be recorded as a condition to permitting the assignee to take action in a matter pending before the Office. In addition, the assignee of a patent application or patent must submit a statement specifying that the evidentiary documents have been reviewed and certifying that, to the best of assignee's knowledge and belief, title is in the assignee seeking to take the action.

## ISSUANCE TO ASSIGNEE

### § 3.81 Issue of patent to assignee.

(a) For a patent application, if an assignment of the entire right, title, and interest is recorded before the issue fee is paid, the patent may issue in the name of the assignee. If the assignee holds an undivided part interest, the patent may issue jointly to the inventor and the assignee. At the time the issue fee is

paid, the name of the assignee must be provided if the patent is to issue solely or jointly to that assignee.

(b) If the assignment is submitted for recording after the date of payment of the issue fee, but prior to issuance of the patent, the assignee may petition that the patent issue to the assignee. Any such petition must be accompanied by the fee set forth in 1.17(i)(1) of this Chapter.

### § 3.85 Issue of registration to assignee.

The certificate of registration may be issued to the assignee of the applicant, or in a new name of the applicant, provided that the party files a written request in the trademark application by the time the application is being prepared for issuance of the certificate of registration, and the appropriate document is recorded in the Office. If the assignment or name change document has not been recorded in the Office, then the written request must state that the document has been filed for recordation. The address of the assignee must be made of record in the application file.

June 24, 1992

DOUGLAS B. COMER  
Acting Assistant Secretary and  
Acting Commissioner of Patents  
and Trademarks

[1140 OG 53]

### (30) Issuance of a Patent to an Assignee

The purpose of this notice is to clarify the procedures to have a patent issue to an assignee. See 37 CFR 3.81 and Manual of Patent Examining Procedure § 307.

Section 3.81(a) permits a patent to issue to an assignee, provided that at the time the issue fee is paid, the assignment has been submitted for recordation and the name of the assignee is provided. The name of the assignee is usually provided in item 5 of the Issue Fee Transmittal form (PTOL-85B).

Section 3.81(b) permits a patent to issue to an assignee when the assignment is submitted for recording after the date of payment of the issue fee, but prior to issuance of the patent, provided a petition and fee are filed requesting that the patent issue to the newly recorded assignee.

When the correct name of the assignee was not provided in accordance with either section 3.81(a) or (b) (i.e., either no name or an incorrect name was provided in item 5 of the Issue Fee Transmittal when the assignment had been recorded or submitted for recordation at the time the issue fee was paid, or an incorrect name was provided in the petition required by section 3.81(b) when the assignment is submitted for recording after the date of payment of the issue fee, but prior to issuance of the patent), a correction can be made by filing a petition under 37 CFR 1.183 requesting that the requirements of 37 CFR 3.871 be waived. This procedure is required at any time after the issue fee is paid, including after issuance of the patent. A petition under 37 CFR 1.183 should include: (1) the petition fee set forth in 37 CFR 1.17(h) (currently \$130); (2) the correct name of the assignee; and (3) the reel and frame number where the assignment is recorded or proof of the date the assignment was submitted for recordation.

If the petition under 37 CFR 1.183 is filed and granted prior to issuance of the patent, the patent will either: (1) be printed with the correct assignee's name; or (2) be printed without the correct assignee's name. In the latter case, patentee would be entitled to a certificate of correction under 37 CFR 1.322 to correct an Office mistake in not correctly printing the assignee's name on the patent.

If the petition under 37 CFR 1.183 is filed and/or granted after issuance of the patent, the patent would be printed without the correct assignee's name. However, if the petition is granted, patentee would be entitled to a certificate of correction under



37 CFR 1.323 due to the mistake in not complying with 37 CFR 3.81.

March 16, 1994 CHARLES E. VAN HORN  
Patent Policy and Projects Administrator  
Office of the Assistant Commissioner for Patents

[1161 OG 293]

(31) DEPARTMENT OF COMMERCE  
Patent and Trademark Office  
37 CFR Parts 1, 2 & 3

[Docket No. 910246-2140]  
RIN 0651-AA43

Changes in Patent and Trademark Assignment Practice

Agency: Patent and Trademark Office, Commerce  
Action: Final Rule; correction.

Summary: The Patent and Trademark Office (Office) amended the rules of practice regarding assignments in patent and trademark cases to improve and clarify the rules, to codify changes in practice and to consolidate the rules into a new Part 3 directed to assignments. In the final assignment rules a fee change promulgated in January 1992 was inadvertently omitted from the § 1.17(i)(1) listing.

Effective Date: September 4, 1992.

For Further Information Contact: Jeffery V. Nase by telephone at (703) 305-9282 or by mail marked to his attention and addressed to Commissioner of Patents and Trademarks, Box DAC, Washington, D.C. 20231.

Supplementary Information: The amended assignment rules first appeared in a notice of proposed rulemaking published in the *Federal Register* on May 10, 1991, at 56 FR 21641, and the Patent and Trademark Office *Official Gazette* of June 4, 1991, at 1127 OG 8-16. The final rules appeared in the *Federal Register* on July 6, 1992, at 57 FR 29634. Between the time the proposed and final rules were published, 37 CFR § 1.97(d) was amended, effective March 16, 1992, by a final rule which appeared in the *Federal Register* of January 17, 1992, 57 FR 2021, relating to the duty of disclosure. The amendment provided for a new petition fee which was referenced in 37 CFR § 1.17, patent application processing fees. The reproduction of § 1.17 in the final assignment rule package neglected to add the reference to the new petition under § 1.97(d).

Section 1.17(i)(1) is reproduced in its entirety to include the reference to § 1.97(d) which was inadvertently omitted. The amount of the fee for considering an information disclosure statement is not affected by this rule change.

List of Subjects

37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents.

For the reasons set out in the preamble and pursuant to the authority contained in 35 U.S.C. 6, part 1 of title 37 of the Code of Federal Regulations has been amended as set forth below.

PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.17 is amended by revising paragraph (i)(1) to read as follows:

§ 1.17 Patent application processing fees.

\*\*\*\*\*

(i)(1) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph.....\$130.00

- § 1.12 - for access to an assignment record.
- § 1.14 - for access to an application.
- § 1.53 - to accord a filing date.
- § 1.55 - for entry of late priority papers.
- § 1.60 - to accord a filing date.
- § 1.62 - to accord a filing date.
- § 1.97(d) - to consider an information disclosure statement.
- § 1.103 - to suspend action in application.
- § 1.177 - for divisional reissues to issue separately.
- § 1.312 - for amendment after payment of issue fee.
- § 1.313 - to withdraw an application from issue.
- § 1.314 - to defer issuance of a patent.
- § 1.666(b) - for access to interference settlement agreement.
- § 3.81 - for patent to issue to assignee, assignment submitted after payment of the issue fee.

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July 17, 1992

DOUGLAS B. COMER  
Assistant Secretary & Acting  
Commissioner of Patents  
and Trademarks

[1141 OG 38]

(32) Taking Action in a Patent Matter Before the  
Office by the Assignee under 37 CFR 3.73.

When the assignee of the entire right, title and interest first seeks to take action in a matter before the Office with respect to a patent application, patent or reexamination proceeding, the assignee must establish its ownership of the property to the satisfaction of the Commissioner. 37 CFR 3.73(b). The assignee's ownership may be established either 1) by submitting to the Office copies of the documentary evidence of a chain of title from the original inventor to the assignee, or 2) by specifying, by reel and frame number, for example, where such documentary evidence is recorded in the Office. In addition to the establishment of ownership, there is further requirement that the assignee submit a statement specifying that the evidentiary documents have been reviewed and certifying that, to the best of the assignee's knowledge and belief, title is in the assignee seeking to take action. Once 37 CFR 3.73(b) is complied with by an assignee, that assignee may continue to take action in that application, patent or reexamination proceeding without filing a 37 CFR 3.73(b) statement each time, provided that ownership has not changed.

When an assignee files a continuation or divisional application (under 37 CFR 1.53, 1.60 or 1.62), reference may be made to a statement filed under 37 CFR 3.73(b) in the parent application or a copy of that statement may be filed. A newly executed statement under 37 CFR 3.73(b) must be filed when a continuation-in-part application is filed by an assignee.

The statement under 37 CFR 3.73(b) may be signed on behalf of the assignee in the following two manners if the assignee is an organization (e.g., corporation, partnership, university, government agency, etc.).

(1) The statement may be signed by a person in the organization having apparent authority to sign on behalf of the organization. An officer (president, vice-president, secretary, or treasurer) is presumed to have authority to sign on behalf of the organization. The signature of the chairman of the board of directors is acceptable, but not the signature of an individual director. A person having a title (manager, director, administrator, general counsel) that does not clearly set forth that person as an officer of the assignee is not presumed to be an officer of the assignee or to have authority to sign the statement on behalf of the assignee. A power of attorney from the inventors in an organization to a practitioner to prosecute a patent application does not make the practitioner an official of an assignee or empower the practitioner to sign the statement on behalf of the assignee.

(2) The statement may be signed by any person, if the statement includes an averment that the person is empowered to sign the statement on behalf of the assignee and, if not signed by a registered practitioner, the statement must be in oath or declaration form. Where a statement does not include such an averment, and the person signing does not hold a position in the organization that would give rise to a presumption that the person is empowered to sign the statement on behalf of the assignee, evidence of the person's authority to sign will be required.

Examples of situations where ownership must be established and the statement under 37 CFR 3.73(b) must be submitted are when the assignee: signs a request for status of an application or gives a power to inspect an application; acquiesces to express abandonment of an application; appoints its own legal representative; signs a terminal disclaimer; consents to the filing of a reissue application; consents to the correction of inventorship; files an application under 37 CFR 1.47(b) or 37 CFR 1.475; signs an Issue Fee Transmittal (PTOL-85B); or signs a response to an Office action.

Examples of situations where ownership need not be established and a statement under 37 CFR 3.73(b) is not required to be submitted are when the assignee: signs a small entity declaration; signs an affidavit or declaration of common ownership of two inventions; signs a NASA or DOE property rights statement; signs an affidavit under 37 CFR 1.131 where the inventor is unavailable; signs a Certificate of Mailing under 37 CFR 1.8; or files a request for reexamination of a patent under 37 CFR 1.510.

An acceptable certification under 37 CFR 3.73(b) is attached to this notice.

For further information related to actions taken by an assignee in patent matters, contact Jeffery V. Nase at (703) 305-9282.

Apr. 30, 1993

CHARLES E. VAN HORN  
Patent Policy and Projects Administrator  
Office of the Assistant Commissioner  
for Patents

[1150 OG 62]

(33) Submission of Uniform Assignee Names  
on the Issue Fee Payment Form PTOL-85b

The Patent and Trademark Office is experiencing problems when computer-sorting assignee names for the Patentee Index because of the non-uniform use of the names of certain companies and corporations on the issue fee payment form PTOL-85b. The use of different spellings or nomenclature for the same company requires the Office to expend time and effort to determine whether the various name forms are in fact for the same company. If such inconsistencies are not corrected, patents to the same company will appear in different locations in the Patentee Index. An example of inconsistent use is "ABC Company, Ltd." and "ABC Co., Limited."

Therefore, persons who list assignee names on issue fee payment form PTOL-85b should ensure that the same company name form is used for all patents issuing to a particular company.

Nov. 17, 1977

RICHARD J. SHAKMAN  
Assistant Commissioner  
for Administration

[965 O.G. 8]

(34) Indexing Against a Recorded Assignment

It has been the practice of the Patent and Trademark Office (PTO) to process requests for indexing against a recorded document by adding the newly requested property to the data base record for the previously recorded document, except if the previously recorded document was an assignment. The PTO only required a transmittal letter with the recording fee and not a copy of the previously recorded document to process the indexing request. While indexing the additional properties

resulted in the assignment data base being updated, the indexing request itself was never microfilmed to become part of the official record.

Effective immediately, the PTO will no longer process such indexing requests. Such indexing requests do not comply with 37 CFR 3.11, 3.28, and 3.31 which require that each request for recordation include the document to be recorded and a cover sheet. Instead of filing an indexing request, a party should submit a cover sheet in conformance with 37 CFR 3.31, a true copy of the document, and the recording fee. PTO will assign a new recording date to that submission, update the assignment data base, and microfilm the cover sheet and document to become part of the official record.

Nov. 3, 1993

THERESA A. BRELSFORD  
Assistant Commissioner for  
Public Services and  
Administration

[1157 OG 12]

(35) Recordability of Foreclosures  
for Assignment Purposes

It has been the practice of the Assignment Branch to record security agreements between a secured party and a debtor which refer specifically to a patent or a patent application and which are signed by the debtor. However, foreclosures by the secured party were not recorded because they were not signed by the debtor. Accordingly, before recording a foreclosure not signed by a debtor, the Assignment Branch required a Court order. This requirement forced the secured party to bring action in a court of law where otherwise Court action might not have been necessary.

To facilitate recording of foreclosures not signed by a debtor and avoid unnecessary court proceedings, the Office will record foreclosures which comply with all of the following criteria:

- (1) Submission of the foreclosure document with original endorsement by the secured party, or a verified copy thereof;
- (2) Identification of the patent by patent number or the patent application by serial number, or other acceptable identifier(s) as specified in 37 CFR 1.331(c), in the body of the foreclosure document itself or any addenda incorporated by reference;
- (3) Reference to the security agreement recorded under 37 CFR 1.331; and
- (4) Submission of a verified statement by a representative of the secured party stating that the patent or the patent application has been legally foreclosed on based upon the applicable state laws.

A foreclosure document complying with the above criteria will be deemed to be a recordable instrument in accordance with 37 CFR 1.331.

March 14, 1988

THERESA A. BRELSFORD  
Assistant Commissioner  
for Administration

[1089 OG 35]

(36) Department of Commerce  
Patent and Trademark Office

37 CFR Parts 1, 2, and 3  
[Docket No. 950501124-5185-02]  
RIN 0651-AA74

Revision of Patent and Trademark Fees

Agency: Patent and Trademark Office, Commerce.  
Action: Final Rule.

Summary: The Patent and Trademark Office (PTO) is amending the rules of practice in patent and trademark cases, Parts 1, 2



and 7 of title 37, Code of Federal Regulations, to adjust certain patent and trademark fee amounts to reflect fluctuations in the Consumer Price Index (CPI) and to recover costs of operation, and is amending the requirements for recording documents on the Government Register. This rule also includes information relating to the availability of patent and trademark information products provided by the PTO.

**Effective Date:** October 1, 1995.

For Further Information Contact: Robert Kopson by telephone at (703) 305-8510, fax at (703) 305-8525, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

**Supplementary Information:** This rule change is designed to adjust PTO fees in accordance with the applicable provisions of title 35, United States Code; section 31 of the Trademark (Lanham) Act of 1946 (15 U.S.C. 1113); and section 10101 of the Omnibus Budget Reconciliation Act of 1990 (as amended by section 8001 of Public Law 103-66), all as amended by the Patent and Trademark Office Authorization Act of 1991 (Public Law 102-204).

The cover sheet referenced in 37 CFR 7.1 (c) must be in a format approved by the Office. The Office of Public Records will maintain a list of approved formats that will meet this requirement. Contact the Office of Public Records at (703) 308-9743 regarding specific questions relating to this requirement and to seek approval of additional formats.

## BACKGROUND

### Statutory Provisions

Patent fees are authorized by 35 U.S.C. 41 and 35 U.S.C. 376. A fifty percent reduction in the fees paid under 35 U.S.C. 41(a) and (b) by independent inventors, small business concerns, and nonprofit organizations who meet prescribed definitions is required by 35 U.S.C. 41(h).

Subsection 41(f) of title 35, United States Code, provides that fees established under 35 U.S.C. 41(a) and (b) may be adjusted on October 1, 1992, and every year thereafter, to reflect fluctuations in the Consumer Price Index (CPI) over the previous 12 months.

Section 10101 of the Omnibus Budget Reconciliation Act of 1990 (amended by section 8001 of Public Law 103-66) provides that there shall be a surcharge on all fees established under 35 U.S.C. 41(a) and (b) to collect \$111 million in fiscal year 1996.

Subsection 41(d) of title 35, United States Code, authorizes the Commissioner to establish fees for all other processing, services, or materials related to patents to recover the average cost of providing these services or materials, except for the fees for recording a document affecting title, for each photocopy, and for each black and white copy of a patent.

Section 376 of title 35, United States Code, authorizes the Commissioner to set fees for patent applications filed under the Patent Cooperation Treaty (PCT).

Subsection 41(g) of title 35, United States Code, provides that new fee amounts established by the Commissioner under section 41 may take effect thirty days after notice in the *Federal Register* and the *Official Gazette of the Patent and Trademark Office*.

Section 31 of the Trademark (Lanham) Act of 1946, as amended (15 U.S.C. 1113), authorizes the Commissioner to establish fees for the filing and processing of an application for the registration of a trademark or other mark, and for all other services and materials relating to trademarks and other marks.

Section 31(a) of the Trademark (Lanham) Act of 1946 (15 U.S.C. 1113(a)), as amended, allows trademark fees to be adjusted once each year to reflect, in the aggregate, any fluctuations during the preceding 12 months in the CPI.

Section 31 also allows new trademark fee amounts to take effect thirty days after notice in the *Federal Register* and the *Official Gazette of the United States Patent and Trademark Office*.

### Recovery Level Determinations

This rule adjusts patent and trademark fees for a planned recovery of \$643,014,000 in fiscal year 1996, as proposed in the Administration's budget request to the Congress.

The patent statutory fees established by 35 U.S.C. 41(a) and (b) are being adjusted on October 1, 1995, to reflect any fluctuations occurring during the previous 12 months in the Consumer Price Index (CPI-U). In calculating these fluctuations, the Office of Management and Budget (OMB) has determined that the PTO should use CPI-U data as determined by the Secretary of Labor. However, the Department of Labor does not make public the CPI-U until approximately 21 days after the end of the month being calculated. Therefore, the latest CPI-U information available is for the month of May 1995. In accordance with previous rulemaking methodology, the PTO uses the Administration's projected CPI-U for the 12-month period ending September 30, 1995, which is 3.2 percent. Based on this projection, patent statutory fees will be adjusted by 3.2 percent. Before the final fee schedule is published, the fees may be slightly adjusted based on actual data available from the Department of Labor.

Certain non-statutory patent processing fees established under 35 U.S.C. 41(d) and PCT processing fees established under 35 U.S.C. 376 are being adjusted to recover their estimated average costs in fiscal year 1996. Three patent service fees that are set by statute will not be adjusted. The three fees that are not being adjusted are assignment recording fees, printed patent copy fees and photocopy charge fees.

Certain trademark service fees established under 15 U.S.C. 1113 are being adjusted to recover their estimated average costs in fiscal year 1996.

The fee amounts were rounded by applying standard arithmetic rules so that the amounts rounded would be convenient to the user. Fees of \$100 or more were rounded to the nearest \$10. Fees between \$2 and \$99 were rounded to an even number so that the comparable small entity fee would be a whole number.

### Workload Projections

Determination of workloads varies by fee. Principal workload projection techniques are as follows:

Patent application workloads are projected from statistical regression models using recent application filing trends. Patent issues are projected from an in-house patent production model and reflect examiner production achievements and goals. Patent maintenance fee workloads utilize patents issued 3.5, 7.5 and 11.5 years prior to payment and assume payment rates of 79 percent, 55 percent and 32 percent, respectively. Service fee workloads follow linear trends from prior years' activities.

### General Procedures

Any fee amount that is paid on or after the effective date of the fee increase would be subject to the new fees then in effect. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing or Transmission, where authorized under 37 CFR 1.8, will be considered to be the date of receipt in the PTO. A Certificate of Mailing or Transmission under Section 1.8 is not "proper" for items which are specifically excluded from the provisions of Section 1.8. Section 1.8 should be consulted for those items for which a Certificate of Mailing or Transmission is not "proper." Such items include, inter alia, the filing of national and international applications for patents and the filing of trademark applications. However, the provisions of 37 CFR 1.10 relating to filing papers and fees with an "Express Mail" certificate do apply to any paper or fee (including patent and trademark applications) to be filed in the PTO. If an application or fee is filed by "Express Mail" with a proper certificate dated on or after the effective date of the rules, as amended, the amount of the fee to be paid would be the fee established by the amended rules.

A notice of final rulemaking was published at 60 FR 20195 (April 25, 1995) wherein several new fee provisions were made to implement the 20-year patent term and provisional applications. Language changes were made in 37 CFR 1.16(a), (b), (d), (f), and (g) which are reproduced in this final rule package. In addition, fees involving 37 CFR 1.17(r) and (s) are being

adjusted by changes in the CPI to remain equal to the basic filing fee for a utility patent application.

### PTO Information Dissemination Products

The PTO provides information to the public in the Patent Search Room and the Trademark Search Library in Arlington, Virginia, and at 78 Patent and Trademark Depository Libraries around the country. A list of the libraries is included in each issue of the *Official Gazette of the Patent and Trademark Office*. In addition, a number of patent and trademark search tools and document-delivery products, published on paper and on various machine-readable media, are sold directly to the public.

Printed PTO publications may be ordered from the Government Printing Office (GPO) or one of its Book Stores located throughout the country. A list of patent and trademark-related publications with current prices and ordering information is available from the GPO (Subject Bibliography SB 021).

Superintendent of Documents  
P.O. Box 371984  
Pittsburgh, Pa. 15250-7954  
Voice: 202-512-1800  
Fax: 202-512-2250

Machine-readable publications, including magnetic tapes and CD-ROMs, may be ordered directly from the PTO. A printed catalog of machine-readable products, including current prices and ordering information, is available from the Office of Information Products Development.

US Patent and Trademark Office  
Office of Information Products Development  
Crystal Park 3, Room 412  
Washington, D.C. 20231  
Voice: 703-308-0322  
Fax: 703-308-0493

The catalog of machine-readable products is published in the *Official Gazette of the Patent and Trademark Office* in late December each year and may also be viewed on, or downloaded from, the PTO electronic bulletin board (703-305-8950, 8/no/1) or from the PTO's home page on the Internet (<http://www.uspto.gov/>).

In order to ensure clarity in the implementation of the new fees, a discussion of specific sections is set forth below.

### Discussion of Specific Rules

#### 37 CFR 1.16 National application filing fees.

Section 1.16, paragraphs (a), (b), (d), and (f)-(i), is revised to adjust fees established therein to reflect fluctuations in the CPI.

Section 1.16, paragraphs (a), (b), (d), and (g) include language changes relating to provisional patent applications (see 60 FR 20195, dated April 25, 1995).

#### 37 CFR 1.17 Patent application processing fees.

Section 1.17, paragraphs (b)-(g) (m), (r), and (s), is revised to adjust fees established therein to reflect fluctuations in the CPI.

Section 1.17, paragraphs (j) and (n)-(p), is revised to adjust fees established therein to recover costs.

#### 37 CFR 1.18 Patent issue fees.

Section 1.18, paragraphs (a)-(c), is revised to adjust fees established therein to reflect fluctuations in the CPI.

#### 37 CFR 1.19 Document supply fees.

Section 1.19, paragraphs (a)(1)(ii) and (a)(1)(iii), is revised to amend the language to reflect the PTO's most recent business practices.

Section 1.19, paragraph (b)(1), is revised to adjust fees established therein to reflect fluctuations in the CPI.

#### 37 CFR 1.20 Post-issuance fees.

Section 1.20, paragraphs (c), (i), and (j), is revised to adjust fees established therein to recover costs.

Section 1.20, paragraphs (e)-(g), is revised to adjust fees established therein to reflect fluctuations in the CPI.

#### 37 CFR 1.21 Miscellaneous fees and charges.

Section 1.21, paragraph (a)(1), is revised to adjust fees established therein to recover costs.

#### 37 CFR 1.445 International application filing, processing, and search fees.

Section 1.445, paragraph (a), is revised to adjust the fees authorized by 35 U.S.C. 376 to recover costs.

#### 37 CFR 1.482 International preliminary examination fees.

Section 1.482, paragraphs (a)(1)(i), (a)(1)(ii), and (a)(2)(ii), is revised to adjust the fees authorized by 35 U.S.C. 376 to recover costs.

#### 37 CFR 1.492 National stage fees.

Section 1.492, paragraphs (a), (b) and (d), is revised to adjust fees established therein to reflect fluctuations in the CPI.

#### 37 CFR 2.6 Trademark fees.

Section 2.6, paragraphs (b)(1)(ii) and (b)(1)(iii), is revised to amend the language to reflect the PTO's most recent business practices.

Section 2.6, paragraph (b)(2), is revised to adjust fees therein to recover costs.

#### 37 CFR 7.1 Requirements

Section 7.1, is revised to designate the current language as paragraph (a), and to add new paragraphs (b)-(j) to clarify that the requirements for patent and patent application assignment documents, including the requirement for the fee set forth in § 1.21(h), submitted for recording also apply to instruments submitted for recording on the Government Register. Sections 7.1(b)-(d) and (f)-(i) contain language similar to that in §§ 3.21, 3.28, 3.31, 3.34, 3.26, 3.27, and 3.41, respectively.

Section 7.1(b), is added to provide that an instrument relating to a patent must identify the patent by the patent number, that an instrument relating to a national patent application must identify the national patent application by the application number (consisting of the series code and the serial number, e.g., 07/123,456) or the serial number and filing date, that an instrument relating to an international patent application which designates the United States of America must identify the international application by the international application number (e.g., PCT/US90/01234), and that if an assignment is executed concurrently with, or subsequent to, the execution of the patent application, but before the patent application is filed, it must identify the patent application by its date of execution, name of each inventor, and title of the invention so that there can be no mistake as to the patent application intended.

Section 7.1(c), is added to provide that each instrument submitted to the PTO for recording must be accompanied by a cover sheet referring to those patent applications and patents against which the instrument is to be recorded, that one set of instruments and cover sheets to be recorded should be filed, and that if an instrument to be recorded is not accompanied by a completed cover sheet, the instrument and any incomplete cover sheet will be returned for proper completion of a cover sheet and resubmission of the instrument and a completed cover sheet.

Section 7.1(d), is added to provide that each cover sheet must contain: (1) the name of the party conveying the interest; (2) the name and address of the party receiving the interest; (3) a description of the interest conveyed or transaction to be



recorded; (4) each application number or patent number against which the instrument is to be recorded, or an indication that the instrument is filed together with a patent application; (5) the name and address of the party to whom correspondence concerning the request to record the instrument should be mailed; (6) the number of applications or patents identified in the cover sheet and the total fee; (7) the date the instrument was executed; (8) a statement by the party submitting the instrument that to the best of the person's knowledge and belief, the information contained on the cover sheet is true and correct and any copy submitted is a true copy of the original instrument; and (9) the signature of the party submitting the instrument.

Section 7.1(e), is added that each patent cover sheet required by paragraph (c) of this section seeking to record a governmental interest as provided by paragraph (a) of this section must: (1) indicate that the instrument is to be recorded on the governmental register, and, if applicable, that the instrument is to be recorded on the Secret Register. See § 7.7, and (2) indicate, if applicable, that the instrument to be recorded is not an instrument affecting title. See paragraph (j) of this section.

Section 7.1(f), is added to provide for the correction of errors in the cover sheet. Specifically, § 7.1(e), provides that an error in a cover sheet recorded pursuant to this Part will be corrected only if: (1) the error is apparent when the cover sheet is compared with the recorded instrument to which it pertains, and (2) a corrected cover sheet accompanied by the recording fee set forth in paragraph (i) of this section and either the original recorded instrument or a copy of the original recorded instrument is filed for recordation.

Section 7.1(g), is added to provide that the Office will accept and record non-English language instruments only if accompanied by a verified English translation signed by the individual making the translation.

Section 7.1(h), is added to provide that instruments and cover sheets to be recorded should be addressed to the Commissioner of Patents and Trademarks, Box Assignment, Washington, D.C. 20231.

Section 7.1(i), is added to provide that all requests, except as provided by paragraph (j) of this section, to record instruments must be accompanied by the recording fee set forth in § 1.21(h) of this chapter, and that the fee set forth in § 1.21(h) of this chapter is required for each application and patent against which the instrument is recorded as identified in the cover sheet.

Section 7.1(j), is added to provide that no fee is required for each patent application and patent against which an instrument required by Executive Order 9424 (3 CFR 1943-1948 Comp.) to be filed if: (1) the instrument does not affect title and is so identified in the cover sheet (see paragraph (e) of this section); and (2) the cover sheet is filed in a format approved by the Office.

#### Response to Comments on the Rules

A notice of proposed rulemaking to adjust certain patent and trademark fee amounts and to amend the requirements for recording an assignment to apply to documents forwarded for recording on the Government Register was published in the *Federal Register* on May 26, 1995, at 60 FR 27934, and in the *Official Gazette of the United States Patent and Trademark Office* on May 30, 1995, at 1174 OG 134.

A public hearing was held June 29, 1995. Nine comments were received and considered in adopting the rules set forth herein. No oral testimony was presented.

**Comments:** Two respondents stated that the proposed inflationary increase of patent and trademark fees is unnecessary because the PTO is already operating at a surplus.

**Response:** Current PTO resources include carryover funds from fiscal year 1994. These carryover funds are partly unobligated balances to be carried forward, but primarily advanced fee payments for work to be done in fiscal year 1995. Furthermore, this carryover includes fee income generated from trademark-related products and services which, according to 35 U.S.C. 42(c), may be used only for trademark-related activities. Therefore, to recover all costs associated with the processing of patent applications, and to remain consistent with the current rate of inflation, the PTO is increasing certain patent fees by 3.2 percent as authorized by 35 U.S.C. 41(f).

In addition, two trademark service fees were proposed to be increased. The adopted fee amounts will recover the average cost of providing the service as authorized by 35 U.S.C. 41(d), and will also remain consistent with the equivalent patent service fee amounts.

**Comments:** Seven respondents objected to the proposal to amend the requirements for recording an assignment to apply to documents forwarded for recording on the Government Register. The respondents stated that not only are Government agencies required by Executive Order 9424 to forward an assignment to the PTO for recordation, but also the PTO lacks the authority under Title 35 of the United States Code to impose a fee for recording an assignment on the Government Register. **Response:** 35 U.S.C. 41(d)(1) provides that the Commissioner shall charge a fee of \$40 per property for recording any document affecting title. An assignment is a document affecting title. Therefore, the Office must require a \$40 recording fee for recording any assignment, even those being recorded on the Government Register. If a document to be recorded on the Government Register does not affect title and if it is accompanied by the appropriate cover sheet, then no fee is required.

#### Other Considerations

This final rule change is in conformity with the requirements of Executive Order 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501, et seq. This rulemaking contains no information collection within the meaning of the Paperwork Reduction Act. This final rule has been determined not to be significant for purposes of Executive Order 12866.

The PTO has determined that this final rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the final rule change would not have a significant impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The final rule change increases fees to reflect the change in the CPI as authorized by 35 U.S.C. 41(f). Further, the principal impact of the major patent fees has already been taken into account in 35 U.S.C. 41(h), which provides small entities with a 50-percent reduction in the major patent fees.

A comparison of existing and new fee amounts is included as an Appendix to this notice of final rulemaking.

#### Lists of Subjects

##### 37 CFR Part 1

Administrative practice and procedure, Inventions and patents, Reporting and record keeping requirements, Small businesses.

##### 37 CFR Part 2

Administrative practice and procedure, Courts, Lawyers, Trademarks.

##### 37 CFR Part 7

Administrative practice and procedure, Inventions and patents, Reporting and record keeping requirements.

For the reasons set forth in the preamble, the PTO is amending title 37 of the Code of Federal Regulations, Chapter 1, Part 1, as set forth below.

#### Part 1 - Rules of Practice in Patent Cases

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.16 is amended by revising paragraphs (a), (b), (d), and (f) through (i), to read as follows:

#### § 1.16 National application filing fees.

(a) Basic fee for filing each application for an original patent, except provisional, design or plant applications:

By a small entity (§ 1.9(f)) .....\$375.00  
By other than a small entity .....\$750.00

(b) In addition to the basic filing fee in an original application, except provisional applications, for filing or later presentation of each independent claim in excess of 3:

By a small entity (§ 1.9(f)) .....\$39.00  
By other than a small entity .....\$78.00

\*\*\*\*\*  
(d) In addition to the basic filing fee in an original application, except provisional applications, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:

By a small entity (§ 1.9(f)) .....\$125.00  
By other than a small entity .....\$250.00

(If the additional fees required by paragraphs (b), (c), and (d) of this section are not paid on filing or on later presentation of the claims for which the additional fees are due, they must be paid or the claims canceled by amendment prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

\*\*\*\*\*

(f) Basic fee for filing each design application

By a small entity (§ 1.9(f)) .....\$155.00  
By other than a small entity .....\$310.00

(g) Basic fee for filing each plant application, except provisional applications:

By a small entity (§ 1.9(f)) .....\$255.00  
By other than a small entity .....\$510.00

(h) Basic fee for filing each reissue application:

By a small entity (§ 1.9(f)) .....\$375.00  
By other than a small entity .....\$750.00

(i) In addition to the basic filing fee in a reissue application, for filing or later presentation of each independent claim which is in excess of the number of independent claims in the original patent:

By a small entity (§ 1.9(f)) .....\$39.00  
By other than a small entity .....\$78.00

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3. Section 1.17 is amended by revising paragraphs (b) through (g), (j), (m) through (p), (r), and (s) to read as follows:

#### § 1.17 Patent application processing fees.

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(b) Extension fee for response within second month pursuant to § 1.136(a):

By a small entity (§ 1.9(f)) .....\$190.00  
By other than a small entity .....\$380.00

(c) Extension fee for response within third month pursuant to § 1.136(a):

By a small entity (§ 1.9(f)) .....\$450.00

By other than a small entity .....\$900.00

(d) Extension fee for response within fourth month pursuant to § 1.136(a):

By a small entity (§ 1.9(f)) .....\$700.00  
By other than a small entity .....\$1,400.00

(e) For filing a notice of appeal from the examiner to the Board of Patent Appeals and Interferences:

By a small entity (§ 1.9(f)) .....\$145.00  
By other than a small entity .....\$290.00

(f) In addition to the fee for filing a notice of appeal, for filing a brief in support of an appeal:

By a small entity (§ 1.9(f)) .....\$145.00  
By other than a small entity .....\$290.00

(g) For filing a request for an oral hearing before the Board of Patent Appeals and Interferences in an appeal under 35 U.S.C. 134:

By a small entity (§ 1.9(f)) .....\$125.00  
By other than a small entity .....\$250.00

\*\*\*\*\*

(j) For filing a petition to institute a public use proceeding under § 1.292 .....\$1,430.00

\*\*\*\*\*

(m) For filing a petition:

(1) For revival of an unintentionally abandoned application, or  
(2) For the unintentionally delayed payment of the fee for issuing a patent:

By a small entity (§ 1.9(f)) .....\$625.00  
By other than a small entity .....\$1,250.00

(n) For requesting publication of a statutory invention registration prior to the mailing of the first examiner's action pursuant to § 1.104—\$870.00 reduced by the amount of the application basic filing fee paid.

(o) For requesting publication of a statutory invention registration after the mailing of the first examiner's action pursuant to § 1.104—\$1,740.00 reduced by the amount of the application basic filing fee paid.

(p) For submission of an information disclosure statement under § 1.97(c) .....\$220.00

\*\*\*\*\*

(r) For entry of a submission after final rejection under § 1.129(a):

By a small entity (§ 1.9(f)) .....\$375.00  
By other than a small entity .....\$750.00

(s) For each additional invention requested to be examined under § 1.129(b):

By a small entity (§ 1.9(f)) .....\$375.00  
By other than a small entity .....\$750.00

4. Section 1.18 is revised to read as follows:

#### § 1.18 Patent issue fees.

(a) Issue fee for issuing each original or reissue patent, except a design or plant patent:



By a small entity (§ 1.9(f))	\$625.00	By other than a small entity	\$2,990.00
By other than a small entity	\$1,250.00		

## (b) Issue fee for issuing a design patent:

By a small entity (§ 1.9(f))	\$215.00
By other than a small entity	\$430.00

## (c) Issue fee for issuing a plant patent:

By a small entity (§ 1.9(f))	\$315.00
By other than a small entity	\$630.00

5. Section 1.19 is amended by revising paragraphs (a)(1)(ii), (a)(1)(iii), (b)(1)(i), and (b)(1)(ii) to read as follows:

## § 1.19 Document supply fees.

(a) ***	
(1) ***	
(ii) Overnight delivery to PTO Box or overnight fax	\$6.00
(iii) Expedited service for copy ordered by expedited mail or fax delivery service and delivered to the customer within two workdays	\$25.00
(b) ***	
(1) ***	
(i) Regular service	\$15.00
(ii) Expedited regular service	\$30.00

6. Section 1.20 is amended by revising paragraphs (c), (e) through (g), (i)(1), (i)(2), and (j) to read as follows:

## § 1.20 Post issuance fees.

(c) For filing a request for reexamination (§ 1.510(a))	\$2,390.00
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(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond four years; the fee is due by three years and six months after the original grant

By a small entity (§ 1.9(f))	\$495.00
By other than a small entity	\$990.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond eight years; the fee is due by seven years and six months after the original grant

By a small entity (§ 1.9(f))	\$995.00
By other than a small entity	\$1,990.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond twelve years; the fee is due by eleven years and six months after the original grant

By a small entity (§ 1.9(f))	\$1,495.00
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\*\*\*\*\*

(i) \*\*\*

(1) unavoidable	\$660.00
(2) unintentional	\$1,550.00

\*\*\*\*\*

(j) For filing an application for extension of the term of a patent (§ 1.740)	\$1,060.00
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7. Section 1.21 is amended by revising paragraph (a)(1) to read as follows:

## § 1.21 Miscellaneous fees and charges.

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(a) \*\*\*

(1) For admission to examination for registration to practice: fee payable upon application

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8. Section 1.445 is amended by revising paragraph (a) to read as follows:

## § 1.445 International application filing, processing and search fees.

(a) The following fees and charges for international applications are established by the Commissioner under the authority of 35 U.S.C. 376:

(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14)	\$220.00
(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16) where:	

(i) No corresponding prior United States national application with basic filing fee has been filed	\$660.00
(ii) A corresponding prior United States national application with basic filing fee has been filed	\$430.00

(3) A supplemental search fee when required, per additional invention	\$190.00
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9. Section 1.482 is amended by revising paragraphs (a)(1)(i), (a)(1)(ii), and (a)(2)(ii) to read as follows:

## § 1.482 International preliminary examination fees.

(a) \*\*\*

(1) A preliminary examination fee is due on filing the Demand:

(i) Where an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority, a preliminary examination fee of	\$470.00
(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office, a preliminary examination fee of	\$710.00

(2) \*\*\*

(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office

	\$250.00
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Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

10. Section 1.492 is amended by revising paragraphs (a), (b), and (d) to read as follows:

## § 1.492 National stage fees.

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(a) The basic national fee:

(1) Where an international preliminary examination fee as set forth in § 1.482 has been paid on the international application to the United States Patent and Trademark Office:

By a small entity (§ 1.9(f))	\$340.00
By other than a small entity	\$680.00

(2) Where no international preliminary examination fee as set forth in § 1.482 has been paid to the United States Patent and Trademark Office, but an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority:

By a small entity (§ 1.9(f))	\$375.00
By other than a small entity	\$750.00

(3) Where no international preliminary examination fee as set forth in § 1.482 has been paid and no international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office:

By a small entity (§ 1.9(f))	\$505.00
By other than a small entity	\$1,010.00

(4) Where an international preliminary examination fee as set forth in § 1.482 has been paid to the United States Patent and Trademark Office and the international preliminary examination report states that the criteria of novelty, inventive step (non-obviousness), and industrial applicability, as defined in PCT Article 33 (1) to (4) have been satisfied for all the claims presented in the application entering the national stage (see § 1.496(b)):

By a small entity (§ 1.9(f))	\$47.00
By other than a small entity	\$94.00

(5) Where a search report on the international application has been prepared by the European Patent Office or the Japanese Patent Office:

By a small entity (§ 1.9(f))	\$440.00
By other than a small entity	\$880.00

(b) In addition to the basic national fee, for filing or later presentation of each independent claim in excess of 3:

By a small entity (§ 1.9(f))	\$39.00
By other than a small entity	\$78.00

\*\*\*\*\*

(d) In addition to the basic national fee, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:

By a small entity (§ 1.9(f))	\$125.00
By other than a small entity	\$250.00

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## Part 2 - Rules of Practice in Trademark Cases

1. The authority citation for 37 CFR Part 2 would continue to read as follows:

2. Section 2.6 is amended by revising paragraphs (b)(1)(ii), (b)(1)(iii), (b)(2)(i), and (b)(2)(ii) to read as follows:

## § 2.6 Trademark fees.

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(b) \*\*\*

(1) \*\*\*

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(ii) Overnight delivery to PTO Box or overnight fax	\$6.00
(iii) Expedited service for copy ordered by expedited mail or fax delivery service and delivered to the customer within two work days	\$25.00

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(2) \*\*\*

(i) Regular service	\$15.00
(ii) Expedited local service	\$30.00

\*\*\*\*\*

## Part 7 - Register of Government Interests in Patents

1. The authority citation for 37 CFR Part 7 would continue to read as follows:

Authority: E.O. 9424, February 18, 1944, 9 FR 1959; 3 CFR 1943-1948 Comp.

2. Section 7.1 is revised to read as follows:

a) Executive Order 9424 (3 CFR 1943-1948 Comp.) requires the several departments and other executive agencies of the Government, including Government-owned or Government-controlled corporations, to forward promptly to the Commissioner of Patents and Trademarks for recording all licenses, assignments, or other interests of the Government in or under patents or applications for patents.

(b) An instrument relating to a patent must identify the patent by the patent number. An instrument relating to a national patent application must identify the national patent application by the application number (consisting of the series code and the serial number, e.g., 07/123,456) or the serial number and filing date. An instrument relating to an international patent application which designates the United States of America must identify the international application by the international application number (e.g., PCT/US90/01234). If an assignment is executed concurrently with, or subsequent to, the execution of the patent application, but before the patent application is filed, it must identify the patent application by its date of execution, name of each inventor, and title of the invention so that there can be no mistake as to the patent application intended.

(c) Each instrument submitted to the Office for recording must be accompanied by at least one cover sheet as specified in paragraph (d) of this section referring to those patent applications and patents against which the instrument is to be recorded. Only one set of instruments and cover sheets to be recorded should be filed. If an instrument to be recorded is not accompanied by a completed cover sheet, the instrument and any incomplete cover sheet will be returned for proper completion of a cover sheet and resubmission of the instrument and a completed cover sheet.

(d) Each cover sheet required by paragraph (c) of this section must contain:



- (1) the name of the party conveying the interest;
- (2) the name and address of the party receiving the interest;
- (3) a description of the interest conveyed or transaction to be recorded;
- (4) each application number or patent number against which the instrument is to be recorded, or an indication that the instrument is filed together with a patent application;
- (5) the name and address of the party to whom correspondence concerning the request to record the instrument should be mailed;
- (6) the number of applications or patents identified in the cover sheet and the total fee;
- (7) the date the instrument was executed;
- (8) a statement by the party submitting the instrument that to the best of the person's knowledge and belief, the information contained on the cover sheet is true and correct and any copy submitted is a true copy of the original instrument; and
- (9) the signature of the party submitting the instrument.

(e) Each patent cover sheet required by paragraph (c) of this section seeking to record a governmental interest as provided by paragraph (a) of this section must:

(1) indicate that the instrument is to be recorded on the governmental register, and, if applicable, that the instrument is to be recorded on the Secret Register. See § 7.7.

(2) indicate, if applicable, that the instrument to be recorded is not an instrument affecting title. See paragraph (j) of this section.

(f) An error in a cover sheet recorded pursuant to this Part will be corrected only if:

(1) the error is apparent when the cover sheet is compared with the recorded instrument to which it pertains, and

(2) a corrected cover sheet accompanied by the recording fee set forth in paragraph (i) of this section and either the original recorded instrument or a copy of the original recorded instrument is filed for recordation.

(g) The Office will accept and record non-English language instruments only if accompanied by a verified English translation signed by the individual making the translation.

(h) Instruments and cover sheets to be recorded should be addressed to the Commissioner of Patents and Trademarks, Box Assignment, Washington, D.C. 20231.

(i) All requests to record instruments must be accompanied by the appropriate fee. Except as provided in paragraph (j) of this section, a recording fee set forth in § 1.21(h) of this chapter fee is required for each application and patent against which the instrument is recorded as identified in the cover sheet.

(j) No fee is required for each patent application and patent against which an instrument required by Executive Order 9424 (3 CFR 1943 - 1948 Comp.) to be filed if:

(1) the instrument does not affect title and is so identified in the cover sheet (see paragraph (e) of this section); and

(2) the cover sheet is filed in a format approved by the Office.

August 4, 1995

BRUCE A. LEHMAN  
Secretary of Commerce and  
Commissioner of Patents and Trademarks  
[1177 O.G. 171]

(37) DEPARTMENT OF COMMERCE  
Billing Code: 3510-16M

Patent and Trademark Office  
37 CFR Parts 1 and 2

[Docket No. 920401-2194]  
RIN 0651-AA54

Revision of Patent and Trademark Fees

Agency: Patent and Trademark Office, Commerce  
Action: Final Rule.

**Summary:** The Patent and Trademark Office (PTO) is amending the rules of practice in patent and trademark cases, Parts 1 and 2 of title 37, Code of Federal Regulations, to adjust certain patent and trademark fee amounts to reflect fluctuations in the Consumer Price Index (CPI) and to recover costs of operation. The PTO is also establishing fees for providing public access to APS-Text in Patent and Trademark Depository Libraries (PTDLs), and for dividing a trademark application. In response to comments received from the Libraries in which they expressed their concerns about the administrative burdens of collecting fees from the public for use of APS-Text, the Commissioner is immediately suspending collection of that fee to provide additional time for the PTO to solicit input from the private sector on alternative collection methods, and other options for accessing patent search and retrieval in the Libraries. **Dates:** *Effective Date:* October 1, 1992. Rule 1.21(p) will take effect on October 1, 1992 but will immediately be suspended by the Commissioner. *Comment Date:* The PTO will accept comments on alternative collection methods, and other options for accessing patent search and retrieval in the PTDLs (37 CFR 1.21(p)) until January 4, 1993. The Office will provide written notice in the Federal Register and the Official Gazette of the United States Patent and Trademark Office thirty days before starting to collect fees for accessing APS-Text in the PTDLs. **Addresses:** Address written comments to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: Frances Michalkewicz, Suite 507, Crystal Park 1, or by FAX to (703) 305-8436.

**For Further Information Contact:** Frances Michalkewicz by telephone at (703) 305-8510 or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

**Supplementary Information:** This rule change is designed to adjust the Patent and Trademark Office fees in accordance with the applicable provisions of title 35, United States Code, section 31 of the Trademark (Lanham) Act of 1946 (15 U.S.C. 1113), and section 10101 of the Omnibus Budget Reconciliation Act of 1990 (Public Law 101-508), all as amended by the Patent and Trademark Office Authorization Act of 1991 (Public Law 102-204).

#### Background:

**Statutory Provisions:** Patent fees are authorized by 35 U.S.C. 41 and 35 U.S.C. 376. A 50 percent reduction in the fees paid under 35 U.S.C. 41(a) and 41(b) by independent inventors, small business concerns, and nonprofit organizations who meet prescribed definitions is authorized by 35 U.S.C. 41(b).

Subsection 41(f) of title 35, United States Code, provides that fees established under 35 U.S.C. 41(a) and (b) may be adjusted on October 1, 1992, and every year thereafter, to reflect fluctuations in the Consumer Price Index (CPI) over the previous 12 months.

Section 10101 of the Omnibus Budget Reconciliation Act of 1990 (Pub. L. 101-508) provides that there shall be a surcharge on all fees established under 35 U.S.C. 41(a) and 41(b) to collect \$99 million in fiscal year 1993.

Subsection 41(d) of title 35, United States Code, authorizes the Commissioner to establish fees for all other processing, services, or materials related to patents to recover the average cost of providing these services or materials, except for the fees for recording a document affecting title, for each photocopy, and for each black and white copy of a patent.

Section 376 of title 35, United States Code, authorizes the Commissioner to set fees for patent applications filed under the Patent Cooperation Treaty.

Subsection 41(g) of title 35, United States Code, provides that new fee amounts established by the Commissioner under section 41 may take effect thirty days after notice in the Federal Register and the Official Gazette of the Patent and Trademark Office.

Subsection 41(i)(3) of title 35, United States Code, authorizes the Commissioner to establish reasonable fees for access to automated search systems of the PTO.

Section 31 of the Trademark (Lanham) Act of 1946, as amended (15 U.S.C. 1113), authorizes the Commissioner to establish fees for the filing and processing of an application for the registration of a trademark or other mark, and for all

other services and materials furnished by the PTO relating to trademarks and other marks.

Section 31(a) of the Trademark (Lanham) Act of 1946 (15 U.S.C. 1113(a)), as amended, allows trademark fees to be adjusted once each year to reflect, in the aggregate, any fluctuations during the preceding 12 months in the CPI.

Section 31 also allows new fee amounts to take effect thirty days after notice in the Federal Register and the Official Gazette of the Patent and Trademark Office.

**Recovery Level Determination:** Fees have been adjusted for a planned recovery of \$486,000,000 in fiscal year 1993, as proposed in the Administration's budget request to the Congress.

Fees established by 35 U.S.C. 41(a) and 41(b) (patent statutory fees) may be adjusted on October 1, 1992, to reflect any fluctuations occurring during the previous 12 months in the CPI. The Office of Management and Budget (OMB) has determined that the PTO should use Consumer Price Index-U to adjust patent statutory fees. The Department of Labor's Consumer Price Index is made public approximately 21 days after the end of the month being calculated. The patent statutory fees are being adjusted by 3.3 percent, which reflects the Administration's projected Consumer Price Index-U for the 12-month period beginning October 1, 1991.

The patent statutory fees established by rule (56 FR 65142) on December 13, 1991, are being adjusted by the projected changes in the CPI of 3.3 percent. Amounts were rounded by applying standard arithmetic rules so that the amounts rounded would be convenient to the user. Fees of \$100 or more were rounded to the nearest \$10. Fees between \$2 and \$99 were rounded to an even number so that the comparable small entity fee would be a whole number.

Patent statutory fees also are subject to the provisions of the Omnibus Budget Reconciliation Act of 1990, as amended by Public Law 102-204. These provisions require that \$99 million be collected in fiscal year 1993 for deficit reduction purposes in lieu of seeking general taxpayer funds from the U.S. Treasury. The \$99 million is deposited in a special account in the U.S. Treasury, and is reserved exclusively for use by the PTO, and is made available to the PTO through the appropriation process.

In establishing the 1993 patent statutory fees, the PTO applied the projected Consumer Price Index-U rate of 3.3 percent to the 1992 fees. The 1993 fees were rounded as explained above. Of the total amount of section 41(a) and (b) income expected to be collected in 1993, \$99 million must be deposited to the Fee Surcharge Fund.

Non-statutory patent service fees established under section 41(d) of title 35, United States Code, as amended, and PCT processing fees are being adjusted to recover planned costs in 1993, except in the case of three patent service fees set by statute. The three fees are assignment recording fees, printed patent copy fees and photocopy charge fees.

Trademark fees are being adjusted in fiscal year 1993, in the aggregate, to reflect changes over the prior 12 months in the CPI. The OMB has determined that the PTO should use Consumer Price Index-U to adjust trademark fees, which is made public by the Department of Labor approximately 21 days after the end of the month being calculated. The trademark fees are being adjusted, in the aggregate, by 3.3 percent, which reflects the Administration's projected Consumer Price Index-U for the 12 month period beginning October 1, 1991. The PTO is adjusting only two trademark fees in 1993: for filing an application (37 CFR § 2.6(a)(1)) and for assignment records, abstract of title and certification (37 CFR § 2.6(b)(7)). One new fee is being set for dividing an application (37 CFR 2.6(a)(19)). No other trademark fees are changing in 1993. The net effect of these changes is to increase trademark fees, in the aggregate, by 3.3 percent, the expected Consumer Price Index-U rate for the prior 12 month period.

**Workload Projections:** Determination of workloads varies by fee. Principal workload projection techniques are as follows:

Patent and trademark application workloads are projected from statistical regression models using recent application filing trends. Patent issues are projected from an inhouse patent production model and reflect examiner production achievements

and goals. Patent maintenance fee workloads utilize patents issued 3.5, 7.5 and 11.5 years prior to payment and assume payment rates of 75 percent, 50 percent and 25 percent, respectively. Trademark affidavit projections are based on filing trends for marks registered five to six years prior to 1993. Trademark renewal projections are based on marks registered 20 years prior to 1993. Service fee workloads follow linear trends from prior year activities.

**Public Access to Automated Systems:** In April 1989, the PTO began providing access to APS-Text in the Patent Search Room at its facilities in Arlington, Virginia. On February 12, 1990, the PTO began charging a fee for access to APS-Text in the Patent Search Room. In September 1991, the PTO began providing, without charge, APS-Text to 14 Patent and Trademark Depository Libraries (PTDLs) as a pilot test program. APS-Text provides users of the patent search files with a value added search tool that enables them to conduct more comprehensive searches.

Although many PTDLs believe that government information should be available to the public free of charge, the PTO's fiscal year 1993 budget does not include any general taxpayer funds, but requires that all of the expenses of the PTO be recovered through user fees. These expenses include the cost of providing APS-Text to the public, both in the Patent Search Room in Virginia and at the PTDLs. Continuation of this service in the PTDLs, without direct charge to the users of the automated system, would require support from all other customers who pay for products and services from the PTO.

A second issue raised by many PTDLs concerns the method that PTO would use to collect fees from the users of APS-Text in the PTDLs. Users of APS-Text in the Patent Search Room pay for use of the system directly to the PTO. PTDLs have commented that collecting fees would be an administrative burden for many, while some are legally precluded from collecting fees.

The PTO has a strong interest in expanding access to APS-Text to all PTDLs that wish to participate, but considers allocating user fees paid for other products and services to subsidize this effort to be inappropriate. Therefore, PTO concludes that establishment of a fees for access to APS-Text is necessary.

At the same time, PTO wants to limit the administrative burden imposed on the PTDLs to collect user fees. Therefore, PTO intends to enter into an agreement establishing a service bureau arrangement for administering the collection of fees at participating PTDLs. This arrangement provides one alternative for providing administrative services, but PTO is seeking others. Therefore, through this rulemaking notice, the PTO is soliciting alternatives from other organizations, including the libraries themselves, for providing the administrative services associated with APS-Text. Likewise, the Office would like to consider other options for accessing patent search and retrieval in the PTDLs. The PTO will accept comments on alternative collection methods, and other options for accessing patent search and retrieval in the PTDLs until January 4, 1993.

In rule 1.21(p), the PTO is establishing a \$70 per connect hour fee to recover the cost of providing APS-Text services in participating PTDLs, but the Commissioner is immediately suspending collection of that fee until alternative methods of collecting the fee from users of APS-Text in the PTDLs are identified. Although access to the 14 pilot PTDLs will continue for further evaluation purposes, the PTO will not extend access to additional PTDLs until a fee collection arrangement is established. Section 41(i)(3) of 35 U.S.C. states that if PTO establishes fees for access to the automated search system "a limited amount of free access shall be made available to users of the systems for purposes of education and training."

The \$70 per connect hour fee amount established by this rule is based on a calculation of the costs of PTO services, and preliminary cost estimates that were provided by a potential service bureau contractor. The cost elements for PTO include training; training software for personal computers (to be developed); manuals and documentation; additional mainframe CPU; and additional staff time for client support. The cost elements for services provided by the service bureau include billing, account administration, and user support; telecommunication costs to the network; and the Messenger Software enhancement fee.

After PTO has evaluated other options for a service bureau arrangement, a notice will be published in the Federal Register.



tion and the Official Gazette of the Patent and Trademark Office. At that time, PTO will provide administrative procedures for public use of APS-Text in the PTDLS. Depending on responses to the solicitation for alternatives for providing the administrative services associated with APS-Text, the fee amount could be reduced at that time.

**General Procedures:** Any fee amount that is paid on or after October 1, 1992, would be subject to the new fees then in effect. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing, where authorized under 37 CFR 1.8, will be considered to be the date of receipt in the PTO. A "Certificate of Mailing under Section 1.8" is not "proper" for items which are specifically excluded from the provisions of § 1.8. Section 1.8 should be consulted for those items for which a Certificate of Mailing is not "proper." Such items include, inter alia, the filing of national and international applications for patents and the filing of trademark applications. However, the provisions of 37 CFR 1.10 relating to filing papers and fees with an "Express Mail" certificate do apply to any paper or fee (including patent and trademark applications) to be filed in the PTO. If an application or fee is filed by "Express Mail" with a proper certificate dated on or after the effective date of the rules, as amended, the amount of the fee to be paid would be the fee established by the amended rules.

A comparison of existing and revised fee amounts is included as an Appendix to this final rule.

In order to ensure clarity in the implementation of the revised fees, a discussion of specific sections is set forth below.

#### DISCUSSION OF SPECIFIC RULES

##### 37 CFR 1.16 National application filing fees.

Section 1.16, paragraphs (a)-(d) and (f)-(j), is revised to adjust patent application filing fees to reflect fluctuations in the CPI.

##### 37 CFR 1.17 Patent application processing fees.

Section 1.17, paragraphs (b)-(g), and (m), is revised to adjust fees established therein to reflect fluctuations in the CPI.

Section 1.17, paragraphs (j), (n) and (o), is revised to adjust fees established therein to recover costs.

##### 37 CFR 1.18 Patent issue fees.

Section 1.18, paragraphs (a)-(c), is revised to adjust the issue fee for each original or reissue patent to reflect fluctuations in the CPI.

##### 37 CFR 1.19 Document supply fees.

Section 1.19, subparagraph (b)(4) and paragraphs (f) and (h), is revised to adjust fees established therein to recover costs.

##### 37 CFR 1.20 Post-issuance fees.

Section 1.20, paragraphs (a), (c) and (i), is revised to adjust fees established therein to recover costs.

Section 1.20, paragraphs (e)-(g), is revised to adjust fees established therein to reflect fluctuations in the CPI.

##### 37 CFR 1.21 Miscellaneous fees and charges.

Section 1.21, subparagraphs (a)(1), (a)(5), (a)(6), (b)(2), (b)(3), and paragraphs (e) and (i), is revised to adjust fees established therein to recover costs.

Section 1.21, paragraph (p), is added to establish the fee for providing public access to the Automated Patent System full-text search (APS-Text) capability in Patent and Trademark Depository Libraries. The \$70.00 per connect hour fee would recover the marginal cost of providing the service to the public,

including the cost for a service bureau to handle billing, account administration, and user support.

##### 37 CFR 1.26 Refunds.

Section 1.26, paragraph (a), is revised to increase the minimum amount of a refund, without a request, from one dollar to twenty-five dollars in accordance with the Treasury Fiscal Manual, Volume One, Part Six, Chapter 3000.

Section 1.26, paragraph (c), is revised to provide for a refund of \$1,690 if the Commissioner decides not to institute reexamination proceedings. The \$1,690 refund would apply to those instances where the reexamination fee of \$2,250 under 37 CFR 1.20(c) was paid. The current \$1,635 refund would be made in those cases where the current \$2,180 reexamination fee was paid.

##### 37 CFR 1.445 International application filing, processing, and search fees.

Section 1.445, is revised to adjust the fees authorized by 35 U.S.C. 376 to recover costs.

##### 37 CFR 1.482 International preliminary examination fees.

Section 1.482, subparagraphs (a)(1), and (a)(2)(ii), is revised to adjust the fees authorized by 35 U.S.C. 376 to recover costs.

##### 37 CFR 1.492 National stage fees.

Section 1.492, subparagraphs (a)(1)-(a)(3), and paragraphs (b)-(d), is revised to adjust fees established therein to reflect fluctuations in the CPI.

Section 1.492, subparagraph (a)(5), is revised to adjust the fee authorized by 35 U.S.C. 376 to recover costs.

##### 37 CFR 2.6 Trademark fees.

Section 2.6, subparagraphs (a)(1) and (b)(7), is revised to adjust the fees authorized by the Trademark (Lanham) Act of 1946 to reflect fluctuations in the CPI.

New section 2.6(a)(19), is added to establish a fee for dividing a trademark application in accordance with 37 CFR 2.87. Section 2.6(a)(19) is revised from the proposal by adding the words "file wrapper" to clarify that the fee amount is due for each new file wrapper created.

##### 37 CFR 2.87 Dividing an Application.

Section 2.87, is revised to establish a fee for dividing an application into two or more applications. Currently, no fee is charged for the physical act of dividing an application. Experience to date reveals that the creation of so-called "divisional" applications is labor intensive. For that reason, and because the creation of a divisional application is a significant benefit to an applicant, the PTO will charge a fee for dividing an application. The fee will be due for each new file wrapper created.

Section 2.87, is revised to divide paragraph (a) into paragraphs (a) and (b), and renumber paragraphs (b) and (c) as (c) and (d).

**Response to Comments on the Rules:** A notice of proposed rulemaking to adjust patent and trademark fees in accordance with the proposed provisions of Public Law 102-204 was published in the Federal Register on May 20, 1992, at 57 FR 21536, and in the Official Gazette on May 26, 1992, at 1138 OG 58. Corrections were published in the Federal Register on June 2, 1992, at 57 FR 23257.

A public hearing was held on June 24, 1992. A total of 28 comments were received: 27 respondents submitted written comments and three people presented oral testimony (two of whom also submitted written comments) at the public hearing. Over half of the comments received represented the views of libraries. All of the written and oral comments were considered in adopting the rules set forth herein.

**Comment:** Two people claimed that the proposed fees for filing an application under the Patent Cooperation Treaty (PCT) is discriminatory against applicants who file under the PCT route.

**Response:** The PTO is undertaking a thorough analysis of all PCT fees. The results of this analysis, and the recommendations concerning PTO's fee structure to be made to the Secretary of Commerce by the Advisory Commission on Patent Law Reform, will be taken into consideration when PTO proposes the fiscal year 1994 fee adjustments.

**Comment:** One respondent, although not objecting to the proposed 3.3 percent fee increase, suggested that the PTO may be understating its projected income from maintenance fees which could be used to offset inflationary increases and possibly reduce PCT fees.

**Response:** When maintenance fees first were imposed, the Office looked at historical payment trends experienced by other offices, such as the European Patent Office. The PTO conservatively projected the number of maintenance fees to be paid for two reasons. First, there is not a long history of maintenance fee payments on which to base income projections; for example, second stage maintenance fees only recently have started to come due, and third stage maintenance fees will not become due for many patent owners until 1995. Second, the percentage of patent owners paying second stage maintenance fees in recent months has declined from the renewal rate that was experienced during the first year that second stage maintenance fees were paid. Therefore, PTO is properly conservative in its maintenance fee payment projections. We will conduct a comprehensive analysis of projected maintenance fee payments prior to proposing the fiscal year 1994 fee adjustment.

**Comment:** Eighteen respondents opposed establishment of fees for the public to access APS-Text at the Patent and Trademark Depository Libraries, primarily because the public has a right to free access to patent information. One person asked about administrative procedures for providing APS-Text in the PTDLS, and suggested that CD-ROM products continue to be made available free of charge and access fees for APS-Text be kept as low as possible.

**Response:** As a fully fee-funded agency, the costs to the PTO of providing access to APS-Text in the 74 Patent and Trademark Depository Libraries (PTDLs) would have to be borne either by the individual users of the system, or by all users of the patent system (e.g., patent applicants). In June 1988, the PTO published in 53 Federal Register 23677 the results of comments solicited on alternatives for funding access to the PTO's automated systems. In response, the PTO received 21 comments, 12 of which advocated the use of taxpayer revenues, and seven supported at least some reliance on user fees. The latter based their decisions on the reality of budget deficit problems; the inequity of providing taxpayer funds to subsidize on-line searchers who charge fees for their services; and the need to have an equitable fee structure that applies throughout the United States.

The PTO has a strong interest in expanding access to APS-Text to all PTDLs that wish to participate, with the least amount of administrative burden to the PTDLs, but considers allocating user fees paid for other products and services to subsidize this effort to be inappropriate. Therefore, the PTO is establishing a fee of \$70 per connect hour for accessing APS-Text in the PTDLs, which includes the cost of having a service bureau provide billing, account administrative, and user support. However, the Commissioner is immediately suspending collection of that fee to provide additional time to solicit comments through this rulemaking for providing the administrative services associated with APS-Text. Likewise, the Office would like to consider other options for accessing

patent search and retrieval in the PTDLs. The Office will publish a notice in the Federal Register and the Official Gazette of the Patent Trademark Office thirty days before it begins collecting a fee for public access to APS-Text in the PTDLs. **Comment:** One respondent claimed that proposed 37 CFR 1.21(p) is not in accord with the rulemaking provision of 5 U.S.C. 553(b) which requires that the issues involved be described in the notice of proposed rulemaking.

**Response:** The Notice of Proposed Rulemaking 57 FR 21536, referenced 35 U.S.C. 41(i)(3) which authorizes the Commissioner to establish reasonable fees for access to automated search systems of the PTO. Further in the notice at 57 FR 21537, under the discussion of the proposed revision to 37 CFR § 1.21, it was stated that the proposed \$40.00 fee would recover the PTO's estimated marginal cost of providing the service to the PTDLs. The notice also indicated the PTO was investigating the use of a contract service bureau to provide access in which case the fee would be approximately \$70.00. This fully described the issue involved in the proposed rule change.

**Comment:** Two respondents commented on the administrative burden caused by a change to the fee structure at this time, particularly in light of prior fee changes and the small amount of the adjustment.

**Response:** The PTO proposed to adjust its fees because operating costs have increased over the past year. The Commissioner is authorized to adjust patent and trademark fees on October 1, 1992 and every year thereafter to reflect fluctuations in the Consumer Price Index over the prior twelve months. Future charges are expected to occur annually on October 1st. The fee increases that will be implemented on October 1, 1992, are expected to generate \$15.1 million. Without this revenue, PTO would be forced to make cuts in patent and trademark operations that would affect the quality of examination.

**Comment:** One person expressed concern about the quality and timeliness of services for which new or increased fees are proposed, complaining specifically of the delay in receiving an official filing receipt when a trademark application is divided and in the recording of assignments.

**Response:** A major objective of the Office is to assure continuous quality improvements throughout all operations. The Office has taken steps to address the areas of concern identified.

**Comment:** One organization and one person objected to the PTO's sole reliance on fee income, particularly for funding automation development costs.

**Response:** The Omnibus Budget Reconciliation Act of 1990 requires that a user fee surcharge on certain patent fees replace taxpayer funds for the five year period 1991-1995. Whether PTO should receive funds from other sources in future fiscal years is beyond the scope of the rule package.

The automation programs, which are funded from user fees, are designed to improve the quality and timeliness of PTO services and products, and to discontinue reliance on manual processes and paper references.

**Comment:** One person said that small entities do not benefit from the 50 percent reduction to certain patent fees, because many small companies, particularly those in high technology areas, must license their patent rights and thus pay large entity status fees.

**Response:** The purpose of the small entity subsidy is to ensure that individual inventors, small businesses and non-profit organizations are not barred from using the patent system because of the PTO's fee structure. Once a small entity assigns the rights to a patent application or a patent to a large entity, presumably receiving compensation from the large entity, the reduced fee amounts no longer apply.

**Comment:** One organization said that trademark fees appear to be justified but PTO must ensure that trademark functions are being discharged in the most efficient and economical manner. For example, the organization questioned whether it is efficient for the Office to continue to maintain a paper search file and to continue to pay the General Services Administration (GSA) for building services.

**Response:** The Office is committed to ensuring that its trademark functions are being discharged effectively and, as part of its quality improvement program, is currently reviewing various work-related processes. No decision has yet been made as to when the paper search file will be eliminated and no such decision will be made until the public has been given an oppor-



tunity to comment. The Office has asked GSA to review the level of charges assessed in light of current market conditions.

**Other Considerations:** The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354); Executive Orders 12291 and 12612; and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501, et seq. There are no information collection requirements relating to patent and trademark fee rules.

The PTO has determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule change would not have a significant adverse impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The rule change increases fees by changes in the CPI as authorized by 35 U.S.C. 41(f). Further, the principal impact of the major patent fees has already been taken into account in 35 U.S.C. 41(h), which provides small entities with a 50-percent reduction in the major patent fees.

The PTO has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy would be less than \$100 million. There would be no major increase in costs or prices for consumers; individual industries; Federal, state, or local government agencies; or geographic regions. There would be no significant adverse effects on competition, employment, investment, productivity, or innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

#### List of Subjects

##### 37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Reporting and record keeping requirements, Small businesses.

##### 37 CFR Part 2

Administrative practice and procedure, Courts, Lawyers, Trademarks.

For the reasons set forth in the preamble, the PTO is amending title 37 of the Code of Federal Regulations, Chapter I, as set forth below.

#### Part 1—Rule of Practice in Patent Cases

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.16 is amended by revising paragraphs (a)-(d), the parenthetical following paragraph (d), paragraphs (f)-(j), and the note at the end of the section to read as follows:

##### § 1.16 National application filing fees.

(a) Basic fee for filing each application for an original patent, except design or plant cases:  
By a small entity (§ 1.19(f)) .....\$355.00  
By other than a small entity .....\$710.00

(b) In addition to the basic filing fee in an original application, for filing or later presentation of each independent claim in excess of 3:  
By a small entity (§ 1.9(f)) .....\$37.00  
By other than a small entity .....\$74.00

(c) In addition to the basic filing fee in an original application, for filing or later presentation of each claim (whether independent or dependent) in excess of 20.  
(Note that § 1.75(c) indicates how multiple dependent claims

are considered for fee calculation purposes):

By a small entity (§ 1.9(f)) .....\$11.00  
By other than a small entity .....\$22.00

(d) In addition to the basic filing fee in an original application, if the application contains, or is amended to contain, a multiple dependent claim(s) per application:

By a small entity (§ 1.9(f)) .....\$115.00  
By other than a small entity .....\$230.00

(If the additional fees required by paragraphs (b), (c), and (d) of this section are not paid on filing or on later presentation of the claims for which the additional fees are due, they must be paid or the claims canceled by amendment prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

\*\*\*\*\*

(f) For filing each design application:

By a small entity (§ 1.9(f)) .....\$145.00  
By other than a small entity .....\$290.00

(g) Basic fee for filing each plant application:

By a small entity (§ 1.9(f)) .....\$240.00  
By other than a small entity .....\$480.00

(h) Basic fee for filing each reissue application:

By a small entity (§ 1.9(f)) .....\$355.00  
By other than a small entity .....\$710.00

(i) In addition to the basic filing fee in a reissue application, for filing or later presentation of each independent claim which is in excess of the number of independent claims in the original patent:

By a small entity (§ 1.9(f)) .....\$37.00  
By other than a small entity .....\$74.00

(j) In addition to the basic filing fee in a reissue application, for filing or later presentation of each claim (whether independent or dependent) in excess of 20 and also in excess of the number of claims in the original patent.  
(Note that § 1.75(c) indicates how multiple dependent claims are considered for fee calculation purposes):

By a small entity (§ 1.9(f)) .....\$11.00  
By other than a small entity .....\$22.00

(Note: See §§ 1.445, 1.482 and 1.492 for international application filing and processing fees.)

(m)-(o) to read as follows:

##### § 1.17 Patent application processing fees.

\*\*\*\*\*

(b) Extension fee for response within second month pursuant to § 1.136(a):

By a small entity (§ 1.9(f)) .....\$180.00  
By other than a small entity .....\$360.00

(c) Extension fee for response within third month pursuant to § 1.136(a):

By a small entity (§ 1.9(f)) .....\$420.00  
By other than a small entity .....\$840.00

(d) Extension fee for response within fourth month pursuant to § 1.136(a):

By a small entity (§ 1.9(f)) .....\$660.00  
By other than a small entity .....\$1,320.00

(e) For filing a notice of appeal from the examiner to the Board of Patent Appeals and Interferences:

By a small entity (§ 1.9(f)) .....\$135.00  
By other than a small entity .....\$270.00

(f) In addition to the fee for filing a notice of appeal, for filing a brief in support of an appeal:

By a small entity (§ 1.9(f)) .....\$135.00  
By other than a small entity .....\$270.00

(g) For filing a request for an oral hearing before the Board of Patent Appeals and Interferences in appeal under 35 U.S.C. 134:

By a small entity (§ 1.9(f)) .....\$115.00  
By other than a small entity .....\$230.00

\*\*\*\*\*

(j) For filing a petition to institute a public use proceeding under § 1.292 .....\$1,350.00

\*\*\*\*\*

(m) For filing a petition:

(1) For revival of an unintentionally abandoned application, or

(2) For the unintentionally delayed payment of the fee for issuing a patent:

By a small entity (§ 1.9(f)) .....\$585.00  
By other than a small entity .....\$1,170.00

(n) For requesting publication of a statutory invention registration prior to the mailing of the first examiner's action pursuant to § 1.104-\$820.00 reduced by the amount of the application basic filing fee paid

(o) For requesting publication of a statutory invention registration after the mailing of the first examiner's action pursuant to § 1.104-\$1,640.00 reduced by the amount of the application basic filing fee paid

\*\*\*\*\*

4. Section 1.18 is amended by revising paragraphs (a)-(c) to read as follows:

##### § 1.18 Patent issue fees.

(a) Issue fee for issuing each original or reissue patent, except a design or plant patent:

By a small entity (§ 1.9(f)) .....\$585.00  
By other than a small entity .....\$1,170.00

(b) Issue fee for issuing a design patent:

By a small entity (§ 1.9(f)) .....\$205.00  
By other than a small entity .....\$410.00

(c) Issue fee for issuing a plant patent:

By a small entity (§ 1.9(f)) .....\$295.00  
By other than a small entity .....\$590.00

5. Section 1.19 is amended by revising paragraph (b)(4) and paragraphs (f) and (h) to read as follows:

##### § 1.19 Document supply fees:

\*\*\*\*\*

(b) \*\*\*

(4) For assignment records, abstract of title and certification, per patent .....\$25.00

\*\*\*\*\*

(f) Uncertified copy of a non-United States patent document, per document .....\$25.00

\*\*\*\*\*

(h) Additional filing receipts; duplicate; or corrected due to applicant error .....\$25.00

6. Section 1.20 is amended by revising paragraphs (a), (c), (e)-(g) and (i) to read as follows:

##### § 1.20 Post issuance fees.

(a) For providing a certificate of correction for applicant's mistake (§ 1.323) .....\$100.00

\*\*\*\*\*

(c) For filing a request for reexamination (§ 1.510(a)) \$2,250.00

\*\*\*\*\*

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond four years; the fee is due by three years and six months after the original grant.

By a small entity (§ 1.9(f)) .....\$465.00  
By other than a small entity .....\$930.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond eight years; the fee is due by seven years and six months after the original grant.

By a small entity (§ 1.9(f)) .....\$935.00  
By other than a small entity .....\$1,870.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond twelve years; the fee is due by eleven years and six months after the original grant.

By a small entity (§ 1.9(f)) .....\$1,410.00  
By other than a small entity .....\$2,820.00

\*\*\*\*\*

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable .....\$620.00

\*\*\*\*\*

7. Section 1.21 is amended by revising paragraphs (a)(1), (a)(5), (a)(6), (b)(2), (b)(3), (c), and (i) and adding paragraph (p) to read as follows:

##### § 1.21 Miscellaneous fees and charges.

\*\*\*\*\*

(a) \*\*\*

(1) For admission to examination for registration to practice, fee payable upon application .....\$300.00

\*\*\*\*\*

(5) For review of a decision of the Director of Enrollment and Discipline under § 10.2(c) .....\$130.00

(6) For requesting regrading of an examination under § 10.7(c) .....\$130.00

(b) \*\*\*

(2) Service charge for each month when the balance at the end of the month is below \$1,000 .....\$25.00

(3) Service charge for each month when the balance at the end of the month is below \$300.00 for restricted subscription deposit accounts used exclusively for subscription order of patent copies as issued .....\$25.00

\*\*\*\*\*

(e) International type search reports: For preparing an international type search report of an international type search made at the time of the first action on the merits in a national patent application .....\$40.00

\*\*\*\*\*

(i) Publication in Official Gazette: For publication in the Official Gazette of a notice of the availability of an application or

a patent for licensing or sale, each application or patent.....\$25.00

\*\*\*\*\*

(p) Library service: marginal cost for providing to a Patent and Trademark Depository Library access to Automated Patent System (APS) full-text search capability, per hour of terminal session time, including print time.....\$70.00

8. Section 1.26 is amended by revising paragraphs (a) and (c) to read as follows:

**§ 1.26 Refunds.**

(a) Money paid in excess will be refunded, but a mere change of purpose after the payment of money, as when a party desires to withdraw an application, an appeal, or a request for oral hearing, will not entitle a party to demand such a return. Amounts of twenty-five dollars or less will not be returned unless specifically requested within a reasonable time, nor will the payer be notified of such amount; amounts over twenty-five dollars may be returned by check, or if requested, by credit to a deposit account.

\*\*\*\*\*

(c) If the Commissioner decides not to institute a reexamination proceeding, a refund of \$1,690 will be made to the requester of the proceeding. Reexamination requesters should indicate whether any refund should be made by check or by credit to a deposit account.

9. Section 1.445 is amended by revising paragraph (a) to read as follows:

**§ 1.445 International application filing, processing and search fees.**

(a) The following fees and charges for international applications are established by the Commissioner under the authority of 35 U.S.C. 376:

(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14).....\$200.00

(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16) where:

(i) No corresponding prior United States national application with basic filing fee has been filed.....\$620.00

(ii) A corresponding prior United States national application with basic filing fee has been filed.....\$410.00

(3) A supplemental search fee when required, per additional invention.....\$170.00

\*\*\*\*\*

10. Section 1.482 is amended by revising paragraphs (a) introductory text, (a)(1), and (a)(2)(ii) to read as follows:

**§ 1.482 International preliminary examination fees.**

(a) The following fees and charges for international preliminary examination are established by the Commissioner under the authority of 35 U.S.C. 376:

(1) A preliminary examination fee is due on filing the Demand:

(i) Where an international search fee as set forth in § 1.455(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority, a preliminary examination fee of.....\$450.00

(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office, a preliminary examination fee of.....\$670.00

(2)\*\*\*

(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office.....\$230.00

\*\*\*\*\*

11. Section 1.492 is amended by revising paragraphs (a)(1)-(a)(3), (a)(5), paragraphs (b)-(d), and the parenthetical following paragraph (d) to read as follows:

**§ 1.492 National stage fees.**

\*\*\*\*\*

(a) \*\*\*

(1) Where an international preliminary examination fee as set forth in § 1.482 has been paid on the international application to the United States Patent and Trademark Office:

By a small entity (§ 1.9(f)).....\$320.00

By other than a small entity.....\$640.00

(2) Where no international preliminary examination fee as set forth in § 1.482 has been paid to the United States Patent and Trademark Office, but an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority:

By a small entity (§ 1.9(f)).....\$355.00

By other than a small entity.....\$710.00

(3) Where no international preliminary examination fee as set forth in § 1.482 has been paid and no international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office:

By a small entity (§ 1.9(f)).....\$475.00

By other than a small entity.....\$950.00

\*\*\*\*\*

(5) Where a search report on the international application has been prepared by the European Patent Office or the Japanese Patent Office: By a small entity (§ 1.9(f)).....\$415.00

By other than a small entity.....\$830.00

(b) In addition to the basic national fee, for filing or later presentation of each independent claim in excess of 3:

By a small entity (§ 1.9(f)).....\$37.00

By other than a small entity.....\$74.00

(c) In addition to the basic national fee, for filing or later presentation of each claim (whether independent or dependent) in excess of 20 (Note that § 1.75(c) indicates how multiple dependent claims are considered for fee calculation purposes.):

By a small entity (§1.9(f)).....\$11.00

By other than a small entity.....\$22.00

(d) In addition to the basic national fee, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:

By a small entity (§ 1.9(f)).....\$115.00

By other than a small entity.....\$230.00

(If the additional fees required by paragraphs (b), (c) and (d) are not paid on presentation of the claims for which the additional fees are due, they must be paid or the claims cancelled by amendment prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

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**Part 2 - Rules of Practice in Trademark Cases**

1. The authority citation for Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

2. Section 2.6 is amended by revising paragraphs (a)(1) and (b)(7) and adding paragraph (a)(19) to read as follows:

**§ 2.6 Trademark fees.**

\*\*\*\*\*

(a) Trademark process fees.

(1) For filing an application, per class.....\$210.00

\*\*\*\*\*

(19) Dividing an application, per new application (file wrapper) created.....\$100.00

(b) Trademark service fees.

\*\*\*\*\*

(7) For assignment records, abstract of title and certification, per registration.....\$25.00

\*\*\*\*\*

3. Section 2.87 is revised to read as follows:

**Section 2.87 Dividing an Application**

(a) An application may be physically divided into two or more separate applications upon the payment of a fee for each new application created and submission by the applicant of a request in accordance with paragraph (d) of this section.

(b) In the case of a request to divide out one or more entire classes from an application, only the fee under paragraph (a) of this section will be required. However, in the case of a

request to divide out some, but not all, of the goods or services in a class, an application filing fee for each new separate application to be created by the division must be submitted, together with the fee under paragraph (a) of this section. Any outstanding time period for action by the applicant in the original application at the time of the division will be applicable to each new separate application created by the division.

(c) A request to divide an application may be filed at any time between the filing of the application and the date the Trademark Examining Attorney approves the mark for publication or the date of expiration of the six-month response period after issuance of a final action; or during an opposition, upon motion granted by the Trademark Trial and Appeal Board. Additionally, a request to divide an application under section 1(b) of the Act may be filed with a statement of use under § 2.88 or at any time between the filing of a statement of use and the date the Trademark Examining Attorney approves the mark for registration or the date of expiration of the six-month response period after issuance of a final action.

(d) A request to divide an application should be made in a separate paper from any other amendment or response in the application. The title "Request to divide application." should appear at the top of the first page of the paper.

Aug. 17, 1992

DOUGLAS B. COMER  
Acting Assistant Secretary  
and Acting Commissioner  
of Patents and Trademarks

Note.- The following appendix will not appear in the Code of Federal Regulations

**Appendix A - Comparison of Existing and Revised Fee Amounts**

37 CFR Sec.	DESCRIPTION	Dec 1991	Oct 1992
1.16(a)	Basic Filing Fee	\$690	\$710
1.16(a)	Basic Filing Fee (Small Entity)	\$345	\$355
1.16(b)	Independent Claims	\$72	\$74
1.16(b)	Independent Claims (Small Entity)	\$36	\$37
1.16(c)	Claims in Excess of 20	\$20	\$22
1.16(c)	Claims in Excess of 20 (Small Entity)	\$10	\$11
1.16(d)	Multiple Dependent Claims	\$220	\$230
1.16(d)	Multiple Dependent Claims (Small Entity)	\$110	\$115
1.16(e)	Surcharge - Late Filing Fee	\$130	\$130
1.16(e)	Surcharge - Late Filing Fee (Small Entity)	\$65	\$65
1.16(f)	Design Filing Fee	\$280	\$290
1.16(f)	Design Filing Fee (Small Entity)	\$140	\$145
1.16(g)	Plant Filing Fee	\$460	\$480
1.16(g)	Plant Filing Fee (Small Entity)	\$230	\$240
1.16(h)	Reissue Filing Fee	\$690	\$710
1.16(h)	Reissue Filing Fee (Small Entity)	\$345	\$355
1.16(i)	Reissue Independent Claims	\$72	\$74
1.16(i)	Reissue Independent Claims (Small Entity)	\$36	\$37
1.16(j)	Reissue Claims in Excess of 20	\$20	\$22
1.16(j)	Reissue Claims in Excess of 20 (Small Entity)	\$10	\$11
1.17(a)	Extension - First Month	\$110	\$110
1.17(a)	Extension - First Month (Small Entity)	\$55	\$55
1.17(b)	Extension - Second Month	\$350	\$360
1.17(b)	Extension - Second Month (Small Entity)	\$175	\$180
1.17(c)	Extension - Third Month	\$810	\$840
1.17(c)	Extension - Third Month (Small Entity)	\$405	\$420
1.17(d)	Extension - Fourth Month	\$1,280	\$1,320
1.17(d)	Extension - Fourth Month (Small Entity)	\$640	\$660
1.17(e)	Notice of Appeal	\$260	\$270
1.17(e)	Notice of Appeal (Small Entity)	\$130	\$135
1.17(f)	Filing a Brief	\$260	\$270
1.17(f)	Filing a Brief (Small Entity)	\$130	\$135
1.17(g)	Request for Oral Hearing	\$220	\$230
1.17(g)	Request for Oral Hearing (Small Entity)	\$110	\$115
1.17(h)	Petition - Not All Inventors	\$130	\$130
1.17(h)	Petition - Correction of Inventorship	\$130	\$130
1.17(h)	Petition - Decision on Questions	\$130	\$130
1.17(h)	Petition - Suspend Rules	\$130	\$130
1.17(h)	Petition - Expedited License	\$130	\$130
1.17(h)	Petition - Scope of License	\$130	\$130
1.17(h)	Petition - Retroactive License	\$130	\$130
1.17(h)	Petition - Refusing Maintenance Fee	\$130	\$130
1.17(h)	Petition - Refusing Maintenance Fee - Expired Patent	\$130	\$13
1.17(h)	Petition - Interference	\$130	\$130



1.17(b)	Petition - Reconsider Interference	\$130	\$130
1.17(b)	Petition - Late Filing of Interference	\$130	\$130
1.20(b)	Petition - Correction of Inventorship	\$130	\$130
1.17(b)	Petition - Refusal of Publish SIR	\$130	\$130
1.17(i)(1)	Petition - For Assignment	\$130	\$130
1.17(i)(1)	Petition - For Application	\$130	\$130
1.17(i)(1)	Petition - Late Priority Papers	\$130	\$130
1.17(i)(1)	Petition - Suspend Action	\$130	\$130
1.17(i)(1)	Petition - Divisional Reissues to Issue Separately	\$130	\$130
1.17(i)(1)	Petition - For Interference Agreement	\$130	\$130
1.17(i)(1)	Petition - Amendment After Issue	\$130	\$130
1.17(i)(1)	Petition - Withdrawal After Issue	\$130	\$130
1.17(i)(1)	Petition - Defer Issue	\$130	\$130
1.17(i)(1)	Petition - Issue to Assignee	\$130	\$130
1.17(i)(1)	Petition - Accord a Filing Date Under § 1.53	\$130	\$130
1.17(i)(1)	Petition - Accord a Filing Date Under § 1.60	\$130	\$130
1.17(i)(1)	Petition - Accord a Filing Date Under § 1.62	\$130	\$130
1.17(i)(2)	Petition - Make Application Special	\$130	\$130
1.17(j)	Petition - Public Use Processing	\$1,310	\$1,350
1.17(k)	Non-English Specification	\$130	\$130
1.17(l)	Petition - Revive Abandoned Appl.	\$110	\$110
1.17(l)	Petition - Revive Abandoned Appl. (Small Entity)	\$55	\$55
1.17(m)	Petition - Revive Unintentionally Abandoned Appl.	\$1,130	\$1,170
1.17(m)	Petition - Revive Unintentionally Abandoned Appl. (Small Entity)	\$565	\$585
1.17(n)	SIR - Prior to Examiner's Action	\$790	\$820
1.17(o)	SIR - After Examiner's Action	\$1,580	\$1,640
1.17(p)	Submission of an Information Disclosure Statement (§ 1.97)	\$200	\$200
1.18(a)	Issue Fee	\$1,130	\$1,170
1.18(a)	Issue Fee (Small Entity)	\$565	\$585
1.18(b)	Design Issue Fee	\$400	\$410
1.18(b)	Design Issue Fee (Small Entity)	\$200	\$205
1.18(c)	Plant Issue Fee	\$570	\$590
1.18(c)	Plant Issue Fee (Small Entity)	\$285	\$295
1.19(a)(1)(i)	Copy of Patent	\$3	\$3
1.19(a)(1)(ii)	Patent Copy - Expedited Local Service	\$6	\$6
1.19(a)(1)(iii)	Patent Copy Ordered Via EOS - Expedited Service	\$25	\$25
1.19(a)(2)	Plant Patent Copy	\$12	\$12
1.19(a)(3)(i)	Copy of Utility Patent or SIR in Color	\$24	\$24
1.19(b)(1)(i)	Certified Copy of Patent Application as Filed	\$12	\$12
1.19(b)(1)(ii)	Certified Copy of Patent Application as Filed, Expedited	\$24	\$24
1.19(b)(2)	Cert. or Uncert. Copy of Patent-Related File Wrapper/Contents	\$150	\$150
1.19(b)(3)	Cert. or Uncert. Copies of Office Records, per Document	\$25	\$25
1.19(b)(4)	For Assignment Records, Abstract of Title and Certification	\$20	\$25
1.19(c)	Library Service	\$50	\$50
1.19(d)	List of Patents in Subclass	\$3	\$3
1.19(e)	Uncertified Statement-Status of Maintenance Fee Payment	\$10	\$10
1.19(f)	Copy of Non-U.S. Patent Document	\$12	\$25
1.19(g)	Comparing the Certifying Copies, Per Document, Per Copy	\$25	\$25
1.19(h)	Duplicate or Corrected Filing Receipt	\$20	\$25
1.20(a)	Certificate of Correction	\$70	\$100
1.20(c)	Reexamination	\$2,180	\$2,250
1.20(d)	Statutory Disclaimer	\$110	\$110
1.20(d)	Statutory Disclaimer (Small Entity)	\$55	\$55
1.20(e)	Maintenance Fee - 3.5 Years	\$900	\$930
1.20(e)	Maintenance Fee - 3.5 Years (Small Entity)	\$450	\$465
1.20(f)	Maintenance Fee - 7.5 Years	\$1,810	\$1,870
1.20(f)	Maintenance Fee - 7.5 Years (Small Entity)	\$905	\$935
1.20(g)	Maintenance Fee - 11.5 Years	\$2,730	\$2,820
1.20(g)	Maintenance Fee - 11.5 Years (Small Entity)	\$1,365	\$1,410
1.20(h)	Surcharge - Maintenance Fee - 6 Months	\$130	\$130
1.20(h)	Surcharge - Maintenance Fee - 6 Months (Small Entity)	\$65	\$65
1.20(i)	Surcharge - Maintenance After Expiration	\$600	\$620
1.20(j)	Extension of Term of Patent	\$1,000	\$1,000
1.21(a)(1)	Admission to Examination	\$290	\$300
1.21(a)(2)	Registration to Practice	\$100	\$100
1.21(a)(3)	Reinstatement to Practice	\$15	\$15
1.21(a)(4)	Certificate of Good Standing	\$10	\$10
1.21(a)(4)	Certificate of Good Standing, Suitable Framing	\$20	\$20
1.21(a)(5)	Review of Decision of Director, OED	\$120	\$130
1.21(a)(6)	Regrading of Examination	\$120	\$130
1.21(b)(1)	Establish Deposit Account	\$10	\$10
1.21(b)(2)	Service Charge Below Minimum Balance	\$20	\$25
1.21(b)(3)	Service Charge Below Minimum Balance	\$20	\$25
1.21(c)	Filing a Disclosure Document	\$10	\$10
1.21(d)	Box Rental	\$50	\$50
1.21(e)	International Type Search Report	\$35	\$40
1.21(g)	Self-Service Copy Charge	\$0.25	\$0.25
1.21(h)	Recording Patent Property	\$40	\$40
1.21(i)	Publication in the OG	\$20	\$25

1.21(j)	Labor Charges for Services	\$30	\$30
1.21(k)	Unspecified Other Services	Actual Cost	Actual Cost
1.21(l)	Retaining Abandoned Application	\$130	\$130
1.21(m)	Processing Returned Checks	\$50	\$50
1.21(n)	Handling Fee - Incomplete Application	\$130	\$130
1.21(o)	Terminal Use APS-Text	\$40	\$40
1.21(p)	Terminal Use APS-Text by the PTDL's	-	\$70
1.24	Coupons for Patent Copies	\$3	\$3
1.296	Handling Fee - Withdrawal SIR	\$130	\$130
1.445(a)(1)	Transmittal Fee	\$190	\$200
1.445(a)(2)(i)	PCT Search Fee - No U.S. Application	\$600	\$620
1.445(a)(2)(ii)	PCT Search Fee - Prior U.S. Application	\$400	\$410
1.445(a)(3)	Supplemental Search	\$160	\$170
1.482(a)(1)(i)	Preliminary Exam Fee	\$440	\$450
1.482(a)(1)(ii)	Preliminary Exam Fee	\$650	\$670
1.482(a)(2)(i)	Additional Invention	\$140	\$140
1.482(a)(2)(ii)	Additional Invention	\$220	\$230
1.492(a)(1)	Preliminary Examining Authority	\$620	\$640
1.492(a)(1)	Preliminary Examining Authority (Small Entity)	\$310	\$320
1.492(a)(2)	Searching Authority	\$690	\$710
1.492(a)(2)	Searching Authority (Small Entity)	\$345	\$355
1.492(a)(3)	PTO Not ISA nor IPEA	\$920	\$950
1.492(a)(3)	PTO Not ISA nor IPEA (Small Entity)	\$460	\$475
1.492(a)(4)	Claims - IPEA	\$90	\$90
1.492(a)(4)	Claims - IPEA (Small Entity)	\$45	\$45
1.492(a)(5)	Filing with EPO/JPO Search Report	\$800	\$830
1.492(a)(5)	Filing with EPO/JPO Search Report (Small Entity)	\$400	\$415
1.492(b)	Claims - Extra Individual (Over 3)	\$72	\$74
1.492(b)	Claims - Extra Individual (Over 3) (Small Entity)	\$36	\$37
1.492(c)	Claims - Extra Total (Over 20)	\$20	\$22
1.492(c)	Claims - Extra Total (Over 20) (Small Entity)	\$10	\$11
1.492(d)	Claims - Multiple Dependents	\$220	\$230
1.492(d)	Claims - Multiple Dependents (Small Entity)	\$110	\$115
1.492(e)	Surcharge	\$130	\$130
1.492(e)	Surcharge (Small Entity)	\$65	\$65
1.492(f)	English Translation - After 20 Months	\$130	\$130
2.6(a)(1)	Application for Registration, Per Class	\$200	\$210
2.6(a)(2)	Amendment to Allege Use, Per Class	\$100	\$100
2.6(a)(3)	Statement of Use, Per Class	\$100	\$100
2.6(a)(4)	Extension for Filing Statement of Use, Per Class	\$100	\$100
2.6(a)(5)	Application for Renewal, Per Class	\$300	\$300
2.6(a)(6)	Surcharge for Late Renewal, Per Class	\$100	\$100
2.6(a)(7)	Publication of Mark Under § 12(a), Per Class	\$100	\$100
2.6(a)(8)	Issuing New Certificate of Registration	\$100	\$100
2.6(a)(9)	Certificate of Correction of Registrant's Error	\$100	\$100
2.6(a)(10)	Filing Disclaimer to Registration	\$100	\$100
2.6(a)(11)	Filing Amendment to Registration	\$100	\$100
2.6(a)(12)	Filing Affidavit Under Section 8, Per Class	\$100	\$100
2.6(a)(13)	Filing Affidavit Under Section 15, Per Class	\$100	\$100
2.6(a)(14)	Filing Affidavit Under Sections 8 & 15, Per Class	\$200	\$200
2.6(a)(15)	Petitions to the Commissioner	\$100	\$100
2.6(a)(16)	Petition to Cancel, Per Class	\$200	\$200
2.6(a)(17)	Notice of Opposition, Per Class	\$200	\$200
2.6(a)(18)	Ex Parte Appeal to the TTAB, Per Class	\$100	\$100
2.6(a)(19)	Dividing an Application, Per New Application Created	-	\$100
2.6(b)(1)(i)	Copy of Registered Mark	\$3	\$3
2.6(b)(1)(ii)	Copy of Registered Mark, Expedited	\$6	\$6
2.6(b)(1)(iii)	Copy of Registered Mark Ordered Via EOS, Expedited Svc.	\$25	\$25
2.6(b)(2)(i)	Certified Copy of TM Application as Filed	\$12	\$12
2.6(b)(2)(ii)	Certified Copy of TM Application as Filed, Expedited	\$24	\$24
2.6(b)(3)	Cert. or Uncert. Copy of TM-Related File Wrapper/Contents	\$50	\$50
2.6(b)(4)(i)	Cert. Copy of Registered Mark, Title, or Status	\$10	\$10
2.6(b)(4)(ii)	Cert. Copy of Registered Mark, Title or Status - Expedited	\$20	\$20
2.6(b)(5)	Certified or Uncertified Copy of TM Records	\$25	\$25
2.6(b)(6)	Recording Trademark Property, Per Mark, Per Document	\$40	\$40
2.6(b)(6)	For Second and Subsequent Marks in Same Document	\$25	\$25
2.6(b)(7)	For Assignment Records, Abstracts of Title and Cert.	\$20	\$25
2.6(b)(8)	Terminal Use T-SEARCH	\$40	\$40
2.6(b)(9)	Self-Service Copy Charge	\$0.25	\$0.25
2.6(b)(10)	Labor Charges for Services	\$30	\$30
2.6(b)(11)	Unspecified Other Services	Actual Cost	Actual Cost
1.19(g)	Comparing and Certifying Copies, per Document, per Copy	\$25	\$25
1.24	Trademark Coupons	\$3	\$3



**DEPARTMENT OF COMMERCE**  
**Billing Code: 3510-16-M**  
**Patent and Trademark Office**  
**37 CFR Part 1**  
**[Docket No. 940415-4212]**  
**RIN 0651-AA68**  
**Revision of Patent Fees**

**Agency:** Patent and Trademark Office, Commerce  
**Action:** Notice of Final Rulemaking and Lifting of Suspension.  
**Summary:** The Patent and Trademark Office (PTO) is amending the rules of practice in patent cases, Part 1 of title 37, Code of Federal Regulations, to adjust certain patent fee amounts to reflect fluctuations in the Consumer Price Index (CPI) and to recover costs of operation. The PTO also is providing notice that, beginning on October 1, 1994, the suspension of the fee for access to the Automated Patent System's Full Text Search capability (APS-Text) at a Patent and Trademark Depository Library (PTDL) will be lifted. However, the PTO is rescinding this hourly fee, which was established by 37 CFR 1.21(p), and in its place assessing an annual subscription fee on PTDLs providing such service. On October 1, 1994, the PTO also will begin collecting a fee for access to the Automated Patent System's Classified Search and Image Retrieval capability (APS-CSIR) from the search facilities Arlington, Virginia.  
**Effective Date:** October 1, 1994.

**For Further Information Contact:** Robert Kopson by telephone at (703) 305-8510, fax at (703) 305-8525, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

**Supplementary Information:** This rule change is designed to adjust PTO fees in accordance with the applicable provisions of title 35, United States Code, and section 10101 of the Omnibus Budget Reconciliation Act of 1990 (Public Law 101-508), all as amended by the Patent and Trademark Office Authorization Act of 1991 (Public Law 102-204).

There are two objectives of this final rule package. The first objective is to adjust certain patent fee amounts to reflect fluctuations in the Consumer Price Index (CPI) and to recover costs of operation.

The second objective is to provide notice that PTO is lifting the suspension or on the fee for access to APS-Text at a Patent and Trademark Depository Library (PTDL). This was established by rule on October 1, 1992 (published in the Federal Register on August 21, 1992 at 57 FR 38190). Collection of the fee was immediately suspended by the Commissioner to provide additional time for the PTO to solicit input from the private sector on alternative collection methods, and other options for accessing patent search and retrieval in the Libraries. In response to public comments, the PTO will rescind the fee established by 37 CFR 1.21(p), and assess a subscription fee under 37 CFR 1.21(k) on each PTDL that provides its patrons with access to APS-Text. The basis for the subscription amount is less than the fee amount that was established in 37 CFR 1.21(p). Each participating library will be responsible for establishing policies for providing access to their patrons.

The PTO also will begin charging a fee for on-line access to APS-CSIR at the Patent Search and Image Retrieval Facility (PSIRF) in Arlington, Virginia. Free access to APS-CSIR has been offered at the PSIRF since July 12, 1993. The PTO now will begin recovering the cost of providing this on-line access in accordance with 37 CFR 1.21(k).

The PTO will make any necessary adjustments to these automated system fees based upon actual fiscal year 1995 usage. Future adjustments will be made based upon deviations in system costs and/or public usage.

## BACKGROUND

### Statutory Provisions

Patent fees are authorized by 35 U.S.C. 41 and 35 U.S.C. 376. A fifty percent reduction in the fees paid under 35 U.S.C. 41(a) and 41(b) by independent inventors, small business concerns, and nonprofit organizations who meet prescribed definitions is required by 35 U.S.C. 41(h).

Subsection 41(f) of title 35, United States Code, provides that fees established under 35 U.S.C. 41(a) and (b) may be adjusted on October 1, 1992, and every year thereafter, to

reflect fluctuations in the Consumer Price Index (CPI) over the previous 12 months.

Section 10101 of the Omnibus Budget Reconciliation Act of 1990 (Pub. L. 101-508) provides that there shall be a surcharge on all fees established under 35 U.S.C. 41(a) and 41(b) to collect \$107 million in fiscal year 1995.

Subsection 41(d) of title 35, United States Code, authorizes the Commissioner to establish fees for all other processing, services, or materials related to patents to recover the average cost of providing these services or materials, except for the fees for recording a document affecting title, for each photocopy, and for each black and white copy of a patent.

Section 376 of title 35, United States Code, authorizes the Commissioner to set fees for patent applications filed under the Patent Cooperation Treaty (PCT).

Subsection 41(i)(3) of title 35, United States Code, authorizes the Commissioner to establish reasonable fees for access to automated search systems of the PTO.

Subsection 41(g) of title 35, United States Code, provides that new fee amounts established by the Commissioner under Section 41 may take effect thirty days after notice in the *Federal Register* and the *Official Gazette of the Patent and Trademark Office*.

### Recovery Level Determinations

This rule adjusts patent fees for a planned recovery of \$571,439,000 in fiscal year 1995, as proposed in the Administration's budget request to the Congress. The fee amounts established for automated access to PTO's data bases will recover reasonable costs of providing these services to the public. The total amount expected to be collected is consistent with the budgeted amount.

The patent statutory fees established by 35 U.S.C. 41(a) and 41(b) are being adjusted on October 1, 1994, to reflect any fluctuations occurring during the previous 12 months in the Consumer Price Index (CPI-U). In calculating these fluctuations, the Office of Management and Budget (OMB) has determined that the PTO should use CPI-U data as determined by the Secretary of Labor. However, the Department of Labor does not make public the CPI-U until approximately 21 days after the end of the month being calculated. Therefore, the latest CPI-U information available is for the month of May 1994. In accordance with previous rulemaking methodology, the PTO uses the Administration's projected CPI-U for the 12-month period ending September 30, 1994, which is 3.0 percent. Based on this projection, patent statutory fees are being adjusted by 3.0 percent. Before the final fee schedule is published, the fees may be slightly adjusted based on actual data available from the Department of Labor.

Certain non-statutory patent processing fees established under 35 U.S.C. 41(d) and PCT processing fees established under 35 U.S.C. 376 are being adjusted up to the three percent fluctuation in the CPI in order to recover their estimated average costs in 1995. Three patent service fees that are set by statute are not adjusted. The three fees that are not being adjusted are assignment recording fees, printed patent copy fees and photocopy charge fees.

The Office calculated unit costs for all fees based on OMB Circular A-25, "User Fees", and OMB Circular A-130, "Management of Federal Information Resources". Costs were determined from the best available records (for example, financial statements of the Office) and included direct and indirect costs to the Office for carrying out the activity, as directed by OMB Circular A-25. The patent statutory fee amounts were rounded by applying standard arithmetic rules so that the amounts rounded would be convenient to the user.

Fees of \$100 or more were rounded to the nearest \$10. Fees between \$2 and \$99 were rounded to an even number so that the comparable small entity fee would be a whole number.

The Office has detailed cost calculation worksheets for each fee amount. These worksheets are available for public inspection in Suite 507 of Crystal Park 1, 2011 Crystal Drive, Arlington, Virginia

### Workload Projections

Determination of workloads varies by fee. Principal workload projection techniques are as follows:

Patent application workloads are projected from statistical regression models using recent application filing trends. Patent issues are projected from an in-house patent production model and reflect examiner production achievements and goals. Patent maintenance fee workloads utilize patents issued 3.5, 7.5 and 11.5 years prior topayment and assume payment rates of 80 percent, 57 percent and 25 percent, respectively. Service fee workloads follow linear trends from prior years' activities.

Any fee amount that is paid on or after October 1, 1994, would be subject to the new fees then in effect. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing or Transmission, where authorized under 37 CFR 1.8, will be considered to be the date of receipt in the PTO. A Certificate of Mailing or Transmission under Section 1.8 is not "proper" for items which are specifically excluded from the provisions of Section 1.8. Section 1.8 should be consulted for those items for which a Certificate of Mailing or Transmission is not "proper." Such items include, *inter alia*, the filing of national and international applications for patents. However, the provisions of 37 CFR 1.10 relating to filing papers and fees with an "Express Mail" certificate do apply to any paper or fee (including patent applications) to be filed in the PTO. If an application or fee is filed by "Express Mail" with a proper certificate dated on or after the effective date of the rules, as amended, the amount of the fee, to be paid would be the fee established by the amended rules.

## COST CALCULATIONS

### APS-Text at a Patent and Trademark Depository Library

(PTDL) The costs for one hour terminal session time on APS-Text at a PTDL include license fees that must be paid to Chemical Abstracts Service (CAS) for its proprietary text and structure search software. Other costs are included for a portion, projected at 3.65 percent, of the lease of a computer mainframe for memory storage purposes; all costs associated with training PTDL staff (equipment rental, materials and time); personnel to provide client support to the PTDLs; and telecommunication costs. A summary of the costs are listed below.

### APS-Text Cost of One Hour of Terminal Session Time at a Patent and Trademark Depository Library

Cost Element	Public Share
Client Support Overtime	\$10,203
Additional Mainframe Costs	\$43,216
Software (license fee)	\$273,000
Training Costs	\$10,000
Subtotal	\$336,419
General & Admin. Overhead @ 12.2%	\$40,976
Total Cost	\$377,395
Estimated Annual Usage (hours)	54,600

Unit Cost (per hour)	\$6.91
Telecommunication Costs (per hour)	\$8.00
Total Cost (per hour)	\$14.91
Total Cost (per hour - rounded)	\$15.00

The PTDLs will pay an annual maximum use subscription rate based on one of five tier levels, roughly equivalent to one to five hours of use per day, five days per week. Each PTDL will select a maximum use subscription tier based on its anticipated usage and be responsible for monitoring their own use. The PTDLs will also be responsible for establishing their own policies regarding the provision of APS-Text in their library. If during the year a PTDL is about to exceed its chosen level of maximum use, the PTDL will be allowed to move to a higher tier (and pay the additional subscription rate) or to use up to the subscribed level and cease continued access mid-year.

Tiers	Annual Usage	Annual Subscription Rate
I	0 - 300 hours	\$2,250
II	301 - 600 hours	\$6,750
III	601 - 900 hours	\$11,250
IV	901 - 1200 hours	\$15,750
V	1201 - 1500 hours	\$20,250

The subscription rates were derived using the \$15.00 per hour access charge previously calculated. There will be no additional charges or refunds to each library. For each tier, a discount mechanism is included in the annual subscription calculation. For example, the annual subscription rate of \$2,250 for Tier I is calculated by taking the mean average of the annual usage range (in this case 150 hours is the mean of zero and 300 hours) and multiplying it by the \$15.00 per hour access charge. Therefore, for a PTDL in Tier I, any usage over 150 hours is free to the library. But if a PTDL in Tier I were to not use at least 150 hours, the PTO would not be required to refund the amount of the subscription fee that was not used.

### APS-CSIR at the Patent Search and Image Retrieval Facility (PSIRF)

The costs for one hour terminal session time on APS-CSIR at the PSIRF include proprietary text and structure search software. It is estimated that 40 percent of the terminal time license fees that must be paid to Chemical Abstracts Service (CAS) for its will be used for text searching, which requires the search software from CAS.

Other costs are included for a portion, projected at 2.25 percent, of the lease of a computer mainframe for memory storage purposes; additional personnel for the PSIRF and the Office of Computer and Telecommunications Operations; computer acquisition, installation, and maintenance; supplies and equipment dedicated to public use; and general and administrative overhead. A summary of the costs are listed below.

### APS-CSIR Cost of One Hour of Terminal Session Time at the Patent Search and Image Retrieval Facility

Cost Element	Total Cost
Compensation and Benefits	\$250,813
Additional Hardware and Mainframe Costs	\$226,792
Software (license fee)	\$25,000
Supply Costs	\$10,512
Installation Costs (amortized)	\$25,366
Subtotal	\$538,483
Space Costs	\$41,759
General & Admin Overhead @ 12.2%	\$65,695
Total Cost	\$645,937
Estimated Annual Usage (hours)	13,000
Unit Cost (per hour)	\$49.68
Rounded Fee Amount (per hour - projected)	\$50.00

A comparison of existing and revised fee amounts is included as an Appendix to this notice of final rulemaking.

In order to ensure clarity in the implementation of the revised fees, a discussion of specific sections is set forth below.

### Discussion of Specific Rules

#### 37 CFR 1.16 National application filing fees.

Section 1.16, paragraphs (a), (b), (d), and (f)-(i), is revised to adjust fees established therein to reflect fluctuations in the CPI.

#### 37 CFR 1.17 Patent application processing fees.

Section 1.17, paragraphs (b)-(g) and (m), is revised to adjust fees established therein to reflect fluctuations in the CPI.

Section 1.17, paragraphs (j), and (n)-(p), is revised to adjust fees established therein to recover costs.

#### 37 CFR 1.18 Patent issue fees.

Section 1.18, paragraphs (a)-(c), is revised to adjust fees established therein to reflect fluctuations in the CPI.

#### 37 CFR 1.20 Post-issuance fees.

Section 1.20, paragraphs (c), (i)(1), and (j), is revised to adjust fees established therein to recover costs.



Section 1.20, paragraphs (e)-(g), is revised to adjust fees established therein to reflect fluctuations in the CPI.

### 37 CFR 1.21 Miscellaneous fees and charges.

Section 1.21 is amended to remove paragraph (p).

### 37 CFR 1.445 International application filing, processing, and search fees.

Section 1.445, paragraph (a), is revised to adjust the fees authorized by 35 U.S.C. 376 to recover costs.

### 37 CFR 1.482 International preliminary examination fees.

Section 1.482, paragraphs (a)(1) and (a)(2)(ii), is revised to adjust the fees authorized by 35 U.S.C. 376 to recover costs.

### 37 CFR 1.492 National stage fees.

Section 1.492, paragraphs (a), (b) and (d), is revised to adjust fees established therein to reflect fluctuations in the CPI.

### Response to Comments on the Rules

#### Patent Fee Increase

A notice of proposed rulemaking to adjust patent fees was published in the *Federal Register* on May 27, 1994, at 59 FR 27519, and in the *Official Gazette* on June 7, 1994, at 1163 OG 14.

A public hearing was held on June 28, 1994. Three comments were received and considered in adopting the rules set forth herein.

**Comments:** The respondents, although not objecting to the three percent fee increase, strongly oppose any fee increase for the purpose of making up patent fee surcharge money that is being withheld from the PTO. The respondents support the Administration's proposal to ensure that all user fees assessed by the PTO are used exclusively by the PTO.

**Response:** The Omnibus Budget Reconciliation Act of 1990 (Public Law 101-508) requires the PTO, in fiscal year 1995, to collect \$107 million in patent fee surcharges and to deposit these collections to the Patent and Trademark Office Fee Surcharge Fund. In the past, Congress has only appropriated part of these deposits back to the PTO. Deposits not made available to the Office reside in the Fund. To date, the reserve in the Fund is slightly in excess of \$35 million. For fiscal year 1995, the PTO requested that all patent fees be provided directly to the Office, thereby eliminating reliance on appropriations from the Fee Surcharge Fund. This language will not be enacted. The House of Representatives has recommended that an additional \$18.7 million in patent fee surcharges not be made available to the Office in fiscal year 1995. Final action on the 1995 appropriations bill is pending. The Administration does not propose to increase patent fees in fiscal year 1995 other than the increase that reflects fluctuations in the Consumer Price Index.

#### Collection of the Fee for Access to APS-Text at the PTDLS

A fee for access to APS-Text at a PTDL was set in the final rule package published in the *Federal Register* on August 21, 1992 (57 FR 38189). The final rule became effective October 1, 1992. On that date, the fee took effect but collection was immediately suspended by the Commissioner to provide additional time to solicit input from the private sector on alternative collection methods, and other options for accessing patent search and retrieval in the Libraries.

The Office received six comments.

**Comment:** Two respondents stated that many of the PTDLS already have considerable experience in collecting fees for access to on-line patent and trademark services provided by private sector vendors. They suggested that mechanisms already in place could be adapted to the collection of fees for PTO-provided services.

These respondents also suggested that the PTO procure access for the PTDLS to private sector on-line patent and trademark services, using a Federal procurement mechanism, such as Fedlink.

**Response:** The PTO encourages the PTDLS to provide a variety of patent and trademark services for their patrons. However, the PTDLS are not required to provide access to private sector on-line services, and the PTO can only provide support and training to the PTDLS for products and services it develops.

In the case of APS access, participation on the part of the PTDLS will be voluntary. With respect to other services, the PTDLS will make the decision as to which ones best fit the needs of their user communities. Fedlink, which provides on-line services to Government agencies, cannot extend its charter to include the PTDLS.

Under the proposed subscription method, libraries should develop policies and procedures which best suit their particular circumstances.

**Comment:** One respondent suggested that the access to APS be expanded beyond the PTDLS, with a small fee for general use, and discounted fees for independent inventors and/or off-peak usage.

**Response:** At this time, allowing direct access by the public would impact internal PTO operations. Access at PTDLS will ensure usage in a controlled environment, where end-users will have access to knowledge and skills of trained librarians.

**Comment:** One respondent suggested that the PTO permit voluntary participation by the individual PTDLS.

**Response:** Participation on the part of the PTDLS will be voluntary. The level of participation by the PTDLS will not affect their relationship with the PTO in any manner.

**Comment:** One respondent suggested that the PTO provide access to APS-Text on a subscription basis. This method would set a fee for anticipated usage over a determined period of time.

**Response:** The PTO will provide access to APS-Text to the PTDLS on an annual subscription basis. All of the libraries will have the option of subscribing. Each library that chooses to subscribe will establish a policy for providing the public with access to APS-Text.

**Comment:** One respondent suggested that the PTO set up a system that allows users to input credit or debit card numbers.

**Response:** Currently, the PTO is studying this collection option. The current equipment in use does not allow access via a credit or debit card. This option may be feasible in the near future.

#### Other Considerations

This final rule change is in conformity with the requirements of Executive Order 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501, et seq. There are no information collection requirements relating to these patent fee rules. This final rule has been determined to be significant for purposes of Executive Order 12866.

The PTO has determined that this final rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the final rule change would not have a significant impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The final rule change increases fees by changes in the CPI as authorized by 35 U.S.C. 41(f). The principal impact of the major patent fees has already been taken into account in 35 U.S.C. 41(h), which provides small entities with a 50-percent reduction in the major patent fees.

#### Lists of Subjects

#### 37 CFR Part 1

Administrative practice and procedure, Inventions and patents, Reporting and record keeping requirements, Small businesses.

For the reasons set forth in the preamble, the PTO is amending title 37 of the Code of Federal Regulations, Chapter 1, Part 1, as set forth below.

#### Part 1 - Rules of Practice in Patent Cases

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.16 is amended by revising paragraphs (a), (b), (d), and (f) through (i) to read as follows:

#### § 1.16 National application filing fees.

- (a) Basic fee for filing each application for an original patent, except design or plant cases:  
By a small entity (§ 1.9(f)) .....\$65.00  
By other than a small entity .....\$730.00  
(b) In addition to the basic filing fee in an original application, for filing or later presentation of each independent claim in excess of 3:  
By a small entity (§ 1.9(f)) .....\$38.00  
By other than a small entity .....\$76.00

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- (d) In addition to the basic filing fee in an original application, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:  
By a small entity (§ 1.9(f)) .....\$120.00  
By other than a small entity .....\$240.00

(If the additional fees required by paragraphs (b), (c), and (d) of this section are not paid on filing or on later presentation of the claims for which the additional fees are due, they must be paid or the claims canceled by amendment prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

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- (f) For filing each design application:  
By a small entity (§ 1.9(f)) .....\$150.00  
By other than a small entity .....\$300.00  
(g) Basic fee for filing each plant application:  
By a small entity (§ 1.9(f)) .....\$245.00  
By other than a small entity .....\$490.00  
(h) Basic fee for filing each reissue application:  
By a small entity (§ 1.9(f)) .....\$365.00  
By other than a small entity .....\$730.00  
(i) In addition to the basic filing fee in a reissue application, for filing or later presentation of each independent claim which is in excess of the number of independent claims in the original patent:  
By a small entity (§ 1.9(f)) .....\$38.00  
By other than a small entity .....\$76.00

\*\*\*\*\*

3. Section 1.17 is amended by revising paragraphs (b) through (g), (j), and (m) through (p) to read as follows:

#### § 1.17 Patent application processing fees.

\*\*\*\*\*

- (b) Extension fee for response within second month pursuant to 1.136(a):  
By a small entity (§ 1.9(f)) .....\$185.00  
By other than a small entity .....\$370.00  
(c) Extension fee for response within third month pursuant to 1.136(a):  
By a small entity (§ 1.9(f)) .....\$435.00  
By other than a small entity .....\$870.00  
(d) Extension fee for response within fourth month pursuant to 1.136(a):  
By a small entity (§ 1.9(f)) .....\$680.00  
By other than a small entity .....\$1,360.00  
(e) For filing a notice of appeal from the examiner to the Board of Patent Appeals and Interferences:  
By a small entity (§ 1.9(f)) .....\$140.00  
By other than a small entity .....\$280.00  
(f) In addition to the fee for filing a notice of appeal, for filing a brief in support of an appeal:

- By a small entity (§ 1.9(f)) .....\$140.00  
By other than a small entity .....\$280.00  
(g) For filing a request for an oral hearing before the Board of Patent Appeals and Interferences in an appeal under 35 U.S.C. 134:  
By a small entity (§ 1.9(f)) .....\$120.00  
By other than a small entity .....\$240.00

\*\*\*\*\*

- (j) For filing a petition to institute a public use proceeding under 1.292 .....\$1,390.00

\*\*\*\*\*

- (m) For filing a petition:  
(1) For revival of an unintentionally abandoned application, or  
(2) For the unintentionally delayed payment of the fee for issuing a patent:  
By a small entity (§ 1.9(f)) .....\$605.00  
By other than a small entity .....\$1,210.00  
(n) For requesting publication of a statutory invention registration prior to the mailing of the first examiners action pursuant to § 1.104-\$840.00 reduced by the amount of the application basic filing fee paid.  
(o) For requesting publication of a statutory invention registration after the mailing of the first examiners action pursuant to § 1.104-\$1,690.00 reduced by the amount of the application basic filing fee paid.  
(p) For submission of an information disclosure statement under § 1.97(c) .....\$210.00

4. Section 1.18 is revised to read as follows:

#### § 1.18 Patent issue fees.

- (a) Issue fee for issuing each original or reissue patent, except a design or plant patent:  
By a small entity (§ 1.9(f)) .....\$605.00  
By other than a small entity .....\$1,210.00  
(b) Issue fee for issuing a design patent:  
By a small entity (§ 1.9(f)) .....\$210.00  
By other than a small entity .....\$420.00  
(c) Issue fee for issuing a plant patent:  
By a small entity (§ 1.9(f)) .....\$305.00  
By other than a small entity .....\$610.00

5. Section 1.20 is amended by revising paragraphs (c), (e) through (g), (i)(1), and (j) to read as follows:

#### § 1.20 Post issuance fees.

\*\*\*\*\*

- (c) For filing a request for reexamination:  
(§ 1.510(a)) .....\$2,320.00

\*\*\*\*\*

- (e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond four years; the fee is due by three years and six months after the original grant:  
By a small entity (§ 1.9(f)) .....\$480.00  
By other than a small entity .....\$960.00  
(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond eight years; the fee is due by seven years and six months after the original grant:  
By a small entity (§ 1.9(f)) .....\$965.00  
By other than a small entity .....\$1,930.00  
(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond twelve years; the fee is due by eleven years and six months after the original grant:  
By a small entity (§ 1.9(f)) .....\$1,450.00  
By other than a small entity .....\$2,900.00

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(i) \*\*\*

(1) unavoidable .....\$640.00

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(j) For filing an application for extension of the term of a patent (§ 1.740) .....\$1,030.00

6. Section 1.21 is amended by removing paragraph (p).

7. Section 1.445 is amended by revising paragraph (a) to read as follows:

**§ 1.445 International application filing, processing and search fees.**

(a) The following fees and charges for international applications are established by the Commissioner under the authority of 35 U.S.C. 376:

(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14) .....\$210.00

(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16) where: (i) No corresponding prior United States national application with basic filing fee has been filed .....\$640.00

(ii) A corresponding prior United States national application with basic filing fee has been filed .....\$420.00

(3) A supplemental search fee when required, per additional invention .....\$180.00

\*\*\*\*\*

8. Section 1.482 is amended by revising paragraphs (a)(1) and (a)(2)(ii) to read as follows:

**§ 1.482 International preliminary examination fees.**

(a) \*\*\*

(1) A preliminary examination fee is due on filing the Demand:

(i) Where an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority, a preliminary examination fee of .....\$460.00

(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office, a preliminary examination fee of .....\$690.00

(2) \*\*\*

(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office .....\$240.00

\*\*\*\*\*

9. Section 1.492 is amended by revising paragraphs (a), (1) through (5), (b), and (d) to read as follows:

**§ 1.492 National stage fees.****Appendix A - Comparison of Existing and Revised Fee Amounts**

37 CFR Sec.	DESCRIPTION	Dec 1991	Oct 1992
1.16(a)	Basic Filing Fee	\$690	\$710
1.16(a)	Basic Filing Fee (Small Entity)	\$345	\$355
1.16(b)	Independent Claims	\$72	\$74
1.16(b)	Independent Claims (Small Entity)	\$36	\$37
1.16(c)	Claims in Excess of 20	\$20	\$22
1.16(c)	Claims in Excess of 20 (Small Entity)	\$10	\$11
1.16(d)	Multiple Dependent Claims	\$220	\$230
1.16(d)	Multiple Dependent Claims (Small Entity)	\$110	\$115
1.16(e)	Surcharge - Late Filing Fee	\$130	\$130
1.16(e)	Surcharge - Late Filing Fee (Small Entity)	\$65	\$65
1.16(f)	Design Filing Fee	\$280	\$290
1.16(f)	Design Filing Fee (Small Entity)	\$140	\$145
1.16(g)	Plant Filing Fee	\$460	\$480
1.16(g)	Plant Filing Fee (Small Entity)	\$230	\$240
1.16(h)	Reissue Filing Fee	\$690	\$710

\*\*\*\*\*

(a) \*\*\*

(1) Where an international preliminary examination fee as set forth in § 1.482 has been paid on the international application to the United States Patent and Trademark Office:

By a small entity (§ 1.9(f)) .....\$330.00

By other than a small entity .....\$660.00

(2) Where no international preliminary examination fee as set forth in § 1.482 has been paid to the United States Patent and Trademark Office, but an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority:

By a small entity (§ 1.9(f)) .....\$365.00

By other than a small entity .....\$730.00

(3) Where no international preliminary examination fee as set forth in § 1.482 has been paid and no international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office:

By a small entity (§ 1.9(f)) .....\$490.00

By other than a small entity .....\$980.00

(4) Where an international preliminary examination fee as set forth in § 1.482 has been paid to the United States Patent and Trademark Office and the international preliminary examination report states that the criteria of novelty, inventive step (non-obviousness), and industrial applicability, as defined in PCT Article 33 (1) to (4) have been satisfied for all the claims presented in the application entering the national stage (see § 1.496(b)):

By a small entity (§ 1.9(f)) .....\$46.00

By other than a small entity .....\$92.00

(5) Where a search report on the international application has been prepared by the European Patent Office of the Japanese Patent Office:

By a small entity (§ 1.9(f)) .....\$425.00

By other than a small entity .....\$850.00

(b) In addition to the basic national fee, for filing or later presentation of each independent claim in excess of 3:

By a small entity (§ 1.9(f)) .....\$38.00

By other than a small entity .....\$76.00

\*\*\*\*\*

(d) In addition to the basic national fee, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:

By a small entity (§ 1.9(f)) .....\$120.00

By other than a small entity .....\$240.00

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Aug. 18, 1994

Bruce A. Lehman  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

1.16(h)	Reissue Filing Fee (Small Entity)	\$345	\$355
1.16(i)	Reissue Independent Claims	\$72	\$74
1.16(i)	Reissue Independent Claims (Small Entity)	\$36	\$37
1.16(j)	Reissue Claims in Excess of 20	\$20	\$22
1.16(j)	Reissue Claims in Excess of 20 (Small Entity)	\$10	\$11
1.17(a)	Extension - First Month	\$110	\$110
1.17(a)	Extension - First Month (Small Entity)	\$55	\$55
1.17(b)	Extension - Second Month	\$350	\$360
1.17(b)	Extension - Second Month (Small Entity)	\$175	\$180
1.17(c)	Extension - Third Month	\$810	\$840
1.17(c)	Extension - Third Month (Small Entity)	\$405	\$420
1.17(d)	Extension - Fourth Month	\$1,280	\$1,320
1.17(d)	Extension - Fourth Month (Small Entity)	\$640	\$660
1.17(e)	Notice of Appeal	\$260	\$270
1.17(e)	Notice of Appeal (Small Entity)	\$130	\$135
1.17(f)	Filing a Brief	\$260	\$270
1.17(f)	Filing a Brief (Small Entity)	\$130	\$135
1.17(g)	Request for Oral Hearing	\$220	\$230
1.17(g)	Request for Oral Hearing (Small Entity)	\$110	\$115
1.17(h)	Petition - Not All Inventors	\$130	\$130
1.17(h)	Petition - Correction of Inventorship	\$130	\$130
1.17(h)	Petition - Decision on Questions	\$130	\$130
1.17(h)	Petition - Suspend Rules	\$130	\$130
1.17(h)	Petition - Expedited License	\$130	\$130
1.17(h)	Petition - Scope of License	\$130	\$130
1.17(h)	Petition - Retroactive License	\$130	\$130
1.17(h)	Petition - Refusing Maintenance Fee	\$130	\$130
1.17(h)	Petition - Refusing Maintenance Fee - Expired Patent	\$130	\$13
1.17(h)	Petition - Interference	\$130	\$130
1.17(h)	Petition - Reconsider Interference	\$130	\$130
1.17(h)	Petition - Late Filing of Interference	\$130	\$130
1.20(b)	Petition - Correction of Inventorship	\$130	\$130
1.17(h)	Petition - Refusal of Publish SIR	\$130	\$130
1.17(i)(1)	Petition - For Assignment	\$130	\$130
1.17(i)(1)	Petition - For Application	\$130	\$130
1.17(i)(1)	Petition - Late Priority Papers	\$130	\$130
1.17(i)(1)	Petition - Suspend Action	\$130	\$130
1.17(i)(1)	Petition - Divisional Reissues to Issue Separately	\$130	\$130
1.17(i)(1)	Petition - For Interference Agreement	\$130	\$130
1.17(i)(1)	Petition - Amendment After Issue	\$130	\$130
1.17(i)(1)	Petition - Withdrawal After Issue	\$130	\$130
1.17(i)(1)	Petition - Defer Issue	\$130	\$130
1.17(i)(1)	Petition - Issue to Assignee	\$130	\$130
1.17(i)(1)	Petition - Accord a Filing Date Under § 1.53	\$130	\$130
1.17(i)(1)	Petition - Accord a Filing Date Under § 1.60	\$130	\$130
1.17(i)(1)	Petition - Accord a Filing Date Under § 1.62	\$130	\$130
1.17(i)(2)	Petition - Make Application Special	\$130	\$130
1.17(j)	Petition - Public Use Processing	\$1,310	\$1,350
1.17(k)	Non-English Specification	\$130	\$130
1.17(l)	Petition - Revive Abandoned Appl.	\$110	\$110
1.17(l)	Petition - Revive Abandoned Appl. (Small Entity)	\$55	\$55
1.17(m)	Petition - Revive Unintentionally Abandoned Appl.	\$1,130	\$1,170
1.17(m)	Petition - Revive Unintentionally Abandoned Appl. (Small Entity)	\$565	\$585
1.17(n)	SIR - Prior to Examiner's Action	\$790	\$820
1.17(o)	SIR - After Examiner's Action	\$1,580	\$1,640
1.17(p)	Submission of an Information Disclosure Statement (§ 1.97)	-	\$200
1.18(a)	Issue Fee	\$1,130	\$1,170
1.18(a)	Issue Fee (Small Entity)	\$565	\$585
1.18(b)	Design Issue Fee	\$400	\$410
1.18(b)	Design Issue Fee (Small Entity)	\$200	\$205
1.18(c)	Plant Issue Fee	\$570	\$590
1.18(c)	Plant Issue Fee (Small Entity)	\$285	\$295
1.19(a)(1)(i)	Copy of Patent	\$3	\$3
1.19(a)(1)(ii)	Patent Copy - Expedited Local Service	\$6	\$6
1.19(a)(1)(iii)	Patent Copy Ordered Via EOS - Expedited Service	\$25	\$25
1.19(a)(2)	Plant Patent Copy	\$12	\$12
1.19(a)(3)(i)	Copy of Utility Patent or SIR in Color	\$24	\$24
1.19(b)(1)(i)	Certified Copy of Patent Application as Filed	\$12	\$12
1.19(b)(1)(ii)	Certified Copy of Patent Application as Filed, Expedited	\$24	\$24
1.19(b)(2)	Cert. or Uncert. Copy of Patent- Related File Wrapper/Contents	\$150	\$150
1.19(b)(3)	Cert. or Uncert. Copies of Office Records, per Document	\$25	\$25
1.19(b)(4)	For Assignment Records, Abstract of Title and Certification	\$20	\$25
1.19(c)	Library Service	\$50	\$50
1.19(d)	List of Patents in Subclass	\$3	\$3
1.19(e)	Uncertified Statement-Status of Maintenance Fee Payment	\$10	\$10
1.19(f)	Copy of Non-U.S. Patent Document	\$12	\$25
1.19(g)	Comparing the Certifying Copies, Per Document, Per Copy	\$25	\$25
1.19(h)	Duplicate or Corrected Filing Receipt	\$20	\$25
1.20(a)	Certificate of Correction	\$70	\$100

1.20(c)	Reexamination	\$2,180	\$2,250
1.20(d)	Statutory Disclaimer	\$110	\$110
1.20(d)	Statutory Disclaimer (Small Entity)	\$55	\$55
1.20(e)	Maintenance Fee - 3.5 Years	\$900	\$930
1.20(e)	Maintenance Fee - 3.5 Years (Small Entity)	\$450	\$465
1.20(f)	Maintenance Fee - 7.5 Years	\$1,810	\$1,870
1.20(f)	Maintenance Fee - 7.5 Years (Small Entity)	\$905	\$935
1.20(g)	Maintenance Fee - 11.5 Years	\$2,730	\$2,820
1.20(g)	Maintenance Fee - 11.5 Years (Small Entity)	\$1,365	\$1,410
1.20(h)	Surcharge - Maintenance Fee - 6 Months	\$130	\$130
1.20(h)	Surcharge - Maintenance Fee - 6 Months (Small Entity)	\$65	\$65
1.20(i)	Surcharge - Maintenance After Expiration	\$600	\$620
1.20(j)	Extension of Term of Patent	\$1,000	\$1,000
1.21(a)(1)	Admission to Examination	\$290	\$300
1.21(a)(2)	Registration to Practice	\$100	\$100
1.21(a)(3)	Reinstatement to Practice	\$15	\$15
1.21(a)(4)	Certificate of Good Standing	\$10	\$10
1.21(a)(4)	Certificate of Good Standing, Suitable Framing	\$20	\$20
1.21(a)(5)	Review of Decision of Director, OED	\$120	\$130
1.21(a)(6)	Regrading of Examination	\$120	\$130
1.21(b)(1)	Establish Deposit Account	\$10	\$10
1.21(b)(2)	Service Charge Below Minimum Balance	\$20	\$25
1.21(b)(3)	Service Charge Below Minimum Balance	\$20	\$25
1.21(c)	Filing a Disclosure Document	\$10	\$10
1.21(d)	Box Rental	\$50	\$50
1.21(e)	International Type Search Report	\$35	\$40
1.21(g)	Self-Service Copy Charge	\$0.25	\$0.25
1.21(h)	Recording Patent Property	\$40	\$40
1.21(i)	Publication in the OG	\$20	\$25
1.21(j)	Labor Charges for Services	\$30	\$30
1.21(k)	Unspecified Other Services	Actual Cost	Actual Cost
1.21(l)	Retaining Abandoned Application	\$130	\$130
1.21(m)	Processing Returned Checks	\$50	\$50
1.21(n)	Handling Fee - Incomplete Application	\$130	\$130
1.21(o)	Terminal Use APS-Text	\$40	\$40
1.21(p)	Terminal Use APS-Text by the PTDL's	-	\$70
1.24	Coupons for Patent Copies	\$3	\$3
1.296	Handling Fee - Withdrawal SIR	\$130	\$130
1.445(a)(1)	Transmittal Fee	\$190	\$200
1.445(a)(2)(i)	PCT Search Fee - No U.S. Application	\$600	\$620
1.445(a)(2)(ii)	PCT Search Fee - Prior U.S. Application	\$400	\$410
1.445(a)(3)	Supplemental Search	\$160	\$170
1.482(a)(1)(i)	Preliminary Exam Fee	\$440	\$450
1.482(a)(1)(ii)	Preliminary Exam Fee	\$650	\$670
1.482(a)(2)(i)	Additional Invention	\$140	\$140
1.482(a)(2)(ii)	Additional Invention	\$220	\$230
1.492(a)(1)	Preliminary Examining Authority	\$620	\$640
1.492(a)(1)	Preliminary Examining Authority (Small Entity)	\$310	\$320
1.492(a)(2)	Searching Authority	\$690	\$710
1.492(a)(2)	Searching Authority (Small Entity)	\$345	\$355
1.492(a)(3)	PTO Not ISA nor IPEA	\$920	\$950
1.492(a)(3)	PTO Not ISA nor IPEA (Small Entity)	\$460	\$475
1.492(a)(4)	Claims - IPEA	\$90	\$90
1.492(a)(4)	Claims - IPEA (Small Entity)	\$45	\$45
1.492(a)(5)	Filing with EPO/JPO Search Report	\$800	\$830
1.492(a)(5)	Filing with EPO/JPO Search Report (Small Entity)	\$400	\$415
1.492(b)	Claims - Extra Individual (Over 3)	\$72	\$74
1.492(b)	Claims - Extra Individual (Over 3) (Small Entity)	\$36	\$37
1.492(c)	Claims - Extra Total (Over 20)	\$20	\$22
1.492(c)	Claims - Extra Total (Over 20) (Small Entity)	\$10	\$11
1.492(d)	Claims - Multiple Dependents	\$220	\$230
1.492(d)	Claims - Multiple Dependents (Small Entity)	\$110	\$115
1.492(e)	Surcharge	\$130	\$130
1.492(e)	Surcharge (Small Entity)	\$65	\$65
1.492(f)	English Translation - After 20 Months	\$130	\$130
2.6(a)(1)	Application for Registration, Per Class	\$200	\$210
2.6(a)(2)	Amendment to Allege Use, Per Class	\$100	\$100
2.6(a)(3)	Statement of Use, Per Class	\$100	\$100
2.6(a)(4)	Extension for Filing Statement of Use, Per Class	\$100	\$100
2.6(a)(5)	Application for Renewal, Per Class	\$300	\$300
2.6(a)(6)	Surcharge for Late Renewal, Per Class	\$100	\$100
2.6(a)(7)	Publication of Mark Under § 12(a), Per Class	\$100	\$100
2.6(a)(8)	Issuing New Certificate of Registration	\$100	\$100
2.6(a)(9)	Certificate of Correction of Registrant's Error	\$100	\$100
2.6(a)(10)	Filing Disclaimer to Registration	\$100	\$100
2.6(a)(11)	Filing Amendment to Registration	\$100	\$100
2.6(a)(12)	Filing Affidavit Under Section 8, Per Class	\$100	\$100
2.6(a)(13)	Filing Affidavit Under Section 15, Per Class	\$100	\$100
2.6(a)(14)	Filing Affidavit Under Sections 8 & 15, Per Class	\$200	\$200

2.6(a)(15)	Petitions to the Commissioner	\$100	\$100
2.6(a)(16)	Petition to Cancel, Per Class	\$200	\$200
2.6(a)(17)	Notice of Opposition, Per Class	\$200	\$200
2.6(a)(18)	Ex Parte Appeal to the TTAB, Per Class	\$100	\$100
2.6(a)(19)	Dividing an Application, Per New Application Created	-	\$100
2.6(b)(1)(i)	Copy of Registered Mark	\$3	\$3
2.6(b)(1)(ii)	Copy of Registered Mark, Expedited	\$6	\$6
2.6(b)(1)(iii)	Copy of Registered Mark Ordered Via EOS, Expedited Svc.	\$25	\$25
2.6(b)(2)(i)	Certified Copy of TM Application as Filed	\$12	\$12
2.6(b)(2)(ii)	Certified Copy of TM Application as Filed, Expedited	\$24	\$24
2.6(b)(3)	Cert. or Uncert. Copy of TM-Related File Wrapper/Contents	\$50	\$50
2.6(b)(4)(i)	Cert. Copy of Registered Mark, Title or Status	\$10	\$10
2.6(b)(4)(ii)	Cert. Copy of Registered Mark, Title or Status - Expedited	\$20	\$20
2.6(b)(5)	Certified or Uncertified Copy of TM Records	\$25	\$25
2.6(b)(6)	Recording Trademark Property, Per Mark, Per Document	\$40	\$40
2.6(b)(6)	For Second and Subsequent Marks in Same Document	\$25	\$25
2.6(b)(7)	For Assignment Records, Abstracts of Title and Cert.	\$20	\$25
2.6(b)(8)	Terminal Use T-SEARCH	\$40	\$40
2.6(b)(9)	Self-Service Copy Charge	\$0.25	\$0.25
2.6(b)(10)	Labor Charges for Services	\$30	\$30
2.6(b)(11)	Unspecified Other Services	Actual Cost	Actual Cost
1.19(g)	Comparing and Certifying Copies, per Document, per Copy	\$25	\$25
1.24	Trademark Coupons	\$3	\$3

[1141 OG 68]

(39) DEPARTMENT OF COMMERCE  
Patent and Trademark Office37 CFR Parts 1 and 2  
[Docket No. 90363-9221]  
RIN: 0651-AA40

## Patent and Trademark Automated Search System Fees

Agency: Patent and Trademark Office, Commerce  
Action: Final Rule

**Summary:** The Patent and Trademark Office (Office) is amending the rules of practice in patent and trademark cases, Parts 1 and 2 of Title 37, Code of Federal Regulations, to set forth fees for public access to the text data bases resident on the Automated Patent System (APS) and the automated trademark search system (T-Search). Pub. L. 100-703, enacted on November 19, 1988, allows the Commissioner to establish reasonable fees for on-line access to the automated search systems.

The Office will provide on-line access to its USPAT data base (full text of U.S. patents issued after 1974), the U.S. classification data from 1790 to the present, and to English abstracts of Japanese and Chinese patents (to the extent they are available), hereinafter referred to as APS-Text, in its Patent Search Room and to T-Search in its Trademark Search Library, located in Arlington, Virginia. Except for a series of pilot experiments which may occur over the next one or two years, the Office does not plan to provide routine remote on-line access to these data bases at any other facilities at the present time. A separate rulemaking process will be followed when the Office determines to provide such remote on-line access.

Both search systems have been made available to the public free of charge since April 3, 1989, for the purposes of education and training (familiarization).

The paper and/or microfilm collections of U.S. patents, foreign patents documents and U.S. trademark registrations continue to be available to the public free of charge, as provided by section 104(b) of Pub. L. 100-703. The Office reaffirms its commitment to hold a public hearing prior to making any decision concerning the elimination of the paper files.

This final rule establishes fees for use of the on-line automated search systems. In addition, procedures for public use of the automated search systems, including training and charging of fees, are presented.

In response to the notice of proposed rulemaking published in the *Federal Register* on May 3, 1989 (54 FR 18907), and at a public hearing held on June 30, 1989, the Office received many comments regarding problems encountered by the public in the use of T-Search. The Office believes that T-Search has proven effective for searches performed by Trademark exam-

ining attorneys in connection with their examination of applications for the registration of marks. Although the Office is establishing a fee for accessing the T-Search system, the Commissioner is immediately suspending collection of that fee to provide additional time for the public to familiarize themselves with T-Search. The Office will provide the public with sixty days notice before starting to collect the fee.

**Effective Date:** February 12, 1990. Rule 2.6(w) will take effect February 12, 1990 but immediately be suspended by the Commissioner. The Office will provide written notice in the *Federal Register* sixty days before starting to collect fees for accessing T-Search.

**For Further Information:** Frances Michalkewicz by telephone at (703) 557-1610 or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

**Supplementary Information:** The purpose of this final rule is to establish new fees for the on-line use by the public of APS-Text, and T-Search that are to be provided in the Office's facilities in Arlington, Virginia. This final rule is consistent with the Office's Electronic Data Dissemination Policies and Guidelines, which were published in final form in the *Federal Register* on May 3, 1989, at 54 FR 18920. Establishment and adjustment of patent fees is provided for by section 6 and section 41 of Title 35, United States Code, and section 103(b) of Pub. L. 100-703. Establishment and adjustment of trademark fees is authorized by section 31 of the Trademark (Lanham) Act 1946, as amended (15 U.S.C. 1113), and section 103(a) of Pub. L. 100-703. Information on the procedures for public use of the automated systems, including training, waivers, and the charging of fees, also is presented.

**Background:** In response to Pub. L. 96-517, the 1980 legislation which amended patent and trademark laws, the Office prepared and submitted a plan for the automation of its operations to Congress on December 13, 1982. The plan centered on two basic concepts: the creation of electronic data bases that (1) would eventually replace the Office's all-paper patent and trademark files, and thereby improve the integrity and quality of Office records; and (2) would support searches, examinations, Office actions and other Office functions through electronic workstations which would provide text and image retrieval capabilities and perform other automation functions.

Over 700,000 active Federal trademark registrations have been converted to an electronic data base of textual and digital image data. A computer system has been installed to enable trademark examining attorneys to search the data base for registered and pending trademarks and associated textual data, including marks containing designs, and to retrieve, display and print all information as a substitute for paper file searches. Trademark examining attorneys have been using T-Search exclusively since January 1988 via a network of approximately



40 terminals. After a six-month experimental T-Search evaluation program conducted between June and December 1988, the capability was deployed for public use in the Trademark Search Library on April 3, 1989.

The T-Search "dead data base", trademarks cancelled, expired or abandoned since March 1984, also is available to the public, but approximately 17,000 images are missing and an additional 184,000 registrations and applications have not been quality checked. Trademark examining attorneys do not search this data base in connection with examining activities.

An Automated Patent System (APS) was installed for test and evaluation purposes, using one patent examining group as an operational testbed. Major operational components of APS, that is, large scale computers with conventional magnetic storage devices, a high-speed local data communications network, and electronic workstations equipped with two high resolution graphic displays and laser printers were interconnected on July 1, 1986, to enable system test and evaluation to begin in the testbed group.

On-line access to the full-text of all U.S. patents granted after 1974 and then to English language abstracts of Japanese patents was deployed to the patent examining staff beginning in 1986. On-line access to APS-Text permits examiners to search the text of approximately one million U.S. patents containing more than five billion words. Today, all examiners have been trained in the use of the full-text searching tool, and it has become a routine part of the patent examination process for many examiners. Searches are conducted from approximately 71 single screen text terminals located throughout the Office. The APS-Text capability was deployed to the public in the Patent Search Room on April 3, 1989.

The Office intends to enter the text of virtually all U.S. patents issued after 1970. In addition, selected tubular data and chemical and mathematical equations will be added to the current full text file. Ultimately, approximately 1.2 million U.S. patents will be available to both patent examiners and the public for search in full text form.

Public evaluation of the APS full-text search capability was conducted between January 11 and April 15, 1988. Forty-two (42) public users were trained an APS-Text during January 1988, and allowed first-come/first-serve access to several terminals. Reactions of public users to APS-Text were positive. Public users found APS-Text useful for pre-application and state-of-the-art searches.

A total of 38 public users were trained on T-Search during a public evaluation period conducted between June and December 1988. Preliminary review indicated that public users considered T-Search to be useful both as a source for registrability searching and for verifying paper searches. In addition, T-Search was found to facilitate searches by class and ownership.

Pub. L. 100-703, enacted on November 19, 1988, allows the Commissioner to establish reasonable fees for public access to the automated search systems while it continues the requirements that no more than 30 percent of automation resources may be from user fees and that the Office may not enter into exchange agreements relating to automatic data processing resources.

Section 104(c) of Pub. L. 100-703 allows the Commissioner to waive the payment by an individual of fees for accessing the automated search systems upon a showing of need or hardship, and if such waiver is in the public interest.

The information contained in the automated data bases, which will be available to the public at the Patent and Trademark Office in Arlington, Virginia, is available free of charge at that location in paper form, and is substantially available through commercial vendors. The Office believes it to be in the public interest to waive the fee for public access to its text data bases in situations where access to the data base is needed for a personal, educational purpose by an individual or member of an educational or non-profit organization, or where payment of the fee would pose a genuine financial hardship to the user.

A personal, educational purpose is one in which the person using the data base is attempting to satisfy a personal need, and is not conducting a search or otherwise using the data base for compensation in any form. Examples of appropriate waiver situations would include students or teachers doing a term paper, a university professor collecting background information for the preparation of an application for a research grant. An example of a situation where a waiver would not be appropriate

would include an individual doing work for remuneration — e.g., a law student doing a pre-examination or infringement search for a law firm.

The Commissioner will further consider a fee waiver based on a genuine financial hardship. The person requesting a waiver will be required to provide information that would demonstrate a clear inability to pay the fee.

A waiver for the payment of fees is intended to be granted sparingly, and generally only when terminals are available. It is not anticipated that fees will be waived for any one individual more than once or twice each year. The Commissioner reserves the authority to control access to the data bases and deny a waiver to any individual.

The waiver policy would apply only to use of the automated system, and not to the printing or sale of copies. Any abuse of the waiver policy could lead to a ban on the use of any public search facility for that individual.

**Cost Calculations:** The Office calculated unit costs for all fees based on OMB Circular A-25 "User Fees", and OMB Circular A-130, "Management of Federal Information Resources." Costs were determined from the best available records (for example, financial statements for the Office) and included direct and indirect costs to the Office of carrying out the activity, as directed by OMB Circular A-25. User charges for both APS-Text and T-Search were based on the marginal costs of providing these services to the public.

In calculating the costs of providing access to T-Search and APS-Text to the public, the Office followed Congressional direction that fees be reasonable by reflecting the marginal cost for providing the new service and not include the costs of designing or installing the automated system for use by Office examiners, or the development of the new systems.

Prior to preparation of this final rule, all of the cost assumptions and cost calculations were reviewed and modified to ensure that they included the Office's best estimates and projections.

#### APS-Text

The Office is establishing the \$40.00 fee for each hour of terminal session time on APS-Text. The marginal costs for one hour terminal session time on APS-Text include a portion of the lease cost of a new computer mainframe which originally was to be acquired in fiscal year 1990 for use by Office patent examiners. To meet public search requirements, the mainframe is being leased earlier than originally planned. That portion of lease costs for the three (3) month period March 1990 through May 1990 over and above the lease costs for a mainframe sized to meet only examiner needs is being passed on to the user. After May 1990, the mainframe was intended to be procured and installed to support APS. Therefore, no costs are being passed on to the public user after that time. When public usage reaches the level where a mainframe dedicated for public use is required, fee adjustments will be proposed to pass all of the costs of that mainframe on to the public.

The level of public use will affect the amount of main memory needed to support the additional search sessions. It is projected that an additional increment of main memory will be required in fiscal years 1991 and 1992. This increment would not be required to support the examiner workload alone.

The fee calculations for public access also include the costs for equipment: network interface units, text terminals, printer noise dampeners and text terminal printers.

Other costs include a portion of the license fees that must be paid to Chemical Abstracts Service for its proprietary text and structure search software; additional personnel for the Patent Search Room, and the Office of Information Systems; computer installation costs; supplies and equipment dedicated to public use; and general and administrative overhead.

The Office is providing free access time during training on the automated search systems in accordance with § 104(c) of Public Law 100-703 which reads, "...a limited amount of free access shall be made available to all users of the systems for purposes of education and training."

The usage rate estimates are based on the three-month public user study performed from January through March 1988. For this study, 42 frequent Patent Search Room users were selected to be trained in the use of APS-Text. Three text terminals were made available to the trained public users at no charge. During

the three-month study period, use of the three terminals averaged approximately 50 percent. While it is impossible to accurately predict future use by a more diverse group of public users, the cost calculations attempted to take into account the following factors and assumptions:

1. Future public users, on average, would use APS-Text less frequently than the 42 frequent users selected for the 1988 study, many of whom routinely used commercially available automated text search tools.

2. Collection of a fee for use (as opposed to the absence of any charge during the study) would reduce demand for text search services when compared with usage data obtained during the study period.

3. The potential universe of public users is expected to average no more than 300 per day.

4. The average length of a public user search session is projected to be approximately 22 minutes — the average length of a search session during the 1988 test of public use.

5. Based on the preceding assumptions, if all 300 potential public users conducted a single search session during a workday, a total of 110 hours of access would be required. Twenty-five text terminals available five days a week, twelve hours a day, would provide a maximum potential of 300 hours of available text search time. Under these assumptions, the number of text terminals appeared to be adequate for the foreseeable future.

6. For purposes of actual use of available text terminals, the following estimates were used:

(a) In fiscal year 1990, between four (4) and six (6) terminals would be available during the first quarter. An estimate of 45 percent utilization of available text terminal time was projected. By increasing the number of text terminals to 10 in January 1990 and 20 in April 1990, an estimate of 40 percent utilization of available text terminal time was projected. By increasing the number of text terminals to 25 in July 1990, an estimate of 35 percent utilization of available text terminal time was projected.

(b) During fiscal year 1991 and beyond, stable levels of usage were projected to be achieved, yielding an estimated 35 percent average utilization of the 25 available terminals. This utilization rate equates to 105 session hours per day, or an average of 4.2 session hours per terminal per day. At an average of 22 minutes per session, a total of 286 search sessions per day. Although usage rates since the system was made available to the public in April 1989 have been higher than projected, the Office believes these projections are valid for the three-year fee cycle.

A summary of the fee calculations is as follows:

#### APS-Text Marginal Cost of One-Hour of Terminal Session Time (December 1989-November 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	\$918,196
Hardware & Maintenance	\$691,289
Software (license fees)	\$295,676
Site Preparation	\$38,118
Non-capital Furniture	\$8,750
Supplies & Forms	\$3,500
Sub-Total	\$1,955,529
General & Administrative Overhead	\$361,773
<b>TOTAL COST</b>	<b>\$2,317,302</b>
Estimated Use (hours)	\$65,946
<b>UNIT COST (per hour)</b>	<b>\$35.14</b>

The marginal cost for one hour of Office staff search assistance on APS-text includes the costs of personnel compensation and benefits.

A summary of the fee calculation is as follows:

#### APS-Text Marginal Cost of One-Hour of Office Staff Search Assistance (December 1989-November 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Annual Compensation and Benefits	
<b>TOTAL COST</b>	<b>\$45,659</b>
Work Hours (per annum)	1,776
<b>UNIT COST (per hour)</b>	<b>\$25.71</b>

The marginal cost for a printed copy generated from APS-Text includes costs for compensation and benefits, printers, furniture for the printers, supplies and forms, and general and administrative overhead. A summary is as follows:

#### APS-Text Marginal Cost of Each Printed Page (December 1989-November 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	\$173,472
Hardware & Maintenance	\$13,483
Non-capital Furniture	\$5,000
Supplies & Forms	\$35,882
Sub-Total	\$227,837
General & Administrative Overhead	\$42,150
<b>TOTAL COST</b>	<b>\$269,987</b>
Estimated Use (pages)	4,496,325
<b>UNIT COST(per page)</b>	<b>\$0.060</b>

#### T-Search

The marginal cost for one hour of terminal session time on T-Search includes the costs of personnel in the Trademark Search Library, maintenance of the T-Search terminals, routine site preparation, supplies and forms, and general and administrative overhead. The Office is establishing the \$40.00 fee for each hour of terminal session time on T-Search, but is immediately suspending collection of that fee in order to provide public users additional time to familiarize themselves with the system.

The comments submitted in response to the proposed rule-making indicate that the public users have not adequately adjusted to the T-Search system. During the period collection of the fee is suspended, the public will have an opportunity to better learn the system so as to perform more effective searches than they may be experiencing now. The Office will publish a notice in the *Federal Register* sixty days before it begins collecting a fee for public access to T-Search.

Usage rates for T-Search during fiscal years 1990-1992 were projected to be 28 percent of the hours the system would be available to the public. This rate was extrapolated from actual usage rates during the T-Search public user pilot program which was conducted from June through December 1988. A total of 38 members of the public were trained on T-Search, and about 24 to 28 public users were active on T-Search each month. The overall usage rate of these active users was 14 percent of the hours the system was available to the public. In projecting usage rates on which to base a fee amount, it was anticipated that the overall number of users and the usage rate would double once T-Search was made available in the Trademark Search Library to all users of that search facility and training was provided on a routine basis. Although usage rates since the system was made available to the public in April 1989 have been higher projected, the Office believes these projections are valid for the three-year fee cycle.

A summary of the fee calculations are as follows:



**T-Search**  
**Marginal Cost of One-Hour of**  
**Terminal Session Time**  
 (December 1989-November 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	\$154,451
Hardware & Maintenance	\$28,809
Site Preparation	\$1,000
Supplies & Forms	\$3,298
Sub-Total	\$187,558
General & Administrative Overhead	\$34,698
<b>TOTAL COST</b>	<b>\$222,256</b>
Estimated Use (hours)	5,985
<b>UNIT COST (per hour)</b>	<b>\$37.14</b>

The marginal cost for a printed copy generated from T-Search includes costs for compensation, and supplies and forms. A summary of the costs is as follows:

**T-Search**  
**Marginal Cost of**  
**Each Printed Page**  
 (December 1989-November 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	\$27,862
Hardware & Maintenance	\$5,274
Supplies & Forms	\$3,579
Sub-Total	\$36,715
General & Administrative Overhead	\$6,792
<b>TOTAL COST</b>	<b>\$43,507</b>
Estimated Use (pages)	448,875
<b>UNIT COST (per page)</b>	<b>\$0.097</b>

The proposed fee of \$25.00 for each hour of Office staff search assistance to conduct a search using T-Search has been withdrawn. The T-Search system can be used by the public with routine assistance provided by the regular staff of the Trademark Search Library. This is similar to assistance on how to use the paper files now provided free of charge by the Trademark Search Library staff. Office employees will neither work one-on-one with members of the public in conducting searches, nor conducted searches for members of the public.

**Rounding Procedures:** Fee amounts were rounded so that the amount rounded would be de minimis and convenient to the user. This procedure is consistent with section 103(b) of Pub. L. 100-703 which allows the Office to adjust patent fees in the aggregate, and with section 103(a) of Pub. L. 100-703 which allows the Office to adjust trademark fees in the aggregate.

The Office has detailed cost calculation worksheets for each fee item, which are available for public inspection in Suite 904 of Building 2, Crystal Park at 2121 Crystal Drive, Arlington, Virginia.

**PROCEDURES FOR PUBLIC USE OF**  
**APS-TEXT AND T-SEARCH**

**Patent Search Room Configuration**

Initially four (4) text search terminals will be installed and available for public use in the Patent Search Room. A printer will be associated with each text search terminal. An additional terminal will be located in Patent Search Room employee office space for control and administrative activities. Up to twenty-one (21) more terminals and printers are planned to be added for public use during fiscal year 1990, if necessary.

**Trademark Search Library Configuration**

Initially three (3) T-Search terminals with associated printers will be installed and available for public use in the Trademark Search Library. The terminals will be clustered in one area of the Trademark Search Library. An additional terminal will be located in Trademark Search Library employee office space for control and administrative activities. Additional terminals printers will be added as demand warrants and space permits.

**Training**

To enable prospective public users to become effective on APS-Text, approximately fourteen (14) hours of free basic training is being offered. For those familiar with automated search systems, a shorter course of six (6) hours is provided. Ten (10) members of the public can be trained during each class. Training is being held at the Office's Arlington, Va. complex during normal work hours.

Four (4) hours of basic training is being offered on the use of T-Search. For those familiar with automated search systems, a shorter course of one (1) hour is available. T-Search training is being held in the Office's Arlington, Va. complex during morning, evening and weekend hours.

Enrollment in all training classes initially was on a lottery basis. Public users who wished to be trained on APS-Text or T-Search were required to submit an application form. The Office is now accepting requests for training and adding the names to the list. As of August 31, 1989, 696 people or 70 percent of all those requesting training have been trained.

**System Use and Fee Procedures**

To ensure equity of public access to the automated systems, as well as efficient operations, rules for use will be posted at the terminals. Users of the systems will be expected to comply with the rules and with all other regulations regarding the use of facilities.

Users are strongly encouraged to register in advance for system use. Each week, the next week's schedule will be available in the Patent Search room and the Trademark Search Library. Should requests for blocks of terminal time exceed the availability of terminals, limits on the amount of reserved time may be instituted. Up to three (3) of the initial four (4) terminals in the Patent Search Room and up to two (2) of the initial three (3) terminals in the Trademark Search Library will be allocated to public users with advance reserved times. The remaining terminal in the Patent Search Room will be available for walk-up users and for assisted searches for infrequent users. The remaining terminal in the Trademark Search Library will be available for walk-up users. The terminal time reservation system and the number of terminals available for walk-up public use and for assisted searches (in the Patent Search Room) is subject to change based upon operational experience.

All public use of APS-Text and T-Search, with the exception of scheduled training classes, is on a pre-payment basis. In pre-paying for use of the systems, the public may use a blank signed check, major credit card or charge to a deposit account. At the end of the search or the pre-paid amount of time, users will receive an accounting from Patent Search Room or Trademark Search Library staff for terminal time used and prints produced. The user must then finalized payment.

**Discussion of Specific Rules**

**37 CFR 1.21 Miscellaneous fees and charges.**

Section 1.21 is amended to add new paragraph (o) to set the fees for access to the Automated Patent System full-text search capability (APS-Text) and to provide for the waiver of fees under certain circumstances.

Section 1.21 is amended to add new paragraph (p) to set the fees for APS-Text search assistance by Office staff.

Section 1.21 is amended to add new paragraph (q) to set the fee for a printed copy from APS-Text.

**37 CFR 2.6 Trademark fees**

Section 2.6 is amended to add new paragraph (w) to set the fees for access to the automated trademark search system (T-

Search) and to provide for the waiver of fees under certain circumstances.

Section 2.6 is amended to add new paragraph (x) to set the fee for a printed copy from T-Search.

A final rule package establishing two new fees under the provisions of Pub. L. 100-667, the Trademark Law Revision Act of 1988, has been published which added paragraphs (u) and (v) to section 2.6. Therefore, the rule has been modified from the proposal to add paragraphs (w) and (x) instead of paragraphs (u), (v) and (w).

**Response to Comments on the Rules**

A notice of proposed rulemaking to establish a basis for the charges for use of the on-line automated search systems in the Patent Search Room and Trademark Search Library located at the Patent and Trademark Office in Arlington, Virginia was published in the *Federal Register* on May 3, 1989, at 54 FR 18907. Corrections were published in the *Federal Register* on May 12, 1989, at 54 FR 20670. A notice also was published on May 30, 1989, in volume 1102 of the Official Gazette of the United States Patent and Trademark Office, pages 94 through 98 for patents, and pages 96 through 100 for trademarks.

A public hearing was conducted on June 30, 1989. A total of 25 comments were received: 24 respondents submitted written comments and five people presented oral testimony (four of whom also submitted written comments) at the public hearing. On the 25 comments, twelve (12) were from individuals, seven (7) from libraries, five (5) from organizations and one (1) from business. All of the written and oral comments were considered in adopting the rules set forth herein.

Many of the comments from the representatives of the Patent Depository Libraries raised questions or commented on the proposed rules from the perspective of their impact on Patent Depository Libraries. The proposed rules and policies set forth in the *Federal Register* Notice of May 3, 1989 are applicable only to the automated search systems provided in PTO's facilities located in Arlington, Virginia. When the Office is prepared to offer the automated search systems at the Patent Depository Libraries, a proposed notice will be published for public comment. Therefore, any comments relating to procedures for accessing the automated search systems in the Patent Depository Libraries will not be addressed at this time.

**Comment:** Overall, nine respondents acknowledged the usefulness of the automated search systems, particularly APS-Text. Although seven respondents alleged that T-Search is not adequate to meet the needs of the public, that its response time is too slow, and that it is not sufficiently accurate to meet the specific needs of the commentator, most of these respondents acknowledged that T-Search had the potential for being a useful tool. Documentation of specific problems, for example, those associated with conducting a phonetic search, were provided. Two respondents said that T-Search is flawed and the decision to require examiners to use the system on an exclusive basis was ill-advised and regrettable.

**Response:** Trademark examining attorneys have been using T-Search for word mark searches since August 1987, and for word mark and design searches since January 1988. The public has been using the system since April 3, 1989.

The minutes to the September 27, 1988, meeting of the Public Advisory Committee for Trademark Affairs, express the view that: "...T-Search searches are more thorough than manual searches." The transcript to that meeting contains the following comments: "I don't think there is any question, but a T-Search [sic] properly done gives an excellent result" and "...from the corporate point of view, ... I am pleased to say that I like what I see. I like the very fast action we're getting on the first action." From the transcript to the February 23, 1988 meeting: "I'd like to start with a glowing report. I think that the registration process is working very well. From my own personal experience in terms of what the examiners are doing, they get an A plus. They're really doing a good job."

The consensus of the management of the Trademark Examining Operation is that the T-Search system meets the needs of the Office at this time. There is no indication in any records or activities in the PTO which would indicate that the use of T-Search has caused a deterioration in the quality of searches conducted by Trademark examining attorneys.

The difference between the perceptions of the Trademark examining attorneys and the public may be attributed to several factors; Trademark examining attorneys use the system on a daily basis; they know what the system can do and what it cannot do and avoid the latter; and they know how to utilize the system's functionalities to perform the best search possible. Further, Trademark examining attorneys do different types of searches, and have different needs, than the public. T-Search use statistics for the period April 1989 through August 1989 demonstrate that the public is making extensive use of the system. Following is a summary of those statistics:

Month	Available Hours	Hours Used By Public	Rate of Usage	Average Session Time
April	513	108	21%	13.02 min.
May	513	126	24%	12.25 min.
June	627	183	29%	10.84 min.
July	570	186	33%	12.51 min.
August	656	217	33%	9.66 min.

This usage rate compares favorably to the projected usage rate of 28 percent.

**Comment:** Seven respondents claimed that the paper Trademark files have been allowed to deteriorate and, therefore, are not reliable for use by the public.

**Response:** The Office contracts for file maintenance services in both the Trademark Search Library and the Patent Search Room. Among the tasks performed by the contractor in the Trademark Search Library are maintaining the pending files, filing newly registered Trademarks, pulling erroneous registrations from the file, etc. The contract for the Trademark Search Library includes a monitoring system based on MIL-STD 105, which is a sampling plan that provides a 97 percent accuracy level. Once the contractor completes a task, Office staff check the required sample levels to ensure that filing was performed accurately. The Office is constantly monitoring the status of the paper files, but notes that maintenance of paper file integrity is subject to inherent limitations.

**Comment:** In view of the above comments about the inadequacy of the Trademark paper search files and T-Search, six respondents advocated the need for T-Search, at no charge to the user, as an adjunct or back-up to the paper files. One respondent suggested a similar arrangement in the Patent Search Room.

**Response:** The Office has adopted the \$40.00 fee amount for one hour of terminal session time on both APS-Text and T-Search. In order to give the public more time to become familiar with the T-Search system, the Commissioner is immediately suspending collection of that fee. This will enable users to learn the system so as to perform more effective searches. The Office will publish a notice in the *Federal Register* announcing its decision regarding the imposition of the fee at least 60 days before starting to collect the fee amount. At that time, the Office also will publish validated cost estimates based on usage rates and actual costs documented from the present time to the time the decision to collect a fee is made.

**Comment:** Two respondents claimed that the objective of automation necessarily contemplated a free search system to give meaning to the constructive notice provisions of the Trademark Act.

**Response:** Registration of a trademark constitutes constructive notice and records of all active trademark registrations and pending applications are available for searching free of charge in the paper file and on TRAM (Trademark Reporting and Monitoring System) data base.

**Comment:** One respondent claimed that PTO is required to provide access to disclosed patent information as the information is made public; four respondents were opposed to the Office charging fees for accessing the automated search systems; two other respondents commented that the Office should not charge fees for using systems designed to be the sole searching source of the public records which the Office is charged by law to provide; and one respondent commented that the proposal to limit access to the automated data bases only to those who can pay a fee is deplorable policy at a time when there is concern about industrial competitiveness with Japan.



**Response:** The Office will continue to make the paper and/or microfilm collections of U.S. patents, foreign patent documents and U.S. trademark registrations available for public access free of charge. The Office also has adopted a policy whereby the hourly terminal session fee for access to the data base can be waived when it is needed for a personal, educational purpose by an individual or member of an educational or non-profit organization, or where payment of the fee would pose a genuine financial hardship to the user. In this way, the Office will continue to provide public access to all available information free of charge.

**Comment:** One respondent commented that user fees for electronic data is a form of dual taxation when information was gathered, organized and produced at taxpayers expense; and two respondents claimed that users of information have contributed up to 30 percent of the \$120 million for development of the APS system to date — in other words, the public already has paid for APS.

**Response:** In calculating the proposed fees, the Office is consistent with the Office of Management and Budget's proposed policy on user charges for Government information products, as clarified in the June 15, 1989 *Federal Register* notice entitled "Second Advance Notice of Further Policy Development on Dissemination of Information." In that notice, OMB's stated policy is that user charges for Government Information products should be no higher than a level sufficient to recover the costs of disseminating, not collecting, the information.

The costs associated with the fees for accessing APS-Text and T-Search are directly related to the public's use of the systems; for example, the costs associated with the acquisition of the APS-Text terminals that are being used by the public. No costs associated with designing or installing the automated system for use by Office examiners, or the development of the new systems have been included. Neither have costs been included for gathering, organizing or producing information.

The *Federal Register* notice of June 15, 1989 (54 FR 25554, 25558) dealing with policy development on dissemination of information states that: "As to double taxation, OMB notes that user charges policy has a basis in statute (31 U.S.C. 9701), and the Congress has not viewed user charges as double taxation because they are applied when the recipient receives special benefits."

**Comment:** Two respondents stated that Government information is the same, whether it is provided in printed or electronic form.

**Response:** Charging fees for access to the automated search systems is consistent with PTO's fee policy. For example, fees are charged for manual search services (e.g., for a search of Office records or for a search of assignment records), and for printed copies of patents and trademarks and for copies of Office documents.

**Comment:** The Japanese system is available at four locations at no cost, and includes U.S. information made available at U.S. taxpayer expense.

**Response:** The Japanese automated search system, like the automated search systems in the PTO's search facilities, is being made available free of charge at the present time. The costs of such use, however, are being paid from general fee revenues collected by the Japanese Patent Office. Additionally, the APS-Text system currently includes Japanese English language abstracts and the Office is in the process of acquiring Japanese patent information in digital facsimile form.

**Comment:** One respondent commented that PTO has no responsibility to provide an expensive, complex, internal Government on-line value-added computer service, that this is far beyond the requirements of public access to patent files; and another respondent commented that it is in the public interest to have the same system that is being used by the examiners also available to the public.

**Response:** The Office agrees that it is in the public interest to provide the same search system capability to the public that is being used by the examiners.

**Comment:** One respondent stated that providing free access is not competing with the private sector, and that there always is a place for the private sector to provide value-added information.

**Response:** The user charges adopted for public access to the APS-Text and T-Search systems are consistent with OMB Circulars A-25 "User Charges" and A-130 "Management of

Federal Information Resources", and with the PTO's Electronic Data Dissemination Policies and Guidelines. The PTO's user's fees are designed to recover the marginal costs associated with providing access to the automated search systems to the public.

**Comment:** Five respondents stated that the proposed fees are not "reasonable" and the Office does not have documented cost estimates and usage rates to support the proposed fee amounts.

**Response:** The Office is meeting Congressional direction to establish "reasonable" fees by recovering only the marginal costs associated with providing public access to the automated search systems. Costs and projected usage rates were determined from the best available records, for example, financial statements for the Office and the results of the public evaluations of the APS-Text and T-Search systems. A summary of the costs used in the fee calculations is included above under "Cost Calculations." Full details of these cost calculations are available for public inspection at the Patent and Trademark Office in Suite 904 of Building 2, Crystal Park, at 2121 Crystal Drive, Arlington, Virginia.

**Comment:** Two respondents questioned the proposed fees for search assistance. If the search assistance is similar to that which is provided free now, there should be no fee. If the search assistance entails doing searches, the Office should not be getting into that business.

**Response:** The PTO is withdrawing the proposed fee for staff search assistance to conduct a search using T-Search capabilities. The fee for staff search assistance to conduct a search using APS-Text capabilities is being adopted, because an untrained user cannot conduct a search without significant help from Office staff. Users of course, have the option of obtaining free training on the system.

**Comment:** One respondent commented that user fees cannot be justified under the theory that electronic search provides a new service or offers an enhancement to the public's ability to search the patent data base, and that the public has an option of paying the fee or using the paper files. Another respondent commented that APS-Text and T-Search represent enhancements to services already provided.

**Response:** The fees are specifically authorized under § 104 (c) of Pub. L. 100-703 and are calculated to allow recovery of only the marginal cost for providing the system to the public.

**Comment:** Two respondents claimed that the Office should ask Congress for funding to offer free access here and at the PDLs.

**Response:** It continues to be PTO policy, consistent with OMB Circular A-130, that costs for access to the automated search systems be borne by those who actually use the automated search systems.

**Comment:** One respondent claimed that the accuracy of the trademark data base is suspect.

**Response:** All of the backfile data base elements (registrations issued prior to September 9, 1980) have been corrected except owner information. As originally planned, the owner field will be cleaned up the active registrations issued prior to September 9, 1980. It is projected that this owner field will be cleaned up by the third quarter of fiscal year 1991.

**Comment:** Three respondents claimed that the public requires access to the dead data base.

**Response:** The Office will consider this proposal further. The dead data base is now available in electronic format for all applications and registrations that were active on January 1, 1983 and are now inactive. However, many of these records are of poor quality. Costs for cleaning up these records would be significant, and those costs would likely be reflected in the T-Search user fee.

**Comment:** Four respondents addressed the fee waiver policy. The proposal to waive fee appears inconsistent with PTO's position that the free paper search files provide an equal and viable resource to anyone not wanting to pay for the automated files. If paper records are inferior, then anyone seeking access to T-Search should be able to qualify for the fee waiver. If the paper records are adequate, then there should be no need to waive the access fee for anyone.

**Response:** The waiver policy authorized by Pub. L. 100-703 is designed for those individuals who, for some reason in the public interest, such as an educational purpose, need the capabilities of the automated system, for example, to manipulate the data.

**Comment:** One respondent commented that the procedure to enroll people in training classes by the use of a lottery was unfair and that everyone who wants to be trained should be enrolled.

**Response:** The lottery was a method for establishing the initial schedules to provide training. Everyone who requests training will be trained. As of August 31, 1989, 449 out of 623 people requesting training on APS-Text, and 247 out of 376 people requesting training on T-Search have been trained.

**Comment:** One respondent commented that advance registration is an unrealistic approach for many searchers.

**Response:** At least one terminal in the Patent Search Room and one in the Trademark Search Library will be available for walk-up users. The other terminals will be available first for users with a reservation and then, if needed, for walk-up users. The system is designed to ensure equity of public access to the automated systems.

**Comment:** Two respondents asked for information justifying that this is not a "Major Rule" as defined by Executive Order 12291, and that the rule will not have a significant adverse impact on small entities.

**Response:** The no "major rule" determination and no significant adverse impact on small entities was based on the fact that the automated systems are being offered only at the Patent and Trademark Office's public search facilities located in Arlington, Virginia. The total number of users of these facilities averages less than 400 a day, and many of these users are members of law firms or commercial search services. The annual effect on the economy is expected to be about \$1 million, far less than the \$100 million annual threshold specified in the Executive Order. The fees for accessing the automated search systems are reasonable and should not burden small entities and, at the same time, the Office is continuing to maintain the paper search files which are available to the public free of charge. Finally, there should be no significant adverse effects on competition, because the systems are being offered only at one location, the Patent and Trademark Office in Arlington, Virginia, and the public may continue to use paper files without payment of any fee.

**Comment:** Five respondent commented that user fees burden small entities and run counter to a fundamental objective of the patent system which is to advance technology through dissemination of the technical information contained in patents.

**Response:** The Office does not believe that the fee amounts adopted will burden small entities or negatively impact the dissemination of technical information. The Office also will continue to maintain the paper search files using taxpayer funds, and provide access to the public free of charge. Further, the Office has adopted a fee waiver policy whereby the fee amount can be waived where access to the data base is needed for a personal, educational purpose by an individual or member of an educational or non-profit organization, or where payment of the fee would pose a genuine financial hardship to the user. Full details are included above under "Background".

**Comment:** One respondent commented that the Office needs a policy to ensure that no user of the patent and trademark information is disenfranchised due to an inability to pay for the services necessary to its access.

**Response:** The Commissioner will consider a fee waiver for users with a genuine financial hardship.

#### Other Considerations:

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501, et seq. There are no information collection requirements relating to patent and trademark fee rules.

The Office has determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The rules make the Office's on-line, automated patent full-text search

and trademark search systems available to the public at rates significantly less than commercial systems.

The Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

#### List of Subjects in 37 CFR Parts 1 and 2

##### 37 CFR Part 1

Administrative practice and procedure, Courts, Inventions and patents, Lawyers, Reporting and record keeping requirements, Small businesses.

##### 37 CFR Part 2

Administrative practice and procedure, Courts, Lawyers, Trademarks.

For the reasons set forth in the permeable, the Office is proposing to amend Title 37 of the code of Federal Regulations, Chapter 1, as set forth below.

#### PART 1-RULES OF PRACTICE IN PATENT CASES.

1. The authority citation for 37 CFR Part 1 continues to read as follows:  
Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.21 is amended by adding new paragraphs (o)-(q).

##### §1.21 Miscellaneous fees and charges.

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(o) Marginal cost, paid in advance, for each hour of terminal session time, including print time, using Automated Patent System full-text search capabilities, prorated for the actual time used. The Commissioner may waive the payment by an individual for access to the Automated Patent System full-text search capability (APS-Text) upon a showing of need or hardship, and if such waiver is in the public interest.....\$40.00

(p) Marginal cost, paid advance, for each hour of Office staff search assistance to conduct a search using Automated Patent System full-text search capabilities (APS-Text), prorated for the actual time used..... \$25.00

(q) Marginal cost, for each printed page generated from the Automated Patent System text terminal.....\$0.10

#### PART 2- RULES OF PRACTICE IN TRADEMARK CASES

1. The authority citation for Part 2 continues to read as follows:  
Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

2. Section 2.6 is amended by adding new paragraphs (w)-(x).

##### § 2.6 Trademark fees

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(w) Marginal cost, paid in advance, for each hour of terminal session time, including print time, using T-Search capabilities, prorated for the actual time used. The Commissioner may waive the payment by an individual for access to T-Search upon a showing of need or hardship, and if such waiver is in the public interest..... \$40.00



(x) Marginal cost, for each printed page generated from the T-Search terminal.....\$0.10

Dec. 4, 1989

JEFFREY M. SAMUELS  
Acting Commissioner of Patents  
and Trademarks

[1110 O.G. 601]

(40) **DEPARTMENT OF COMMERCE**  
**Patent and Trademark Office**  
**37 CFR Part 2**

**Patent and Trademark Automated Search System Fees**

Agency: Patent and Trademark Office, Commerce

Action: Listing of suspension of final rule

Summary: The Patent and Trademark Office (Office), on December 11, 1989, amended the rules of practice in patent and trademark cases, Parts 1 and 2 of Title 37, Code of Federal Regulations, setting forth the fees for public access to the Office's text data bases: the Automated Patent System (APS) and the automated trademark search system (T-Search). 54 FR 50942. That final rule became effective on February 12, 1990. On that date, 37 CFR 2.6(w), dealing with T-Search fees, took effect, but was immediately suspended by the Commissioner.

The collection of the fee was initially suspended to permit users to become familiar with the T-Search system. The T-Search system has been available to the public since April 1989, a sufficient time for users to become familiar with the system. Therefore, as provided in the final rule, the Office now gives notice that the suspension is lifted. The Office will begin to collect the fees set forth in 37 CFR 2.6(w) sixty (60) days from the date of this notice. Cost estimates based on usage and actual costs are available for inspection in the Office of Long-Range Planning and Evaluation, Room 507, Crystal Park 1, Crystal Drive, Arlington, Virginia.

Dates: The suspension of 37 CFR 2.6(w) is lifted as of Nov. 13, 1990. The collection of fees under 37 CFR 2.6(w) will begin on November 13, 1990.

For Further Information Contact: Frances Michalkewicz by telephone at (703) 557-1610 or by mail to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

September 4, 1990

HARRY F. MANBECK, Jr.  
Assistant Secretary and Commissioner  
of Patents and Trademarks

[1119 O.G.6]

(41) **Department of Commerce**  
**Patent and Trademark Office**

**37 CFR Part 1**  
**[Docket No. 95-0720187-5187-01]**  
**RIN 0651-AA79**

**Rules of Practice in Patent Cases;  
Reexamination Proceedings**

Agency: Patent and Trademark Office, Commerce.

Action: Notice of Proposed Rulemaking

Summary: The Patent and Trademark Office (Office) is proposing to amend its rules of practice in patent cases to provide revised procedures for the reexamination of patents. H.R. 1732 proposes to authorize the extension of reexamination proceedings as a means for improving the quality of United States patents. The Office intends, through this proposed amendment of its rules, to provide patent owners and the public with guidance on the procedures the Office would follow in conducting reexamination proceedings.

Dates: A public hearing will be held on Wednesday, September 20, 1995, at the Stouffer Renaissance Crystal City Hotel, 2399 Jefferson Davis Highway, Arlington, Virginia, 22202 at 9:30 a.m. Those wishing to present oral testimony must request an

opportunity to do so no later than September 14, 1995. Written comments must be submitted on or before September 22, 1995. Addresses: Written comments concerning the rule changes should be addressed to the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231, marked to the attention of Gerald A. Dost, Senior Legal Advisor, Special Program Law Office, Crystal Park 1, Suite 520. In addition, written comments may also be sent by facsimile transmission to (703) 308-6916 with a confirmation copy mailed to the above address, or by electronic mail messages over the Internet to [reexamrule@uspto.gov].

Written comments concerning reexamination rule matters will be available for public inspection on October 2, 1995, in Room 520 of Crystal Park One, 2011 Crystal Drive, Arlington, Virginia.

For Further Information Contact: Gerald A. Dost or Lawrence E. Anderson by telephone at (703) 305-9285, by electronic mail at landerso@uspto.gov, or by mail to Gerald A. Dost to his attention addressed to the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231.

**Supplementary Information:****Background**

This proposed rulemaking sets forth distinct procedures directed towards determining and improving the quality and reliability of United States patents. The procedures are proposed to provide for the expanded reexamination of patents as proposed in H.R. 1732.

**Discussion of General Issues Involved**

The proposals are in response to H.R. 1782 which resulted from suggestions and comments to the Administration by the public, bar groups, and the August 1992 Advisory Commission on Patent Law Reform suggesting more participation in the reexamination proceeding by third party requesters. Under the rules proposed herein, third party requesters will have greater opportunity to participate in reexamination proceedings in keeping with the spirit and intent of the proposed law. At the same time, participation will be limited to minimize the costs and other effects of reexamination requests on patentees.

If H.R. 1732 is amended during the legislative process, the final rules will comply with this legislation as enacted. If H.R. 1732 is not enacted, the proposed rules that would implement expanded reexamination of patents would be withdrawn.

Because reexaminations filed before the proposed law takes effect will continue to be governed by 37 CFR 1.501 - 1.570, to avoid confusion between the new and old rules the newly proposed reexamination rules have been numbered 37 CFR 1.901 - 1.997.

Regarding the reexamination fee, 35 U.S.C. 41(d) requires the Commissioner to set the fee for reexamination at a level which will recover the estimated average cost to the Office. The estimated average cost is \$4,500 per patent owner requested reexamination and \$11,000 for third party requested reexaminations. The difference in price takes into account the estimate that the examiner will spend twice the amount of time examining a case where a third party requester is present and additional costs incurred during the appellate stages incident to additional processing steps required in the third party proceedings.

**Discussion of the Major Specific Issues Involved**

The proposed rules relating to reexamination proceedings are directed to the procedures set forth in proposed Chapter 30 of Title 35 of the United States Code (35 U.S.C. 301-307). This proposed Chapter provides for the citation of prior art in patents, filing of requests for reexamination, decisions on such requests, reexamination and appeal from reexamination decisions, and the issuance of a certificate at the termination of the reexamination proceedings.

Section 1.4 is proposed to be amended so that paragraph (a)(2) includes the reexamination §§ 1.901 - 1.997.

Section 1.6 is proposed to be amended so that paragraph (d)(5) includes § 1.913, which related to the exception of the use of facsimile transmission for filing the request for reexamination.

Section 1.11 is proposed to be amended so that paragraph (c), which relates to reexaminations at the initiative of the Commissioner, includes the reference to reexamination § 1.929.

Section 1.17 is proposed to be amended so that paragraph (l) reflects the fact that in the case of reexaminations filed after January 1, 1996, petitions for revival of a reexamination proceeding terminated for an unavoidable failure to respond require the fees of \$55.00 for a small entity and \$110.00 for other than small entity. Also, § 1.17 is proposed to be amended so that paragraph (m) reflects the fact that in the case of reexaminations filed after January 1, 1996, petitions for revival of a reexamination proceeding terminated for an unintentional failure to respond require the fees of \$605.00 for a small entity and \$1,210.00 for other than small entity. The Office has proposed an increase in the fee set by § 1.17(m). See "Revision of Patent and Trademark Fees" published in the *Federal Register* at 60 FR 27934 (May 26, 1995) and in the Patent and Trademark Office *Official Gazette* at 1174 Off. Gaz. Pat. Office 134 (May 30, 1995).

Section 1.20 is proposed to be amended so that paragraph (c) reflects the fact that in the case of reexaminations filed after January 1, 1996, there is a two tier fee scale in which patent owner requesters will be charged \$4,500 and third party requesters will be charged \$11,000.

Section 1.25 is proposed to be amended so that paragraph (b), which relates to requests for reexaminations, includes the reference to reexamination § 1.913.

Section 1.26 is proposed to be amended so as to reflect that in the case of reexaminations filed after January 1, 1996, a refund of seventy-five percent (75%) of the fee paid for filing the request for reexamination will be made to the requester.

Section 1.112 is proposed to be amended so that the last sentence reflects the fact that in the case of reexaminations filed after January 1, 1996, the examiner may close prosecution prior to making the action final. Section 1.113, which provides for a final rejection or action in a reexamination proceeding, is proposed to be amended so that its application is limited to applicants and patent owners in reexaminations filed before January 1, 1996. For reexaminations filed after January 1, 1996, the new reexamination rules will apply.

Section 1.115, which provides for amendments by the patent owner in a reexamination proceeding, is proposed to be amended so that its application is limited to applicants and patent owners in reexaminations filed before January 1, 1996. For reexaminations filed after January 1, 1996, the new reexamination rules will apply.

Section 1.116, which provides for amendments after final action in reexamination proceedings, is proposed to be amended so that its application is permissible after an action closing prosecution for patent owners in reexaminations filed on or after January 1, 1996. Also, for clarity, the rule is amended to provide that for reexaminations filed after January 1, 1996, no appeal is permitted until a right of appeal notice has been issued.

Section 1.136, which provides for filing of timely responses with petitions and fee for extension of time and extensions of time for cause, is amended to make it clear that for reexamination proceedings filed on or after January 1, 1996, § 1.957 is controlling for extensions of time.

Section 1.137, which provides for revival of abandoned applications or lapsed patents, is proposed to be amended to change the title and add new paragraphs (g) and (h). Paragraph (f) is proposed to be utilized for provisional applications. Paragraph (g) is proposed to be added to provide for revival of unavoidably terminated proceedings for reexamination proceedings filed before January 1, 1996. Paragraph (h) is proposed to be added to make it clear that for reexamination proceedings filed on or after January 1, 1996, § 1.958 is controlling.

Section 1.191, which provides for appeal to the Board of Patent Appeals and Interferences by the patent owner from any decision adverse to patentability, is proposed to be amended so as to be applicable to reexaminations filed before January 1, 1996. For reexamination proceedings filed on or after January 1, 1996, § 1.959 is controlling.

Section 1.192, which provides two months from the date of the Notice of Appeal for the patent owner to file an appeal brief in a reexamination proceeding, is proposed to be amended so as to be applicable to reexaminations filed before January

1, 1996. For reexamination proceedings filed on or after January 1, 1996, § 1.965 is controlling.

Section 1.193, which provides for the Examiner's answer and reply brief, is proposed to be amended so as to be applicable to reexaminations filed before January 1, 1996. For reexamination proceedings filed on or after January 1, 1996, §§ 1.969 and 1.971 are controlling.

Section 1.194, which provides for the oral hearing, is proposed to be amended so as to be applicable to reexaminations filed before January 1, 1996. For reexamination proceedings filed on or after January 1, 1996, § 1.973 is controlling.

Section 1.195, which provides for the affidavits or declarations after appeal, is proposed to be amended so as to be applicable to reexaminations filed before January 1, 1996. For reexamination proceedings filed on or after January 1, 1996, § 1.975 is controlling.

Section 1.196, which provides for the decision of the Board of Patent Appeals and Interferences, is proposed to be amended so as to be applicable to reexaminations filed before January 1, 1996. For reexamination proceedings filed on or after January 1, 1996, § 1.977 is controlling.

Section 1.197, which provides for action following the decision, is proposed to be amended so as to be applicable to reexaminations filed before January 1, 1996. For reexamination proceedings filed on or after January 1, 1996, § 1.979 is controlling.

Section 1.198, which provides for reopening after the decision, is proposed to be amended so as to be applicable to reexaminations filed before January 1, 1996. For reexamination proceedings filed on or after January 1, 1996, § 1.981 is controlling.

Section 1.301, which provides for appeal by the owner of a patent in reexamination proceedings to the U.S. Court of Appeals for the Federal Circuit, is proposed to be amended so as to be applicable to reexaminations filed before January 1, 1996. For reexamination proceedings filed on or after January 1, 1996, § 1.983 is controlling.

Section 1.303, which provides for remedy by civil action under 35 U.S.C. 145 for the owner of a patent in reexamination proceedings, is proposed to be amended so as to be applicable to reexaminations filed before January 1, 1996. For reexamination proceedings filed on or after January 1, 1996, § 1.983 is controlling.

Section 1.304 which provides for time for appeal or civil action, is proposed to be amended so as to refer also to § 1.957.

The title to Subpart D is proposed to be amended to provide that the reexamination rules in this part apply only to reexamination proceedings filed before January 1, 1996.

The proposed title to Subpart H provides that the reexamination rules in this part apply only to reexamination proceedings filed on or after January 1, 1996.

Proposed § 1.901 provides a system for citation of patents and printed publications to the Office for placement in the patent file by any person during the period of enforceability of the patent in accordance with 35 U.S.C. 301. The section provides for citations limited to patents and printed publications when the person making the citation states the pertinency and applicability of the citation to the patent and the bearing the citation has on the patentability of at least one claim of the patent. The rule provides that a citation made by the patent owner may include an explanation of how the claims differ from the prior art cited. Any citations which include items other than patents and printed publications will not be entered in the patent file. This does not, of course, limit in any manner the kinds and types of information which can be relied upon in protests against pending patent applications, whether such be original applications or reissue applications. The term "period of enforceability of a patent" includes any period for which recovery can be had for infringement. Under usual circumstances, this would be the term of the patent plus the six years provided by 35 U.S.C. 286.

Proposed § 1.902 provides for the processing of prior art citations during a reexamination proceeding.

Proposed § 1.903 provides for the service of papers on parties.

Proposed § 1.904 provides that the notices published in the *Official Gazette* will be considered to be constructive notice.

Proposed § 1.905 provides for submission of papers by the public.



Proposed § 1.906 covers the scope of reexamination in a reexamination proceeding. While it is not intended that the examiners will routinely complete a new search when conducting reexamination, the examiners will be free to, and will, very likely, conduct additional searches and cite and apply additional prior patents and publications when they consider it is appropriate and beneficial to do so. Insofar as the actual reexamination is concerned, the examination is only on the basis of patents or printed publications and on the basis of the requirements of 35 U.S.C. 112, except for the best mode requirement. Claims in a reexamination proceeding must not enlarge the scope of the claims of the patent and must not introduce new matter. Paragraph (c) provides that questions relating to matters other than those indicated in paragraphs (a) and (b) of this section will not be resolved in a reexamination proceeding, but will be noted by the examiner as being an open question in the record. Patent owners could then file a reissue application if they wish such questions to be resolved.

Proposed § 1.907 sets forth when reexamination is prohibited. Once an order to reexamine has been issued under § 1.931, neither the patent owner nor the third party requester, if any, nor privies of either, may file a subsequent request for reexamination of the patent until a reexamination certificate is issued under § 1.997, unless authorized by the Commissioner. Once a final decision has been entered against a party in a civil action arising in whole or in part under 28 U.S.C. 1338 in which the party did not sustain its burden of proving invalidity of any patent claim in suit, then neither that party nor its privies may thereafter request reexamination of any such patent claim on the basis of issues which that party or its privies raised or could have raised in such civil action, and a reexamination requested by that party or its privies on the basis of such issues may not thereafter be maintained by the Office.

Proposed § 1.909 provides for estoppel of third party requesters from previous reexamination proceedings. A third party requester, or its privy, who, during a reexamination proceeding, has filed a notice of appeal to the Court of Appeals for the Federal Circuit, or who has participated as a party to an appeal by the patent owner, under the provisions of 35 U.S.C. 141 to 144, is estopped from later asserting, in a subsequent reexamination proceeding, the invalidity of any claim determined to be patentable on appeal on any ground which the third party requester, or its privy, raised or could have raised during the prior reexamination proceeding. A third party requester, or its privy, is deemed not to have participated as a party to an appeal by the patent owner unless, within twenty days after the patent owner has filed notice of appeal, the third party (or its privy) files notice with the Commissioner electing to participate.

Proposed § 1.911 provides factors for consideration of privies and persons bound. For the purposes of § 1.907, a determination of whether a person is a privy with respect to the patent owner shall include consideration of whether there is: (1) a mutual, concurrent or successive relationship to the same property rights in the patent involved in the reexamination proceeding; or (2) representation of the interests of the patent owner concerning the patent. For the purposes of §§ 1.907 and 1.909, a determination of whether a person is a privy with respect to a third party requester shall include consideration of whether there is: (1) a mutual, concurrent or successive relationship to the same property rights which are or may be affected by and/or infringe the patent involved in the reexamination proceeding; or (2) representation of the interests of the other party which are or may be affected by and/or potentially infringe the patent. For the purposes of §§ 1.907 and 1.909, a person who is not a party to the reexamination proceeding but who controls or substantially participates in the control of the presentation of the reexamination proceeding on behalf of a party is bound by the determination of issues decided as though he or she were a named party. To have control of the presentation requires that person to have effective choice as to the legal theories and/or grounds of rejection or defenses to be advanced on behalf of the party to the reexamination proceeding. Under this section a party would be precluded from hiring another law firm and having that firm file a subsequent reexamination request in order to avoid the prohibitions of 35 U.S.C. 307(c) or 308.

Proposed § 1.913 sets forth procedures for any person to request reexamination in accordance with 35 U.S.C. 302 and

limits the period for such request to the period of enforceability of the patent for which the request is filed.

Proposed § 1.915(a) requires payment of the fee for requesting reexamination. Paragraph (b) of new § 1.915 indicates what each request for reexamination must include. Paragraph (c) of new § 1.915 covers amendments which a patent owner can propose. Such amendments can accompany a request for reexamination by the patent owner. Paragraph (d) indicates that requests for reexamination may be filed by attorneys or agents on behalf of a requester, but it is noted that the real party in interest must be identified in accordance with § 1.915(b) (10).

Proposed § 1.917 indicates what will be done if the request is incomplete.

Proposed § 1.919 indicates the date on which the entire fee is received will be considered to be the date of the request for reexamination.

Proposed § 1.921 provides that prior art submissions by the third party requester filed after the reexamination order shall be limited solely to prior art which is used to rebut a finding of fact by the examiner or a response of the patent owner.

Proposed § 1.923 relates to a determination as to whether the request has presented a substantial new question of patentability under 35 U.S.C. 303 and requires that the determination be made within 3 months of the filing date of the request.

Proposed § 1.925 refers to the refund provisions.

Proposed § 1.927 provides for review by petition to the Commissioner of any decision refusing reexamination.

Proposed § 1.929 provides for reexamination at the initiative of the Commissioner under the provisions of the last sentence of paragraph (a) of 35 U.S.C. 303.

Proposed § 1.931 provides for ordering reexamination where a substantial new question of patentability has been found pursuant to §§ 1.923 or 1.929. Under paragraph (b), the only limitation placed on the selection of the examiner by the Office is that the same examiner whose decision was reversed on petition ordinarily will not conduct the reexamination.

Proposed § 1.933 covers the duty of disclosure by a patent owner in a reexamination proceeding involving the owner's patent.

Proposed § 1.935 indicates that the initial Office action normally accompanies the reexamination order.

Proposed § 1.937 provides that in accordance with 35 U.S.C. 305(c), unless otherwise provided by the Commissioner for good cause, all reexamination proceedings will be conducted with special dispatch. Paragraph (b) covers the basic items relating to the conduct of reexamination proceedings.

Proposed § 1.939 provides that no paper shall be filed before the first Office action.

Proposed § 1.941 provides for proposed amendments provided for in the second sentence of 35 U.S.C. 305. Amendments submitted by the patent owner cannot enlarge the scope of a claim in the patent. Amendments will not be effectively entered into the patent until the certificate under § 1.997 and 35 U.S.C. 307 is issued.

Proposed § 1.943 provides a page limit for responses and briefs of 50 pages. Prior art references and Appendix of claims would not be included in this total.

Proposed § 1.945 provides that a patent owner will be given at least thirty days to respond to any Office action. Although problems may arise in certain cases and extensions of time may be granted, it is felt that relatively short response times are necessary in order to process reexaminations with "special dispatch."

Proposed § 1.947 provides that in accordance with 35 U.S.C. 305 (b)(3), if a patent owner files a response to any Office action on the merits, the third party requester may once file written comments.

Proposed § 1.949 provides when prosecution may be closed. Proposed § 1.951 provides for responses by the parties after an Office action closing prosecution. The responses and time periods provided for by paragraphs (a) and (b) may run concurrently.

Proposed § 1.953 provides that, following the responses or expiration of the time for response in § 1.951, the examiner may issue a right of appeal notice which shall include a final rejection or final decision favorable to patentability in accordance with 35 U.S.C. 134. The intent of limiting the appeal rights until after the examiner issues a "Right of Appeal Notice"

is to specifically preclude the possibility of one party attempting to appeal prematurely while prosecution before the examiner is being continued by the other party.

Proposed § 1.955 relates to the conduct of interviews in reexamination proceedings. The third party requester is permitted to attend all interviews. Interviews are permitted before the first Office action only when initiated by the examiner.

Proposed § 1.957 relates to extensions of time and termination of reexamination proceedings. In circumstances where the response by the patent owner is not required by the examiner and is merely discretionary, such as when all claims are allowed or their patentability is confirmed and the patent owner is merely given the opportunity for comment, such a failure to comment is not the type of lack of response contemplated by paragraphs (b) and (c) and, therefore, not grounds for termination or limiting prosecution.

Proposed § 1.958 relates to revival of terminated proceedings.

Proposed § 1.959 relates to appeals and cross appeals to the Board of Patent Appeals and Interferences. Both patent owners and third party requesters are given appeal rights in accordance with 35 U.S.C. 306.

Proposed § 1.961 relates to time of transfer of the jurisdiction of the appeal over to the Board of Patent Appeals and Interferences.

Proposed § 1.962 relates to the definition of appellant and respondent.

Proposed § 1.963 relates to the time periods for filing briefs.

Proposed § 1.965 relates to the appellant brief.

Proposed § 1.967 relates to the respondent brief.

Proposed § 1.969 relates to the examiner's answer.

Proposed § 1.971 relates to the reply brief.

Proposed § 1.973 relates to the oral hearing.

Proposed § 1.975 relates to affidavits or declarations after appeal.

Proposed § 1.977 relates to the decision by the Board of Patent Appeals and Interferences.

Proposed § 1.979 relates to the procedure following the decision by the Board of Patent Appeals and Interferences.

Proposed § 1.981 relates to the procedure for reopening prosecution following the decision by the Board of Patent Appeals and Interferences.

Proposed § 1.983 relates to appeals to the United States Court of Appeals for the Federal Circuit. In accordance with 35 U.S.C. 306, Under H.R. 1732, civil actions under 35 U.S.C. 145 are not permitted in reexamination proceedings filed on or after January 1, 1996.

Proposed § 1.985 relates to notification of prior or concurrent proceedings.

Proposed § 1.987 relates to the stay of concurrent proceedings. Decisions as to whether to delay or combine cases will be made on a case-by-case basis to minimize delays and to protect the interests of all parties concerned.

Proposed § 1.989 relates to the merger of concurrent proceedings.

Proposed § 1.991 relates to the merger of a concurrent reissue application and a reexamination proceeding.

Proposed § 1.993 relates to the stay of a concurrent interference and reexamination proceeding.

Proposed § 1.995 relates to a third party requester's participation rights being preserved in merged proceeding.

Proposed § 1.997 concerns the issuance of the reexamination certificate under 35 U.S.C. 307 after the conclusion of reexamination proceedings. The certificate will cancel any patent claims determined to be unpatentable, confirm any patent claims determined to be patentable, and incorporate into the patent any amended or new claim determined to be patentable. Once all of the claims have been canceled from the patent, the patent ceases to be enforceable for any purpose. Accordingly, any pending reissue or other Office proceeding relating to a patent in which such a certificate has been issued will be terminated. This provides a degree of assurance to the public that patents with all the claims canceled via reexamination proceedings will not again be asserted. It is intended that copies of the certificate will continue to be part of subsequently sold copies of the patent.

#### Other Considerations

The proposed rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Order 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.* It has been determined that this rulemaking is not significant for the purposes of Executive Order 12866.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these proposed rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impacts of these proposed changes are to expand the grounds for requesting a reexamination and to permit the third party to participate more extensively during the reexamination proceeding as well as having appeal rights.

The Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes contain collection of information requirements subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, which is currently approved by the Office of Management and Budget under Control No. 0651-0033. The public reporting burden for the collection of information for requests for reexamination is estimated to average 2.0 hours each including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Office of System Quality and Enhancement, Patent and Trademark Office, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503 (ATTN: Paperwork Reduction Act Project 0651-0033).

Notice is hereby given that pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, the Patent and Trademark Office proposed to amend Title 37 of the Code of Federal Regulations as set forth below.

#### List of Subjects

##### 37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of Information, Inventions and patents, Reporting and record keeping requirements, Small Businesses.

For the reasons set out in the preamble and under the authority given to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, Part 1 of Title 37 CFR is proposed to be amended as set forth below.

#### PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.4(a)(2) is proposed to be revised to read as follows:

#### § 1.4 Nature of correspondence and signature requirements.

(a) \* \* \*

(2) Correspondence in and relating to a particular application or other proceeding in the Office. See particularly the rules relating to the filing, processing, or other proceedings of national applications in Subpart B, §§ 1.31 to 1.378; of international applications in Subpart C, §§ 1.401 to 1.499; of reexamination of patents filed before January 1, 1996, in Subpart D, 1.501 to 1.570, and of reexaminations filed on or after January 1, 1996, in Subpart H, §§ 1.901-1.997; of interferences in Subpart E, §§ 1.601 to 1.690; of extension of patent term in Subpart F, §§ 1.710 to 1.785; and of trademark applications §§ 2.11 to 2.189.

\* \* \* \* \*



3. Section 1.6(d)(5) is proposed to be revised to read as follows:

### § 1.6 Receipt of Correspondence

\*\*\*\*\*

(d)(5) A request for reexamination under § 1.510 or § 1.913.

\*\*\*\*\*

4. Section 1.11(c) is proposed to be revised to read as follows:

### § 1.11 Files open to the public.

\*\*\*\*\*

(c) All requests for reexamination for which the fee under 1.20(c) has been paid, will be announced in the Official Gazette. Any reexaminations at the initiative of the Commissioner pursuant to 1.520 or 1.929 will also be announced in the Official Gazette. The announcement shall include at least the date of the request, if any, the reexamination request control number or the Commissioner initiated order control number, patent number, title, class and subclass, name of the inventor, name of the patent owner of record, and the examining group to which the reexamination is assigned.

5. Section 1.17(l) and (m) are proposed to be revised to read as follows:

### § 1.17 Patent application processing fees.

\*\*\*\*\*

(l) For filing a petition:

(1) For the revival of an unavoidably abandoned application under 35 U.S.C. 111, 133, 364, or 371,

(2) For delayed payment of the issue fee under 35 U.S.C. 151, or,

(3) For the revival of an unavoidably terminated reexamination proceeding:

By a small entity (§ 1.9(f))	55.00
By other than a small entity	110.00

(m) For filing a petition:

(1) For revival of an unintentionally abandoned application,

(2) For the unintentionally delayed payment of the fee for issuing a patent, or

(3) For reexamination proceedings filed on or after January 1, 1996, for the revival of an unintentionally terminated reexamination proceeding:

By a small entity (§ 1.9(f))	605.00
By other than a small entity	1,210.00

6. Section 1.20(c) is proposed to be revised to read as follows:

### § 1.20 Post issuance fees.

\*\*\*\*\*

(c) For filing a request for reexamination (§ 1.915(a)):

by a patent owner	\$4,500.00
by a third party requester	\$11,000.00

\*\*\*\*\*

7. Section 1.25(b) is proposed to be revised to read as follows:

### § 1.25 Deposit accounts.

\*\*\*\*\*

(b) Filing, issue, appeal, international-type search report, international application processing, petition, and post-issuance fees may be charged against these accounts if sufficient funds

are on deposit to cover such fees. A general authorization to charge all fees, or only certain fees, set forth in §§ 1.16 to 1.18 to a deposit account containing sufficient funds may be filed in an individual application, either for the entire pendency of the application or with respect to a particular paper filed. An authorization to charge to a deposit account the fee for a request for reexamination pursuant to § 1.510 or § 1.915 and any other fees required in a reexamination proceeding in a patent may also be filed with the request for reexamination. An authorization to charge a fee to a deposit account will not be considered payment of the fee on the date the authorization to charge the fee is effective as to the particular fee to be charged unless sufficient funds are present in the account to cover the fee.

8. Section 1.26(c) is proposed to be revised to read as follows:

### § 1.26 Refunds.

\*\*\*\*\*

(c) If the Commissioner decides not to institute a reexamination proceeding, for reexaminations filed on or after January 1, 1996, a refund of seventy-five percent (75%) of the fee paid for filing the request for reexamination will be made to the requester. Reexamination requesters should indicate whether any refund should be made by check or by credit to a deposit account.

9. Section 1.112 is proposed to be revised to read as follows:

### § 1.112 Reconsideration.

After response by applicant or patent owner (§ 1.111), the application or patent under reexamination will be reconsidered and again examined. The applicant or patent owner will be notified if claims are rejected, or objections or requirements made, in the same manner as after the first examination. Applicant or patent owner may respond to such Office action in the same manner provided in § 1.111, with or without amendment. Any amendments after the second Office action must ordinarily be restricted to the rejection or to the objections or requirements made. The application or patent under reexamination will be again considered, and so on repeatedly, unless the examiner has indicated that the action is final or is an action closing prosecution.

10. Section 1.113(a) is proposed to be revised to read as follows:

### § 1.113 Final rejection or action.

(a) On the second or any subsequent examination or consideration the rejection or other action may be made final, whereupon applicant's or (for reexaminations filed before January 1, 1996) patent owner's response is limited to appeal in the case of rejection of any claim (§ 1.191), or to amendment as specified in § 1.116. Petition may be taken to the Commissioner in the case of objections or requirements not involved in the rejection of any claim (§ 1.181). Response to a final rejection or action must include cancellation of, or appeal from the rejection of, each rejected claim. If any claim stands allowed, the response to a final rejection or action must comply with any requirements or objection as to form.

\*\*\*\*\*

11. Section 1.115 is proposed to be revised to read as follows:

### § 1.115 Amendment.

The applicant may amend before or after the first examination and action and also after the second or subsequent examination or reconsideration as specified in § 1.112 or when and as specifically required by the examiner. For reexaminations filed before January 1, 1996, the patent owner may amend in accordance with §§ 1.510(e) and 1.530(b) prior to reexamination, and during reexamination proceedings in accordance with §§ 1.112 and 1.116. For reexaminations filed on or after January 1, 1996, the patent owner may amend in accordance with § 1.915(c) prior to reexamination, and during reexamination pro-

ceedings in accordance with §§ 1.941 and 1.945.

12. Section 1.116(a) is proposed to be revised to read as follows:

### § 1.116 Amendments after final action.

(a) After final rejection or action (§ 1.113) or action closing prosecution (§ 1.949) for reexaminations filed on or after January 1, 1996, amendments may be made cancelling claims or complying with any requirement of form which has been made. Amendments presenting rejected claims in better form for consideration on appeal may be admitted. The admission of, or refusal to admit, any amendment after final rejection, and any proceedings relative thereto, shall not operate to relieve the application or patent under reexamination from its condition as subject to appeal or to save the application from abandonment under § 1.135. Notwithstanding the above, for reexamination proceedings filed on or after January 1, 1996, no appeal may be had until a right of appeal notice has been issued pursuant to § 1.953.

\*\*\*\*\*

13. Section 1.136(a) (2) and (b) are proposed to be revised to read as follows:

### § 1.136 Filing of timely responses with petition and fee for extension of time and extensions of time for cause.

(a)\*\*\*

(2) The date on which the response, the petition, and the fee have been filed is the date of the response and also the date for purposes of determining the period of extension and the corresponding amount of the fee. The expiration of the time period is determined by the amount of the fee paid. In no case may an applicant respond later than the maximum time period set by statute, or be granted an extension of time under paragraph (b) of this section when the provisions of this paragraph are available. See § 1.136(b) for extensions of time relating to proceedings pursuant to § 1.193(b), 1.194, 1.196 or 1.197. See § 1.304 for extension of time to appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action. See § 1.550(c) for extension of time in reexamination proceedings filed before January 1, 1996, § 1.957 for extension of time in reexamination proceedings filed on or after January 1, 1996, and § 1.645 for extension of time in interference proceedings.

(b) When a response with petition and fee for extension of time cannot be filed pursuant to paragraph (a) of this section, the time for response will be extended only for sufficient cause and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the applicant is due, but in no case will the mere filing of the request effect any extension. In no case can any extension carry the date on which response to an Office action is due beyond the maximum time period set by statute or be granted when the provisions of paragraph (a) of this section are available. See § 1.304 for extension of time to appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action, § 1.645 for extension of time in interference proceedings, § 1.550(c) for extension of time in reexamination proceedings filed before January 1, 1996, and § 1.957 for extension of time in reexamination proceedings filed on or after January 1, 1996.

14. Section 1.137(g) and (h) are proposed to be added and the Section heading revised to read as follows:

### § 1.137 Revival of abandoned application, lapsed patent or terminated reexamination.

\*\*\*\*\*

(g) A reexamination proceeding filed before January 1, 1996, which is terminated for failure to prosecute may be revived as a pending proceeding if it is shown to the satisfaction of the Commissioner that the delay was unavoidable. A petition to revive an unavoidably terminated reexamination proceeding must be promptly filed after the patent owner is notified of,

or otherwise becomes aware of, the termination of the proceeding, and must be accompanied by:

- (1) a proposed response to continue prosecution of that proceeding unless it has been previously filed;
  - (2) the petition fee as set forth in § 1.17(l); and
  - (3) a showing that the delay was unavoidable. The showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office.
- (h) For reexamination proceedings filed on or after January 1, 1996, see § 1.958.

15. Section 1.191(a) is proposed to be revised to read as follows:

### § 1.191 Appeal to Board of Patent Appeals and Interferences.

(a) Every applicant for a patent or for reissue of a patent, or every owner of a patent under reexamination (for reexaminations filed before January 1, 1996), any of the claims of which have been twice rejected or who has been given a final rejection (§ 1.113), may, upon the payment of the fee set forth in § 1.17(e), appeal from the decision of the examiner to the Board of Patent Appeals and Interferences within the time allowed for response. Notwithstanding the above, for reexamination proceedings filed on or after January 1, 1996, § 1.959 *et seq.* is controlling.

\*\*\*\*\*

16. Section 1.192(a) is proposed to be revised to read as follows:

### § 1.192 Appellant's brief.

(a) The appellant shall, within 2 months from the date of the notice of appeal under § 1.191 in an application, reissue application, or patent under reexamination (for reexaminations filed before January 1, 1996), or within the time allowed for response to the action appealed from, if such time is later, file a brief in triplicate. The brief must be accompanied by the requisite fee set forth in § 1.17(f) and must set forth the authorities and arguments on which the appellant will rely to maintain the appeal. Any arguments or authorities not included in the brief may be refused consideration by the Board of Patent Appeals and Interferences. Notwithstanding the above, for reexamination proceedings filed on or after January 1, 1996, § 1.965 is controlling.

\*\*\*\*\*

17. Section 1.193 is proposed to be amended by adding a paragraph (c) to read as follows:

### § 1.193 Examiner's answer.

\*\*\*\*\*

(c) Notwithstanding the above, for reexamination proceedings filed on or after January 1, 1996, §§ 1.969 and 1.971 are controlling.

18. Section 1.194 is proposed to be amended by adding a paragraph (d) to read as follows:

### § 1.194 Oral hearing.

\*\*\*\*\*

(d) Notwithstanding the above, for reexamination proceedings filed on or after January 1, 1996, § 1.973 is controlling.

19. Section 1.195 is proposed to be revised to read as follows:

### § 1.195 Affidavits or declarations after appeal.

Affidavits, declarations, or exhibits submitted after the case has been appealed will not be admitted without a showing of good and sufficient reasons why they were not earlier presented. Notwithstanding the above, for reexamination proceedings filed



on or after January 1, 1996, § 1.975 is controlling.

20. Section 1.196 is proposed to be amended by adding a paragraph (g) to read as follows:

**§ 1.196 Decision by the Board of Patent Appeals and Interferences.**

\*\*\*\*\*

(g) Notwithstanding the above, for reexamination proceedings filed on or after January 1, 1996, § 1.977 is controlling.

21. Section 1.197 is proposed to be amended by adding a paragraph (d) to read as follows:

**§ 1.197 Action following decision.**

\*\*\*\*\*

(d) Notwithstanding the above, for reexamination proceedings filed on or after January 1, 1996, § 1.979 is controlling.

22. Section 1.198 is proposed to be revised to read as follows:

**§ 1.198 Reopening after decision.**

Cases which have been decided by the Board of Patent Appeals and Interferences will not be reopened or reconsidered by the primary examiner except under the provisions of § 1.196 without the written authority of the Commissioner, and then only for the consideration of matters not already adjudicated, sufficient cause being shown. Notwithstanding the above, for reexamination proceedings filed on or after January 1, 1996, § 1.981 is controlling.

23. Section 1.301 is proposed to be revised to read as follows:

**§ 1.301 Appeal to U.S. Court of Appeals for the Federal Circuit.**

Any applicant or any owner of a patent involved in a reexamination proceeding (filed before January 1, 1996) dissatisfied with the decision of the Board of Patent Appeals and Interferences, and any party to an interference dissatisfied with the decision of the Board of Patent Appeals and Interferences, may appeal to the U.S. Court of Appeals for the Federal Circuit. The appellant must take the following steps in such an appeal: In the Patent and Trademark Office file a written notice of appeal directed to the Commissioner (see §§ 1.302 and 1.304); and in the Court, file a copy of the notice of appeal and pay the fee for appeal as provided by the rules of the Court. Notwithstanding the above, for reexamination proceedings filed on or after January 1, 1996, § 1.983 is controlling.

24. Section 1.303 is proposed to be amended by revising paragraphs (a) and (b) and adding a new paragraph (d) to read as follows:

**§ 1.303 Civil action under 35 U.S.C. 145, 146, 306.**

(a) Any applicant or any owner of a patent involved in a reexamination proceeding (filed before January 1, 1996) dissatisfied with the decision of the Board of Patent Appeals and Interferences, and any party dissatisfied with the decision of the Board of Patent Appeals and Interferences may, instead of appealing to the U.S. Court of Appeals for the Federal Circuit (§ 1.301), have remedy by civil action under 35 U.S.C. 145 or 146, as appropriate. Such civil action must be commenced within the time specified in § 1.304.

(b) If an applicant in an ex parte case or an owner of a patent involved in a reexamination proceeding (filed before January 1, 1996) has taken an appeal to the U.S. Court of Appeals for the Federal Circuit, he or she thereby waives his or her right to proceed under 35 U.S.C. 145.

\*\*\*\*\*

(d) For reexamination proceedings filed on or after January 1, 1996, no remedy by civil action under 35 U.S.C. 145 is available.

25. Section 1.304(a)(2) is proposed to be revised to read as follows:

**§ 1.304 Time for appeal or civil action.**

(a) \*\*\*

(2) The time periods set forth in this section are not subject to the provisions of §§ 1.136, 1.550(c), 1.957 or 1.645 (a) or (b).

\*\*\*\*\*

26. The heading for Subpart D is proposed to be revised to read as follows:

**Subpart D — Reexamination of Patents for Proceedings Filed Before January 1, 1996**

(For Proceedings beginning on or after January 1, 1996, see Subpart H)

27. Subpart H is proposed to be added to read as follows:

**Subpart H — Reexamination of Patents for Proceedings Filed On or After January 1, 1996**

(For Proceedings beginning Before January 1, 1996, see Subpart D)

**§ 1.901 Citation of prior art in patent files.**

**§ 1.902 Processing of prior art citations in patent files during a reexamination proceeding.**

**§ 1.903 Service of papers on parties.**

**§ 1.904 Notice of reexamination in Official Gazette.**

**§ 1.905 Submission of papers by public.**

**§ 1.906 Scope of reexamination in reexamination proceeding.**

**§ 1.907 Reexamination prohibited.**

**§ 1.909 Estoppel of third party requester from previous reexamination proceedings.**

**§ 1.911 Privies and persons bound.**

**§ 1.913 Persons eligible.**

**§ 1.915 Content of request.**

**§ 1.917 Omission of a requirement in the request for reexamination.**

**§ 1.919 Filing date for request for reexamination.**

**§ 1.921 Submission of prior art by third party following the order for reexamination.**

**§ 1.923 Examiner's consideration of the request for reexamination.**

**§ 1.925 Partial refund if request is denied.**

**§ 1.927 Petition to review denial of the request for reexamination.**

**§ 1.929 Reexamination at the initiative of the Commissioner.**

**§ 1.931 Order to reexamine.**

**§ 1.933 Information material to patentability in reexamination proceedings.**

**§ 1.935 Initial Office action normally accompanies order to reexamine.**

**§ 1.937 Conduct of Reexamination.**

**§ 1.939 Unauthorized papers.**

**§ 1.941 Amendments by patent owner and their effective date.**

**§ 1.943 Length of responses and briefs.**

**§ 1.945 Response by patent owner.**

**§ 1.947 Response by third party requester to patent owner's response.**

**§ 1.949 Examiner's Office action closing prosecution.**

**§ 1.951 Responses after Office action closing prosecution.**

**§ 1.953 Examiner's Right of Appeal Notice.**

**§ 1.955 Interviews in reexamination proceedings.**

**§ 1.957 Extensions of time and cause for termination in reexamination proceedings.**

**§ 1.958 Revival of terminated proceedings.**

**§ 1.959 Notice of appeal and cross appeal to Board of Patent Appeals and Interferences.**

**§ 1.961 Jurisdiction over appeal.**

**§ 1.962 Appellant and respondent defined.**

**§ 1.963 Time for filing briefs.**

**§ 1.965 Appellant brief.**

**§ 1.967 Respondent brief.**

**§ 1.969 Examiner's answer.**

**§ 1.971 Reply brief.**

**§ 1.973 Oral hearing.**

**§ 1.975 Affidavits or declarations after appeal.**

**§ 1.977 Decision by the Board of Patent Appeals and Interferences.**

**§ 1.979 Action following decision.**

**§ 1.981 Reopening after decision.**

**§ 1.983 Appeal to the United States Court of Appeals for the Federal Circuit.**

**§ 1.985 Notification of prior or concurrent proceedings.**

**§ 1.987 Stay of concurrent proceeding.**

**§ 1.989 Merger of concurrent reexamination proceedings.**

**§ 1.991 Merger of concurrent reissue application and reexamination proceeding.**

**§ 1.993 Stay of concurrent interference and reexamination proceeding.**

**§ 1.995 Third party requester's participation rights preserved in merged proceeding.**

**§ 1.997 Issuance of reexamination certificate after reexamination proceedings.**

**§ 1.901 Citation of prior art in patent files.**

(a) At any time during the period of enforceability of a patent, any person may cite to the Patent and Trademark Office in writing prior art consisting of patents or printed publications which that person states to be pertinent and applicable to the patent and believes to have a bearing on the patentability of any claim of a particular patent. If the citation is made by the patent owner, the explanation of pertinency and applicability may include an explanation of how the claims differ from the prior art.

(b) If the person making the citation wishes his or her identity to be excluded from the patent file and kept confidential, the citation papers must be submitted without any identification of the person making the submission.

(c) Citations of patent or printed publications by the public in patent files should either:

(1) reflect that a copy of the same has been mailed to the patent owner at the address as provided for in § 1.33(c); or in the event service is not possible,

(2) be filed with the Office in duplicate.

(d) Except as provided in § 1.902, citations submitted in accordance with this section will be placed and made of record in the patent file.

**§ 1.902 Processing of prior art citations in patent files during a reexamination proceeding.**

Citations by the patent owner in accordance with § 1.933 and by a reexamination third party requester under § 1.915 will be entered in the patent file. The entry in the patent file of other citations submitted after the date of an order to reexamine pursuant to § 1.931 will be delayed until the reexamination proceeding has been terminated.

**REEXAMINATION PROCEEDINGS**

**§ 1.903 Service of papers on parties.**

The patent owner and any third party requester will be sent copies of Office actions issued during the reexamination proceeding. After filing of a request for reexamination by a third party requester, any document filed by either the patent owner or the third party requester must be served on every other party in the reexamination proceeding in the manner provided in § 1.248. Any document must reflect service or the document may be refused consideration by the Office. The failure of the third party requester, if any, to timely file or serve documents may result in their being refused consideration.

**§ 1.904 Notice of reexamination in Official Gazette.**

A notice of the filing of a reexamination request or initiation of a Commissioner-ordered reexamination will be published in the Official Gazette. The notice published in the Official Gazette under § 1.11(c) will be considered to be constructive notice of the reexamination proceeding and reexamination will proceed.

**§ 1.905 Submission of papers by public.**

Unless specifically provided for, no submissions on behalf of any third parties other than third party requesters as defined in 35 U.S.C. 100(e) will be considered unless such submissions are (1) in accordance with § 1.915 or (2) entered in the patent file prior to the date of the order to reexamine pursuant to § 1.931. Submissions by third parties, other than third party requesters, filed after the date of the order to reexamine pursuant to § 1.931, must meet the requirements of § 1.901(a-c) and will be treated in accordance with § 1.902.

**§ 1.906 Scope of reexamination in reexamination proceeding.**

(a) Claims in a reexamination proceeding will be examined on the basis of patents or printed publications and on the basis



of the requirements of 35 U.S.C. 112 except for the best mode requirement.

(b) Claims in a reexamination proceeding must not enlarge the scope of the claims of the patent.

(c) Questions other than those indicated in paragraphs (a) and (b) of this section will not be resolved in a reexamination proceeding. If such questions are raised by the patent owner or third party requester during a reexamination proceeding, the existence of such questions will be noted by the examiner in the next Office action, in which case the patent owner may desire to consider the advisability of filing a reissue application to have such questions considered and resolved.

#### § 1.907 Reexamination prohibited.

(a) Once an order to reexamine has been issued under § 1.931, neither the patent owner nor the third party requester, if any, nor privies of either, may file a subsequent request for reexamination of the patent until a reexamination certificate is issued under § 1.997, unless authorized by the Commissioner.

(b) Once a final decision has been entered against a party in a civil action arising in whole or in part under 28 U.S.C. 1338 that the party has not sustained its burden of proving invalidity of any patent claim in suit, then neither that party nor its privies may thereafter request reexamination of any such patent claim on the basis of issues which that party or its privies raised or could have raised in such civil action, and a reexamination requested by that party, or its privies, on the basis of such issues may not thereafter be maintained by the Office.

#### § 1.909 Estoppel of third party requester from previous reexamination proceedings.

A third party requester, or its privy, who, during a reexamination proceeding, has filed a notice of appeal to the Court of Appeals for the Federal Circuit, or who has participated as a party to an appeal by the patent owner, under the provisions of 35 U.S.C. 141 to 144, is estopped from later asserting, in a subsequent reexamination proceeding, the invalidity of any claim determined to be patentable on appeal on any ground which the third party requester, or its privy, raised or could have raised during the prior reexamination proceeding. A third party requester, or its privy, is deemed not to have participated as a party to an appeal by the patent owner unless, within twenty days after the patent owner has filed notice of appeal, the third party, or its privy, files notice with the Commissioner electing to participate.

#### § 1.911 Privies and persons bound.

(a) For the purposes of § 1.907, a determination of whether a person is a privy with respect to the patent owner shall include consideration of whether there is:

- (1) a mutual, concurrent or successive relationship to the same property rights in the patent involved in the reexamination proceeding; or
- (2) representation of the interests of the patent owner concerning the patent.

(b) For the purposes of §§ 1.907 and 1.909, a determination of whether a person is a privy with respect to a third party requester shall include consideration of whether there is:

- (1) a mutual, concurrent or successive relationship to the same property rights which are or may be affected by and/or infringe the patent involved in the reexamination proceeding; or

- (2) representation of the interests of the other party which are or may be affected by and/or potentially infringe the patent.

(c) For the purposes of §§ 1.907 and 1.909, a person who is not a party to the reexamination proceeding but who controls or substantially participates in the control of the presentation of the reexamination proceeding on behalf of a party is bound by the determination of issues decided as though he or she were a named party. To have control of the presentation requires that person to have effective choice as to the legal theories and/or grounds of rejection or defenses to be advanced on behalf of the party to the reexamination proceeding.

DETERMINING IF REEXAMINATION WILL BE

#### ORDERED

#### § 1.913 Persons eligible.

Except as otherwise provided, any person may, at any time during the period of enforceability of a patent, file a request for reexamination by the Patent and Trademark Office of any claim of the patent on the basis of prior art patents or printed publications cited under § 1.901 or on the basis of the requirements of 35 U.S.C. 112 except for the best mode requirement.

#### § 1.915 Content of request.

(a) The request must be accompanied by the fee for requesting reexamination set in § 1.20(c).

(b) Any request for reexamination must include the following parts:

(1) A statement pointing out each substantial new question of patentability based on prior patents and printed publications or based on the manner in which the patent specification or claims fail to comply with the requirements of 35 U.S.C. 112 except for the best mode requirement.

(2) An identification of every claim for which reexamination is requested.

(3) A detailed explanation of the pertinency and manner of applying the cited prior art to every claim for which reexamination is requested or a detailed explanation of the manner in which the specification or claim(s) fail to comply with 35 U.S.C. 112 except for the best mode requirement. If appropriate, the party requesting reexamination may also point out how claims distinguish over cited prior art or how 35 U.S.C. 112 requirements are complied with except for the best mode requirement.

(4) A copy of every patent or printed publication relied upon or referred to in paragraphs (b)(1) and (3) of this section accompanied by an English language translation of all the necessary and pertinent parts of any non-English language document.

(5) The entire patent for which reexamination is requested must be furnished in the form of cut-up copies of the original patent with only a single column of the printed patent securely mounted or reproduced in permanent form on one side of a separate paper. A copy of any disclaimer, certificate of correction, or reexamination certificate issued in the patent must also be included.

(6) A certification that a copy of the request filed by a person other than the patent owner has been served in its entirety on the patent owner at the address as provided for in § 1.33(c). The name and address of the party served must be indicated. If service was not possible, a duplicate copy must be supplied to the Office.

(7) If the patent is currently involved in a reexamination proceeding for which a reexamination certificate has not been issued, a certification that the person making the request is not a privy of the patent owner or third party requester, unless otherwise authorized by the Commissioner.

(8) In a request filed by a third party requester, a certification that (i) no final decision has been entered against that party or its privies in a civil action arising in whole or in part under 28 U.S.C. 1338 in which that party or its privies did not sustain its burden of proving the invalidity of any patent claim in suit and (ii) neither that party nor its privies are requesting reexamination of any such patent claim on the basis of issues which that party or its privies raised or could have raised in such civil action.

(9) In a request filed by a third party requester, a certification that the request does not assert the invalidity of any claim determined to be patentable on appeal on any ground which the third party requester or its privy raised or could have raised during a prior reexamination proceeding in which that party or its privies filed a notice of appeal to the Court of Appeals for the Federal Circuit and/or participated as a party to an appeal by the patent owner, under the provisions of 35 U.S.C. 141 to 144.

(10) A statement identifying the real party in interest to the extent necessary for a subsequent person filing a reexamination request to determine whether that person is a privy.

(c) A request filed by the patent owner may include a proposed amendment in accordance with § 1.121(f).

(d) If a request is filed by an attorney or agent identifying another party on whose behalf the request is being filed, the attorney or agent must have a power of attorney from that party or be acting in a representative capacity pursuant to § 1.34(a).

#### § 1.917 Omission of a requirement in the request for reexamination.

If the request is not accompanied by the fee for requesting reexamination or all of the other parts required by § 1.915, the person identified as requesting reexamination will be so notified and given an opportunity to complete the request within a specified time. If the fee for requesting reexamination has been paid but the defect in the request is not corrected within the specified time, the determination whether or not to institute reexamination will be made on the request as it then exists. If the fee for requesting reexamination has not been paid, no determination will be made and the request will be placed in the patent file as a citation if it complies with the requirements of § 1.901 and/or § 1.902.

#### § 1.919 Filing date for request for reexamination.

The filing date of the request is the date on which the request including the entire fee for requesting reexamination is received; or, if the request is not initially accompanied by the entire fee, the date on which the last portion of the fee is received in the Patent and Trademark Office.

#### § 1.921 Submission of prior art by third party following the order for reexamination.

Prior art submissions by the third party requester filed after the reexamination order shall be limited solely to prior art which is used to rebut a finding of fact by the examiner or a response of the patent owner.

#### § 1.923 Examiner's consideration of the request for reexamination.

Within three months following the filing date of a request for reexamination, an examiner will consider the request and determine whether or not a substantial new question of patentability affecting any claim of the patent is raised by the request and the prior art cited therein, with or without consideration of other patents or printed publications, or by the failure of the patent specification or claim(s) to comply with the requirements of 35 U.S.C. 112 except for the best mode requirement. The examiner's determination will be based on the claims in effect at the time of the determination and will become a part of the official file of the patent and will be mailed to the patent owner at the address as provided for in § 1.33(c) and to the person requesting reexamination.

#### § 1.925 Partial refund if request is denied.

Where no substantial new question of patentability has been found, a refund of a portion of the fee for requesting reexamination will be made to the requester in accordance with § 1.26(c).

#### § 1.927 Petition to review denial of the request for reexamination.

The requester may seek review by a petition to the Commissioner under § 1.181 within one month of the mailing date of the examiner's determination refusing reexamination. Any such petition must comply with § 1.181(b). If no petition is timely filed or if the decision on petition affirms that no substantial new question of patentability has been raised, the determination shall be final and nonappealable.

#### REEXAMINATION OF PATENTS

#### § 1.929 Reexamination at the initiative of the Commissioner.

The Commissioner, at any time during the period of enforceability of a patent, may determine whether or not a substantial new question of patentability is raised by patents or printed

publications which have been discovered by the Commissioner or which have been brought to the Commissioner's attention or by the failure of the patent specification or claim(s) to comply with the requirements of 35 U.S.C. 112 except for the best mode requirement. The Commissioner may order reexamination even though no request for reexamination has been filed in accordance with § 1.915. Normally requests from outside the Patent and Trademark Office that the Commissioner undertake reexamination on his or her own initiative will not be considered. Any determination to initiate reexamination under this section will become a part of the official file of the patent and will be given or mailed to the patent owner at the address as provided for in § 1.33(c).

#### § 1.931 Order to reexamine.

(a) If a substantial new question of patentability is found, the determination will include an order for reexamination of the patent for resolution of the question.

(b) If the order for reexamination resulted from a petition pursuant to § 1.927, the reexamination will ordinarily be conducted by an examiner other than the examiner responsible for the initial determination under § 1.923.

#### INFORMATION DISCLOSURE

#### § 1.933 Information material to patentability in reexamination proceedings.

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective reexamination occurs when, at the time a reexamination proceeding is being conducted, the Office is aware of and evaluates the teachings of all information material to patentability in a reexamination proceeding. Each individual associated with the patent owner in a reexamination proceeding has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability in a reexamination proceeding. The individuals who have a duty to disclose to the Office all information known to them to be material to patentability in a reexamination proceeding are the patent owner, each attorney or agent who represents the patent owner, and every other individual who is substantively involved on behalf of the patent owner in a reexamination proceeding. The duty to disclose the information exists with respect to each claim pending in the reexamination proceeding until the claim is cancelled. Information material to the patentability of a cancelled claim need not be submitted if the information is not material to patentability of any claim remaining under consideration in the reexamination proceeding. The duty to disclose all information known to be material to patentability in a reexamination proceeding is deemed to be satisfied if all information known to be material to patentability of any claim in the patent after issuance of the reexamination certificate was cited by the Office or submitted to the Office in an information disclosure statement. However, the duties of candor, good faith, and disclosure have not been complied with if any fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct by, or on behalf of, the patent owner in the reexamination proceeding. Any information disclosure statement must be filed with the items listed in § 1.98(a) as applied to individuals associated with the patent owner in a reexamination proceeding, and should be filed within two months of the date of the order for reexamination, or as soon thereafter as possible.

(b) Under this section, information is material to patentability in a reexamination proceeding when it is not cumulative to information of record or being made of record in the reexamination proceeding, and

- (1) It is a patent or printed publication that establishes, by itself or in combination with other patents or printed publications, a *prima facie* case of unpatentability of a claim; or
- (2) It refutes, or is inconsistent with, a position the patent owner takes in:

- (i) Opposing an argument of unpatentability relied on by the Office, or
- (ii) Asserting an argument of patentability.



A prima facie case of unpatentability of a claim pending in a reexamination proceeding is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

(c) The responsibility for compliance with this section rests upon the individuals designated in paragraph (a) of this section, and no evaluation will be made by the Office in the reexamination proceeding as to compliance with this section. If questions of compliance with this section are discovered during a reexamination proceeding, they will be noted as unresolved questions in accordance with § 1.906(c).

#### OFFICE ACTIONS AND RESPONSES (BEFORE THE EXAMINER)

##### § 1.935 Initial Office action normally accompanies order to reexamine.

The order for reexamination will normally be accompanied by the initial Office action on the merits of the reexamination.

##### § 1.937 Conduct of Reexamination.

(a) All reexamination proceedings, including any appeals to the Board of Patent Appeals and Interferences, will be conducted with special dispatch within the Office, unless the Commissioner makes a determination that there is good cause for suspending the reexamination proceeding. A final determination that good cause exists shall not be made until the patent owner and third party requesters (if any) have had a reasonable opportunity to comment on or oppose any suspension.

(b) Except as otherwise provided, the reexamination proceeding will be conducted in accordance with the sections governing the application examination process; §§ 1.104 through 1.119, and will result in the issuance of a reexamination certificate under § 1.997.

##### § 1.939 Unauthorized papers.

Unless authorized by the reexamination regulations (§§ 1.901-1.997), no paper shall be filed prior to the first Office action. If an unauthorized paper is filed by the patent owner or third party requester, it will not be considered in making the determination under § 1.923 and will be returned.

##### § 1.941 Amendments by patent owner and their effective date.

(a) Any proposed amendment to the description and claims must be made in accordance with § 1.121(f) and be accompanied by an explanation of the support for the proposed amendment in the disclosure of the patent. No amendment may enlarge the scope of the claims of the patent or introduce new matter. No amendment may be proposed for entry in an expired patent. Moreover, no amendment will be incorporated into the patent by certificate issued after the expiration of the patent.

(b) Amendments made to a patent during a reexamination proceeding will not be effective until a reexamination certificate is issued.

##### § 1.943 Length of responses and briefs.

Responses and appellant briefs by the patent owner (including amendments) and third party requester, if any, shall not exceed 50 pages in length, excluding Appendix of claims and reference materials such as prior art references. All further briefs by any party shall not exceed 35 pages in length.

##### § 1.945 Response by patent owner.

The patent owner will be given at least thirty (30) days to respond to any Office action. Such response may include arguments in response to any rejections and/or proposed amendments or new claims to place the patent in condition where all claims, if amended as proposed, would be patentable.

##### § 1.947 Response by third party requester to patent owner's response.

If the patent owner files a response to an Office action, any third party requester may once file written comments within a period of one month from the date of service of the patent owner's response. These comments shall be limited to issues covered by the action or the patent owner's response.

##### § 1.949 Examiner's Office action closing prosecution.

Upon consideration of the issues and/or grounds of rejection a second or subsequent time, or upon allowance of all claims, the examiner shall issue an Office action treating all claims present in the reexamination proceeding, which may be an action closing prosecution. An action will not normally close prosecution if it includes a new ground of rejection which was not previously addressed by the patent owner, unless the new ground was necessitated by an amendment.

##### § 1.951 Responses after Office action closing prosecution.

(a) After any action closing prosecution issued by the examiner, the third party requester may once file written comments limited to the issues raised in the Office action closing prosecution. Such comments must be filed within the time set for response in the action closing prosecution. When the third party requester does file such comments, the patent owner may file comments responding to the third party requester's comments within one month from the date of service of the third party requester's comments on the patent owner.

(b) After any action closing prosecution issued by the examiner, the patent owner may once file written comments limited to the issues raised in the reexamination proceeding and/or present a proposed amendment to the claims which amendment will be subject to the criteria of § 1.116 as to whether it shall be entered and/or considered. Such comments and/or proposed amendments must be filed within the time set for response in the action closing prosecution. Where the patent owner does file such comments and/or proposed amendment, the third party requester may file comments responding to such comments and/or proposed amendments by the patent owner within one month from the date of service of patent owner's comments and/or proposed amendment on the third party requester.

##### § 1.953 Examiner's Right of Appeal Notice.

Upon considering the responses of the patent owner and any third party requester subsequent to the Office action closing prosecution, or upon expiration of the time for submitting such responses, the examiner shall issue a "Right of Appeal Notice," unless the examiner reopens prosecution. The "Right of Appeal Notice" shall include a final rejection and/or final decision favorable to patentability which shall identify the status of each claim and reasons for patentability or grounds of rejection for each claim. It shall set a 30-day or one month time period, whichever is longer, for either party to appeal. If no appeal follows, the reexamination proceeding will be terminated and the Commissioner will proceed to issue a certificate under § 1.997 in accordance with the last action of the Office.

#### INTERVIEWS

##### § 1.955 Interviews in reexamination proceedings.

(a) Interviews in reexamination proceedings pending before the Office between examiners and the owners of such patents or their attorneys or agents of record must be had in the Office at such times, within Office hours, as the respective examiners may designate. Interviews will not be permitted at any other time or place without the authority of the Commissioner. Interviews should be arranged for in advance. A third party requester may not initiate an interview. A third party requester has a right to participate in an interview initiated by the patent owner or the examiner and must be given adequate notice and opportunity to participate. A senior level Office official will be present when the interview is attended by a third party requester.

(b) Interviews for the discussion of the patentability of claims in patents involved in reexamination proceedings will not be initiated by the patent owner prior to the first office action thereon.

(c) In every instance of an interview with an examiner, each party must present a statement of the issues which were discussed. An interview does not remove the necessity for response to Office actions as specified in § 1.111.

#### EXTENSIONS OF TIME AND REVIVAL OF PROCEEDINGS

##### § 1.957 Extensions of time and cause for termination in reexamination proceedings.

(a) The time for taking any action by a patent owner or third party requester in a reexamination proceeding will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the patent owner or third party requester is due, but in no case will the mere filing of a request effect any extension. See § 1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit.

(b) If the patent owner fails to file a timely and appropriate response to any Office action in a reexamination proceeding, the reexamination proceeding will be terminated and the Commissioner will proceed to issue a certificate under § 1.997 in accordance with the last action of the Office, unless there is a third party requester and claims are found patentable.

(c) If there is a third party requester and claims are found patentable, and the patent owner fails to file a timely and appropriate response to any action in a reexamination proceeding, prosecution will be limited to claims found patentable at the time of the failure to respond and to claims which do not enlarge the scope of the claims found patentable at that time.

##### § 1.958 Revival of terminated proceedings.

(a) A reexamination proceeding terminated for failure to prosecute may be revived as a pending proceeding if it is shown to the satisfaction of the Commissioner that the delay was unavoidable. A petition to revive an unavoidably terminated reexamination proceeding must be promptly filed after the patent owner is notified of, or otherwise becomes aware of, the termination of the proceeding, and must be accompanied by:

- (1) a proposed response to continue prosecution of that proceeding unless it has been previously filed;
- (2) the petition fee as set forth in § 1.17(l); and
- (3) a showing that the delay was unavoidable. The showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office.

(b) A reexamination proceeding terminated for failure of the patent owner to prosecute may be revived as a pending proceeding if the delay in prosecution was unintentional. A petition to revive an unintentionally terminated reexamination proceeding must be:

- (1) accompanied by a proposed response to continue prosecution of that proceeding unless it has been previously filed;
- (2) accompanied by the petition fee as set forth in § 1.17(m);
- (3) accompanied by a statement that the delay was unintentional. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional information where there is a question whether the delay was unintentional; and
- (4) filed either:

- (i) within two months of the date of the first Office notification that the proceeding has been terminated; or
- (ii) within two months of the date of the first decision on a petition to revive under paragraph (a) of this section which was timely filed within the time period set forth in paragraph (b)(4)(i) of this section.

(c) Any request for reconsideration or review of a decision refusing to revive a proceeding upon petition filed pursuant to paragraphs (a) or (b) of this section, to be considered timely,

must be filed within two months of the decision refusing to revive or within such time as set in the decision.

(d) The time periods set forth in this section cannot be extended, except that the time period set forth in paragraph (c) of this section may be extended under the provisions of § 1.957(a).

#### APPEAL TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

##### § 1.959 Notice of appeal and cross appeal to Board of Patent Appeals and Interferences.

(a)(1) Once a "Right of Appeal Notice" has been issued, by filing a notice of appeal within the time provided in § 1.953 and paying the fee set forth in § 1.17(e), the patent owner may appeal to the Board of Patent Appeals and Interferences with respect to any decision adverse to the patentability of any original or proposed amended or new claim of the patent.

(2) Once a "Right of Appeal Notice" has been issued, by filing a notice of appeal within the time provided in § 1.953 and paying the fee set forth in § 1.17(e), a third party requester involved in a reexamination proceeding may appeal to the Board of Patent Appeals and Interferences with respect to any final decision favorable to the patentability of any original or proposed amended or new claim of the patent.

(b)(1) Within fourteen days of service of a third party requester's notice of appeal, and upon payment of the fee set forth in § 1.17(e), a patent owner who has not filed a notice of appeal may file a notice of cross appeal with respect to any decision adverse to the patentability of any original or proposed amended or new claim of the patent.

(2) Within fourteen days of service of a patent owner's notice of appeal, and upon payment of the fee set forth in § 1.17(e), a third party requester who has not filed a notice of appeal may file a notice of cross appeal with respect to any final decision favorable to the patentability of any original or proposed amended or new claim of the patent.

(c) The appeal in a reexamination proceeding must identify the claim(s) appealed, and must be signed by the patent owner or third party requester, or their duly authorized attorney or agent.

(d) An appeal when taken must be taken from the rejection of all claims under rejection in a Right of Appeal Notice which the patent owner proposes to contest, or from the determination of patentability of all claims indicated as patentable in a Right of Appeal Notice which the third party requester proposes to contest. Questions relating to matters not affecting the merits of the invention may be required to be settled before an appeal can be considered.

(e) The time periods set forth in §§ 1.959 through 1.969 are subject to the provisions of § 1.957(a) for reexamination proceedings. See § 1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit.

##### § 1.961 Jurisdiction over appeal.

Jurisdiction over the patent under reexamination passes to the Board of Patent Appeals and Interferences upon transmittal of the file, including all briefs and examiner's answers, to the Board. Prior to the entry of a decision on the appeal, the Commissioner may sua sponte order the patent remanded to the examiner, for action consistent with the Commissioner's order.

##### § 1.962 Appellant and respondent defined.

For the purposes of reexamination, appellant is any party filing a notice of appeal. A respondent is any opposing party responding to the appeal of the appellant. If more than one party appeals, each is an appellant with respect to the claims to which his or her appeal is directed and, to the extent each responds, each is a respondent with respect to the claims to which his or her opponent's appeal is directed.

##### § 1.963 Time for filing briefs.



(a) If a party files a notice of appeal or cross appeal, the party must file an appellant brief within two months of the date of filing of their notice of appeal or cross appeal. However, if another party files a notice of appeal or cross appeal subsequent to that of the party, then the party must file an appeal brief within two months of the date of filing of the subsequent notice of appeal or cross appeal, so that the appellant briefs of all parties filing a notice of appeal or cross appeal will be due no later than two months after the last-filed notice.

(b) Once an appellant brief has been properly filed, an opposing party may file a respondent brief within one month from the date of service of the appellant brief. The examiner will consider both the appellant and respondent briefs and prepare an examiner's answer.

(c) The third party requester and the patent owner may each file a reply brief within one month of the date of the examiner's answer. No further brief will be acknowledged or considered.

#### § 1.965 Appellant brief.

(a) Appellant(s) shall, within time limits for filing set forth in § 1.963, file a brief in triplicate and serve the brief on all parties in accordance with § 1.903. The brief must be accompanied by the requisite fee set forth in § 1.17(f) and must set forth the authorities and arguments on which appellant will rely to maintain the appeal. Any arguments or authorities not included in the brief will be refused consideration by the Board of Patent Appeals and Interferences, unless good cause is shown.

(b) On failure of a party to file the brief, accompanied by the requisite fee, within the time allowed, the appeal shall stand dismissed with respect to the claims appealed by that party.

(c) The brief shall contain the following items under appropriate headings and in the order indicated below unless the brief is filed by a party who is not represented by a registered practitioner:

(1) *Real Party in Interest.* A statement identifying the real party in interest, if the party named in the caption of the brief is not the real party in interest.

(2) *Related Appeals and Interferences.* A statement identifying by number and filing date all other appeals or interferences known to the appellant, the appellant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) *Status of Claims.* A statement of the status of all the claims, pending or cancelled, and identifying the claims appealed.

(4) *Status of Amendments.* A statement of the status of any amendment filed subsequent to final rejection.

(5) *Summary of Invention.* A concise explanation of the invention or subject matter defined in the claims involved in the appeal, which shall refer to the specification by column and line number, and to the drawing(s), if any, by reference characters.

(6) *Issues.* A concise statement of the issues presented for review.

(7) *Grouping of Claims.* For each ground of rejection, or, in the case where the appeal is by a third party requester, each determination of patentability or determination of inapplicability of a proposed rejection, which appellant contests and which applies to a group of two or more claims, the Board shall select a single claim from the group and shall decide the appeal as to the ground of rejection on the basis of that claim alone unless a statement is included that the claims of the group do not stand or fall together and, in the argument under paragraph (c)(8) of this section, appellant explains why the claims of this group are believed to be separately patentable or unpatentable. Merely pointing out differences in what the claims cover is not an argument as to why the claims are separately patentable.

(8) *Argument.* The contentions of appellant with respect to each of the issues presented for review in paragraph (c)(6) of this section, and the basis therefor, with citations of the authorities, statutes, and parts of the record relied on. Each issue should be treated under a separate heading.

(i) For each rejection or, in the case where the appeal is by a third party requester, any other determination under 35 U.S.C. 112, first paragraph, the argument shall specify the errors in the rejection or other determination and how the first

paragraph of 35 U.S.C. 112 is or is not complied with, including, as appropriate, how the specification and drawings, if any,

(A) describe or fail to describe the subject matter defined by each of the appealed claims, and

(B) enable or fail to enable any person skilled in the art to make and use the subject matter defined by each of the appealed claims, and

(ii) For each rejection, or in the case where the appeal is filed by a third party requester, any determination, under 35 U.S.C. 112, second paragraph, the argument shall specify the errors in the rejection or other determination and how the claims do or do not particularly point out and distinctly claim the subject matter which appellant regards as the invention.

(iii) For each rejection or, in the case where the appeal is by a third party requester, each determination of patentability, under 35 U.S.C. 102, the argument shall specify the errors in the rejection or determination and why the appealed claims are or are not patentable under 35 U.S.C. 102, including any specific limitations in the appealed claims which are not described in the prior art.

(iv) For each rejection or, in the case where the appeal is by a third party requester, each determination of patentability under 35 U.S.C. 103, the argument shall specify the errors in the rejection or determination and, if appropriate, the specific limitations in the appealed claims which are or are not described in the prior art, and shall explain how such limitations render the claimed subject matter obvious or unobvious over the prior art. If the rejection or determination is based upon a combination of references, the argument shall explain why the references, taken as a whole, do or do not suggest the claimed subject matter, and shall include, as may be appropriate, an explanation of why features disclosed in one reference may or may not properly be combined with features disclosed in another reference. A general argument that all the limitations are or are not described in a single reference does not satisfy the requirements of this paragraph.

(v) For any rejection or, in the case where the appeal is by a third party requester, any determination of patentability, other than those referred to in paragraphs (c)(8)(i) to (iv) of this section, the argument shall specify the errors in the rejection or other determination and the specific limitations in the appealed claims, if appropriate, or other reasons, which cause the rejection or other determination to be in error.

(9) *Appendix.* An appendix containing a copy of the claims involved in the appeal.

(d) If a brief is filed which does not comply with all the requirements of paragraph (c) of this section, appellant will be notified of the reasons for non-compliance and provided with a period of one month within which to file an amended brief. If the appellant does not file an amended brief during the one-month period, or files an amended brief which does not overcome all the reasons for non-compliance stated in the notification, the appeal will stand dismissed as to that party.

#### § 1.967 Respondent brief.

(a) The brief(s) of the respondent(s) specified in § 1.963 must be filed in triplicate, served on all other parties in accordance with § 1.903 and be accompanied by the requisite fee set forth in § 1.17(f). Any arguments or authorities not included in the brief will be refused consideration by the Board of Patent Appeals and Interferences, unless good cause is shown. The respondent brief shall be limited to issues raised in the appellant brief to which the respondent brief is directed.

(b) The respondent brief shall contain the following items under appropriate headings and in the order here indicated, and may include an appendix containing portions of the record on which reliance is made:

(1) *Real Party in Interest.* A statement identifying the real party in interest, if the party named as the respondent in the brief is not the real party in interest.

(2) *Related Appeals and Interferences.* A statement identifying by number and filing date all other appeals or interferences known to the respondent, the respondent's legal representative, or assignee (if any) which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) *Status of claims.* A statement accepting or disputing appellant's statement of the status of claims. If appellant's

statement of the status of claims is disputed, the errors in appellant's statement must be specified with particularity.

(4) *Status of amendments.* A statement accepting or disputing appellant's statement of the status of amendments. If appellant's statement of the status of amendments is disputed, the errors in appellant's statement must be specified with particularity.

(5) *Summary of invention.* A statement accepting or disputing appellant's summary of the invention or subject matter defined in the claims involved in the appeal. If appellant's summary of the invention or subject matter defined in the claims involved in the appeal is disputed, the errors in appellant's summary must be specified with particularity. A counter explanation of the invention may be made.

(6) *Issues.* A statement accepting or disputing appellant's statement of the issues presented for review and identifying any examiner's determination not to make a rejection proposed by the third party requester. If appellant's statement of the issues presented for review is disputed, the errors in appellant's statement must be specified with particularity. A counter statement of the issues for review may be made.

(7) *Grouping of claims.* A statement accepting or disputing any statement by appellant that allowed or rejected claims stand or fall together. If appellant's statement is disputed, the errors in appellant's statement must be specified with particularity. A counter statement may be made.

(8) *Argument.* A statement accepting or disputing the contentions of the appellant with respect to each of the issues. If a contention of the appellant or a determination of the examiner not to make a rejection proposed by the requester is disputed, the errors in appellant's argument or examiner's determination must be specified with particularity, stating the basis therefor, with citations of the authorities, statutes and parts of the record relied on. Each issue should be treated under a separate heading. An argument may be made with respect to each of the issues stated in the counter statement of the issues, with each counter stated issue being treated under a separate heading. The provisions of §§ 1.965(c)(8)(iii) and (iv) of these regulations shall apply to any argument raised under 35 U.S.C. 102 or 103.

(c) If a respondent brief is filed which does not comply with all the requirements of paragraph (b) of this section, respondent will be notified of the reasons for non-compliance and provided with a period of one month within which to file an amended brief. If the respondent does not file an amended brief during the one-month period, or files an amended brief which does not overcome all the reasons for non-compliance stated in the notification, the respondent brief will not be received into the record and will not be considered.

#### § 1.969 Examiner's answer.

The primary examiner may, within such time as may be directed by the Commissioner, furnish a written statement in answer to the patent owner's and/or third party requester's appellant brief or respondent brief including such explanation of the invention claimed and of the references and grounds of rejection or reasons for patentability as may be necessary, supplying a copy to the patent owner and each third party requester, if any. If the primary examiner shall find that the appeal is not regular in form or does not relate to an appealable action, he or she shall so state and a petition from such decision may be taken to the Commissioner as provided in § 1.181.

#### § 1.971 Reply brief.

(a) The patent owner and any third party requester may each file a reply brief directed only to such new points of argument as may be raised in the examiner's answer, within one month from the date of such answer. The new points of argument shall be specifically identified in the reply brief. If the examiner determines that the reply brief is not directed only to new points of argument raised in the examiner's answer, the examiner may refuse entry of the reply brief and will so notify the appellant.

(b) If the examiner's answer expressly states that it includes a new ground of rejection or allowance of claims not previously allowed, the party adversely affected must file a reply thereto within one month from the date of such answer to avoid dismissal of the appeal as to the claims subject to the new ground of rejection or allowance; such reply may be accompanied by

any amendment (in the case of the patent owner) or material appropriate to the new ground. See § 1.957 for extensions of time for filing a reply brief.

#### § 1.973 Oral hearing.

(a) An oral hearing should be requested only in those circumstances in which the appellant, or a respondent who has filed a respondent brief under § 1.967, considers such a hearing necessary or desirable for a proper presentation of the appeal. An appeal decided without an oral hearing will receive the same consideration by the Board of Patent Appeals and Interferences as an appeal decided after oral hearing.

(b) If appellant, or a respondent who has filed a respondent brief under § 1.967, desires an oral hearing, he or she must file a written request for such hearing accompanied by the fee set forth in § 1.17(g) within one month after the date of the examiner's answer. If appellant, or a respondent who has filed a respondent brief under § 1.967, requests an oral hearing and submits therewith the fee set forth in § 1.17(g), an oral argument may be presented by, or on behalf of, the primary examiner if considered desirable by either the primary examiner or the Board. See § 1.957 for extensions of time in a reexamination proceeding.

(c) If no request and fee for oral hearing have been timely filed by an appellant or a respondent who has filed a respondent brief under § 1.967, the appeal will be assigned for consideration and decision. If an appellant or respondent who has filed a respondent brief under § 1.967 has requested an oral hearing and has submitted the fee set forth in § 1.17(g), a hearing date will be set, and notice thereof given to each appellant, to the primary examiner and to each respondent who has filed a respondent brief under § 1.967. The notice shall set a period within which all requests for oral hearing shall be submitted. Hearing will be held as stated in the notice, and oral argument will be limited to twenty minutes for each appellant and respondent, and fifteen minutes for the primary examiner unless otherwise ordered before the hearing begins.

#### § 1.975 Affidavits or declarations after appeal.

Affidavits, declarations, or exhibits submitted after the case has been appealed will not be admitted without a showing of good and sufficient reasons why they were not earlier presented.

#### § 1.977 Decision by the Board of Patent Appeals and Interferences.

(a) The Board of Patent Appeals and Interferences, in its decision, may affirm or reverse the decision of the examiner in whole or in part on the grounds and on the claims specified by the examiner, or on the grounds presented by a third party requester, or remand the reexamination proceeding to the examiner for further consideration. The affirmation of the rejection or allowance of a claim on any of the grounds specified constitutes a general affirmation of the decision of the examiner on that claim, except as to any ground specifically reversed or otherwise stated. A rejection of claims by the examiner may also be affirmed on the basis of the arguments presented by the third party requester.

(b) Should the Board of Patent Appeals and Interferences have knowledge of any grounds for rejecting any appealed claim not raised in the appeal, it may include in the decision a statement to that effect with its reasons for so holding, which statement shall constitute a new rejection of the claims. A new rejection shall not be considered final for purposes of judicial review. When the Board of Patent Appeals and Interferences makes a new rejection of an appealed claim, the patent owner may exercise one of the following two options with respect to the new ground:

(1) The patent owner may submit an appropriate amendment of the claims so rejected or a showing of facts, or both, and have the matter reconsidered by the examiner in which event the patent will be remanded to the examiner. The statement of the Board of Patent Appeals and Interferences shall be binding upon the examiner unless an amendment or showing of facts not previously of record be made which, in the opinion of the examiner, overcomes the new ground for rejection stated in the decision. Should the examiner again reject the claims,



the patent owner may again appeal to the Board of Patent Appeals and Interferences.

(2) The patent owner may have the case reconsidered under § 1.979(b) by the Board of Patent Appeals and Interferences upon the same record. The request for reconsideration shall address the new ground for rejection and state with particularity the points believed to have been misapprehended or overlooked in rendering the decision and also state all other grounds upon which reconsideration is sought. Where request for such reconsideration is made, the Board of Patent Appeals and Interferences shall reconsider the new ground for rejection and, if necessary, render a new decision which shall include all grounds upon which a patent is refused. The decision on reconsideration is deemed to incorporate the earlier decision, except for those portions specifically withdrawn on reconsideration, and is final for the purpose of judicial review.

(c) Should the decision of the Board of Patent Appeals and Interferences include an explicit statement that a claim may be allowed in amended form, patent owner shall have the right to amend in conformity with such statement which shall be binding on the examiner in the absence of new references or grounds of rejection.

(d) Although the Board of Patent Appeals and Interferences normally will confine its decision to a review of rejections and allowances made by the examiner and/or arguments of the third party requester, should it have knowledge of any grounds for rejecting any allowed claim not advanced by the examiner or third party requester, it may recommend a rejection of the claim in its decision and remand the case to the examiner. In such event, the Board shall set a period, not less than one month, within which the patent owner may submit to the examiner an appropriate amendment, a showing of facts or reasons, or both, in order to avoid any grounds for rejection set forth in the recommendation of the Board of Patent Appeals and Interferences. The examiner shall be bound by any such recommended rejection and shall enter and maintain the recommended rejection unless an amendment or showing of facts not previously of record is filed which, in the opinion of the examiner, overcomes the recommended rejection. Should the examiner make the recommended rejection final the patent owner may again appeal to the Board of Patent Appeals and Interferences.

(e) Whenever a decision of the Board of Patent Appeals and Interferences includes a remand, that decision shall not be considered a final decision. When appropriate, upon conclusion of proceedings on remand before the examiner, the Board of Patent Appeals and Interferences may enter an order otherwise making its decision final.

(f) See § 1.957(a) for extensions of time to take action under this section.

#### § 1.979 Action following decision.

(a) After decision by the Board of Patent Appeals and Interferences, the case shall be returned to the examiner, subject to a right of appeal or other review by the appellant or respondent, for such further action by the patent owner or by the examiner, as the condition of the case may require, to carry into effect the decision.

(b) Each party may file a single request for reconsideration or modification of the decision if filed within one month from the date of the original decision, unless that decision is so modified by the decision on reconsideration as to become, in effect, a new decision, and the Board of Patent Appeals and Interferences so states. The request for reconsideration shall state with particularity the points believed to have been misapprehended or overlooked in rendering the decision and also state all other grounds upon which reconsideration is sought. See § 1.957(a) for extensions of time for seeking reconsideration.

(c) The appeal proceedings are considered terminated by the dismissal of an appeal or the failure to timely file an appeal to the U.S. Court of Appeals for the Federal Circuit. The date of termination of proceedings is the date on which the appeal is dismissed or the date on which the time for appeal to the Federal Circuit expires. If an appeal to the Federal Circuit has been filed, proceedings are considered terminated when the appeal is terminated. An appeal to the Federal Circuit is terminated when the mandate is received by the Office. Upon termination of the reexamination proceeding, the Commissioner will

issue a certificate under § 1.997.

#### § 1.981 Reopening after decision.

(a) Cases which have been decided by the Board of Patent Appeals and Interferences will not be reopened or reconsidered by the primary examiner except under the provisions of § 1.979 without the written authority of the Commissioner, and then only for the consideration of matters not already adjudicated, sufficient cause being shown.

(b) In the event prosecution is reopened or the case is reconsidered by the primary examiner after decision by the Board of Patent Appeals and Interferences or by the U.S. Court of Appeals for the Federal Circuit, any third party requester who appealed or responded under § 1.967 may again present comments pursuant to § 1.947 and may appeal or participate in an appeal by the patent owner pursuant to § 1.959.

#### APPEAL TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

#### § 1.983 Appeal to the United States Court of Appeals for the Federal Circuit.

Any third party requester or patent owner involved in a reexamination proceeding who is a party to any appeal to the Board of Patent Appeals and Interferences and who is dissatisfied with the decision of the Board of Patent Appeals and Interferences may appeal to the U.S. Court of Appeals for the Federal Circuit and may be a party to any appeal thereto taken from a reexamination decision of the Board of Patent Appeals and Interferences. The appellant must take the following steps in such an appeal:

(a) in the Patent and Trademark Office file a written notice of appeal directed to the Commissioner (see §§ 1.302 and 1.304); and

(b) in the Court, file a copy of the notice of appeal and pay the fee, as provided for in the rules of the Court. A third party requester is deemed not to have participated as a party to an appeal by the patent owner, and thereby not subject to § 1.909, unless, within twenty days after the patent owner has filed notice of appeal pursuant to § 1.983(a), the third party requester files notice with the Commissioner electing to participate.

#### PROCEEDINGS INVOLVING SAME PATENT AS IN REEXAMINATION

#### § 1.985 Notification of prior or concurrent proceedings.

Any person at any time may file a paper in a reexamination proceeding notifying the Office of a prior or concurrent proceeding in which the same patent is or was involved, such as interferences, reissues, reexaminations, or litigation and the results of such proceedings. Such paper must be limited to merely providing notice of the other proceeding without discussion of issues of the current reexamination proceeding.

#### § 1.987 Stay of concurrent proceeding.

If a patent in the process of reexamination is or becomes involved in litigation or a reissue application for the patent is filed or pending, the Commissioner shall determine whether or not to stay the reexamination or reissue proceeding.

#### § 1.989 Merger of concurrent reexamination proceedings.

(a) If reexamination is ordered while a prior reexamination proceeding is pending for the same patent, the reexamination proceedings will be merged and result in the issuance of a single certificate under § 1.997.

(b) A reexamination proceeding filed under § 1.915 which is merged with a reexamination proceeding filed under § 1.510 will result in the merged proceeding being governed by §§ 1.901 - 1.997.

#### § 1.991 Merger of concurrent reissue application and reexamination proceeding.

If a reissue application and a reexamination proceeding in which an order pursuant to § 1.931 has been mailed are pending concurrently on a patent, a decision may be made to merge the two proceedings or to stay one of the two proceedings. Where merger of a reissue application and a reexamination proceeding is ordered, the merged examination will be conducted in accordance with §§ 1.171 through 1.179 and the patent owner will be required to place and maintain the same claims in the reissue application and the reexamination proceeding during the pendency of the merged proceeding. In a merged proceeding, participation by the third party requester shall be limited to issues within the scope of reexamination. The examiner's actions and any responses by the patent owner or third party requester in a merged proceeding will apply to both the reissue application and the reexamination proceeding and be physically entered into both files. Any reexamination proceeding merged with a reissue application shall be terminated by the grant of the reissued patent.

#### § 1.993 Stay of concurrent interference and reexamination proceeding.

If a patent in the process of reexamination is or becomes involved in an interference, the Commissioner may stay reexamination or the interference. The Commissioner will not consider a request to stay an interference unless a motion (§ 1.635) to stay the interference has been presented to and denied by an administrative patent judge and the request is filed within ten (10) days of a decision by an administrative patent judge denying the motion for a stay or such other time as the administrative patent judge may set.

#### § 1.995 Third party requester's participation rights preserved in merged proceeding.

When a third party requester is involved in one or more proceedings including a reexamination proceeding, the merger of such proceedings will be accomplished so as to preserve the third party requester's right to participate to the extent

specifically provided for in these regulations. In merged proceedings involving different requesters, any paper filed by one party in the merged proceeding shall be served on all other parties of the merged proceeding.

#### CERTIFICATE

#### § 1.997 Issuance of reexamination certificate after reexamination proceedings.

(a) Upon the conclusion of a reexamination proceeding, the Commissioner will issue a certificate in accordance with 35 U.S.C. 307 setting forth the results of the reexamination proceeding and the content of the patent following the reexamination proceeding.

(b) A certificate will be issued in each patent in which a reexamination proceeding has been ordered under § 1.931. Any statutory disclaimer filed by the patent owner will be made part of the certificate.

(c) The certificate will be mailed on the day of its date to the patent owner at the address as provided for in § 1.33(c). A copy of the certificate will also be mailed to the requester of the reexamination proceeding.

(d) If a certificate has been issued which cancels all of the claims of the patent, no further Office proceedings will be conducted with regard to that patent or any reissue applications or reexamination requests relating thereto.

(e) If the reexamination proceeding is terminated by the grant of a reissued patent as provided in § 1.965(d), the reissued patent will constitute the reexamination certificate required by this section and 35 U.S.C. 307.

(f) A notice of the issuance of each certificate under this section will be published in the Official Gazette on its date of issuance.

August 1, 1995

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

[1177 OG 130]

(42)

#### Public Law 96-517 96th Congress An Act

To amend the patent and trademark laws.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled That title 35 of the United States Code, entitled "Patents," is amended by adding after chapter 29 the following new chapter 30:

#### "CHAPTER 30-PRIOR ART CITATIONS TO OFFICE AND REEXAMINATION OF PATENTS

"Sec.

"301. Citation of prior art.

302. Request for reexamination.

303. Determination of issue by Commissioner.

304. Reexamination order by Commissioner.

305. Conduct of reexamination proceedings.

306. Appeal.

307. Certificate of patentability, unpatentability, and claim cancellation.

#### "§ 301. Citation of prior art

Any person at any time may cite to the Office in writing prior art consisting of patents or printed publications which that person believes to have a bearing on the patentability of any claim of a particular patent. If the person explains in writing the pertinency and manner of applying such prior art to at least one claim of the patent, the citation of such prior art and the explanation thereof will become a part of the official file of the patent. At the written request of the person citing the prior art, his or her identity will be excluded from the patent file and kept confidential.

#### " § 302. Request for reexamination

Dec. 12, 1990  
[H.R. 6933]

Patent and  
trademark laws,  
amendment.

35 USC 301.

35 USC 302.



"Any person at any time may file a request for reexamination by the Office of any claim of a patent on the basis of any prior art cited under the provisions of section 301 of this title. The request must be in writing and must be accompanied by payment of a reexamination fee established by the Commissioner of Patents pursuant to the provisions of section 41 of this title. The request must set forth the pertinency and manner of applying cited prior art to every claim for which reexamination is requested. Unless the requesting person is the owner of the patent, the Commissioner promptly will send a copy of the request to the owner of record of the patent.

#### "§ 303. Determination of issue by Commissioner

"(a) Within three months following the filing of a request for reexamination under provisions of section 302 of this title, the Commissioner will determine whether a substantial new question of patentability affecting any claim of the patent concerned is raised by the request, with or without consideration of other patents or printed publications. On his own initiative, and any time, the Commissioner may determine whether a substantial new question of patentability is raised by patents and publications discovered by him or cited under the provisions of section 301 of this title.

"(b) A record of the Commissioner's determination under subsection (a) of this section will be placed in the official file of the patent and a copy promptly will be given or mailed to the owner of record of the patent and to the person requesting reexamination, if any.

"(c) A determination by the Commissioner pursuant to subsection (a) of this section that no substantial new question of patentability has been raised will be final and nonappealable. Upon such a determination, the Commissioner may refund a portion of the reexamination fee required under section 302 of this title.

#### "§ 304. Reexamination order by Commissioner

"If, in a determination made under the provisions of subsection 303(a) of this title, the Commissioner finds that a substantial new question of patentability affecting any claim of a patent is raised, the determination will include an order for reexamination of the patent for resolution of the question. The patent owner will be given a reasonable period, not less than two months from the date a copy of the determination is given or mailed to him, within which he may file a statement on such question, including any amendment to his patent and new claim or claims he may wish to propose, for consideration in the reexamination. If the patent owner files such a statement, he promptly will serve a copy of it on the person who has requested reexamination under the provisions of section 302 of this title. Within a period of two months from the date of service, that person may file and have considered in the reexamination a reply to any statement filed by the patent owner. That person promptly will serve on the patent owner a copy of any reply filed.

#### "§ 305. Conduct of reexamination proceedings

"After the times for filing the statement and reply provided for by section 304 of this title have expired, reexamination will be conducted according to the procedures established for initial examination under the provisions of sections 132 and 133 of this title. In any reexamination proceeding under this chapter, the patent owner will be permitted to propose any amendment to his patent and a new claim or claims thereto, in order to distinguish the invention as claimed from the prior art cited under the provisions of section 301 of this title, or in response to a decision adverse to the patentability of a claim of a patent. No proposed amended or new claim enlarging the scope of a claim of the patent will be permitted in a reexamination proceeding under this chapter. All reexamination proceedings under this section, including any appeal to the Board of Appeals, will be conducted with special dispatch within the Office.

#### "§ 306. Appeal

"The patent owner involved in a reexamination proceeding under this chapter may appeal under the provisions of section 134 of this title, and may seek court review under the provisions of sections 141 to 145 of this title, with respect to any decision adverse to the patentability of any original or proposed amended or new claim of the patent.

#### "§ 307. Certificate of patentability, unpatentability, and claim cancellation

"(a) In a reexamination proceeding under this chapter, when the time for appeal has expired or any appeal proceeding has terminated, the Commissioner will issue and publish a certificate canceling any claim of the patent finally determined to be unpatentable, confirming any claim of the patent determined to be patentable, and incorporating in the patent any proposed amended or new claim determined to be patentable.

"(b) Any proposed amended or new claim determined to be patentable and incorporated into a patent following a reexamination proceeding will have the same effect as that specified in section 252 of this title for reissued patents on the right of any person who made, purchased, or used anything patented by such proposed amended or new claim, or who made substantial preparation for the same, prior to issuance of a certificate under the provisions of subsection (a) of this section."

SEC. 2. Section 41 of title 35, United States Code, is amended to read as follows:

#### § 41. Patent fees

Fee

35 USC 303.

Record.

Refund

35 USC 304.

Filing period

35 USC 305.

35 USC 132, 133.

35 USC 306.

35 USC 134.

35 USC 141-145.

35 USC 307.

35 USC 252.

35 USC 41.

"(a) The Commissioner of Patents will establish fees for the processing of an application for a patent, from filing through disposition by issuance or abandonment, for maintaining a patent in force, and for providing all other services and materials related to patents. No fee will be established for maintaining a design patent in force.

"(b) By the first day of the first fiscal year beginning on or after one calendar year after enactment of this Act, fees for the actual processing of an application for a patent, other than for a design patent, from filing through disposition by issuance or abandonment, will recover in aggregate 25 per centum of the estimated average cost to the Office of such processing. By the first day of the first fiscal year beginning on or after one calendar year after enactment, fees for the processing of an application for a design patent, from filing through disposition by issuance or abandonment, will recover in aggregate 50 per centum of the estimated average cost to the Office of such processing.

"(c) By the fifteenth fiscal year following the date of enactment of this Act, fees for maintaining patents in force will recover 25 per centum of the estimated cost to the Office, for the year in which such maintenance fees are received, of the actual processing all applications for patents, other than for design patents, from filing through disposition by issuance or abandonment. Fees for maintaining a patent in force will be due three years and six months, seven years and six months, and eleven years and six months after the grant of the patent. Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of an applicable maintenance fee.

"(d) By the first day of the first fiscal year beginning on or after one calendar year after enactment, fees for all other services or materials related to patents will recover the estimated average cost to the Office of performing the service or furnishing the material. The yearly fee for providing a library specified in section 13 of this title with uncertified printed copies of the specifications and drawings for all patents issued in that year will be \$50.

"(e) The Commissioner may waive the payment of any fee for any service or material related to patents in connection with an occasional or incidental request made by a department or agency of the Government, or any officer thereof. The Commissioner may provide any applicant issued a notice under section 132 of this title with a copy of the specifications and drawings for all patents referred to in that notice without charge.

"(f) Fees will be adjusted by the Commissioner to achieve the levels of recovery specified in this section; however, no patent application processing fee or fee for maintaining a patent in force will be adjusted more than once every three years.

"(g) No fee established by the Commissioner under this section will take effect prior to sixty days following notice in the Federal Register."

SEC. 3. Section 42 of title 35, United States Code, is amended to read as follows:

#### § 42. Patent and Trademark Office funding

"(a) All fees for services performed by or materials furnished by the Patent and Trademark Office will be payable to the Commissioner.

"(b) All fees paid to the Commissioner and all appropriations for defraying the costs of the activities of the Patent and Trademark Office will be credited to the Patent and Trademark Office Appropriation Account in the Treasury of the United States, the provisions of section 725e of title 31, United States Code, notwithstanding.

"(c) Revenues from fees will be available to the Commissioner of Patents to carry out, to the extent provided for in appropriation Acts, the activities of the Patent and Trademark Office.

"(d) The Commissioner may refund any fee paid by mistake or any amount paid in excess of that required."

SEC. 4. Section 154 of title 35, United States Code, is amended by deleting the word "issue".

SEC. 5. Section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), is amended to read as follows:

#### "§ 31. Fees

"(a) The Commissioner of Patents will establish fees for the filing and processing of an application for the registration of a trademark or other mark and for all other services performed by and materials furnished by the Patent and Trademark Office related to trademarks and other marks. Fees will be set and adjusted by the Commissioner to recover in aggregate 50 per centum of the estimated average cost to the Office of such processing. Fees for all other services or materials related to trademarks and other marks will recover the estimated average cost to the Office of performing the service or furnishing the material. However, no fee for the filing or processing of an application for the registration of a trademark or other mark or for the renewal or assignment of a trademark or other mark will be adjusted more than once every three years. No fee established under this section will take effect prior to sixty days following notice in the Federal Register.

"(b) The Commissioner may waive the payment of any fee for any service or material related to trademarks or other marks in connection with any occasional request made by a department or agency of the Government, or any officer thereof. The Indian Arts and Crafts Board will not be charged any fee to register Government trademarks of genuineness and quality for Indian products or for products of particular Indian tribes and groups."

SEC. 6. (a) Title 35 of the United States Code, entitled "Patents", is amended by adding

35 USC 13.

Waiver.

35 USC 132.

Notice.

35 USC 42

Refund Notice.

Waiver.

Indian Products.



after chapter 37 the following new chapter 38:

**"CHAPTER 38-PATENT RIGHTS IN INVENTIONS MADE  
WITH FEDERAL ASSISTANCE**

- "Sec.  
"200. Policy and objective.  
"201. Definitions.  
"202. Disposition of rights.  
"203. March-in rights.  
"204. Preference for United States industry.  
"205. Confidentiality.  
"206. Uniform clauses and regulations.  
"207. Domestic and foreign protection of federally owned inventions.  
"208. Regulations governing Federal licensing.  
"209. Restrictions on licensing of federally owned inventions.  
"210. Precedence of chapter.  
"211. Relationship to antitrust laws.

**" § 200. Policy and objective.**

"It is the policy and objective of the Congress to use the patent system to promote the utilization of inventions arising from federally supported research or development; to encourage maximum participation of small business firms in federally supported research and development efforts; to promote collaboration between commercial concerns and nonprofit organizations, including universities; to ensure that inventions made by nonprofit organizations and small business firms are used in a manner to promote free competition and enterprise; to promote the commercialization and public availability of inventions made in the United States by United States industry and labor; to ensure that the Government obtains sufficient rights in federally supported inventions to meet the needs of the Government and protect the public against nonuse or unreasonable use of inventions; and to minimize the costs of administering policies in this area.

**" § 201. Definitions**

"As used in this chapter—

- "(a) The term 'Federal agency' means any executive agency as defined in section 105 of title 5, United States Code, and the military departments as defined by section 102 of title 5, United States Code.  
"(b) The term 'funding agreement' means any contract, grant, or cooperative agreement entered into between any Federal agency, other than the Tennessee Valley Authority, and any contractor for the performance of experimental, developmental, or research work funded in whole or in part by the Federal Government. Such term includes any assignment, substitution of parties, or subcontract of any type entered into for the performance of experimental, developmental, or research work under a funding agreement as herein defined.  
"(c) The term 'contractor' means any person, small business firm, or nonprofit organization that is a party to a funding agreement.  
"(d) The term 'invention' means any invention or discovery which is or may be patentable or otherwise protectable under this title.  
"(e) The term 'subject invention' means any invention of the contractor conceived or first actually reduced to practice in the performance of work under a funding agreement.  
"(f) The term 'practical application' means to manufacture in the case of a composition or product, to practice in the case of a process or method, or to operate in the case of a machine or system; and, in each case, under such conditions as to establish that the invention is being utilized and that its benefits are to the extent permitted by law or Government regulations available to the public on reasonable terms.  
"(g) The term 'made' when used in relation to any invention means the conception or first actual reduction to practice of such invention.  
"(h) The term 'small business firm' means a small business concern as defined at section 2 of Public Law 85-536 (15 U.S.C. 632) and implementing regulations of the Administrator of the Small Business Administration.  
"(i) The term 'nonprofit organization' means universities and other institutions of higher education or an organization of the type described in section 501(c)(3) of the Internal Revenue Code of 1954 (26 U.S.C. 501(c)) and exempt from taxation under section 501(a) of the Internal Revenue Code (26 U.S.C. 501(a)) or any nonprofit scientific or educational organization qualified under a State nonprofit organization statute.

**" § 202. Disposition of rights**

- "(a) Each nonprofit organization or small business firm may, within a reasonable time after disclosure as required by paragraph (c)(1) of this section, elect to retain title to any subject invention: Provided, however, That a funding agreement may provide otherwise (i) when the funding agreement is for the operation of Government-owned research or production facility, (ii) in exceptional circumstances when it is determined by the agency that restriction or elimination of the right to retain title to any subject invention will better promote the policy and objectives of this chapter or (iii) when it is determined by a

exception.

35 USC 200.

35 USC 201.

35 USC 202.

Funding  
agreement

Government authority which is authorized by statute or Executive order to conduct foreign intelligence or counterintelligence activities that the restriction or elimination of the right to retain title to any subject invention is necessary to protect the security of such activities. The rights of the nonprofit organization or small business firm shall be subject to the provisions of paragraph (c) of this section and the other provisions of this chapter.

"(b)(1) Any determination under (ii) of paragraph (a) of this section shall be in writing and accompanied by a written statement of facts justifying the determination. A copy of each such determination and justification shall be sent to the Comptroller General of the United States within thirty days after the award of the applicable funding agreement. In the case of determinations applicable to funding agreements with small business firms copies shall also be sent to the Chief Counsel for Advocacy of the Small Business Administration.

"(2) If the Comptroller General believes that any pattern of determinations by a Federal agency is contrary to the policy and objectives of this chapter or that an agency's policies or practices are otherwise not in conformance with this chapter, the Comptroller General shall so advise the head of the agency. The head of the agency shall advise the Comptroller General in writing within one hundred and twenty days of what action, if any, the agency has taken or plans to take with respect to the matters raised by the Comptroller General.

"(3) At least once each year, the Comptroller General shall transmit a report to the Committees on the Judiciary of the Senate and House of Representatives on the manner in which this chapter is being implemented by the agencies and on such other aspects of Government patent policies and practices with respect to federally funded inventions as the Comptroller General believes appropriate.

"(c) Each funding agreement with a small business firm or nonprofit organization shall contain appropriate provisions to effectuate the following:

"(1) A requirement that the contractor disclose each subject invention to the Federal agency within a reasonable time after it is made and that the Federal Government may receive title to any subject invention not reported to it within such time.

"(2) A requirement that the contractor make an election to retain title to any subject invention within a reasonable time after disclosure and that the Federal Government may receive title to any subject invention in which the contractor does not elect to retain rights or fails to elect rights within such time.

"(3) A requirement that a contractor electing rights file patent applications within reasonable times and that the Federal Government may receive title to any subject inventions in the United States or other countries in which the contractor has not filed patent applications on the subject invention within such times.

"(4) With respect to any invention in which the contractor elects rights, the Federal agency shall have a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States any subject invention throughout the world, and may, if provided in the funding agreement, have additional rights to sublicense any foreign government or international organization pursuant to any existing or future treaty or agreement.

"(5) The right of the Federal agency to require periodic reporting on the utilization or efforts at obtaining utilization that are being made by the contractor or his licensees or assignees: Provided, That any such information may be treated by the Federal agency as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of title 5 of the United States Code.

"(6) An obligation on the part of the contractor, in the event a United States patent application is filed by or on its behalf or by any assignee of the contractor, to include within the specification of such application and any patent issuing thereon, a statement specifying that the invention was made with Government support and that the Government has certain rights in the invention.

"(7) In the case of a nonprofit organization, (A) a prohibition upon the assignment of rights to a subject invention in the United States without the approval of the Federal agency, except where such assignment is made to an organization which has as one of its primary functions the management of inventions and which is not, itself, engaged in or does not hold a substantial interest in other organizations engaged in the manufacture or sale of products or the use of processes that might utilize the invention or be in competition with embodiments of the invention (provided that such assignee shall be subject to the same provisions as the contractor); (B) a prohibition against the granting of exclusive licenses under United States Patents or Patent Applications in a subject invention by the contractor to persons other than small business firms for a period in excess of the earlier of five years from first commercial sale or use of the invention or eight years from the date of the exclusive license excepting that time before regulatory agencies necessary to obtain premarket clearance unless, on a case-by-case basis, the Federal agency approves a longer exclusive license. If exclusive field of use licenses are granted, commercial sale or use in one field of use shall not be deemed commercial sale or use as to other fields of use, and a first commercial sale or use with respect to a product of the invention shall not be deemed to end the exclusive period to different subsequent products covered by the invention; (C) a requirement that the contractor share royalties with the inventor; and (D) a requirement that the balance of any royalties or income earned by the contractor with respect to subject inventions, after payment of expenses (including payments to inventors) incidental to the administration of subject inventions, be utilized for the support of scientific research or education.

"(8) The requirements of sections 203 and 204 of this chapter.

"(d) If a contractor does not elect to retain title to a subject invention in cases subject to this section, the Federal agency may consider and after consultation with the contractor

Written  
determination.

Copy to  
Comptroller  
General.

Copy to SBA.

Contrary agency  
determinations.

Report to  
congressional  
committees.

funding  
agreement  
requirements.

Rights,  
retention.

Rights,  
transfer  
or assignment.

Third-party

licensing,  
prohibition.



grant requests for retention of rights by the inventor subject to the provisions of this Act and regulations promulgated hereunder.

"(c) In any case when a Federal employee is a coinventor of any invention made under a funding agreement with a nonprofit organization or small business firm, the Federal agency employing such coinventor is authorized to transfer or assign whatever rights it may acquire in the subject invention from its employee to the contractor subject to the conditions set forth in this chapter.

"(f) (1) No funding agreement with a small business firm or nonprofit organization shall contain a provision allowing a Federal agency to require the licensing to third parties of inventions owned by the contractor that are not subject inventions unless such provision has been approved by the head of the agency and a written justification has been signed by the head of the agency. Any such provision shall clearly state whether the licensing may be required in connection with the practice of a subject invention, a specifically identified work object, or both. The head of the agency may not delegate the authority to approve provisions or sign justifications required by this paragraph.

"(2) A Federal agency shall not require the licensing of third parties under any such provision unless the head of the agency determines that the use of the invention by others is necessary for the practice of a subject invention or for the use of a work object of the funding agreement and that such action is necessary to achieve the practical application of the subject invention or work object. Any such determination shall be on the record after an opportunity for an agency hearing. Any action commenced for judicial review of such determination shall be brought within sixty days after notification of such determination.

#### " § 203. March-in rights

35 USC 203.

"With respect to any subject invention in which a small business firm or nonprofit organization has acquired title under this chapter, the Federal agency under whose funding agreement the subject invention was made shall have the right, in accordance with such procedures as are provided in regulations promulgated hereunder to require the contractor, an assignee or exclusive licensee of a subject invention to grant a nonexclusive, partially exclusive, or exclusive license in any field of use to a responsible applicant or applicants, upon terms that are reasonable under the circumstances, and if the contractor, assignee, or exclusive licensee refuses such request, to grant such a license itself, if the Federal agency determines that such—

"(a) action is necessary because the contractor or assignee has not taken, or is not expected to take within a reasonable time, effective steps to achieve practical application of the subject invention in such field of use;

"(b) action is necessary to alleviate health or safety needs which are not reasonably satisfied by the contractor, assignee, or their licensees;

"(c) action is necessary to meet requirements for public use specified by Federal regulations and such requirements are not reasonably satisfied by the contractor, assignee, or licensees; or

"(d) action is necessary because the agreement required by section 204 has not been obtained or waived or because a licensee of the exclusive right to use or sell any subject invention in the United States is in breach of its agreement obtained pursuant to section 204.

#### " § 204. Preference for United States industry

35 USC 204.

"Notwithstanding any other provision of this chapter, no small business firm or nonprofit organization which receives title to any subject invention and no assignee of any such small business firm or nonprofit organization shall grant to any person the exclusive right to use or sell any subject invention in the United States unless such person agrees that any products embodying the subject invention or produced through the use of the subject invention will be manufactured substantially in the United States. However, in individual cases, the requirement for such an agreement may be waived by the Federal agency under whose funding agreement the invention was made upon a showing by the small business firm, nonprofit organization, or assignee that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible.

#### " § 205. Confidentiality

35 USC 205.

"Federal agencies are authorized to withhold from disclosure to the public information disclosing any invention in which the Federal Government owns or may own a right, title, or interest (including a nonexclusive license) for a reasonable time in order for a patent application to be filed. Furthermore, Federal agencies shall not be required to release copies of any document which is part of an application for patent filed with the United States Patent and Trademark Office or with any foreign patent office.

#### " § 206. Uniform clauses and regulations

35 USC 206.

"The Office of Federal Procurement Policy, after receiving recommendations of the Office of Science and Technology Policy, may issue regulations which may be made applicable to Federal agencies implementing the provisions of sections 202 through 204 of this chapter and the Office of Federal Procurement Policy shall establish standard funding agreement provisions required under this chapter.

#### " § 207. Domestic and foreign protection of federally owned inventions

35 USC 207.

"Each Federal agency is authorized to—

"(1) apply for, obtain, and maintain patents or other forms of protection in the United States and in foreign countries on inventions in which the Federal Government owns a right, title, or interest;

"(2) grant nonexclusive, exclusive, or partially exclusive licenses under federally owned patent applications, patents, or other forms of protection obtained, royalty-free or for royalties or other consideration, and on such terms and conditions, including the grant to the licensee of the right of enforcement pursuant to the provisions of chapter 29 of this title as determined appropriate in the public interest;

35 USC 281  
et seq.

"(3) undertake all other suitable and necessary steps to protect and administer rights to federally owned inventions on behalf of the Federal Government either directly or through contract; and

"(4) transfer custody and administration, in whole or in part, to another Federal agency, of the right, title, or interest in any federally owned invention.

#### " § 208. Regulations governing Federal licensing

35 USC 208.

"The Administrator of General Services is authorized to promulgate regulations specifying the terms and conditions upon which any federally owned invention, other than inventions owned by the Tennessee Valley Authority, may be licensed on a nonexclusive, partially exclusive, or exclusive basis.

#### " § 209. Restrictions on licensing of federally owned inventions

35 USC 209

"(a) No Federal agency shall grant any license under a patent or patent application on a federally owned invention unless the person requesting the license has supplied the agency with a plan for development and/or marketing of the invention, except that any such plan may be treated by the Federal agency as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of title 5 of the United States Code.

Development or  
marketing plan

"(b) A Federal agency shall normally grant the right to use or sell any federally owned invention in the United States only to a licensee that agrees that any products embodying the invention or produced through the use of the invention will be manufactured substantially in the United States.

Manufacture in  
U.S.

"(c)(1) Each Federal agency may grant exclusive or partially exclusive licenses in any invention covered by a federally owned domestic patent or patent application only if, after public notice and opportunity for filing written objections, it is determined that—

"(A) the interests of the Federal Government and the public will best be served by the proposed license, in view of the applicant's intentions, plans, and ability to bring the invention to practical application or otherwise promote the invention's utilization by the public;

"(B) the desired practical application has not been achieved, or is not likely expeditiously to be achieved, under any nonexclusive license which has been granted, or which may be granted, on the invention.

"(C) exclusive or partially exclusive licensing is a reasonable and necessary incentive to call forth the investment of risk capital and expenditures to bring the invention to practical application or otherwise promote the invention's utilization by the public; and

"(D) the proposed terms and scope of exclusivity are not greater than reasonably necessary to provide the incentive for bringing the invention to practical application or otherwise promote the invention's utilization by the public.

"(2) A Federal agency shall not grant such exclusive or partially exclusive license under paragraph (1) of this subsection if it determines that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the country in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with the antitrust laws.

Antitrust  
factors.

"(3) First preference in the exclusive or partially exclusive licensing of federally owned inventions shall go to small business firms submitting plans that are determined by the agency to be within the capabilities of the firms and equally likely, if executed, to bring the invention to practical application as any plans submitted by applicants that are not small business firms.

Small business  
preference.

"(d) After consideration of whether the interests of the Federal Government or United States industry in foreign commerce will be enhanced, any Federal agency may grant exclusive or partially exclusive licenses in any invention covered by a foreign patent application or patent, after public notice and opportunity for filing written objections, except that a Federal agency shall not grant such exclusive or partially exclusive license if it determines that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the United States in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with antitrust laws.

Antitrust  
factors.

"(e) The Federal agency shall maintain a record of determinations to grant exclusive or partially exclusive licenses.

Record.

"(f) Any grant of a license shall contain such terms and conditions as the Federal agency determines appropriate for the protection of the interests of the Federal Government and the public, including provisions for the following:

Terms and  
conditions.

"(1) periodic reporting on the utilization or efforts at obtaining utilization that are being made by the licensee with particular reference to the plan submitted: Provided, That any such information may be treated by the Federal agency as commercial and



financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of title 5 of the United States Code;

"(2) the right of the Federal agency to terminate such license in whole or in part if it determines that the licensee is not executing the plan submitted with its request for a license and the licensee cannot otherwise demonstrate to the satisfaction of the Federal agency that it has taken or can be expected to take within a reasonable time, effective steps to achieve practical application of the invention;

"(3) the right of the Federal agency to terminate such license in whole or in part if the licensee is in breach of an agreement obtained pursuant to paragraph (b) of this section; and

"(4) the right of the Federal agency to terminate the license in whole or in part if the agency determines that such action is necessary to meet requirements for public use specified by Federal regulations issued after the date of the license and such requirements are not reasonably satisfied by the licensee.

#### " § 210. Precedence of chapter

"(a) This chapter shall take precedence over any other Act which would require a disposition of rights in subject inventions of small business firms or nonprofit organizations contractors in a manner that is inconsistent with this chapter, including but not necessarily limited to the following:

"(1) section 10(a) of the Act of June 29, 1935, as added by title I of the Act of Aug. 14, 1946 (7 U.S.C. 427i(a); 60 Stat. 1085);

"(2) section 205(a) of the Act of Aug. 14, 1946 (7 U.S.C. 1624(a); 60 Stat. 1090);

"(3) section 501(c) of the Federal Mine Safety and Health Act of 1977 (30 U.S.C. 951(c); 83 Stat. 742);

"(4) section 106(c) of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1395(c); 80 Stat. 721);

"(5) section 12 of the National Science Foundation Act of 1950 (42 U.S.C. 1871(a); 82 Stat. 360);

"(6) section 152 of the Atomic Energy Act of 1954 (42 U.S.C. 2182; 68 Stat. 943);

"(7) section 305 of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457);

"(8) section 6 of the Coal Research Development Act of 1960 (30 U.S.C. 666; 74 Stat. 337);

"(9) section 4 of the Helium Act Amendments of 1960 (50 U.S.C. 167b; 74 Stat. 920);

"(10) section 32 of the Arms Control and Disarmament Act of 1961 (22 U.S.C. 2572; 75 Stat. 634);

"(11) subsection (e) of section 302 of the Appalachian Regional Development Act of 1965 (40 U.S.C. App. 302(e); 79 Stat. 5);

"(12) section 9 of the Federal Nonnuclear Energy Research and Development Act of 1974 (42 U.S.C. 5901); 88 Stat. 1878);

"(13) section 5(d) of the Consumer Product Safety Act (15 U.S.C. 2054(d); 86 Stat. 1211);

"(14) section 3 of the Act of April 5, 1944 (30 U.S.C. 323; 58 Stat. 191);

"(15) section 8001(c)(3) of the Solid Waste Disposal Act (42 U.S.C. 6981(c); 90 Stat. 2829);

"(16) section 219 of the Foreign Assistance Act of 1961 (22 U.S.C. 2179; 83 Stat. 806);

"(17) section 427(b) of the Federal Mine Health and Safety Act of 1977 (30 U.S.C. 937(b); 86 Stat. 155);

"(18) section 306(d) of the Surface Mining and Reclamation Act of 1977 (30 U.S.C. 1226(d); 91 Stat. 455);

"(19) section 21(d) of the Federal Fire Prevention and Control Act of 1974 (15 U.S.C. 2218(d); 88 Stat. 1548);

"(20) section 6(b) of the Solar Photovoltaic Energy Research Development and Demonstration Act of 1978 (42 U.S.C. 5585(b); 92 Stat. 2516);

"(21) section 12 of the Native Latex Commercialization and Economic Development Act of 1978 (7 U.S.C. 178(j); 92 Stat. 2533); and

"(22) section 408 of the Water Resources and Development Act of 1978 (42 U.S.C. 7879; 92 Stat. 1360).

The Act creating this chapter shall be construed to take precedence over any future Act unless that Act specifically cites this Act and provides that it shall take precedence over this Act.

"(b) Nothing in this chapter is intended to alter the effect of the laws cited in paragraph (a) of this section or any other laws with respect to the disposition of rights in inventions made in the performance of funding agreements with persons other than nonprofit organizations or small business firms.

"(c) Nothing in this chapter is intended to limit the authority of agencies to agree to the disposition of rights in inventions made in the performance of work under funding agreements with persons other than nonprofit organizations or small business firms in accordance with the Statement of Government Patent Policy issued on Aug. 23, 1971 (36 Fed. Reg. 16887), agency regulations, or other applicable regulations or to otherwise limit the authority of agencies to allow such persons to retain ownership of inventions. Any disposition of rights in inventions made in accordance with the Statement or implementing regulations, including any disposition occurring before enactment of this section, are hereby authorized.

"(d) Nothing in this chapter shall be construed to require the disclosure of intelligence sources or methods or to otherwise affect the authority granted to the Director of Central Intelligence by statute or Executive order for the protection of intelligence sources or

35 USC 210

91 Stat. 1320

64 Stat. 154

68 Stat. 944

88 Stat. 1887.

42 USC 5908.

7 USC 178j.

92 Stat. 1316.

Rights,  
disposition

methods.

#### " § 211. Relationship to antitrust laws

"Nothing in this chapter shall be deemed to convey to any person immunity from civil or criminal liability, or to create any defenses to actions, under any antitrust law."

(b) The table of chapters for title 35, United States Code, is amended by adding immediately after the item relating to chapter 37 the following:

"38. Patent rights in inventions made with Federal assistance."

SEC. 7. AMENDMENTS TO OTHER ACTS.—The following Acts are amended as follows:

(a) Section 156 of the Atomic Energy Act of 1954 (42 U.S.C. 2186; 68 Stat. 947) is amended by deleting the words "held by the Commission or".

(b) The National Aeronautics and Space Act of 1958 is amended by repealing paragraph (g) of section 305 (42 U.S.C. 2457(g); 72 Stat. 436).

(c) The Federal Nonnuclear Energy Research and Development Act of 1974 is amended by repealing paragraphs (g), (h), and (i) of section 9 (42 U.S.C. 5908 (g), (h), and (i); 88 Stat. 1889-1891).

SEC. 8. (a) Sections 2, 4, and 5 of this Act will take effect upon enactment.

(b) Section 1 of this Act will take effect on the first day of the seventh month beginning after its enactment and will apply to patents in force as of that date or issued thereafter.

(c) Section 3 of this Act will take effect on the first day of the first fiscal year beginning on or after one calendar year after enactment. However, until section 3 takes effect, the Commissioner may credit the Patent and Trademark Office appropriation account in the Treasury of the United States with the revenues from collected reexamination fees, which will be available to pay the costs to the Office of reexamination proceedings.

(d) Any fee in effect as of the date of enactment of this Act will remain in effect until a corresponding fee established under section 41 of title 35, United States Code, or section 1113 of title 15, United States Code, takes effect.

(e) Fees for maintaining a patent in force will not be applicable to patents applied for prior to the date of enactment of this Act.

(f) Sections 6 and 7 of this Act will take effect on the first day of the seventh month beginning after its enactment. Implementing regulations may be issued earlier.

(g) Sections 8 and 9 will take effect on the date of enactment of this Act.

SEC. 9. The Commissioner of Patents and Trademarks shall report to Congress, within two years after the effective date of this Act, a plan to identify, and if necessary develop or have developed, computerized data and retrieval systems equivalent to the latest state of the art which can be applied to all aspects of the operation of the Patent and Trademark Office, and particularly to the patent search file, the patent classification system, and the trademark search file. The report shall specify the cost of implementing the plan, how rapidly the plan can be implemented by the Patent and Trademark Office, without regard to funding which is or which may be available for this purpose in the future.

SEC. 10. (a) Section 101 of title 17 of the United States Code is amended to add at the end thereof the following new language:

"A 'computer program' is a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result."

(b) Section 117 of title 17 of the United States Code is amended to read as follows:

#### "117. Limitations on exclusive rights: Computer programs

"Notwithstanding the provisions of section 106, it is not an infringement for the owner of a copy of a computer program to make or authorize the making of another copy or adaptation of that computer program provided:

"(1) that such a new copy or adaptation is created as an essential step in the utilization of the computer program in conjunction with a machine and that it is used in no other manner, or

"(2) that such new copy or adaptation is for archival purposes only and that all archival copies are destroyed in the event that continued possession of the computer program should cease to be rightful.

"Any exact copies prepared in accordance with the provisions of this section may be leased, sold, or otherwise transferred, along with the copy from which such copies were prepared, only as part of the lease, sale, or other transfer of all rights in the program. Adaptations so prepared may be transferred only with the authorization of the copyright owner."

Approved Dec. 12, 1980.  
LEGISLATIVE HISTORY:

HOUSE REPORTS: No. 96-1307, Pt. 1 (Comm. on the Judiciary) and No. 96-1307, Pt. 2 (Comm. on Government Operations).

CONGRESSIONAL RECORD, Vol. 126 (1980):

Nov. 17, considered and passed House.

Nov. 20, considered and passed Senate, amended.

Nov. 21, House concurred in Senate amendment.

Disclosure.

35 USC 211.

Effective dates.

35 USC 41 note.

Computerized  
data and  
retrieval  
system, report toCongress  
35 USC 14 note."Computer  
program."

17 USC 117.

17 USC 106



Public Law 97-247

97th Congress  
An Act

15 USC 632.

To authorize appropriations to the Patent and Trademark Office in the Department of Commerce, and for other purposes.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled.* That there is authorized to be appropriated for the payment of salaries and necessary expenses of the Patent and Trademark Office to become available for fiscal year 1983, \$76,000,000, and in fiscal years 1984 and 1985 such sums as may be necessary as well as such additional or supplemental amounts as may be necessary, for increases in salary, pay, retirement, or other employee benefits authorized by law. Funds available under this section shall be used to reduce by 50 per centum the payment of fees under section 41 (a) and (b) of title 35, United States Code, by independent inventors and nonprofit organizations as defined in regulations established by the Commissioner of Patents and Trademarks, and by small business concerns as defined in section 3 of the Small Business Act and by regulations established by the Small Business Administration. When so specified and the extent provided in an appropriation Act, any amount appropriated pursuant to this section and, in addition, such fees as shall be collected pursuant to title 35, United States Code, and the Trademark Act of 1946, as amended (15 U.S.C. 1051 et seq.), may remain available without fiscal year limitation.

SEC. 2. Notwithstanding any other provision of law, there is authorized to be appropriated for the payment of salaries and expenses of the Patent and Trademark Office, \$121,461,000 for the fiscal year ending September 30, 1982, and such additional or supplemental amounts as may be necessary for increases in salary, pay, retirement, or other employee benefits authorized by law.

SEC. 3. (a) Section 41(a) of title 35, United States Code, is amended to read as follows:

"(a) The Commissioner shall charge the following fees:

"1. On filing each application for an original patent, except in design or plant cases, \$300; in addition, on filing or on presentation at any other time, \$30 for each claim in independent form which is in excess of three, \$10 for each claim (whether independent or dependent) which is in excess of twenty, and \$100 for each application containing a multiple dependent claim. For the purpose of computing fees, a multiple dependent claim as referred to in section 112 of this title or any claim depending therefrom shall be considered as separate dependent claims in accordance with the number of claims to which reference is made. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

"2. For issuing each original or reissue patent, except in design or plant cases, \$500.

"3. In design and plant cases:

"a. On filing each design application, \$125.

"b. On filing each plant application, \$200.

"c. On issuing each design patent, \$175.

"d. On issuing each plant patent, \$250.

"4. On filing each application for the reissue of a patent, \$300; in addition, on filing or on presentation at any other time, \$30. for each claim in independent form which is in excess of the number of independent claims of the original patent, and \$10 for each claim (whether independent or dependent) which is in excess of twenty and also in excess of the number of claims of the original patent. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

"5. On filing each disclaimer, \$50.

"6. On filing an appeal from the examiner to the Board of Appeals, \$115; in addition, on filing a brief in support of the appeal, \$115, and on requesting an oral hearing before the Board of Appeals, \$100.

"7. On filing each petition for the revival of an unintentionally abandoned application for a patent or for the unintentionally delayed payment of the fee for issuing each patent, \$500, unless the petition is filed under sections 133 or 151 of this title, in which case the fee shall be \$50.

"8. For petitions for one-month extensions of time to take actions required by the Commissioner in an application:

"a. On filing a first petition, \$50.

"b. On filing a second petition, \$100.

"c. On filing a third or subsequent petition, \$200."

(b) Section 41(b) of title 35, United States Code, is amended to read as follows:

"(b) The Commissioner shall charge the following fees for maintaining a patent in force:

"1. Three years and six months after grant, \$400.

"2. Seven years and six months after grant, \$800.

"3. Eleven years and six months after grant, \$1,200.

Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of an application maintenance fee. No fee will be established for maintaining a design or plant patent in force."

(c) Section 41(c) of title 35, United States Code, is amended to read as follows:

"(c)(1) The Commissioner may accept the payment of any maintenance fee required by subsection (b) of this section after the six-month grace period if the delay is shown

Fees.

35 USC 112.

35 USC 133, 151.

Maintenance  
fees.

Expiration.  
Surcharge.

Maintenance  
fee, delayed  
payment.  
NSurcharge.

to the satisfaction of the Commissioner to have been unavoidable. The Commissioner may require the payment of a surcharge as a condition of accepting payment of any maintenance fee after the six-month grace period. If the Commissioner accepts payment of a maintenance fee after the six-month grace period, the patent shall be considered as not having expired at the end of the grace period.

"(2) No patent, the term of which has been maintained as a result of the acceptance of a payment of a maintenance fee under this subsection, shall abridge or affect the right of any person or his successors in business who made, purchased or used after the six-month grace period but prior to the acceptance of a maintenance fee under this subsection anything protected by the patent, to continue the use of, or to sell to others to be used or sold, the specific thing so made, purchased, or used. The court before which such matter is in question may provide for the continued manufacture, use or sale of the made, purchased, or used as specified, or for the manufacture, use or sale of which substantial preparation was made after the six-month grace period but before the acceptance of a maintenance fee under this subsection, and it may also provide for the continued practice of any process, practiced, or for the practice of which substantial preparation was made, after the six-month grace period but prior to the acceptance of a maintenance fee under this subsection, to the extent and under such terms as the court deems equitable for the protection of investments made or business commenced after the six-month grace period but before the acceptance of a maintenance fee under the subsection."

(d) Section 41(d) of title 35, United States Code, is amended to read as follows:

"(d) The Commissioner will establish fees for all other processing, services, or materials related to patents not specified above to recover the estimated average cost to the Office of such processing, services, or materials. The yearly fee for providing a library specified in section 113 of this title with uncertified printed copies of the specifications and drawings for all patents issued in that year will be \$50."

(e) Section 41(f) of title 35, United States Code, is amended to read as follows:

"(f) The fees established in subsections (a) and (b) of this section may be adjusted by the Commissioner on October 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Changes of less than 1 per centum may be ignored."

(f) Subsection (a) of section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), is amended by deleting "Fees will be set and adjusted by the Commissioner to recover the aggregate 50 per centum of the estimated average cost to the Office of such processing. Fees for all other services or materials related to trademarks and other marks will recover the estimated average cost to the Office of performing the service or furnished the material."

(g) Section 42(c) of the title 35, United States Code, is amended by adding the following sentence at the end thereof: "Fees available to the Commissioner under section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), shall be used exclusively for the processing of trademark registrations and for other services and materials related to trademarks."

SEC. 4. Section 3(a) of title 35, United States Code is amended (1) by deleting the phrase "not more than fifteen"; and (2) by inserting the phrase "appointed under section 7 of this title" immediately after the phrase "examiners-in-chief".

SEC. 5. Section 111 of title 35, United States Code, is amended to read as follows:

"SEC. 111. Application for patent shall be made, or authorized to be made, by the inventor, except as otherwise provided in this title, in writing to the Commissioner. Such application shall include (1) a specification as prescribed by section 112 of this title; (2) a drawing as prescribed by section 113 of this title; and (3) an oath by the applicant as prescribed by section 115 of this title. The application must be accompanied by the fee required by law. The fee and oath may be submitted after the specification and any required drawing are submitted, within such period and under such conditions, including the payment of a surcharge, as may be prescribed by the Commissioner. Upon failure to submit the fee and oath within such prescribed period, the application shall be regarded as abandoned, unless it is shown to the satisfaction of the Commissioner that the delay in submitting the fee and oath was unavoidable. The filing date of an application shall be the date on which the specification and any required drawing are received in the Patent and Trademark Office."

SEC. 6. (a) Section 116 of title 35, United States Code, is amended (1) by deleting the phrase "Joint inventors" from the title and inserting in its place "Inventors"; and (2) in the third paragraph, by deleting the phrase "a person is joined in an application for patent as joint inventor through error, or a joint inventor is not included in an application through error" and inserting in its place the phrase "through error a person is named in an application for patent as the inventor, or through error an inventor is not named in an application".

(b) Section 256 of title 35, United States Code, is amended to read as follows:

"§ 256. Correction of named inventor

"Whenever through error a person is named in an issued patent as the inventor, or through error an inventor is not named in an issued patent and such error arose without any deceptive intention on his part, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate correcting such error.

"The error of omitting inventors or naming persons who are not inventors shall not invalidate the patent in which such error occurred if it can be corrected as provided in this section. The court before which such matter is called in question may order correction of the patent on notice and hearing of all parties concerned and the Commissioner shall issue a certificate accordingly."

Fees.

Adjusted fees.

Applications.

35 USC 112.  
35 USC 113.  
35 USC 115.

Filing date.



SEC. 7. Section 6 of the title 35, United States Code, is amended by deleting paragraph (d) thereof.

SEC. 8. (a) Section 8(a) of the Trademark Act of 1946, as amended (15 U.S.C. 1058(a)), is amended (a) by deleting the word "still"; and (2) by inserting the phrase "in commerce" immediately after the word "use".

(b) Section 8(b) of the Trademark Act of 1946, as amended (15 U.S.C. 1058(b)), is amended (1) by deleting the word "stille"; and (2) by inserting the phrase "in commerce" immediately after the word "use".

SEC. 9. (a) Section 13 of the Trademark Act of 1946, as amended (15 U.S.C. 1063), is amended (1) by deleting the phrase "a verified" and inserting in its place the word "an"; (2) by adding the phrase "when requested prior to the expiration of an extension" immediately after the word "cause"; and (3) by deleting the fourth sentence.

(b) Section 14 of the Trademark Act of 1946, as amended (15 U.S.C. 1064), is amended by deleting the word "verified".

SEC. 10. Section 15 of the Trademark Act of 1946, as amended (15 U.S.C. 1065), is amended by deleting the phrase "the publication" and inserting in its place the word "registration".

SEC. 11. The first sentence of section 16 of the Trademark Act of 1946, as amended (15 U.S.C. 1066), is amended to read as follows: "Upon petition showing extraordinary circumstances, the Commissioner may declare that an interference exists when application is made for the registration of a mark which so resembles a mark previously registered by another, or for the registration of which another has previously made application; as to be likely when applied to the goods or when used in connection with the services of the applicant to cause confusion or mistake or to deceive."

SEC. 12. Section 21 of title 35, United States Code, is amended—

(1) by deleting the phrase "Day for taking action falling on Saturday, Sunday, or holiday" from the title and inserting in its place the phrase "Filing date and day for taking action";

(2) by inserting the following as subsection (a):

"(a) The Commissioner may be rule prescribe that any paper or fee required to be filed in the Patent and Trademark Office will be considered filed in the Office on the date on which it was deposited with the United States Postal Service or would have been deposited with the United States Postal Service but for postal service interruptions or emergencies designated by the Commissioner."

(3) by designating the existing paragraph as subsection (b); and

(4) by inserting the word "federal" in subsection (b), as designated above, immediately after the word "a".

SEC. 13. Section 6(a) of title 35, United States Code, is amended (1) by deleting the word "and", third occurrence, and inserting in its place a comma; (2) by inserting the phrase, "or exchanges of items or services" immediately after the word "programs"; and (3) by inserting the phrase "or the administration of the Patent and Trademark Office" immediately after the word "law", second occurrence.

SEC. 14. (a) Section 115 of title 35, United States Code, is amended by (1) deleting the phrase "shall be" and inserting in its place the word "is"; and (2) inserting the following immediately after the phrase "United States", third occurrence: ", or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States".

(b) Section 261 of title 35, United States Code, is amended, in the third paragraph, by inserting the following immediately after the phrase "United States", third occurrence: ", or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States".

(c) Section 11 of the Trademark Act of 1946, as amended (15 U.S.C. 1061), is amended by (1) deleting the phrase "shall be", first occurrence, and inserting in its place the word "is"; and (2) inserting the following immediately after the phrase "United States", third occurrence: ", or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States".

SEC. 15. Section 13 of title 35, United States Code, is amended by deleting "(a)" and inserting in its place "(d)".

SEC. 16. Section 173 of title 35, United States Code, is amended to read as follows: "Patents for designs shall be granted for the term of fourteen years."

SEC. 17. (a) Sections 1, 2, 4, 7, and 13 through 15 of this Act shall take effect on the date of enactment of this Act. Sections 3 and 16 of this Act shall take effect on Oct. 1, 1982. The maintenance fees provided for in section 3(b) of this Act shall not apply to patents applied for prior to the date of enactment of this Act. Each patent applied for on or after the date of enactment of this Act shall be subject to the maintenance fees established pursuant to section 3(b) of this Act or to maintenance fees hereafter established by law, as to the amounts paid and the number and timing of the payments.

(b)(1) Title 35, United States Code, is amended by inserting after section 293 the following new section of chapter 29:

#### "§ 294. Voluntary arbitration

"(a) A contract involving a patent or any right under a patent may contain a provision requiring arbitration of any dispute relating to patent validity or infringement arising under the contract. In the absence of such a provision, the parties to an existing patent validity or infringement dispute may agree in writing to settle such dispute by arbitration. Any such provision or agreement shall be valid, irrevocable, and enforceable, except for any grounds that exist at law or in equity for revocation of a contract.

"(b) Arbitration of such disputes, awards by arbitrators and confirmation of awards

Filing Date

Effective dates.

35 USC 41 note.

Awards.  
9 USC 1 et seq.  
35 USC 282.

shall be governed by title 9, United States Code, to the extent such title is not inconsistent with this section. In any such arbitration proceeding, the defenses provided for under section 282 of this title shall be considered by the arbitrator if raised by any party to the proceeding.

"(c) An award by an arbitrator shall be final and binding between the parties to the arbitration but shall have no force or effect on any other person. The parties to an arbitration may agree that in the event a patent which is the subject matter of an award is subsequently determined to be invalid or unenforceable in a judgment rendered by a court to competent jurisdiction from which no appeal can or has been taken, such award may be modified by any court of competent jurisdiction upon application by any party to the arbitration. Any such modification shall govern the rights and obligations between such parties from the date of such modification.

"(d) When an award is made by an arbitrator, the patentee, his assignee or licensee shall give notice thereof in writing to the Commissioner. There shall be a separate notice prepared for each patent involved in such proceeding. Such notice shall set forth the names and addresses of the parties, the name of the inventor, and the name of the patent owner, shall designate the number of the patent, and shall contain a copy of the award. If an award is modified by a court, the party requesting such modification shall give notice of such modification to the Commissioner. The Commissioner shall, upon receipt of either notice, enter the same in the record of the prosecution of such patent. If the required notice is not filed with the Commissioner, any party to the proceeding may provide such notice to the Commissioner.

"(e) The award shall be unenforceable until the notice required by subsection (d) is received by the Commissioner."

(2) The analysis for chapter 29 of title 35 of the United States Code is amended by adding at the end the following:

"294. Voluntary arbitration."

(c) Sections 5, 6, 8 through 12, and 17(b) of this Act shall take effect six months after enactment.

Approved Aug. 27, 1982.

#### LEGISLATIVE HISTORY-H.R. 6260

HOUSE REPORT No. 97-542 (Comm. on the Judiciary).

CONGRESSIONAL RECORD, Vol. 128 (1982):

June 8, considered and passed House.

Aug. 12, considered and passed Senate.

WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS, Vol. 18, No. 36 (1982):

Aug. 28, Presidential statement.

#### (44) 97TH CONGRESS HOUSE OF REPRESENTATIVES REPORT

2d Session

No. 97-542

#### PATENT AND TRADEMARK OFFICE AUTHORIZATION

May 17, 1982.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. KASTENMEIER, from the Committee on the Judiciary, submitted the following REPORT

[To accompany H.R. 6260]

[Including cost estimate of the Congressional Budget Office]

The Committee on the Judiciary, to whom was referred the bill (H.R. 6260) to authorize appropriations to the Patent and Trademark Office in the Department of Commerce, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

The amendment strikes out all after the enacting clause of the bill and inserts a new text which appears in italic type in the reported bill.

#### PURPOSE OF THE BILL

The purpose of H.R. 6260 is to authorize appropriations for the Patent and Trademark Office for fiscal years 1983 through 1985.

#### STATEMENT

The Subcommittee on Courts, Civil Liberties and the Administration of Justice previously held two days of hearings on the legislation, receiving testimony from a representative group of witnesses including the Commissioner of Patents and Trademarks, the American Bar Association Section of Patent, Trademark and Copyright Law, the American Patent Law Association, the Patent, Trademark and Copyright Section of the State Bar of Virginia, the United States Trademark Association and the General Patent Counsel of the General Electric Corporation.

H.R. 6260 reflects the recommendation of the Administration with three modifications as follows. First, the Administration proposal authorized the Commissioner of Patents and Trademarks to establish fees administratively. The subcommittee approved an amendment to set forth

Modification.

Notices  
Modification.



specific fees in the statute and limited the Commissioner's authority to raise fees. Second, the Administration recommended that user fees recover 100% of the costs of actual processing of patents and trademarks. The subcommittee amended the bill to reduce by 50% patent filing and maintenance fees for individual inventors, small businesses and not for profit institutions. The effect of the amendment is to increase by \$8 million the authorized appropriation which would have been provided under the original Administration request. Third, the subcommittee adopted a recommendation of the Commissioner of Patents and Trademarks, the American Bar Association and a coalition of corporate patent counsel permitting arbitration of patent disputes.

H.R. 6260 was considered by the Full Committee on the Judiciary on May 11, 1982 and was approved as reported by the subcommittee with an amendment offered by Mr. Frank described below.

## SYNOPSIS OF H.R. 6260

## SECTIONS 1-3

Authorizes the Patent and Trademark Office for fiscal year 1983 at an appropriations level of \$76,000,000 and for fiscal years 1984 and 1985 such sums as may be necessary. This would be augmented by additional fee income under the bill of approximately \$79 million for a total budget of \$155 million. In fiscal year 1982 the Patent and Trademark Office was authorized at a level of \$118,961,000 of which \$29,600,000 was provided through fee income. Fiscal year 1983 will be the first year in which fee income under P.L. 96-517 will be credited to the Patent and Trademark Office without being counted as part of its authorized appropriation. Had this new accounting procedure been applied to fiscal year 1982 the authorization and appropriation for the Patent and Trademark Office would have been \$89 million. This constitutes the actual level of taxpayer support of the Office. Thus, H.R. 6260 authorizes the expenditure of tax revenue in fiscal 1983 to support the Patent and Trademark Office at a level \$21 million lower than for fiscal 1982. H.R. 6260 proposes to double current fees as the means of making up for the difference between a lower level of taxpayer support and an increased total budget. Further, maintenance fees which were first authorized in P.L. 96-517 and which will not begin to be collected until fiscal year 1986 (Oct. 1, 1985) will also be doubled over the amounts provided for under P.L. 96-517.

The overall objective of H.R. 6260 is to provide for increased user support for the Patent and Trademark Office costs associated with the actual processing of patent applications by fiscal year 1996. The fee schedule is designed to return to the government 100% of actual costs. However, an amendment to the original Administration proposal adopted by the subcommittee would reduce by half the fees for individuals, small businesses and nonprofit inventors. At the present time less than 25% of the actual costs of processing patent applications are supported by fee revenue and under P.L. 96-517, which becomes effective on Oct. 1, 1982, this amount will gradually begin to rise but will only reach 50% of actual costs in 1996.

The amendment offered by Mr. Frank and approved by the Committee modifies that portion of Section 3 of H.R. 6260 dealing with Trademark fees. Public Law 96-517 (35 United States Code, section 31(a)) provides, "Fees will be set and adjusted by the Commissioner to recover in aggregate 50 per centum of the estimated average cost to the Office of such processing. Fees for all other services or materials related to trademarks and other marks will recover the estimated average cost . . . of performing the service or furnishing the material."

The Administration requested that the figure, "50 per centum", be changed to "100 per centum", thus mandating full recovery to the Treasury of all costs associated with processing trademarks. An amendment offered during subcommittee consideration of the legislation proposed to reduce fee generated revenue supporting processing of trademarks to less than the 100 per centum recovery level. The amendment was not agreed to. The author of the amendment, Mr. Frank, then proposed to amend the law to provide a statutory fee schedule which would return revenue to the Patent and Trademark Office at a level designed to recover 100 per centum of costs. However, following consultations with interested parties, Mr. Frank modified his amendment simply to repeal those portions of P.L. 96-517 which mandate a specified level of cost recovery for the processing of trademark registrations. Thus, the level of cost recovery for processing of trademark registrations will be within the discretion of the Commissioner. The Committee is aware of the concerns of users of the Trademark registration system, however, and intends to exercise vigorous oversight with respect to the Commissioner to ensure that fees remain at a reasonable level and that trademark registrations are processed in an efficient and cost effective manner. As part of this oversight, the Committee recommends the following fee structure to the Commissioner for Fiscal Year 1983.

Type of fee:	Proposed fee
Application filing fee per class.....	\$175
Renewal fee .....	300
Late renewal .....	100
Section 12(c) claim .....	100
New certificate.....	100
Certificate of correction .....	100
Disclaimer to registration.....	100
Amendment to registration.....	100
Per class combines section 8 and 15 affidavit.....	200
Per class section 8 affidavit alone.....	100
Per class section 15 affidavit alone .....	100
All petitions to Commissioner .....	100
Cancellation opposition per class .....	200
TTAB appeal .....	100
Certified copies.....	10

Copies of trademarks.....	1
Assignments.....	1
*100 plus for each mark in addition to 1.	

Section 3(d) also permits the Commissioner of Patents to accept late payment of maintenance fees where it is established that the delay in payment was unavoidable.

Section 4 permits the Commissioner of Patents and Trademarks to appoint temporary examiners in chief for the Board of Patent Appeals to deal more flexibly with workload.

Section 5 permits late filing of the oath and fee accompanying submission of specifications and drawings which accompany patent claims.

Section 6 permits greater flexibility in correcting mistakes in the naming of inventors on a patent application.

Section 7 allocates funds from the Patent and Trademark Office to the Department of State to pay the financial obligations of administering the patent Cooperation Treaty.

Section 8 clarifies the Trademark law with respect to what constitutes use of a mark "in commerce".

Section 9 deletes the burdensome technical requirement that trademark oppositions be verified.

Section 10 makes the date of registration rather than the date of publication the crucial date for purposes of establishing the incontestability of a trademark. This eliminates an ambiguity in the present law.

Section 11 limits the declaration of interferences under the trademark law to situations where extraordinary circumstances exist.

Section 12 authorizes the Commissioner of the Patent and Trademark Office the flexibility to deal with problems of delay in filing due to postal service breakdowns.

Section 13 permits the Commissioner of Patents to enter into cooperative studies, programs, exchanges and similar ventures associated with the administration of the Patent Office.

Section 14 conforms U.S. Patent and Trademark Law to a recent international treaty governing diplomatic or consular legalization of documents.

Section 15 corrects a mistaken citation in P.L. 96-517.

Section 16 creates a uniform term for design patents.

Section 17 establishes the effective dates for provisions of the Act. Increased filing fees would apply to all applications made on or after the date of enactment of H.R. 6260.

Section 18 permits voluntary arbitration of patent disputes.

SECTION-BY-SECTION ANALYSIS  
SECTION 1

This section authorizes appropriations for the Patent and Trademark Office for the payment of salaries and necessary expenses of the Office. For Fiscal Year 1983, this section authorizes appropriations of \$76,000,000, and in fiscal years 1984 and 1985 such sums as may be necessary, as well as such additional and supplemental amounts as may be necessary to cover any increases in salary, pay, retirement, or employee benefits which may be authorized by law. Funds made available by these appropriations are to be used to reduce by 50 per centum the amount of the fees to be paid under title 35, United States Code, section 41(a) and (b) by independent inventors and nonprofit organizations as defined in regulations established by the Commissioner of Patents and Trademarks, and by small business concerns as defined in section 3 of the Small Business Act and by regulations established by the Small Business Administration.

In addition, fees collected pursuant to title 35, United States Code, and the Trademark Act of 1946, as amended (15 U.S.C. 1051 et seq.), will augment the authorized appropriation to provide the resources needed to conduct the operations of the Office for fiscal year 1983. The total resources for the Office in fiscal year 1983, that is, the amount appropriated pursuant to this section plus fees collected pursuant to the patent and trademark laws, which will be available to the Office, are estimated to be \$154,934,000. The corresponding levels for fiscal year 1984 and fiscal year 1985 are estimated in the President's Budget to be \$167 million and \$176 million, respectively. Any additional amounts to cover increases in salary, pay, retirement, or other employee benefits which may be authorized by law will be in addition to, and will therefore increase, those program levels. Finally, any funds appropriated pursuant to this section and all fees collected, when specified in an appropriation act, will remain available without any fiscal year limitation.

## SECTION 2

This section provides that, notwithstanding any other provision of law, there is authorized to be appropriated to the Patent and Trademark Office for fiscal year 1982, \$121,461,000 and such additional or supplemental amounts as may be necessary for increases in salary, pay, retirement, or other employee benefits authorized by law. This section increases the amount authorized for the Patent and Trademark Office by 2.5 million over that authorized in Public law 97-35. The President is recommending a supplemental appropriation of \$2,500,000 for the Patent and Trademark Office for fiscal year 1982 in order to carry out the program recommendations included in his fiscal year 1983 Budget.

## SECTION 3

This section establishes certain statutory fees which are to be charged by the Commissioner and authorizes the Commissioner to establish other fees whose amounts are not specifically set. Thus, the major routine fees which are applicable to patents and patent application processing are established (e.g., filing, issuance, and maintenance fees). The Commissioner is authorized to establish fees for all other processing, services, or materials related to patents which are not specifically established by statute. The processing and service fees, which would be established



at a level to recover the estimated average costs to the Office. A more specific discussion of the various provisions of this section is set forth below.

Section 3(a) amends section 41(a) of title 35 to provide the amounts of the fees for filing and issuance of patent applications. In addition, the section includes provisions for increasing the filing fees due to increased complexities presented by certain applications, e.g., applications containing more than a specified number of claims and any application containing a multiple dependent claim. The section also provides that fees will be charged when the number of claims is increased above the specified number or when a multiple dependent claim is first presented, whether on filing or at a later point in processing.

Under section 41(a)1, the filing fee for an original patent, except in design or plant cases, is \$300. In addition, on filing or on presentation at any other time, \$30 is due for each claim in independent form which is in excess of three, \$10 is due for each claim (whether independent or dependent) which is in excess of twenty, and \$100 is due for each application containing a multiple dependent claim. The latter fee is a one-time charge per application due the first time a multiple dependent claim is presented for examination. For the purpose of computing fees, a multiple dependent claim as referred to in section 112 of title 35, United States Code, or any claim depending therefrom, will be considered as separate dependent claims in accordance with the number of claims to which reference is made. Under the section, errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner. This will enable the Commissioner to establish regulations whereby patent applications may correct, without prejudice, errors in the additional fees, i.e., those in addition to the basic fees established.

Under section 41(a)2, the fee for issuing all original and reissue patents, except in design or plant cases, would be a uniform amount of \$500. No supplemental issue fees are required.

Section 41(a)3 establishes fixed fees for filing applications for, and issuance of design and plant patents. For design patent cases, the filing fee would be \$200 and the issue fee \$250.

Section 41(a)4 relates to fees in reissue cases and establishes a fee of \$300 for filing each application for the reissue of a patent. In addition, on filing or on presentation at any other time, \$30 is due for each claim in independent form which is in excess of the number of independent claims of the original patent, and \$10 is due for each claim (whether independent or dependent) which is in excess of twenty and also in excess of the number of claims of the original patent. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

Under section 41(a)5, a fee of \$50 would be established for filing each disclaimer in a patent or patent application.

Section 41(a)6 establishes a fee due on filing an appeal from the examiner to the Board of Appeals of \$115. In addition, a fee of \$115 is due on filing a brief in support of the appeal, and a fee of \$100 is due for requesting an oral hearing before the Board of Appeals.

Section 41(a)7 establishes two different fees for filing petitions with different standards to revive abandoned patent applications. The same two fees are applicable to petitions to accept the delayed payment of the fee for issuing a patent. The fees set forth in this section are due on filing the petition. Since the section provides for two alternative fees with different standards, the section would permit the applicant seeking revival or acceptance of a delayed payment of the fee for issuing a patent to choose one or the other of the fees and standards under such regulations as the Commissioner may establish. Under the section the Commissioner could establish time limits within which petitions under each of the different fees and standards can be filed. The section establishes a fee of \$500 for filing each petition for revival or for acceptance of the delayed payment of an issue fee where the abandonment or the failure to pay the issue fee is unintentional. In order to prevent abuse and injury to the public the Commissioner could require a terminal disclaimer equivalent to the period of abandonment and could require applicants to act promptly after becoming aware of the abandonment. The section establishes a fee of \$50 for filing a petition under sections 133 or 151 of title 35 in accordance with standards presently in effect requiring that the delay resulting in the abandonment, or the delay in payment of the issue fee, be unavoidable. Under this section a petition accompanied by either a fee of \$500 or a fee of \$50 would not be granted where the abandonment or the failure to pay the fee for issuing the patent was intentional as opposed to being unintentional or unavoidable. This section would permit the Commissioner to have more discretion than present law to revive abandoned applications and accept late payment of the fee for issuing a patent in appropriate circumstances.

Section 41(a)8 establishes fees for filing of petitions for extensions of time. Various time periods are set by the Office for taking actions on matters relating to patent applications. These time periods are set pursuant to statute or by regulations established by the Commissioner under the authority granted to the Commissioner by statute. This section would provide for fees for filing petitions to extend the time periods set pursuant to statute or by regulations for taking action within any limitations set by statute.

A fee of \$50 is established for filing a request for a first one month extension of time, an additional fee of \$100 for filing a request for a second one month extension of time which would expire two months after the end of the time period set for taking action, and an additional fee of \$200 for filing a request for a third one month extension of time which would expire three months after the end of the time period set for taking action. A subsequent or fourth extension could be requested if additional time was available under the statute. In no case could a period be extended beyond the maximum time set by statute.

The Commissioner may issue regulations providing when, within any maximum period permitted by statute, petitions for extensions of time, and the required fee therefor, may be filed. This section does preclude the Commissioner from waiving the fee for filing a petition for an extension of time where the Office extends the period due to equity considerations or sufficient cause.

Section 41(b) provides that the Commissioner charge the following fees for maintaining a patent other than a design or plant patent, in force: at three years and six months after grant, \$400; at seven years and six months after grant, \$800; and at eleven years and six months after grant, \$1,200. Unless payment of the applicable maintenance fee is received in the Patent and

Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of a maintenance fee.

In order to avoid an inequitable loss of patent rights, the Commissioner is given the authority to accept payment of any maintenance fee after the six-month grace period if it is established that the delay in payment was unavoidable. It is intended that the Commissioner will issue regulations establishing guidelines for acceptance of late payment. After the expiration of a reasonable period of time, the patentee would bear a heavy burden of proof that the delay was unavoidable. A surcharge may be imposed by the Commissioner as a precondition to acceptance of a late fee. This surcharge may be in addition to any surcharge imposed for payment during the grace period.

A provision is included to protect the rights of one who began using or who took steps to begin use of a patent which expired for failure to pay a maintenance fee and which was subsequently reestablished by acceptance of the late payment. The intervening rights provision in section 41(c)(2) is similar to the intervening rights provision in 35 U.S.C. 252 concerning reissued patents.

Section 41(d) provides that the Commissioner establish fees for all other processing services, or materials related to patents not specified in section 41 at an amount calculated to recover the estimated average cost to the Office of such processing, services, or materials. Such processing and other services includes, but is not limited to, the processing of various petitions desiring certain actions to be taken regarding patent applications, recording of assignments, reexamination of patents and the processing of international applications. Fees for materials include the price of patent copies, certifications and other copying services. The yearly fee for providing a library specified in section 13 of title 35 with uncertified copies of the specifications and drawings for all patents issued in that year is set at \$50.

Section 41(f) provides that the fees established in subsections (a) and (b) of section 41 may be adjusted by the Commissioner on Oct. 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Changes of less than one per centum may be ignored by the Commissioner in making such adjustments.

Subsection (a) of section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), is being changed to grant the Commissioner discretion to establish the level of recovery of office costs related to trademarks. It is expected that the Commissioner will set the fees in a way that the filing fee will be kept as low as possible to foster use of the Federal registration system. This may require that other fees for services or materials related to trademarks recover more than their actual estimated cost in order that the Commissioner achieve in the aggregate adequate cost recovery for the entire trademark operation.

A provision is inserted in section 42(c) of title 35 in order to ensure that the trademark fees collected are used to fund trademark operations only and not the processing of patent applications.

#### SECTION 4

Section 3 of title 35 is amended by deleting specific reference to the number of examiners-in-chief in the first sentence. Elimination of the upper limit on the number of permanent members of the Board of Appeals would provide greater flexibility in filling most of its personnel needs, thereby avoiding an excess of examiner details. The authority to appoint acting examiners-in-chief, however, is maintained in order that temporary fluctuations in the workload of the Board may be accommodated.

#### SECTION 5

Under revised section 111 of title 35, the filing date of an application would be that on which the specification and any required drawings are received by the Patent and Trademark Office. The oath or declaration and filing fee could be submitted at such later time as established by the Commissioner, without any loss of the original filing date. Under the amendment, an applicant could either file the oath or declaration (including the applicant's signature) and fee together with an application or submit them at a later time as determined by the Commissioner.

The section would also authorize the imposition of a surcharge as a condition for accepting filing of the oath of payment of the filing fee after the filing date of the application. Since an application filed without the oath or declaration would not be signed or "made" by the applicant, the amendment permits a patent attorney or agent, authorized by the applicant, to submit the specification and drawings for the purpose of obtaining a filing date. Should the applicant, however, fail to file the oath or declaration, or pay the filing fee within the time limits set by the Commissioner, the application would be regarded as having been abandoned.

#### SECTION 6

The third paragraph of section 116 of title 35 is amended to enlarge the possibilities for correcting misnamed inventive entities. As a consequence, correction would be permitted also in cases where the person originally named as inventor was in fact not the inventor of the subject matter contained in the application. If such error occurred without any deceptive intention on the part of the true inventor, the Commissioner would have the authority to substitute the true inventor for the erroneously named person. Although probably rarer, instances such as changes from a mistakenly identified sole inventor to a different, but actual, joint inventors, conversions from erroneously identified joint inventors to different but actual, joint inventors, and conversions from erroneously identified joint inventors to a different, but actual, sole inventor would also be permitted. In each instance, however, the Commissioner must be assured of the presence of innocent error, without deceptive intention on the part of the true inventor or inventors, before permitting substitution of a true inventor's name.



The ability to receive a filing date based on a specification and drawings without signature as set forth in revised section 111 of title 35, and to file the oath or declaration and pay the filing fee within such period as determined by the Commissioner is also available to joint inventors.

Section 256 of title 35, which is a companion to section 116, would be amended to similarly enlarge the possibilities for correction of misnamed inventors in issued patents.

## SECTION 7

Section 6(d) of title 35, which provides for the allocation of appropriated Patent and Trademark Office funds to the Department of State for payment of United States financial obligations under the Patent Cooperation Treaty, is deleted. The Department of State has traditionally assumed responsibility for financial obligations for international agreements to which the United States adheres.

## SECTION 8

Section 8(a) of the Trademark Act is amended to clarify that the continued use required to be shown in the sixth year be use "in commerce". Although it is believed by some that omission of the words "in commerce" may have been inadvertent in the 1946 Act, this section has been interpreted so that use in a foreign country, or use in intrastate commerce, is sufficient. Such interpretation is fundamentally in conflict with other requirements of the Act.

Section 8(b) of the Act is also amended to clarify that the continued use required to be shown in the sixth year be use "in commerce". Although it is believed by some that omission of the words "in commerce" may have been inadvertent in the 1946 Act, this section has interpreted so that use in a foreign country, or use in intrastate commerce, is sufficient. Such interpretation is fundamentally in conflict with other requirements of the Act.

Section 8(b) of the Act is also amended to clarify that the continued use required to be shown in the sixth year be use "in commerce" for registrations published under section 12(c) of the Act. (This pertains to registrations issued under the Act of Mar. 3, 1881 and the Act of Feb. 20, 1905).

The word "still" has been deleted from section 8(a) and 8(b). Thus, the owner of a registration issued on the basis of a foreign registration under the provisions of section 44(e) of the Act will have to submit an affidavit to the effect that the mark is in use in commerce. Since the mark need not be used in commerce when it is registered, the requirement cannot be required to state that it is "still" in such use.

## SECTION 9

Section 13 of the Trademark Act is amended to delete the requirement that an opposition be verified. The sentence which allowed an unverified application to be verified at a later date has been deleted. In addition, a phrase has been added to make it clear that any subsequent extension of time to file an opposition, beyond the first extension, must be requested before the end of the preceding extension.

Section 14 of the Trademark Act would also be amended to delete the requirement that a petition to cancel a registration be verified.

## SECTION 10

Section 15 of the Trademark Act is amended to change the term "the publication" to "registration" in the first sentence. This change makes the date of registration rather than the date of publication the crucial date for purposes of incontestability. It will also make section 15 consistent with sections 22 and 33 of the Act.

## SECTION 11

Section 16 of the Trademark Act is amended to limit the declaration of interferences to those situations where a petition to the Commissioner shows that extraordinary circumstances exist, the rights of the parties can be determined adequately by the existing opposition and cancellation procedures. Additionally, if an interference is declared between an application and a registration and the applicant wins, a cancellation must still be initiated against the registration.

## SECTION 12

A new subsection (a) has been added to section 21 of title 35 to authorize, but not to require, the Commissioner of Patents and Trademarks to give as the filing date of any paper or fee which is required to be filed in the Patent and Trademark Office the date on which the paper or fee was deposited with the United States Postal Service. The Commissioner may also give as the filing date of any paper or fee which was required to be filed in the Patent and Trademark Office the date it would have been deposited with the United States Postal Service but for postal service interruptions or emergencies which the Commissioner designates. The requirements governing whether any given paper or fee may be given the filing date of the day on which it was, or would have been deposited with the United States Postal Service will be set forth in regulations established by the Commissioner.

Section 21(b) of title 35 is identical to existing section 21 with two minor amendments. The word "federal" has been inserted before the phrase "holiday within the District of Columbia" to clarify the nature of the holiday.

## SECTION 13

This section clarifies the authority of the Commissioner in section 6(a) of title 35 to enter into a wide range of cooperative agreements concerning the patent and trademark laws or the administration of the Patent and Trademark Office. These agreements are in addition to the exchange of publications authorized in 35 U.S.C. 11(b) and 12. These cooperative agreements may take the form of studies, programs, exchanges, and other similar ventures. Thus, the Patent and Trademark Office could, for example, exchange patent copies, non-patent literature, tapes or services in return for goods or services of value to the Patent and Trademark Office.

## SECTION 14

The amendments of 35 U.S.C. 115 and Section 11 of the Trademark Act of 1946 recognize the Hague "Convention Abolishing the Requirement of Legalization for Foreign Public Documents" which entered into force in the United States on Oct. 15, 1981. The Convention abolishes the requirement of diplomatic or consular legalization for foreign public documents which are sworn to or acknowledged by a notary public in any of the countries adhering to the Convention. For documents executed by a notary public of all other foreign countries, diplomatic or consular legalization will still be required.

The amendment of 35 U.S.C. 261 is intended to give affirmative effect to acknowledgments executed pursuant to the Hague Convention.

## SECTION 15

This section corrects an incorrect citation. Public Law 96-517 amended section 41 of title 35, United States Code, in a way which eliminated 35 U.S.C. § 41(a)(9). Unfortunately, section 13 of title 35, United States Code, was not amended accordingly by Public Law 96-517. This section corrects that oversight.

## SECTION 16

This section sets a uniform term of fourteen years for all design patents.

## SECTION 17

Sections 17(a) and (c) specify the effective dates of the Act. Section 17(a) also specifies that the maintenance fees provided for in section 3(b) of this Act will only apply to patents in which the application was filed on and after the date of enactment or to maintenance fees later established by law.

Section 17(b) adds a section to title 35 providing for the voluntary arbitration of patent disputes by the parties to the dispute. The section requires that the Commissioner be notified in writing of an award made by an arbitrator or modified by a court. Such notification will be entered in the record of the prosecution of the patent.

At present, agreements to arbitrate some aspects of disputes arising under patent licenses are enforceable by the courts; however, there have been court decisions that have disapproved arbitration of disputes concerning patent validity or infringement. In this regard, see, for example, *Zip Mfg. Co. v. Pep Mfg. Co.* 44 F.2d 184, 7 U.S.P.Q. 62 (D. Del. 1930) and *Beckman Instruments, Inc. v. Technical Developments Corp.* 433 F.2d 55, 167 U.S.P.Q. 10 (7th Cir. 1965).

Partly as a reaction to those decisions, during the 93rd Congress both the Department of Commerce and the Department of Justice endorsed a provision specifically authorizing arbitration of validity and infringement disputes. This provision, included in an omnibus patent law revision bill, S. 2504, was never enacted due to the many controversial aspects of that legislation.

In the view of the Committee, a statutory authorization of voluntary agreements to arbitrate validity and infringement disputes would benefit both the parties to these disputes and the public.

Statutory endorsement of arbitration agreements would assure the parties that they could avail themselves of the numerous advantages of arbitration without the possibility of having to reargue the dispute in court. The advantages of arbitration are many: it is usually cheaper and faster than litigation; it can have simpler procedural and evidentiary rules; it normally minimizes hostility and is less disruptive of ongoing and future business dealings among the parties; it is often more flexible in regard to scheduling of times and places of hearings and discovery devices; and, arbitrators are frequently better versed than judges and juries in the area of trade customs and the technologies involved in these disputes.

The enforcement of voluntary arbitration provisions would serve the public in two ways. First, the availability of arbitration with its numerous advantages will enhance the patent system and thus will encourage innovation. This view is supported by the Committee for Economic Development in their Jan. 1980 statement entitled "Stimulating Technological Progress." Secondly, arbitration could relieve some of the burdens on the overworked Federal courts. Chief Justice Burger in his speech to the American Bar Association on Jan. 24, 1982, generally endorsed the use of arbitration to reduce the judicial backlog. Also, I think it is important to note that the American Bar Association's Section on Patent, Trademark and Copyright Law has endorsed court enforcement of arbitration agreements calling for arbitration of validity and infringement.

The recommendations of the Secretary of Commerce to increase substantially patent and trademark user fees were made on the promise that such increases "will lay the groundwork for revitalizing the patent and trademark systems." The Secretary committed to three major goals: (1) to reach an average patent application pendency time of 18 months by FY 1987, (2) to issue an examiner's first action on trademark registrability in three months and disposal of an application within 13 months, and (3) to move realistically toward a fully automated Office by the 1990's. In accepting the Administration's recommendations on user fees, the Committee fully expects the Administration to live up to its end of the bargain to bring about a first-class Patent and



Trademark Office. To provide an opportunity for timely and effective Committee oversight of progress toward improving the Patent and Trademark Office, the Committee directs that the Secretary of Commerce report annually to the Committee on progress toward achieving the three major goals of the Patent and Trademark Office, as outlined above, and, in addition, promptly inform the Committee at any time it appears that any of the goals, for any reason, is viewed as not attainable.

## OVERSIGHT STATEMENT

The Committee on the Judiciary has oversight responsibility over the Patent and Trademark Office in the Department of Commerce. In addition to its ongoing oversight, the Committee's Subcommittee on Courts, Civil Liberties and the Administration of Justice held an oversight hearing with respect to the Patent and Trademark Office on Mar. 4, 1981, published as Oversight Hearings Before the Subcommittee on Courts, Civil Liberties and the Administration of Justice of the Committee on the Judiciary, House of Representatives, Ninety-Seventh Congress, First Session on the Copyright Office, The U.S. Patent and Trademark Office, and the Copyright Royalty Tribunal. Serial No. 17.

The Committee expects to continue its oversight activities in this area.

## STATEMENT OF THE BUDGET COMMITTEE

No statement has been received on H.R. 6260 from the House Committee on the Budget.

## STATEMENT OF THE CONGRESSIONAL BUDGET OFFICE

Pursuant to clause 7, rule XIII of the Rules of the House of Representatives and section 403 of the Congressional Budget Act of 1974, the following is the cost estimate of H.R. 6260, as amended, prepared by the Congressional Budget Office.

U.S. CONGRESS  
CONGRESSIONAL BUDGET OFFICE,  
Washington, D.C., May 13, 1982.

Hon. PETER W. RODINO, Jr.,  
*Chairman, Committee on the Judiciary, House of Representatives, Washington, D.C.*

DEAR MR. CHAIRMAN: Pursuant to Section 403 of the Congressional Budget Act of 1974, the Congressional Budget Office has prepared the attached cost estimate for H.R. 6260, a bill to authorize appropriations to the Patent and Trademark Office in the Department of Commerce, and for other purposes.

Should the Committee so desire, we would be pleased to provide further details on this estimate.  
Sincerely

ALICE M. RIVLIN,  
*Director.*

## CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

1. Bill number: H.R. 6260.
2. Bill title: A bill to authorize appropriations to the Patent and Trademark Office in the Department of Commerce, and for other purposes.
3. Bill status: As ordered reported by the House Committee on the Judiciary, May 11, 1982.  
Bill purpose: H.R. 6260 would authorize 1982 appropriations at a level \$2.5 million above the amount already appropriated, and would provide a \$76 million authorization level in 1983 to carry out the activities of the Patent and Trademark Office (PTO). In addition, such sums as may be necessary are authorized for fiscal years 1984 and 1985, plus such additional or supplemental amounts as may be necessary for increases in salary, pay, retirement, or other benefits authorized by law for each fiscal year 1983 through 1985. PTO would also have available for obligation offsetting fee collections as provided for in Public Law 96-517, plus the additional fees as specified in H.R. 6260.

Assuming enactment of H.R. 6260, total PTO collections over time would result in recovery of approximately 100 percent of patent and trademark processing costs. Individuals, small businesses, and non-profit institutions would be exempt from the proposed additional fees, however, but would continue to follow the fee schedule outlined in P.L. 96-517, which assumes the ultimate recovery of approximately 50 percent of all processing costs.

The President's 1982 budget includes a request for a \$2.5 million supplemental for the PTO. The Administration has recommended increasing user fees to ultimately recover 100 percent of processing costs beginning in 1983, but does not provide for any exemptions to the proposed fee increases relative to current law. The effect of exemptions is to increase by approximately \$8 million the authorized level of appropriations relative to the Administration's request.

In addition, the bill would make a number of other changes that are not expected to have a cost impact.

5. Cost estimate:

[By fiscal years, in millions of dollars]

	1982	1983	1984	1985	1986
Authorization level:					
Specified .....	2.5	76.0	....	....	....
Estimated .....	....	6.8	86.4	86.8	....

Subtotal .....	2.5	82.8	86.4	86.8	....
Total estimated outlays .....	2.4	61.8	82.4	82.8	5.5

Including outlays from appropriations to date for PTO, total 1982 outlays are estimated to be \$121.5 million, and total 1983 outlays are estimated to be \$79.8.

The costs of this bill fall within budget subfunction 376.

6. Basis of estimate: The authorization levels for PTO for 1982 and 1983 are those specified in the bill. The estimate authorization levels for 1984 and 1985 assume a level of funding sufficient to maintain a program level of \$167 million and \$176 million, respectively, including offsetting collections. In addition, authorization for increases in pay and other benefits of approximately \$6.8 million, \$7.4 million, and \$7.8 million for fiscal years 1983 through 1985, respectively, were estimated based on CBO's current inflators. Outlays are based on historical spending patterns.

The estimated collections to PTO as a result of fees charged to cover the costs of processing trademarks and patents were provided by the agency, and assume the fee structure outlined in the bill. The estimated collections, under current law and under H.R. 6260, are shown in the table below.

[By fiscal years, in millions of dollars]

	1982	1983	1984	1985	1986
Estimated offsetting collections:					
Current law .....	....	47.8	52.7	57.7	....
Added by H.R. 6260 .....	....	31.2	35.3	39.3	....
Total H.R. 6260 .....	....	79.0	88.0	97.0	....

7. Estimate comparison: None.

8. Previous CBO estimate: None.

9. Estimate prepared by: Mary B. Maginniss.

10. Estimate approved by: C. G. Nuckols (James L. Blum, Assistant Director for Budget Analysis).

## COMMITTEE VOTE

The Committee on the Judiciary ordered H.R. 6260 as amended reported by a voice vote, without objection being heard, with a quorum of Members being present.

## CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3 of Rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italics, existing law in which no change is proposed is shown in roman):

TITLE 35, UNITED STATES CODE  
PART 1—PATENT AND TRADEMARK OFFICE

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## CHAPTER 1—ESTABLISHMENT, OFFICERS, FUNCTIONS

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## § 3. Officers and employees.

(a) There shall be in the Patent and Trademark Office a Commissioner of Patents and Trademarks, a Deputy Commissioner, two Assistant Commissioners, and [not more than fifteen] examiners-in-chief appointed under section 7 of this title. The Deputy Commissioner, or, in the event of a vacancy in that office, the Assistant Commissioner senior in date of appointment shall fill the office of Commissioner during a vacancy in that office until the Commissioner is appointed and takes office. The Commissioner of Patents and Trademarks, the Deputy Commissioner, and the Assistant Commissioners shall be appointed by the President, by and with the advice and consent of the Senate. The Secretary of Commerce, upon the nomination of the Commissioner, in accordance with law shall appoint all other officers and employees.

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## § 6. Duties of Commissioner.

(a) The Commissioner, under the direction of the Secretary of Commerce, shall superintend or perform all duties required by law respecting the granting and issuing of patents and the registration of trademarks; shall have the authority to carry on studies [and] programs, or exchanges of items or services regarding domestic and international patent and trademark law or the administration of the Patent and Trademark Office, and shall have charge of property belonging to the Patent and Trademark Office. He may, subject to the approval of the Secretary of Commerce, establish regulations, not inconsistent with law, for the conduct of proceedings in the Patent and Trademark Office.

(b) The Commissioner, under the direction of the Secretary of Commerce, may, in coordination with the Department of State, carry on programs and studies cooperatively with foreign patent



offices and international intergovernmental organizations, or may authorize such programs and studies to be carried on, in connection with the performance of duties stated in subsection (a) of this section.

(c) The Commissioner, under the direction of the Secretary of Commerce, may, with the concurrence of the Secretary of State, transfer funds appropriated to the Patent and Trademark Office, not to exceed \$100,000 in any year, to the Department of State for the purpose of making special payments to international intergovernmental organizations for studies and programs for advancing international cooperation concerning patents, trademarks, and related matters. These special payments may be in addition to any other payments or contributions to the international organization and shall not be subject to any limitations imposed by law on the amounts of such other payments or contributions by the Government of the United States.

(d) The Commissioner, under the direction of the Secretary of Commerce, may, with the concurrence of the Secretary of State, allocate funds appropriated to the Patent Office, to the Department of State for the purpose of payment of the share on the part of the United States to the working capital fund established under the Patent Cooperation Treaty. Contributions to cover the share on the part of the United States of any operating deficits of the International Bureau under the Patent Cooperation Treaty shall be included in the annual budget of the Patent Office and may be transferred by the Commissioner, under the direction of the Secretary of Commerce, to the Department of State for the purpose of making payments thereof to the International Bureau.]

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### § 13. Copies of patents for public libraries.

The Commissioner may supply printed copies of specifications and drawings of patents to public libraries in the United States which shall maintain such copies for the use of the public, at the rate for each year's issue established for this purpose in section 41 [(a)9] (d) of this title.

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## CHAPTER 2-PROCEEDINGS IN THE PATENT AND TRADEMARK OFFICE

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### § 21. [Day for taking action falling on Saturday, Sunday, or holiday] Filing date and day for taking action.

(a) The Commissioner may by rule prescribe that any paper or fee required to be filed in the Patent and Trademark Office will be considered filed in the Office on the date on which it was deposited with the United States Postal Service or would have been deposited with the United States Postal Service but for postal service interruptions or emergencies designated by the Commissioner.

(b) When the day, or the last day, for taking any action or paying any fee in the United States Patent and Trademark Office falls on Saturday, Sunday, or a Federal holiday within the District of Columbia, the action may be taken, or the fee paid, on the next succeeding secular or business day.

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## CHAPTER 4-PATENT FEES

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### § 41. Patent fees

(a) The Commissioner of Patents will establish fees for the processing of an application for a patent, from filing through disposition by issuance or abandonment, for maintaining a patent in force, and for providing all other services and materials related to patents. No fee will be established for maintaining a design patent in force.

(b) By the first day of the first fiscal year beginning on or after one calendar year after enactment of this Act, fees for the actual processing of an application for a patent, other than for a design patent, from filing through disposition by issuance or abandonment, will recover in aggregate 25 per centum of the estimated average cost to the Office of such processing. By the first day of the first fiscal year beginning on or after one calendar year after enactment, fees for the processing of an application for a design patent, from filing through disposition by issuance or abandonment, will recover in aggregate 50 per centum of the estimated average cost to the Office of such processing.

(c) By the fifteenth fiscal year following the date of enactment of this Act, fees for maintaining patents in force will recover 25 per centum of the estimated cost to the Office, for the year in which such maintenance fees are received, of the actual processing all applications for patents, other than for design patents, from filing through disposition by issuance or abandonment. Fees for maintaining a patent in force will be due three years and six months, seven years and six months, and eleven years and six months after the grant of the patent. Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire at the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of an applicable maintenance fee.

[(d) By the first day of the first fiscal year beginning on or after one calendar year after enactment, fees for all other services or materials related to patents will recover the estimated average cost to the Office of performing the service or furnishing the material. The yearly fee for providing a library specified in section 13 of this title with uncertified printed copies of the specifications and drawings for all patents issued in that year will be \$50.]

(a) The Commissioner shall charge the following fees:

1. On filing each application for an original patent, except in design or plant cases, \$300; in addition, on filing or on presentation at any other time, \$30 for each claim in independent form which is in excess of three, \$10 for each claim (whether independent or dependent) which is in excess of twenty, and \$100 for each application containing a multiple dependent claim. For the purpose of computing fees, a multiple dependent claim as referred to in section 112 of this title or any claim depending therefrom shall be considered as separate dependent claims in accordance with the number of claims to which reference is made. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

2. For issuing each original or reissue patent, except in design or plant cases, \$500.

3. In design and plant cases:

a. On filing each design application, \$125.

b. On filing each plant application, \$200.

c. On issuing each design patent, \$175.

d. On issuing each plant patent, \$250.

4. On filing each application for the reissue of a patent, \$300; in addition, on filing or on presentation at any other time, \$30 for each claim in independent form which is in excess of the number of independent claims of the original patent, and \$10 for each claim (whether independent or dependent) which is in excess of twenty and also in excess of the number of claims of the original patent. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

5. On filing each disclaimer, \$50.

6. On filing an appeal from the examiner to the Board of Appeals, \$115; in addition, on filing a brief in support of the appeal, \$115, and on requesting an oral hearing before the Board of Appeals, \$100.

7. On filing each petition for the revival of an unintentionally abandoned application for a patent or for the unintentionally delayed payment of the fee for issuing each patent, \$500, unless the petition is filed under sections 133 or 151 of this title, in which case the fee shall be \$50.

8. For petitions for one-month extensions of time to take actions required by the Commissioner in an application:

a. On filing a first petition, \$50.

b. On filing a second petition, \$100.

c. On filing a third or subsequent petition, \$200.

(b) The Commissioner shall charge the following fees for maintaining a patent in force:

1. Three years and six months after grant, \$400.

2. Seven years and six months after grant, \$800.

3. Eleven years and six months after grant, \$1,200.

Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of an applicable maintenance fee. No fee will be established for maintaining a design or plant patent in force.

(c)(1) The Commissioner may accept the payment of any maintenance fee required by subsection (b) of this section after the six-month grace period if the delay is shown to the satisfaction of the Commissioner to have been unavoidable. The Commissioner may require the payment of a surcharge as a condition of accepting payment of any maintenance fee after the six-month grace period. If the Commissioner accepts payment of a maintenance fee after the six-month grace period, the patent shall be considered as not having expired at the end of the grace period.

(2) No patent, the term of which has been maintained as a result of the acceptance of a payment of a maintenance fee under this subsection, shall abridge or affect the right of any person or his successors in business who made, purchased or used after the six-month grace period but prior to the acceptance of a maintenance fee under this subsection anything protected by the patent, to continue the use of, or to sell to others to be used or sold, the specific thing so made, purchased, or used. The court before which such matter is in question may provide for the continued manufacture, use or sale of the thing made, purchased, or used as specified, or for the manufacture, use or sale of which substantial preparation was made after the six-month grace period but before the acceptance of a maintenance fee under this subsection, and it may also provide for the continued practice of any process, practiced, or for the practice of which substantial preparation was made, after the six-month grace period but prior to the acceptance of a maintenance fee under this subsection, to the extent and under such terms as the court deems equitable for the protection of investments made or business commenced after the six-month grace period but before the acceptance of a maintenance fee under the subsection.

(d) The Commissioner will establish fees for all other processing, services, or materials related to patents not specified above to recover the estimated average cost to the Office of such processing, services, or materials. The yearly fee for providing a library specified in section 13 of this title with uncertified printed copies of the specifications and drawings for all patents issued in that year will be \$50.

(3) The Commissioner may waive the payment of any fee for any service or material related to patents in connection with an occasional or incidental request made by a department or agency of the Government, or any officer thereof. The Commissioner may provide any applicant issued a notice under section 132 of this title with a copy of the specifications and drawings for all patents referred to in that notice without charge.



(f) Fees will be adjusted by the Commissioner to achieve the levels of recovery specified in this section; however, no patent application processing fee or fee for maintaining a patent in force will be adjusted more than once every three times.

(f) The fees established in subsection (a) and (b) of this section may be adjusted by the Commissioner on Oct. 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Changes of less than 1 per centum may be ignored.

(g) No fee established by the Commissioner under this section will take effect prior to sixty days following notice in the Federal Register.

#### § 42. Patent and Trademark Office funding.

(a) All fees for services performed by or materials furnished by the Patent and Trademark Office will be payable to the Commissioner.

(b) All fees paid to the Commissioner and all appropriations for defraying the costs of the activities of the Patent and Trademark Office will be credited to the Patent and Trademark Office Appropriation Account in the Treasury of the United States, the provisions of section 725e of title 31, United States Code, notwithstanding.

(c) Revenues from fees will be available to the Commissioner of Patents to carry out, to the extent provided for in appropriation Acts, the activities of the Patent and Trademark Office. Fees available to the Commissioner under section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), shall be used exclusively for the processing of trademark registrations and for other services and materials related to trademarks.

(d) The Commissioner may refund any fee paid by mistake or any amount paid in excess of that required.

### PART II-PATENTABILITY OF INVENTIONS AND GRANT OF PATENTS

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#### CHAPTER 11-APPLICATION FOR PATENT

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##### § 111. Application for patent

[Application for patent shall be made by the inventor, except as otherwise provided in this title, in writing to the Commissioner. Such application shall include: (1) a specification as prescribed by section 112 of this title; (2) a drawing as prescribed by section 113 of this title; and (3) an oath by the applicant as prescribed by section 115 of this title. The application must be signed by the applicant and accompanied by the fee required by law.]

SEC. 111. Application for patent shall be made, or authorized to be made, by the inventor, except as otherwise provided in this title, in writing to the Commissioner. Such application shall include (1) a specification as prescribed by section 112 of this title; (2) a drawing as prescribed by section 113 of this title; and (3) an oath by the applicant as prescribed by section 115 of this title. The application must be accompanied by the fee required by law. The fee and oath may be submitted after the specification and any required drawing are submitted, within such period and under such conditions, including the payment of a surcharge, as may be prescribed by the Commissioner. Upon failure to submit the fee and oath within such prescribed period, the application shall be regarded as abandoned, unless it is shown to the satisfaction of the Commissioner that the delay in submitting the fee and oath was unavoidable. The filing date of an application shall be the date on which the specification and any required drawing are received in the Patent and Trademark Office.

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##### § 115. Oath of applicant

The applicant shall make oath that he believes himself to be the original and first inventor of the process, machine, manufacture, or composition of matter, or improvement thereof, for which he solicits a patent; and shall state of what country he is a citizen. Such oath may be made before any person within the United States authorized by law to administer oaths, or when, made in a foreign country, before any diplomatic or consular office of the United States authorized to administer oaths, or before any officer having an official seal and authorized to administer oaths in the foreign country in which the applicant may be, whose authority [shall be] is proved by certificate of a diplomatic or consular officer of the United States, or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States and such oath shall be valid if it complies with the laws of the state or country where made. When the application is made as provided in this title by a person other than the inventor, the oath may be so varied in form that it can be made by him.

##### § 116. [Joint inventors] Inventors.

When an invention is made by two or more persons jointly, they shall apply for patent jointly and each sign the application and make the required oath, except as otherwise provided in this title.

If a joint inventor refuses to join in an application for patent or cannot be found or reached after diligent effort, the application may be made by the other inventor on behalf of himself and the omitted inventor. The Commissioner, on proof of the pertinent facts and after such notice to the omitted inventor as he prescribes, may grant a patent to the inventor making the application, subject to the same rights which the omitted inventor would have had if he had been joined. The omitted inventor may subsequently join in the application.

Whenever [a person is joined in an application for patent as joint inventor through error, or a joint inventor is not included in an application through error] through error a person is named in an application for patent as the inventor, or through error an inventor is not named in an application, and such error arose without any deceptive intention on his part, the Commissioner may permit the application to be amended accordingly, under such terms as he prescribes.

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#### CHAPTER 16-DESIGNS

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##### § 173. Term of design patent.

[Patents for designs may be granted for the term of three years and six months, or for seven years, or for fourteen years, as the applicant, in his application, elects.]

Patents for designs shall be granted for the term of fourteen years.

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### PART III-PATENTS AND PROTECTION OF PATENT RIGHTS

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#### CHAPTER 25-AMENDMENT AND CORRECTION OF PATENTS

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##### § 256. Misjoinder of inventor.

[Whenever a patent is issued on the application of persons as joint inventors and it appears that one of such persons was not in fact a joint inventor, and that he was included as a joint inventor by error and without any deceptive intention, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate deleting the name of the erroneously joined person from the patent.]

[Whenever a patent is issued and it appears that a person was a joint inventor, but was omitted by error and without deceptive intention on his part, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate adding his name to the patent as a joint inventor.]

[The misjoinder or nonjoinder of joint inventors shall not invalidate a patent, if such error can be corrected as provided in this section. The court before which such matter is called in question may order correction of the patent on notice and hearing of all parties concerned and the Commissioner shall issue a certificate accordingly.]

##### § 256. Correction of named inventor.

Whenever through error a person is named in an issued patent as the inventor, or through error an inventor is not named in an issued patent and such error arose without any deceptive intention on his part, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate correcting such error. The error of omitting inventors or naming persons who are not inventors shall not invalidate the patent in which such error occurred if it can be corrected as provided in this section. The court before which such matter is called in question may order correction of the patent on notice and hearing of all parties concerned and the Commissioner shall issue a certificate accordingly.

#### CHAPTER 16-OWNERSHIP AND ASSIGNMENT

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##### § 261. Ownership; assignment.

Subject to the provisions of this title, patents shall have the attributes of personal property.

Applications for patent, patents, or any interest therein, shall be assignable in law by an instrument in writing. The applicant, patentee, or his assigns or legal representatives may in like manner grant and convey an exclusive right under his application for patent, or patents, to the whole or any specified part of the United States.

A certificate of acknowledgment under the hand and official seal of a person authorized to administer oaths within the United States, or, in a foreign country, of a diplomatic or consular officer of the United States or an officer authorized to administer oaths whose authority is proved by a certificate of a diplomatic or consular officer of the United States, or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles



of designated officials in the United States, shall be prima facie evidence of the execution of an assignment, grant or conveyance of a patent or application for patent.

An assignment, grant or conveyance shall be void as against any subsequent purchaser or mortgagee for a valuable consideration, without notice, unless it is recorded in the Patent and Trademark Office within three months from its date or prior to the date of such subsequent purchase or mortgage.

## CHAPTER 29-REMEDIES FOR INFRINGEMENT OF PATENT, AND OTHER ACTIONS

### Sec. 281. Remedy for infringement of patent.

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### 294. Voluntary arbitration.

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### § 294. Voluntary arbitration.

(a) A contract involving a patent or any right under a patent may contain a provision requiring arbitration of any dispute relating to patent validity or infringement arising under the contract. In the absence of such a provision, the parties to an existing patent validity or infringement dispute may agree in writing to settle such dispute by arbitration. Any such provision or agreement shall be valid, irrevocable, and enforceable, except for any grounds that exist at law or in equity for revocation of a contract.

(b) Arbitration of such disputes, awards by arbitrators and confirmation of awards shall be governed by title 9, United States Code, to the extent such title is not inconsistent with this section. In any such arbitration proceeding, the defenses provided for under section 282 of this title shall be considered by the arbitrator if raised by any party to the proceeding.

(c) An award by an arbitrator shall be final and binding between the parties to the arbitration but shall have no force or effect on any other person. The parties to an arbitration may agree that in the event a patent which is the subject matter of an award is subsequently determined to be invalid or unenforceable in a judgment rendered by a court to competent jurisdiction from which no appeal can or has been taken, such award may be modified by any court of competent jurisdiction upon application by any party to the arbitration. Any such modification shall govern the rights and obligations between such parties from the date of such modification.

(d) When an award is made by an arbitrator, the patentee, his assignee or licensee shall give notice thereof in writing to the Commissioner. There shall be a separate notice prepared for each patent involved in such proceeding. Such notice shall set forth the names and addresses of the parties, the name of the inventor, and the name of the patent owner, shall designate the number of the patent, and shall contain a copy of the award. If an award is modified by a court, the party requesting such modification shall give notice of such modification to the Commissioner. The Commissioner shall upon receipt of either notice, enter the same in the record of the prosecution of such patent. If the required notice is not filed with the Commissioner, any party to the proceeding may provide such notice to the Commissioner.

(e) The award shall be unenforceable until the notice required by subsection (d) is received by the Commissioner.

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## TRADEMARK ACT OF 1946

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### Sec. 8 (a). Duration of registration-Cancellation at end of 6 years unless affidavit of use filed.

Each certificate of registration shall remain in force for 20 years: *Provided*, That the registration of any mark under the provisions of this Act shall be canceled by the Commissioner at the end of 6 years following its date, unless within 1 year next preceding the expiration of such 6 years the registrant shall file in the Patent and Trademark Office an affidavit showing that said mark is [still] in use in commerce or showing that its nonuse is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark. Special notice of the requirement for such affidavit shall be attached to each certificate of registration.

### Sec. 8(b). Cancellation of republished prior registrations unless affidavit of use filed.

Any registration published under the provisions of subsection (c) of section 12 of this Act shall be canceled by the Commissioner at the end of 6 years after the date of such publication unless within 1 year next preceding the expiration of such 6 years and registrant shall file in the Patent and Trademark Office an affidavit showing that said marks is [still] in use in commerce or showing that its nonuse is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark.

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### Sec. II. Acknowledgments and verifications.

Acknowledgments and verifications required hereunder may be made before any person within the United States authorized by law to administer oaths, or, when made in a foreign country, before any diplomatic or consular officer of the United States or before any official authorized to administer oaths in the foreign country concerned whose authority [shall] is proved by a certificate of a diplomatic or consular officer of the United States or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States, and shall be valid if they comply with the laws of the state or country where made.

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### Sec. 13. Opposition to registration of marks on the Principal Register.

Any person who believes that he would be damaged by the registration of a mark upon the principal register may upon payment of the required fee, file [a verified] an opposition in the Patent and Trademark Office, stating the grounds therefor, within thirty days after the publication under subsection (a) of section 12 of this Act of the mark sought to be registered. Upon written request prior to the expiration of the thirty-day period, the time for filing opposition shall be extended for an additional thirty days, and further extensions of time for filing opposition may be granted by the Commissioner for good cause when requested prior to the expiration of an extension. The Commissioner shall notify the applicant 86 of each extension of the time for filing opposition. [An unverified opposition may be filed by a duly authorized attorney, but such opposition shall be null and void unless verified by the opposer within a reasonable time after such filing to be fixed by the Commissioner.] An opposition may be amended under such conditions as maybe prescribed by the Commissioner.

SEC. 14. A [verified] petition to cancel a registration of a mark, stating the grounds relied upon, may, upon payment of the prescribed fee, be filed by any person who believes that he is or will be damaged by the registration of a mark on the principal register established by this Act, or under the Act of Mar. 3, 1881, or the Act of Feb. 20, 1905—

(a) within five years from the date of the registration of the mark under this Act; or

(b) within five years from the date of publication under section 12(c) hereof of a mark registered under the Act of Mar. 3, 1881, or the Act of Feb. 20, 1905; or

(c) at any time if the registered mark becomes the common descriptive name of an article or substance, or has been abandoned, or its registration was obtained fraudulently or contrary to the provisions of section 4 or of subsections (a), (b), or (c) of section 2 of this Act for a registration hereunder, or contrary to similar prohibitory provisions of said prior Acts for a registration thereunder, or if the registered mark is being used by, or with the permission of, the registrant so as to misrepresent the source of the goods or services in connection with which the mark is used; or

(d) at any time if the mark is registered under the Act of Mar. 3, 1881, or the Act of Feb. 20, 1905, and has not been published under the provisions of subsection (c) of section 12 of this Act; or

(e) at any time in the case of a certification mark on the ground that the registrant (1) does not control, or is not able legitimately to exercise control over, the use of such mark, or (2) engages in the production or marketing of any goods or services to which the certification mark is applied, or (3) permits the use of the certification mark for purposes other than to certify, or (4) discriminately refuses to certify or to continue to certify the goods or services of any person who maintains the standards or conditions which such mark certifies:

*Provided*, That the Federal Trade Commission may apply to cancel on the grounds specified in subsections (c) and (e) of this section any mark registered on the principal register established by this Act, and the prescribed fee shall not be required.

### Sec. 15. Incontestability under certain conditions of right to use mark.

Except on a ground for which application to cancel may be filed at any time under subsections (c) and (e) of section 14 of this Act, and except to the extent, if any, to which the use of a mark registered on the principal register infringes a valid right acquired under the law of any State or Territory by use of a mark or trade name continuing from a date prior to the date of [the publication] registration under this Act of such registered mark, the right of the registrant to use such registered mark in commerce for the goods or services on or in connection with which such registered mark has been in continuous use for 5 consecutive years subsequent to the date of such registration and is still in use in commerce, shall be incontestable: *Provided*, That—

(1) there has been no final decision adverse to registrant's claim of ownership of such mark for such goods or services, or to registrant's right to register the same or to keep the same on the register; and

(2) there is no proceeding involving said rights pending in the Patent Office or in a court and not finally disposed of; and

(3) an affidavit is filed with the Commissioner within 1 year after the expiration of any such 5-year period setting forth those goods or services stated in the registration on or in connection with which such mark has been in continuous use for such 5 consecutive years and is still in use in commerce, and the other matters specified in subsections (1) and (2) hereof; and

(4) no incontestable right shall be acquired in a mark which is the common descriptive name of any article or substance, patented or otherwise.



Subject to the conditions above specified in this section, the incontestable right with reference to a mark registered under this Act shall apply to a mark registered under the Act of Mar. 3, 1881, or the Act of Feb. 20, 1905, upon the filing of the required affidavit with the Commissioner within 1 year after the expiration of any period of 5 consecutive years after the date of publication of a mark under the provisions of subsection (c) of section 12 of this Act.

The Commissioner shall notify any registrant who files the above-prescribed affidavit of the filing thereof.

#### Sec. 16. Interference.

[Whenever application is made for the registration of a mark which so resembles a mark previously registered by another, or for the registration of which another has previously made application, as to be likely when applied to the goods or when used in connection with the services of the applicant to cause confusion or mistake or to deceive, the Commissioner may declare that an interference exists.] Upon petition showing extraordinary circumstances, the Commissioner may declare that an interference exists when application is made for the registration of a mark which so resembles a mark previously registered by another, or for the registration of which another has previously made application, as to be likely when applied to the goods or when used in connection with the services of the applicant to cause confusion or mistake or to deceive. No interference shall be declared between an application and the registration of a mark the right to the use of which has become incontestable.

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#### § 31. Fees

(a) The Commissioner of Patents will establish fees for the filing and processing of an application for the registration of a trademark or other mark and for all other services performed by and materials furnished by the Patent and Trademark Office related to trademarks and other marks. [Fees will be set and adjusted by the Commissioner to recover in aggregate 50 per centum of the estimated average cost to the Office of such processing. Fees for all other services or materials related to trademarks and other marks will recover the estimated average cost to the Office of performing the service or furnishing the material.] However, no fee for the filing or processing of an application for the registration of a trademark or other mark or for the renewal or assignment of a trademark or other mark will be adjusted more than once every three years. No fee established under this section will take effect prior to sixty days following notice in the Federal Register.

(b) The Commissioner may waive the payment of any fee for any service or material related to trademarks or other marks in connection with an occasional request made by a department or agency of the Government, or any officer thereof. The Indian Arts and Crafts Board will not be charged any fee to register Government trademarks of genuineness and quality for Indian products or for products of particular Indian tribes and groups.

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#### (45) Request for Refunds

In order to expedite the processing of refunds for payment of fees by actual mistake or in excess of the designated fees, attorneys and applicants requesting refunds should direct their correspondence to the attention of the "Refund Section, Accounting Division, Office of Finance." This procedure should be followed whether the request is for a refund check or for a credit to the deposit account. The problems of misrouting the request for a refund in the Patent and Trademark Office would be alleviated and the payment of refunds accelerated.

BRADFORD R. HUTHER  
Assistant Commissioner  
for Finance & Planning.

[1024 O.G. 59 (11-23-82)]

#### (46) Deposit Account Authorizations

The rules of practice were amended effective Oct. 1, 1982, at 37 CFR 1.25(b) to state that: "A general authorization to charge all fees, or only certain fees, set forth in §§ 1.16 to 1.18 to a deposit account may be filed in an individual application, either for the entire pendency of the application or with respect to a particular paper filed." A general authorization would not apply to document supply fees under § 1.19, such as those required for certified copies; to post-issuance fees under § 1.20 such as those required for maintenance fees; or to miscellaneous

fees and charges under § 1.21, such as assignment recording fees.

Many applications filed prior to Oct. 1, 1982, contain broad language authorizing any additional fees which might have been due to be charged to a deposit account. The Patent and Trademark Office does not interpret such broad authorizations, filed in an application on or after Oct. 1, 1982, will be interpreted as authorization to charge the issue fee; as well as any other fee set forth in §§ 1.16, 1.17 or 1.18. Fees under sections 1.19, 1.20 and 1.21 will not be charged as a result of a general authorization under section 1.25.

It is recommended that authorizations to charge fees to deposit accounts include reference to the particular fees or fee sections of the rules which applicant intends to authorize. For example, if filing and processing fees under §§ 1.16 and 1.17 only are intended to be included in the authorization, and not the issue fee under § 1.18, the authorization could read: "The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required during the entire pendency of the application to Deposit Account No. . . ."

Such an authorization would clearly exclude issue fees under 37 CFR 1.18 while including all the filing and processing fees listed in 37 CFR 1.16 and 1.17. Similarly, if it were intended to authorize the charging of fees relating only to a specific paper, the authorization could read "The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required by this paper to Deposit Account No. . . ."

Such authorizations would cover situations in which a check to cover a filing and processing fee under 37 CFR 1.16 and 1.17 was omitted or was for an amount less than the amount required.

Aug. 27, 1982

[H.R. 6260]

Patent and Trade-  
mark Office

Appropriation  
Authorization

It is extremely important that the authorization be clear and unambiguous. If applicants file authorizations which are ambiguous and which deviate from the usual forms of authorizations, the Office may not interpret the authorizations in the manner applicants intend. In such cases applicants could be subject to further expenses, petitions, etc. in order to correct fees which were not charged as intended due to an ambiguous authorization.

July 1, 1983

GERALD J. MOSSINGHOFF  
Commissioner of Patents  
and Trademarks

[1032 OG 32]

#### (47) Deposit Account Authorization to Charge Issue Fee

This notice supplements the Official Gazette notice, dated July 1, 1983, published at 1032 O.G. 33 on July 26, 1983.

The rules of practice were amended effective Oct. 1, 1982, at 37 CFR 1.25(b) to state that: "A general authorization to charge all fees, or only certain fees, set forth in 37 CFR 1.16 to 1.18 to a deposit account may be filed in an individual application, either for the entire pendency of the application or with respect to a particular paper filed."

The Patent and Trademark Office will treat broad language to "charge any additional fees which may be required at any time during the prosecution of the application" as authorization to charge the issue fee on applications filed on or after Oct. 1, 1982.

Sept. 30, 1988

RENE D. TEGTMEYER  
Assistant Commissioner  
for Patents

[1095 OG 44]

#### (48) Unpaid Fee Checks

Beginning Dec. 1, 1987, the Office will change the procedure for handling fee checks of attorneys and agents that are returned to the Office unpaid. Presently, when a check submitted as payment for an application, a processing, an issue or any other fee is returned to the Office unpaid, the Office of Finance sends a letter to the attorney or agent who represents the applicant, or to the applicant if unrepresented by an attorney or agent, enclosing the check and calling attention to the fact that the check was returned unpaid. Beginning Dec. 1, 1987, the Office of Finance will send a copy of its letter to the applicant if the letter is addressed to an attorney or agent. The prohibition of 37 CFR §§ 1.33 and 2.18 against double correspondence is waived in view of the submission of a check that is returned unpaid to the Office.

A registered patent attorney or agent who repeatedly submits checks that are returned unpaid through no fault of the bank may expect to have the matter referred to the Office of Enrollment and Discipline.

Oct. 5, 1987

DONALD W. PETERSON  
Deputy Commissioner

[1083 TMOG 44]

#### (49) Posting of Filing Fee Codes

We are making a minor change in the recording of fees so that we can speed up the processing of mail.

First, a brief explanation of the problem. Incoming mail to the PTO has soared. The number of envelopes received in the Mail Room in the first four months of this fiscal year is almost 30% higher than for the same period last year. This sudden increase has taxed existing resources and a backlog has devel-

oped. It takes a new employee over one year to become proficient in recognizing the hundreds of different types of documents entering the Office, the appropriate fee codes to apply, and the appropriate destination.

One of the most time-consuming functions of the Mail Room initial review clerks is the determination of how many independent and dependent claims there are in a patent application so that the appropriate amounts can be coded for the basic application fee, the extra independent claim fee, the extra total claim fee, and the multiple dependent claim fee. This can involve a substantial amount of time in complicated cases, particularly when there are preliminary amendments. With over 30,000 individual documents patent applications and all other mail to be processed and routed each day, such time-consuming delays have a severe adverse impact in moving all the work.

So, effective immediately, we are making a change which will move the mail more quickly. Rather than go through the time-consuming computation in the Mail Room to determine the amount to charge to each specific claim fee code, the total amount received will be recorded in one filing code. The detailed calculations will continue to be done later in the process where, in conjunction with the formality review of the application, the analysis takes place as to whether or not the fee submitted was correct. The individual charges remain the same and the information on claims contained in the application will continue to be reported on the application filing receipt without change. Here's what would be seen on deposit account charges and checks:

101-Includes amount for basic filing fee, extra independent claims, extra total claims, and multiple dependent claims, previously recorded as 101, 102, 103, and 104, respectively.

201-Includes same items as above for small entity applications, previously recorded as 201, 202, 203, and 204.

108-Includes same items as above for reissue applications, previously recorded as 108, 109, and 110.

208-Includes same items as above for small entity reissue applications, previously recorded as 208, 209, and 210.

This revised procedure allows us to be more efficient.

Mar. 31, 1988

THERESA A. BRELSFORD  
Assistant Commissioner  
for Administration

[1089 OG 57]

#### (50) Use of Metric System of Measurements in Patent Applications

The ability of the United States to compete in world trade and improve our trade balance is becoming more important and more difficult each day as our competitors get stronger. Presently, the United States is the only industrial country which has not adopted the metric system of weights and measures. The lack of U.S. goods being produced and packaged under metric standards results in our country being at a competitive disadvantage in world markets.

To improve our competitiveness, in the 1988 trade bill, Congress established metric as the Nation's "preferred system of units for United States trade and commerce," and set a 1992 date for Federal agencies to complete their transition to metric uses in "procurement, grants and other business related activities".

To implement the congressional designation of the metric system of measurement for U.S. trade and commerce, the President on July 25, 1991, issued an Executive Order (Metric Usage in Federal Government Programs) for the Federal Government to lead the way in metric usage. The Department of Commerce has been designated as the lead agency responsible for coordinating usage by the Federal Government.

The Patent and Trademark Office (PTO) does not currently require weights and measures in patent applications to be stated in the metric system. However, in Section 608.01 of the Manual of Patent Examining Procedure, all patent applicants are



strongly encouraged to use either (1) only metric units or (2) inch-pound units together with their metric equivalents, when describing their inventions in the specifications of patent applications.

In the spirit of the Executive Order, the PTO reiterates and emphasizes strong encouragement for patent applicants to use the metric system of weights and measurements in patent applications. At some future time when there has been a sufficient conversion to metric usage by U.S. research and development industries, the PTO will consider making it a requirement that patent applicants use metric units in patent applications.

Jan. 15, 1992

HARRY F. MANBECK, Jr.  
Assistant Secretary and Commissioner  
of Patents and Trademarks

[1135 OG 55]

(51) **DEPARTMENT OF COMMERCE**  
**Patent and Trademark Office**  
**37 CFR Parts 1, 2 and 10**  
**[Docket No. 920671-3225]**  
**RIN 0651-AA55**

**Changes in Signature and Filing Requirements for Correspondence filed in the Patent and Trademark Office**

*Agency:* Patent and Trademark Office, Commerce  
*Action:* Final rule; correction.

*Summary:* The Patent and Trademark Office (Office) is correcting errors in the final rule which appeared in the Federal Register on Friday, October 22, 1993 (53 FR 54494). The regulations related to changes in signature and filing requirements for correspondence filed in the patent and Trademark Office contained in parts 1.2 and 10.

*Effective Date:* November 22, 1993.

*For Further Information Contact:* Abraham Herskovitz by telephone at (703) 305-9282, or by facsimile transmission at (703) 305-8825, or by mail marked to his attention and addressed to Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231

*Supplementary Information:*

**Background**

The final regulations that are the subject of these corrections, make changes to the rules of practice relating to signatures and filing requirements for correspondence filed in the Patent and Trademark Office.

**Need for Correction**

As published, the final regulations contain errors, which may be misleading and are in need of clarification. Several sections relating to receipt of facsimile transmissions in certain trademark documents were omitted.

**Correction of Publication**

Accordingly, the publication on October 22, 1993, of the final regulations (docket No. 920671-3225), which were the subject of FR Doc. 93-25864, is corrected as follows:

1. On page 54494, in the second column, at the end of the first partial paragraph, the following sentence should be added: "This final rulemaking also expands the acceptability of facsimile transmission to certain trademark documents which were not part of the proposed rulemaking."

2. On page 54495, in the second column, after the first full paragraph, the following paragraphs should be added: "This final rulemaking also expands the acceptability of facsimile transmissions to certain trademark documents, not included in the proposed rulemaking. These additional documents are:

(1) An affidavit showing that a mark is still in use or containing an excuse for nonuse under section 8 (a) or (b) or section 12 (c) of the Trademark Act, 15 U.S.C. 1058(a), 1058(b), 1062(c);

(2) An application for renewal of a registration under section 9 of the Trademark Act, 15 U.S.C. 1059;

(3) In an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), the filing of an amendment to allege use in commerce under section 1(c) of the Trademark Act, 15 U.S.C. 1051(c); or the filing of a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051 (d)(1).

The Certificate of Mailing or Transmission provisions of § 1.8 do not apply to correspondence listed in (1) through (3) above, nor to the filing of correspondence in an international application before the U.S. Receiving Office, the U.S. International Searching Authority, or the U.S. International Preliminary Examining Authority or to the filing, in an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), of a request under section 1(d)(2) of the Trademark Act, 15 U.S.C. 1051 (d)(2), for an extension of time to file a statement of use under 1(d)(1) of the Trademark Act, 15 U.S.C. 1051 (d)(1). See 1.8(a) (v), (viii), (ix), (xi) and (xii). If the transmission of any of these documents is completed after midnight (Eastern time) of the due date, the papers are untimely"

3. On page 54495, second column, in the first sentence of the second full paragraph, "2.51, 2.52 or 2.72" should be revised to read "or 2.21".

4. On page 54495, second column, at the end of the third full paragraph, the following sentence should be added: "This final rulemaking also expands the acceptability of specimens filed in conjunction with amendments to allege use under section 1(c); statements of use under section 1(d); affidavits of use or excusable nonuse under section 8(a) or (b) or 12(c); and application for renewal under section 9 of the Trademark Act, 15 U.S.C. 1051 (c) and (d); 1058 (a) and (b); 1062(c) and 1059."

5. On page 54495, third column, in item numbered (2) §§ 2.51, 2.52, or 2.72" should be revised to read "§ 2.21".

6. On the page 54495, third column, the item numbered "(3)" at the bottom of the column, should be removed.

7. On page 54495, third column, the item numbered "(4)" at the bottom of the column, should be removed.

8. On page 54495, third column, the item numbered "(5)" should be redesignated as "(3)".

9. On page 54495, the item numbered "(6)" should be removed.

10. On page 54496, top of the first column, the item numbered "(7)" should be redesignated as "(4)".

11. On page 54496, top of the first column, the item numbered "(8)" should be redesignated as "(5)".

12. On page 54498, in lines 16 and 17, from the top of the third column, "2.51, 2.51, or 2.72" should be revised to read "or 2.21".

13. On page 54498, in the third column, at the end of the first paragraph, the following sentence should be added: "However, the suggestion has been adopted to the extent that the Office will accept, via facsimile transmission, an affidavit showing that a mark is still in use or containing an excuse for nonuse under section 8 (a) or (b) or section 12(c) of the Trademark Act, 15 U.S.C. 1058(a), 1058(b), 1062(c); an application for renewal of a registration under section 9 of the Trademark Act, 15 U.S.C. 1059; and in application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), the filing of an amendment to allege use in commerce under section 1(c) of the Trademark Act, 15 U.S.C. 1051(c); or the filing of a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051(d)(1)."

14. On page 54502, in section 1.603, lines 4 and 5 should be revised to read "§ 1.8(a)(2)(i)(A) through (D) and (F); 1.8

(a)(2)(ii)(A) and (D); and 1.8(a)(2)(iii)(A)".

15. On page 54502, in section 1.8(a)(2) introductory text, the comma in the last line between "on" and "the" should be removed.

November 27, 1993

BRUCE A. LEHMAN  
Assistant Secretary of Commerce  
and Commissioner  
of Patents and Trademarks

The corrected Final Rulemaking incorporating the changes identified above is set forth below.

**DEPARTMENT OF COMMERCE**  
**Patent and Trademark Office**  
**37 CFR Parts 1, 2 and 10**  
**[Docket No. 90671-3225]**  
**RIN 0651-AA55**

**Changes in Signature and Filing Requirements for Correspondence Filed in the Patent and Trademark Office**

*Agency:* Patent and Trademark Office, Commerce.

*Action:* Final Rule.

*Summary:* The Patent and Trademark Office (Office) is amending the rules of practice in patent and trademark cases to: specify the types of correspondence which will no longer require original signatures; provide for facsimile transmission of certain correspondence to the Office; discontinue use of the drop boxes at Crystal Plaza Building 3 and at the Department of Commerce Building in Washington, D.C.; and clarify other provisions with respect to practice before the Office.

*Effective Date:* November 22, 1993. These rules will be applicable to all correspondence filed with the Office on or after the effective date.

*For Further Information Contact:* Abraham Herskovitz by telephone at (703) 305-9282, by facsimile transmission at (703) 305-8825, or by mail marked to his attention and addressed to Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231.

*Supplementary Information:* In a Notice of Proposed Rulemaking published in the Federal Register at 57 FR 36034 (August 12, 1992) and in the Patent and Trademark Office Official Gazette at 1142 Off. Gaz. Pat. Office 8-13 (September 1, 1992), the Office proposed to amend the rules of practice in patent and trademark cases to simplify the manner in which correspondence may be transmitted to the Office and clarify other provisions with respect to practice before the Office. This rulemaking includes changes to expand those situations where a party can use the Certificate of Mailing or Transmission procedure, and minor technical modifications in Part 2 of Title 37 of the Code of Federal Regulations which were not part of the proposed rulemaking. This rule making also expands the acceptability of facsimile transmissions to certain trademark documents which were not part of the proposed rulemaking.

Written comments were submitted by twenty-two law firms, five individuals, nine corporations, two organizations and three agencies. An oral hearing was not conducted.

The following includes a discussion of the rules being changed and the reasons for those changes, and an analysis of the comments received in response to the notice of proposed rule-making.

**Discussion of Specific Sections to be Changed or Added:**

(1) Types of Correspondence No longer Requiring Original Signatures (Section 1.4)

Section 1.4 is amended to include a new paragraph (d) to specify that most correspondence filed in the Office, which requires a person's signature, may be an original, or a copy thereof. See §§ 1.4 (e) and (f) for types of correspondence where the original must be filed in the Office. The word original, as used in this rulemaking, is defined as correspondence which is personally signed in permanent ink by the person whose signature appears thereon. Where copies of correspondence are acceptable, photocopies or facsimile transmissions may be filed. For example, a photocopy or facsimile transmission of an original of an amendment, declaration, petition, issue fee

transmittal form, authorization to charge a deposit account, etc., may be submitted in a patent or trademark application. Furthermore, where copies are permitted, second and further generation copies (i.e., copy of a copy) are acceptable. The original, if not submitted to the Office, should be retained as evidence of proper execution in the event that questions arise as to the authenticity of the signature reproduced on the photocopy or facsimile-transmitted correspondence. If a question of authenticity arises, the Office may require submission of the original.

Section 1.4(e) identifies types of correspondence in which an original must be submitted to the Office. Where an original is required, copies are not acceptable and will not be accorded a receipt date. Correspondence, as referred to in this section, includes application forms for registration to practice before the Office and data sheets for the register of patent attorneys and agents.

Section 1.4(f) provides that when a document that is required by statute to be certified must be filed (such as a certified copy of a foreign patent application, pursuant to 35 U.S.C. 119; a certified copy of an international application, pursuant to 35 U.S.C. 365; a certified copy of a foreign trademark registration, pursuant to 15 U.S.C. 1126(e); a certified copy of a final court order, pursuant to 15 U.S.C. 1119; or a certified copy of a U.S. trademark registration), a copy of the certification, including a photocopy or facsimile transmission, will not be acceptable. The requirement for an original certification does not apply to certifications such as required under §§ 1.8, 1.10, 1.60, 1.97(e) and 3.73(b), since these certifications are not required by statute.

(2) Identification of Applications (Section 1.5) Section 1.5(a) is amended to make reference to the certificate procedure under § 1.8 consistent with the new title for § 1.8.

(3) Receipt of Correspondence (Section 1.6)

A descriptive heading is added to each paragraph of § 1.6 to identify the content of that paragraph.

The phrase "correspondence" is used in § 1.6 since the terms "papers", "letters" and "fees" all fall within the generic definition of "correspondence".

Section 1.6(a) is amended to clarify that correspondence transmitted by facsimile on weekends or Federal holidays within the District of Columbia, will be accorded the next business day as the date of receipt.

Sections 1.6(b) and (c) are amended to clarify that weekdays refer to any day except a Saturday, Sunday, or Federal holiday within the District of Columbia.

Section 1.6(c) is amended to delete reference to the box locations in the lobby of Crystal Plaza Building 3, Arlington, Virginia, and at the Department of Commerce Building in Washington, D.C. The use of the drop boxes was discontinued on April 21, 1992, and the hours of operation for the attorney's window were extended to midnight, the same hours the drop boxes were available. The public can now deposit correspondence with the Office and obtain an acknowledgment of receipt after normal business hours. See "Changes in How Papers May Be Filed in the Patent and Trademark Office", 1137 Off. Gaz. Pat. Office 7 (April 7, 1992).

Use of the drop boxes at Crystal Plaza Building 3 and Department of Commerce Building locations had caused problems for both the public and the Office. Occasionally, it had been difficult to determine the dates of actual deposit of correspondence in the boxes. On occasion, Office employees and/or members of the public had been denied access to the drop box at the Department of Commerce by building security guards due to a special event taking place at the Department. Additionally, there were instances of correspondence being found outside of the drop boxes (e.g., on the floor of the main lobby of the Department of Commerce Building, on the guard's desk, on a nearby table, etc.). As a result, on occasion, the Office lacked confidence in assigning correct dates of receipt to correspondence deposited in the boxes at Crystal Plaza Building 3 and at the Department of Commerce Building. Given these difficulties, and the fact that the necessity for these boxes has been greatly diminished as a result of the facsimile transmission and certificate of mailing procedures, 1.6(c) is amended by deleting reference to the drop boxes at Crystal Plaza Building 3 and the Department of Commerce Building.

A new section 1.6(d) is added to specify the types of correspondence which may be transmitted by facsimile and former § 1.6(d) is revised to be consistent with § 1.8(b) and redesignated



nated as § 1.6(e). The widespread use of facsimile transmission and the resulting time saved in correspondence between applicants and the Office prompted the Office to establish a trial program to accept facsimile transmission of certain correspondence. The policy on "Filing of Certain Papers and Authorizations to Charge Deposit Accounts by Facsimile Transmission" was published at 1096 Off. Gaz. Pat. Office 30 (November 15, 1988) and was supplemented in the notice "Filing of Certain Papers with the Board of Patent Appeals and Interferences by Facsimile Transmission" published at 1108 Off. Gaz. Pat. Office 15 (November 14, 1989). The policy on "Filing of Certain Trademark Papers and Authorizations to Charge Deposit Accounts by Facsimile Transmission" was published at 1123 Off. Gaz. TM. Office 18 (February 12, 1991). In light of the success of the trial program, a policy on acceptance of facsimile transmission is incorporated into § 1.6(d). The situations where transmission of correspondence by facsimile is permitted have been increased over those permissible under the trial program outlined above. The situations where transmissions by facsimile remain prohibited are identified in 1.6(d)(1)-(9). Prohibitions cover situations where originals are required as specified in §§ 1.4 (e) and (f), and situations where accepting a facsimile transmission would be unduly burdensome on the Office. As a courtesy, the Office will attempt to notify senders whenever correspondence is sent to the Office by facsimile transmission that falls within one of these prohibitions. Senders are cautioned against submitting correspondence by facsimile transmission which is not permitted under § 1.6(d) since such correspondence will not be accorded a receipt date.

This final rulemaking expands the acceptability of facsimile transmission to certain patent interference proceedings, not included in the proposed rulemaking, to reflect the practice set forth at 1108 Off. Gaz. Pat. Office 15 (November 14, 1989).

This final rulemaking also expands the acceptability of facsimile transmission to certain trademark documents, not included in the proposed rulemaking. These additional documents are:

(1) An affidavit showing that a mark is still in use or containing an excuse for nonuse under section 8(a) or (b) or section 12(c) of the Trademark Act, 15 U.S.C. 1058(a), 1058(b), 1062(c);

(2) An application for renewal of a registration under section 9 of the Trademark Act, 15 U.S.C. 1059;

(3) In an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), the filing of an amendment to allege use in commerce under section 1(c) of the Trademark Act, 15 U.S.C. 1051(c); or the filing of a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051(d)(1).

The Certificate of Mailing or Transmission provisions of § 1.8 do not apply to correspondence listed in (1)-(3) above, nor to the filing of correspondence in an international application before the U.S. Receiving Office, the U.S. International Searching Authority, or the U.S. International Preliminary Examining Authority or to the filing, in an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), of a request under section 1(d)(2) of the Trademark Act, 15 U.S.C. 1051(d)(2), for an extension of time to file a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051(d)(1). See §§ 1.8 (a)(2)(i)(E) and 1.8 (a)(2)(ii)(B), (C), (E) and (F). If the transmission of any of these documents is completed after midnight (Eastern time) of the due date, the papers are untimely.

Under § 1.6(d)(4) as adopted in this final rulemaking, drawings submitted under §§ 1.81, 1.83-1.85, 1.152, 1.165, 1.174, 1.437, or 2.21 may not be filed by facsimile in patent and trademark applications. The experience of the Office is that the quality of the drawings received by facsimile transmission is generally not sufficient to comply with the drawing requirements set forth in these rules. However, applicants may submit by facsimile transmission proposed drawing corrections for approval by the Office.

In trademark proceedings, the facsimile transmission of specimens in response to an Office action will be permitted. Facsimile-transmitted specimens must be legible in order to be accepted and examined as specimens. This final rulemaking also expands the acceptability of specimens filed in conjunction with amendments to allege use under section 1(c); statements of use under section 1(d); affidavits of use or excusable nonuse under section 8 (a) or (b) or 12(c); and applications for renewal

under section 9 of the Trademark Act, 15 U.S.C. 1051 (c) and (d); 1058 (a) and (b); 1062(c) and 1059.

The date of receipt accorded to any correspondence permitted to be sent by facsimile transmission is the date the complete transmission is received by an Office facsimile unit, unless the transmission is completed on a Saturday, Sunday, or Federal holiday within the District of Columbia. Correspondence for which transmission was completed on a Saturday, Sunday, or Federal holiday within the District of Columbia, will be accorded a receipt date of the next succeeding day which is not a Saturday, Sunday, or Federal holiday within the District of Columbia. For example, a facsimile transmission to the Office from California starting on a Friday at 8:45 p.m. Pacific time and taking 20 minutes, would be completed at 9:05 p.m. Pacific time. The complete transmission would be received in the Office around 12:05 a.m. Eastern time on Saturday. The receipt date accorded to the correspondence is the date of the following business day, which in this case, would be Monday (assuming that Monday was not a Federal holiday within the District of Columbia).

The following lists itemize types of correspondence which may not be filed by facsimile transmission, and, if submitted by facsimile, will not be accorded a date of receipt:

#### Correspondence Relative to Patents and Patent Applications Where Filing by Facsimile Transmission is Not permitted

- (1) A document that is required by statute to be certified;
- (2) A national patent application specification and drawing or other correspondence for the purpose of obtaining an application filing date;
- (3) Drawings submitted under §§ 1.81, 1.83-1.85, 1.152, 1.165, 1.174, or 1.437;
- (4) Correspondence in an interference which an examiner-in-chief orders to be filed by hand or "Express Mail";
- (5) Agreements between parties to an interference under 35 U.S.C. 135(c);
- (6) Correspondence to be filed in an interference proceeding which consists of a preliminary statement under § 1.621; a transcript of a deposition under § 1.676 or of interrogatories, cross-interrogatories, or recorded answers under 1.684(c); or an evidentiary record and exhibits under § 1.653;
- (7) Correspondence to be filed in a patent application subject to a secrecy order under §§ 5.1-5.8 of this chapter and directly related to the secrecy order content of the application;
- (8) An international application for patent;
- (9) A copy of the international application and the basic national fee necessary to enter the national stage, as specified in § 1.494(b) or § 1.495(b);
- (10) A request for reexamination under § 1.510.

#### Correspondence Relative to Trademark Registrations and Trademark Applications Where Filing by Facsimile Transmission is Not Permitted

- (1) The filing of a trademark application;
- (2) Drawings submitted under § 2.21;
- (3) A petition to cancel a registration of a mark under section 14, subsection (1) or (2) of the Trademark Act, 15 U.S.C. 1064;
- (4) Request for cancellation or amendment of a registration under section 7(e) of the Trademark Act, 15 U.S.C. 1057(e); and certificates of registration surrendered for cancellation or amendment under section 7(e) of the Trademark Act, 15 U.S.C. 1057(e);
- (5) Correspondence to be filed with the Trademark Trial and Appeal Board, except the notice of ex parte appeal.

#### Correspondence Relative to Practitioner Registrations, Investigations, and Disciplinary Proceedings Where Filing by Facsimile Transmission is Not Permitted

Correspondence requiring a person's signature and relating to:

- (1) Registration to practice before the Patent and Trademark Office in patent cases;
  - (2) Enrollment and disciplinary investigations; or
  - (3) Disciplinary proceedings.
- (4) Certificate of Mailing or Transmission Procedure

#### (Section 1.8)

The title of § 1.8 is changed from Certificate of Mailing to Certificate of Mailing or Transmission so as to include facsimile transmission.

Section 1.8(a) prescribes procedures for the use of a certificate of mailing or transmission to file papers or fees in the Office by first class mail or by facsimile transmission. The description of the Certificate of Mailing or Transmission practice is set forth in § 1.8(a)(1), and the list of exceptions to the certificate practice is found in § 1.8(a)(2). The phrase papers or fees in § 1.8(a) is changed to correspondence since both "papers and "fees" fall within the generic definition of correspondence. Paragraphs (a) and (b) of § 1.8 are amended to include correspondence transmitted by facsimile. In the event that correspondence is filed by facsimile transmission, it is recommended that the sending facsimile machine generate a report confirming transmission for each transmission session. This report should be retained by the applicant, along with the correspondence used as the original, as evidence of content and date of transmission. Paragraph (a)(2) of § 1.8 is amended to include separate headings for correspondence which relate to patents, trademarks and disciplinary proceedings. The sequence of some of the paragraphs found in 1.8(a)(2) has been changed in order to have those paragraphs listed under the appropriate heading. The ability to use the Certificate of Mailing or Transmission procedures has been expanded to the filing of an affidavit under section 15, subsection (3) of the Trademark Act, 15 U.S.C. 1065(3), the filing of a notice of election to proceed by civil action in an inter partes proceeding under 35 U.S.C. 141 or 15 U.S.C. 1071(a)(1), in response to another party's appeal to the Court of Appeals for the Federal Circuit, the filing of a notice and reasons of appeal under 35 U.S.C. 142 or a notice of appeal under 15 U.S.C. 1071(a)(2), and the filing of a statement under 42 U.S.C. 2182 or 42 U.S.C. 2457(c).

Paragraph (a)(2)(vi) of § 1.8 is redesignated as paragraph (a)(2)(x) and amended to refer to section 14(1) or 14(2) of the Trademark Act, 15 U.S.C. 1064, to conform with the numbering of the Trademark Law Revision Act of 1988. Other sections of paragraph (a)(2) of § 1.8 are amended to identify the types of correspondence which will not receive the benefit of a certificate of mailing or transmission.

Paragraph (b) of § 1.8 outlines procedures to be followed to document the timely filing of correspondence in accordance with § 1.8(a) where such correspondence is not received by the Office. The phrase "correspondence or fees" in § 1.8(b) is changed to "correspondence" since "fees" fall within the generic definition of "correspondence". Before adoption of this final rule, 1.8(b) required that the party forwarding the correspondence or fee include a declaration, under §§ 1.68 or 2.20 of this chapter, attesting to the previous timely mailing or transmission. In order to be consistent with other sections in Parts 1 and 2 of this chapter, the practice under § 1.8(b) is amended to permit a practitioner, as defined in § 10.1(r), to submit a statement rather than an oath or declaration under §§ 1.68 or 2.20 of this chapter. New paragraph (c) of § 1.8 is added to explicitly provide for a requirement for additional evidence relating to the mailing or transmission of correspondence in accordance with paragraph (a) of this section. The Office may invoke this requirement when it is deemed appropriate to establish an actual date of mailing or transmission. See, e.g., *In re Klein*, 6 USPQ2d 1547 (Comm'r Pat. 1987), *aff'd sub nom. Klein v. Peterson*, 696 F. Supp. 695, 8 USPQ2d 1434 (D.D.C. 1988), *aff'd* 866 F.2d 412, 9 USPQ2d 1558 (Fed. Cir.), cert. denied, 490 U.S. 1091 (1989).

#### (5) Time for Appeal or Civil Action (Section 1.304)

In section 1.304, paragraphs (a) and (c) are amended to delete a statement that use of the certificate procedure under § 1.8 is prohibited so as to be consistent with changes to § 1.8. Also, a cross reference to 1.658 in paragraph (a) is clarified.

(6) Submission of Maintenance Fees (Section 1.366)  
Section 1.366(b) is amended by deleting the words "of mailing" to conform with the new title for § 1.8.

(7) Filing Date of Application for Extension of Patent Term  
Section 1.741(a) Section 1.741(a) is amended to conform with the new title for the certificate procedure under § 1.8.

#### (8) Appeal to Court and Civil Action (Section 2.145)

Sections 2.145(c)(3) and 2.145(d)(1) are amended to conform with the revised list of types of correspondence excluded from the certificate of mailing or transmission procedure set out in

§ 1.8. Formerly, the notice of election to proceed by civil action in an inter partes proceeding under 35 U.S.C. 141 or section 21(a)(1) of the Trademark Act, 15 U.S.C. 1071(a)(1), and the filing of notice and reasons of appeal under 35 U.S.C. 142 or a notice of appeal under section 21(a)(2) of the Trademark Act, 15 U.S.C. 1071(a)(2), were specifically excluded, under §§ 1.8(a)(2) (viii) and (ix), respectively, from the certificate of mailing procedure. Since these notices are no longer excluded under amended § 1.8(a)(2), sections 2.145(c)(3) and 2.145(d)(1) are amended to conform with § 1.8 by deleting the last sentence which provided that the certificate of mailing procedure was not available.

(9) Reconsideration of Affidavit or Declaration (Section 2.165)  
Section 2.165(a)(1) is amended to refer to the new title for the certificate procedure under § 1.8 of this chapter.

(10) Signature and Certificate of Practitioner (Section 10.18)  
Section 10.18 is modified to clarify signature requirements for correspondence signed by practitioners. The reference to § 1.4 of this chapter will make it apparent that copies, including photocopies or facsimile transmissions, of correspondence signed by practitioners will be accepted under appropriate circumstances.

#### (11) Misconduct (Section 10.23(c))

Section 10.23(c) is amended to refer to the new title for the certificate procedure under § 1.8 of this chapter.

#### Response to Comments on the Rules

The comments received in response to the notice of proposed rulemaking have been given careful consideration and a number of the suggested modifications have been adopted. The comments and responses are discussed below.

**Comment:** In order to clarify how the Office will treat a copy of a paper, one comment suggested changing the second sentence in proposed § 1.4(d) to indicate that, except as provided in §§ 1.4 (e) and (f), a copy would be treated by the Office as if the original had been filed.

**Response:** While the suggested language was not adopted, the rule was modified to clarify that, except as provided in §§ 1.4 (e) and (f), an original or a copy thereof may be filed. The rules as stated in this final rulemaking are clear that, where an original is not required, a paper filed will be treated in the same way regardless of whether it is an original or a copy.

**Comment:** Five comments objected to a perceived requirement in § 1.4(d) that the color of ink used for signing a paper be different from the printing on the paper.

**Response:** Proposed § 1.4(d) did not require that the color of ink used for signing a paper be different from the printing on the paper. The suggested use of different colors of ink is a preferred procedure for distinguishing between an original and a copy. However, in order to avoid further confusion, the suggestion that a different color of ink be used has been deleted.

**Comment:** One comment recommended that the issue of signature authenticity end upon issuance of a patent in order to reduce the need to keep files in storage for long periods of time and to remove the burden on applicants of having to retrieve files from storage.

**Response:** Once a patent issues, the Office is not likely to inquire into any matters related to signature authenticity of correspondence filed in that patent application. Nevertheless, on rare occasions, a question of signature authenticity might arise after issuance of a patent. Applicants must therefore make their own decisions as to how long to retain originals.

**Comment:** Two comments questioned the justification for proposed § 1.4(e) requiring originals to be submitted in international patent applications.

**Response:** Section 1.4(e), as adopted, does not prohibit the filing of photocopies in an international patent application. With regard to facsimile transmissions, Patent Cooperation Treaty (PCT) Rule 92.4, as revised on July 1, 1992, permits the filing by facsimile of certain correspondence related to an international patent application. However, as indicated in §§ 1.6(d)(3), 1.8(a)(2)(iv) and 1.8(a)(2)(vi), the filing by facsimile is not permitted in the following situations relative to international applications for patent: (1) the filing of an international application for patent and (2) the filing of a copy of the international application and the basic national fee necessary to enter the national stage, as specified in §§ 1.494(b) or 1.495(b).



Applicants are cautioned, however, that the Certificate of Mailing or Transmission provisions of § 1.8 do not apply to correspondence filed in an international application before the U.S. Receiving Office, the U.S. International Searching Authority, or the U.S. International Preliminary Examining Authority, regardless of whether the correspondence was filed by mail or facsimile transmission. See § 1.8(a)(2)(5).

**Comment:** One comment suggested that, in applications filed under § 1.60, the certification that the application and papers being filed are true copies of those filed in the parent application should be excluded from the original signature requirement.

**Response:** Filing of copies of statements under § 1.60 as well as certifications under §§ 1.8, 1.10, 1.97(e) and 3.73(b) will be permitted. The certified documents referred to in § 1.4(f) are those which are required to be certified by statute (e.g., certified documents under 35 U.S.C. 119).

**Comment:** One comment questioned whether routine papers could be photocopied with a practitioner's signature thereon with appropriate information being filled in later by another person.

**Response:** Section 10.18(a) states that the signature of a practitioner, on correspondence filed, constitutes a certificate that the correspondence has been read by the practitioner. Accordingly, the photocopying of papers with a practitioner's signature thereon and subsequently having appropriate information filled in by another person, is not authorized or permitted under the rules.

**Comment:** One comment questioned whether a docket clerk could use a signature stamp of a registered attorney on a transmittal letter.

**Response:** Section 10.18(a) states that correspondence filed by a practitioner must be personally signed by that practitioner. Accordingly, use of a signature stamp of a registered attorney by a docket clerk would not be permitted.

**Comment:** Two comments suggested that the facsimile transmission practice be further liberalized to permit scanned-in signatures to be affixed to facsimile or electronically transmitted correspondence. The personal, handwritten signature would be affixed on a copy of the transmitted correspondence which would be kept by the applicant or his or her representative.

**Response:** The Office is actively considering acceptance of electronically filed applications and papers related thereto. See "Electronic Filing of Patent and Trademark Applications" published at 57 FR 56537 (November 30, 1992) and 1145 Off. Gaz. Pat. Office 378 (December 22, 1992). Until an acceptable program is established, every paper, requiring a signature, filed in the Office, regardless of the manner in which it was transmitted, will have to be a paper which was signed by the person whose signature appears thereon, or be a copy thereof. Scanned signatures affixed to papers which were not personally signed will not be permitted at this time.

**Comment:** One comment indicated that proposed § 1.5(a) appeared to be contrary to PCT Article 27(1) in that it added the additional requirement not set forth in the PCT of requiring correspondence concerning an international application to identify the international application number.

**Response:** PCT Rule 92.1 requires any paper relating to an international application to identify the international application to which it relates. In order to ensure prompt and proper association of correspondence with the intended application file, it is essential to use the application number on all papers. The practice (which was not a new one added in this rulemaking) is a mere implementation of the requirement in PCT Rule 92.1 and is not contrary to PCT Article 27(1) as no additional requirement is being placed on applicants.

**Comment:** Two comments recommended an increase from two weeks to 30 days or one month in the period provided in § 1.5(a) for resubmission of correspondence.

**Response:** The two-week period provided in § 1.5(a) is to enable applicants to provide the necessary identifying data where such data was not provided during the original submission. This is intended to permit immediate resubmission and no additional time is deemed to be necessary. Extending this period to 30 days would unnecessarily delay prosecution of applications.

**Comment:** Section 1.5(a) suggests that all letters directed to the Office concerning applications for patents should also state "Patent Application". One comment suggested that § 1.5(a) be amended to replace the restrictive reference to a "Patent Application" to read "identifying the correspondence a relating

to a patent application".

**Response:** In order to make it easier for Office employees handling incoming correspondence to direct mail, § 1.5(a) recommends that letters relating to a patent application should state "Patent Application". The suggestion in the comment was not adopted since uniformity in the reference to "Patent Application" is desirable. Furthermore, this suggested labeling is not a requirement as evidenced by the use of the word "should" rather than "must".

**Comment:** Section 1.5(a) states that "No correspondence relating to an application should be filed prior to when notification of the application number is received from the Patent and Trademark Office". One comment suggested that the phrase "notification of the application number" was not adequately defined as it was not clear if applicants had to wait for the official filing receipt before information disclosure statements or other papers could be filed.

**Response:** The phrase "notification of the application number" as used in 1.5(a) includes any manner in which an applicant becomes aware of the application number. The phrase is purposely broad and is not limited to the mailing of an official filing receipt. Rather, it includes a return post card which has an application number stamped thereon. The reasoning behind the statement in § 1.5(a) that no correspondence should be filed prior to notification of the application number is that correspondence received without an application number is difficult to match with the appropriate file. Further defining the phrase "notification of the application number" in 1.5(a) is not warranted.

**Comment:** One comment suggested defining a business day as Monday through Friday, except for Federal holidays in the District of Columbia.

**Response:** It is not clear which section the comment was directed to, but § 1.6 indicates that no correspondence will be received by the Office on Saturdays, Sundays or Federal holidays within the District of Columbia. Since the language has not created problems in the past, the suggestion will not be adopted.

**Comment:** Two comments suggested amending § 1.6(c) to indicate the hour of operation of the "walk-up window".

**Response:** Specifying in the regulations the hours of operation of the "walk-up window" is unnecessary. The hours of operation have been published in Official Gazette announcements and if those hours are changed in the future, the new schedule will be published. Should the hours of operation of the "walk-up window" be changed due to unforeseen circumstances (i.e., snow emergency, etc.), a sign will be posted at the "walk-up window" giving an alternate location to deposit correspondence for the Office.

**Comment:** Two comments requested that the Office reconsider and withdraw the proposal to eliminate the mail drop box at the guard's desk at the Department of Commerce Building in Washington, D. C.

**Response:** As indicated in the notice of proposed rulemaking, members of the public were occasionally denied access to the drop box at the Department of Commerce. Additionally, the Office lacked confidence in assigning correct dates of receipt to correspondence deposited in the box as a result of instances when correspondence was found outside of the drop box. Further, since there are many ways to file papers with the Office (i.e., certificate of mailing or transmission, Express Mail, facsimile transmission, longer hours at the "walk-up-window"), there is no need to maintain an off-site drop box.

**Comment:** One comment suggested that the Office publish phone numbers for facsimile machines at various locations, (i.e., Publishing Division, various examining groups, etc.), in order to enable the public to direct their transmissions to a particular location, rather than a central location.

**Response:** The suggestion has been adopted. See "Patent and Trademark Office (PTO) Information Contacts", 1149 Off. Gaz. Pat. Office 67 (April 27, 1993). The Office will publish in the Official Gazette periodic updates of this list.

**Comment:** Three comments advocated a further expansion of the facsimile transmission practice to permit transmission of any paper which did not require an original signature. According to the comment, it was difficult to understand why the Office would not permit facsimile transmission of certain papers directly to the Office, but would accept those same papers if transmitted by facsimile to a third party who then

hand-delivered the papers to the Office.

**Response:** The only papers, not requiring an original signature or certification, which the Office will not accept by facsimile transmission are those which, for various reasons, would cause an undue burden on the Office. For example, papers submitted for the purpose of obtaining an application filing date are often rather voluminous difficult to collate and would create inefficiencies in tying up the Office facsimile machines for long periods of time. In addition, there is a time and content criticality to papers filed for the purpose of obtaining a filing date which is not shared by other types of papers. Another example would be drawings submitted under §§ 1.81, 1.83-1.85, 1.152, 1.165, 1.174, 1.437, or 2.21. Experience has shown that the quality of drawings received by facsimile transmission would typically result in an objection by the Official Draftsman. Disputes might arise at that point as to whether the cause of the poor quality was applicant's transmitting unit or the receiving unit of the Office. Hence, the Office will continue to prohibit facsimile transmission of certain papers as specified in § 1.6(d). However, the suggestion has been adopted to the extent that the office will accept, via facsimile transmission, an affidavit showing that a mark is still in use or containing an excuse for nonuse under section 8(a) or (b) or section 12 (c) of the Trademark Act, 15 U.S.C. 1058(a), 1058(b), 1062(c); an application for renewal of a registration under section 9 of the Trademark Act, 15 U.S.C. 1059; and in an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), the filing of an amendment to allege use in commerce under section 1(c) of the Trademark Act, 15 U.S.C. 1051(c); or the filing of a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051 (d)(1).

**Comment:** Section 1.6(d) states that the receipt date accorded to a paper transmitted by facsimile will be the date on which the complete transmission is received in the Office. Three comments objected to this language by arguing that this practice discriminated against West Coast practitioners and gave an advantage to East Coast practitioners because the West Coast practitioners had only until 9 P.M. to complete a transmission in order to receive the benefit of that day's filing.

**Response:** The facsimile transmission practice is similar to regular mail practice. Thus, a West Coast practitioner depositing correspondence with the local postal service without a certificate of mailing will receive as a receipt date the date on which the Office receives the correspondence, rather than the date on which the correspondence was deposited. Similarly, a paper transmitted by facsimile will be accorded, as the date of receipt, the date on which the complete transmission was received in the Office, unless the date of receipt is a Saturday, Sunday, or Federal holiday within the District of Columbia, in which case, the date of receipt will be the next business day.

The certificate practice provided in § 1.8, on the other hand, permits the sender to indicate on the correspondence the date of mailing or transmission from the sender's perspective, which date would then be effective to meet a deadline set for response. Use of the certificate of mail or transmission is applicable to correspondence submitted by mail and correspondence transmitted by facsimile. If transmitted by facsimile, the person signing the certificate certifies the expectation that the transmission would be initiated before midnight, local time.

By way of example, a West Coast practitioner preparing a response on the last day of the period for response would have to use the § 1.8 certificate of mailing procedure or the § 1.10 Express Mail procedure, for the response to be considered timely, if the correspondence was sent by way of the U. S. Postal Service. If the practitioner chose to send the correspondence by facsimile on the last day for response and the transmission was started before 9:00 p.m. Pacific time, but was completed after 9:00 p.m. Pacific time, the Office would accord that correspondence a receipt date as of the next business day, which would be after the period for response expired because the Office would have received the correspondence after midnight Eastern time of the last day for response. However, if the practitioner affixed a certificate of transmission to the correspondence sent by facsimile transmission, indicating that the correspondence was being transmitted on the last day in the period for response, then the correspondence would be considered timely filed.

As another example, a transmission started before midnight, Pacific time, on the last day for response and having a certificate of transmission affixed thereto, would be considered timely

filed even though the transmission was completed after midnight, Pacific time and was received in the Office the day after the deadline for response.

**Comment:** One comment suggested replacing "drawings" in § 1.6(d)(4) with "formal drawings" for clarity.

**Response:** The suggestion has not been adopted because the phrase "formal drawings" does not find support or antecedent basis in sections referred to in § 1.6(d)(4).

**Comment:** One comment objected to the perceived requirement for a certificate of transmission in order for a facsimile-transmitted document to be accorded a date of receipt.

**Response:** The receipt date accorded to correspondence eligible for facsimile transmission, whether containing a certificate of transmission or not, will be the date of receipt in the Office of the complete transmission (unless that date is a Saturday, Sunday, or Federal holiday within the District of Columbia, in which case the date accorded will be the next business day). The certificate of transmission, if used, is for purposes of establishing timely filing if the correspondence is transmitted within the period for response but is (1) received in the Office after expiration of the period for response, or (2) lost or (3) not received by the Office.

**Comment:** One comment requested clarification as to what constituted a "complete transmission" as used in § 1.6(d).

**Response:** The context in which the phrase "complete transmission" was used in 1.6(d) was to indicate that the transmission was finished. For example, if page 1 of a ten-page facsimile transmission is received in the Office at 11:55 p.m. on a Tuesday and page 10 of that transmission is received at 12:05 a.m. Wednesday, the receipt date accorded to that correspondence will be the date of that Wednesday. (This example assumes that Wednesday is not a Federal holiday within the District of Columbia).

**Comment:** One comment questioned whether a confirmation in the sender's facsimile machine that the entire facsimile was received constituted sufficient proof that a transmission was complete.

**Response:** A confirmation by the sender's facsimile machine is evidence that a transmission was made. As such, the confirmation will be considered together with any other evidence presented when questions of filing by facsimile transmission arise. It is therefore suggested that a certificate of transmission be used to enable the sender to rely on the procedures set forth in § 1.8(b).

**Comment:** One comment requested clarification as to what constituted an incomplete, faulty or illegible facsimile. Also, if an incomplete transmission was sent near the end of the period for response, will the sender be able to rely on the date the facsimile was initially transmitted, or would the sender have to rely on § 1.137 to revive the application if it became abandoned?

**Response:** If an incomplete, faulty or illegible facsimile transmission is received, that correspondence will be treated by the Office in the same manner that a comparably incomplete, faulty or illegible piece of correspondence would be treated if the correspondence were hand-delivered or mailed to the Office. Whether the application would be held abandoned upon receipt of an incomplete facsimile transmission or whether an opportunity would be provided to complete the transmission will be decided on a case-by-case basis using the same standards that are currently used - for example, for incomplete responses to Office actions, see § 1.135(c).

**Comment:** One comment indicated that the proposed practice of not accepting papers related to international applications if transmitted by facsimile and the indication that papers transmitted by facsimile, when prohibited, may be disposed of is contrary to PCT practice wherein PCT expressly provides for facsimile transmission of such papers and when not acceptable, an opportunity to correct is provided.

**Response:** PCT does not mandate acceptance of facsimile transmissions; it merely authorizes their acceptance. See PCT Rule 92.4(h). Additionally, as indicated above, the suggestion that the Office permit facsimile transmission of correspondence relative to an already filed international application has been adopted to a large extent.

There is no provision in PCT to provide an opportunity for correction when correspondence is filed by facsimile in spite of a refusal by a national Office to accept that type of correspondence by facsimile. As with national applications, the Office



will attempt to notify senders whenever a facsimile transmission received is of a type which the Office has not agreed to accept by facsimile. Senders are cautioned against submitting such correspondence by facsimile transmission since the correspondence will not be accorded a filing date or date of receipt in the Office.

**Comment:** One comment suggested changing the phrase "Certificate of Transfer" in § 1.8 to "Certificate of Transmittal" or "Certificate of Sending" because "transfer" typically implies transfer of ownership interest in patents or trademarks.

**Response:** While each phrase has its own advantages and drawbacks, the suggestion will not be adopted. Nevertheless, in order to avoid confusion, this rulemaking leaves the old "Certificate of Mailing" intact, while adding "or Transmission" to include correspondence filed by facsimile transmission.

**Comment:** In the notice of proposed rulemaking, it was recommended that the facsimile machine transmission report be retained by the sender along with the correspondence used as the original, as evidence of content and date of transfer. One comment indicated that the correspondence used as the original can only be retained using the older stand-alone type of facsimile machine, since there is no such physical document with the newer in-computer facsimile cards.

**Response:** Section 1.4(d)(2) provides for submission of copies, e.g., by facsimile, of originals as defined in § 1.4(d)(1). Section 1.4(d)(2) does not provide for transmission of unsigned correspondence from a computer. While 1.4(d)(2) does not require the sender to retain the original, there may be occasions when the sender will have to document the date and content of a document previously filed by facsimile transmission. The recommendation made in the notice of proposed rulemaking will apply to any situation where a paper document served as the original from which a facsimile was transmitted. If a facsimile transmission by using a computer is desired, a paper copy of the document to be transmitted may be printed out, signed and retained by the sender as evidence of content of the document transmitted. Once signed, if filing of a copy is permitted, the document could be scanned into the computer and facsimile transmitted to the Office.

**Comment:** In proposed section 1.8(a)(1) published in the Federal Register, paragraphs (i) and (ii) were joined with the alternative "or" to indicate that correspondence could be filed by being deposited with the U. S. Postal Service or transmitted by facsimile. This same section was published in the Official Gazette, by having paragraphs (i) and (ii) joined with the connective "and". Numerous comments, received apparently from individuals who saw the proposed rules in the Official Gazette, objected to the requirement that, in order to receive benefits under § 1.8, correspondence transmitted by facsimile also had to be mailed.

**Response:** Section 1.8(a)(1) as published in the Federal Register was correct, while the version published in the Official Gazette contained a typographical error. Hence, §§ 1.8(a)(1)(i) (A) and (B), as adopted in this rulemaking, make clear that the certificate of mailing or transmission practice will be applicable to correspondence mailed or sent by facsimile. The Office discourages the practice of having the same papers submitted by both methods as this practice would result in unnecessary duplication of papers and processing requirements.

**Comment:** One comment indicated that since all facsimile transmissions include the date and time of the actual facsimile transmission, the Office should not require a certificate of transmission, in order to get the benefit of an earlier filing date under § 1.8(a), when correspondence is transmitted by facsimile.

**Response:** The Office is concerned that some older machines may not print the date and time of the actual transmission. Furthermore, even on the new machines the date and time printed by the sending unit may not always be correct, particularly after a temporary electrical disconnection, change in time, etc. Hence, for purposes of being considered timely filed, if the sender wishes to obtain the benefits of a date earlier than the date the complete transmission is received in the Office, the correspondence must include a certification in accordance with § 1.8(a).

A suggested format for a Certificate of Mailing and a Certificate of Transmission under § 1.8, to be included with the correspondence, is reproduced below:

**Certificate of Mailing**

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to:

Commissioner of Patents and Trademarks  
Washington, D.C. 20231

on

Date	Signature
_____ Typed or printed name of person signing certificate	

**Certificate of Transmission**

I hereby certify that this correspondence is being facsimile transmitted to the Patent and Trademark Office:

on

Date	Signature
_____ Typed or printed name of person signing certificate	

**OTHER CONSIDERATIONS**

The rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 et seq.), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these changes is to incorporate existing Office policy into the regulations, permit the filing of certain correspondence without an original signature and permit the filing of certain correspondence by facsimile transmission.

The Office has determined that these rule changes are not major rules under Executive Order 12291. The annual effect on the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers, individuals, industries, Federal, state or local government agencies, or geographic regions because most of the changes reduce procedural burdens. There will be no significant effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Office has also determined that these changes have no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes contain collection-of-information requirements subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., which have previously been approved by the Office of Management and Budget under Control Nos. 0651-0009 and 0651-0011. The public reporting burden for these collections of information for Certificates of Mailing or Transmission is estimated to average 0.1 hours each, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collections of information. Send comments regarding these burden estimates, or any other aspect of these collections of information, including suggestions for reducing the burden, to Abraham Herskovitz, Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C.

20503 (ATTN: Paperwork Reduction Act Projects 0651-0009 and 0651-0011).

**List of Subjects****37 CFR Part 1**

Administrative practice and procedure, Freedom of information, Inventions and patents, Reporting and record keeping requirements.

**37 CFR Part 2**

Administrative practice and procedure, Courts, Lawyers, Trademarks.

**37 CFR Part 10**

Administrative practice and procedure, Conflicts of interest, Courts, Inventions and patents, Lawyers.

For the reasons set out in the preamble, and pursuant to the authority contained in 15 U.S.C. 1123 and 35 U.S.C. 6, parts 1, 2 and 10 of title 37 of the Code of Federal Regulations are amended as set forth below:

**PART 1 - RULES OF PRACTICE IN PATENT CASES**

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. In Section 1.4, the title is revised and paragraphs (d) through (f) are added to read as follows:

**§ 1.4 Nature of correspondence and signature requirements.**

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(d) Each piece of correspondence, except as provided in paragraphs (e) and (f) of this section, filed in a patent or trademark application, reexamination proceeding, patent or trademark interference proceeding, patent file or trademark registration file, trademark opposition proceeding, trademark cancellation proceeding, or trademark concurrent use proceeding, which requires a person's signature, must either:

(1) be an original, that is, have an original signature personally signed in permanent ink by that person; or

(2) be a copy, such as a photocopy or facsimile transmission (§ 1.6(d)), of an original. In the event that a copy of the original is filed, the original should be retained as evidence of authenticity. If a question of authenticity arises, the Patent and Trademark Office may require submission of the original.

(e) Correspondence requiring person's signature and relating to registration to practice before the Patent and Trademark Office in patent cases, enrollment and disciplinary investigations, or disciplinary proceedings must be submitted with an original signature personally signed in permanent ink by that person.

(f) When a document that is required by statute to be certified must be filed, a copy, including a photocopy or facsimile transmission, of the certification is not acceptable.

3. Section 1.5(a) is revised to read as follows:

**§ 1.5 Identification of application, patent or registration.**

(a) No correspondence relating to an application should be filed prior to when notification of the application number is received from the Patent and Trademark Office. When a letter directed to the Patent and Trademark Office concerns a previously filed application for a patent, it must identify on the top page in a conspicuous location, the application number (consisting of the series code and the serial number, e.g., 07/123,456), or the serial number and filing date assigned to that application by the Patent and Trademark Office, or the international application number of the international application. Any correspondence not containing such identification will be returned to the sender where a return address is available. The returned correspondence will be accompanied with a cover

letter which will indicate to the sender that if the returned correspondence is resubmitted to the Patent and Trademark Office within two weeks of the mail date on the cover letter, the original date of (a) No correspondence relating to an application should be filed prior to when notification of the application number is received from the Patent and Trademark Office. When a letter directed to the Patent and Trademark Office concerns a previously filed application for a patent, it must identify on the top page in a conspicuous location, the application number (consisting of the series code and the serial number, e.g., 07/123,456), or the serial number and filing date assigned to that application by the Patent and Trademark Office, or the international application number of the international application. Any correspondence not containing such identification will be returned to the sender where a return address is available. The returned correspondence will be accompanied with a cover letter which will indicate to the sender that if the returned correspondence is resubmitted to the Patent and Trademark Office within two weeks of the mail date on the cover letter, the original date of receipt of the correspondence will be considered by the Patent and Trademark Office as the date of receipt of the correspondence. Applicants may use either the Certificate of Mailing or Transmission procedure under § 1.8 or the Express Mail procedure under § 1.10 for resubmissions of returned correspondence if they desire to have the benefit of the date of deposit in the United States Postal Service. If the returned correspondence is not resubmitted within the two-week period, the date of receipt of resubmission will be considered to be the date of receipt of the correspondence. The two-week period to resubmit the returned correspondence will not be extended. If for some reason returned correspondence is resubmitted with proper identification later than two weeks after the return mailing by the Patent and Trademark Office, the resubmitted correspondence will be accepted but given its date of receipt. In addition to the application number, all letters directed to the Patent and Trademark Office concerning applications for patent should also state "PATENT APPLICATION," the name of the applicant, the title of the invention, the date of filing the same, and if known, the group art unit or other unit within the Patent and Trademark Office responsible for considering the letter and the name of the examiner or other person to which it has been assigned.

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4. In section 1.6, is revised, to read as follows:

**§ 1.6 Receipt of correspondence.**

(a) Date of receipt and Express Mail date of deposit. Correspondence received in the Patent and Trademark Office is stamped with the date of receipt except as follows:

(1) No correspondence is received in the Patent and Trademark Office on Saturdays, Sundays or Federal holidays within the District of Columbia;

(2) Correspondence filed in accordance with § 1.10 will be stamped with the date of deposit as "Express Mail" with the United States Postal Service unless the date of deposit is a Saturday, Sunday, or Federal holiday within the District of Columbia in which case the date stamped will be the next succeeding day which is not a Saturday, Sunday, or Federal holiday within the District of Columbia;

(3) Correspondence transmitted by facsimile to the Patent and Trademark Office will be stamped with the date on which the complete transmission is received in the Patent and Trademark Office unless that date is a Saturday, Sunday, or Federal holiday within the District of Columbia, in which case the date stamped will be the next succeeding day which is not a Saturday, Sunday, or Federal holiday within the District of Columbia.

(b) Patent and Trademark Office Post Office pouch. Mail placed in the Patent and Trademark Office pouch up to midnight on any day, except Saturdays, Sundays and Federal holidays within the District of Columbia, by the post office at Washington, D.C., serving the Patent and Trademark Office, is considered as having been received in the Patent and Trademark Office on the day it was so placed in the pouch by the U.S. Postal Service.



(c) Correspondence delivered by hand.  
In addition to being mailed, correspondence may be delivered by hand during hours the Office is open to receive correspondence.

(d) Facsimile transmission.

Except in the cases enumerated below, correspondence, including authorizations to charge a deposit account, may be transmitted by facsimile. The receipt date accorded to the correspondence will be the date on which the complete transmission is received in the Patent and Trademark Office, unless that date is a Saturday, Sunday, or Federal holiday within the District of Columbia. See § 1.6(a)(3). To facilitate proper processing, each transmission session should be limited to correspondence to be filed in a single application or other proceeding before the Patent and Trademark Office. The application number of a patent or trademark application, the control number of a reexamination proceeding, the interference number of an interference proceeding, the patent number of a patent, or the registration number of a trademark should be entered as a part of the sender's identification on a facsimile cover sheet. Facsimile transmissions are not permitted and if submitted, will not be accorded a date of receipt, in the following situations:

(1) Correspondence as specified in § 1.4(e), requiring an original signature;

(2) Certified documents as specified in § 1.4(f);

(3) Correspondence which cannot receive the benefit of the certificate of mailing or transmission as specified in §§ 1.8(a)(2)(i)(A) through (D) and (F); 1.8(a)(2)(ii)(A) and (D); and 1.8(a)(2)(iii)(A);

(4) Drawings submitted under §§ 1.81, 1.83 through 1.85, 1.152, 1.165, 1.174, 1.437, 2.51, 2.52, or 2.72;

(5) A request for reexamination under § 1.510;

(6) Correspondence to be filed in a patent application subject to a secrecy order under §§ 5.1 through 5.8 of this chapter and directly related to the secrecy order content of the application;

(7) Requests for cancellation or amendment of a registration under section 7(e) of the Trademark Act, 15 U.S.C. 1057(e); and certificates of registration surrendered for cancellation or amendment under section 7(e) of the Trademark Act, 15 U.S.C. 1057(e);

(8) Correspondence to be filed with the Trademark Trial and Appeal Board, except the notice of ex parte appeal;

(9) Correspondence to be filed in an interference proceeding which consists of a preliminary statement under § 1.621; a transcript of a deposition under § 1.676 or of interrogatories, cross-interrogatories, or recorded answers under § 1.684(c); or an evidentiary record and exhibits under § 1.653.

(e) Interruptions in U.S. Postal Service.  
If interruptions or emergencies in the United States Postal Service which have been so designated by the Commissioner occur, the Patent and Trademark Office will consider as filed on a particular date in the Office any correspondence which is:

(1) Promptly filed after the ending of the designated interruption or emergency; and

(2) Accompanied by a statement indicating that such correspondence would have been filed on that particular date if it were not for the designated interruption or emergency in the United States Postal Service. Such statement must be a verified statement if made by a person other than a practitioner as defined in § 10.1(r) of this chapter.

5. Section 1.8 is revised to read as follows:

#### § 1.8 Certificate of mailing or transmission.

(a) Except in the cases enumerated in paragraph (a)(2) of this section, correspondence required to be filed in the Patent and Trademark Office within a set period of time will be considered as being timely filed if the procedure described in this section is followed. The actual date of receipt will be used for all other purposes.

(1) Correspondence will be considered as being timely filed if:

(i) the correspondence is mailed or transmitted prior to expiration of the set period of time by being:

(A) deposited with the U.S. Postal Service with sufficient postage as first class mail addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231; or

(B) transmitted by facsimile to the Patent and Trademark Office in accordance with § 1.6(d); and

(ii) the correspondence includes a certificate for each piece of correspondence stating the date of deposit or transmission. The person signing the certificate should have reasonable basis to expect that the correspondence would be mailed or transmitted on or before the date indicated.

(2) The procedure described in paragraph (a)(1) of this section does not apply to, and no benefit will be given to a Certificate of Mailing or Transmission on the following:

(i) Relative to Patents and Patent Applications

A. The filing of a national patent application specification and drawing or other correspondence for the purpose of obtaining an application filing date;

B. The filing of correspondence in an interference which an examiner-in-chief orders to be filed by hand or "Express Mail";

C. The filing of agreements between parties to an interference under 35 U.S.C. 135(c);

D. The filing of an international application for patent;

E. The filing of correspondence in an international application before the U.S. Receiving Office, the U.S. International Searching Authority, or the U.S. International Preliminary Examining Authority;

F. The filing of a copy of the international application and the basic national fee necessary to enter the national stage, as specified in § 1.494(b) or § 1.495(b).

(ii) Relative to Trademark Registrations and Trademark Applications

A. The filing of a trademark application;

B. The filing of an affidavit showing that a mark is still in use or containing an excuse for nonuse under section 8 (a) or (b) or section 12(c) of the Trademark Act, 15 U.S.C. 1058(a), 1058(b), 1062(c);

C. The filing of an application for renewal of a registration under section 9 of the Trademark Act, 15 U.S.C. 1059;

D. The filing of a petition to cancel a registration of a mark under section 14, subsection (1) or (2) of the Trademark Act, 15 U.S.C. 1064;

E. In an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), the filing of an amendment to allege use in commerce under section 1(c) of the Trademark Act, 15 U.S.C. 1051(c); or the filing of a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051(d)(1);

F. In an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), the filing of a request under section 1(d)(2) of the Trademark Act, 15 U.S.C. 1051(d)(2), for an extension of time to file a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051(d)(1).

(iii) Relative to Disciplinary Proceedings

A. Correspondence filed in connection with a disciplinary proceeding under Part 10 of this chapter.

B. Reserved.

(b) In the event that correspondence is considered timely filed by being mailed or transmitted in accordance with paragraph (a) of this section, but not received in the Patent and Trademark Office, and the application is held to be abandoned or the proceeding dismissed, terminated, or decided with prejudice, the correspondence will be considered timely if the party who forwarded such correspondence:

(1) informs the Office of the previous mailing or transmission of the correspondence promptly after becoming aware that the Office has no evidence of receipt of the correspondence,

(2) supplies an additional copy of the previously mailed or transmitted correspondence and certificate, and

(3) includes a statement which attests on a personal knowledge basis or to the satisfaction of the Commissioner to the previous timely mailing or transmission. Such statement must be a verified statement if made by a person other than a practitioner as defined in § 10.1(r) of this chapter. If the correspondence was sent by facsimile transmission, a copy of the sending unit's report confirming transmission may be used to support this statement.

(c) The Office may require additional evidence to determine if the correspondence was timely filed.

6. Section 1.304 paragraphs (a) and (c) are revised to read as follows:

#### § 1.304 Time for appeal or civil action.

(a)(1) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (§ 1.302) or for commencing a civil action (§ 1.303) is two months from the date of the decision of the Board of Patent Appeals and Interferences. If a request for reconsideration or modification of the decision is filed within the time period provided under § 1.197(b) or § 1.658(b), the time for filing an appeal or commencing a civil action shall expire two months after action on the request. In interferences, the time for filing a cross-appeal or cross-action expires:

(i) 14 days after service of the notice of appeal or the summons and complaint; or

(ii) Two months after the date of decision of the Board of Patent Appeals and Interferences, whichever is later.

(a)(2) The time periods set forth in this section are not subject to the provisions of §§ 1.136, 1.550(c) or § 1.645 (a) or §§ (b). (a)(3) The Commissioner may extend the time for filing an appeal or commencing a civil action:

(i) For good cause shown if requested in writing before the expiration of the period for filing an appeal or commencing a civil action; or

(ii) Upon written request after the expiration of the period for filing an appeal or commencing a civil action upon a showing that the failure to act was the result of excusable neglect.

(c) If a defeated party to an interference has taken an appeal to the U.S. Court of Appeals for the Federal Circuit and an adverse party has filed notice under 35 U.S.C. 141 electing to have all further proceedings conducted under 35 U.S.C. 146 (§ 1.303(c)), the time for filing a civil action thereafter is specified in 35 U.S.C. 141. The time for filing a cross-action expires 14 days after service of the summons and complaint.

7. Section 1.366(b) is revised to read as follows:

#### § 1.366 Submission of maintenance fees.

(b) A maintenance fee and any necessary surcharge submitted for a patent must be submitted in the amount due on the date the maintenance fee and any necessary surcharge are paid and may be paid in the manner set forth in § 1.23 or by an authorization to charge a deposit account established pursuant to § 1.25. Payment of a maintenance fee and any necessary surcharge or the authorization to charge a deposit account must be submitted within the periods set forth in § 1.362 (d), (e) or (f). Any payment or authorization of maintenance fees and surcharges filed at any other time will not be accepted and will not serve as a payment of the maintenance fee except insofar as a delayed payment of the maintenance fee is accepted by the Commissioner in an expired patent pursuant to a petition filed under § 1.378. Any authorization to charge a deposit account must authorize the immediate charging of the maintenance fee and any necessary surcharge to the deposit account. Payment of less than the required amount, payment in a manner other than that set forth in § 1.23, or the filing of an authorization to charge a deposit account having insufficient funds will not constitute payment of a maintenance fee or surcharge on a patent. The certificate procedures of either §§ 1.8 or 1.10 may be utilized in paying maintenance fees and any necessary surcharges.

8. Section 1.741, paragraph (a) is revised to read as follows:

#### § 1.741 Filing date of application.

(a) The filing date of an application for extension of patent term is the date on which a complete application is received in the Patent and Trademark Office or filed pursuant to the

"Certificate of Mailing or Transmission" provisions of 37 CFR 1.8 or "Express Mail" provisions of 37 CFR 1.10.

#### PART 2-RULES OF PRACTICE IN TRADEMARK CASES

9. The authority citation for 37 CFR Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

10. Section 2.145 is amended by revising Paragraphs C(3) and D(1) to read as follows:

#### § 2.145 Appeal to Court and Civil Action.

(c) \*\*\*

(3) Any adverse party to an appeal taken to the U.S. Court of Appeals for the Federal Circuit by a defeated party in an inter partes proceeding may file a notice with the Commissioner within twenty days after the filing of the defeated party's notice of appeal to the court (paragraph (b) of this section), electing to have all further proceedings conducted as provided in section 21(b) of the Act. The notice of election must be served as provided in § 2.119.

(d) Time for appeal or civil action.

(1) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (paragraph (b) of this section), or for commencing a civil action (paragraph (c) of this section), is two months from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, as the case may be. If a request for rehearing or reconsideration or modification of the decision is filed within the time specified in §§ 2.127(b), 2.129(c) or § 2.144, or within any extension of time granted thereunder, the time for filing an appeal or commencing a civil action shall expire two months after action on the request. In inter partes cases, the time for filing a cross-action or a notice of a cross-appeal expires

(i) 14 days after service of the notice of appeal or the summons and complaint; or

(ii) two months from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, whichever is later.

11. Section 2.165(a)(1) is revised to read as follows:

#### § 2.165 Reconsideration of Affidavit or Declaration

(a)(1) If the affidavit or declaration filed pursuant to § 2.162 is insufficient or defective, the affidavit or declaration will be refused and the registrant will be notified of the reason. Reconsideration of the refusal may be requested within six months from the date of the mailing of the action. The request for reconsideration must state the grounds for the request. A supplemental or substitute affidavit or declaration required by section 8 of the Act of 1946 cannot be considered unless it is filed before the expiration of six years from the date of the registration or from the date of publication under section 12(c) of the Act. The Certificate of Mailing or Transmission" procedure provided by § 1.8 does not apply to affidavits or declarations or to supplemental or substitute affidavits or declarations filed under section 8(a) or (b) of the Act, but the certificate by "Express Mail" procedure provided by § 1.10 does apply thereto.

#### PART 10-REPRESENTATION OF OTHERS BEFORE THE PATENT AND TRADEMARK OFFICE

12. The authority citation for 37 CFR Part 10 continues to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32 41.



13. Section 10.18, is revised to read as follows:

### § 10.18 Signature and certificate of practitioner.

(a) Except where a copy, including a photocopy or facsimile transmission, of a personally signed piece of correspondence is permitted to be filed pursuant to § 1.4 of this chapter, every piece of correspondence filed by a practitioner on behalf of himself or herself or representing an applicant or a party to a proceeding in the Patent and Trademark Office must bear an original signature personally signed in permanent ink by such practitioner except for correspondence which is required to be signed by the applicant or party. The signature of a practitioner on correspondence filed by the practitioner, regardless of whether the correspondence has an original signature or is a copy, including a photocopy or facsimile transmission, of correspondence bearing an original signature, constitutes a certificate that:

- (1) The correspondence has been read by the practitioner;
- (2) The filing of the correspondence is authorized;
- (3) To the best of practitioner's knowledge, information, and belief, there is good ground to support the correspondence, including any allegations of improper conduct contained or alleged therein; and
- (4) The correspondence is not interposed for delay.

(b) Any practitioner knowingly violating the provisions of this section is subject to disciplinary action. See § 10.23(c)(15).

14. Section 10.23, paragraph (c)(9), is revised to read as follows:

### 10.23 Misconduct

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(c) \*\*\*

(9) Knowingly misusing a "Certificate of Mailing or Transmission" under 1.8 of this chapter or a certificate of "Express Mail" under § 1.10 of this chapter.

Oct. 15, 1993

BRUCE A. LEHMAN  
Assistant Secretary of Commerce  
and Commissioner of Patents  
and Trademarks

[1157 OG 86]

(52) DEPARTMENT OF COMMERCE  
Patent and Trademark Office  
37 CFR Part 1  
[Docket No. 920666-2275]  
RIN 0651-AA59

### Changes in Practice Relating to Filing Patent Applications

Agency: Patent and Trademark Office, Commerce.  
Action: Final Rule.

Summary: The Patent and Trademark Office (Office) is amending the rules of practice in patent cases to provide a uniform practice with respect to filing an oath or declaration and filing fees in continuing applications.

Effective Date: Jan. 4, 1993. These rules will be applicable to all papers and applications filed with the Office on or after the effective date.

For Further Information Contact: Jeffrey V. Nase by telephone at (703) 305-9282 or by mail marked to his attention and addressed to Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231.

Supplementary Information: In a Notice of Proposed Rulemaking published in the *Federal Register* (57 FR 31344) on July 15, 1992, and in the Patent and Trademark Office *Official Gazette* (1141 Off. Gaz. Pat. Office 9) on Aug. 4, 1992, the Office proposed to amend § 1.60. The due date for submitting written comments was extended to Sept. 10, 1992, in an Extension of Comment Period published in the *Federal Register* (57 FR 38640) on Aug. 26, 1992.

One comment was received. The comment favored adoption of the proposed rule changes.

A continuation or divisional application filed under § 1.60 did not receive a filing date until a complete copy of the prior application was filed, including a true copy of the oath or declaration. Since the Office is in possession of the oath or declaration of the prior application, § 1.60 is being modified to be consistent with §§ 1.53 and 1.62 by permitting filing of a true copy of the oath or declaration within a time specified in a notice of missing parts mailed by the Office.

The specific revisions are discussed below:

### (1) Correction of inventorship (§ 1.48)

Section 1.48(a) is amended to replace the designation by letter of various requirements therein with numbered designations so as to avoid confusion when making reference to this section.

### (2) Procedures for completing applications filed under § 1.60

Section 1.60 outlines one of the procedures that may be followed by applicants to file a continuation or divisional application. One of the requirements under this section is that applicants file a true copy of the complete parent application as filed, including the oath or declaration. Paragraph (c) of this section had specified that a filing date would not be granted if applicant failed to file a complete application under this section. When the missing item was filed, a filing date was granted as of the date of receipt of the missing item. Practice under § 1.60 is being modified to be similar to the procedures for filing continuing applications under §§ 1.53(d) and continuation-in-part applications under § 1.62. More specifically, a new paragraph (d) is added in § 1.60 to indicate that if an application filed pursuant to § 1.60(b) is otherwise complete, but does not include the appropriate filing fee or a true copy of the oath or declaration from the prior complete application, a filing date will be granted. The copy of the oath or declaration, as well as payment of the appropriate filing fee must be submitted within a time period specified in a notice of missing parts mailed by the Office. In a manner similar to the practice under §§ 1.53(d) and 1.62(d), the appropriate oath or declaration and/or filing fee as well as the surcharge set forth in § 1.16(e) must be filed within the time period specified in the notice of missing parts in order to avoid abandonment of the application. Paragraphs (b) and (c) of this section are amended to make reference to the exception specified in paragraph (d) discussed above.

### OTHER CONSIDERATIONS

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these changes is to accord a filing date to certain continuing applications which, through oversight, fail to include certain papers which can be submitted after the filing date.

The Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers; individuals; industries; Federal, state or local government agencies; or geographic regions most of the changes reduce procedural burdens. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of the United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Office has also determined that this notice has no Federalism implications affecting the relationship between the

National Government and the States as outlined in Executive Order 12612.

The rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

### List of Subjects

### 37 CFR Part 1

Administrative practice and procedure, Freedom of information, Inventions and patents, Reporting and record keeping requirements.

For the reasons set out in the preamble, and pursuant to the authority contained in 35 U.S.C. 6, part 1 of title 37 of the Code of Federal Regulations is amended as set forth below.

### PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.48, paragraph (a) is revised to read as follows:

### § 1.48 Correction of inventorship

(a) if the correct inventor or inventors are not named in an application for patent through error without any deceptive intention on the part of the actual inventor or inventors, the application may be amended to name only the actual inventor or inventors. Such amendment must be diligently made and must be accompanied by:

(1) a petition including a statement of facts verified by the original named inventor or inventors establishing when the error without deceptive intention was discovered and how it occurred;

(2) an oath or declaration by each actual inventor or inventors as required by § 1.63;

(3) the fee set forth in § 1.17(h); and

(4) the written consent of any assignee.

When the application is involved in an interference, the petition shall comply with the requirements of this section and shall be accompanied by a motion under § 1.634.

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3. In Section 1.60, paragraphs (b) and (c) are revised and paragraph (d) is added to read as follows:

### § 1.60 Continuation or divisional application for invention disclosed in a prior application.

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(b) An applicant may omit signing of the oath or declaration in a continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 and 121 and § 1.78(a)) if:

(1) the prior application was a complete application as set forth in § 1.51(a),

(2) applicant indicates that the application is being filed pursuant to this section and files a true copy of the prior complete application as filed including the specification (with claims), drawings, oath or declaration showing the signature or an indication it was signed, and any amendments referred to in the oath or declaration filed to complete the prior application,

(3) the inventors named in the continuation or divisional application are the same or less than all the inventors named in the prior application, and

(4) the application is filed before the patenting or abandonment of or termination of proceedings on the prior application. The copy of the prior application must be accompanied by a statement that the application papers filed are a true copy of the prior application and that no amendments referred to in the oath or declaration filed to complete the prior application introduced new matter therein. Such statement must be by the applicant or applicant's attorney or agent and must be a verified

statement if made by a person not registered to practice before the Patent and Trademark Office. Only amendments reducing the number of claims or adding a reference to the prior application (2.1.78(a)) will be entered before calculating the filing fee and granted the filing date. If the continuation or divisional application is filed by less than all the inventors named in the prior application, a statement must accompany the application when filed requesting deletion of the names of the person or persons who are not inventors of the invention being claimed in the continuation or divisional application. Except as provided in paragraph (d) of this section, if a true copy of the prior application as filed is not filed with the application or if the statement that the application papers are a true copy is omitted, the application will not be given a filing date earlier than the date upon which the copy and statement are filed, unless a petition with the fee set forth in § 1.17(i)(1) is filed which satisfactorily explains the delay in filing these items.

(c) if an application filed pursuant to paragraph (b) of this section is incomplete for reasons other than those specified in paragraph (d) of this section, applicant will be notified and given a time period within which to complete the application in order to obtain a filing date as of the date of filing the omitted item provided the omitted item is filed before the patenting or abandonment of or termination or proceedings on the prior application. If the omission is not corrected within the time period set, the application will be returned or otherwise disposed of; the fee, if submitted, will be refunded less the handling fee set forth in § 1.21(n).

(d) If an application filed pursuant to paragraph (b) of this section is otherwise complete, but does not include the appropriate filing fee or a true copy of the oath or declaration from the prior complete application, showing the signature or an indication it was signed, a filing date will be granted and applicant will be so notified and given a period of time within which to file the fee, or the true copy of the oath or declaration and to pay the surcharge as set forth in § 1.16(e) in order to prevent abandonment of the application. The notification pursuant to this paragraph may be made simultaneously with any notification pursuant to paragraph (c) of this section.

Dec. 2, 1992

DOUGLAS B. COMER  
Acting Assistant Secretary and Acting  
Commissioner of Patents and Trademarks

[1145 OG 377]

### (53) Applications Filed Under 37 CFR 1.60 on or After May 8, 1995, and Prior to June 8, 1995

The PTO has always required a proper continuation or divisional application filed under 37 CFR 1.60 to identify the application number (or serial number and filing date) of the prior application. The information is typically provided by the applicant in the application transmittal letter containing the request for processing under 37 CFR 1.60 or in a separate statement verifying the copy of the prior application supplied by the applicant as a "true copy".

As a result of the new 20-year patent term which was effective on June 8, 1995, a large number of continuation or divisional applications were received in the Patent and Trademark Office (PTO) during the weeks prior to June 8, 1995, using the procedure set forth in 37 CFR 1.60. Unfortunately, a number of these applications were incomplete under 37 CFR 1.60 because the applications failed to identify the application number (or serial number and filing date) of the prior application. In some instances, the application number of the prior application could not be identified in the 37 CFR 1.60 application papers because the information concerning the application number assigned to the prior application by the PTO had not yet been supplied to the applicant by the PTO. A petition and payment of the \$130.00 petition fee would normally be required to accord the application the original date of deposit as the filing date.

However, in view of the extraordinary circumstances which necessitated the filing of these continuation or divisional applications prior to June 8, 1995, the requirement that the application number of the prior application be supplied in the 37 CFR 1.60 application papers on filing is hereby waived, *sua sponte*, for



all continuation or divisional applications filed under 37 CFR 1.60 which were filed in the PTO or deposited in the Express Mail service pursuant to 37 CFR 1.10 on or after May 8, 1995, and prior to June 8, 1995. No other requirement of 37 CFR 1.60 is being waived by this notice.

Where applicant receives a notice from the PTO in a continuation or divisional application under 37 CFR 1.60 filed on or after May 8, 1995, and prior to June 8, 1995, stating that the application is incomplete because the application number of the prior application was omitted, the delay in supplying the application number of the prior application will be excused without a petition or a petition fee being required, if applicant files a paper supplying the application number (or serial number and filing date) of the prior application within TWO MONTHS of the date of the notice mailed in the application or the publication date of this notice in the *Official Gazette*, whichever is later. If a petition fee has already been paid in such a case, the Office will refund the petition fee.

June 27, 1995

EDWARD R. KAZENSKE  
Deputy Assistant Commissioner  
for Patents

[1177 OG 130]

(54) **Patent and Trademark Office**  
**37 CFR Part 1**  
**Changes in Patent Drawing Standards**

Agency: Patent and Trademark Office, Commerce  
Action: Final Rule

**Summary:** The Patent and Trademark Office (Office) is amending the rules of practice regarding patent drawings to adopt international standards and to eliminate unnecessary requirements. The Office is amending the rules to provide clarification and adopt international standards; to delete the reference to changes by bonded draftsmen since the Office will no longer release drawings from patent applications and to include the option of submitting black and white photographs in lieu of black ink drawings.

**Effective Date:** October 1, 1993. These rules will be applicable to all drawings and papers filed with the Office on or after the effective date.

**For Further Information Contact:** Richard A. Bawcombe by telephone at (703) 305-8594, by mail marked to his attention addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, or by facsimile transmission to his attention at (703) 305-4372.

**Supplementary Information:** In a Notice of Proposed Rulemaking published in the *Federal Register* (57 FR 42721) on September 16, 1992, and in the Patent and Trademark Office *Official Gazette* (1143 Off. Gaz. Pat. Office 13) on Oct. 6, 1992, the Office proposed to amend the rules of practice in patent drawings. Drawings acceptable for patent applications filed outside of the United States are not always acceptable in a patent application filed in the United States. Therefore, the rules relating to drawing requirements are being amended to enable the Office, when appropriate, to accept drawings that are capable of clear reproduction for the printing of any resulting patent. Drawings in compliance with the old § 1.84 will be in compliance with the new § 1.84. An oral hearing was not conducted. However, six written comments were submitted.

**Response to Comments on the Rules**

The comments received in response to the notice of proposed rulemaking have been given careful consideration and several of the suggested modifications have been adopted.

Another modification, since the "Notice of Proposed Rulemaking" is under § 1.84 wherein five sets of drawings were required, but the total has been decreased to three sets due to a reassessment of the need for the additional copies for Office use. The comments and responses are discussed below.

**Comment:** Three comments were received regarding the proposed changes within § 1.84(b). Three other comments were received regarding the proposed changes to § 1.165. All six

comments suggested that the Office continue to accept mounted photographs.

**Response:** The Office will adopt the suggestion and continue to accept mounted photographs for utility, design, and plant patent applications. The initial reason the Office sought to change the rule was to overcome the problem of mounted photographs becoming detached and separated from the file. The apparent burden to applicants associated with the Office not accepting mounted photographs is the reason the Office will continue to permit mounted photographs provided they are permanently affixed.

Several of the commenters mentioned that they have never had problems with mounted photographs. As commentary on these remarks, it is not the person filing the drawings who would have problems with mounted photographs; it is the Office. And, indeed, the Office has, in the past, experienced problems with mounted photographs coming loose from the paper they are mounted on. When this happens, the photographs can become displaced from the file and lost. This has occurred many times, leading to frustration and wasted effort on the part of many practitioners, as well as on the part of Office personnel. If mounted photographs are to be used, they must be mounted in such a way that they cannot become loose from the bristol board to which they are mounted.

**Comment:** Two of the comments regarding 1.84(b) also mentioned that the proposed rules would not allow more than one figure on each sheet of drawings where photographs are being used, and sought relief from this proposed change.

**Response:** Since the Office will continue to accept mounted photographs, the Office will also accept sheets of drawings where more than one photograph appears on the drawing sheet provided that all other drawing requirements are met.

**Comment:** Two of the comments suggested that the Office not require photographs to be on A4 size paper.

**Response:** The Office will adopt the suggestion. The Office will accept photographs on one of the four paper sizes specified in § 1.84(f), as long as all sheets are the same size.

**Comment:** Regarding § 1.84(f), one comment suggested that the Office permit use of an additional size of paper, i.e., 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches).

**Response:** The Office will adopt the suggestion. The adoption of the suggestion to add an additional paper size under § 1.84(f), results in the need for an additional margin size. Therefore, an additional paragraph is added to § 1.84(g) to state that "On 21.6 cm. by 27.9 cm. (8 1/2 by 11 inch) drawing sheets, each sheet must include a top margin of 2.5 cm. (1 inch) and bottom and side margins of .64 cm. (1/4 inch) from the edges, thereby leaving a sight precisely 20.3 by 24.8 cm. (8 by 9 3/4 inches)."

**Comment:** Regarding 1.84(p)(3), one comment suggested liberalization for drawings which include typewritten subject matter, such as gene or protein sequences that consist predominantly of letters, sometimes with underlining and boxes around them. Other situations cited were graphs and photographs of gels, which often appear in biotechnological inventions, which include typed matter as legends.

**Response:** The suggestion has not been adopted because letters need to stand at the designated height to maintain legibility when reductions become necessary to accommodate the various photocomposed products.

**Comment:** Regarding § 1.84(w), one comment mentioned that correction fluid is not permanent and has a tendency to flake and fall from the surface it covers.

**Response:** Section 1.84(w) permits correction fluid to be used provided the correction fluid is durable and permanent. If correction fluid is used on drawings submitted to the Office, the applicant will be required by the Office to correct the drawings if the correction fluid becomes loose before the patent printing process is completed.

**Comment:** One comment suggested that § 1.152 was improper in permitting either ink drawings or photographs to be submitted with an application for a design patent, but not both, and in requiring any photographs submitted to show only the design claimed and none of the environment in which it is used. The comment argued that prohibition against using both ink drawings and photographs is inconsistent with 35 U.S.C. 112. Under that section of the statute, a design patent application must disclose the invention "in such full, clear, concise, and exact terms as enable any person skilled in the art... to make and use" the invention and "set forth the best mode contemplated by

the inventor of carrying out his invention."

**Response:** Section 1.152 is consistent with 35 U.S.C. 112. The introduction of both photographs and ink drawings in a design application would result in a high probability of inconsistencies between corresponding elements on the ink drawings as compared with the photographs. However, if special circumstances warrant use of both ink drawings and photographs, applicant can file a petition under § 1.183 to permit both in a design application if such drawings do not introduce inconsistencies between the views.

**DISCUSSION OF SPECIFIC SECTIONS CHANGED OR ADDED:**

Section 1.17(h) is amended to include a reference to § 1.84 for accepting color drawings or photographs in utility patent applications.

Section 1.19(a)(3) is amended to change the citation of § 1.84(p) to § 1.84(a)(2) in view of the amendments to § 1.84.

Section 1.71(d) is amended to change the citation of § 1.84(o) to § 1.84(s) in view of the amendments to § 1.84.

Section 1.84 is revised as follows:

(a) Drawings. This paragraph is added to classify drawings into two categories, i.e., black ink and color, and deletes the limitation that the use of white pigment to cover lines is not normally acceptable. The black ink drawing requirements are amended to allow computer-generated drawings to be accepted subject to the same standards applied to all black ink drawings. Color drawing requirements are moved from § 1.84(p) to § 1.84(a). Color drawings may be acceptable upon the granting of a petition filed under this paragraph explaining why the color drawings are necessary. A petition is required because the special handling necessary for color drawings is time consuming and the Office cannot permit such a special procedure except in extenuating circumstances. Since utility patents are not printed in color, 3 sets of color drawings are necessary for proper distribution within the Office. One color set will be attached to the Letters Patent for routing to the applicant. The remaining two color sets will be routed to (1) the patent file, and (2) the Office of Publication and Dissemination, Patent and Trademark Copy Sales, for copying purposes when a copy in color of a utility patent containing a color drawing, as provided for in § 119(a)(3), is requested.

(b) Photographs. This paragraph permits the acceptance of photographs upon granting of an applicant's petition. The Office will accept black and white and color photographs or photomicrographs (not photolithographs or other reproductions of photographs made by using screens) developed on double weight photographic paper or permanently mounted on bristol board, in lieu of ink drawings. The photographs must be of sufficient quality so that all details in the drawing are reproducible in the printed patent.

(c) Identification of drawings. This paragraph permits an applicant to provide proper identification information on the reverse side of each sheet of drawings. The identification information allows the Office to match drawing sheets with the proper application. The identification information should include the application number, if known, or the title of the invention, inventor's name, docket number (if any), and name and telephone number of the person to call if the drawings cannot be matched to the proper patent application. The Office will not object if identifying information is not present; however, if the drawings become separated, it will be virtually impossible for the Office to match the drawings with the application. This paragraph is restructured from previous § 1.84(1) and revised to state that the preferred placement of the information is on the back side of the drawing sheets.

(d) Graphic forms in drawings. This paragraph is added to set standards for chemical and mathematical formulae to align Office standards for formulae, tables, and waveforms with international standards.

(e) Type of paper. This paragraph is a revision of previous § 1.84(a) to set forth the requirements for the type of paper to be used for drawings, including the type of paper for photographs.

(f) Size of paper. This paragraph clarifies Office requirements set forth in previous § 1.84(b) and permits one additional size of paper, i.e., 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches) for drawings.

(g) Margins. This paragraph is restructured from previous § 1.84(b) to indicate how the size of the paper changes the margin requirements. The Office will accept four sizes of paper, however, the sight (i.e. the usable surface) is the same for two of the paper sizes, i.e., 21.6 cm. by 33.1 cm. (8 1/2 by 13 inches), and 21.6 cm. by 35.6 cm. (8 1/2 by 14 inches). The sight is 17.0 cm. by 26.2 cm. for DIN size A4 paper. The sight is 20.3 cm. by 24.8 cm. (8 by 9 3/4 inches) for the added paper size of 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches).

(h) Views. This paragraph is added to reformat previous § 1.84(i) to provide a logical arrangement of the different views provided in the rules, to revise the standards for purposes of clarification, to include the standard for waveforms to show the relative timing, to provide clearer language relative to hatching shown on drawings, to set forth the standard for depicting hatching in sectional views as regularly spaced parallel oblique strokes which precludes use of cross-hatching strokes, and to include requirements pertaining to alternate positions. In addition, both Roman and Arabic numerals are acceptable to designate the section being illustrated.

(i) Arrangement of views. This paragraph is relocated from previous § 1.84(j) and revised to incorporate international standards. In addition, this paragraph is changed and broadened to provide for placement of words on drawings. One view is not to be superimposed within the outline of another. The changes expand the possibilities for presenting graphs to conform to standard scientific conventions, while using a format which is compatible with automated patent searching displays. See 1121 Off. Gaz. Pat. Office 54 (Dec. 25, 1990) and 1129 Off. Gaz. Pat. Office 22 (Aug. 13, 1991).

(j) View for *Official Gazette*. This paragraph is relocated from previous § 1.84(k).

(k) Scale. This paragraph is relocated from previous § 1.84(e) and § 1.84(i) and revised to indicate that the words "actual size" or "scale 1/2" on the drawings are not permitted since the meaning is lost in reduction/enlargement. The paragraph provides that elements of the same view must be in proportion to each other, unless a difference in proportion is indispensable for the clarity of the view. As a preferred alternative to a difference in proportion within one view for the purpose of achieving the necessary clarity, a supplementary view may be added giving a larger-scale illustration of an element from the initial view. When a supplementary view is included, it is recommended that the enlarged element shown in the second view be surrounded by a finely drawn or "dot-dash" circle in the first view pinpointing its location, without obscuring the view.

(l) Character of lines, numbers, and letters. This paragraph is relocated from previous § 1.84(c) and revised to indicate that lines and strokes of different thicknesses may be used in the same drawing where different thicknesses have different meanings. In addition, this paragraph is changed and broadened to allow drawings to be made by any process which will give them satisfactory reproduction characteristics.

(m) Shading. This paragraph is changed and broadened to expand definitions for shading and deletes the limitation that drawings transmitted to the Office should be sent flat, protected by a sheet of heavy binder's board, or rolled for transmission in a suitable mailing tube. This change provides the individual practitioner with greater discretion on how to send drawings. In addition, this paragraph is relocated from previous § 1.84(d) to separate shading requirements from hatching requirements by stating that shading may be used to indicate the surface or shape of spherical, cylindrical, and conical elements of an object, and that spaced lines are preferred for shading purposes. Solid black areas are not permitted, except when used to represent bar graphs or color.

(n) Symbols. This paragraph is relocated from previous § 1.84(g) to separate symbols requirements from legends requirements and enlarges the number of acceptable symbols. Known devices should be illustrated by symbols which have a universally-recognized meaning, and which are generally accepted in the art, provided no further detail is essential for understanding the subject matter of the claimed invention. Symbols which are not universally recognized may be used if they are not likely to be confused with existing conventional symbols and if they are readily identifiable, subject to approval by the Examiner.



(o) **Legends.** This paragraph is relocated from previous § 1.84(g) to separate legends requirements from symbols requirements and revised to integrate international standards. Where text matter is (1) deemed indispensable for understanding the drawing or (2) may be required by the Examiner, a minimum of words should be used. While such requirement by the Examiner was not contained in the "Notice of Proposed Rulemaking," it was contained in former § 1.84(g). Words should not be used to describe the figure itself, such as "this is a bar graph." All text legends are subject to approval by the examiner.

(p) **Numbers, letters, and reference characters.** This paragraph is relocated from previous § 1.84(f) and revised to include numbers and letters in the heading formerly designated "reference characters." This section has been reformatting into five subsections and revised to integrate international standards, where possible. Although the Latin alphabet is used in the international standard, the Office takes the view that the English alphabet is more universally acceptable for letters, except where another alphabet is customarily used, such as the Greek alphabet to indicate angles, wavelengths, and mathematical formulae. In addition, the characters used must be oriented in the same direction as the view so as to avoid having to rotate the sheet. Reference characters should be so arranged to follow the profile of the object depicted. See 1121 Off. Gaz. Pat. Office 54 (Dec. 25, 1990) and 1129 Off. Gaz. Pat. Office 22 (Aug. 13, 1991).

(q) **Lead lines.** This paragraph is added to integrate international standards, to incorporate brief language which appears in previous § 1.84(f), and to change and expand the definition for lead lines. Lead lines are those lines between the reference characters and the details referred to, and they must be executed in the same way as other lines in the drawing.

(r) **Arrows.** This paragraph is relocated from previous § 1.84(g) and revised to indicate the meaning of the use of arrows, and to show that they may be used at the end of lead lines only if their meaning is clear.

(s) **Copyright or mask work notice.** This paragraph is relocated from previous § 1.84(o).

(t) **Numbering of sheets of drawings.** This paragraph is relocated from previous § 1.84(n) and changed and broadened to allow for the placement of sheet numbers within the sight of the drawing. It is preferable that the sheets be numbered with two Arabic numerals placed on either side of an oblique line, with the first number being the sheet number and the second the total number of sheets of drawings.

(u) **Numbering of views.** This paragraph is relocated from previous § 1.84(i) and, for clarity, is separately identified in this new section. Use of the abbreviation "FIG." must precede all view numbers.

(v) **Security markings.** This paragraph is relocated from previous § 1.84(l) to provide that security markings may be placed on the drawings if they are outside the sight and preferably centered in the top margin.

(w) **Corrections.** This paragraph is added to provide that any corrections made on drawings submitted to the Office must be durable and permanent. The language is revised from previous 1.84(a) which prohibited the use of white pigment to cover lines.

(x) **Holes.** This paragraph is relocated from previous § 1.84(b) to permit two holes to be punched in the top margin of the drawings with their center lines spaced 7.0 cm. (2 3/4 inches) apart.

Section 1.88 is removed and reserved since the changes effective January 1, 1991, in § 1.85(b) make the regulation regarding the transfer of drawings unnecessary. Since the Office no longer releases drawings from patent applications, applicants are generally retaining the master copy of the drawings. Accordingly, applicants can easily file a copy of drawings in an application and therefore eliminate the need for the Office to transfer drawings. Any situations which present a hardship to applicants may be accommodated by the filing of a petition under § 1.182 requesting the transfer of the drawings.

Section 1.123 prescribes procedures for amending drawings. With the adoption of new rules for amending drawings effective January 1, 1989, the Office no longer requires the submission of formal drawings upon filing a patent application. See 1097 Off. Gaz. Pat. Office 36 (Dec. 13, 1988). Since corrections are the responsibility of the applicant, the original drawing(s)

should be retained by the applicant for future correction, if necessary.

As a result of adoption of the new rules in 1989 relating to drawings, the Office will no longer release to applicants, bonded drafting companies or others, drawings from patent applications. Effective January 1, 1991, § 1.85(b) prohibits release of drawings from all patent applications. Accordingly, the reference to changes by bonded draftsmen is deleted from § 1.123.

Section 1.152 is revised to provide that photographs and ink drawings must not be combined in one design application. The reason for this requirement is to avoid inconsistencies between the photograph and the drawing, and further eliminate views that may distort the proportionate relationship between the corresponding elements on the drawing and the photograph. All design photographs are limited to the design for the article claimed and are not to include environmental structure.

Color drawings and color photographs are not permissible in design patent applications. The submission of color photographs will be accepted for filing date purposes, in design patent applications, contrary to the requirement for black ink drawings. The Applications Processing Division has been authorized to construe the color photographs as informal drawings, rather than to hold the applications incomplete as filed. By so construing color photographs when filed as informal drawings, the Office will accept the applications without requiring applicants to file a petition to obtain the original deposit date as the filing date. During the course of prosecution, the Examiner will require properly executed formal black ink drawings or black and white photographs as a substitute for the originally filed color photographs prior to allowance of the claim. Solid black surface shading is not permitted on a design drawing, except when used to represent color contrast.

Section 1.165 is revised to provide that plant patent drawings must comply with the requirements of § 1.84. The current exception that plant patent drawings do not automatically require view numbers and reference characters is maintained. Two sets of the drawings are needed. One set will be forwarded to the Department of Agriculture and the other set will be routed to the Office of Publication and Dissemination, Patent and Trademark Copy Sales, for copying purposes.

#### OTHER CONSIDERATIONS

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The Acting General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these changes is to revise and reformat the drawing standards to adopt international standards, to the extent possible, and to facilitate access to sections through inclusion of pertinent subsection headings, which should be helpful to small entities.

The Office has determined that these rule changes are not a major rule under Executive Order 12291. The annual effect on the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers, individuals, industries, Federal, state or local government agencies, or geographic regions because most of the changes reduce procedural burdens. There will be no adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Office has also determined that these rule changes have no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes contain a collection of information requirements subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, which has previously been approved by the Office of Management and Budget under Control No. 0651-0011.

#### List of Subjects in 37 CFR Part 1.

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Reporting, and Record keeping requirement.

For the reasons set out in the preamble, and pursuant to the authority contained in 35 U.S.C. 6, Part 1 of Title 37 of the Code of Federal Regulations is amended as set forth below.

#### PART 1 - RULES OF PRACTICE IN PATENT CASES

The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.17(h) is revised to read as follows:

#### § 1.77 Patent application processing fees.

\*\*\*\*\*

(h) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph.....\$130.00

§ 1.47—for filing by other than all the inventors or a person not the inventor.

§ 1.48—for correction of inventorship

§ 1.84—for accepting color drawings or photographs.

§ 1.182—for decision on questions not specifically provided for.

§ 1.183—to suspend the rules.

§ 1.295—for review of refusal to publish a statutory invention registration.

§ 1.377—for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent.

§ 1.378(e)—for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in expired patent.

§ 1.644(c)—for petition in an interference.

§ 1.644(f)—for request for reconsideration of a decision on petition in an interference.

§ 1.666(c)—for late filing of interference settlement agreement.

§§ 5.12, 5.13, & 5.14—for expedited handling of a foreign filing license.

§ 5.15—for changing the scope of a license.

§ 5.25—for retroactive license.

\*\*\*\*\*

3. Section 1.19(a)(3) is revised to read as follows:

#### § 1.19 Document supply fees.

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#### (a) Uncertified copies of patents:

\*\*\*\*\*

(3) Copy of a utility patent or statutory invention registration containing color drawing (see § 1.84(a)(2))..... \$24.00

\*\*\*\*\*

4. Section 1.71(d) is revised to read as follows:

#### § 1.71 Detailed description and specification of the invention.

\*\*\*\*\*

(d) A copyright or mask work notice may be placed in a design or utility patent application adjacent to copyright and mask work material contained therein. The notice may appear at any appropriate portion of the patent application disclosure. For notices in drawings, see § 1.84(s). The content of the notice must be limited to only those elements provided for by law. For example, "©1983 John Doe" (17 U.S.C. 401) and "M\* John Doe" (17 U.S.C. 909) would be properly limited and,

under current statutes, legally sufficient notices of copyright and mask work, respectively. Inclusion of a copyright or mask work notice will be permitted only if the authorization language set forth in paragraph (e) of this section is included at the beginning (preferably as the first paragraph) of the specification.

\*\*\*\*\*

5. Section 1.84 is revised to read as follows:

#### § 1.84. Standards for drawings.

(a) **Drawings.** There are two acceptable categories for presenting drawings in utility patent applications:

(1) **Black ink.** Black and white drawings are normally required. India ink, or its equivalent that secures solid black lines, must be used for drawings, or

(2) **Color.** On rare occasions, color drawings may be necessary as the only practical medium by which to disclose the subject matter sought to be patented in a utility patent application or the subject matter of a statutory invention registration. The Patent and Trademark Office will accept color drawings in utility patent applications and statutory invention registrations only after granting a petition filed under this paragraph explaining why the color drawings are necessary. Any such petition must include the following:

(i) The appropriate fee set forth in § 1.17(h);

(ii) Three (3) sets of color drawings; and

(iii) The specification must contain the following language as the first paragraph in that portion of the specification relating to the brief description of the drawing:

*The file of this patent contains at least one drawing executed in color. Copies of this patent with color drawing(s) will be provided by the Patent and Trademark Office upon request and payment of the necessary fee.*

If the language is not in the specification, a proposed amendment to insert the language must accompany the petition.

#### (b) Photographs.

(1) **Black and white.** Photographs are not ordinarily permitted in utility and design patent applications. However, the Office will accept photographs in utility and design patent applications only after granting a petition filed under this paragraph which requests that photographs be accepted. Any such petition must include the following:

(i) The appropriate fee set forth in 1.17(h); and

(ii) Three (3) sets of photographs. Photographs must either be developed on double weight photographic paper or be permanently mounted on bristol board. The photographs must be of sufficient quality so that all details in the drawing are reproducible in the printed patent.

(2) **Color.** Color photographs will be accepted in utility patent applications if the conditions for accepting color drawings have been satisfied. See paragraph (a)(2) of this section.

(c) **Identification of drawings.** Identifying indicia, if provided, should include the application number or the title of the invention, inventor's name, docket number (if any), and the name and telephone number of a person to call if the Office is unable to match the drawings to the proper application. This information should be placed on the back of each sheet of drawings a minimum distance of 1.5 cm. (5/8 inch) down from the top of the page.

(d) **Graphic forms in drawings.** Chemical or mathematical formulae, tables, and waveforms may be submitted as drawings, and are subject to the same requirements as drawings. Each chemical or mathematical formula must be labeled as a separate figure, using brackets when necessary, to show that information is properly integrated. Each group of waveforms must be presented as a single figure, using a common vertical axis with time extending along the horizontal axis. Each individual waveform discussed in the specification must be identified with a separate letter designation adjacent to the vertical axis.

(e) **Type of paper.** Drawings submitted to the Office must be made on paper which is flexible, strong, white, smooth, nonshiny, and durable. All sheets must be free from cracks, creases, and folds. Only one side of the sheet shall be used for the drawing. Each sheet must be reasonably free from erasures and must be free from alterations, overwritings, and interlinea-



tions. Photographs must either be developed on double weight photographic paper or be permanently mounted on bristol board. See paragraph (b) of this section for other requirements for photographs.

(f) *Size of paper.* All drawing sheets in an application must be the same size. One of the shorter sides of the sheet is regarded as its top. The size of the sheets on which drawings are made must be:

- (1) 21.6 cm. by 35.6 cm. (8 1/2 by 14 inches),
- (2) 21.6 cm. by 33.1 cm. (8 1/2 by 13 inches),
- (3) 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches), or
- (4) 21.0 cm. by 29.7 cm. (DIN size A4).

(g) *Margins.* The sheets must not contain frames around the sight, i.e., the usable surface. The following margins are required:

(1) On 21.6 cm. by 35.6 cm. (8 1/2 by 14 inch) drawing sheets, each sheet must include a top margin of 5.1 cm. (2 inches), and bottom and side margins of .64 cm. (1/4 inch) from the edges, thereby leaving a sight no greater than 20.3 cm. by 29.8 cm. (8 by 11 3/4 inches).

(2) On 21.6 cm. by 33.1 cm. (8 1/2 by 13 inch) drawing sheets, each sheet must include a top margin of 2.5 cm. (1 inch) and bottom and side margins of .64 cm. (1/4 inch) from the edges, thereby leaving a sight no greater than 20.3 cm. by 29.8 cm. (8 by 11 3/4 inches).

(3) On 21.6 cm. by 27.9 cm. (8 1/2 by 11 inch) drawing sheets, each sheet must include a top margin of 2.5 cm. (1 inch) and bottom and side margins of .64 cm. (1/4 inch) from the edges, thereby leaving a sight no greater than 20.3 cm. by 24.8 cm. (8 by 9 3/4 inches).

(4) On 21.0 cm. by 29.7 cm. (DIN size A4) drawing sheets, each sheet must include a top margin of at least 2.5 cm., a left side margin of 2.5 cm., a right side margin of 1.5 cm., and a bottom margin of 1.0 cm., thereby leaving a sight no greater than 17.0 cm. by 26.2 cm.

(h) *Views.* The drawing must contain as many views as necessary to show the invention. The views may be plan, elevation, section, or perspective views. Detail views of portions of elements, on a larger scale if necessary, may also be used. All views of the drawing must be grouped together and arranged on the sheet(s) without wasting space, preferably in an upright position, clearly separated from one another, and must not be included in the sheets containing the specifications, claims, or abstract. Views must not be connected by projection lines and must not contain center lines. Waveforms of electrical signals may be connected by dashed lines to show the relative timing of the waveforms.

(1) *Exploded views.* Exploded views, with the separated parts embraced by a bracket, to show the relationship or order of assembly of various parts are permissible. When an exploded view is shown in a figure which is on the same sheet as another figure, the exploded view should be placed in brackets.

(2) *Partial views.* When necessary, a view of a large machine or device in its entirety may be broken into partial views on a single sheet, or extended over several sheets if there is no loss in facility of understanding the view. Partial views drawn on separate sheets must always be capable of being linked edge to edge so that no partial view contains parts of another partial view. A smaller scale view should be included showing the whole formed by the partial views and indicating the positions of the parts shown. When a portion of a view is enlarged for magnification purposes, the view and the enlarged view must each be labeled as separate views.

(i) Where views on two or more sheets form, in effect, a single complete view, the views on the several sheets must be so arranged that the complete figure can be assembled without concealing any part of any of the views appearing on the various sheets.

(ii) A very long view may be divided into several parts placed one above the other on a single sheet. However, the relationship between the different parts must be clear and unambiguous.

(3) *Sectional views.* The plane upon which a sectional view is taken should be indicated on the view from which the section is cut by a broken line. The ends of the broken line should be designated by Arabic or Roman numerals corresponding to the view number of the sectional view, and should have arrows to indicate the direction of sight. Hatching must be used to indicate section portions of an object, and must be

made by regularly spaced oblique parallel lines spaced sufficiently apart to enable the lines to be distinguished without difficulty. Hatching should not impede the clear reading of the reference characters and lead lines. If it is not possible to place reference characters outside the hatched area, the hatching may be broken off wherever reference characters are inserted. Hatching must be at a substantial angle to the surrounding axes or principal lines, preferably 45. A cross section must be set out and drawn to show all of the materials as they are shown in the view from which the cross section was taken. The parts in cross section must show proper material(s) by hatching with regularly spaced parallel oblique strokes, the space between strokes being chosen on the basis of the total area to be hatched. The various parts of a cross section of the same item should be hatched in the same manner and should accurately and graphically indicate the nature of the material(s) that is illustrated in cross section. The hatching of juxtaposed different elements must be angled in a different way. In the case of large areas, hatching may be confined to an edging drawn around the entire inside of the outline of the area to be hatched. Different types of hatching should have different conventional meanings as regards the nature of a material seen in cross section.

(4) *Alternate position.* A moved position may be shown by a broken line superimposed upon a suitable view if this can be done without crowding; otherwise, a separate view must be used for this purpose.

(5) *Modified forms.* Modified forms of construction must be shown in separate views.

(i) *Arrangement of views.* One view must not be placed upon another or within the outline of another. All views on the same sheet should stand in the same direction and, if possible, stand so that they can be read with the sheet held in an upright position. If views wider than the width of the sheet are necessary for the clearest illustration of the invention, the sheet may be turned on its side so that the top of the sheet, with the appropriate top margin to be used as the heading space, is on the right-hand side. Words must appear in a horizontal, left-to-right fashion when the page is either upright or turned so that the top becomes the right side, except for graphs utilizing standard scientific convention to denote the axis of abscissas (of X) and the axis of ordinates (of Y).

(j) *View for Official Gazette.* One of the views should be suitable for publication in the *Official Gazette* as the illustration of the invention.

(k) *Scale.*

(1) The scale to which a drawing is made must be large enough to show the mechanism without crowding when the drawing is reduced in size to two-thirds in reproduction. Views of portions of the mechanism on a larger scale should be used when necessary to show details clearly. Two or more sheets may be used if one does not give sufficient room. The number of sheets should be kept to a minimum.

(2) When approved by the examiner, the scale of the drawing may be graphically represented. Indications such as "actual size" or "scale 1/2" on the drawings, are not permitted, since these lose their meaning with reproduction in a different format.

(3) Elements of the same view must be in proportion to each other, unless a difference in proportion is indispensable for the clarity of the view. Instead of showing elements in different proportion, a supplementary view may be added giving a larger-scale illustration of the element of the initial view. The enlarged element shown in the second view should be surrounded by a finely drawn or "dot-dash" circle in the first view indicating its location without obscuring the view.

(l) *Character of lines, numbers, and letters.* All drawings must be made by a process which will give them satisfactory reproduction characteristics. Every line, number, and letter must be durable, clean, black (except for color drawings), sufficiently dense and dark, and uniformly thick and well-defined. The weight of all lines and letters must be heavy enough to permit adequate reproduction. This requirement applies to all lines however fine, to shading, and to lines representing cut surfaces in sectional views. Lines and strokes of different thicknesses may be used in the same drawing where different thicknesses have a different meaning.

(m) *Shading.* The use of shading in views is encouraged if it aids in understanding the invention and if it does not reduce

legibility. Shading is used to indicate the surface or shape of spherical, cylindrical, and conical elements of an object. Flat parts may also be lightly shaded. Such shading is preferred in the case of parts shown in perspective, but not for cross sections. See paragraph (h)(3) of this section. Spaced lines for shading are preferred. These lines must be thin, as few in number as practicable, and they must contrast with the rest of the drawings. As a substitute for shading, heavy lines on the shade side of objects can be used except where they superimpose on each other or obscure reference characters. Light should come from the upper left corner at an angle of 45. Surface delineations should preferably be shown by proper shading. Solid black shading areas are not permitted, except when used to represent bar graphs or color.

(n) *Symbols.* Graphical drawing symbols may be used for conventional elements when appropriate. The elements for which such symbols and labeled representations are used must be adequately identified in the specification. Known devices should be illustrated by symbols which have a universally recognized conventional meaning and are generally accepted in the art. Other symbols which are not universally recognized may be used, subject to approval by the Office, if they are not likely to be confused with existing conventional symbols, and if they are readily identifiable.

(o) *Legends.* Suitable descriptive legends may be used, or may be required by the Examiner, where necessary for understanding of the drawing, subject to approval by the Office. They should contain as few words as possible.

(p) *Numbers, letters, and reference characters.*

(1) Reference characters (numerals are preferred), sheet numbers, and view numbers must be plain and legible, and must not be used in association with brackets or inverted commas, or enclosed within outlines, e.g., encircled. They must be oriented in the same direction as the view so as to avoid having to rotate the sheet. Reference characters should be arranged to follow the profile of the object depicted.

(2) The English alphabet must be used for letters, except where another alphabet is customarily used, such as the Greek alphabet to indicate angles, wavelengths, and mathematical formulas.

(3) Numbers, letters, and reference characters must measure at least .32 cm. (1/8 inch) in height. They should not be placed in the drawing so as to interfere with its comprehension. Therefore, they should not cross or mingle with the lines. They should not be placed upon hatched or shaded surfaces. When necessary, such as indicating a surface or cross section, a reference character may be underlined and a blank space may be left in the hatching or shading where the character occurs so that it appears distinct.

(4) The same part of an invention appearing in more than one view of the drawing must always be designated by the same reference character, and the same reference character must never be used to designate different parts.

(5) Reference characters not mentioned in the description shall not appear in the drawings. Reference characters mentioned in the description must appear in the drawings.

(q) *Lead lines.* Lead lines are those lines between the reference characters and the details referred to. Such lines may be straight or curved and should be as short as possible. They must originate in the immediate proximity of the reference character and extend to the feature indicated. Lead lines must not cross each other. Lead lines are required for each reference character except for those which indicate the surface or cross section on which they are placed. Such a reference character must be underlined to make it clear that a lead line has not been left out by mistake. Lead lines must be executed in the same way as lines in the drawing. See paragraph (1) of this section.

(r) *Arrows.* Arrows may be used at the ends of lines, provided that their meaning is clear, as follows:

(1) On a lead line, a freestanding arrow to indicate the entire section towards which it points;

(2) On a lead line, an arrow touching a line to indicate the surface shown by the line looking along the direction of the arrow; or

(3) To show the direction of movement.

(s) *Copyright or Mask Work Notice.* A copyright or mask work notice may appear in the drawing, but must be placed within the sight of the drawing immediately below the figure

representing the copyright or mask work material and be limited to letters having a print size of .32 cm. to .64 cm. (1/8 to 1/4 inches) high. The content of the notice must be limited to only those elements provided for by law. For example, "© 1983 John Doe" (17 U.S.C. 401) and "M\* John Doe" (17 U.S.C. 909) would be properly limited and, under current statutes, legally sufficient notices of copyright and mask work, respectively. Inclusion of a copyright or mask work notice will be permitted only if the authorization language set forth in § 1.71(e) is included at the beginning (preferably as the first paragraph) of the specification.

(t) *Numbering of sheets of drawings.* The sheets of drawings should be numbered in consecutive Arabic numerals, starting with 1, within the sight as defined in paragraph (g) of this section. These numbers, if present, must be placed in the middle of the top of the sheet, but not in the margin. The numbers can be placed on the right-hand side if the drawing extends too close to the middle of the top edge of the usable surface. The drawing sheet numbering must be clear and larger than the numbers used as reference characters to avoid confusion. The number of each sheet should be shown by two Arabic numerals placed on either side of an oblique line, with the first being the sheet number, and the second being the total number of sheets of drawings, with no other marking.

(u) *Numbering of views.*

(1) The different views must be numbered in consecutive Arabic numerals, starting with 1, independent of the numbering of the sheets and, if possible, in the order in which they appear on the drawing sheet(s). Partial views intended to form one complete view, on one or several sheets, must be identified by the same number followed by a capital letter. View numbers must be preceded by the abbreviation "FIG." Where only a single view is used in an application to illustrate the claimed invention, it must not be numbered and the abbreviation "FIG." must not appear.

(2) Numbers and letters identifying the views must be simple and clear and must not be used in association with brackets, circles, or inverted commas. The view numbers must be larger than the numbers used for reference characters.

(v) *Security markings.* Authorized security markings may be placed on the drawings provided they are outside the sight, preferably centered in the top margin.

(w) *Corrections.* Any corrections on drawings submitted to the Office must be durable and permanent.

(x) *Holes.* The drawing sheets may be provided with two holes in the top margin. The holes should be equally spaced from the respective side edges, and their center lines should be spaced 7.0 cm. (2 3/4 inches) apart. (See § 1.152 for design drawings, § 1.165 for plant drawings, and § 1.174 for reissue drawings.)

6. Section 1.88 is removed and reserved.

§ 1.88 {Reserved}

7. Section 1.123 is revised to read as follows:

§ 1.123 Amendments to the drawing.

No change in the drawing may be made except with permission of the Office. Permissible changes in the construction shown in any drawing may be made only by the submission of a substitute drawing by applicant. A sketch in permanent ink showing proposed changes, to become part of the record, must be filed for approval by the examiner and should be a separate paper.

8. Section 1.152 is revised to read as follows:

§ 1.152 Design drawing.

The design must be represented by a drawing that complies with the requirements of § 1.84, and must contain a sufficient number of views to constitute a complete disclosure of the appearance of the article. Appropriate surface shading must be used to show the character or contour of the surfaces represented. Solid black surface shading is not permitted except



when used to represent color contrast. Broken lines may be used to show visible environmental structure, but may not be used to show hidden planes and surfaces which cannot be seen through opaque materials. Alternate positions of a design component, illustrated by full and broken lines in the same view are not permitted in a design drawing. Photographs and ink drawings must not be combined in one application. Photographs submitted in lieu of ink drawings in design patent applications must comply with § 1.84(b) and must not disclose environmental structure but must be limited to the design for the article claimed. Color drawings and color photographs are not permitted in design patent applications.

9. Section 1.165 is revised to read as follows:

#### § 1.165 Plant drawings.

(a) Plant patent drawings should be artistically and competently executed and must comply with the requirements of § 1.84. View numbers and reference characters need not be employed unless required by the examiner. The drawing must disclose all the distinctive characteristics of the plant capable of visual representation.

(b) The drawing may be in color and when color is a distinguishing characteristic of the new variety, the drawing must be in color. Two copies of color drawings or color photographs must be submitted.

July 14, 1993

MICHAEL K. KIRK  
Acting Assistant Secretary and  
Acting Commissioner of  
Patents and Trademarks

[1153 OG 33]

#### (55) Temporary Suspension of "At Cost" Services for Orders for Certified Copies

Effective immediately, and until further notice, the Certification Division, Office of Public Records, will temporarily suspend accepting requests for "at cost" service for orders of certified copies of PTO documents except where the requester provides documentation that the copy is required for pending litigation.

The Certification Division's ability to provide "at cost" services is based upon the ready availability of source documents either on microform or via access to electronic images. Increased filings of both patent and trademark applications have resulted in more instances where requested documents are not yet available on film or electronic media to fill customer orders on an "at cost" basis efficiently and for a reasonable fee.

Orders for expedited service for certified copies of both patent and trademark applications-as-filed and trademark registrations will continue to be accepted. Customers will be advised within three working days if microform or electronic images are not available to fill their orders on an expedited basis, and the order will be filled as a request for regular service with an appropriate adjustment and/or credit for fees paid.

Customers are reminded that expedited service is provided on a "local basis" for those orders: (1) placed through the PTO's Public Service Windows located in the Patent Search Room and the Trademark Search Library; (2) hand-delivered to the Office of Public Records' (OPR) Service Counter in the North Tower building; (3) transmitted via fax directly to the Certification Division; or (4) received from an overnight delivery service at the OPR Service Counter. Requests for expedited service received through the US mail will be processed as regular orders.

In those cases where Certification Division cannot fill a customer order within 30 days of receipt due to unavailability of media or the source document itself, customers will be provided with a certified letter documenting their request and the Office's inability to fill the order as requested. These letters will be provided at no charge. The order itself will be closed and a full refund or credit made to the customer.

Customers placing orders for certified copies may use the following as guidelines for expected turnaround times from

initial receipt of an order in PTO to mailing date from the Office:

Certified Product	Days to Mail
Patent Application-As-Filed, Expedited (microfiche available)	7
Patent Applications-As-Filed, Regular	17
Patent Related File Wrapper	25
Patent Copy	10
Trademark Application-As-Filed, Expedited (microfiche available)	7
Trademark Application-As-Filed, Regular	17
Trademark Related File Wrapper	25
Trademark Registration	10
Trademark Registration, Expedited	3

Delivery of any specific copy will vary based on the availability of microfilm products and/or file accessibility. Customers are encouraged to fax orders for copies directly to Certification Division at (703) 308-9759 and to pay by PTO Deposit Account, MasterCard, or Visa to minimize processing time. Information on the status of pending orders may be obtained by calling (703) 308-9726 or 1 (800) 972-6382 (outside the Washington, D.C. Metro area).

November 2, 1995

WESLEY H. GEWEHR  
Administrator for  
Information Dissemination

[1180 OG 121]

#### (56) Use of Symbol "Ø" in Patent Applications

The Greek letter Phi has long been used as a symbol in equations in all technical disciplines. It further has special uses which include the indication of an electrical phase or clocking signal as well as an angular measurement. The recognized symbols for the upper and lower case Greek Phi characters, however, do not appear on most typewriters. This apparently has led to the use of a symbol composed by first striking a zero key and then backspacing and striking the "cancel" or "slash" key to result in "Ø" which is an approximation of accepted symbols for the Greek character Phi. In other instances the symbol is composed using the upper or lower case letter "O" with the "cancel" or "slash" superimposed thereon by backspacing or is simply handwritten in a variety of styles. These expedients result in confusion because of the variety of type sizes and styles available on modern typewriters.

In recent years, the growth of data processing has seen the increasing use of this symbol ("Ø") as the standard representation of zero. The "slashed" or "cancelled zero" is used to indicate zero and avoid confusion with the upper case letter "O" in both text and drawings.

Thus, when the symbol "Ø" in one of its many variations, as discussed above, appears in patent applications being prepared for printing, confusion as to the intended meaning of the symbol arises. Those (such as examiners, attorneys, and applicants) working in the art can usually determine the intended meaning of this symbol because of their knowledge of the subject matter involved, but editors preparing these applications for printing have no such specialized knowledge and confusion arises as to which symbol to print. The result, at the very least, is delay until the intended meaning of the symbol can be ascertained.

Since the Office does not have the resources to conduct a technical editorial review of each application before printing, and in order to eliminate the problem of printing delays associated with the usage of these symbols, any questions about the intended symbol will be resolved by the editorial staff of the Office of Publications by printing the symbol "Ø" whenever that symbol is used by the applicant. Any Certificate of Correction necessitated by the above practice will be at the patentee's expense (37 CFR 1.323) because the intended symbol was not

accurately presented by the Greek upper or lower case Phi letters (I, Ø) in the patent application.

Dec. 20, 1978

RICHARD J. SHAKMAN  
Assistant Commissioner  
for Administration.

[978 O.G. 152]

#### (57) U.S. Accession to Hague Convention Abolishing the Requirement of Legalization for Foreign Public Documents

On Oct. 15, 1981, the Hague "Convention Abolishing the Requirement of Legalization for Foreign Public Documents" entered into force between the United States and twenty-eight foreign countries that are parties to the Convention. The Convention applies to any document submitted to the United States Patent and Trademark Office for filing or recording, which is sworn to or acknowledged by a notary public in any one of the member countries. The Convention abolishes the certification of the authority of the notary public in a member country by a diplomatic or consular officer of the United States and substitutes certification by a special certificate, or apostille, executed by an officer of the member country. Accordingly, the Office will accept for filing or recording a document sworn to or acknowledged before a notary public in a member country if the document bears, or has appended to it, an apostille certifying the notary's authority. The requirement for a diplomatic or consular certificate, specified in 37 CFR 1.66 and note 1 of 37 CFR 3.45, will not apply to a document sworn to or acknowledged before a notary public in a member country if an apostille is used.

The member countries that are parties to the Convention are:

Austria	Italy	Spain
Bahamas	Japan	Suriname
Belgium	Lesotho	Swaziland
Botswana	Liechtenstein	Switzerland
Cyprus	Luxembourg	Tonga
Fiji	Malawi	U.K. of Great
France	Malta	Britain and
Germany	Mauritius	N. Ireland
Fed. Rep. of	Netherlands	United States
Hungary	Portugal	Yugoslavia
Israel	Seychelles	

The Convention prescribes the following form for the apostille:

#### Model of certificate

The certificate will be in the form of a square with sides at least 9 centimetres long

#### APOSTILLE

(Convention de La Haye du Oct. 5, 1961)

1. Country: .....
2. This public document has been signed by .....
3. acting in the capacity of .....
4. bears the seal/stamp of .....

#### Certified

5. at .....
6. the .....
7. by .....
8. No .....
9. Seal/stamp: .....
10. Signature: .....

Nov. 5, 1981

GERALD J. MOSSINGHOFF  
Commissioner of Patents  
and Trademarks

[1013 O.G. 3]

#### Department of Commerce Patent and Trademark Office 37 CFR Part 1 [Docket No. 71008-7208]

#### Variety Denomination Requirements for Plant Patent Applications

Agency: Patent and Trademark Office, Commerce.

Action: Notice of proposed rulemaking.

Summary: The Patent and Trademark Office proposes to amend certain of the rules of practice applicable to the patenting of plants. Under the proposed rules of practice, an applicant for such a patent would, in addition to any requirements for obtaining a patent, also be required to record an identifying variety denomination for the plant. These proposed rules fulfill an obligation imposed by the Convention of the International Union for the Protection of New Plant Varieties (the UPOV Convention), to which the United States adheres.

Dates: Comments on the proposed rules must be submitted by Jan. 8, 1988, to assure their consideration in formulating the rules put into effect. A public hearing will be held on Jan. 15, 1988, beginning at 9:30 A.M., in the Commissioner's Conference Room, Crystal Plz. 3, the Patent and Trademark Office.

Addresses: Address comments to the Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231. All comments received will be publicly available in the Patent and Trademark Office, Crystal Plz. 3, Arlington, Va., Rm. 11C28.

For Further Information Contact: Mr. Stanley D. Schlosser, Office of Legislation and International Affairs, by telephone at (703) 557-3065 or by mail addressed to the Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231.

Supplementary Information: The UPOV Convention became applicable to the United States on Nov. 8, 1981, as a consequence of the President's exercise of authority to adhere to this international agreement. Under Articles 6 and 13 of the UPOV Convention, each plant variety for which protection is sought must be given a variety denomination and that denomination recorded ("registered" in the language of the Convention) at least by the time the patent is granted. It is left to each of the UPOV member states to determine how recordation is effected. For the United States, the issuance of a patent which includes the denomination of the variety would constitute recordation and registration for the purposes of compliance with UPOV Convention. The patent examining process would include consideration of the suitability for recordation of the proposed variety denomination.

Attention is called to two earlier Commissioner's Notices on this subject. The Notice of Oct. 20, 1981 (46 FR 51426) stated that appropriate rules for the registration of variety denominations, as required by the UPOV Convention, would be issued. The Commissioner's Notice, published in the Federal Register on Aug. 16, 1985, 50 FR 33062, proposed amendments to the Patent and Trademark Office's rules of practice to carry out this requirement. In light of public comments received, the earlier proposed rules are being withdrawn from consideration and replaced by these revised proposed rules. These would apply to plants patented under either 35 U.S.C. 101 or 161, but would not apply to any protection sought under the Plant Variety Protection Act (7 U.S.C. 2321 et seq.), administered by the United States Department of Agriculture.

These proposed rules, in accordance with the patent law requirements for providing a descriptive title for a patent application, would require the variety denomination proposed for recordation to be included in the title of the application. The denomination would be judged for recordability by the examiner assigned the application for examination, who would consult with appropriate trademark examination officials to determine if there exists a possibly conflicting trademark registration or application for registration.

The recordation of a variety denomination for purposes of compliance with UPOV Convention Article 13 is not to be understood as conveying any legal rights in that denomination. Recordation does no more than establish a prima facie case that can be asserted as evidence of the possible generic nature of the variety denomination, if genericness is not already established by its usage in the commercial market, advertising or publication.

Under the proposed rules, the Patent and Trademark Office in examining the recordability of variety denominations will,



in addition to its trademark records, utilize the Office's compilation of denominations obtained from horticultural, agricultural, floral and other professional societies, national breeders' rights offices, the UPOV Union's Secretariat, standard references and other available sources. Article 13 of the UPOV Convention requires that the variety denomination must enable the plant variety to be identified, that the denomination not consist solely of numbers except if this is shown to be an established practice for designating plant varieties, and that the denomination not be liable to mislead or cause confusion concerning the characteristics, value or identity of the variety or the identity of the breeder. No specific naming system is required by the Article. While a portion of the consuming public and others might prefer plant variety names conforming to the International Code of Nomenclature for Cultivated Plants or the UPOV Guidelines, common usage, code systems or other ways of identifying plants cannot be ignored.

The Patent and Trademark Office would accept for recordation a variety denomination complying with the requirements of the UPOV Convention's Articles 13(2) and 13(4). A number of variety denomination systems currently in use, such as the system described in the 1980 revision of the International Code of Nomenclature for Cultivated Plants, the UPOV Guidelines and various code systems may also meet these requirements. Sexually reproduced varieties could be named in compliance with the requirements of the Federal Seed Act. In the event the examiner does not approve a proposed variety denomination for recordation, the applicant could petition the Commissioner for approval. Thus, the examination and approval of variety denominations will be handled in the same way as other procedural and administrative requirements not relating to the merits of the invention, such as the requirement to provide an abstract of the disclosure or the requirement to provide a title. A final refusal by the Commissioner on petition would require submission of another proposed denomination for recordation.

The petition to the Commissioner will be subject to a fee and the other requirements relating to petitions. The Commissioner may in appropriate cases delegate to the Assistant Commissioner for Trademarks or other appropriate trademark officials the decision of such petitions, under 37 C.F.R. 1.181(g).

The UPOV Convention requires the applicant to identify the patented variety by the same variety denomination (or a translation thereof) in all UPOV member states. A different denomination may be recorded in a particular member state, however, in cases where the denomination registered in another member state is unsuitable for business or other reasons. An applicant may during the course of examination be required to inform the Office of any other denomination by which the variety is known.

While these rules provide for the recordation of variety denominations, they recognize at the same time that, in cases of conflict, previously established proprietary rights are paramount. Recordation is in legal effect, therefore, no more than publication of a denomination which is or may become the generic name of a plant variety.

Trademark owners, owners of other proprietary rights and patent applicants share a common interest in knowing as early as possible if a variety denomination proposed for recordation possibly conflicts with a trademark or other proprietary rights. Accordingly, each denomination proposed for recordation, along with the genus and species to which the variety belongs, shall be published in the *Official Gazette* as soon as reasonably possible after receipt of the application in the Office. The Commissioner has determined that publication of such information constitutes special circumstances under 35 U.S.C. 122.

The public may provide information to the Office concerning the recordability of a proposed denomination. Such information would be entered in the official file wrapper of the application and be available to the examiner. Such information shall be called to the attention of the applicant by the Office.

Also, the *Official Gazette* would list newly recorded denominations in United States patents in order for trademark owners to assert their rights in appropriate cases through private negotiations or judicially, as they may now do in trademark cases. Proceedings in the Office in regard to the registration of variety denominations, however, will be conducted ex parte.

Under the proposed rules, each applicant would be required to specify in an application for protection of a plant variety the date of first use of the denomination if used prior to filing

of the patent application, or later to provide information about the date of first commercial use during pendency of the application. In cases of conflict between a trademark and a proposed variety denomination, the variety denomination will not be accepted for recordation unless its first commercial use clearly antedates another's established rights.

If a patentee learns of a conflict between a trademark and the recorded variety denomination after issuance of the patent, the patentee in order to resolve the conflict will be permitted to record a different denomination by means of the Certificate of Correction procedure. Also, a variety denomination found after issuance of a patent to be commercially unsuitable or ill-advised could be changed in a similar manner.

The Office now permits plants and plant varieties to be patented both specifically and broadly under patent 35 U.S.C. 101. In some cases, however, claims in an application will not be limited to a specific variety. These proposed rules would apply only to applications where a specific variety or varieties are claimed. Only these need be identified by a variety denomination, except where the number of varieties involved makes this impractical. In such a case, each claim directed to a specific variety would include its variety denomination, but these variety denominations could be omitted from the title of the patent. Variety denominations would not be required for microorganisms or microscopic plant parts.

**Other Considerations:** The proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. This rule contains a collection of information requirement subject to the Paperwork Reduction Act. This collection of information requirement has been cleared by OMB under control No. 0651-0011.

The General Counsel of the Department of Commerce has certified to the Small Business Administration that the proposed rule changes will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The variety denomination requirement will not impose extra work on patent applicants (whether small or large businesses or individuals). The rules will help avoid burdensome and expensive litigation over trademark rights.

The Patent and Trademark Office has determined that this proposed rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

#### List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Courts, Inventions and patents.

For the reasons set out in the preamble, 37 CFR Part I is proposed to be amended by revising §§ 1.72, and 1.17 and adding a new § 1.168 as set forth below. All proposed additions are printed between arrows.

#### PART I - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part I would continue to read as follows:

AUTHORITY: 35 U.S.C. 6 unless otherwise noted.

2. Section 1.17 is proposed to be amended by adding the following items in numerical order to the list in paragraph (h) to read as follows:

§ 1.17 Patent application processing fees.

(h) \* \* \*

►§ 1.168(d) For petitioning the Commissioner to record a plant variety denomination . . .  
§ 1.168(g) For petitioning the Commissioner to record a substitute plant variety denomination . . . ◄

3. Section 1.72 is proposed to be amended by adding the following paragraph:

§ 1.72 Title and abstract.

\* \* \*

►(c) In the case of an application for the patenting of a plant variety under the provisions of 35 U.S.C. 101 or 161, the title of the application must include a variety denomination for the specific new variety claimed, except as provided for in § 1.168(b). The granting of the patent will be deemed the recordation of the variety denomination for purposes of compliance with Article 13 of the International Convention for the Protection of New Varieties of Plants, as revised on Oct. 23, 1978.

4. A new § 1.168 is proposed to be added, to read as follows:

►§ 1.168 Variety denomination, submission to the Office, examination.

(a) The variety denomination submitted by the patent applicant under § 1.72 will be examined for compliance with the International Convention for the Protection of New Varieties of Plants. Specifically, the denomination:

- (1) must enable the plant variety to be identified;
- (2) must not be likely to cause confusion, to cause mistake or to deceive concerning the characteristics, value or identity of the plant variety or the identity of the breeder;
- (3) must not consist solely of numbers except if this is an established practice for designating plant varieties; and
- (4) must not be likely to cause confusion or mistake or to deceive as to any prior right of a third party, and shall not affect prior rights of third parties.

(b) If a proposed variety denomination is not included as part of the title of the application, when filed, the examiner shall set a period of not less than thirty days to provide a variety denomination. If a plurality of plant varieties are claimed, which make it impractical to include each variety denomination in the title of the application, each claim directed to a specific plant variety shall instead include the denomination of the claimed plant variety. In cases where no specific plant variety is claimed, for example, a patent directed to the improvement of a plant species, the denomination requirement applicable to the patenting of a plant variety or varieties will be waived.

(c) If the examiner determines that a proposed variety denomination is not suitable for recordation, the examiner shall refuse recordation thereof and shall set forth in an Office action the reasons for such refusal. An applicant disagreeing with the reasons for such refusal may request reconsideration and withdrawal of the refusal, giving the reasons therefor. If the examiner's refusal to record a proposed variety denomination is repeated and made final, the examiner shall at the same time require the applicant to propose another variety denomination for recordation.

(d) After a final requirement by the examiner for submission of a proposed new variety denomination, the applicant, in addition to making any response due on the remainder of the action, may in lieu of proposing another variety denomination petition the Commissioner for review of the examiner's holding, upon payment of the fee set forth in § 1.17(h).

(e) The applicant is required to submit for recordation the same variety denomination (or, if not in English, a translation or transliteration thereof) as that previously registered or recorded, or proposed for registration in an earlier filed application for protection

of the same variety in another member state of the International Union for the Protection of New Varieties of Plants. The applicant may submit another denomination for recordation, however, upon a showing satisfactory to the examiner as to why the denomination originally submitted or registered in another member state of the said Union is unsuitable for recordation in the United States. During pendency of an application, the examiner may require the applicant to provide information regarding all denominations for the same variety registered or proposed for registration in other member states of the said Union before the application was filed in the United States. (f) The applicant shall indicate in the application the date of first commercial use in the United States if any, of the variety denomination proposed for recordation; or, if not commercially used prior to filing of the application, indicate during pendency of the application when the denomination has first been commercially used in this country. No variety denomination will be recorded if first commercially used after the establishment of third party proprietary rights to the denomination.

(g) A patentee in order to avoid a conflict between a recorded variety denomination and a trademark or other proprietary right, or where the recorded variety denomination is likely to be confused with another, or where business or marketing considerations dictate, may propose for recordation a substitute variety denomination for that already recorded. Such a proposal shall be in the form of a petition to the Commissioner together with the fee set forth in § 1.17(h). The proposed substitute denomination will be examined in the same manner as the denomination originally recorded, and upon recordation shall be promptly published in the *Official Gazette*. A Certificate of Correction indicating such substitute denomination shall be issued for the patent. If the patent has been assigned, only the assignee of record may apply for recordation of a substitute denomination.

(h) The Commissioner shall upon its receipt in the Office promptly publish in the *Official Gazette* each variety denomination proposed for recordation and the genus and species of the plant involved. Correspondence from the public objecting to the recordation of such denomination, if accompanied by reasons therefor, will be placed in the official file and considered by the examiner in an ex parte manner. An objection to recordation may be based on an earlier recorded or unrecorded variety denomination, a registered or common law trademark, a trade name or trade indicia, or other alleged prior right timely called to the Office's attention. The applicant shall be notified by the Office of the receipt of such correspondence. The secrecy of any pending application will be preserved in accordance with 35 U.S.C. 122 ◄

Sept. 18, 1987

RENE TEGTMEYER  
Assistant Commissioner  
for Patents

[1085 OG 13].

#### (59) Summary Results of 1991 Patent Action Survey

The Patent and Trademark Office conducted a survey in the March-June 1991 period to gather information from patent practitioners and other Office "customers" about the quality of Office actions. Approximately 27,000 questionnaires (survey forms) were mailed with Office actions. Each survey form included 10 specific questions and provided space to make general comments. Each survey form identified only the Examining Group to which the application was assigned so that all responses would be completely anonymous.

Approximately 4,200 survey forms were returned (16% return rate).

Results



**I. A tabulation of respondents' answers to the 10 specific questions revealed the following compliance rates relative to the accompanying Office actions:**

**35 U.S.C. 103 Rejections:**

1. 72% identify portion of references relied on.
2. 70% indicate how teachings of references are modified or combined.
3. 65% communicate the rationale why the claimed invention would have been obvious.

**35 U.S.C. 112, 1st para. rejections:**

4. 58% sufficiently explain "new matter" position.
5. 67% sufficiently explain "non-enabling" disclosure position.

**Final Rejection Practice:**

6. 56% respond to applicant's arguments.
7. 52% of Advisory Actions identify new issues and/or new matter when denying entry.

**Allowance Practice:**

8. 90% of reasons for allowance were clear.

**Miscellaneous:**

9. 45% clearly communicate reasons for finding declarations/affidavits unpersuasive.
10. 54% of Examiner's Answers address appellant's arguments.

The questions relating to "Final Rejection Practice" and to the "Miscellaneous" topic areas asked whether examiners respond to attorney arguments and how attorneys interpret the examiners' responses to their arguments. These topic areas and others where there are relatively low compliance rates have been identified as areas of Office practice needing improvement.

The responses to the 10 survey questions show that continuous improvement has been achieved in several areas. For example, the high percentage of affirmative responses in the area of explaining 35 U.S.C. 103 rejections (72%, 70%, and 65%) reflects a clear improvement over internal surveys made within the last several years, and reflects the effectiveness of recent extensive Office training programs in this area. It is also apparent there is still room for further improvement. Another positive result was that 90% of respondents, commenting on Reasons for Allowance, felt that the reasons given were clear.

**II. Analysis of respondents' general comments:**

Over 1800 survey forms were returned with comments (43% of total responses). While these comments were directed toward many different areas, two major categories were apparent:

**Category A: 62% of the comments expressed the need for additional quality improvement of actions.**

The most commonly expressed comments in this category indicate that the quality of Office actions can be improved by giving a better explanation of the rationale or reasons in support of rejections. Examples of comments received include: all elements of claims are not addressed in 35 U.S.C. 102(b) rejections; one of the references used in a 35 U.S.C. 103 rejection is not explained; features of dependent claims were not treated; claim limitations were ignored; "boilerplate" 35 U.S.C. 103 rejections were being given; and it was difficult to understand the rationale for the rejection, and, therefore, to file a proper and meaningful response.

The second most common type of comment in this category indicated that examiners misunderstand an essential feature. For example: actions reflect a misunderstanding by the examiner of the scope and content of the prior art, the presently claimed invention, or the original disclosure. Further, comments indicate

that some cited references seem to have no bearing on the claimed invention because the rejection of the claims is not supported by the disclosure of the applied reference.

**Category B: 20% of the comments had compliments about the quality of Office actions.**

The compliments acknowledged actions which presented a thorough analysis of the claim language with respect to the prior art references; which included suggestions for amendments to the claims so as to place the application in condition for allowance; and/or which gave a "tough" examination which would result in a stronger patent.

It is significant that the most common type of comment indicated that enhanced explanations would improve the quality of Office actions, while, at the same time, the second most common type of comment indicated that the quality of Office actions is considered to be very good in this regard. This seems to indicate that the quality of many Office actions are good, but that additional emphasis is still needed in this area.

**Planned Initiatives:**

The answers to the 10 questions and the comments are considered vital to current Office efforts to improve the quality of patent examination. The data, where statistically reliable, has been analyzed on an examining corps and individual group basis and the following initiatives have been, or will be, taken:

1. Update our continuing legal education program for experienced examiners with extra emphasis being placed on areas where improved performance is needed, such as the need for better motivation statements in rejections. Specific courses have been developed to provide tailored training in important areas, such as treatment of algorithms in claims, evaluating evidence submitted by applicants, and responding to applicant's arguments.
2. Enhance the Patent Academy curriculum for training junior examiners to place greater emphasis on the areas of examination where improved performance is needed, such as in responding to amendments after final rejection.
3. Implement focused training in each Examining Group to address specific technological/group specific problems that have been indicated by the survey. The training has been implemented in a variety of ways including one-on-one, art unit and group level programs. Form paragraphs have been developed to help ensure that applicant's arguments are appropriately considered and responded to in Office actions.
4. Develop follow-up surveys in order to determine if the corrective actions were successful. In this regard the answers to the questions and the concerns raised by respondents in their comments will serve as baselines for improvement.

The relatively small number of responses (only 16%, 4,200 responses from 27,000 survey forms mailed) resulted in statistically insignificant data for analysis of some questions at the group level. In part, this may have been due to confusion with prior perception surveys, requiring only a single response from each practitioner involved. Unlike perception surveys, each Patent Action Survey is specific to the Office action that accompanies it, and requests a brief response for that action. Hence, a practitioner who received more than one Office action with a survey form was requested to complete a survey form for each accompanying Office action.

The Office is planning follow-up surveys in FY-1992 and 1993. These surveys will be more meaningful and reliable if respondents answer the questions in as objective a manner as possible. Thus, respondents should try to objectively evaluate the accompanying examiner's action to see if that particular action did or did not include the feature(s) addressed by the question rather than whether there is agreement or disagreement with the examiner's position. Further, since greater participation would yield more reliable statistics, patent practitioners are encouraged to respond to future surveys.

Questions about the FY-1991 Patent Action Surveys should be directed to John Terapane, Director Group 1200, or Carolyn

Ballard, Patent Action Survey Coordinator, both at (703) 308-0193.

June 29, 1992

STEPHEN G. KUNIN  
Deputy Assistant Commissioner  
for Patents

[1140 OG 62]

**(60) Report on the Quality Reinforcement Program**

The Patent and Trademark Office (PTO) has instituted a Quality Reinforcement Program to identify services offered by the PTO that are in need of improvement. As a part of this program, the Office, in cooperation with the American Intellectual Property Law Association (AIPPLA), has completed an evaluation of selected practices performed by both patent examiners and representatives of patent applicants during the examination process. The results of this evaluation are detailed in Volume I of the PTO Report of the Quality Reinforcement Program. A summary of the findings of this report is presented below. This summary is presented to report on the findings and to solicit suggestions from both the public and employees of the Patent & Trademark Office on steps that might be taken to raise the level of performance of those practices found to be in need of improvement. The full report and evaluation, which is quite extensive with over 350 pages, is available at the PTO.

Address: Comments and inquiries should be addressed to: The Commissioner of Patents and Trademarks, Washington, D.C. 20231, to the attention of Edward Kubasiewicz, Director, Examining Group 250, Rm. CP4-9D19.

Date: Comments should be submitted by June 16, 1987.

DONALD J. QUIGG  
Assistant Secretary and  
Commissioner of Patents  
and Trademarks.

**Summary of Volume I-Report on Current  
Level of Performance of Selected Patent  
Examining Corps Practices**

This is a summary of Volume I of the Quality Reinforcement Program Report, which addresses the current level of performance of selected Patent Examining Corps practices. This summary presents a background of the Quality Reinforcement Program and a synopsis of conclusions reached for each selected practice.

**Background of the Quality Reinforcement Program**

On Feb. 25, 1986, President Reagan issued an executive order establishing a comprehensive program for the improvement of productivity throughout all of government. From this executive order the Department of Commerce evolved a Productivity Improvement Program entitled PROJECT PRIDE. The program was announced as encompassing productivity, quality excellence and client satisfaction.

The role of U.S. Patent and Trademark Office (PTO) in PROJECT PRIDE centers around quality, and is entitled the Quality Reinforcement Program.

The goal of the PTO program is to improve the quality of patent examining functions and the timeliness and quality of other public services. In particular, the program focuses on improving the quality of practices performed in three different areas of the PTO, i.e., the Patent Examining Corps, the Office of Administration and the Office of Documentation.

The quality of an issued patent and the record before the PTO in the patented file are extremely important to the patent owner and to others who may be competitors or otherwise affected by the patent. Investment decisions and the recoupment of research, development and marketing expenditures often depend upon patent protection. Potential licensees and infringers need to know where they stand in regard to an issued patent. Patent owners and others need to be able to have a high degree of confidence in the validity of a patent. Valid patents and a clear and correct file record will help to eliminate unneces-

sary and expensive patent litigation costs which are currently estimated to total at least \$800 million per year.

The concern for productivity and productivity improvement is not a recent development at the PTO. During the past quarter of a century one of the most pressing problems for the Office has been a large and growing backlog of unexamined patent applications and the resulting long pendency time between filing an application and issuance of a patent. The average pendency of patent applications in 1964 was 37 months. However, average pendency dropped steadily in the 1970s until it culminated in an average pendency of 18 months in 1977. This pendency was shortlived due to a loss of adequate resources. However, pendency is once again falling and it is expected that an average pendency of 18 months will be achieved in 1989.

Historically, the Office has successfully responded to situations similar to the one in which it presently finds itself. Beginning in the 1960s when the backlog of new applications exceeded 200,000, a program designed to drastically increase the productivity of the Corps was initiated. Part of that program was what has since become known as "compact prosecution". An increased staff of examiners was restructured to take a new approach toward examining in which patentable subject matter was looked for and indicated as early in the prosecution of the case as possible, references were automatically furnished with actions, attorneys were urged to originally file claims of the broadest possible range of scope, telephonic prosecution was instituted, first actions and application disposals became the measure of examiners' performance, preprinted first action forms were designed, etc.

The question before the Office now is whether sufficient attention is being given to quality. The intent of the Quality Reinforcement Program, as it applies to the Patent Examining Corps, is to take stock of the present situation and to consider whether any corrective action needs to be taken to improve the quality of the examination process.

The Office is currently using and improving various tools to assure a quality examined patent. These tools include the quality review program, supervisory reviews of examiner work through the performance appraisal system and through the promotion and signatory authority programs, improved and expanded examiner training, development of the automated patent system to improve the quality of examiner searching, recruitment of "top-of-the-class" new examiners, and detailed and clear guidelines on examining policy and procedure.

The Quality Reinforcement Program is a new quality tool for improving the actual quality of the patents issued as well as the record behind the issuance of these patents. This new program differs from the quality review program in that this program looks at the key pieces of the patent examining process that contribute to and make up the end product or patent rather than looking only at the end product. The Quality Reinforcement Program focuses on the effectiveness and consistency with which examiners apply existing law and procedures and how they communicate their findings to applicants. The program also focuses on the attorney's contribution to this work product. Lastly, the program focuses on the timeliness of some of the services provided by the Corps' clerical support staff. Such focusing is not intended to be carried out one time only. Rather, the methodology used in this program will be applied to any key pieces, identified by PTO personnel or the bar in the future, as needing a review of the type dictated by this program. The aim in short is to build quality and timeliness from the ground up and to maintain them at a high level.

This report presents and analyzes the findings of the Quality Reinforcement Program only as the findings relate to practices performed in the Patent Examining Corps. The portion of the program reported in this volume represents a cooperative effort between the Corps and the American Intellectual Property Law Association (AIPPLA) through its Ad Hoc Committee on Quality. The focus is on certain practices involved in the prosecution, examination and processing of patent applications by both the PTO and by patent applicants and their representatives.

**Methodology**

The methodology adopted for the program comprises the following process:

1. select target practices,



2. determine the current quality or performance level of the target practices,
3. compare the current performance of the target practices to the desired level of performance,
4. implement, where appropriate, steps to raise the current level of performance to the desired level,
5. subsequently, determine the level of performance of the target practices, and
6. compare the current level of performance to the subsequently determined level of performance to determine what, if any, change has occurred.

#### Target Practices

A number of practices were targeted for the program as a result of complaints and concerns, raised by the bar and PTO personnel. The targeted practices are identified as follows:

#### A. Explanations of Rejections

This program targeted examiner "explanations of rejections" as a practice to be reviewed based in part on a de-emphasis by the Office on the degree to which examiners were required to include detailed explanations of the supporting rationale behind their rejections during the 1970s. The PTO instituted the use of an abbreviated, handwritten form (PTO-1142) for the preparation of first Office actions during the early 1970s. The form provided for a cryptic description of how the references were being combined in a § 103 rejection and provided little space for explanation of the supporting rationale behind rejections. The form was mandatory for all first actions, and was discontinued in 1982 primarily due to complaints from the patent bar and the courts that examiner explanations of rejections were not sufficient. The inclusion of "explanations of rejections" as a targeted practice for this program enables the evaluation of whether further improvement is needed in this area.

#### B. Final Rejection Practice

This program targeted "final rejection practice" for review based in part on the conflicting needs of PTO and patent applicants/attorneys in this area of practice. In order to reduce the time applicants must wait to obtain a patent and to increase efficiency of the examination process, the PTO uses various incentives for examiners to make their rejections final early in the prosecution.

To the contrary, patent applicants often desire to have the examiner repeatedly reconsider his or her position or to continue to amend the claims. These conflicting incentives often lead to disputes relating to the propriety and/or timeliness of final rejections and to whether amendments are entered after an action has been made final.

#### C. Information Disclosure Statements

This program targeted "information disclosure statements" for review based upon concerns expressed by both applicants/attorneys and by the Patent Examining Corps over the submission of these statements.

Patent examiners, in the interest of efficiency and productivity, are benefited by the disclosure to the Office of all material information relating to the patentability of the application prior to their first Office action. However, this must be balanced against the practical reality that applicants/attorneys often don't become aware of material information until later in the prosecution, and don't have readily available translations of foreign documents or copies of documents for submission to the PTO. This practice looks at the extent to which the practical needs of both the PTO and the applicant/attorney are served by the procedures relating to "information disclosure statements".

#### D. Interviews

This program targeted "interviews" for review to determine the extent to which personal discussions are held

between examiners and attorneys and to evaluate whether the parties consider personal interviews to be a productive or helpful means for clarifying issues that may not have been clearly communicated in earlier written communications. Selection of "interviews" as a targeted practice was based in part on isolated complaints by some examiners that interviews were not always productive for them and by some attorneys that some examiners are reluctant to hold interviews.

PTO procedures require that all business with the Office be conducted in writing (37 CFR § 1.2). To comply with this rule and still accommodate request for oral discussions with examiners, it is PTO policy that the substance of all personal interviews must be reduced to writing (see § 713.04 of the MPEP). Selection of "interviews" as a targeted practice was also based on concerns that the written record include an explanation of the substance of all oral interviews. Under this practice, the program focused on determining the perceptions of examiners and attorneys about interviews.

#### E. Responses by Applicant

This program targeted "responses by applicant" for review to determine the extent to which practitioners representing patent applicants submit responses to examiner actions that are complete and in compliance with current rules and procedures. Specific activities under this topic, such as the extent to which explanations of why claims are considered unobvious over the art cited by the examiner and the degree of compliance with 37 CFR § 1.116 when amendments are presented after a final rejection, were selected based upon some complaints by examiners about attorney responses in these areas.

#### F. Completeness of the Record

This program targeted "Completeness of the Record" for review based primarily upon the importance of a complete file record to those who must review patented files and make important decisions based upon the facts and determinations therein. The necessity of insuring a complete file record has been urged by such diverse interests as federal court judges, potential licensees, potential infringers, and those attempting to avoid infringement.

This topic looks at the extent to which examiners insure a complete file record by including a statement of reasons for allowance where appropriate, fully and properly record the search of the prior art, and check foreign priority information for accuracy and completeness. This topic does not look at the extent to which examiners explain their rejection; see targeted practice A, "Explanation of Rejections." The extent to which applicants file complete responses is covered in targeted practice E, "Responses by Applicant."

#### G. Compact Prosecution

This program targeted "Compact Prosecution" for review based upon its importance as a key element in current PTO efforts to reduce pendency time of applications to an average of 18 months. The premise behind compact prosecution is that pendency time will be minimized if each stage of prosecution is fully and thoroughly conducted by both examiners and applicants. The demands of such a standard have inevitably led to complaints from each side relating to the completeness of considerations and the willingness to take that "extra step". Examiners have been criticized for confining searches to only what is literally claimed, and for failing to indicate possible areas of patentability at the earliest possible stage. Applicants have been criticized for failure to claim all limitations that might be considered patentable prior to the initial search by the examiner, for amending the claims to include these limitations only after first action, and for failing to correct significant formal deficiencies prior to initial

examination.

#### H. Appeal Practice

This program targeted "Appeal Practice" for review primarily due to the recent and substantial increase in the backlog of appealed applications awaiting decision by the Board of Patent Appeals and Interferences. Primary emphasis was placed on determining the extent to which appellant's brief and the examiner's answer are formally complete so that expeditious consideration may be given by the Board.

As a result of the high priority being given by the PTO to reduce the backlog of cases at the Board, additional survey questions were included to determine the extent to which additional requirements beyond those currently in effect for the preparation of the appellant's brief and examiner's answer would be useful to examiners and the Board.

#### I. Allowances After Appeal Brief

This program targeted "Allowances after Appeal" for review in response to complaints that examiners often allow cases after appellant has filed a brief when the cases should have been allowed before the brief was filed.

#### J. Processing Times

This program targeted "Processing Times" for review based upon its importance to the PTO goal of reducing pendency of patent applications to 18 months.

#### DETERMINATION OF CURRENT LEVELS OF PERFORMANCE

The step of determining the current level of performance of the targeted practices was accomplished through a number of surveys.

One survey, called the Applications Survey, was an internal factual survey that involved selecting a sample of 150 applications on a random basis from all the examining groups. A survey team, comprising three Supervisory Patent Examiners (SPEs) and three reviewers from Quality Review, performed a detailed review of the applications according to a questionnaire, which was developed with the joint cooperation of the AIPLA Ad Hoc Quality Committee.

A second survey, called the AIPLA Survey, was an opinion questionnaire provided by the AIPLA to 5500 of its members. The questionnaire was developed jointly with the AIPLA Ad Hoc Quality Committee. The AIPLA questionnaire sought the perception of the attorneys of the quality of the work performed by the Corps relative to the targeted practices. Space was provided for the respondents to include comments on the questionnaire. Over 1100 attorneys responded to the questionnaire.

Another survey, called the Examiners Survey, was also an opinion questionnaire provided to all patent examiners and SPEs on a voluntary and anonymous basis. The questionnaire queried the examiners and SPEs about the practices of the practitioners before the PTO. Space was provided for the respondents to include comments on the questionnaire. Over 650 responses were received.

A fourth survey, called the Appeals Survey, was also an internal factual survey. The questionnaire was developed with the cooperation of the AIPLA Ad Hoc Quality Committee. The questionnaire sought data about the practices carried out in the appeal process in the PTO. For this survey, 60 applications were selected on a random basis from all the examining groups. The survey team performed a detailed review of the applications according to the questionnaire.

Three other surveys were used to gather data. All of these surveys were developed and conducted by the Office of Quality Review. Two surveys involved the review of 1878 allowed applications concerning information disclosure statements. Another survey involved the review of 290 applications allowed after appellant had filed an appeal brief, but before an examiner's answer was prepared.

Relative to the processing times, PALM reports were used to obtain data on the practices targeted for this activity.

#### COMPARISON OF CURRENT LEVELS TO DESIRED LEVELS

The step of comparing the current levels of performance to the desired or standard levels of performance was accomplished by setting out the desired or standard level for each target practice. Next, all the information provided by the surveys was analyzed for each target practice and compared to the desired or standard level for the target practice. The analysis resulted in the following general conclusions. (A detailed listing of all conclusions for each targeted practice is presented in Section VII of Volume I of the Quality Reinforcement Program Report.)

#### SUMMARY OF CONCLUSIONS

#### A. Explanations of Rejections

##### 1. Identification of Statutory Basis for Rejection

Over 95% of the rejections under 35 USC §§ 103 and 112, second paragraph (clarity), cited the statutory basis for the rejection. With respect to rejections under 35 USC § 102, 92% of the rejections cited the statutory basis. Hence, no significant improvement is needed in specifying the statutory basis of a rejection based on 35 USC §§ 102, 103 or 112, second paragraph.

With respect to rejections under 35 USC § 112, first paragraph, 14-19% of the rejections based on a non-enabling disclosure and 42% of the rejections based on new matter failed to cite the statutory basis. Hence, improvement is needed in specifying that a rejection, based on new matter or the lack of an enabling disclosure, is under 35 USC § 112, first paragraph.

##### 2. Explanation of Rejections Based on Prior Art

Approximately two-thirds of the rejections reviewed failed to explain why the claimed invention would have been obvious in view of the applied prior art. Over 75% of the attorneys responding to the AIPLA survey perceived rejections under 35 USC § 103 as lacking an explanation of why the claimed invention would have been obvious. Moreover, 70 comments from attorneys (the highest for any topic) were critical of the explanations of rejections under 35 USC § 103. Hence, significant improvement is needed to assure that rejections based on prior art appropriately communicate the rationale for such rejections.

##### 3. Explanation of Rejections Under 35 USC § 112, First Paragraph, Non-Enabling Disclosure

Nineteen percent of all the non-enabling disclosure rejections reviewed failed to give reasons in support of the rejection. Hence, improvement is needed in explaining why a disclosure is non-enabling.

##### 4. Explanation of Rejections Under 35 USC § 112, First Paragraph, New Matter

With respect to rejections based on new matter, 35% of the rejections reviewed failed to point out the language considered to be new matter, and 40% of these rejections did not give a reason why the language was considered new matter. Hence, significant improvements are needed in pointing out the language that is considered to be new matter, and explaining why the new matter is not supported by the disclosure as originally filed.

##### 5. Explanation of Rejections Under 35 USC § 112, Second Paragraph

Approximately 90% of the rejections reviewed pointed out the claim language considered unclear. Thus, no significant improvement is needed in pointing out what claim language is considered unclear in rejections under the second paragraph of § 112.

Twenty-three percent of the non-final rejections reviewed failed to explain why the language was considered unclear. In final actions, 8% of the rejections failed to



explain why the language was considered unclear. Hence, improvement is needed in explaining why the claim language is considered unclear in rejections under the second paragraph of § 112.

#### 6. Alternative Rejections Under 35 USC §§ 102/103

Three percent of the actions reviewed contained alternative rejections under 35 USC §§ 102, 103. Ten percent of the examiners' answers reviewed contained similar rejections. The number of alternative rejections under either § 102 or § 103 was sufficiently low so that no further action is required.

#### B. Final Rejection Practice

##### 1. Timely Development of Issues in Examiner and Attorney Communications

The perception surveys indicate that examiner actions and attorney responses leading up to final rejection do not adequately develop the issues. The objective Applications Survey data indicate that 32% of examiners' non-final actions do not fully respond to all arguments raised by the applicant. Improvement is needed by both examiners and attorneys in fully developing the issues prior to final.

Final rejections were found to treat all claims, but were deficient in answering all arguments presented by the applicant and in treating affidavits and declarations submitted to overcome rejections. Improvement is needed in responding to all issues raised during the prosecution when making a final rejection.

##### 2. Appropriateness of Final Rejection

Thirteen percent of the final actions surveyed were considered premature. However, 91% of the final rejections reviewed were considered to be reasonable. Thirty-nine percent of the attorneys responding to the APLA survey perceived final actions as proper only occasionally or rarely.

Though examiners appear to be doing an acceptable job in making reasonable and proper final rejections, some improvement is needed. However, attorney perception is substantially lower than the factual findings. This may be due to a desire by attorneys for a more liberal after final procedure rather than improper examiner application of the current procedure.

##### 3. Advisory Actions

Advisory actions were found to be mailed in a timely manner.

Thirty-three percent of the amendments filed after final were improperly refused entry. Only 46% of the attorneys responding to the APLA survey perceived that reasons given by examiners for the non-entry of amendments after final were clear almost always or most of the time. Moreover, only 50% of these attorneys perceived their response to final rejections to have been given full consideration.

In only 39% of the instances when an amendment to existing claims was entered after final did the advisory action clearly specify the grounds of rejection applicable to the amended claims.

Hence, significant improvements are needed in assuring that amendments after final:

- are not arbitrarily refused entry,
- are given sufficient consideration, and
- communicate the ground of rejection for any claim amended after the final rejection.

#### C. Information Disclosure Statements

##### 1. Frequency and Timeliness of Submissions

Information disclosure statements are submitted either as statements in the specification or as separate papers in approximately 60% of the applications. Eighty-two percent of the statements are submitted prior to the first action. However, 47% are filed more than three months from the

filing date. In 1978, just after 37 CFR § 1.56 was amended, only 21% of the statements were filed more than three months after the filing date. Twelve percent of applications on appeal had statements filed after the final rejection. Two percent of the statements are filed after the application has been allowed.

Only 11% of the statements filed more than three months after the filing date contained an explanation for the delay.

Hence, significant improvements are needed for assuring that information disclosure statements are filed in a timely manner, and with an explanation for the delay when filed late.

##### 2. Submission Includes Explanation of Relevancy of Documents

The explanation of the relevance of the art is substantially below standard whether the citation is incorporated in the specification or is in a separate paper. Hence, significant improvement is needed in assuring that explanations of the relevance of documents cited in information disclosure statements are provided.

##### 3. Copy of Documents Supplied

Copies of cited documents, regardless of type, are not provided in approximately 60% of cases when statements are incorporated into the specification. Even when eliminating those statements citing only U.S. patent documents, the Applications Survey still shows a 25% level of non-compliance for specification-incorporated statements. There is a need for improvement in supplying copies of documents cited in specification-incorporated statements.

##### 4. Translation of Foreign Documents Provided

Either a translation or a statement that a translation is not readily available is generally not provided when the citation is incorporated in the specification. While compliance with the standard is better when the citation is in a separate paper, compliance is still poor. Improvement is needed.

##### 5. Form PTO-1449 or Equivalent

Since the use of PTO form 1449 is not mandatory, this section merely reports the degree to which the form is voluntarily used and is thus informational only. Form PTO-1449 is used in about 70% of disclosure statement submissions when the submission is in a separate paper. The form is used in about 25% of the disclosure statements incorporated in the specification.

##### 6. Miscellaneous

Examiners considered art submitted prior to first action in 93% of cases reviewed. Improvement is needed to insure 100% compliance.

While the survey results indicate a perception by examiners that related copending applications are not being fully disclosed, no objective survey data was recorded on this topic. Since attorneys are only required to cite related applications that are *material*, the survey question does not measure perceived performance against the current standard. No conclusions can be reached based upon the survey data.

#### D. Interviews

##### 1. Interviews in General

The results of the APLA survey indicate that, of the attorneys responding to the survey,

- 75% perceived interviews as productive,
- 89% perceived interviews to be kept as scheduled,
- 68% perceived examiners to be adequately prepared, and
- 85% perceived the interview summary form to be completed adequately.

The results of the Examiners Survey indicate that, of the examiners responding to the survey,

- 53% perceived interviews as productive,

- 96% perceived interviews to be kept as scheduled,
- 88% perceived attorneys to be adequately prepared, and
- 67% perceived attorneys as making the substance of the interview of record.

The survey results indicate that attorneys perceive that examiners are willing to grant at least one interview if timely requested. No need for improvement would appear necessary. A substantial number of attorneys (approximately 30%) feel that examiners are only occasionally or rarely willing to discuss and attempt to resolve substantive issues at interviews. However, examiners often express the desire to reserve commitments until after an interview so that full consideration of all points could be made. It cannot be concluded from the survey data whether examiners could be making more substantive commitments at interviews. No need for improvement is indicated. Some improvement is needed by attorneys in ensuring that an adequate written record of the substance of all interviews is provided.

##### 2. Telephone Restriction

As a general policy, the examiner should telephone the attorney of record and request an oral election when making a restriction requirement. In 62% of the restriction requirements reviewed, the policy was followed. However, the telephone is not required to be used when examiners know that an election will not be made by phone. The number of instances of the remaining 38% where no restriction was made for this reason was not determined. Hence, while it appears that some improvement is needed, the degree of need for improvement cannot be determined without further study.

#### E. Responses by Applicant

##### 1. Responses under 37 CFR § 1.111

Approximately 90% of the responses reviewed were technically fully responsive to Office actions. However, the percentage of responses that explained why the claimed invention would have been unobvious in view of the prior art was significantly lower. Moreover, some of the comments from examiners indicate that they feel responses often argue references individually rather than address the combination of references set forth in the prior Office action. At least part of this may be due to the lack of an examiner explanation in rejections how references are used and combined.

Hence, no significant improvement is needed in assuring that responses under § 1.1 treat all objections and rejections. However, significant improvement is needed in assuring that responses include an explanation of why it would have been unobvious to combine or modify the references in the manner suggested by the examiner.

##### 2. Responses Under 37 CFR § 1.116

Only 16% of the amendments filed after a final rejection that were reviewed presented a showing of good and sufficient reasons why they were necessary and why they were not presented earlier. Moreover, 48% of the examiners and SPEs responding to the Examiners Survey perceived that attorneys generally do not start serious prosecution or make substantial amendments until after the final rejection.

Hence, significant improvement is needed in assuring that responses under § 1.116 explain why an amendment was not presented earlier.

##### 3. Appeal Briefs-Responses to Rejections

Ninety-four percent of the briefs reviewed contained an explanation why the examiner's modification of the references would have been unobvious. Hence, no significant improvement is needed in assuring that briefs adequately communicate why the examiner's rejection is considered improper.

##### 4. Affidavits/Declarations Submitted to Overcome Rejections

Approximately 20% of affidavits/declarations are not filed in a timely manner. Hence, improvement is needed in assuring that affidavits/declarations are submitted in a timely manner.

Examiner perception of the sufficiency of affidavits to either establish proper "nexus" when asserting commercial success or to present evidence to substantiate an allegation of "secondary considerations" was very low, indicating a need for at least some attorney improvement.

#### F. Completeness of the Record

##### 1. Reasons for Allowance

In 22% of the applications reviewed, the reason for allowance was not clear from the record. Moreover, only 50% of the attorneys responding to the APLA Survey perceived the reason for allowance made of record by the examiner, as clearly establishing why the claims were allowed. Hence, significant improvement is needed in assuring that the record clearly explain why the claims were allowed.

##### 2. Recordation of Searches

Eighty-five percent of the applications surveyed had search boxes properly filled out by the examiner. Approximately 45% of the applications, wherein an automated search was made, were lacking information about the automated search. Hence, improvements are needed in assuring that the search data are recorded in a complete and accurate manner.

##### 3. Foreign Priority Data Verified

The priority/PCT data appearing on the face of the file wrapper were not verified in 23% of the applications reviewed. Hence, a significant improvement is needed in assuring that the priority/PCT data appearing on the file jacket are verified.

#### G. Compact Prosecution

##### 1. Adequacy of Applications Prior to First Action

Applications should be devoid of obvious informalities. Significant improvement is needed in foreign origin applications since 70% of the examiners surveyed perceived foreign applications as containing substantial formal deficiencies almost always or most of the time. However, only 16% of the examiners perceived U.S. origin applications as containing substantial formal deficiencies.

The disclosure should be readily understandable and the claims should clearly define the invention to enable the examiner to conduct an adequate search. Improvement is needed in foreign origin applications since 20% of the examiners surveyed perceive such applications as lacking an adequate disclosure to permit examination almost always or most of the time. However, 97% of these examiners perceive U.S. origin applications as containing an adequate disclosure.

Claims should be presented that range from the broadest to the most detailed that applicant is willing to accept. Substantial improvement is needed in this area since the Applications Survey shows that only approximately 60% of the applications surveyed contained such a range of claims.

##### 2. Searches

The first search should cover the invention as described and claimed. Substantial improvement is needed in conducting a more thorough search at the time of the first action since 50% of the applications surveyed revealed newly applied art in subsequent actions that should have been applied in a previous action.

A search should be made in the issuing class/subclass. Improvement is needed in this area because 11% of the allowed applications reviewed did not indicate that the issuing class/subclass was searched.

##### 3. Indication of Allowable Subject Matter

Examiners should communicate certain aspects or features of applicant's invention that if properly claimed



would receive favorable consideration. Significant improvement is needed in this area since only 59% of the applications that were deemed appropriate for an indication of allowable subject matter had such an indication.

## H. Appeal Practice

### 1. Appellant's Brief-Format

Ninety-five percent of the briefs reviewed contained a concise explanation of the invention. However, only 46% of the explanations contained a reference back to the drawings and/or specification. Hence, a significant improvement is needed in assuring that appellant's explanation of the invention refers to the drawing and/or specification. Ninety-five percent of the briefs reviewed contained a copy of the claims. Hence, no significant improvement is needed in assuring that appellants provide a copy of the claims on appeal.

In addition, formal matters that are not currently required in briefs were found to be included in the surveyed briefs to the following extent,

- 27% of the briefs included a separate summary of the issues on appeal.
- 53% of the briefs included a citation of the references as well as an explanation of each reference.
- 7% of the briefs included a reference back to the drawings or specification in the copy of the claims presented in the brief; however, 58% of the examiners surveyed thought that an appeal brief would be more useful if the claims on appeal were read on the drawings or specification, and
- 2% of the briefs pointed out an exemplary claim; however 60% of the examiners surveyed thought that an appeal brief would be more useful if appellant is required to state whether all the claims on appeal stand or fall together.

The formal requirements of the brief should be reviewed to determine if these additional requirements would improve the manner in which issues on appeal and evidence in support thereof are set forth in the brief.

### 2. Examiner's Answer-Format

Ninety percent of the answers surveyed identified the status of all the claims in the applications. One hundred percent of the answers cited all the references relied upon in the appeal and pointed out any deficiencies in the copy of the claims provided by appellant. Hence, no significant improvements are needed in the format of the examiners' answers, as measured against the formal requirements for examiner's answers.

In addition, formal matters that are not currently required in examiner's answers were found to be included in the surveyed answers to the following extent,

- 15% of the answers included a summary of the issues on appeal.
- 40% of the answers included an explanation of the invention, and
- 28% of the answers included an explanation of the references.

The formal requirements of the examiner's answer should be reviewed to determine if these additional requirements would improve the manner in which issues on appeal and evidence in support thereof are set forth in the examiner's answer.

### 3. Examiner's Answer-Completeness

Seventy-two percent of the answers reviewed responded to every significant argument raised in the briefs. Hence, a significant improvement is needed in assuring that examiners' answers respond to every significant argument/issue raised by appellants.

### 4. Post Examiner's Answer Practice

The Appeals Survey shows that a substantial number of reply briefs are merely noted with no further comment

by the examiner. The findings are inconclusive regarding the propriety of the reply briefs or whether reply briefs are being treated properly by examiners.

## I. Allowance After Appeal Brief

Thirty-nine percent of applications allowed after an appeal brief had been filed were found to have no change in appellant's position. Hence, significant improvement is needed in assuring that applications are allowed at the earliest appropriate stage of prosecution.

## J. Processing Times

### 1. 16 Mailing of Office Actions

Substantial improvement in mailing Office actions earlier than one month from the day when the examiners are given credit for the Office action has been accomplished since the inception of the Quality Reinforcement Program.

### 2. Mailing of Notices of Allowance

Substantial improvement in assuring that Notices of Allowances are mailed promptly has been accomplished since the inception of the Quality Reinforcement Program.

### 3. Responses to Amendments After Final

Substantial improvement in mailing responses to amendments after final has been accomplished since the inception of the Quality Reinforcement Program.

## Perceptions

In addition to reaching conclusions on the current level of performance of each target practice, the program determined the opinions of patent examiners and representatives of applicants on various topics involved in the examination process. A summary of their perceptions is presented below.

Examiner legal proficiency was perceived by attorneys to be in definite need of improvement.

Examiner technical competency, care in doing the job, and neatness of attire were perceived by attorneys as more positive than negative, but in need of improvement.

Clerical competency and care in doing the job were perceived by attorneys to be in definite need of improvement.

Clerical functions including neatness of attire, cooperativeness, courteousness and availability were perceived as being more positive than negative, but with substantial room for improvement.

Attorney handling of foreign origin applications was perceived by examiners to be deficient in preparation of the case for examination. Attorney practices including continued prosecution after final, interview practice, submission of information disclosure statements and explanation of reasons for disagreement with § 103 rejections were also of concern to examiners.

[1078 OG 22]

## (61) Diligence in Filing Petitions to Revive and Petitions to Withdraw the Holding of Abandonment

Once an application becomes inadvertently abandoned, it is incumbent on applicant to act with diligence in providing the response necessary to continue prosecution. Petitions to revive or to withdraw the holding of abandonment must be filed promptly after applicant is notified or otherwise becomes aware of the abandonment. Unless and until the Commissioner accepts applicant's response as sufficient and complete to revive the

application or to withdraw the holding of abandonment, the application remains abandoned and the burden continues to rest with applicant to exercise diligence.

Some practitioners have demonstrated a lack of diligence in filing or renewing a petition to revive or a petition to withdraw the holding of abandonment. This appears to have been a conscious decision on the practitioners' part based on the belief that any delay in filing or renewing a petition could be cured by filing a terminal disclaimer equivalent to the period of delay in prosecuting the application. While the Office does have a policy of requiring a terminal disclaimer in those situations where there has been a delay of more than six months in filing a grantable petition to revive an application that has become abandoned [37 CFR 1.137(c), 1.316(d) and 1.317(c)], the terminal disclaimer has never been authorized or set forth in the rules as a substitute for diligence. Indeed, such an interpretation would be contrary to the traditional concept of reasonable diligence and is contrary to the explicit requirement of 37 CFR 1.137(a), 1.155(b), 1.181(f), 1.316(b) and 1.317(b) that a petition to revive be filed promptly. See *In re Application of Takeo*, 17 USPQ2d 1155 (Comm'r. 1990).

JAMES E. DENNY  
Assistant Commissioner for  
Patents-designate

[1124 OG 23]

## (62) Patent and Trademark Office 37 CFR Part 1

### Changes in Procedures for Revival of Patent Applications and Reinstatement of Patents

Agency: Patent and Trademark Office, Commerce  
Action: Final Rule

**Summary:** The Patent and Trademark Office (Office) is amending the rules of practice in patent cases to: modify the petition requirements for reviving abandoned applications; extend the provisions for revival under the unintentional standard to applications abandoned under § 1.53(d); modify the requirements for a petition to accept late payment of a maintenance fee filed more than six months after expiration of a patent; modify the requirements for a petition to accept unavoidably delayed payment of a maintenance fee; and provide for reinstatement of a patent where the delay in timely payment of a maintenance fee was unintentional. The Office is also establishing the amount for the surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unintentional. **Effective Date:** Sept. 20, 1993. These rules will be applicable to all papers filed with the Office on or after the effective date. **For Further Information Contact:** Jeffrey V. Nase by telephone at (703) 305-9282 or by mail marked to his attention and addressed to Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231.

**Supplementary Information:** In a Notice of Proposed Rulemaking published in the Federal Register (57 FR 41899) on Sept. 14, 1992, and in the Patent and Trademark Office *Official Gazette* (1143 Off. Gaz. Pat. Office 8) on October 6, 1992, the Office proposed to amend §§ 1.17, 1.137, 1.155, 1.316, 1.317 and 1.378. In an Interim Rule published in the Federal Register (57 FR 56448 on November 30, 1992, and in the Patent and Trademark Office *Official Gazette* (1145 Off. Gaz. Pat. Office 339) on December 8, 1992, the Office, pursuant to Public Law 102-444 enacted October 23, 1992, established interim rules for reinstatement of a patent where the delay in timely payment of a maintenance fee was unintentional. The Office also established the amount for the surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment was shown to the satisfaction of the Commissioner to have been unintentional. No oral hearing was held.

## DISCUSSION OF SPECIFIC SECTIONS TO BE CHANGED

## OR ADDED:

### (1) Post issuance fees. (§ 1.20)

Section 1.20(i) is amended to add a \$1,500 surcharge fee for accepting the unintentionally delayed payment of a maintenance fee.

### (2) Unavoidable or unintentional abandonment of an application

Sections 1.137, 1.155, 1.316 and 1.317 each provide for petitions to the Commissioner for relief from failure to timely comply with a requirement of the Office. Section 1.137 provides for petitions to revive patent applications abandoned for failure to prosecute where the delay in prosecution was unavoidable (§ 1.137(a)) or the delay was unintentional (§ 1.137(b)). Section 1.155 provides for petitions for acceptance of late payment of issue fees in applications for design patents as though no abandonment had ever occurred where the delay in payment was unavoidable (§ 1.155(b)) or unintentional (§ 1.155(c)). Section 1.316 provides for petitions for acceptance of late payment of issue fees in applications for patent as though no abandonment had ever occurred where the delay in payment was unavoidable (§ 1.316(b)) or unintentional (§ 1.316(c)). Section 1.317 provides for acceptance of late payment of the balance of issue fees in patents as though no lapse had ever occurred where the delay in payment was unavoidable (§ 1.317(b)) or unintentional (§ 1.317(c)).

In order to obtain relief under the unavoidable standard in the above-noted sections, the regulations continue to require the filing of a terminal disclaimer if the petition is filed more than six months after the date of abandonment. See §§ 1.137(c), 1.155(d), 1.316(d) and 1.317(d). The terminal disclaimer must disclaim a period equivalent to the period of abandonment. The period of abandonment is considered to be the number of months lapsed from the date of abandonment until the date of filing of a grantable petition.

Sections 1.137(c), 1.155(d) and 1.316(d) are amended to reflect the current practice that a terminal disclaimer filed for the purpose of reviving an application also applies to a patent granted on any continuing application entitled to the benefit of the filing date of the subject application under 35 U.S.C. 120.

Applicants may petition under the provisions of § 1.183 for a waiver of the requirement that a period equivalent to the period of abandonment be disclaimed if it can be shown that an extraordinary situation exists in which justice requires waiver of this requirement.

If petitions under the above-noted sections were not grantable because of insufficient evidence or petitioner's failure to comply with certain requirements, the Office dismissed the petitions. The dismissal indicated any missing items and warned petitioners that any renewed petition seeking reconsideration must be filed promptly. While the promptness requirement was not precisely defined, § 1.181(f) requires the filing of petitions within two months from an action complained of in order to avoid possible dismissal of the petition on the grounds that it was not timely filed. The above-noted sections are being amended to specify a two-month period or such time as may be set in the dismissal as being the appropriate deadline for requesting reconsideration. In those situations where petitioners require more time to gather additional evidence or items needed for reconsideration, an extension of time of up to four months may be obtained under the provisions of § 1.136(a). The filing of a renewed petition within the period specified in the decision or within the extended period permitted under § 1.136 will satisfy the promptness requirement of petitions under the unavoidable standard.

Upon failure to timely file a renewed petition under the unavoidable standard, the Office will require a showing of unavoidable delay for the entire period of abandonment. To be entitled to relief under the unavoidable standard, petitioner must be able to show unavoidable delay from a time prior to abandonment to the filing of a grantable petition. *In re Application of Takeo*, 17 USPQ2d 1155 (Comm'r Pat. 1990). Upon failure to timely file a renewed petition under the unintentional standard (see §§ 1.137(d), 1.155(e), 1.316(e) and 1.317(e)), petitioner may be subject to a loss of the right to proceed under



the unintentional standard if more than one year lapsed between the date of abandonment and the date the renewed petition is filed.

The unintentional provisions specified in § 1.137(b) will apply to applications abandoned under § 1.53(d). Effective Nov. 5, 1990, the Commissioner waived, under § 1.183, the exception specified in § 1.137(b) as to applicability of petitions under the unintentional standards to applications abandoned under § 1.53(d). See "Petitions to Revive Patent Applications Waiver of Provisions of 37 CFR § 1.137(b)", 1121 Off. Gaz. Pat. Office 6 (Dec. 4, 1990). Section 1.137(b) is amended to incorporate this new practice into the regulations.

The Office is amending § 1.137(b) to clearly require applicant to state that the delay was unintentional, rather than the abandonment was unintentional. The Office has withdrawn its proposal that would have amended the rules of practice to require a terminal disclaimer if a grantable petition to reinstate an abandoned application was not filed within six months from the date of abandonment. The terminal disclaimer proposal was withdrawn because of the burden that such a requirement would impose on applicants and the Office and because it is unnecessary to achieve its intended purpose. The Office had suggested the terminal disclaimer proposal to ensure that any petition to revive was promptly filed. However, the proposed terminal disclaimer requirement is unnecessary to ensure prompt filing of the petition to revive since the first sentence of § 1.137(b) states that an application may be revived if the delay was unintentional. Accordingly, the specific requirements for the unintentional petition to revive have been amended to correspond to the existing rule provision that revival is available if the delay was unintentional, not just that the abandonment was unintentional. A person seeking revival should not make a statement that the delay was unintentional unless the entire delay, including the delay from the date it was discovered that the application was abandoned up until the petition to revive was actually filed, was unintentional. For example, a statement that the delay was unintentional would not be proper when applicant becomes aware of an abandonment and then intentionally delays filing a petition to revive the application under § 1.137.

The Office adopted a policy wherein, under certain strictly limited conditions, the one-year period for requesting revival of an unintentionally abandoned application could be waived. Accordingly, the prohibition against requests for waiver found in §§ 1.137(b), 1.155(c), 1.316(c) and 1.317(c) has been deleted. See "Petitions Under 37 CFR 1.183 to Waive the One Year Time Period Requirement in 37 CFR 1.137(b), 1.155(c) and 1.316(c)" at 1059 Off. Gaz. Pat. Office 4 (Oct. 1, 1985). However, applicants are cautioned that waiver of the one-year deadline under the unintentional standard will continue to be subject to strictly limited conditions.

### (3) Issue and term of design patents (§ 1.155)

Section 1.155 is amended to be consistent with the changes to § 1.137. Paragraph (b) of § 1.155 is further modified to correct a typographical error. In the reference to the fee in § 1.17(1), the letter (l) should have appeared instead of the numeral (1).

### (4) Application abandoned for failure to pay issue fee (§ 1.316)

Section 1.316 is amended to be consistent with the changes to § 1.137. Paragraph (b) of § 1.316 is further modified to correct a typographical error. In the reference to the fee in § 1.17(1), the letter (l) should have appeared instead of the numeral (1).

### (5) Lapsed Patents; delayed payment of balance of issue fee (§ 1.317)

Section 1.317 contains a provision regarding issue fees paid prior to October 1, 1982. Prior to that date, the Office charged an initial base issue fee and, depending on the size of the specification and drawings printed, billed applicants for a balance of issue fee due. Subsequent to Oct. 1, 1982, all applicants were required to pay the same issue fee regardless of the size of the specification and drawings. Reference to the date in §

1.317 is being deleted at this point in time since it is no longer relevant to pending applications. However, practice under this section continues to be relevant when a fee change becomes effective before payment is received.

In order to satisfy the requirement of 35 U.S.C. 151, the Office mails out a Notice of Allowance which specifies the sum of the issue fee due. When the issue fee amount is changed, the sum specified on the Notice of Allowance is at times different from that required at the time payment is actually received in the Office. If applicants submit issue fee payments in the amount specified on the Notice of Allowance after the effective date of a fee increase, then a balance of issue fee is due. The Office will accept payment of the amount specified on the Notice of Allowance and process the application into a patent. In accordance with 35 U.S.C. 151 and 37 CFR 1.317, a notice is sent to applicants requesting payment of the balance of the issue fee due (the difference between the fee due at time of receipt of payment in the Office and the fee specified on the Notice of Allowance), and setting a three-month period for payment. See *In re Mills*, 12 USPQ2d 1847 (Comm'r Pat. 1989). Failure to pay the balance of the issue fee within the specified three-month period, result in lapse of the patent. Therefore, the reference to Oct. 1, 1982, in § 1.317 is being replaced by language specifying the consequences of failure to pay the issue fee due at the time payment is made.

Section 1.317 is amended to be consistent with the changes in § 1.137. Paragraph (b) of § 1.317 is further modified to correct a typographical error. In the reference to the fee in § 1.17(1), the letter (l) should have appeared instead of the numeral (1).

### (6) Delayed payment of a maintenance fee (§ 1.378)

Public Law 102-444 amends subsection 41(c)(1) of title 35, United States Code, to permit the Commissioner to accept late payment of any maintenance fee filed within twenty-four months after the six-month grace period, if the delay in payment is shown to the satisfaction of the Commissioner to have been unintentional. In order to implement Public Law 102-444, paragraphs (a) and (c) of § 1.378 are amended to permit the filing of a petition to accept late payment of a maintenance fee, where the delay in payment was unintentional.

In addition to the timeliness deadline set forth in the preceding paragraph, a petition filed under the unintentional standard of § 1.378(c) would have to include the required maintenance fee set forth in § 1.20(c) through (g), the surcharge for an unintentionally expired patent as set forth in § 1.20(i)(2), and a statement that the delay in payment of the maintenance fee was unintentional.

A person seeking reinstatement of an expired patent should not make a statement that the delay in payment of the maintenance fee was unintentional unless the entire delay, including the delay from the date it was discovered that the maintenance fee was not paid timely up until the maintenance fee was actually paid, was unintentional. For example, a statement that the delay in payment of the maintenance fee was unintentional would not be proper when patentee becomes aware of an unintentional failure to timely pay the maintenance fee and then intentionally delays filing a petition for reinstatement of the patent under § 1.378.

Petitions to accept delayed payment of a maintenance fee in an expired patent, prior to enactment of Public Law 102-444, required a showing of unavoidable delay. In the case of petitions filed more than six months after expiration of a patent, former § 1.378(c) further required a showing that the failure to timely pay the maintenance fee was beyond the control of the patentee. The Office had determined that the "beyond the control" standard did not find adequate support in the relevant statute (35 U.S.C. 41(c)) or in the legislative history of Public Law 97-247. See "Acceptance of Delayed Payment of Maintenance Fees in Expired Patents", 1115 Off. Gaz. Pat. Office 18 (June 12, 1990). Therefore, former § 1.378(c) has been deleted in its entirety to be replaced by the unintentional delay provisions discussed above. Additionally, § 1.378(b) is amended to provide that the unavoidable delay provisions are available at any time following expiration of a patent for failure to pay a maintenance fee.

Furthermore, the practice of accepting late payment of maintenance fees is modified to be more analogous to the practice

of reviving abandoned applications and accepting late payment of issue fees. Additionally, the public interest is best served by prompt reinstatement of a patent in which there was an unavoidable or unintentional delay in the timely payment of the maintenance fee.

The requirements for a petition to accept late payment of a maintenance fee, where the delay was unavoidable, are outlined in paragraph (b) of § 1.378. In addition to the maintenance fee and surcharge previously required, paragraph (b) is amended to require prompt filing of a petition after the patentee is notified, or otherwise becomes aware, of the expiration of the patent.

### Response to Comments on the Rules

Four comments were received.

**Comment 1:** One comment questioned the time limits in proposed § 1.378(c)(5).

**Reply:** The proposed time limits will not be adopted because Public Law 102-444 sets the time limit for filing a petition to accept the delayed payment of a maintenance fee at twenty-four months after the six-month grace period provided in 35 U.S.C. 41(c).

**Comment 2:** One comment questioned the proposed terminal disclaimer requirement for petitions to revive an abandoned application under the unintentional standard.

**Reply:** The proposed terminal disclaimer requirement for petitions to revive an abandoned application under the unintentional standard will not be adopted. First, it has been determined that the proposed terminal disclaimer requirement would have created an unduly complex procedure for both the applicant and the Office. Second, the terminal disclaimer requirement is unnecessary to address a delay in filing a petition for unintentional abandonment since § 1.137(b) already indicates that the application may be revived if the delay was unintentional. If a delay in filing a petition was intentional, the petition would be denied. Third, the requirements for a petition have been amended to add the requirement for a statement that the delay in responding was unintentional so as to be consistent with the requirements of the first sentence of § 1.137(b). Finally, applicants are cautioned against intentionally delaying the filing of a petition to revive an abandoned application because it may preclude any revival from an abandoned status. Applicants have delayed filing a petition under the unintentional standard until after expiration of the one-year period because of a miscalculation of the one-year period. This miscalculation resulted in the applicant being unable to show that the delay was unavoidable. *In re Application of S. 8 USPQ2d 1630 (Comm'r Pat. 1988).*

**Comment 3:** One comment questioned whether Public Law 102-444 and therefore 37 CFR 1.378(c) were applicable to patents that had expired prior to Oct. 23, 1992, for failure to timely pay the required maintenance fee.

**Reply:** Section 1.378 has been established in accordance with the statutory mandate. Public Law 102-444 and 37 CFR 1.378(c) are effective as to any patent that would be covered by the literal language of the sections. Public Law 102-444 and interim rule 37 CFR 1.378(c) were effective Oct. 23, 1992. Since Public Law 102-444 provides up to a twenty-four month period after the six-month grace period provided in 35 U.S.C. 41(c) to seek reinstatement of an expired patent where the delay was unintentional, any patent that expired on or after Oct. 23, 1990, for failure to timely pay a maintenance fee is eligible for relief under 37 CFR 1.378(c). However, it should be noted that a petition to reinstate an unintentionally expired patent, the required maintenance fee, and the unintentional surcharge (37 CFR 1.20(i)(2)) must be filed within twenty-four months after the six-month grace period to be eligible for relief under the new unintentional provision.

**Comment 4:** One comment protested that the \$1,500 surcharge established in § 1.20(i)(2) was too high.

**Reply:** The \$1,500 surcharge established in § 1.20(i)(2) is proper. The amount of \$1,500 was determined by considering: (1) the \$1,170 petition fee for reinstating an unintentionally abandoned patent application, (2) the relationship imposed by statute between the \$1,170 petition fee for reinstating an unintentionally abandoned patent application and the \$110 petition fee for reinstating an unavoidably abandoned patent application, and (3) the \$620 surcharge for reinstating an unavoidably expired patent. Additionally, the Office noted in its original

request for comments on the desirability of permitting acceptance of unintentionally delayed payment of maintenance fees (see 1089 Off. Gaz. Pat. Office 55, April 26, 1988) that the surcharge to accept an unintentionally delayed payment of a maintenance fee would be substantially higher than the surcharge to accept an unavoidably delayed payment of a maintenance fee. Not only was there no comment adverse to the suggestion of a higher fee, one comment suggested that the surcharge to accept an unintentionally delayed payment of a maintenance fee be set extremely high so that the Office could be assured that the late payment was, in fact, unintentional. The Office, after taking all of the above into consideration, determined that \$1,500 was an appropriate amount to charge as the surcharge to accept an unintentionally delayed payment of a maintenance fee.

### OTHER CONSIDERATIONS

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 et seq., Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.).

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these changes is to incorporate Public Law 102-444 into the regulations and will give relief to many small entities that do not now have a mechanism to reinstate their expired patent.

The Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers; individuals; industries; Federal, state or local government agencies; or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes contain a collection of information requirements subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., which have previously been approved by the Office of Management and Budget under Control Nos. 0651-0016 and 0651-0031. The public reporting burden for these collections of information for abandoned applications and delayed maintenance fees is estimated to average 1.0 hour each including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collections of information. Send comments regarding these burden estimates, or any other aspect of these collections of information, including suggestions for reducing the burden, to Jeffrey V. Nase, Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503 (ATTN: Paperwork Reduction Act Project 0651-0011 and 0651-0016).

### List of Subjects 37 CFR Part 1

Administrative practice and procedure, Freedom of information, Inventions and patents, Reporting and record keeping requirements.

For the reasons set out in the preamble, and pursuant to the authority contained in 35 U.S.C. 6, Part 1 of title 37 of the Code of Federal Regulations is amended as set forth below.

### PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.20 is amended by revising paragraph (i) to read as follows:



## § 1.20 Post issuance fees.

\*\*\*\*\*

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been

- (1) unavoidable .....\$620.00
- (2) unintentional .....\$1,500.00

\*\*\*\*\*

3. Section 1.137 is revised to read as follows:

## (a) § 1.137 Revival of abandoned application.

(a) An application abandoned for failure to prosecute may be revived as a pending application if it is shown to the satisfaction of the Commissioner that the delay was unavoidable. A petition to revive an abandoned application must be promptly filed after the applicant is notified of, or otherwise becomes aware of, the abandonment, and must be accompanied by:

- (1) a proposed response to continue prosecution of that application, or the filing of a continuing application, unless either has been previously filed;
- (2) the petition fee as set forth in § 1.17(1); and
- (3) a showing that the delay was unavoidable. The showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office.

(b) An application unintentionally abandoned for failure to prosecute may be revived as a pending application if the delay was unintentional. A petition to revive an unintentionally abandoned application must be:

- (1) accompanied by a proposed response to continue prosecution of that application, or the filing of a continuing application, unless either has been previously filed;
- (2) accompanied by the petition fee as set forth in § 1.17(m);

(3) accompanied by a statement that the delay was unintentional. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional information where there is a question whether the delay was unintentional; and

- (4) filed either:
  - (i) within one year of the date on which the application became abandoned; or
  - (ii) within three months of the date of the first decision on a petition to revive under paragraph (a) of this section which was filed within one year of the date on which the application became abandoned.

(c) Any petition pursuant to paragraph (a) of this section not filed within six months of the date of abandonment of the application, must be accompanied by a terminal disclaimer with fee under § 1.321 dedicating to the public a terminal part of the term of any patent granted thereon equivalent to the period of abandonment of the application. The terminal disclaimer must also apply to any patent granted on any continuing application entitled under 35 U.S.C. 120 to the benefit of the filing date of the application for which revival is sought.

(d) Any request for reconsideration or review of a decision refusing to revive an application upon petition filed pursuant to paragraphs (a) or (b) of this section, to be considered timely, must be filed within two months of the decision refusing to revive or within such time as set in the decision.

(e) The time periods set forth in this section cannot be extended, except that the three-month period set forth in paragraph (b)(4)(ii) and the time period set forth in paragraph (d) of this section may be extended under the provisions of § 1.136.

4. Section 1.155 is amended by revising paragraphs (b) through (d) and adding paragraphs (e) and (f) to read as follows:

## § 1.155 Issue and term of design patents.

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(b) The Commissioner may accept the payment of the issue fee later than three months after the mailing of the notice of allowance as though no abandonment had ever occurred if upon petition the delay in payment is shown to have been unavoidable. The petition to accept the delayed payment must be promptly filed after the applicant is notified of, or otherwise becomes aware of, the abandonment, and must be accompanied by:

- (1) the issue fee, unless it has been previously submitted;
- (2) the fee for delayed payment (§ 1.17(1)); and
- (3) a showing that the delay was unavoidable. The showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office.

(c) The Commissioner may, upon petition, accept the payment of the issue fee later than three months after the mailing of the notice of allowance as though no abandonment had ever occurred if the delay in payment was unintentional. The petition to accept the delayed payment must be:

- (1) accompanied by the issue fee, unless it has been previously submitted;
- (2) accompanied by the fee for unintentionally delayed payment (§ 1.17(m));

(3) accompanied by a statement that the delay was unintentional. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional information where there is a question whether the delay was unintentional; and

- (4) filed either:
  - (i) within one year of the date on which the application became abandoned; or
  - (ii) within three months of the date of the first decision on a petition under paragraph (b) of this section which was filed within one year of the date on which the application became abandoned.

(d) Any petition pursuant to paragraph (b) of this section not filed within six months of the date of abandonment of the application, must be accompanied by a terminal disclaimer with fee under § 1.321 dedicating to the public a terminal part of the term of any patent granted thereon equivalent to the period of abandonment of the application. The terminal disclaimer must also apply to any patent granted on any continuing application entitled under 35 U.S.C. 120 to the benefit of the filing date of the application for which revival is sought.

(e) Any request for reconsideration or review of a decision refusing to accept the delayed payment upon petition filed pursuant to paragraphs (b) or (c) of this section, to be considered timely, must be filed within two months of the decision refusing to accept the delayed payment or within such time as set in the decision.

(f) The time periods set forth in this section cannot be extended, except that the three-month period set forth in paragraph (c)(4)(i) of this section and the time period set forth in paragraph (e) of this section may be extended under the provisions of § 1.136.

5. Section 1.316 is amended by revising paragraphs (b) through (d) and adding paragraphs (e) and (f) to read as follows:

## § 1.316 Application abandoned for failure to pay issue fee.

\*\*\*\*\*

(b) The Commissioner may accept the payment of the issue fee later than three months after the mailing of the notice of allowance as though no abandonment had ever occurred if upon petition the delay in payment is shown to have been unavoidable. The petition to accept the delayed payment must be promptly filed after the applicant is notified of, or otherwise becomes aware of, the abandonment, and must be accompanied by:

- (1) the issue fee, unless it has been previously submitted;
- (2) the fee for delayed payment (§ 1.17(1)); and
- (3) a showing that the delay was unavoidable. The showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office.

(c) The Commissioner may, upon petition, accept the payment of the issue fee later than three months after the mailing of the notice of allowance as though no abandonment had ever

occurred if the delay in payment was unintentional. The petition to accept the delayed payment must be:

- (1) accompanied by the issue fee, unless it has been previously submitted;
- (2) accompanied by the fee for unintentionally delayed payment (§ 1.17(m));

(3) accompanied by a statement that the delay was unintentional. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional information where there is a question whether the delay was unintentional; and

- (4) filed either:
  - (i) within one year of the date on which the application became abandoned; or
  - (ii) within three months of the date of the first decision on a petition under paragraph (b) of this section which was filed within one year of the date on which the application became abandoned.

(d) Any petition pursuant to paragraph (b) of this section not filed within six months of the date of abandonment of the application, must be accompanied by a terminal disclaimer with fee under § 1.321 dedicating to the public a terminal part of the term of any patent granted thereon equivalent to the period of abandonment of the application. The terminal disclaimer must also apply to any patent granted on any continuing application entitled under 35 U.S.C. 120 to the benefit of the filing date of the application for which revival is sought.

(e) Any request for reconsideration or review of a decision refusing to accept the delayed payment upon petition filed pursuant to paragraphs (b) or (c) of this section, to be considered timely, must be filed within two months of the decision refusing to accept the delayed payment or within such time as set in the decision.

(f) The time periods set forth in this section cannot be extended, except that the three-month period set forth in paragraph (c)(4)(ii) of this section and the time period set forth in paragraph (e) of this section may be extended under the provisions of § 1.136.

6. Section 1.317 is revised to read as follows:

## § 1.317 Lapsed patents; delayed payment of the balance of issue fee.

(a) If the issue fee paid is the amount specified in the Notice of Allowance, but a higher amount is required at the time the issue fee is paid, any remaining balance of the issue fee is to be paid within three months from the date of notice thereof and, if not paid, the patent will lapse at the termination of the three-month period.

(b) The Commissioner may accept the payment of the remaining balance of the issue fee later than three months after the mailing of the notice thereof as though no lapse had ever occurred if upon petition the delay in payment is shown to have been unavoidable. The petition to accept the delayed payment must be promptly filed after the applicant is notified of, or otherwise becomes aware of, the lapse, and must be accompanied by:

- (1) the remaining balance of the issue fee, unless it has been previously submitted;
- (2) the fee for delayed payment (§ 1.17(1)); and
- (3) a showing that the delay was unavoidable. The showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office.

(c) The Commissioner may, upon petition, accept the payment of the remaining balance of the issue fee later than three months after the mailing of the notice thereof as though no lapse had ever occurred if the delay in payment was unintentional. The petition to accept the delayed payment must be:

- (1) accompanied by the remaining balance of the issue fee, unless it has been previously submitted;
- (2) accompanied by the fee for unintentionally delayed payment (§ 1.17(m));

(3) accompanied by a statement that the delay was unintentional. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional

information where there is a question whether the delay in payment was unintentional; and

- (4) filed either:
  - (i) within one year of the date on which the patent lapsed; or
  - (ii) within three months of the date of the first decision on a petition under paragraph (b) of this section which was filed within one year of the date on which the patent lapsed.

(d) Any petition pursuant to paragraph (b) of this section not filed within six months of the date of lapse of the patent, must be accompanied by a terminal disclaimer with fee under § 1.321 dedicating to the public a terminal part of the term of the patent equivalent to the period of lapse of the patent.

(e) Any request for reconsideration or review of a decision refusing to accept the delayed payment upon petition filed pursuant to paragraphs (b) or (c) of this section, to be considered timely, must be filed within two months of the decision refusing to accept the delayed payment or within such time as set in the decision.

(f) The time periods set forth in this section cannot be extended, except that the three-month period set forth in paragraph (c)(4)(ii) and the time period set forth in paragraph (e) of this section may be extended under the provisions of § 1.136.

7. Section 1.378, paragraphs (a), (b), (c) and (e) are revised to read as follows:

## § 1.378 Acceptance of delayed payment of maintenance fee in expired patent to reinstate patent.

(a) The Commissioner may accept the payment of any maintenance fee due on a patent after expiration of the patent if, upon petition, the delay in payment of the maintenance fee is shown to the satisfaction of the Commissioner to have been unavoidable (paragraph (b) of this section) or unintentional (paragraph (c) of this section) and if the surcharge required by § 1.20(i) is paid as a condition of accepting payment of the maintenance fee. If the Commissioner accepts payment of the maintenance fee upon petition, the patent shall be considered as not having expired, but will be subject to the conditions set forth in 35 U.S.C. 41(c)(2).

(b) Any petition to accept an unavoidably delayed payment of a maintenance fee filed under paragraph (a) of this section must include:

- (1) the required maintenance fee set forth in § 1.20(e) through (g)
- (2) the surcharge set forth in § 1.20(i)(1); and
- (3) a showing that the delay was unavoidable since reasonable care was taken to ensure that the maintenance fee would be paid timely and that the petition was filed promptly after the patentee was notified of, or otherwise became aware of, the expiration of the patent. The showing must enumerate the steps taken to ensure timely payment of the maintenance fee, the date and the manner in which patentee became aware of the expiration of the patent, and the steps taken to file the petition promptly.

(c) Any petition to accept an unintentionally delayed payment of a maintenance fee filed under paragraph (a) of this section must be filed within twenty-four months after the six-month grace period provided in § 1.362(e) and must include:

- (1) the required maintenance fee set forth in § 1.20 (e) through (g);
- (2) the surcharge set forth in § 1.20(i)(2); and
- (3) a statement that the delay in payment of the maintenance fee was unintentional.

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(e) Reconsideration of a decision refusing to accept a maintenance fee upon petition filed pursuant to paragraph (a) of this section may be obtained by filing a petition for reconsideration within two months of, or such other time as set in, the decision refusing to accept the delayed payment of the maintenance fee. Any such petition for reconsideration must be accompanied by the petition fee set forth in § 1.17(h). After decision on the petition for reconsideration, no further reconsideration or review of the matter will be undertaken by the Commissioner. If the delayed payment of the maintenance fee is not accepted, the maintenance fee and the surcharge set forth in § 1.20(i)



will be refunded following the decision on the petition for reconsideration, or after the expiration of the time for filing such a petition for reconsideration, if none is filed. Any petition fee under this section will not be refunded unless the refusal to accept and record the maintenance fee is determined to result from an error by the Patent and Trademark Office.

Aug. 11, 1993

MICHAEL K. KIRK  
Acting Assistant Secretary  
and Acting Commissioner of  
Patents and Trademarks

[1154 OG 35]

(63) DEPARTMENT OF COMMERCE  
Patent and Trademark Office  
37 CFR Part 1  
[Docket No. 920670-2281]  
RIN 0651-AA57

## Changes in Procedures for Reinstatement of Patents

Agency: Patent and Trademark Office, Commerce  
Action: Interim Rule

**Summary:** The Patent and Trademark Office (Office) is amending the rules of practice in patent cases to provide for reinstatement of a patent where the delay in timely payment of a maintenance fee was unintentional. The Office is also establishing the amount for the surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unintentional. **Dates:** Interim rule effective Oct. 23, 1992. These rules will be applicable to all petitions to reinstate an expired patent filed with the Office on or after the effective date. The surcharge cited in sections 1.20(i)(2) and 1.378(c)(2) of title 37 of the Code of Federal Regulations will be effective thirty days from publication of this rulemaking in the *Federal Register* or the *Official Gazette* of the Patent and Trademark Office, whichever is later. Written comments on this rulemaking must be received on or before Jan. 8, 1993 to ensure consideration. An oral hearing will not be conducted.

**Addressee:** Address written comments on this interim rulemaking to Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231, marked to the attention of Jeffrey V. Nase. Correspondence may be sent by FAX to the attention of Jeffrey V. Nase at (703) 305-8825.

**For Further Information Contact:** Jeffrey V. Nase by telephone at (703) 305-9282 or by mail marked to his attention and addressed to Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231.

**Supplementary Information:** In a Notice of Proposed Rulemaking published in the *Federal Register* (57 FR 41899) on Sept. 14, 1992, and in the Patent and Trademark Office *Official Gazette* (1143 Off. Gaz. Pat. Office 8) on Oct. 6, 1992, the Office proposed to amend the current regulations in the event that proposed statutory changes were enacted to allow for the reinstatement of a patent where the delay in timely payment of a maintenance fee was unintentional.

Section 41 of title 35, United States Code, establishes fees that the Commissioner shall charge for patent-related matters. A bill to amend title 35 with respect to the late payment of maintenance fees was introduced on June 4, 1992, in the House of Representatives as H.R. 5328 (hereafter, Bill). The Bill, as introduced, proposed to: (1) amend 35 U.S.C. § 41(c)(1) to permit reinstatement of a patent which expired unintentionally for failure to timely pay the maintenance fee, provided that the payment is made within eighteen months after the six-month grace period specified in 35 U.S.C. § 41(b); and (2) amend 35 U.S.C. § 41(a)(7) to require a petition fee for an unintentionally delayed payment for maintaining a patent in force. The Bill, with amendments, was enacted as Public Law No. 102-444 (hereafter, Act).

The Act amends 35 U.S.C. § 41(c)(1) to permit reinstatement of a patent which expired unintentionally for failure to timely pay the maintenance fee, provided that the payment is made

within twenty-four months after the six-month grace period specified in 35 U.S.C. § 41(b).

Since the Act is effective on enactment and since it differs significantly from the Bill, as introduced, it is necessary to promulgate this interim rulemaking. This interim rulemaking implements the procedures the Office will follow to accept the unintentionally delayed payment of a maintenance fee. All aspects of this rulemaking either confer a benefit or are clearly and directly related to the benefit conferred. Therefore, this rulemaking is exempt from the Administrative Procedures Act's rulemaking requirements under the proprietary matters exception, 5 U.S.C. § 553(a)(2). Furthermore, any delay in the implementation of this interim rulemaking would be contrary to the public interest in granting relief by ensuring that patents unintentionally expired for failure to pay the required maintenance fee are promptly reinstated.

Under the Act, the Commissioner has authority to set a surcharge for accepting the unintentionally delayed payment of a maintenance fee. The Commissioner has determined that an interim surcharge of \$1,500 is appropriate. If a surcharge in a lower amount is finally adopted (after review of public comments in response to this interim rulemaking), patentees will be refunded any excess payment. The \$1,500 interim surcharge was determined to be the appropriate amount when compared to the existing \$620 surcharge for accepting the unavoidably delayed payment of a maintenance fee. The higher interim surcharge is appropriate since a petition to accept the unintentionally delayed payment of a maintenance fee will require only a statement that the delay in payment of the maintenance fee was unintentional, not a showing of facts sufficient to establish unavoidable delay. Furthermore, the higher amount for relief based on the unintentional delay relative to those based on unavoidable delay is similar to the statutory difference in fees for petitioning to revive an abandoned application.

The \$1,500 interim surcharge will not take effect until the date thirty days from publication of this interim rulemaking in the *Federal Register* or the *Official Gazette* of the Patent and Trademark Office, whichever is later. Section 1.378(c)(2) is waived until the \$1,500 surcharge becomes effective. However, petitions to accept the delayed payment of a maintenance fee should not be delayed for that thirty-day period. The surcharge for the acceptance of a maintenance fee resulting from a petition filed under this waiver will be due when the petition is granted.

One comment on the proposed § 1.378 has been received.

**Comment:** The comment questioned the time limits proposed for § 1.378(c)(5).

**Reply:** The proposed time limits will not be adopted because the Act sets the time limit for filing a petition to accept the delayed payment of a maintenance fee.

Any final rule will treat both the comments made to the proposed rules and to these interim rules.

## DISCUSSION OF SPECIFIC SECTIONS TO BE CHANGED OR ADDED:

## (1) Post issuance fees. (§ 1.20)

Section 1.20(i) is amended to add a \$1,500 surcharge fee for accepting the unintentionally delayed payment of a maintenance fee. This amendment will not become effective until the date thirty days after Publication of this interim rulemaking in the *Federal Register* or in the *Official Gazette* of the Patent and Trademark Office, whichever is later.

## (2) Delayed payment of a maintenance fee (§ 1.378)

The Act amends subsection 41(c)(1) of title 35, United States Code, to permit the Commissioner to accept late payment of any maintenance fee filed within twenty-four months after the six-month grace period, if the delay in payment is shown to the satisfaction of the Commissioner to have been unintentional. In order to implement the Act, paragraphs (a) and (c) of § 1.378 are amended to permit the filing of a petition to accept late payment of a maintenance fee, where the delay in payment was unintentional.

In addition to the timeliness deadlines set forth in the preceding paragraph, a petition filed under the unintentional stan-

dard of § 1.378(c) would have to include the required maintenance fee set forth in § 1.20(e) through (g), the surcharge for an unintentionally expired patent as set forth in § 1.20(i)(2), and a statement that the delay in payment of the maintenance fee was unintentional. The requirement of § 1.378(c)(2) that the petition must include the surcharge will be waived until the date thirty days after publication of this interim rulemaking in the *Federal Register* or in the *Official Gazette* of the Patent and Trademark Office, whichever is later. The surcharge for the acceptance of a maintenance fee resulting from a petition filed under this waiver will be due when the petition is granted.

A statement that the delay in payment of the maintenance fee was unintentional would not be appropriate unless the entire delay, up until the maintenance fee was actually paid, was unintentional. For example, a statement that the delay in payment of the maintenance fee was unintentional would not be proper when patentee becomes aware of an unintentional failure to timely pay the maintenance fee and then intentionally delays filing a petition for reinstatement of the patent under § 1.378.

Petitions to accept delayed payment of a maintenance fee in an expired patent, prior to enactment of the Act, required a showing of unavoidable delay. In the case of petitions filed more than six months after expiration of a patent, current § 1.378(c) further required a showing that the failure to timely pay the maintenance fee was beyond the control of the patentee. The Office has determined that the "beyond the control" standard does not find adequate support in the relevant statute (35 U.S.C. 41(c)) or in the legislative history of Public Law 97-247. See "Acceptance of Delayed Payment of Maintenance Fees in Expired Patents", 1115 Off. Gaz. Pat. Office 18 (June 12, 1990). Therefore, current § 1.378(c) is being deleted in its entirety to be replaced by the unintentional delay provisions discussed above. Additionally, § 1.378(b) is amended to provide that the unavoidable delay provisions are available at any time following expiration of a patent for failure to pay a maintenance fee.

## OTHER CONSIDERATIONS

The rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 et seq.), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these rule changes will not have a significant economic impact on a substantial number of small entities (regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these changes is to incorporate the Act into the regulations and will give relief to many small entities that do not now have a mechanism to reinstate their expired patent.

The Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers; individuals; industries; Federal, state or local government agencies; or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes contain a collection of information requirement subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., which has previously been approved by the Office of Management and Budget under Control Nos. 0651-011 and 0651-0016.

## List of Subjects

## 37 CFR Part 1

Administrative practice and procedure, Freedom of information, Inventions and patents, Reporting and record keeping requirements.

For the reasons set out in the preamble, and pursuant to the authority contained in 35 U.S.C. § 6, part 1 of title 37 of the Code of Federal Regulations is amended as set forth below.

## PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.20 is amended by revising paragraph (i) to read as follows:

## § 1.20 Post issuance fees.

\*\*\*\*\*

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been

- (1) unavoidable ..... \$620.00
- (2) unintentional ..... \$1,500.00

\*\*\*\*\*

3. Section 1.378, paragraphs (a), (b) and (c) are revised to read as follows:

## § 1.378 Acceptance of delayed payment of maintenance fee in expired patent to reinstate patent.

(a) The Commissioner may accept the payment of any maintenance fee due on a patent after expiration of the patent if, upon petition, the delay in payment of the maintenance fee is shown to the satisfaction of the Commissioner to have been unavoidable (paragraph (b) of this section) or unintentional (paragraph (c) of this section) and if the surcharge required by § 1.20(i) is paid as a condition of accepting payment of the maintenance fee. If the Commissioner accepts payment of the maintenance fee upon petition, the patent shall be considered as not having expired, but will be subject to the conditions set forth in 35 U.S.C. 41(c)(2).

(b) Any petition to accept an unavoidably delayed payment of a maintenance fee filed under paragraph (a) of this section must include:

- (1) The required maintenance fee set forth in § 1.20 (e)-(g);
- (2) The surcharge set forth in § 1.20(i)(1); and
- (3) A showing that the delay was unavoidable since reasonable care was taken to ensure that the maintenance fee would be paid timely. The showing must enumerate the steps taken to ensure timely payment of the maintenance fee.

(c) Any petition to accept an unintentionally delayed payment of a maintenance fee filed under paragraph (a) of this section must be filed within twenty-four months after the six-month grace period provided in § 1.362(e) and must include:

- (1) The required maintenance fee set forth in § 1.20(e)-(g);
- (2) The surcharge set forth in § 1.20(i)(2); and
- (3) A statement that the delay in payment of the maintenance fee was unintentional.

\*\*\*\*\*

Nov. 23, 1992

DOUGLAS B. COMER  
Acting Assistant Secretary  
and Acting Commissioner  
Patents and Trademarks

## (64) Withdrawing the Holding of Abandonment When Office Actions Are Not Received

The purpose of this notice is to announce a practice that will minimize costs and burdens to the practitioner and the Office when an application has become abandoned due to a failure to receive an Office action.

A petition to withdraw the holding of abandonment in accordance with *Delgar Inc. v. Schuyler*, 172 USPQ 513 (D.D.C.



1971) is burdensome to the practitioner since the practitioner must overcome a strong presumption that an Office action duly addressed and indicated as mailed was timely delivered to the addressee. To overcome this presumption, a practitioner is currently required to submit a persuasive showing that would permit the Office to conclude that the Office action was not received. Accordingly, evidence which is typically required includes: copies of records which would disclose the receipt of other correspondence mailed from the Patent and Trademark Office on or about the mail date of the non-received Office action, but fail to disclose receipt of the Office action mailed that date; copies of records on which the Office action would have been entered had it been received (e.g., a copy of the outside of the file jacket maintained by the practitioner); and verified statements from persons who would have handled the Office action (e.g., mail clerks, docket clerks, secretary, etc.).

In order to minimize costs and burdens to the practitioner and the Office when an application has become abandoned due to a failure to receive an Office action, the Office is modifying the showing required to make a petition to withdraw the holding of abandonment grantable. The showing required to establish the failure to receive an Office action must consist of a statement from the practitioner stating that the Office action was not received by the practitioner and attesting to the fact that a search of the file jacket and docket records indicates that the Office action was not received. A copy of the docket record where the non-received Office action would have been entered had it been received and docketed must be attached to and referenced in practitioner's statement.

The showing outlined above may not be sufficient if there are circumstances that point to a conclusion that the Office action may have been lost after receipt rather than a conclusion that the Office action was lost in the mail, e.g., if the practitioner has a history of not receiving Office actions. Two additional procedures are available for reviving an application that has become abandoned due to a failure to respond to an Office Action: (1) a petition based on unintentional abandonment or delay; and (2) a petition based on unavoidable delay. See Manual of Patent Examining Procedure § 711.03(c).

Oct. 25, 1993

CHARLES E. VAN HORN  
Patent Policy and Projects Administrator  
Office of the Assistant Commissioner  
for Patents

[1156 OG 53]

## (65) Viewing of Video Tapes During Interviews

The Patent and Trademark Office has video tape equipment available in the facilities of the Patent Academy for viewing video tapes from applicants during interviews with patent examiners.

The video tape equipment may use VHS and UHS (3/4 inch tape) cassettes.

Attorneys or applicants wishing to show a video tape during an examiner interview must be able to demonstrate that the content of the video tape has a bearing on an outstanding issue in the application and its viewing will advance the prosecution of the application. Prior approval of viewing of a video tape during an interview must be granted by the SPE. Also, use of the room and equipment must be granted by the Training Manager to avoid any conflict with the Patent Academy.

Requests to use video tape viewing equipment for an interview should be made at least one week in advance to allow the Patent Academy staff sufficient time to ensure the availability and proper scheduling of both a room and equipment.

Interviews using Office video tape equipment will be held only in the Academy facilities located in One Crystal Park, Rm. 502. Attorneys or applicants should not contact the Patent Academy directly regarding availability and scheduling of video equipment. All scheduling of rooms and equipment

should be done through and by the examiner conducting the interview.

May 6, 1986

RENE D. TEGTMEYER  
Assistant Commissioner  
for Patents

[1067 OG 4]

## (66) Procedures for Restarting Response Periods

The purpose of this notice is to announce revised procedures for restarting response periods set in patent related matters. Occasionally, mail from the Patent and Trademark Office (PTO) is received late at the correspondence address or the mail is delayed in leaving the PTO.

The following revised procedures are effective immediately and will be followed in processing a petition to reset a period for response due to late receipt of a PTO action or due to a postmark date which is later than the mail date printed on a PTO action. The authority to decide such petitions is delegated to the Group Director, where the PTO action involved in the petition was mailed by a patent examining group.

## Petition to reset a period for response due to late receipt of a PTO action

The PTO will grant a petition to restart the previously set period for response to a PTO action to run from the date of receipt of the PTO action at the correspondence address when the following criteria are met: (1) the petition is filed within two weeks of the date of receipt of the PTO action at the correspondence address; (2) a substantial portion of the set response period had elapsed on the date of receipt (e.g., at least one month of a two or three month response period had elapsed); and (3) the petition includes (a) evidence showing the date of receipt of the PTO action at the correspondence address (e.g., a copy of the PTO action having the date of receipt of the PTO action at the correspondence address stamped thereon, a copy of the envelope (which contained the PTO action) having the date of receipt of the PTO action at the correspondence address stamped thereon, etc.), and (b) a statement (verified if made by other than a registered practitioner) setting forth the date of receipt of the PTO action at the correspondence address and explaining how the evidence being presented establishes the date of receipt of the PTO action at the correspondence address.

There is no statutory requirement that a shortened statutory period of longer than thirty days to respond to a PTO action be reset due to delay in the mail or in the PTO. However, when a substantial portion of the set response period had elapsed on the date of receipt at the correspondence address (e.g., at least one month of a two or three month response period had elapsed), the procedures set forth above for late receipt of a PTO action are available. Where a PTO action was received with less than two months remaining in a shortened statutory period of three months, the period may be restarted from the date of receipt. Where the period remaining is between two and three months, the period will be reset only in extraordinary situations—e.g., complex PTO action suggesting submission of comparative data.

## Petitions to reset a period for response due to a postmark date later than the mail date printed on a PTO action

The PTO will grant a petition to restart the previously set period for response to a PTO action to run from the postmark date shown on the PTO mailing envelope which contained the PTO action when the following criteria are met: (1) the petition is filed within two weeks of the date of receipt of the PTO action at the correspondence address; (2) the response period was for payment of the issue fee<sup>1</sup>; or the response period set was one

<sup>1</sup>35 USC 151 permits payment of the issue fee within three months of the date that the Notice of Allowance is mailed to the applicant.

month or thirty days<sup>2</sup>; and (3) the petition includes (a) evidence showing the date of receipt of the PTO action at the correspondence address (e.g., a copy of the PTO action having the date of receipt of the PTO action at the correspondence address stamped thereon, etc.), (b) a copy of the envelope which contained the PTO action showing the postmark date, and (c) a statement (verified if made by other than a registered practitioner) setting forth the date of receipt of the PTO action at the correspondence address and stating that the PTO action was received in the post-marked envelope.

The provision of 37 CFR 1.8 and 1.10 apply to the filing of the above-noted petitions with regard to the requirement that the petition be filed within two weeks of the date of receipt of the PTO action.

The showings outlined above may not be sufficient if there are circumstances that point to a conclusion that the PTO action may have been delayed after receipt rather than a conclusion that the PTO action was delayed in the mail or in the PTO.

February 3, 1994

CHARLES E. VAN HORN  
Patent Policy and Projects Administrator  
Office of the Assistant Commissioner for Patents

[1160 OG 14]

(67)

Patent and Trademark Office  
37 CFR Parts 1 and 10  
[Docket No. 910764-1306]  
RIN: 0651-AA27

## Duty of Disclosure

Agency: Patent and Trademark Office, Commerce  
Action: Notice of final rulemaking.

Summary: The Patent and Trademark Office (Office) is amending the rules of practice in patent cases to (1) clarify the duty of disclosure for information required to be submitted to the Office; (2) provide flexible time limits for submitting information disclosure statements including the requirement for a fee in certain cases; (3) eliminate consideration of duty of disclosure issues by the Office except in disciplinary and interference proceedings, and under other limited circumstances; and (4) eliminate the striking of patent applications which are improperly executed. The Office further is amending the Patent and Trademark Office Code of Professional Responsibility to define as misconduct a failure to comply with the rules on duty of disclosure. The rules as adopted strike a balance between the need of the Office to obtain and consider all known relevant information pertaining to patentability before a patent is granted and the desire to avoid or minimize unnecessary complications in the enforcement of patents.

Effective Date: March 16, 1992. These rules will be applicable to all applications and reexamination proceedings pending or filed after the effective date.

For Further Information Contact: By telephone Charles E. Van Horn (703-305-9054) or J. Michael Thesz (703-305-9384) or by mail addressed to Commissioner of Patents and Trademarks, Washington, D.C. 20231, and marked to the attention of Charles E. Van Horn (Crystal Park 2 - Room 919).

Supplementary Information: A notice of proposed rulemaking on duty of disclosure and practitioner misconduct published in the Federal Register at 54 FR 11334 (March 17, 1989), and in the Patent and Trademark Office Official Gazette at 1101 Off. Gaz. Pat. Off. 12 (April 4, 1989), was withdrawn. On August 6, 1991, the Office published in the Federal Register a notice of proposed rulemaking relating to duty of disclosure. 56 FR 37321 The notice was also published in the Official Gazette. 1129 Off. Gaz. Pat. Off. 52 (August 27, 1991). Sixty written comments were received in response to the notice of proposed rulemaking. A public hearing was held on October 8, 1991. Eleven individuals offered oral comments at the hearing. The sixty written comments and a copy of the transcript of the

<sup>2</sup>35 USC 133 does not permit a response period to be less than thirty days from the date the PTO action is given or mailed to the applicant.

hearing are available for public inspection in the Office of the Assistant Commissioner for Patents, Room 919, Crystal Park II, 2121 Crystal Drive, Arlington, VA.

Familiarity with the notice of proposed rulemaking is assumed. Changes in the text of the rules published for comment in the notice of proposed rulemaking are discussed. Comments received in writing and at the public hearing in response to the notice of proposed rulemaking are discussed.

The rules as adopted shall take effect as to all applications and reexamination proceedings either pending or filed on or after the effective date of these rules. Thus, any information disclosure statement that is filed on or after that date must comply with the provisions of §§ 1.97 and 1.98 to be entitled to consideration.

Changes in Text: The final rules contain several changes to the text of the rules as proposed for comment. Those changes are discussed below.

Section 1.17(i)(1) has been changed from the proposed text to reflect the recent increase in the amount of the fee for filing a petition from \$120.00 to \$130.00.

Section 1.56(a) has been clarified to indicate that the duty of an individual to disclose information is based on the knowledge of that individual that the information is material to patentability. A sentence has been added to § 1.56(a) to express the principle that the Office does not condone the granting of a patent on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. In addition, § 1.56(a) as proposed has been changed to indicate that if all information material to patentability of any claim issued in a patent is cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98, the Office will consider as satisfied the duty to disclose to the Office all information known to be material to patentability, as contrasted to the broader duty of candor and good faith. This rule does not attempt to define the spectrum of conduct that would lack the candor and good faith in dealing with the Office which is expected of individuals who are associated with the filing or prosecution of a patent application.

In § 1.56(b), the phrase "or being made of record" has been inserted to make it clear that information is not material to patentability within the meaning of § 1.56 if it is cumulative to either information already of record in the application or contemporaneously being made of record by applicant. For example, there would be no benefit to the Office for applicant to submit to the Office 10 different documents having the same teaching simply because the information was not cumulative to the information already of record.

The term "creates" has been replaced by the term "establishes" in § 1.56(b)(1). In addition, the definition of a prima facie case of unpatentability, as set out in the preamble of the notice of proposed rulemaking, has been incorporated into the rule itself. A prima facie case of unpatentability of a claim is established when the information compels a conclusion that the claim is unpatentable

- (1) under the preponderance of evidence, burden-of-proof standard,
- (2) giving each term in the claim its broadest reasonable construction consistent with the specification, and
- (3) before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

This prima facie standard conforms to the standard used by an examiner to determine whether a claim is prima facie unpatentable.

Section 1.56(b)(2) has been modified from the text of the proposed rule. The focus of this paragraph has been changed so that it now relates to information which either refutes, or is inconsistent with, a position that applicant takes in either (1) opposing an argument of unpatentability relied on by the Office, or

(2) asserting an argument of patentability. The change from the proposed rule makes clear that information is material when it either refutes, or is inconsistent with, a position taken by applicant before the Office.

Section 1.97(e) has been changed from the proposed text to make it clear that a certification could contain either of two statements. One statement is that each item of information in



an information disclosure statement was cited in a search report from a patent office outside the U.S. not more than three months prior to the filing date of the statement. Under this certification, it would not matter whether any individual with a duty actually knew about any of the information cited before receiving the search report. In the alternative, the certification could state that no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application or, to the knowledge of the person signing the certification after making reasonable inquiry, was known to any individual having a duty to disclose more than three months prior to the filing of the statement.

The changes to the text of § 1.97(e) as proposed place the appropriate priority on getting relevant information to the Office promptly, with minimum burden to applicant. The text of the proposal has also been changed by adding the phrase "after making reasonable inquiry" to make it clear that the individual making the certification has a duty to make reasonable inquiry regarding the facts that are being certified. For example, if an inventor gave a publication to the practitioner prosecuting an application with the intent that it be cited to the Office, the practitioner should inquire as to when that inventor became aware of the publication before submitting a certification under § 1.97(e)(ii) to the Office.

A new paragraph (h) has been added to the text of proposed § 1.97. The purpose of new paragraph (h) is to ensure that no one could construe the mere filing of an information disclosure statement as an admission that the information cited in the statement is, or is considered to be, material to patentability as defined in § 1.56(b). It is in the best interest of the Office and the public to permit and encourage individuals to cite information to the Office without fear of making an admission against interest.

In § 1.98(a)(2)(iii), the wording has been changed to make it clear that the requirement to submit a copy of each item of information listed in an information disclosure statement does not apply to the citation of a U.S. patent application.

The requirement in proposed § 1.98(a)(3) for a concise explanation of the relevance of each item of information has been substantially changed by limiting the requirement in two significant ways. First, as adopted, the requirement is limited to information that is not in the English language. Second, the explanation required is limited to the relevance as understood by the individual designated in § 1.56(c) most knowledgeable about the content of the information at the time the information is submitted to the Office. Where the information listed is not in the English language, but was cited in a search report by a foreign patent office, the requirement for a concise explanation of relevance is satisfied by submitting an English language version of the search report.

In § 1.98(d), the proposed text has been changed by adding the phrase "cited by or" to make it clear that legible copies of information listed in an information disclosure statement need not be submitted in a continuing application provided the information was either cited by or submitted to the Office in a prior application. A distinction between information cited by the Office or supplied by applicant to the Office serves no useful purpose in this situation.

The text of proposed § 1.555 has been modified to limit the definition of information material to patentability in a reexamination proceeding to the types of information that an examiner could use in a reexamination proceeding to determine whether a claim was patentable, and to adopt other changes that parallel changes made in § 1.56. Proposed § 1.555(a) has been divided into two paragraphs. Paragraph (a), as adopted, substantially parallels the text of § 1.56(a) as adopted. It indicates that the duty to disclose information to the Office in a reexamination proceeding is a part of the duty of candor and good faith that is owed to the Office by individuals transacting business with the Office. It further states one way that an individual may discharge the duty to disclose information material to patentability in a reexamination proceeding - i.e., by filing an information disclosure statement with the items listed in § 1.98(a) as applied to individuals associated with the patent owner in a reexamination proceeding. Finally, the text of the rule has been changed to add a sentence that expresses the principle that a patent should not be granted on an application in connection with which fraud was practiced or attempted on the Office or

there was any violation of the duty of disclosure through bad faith or intentional misconduct.

New paragraph (b) of § 1.555 has been adopted to define information material to patentability in a reexamination proceeding. Much like the definition in § 1.56(b), information is not material when it is cumulative to information of record or being made of record in the reexamination proceeding. Information is considered material when it satisfies either or both of the definitions in § 1.555(b). Under § 1.555(b)(1), information is material when it is a patent or printed publication that establishes, by itself or in combination with other patents or printed publications, a prima facie case of unpatentability of a claim. This definition is limited to patents or printed publications because a reexamination proceeding must be based on patents or printed publications. 35 U.S.C. 302.

The definition of a prima facie case of unpatentability of a claim pending in a reexamination proceeding has been provided in the rule. A prima facie case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the same principles that are applicable during ex parte examination of a patent application; namely

- (1) under the preponderance of evidence, burden-of-proof standard,
- (2) giving each term in the claim its broadest reasonable construction consistent with the specification, and
- (3) before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

Finally, the definition of information material to patentability in § 1.555(b)(2) has been added to parallel the provision in § 1.56(b)(2).

After reviewing the Office policy on whether to consider duty of disclosure and other inequitable conduct issues in interference proceedings under 35 U.S.C. 135(a), including comments from the public directed to the statement in the notice of proposed rulemaking that the Office will not consider, evaluate, or decide fraud or other inequitable conduct issues during an interference proceeding, a new Office policy has been adopted. Effective October 24, 1991, fraud and inequitable conduct issues will be considered when properly raised inter partes in patent interference cases. 1132 Off. Gaz. Pat. Off. 33 (November 19, 1991). In addition, the Chairman of the Board of Patent Appeals and Interferences has issued a notice that provides guidance on how an issue of fraud or other inequitable conduct can be raised in an interference proceeding. 1133 Off. Gaz. Pat. Off. 21 (December 10, 1991).

**Response to and Analysis of Comments:** Sixty (60) written comments were received in response to the notice of proposed rulemaking. These comments, along with those made at the public hearing, have been analyzed. Some suggestions made in the comments have been adopted and others have been rejected. Responses to the comments follow.

**Comment 1.** Nine comments indicated that the Office should not amend § 1.56 since it is presently in conformance to the materiality standard being applied by the Court of Appeals for the Federal Circuit. One comment questioned what practical value of the proposed rule would justify the burden of the change.

**Reply:** The amendment to § 1.56 was proposed to address criticism concerning a perceived lack of certainty in the materiality standard. The rule as promulgated will provide greater clarity and hopefully minimize the burden of litigation on the question of inequitable conduct before the Office, while providing the Office with the information necessary for effective and efficient examination of patent applications.

**Comment 2.** One comment stated that the present rules should be maintained and strengthened since the public interest is hurt more by an unjustly issued patent than by an unjustly denied patent. Another comment disagreed and argued that an unjustly denied patent can do great harm to society.

**Reply:** The Office strives to issue valid patents. The Office has both an obligation not to unjustly issue patents and an obligation not to unjustly deny patents. Innovation and technological advancement are best served when an inventor is issued a patent with the scope of protection that is deserved. The rules as adopted serve to remind individuals associated with the preparation and prosecution of patent applications of their duty of candor and good faith in their dealings with the Office, and will aid the Office in receiving, in a timely manner, the information it

needs to carry out effective and efficient examination of patent applications.

**Comment 3.** Two comments stated that the rule should not permit applicants to draft claims and a specification to avoid a prima facie case of obviousness over a reference and then to be able to withhold the reference from the examiner.

**Reply:** The comments reflect a correct reading of the rule in that information is not material unless it comes within the definition of § 1.56(b)(1) or (2). If information is not material, there is no duty to disclose the information to the Office. The Office believes that most applicants will wish to submit the information, however, even though they may not be required to do so, to strengthen the patent and avoid the risks of an incorrect judgment on their part on materiality or that it may be held that there was an intent to deceive the Office.

**Comment 4.** One comment stated that promulgation of the proposed rule would result in a significant decrease in the quantity of art cited to the Office because there will be no duty to cite art relevant to a pending claim.

**Reply:** The Office does not anticipate any significant change in the quantity of information cited to the Office after promulgation of amended § 1.56. Presumably, applicants will continue to submit information for consideration by the Office in applications rather than making and relying on their own determinations of materiality. An incentive remains to submit the information to the Office because it will result in a strengthened patent and will avoid later questions of materiality and intent to deceive. In addition, the new rules will actually facilitate the filing of information since the burden of submitting information to the Office has been reduced by eliminating, in most cases, the requirement for a concise statement of the relevance of each item of information listed in an information disclosure statement.

**Comment 5.** Several comments stated that an objective "but for" standard would be preferable to the proposed rule. The objective "but for" standard would presumably consider information as a court does in an infringement proceeding with a clear and convincing, burden-of-proof standard, giving the terms in each claim a narrow construction where necessary to uphold validity.

**Reply:** The Office believes that amended § 1.56 will provide a reasonable balance between the needs of applicants and of the Office. The suggested "but for" standard would not cause the Office to obtain the information it needs to evaluate patentability so that its decisions may be presumed correct by the courts. If the Office does not have needed information, meaningful examination of patent applications will take place for the first time in an infringement case before a district court. Courts will become increasingly less confident of the Office's product if they get the impression that practitioners and inventors can routinely withhold information from the Office, or that practitioners and inventors can make up their own minds about what is patentable. The Office should decide, in the first instance, what is patentable and any decision should be made with the best information available, including that known by the applicant. The Office notes that the House of Delegates of the American Bar Association twice, once in 1990 and again in 1991, refused to adopt a resolution favoring adoption of the "but for" standard.

**Comment 6.** One comment argued that proposed § 1.56 does not relate to "the conduct of proceedings in the Patent and Trademark Office" (35 U.S.C. 6(a)) since the Office does not intend to reject applications as indicated by the cancellation of paragraphs (c) through (i) of current § 1.56.

**Reply:** The amendment to § 1.56 comes within the authority of the Commissioner for establishing regulations. *Norton v. Curtiss*, 433 F.2d 779, 167 USPQ 532 (CCPA 1970). The Office has reserved its inherent authority to reject an application under appropriate circumstances where fraud or other inequitable conduct has occurred. Also, the Office will consider fraud and inequitable conduct when properly raised in interference proceedings under 35 U.S.C. 135(a). The Office will also consider fraud and inequitable conduct in connection with attorney conduct under § 10.23(c).

**Comment 7.** One comment stated that § 1.56 should require only anticipatory art to be submitted during examination of an application, with a procedure such as reexamination being used after discovery in any litigation on the patent has revealed all available art.

**Reply:** An application is examined under all appropriate sections of Title 35, United States Code, and a presumption of validity attaches to a patent with regard to all aspects of patentability, including anticipation. 35 U.S.C. 282. Therefore, § 1.56 should address more than just the submission of anticipatory information, including information relevant to patentability under 35 U.S.C. 103 and 35 U.S.C. 112.

**Comment 8.** One comment suggested that proposed § 1.56 has some dangerous implications since courts are going to find violations of the duty of disclosure if §§ 1.97 and 1.98 are not complied with completely.

**Reply:** Section 1.56 provides that the duty of disclosure can be met by submitting information to the Office in the manner prescribed by §§ 1.97 and 1.98. Sections 1.97 and 1.98 are being amended so that information will be submitted to the Office in the manner and at the time which will facilitate consideration by the examiner. Applicants are provided certainty as to when information will be considered, and applicants will be informed when information is not considered. The Office does not believe that courts should, or will, find violations of the duty of disclosure because of unintentional non-compliance with §§ 1.97 and 1.98. If the non-compliance is intentional, however, the applicant will have assumed the risk that the failure to submit the information in a manner that will result in its being considered by the examiner may be held to be a violation.

**Comment 9.** Two comments stated that the Office should not delete the offense of attempted fraud from the § 1.56. The comments stated that elimination of the reference to "gross negligence" in current § 1.56 would be sufficient to protect the practitioner who delays submission of information with no intent to deceive the Office. One of the comments stated that the disciplinary rules alone are not sufficient to deter attempted fraud or inequitable conduct.

**Reply:** The language of §§ 1.56(a) and 1.555(a) has been modified to retain the provisions of prior § 1.56(d) to indicate that the Office does not condone fraud, attempted fraud, or violation of the duty of disclosure through bad faith or intentional misconduct.

**Comment 10.** One comment stated that the appropriate standards for the duty of candor are analogous to fiduciary law which requires the fiduciary to disclose not only known facts, but also facts which it should have known, i.e., a negligence standard. The comment argued that it was undesirable to measure duty of candor or fraud by a reduced measure of "intent" instead of an objective negligence standard since the Office is not bound by the U.S. Court of Appeals for the Federal Circuit decision in *Kingsdown Medical Consultants, Ltd. v. Hollister, Inc.*, 863 F.2d 867, 9 USPQ2d 1384 (Fed. Cir. 1988) (*en banc*), *cert. denied*, 490 U.S. 1067 (1989), and since the proposed standard is no more objective than alternative standards but is simply narrower and more certain. Another comment suggested that the Office should indicate that there is no intention to change the *Kingsdown* ruling.

**Reply:** Section 1.56 has been amended to present a clearer and more objective definition of what information the Office considers material to patentability. The rules do not define fraud or inequitable conduct which have elements both of materiality and of intent. The Office does not advocate any change to the *Kingsdown* ruling.

**Comment 11.** Two comments stated that the proposed modification of § 1.56 would make submission of information to the Office an implied admission of the prima facie unpatentability of a claim. Several comments suggested that a sentence should be added to proposed § 1.56 to specify that submission of information to the Office under this section shall not be deemed to be an admission or representation that the information is material to patentability.

**Reply:** The suggestions in the comments have been adopted by modifying § 1.97 which deals with submission of information to the Office. Paragraph (h) of § 1.97 now provides that the filing of an information disclosure statement shall not be considered to be an admission that the information cited in the statement is, or is to be considered to be, material to patentability as defined in § 1.56.

**Comment 12.** One comment stated that the proposed § 1.56 definition would be difficult to apply in litigation in which a different burden-of-proof standard is applied.

**Reply:** The definition of information material to patentability



includes standards which are familiar to the Federal courts and which are capable of being handled like other issues.

**Comment 13.** One comment suggested that the last sentence of proposed § 1.56(a), in which the Office encourages applicants to carefully examine prior art cited in foreign search reports and the closest known information, be removed from the rule and be placed in the preamble discussion so as to avoid the interpretation that the sentence creates a duty for applicants.

**Reply:** The suggestion is not adopted. The sentence does not create any new duty for applicants, but is placed in the text of the rule as helpful guidance to individuals who file and prosecute patent applications.

**Comment 14.** Three comments stated that the language of proposed § 1.56(a) required revision to remove all statements or suggestions which might allow a court to consider a pending (i.e., unissued) claim for the purpose of determining whether the duty of disclosure requirement was met in view of the fact that the proposed rule was intended to indicate that there is no duty to disclose information which is material to a pending claim unless that claim ultimately issues in a patent. One comment argued that a court might interpret "the duty of candor and good faith" to be broader than the particular duty of disclosure specified in other portions of the proposed rule.

**Reply:** The language of §§ 1.56 and 1.555 has been modified to emphasize that there is a duty of candor and good faith which is broader than the duty to disclose material information. Section 1.56 further states that "no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct."

**Comment 15.** One comment suggested that proposed § 1.56(a) be modified to clarify that both information and its materiality must be known before there is a duty to disclose the information.

**Reply:** The Office considers the language of § 1.56(a) to be sufficiently clear in referring to a "duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section." If information is known to be material, it inherently must be known. Likewise, if information is not known to an individual, there is no duty to disclose the information whether it is material or not.

**Comment 16.** One comment stated that it should be made clear that "known" is limited to contemporaneous knowledge since a practitioner may have known something ten years ago but may not remember it presently.

**Reply:** Section 1.56 states that each individual associated with the filing and prosecution of a patent application has a duty to disclose all information known to that individual to be material to patentability as defined in the section. Thus, the duty applies to contemporaneously or presently known information. The fact that information was known years ago does not mean that it was recognized that the information is material to the present application.

**Comment 17.** One comment suggested that proposed § 1.56(a) be modified to state that the duty of disclosure ends when an application becomes abandoned or allowed.

**Reply:** Paragraph (a) of § 1.56 states that the duty to disclose information exists until the application becomes abandoned. The duty to disclose information, however, does not end when an application becomes allowed but extends until a patent is granted on that application. The rules provide for information being considered after a notice of allowance is mailed and before the issue fee is paid (§ 1.97(d)) and for an application to be withdrawn from issue after the issue fee has been paid. An application may be withdrawn from issue because one or more claims are unpatentable (§ 1.313(b)(3)) or an application may be withdrawn from issue and abandoned so that information may be considered in a continuing application before a patent issues (§ 1.313(b)(5)).

**Comment 18.** Three comments stated that the first two sentences of proposed § 1.56(a) should be deleted since rules should simply instruct practitioners what to do without discussion of why they should do it or the philosophy involved.

**Reply:** The suggestion has not been adopted since the sentences aid in the understanding of the rule and will provide those involved in enforcing patents with an indication of the policy on which the rule is based.

**Comment 19.** One comment stated that §§ 1.56(a)(2) and (c) should be modified to refer to "individuals substantively associated with" the filing or prosecution of the patent application.

**Reply:** The suggestion is not adopted since the proposed rule language is clear and the suggested modification would create a redundancy with the language of § 1.56(c)(3). The individuals designated in §§ 1.56(c)(1) and (2) as being associated with the filing or prosecution of a patent application within the meaning of the section are inherently substantively involved in the preparation or prosecution of the application.

**Comment 20.** One comment stated that proposed § 1.56(b) should be modified to clarify that information is not material if it is cumulative to information already of record in an application or to information concurrently being made of record.

**Reply:** The suggestion has been adopted by adding a reference to information being made of record with regard to cumulative information in §§ 1.56(b) and 1.555(b).

**Comment 21.** One comment stated that the preamble discussion (of § 1.56(b)) should indicate that test results in situations such as tests involving biological systems may properly be submitted as averages rather than as individual test runs.

**Reply:** Whether test results can be submitted as averages rather than as individual test runs depends on whether doing so would provide to the Office the information needed to make a proper determination on patentability. If the actual results are provided, the examiner can make an independent determination on whether some rejection is appropriate. In some cases providing averages might be misleading, but in other cases providing averages might be appropriate.

**Comment 22.** One comment stated that the definition of materiality in proposed § 1.56(b) imposes substantial new burdens on applicants who would be required to disclose failed experiments, papers published less than one year prior to filing and experimental public uses even if they clearly are refutable and will not affect patentability. One comment stated that the proposed rule would require applicants to incur added expense for affidavits and comparison tests. Five comments stated that the Office should not require applicants to present results from clearly invalid tests since this would be contrary to usual scientific practice. One comment argued that information should not be required to be submitted if there was no doubt that it would not preclude patentability, e.g., where common ownership existed so that the exception of 35 U.S.C. 103, second paragraph, would apply.

**Reply:** The definition of materiality in § 1.56 does not impose substantial new burdens on applicants, but is intended to provide the Office with the information it needs to make a proper and independent determination on patentability. It is the patent examiner who should make the determination after considering all the facts involved in the particular case. The comments reflect that the Office objective of clarifying what information the Office considers to be material has been accomplished by the amendment of the rules.

**Comment 23.** One comment suggested that § 1.56 should confine the duty of disclosure to references known to applicant or the practitioner representing applicant and not found in prior art materials in the Office.

**Reply:** This suggestion is not adopted since information may be in the Office but not in the application file. It is not reasonable to assume that an examiner knows of a particular item of information or appreciates its relevance to a particular invention simply because it exists somewhere in the Office.

**Comment 24.** One comment stated that the language "or in combination with other information" should be removed from proposed § 1.56(b)(1) because it was unworkable to require an applicant to combine references against its own claims, especially since, according to the commentator, examiners and the Board of Patent Appeals and Interferences frequently misapply the law. Another comment stated that the language creates an open field for litigators to claim that an inordinate number of references could be combined.

**Reply:** The rule does not require an applicant to combine references against its own claims. The applicant can submit information to the Office for the examiner's consideration whether the information is considered material or not. The fact that the teachings of a large number of references must be combined for a prima facie case of obviousness does not by itself weigh against a holding of obviousness. See *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991).

**Comment 25.** Four comments stated that the definition of "prima facie case of unpatentability" § 1.56(b)(1) should be included in the rule itself. One comment said that the definition should

not be included in the rule.

**Reply:** The definition has been included in the rule for clarity.

**Comment 26.** One comment stated that the proposed § 1.56(b)(1) placed a burden on the practitioner to analyze references that is inappropriate and contradictory to a practitioner's responsibility to his client.

**Reply:** The rule itself does not place a burden on the practitioner to analyze references. Information can be submitted to the Office in accordance with §§ 1.97 and 1.98, and the examiner will consider the references.

**Comment 27.** One comment questioned whether an applicant would be charged with withholding material information if the "other information" (§ 1.56(b)(1)) necessary to cause an undisclosed reference to become material is unknown to the applicant. Another comment suggested that the language should be changed to read "other known information" to show that the information must be known to applicant to give rise to a duty of disclosure.

**Reply:** Paragraph (b) of § 1.56 defines information material to patentability. While information may be material under the definition, there is no duty on an individual to disclose the information if the information is unknown to the individual (§ 1.56(a)).

**Comment 28.** One comment suggested that defining materiality in § 1.56(b) in terms of prima facie unpatentability would permit a conspiracy of silence in which (1) the applicant knows of information but is incapable of making the legal analysis to determine whether the information is material and (2) the patent practitioner, who is equipped to determine whether information is material, does not know of the information and does not ask. Thus, it is argued there would be no violation of the duty of disclosure which requires knowledge of both information and its materiality.

**Reply:** The Office has set forth what information should be submitted so that the Office can make a proper determination on patentability. The term "conspiracy" has the connotation of unlawfulness which would not be consistent with the duty of candor and good faith required in dealings with the Office.

**Comment 29.** One comment suggested that proposed § 1.56(b)(1) should be revised to read "in combination with other information already of record in the application" to avoid the possibility that undisclosed material could be considered material in subsequent litigation when combined with information not known at the time of the prosecution to any person substantively involved in the preparation or prosecution of the application.

**Reply:** Paragraph (a) of § 1.56 makes it clear that the Office recognizes that the duty to disclose material information is limited to such information which is known by an individual substantively involved in the preparation or prosecution of the application. Thus, while information may be material under the definition of § 1.56(b)(1), there can be no duty to disclose the information if it is material only in combination with unknown information.

**Comment 30.** One comment stated that proposed § 1.56(b) should be modified so that paragraph (b)(1) refers to information that renders a claim unpatentable ("but for"), paragraph (b)(2) remains as proposed, and a paragraph (b)(3) is added to include the definition of materiality as "the closest information over which any pending claim patentably defines." This comment suggested that this modified definition would have the advantage of not requiring the applicant to submit references which applicant knows are immaterial and to then engage in "straw man" arguments based on such references.

**Reply:** The suggested modification to § 1.56 has not been adopted. The suggested language would seemingly require information to be filed in each application, whether the information is relevant or not, since the "closest information" would be required. Section 1.56 does not require information which is not relevant to be submitted, but only information which meets the definition of material as set out in the rule.

**Comment 31.** One comment stated that if proposed § 1.56(b)(1) is promulgated, there would be no need for proposed § 1.56(b)(2) with regard to information which would make a prima facie case of unpatentability and other information required by paragraph (b)(2) might be obscure. Another comment argued that paragraph (b)(2) was unnecessary, confusing and ambiguous and suggested changes in the language to make the requirement clear and less ambiguous.

**Reply:** The suggestion as to the language change to § 1.56(b)(2) has been adopted. The final rule language avoids the perceived problem of requiring an applicant to submit information supporting a position taken by the examiner. It is not appropriate, however, to eliminate paragraph (b)(2) because it is an essential part of the definition of information material to patentability and will help to ensure that all material facts are brought to the attention of the examiner during the examination process.

**Comment 32.** One comment questioned the language of proposed § 1.56(b)(2) as to how an applicant could consider a prior art reference as supporting a position of unpatentability taken by the Office while at the same time disputing that interpretation.

**Reply:** The language of § 1.56(b)(2) has been modified to clarify that information is material to patentability if it refutes, or is inconsistent with, a position the applicant takes in (1) opposing an argument of unpatentability relied on by the Office, or (2) asserting an argument of patentability.

**Comment 33.** One comment stated that § 1.56(b)(2) was flawed in requiring a duty to conduct a file search to make sure that no information exists which even arguably contradicts a position taken or to be taken in response to the examiner, or which supports the examiner's position which may be improper.

**Reply:** Section 1.56(b)(2) does not require a search of files. Under § 1.56(a), the duty of disclosure is confined to that information which is known to an individual to be material as defined in paragraph (b).

**Comment 34.** One comment stated that proposed § 1.56(c) should be modified so that the duty of any individual designated as having a duty of disclosure would terminate when such individual ceases to be substantively involved in the preparation or prosecution of the application. The comment used, as an example, an inventor who would not be aware of art cited by the examiner which would cause information known to the inventor to fall within the definition of materiality for the first time.

**Reply:** The suggestion in the comment is not adopted. The duty to disclose information material to patentability rests on the individuals designated in § 1.56(c) until the application issues as a patent or becomes abandoned. Paragraph (a) of § 1.56 makes it clear, however, that each individual has a duty to disclose only information which is known to that individual to be material.

**Comment 35.** One comment stated that proposed § 1.56(c)(3) should not include the assignee, or anyone to whom there is an obligation to assign the application, in the class of those who have a duty to disclose material information since there might be a "witch hunt" during litigation to find one employee with knowledge of, or possession of, information that should have been disclosed.

**Reply:** No modification to § 1.56(c)(3) is needed since § 1.56 sets forth that only individuals who are associated with the filing and prosecution of a patent application have a duty of candor and good faith, including a duty to disclose to the Office all information known to be material to patentability.

**Comment 36.** One comment stated that proposed § 1.56(d) should be revised to expressly allow an inventor to satisfy the duty by disclosing information to the practitioner who prepares or prosecutes the application so that redundant information disclosure statements will not be required from both the inventor and the attorney or agent.

**Reply:** The suggestion in the comment is not adopted since the duty as described in § 1.56 will be met as long as the information in question was cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98 before issuance of the patent. Statements from both an inventor and the practitioner are not required to be submitted.

**Comment 37.** One comment stated that proposed §§ 1.52(c) and 1.67(c) should be modified to either (1) expressly permit alterations to be made in an application subsequent to the signing of the oath or declaration if a supplemental oath or declaration is later submitted, or (2) more properly, prohibit such alterations since if alterations are desirable, they can be made and the application can be filed with an unsigned oath or declaration. Another comment stated that willfully filling out false oaths should never be condoned.

**Reply:** The Office does not condone willfully filling out false oaths. Further, § 10.23(c)(11) indicates that the Office considers it misconduct for a practitioner to knowingly file or



cause to be filed an application containing a material alteration made after the signing of an accompanying oath or declaration without identifying the alteration. The Office will not consider striking an application in which an alteration was made, but a supplemental oath or declaration is required to be filed in an application containing alterations made after the signing of the oath or declaration.

**Comment 38.** One comment stated that the implementation of proposed §§ 1.63(b)(3) and 1.175(a)(7) allows for a two-month delay in the deadline for requiring declarations complying therewith.

**Reply:** The averments in oath or declaration forms presently in use that comply with the previous § 1.63 or § 1.175 will also comply with the requirements of the new rules. Therefore, the Office will continue to accept the old oath or declaration forms as complying with the new rules.

**Comment 39.** Five comments questioned the need for the proposed rules since statistics show that information disclosure statements are submitted early in prosecution and questioned what new service is being provided for the proposed fee in § 1.97.

**Reply:** The Office desires to continue to encourage information to be submitted promptly so that it can be considered by the examiner when the first Office action is prepared. Some people have expressed a desire to have the option of waiting to submit information until after the first Office action, without concern that they will be subject to a charge of inequitable conduct. Section 1.97(c), as amended, will provide this option to applicants in that information will be considered later than three months after the filing date of the application (§ 1.97(a) prior to amendment) without a showing of promptness (prior § 1.99). The fee will compensate the Office for the added expense caused by the late submission of the information and will serve as a disincentive to the intentional withholding of information even for a short period of time.

**Comment 40.** Two comments suggested that proposed § 1.97(a) be modified so that the mechanism of proposed § 1.98 would not be the only acceptable technique for submitting information.

**Reply:** The Office has set forth the minimum requirements for information to be considered in §§ 1.97 and 1.98. These rules will provide certainty for the public of exactly what the requirements are, when the Office will consider information and when the Office will not consider information. Thus, applicants are provided with means for complying with the duty of disclosure by following the rules. If information is submitted in a manner so that it is not considered by the Office, applicant will assume the risk that a court might find a violation of the duty of candor and good faith which includes the duty to disclose material information.

**Comment 41.** Four comments suggested that information which is recognized by applicant as being material after the period set in proposed § 1.97(b) as the result of prior art cited by the examiner should be permitted to be submitted to the Office without the fee set forth in 1.17(p), the certification or the petition fee required by § 1.97.

**Reply:** The suggestion in the comments is not adopted since it would require a certification, e.g., why the information was just recognized as being material, and would unduly complicate the rules and the procedures for considering information submitted by applicant. Applicants can avoid or, at least, minimize the problem by submitting information which is known to be relevant to the application even though it is not yet recognized as being required to be submitted because it is material to patentability. The fees charged are to compensate the Office for the additional work that will be necessary when information is submitted during an advanced stage of the examination process.

**Comment 42.** Two comments suggested that the period for submitting information set in proposed § 1.97(b) be changed to be two months from the issuance of the Official Filing Receipt to avoid information disclosure statements being misrouted in the Office.

**Reply:** The suggestion in the comment is not adopted. The date that the Filing Receipt is mailed is not maintained in the application file so there would be administrative difficulty in determining when a fee or certification is required to be filed under the new rule. An application can be filed with a self-addressed return postcard so that applicant can obtain the serial number assigned to the application very soon after filing. Fur-

ther, information may be filed under § 1.97(b) before the mailing of a first Office action on the merits even if this occurs later than three months after the application filing date.

**Comment 43.** One comment questions whether § 1.97(b) or § 1.97(d) applies in the event of issuance of a final rejection within three months of the filing of an application. The comment indicated that paragraph (b) should apply in this situation.

**Reply:** Paragraph (b) would apply in this situation since the paragraph specifies that information may be filed within three months of the filing date of the application or before the mailing date of a first Office action on the merits, whichever event occurs last. Thus, information would be considered pursuant to § 1.97(b) if it was filed within three months of the filing date of the application even if a final rejection was mailed prior to three months from the filing date.

**Comment 44.** One comment stated that proposed § 1.97(b)(1) should be clarified to indicate that "the filing of a national application" includes "a continuing application which replaces the original application."

**Reply:** The suggested modification has not been adopted since it is not necessary for clarity. The term "national application" includes continuing applications in this and the other patent rules. It is not desirable to add the suggested language to all occurrences of the term "application" in the rules or to raise the implication that continuing applications are not included in the term in other rules by adding the suggested language to this rule.

**Comment 45.** One comment stated that proposed § 1.97 should be changed to state that if a responsible party becomes aware of material information less than three months before issuance of an Office action, that information will be considered timely filed if it is submitted together with the response to the action. The comment also stated that the Office could go farther and implement a rule which specifies that such information will be considered timely submitted if it reaches the examiner before the response to the Office action is taken up for consideration. Three other comments stated that the Office should accept information disclosure statements with responses to Office actions, with one comment arguing that there is no benefit in submitting two papers where one would suffice.

**Reply:** The suggestions in the comments are not adopted. The rule as proposed and promulgated has the advantage of being relatively easy to comply with and administer. Information should be submitted promptly so that the examiner will have the option of reviewing the information and withdrawing or revising the Office action. Requiring information to be submitted promptly contributes to the efficiency of the examination process.

**Comment 46.** One comment stated that there should be no fee in § 1.97 associated with the filing of an information disclosure statement since this might impact negatively on the submission of material information; rather, it would be sufficient to permit material information submitted subsequent to a non-final action to support a final rejection in the next action, in the absence of the certification proposed in the rules. Another comment, however, stated that the proposed fee requirement would not be a disincentive to submission of prior art, but would force examiners to consider certain art which under current practice often is not made of record, but instead, requires the filing of a continuation application.

**Reply:** The fee required in the rule will serve both to cover additional expense caused the Office by the late submission of information and will also serve as a disincentive to failing to cooperate in submitting information early in the prosecution of an application rather than as a disincentive to submitting information at all.

**Comment 47.** One comment questioned whether information in an information disclosure statement submitted during the period set forth by proposed § 1.97(c) could be used by an examiner to make the next action final if the statement was submitted with a certification under § 1.97(e).

**Reply:** Information submitted with a certification during the period set forth in § 1.97(c) will not be used to make the next Office action final on unamended claims since in this situation it is clear that applicant has submitted the information to the Office promptly after it has become known and the information is being submitted prior to a final determination on patentability by the Office.

**Comment 48.** One comment stated that it was unfair for the

Office to require a fee for considering information pursuant to proposed § 1.97(c) and then also be able to use the information in making the Office action final.

**Reply:** The policy is not considered to be unfair. If information is submitted during the period set forth in § 1.97(c) without the certification, the fee will compensate the Office for extra work that may be caused by the failure to submit information promptly. If the cost for this extra work were not placed upon the applicant in this situation, the cost would have to be borne by all applicants through payment of higher fees. The possibility that the next Office action may be made final will further encourage prompt disclosure of information to the Office.

**Comment 49.** One comment suggested that information should be considered (§ 1.97(c)) after final rejection, since this is different from after allowance when the Office would have to go back and reconsider its work. Two comments stated that proposed § 1.97(c)(1) should not penalize applicants who receive a foreign search report after a final rejection is made in the application and that the certification under § 1.97(e) should be available until an advisory action after final rejection or a notice of allowability occurs in the application. Another comment stated that final action may not even be on the merits but merely administrative.

**Reply:** The suggestions in the comments are not adopted. Both a notice of allowance and a final rejection represent a final Office decision on patentability. Information considered after either of these actions may require the Office to alter its position. After either of these actions, information will be considered only if it is submitted promptly in accordance with § 1.97(d) or is submitted in a refiled application. It should be noted that information cited in a foreign search report, if cited to the Office within three months of the date on the search report, will be considered by the Office if filed before payment of the issue fee.

**Comment 50.** One comment stated that proposed § 1.97(d) would result in unequal treatment of U.S. inventors who file first in the Office as compared to foreign inventors who file first in a foreign country since the latter will have the results of the search made by the foreign examining country earlier in the pendency of the U.S. application. Six comments suggested that a U.S. inventor should have the ability to make the certification of § 1.97(e) and to have the Office consider the information, regardless of the stage of prosecution at which information from a foreign office is submitted.

**Reply:** It should be noted that the certification of § 1.97(e) can be made and information considered by the Office until the issue fee is paid on the application. After the issue fee has been paid on an application, it is impractical for the Office to attempt to consider newly submitted information. The application may be withdrawn from issue at this point, however, pursuant to § 1.313(b)(5) so that the information can be considered in a continuing application, or pursuant to § 1.313(b)(3) if applicant states that one or more claims are unpatentable over the information that is cited. It is further noted that it is applicants, not the Office, who make decisions on when and in which countries to file an application. U.S. inventors who may desire to seek patent protection in foreign countries have the ability to utilize the provisions of the Patent Cooperation Treaty and to delay the requirement to enter the national stage until after a search report on the invention is made.

**Comment 51.** One comment questioned whether a certification under § 1.97(e) could properly be made in situations where information known by the applicant but not considered material is cited by a foreign patent office more than three months later than the first knowledge by applicant.

**Reply:** The language of § 1.97(e) has been modified to permit a certification to be made in the situation described in the comment. If an item of information is submitted within three months of being cited in a communication from a foreign patent office in a counterpart foreign patent application, the certification can be properly made regardless of any individual's previous knowledge of the information.

**Comment 52.** One comment stated that the three-month time period for submitting information from foreign patent offices under proposed § 1.97(e) might be too short because not all foreign offices provide copies of references and that the Office should provide for a petition in unusual circumstances. Five comments stated that a three-month time limit for filing foreign search reports is not reasonable but rather that six months would

be more reasonable.

**Reply:** The Office has chosen the three month time period as appropriate in view of all the factors involved in obtaining information and in the examination process. It should be noted that Office actions typically set a three-month shortened statutory period for response. A response to an Office action generally requires more time for preparation than is involved in the submitting of a foreign search report and copies of the documents cited.

**Comment 53.** Five comments suggested that § 1.97(e) should permit a certification to be made if an individual knew of information for more than three months before it was filed but did not recognize its materiality or relevance to the application.

**Reply:** The suggestion in the comments is not adopted. The Office desires to encourage prompt evaluation of information as to materiality by applicants and the Office so as to contribute to the efficiency and effectiveness of the examination process. It should be noted that an applicant is not required to delay the submission of information while evaluating materiality, but can submit the information pursuant to §§ 1.97 and 1.98.

**Comment 54.** One comment stated that proposed § 1.97(e) should be clarified to specify that the certificates can be made regardless of the source of the information being submitted, so long as it is disclosed within three months of receipt. One comment stated that the three-month period of proposed § 1.97(e) should be measured from the receipt date of a communication from a foreign patent office.

**Reply:** A certification under § 1.97(e) can be made if each item of information was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to filing the statement. A certification can also be made if no item of information was cited in a communication from a foreign patent office in a counterpart foreign application or was known to any individual designated in § 1.56(c) more than three months prior to filing the information disclosure statement. The Office wishes to encourage prompt evaluation of the relevance of information and to have a date certain for determining if a certification can properly be made. Although it is recognized that an individual actually becomes aware of the information in the communication from a foreign patent office sometime after it was mailed, the mailing date of such a communication, if it occurs prior to a first awareness of the same information, would determine the date for filing of an information disclosure statement without a fee. The Office is willing to absorb any additional cost in considering such information relevant to patentability after the time set in proposed paragraph (b) only when it is clear that an applicant is diligent in providing the information to the Office.

**Comment 55.** One comment stated that the cost of making a certification under § 1.97(e) would be more than the \$200.00 fee proposed where no certification is made due to difficulties in obtaining information from foreign clients. The comment suggested that the rule provide for (1) the opportunity to provide documentation (as opposed to certification) illustrating when the information was received, and (2) the opportunity to submit information with increasing fees depending on when in the periods of § 1.97(c) and (d) the information is submitted.

**Reply:** The suggestions in the comment are not adopted since they would add undue complexity to the rules and procedures. Further, the suggested provision of documentation, which presumably would be reviewed by someone in the Office, would probably add considerably to the overall expense of filing an information disclosure statement. No other comments indicated a desire for increasing fees depending on when the information is submitted.

**Comment 56.** Two comments stated that proposed § 1.97(e) is ambiguous in using the language "to the knowledge of the person signing the certification" in that it could refer to "information and belief," "actual knowledge of the facts" or "no knowledge to the contrary." One comment stated that certifications should be able to be made on information and belief by a U.S. attorney or agent submitting a material reference received from a foreign patent attorney or agent, rather than requiring a certification from the foreign individual. Another comment suggested that the period should be calculated from when the applicant either knew or could have known of the reference because the U.S. attorney should not be penalized for delays from their foreign patent associates.

**Reply:** The certification under § 1.97(e) should be made by a



person who has knowledge of the facts being certified. The certification can be made by a practitioner who represents a foreign client and who relies on statements made by the foreign client as to the date the information first became known. A practitioner who receives information from a client without being informed whether the information was known for more than three months, however, cannot make the certification without making reasonable inquiry.

**Comment 57.** One comment stated that the language of proposed § 1.97(e) would preclude the use of the certification in an application by corporations whose practitioners have over the years reviewed thousands of patents and technical publications, even though they are unaware of the relevance of any one thereof to the application.

**Reply:** The language of § 1.97(e) is not intended to preclude use of the certification by representatives of corporations. The certification can be based on present, good faith knowledge about when information became known without a search of files being made. The Office, however, does desire to have information considered promptly by applicants as to materiality and to have information submitted to the Office early in the prosecution of an application.

**Comment 58.** One comment suggested that proposed § 1.97(e) should permit certification only as to information submitted within four months of receipt from a foreign patent office, with all other late-submitted information requiring a fee so as to not open a legal quagmire implicit in the proposed certification requirement.

**Reply:** The suggestion in the comment is not adopted. The certification set forth in § 1.97(e) is preferable since it provides the avoidance of the payment of a fee by a person who is submitting information promptly to the Office. An applicant has the option under the circumstances described in § 1.97(c), however, to not make the certification and to pay the fee instead if so desired.

**Comment 59.** One comment suggested that proposed § 1.97(f) be modified to specify that *not less than one month* will be given if a bona fide attempt is made to comply with § 1.98 but part of the required content is omitted. Another comment suggested that § 1.97(f) should state that the Office will give (rather than may give) additional time for compliance with § 1.98.

**Reply:** The suggestions in the comments are not adopted. The language of § 1.97(f) parallels present § 1.135(c) since the practice and considerations are similar for both rules. The Office intends to provide one month to comply with § 1.98 where a bona fide attempt has been made to do so.

**Comment 60.** One comment stated that proposed § 1.97(f) should specify that the Office shall inform the applicant if a reference will not be considered due to noncompliance with § 1.98 so as to avoid any argument in litigation that a certain reference was not considered due to clerical noncompliance.

**Reply:** The Office plans to notify applicants in accordance with §§ 1.97(f) and (i) if submitted information will not be considered. The examiner will also indicate in the application record what information has been considered. Further details will appear in the Manual of Patent Examining Procedure in due course.

**Comment 61.** One comment suggested that proposed § 1.97(g) should be modified to state that the filing of an information disclosure statement shall not be construed as a representation that no other material information exists such as is set forth in current § 1.97(b).

**Reply:** The suggestion in the comment has not been adopted since referring to "no other material information" would imply that the information being submitted was admitted to be material. There is no requirement that information being submitted be material to the application.

**Comment 62.** One comment suggested that proposed § 1.97(h) be modified to state that information not considered by the Office will be deemed in all respects to have not been submitted by the applicant since this would make a noncompliant submission clearly not a fulfillment of the duty of candor.

**Reply:** The suggestion in the comment is not adopted. The Office has no need or desire to rule on lack of fulfillment of the duty of candor in such a situation. The rules are drafted such that § 1.56 sets forth what information is material to patentability and §§ 1.97 and 1.98 set forth procedures to assure consideration of information by the Office.

**Comment 63.** One comment stated the Office has a duty to consider information even if this involves withdrawing an application from issue or publishing a cancellation notice and that proposed § 1.97(h) should be changed to so state. Another comment stated that it would be an abdication of the duty that the Office owes to the public for information in the file to be ignored since issuance of an invalid patent can be used to discourage others in the field. The comment suggested that the Office should leave in doubt whether the information will be considered or not.

**Reply:** It is necessary for the Office to balance its need and desire to consider all information relevant to an application with its need for an efficient operation and its capability to consider information at various stages in the prosecution of an application. The Office is setting forth when information will and will not be considered to provide certainty for the public.

**Comment 64.** One comment requested information on how a United States patent application or other information (§ 1.98(a)(1)(iii)) should be listed on a PTO 1449 form.

**Reply:** The PTO 1449 has been drafted so as to provide spaces for listing documents which are available to the public and which will be printed on the patent at issuance. Other information should be listed separately from the PTO 1449 form.

**Comment 65.** One comment stated that § 1.98(a)(2)(i) should not require the submission by applicants of United States patents listed in an information disclosure statement since the Office is better equipped to provide examiners with copies of those documents than inventors and their attorneys. Alternatively, the comment suggested that the Office should establish a procedure whereby an order for the Office to provide the copies of the patents at the usual fee can accompany the information disclosure statement.

**Reply:** At the present time, when the Automated Patent System has not been fully implemented, the overall cost of the Office obtaining copies of patents and associating them with application files would be greater than for applicants to provide copies with information disclosure statements. Presumably, the applicant would be using a copy of the patent in preparing the statement and could easily make a copy for submission to the Office.

**Comment 66.** One comment suggested that § 1.98(a)(2)(iii), as proposed, be clarified by substituting "except that no copy of a U.S. patent application need be included" for the proposed phrase "except a U.S. patent application."

**Reply:** The suggested clarification to the language of the rule has been adopted.

**Comment 67.** A number of comments objected to the requirement in § 1.98(a)(3) for a concise explanation of the relevance of all items of information being submitted.

**Reply:** In response to the comments, § 1.98(a)(3) has been modified to require a concise explanation only of patents, publications or other information listed in an information disclosure statement that are not in the English language. Applicants may, if they wish, provide concise explanations of why English-language information is being submitted and how it is understood to be relevant. Concise explanations are helpful to the Office, particularly where documents are lengthy and complex and applicant is aware of a section that is highly relevant to patentability.

**Comment 68.** Five comments stated that the proposed rules should be modified to state that if information is being submitted from a foreign search report, the requirement for a concise explanation in proposed § 1.98(a)(3) may be satisfied by submitting an English-language version of the search report.

**Reply:** The language of § 1.98(a)(3) has been modified so that no concise explanation is required for information submitted in the English language. The concise explanation requirement for non-English language information may be met by the submission of an English language version of the search report indicating the degree of relevance found by the foreign office. It is not necessary that this detail be included in the rule.

**Comment 69.** Five comments questioned whether the requirement in proposed § 1.98(a)(3) would be satisfied by a statement that the references were cited in the prosecution of a parent application.

**Reply:** The requirement in § 1.98(a)(3) for a concise explanation of non-English language information would not be satisfied by a statement that a reference was cited in the prosecution of a parent application. The concise explanation must explain the

relevance as presently understood by the person designated in § 1.56(c) most knowledgeable about the content of the information.

**Comment 70.** One comment suggested that proposed § 1.98(a)(3) should be modified to require a concise explanation of "what is believed to be" the relevance of information listed to avoid the accusation of violation of duty of disclosure merely because more relevant portions of the information are later found. Another comment suggested that the concise explanation should state what is "reasonably understood by the person submitting the statement." Another comment stated that the applicant should be required to explain (1) only what is understood or believed about the item of information at the time the disclosure is made, or (2) why the item is listed.

**Reply:** The suggestions in the comments have been substantially adopted in modifying the language of § 1.98(a)(3).

**Comment 71.** One comment stated that proposed § 1.98(b) should not require the date (unless material) and place of publication of journal articles since such information is not given on search reports from foreign patent offices or on journals published by the American Chemical Society, which just give the year. Another comment indicated that sometimes it is not clear where the place of publication is.

**Reply:** The suggestions in the comments are not adopted. The date of publication is necessary for the Office to be able to determine if the information may be used in a rejection of the claims in an application. The place of publication refers to the name of the journal, magazine or other publication in which the article was published, which should be available in the vast majority of cases.

**Comment 72.** One comment suggested that § 1.98(c) should not require a translation of a non-English language document to be filed if a translation is within the possession, custody or control of an individual designated in § 1.56(c) because such person may not recall that there is a translation somewhere in the records of the individual, perhaps having been made for another application years earlier.

**Reply:** The requirement of the rule for a translation to be submitted under limited conditions is not a change in practice. See prior §§ 1.56(j) and 1.97(b). Since the requirement has caused little, if any, problem in the past, the suggestion of the comment is not adopted.

**Comment 73.** One comment suggested that § 1.98(c) should be revised to make it clear that a reference that is essentially cumulative to another reference need not be listed in an information disclosure statement.

**Reply:** The concept that cumulative information is not material is set forth in § 1.56(b). Section 1.98 does not deal with what information must be submitted, but provides an exception for cumulative information to the requirement for a copy to be submitted of each item of information listed in an information disclosure statement.

**Comment 74.** One comment stated that a sentence in the preamble discussion of proposed § 1.98(c) was burdensome because it would require submission of incomplete or inexact translations which may have been made of an item of information. The sentence in question reads:

"But if the individual has the ability to translate the non-English language into English and has done so for the purposes of reviewing the information relative to the claimed invention, the translation would be considered 'readily available.'"

Another comment stated that proposed § 1.98(c) should be modified to require a translation if the non-English language document is to be considered by the examiner since the attorney would want to prepare an accurate translation of particularly relevant references. One comment suggested that § 1.98(c), or the preamble discussion, should make it clear that an English-language translation of a foreign language material reference need not be submitted where an individual merely reads in the reference in its original language and translates it mentally but does not prepare a written translation. Five other comments requested clarification on this point.

**Reply:** The Office does not intend to require translations unless they have been reduced to writing and are actually translations of what is contained in the non-English language information. Applicants should note, however, that most examiners do not have the ability to understand information which is not in English and that the Office will not routinely translate informa-

tion submitted in a non-English language. The examiner will consider the information insofar as it is understood on its face, e.g., drawings, chemical formulas, English-language abstracts, but will not have the information translated unless it appears to be necessary to do so. Applicants are required to aid the examiner by complying with the requirements for a concise explanation in § 1.98(a)(3) for information submitted in a non-English language.

**Comment 75.** One comment stated that § 1.98(d) should be clarified to state that a copy of an item of information listed in an information disclosure statement need not be submitted if the reference was cited by the Office or previously submitted to the Office in connection with a prior application.

**Reply:** The suggestion in the comment is adopted. The language of § 1.98(d) has been modified to state that a copy of an item of information is not required if it was previously cited by the Office or previously submitted to the Office in a prior application being relied on for an earlier filing date under 35 U.S.C. 120.

**Comment 76.** One comment suggested that proposed § 1.98(d) should be revised to not require the submission of a copy of the information listed in an information disclosure statement if a copy of the information has previously been submitted to the Office in a prior application, whether or not the earlier application is being relied upon for an earlier filing date under 35 U.S.C. 120.

**Reply:** The suggestion in the comment is not adopted. The exception to the requirement for a copy of each item of information to be submitted has been made with regard to prior applications which will normally be available to, and considered by, the examiner. It would not be efficient for the examiner to be required to seek out unrelated application files to obtain a copy of an item of information when a copy could easily be submitted by applicant.

**Comment 77.** One comment questioned what would be considered "timely" under § 1.291 so that information would be considered by the examiner without payment of a fee, in contrast to proposed § 1.97 which may require a fee.

**Reply:** Section 1.291 has not been amended to redefine timeliness. The comment seems to imply that the fee requirements of § 1.97 can be avoided through the use of a protest submitting information, but such a course of action might raise questions regarding compliance with the duty of candor and good faith required in dealings with the Office.

**Comment 78.** One comment stated that the Office should not drop the acknowledgment of a protest having been filed under § 1.291 in a reissue application because the acknowledgment served as an indication that the protest had been received in the examining group from the mail room.

**Reply:** The suggestion in the comment is not adopted. Any perceived benefit from retaining the acknowledgment is outweighed by the administrative burden it causes. There is no good reason to treat the filing of protests in reissue applications differently from the filing of protests in original applications or from the filing of other papers in the Office.

**Comment 79.** One comment questioned whether an application could be withdrawn from issue pursuant to proposed § 1.313(b)(5) without admitting unpatentability.

**Reply:** There is no requirement that unpatentability must be admitted before an application can be withdrawn from issue pursuant to § 1.313(b)(5). The rule provides for applications to be withdrawn from issue and abandoned for consideration of information in a continuing application. This differs from a petition under § 1.313(b)(3) based on unpatentability of one or more claims.

**Comment 80.** One comment questioned whether, if an application is withdrawn from issue pursuant to proposed § 1.313(b)(5), an information disclosure statement can be submitted in the continuing application under § 1.97(b) without a certification.

**Reply:** A continuing application is treated like any other application with regard to the times set forth in § 1.97(b). Thus, for example, an information disclosure statement could be filed without a fee or certification in a continuing application within three months of the filing date of the continuing application.

**Comment 81.** One comment questioned whether an application withdrawn from issue pursuant to § 1.313(b)(5) could have new art and amendments considered in that application rather than in a continuing application. The comment also questioned the handling of applications withdrawn from issue pursuant to



## § 1.313(b)(3).

**Reply:** The language of § 1.313(b)(5) makes it clear that an application withdrawn from issue thereunder is to be abandoned without further prosecution. This differs from an application withdrawn from issue pursuant to § 1.313(b)(3) because applicant had admitted the unpatentability of one or more claims.

**Comment 82.** One comment questioned whether the continuing application mentioned in proposed § 1.313(b)(5) could be a file wrapper continuing application under § 1.62 and how applicants can accomplish the withdrawal from issue under proposed § 1.313(b) late in the prosecution of an application.

**Reply:** The continuing application mentioned in § 1.313(b)(5) can be a file wrapper continuing application under § 1.62. Even though § 1.62 requires a file wrapper continuing application to be filed before the payment of the issue fee, the Office will consider the filing of a petition to withdraw from issue under § 1.313(b)(5) as sufficient grounds to waive that requirement of § 1.62. Late in the prosecution of an application, the Office has difficulty in matching papers with the application file. Papers requesting that an application be withdrawn from issue after the issue fee is paid should be directed, or preferably hand-carried, to the Office of Petitions in the Office of the Assistant Commissioner for Patents.

**Comment 83.** Seven comments suggested that § 1.555(a) should not be amended to require the submission of "all information material to patentability" since a reexamination proceeding is limited to consideration of patents and printed publications.

**Reply:** The suggestion in the comments has been adopted. A paragraph (b), which defines what information is material to patentability in a reexamination proceeding, has been added to the rule.

**Comment 84.** One comment suggested that proposed § 1.555(a) should be modified to make clear that there is no duty of disclosure on employees of a corporate patent owner if the employees are not substantively involved in the preparation of the reexamination request or the reexamination proceeding.

**Reply:** The suggestion in the comment to modify the language in § 1.555(a) has not been adopted. The rule refers to individuals who are substantively involved on behalf of the patent owner in a reexamination proceeding.

**Comment 85.** Two comments stated that the Office should consider fraud or other inequitable conduct issues in interference proceedings.

**Reply:** The suggestion in the comments has been adopted. The Office will consider inequitable conduct issues in interference proceedings as announced on November 19, 1991, in the *Official Gazette* of the Patent and Trademark Office at 1132 Off. Gaz. Pat. Off. 33.

**Comment 86.** One comment requested more examples with regard to proposed § 10.23(c)(10) of what alteration or combination of alterations in a declaration would be considered material.

**Reply:** It is not the function of the rules or the rulemaking process to provide a detailed listing of what alterations may be considered to be improper. This consideration will necessarily be made in view of the totality of the circumstances involved. Practitioners would be well advised to avoid filing applications which contain alterations which have not been initiated and dated.

**Comment 87.** Two comments stated that § 10.23(c)(10) should be amended to prohibit knowingly attempting to mislead the Office in the drafting or prosecution of a patent application. One comment stated that attempted fraud or inequitable conduct would not be prohibited by proposed 10.23(c)(10) because such conduct would not be a violation of proposed §§ 1.56 or 1.555.

**Reply:** No amendment is necessary to the language of § 10.23(c)(10). It should be noted that the duty of candor and good faith in dealing with the Office is included in §§ 1.56 and 1.555. This duty includes a prohibition against knowingly attempting to mislead the Office.

**Comment 88.** Five comments stated that it would be unfair to impose the new disclosure requirements and fees on applications that are pending before the Office on the effective date of the new rule. Another comment stated that the rules should be immediately effective for all pending applications with some grace period for making the initial disclosure without penalty and without fee.

**Reply:** The Office will apply the new rules to all applications pending on, or filed on or after, the effective date of the rules.

While this implementation may cause some burden on some applicants, other applicants will obtain benefits not otherwise available. This decision will also ease the administrative burden on the Office in implementing the new rules.

**Other Considerations**

The rule change is in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 et seq., Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce has certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)) because the rules as adopted do not require individuals to submit information that they are not already aware of and are not already under an obligation to provide to the Office. The rules further promote the efficiency of the examination process by encouraging a timely submission of an information disclosure statement and by substantially eliminating rejections based on inequitable conduct, thereby reducing the costs to all patent applicants.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, state or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity or innovation, or on the ability of the United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Patent and Trademark Office has also determined that this rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

This rule contains a collection of information requirement subject to the Paperwork Reduction Act, which has previously been approved by the Office of Management and Budget under Control No. 0651-0011. Each information disclosure statement is estimated to take approximately 30 minutes, including time for reviewing instructions, gathering and maintaining data needed, and completing and reviewing the collection of information. The time estimate has been reduced from that stated in the proposal since the requirement for a concise explanation of the relevance of each item of information cited in an information disclosure statement has been limited to information submitted in a language other than English. Send comments regarding this burden estimate Patent and Trademark Office, Office of Management and Organization, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503. (Attention Paper Reduction Project 0651-0011)

**List of Subjects****37 CFR Part 1**

Administrative practice and procedure, Inventions and patents, Reporting and record keeping requirements, Small businesses.

**37 CFR Part 10**

Administrative practice and procedure, Inventions and patents, Lawyers, Reporting and record keeping requirements.

For the reasons set forth in the preamble, 37 CFR Parts 1 and 10 are amended as follows:

**Part 1 - Rules of Practice in Patent Cases**

1. The authority citation for Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. In § 1.17, paragraph(i)(1) is revised and paragraph (p) is added to read as follows:

## § 1.17 Patent application processing fees.

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(i)(1) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph.....130.00

- § 1.12—for access to an assignment record.
- § 1.14—for access to an application.
- § 1.53—to accord a filing date.
- § 1.55—for entry of late priority papers.
- § 1.60—to accord a filing date.
- § 1.62—to accord a filing date.
- § 1.97(d)—to consider an information disclosure statement.
- § 1.103—to suspend action in application.
- § 1.177—for divisional reissues to issue separately.
- § 1.312—for amendment after payment of issue fee.
- § 1.313—to withdraw an application from issue.
- § 1.314—to defer issuance of a patent.
- § 1.334—for patent to issue to assignee, assignment recorded late.
- § 1.666(b)—for access to interference settlement agreement.

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(p) For submission of an information disclosure statement under § 1.97(c)..... \$200.00

3. Section 1.28, paragraph (d)(2) is revised to read as follows:

§ 1.28 Effect on fees of failure to establish status, or change status, as a small entity.

\*\*\*\*\*

(d)(1) \*\*\*

- (2) Improperly and with intent to deceive
  - (i) establishing status as a small entity, or
  - (ii) paying fees as a small entity
 shall be considered as a fraud practiced or attempted on the Office.

4. Section 1.51, paragraph (b) is revised to read as follows:

§ 1.51 General requisites of an application.

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(b) Applicants are encouraged to file an information disclosure statement. See §§ 1.97 and 1.98.

5. Section 1.52, paragraph (c) is revised to read as follows:

§ 1.52 Language, paper, writing, margins.

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(c) Any interlineation, erasure, cancellation or other alteration of the application papers filed should be made before the signing of any accompanying oath or declaration pursuant to § 1.63 referring to those application papers and should be dated and initialed or signed by the applicant on the same sheet of paper. Application papers containing alterations made after the signing of an oath or declaration referring to those application papers must be supported by a supplemental oath or declaration under § 1.67(c). After the signing of the oath or declaration referring to the application papers, amendments may be made in the manner provided by §§ 1.121 and 1.123 through 1.125.

\*\*\*\*\*

6. Section 1.56 is revised to read as follows:

§ 1.56 Duty to disclose information material to patentability.

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is

being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is cancelled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is cancelled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information which is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine; (1) prior art cited in search reports of a foreign patent office in a counterpart application, and (2) the closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

(b) Under this section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and

(1) it establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim; or

(2) it refutes, or is inconsistent with, a position the applicant takes in:

- (i) opposing an argument of unpatentability relied on by the Office, or
- (ii) asserting an argument of patentability.

A prima facie case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

(c) Individuals associated with the filing or prosecution of a patent application within the meaning of this section are:

- (1) each inventor named in the application;
- (2) each attorney or agent who prepares or prosecutes the application; and

(3) every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application.

(d) Individuals other than the attorney, agent or inventor may comply with this section by disclosing information to the attorney, agent, or inventor.

7. Section 1.63, paragraphs (b)(3) and (d) are revised to read as follows:

§ 1.63 Oath or declaration.

\*\*\*\*\*

(b) \*\*\*

(3) Acknowledges the duty to disclose to the Office all information known to the person to be material to patentability as defined in § 1.56.

(d) In any continuation-in-part application filed under the conditions specified in 35 U.S.C. 120 which discloses and claims subject matter in addition to that disclosed in the prior copending application, the oath or declaration must also state that the person making the oath or declaration acknowledges the duty to disclose to the Office all information known to the person to be material to patentability as defined in § 1.56,



which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

8. Section 1.67 is amended by adding a new paragraph (c) to read as follows:

§ 1.67 Supplemental oath or declaration.

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(c) A supplemental oath or declaration meeting the requirements of § 1.63 must also be filed if the application was altered after the oath or declaration was signed or if the oath or declaration was signed:

- (1) in blank;
- (2) without review thereof by the person making the oath or declaration; or
- (3) without review of the specification, including the claims, as required by § 1.63(b)(1).

9. Section 1.97 is revised to read as follows:

§ 1.97 Filing of information disclosure statement.

(a) In order to have information considered by the Office during the pendency of a patent application, an information disclosure statement in compliance with § 1.98 should be filed in accordance with this section.

(b) An information disclosure statement shall be considered by the Office if filed:

- (1) within three months of the filing date of a national application;
- (2) within three months of the date of entry of the national stage as set forth in § 1.491 in an international application; or
- (3) before the mailing date of a first Office action on the merits, whichever event occurs last.

(c) An information disclosure statement shall be considered by the Office if filed after the period specified in paragraph (b) of this section, but before the mailing date of either

- (1) a final action under § 1.113 or
  - (2) a notice of allowance under § 1.311,
- whichever occurs first, provided the statement is accompanied by either a certification as specified in paragraph (e) of this section or the fee set forth in § 1.17(p).

(d) An information disclosure statement shall be considered by the Office if filed after the mailing date of either

- (1) a final action under § 1.113 or
  - (2) a notice of allowance under § 1.311,
- whichever occurs first, but before payment of the issue fee, provided the statement is accompanied by:

(i) a certification as specified in paragraph (e) of this section,

(ii) a petition requesting consideration of the information disclosure statement, and

(iii) the petition fee set forth in § 1.17(i)(1).

(e) A certification under this section must state either

- (1) that each item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the statement, or
- (2) that no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application or, to the knowledge of the person signing the certification after making reasonable inquiry, was known to any individual designated in § 1.56(c) more than three months prior to the filing of the statement.

(f) No extensions of time for filing an information disclosure statement are permitted under § 1.136. If a bona fide attempt is made to comply with § 1.98, but part of the required content is inadvertently omitted, additional time may be given to enable full compliance.

(g) An information disclosure statement filed in accordance with this section shall not be construed as a representation that a search has been made.

(h) The filing of an information disclosure statement shall not be construed to be an admission that the information cited

in the statement is, or is considered to be, material to patentability as defined in § 1.56(b).

(i) Information disclosure statements, filed before the grant of a patent, which do not comply with this section and § 1.98 will be placed in the file, but will not be considered by the Office.

10. Section 1.98 is revised to read as follows:

§ 1.98 Content of information disclosure statement.

(a) Any information disclosure statement filed under § 1.97 shall include:

- (1) A list of all patents, publications, or other information submitted for consideration by the Office;
- (2) A legible copy of:
  - (i) Each U.S. and foreign patent;
  - (ii) Each publication or that portion which caused it to be listed; and
  - (iii) All other information or that portion which caused it to be listed, except that no copy of a U.S. patent application need be included; and
- (3) A concise explanation of the relevance, as it is presently understood by the individual designated in § 1.56(c) most knowledgeable about the content of the information, of each patent, publication, or other information listed that is not in the English language. The concise explanation may be either separate from the specification or incorporated therein.

(b) Each U.S. patent listed in an information disclosure statement shall be identified by patentee, patent number and issue date. Each foreign patent or published foreign patent application shall be identified by the country or patent office which issued the patent or published the application, an appropriate document number, and the publication date indicated on the patent or published application. Each publication shall be identified by author (if any), title, relevant pages of the publication, date and place of publication.

(c) When the disclosures of two or more patents or publications listed in an information disclosure statement are substantively cumulative, a copy of one of the patents or publications may be submitted without copies of the other patents or publications provided that a statement is made that these other patents or publications are cumulative. If a written English-language translation of a non-English language document, or portion thereof, is within the possession, custody or control of, or is readily available to any individual designated in § 1.56(c), a copy of the translation shall accompany the statement.

(d) A copy of any patent, publication or other information listed in an information disclosure statement is not required to be provided if it was previously cited by or submitted to the Office in a prior application, provided that the prior application is properly identified in the statement and relied upon for an earlier filing date under 35 U.S.C. 120.

(e) A copy of any patent, publication or other information listed in an information disclosure statement is not required to be provided if it was previously cited by or submitted to the Office in a prior application, provided that the prior application is properly identified in the statement and relied upon for an earlier filing date under 35 U.S.C. 120.

11. Section 1.99 is removed and reserved.

12. Section 1.175, paragraph (a)(7), is revised to read as follows:

§ 1.175 Reissue oath or declaration.

(a) \*\*\*

(7) Acknowledging the duty to disclose to the Office all information known to applicants to be material to patentability as defined in § 1.56.

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13. Section 1.193(c) is removed and reserved.

§ 1.193 Examiner's Answer.

14. Section 1.291, paragraphs (a) and (c), are revised to read as follows:

§ 1.291 Protests by the public against pending applications.

(a) Protests by a member of the public against pending applications will be referred to the examiner having charge of the subject matter involved. A protest specifically identifying the

application to which the protest is directed will be entered in the application file if:

- (1) the protest is timely submitted; and
  - (2) the protest is either served upon the applicant in accordance with § 1.248, or filed with the Office in duplicate in the event service is not possible.
- Protests raising fraud or other inequitable conduct issues will be entered in the application file, generally without comment on those issues. Protests which do not adequately identify a pending patent application will be disposed of and will not be considered by the Office.

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(c) A member of the public filing a protest in an application under paragraph (a) of this section will not receive any communications from the Office relating to the protest, other than the return of a self-addressed postcard which the member of the public may include with the protest in order to receive an acknowledgment by the Office that the protest has been received. The Office may communicate with the applicant regarding any protest and may require the applicant to respond to specific questions raised by the protest. In the absence of a request by the Office, an applicant has no duty to, and need not, respond to a protest. The limited involvement of the member of the public filing a protest pursuant to paragraph (a) of this section ends with the filing of the protest, and no further submission on behalf of the protestor will be considered unless such submission raises new issues which could not have been earlier presented.

15. Section 1.313, paragraph (b), is revised to read as follows:

§ 1.313 Withdrawal from issue.

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(b) When the issue fee has been paid, the application will not be withdrawn from issue for any reason except:

- (1) a mistake on the part of the Office;
- (2) a violation of § 1.56 or illegality in the application;
- (3) unpatentability of one or more claims;
- (4) for interference; or
- (5) for abandonment to permit consideration of an information disclosure statement under § 1.97 in a continuing application.

16. Section 1.555 is revised to read as follows:

§ 1.555 Information material to patentability in reexamination proceedings.

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective reexamination occurs when, at the time a reexamination proceeding is being conducted, the Office is aware of and evaluates the teachings of all information material to patentability in a reexamination proceeding. Each individual associated with the patent owner in a reexamination proceeding has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability in a reexamination proceeding. The individuals who have a duty to disclose to the Office all information known to them to be material to patentability in a reexamination proceeding are the patent owner, each attorney or agent who represents the patent owner, and every other individual who is substantively involved on behalf of the patent owner in a reexamination proceeding. The duty to disclose the information exists with respect to each claim pending in the reexamination proceeding until the claim is cancelled. Information material to the patentability of a cancelled claim need not be submitted if the information is not material to patentability of any claim remaining under consideration in the reexamination proceeding. The duty to disclose all information known to be material to patentability in a reexamination proceeding is deemed to be satisfied if all information known to be material to patentability of any claim in the patent after issuance of the reexamination certificate was cited by the Office or submitted to the Office in an information disclosure

statement. However, the duties of candor, good faith, and disclosure have not been complied with if any fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct by, or on behalf of, the patent owner in the reexamination proceeding. Any information disclosure statement must be filed with the items listed in § 1.98 as applied to individuals associated with the patent owner in a reexamination proceeding, and should be filed within two months of the date of the order for reexamination, or as soon thereafter as possible.

(b) Under this section, information is material to patentability in a reexamination proceeding when it is not cumulative to information of record or being made of record in the reexamination proceeding, and

(1) it is a patent or printed publication that establishes, by itself or in combination with other patents or printed publications, a prima facie case of unpatentability of a claim; or

(2) it refutes, or is inconsistent with, a position the patent owner takes in:

- (i) opposing an argument of unpatentability relied on by the Office, or
- (ii) asserting an argument of patentability.

A prima facie case of unpatentability of a claim pending in a reexamination proceeding is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

(c) The responsibility for compliance with this section rests upon the individuals designated in paragraph (a) of this section and no evaluation will be made by the Office in the reexamination proceeding as to compliance with this section. If questions of compliance with this section are discovered during a reexamination proceeding, they will be noted as unresolved questions in accordance with § 1.552(c).

Part 10 - Representation of Others Before the Patent and Trademark Office

17. The authority citation for Part 10 continues to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

18. Section 10.23, paragraphs (c)(10) and (c)(11), are revised to read as follows:

§ 10.23 Misconduct.

\*\*\*\*\*

(c) \*\*\*

(10) Knowingly violating or causing to be violated the requirements of § 1.56 or § 1.555 of this subchapter.

(11) Knowingly filing or causing to be filed an application containing any material alteration made in the application papers after the signing of the accompanying oath or declaration without identifying the alteration at the time of filing the application papers.

Jan 9, 1992

HARRY F. MANBECK, Jr.  
Assistant Secretary and Commissioner  
of Patents and Trademarks

[1135 OG 13]

(68) DEPARTMENT OF COMMERCE  
Patent and Trademark Office  
37 CFR Part 1

[Docket No. 910764-1306]  
RIN 0651-AA27

Duty of Disclosure

Agency: Patent and Trademark Office, Commerce  
Action: Correcting amendments.



**Summary:** This document contains corrections to the final regulations which were published in the Federal Register on Friday, January 17, 1992 (57 FR 2021). The regulations related to changes regarding the duty of disclosure contained in parts 1 and 10.

**Effective Date:** March 16, 1992.

**For Further Information Contact:** Charles E. Van Horn by telephone at (703) 305-9054, or by facsimile transmission at (703) 305-8825, or by mail marked to his attention and addressed to Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231.

**Supplementary Information:**

#### Background

The final regulations that are the subject of these corrections, make changes to the rules of practice relating to the duty of disclosure and the procedures for submitting information disclosure statements to the Office.

#### Need for Correction

As published, the final regulations contain an error, which may be misleading and is in need of clarification.

#### List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Inventions and patents, Reporting and record keeping requirements, Small businesses.

#### PART 1 - RULES OF PRACTICE IN PATENT CASES

Accordingly, 37 CFR Part 1 is corrected by making the following correcting amendment:

1. The authority citation for Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.  
§ 1.97(c)(2) [Corrected]

2. In § 1.97(c)(2), the fifth line down, is revised to read "certification as specified in paragraph (e) of this section . . ." instead of "(3) of this section."

June 17, 1994

CHARLES E. VAN HORN  
Deputy Assistant Commissioner  
for Patent Policy and  
Projects

[1164 OG 54]

#### (69) Implementation of Rules on Information Disclosure Statements

New rules on the duty of disclosure and information disclosure statements, effective March 16, 1992, were published in the *Federal Register* at 57 FR 2021 (Jan. 17, 1992) and in the *Official Gazette* at 1135 Off. Gaz. Pat. Office 13 (Feb. 4, 1992).

The procedures for handling information disclosure statements (37 CFR 1.97 and 1.98) will be set forth in Section 609 of the Manual of Patent Examining Procedure (MPEP). A copy of the instructions being given to examiners for handling information disclosure statements under the new rules is being published for the benefit of the public. Also being published is a sample declaration form which incorporates language conforming to the amendment to 37 CFR 1.63 contained in the new rules. Declaration forms acceptable under the rules in effect prior to the change effective March 16, 1992, will continue to be acceptable under the new rules.

The Office is considering changing its policy regarding the printing on patents of citations of information considered in patent applications. The proposed change will not affect consideration by the examiner of information submitted to the Office in compliance with 37 CFR 1.97(b)-(d) and 1.98. The proposed change affects only the information printed on the patent. Presently, as set forth in the last paragraph of the instructions which follow, information properly submitted by applicant and considered by the examiner will be printed on the patent along with the references cited by the examiner in Office actions. It

has been suggested that it would be more helpful to the Office and to the public in using a patent for future search purposes if only the references cited and/or relied upon by the examiner in Office actions were listed on the printed patent. Alternatively, it has been suggested that the references listed on a patent be differentiated as to whether they were cited and/or relied on by the examiner or cited by applicant but not relied on by the examiner. The Office has a preference for the option that lists only the information cited and/or relied on by the examiner because it reduces printing costs (some citations by applicants now add several additional pages to the patent grant) and minimizes processing problems associated with correcting incomplete or inaccurate citations before the patent is printed. Public comment on these proposals is welcomed and should be directed to J. Michael Thesz (703-305-9384) or by mail directed to Mr. Thesz in the Office of the Assistant Commissioner for Patents. Comments should be received before May 29, 1992.

April 20, 1992

HARRY F. MANBECK, Jr.  
Assistant Secretary and Commissioner  
of Patents and Trademarks

[1138 OG 37]

#### (70) Processing of Information Disclosure Statements Under the New Rules Effective March 16, 1992

Applicants and other individuals substantively involved with the preparation and/or prosecution of a patent application have a duty to submit to the Office information which is material to patentability as defined in 37 CFR 1.56. These individuals also may want the Office to consider information for a variety of other reasons, e.g., without first determining whether the information meets any particular standard of materiality, or because another patent office considered the information to be relevant in a counterpart or related patent application filed in another country, or to make sure that the examiner has an opportunity to consider the same information that was considered by the individuals that were substantively involved with the preparation or prosecution of a patent application.

An information disclosure statement filed in accordance with the provisions of 37 CFR 1.97 and 1.98 provides the procedure available to an applicant to submit information to the Office so that information will be considered by the examiner assigned to the application. The requirements for the content of a statement have been simplified in the new rules effective March 16, 1992, to encourage individuals associated in a substantive way with the filing and prosecution of a patent application to submit information to the Office so the examiner can determine its relevance to the claimed invention. The procedure for submitting an information disclosure statement under the new rules are designed to encourage individuals to submit information to the Office promptly.

In order to have information considered by the Office during the pendency of a patent application, an information disclosure statement in compliance with 37 CFR 1.98 as to content must be filed in accordance with the procedural requirements of 37 CFR 1.97. The requirements as to content are discussed in A below. The requirements based on the time of filing the statement are discussed in B below. Examiner handling of information disclosure statement is discussed in C below.

The Office has set forth the minimum requirements for information to be considered in 37 CFR 1.97 and 1.98. Once the minimum requirements are met, the examiner has an obligation to consider the information. These rules provide certainty for the public by defining what the requirements are, when the Office will consider information and when the Office will not consider information.

The filing of an information disclosure statement shall not be construed as a representation that a search has been made. 37 CFR 1.97(g). There is no requirement that an application for a patent make a patentability search. Further, the filing of an information disclosure statement shall not be construed to be an admission that the information cited in the statement is, or is considered to be, material to patentability as defined in 37 CFR 1.56(b). 37 CFR 1.97(h). See MPEP 706.02(b) regarding admissions by applicant.

Multiple information disclosure statements may be filed in a single application, and they will be considered, provided each is in compliance with the appropriate requirements. Use of form PTO-1449, "Information Disclosure Citation," is encouraged as a means providing the required list of information. See C(2) below.

Information which is cited or submitted to the Office in the parent application of a file wrapper continuing application under 37 CFR 1.62 will be part of the file before the examiner and need not be resubmitted in the continuing application. Likewise, the examiner will consider information cited or submitted to the Office in a parent application when examining a continuing application and thus this information need not be resubmitted unless applicant desires the information to be printed on the patent.

#### A. Content

An information disclosure statement must comply with the provisions of 37 CFR 1.98 as to content in order to be considered by the Office. Each information disclosure statement must comply with the applicable provisions of A(1), A(2) and A(3) below.

**A(1) Each information disclosure statement must include a list of all patents, publications, or other information submitted for consideration by the Office.**

Paragraph (b) of 37 CFR 1.98 requires that each U.S. patent listed in an information disclosure statement be identified by patentee, patent number and issue date. Each foreign patent or published foreign patent application must be identified by the country or patent office which issued the patent or published the application, an appropriate document number, and the publication date indicated on the patent or published application. Each publication must be identified by author (if any), title, relevant pages of the publication, date (at least month and year) and place of publication. The place of publication refers to the name of the journal, magazine or other publication in which the information being submitted was published.

The list may not be incorporated into the specification but must be submitted in a separate paper. A separate list is required so that it is easy to confirm that applicant intends to submit an information disclosure statement, and because it provides a readily available checklist for the examiner to indicate which identified documents have been considered. A copy of a separate list will also provide a simple means of communication to applicant to indicate the listed documents that have been considered and those listed documents that have not been considered. Use of form PTO-1449, "Information Disclosure Citation," is encouraged. See C(2) below.

**A(2) In addition to the list, each information disclosure statement must also include a legible copy of:**

- (i) Each U.S. and foreign patent;
- (ii) Each publication or that portion which caused it to be listed; and
- (iii) All other information or that portion which caused it to be listed, except that no copy of a U.S. patent application need be included.

There are exceptions to this general rule that a copy must be provided. First, paragraph (d) of 37 CFR 1.98 states that a copy of any patent, publication or other information listed in an information disclosure statement is not required to be provided if it was previously cited by or submitted to the Office in a prior application, provided that the prior application is properly identified in the statement and relied upon for an earlier filing date under 35 U.S.C. 120. The examiner will consider information cited or submitted to the Office in a prior application relied on under 35 U.S.C. 120. This exception to the requirement for copies of information does not apply to information which was cited in an international application under the Patent Cooperation Treaty.

Second, paragraph (c) of 37 CFR 1.98 states that when the disclosures of two or more patents or publications listed in an information disclosure statement are substantively cumulative, a copy of the one of the patents or publications may be submitted

without copies of the other patents or publications provided that a statement is made that these other patents or publications are cumulative. The examiner will then consider only the patent or publication of which a copy is submitted and will so indicate on the list or form PTO-1449 submitted, e.g., by crossing-out the listing of the cumulative information.

Paragraph (c) of 37 CFR 1.98 further states that if a written English language translation of a non-English language document, or portion thereof, is within the possession, custody or control of, or is readily available to any individual designated in 37 CFR 1.56(c), a copy of the translation shall accompany the statement. Translations are not required to be filed unless they have been reduced to writing and are actually translations of what is contained in the non-English language information. If no translation is submitted, the examiner will consider the information in view of the concise explanation and insofar as it is understood on its face, e.g., drawings, chemical formulas, English language abstracts, in the same manner that non-English language information in Office search files is considered by examiners in conducting searches.

**A(3) Each information disclosure statement must further include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent, publication, or other information listed that is not in the English language. The concise explanation may be either separate from the specification or incorporated therein.**

The requirement for a concise explanation of relevance is limited to information that is not in the English language. The explanation required is limited to the relevance as understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information at the time the information is submitted to the Office. If a translation of the information into English is submitted with the foreign language information, no concise explanation is required. There is no requirement for the translation to be verified. Where the information listed is not in the English language, but was cited in a search report by a foreign patent office in a counterpart foreign application, the requirement for a concise explanation of relevance can be satisfied by submitting an English language version of the search report which indicates the degree of relevance found by the foreign office. The requirement for a concise explanation of non-English language information would not be satisfied by a statement that a reference was cited in the prosecution of a parent, related, or copending United States application.

The concise explanation may indicate that a particular figure or paragraph of the patent or publication is relevant to the claimed invention. It might be a simple statement pointing to similarities between the item of information and the claimed invention. It is permissible but not necessary to discuss differences between the cited information and the claims.

Applicants may, if they wish, provide a concise explanation of why English-language information is being submitted and how it is understood to be relevant. Concise explanations are helpful to the Office, particularly where documents are lengthy and complex and applicant is aware of a section that is highly relevant to patentability or where a large number of documents are submitted and applicant is aware that one or more are highly relevant to patentability.

#### B. Time for Filing

The procedure and requirements for submitting an information disclosure statement are linked to four stages in the processing of a patent application: (1) within three months of filing, or before first Office action, whichever is later; (2) after the period in (1), but before final Office action or a Notice of Allowance, whichever is earlier; (3) after the period in (2) but on or before the issue fee is paid; and (4) after the period in (3) and up to the time the patent application can be effectively withdrawn from issue. The procedures and requirements apply to applications filed under 35 U.S.C. 111 (utility), 161 (plants), 171 (designs), and 251 (reissue), as well as international applications entering the national stage under 35 U.S.C. 371.



The requirements based on the time when the information disclosure statement is filed are summarized as follows:

**Time when IDS is filed 37 CFR 1.97 Requirements**

- |  |  |
|--|--|
| (1) Within 3 months of filing or before first Office action on the merits, whichever is later. | None (always considered).                  |
| (2) After (1) but before final action or notice of allowance.                                  | Certification or 1.17(p) fee.              |
| (3) After final action or notice of allowance and before payment of issue fee.                 | Certification, petition, and petition fee. |

**B(1) Statement filed BEFORE first action on the merits or within three (3) months of actual filing date (37 CFR 1.97(b)).**

An information disclosure statement will be considered by the examiner if filed:

- (i) within three months of the filing date of a national application;
- (ii) within three months of the date of entry of the national stage as set forth in 37 CFR 1.491 in an international application; or
- (iii) before the mailing date of a first Office action on the merits, whichever event occurs last. A statement filed within this period requires neither a fee nor a certification of prompt filing.

The term "national application" includes continuing applications (continuations, divisions, continuations-in-part) so three-months will be measured from the actual filing date of an application as apposed to the effective date of a continuing application.

All information disclosure statements that comply with the content requirements of 37 CFR 1.98 and are filed within three months of the filing date will be considered by the examiner, regardless of whatever else has occurred in the examination process up to that point in time. Thus, in the rare instance that a final Office action or a notice of allowance is prepared and mailed prior to a date which is three months from the filing date, any information contained in a complete information disclosure statement filed within that three-month window will be considered by the examiner.

Likewise, an information disclosure statement will be considered if it is filed later than three months after the filing date but before the mailing date of a first Office action on the merits. An action on the merits means an action which treats the patentability of the claims in an application, as opposed to only formal or procedural requirements. An action on the merits would, for example, contain a rejection or indication of allowability of a claim or claims rather than just a restriction requirement (37 CFR 1.142) or just a requirement for additional fees to have a claim considered (37 CFR 1.16(d)). Thus, if an application was filed on Jan. 1 and the first Office action on the merits was not mailed until six months later on July 1, the examiner would be required to consider any proper information disclosure statement filed prior to July 1.

An information disclosure statement will be considered to have been filed on the day it was received in the Office, or on an earlier date of mailing if accompanied by a properly executed certificate of mailing under 37 CFR 1.8, or Express Mail certificate under 37 CFR 1.10. An Office action is mailed on the date indicated in the Office action.

**B(2) Statement filed after B(1), but BEFORE mailing of final action or Notice of Allowance (37 CFR 1.97(c)).**

An information disclosure statement will be considered by the examiner if filed after the period specified in B(1) above, but before the mailing date of either

- a final action under 37 CFR 1.113 or
- a notice of allowance under 37 CFR 1.311,

whichever occurs first, provided: (1) the statement is accompanied by either a certification as specified in 37 CFR 1.97(e) or (2) the fee set forth in 37 CFR 1.17(p). If a final action or notice of allowance is mailed in an application and later withdrawn, the application will be considered as not having had a final action or notice of allowance mailed for purposes of considering an information disclosure statement.

(i) If information submitted during the period set forth in 37 CFR 1.97(c) with a certification is used in a new ground of rejection on unamended claims, the next Office action will not be made final since in this situation it is clear that applicant has submitted the information to the Office promptly after it has become known and the information is being submitted prior to a final determination on patentability by the Office. However, the information submitted with a certification can be used in a new ground of rejection and the next Office action made final. If the new ground of rejection was necessitated by amendment of the application by applicant. Where the information is submitted during this period with a fee, the examiner may use the information submitted, e.g., printed publication or evidence of public use, and make the next Office action final whether or not the claims have been amended, provided that no other new ground of rejection which was not necessitated by amendment to the claims is introduced by the examiner. See MPEP 706.07(a). If a new ground of rejection is introduced that is neither necessitated by an amendment to the claims nor based on the information submitted with the fee set forth in 37 CFR 1.17(p), the Office action shall not be made final.

(ii) A certification under 37 CFR 1.97(e) must state either

(a) that each item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the statement, or

(b) that no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application or, to the knowledge of the person signing the certification after making reasonable inquiry, was known to any individual designated in 37 CFR 1.56(c), more than three months prior to the filing of the statement.

A certification can contain either of two statements. One statement is that each item of information in an information disclosure statement was cited in a communication, such as a search report, from a patent office outside the U.S. in a counterpart foreign application not more than three months prior to the filing date of the statement. Under this certification, it does not matter whether any individual with a duty of disclosure actually knew about any of the information cited before receiving the search report. The date on the communication by the foreign patent office begins the three-month period in the same manner as the mailing of an Office action starts a three-month shortened statutory period for response. The date starting the three-month period is not the date the communication was received by a foreign associate or the date it was received by a U.S. registered practitioner. Likewise, the statement will be considered to have been filed on the date the statement was received in the Office, or on an earlier date of mailing if accompanied by a properly executed certificate of mailing under 37 CFR 1.8, or Express Mail certificate under 37 CFR 1.10.

The term counterpart foreign patent application means that a claim for priority has been made in either the U.S. application or a foreign application based on the other, or that the disclosures of the U.S. and foreign patent applications are substantively identical (e.g., an application filed in the European Patent Office claiming the same U.K. priority as claimed in the U.S. application).

In the alternative, a certification can be made if no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to the knowledge of the person signing the certification after making reasonable inquiry, neither was it known to any individual having a duty to disclose more than three months prior to the filing of the statement.

The phrase "after making reasonable inquiry" makes it clear that the individual making the certification has a duty to make reasonable inquiry regarding the facts that are being certified. The certification can be made by a registered practitioner who represents a foreign client and who relies on statements made by the foreign client as to the date the information first became known. A registered practitioner who receives information from a client without being informed whether the information was known for more than three months, however, cannot make the certification without making reasonable inquiry. For example, if an inventor gave a publication to the attorney prosecuting an application with the intent that it be cited to the Office, the attorney should inquire as to when that inventor became aware of the publication and should not submit a certification under 37 CFR 1.97(e)(2) to the Office until a satisfactory response is received. The certification can be based on present, good faith knowledge about when information became known without a search of files being made.

Certification need not be in the form of an oath or a declaration under 37 CFR 1.68. Certification by a registered practitioner or any other individual that the statement was filed within the three-month period of either first citation by a foreign patent office or first discovery of the information will be accepted as dispositive of compliance with this provision in the absence of evidence to the contrary. For example, a certification could read as follows:

"I hereby certify that each item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement.", or

"I hereby certify that no item of information in the Information Disclosure Statement filed herewith was cited in a communication from a foreign patent office in a counterpart foreign application or, to my knowledge after making reasonable inquiry, was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of this Information Disclosure Statement."

An information disclosure statement may include two list and two certifications, similar to the above examples, in situations where some of the information listed was cited in a communication from a foreign patent office not more than three months prior to filing the statement and some was not, but was not known more than three months prior to filing the statement.

A copy of the foreign search report need not be submitted with the certification, but an individual may wish to submit an English-language version of the search report to satisfy the requirement for a concise explanation where non-English language information is cited. The time at which information "was known to any individual designated in 37 CFR 1.56(c)" is the time when the information was discovered in association with the application even if awareness of the materiality came later. The Office wishes to encourage prompt evaluation of the relevance of information and to have a date certain for determining if a certification can properly be made. A statement on information and belief would not be sufficient. Examiners should not remind or otherwise make any comment about an individual's duty of candor and good faith, but questions about the adequacy of any certification received in writing by the Office should be directed to the Office of the Assistant Commissioner for Patents.

**B(3) Statement filed after B(2), but Prior to Payment of Issue Fee (37 CFR 1.97(d)).**

An information disclosure statement will be considered by the examiner if filed after the mailing date of either a final action under 37 CFR 1.113 or a notice of allowance under 37 CFR 1.311, whichever occurs first, but before or simultaneous

with payment of the issue fee, provided the statement is accompanied by:

- (i) a certification as specified in 37 CFR 1.97(e) (see the discussion in B(2)(ii) above),
- (ii) a petition requesting consideration of the information disclosure statement, and
- (iii) the petition fee set forth in 37 CFR 1.17(i)(1).

These requirements are appropriate in view of the late stage of prosecution when the information is being submitted, i.e., after the examiner has reached a final determination on the patentability of the claims presented for examination. The petition should be directed to the Group Director of the examining group handling the application. The petition need do nothing more than request consideration of the information being submitted. Payment of the petition fee (37 CFR 1.17(i)(1)) and submission of the appropriate certification (37 CFR 1.97(e)) are the essential elements for having information considered at this advanced stage of prosecution.

The requirements of 37 CFR 1.97 provide for consideration by the Office of information which is submitted within a reasonable time, i.e., within 3 months after an individual designated in 37 CFR 1.56(c) becomes aware of the information or within 3 months of the information being cited in a communication from a foreign patent office in a counterpart foreign application. This undertaking by the Office to consider information would be available throughout the pendency of the application until the point where the patent issue fee was paid. If an applicant chose not to comply, or could not comply, with the requirements of 37 CFR 1.97(d), a continuing application could be filed to have the information considered by the examiner. The parent application could be permitted to become abandoned by not paying the issue fee required in the Notice of Allowance, for example, or by the filing of a file wrapper continuing application under 37 CFR 1.62. It would not be proper to make final a first Office action in the continuing application if the information submitted is used in a new ground of rejection.

**B(4) Statement filed after Payment of Issue Fee.**

After the issue fee has been paid on an application, it is impractical for the Office to attempt to consider newly submitted information. Information disclosure statements filed after payment of the issue fee in an application will not be considered but will merely be placed in the application file. See C below. The application may be withdrawn from issue at this point, however, pursuant to 37 CFR 1.313(b)(5) so that the information can be considered in a continuing application. In this situation, a file wrapper continuing application under 37 CFR 1.62 could be filed even though the issue fee had already been paid. The Office will consider the filing of a petition under 37 CFR 1.313(b)(5) as sufficient grounds to waive the requirement that an application under 37 CFR 1.62 be filed before payment of the issue fee. Alternatively, for example, a petition pursuant to 37 CFR 1.313(b)(3) could be filed if applicant states that one or more claims are unpatentable. This statement that one or more claims are unpatentable over the information must be unequivocal. A statement that a serious question as to patentability of a claim has been raised, for example, would not be acceptable to withdraw an application from issue under 37 CFR 1.313(b)(3).

If an application has been withdrawn from issue under one of the provisions of 37 CFR 1.313(b)(1)-(4), it will be treated as though no notice of allowance had been mailed and the issue fee had not yet been paid with regard to the time for filing information disclosure statements. Petitions under 37 CFR 1.313(b) should be directed to the Office of Petitions in the Office of the Assistant Commissioner for Patents.

**B(5) Extensions of Time (37 CFR 1.97(f))**

No extensions of time for filing an information disclosure statement are permitted under 37 CFR 1.136(a) or (b). If a bona fide attempt is made to comply with the content requirements of 37 CFR 1.98, but part of the required content is inadvertently omitted, additional time may be given to enable full compliance.

**C. Examiner Handling of Information Disclosure Statements**



Information disclosure statements will be reviewed for compliance with the requirements of 37 CFR 1.97 and 1.98 as discussed in A and B above. Applicant will be notified of compliance and non-compliance with the rules as discussed below.

### C(1) Non-complying statements

Pursuant to 37 CFR 1.97(i), submitted information, filed before the grant of a patent, which does not comply with 37 CFR 1.97 and 1.98 will be placed in the file, but will not be considered by the Office. Information submitted after the grant of a patent must comply with 37 CFR 1.501.

(i) If an information disclosure statement does not comply with the requirement based on the time of filing the statement as discussed in B above, including the requirements for fees and/or certification, the statement will be placed in the application file, but none of the information will be considered by the examiner. The examiner may use form paragraph 6.49 which is reproduced below to inform applicant that the information has not been considered. Applicant may then file a new information disclosure statement or correct the deficiency in the previously filed statement but the date of that the statement or correction is filed will be the date of the statement for purposes of determining whether the requirements based on the time of filing the statement (37 CFR 1.97) have been complied with.

The examiner should write "not considered" on an information disclosure statement where none of the information listed complies with the requirements, e.g., no copies of listed items submitted. The paper containing the disclosure statement or list will be placed in the record in the application file. The examiner will inform applicant that the information has not been considered and the reasons why by using form paragraph 6.49. If the improper citation appears as part of another paper, e.g., an amendment, which may be properly entered and considered, the portion of the paper which is proper for consideration will be considered.

### 6.49 Information Disclosure Statement Not Considered

The information disclosure statement filed<sup>(1)</sup> fails to comply with the provisions of MPEP 609 because<sup>(2)</sup>. It has been placed in the application file, but the information referred to therein has not been considered as to the merits.

#### Examiner Note:

See MPEP 609 for situations where use of this paragraph would be appropriate.

(ii) If an information disclosure statement complies with the requirements based on the time of filing the statement as discussed in B above, including the requirements for fees and/or certification, but part of the content requirements as discussed in A above has been inadvertently omitted, the examiner may set a one-month time period to correct the omission. Form paragraph 6.51 may be used for this purpose.

### 6.51 Time Limit for Completing Information Disclosure Statement

The Information Disclosure Statement filed on<sup>(1)</sup> does not comply with the requirements of 37 CFR 1.98 because<sup>(2)</sup>. Since the submission appears to be bona fide, but through an apparent oversight or inadvertence failed to comply with the necessary requirements, applicant is required to complete the statement within a time limit of one month from the date of this letter. NO EXTENSION OF THIS TIME LIMIT MAY BE GRANTED UNDER EITHER 37 CFR 1.136(a) OR (b). Failure to comply with this notice will result in the Information Disclosure Statement being placed in the application file with the non-complying information not being considered.

#### Examiner Note:

This practice does not apply where there has been a deliberate omission of some necessary part of an information disclosure statement or where the requirements based on the time of filing

the statement as set forth in 37 CFR 1.97 have not been complied with.

If a statement fails to comply with requirements as discussed in this section for an item of information, that item of information in the statement will not be considered and a line should be drawn through the citation to show that it has not been considered. However, other items of information that do comply with all the requirements will be considered by the examiner.

If information is listed in the specification rather than in a separate paper, or if the other content requirements as discussed in A above are not complied with, the examiner will notify applicant in the next Office action that the information has not been considered. It should be noted, however, that no copy of a U.S. patent application is required to be submitted. See A(2)(iii) above. Where a U.S. patent application is properly cited, the examiner should obtain access to that file within the Office.

### C(2) Complying Statements

The information contained in information disclosure statements which comply with both the content requirements as discussed in A above and the requirements based on the time of filing the statement as discussed in B above will be considered by the examiner.

Applicants, patent owners, reexamination requesters, protesters and others are encouraged to use form PTO-1449, "Information Disclosure Citation," when preparing an information disclosure statement. A copy of this form is reproduced in this section to indicate how the form should be completed. This form will enable persons to comply with the requirements to list each item of information being submitted and to provide the Office with a uniform listing of citations and with a ready way to indicate that information has been considered.

Examiners must consider all citations submitted in conformance with the rules and this section and place their initials adjacent the citations on a list or in the boxes provided on a form PTO-1449. If the citations are submitted on a list other than on a form PTO-1449, the examiner may write "all considered" and his or her initials to indicate that all citations have been considered. If any of the citations are considered, a copy of the submitted list or form, as reviewed by the examiner, will be returned to the applicant with the next communication. The original copy of the form will be entered into the application file. The copy returned to applicant will serve both as acknowledgement of receipt of the information disclosure statement and as an indication that the references were considered by the examiner. Forms PTO-326 and PTOL-37 include a box to indicate the attachment of form PTO-1449.

Information which complies with requirements as discussed in this section but which is in a non-English language will be considered in view of the concise explanation submitted (A(3) above) and insofar as it is understood on its face, e.g., drawings, chemical formulas, in the same manner that non-English language information in Office search files is considered by examiners in conducting searches. The examiner need not have the information translated unless it appears to be necessary to do so. The examiner will indicate that the non-English language information has been considered in the same manner as consideration is indicated for information submitted in English. The examiner should not require that a translation be filed by applicant. The examiner should not make any comment such as that the non-English language information has only been considered to the extent understood, since this fact is inherent.

Since information is required to be listed in a separate paper rather than in the specification, there is no need to mark "All checked" or "Checked" in the margin of a specification containing citations.

If a statement fails to comply with the requirements as discussed in this section for an item of information, a line should be drawn through the citation to show that it has not been considered. The other items of information listed that do comply with the rules and this section will be considered by the examiner and will be appropriately initialed.

### D. Information Printed on Patent

A citation listed on form PTO-1449 and considered by the examiner in accordance with this section will be printed on

the patent. A citation listed in a separate paper, equivalent to but not on form PTO-1449, and considered by the examiner in accordance with this section will be printed on the patent if the list is on a separate sheet which is clearly identified as an information disclosure statement and the list lends itself to easy capture of the necessary information by the Office printing contractor, i.e., each item of information is listed on a single line, the lines are at least double-spaced from each other, the information is uniform in format for each listed item, the list includes a column for the examiner's initials to indicate that the information was considered. If a citation is not printed on the patent but has been considered by the examiner in accordance with this section, the patented file will reflect that fact as noted in C(2) above.

[1138 OG 37]

(71)

Department of Commerce  
Patent and Trademark Office  
[Docket #: 950829221-5221-01]  
RIN 0651-XX03

### Request for Comments Concerning the Right of Priority (35 U.S.C. 119) and Electronic Exchange of Priority Documents

Agency: Patent and Trademark Office, Commerce.

Action: Notice; Request for Comments.

Summary: The Patent and Trademark Office (PTO) requests written public comment on various aspects of existing statutory and regulatory requirements for obtaining the right of priority of an earlier filed foreign application. The PTO also requests written public comment on issues associated with the electronic exchange of priority documents between the PTO, the European Patent Office (EPO), and the Japanese Patent Office (JPO). Dates: Written comments on the topics presented in the supplementary section of this notice, or any related topics, will be accepted by the PTO until October 13, 1995.

Addresses: Those interested in presenting written comments on the topics presented in the supplementary information, or any related topics, may mail their comments to the Assistant Commissioner for Patents, Washington, D.C. 20231, marked to the attention of Box DAC. In addition, comments may also be sent by facsimile transmission to (703) 308-6916, with a confirmation copy mailed to the above address, or by electronic mail messages over the Internet to priority@uspto.gov. For Further Information Contact: Jeffrey V. Nase by telephone at (703) 305-9285, or by mail marked to the attention of Box DAC, addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

### Supplementary Information

#### I. Issues for Public Comment

The PTO is inviting written public comments on the administration and relevance of the existing statutory and regulatory requirements for obtaining the right of priority of an earlier filed foreign application and/or issues associated with the electronic exchange of priority documents between the Trilateral Offices (PTO, EPO, and JPO). Questions included at the end of this section are intended to illustrate the types of issues upon which the PTO is particularly interested in obtaining public comment. This notice has been determined to be not significant for the purposes of Executive Order 12866.

A. The Requirement for a Certified Copy of the Foreign Application Unless Deemed Necessary.

Currently, the Trilateral Offices are reconsidering the need that a certified copy of the foreign application be submitted in all cases. 35 U.S.C. 119 requires that a certified copy of a foreign application be submitted in all cases in order to obtain the right of priority. Specifically, 35 U.S.C. 119(b) requires that the applicant file a claim for the right of priority and a certified copy of the original foreign application before the grant of the patent, or at any time during the pendency of the application as required by the Commissioner, but not earlier

than six months after the filing of the application in this country. The Commissioner may currently require a translation of the papers filed if not in the English language.

37 CFR 1.55, which implements 35 U.S.C. 119(b), requires that the claim for priority and the certified copy of the foreign application must be filed in all cases before the grant of the patent in order to be entitled to the right of priority, and requires a claim for priority or certified copy of the foreign application filed after payment of the issue fee to be accompanied by a petition (and fee under 37 CFR 1.17(i)) requesting entry. However, the certified copy of the foreign application may be required earlier during the pendency of the application in the case of an interference, when necessary to overcome the date of a reference relied upon by the examiner, or when specifically required by the examiner. If the certified copy of the foreign application is not in the English language, a translation will not be required except in the case of an interference, when necessary to overcome the date of a reference relied upon by the examiner, or when specifically required by the examiner.

Consequently, by statute and regulation, the certified copy of the foreign application must be filed in all cases during the pendency of the application even though it may be unnecessary to the examination of the application. Unless a substantive review of the certified copy of the foreign application, or a translation of such, is necessary to the examination of the application, e.g., during an interference or when necessary to overcome an intervening reference, the claim to priority and the certified copy of the foreign application are merely reviewed to determine whether the certified copy of the foreign application corresponds in number, date, and country to the application identified in the oath or declaration and that there are no obvious formal defects. There is generally no examination of the certified copy of the foreign application to determine whether the applicant is entitled to the benefit of the foreign filing date on the basis of the disclosure of the document. Thus, an unnecessary burden is placed upon applicants to obtain certified copies of the priority documents from the appropriate office and then submit them to the PTO in instances in which the PTO does not substantively examine such documents, especially in view of the fact that such documents do not qualify as prior art in the United States. Further, an unnecessary burden is placed upon the PTO in the processing of such documents.

This right of priority originated in a multilateral treaty of 1883, i.e., the Paris Convention for the Protection of Industrial Property (Paris Convention), to which the United States adhered in 1887. The Paris Convention, however, merely requires that a person who wishes to take advantage of a previous filing make a declaration indicating the date of such filing and the country in which it was filed. The Paris Convention permits, but does not require, the countries of the Union to require a certified copy of the foreign application of the application as previously filed. Under the Paris Convention, the countries may also require that a translation accompany the certified copy of the foreign application. See Questions # 1, 2, and 3.

#### B. Electronic Exchange of Priority Documents.

The PTO also requests written public comment on issues associated with the electronic exchange of priority documents between the PTO, EPO, and JPO. Currently, the Trilateral Offices are considering the implementation of procedures that would allow for the direct exchange of priority documents in electronic form between the office of first filing and the offices of subsequent filings. See Question # 4. The PTO is interested in how the public views such electronic exchanges of priority documents, including the evidentiary effect of an electronic document constituting the official PTO record of the priority document. See Questions # 5 and 6.

It is anticipated that it will be some time before the PTO will have an electronic data base containing the content of applications-as-filed in a word-recognizable format, e.g., applications captured by optical character recognition (OCR). As such, any electronic exchange, at least initially, would be in the form of digital images of the applications-as-filed.

It is contemplated that under a system authorizing the exchange of priority documents, an applicant would have to request that an office forward the priority document directly to another office in electronic form, rather than having the certified copy go to the applicant, who in turn would forward



to the other office. The PTO is also considering providing a return receipt to indicate to the applicant that the request to forward the priority document was received by the PTO and that the PTO has forwarded the priority document to the office(s) designated by the applicant.

The cost to the PTO of processing requests and forwarding priority documents to the designated office(s), and of generating and mailing return receipts, would be recovered through service fees. See Questions # 7 and 8.

Nevertheless, such a direct exchange of priority documents for a service fee should result in an overall reduction in costs and administrative work for applicants, as well as cost reductions in the conversion from paper to electronic form.

## II. Questions

1. (a) Does the requirement that a certified copy of the foreign application be submitted in all cases before the grant of a patent in order to be entitled to the right of priority serve any useful purpose? If yes, please provide those useful purposes.

(b) Is your answer affected by the fact that such documents may qualify as novelty defeating prior art in other countries?

2. (a) Notwithstanding the existing requirements, when should an applicant be required to submit a certified copy of the foreign application?

(b) Would you continue to submit a certified copy of the foreign application even if not specifically required?

(c) Should any action taken by the U.S. Government be contingent on action in the other Trilateral countries?

3. When the foreign application is not in the English language and an English translation is deemed necessary, should both a certified copy of the foreign application and an English language translation accompanied by a verified statement that the translation is an accurate translation of the certified copy of the foreign application be required, or should only an English language translation of the foreign application accompanied by a verified statement that the translation is accurate be required?

4. What significant problems, either legal or technical, would need to be solved to permit the offices of subsequent filing to receive the priority documents directly from the office of first filing rather than from the applicant?

5. Should the PTO, EPO, and JPO electronically exchange priority documents at the request of applicant? Would most applicants take advantage of this service? What disadvantages, if any, are there in the electronic transmission of priority documents among the PTO, EPO, and JPO?

6. Will the filing of a priority document in electronic form by the office of first filing, rather than in paper form by the applicant, affect the legal admissibility of the priority document?

7. If there was a service fee for the direct exchange of priority documents among the PTO, EPO, and JPO, which was higher than the current fee charged for a certified copy of the application, would most applicants still take advantage of this service? At what fee amount would most applicants choose to request the direct exchange of priority documents?

8. If providing a return receipt resulted in an increase in the service fee for the direct exchange of priority documents among the PTO, EPO, and JPO, would a return receipt be desirable? Against the background that increasing the information provided on such a return receipt would increase the cost of generating such return receipt, and thus increase the service fee, what information should be included on the return receipt?

September 8, 1995

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

[1179 OG 34]

## (72) Using Certificate of Correction to Perfect Claim for Priority Under 35 USC 119

Under 35 USC 119, an applicant may assert a right of priority and claim the benefit of an earlier filing date in a foreign country. In this regard, 35 USC 119 states:

No application for patent shall be entitled to this right of priority unless a claim therefor and a certified copy of the original foreign application, specification and drawings upon which it is based are filed in the Patent and Trademark Office before the patent is granted. . . .

The failure to perfect a claim to foreign priority benefits prior to issuance of the patent may be cured by filing a reissue application; *Brenner v. State of Israel*, 158 USPQ 584 (CA DC 1968).

However, under certain conditions, this failure may also be cured by filing a Certificate of Correction request under 35 USC 255 and 37 CFR 1.323. For example, in the case of *In re Van Esdonk*, 187 USPQ 671 (Comr. 1975), the Commissioner granted a request to issue a Certificate of Correction in order to perfect a claim to foreign priority benefits. In that case, a claim to foreign priority benefits had not been filed in the application prior to issuance of the patent. However, the application was a continuation of an earlier application in which the requirements of 35 USC 119 had been satisfied. Accordingly, the Commissioner held that the "applicant's" perfection of a priority claim under 35 USC 119 in the parent application will satisfy the statute with respect to their continuation application.

Although *In re Van Esdonk* involved the patent of a continuation application filed under 37 CFR 1.60, it is proper to apply the holding of that case in similar factual circumstances to any patented application having benefits under 35 USC 120. This is primarily because a claim to foreign priority benefits in a continuing application, where the claim has been perfected in the parent application, constitutes in essence a mere affirmation of the applicant's previously expressed desire to receive benefits under 35 USC 119 for subject matter common to the foreign, parent, and continuing applications.

In summary, a Certificate of Correction under 35 USC 255 and 37 CFR 1.323 may be requested and issued in order to perfect a claim to foreign priority benefits in a patented continuing application if the requirements of 35 USC 119 had been satisfied in the parent application prior to issuance of the patent and the requirements of 37 CFR 1.55(a) are met.

However, a claim to foreign priority benefits cannot be perfected via a Certificate of Correction if the requirements of 35 USC 119 had not been satisfied in the patented application, or its parent, prior to issuance and the requirements 37 CFR 155(a) are not met. In this latter circumstance, the claim to foreign priority benefits can be perfected only by way of a reissue application in accordance with the rationale set forth in *Brenner v. State of Israel*, supra.

July 25, 1986

RENE D. TEGTMEYER  
Assistant Commissioner  
for Patents

[1169 OG 38]

## (73) DEPARTMENT OF COMMERCE Patent and Trademark Office 37 CFR Part I [Docket No. 70635-9174] RIN: 0651-AA13 Deposit of Biological Materials for Patent Purposes

Agency: Patent and Trademark Office, Commerce  
Action: Final Rule

Summary: The Patent and Trademark Office (Office) is amending its rules of practice in patent cases to define procedures to govern the deposit of biological materials for patent purposes. Where an invention is or relies on a biological material which cannot be described in writing alone, and access to the biological material is necessary to satisfy the statutory

requirements for patentability under 35 U.S.C. 112, these rules prescribe the procedures and conditions for making a deposit that will satisfy these requirements. These rules also prescribe examining procedures that will be used to address deposit issues, and the procedures pertaining to access to a deposit once a patent is granted.

Effective Date: January 1, 1990.

For Further Information Contact: Charles E. Van Horn or Harris A. Pitlick by telephone at [703] 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

### Supplementary Information:

Every patent must contain a written description of the invention sufficient to enable a person skilled in the art to which the invention pertains to make and use the invention. Where the invention involves a biological material and words alone cannot sufficiently describe how to make and use the invention in a reproducible or repeatable manner, access to the biological material is necessary for the satisfaction of the statutory requirements for patentability under 35 U.S.C. 112. The rules set forth examining procedures and conditions of deposit which must be satisfied in the event a deposit is required to provide the necessary access. The rules do not address the substantive issue of whether a deposit is required under any particular set of facts.

These rules will be effective for all applications filed on or after January 1, 1990, and for all reexamination proceedings in which the request for reexamination was filed on or after January 1, 1990, except that deposits made prior to the effective date which are acceptable under current practice will be acceptable in such applications and proceedings. Since most of the provisions reflect existing policy and practice, little change to existing practice or burden on applicants for patent and patent owners relying on the deposit of biological material is anticipated. Applicants and patent owners are encouraged to comply with these rules prior to the effective date.

The final rules on the deposit of biological materials for patent purposes have evolved over several years of actual experience in administering the guidelines set forth in Section 608.01(p) of the Manual of Patent Examining Procedure, including several administrative and judicial decisions, and interaction with interested public, bar and industry groups. A draft policy statement on the deposit of biological materials was circulated among interested bar and industry groups and published in the *BNA-Patent, Trademark and Copyright Journal* on May 22, 1986. An advance notice of proposed rulemaking setting forth rules being considered for deposits of biological material was published in the *Federal Register*, 52 FR 34080 (September 9, 1987), and in the *Official Gazette*, 1082 O.G. 47 (September 29, 1987). Finally, a notice of proposed rulemaking relating to the deposit of biological materials for patent purposes was published in the *Federal Register* 53 FR 39420 (October 6, 1988), and in the *Official Gazette*, 1095 O.G. 47 (October 25, 1988).

In this notice of final rulemaking, a description of the changes in the text of the proposed rules is provided along with an explanation of the reasons supporting the changes. In addition, comments received in response to the notice of proposed rulemaking are analyzed. Finally, an explanation of the content of the final rules is provided, together with a compilation of relevant comments and responses that have been made during the rulemaking process. This explanation and compilation of previous comments and responses will serve as a set of guidelines that will be reproduced in the Manual of Patent Examining Procedure in due course.

### Changes in Text of Proposed Rules

Several changes have been made in the text of the final rules from the text of the proposed rules which were published for comment in the notice of proposed rulemaking. Those changes are discussed below.

Section 1.200 as proposed has been renumbered as § 1.801 as adopted and the term "patent purposes" as proposed has been replaced with the term "purposes of patents for inventions under 35 U.S.C. 101" as adopted to clarify that the regulations pertaining to the deposit of biological material do not apply for purposes other than patents for inventions. Thus, these

regulations are not applicable to applications for plant patents under 35 U.S.C. 161-164.

Section 1.201 as proposed has been renumbered as § 1.802 as adopted and the term "or Opportunity" in the heading thereof has been inserted after "Need" to reflect the permissive nature of a deposit when not necessary to satisfy 35 U.S.C. 112.

Paragraph (a) thereof as proposed provided that where a claimed invention is or relies on a biological material, the disclosure may include a deposit of the biological material deposited in a depository and under conditions complying with these regulations, provided a precondition was satisfied. The precondition was that the biological material not be known and readily available to the public and not be describable in writing alone. Paragraph (a) as adopted eliminates this precondition, does not require that the biological material be, or be used for, a claimed invention, does not require that the deposit be made in a depository and under conditions complying with these regulations, and more accurately states that the disclosure may include reference to a deposit, since the deposit is not physically part of the disclosure. Paragraph (a) as adopted merely provides that where an invention is, or relies on, a biological material, the disclosure may include reference to a deposit of such biological material.

Paragraph (b) of § 1.802 prescribes that biological material need not be deposited unless access to the material is necessary to satisfy 35 U.S.C. 112. If a deposit is necessary, it shall be acceptable if made in accordance with these regulations. Proposed paragraph (b) made no reference to 35 U.S.C. 112. Situations where a biological material is known and readily available to the public or can be made or isolated without undue experimentation are now listed as some, but not an exhaustive set, of the circumstances where deposit need not be made. The term "from known and readily available material" has been dropped from the end of the term "can be made or isolated without undue experimentation" as redundant. Paragraph (b) as adopted also prescribes that once deposited in a depository complying with these regulations, a biological material will be considered to be readily available even though some requirement of law or regulation permits access only under conditions imposed for safety, public health or similar reasons. Proposed paragraph (b) did not include the condition of deposit in a depository complying with these regulations.

Proposed paragraph (c) thereof was limited to reference to a specific organism or other biological material in a specification disclosure as not creating a presumption that the material was necessary to satisfy 35 U.S.C. 112 or that a deposit thereof is required. Paragraph (c) as adopted eliminates the term "specific organism or other" as redundant and also includes the act of deposit by an applicant or patent owner as not creating a presumption that the deposit is or was required.

Section 1.202 as proposed has been renumbered as § 1.803 as adopted.

Paragraph (a) thereof as proposed prescribed that a deposit shall be made in any International Depository Authority (IDA) or any other depository recognized as suitable by the Office. Paragraph (a) as adopted now specifies that such deposits shall be recognized for the purpose of these regulations so as not to preclude deposits made for other reasons such as a gratuitous disclosure. Paragraph (a)(2) as adopted eliminates the requirement in the proposed rule that impartial consultants be from the biotechnology industry or governmental agencies. Paragraph (a)(2) as adopted also contains new sub-subparagraph (vii) as a requirement which a suitable depository must meet, viz., that it promptly notify depositors of its inability to furnish samples, and the reasons why. This requirement appeared, in essence, in proposed § 1.204(a).

Proposed paragraph (b) thereof has not been adopted. Replacement of deposits is governed solely by § 1.805, infra.

Proposed paragraph (c) thereof has been adopted as paragraph (b). In subparagraph (2) thereof, "(b)" has been changed to "(a)(2)" to correct an inadvertent error in the proposed rule.

Proposed paragraph (d) thereof has been adopted as paragraph (c) except that the reference to paragraph (a) has been changed to paragraph (a)(2) to more clearly delineate which category of depository is intended to be covered by this paragraph of § 1.803 and all references to other paragraphs whose designations have been changed by adoption of these rules have been changed accordingly.



Proposed paragraph (e) thereof has been adopted as paragraph (d).

Section 1.203 as proposed has been renumbered as § 1.804 as adopted.

Paragraph (a) thereof prescribed that an original deposit of a biological material may be made before filing an application for patent or, pursuant to a requirement that will be made by the examiner no later than the date the Notice of Allowance and Issue Fee Due is mailed, during pendency of the application for patent. Paragraph (a) as adopted adds a precondition to making an original deposit that the biological material be specifically identified in the application as filed. Since proposed paragraph (a) did not address original deposits made during the pendency of an application that were not made pursuant to a requirement of an examiner, the rule as adopted states that original deposits may be made during pendency of an application for patent, subject to § 1.809, *infra*, which prescribes, *inter alia*, when during the pendency of an application for patent a deposit shall be made when made pursuant to a requirement by the examiner.

Paragraph (b) thereof as proposed required a statement that, for an original deposit made after the effective filing date of an application for patent, the biological material deposited was the same biological material described in the application as filed. Paragraph (b) as adopted substitutes the word "a" for the word "the" since more than one biological material may be referred to in the application as filed, drops the word "same" and requires the statement that the biological material deposited is a biological material specifically identified in the application as filed.

Section 1.204 as proposed has been renumbered as § 1.805 as adopted and a reference to supplemental deposits has been added to the heading thereof. Paragraphs (a) and (b) of the section as proposed have been substantially rewritten as paragraphs (a), (b) and (c). New elements have been added and some eliminated, although some elements of the proposed rule on replacement deposits have been adopted, either with similar language or different language.

Elements of the proposed rule on replacement deposits which have not been adopted include a requirement that replacement deposits be made or be made within a specific time limit. Ramifications in Office proceedings from not making a replacement deposit, or in the case of a patent, not diligently making a replacement deposit, are stated.

A requirement in the proposed section that depositories promptly notify depositors of an inability to furnish samples has been adopted as § 1.803(a)(2)(vii), *supra*.

Paragraph (a) of § 1.805 requires a depositor, after receiving notice during the pendency of an application for patent, application for reissue patent or reexamination proceeding, that the depository possessing a deposit either cannot furnish samples thereof or can furnish samples thereof but the deposit has become contaminated or has lost its capability to function as described in the specification, to notify the Office in writing, in each application for patent or patent affected. In such a case, or where the Office otherwise learns, during the pendency of an application for patent, application for reissue patent or reexamination proceeding, that the depository possessing a deposit either cannot furnish samples thereof or can furnish samples thereof but the deposit has become contaminated or has lost its capability to function as described in the specification, the need for making a replacement or supplemental deposit will be governed by the same considerations governing the need for making an original deposit under the provisions set forth in § 1.802(b). A replacement or supplemental deposit made during the pendency of an application for patent shall not be accepted unless it meets the requirements for making: an original deposit under these regulations, including the requirement set forth under § 1.804(b). A replacement or supplemental deposit made in connection with a patent, whether or not made during the pendency of an application for reissue patent or a reexamination proceeding or both, shall not be recognized by the Office unless a certificate of correction under § 1.323 is requested by the patent owner which meets the terms of paragraphs (b) and (c) of this section. The proposed rules did not provide for certificates of correction relating to replacement or supplemental deposits.

Paragraph (b) of § 1.805 prescribes that a request for certificate of correction under this section shall not be granted unless

the certificate identifies the accession number for the replacement or supplemental deposit; the date of the deposit; and the name and address of the depository.

Paragraph (c) of § 1.805 prescribes that a certificate of correction under this section shall not be granted unless the request therefor is made promptly after the replacement or supplemental deposit has been made and includes a verified statement of the reason for making the replacement or supplemental deposit; a verified statement from a person in a position to corroborate the fact, and shall state, that the replacement or supplemental deposit is of a biological material which is identical to that originally deposited; a verified showing that the patent owner acted diligently - in the case of a replacement deposit, in making the deposit after receiving notice that samples could no longer be furnished from an earlier deposit, or in the case of a supplemental deposit, in making the deposit after receiving notice that the earlier deposit had become contaminated or had lost its capability to function as described in the specification; a verified statement that the term of the replacement or supplemental deposit expires no earlier than the term of the deposit being replaced or supplemented; and otherwise establishes compliance with these regulations, except that if the person making one or more of the required statements or showing is an attorney or agent registered to practice before the Office, that statement or showing need not be verified.

Paragraph (d) of § 1.805 prescribes that a depositor's failure to replace a deposit, or in the case of a patent, to diligently replace a deposit and promptly thereafter request a certificate of correction which meets the terms of paragraphs (b) and (c) of this section, after being notified that the depository possessing the deposit cannot furnish samples thereof, shall cause the application or patent involved to be treated in any Office proceeding as if no deposit were made.

Paragraph (e) as adopted is identical to proposed paragraph (d) except that the word "the" before "patent" has been replaced with "a" because the term "the patent" had no antecedent basis, and the term "according to these regulations" has been inserted after the word "replaced" to make it clear that the rebuttable presumption according to this paragraph applies only where the replacement deposit has been made according to these regulations.

Paragraph (f) as adopted is substantially similar to proposed paragraph (e) with respect to an applicant's ability to make a replacement for any reason during the pendency of an application for patent. Paragraph (f) extends such applicant's ability to supplemental deposits as well. The first two sentences of proposed paragraph (e) prescribing when a replacement deposit shall be made while an application is still pending and that an applicant notify the Office when a replacement deposit is necessary have been adopted in § 1.805(a), *supra*.

Paragraph (g) as adopted is identical to proposed paragraph (f) except that supplemental deposits are also included and the reference to another section therein has been changed to reflect its renumbering.

Paragraph (h) as adopted is substantially similar to proposed paragraph (g) except for two changes. One is that the word "the" before "biological material" has been changed to "a" because the term "the biological material" had no antecedent basis. The other change is replacement of the term "viable deposit is in the depository" with the term "depository can furnish samples thereof". The term "in the depository" was not clear. The word "viable" before "deposit" would have excluded biological materials not capable of reproduction either directly or indirectly. For biological materials which are so capable of reproduction, samples of viable deposits thereof which become non-viable cannot be furnished by the depository.

Paragraph (i) as adopted modifies paragraph (h) as proposed. Whereas the proposed rule proscribed a patentee from replacing a viable deposit where the depository can furnish samples, the rule as adopted states that the Office will not recognize in any Office proceeding a replacement deposit of a biological material made by a patent owner where the depository could furnish samples of the deposit being replaced.

Section 1.205 as proposed has been renumbered as § 1.806 as adopted. The proposed rule had set the term of deposit as, *inter alia*, at least thirty years after the date of a viable deposit. The rule as adopted sets the thirty-year term to begin after a deposit, before or during pendency of an application for patent, is made. The term of a deposit made by a patent owner is

not prescribed. However, § 1.805(a), *supra*, prescribes that a replacement or supplemental deposit made in connection with a patent will not be recognized in any Office proceeding unless a certificate of correction under § 1.323 is requested by the patent owner which meets the terms of paragraphs (b) and (c) of § 1.805, one of which terms is a verified statement by the patent owner that the term of the new deposit expires no earlier than the term of the deposit being replaced or supplemented. An additional change in the rule as adopted is the replacement of the term "deposited biological material" with the word "deposit" since the former term had no antecedent basis.

Section 1.206 as proposed has been renumbered as § 1.807 as adopted. The rule as adopted is identical to the rule as proposed except for the reference to a rule which has been renumbered.

Section 1.207 as proposed has been renumbered as § 1.808 as adopted.

In paragraph (a) thereof, first word, "The" as proposed has been replaced with "A" because "The" had no antecedent basis.

In view of the non-adoption of proposed § 1.207(c), *infra*, paragraph (a)(2) as adopted refers to only paragraph (b), not paragraphs (b) and (c).

Paragraph (b)(1) as proposed permitted a depositor to require, *inter alia*, that a depository furnish samples only if a request for a sample is in writing and signed.

Paragraph (b) as adopted permits a depositor to require a request to be in writing or other tangible form. The signing requirement, however, has not been adopted.

Paragraph (b)(3) as proposed permitted a depositor to require, *inter alia*, that a depository furnish the depositor with a copy of the request. This requirement has not been adopted.

Paragraph (c) as proposed has not been adopted.

Paragraph (d) as proposed, with one change, has been adopted as paragraph (c). The change is the insertion of the term "made to the Office" after the term "Upon request" to make it clear that certification imposes no burden on a depository.

Section 1.208 as proposed has been renumbered as § 1.809 as adopted.

The term "required" when referring to "deposit" in proposed paragraphs (a), (b) and (c) thereof has been changed to "needed" as adopted for purposes of consistency with § 1.802. The term "in case one has not been made, or" as proposed in paragraph (a) has been replaced with "and if needed," as adopted for purposes of clarification. The statement as proposed that a deposit accepted in any acceptable depository under § 1.202(a) shall be accepted for patent purposes if made under conditions complying with § 1.207(a) has not been adopted. The statement is redundant in view of the provision in § 1.802(b) as adopted that a deposit necessary for the satisfaction of 35 U.S.C. 112 shall be acceptable if made in accordance with these regulations. Since the question of deposits may come up in reissue applications and reexamination proceedings as well as in applications for patents, paragraph (a) as adopted covers examination of all such applications and proceedings. Paragraph (a) as adopted also refers to supplemental deposits since issues of the need for a deposit may arise where a deposit has lost its capability to function as described in the specification. Paragraph (a) as proposed prescribed that affected claims would be rejected in an Office action. Paragraph (a) as adopted drops "in an Office action" and instead prescribes that the claims would be rejected "where appropriate."

Paragraph (b)(1) as proposed was limited to applicants. Paragraph (b)(1) as adopted covers applicants for patents and patent owners involved in specified Office proceedings. The provision for applicants for patents in paragraph (b)(1) as adopted is identical to the provision for applicants in paragraph (b)(1) as proposed except for the additional adoption of a reference to supplemental deposits. Paragraph (b)(1) as adopted additionally provides for patent owners responding to a rejection under paragraph (a) of this section by requesting a certificate of correction of the patent which meets the terms of paragraphs (b) and (c) of § 1.805.

Paragraph (b)(2) as proposed has not been adopted. Subparagraph (3) has therefore been renumbered as (2) and the reference therein to paragraph (b)(2) has been eliminated. Two additions have been made. One, since the question of deposit may come up in connection with a reissue application or reexamination proceeding, the term "or patent" has been inserted after "application" in the first sentence. Two, since paragraph (a) provides

for a rejection under 35 U.S.C. 112 when a deposit actually made cannot be accepted, it is considered an appropriate response that a deposit actually made should be accepted. Thus, the term "and/or why a deposit actually made should be accepted" has been inserted at the end of the first sentence of paragraph (b)(2) as adopted.

Paragraph (c) as proposed has been adopted except that the term "for patent" has been inserted after "application" in the first sentence to make it clear that this paragraph does not apply to other applications, such as applications for reissues. Additionally, the word "the" before the proposed term "required deposit" has been changed to "a" because the term "the required deposit" had no antecedent basis. Finally, the term "37 CFR" preceding "1.136" in the proposed rule has been replaced with "§" as adopted to be consistent with standard nomenclature.

Paragraph (d)(3) as proposed required a taxonomic description of the deposit. Paragraph (d)(3) as adopted requires a description of the deposited biological material sufficient to specifically identify it and to permit examination. Paragraphs (d)(1), (d)(2), (d)(3) and (d)(4) have otherwise been adopted except for the addition of prefatory articles "The" or "A".

#### Response to and Analysis of Comments

Written comments from sixteen (16) sources were received in response to the notice of proposed rulemaking. Some suggestions made in comments have been adopted as presented or in modified form and others have not been adopted. A detailed analysis of the comments follows.

**Comment:** The proposed rule numbers, except § 1.200, are the same as those of the old interference rules, and it appears to be Office practice to normally avoid using rule numbers which end in "00," especially for a rule, viz., 1.200, which is the first of a group of rules. The rules, if adopted, should have different numbers.

**Response:** The suggestion has been adopted. Proposed §§ 1.200 through 1.208 have been renumbered as §§ 1.801 through 1.809 as adopted, respectively.

**Comment:** Two comments ask whether the rules will apply retroactively. One comment suggests that they should and further, that the benefits provided for depositors in proposed §§ 1.207(b) and (c) take effect immediately so that those patent applicants who would benefit from them will be encouraged not to delay in filing or obtaining a patent until a final rule takes effect.

**Response:** To the extent the rules codify existing Office practice, they are already effective. Otherwise, the rules will be effective in applications for patent or for reissue of patent filed on or after January 1, 1990, and in reexamination proceedings in which the request for reexamination was filed on or after January 1, 1990, except that deposits made prior to the effective date which are acceptable under current practice will be acceptable in such applications and proceedings. Applicants and patent owners are encouraged to comply now with those requirements of the rules not required by existing Office practice.

**Comment:** A sentence should be added at the end of proposed § 1.200 to clarify that the rule does not preclude the possibility of depositing other biological materials for patent purposes, such as plants per se, even though not within the scope of the term "biological material" as defined by the rule. Adding such a sentence would be consistent with previous concerns expressed to the Office over the possible requirement for deposits with respect to plant patents. With the added sentence, the rule would not address any kind of requirement for deposit in plant patents.

**Response:** In a response to a comment in the notice of proposed rulemaking, it was stated that the Office did not intend to propose rules on deposits under the Plant Patent Act (35 U.S.C. 161-164) at this time, nor will the Office take the position that a deposit is required under the present provisions of 35 U.S.C. 162. The text of the rule adopted in § 1.801 is the same as proposed in § 1.200 except that the rule now explicitly states that the regulations are for purposes of patents for inventions under 35 U.S.C. 101. Thus, these regulations do not and are not intended to address the question of deposits in plant patent applications.

**Comment:** One comment suggests that the language in § 1.200 should be expanded to make it clear that other biological



materials, such as plants per se, are not precluded from being deposited. Another comment assumes that the Office intends to limit the scope of "biological material" as defined by this rule. The rules and commentary should indicate that the scope and effect of the rules are limited to biological materials as defined in the rules. This rule is acceptable provided it simply defines what constitutes biological material.

**Response:** None of the suggestions have been adopted. In a response to a comment in the notice of proposed rulemaking, it was stated that biological material is defined in the proposed rule in terms of a non-exhaustive list of what it includes and that no materials were explicitly excluded. The response also stated that the Office does not contemplate that there would be many situations where a material that is not capable of self-replication either directly or indirectly would be acceptable as a deposit under these regulations but that an applicant was not precluded in any given case from attempting to show why such a material should be acceptable. Plants per se are an example of such materials.

**Comment:** The proposed rules do not, but should, address a problem associated with marine sponges and other marine macroorganisms. These materials and their natural location can be adequately described so that one skilled in the art could obtain them using the necessary equipment. But their taxonomy is in a developmental stage and scientific names are subject to revision. Deposit and maintenance of these materials in viable form is not practical. They can and have been deposited in non-viable form, preserved or fixated in a suitable non-destructive medium, where their shelf life is expected to be at least 30 years.

**Response:** See the response to the previous comment. As stated in a response to a comment in the advance notice of proposed rulemaking, the PTO Board of Patent Appeals and Interferences held that a description of the precise geographic location of marine tunicates used in a claimed invention was adequate to satisfy the enablement requirement of 35 U.S.C. 112. *Ex Parte Rinehart*, 10 USPQ2d 1719 (PTO Bd. Pat. App. & Int. 1985). It was also stated in that response that the term "readily" as used in the term "known and readily available" appearing in the proposed rules is considered appropriate to define that degree of availability which would be reasonable under the circumstances. Since the comment states that the subject materials and their natural location can be adequately described so that one skilled in the art could obtain them using the necessary equipment, the disclosure would appear to be sufficient to meet the enablement requirements of 35 U.S.C. 112 without a deposit so long as their degree of availability is reasonable under the circumstances.

**Comment:** In a response to a comment in the notice of proposed rulemaking which was in response to a solicitation for comments in the advance notice of proposed rulemaking on the setting of an appropriate minimum number of seeds to ensure availability of the seed through the enforceable life of the patent, it was stated that the Office does not intend to propose rules quantifying a minimum number of seeds but that the Office will consider 2500 to be a minimum number in the normal case and will provide an applicant an opportunity to provide justification why a lesser number would be suitable under the circumstances of a particular case. One comment suggests that 2500 may present problems where the normal yield of a plant is only a few seeds. A more reasonable minimum is 1250. Another comment suggests that there be no minimum number but an obligation on the part of the depositor to replace a seed each time one is requested.

**Response:** Since the Office has stated that an applicant will be provided an opportunity to show why a lesser amount than 2500 seeds would be appropriate in a particular case, the policy of requiring minimum number of 2500 is adhered to. An obligation on the part of the depositor to replace a seed each time one is requested is simply impractical.

**Comment:** The title of proposed § 1.201 should be changed from "Need to make a deposit" to "Opportunity to make a deposit" since the provision states that "the disclosure may include a deposit of a biological material . . ."

**Response:** The suggestion has been adopted in part. Since § 1.802 applies to situations both when a deposit may be made (optional) and when a deposit is necessary, the heading of the rule states both need and opportunity in the alternative.

**Comment:** Proposed § 1.201(a) should state that the disclosure may include reference to a deposit, rather than that the disclosure may include a deposit.

**Response:** The suggestion has been adopted in § 1.802(a).

**Comment:** Proposed § 1.201(a) does not clearly permit deposits where conditions enumerated therein do not apply. The proposed rule should be revised by eliminating the requirement that the biological material not be known and readily available to the public before a deposit may be made. The proposed revision would make clear that an applicant has a universal and unconditional right to make a deposit of a biological material whenever the biological material cannot be described in writing alone, regardless of whether the material is known and readily available. The rule as proposed is not consistent with the permissive use of deposits where they might not be mandated. The proposed revision would dispel any suggestion or implication that the legal standard under which deposits are mandated is that the biological material be neither known nor readily available. Obviously, such materials even if unknown and not readily available might be enabled solely through a written description, rendering deposit unnecessary.

**Response:** The suggestion has been adopted in § 1.802(a). In addition, the rule as adopted permits deposits even where the biological material can be described in writing alone and even where the claimed invention is not, or does not rely on, the biological material. Section 1.802(a) as adopted permits reference in the disclosure to a deposit of a biological material, the only precondition being that an invention is or relies on that material. The requirement in the proposed rule that the biological material not be known and readily available to the public and not be describable in writing alone, and that the material be, or be used for, the claimed invention, has not been adopted.

**Comment:** Two comments suggest that § 1.201(a) refer to 35 U.S.C. 112. One comment suggests that § 1.201(a) should make some reference to 35 U.S.C. 112 for completeness. Another comment suggests that proposed § 1.201(a) contains no standard and should thus make reference to 35 U.S.C. 112, for example, by inserting words to the effect that the biological material cannot be described in writing alone to satisfy the requirements of 35 U.S.C. 112.

**Response:** The suggestions have not been adopted. But see the response to the next comment.

**Comment:** Proposed § 1.201(b) should be revised by stating that biological material need not be deposited unless necessary for the satisfaction of the statutory requirements of 35 U.S.C. 112. Thus, the rule would state that the ultimate reason for a requirement for a deposit would be to satisfy 35 U.S.C. 112. Further, the rule should state one circumstance, among others, where a biological material need not be deposited, viz., where it is known and readily available to the public or can be made or isolated without undue experimentation. The last sentence of proposed § 1.201(b) should state a precondition that a deposit of the biological material be made in a depository complying with these regulations.

**Response:** The suggestions have been adopted in § 1.802(b).

**Comment:** Proposed § 1.201(c) should be revised by stating that the actual deposit of a biological material referred to in a specification disclosure also does not create a presumption that the material is necessary to satisfy 35 U.S.C. 112 or that the deposit is or was required. The proposed revision would recognize that the act of deposit does not and should not constitute an admission by the applicant that the deposit was made because it was necessary to satisfy 35 U.S.C. 112. For example, deposit may be necessary in the United States prior to the time a patent application is filed in order for an applicant to be entitled to assert a priority right under patent laws of a foreign country based on a United States application which makes reference to such deposit. Additionally, applicants ought to be encouraged to make deposits in questionable cases without such act being construed as an admission of any sort.

**Response:** The suggestion has been adopted in § 1.802(c).

**Comment:** The term "or other biological material" in proposed § 1.201(c) should be changed to "or any other biological material" to make sure that all biological materials that would normally be considered for deposits are included.

**Response:** The comment is not understood. Nevertheless, it is moot. The term "specific organism or other biological mate-

rial" in proposed § 1.201(c) has been changed to "biological material" in § 1.802(c) as adopted.

**Comment:** Two comments suggest that proposed § 1.202(a)(2) unnecessarily limits who may be consulted in determining the suitability of a depository to be recognized by the Office to those in the biotechnology industry or Government agencies. Views from academia may be wanted. One of the comments suggests, therefore, that the term "from the biotechnology industry or governmental agencies" be deleted from § 1.202(a)(2).

**Response:** The suggestions have been adopted in § 1.803(a)(2).

**Comment:** Proposed § 1.202(a) should be revised to state that a deposit shall be recognized for the purposes of these regulations if made in a depository according to subparagraph (1) or (2) thereof. The proposed revision would allow for deposits other than in Office-recognized depositories, but give deposits in Office-recognized depositories the "safe harbor" advantages of these regulations.

**Response:** The suggestion has been adopted in § 1.803(a). Simply put, the rules do not prohibit deposits made under any conceivable conditions. The Office will treat a deposit not made according to these regulations, however, as if no deposit had been made.

**Comment:** The provision set forth in proposed § 1.202(c)(3), i.e., that a depository seeking status under paragraph (a)(2) indicate that it intends to be available, for the purposes of deposit, to any depositor under these same conditions, should also be listed in § 1.202(a)(2), which enumerates the qualifications for a depository seeking recognition as suitable by the Office.

**Response:** The suggestion is not being adopted. The requirement in proposed § 1.202(a)(2)(v), and § 1.803(a)(2)(v) as adopted, that the depository be impartial and objective, is inclusive of a requirement that it be available, for purposes of deposit, to any depositor under these same conditions.

**Comment:** One comment suggests that the proposed rules do not adequately define the term "depositor". It could be the inventor, the assignee, one to whom the inventor has an obligation to assign, or the individual who signs the deposit form. In the case of joint inventors with different institutional ties, who is the depositor? Assuming that where the inventor is a university professor, the depositor is the university, deposit in that university's depository would be precluded by proposed § 1.202(a)(2)(ii) and possibly 1.202(a)(2)(v). An exception should be made for non-profit organizations. They should be allowed to "self-deposit" since it is highly improbable that they would refuse to provide samples to third parties. The availability of a strain from a university was found to satisfy 35 U.S.C. 112 in *Merck and Co., Inc. v. Chase Chemical Co.*, 273 F.Supp. 68, 77, 92, 155 USPQ 139, 146, 159 (D.N.J. 1967). Another comment suggests that it is not clear, where the depositor is a separate, independent division of a particular entity and the depository is another separate, independent division of the same entity, whether this arrangement meets the terms of proposed § 1.202(a)(2)(ii).

**Response:** None of the suggestions have been adopted. In § 1.803(a)(2)(ii) as adopted, a depository recognized to be suitable by the Office and not otherwise an IDA must exist independent of the control of the depositor. In a response to a comment in the notice of proposed rulemaking, it was stated that the term "depositor" is intended to include the party on whose behalf the deposit is made. It was further stated in that response that the rationale of the Office in requiring that a depository, if not an IDA, be independent of the depositor was adequately discussed in the advance notice of proposed rulemaking. The advance notice stated:

The concept of an independent depository or an IDA as an acceptable depository is based on the need and desire to ensure the safe and reliable storage of a deposited biological material under circumstances that are free of the opportunity for intentional or negligent handling of the deposited material. The use of an independent depository or an internationally recognized depository will tend to preserve the integrity of the deposit process against those that may accidentally alter the deposited material, may wish to tamper with the deposited material or may wish to resume control of its availability when the patent is no longer enforceable, and to preserve the interest of the public in the free access to the biological material for any

purpose once the term of the patent expires. Further, while the PTO is constrained to approve independent depositories other than an IDA, the PTO has neither the resources nor capability to assess the individual capability of any party that wishes to act as its own depository. The rules under consideration are intended to minimize depositories that will be found acceptable.

The above discussion applies to non-profit organizations as well as for-profit organizations. Moreover, it is clear from the discussion above that the scope of the term "depositor" is limited only by the requirement that the depositor have no control over the depository. Such a relationship is not necessarily inconsistent with one where there is some legal relationship between depositor and depository. The *Merck* case cited above does not stand for the proposition that a university is necessarily an acceptable depository because it makes available samples of a biological material. In *Merck*, the availability of the biological material from the university was evidence that the biological material was known and readily available. While a deposit by an applicant in a depository under the applicant's control will not be recognized by the Office as a deposit under these regulations, an applicant is not precluded from showing that the deposited material, by virtue of conditions of public knowledge of unrestricted availability of samples of the deposit, is known and readily available to the public. However, depositors should be aware that relying on such a showing rather than making a deposit according to these regulations involves a risk that the biological material might in the future not be readily available. The university relied on in the *Merck* case, for example, eventually ceased its practice of making biological materials readily available.

**Comment:** Proposed § 1.202(b) is intended to apply in the event that a depository ceases to enjoy the status of a recognized depository. The manner of making a substitute deposit in such a situation would not seem to be fully explained by a reference to proposed § 1.204. For example, if a depository were to cease operation, it might not be able to, in the words of proposed 1.204(a), "promptly after having noted its inability to furnish samples, notify the depositor of such inability". Second, the rule as proposed is difficult to follow. For example, it indicates that a substitute deposit "must be viable if the biological material is of a kind capable of self-replication". The implication that certain deposits might be non-viable is at best confusing in the absence of a definition for viability.

**Response:** Proposed § 1.202(b) has not been adopted. Section 1.805, the rule as adopted on replacement deposits, puts the burden exclusively on the applicant or patent owner, whatever the case may be, to both make a replacement deposit and make the necessary showing that such a deposit complies with these regulations. Viability is dealt with exclusively by § 1.807 as adopted.

**Comment:** Three comments suggest that it be a requirement of the rules that the biological material have been in existence at the time of filing the patent application. One comment suggests that a sentence be added to proposed 1.208(a) to require that the application as filed state that the biological material is in existence. The other comments suggest that proposed § 1.203 require an averment that the deposited biological material was in existence at the time the application was filed.

**Response:** None of the suggestions have been adopted. Patent law does not require an actual reduction to practice as a condition precedent to filing a patent application. While few, if any, situations can be imagined where the description requirement of 35 U.S.C. 112 can be satisfied where the biological material was not in existence at the time of filing, the rules do not preclude such a situation. But see the response to the next comment.

**Comment:** Proposed § 1.203(a) should require that a biological material may be deposited only if an adequate antecedent basis exists in the specification as filed, i.e., the biological material to be deposited must be specifically identified therein.

**Response:** The suggestion has been adopted in § 1.804(a). It must be clear from the application as filed that the invention claimed and described in the specification "was fully capable of being reduced to practice (i.e., no technological problems, the resolution of which would require more than ordinary skill and reasonable time, remained in order to obtain an operative, useful process)." *Feldman v. Aunstrup* 517 F.2d 1351, 1355, 186 USPQ 108, 113 (CCPA 1975), cert. denied, 424 U.S. 912



(1976). *Accord, In re Lundak*, 773 F.2d 1216, 1221, 227 USPQ 90, 94 (Fed. Cir. 1985).

**Comment:** Two comments suggest that proposed § 1.203(a) be revised so that it addresses the permissible situation where a deposit is made during the pendency of an application for patent not pursuant to a requirement made by an examiner.

**Response:** The suggestion has been substantially adopted in § 1.804(a). An original deposit may be made, subject to § 1.809, during pendency of the application for patent. Where § 1.809 does not apply, i.e., where a deposit is ultimately not required, a deposit may be made at any time during pendency.

**Comment:** The Office should discuss in the commentary accompanying the notice of proposed § 1.203(b) as a final rule the meaning and intent behind the requirement that the deposited biological material be the "same" as the material described in the specification. For example, does the Office contemplate that the statement constitute a representation that the deposited material is in essentially the same form as was in existence at the time of the filing of the patent specification, and, accordingly as specifically described therein?

**Response:** Proposed § 1.203(b) has been adopted as § 1.804(b) but with the word "same" deleted and the term "described" replaced with "specifically identified." Under § 1.804(b), the biological material deposited must be a biological material specifically identified in the application as filed.

**Comment:** One comment asks whether a patent which is defective because of the lack of a deposit can be rectified by making the deposit in connection with a reissue application. Another comment points out that the issue of post-grant original deposits is not addressed by these regulations and the Office is urged to comment to this effect in the final promulgation of the rules.

**Response:** It is assumed from the comment that a deposit was necessary at the time the patent issued. A patent defective because of lack of a necessary deposit is necessarily fatally defective for failure to comply with the first paragraph of 35 U.S.C. 112. Reissue is not available in such cases. See *In re Hay*, 534 F.2d 917, 189 USPQ 790 (CCPA), cert. denied, 429 U.S. 977 (1976). Whether reissue is available where a biological material necessary for compliance with 35 U.S.C. 112 was known and readily available at the time of issuance of the patent and subsequently ceased to be readily available is not addressed by this response. Nor do the rules address the question of post-issue original deposits, whether necessary or not to comply with the patent statutes.

**Comment:** Many comments were received regarding proposed § 1.204 and the subject of replacement deposits. One comment suggests that the time limits in proposed § 1.204(a) for making replacement deposits, specifically as they apply post-grant, are totally arbitrary. For example, a replacement deposit made four months after notice from the depository, without a suitable petition for extension of time, could not be relied on. A number of comments suggest that in proposed § 1.204(a), it is not clear who is required to petition whom in order to obtain an extension of time in which to make a replacement deposit. A depository is not equipped to deal with the legalities of such matters. If the petition is filed with the Office, there will be administrative burdens. Another comment suggests that instead of specified time limits and petitions for extensions of time, the rule should state that where a patentee makes a replacement deposit, the patentee shall promptly request a certificate of correction identifying the particulars of the replacement deposit and that no certificate of correction shall be granted unless the request includes, *inter alia*, a verified showing that the patentee acted diligently in making the replacement deposit. A certificate of correction in providing the particulars of the new deposit (depository and accession number) would provide the simplest and most straightforward vehicle under which the patentee could assure continuing public notice (and accordingly public access) to particular biological materials described in the specification. Corrections to the issued patent would be made subject to all conditions of these deposit regulations and an additional specific requirement that the replacement deposit be made diligently after the notification is received that samples cannot be furnished from the deposit. This generalized requirement of diligence is preferable to the more rigid and cumbersome procedures set forth in the rules as proposed.

**Response:** The provisions of a three-month time limit for making a replacement deposit and petitioning for extensions of time to extend the limit in proposed § 1.204(a) applied by their terms only to patentees or patent owners. These provisions have not been adopted. Except in reexamination and reissue applications, it is beyond the rulemaking authority of the Office to regulate issued patents. Thus, instead of requiring patent owners to make replacement, or supplemental, deposits and to make them within a specified time, or to require them to request certificates of correction, paragraphs (a), (b) and (c) of § 1.805 as adopted specify that a replacement or supplemental deposit made in connection with a patent, whether or not made during the pendency of an application for reissue patent or a reexamination proceeding or both, shall not be recognized in any Office proceeding unless the patent owner requests a certificate of correction under § 1.323 provided certain specified conditions are met, including that the patent owner acted diligently in making the replacement or supplemental deposit and promptly thereafter requested the certificate of correction.

**Comment:** The rules should indicate that replacement deposits made during the pendency of an application will be treated in exactly the same way as any other deposit made after the filing date.

**Response:** The suggestion has been essentially adopted in § 1.805(a) which states, *inter alia*, that a replacement or supplemental deposit made in connection with an application for patent shall be accepted if it meets the requirements for making an original deposit under these regulations, including the requirement set forth under § 1.804(b).

**Comment:** The rules should address a situation where the deposit is of a non-viable biological material, such as a marine sponge or other marine macroorganism. Filling requests for samples can ultimately consume the entire deposit. Two other comments suggest that a depositor be permitted to charge the requesting party a fee sufficient to cover the cost of replacing the deposit. A competitor could "drain off" the store of deposit and thereby require replacement at significant economic hardship to the depositor.

**Response:** Where the biological material deposited is capable of self-replication either directly or indirectly, exhaustion of the deposit would appear to be highly unlikely. Regardless of the type of biological material deposited, however, the depositor must assure that samples thereof be available beyond the enforceable life of any patent relying on the material.

**Comment:** Nothing in the regulations which define the suitability of a depository requires that the depository itself must provide notice to depositors in the event of an inability to furnish samples yet proposed 1.204(a) does.

**Response:** The suggestion has been adopted in § 1.803(a)(2)(vii).

**Comment:** A number of comments suggest that the legal ramifications of an additional deposit made pursuant to proposed § 1.204(h), i.e., made where an earlier deposit has become contaminated or has lost its capability to function as described in the specification, are not clear. Some of the same comments go on to suggest that the deposit provided for in § 1.204(h) be termed a "supplemental" deposit rather than an "additional" deposit to emphasize the relationship between it and the earlier deposit, that such a deposit have the same legal effect as the earlier deposit provided the patent holder provides a verified statement that it is identical to the earlier deposit, and that it have the same accession number as the earlier deposit, perhaps with a suffix modification. One comment suggests that the rules require that a deposit under paragraph (h) be assigned the same accession number but with an appropriate suffix. A depository commentator asks that where a deposit under paragraph (h) is made, which deposit — the earlier or the later one — should be made available to the public. Currently, this depository advises a requesting party that there are two deposits.

**Response:** The suggestion of replacing the term "additional" with the term "supplemental" has been adopted but in a somewhat different setting. Whereas proposed § 1.204(h) stated that nothing in the regulations was intended to prohibit a patentee from making an additional deposit, paragraphs (a), (b), (c), (f) and (g) of § 1.805 as adopted provide for patent owners as well as patent applicants making supplemental deposits of a biological material earlier deposited from which a depository can still furnish samples. These paragraphs provide for supplemental deposits similar to the provisions in these paragraphs

for replacement deposits, including the requirement of showing diligence in making the deposit in connection with a patent, except that instead of making the deposit after receiving notice that samples could no longer be furnished from an earlier deposit, as in the case of a replacement deposit, the deposit is made after receiving notice that the earlier deposit had become contaminated or had lost its capability to function as described in the specification. While the rules specify that the Office in any Office proceeding will recognize supplemental deposits if made under certain conditions, it is not known what legal effect a court will give to such recognition. As far as what accession number a depository should give to a supplemental deposit, this is a matter within the discretion of the depository. As to which deposit, either an earlier deposit or a supplemental deposit, should be made available to the public, this would depend on the accession number requested. A supplemental deposit made according to these regulations would be freely available to the public to the same extent as an original deposit made according to these regulations. Obviously, nothing in these regulations prohibits a depository from advising a requesting party that there is more than one deposit of a particular biological material.

**Comment:** To the extent proposed § 1.204 regulates the effects on patents, in other than certain statutorily defined situations such as reexamination and reissue, for failure to make replacement deposits according to the rule, it exceeds the rulemaking authority of the Office. An example is proposed 1.204(c).

**Response:** Section 1.805 as adopted, to the extent it addresses replacement deposits made by patent owners, contains no affirmative provisions requiring or prohibiting replacement deposits. Rather, it prescribes what an applicant or patent owner may do vis-a-vis the Office if a replacement deposit is made and what the ramifications are in any Office proceeding if a replacement deposit is not made or improperly made. Proposed § 1.204(c) was, and § 1.805(d) as adopted is, limited to Office proceedings. The provision that a patentee may not replace a viable deposit where the depository can furnish samples in proposed 1.204(h) has been replaced in § 1.805(i) as adopted with the provision that the Office will not recognize in any Office proceeding a replacement deposit made by a patent owner where the depository could furnish samples of the deposit being replaced.

**Comment:** One comment suggests that the term of deposit in proposed § 1.205 is excessive. The term should be through the expiration of the patent plus 10 years. Another comment suggests that § 1.205 be adopted except that the last sentence should be deleted and the term "viable" before "deposit" be dropped. The term "viable" should be deleted as viability is dealt with elsewhere, e.g., proposed § 1.206. The last sentence should be deleted because, while the Office may set what it considers adequate terms of deposit on or before patent grant, it has no statutory authority or mechanism for supervising the term of the agreement of the deposit. The last sentence is also highly indefinite in failing to indicate how far beyond the enforceable life of a patent the deposit must be maintained.

**Response:** The suggestions have been adopted in part. Proposed § 1.205, including the last sentence, has been adopted as § 1.806 except that the thirty-year term applies to any deposit made before or during pendency of an application for patent. No requirement of viability is stated in the rule. The Office agrees that once a patent issues, it has no authority or mechanism for supervising the term of the agreement of the deposit. But the Office does have the authority to set the term of deposit while an application is still pending. That is all § 1.806 does. In almost all cases, the term of deposit as set forth in the first sentence of § 1.806 will extend beyond the enforceable life of the patent for which a deposit was made. The last sentence of § 1.806 is intended to cover those rare circumstances where extended prosecution in the Office results in expiration of the term of deposit as set forth in the first sentence while the patent is still enforceable. At this time, there appears to be no need to specify any finite time period beyond the enforceable life of a patent. If experience demonstrates that the public interest is not being served by the present provisions, an appropriate amendment will be proposed.

**Comment:** A depository commentator suggests that the requirement in proposed § 1.207(b)(1) that a request for a sample of the deposited material be signed poses an administrative burden on depositories which accept telephone, telex and

electronic mail requests for samples. Requiring that a request be signed can and will delay the receipt of samples by many days. The signing requirement should not be adopted.

**Response:** The suggestion has been adopted in § 1.808(b)(1).

**Comment:** A depository commentator suggests that the requirement in proposed § 1.207(b)(3) that a copy of the request be provided to the depositor poses a problem since most requests also include a request for samples of many other deposited biological materials. For such a request, it would be necessary to send a copy to each depositor, blanking out the other deposits not made by that depositor. It should be sufficient that the depositor is notified to whom and the date a sample was provided. The cost will be much greater if a copy has to be supplied.

**Response:** The suggestion has been adopted in § 1.808(b)(3).

**Comment:** A depository commentator suggests that in proposed § 1.207(b), it is not clear, after the term of the patent, whether the deposit is again restricted as it was before the patent was granted, i.e., not furnished unless the requesting party has the proper authorization from the depositor or the Commissioner, or whether the deposit is no longer subject to subparagraphs (1), (2) and (3) thereof and can be furnished without any specific identification or notification. It is suggested that either a statement be added as to what happens after the term of the patent or the term "during the term of the patent" be deleted.

**Response:** The suggestions have not been adopted. Section 1.808(a)(2) requires that subject to paragraph (b) thereof, all restrictions imposed by the depositor on the availability to the public of the deposited material will be irrevocably removed upon the granting of the patent. Paragraph (b), by its terms, is limited to the term of the patent. A contract between a depositor and a depository according to paragraph (b) but which extends beyond the term of the patent would violate paragraph (a)(2). It should be self-evident that for deposits in compliance with these regulations, samples of the deposit may be furnished without any specific identification or notification for requests made after the term of the patent.

**Comment:** While many comments suggest adoption of a rule restricting the transfer of a sample of a deposited material to a third party without the depositor's permission, such as proposed § 1.207(c), as well as the adoption of a rule requiring other restrictions on access to deposited material, two comments suggest that such rules not be adopted. The rationale is that if a deposit is basically a replacement for that which could not be adequately written in the patent specification itself, no specific statutory authority exists for restricting access to the deposited material any more than the patent law would countenance restrictions on access to the written description itself. If abuses exist by virtue of the absence of limitations on access to deposited materials, then the remedy for patent infringement is as applicable to deposited material as it is to infringers acting from knowledge of the written description itself. Accordingly, unrestricted access to deposits should be allowed. One of the comments suggests further that if there are to be some restrictions to access, proposed § 1.207(c) is otherwise problematic and ineffective. For example, the limitation on access applies to "derived" materials which could include wholly noninfringing derivatives which might themselves constitute a patentable invention of a third party requester. The proposed rule would deny the third party requester the right to what ought to be an unrestricted right to sell or otherwise dispose of this derivative material to third parties. Moreover, the proposed rule is remediless since the Office neither has continuing jurisdiction over the patentee nor a third party requester. Two depository commentators expressed reservations about proposed 1.207(c). One suggests that the first sentence therein is in direct contradiction to the long-standing policies of both NRRL and ATCC. Most depositories no longer require this type of guarantee from requesting parties as they find it almost impossible to enforce. The other suggests that the administrative burden to the depository in handling agreements made pursuant to the proposed rule will be great and the cost will be borne by the depositor. At \$10 an agreement and 300 requests a year for a particular deposit, the cost to the depositor would be \$3,000 a year. If § 1.207(c) is adopted, there should be some mention that if a depository charges a fee for this service, the fee must be paid or the depository will not be obligated to provide the service. In the European Patent Office (EPO), which has a similar provision, the EPO, not the depository, obtains the agreement



and advises the depository to make the sample available. The comment asks if the Office is prepared to do this. Additional comments ask what rules govern a new deposit for patent purposes of the same or derived biological material by a requesting party if the substance of proposed § 1.207(c) is adopted. Some comments were in response to a solicitation in the notice of proposed rulemaking for alternative approaches and suggested appropriate definition of "essential characteristics" with respect to derived material in proposed § 1.207(c).

**Response:** The Office has decided not to adopt a rule permitting a depositor to require that a sample of a deposited biological material shall be furnished only if the requesting party has agreed not to make the material or a derivative thereof available to a third party without the depositor's permission. Thus, proposed § 1.207(c) has not been adopted. The Office agrees with many of the comments about shortcomings in the proposed rule. Fundamentally, however, the proposed rule has not been adopted in view of the rationale stated in the comment that no greater restriction on access to a deposit should be permitted than is permitted on access to the written description itself, even considering that the practical value of access to a deposit may be substantially greater than access to the written description and that infringement may be more difficult to police. While it might be argued that the adoption of proposed § 1.207(b) with revisions as § 1.808(b) is inconsistent with this rationale, the Office believes that permitting the depositor to require a requesting party, in essence, to identify itself is not unreasonable under the circumstances and is consistent with international practice as embodied in the Budapest Treaty.

**Comment:** Many comments which suggest the adoption of the substance of proposed § 1.207(c) also suggest the adoption of rules incorporating the recommendations made in the April 8, 1987 World Intellectual Property Organization (WIPO) report on the Industrial Property Protection of Biotechnological Inventions (1) to use the biological material only for experimental purposes concerning the invention, and (2) not to export the biological material except to a country for which a relevant patent has been granted. The reasons generally given were that it is necessary to protect the patentee and enhance the patentee's ability to enforce a patent relying on a deposited material. One comment suggests that incorporating the recommendation on experimental use would clarify what is permitted by law. In the Notice of Proposed Rulemaking, 53 Fed. Reg. at 39423-24, the Office described the difficulties in drafting a regulation incorporating these recommendations and requested specific suggestions as to how to draft a regulation which both accomplishes the intended purpose and is not inconsistent with law. No specific suggestions were received, although one comment suggests that where a deposited material is covered by an unexpired U.S. patent, a rule be adopted permitting the depositor to require the requesting party to agree to comply with the provisions of 35 U.S.C. 271. Another comment suggests that legislation is necessary to deal with the problems addressed by the WIPO recommendations. A restriction against exports could be considered to be violative of 35 U.S.C. 112 since foreign requesters would be denied access to deposits where a patentee had never sought foreign patent protection. A restriction to experimental purposes only, while more justifiable, raises two problems. One is that "experimental purposes" have not been defined and the term has been open to several interpretations. The other is that the proper redress for non-experimental use is a suit for patent infringement, not a suit based on the requester's promise to the depo comment suggests that a rule be adopted permitting the depositor to require that a requesting party acknowledge that the furnishing of a sample of the deposited biological material does not constitute a license, express or implied, to use that sample for any purpose.

**Response:** None of the suggestions have been adopted for essentially the same rationale discussed in the response to the previous comment. None suggest how to draft a regulation which both accomplishes the intended purpose and is not inconsistent with law, and which provides a compelling justification and rationale for departing from present policy and practice. The suggestion that a requesting party agree to comply with 35 U.S.C. 271 as a condition precedent to obtaining a sample of deposited biological material is interpreted as an agreement not to infringe a corresponding valid patent, something which a requesting party is already bound not to do under law. The suggestion that a depositor be permitted to require a requesting

party to acknowledge that there is no express or implied license to use a sample for any purpose exceeds the rulemaking authority of the Office since certain unlicensed uses of patented subject matter have been found by the courts to be permissible.

**Comment:** Many of the comments suggesting adoption of the substance of § 1.207(c) and/or the WIPO recommendations on experimental use and export also suggest adoption of rules permitting additional restrictions. One comment suggests requiring the recipient of biological material to report, at least annually, to the patent holder, on the research and other results obtained by use of the biological material. The same commentator suggests that even after patent expiration, an unlicensed recipient should not be permitted to use the biological material for other than experimental purposes absent agreement from the depositor. The commentator would prohibit commercial use of the biological material without permission of the depositor. Another comment suggests that the policy consideration for permitting deposits is to insure that the patented invention can be practiced after patent expiration. Requiring a requesting party to enter into an agreement with the depositor defining the terms and conditions under which a sample of the deposited material would be used making an accounting of such use, and proof of compliance, is neither unreasonable nor contrary to law. It would not place an administrative burden on the Office since the depository could be permitted to release samples only if the requesting party signs a license. Any attempt by the depositor to impose an unlawful restriction and withhold release would be a matter for the courts, not the Office. Another comment suggests various additional restrictions be adopted. These are (1) that the requesting party have residence in the U.S. or in the country where the depository is located, if different; (2) that the patentee be given the option to restrict furnishing of samples to independent experts only for the duration of the patent; and (3) that the deposit be released only if the depositor expressly consents (in the absence of which validity of the patent must be resolved without recourse to the deposit). Restriction (1) should be adopted so that the deposit cannot be legally exported to a country where the patent owner has no enforceable rights. Restriction (2) should be adopted to prevent access of the deposited material to potential infringers. Its adoption should be coupled with a statement that a deposit released to an expert shall be regarded as being available to the public. Restriction (3) should be adopted as an extension to the description in proposed § 1.201 that the disclosure "may include a deposit." In other words, the patentee at any time during the patent term should be able to rely on the written description alone for satisfying 35 U.S.C. 112, such as where the reasons for requiring a deposit originally no longer exist.

**Response:** None of the suggestions have been adopted for essentially the same reasons discussed in the responses to the previous two comments.

**Comment:** A depository commentator suggests that proposed § 1.207(d) needs further deliberation. Now, publication in a U.S. patent of a deposit and accession number is sufficient for that depository (ATCC) to make samples available. The Office should be prepared to receive several thousand requests for certification under § 1.207(d) if adopted. If the Office is going to certify the availability of deposits, it should certify the availability of all deposits. Easier than the proposed rule would be to include a statement in the patent that there is a deposit, its accession number and where it is deposited, and that it has been made under the condition that it is available upon publication of the issued patent.

**Response:** The suggestion has not been adopted. The comment appears to be interpreting the term "Upon request" at the beginning of proposed § 1.207(d) to mean "Upon request to a depository for a sample of a deposited material", or in other words, the commentator appears to have interpreted the proposed language as requiring the depository to request certification from the Office each time a request for a sample of a deposit is made. It was not intended to impose such a burden on depositories. Rather, it was intended that the term "Upon request" refer to a request made to the Office. Therefore, proposed § 1.207(d), revised by inserting the term "made to the Office" after "Upon request", has been adopted as § 1.808(c).

**Comment:** One comment suggests that there is no apparent reason for the use of the different words "[e]stablishing" and "[a]rguing", in proposed paragraphs (b)(2) and (b)(3), respectively, of § 1.208 since the same meaning is intended by each.

Either word alone should be used in both subparagraphs (2) and (3). The same comment goes on to suggest that the reference to paragraph (b)(2) in the last sentence of proposed § 1.208(b)(3) is redundant since the examiner may be convinced that a deposit is not required where the applicant has established that the involved biological material is known and readily available to the public. A comment along the same lines suggests that paragraph (b)(2) is unnecessary. As a purely logical matter, an applicant ought to be entitled to reply to a rejection either by making an acceptable deposit or arguing why a deposit is not required under the circumstances. Proposed 1.208(b)(2) is merely one possibility for an argument that a deposit is not required.

**Response:** The suggestions have been adopted. Proposed § 1.208(b)(2) has not been adopted and proposed § 1.208(b)(3) has been substantially adopted as 1.809(b)(2). In addition, § 1.809(b)(2) provides for examination with respect to a patent, since deposit issues may arise in connection with a reissue application and/or a reexamination proceeding, and provides also for an argument that a deposit actually made should be accepted.

**Comment:** A number of comments suggest that the term "taxonomic description" in proposed § 1.208(d)(3) is unclear and inappropriate in some cases. One comment suggests that it is not clear how complete a description is required. If construed in its broadest sense, it could have the undesirable effect of delaying filing of an application until taxonomic characteristics have been determined. Some biological materials within the scope of the proposed rules, such as plasmids, are not susceptible of taxonomic description. The requirement that the specification contain a taxonomic description should not be adopted since such a description may not be possible and since the availability of a deposit makes such a description superfluous, since the taxonomy is inherent in the deposit. The response to comments made earlier regarding the taxonomic description requirement is inconsistent with the proposed rule. The response states that the extent to which a taxonomic description is required will depend on the facts of the case yet the proposed rule states that the specification shall contain such a description. The response states that the taxonomic description must be sufficient for purposes of 35 U.S.C. 112 yet the requirement of a deposit presupposes that a written description alone will not satisfy the statute. The need to verify that the deposited biological material is that disclosed in the specification arises only when the deposit is made after the filing date. That situation can be dealt with by deleting the taxonomic description requirement from § 1.208(d) and adding a new subparagraph (e) which would provide that in cases where a deposit is made after the filing date and where the nature of the material permits, a taxonomic description is required in addition to the items specified in subparagraph (d). Another comment suggests that the term "taxonomic" be deleted since it is irrelevant to many types of deposits and would provide greater clarity to the rules. Another comment suggests that the current language in proposed § 1.208 (d)(3) be replaced with "Fully identify and describe the deposited material".

**Response:** The suggestions have been adopted in part. Section 1.809(d)(3) as adopted requires a description of the deposited biological material sufficient to specifically identify it and to permit examination. While the rule does not by its terms require a taxonomic description, such a description should satisfy the rule as adopted in cases where the biological material deposited admits of a taxonomic description.

**Comment:** The Office should petition the Budapest Assembly to address the same issues dealt with in the proposed rules so that they apply to both U.S. and foreign filings. Uniformity in the rules is important, especially for U.S. inventors who file here and abroad.

**Response:** While uniformity in both U.S. and foreign rules is desirable, this is not deemed to be the appropriate forum in which to address the suggestion.

#### Discussion of Specific Sections

##### BIOLOGICAL MATERIAL [ § 1.801]:

The section indicates that the rules pertaining to deposits for purposes of patents for inventions under 35 U.S.C. 101 are intended to relate to biological material. For the purposes of

these rules, the term "biological material" is defined in terms of a non-exhaustive list of representative materials which can be deposited in accordance with the procedures defined in these rules. Since these rules are intended to address procedural matters in the deposit of biological material for patent purposes, and are not designed to decide such substantive issues such as whether a deposit of a particular organism or material would be recognized or needed to be made for the purposes of satisfying the statutory requirements for patentability under 35 U.S.C. 112, the definition provided in this section is intended to be permissive - specifically defining materials which can be deposited.

Biological material includes material that is capable of self-replication either directly or indirectly. Direct self-replication includes those situations where the biological material reproduces by itself. Representative examples of materials capable of self-replication are defined in the rule. Indirect self-replication is meant to include those situations where the biological material is only capable of replication when another self-replicating biological material is present. Self-replication after insertion in a host is one example of indirect self-replication. Examples of indirect replicating biological materials include viruses, phages, plasmids, symbionts, and replication defective cells. The list of representative examples of each type of replicating material includes viruses to demonstrate that the lists are not intended to be mutually exclusive.

Although plant material is included within the scope of the definition of biological material for purposes of patents for inventions under 35 U.S.C. 101, these rules on deposits are not applicable to applications filed under the Plant Patent Act (35 U.S.C. 161-164). The Office is of the view that a deposit is not required under the present provisions of 35 U.S.C. 162. Thus, no plant patent granted under the provisions of 35 U.S.C. 161-164 need be supported by a deposit. As with other biological material deposited for purposes of patents for inventions under 35 U.S.C. 101, the deposit of plant material together with the written specification must enable those skilled in the art to make and use the claimed invention.

As with some types of reproducible biological material, seeds can be reproduced only after a growing season which may be relatively long. Although the rules do not specify a specific number of seeds to be deposited to meet the requirements of these rules, the Office will consider 2500 to be a minimum number in the normal case, but will give an applicant the opportunity to provide justification why a lesser number would be suitable under the circumstances of a particular case. The Department of Agriculture requires a deposit of 2500 seeds for the grant of a Plant Variety Protection Certificate. As the reproduction of seeds will often take a substantial period of time, the Office will require, at a minimum, a number of seeds that is likely to satisfy demand for samples once the patent is granted.

Section 1.801 does not attempt to identify what biological material either needs to be or may be deposited to comply with the requirements of 35 U.S.C. 112. For the most part, this issue must be addressed on a case-by-case basis. Thus, while the Office does not presently contemplate that there would be any situations where a material that is not capable of self-replication either directly or indirectly would be acceptable as a deposit, an applicant is clearly not precluded in any given application, by these rules, from attempting to show why the deposit of such a material should be acceptable to satisfy the requirements of 35 U.S.C. 112.

##### NEED OR OPPORTUNITY TO MAKE A DEPOSIT [ § 1.802]

This section permits a deposit of a biological material to be referenced in a patent application where an invention is, or relies on, a biological material. The invention may rely on a biological material for the purposes of making or using the invention, either as a preferred mode or an alternative mode of operation. It is not necessary, for the purposes of paragraph (a), that a deposit be required to satisfy the requirements of 35 U.S.C. 112 before a reference to a deposit is permitted in the specification.

There is no necessary implication or presumption that can or should be made about the need for a deposit simply because reference to a deposit is made in an application disclosure. As noted in paragraph (b), biological material need not be deposited



unless access to such material is necessary for the satisfaction of the statutory requirements for patentability under 35 U.S.C. 112 and that access is not otherwise available in the absence of a deposit. Where a deposit is required to provide the necessary access, a deposit is acceptable for patent purposes only where it is made in accordance with these regulations. Even where access to biological material is required to satisfy these statutory requirements, a deposit may not be necessary if access sufficient to satisfy these requirements is otherwise available.

For example, applicant could show that the biological material is known and readily available to the public. The concepts of "known and readily available" are considered to reflect a level of public accessibility to a necessary component of an invention disclosure that is consistent with an ability to make and use the invention. To avoid the need for a deposit on this basis, the biological material must be both known and readily available - neither concept alone is sufficient. A material may be known in the sense that its existence has been published, but is not available to those who wish to obtain that particular known biological material. Likewise, a biological material may be available in the sense that those having possession of it would make it available upon request, but no one has been informed of its existence.

By showing that a biological material is known and readily available or by making a deposit in accordance with these rules, applicant does not guarantee that such biological material will be available forever. Public access during the term of the patent may affect the enforceability of the patent. Although there is a public interest in the availability of a deposited biological material during and after the period of enforceability of the patent, the examiner need not be unduly concerned about continued access to the public. Unless there is a reasonable basis to believe that the biological material will cease to be available during the life of the patent, the examiner should accept current availability as satisfying the requirement. The incentives provided by the patent system should not be constrained by the mere possibility that a disclosure that was once enabling would become non-enabling over a period of time through no fault of the patentee. *In re Metcalfe*, 410 F.2d 1378, 161 USPQ 789 (CCPA 1969).

There are many factors that may be used as indicia that a biological material is known and readily available to the public. Relevant factors include commercial availability, references to the biological material in printed publications, declarations of accessibility by those working in the field, evidence of predictable isolation techniques, or an existing deposit made in accordance with these rules. Each factor may or may not be sufficient alone to demonstrate that the biological material is known and readily available. Those applicants that rely on evidence of accessibility other than a deposit take the risk that the patent may no longer be enforceable if the biological material necessary to satisfy the requirements of 35 U.S.C. 112 ceases to become accessible.

The Office will accept commercial availability as evidence that a biological material is known and readily available only when the evidence is clear and convincing that the public has access to the material. A product could be commercially available but only at a price that effectively eliminates accessibility to those desiring to obtain a sample. The relationship between an applicant relying on a biological material and the commercial supplier relied upon is one factor that would be considered in determining whether the biological material was known and readily available. However, the mere fact that the biological material was available only through the patent holder or the patent holder's agents or assigns shall not, by itself, justify a finding that the necessary material is not readily available, absent reason to believe that access to the biological material would later be improperly restricted.

The mere reference to a deposit or the biological material itself in any document or publication does not necessarily mean that the deposited biological material is readily available. Even a deposit made under the Budapest Treaty and referenced in a United States or foreign patent document would not necessarily meet the test for known and readily available unless the deposit was made under conditions which are consistent with those specified in these rules, including the one that requires, with one possible exception, that all restrictions on the accessibility will be irrevocably removed upon the granting of the patent.

Applicant may show that a deposit is not necessary even though specific biological materials are required to practice the invention if those biological materials can be made or isolated without undue experimentation. Deposits may be required to support the claims if an isolation procedure requires undue experimentation to obtain the desired biological material. *Ex Parte Jackson*, 217 USPQ 804 (PTO Bd. Pat. App. 1982) No deposit is required, however, where the required biological materials can be obtained from publicly available material with only routine experimentation and a reliable screening test. *Tabuchi v. Nubel*, 559 F.2d 1183, 194 USPQ 521 (CCPA 1977); *Ex Parte Hata*, 6 USPQ 2d 1652 (PTO Bd. Pat. App. & Int. 1987).

Once a deposit is made in a depository complying with these rules, and under conditions complying with these rules, a biological material will be considered to be readily available even though some requirement of law or regulation in the United States or in the country where the depository institution is located permits access to the material only under conditions imposed for health, safety or similar reasons. This provision is consistent with the Budapest Treaty (Article 5) and is designed to permit the patenting of inventions involving materials having restricted distribution, where the restrictions are imposed for the public, as opposed to the private, welfare.

Paragraph (c) specifically provides that the mere reference to a deposit of biological material in the specification disclosure or the actual deposit of such material does not create any presumption that such referenced or deposited material is necessary to satisfy 35 U.S.C. 112, or that a deposit in accordance with these regulations is or was required. Since reference to a biological material cannot be added to a specification disclosure after filing an application without risking the prohibited introduction of new matter (35 U.S.C. 132), applicants must be permitted to address the need to make a deposit in accordance with these regulations without jeopardizing a filing date. Thus, the examiner has the burden of showing that a deposit is required to satisfy 35 U.S.C. 112, and cannot rely on whether a deposit has been made or has been referenced in the specification disclosure to establish a prima facie case that the disclosure does not comply with 35 U.S.C. 112 without deposit.

#### ACCEPTABLE DEPOSITORY [ § 1.803 ]

This section indicates that a depository will be recognized as acceptable for the purposes of these regulations if it is either an International Depository Authority (IDA) established under the Budapest Treaty, or if it is a depository recognized as suitable by the Commissioner. After the effective date of these regulations, a deposit of biological material which is made in a depository which is not recognized as acceptable under this regulation will not be considered as satisfying the requirements of 35 U.S.C. 112. On the other hand, if a deposit is not required to satisfy the requirements of 35 U.S.C. 112, it is permissible to make reference to such a deposit even though it may not be in a depository or made under the conditions which are acceptable under these regulations. As new depositories are accepted under the Budapest Treaty or are recognized as suitable by the Commissioner, their identity will be announced in the *Official Gazette*.

An organization may be recognized as suitable by the Office if the procedure and conditions specified in paragraphs (a)(2) and (b) are followed. Generally, it is not the intention of the Office to recognize as suitable any organization where the need for a suitable depository for patent purposes is being met by depositories recognized as IDAs under the Budapest Treaty. Suitability will be judged by the Commissioner, based on need and the information supplied by the organization seeking status, and information obtained from other sources that may be consulted.

While there is a desire to provide flexibility to a patent applicant in selecting an appropriate depository, these rules are not intended to permit each patent applicant to become its own depository since both the patent owner and the public have an interest in the continued availability and accessibility of the deposit during the enforceable life of the patent, and the public has a continuing interest in its availability when the patent is no longer enforceable. The concept of a depository independent of the control of the depositor or an IDA as an acceptable depository is based on the need and desire to ensure the safe

and reliable storage of a deposited biological material under circumstances that are substantially free of the opportunity for intentional or negligent handling of the deposited material. The use of an independent depository or internationally recognized depository will tend to preserve the integrity of the deposit process against those that may accidentally alter the deposited material, may wish to tamper with the deposited material or may wish to resume control of its availability when the patent is no longer enforceable, and to preserve the interest of the public in the access to the biological material once the term of the patent expires.

When a depository having status under paragraph (a)(2) of this regulation seeks to change the kinds of biological materials that it will accept and maintain for the purposes of these rules, a communication requesting such a change should be directed to the Commissioner containing the information requested in paragraph (b). When such a change is requested, the requesting organization should provide a complete list of the kinds of biological materials it will accept.

Paragraph (d) of this section indicates that once a depository is recognized as suitable for the purposes of this rule, or has defaulted or discontinued its performance under this section, notice thereof will be published in the *Official Gazette* of the Patent and Trademark Office. A current list of IDAs recognized under the Budapest Treaty is as follows:

Agricultural Research Culture Collection (NRRL) - USA  
American Type Culture Collection (ATCC) - USA  
Australian Government Analytical Laboratories (AGAL) - Australia  
Centraalbureau Voor Schimmelcultures (CBS) - Netherlands  
Collection Nationale De Culture De Micro-organismes (CNCM) - France  
Commonwealth Agricultural Bureau (CAB), International - Mycological Institute - United Kingdom  
Culture Collection of Algae and Protozoa (CCAP) - United Kingdom  
Deutsche Sammlung Von Mikroorganismen (DSM) - Federal Republic of Germany  
European Collection of Animal Cell Cultures (ECACC) - United Kingdom  
Fermentation Research Institute (FRI) - Japan  
Institute of Micro-organism Biochemistry and Physiology of the USSR Academy of Science (IBFM) - Soviet Union  
In Vitro International, Inc. (IVI) - USA  
Mezozagdasagi Es Ipari Mikroorganizmusok Magyar Nemzeti Gyujtemenye (MIMNG) - Hungary  
National Bank for Industrial Microorganisms and Cell Cultures (NBIMCC) - Bulgaria  
National Collection of Industrial Bacteria (NCIB) - United Kingdom  
National Collection of Type Cultures (NCTC) - United Kingdom  
National Collection of Yeast Cultures (NCYC) - United Kingdom  
USSR Research Institute for Antibiotics of the USSR Ministry of the Medical and Microbiological Industry (VNIIM) - Soviet Union  
USSR Research Institute for Genetics and Industrial Micro-organism Breeding of the USSR Ministry of the Medical and Microbiological Industry (VNI Genetika) Soviet Union

#### TIME OF MAKING AN ORIGINAL DEPOSIT [ § 1.804 ]

This section specifies the time for making an original deposit to fulfill the requirements of 35 U.S.C. 112. Paragraph (a) specifies not only a permissible time frame for making an original deposit, but also specifies that the biological material deposited must be specifically identified in the application for patent as filed. The requirement for a specific identification is consistent with the description requirement of the first paragraph of 35 U.S.C. 112, and to provide an antecedent basis for the biological material which either has been or will be deposited before the patent is granted.

The description in the Lundak application as filed (now patent 4,594,325) provides a suitable illustration of the specific identification and description which is required in an application for patent as filed. In that application, an immortal B-cell line was disclosed and claimed. The cell line was referred to in

the application as filed as WI-L2-729 HF2. The methods of obtaining and using this cell line were also described in the application as filed. A deposit of the cell line was made with the American Type Culture Collection (ATCC) about a week after the application was filed in the United States. The United States Court of Appeals for the Federal Circuit held that the requirements of access by the Office to a sample of the cell line during pendency, and public access after grant, were met by Lundak's procedures. The Court further held that the addition of information designating the depository, accession number, and deposit date of the deposited cell line in ATCC after the filing date did not violate the prohibition against new matter in 35 U.S.C. 132. *In re Lundak*, 773 F.2d 1216, 227 USPQ 90 (Fed. Cir. 1985). It must be clear from the application as filed that the invention claimed and described in the specification "was fully capable of being reduced to practice (i.e., no technological problems, the resolution of which would require more than ordinary skill and reasonable time, remained in order to obtain an operative, useful process)." *Feldman v. Aunstrup*, 517 F.2d 1351, 1355; 186 USPQ 108, 113 (CCPA 1975), cert. denied, 424 U.S. 912 (1976).

When the original deposit is made after the effective filing date of an application for patent, applicant is required to promptly submit a verified statement from a person in a position to corroborate that the biological material which is deposited is a biological material specifically identified in the application (the filing date of which is relied upon) as filed. The nature of this corroboration will depend on the circumstances in the particular application under consideration, including the length of time between the application filing date and the date of deposit. While few, if any, situations can be imagined where the description requirement of 35 U.S.C. 112 can be satisfied where the biological material was not in existence at the time of filing, the rules do not preclude such a situation. There is no requirement in the patent law that an actual reduction to practice occur as a condition precedent to filing a patent application. The requirement for a verified statement is not necessary under paragraph (b) of this section if the person making the statement is an attorney or agent registered to practice before the Office.

For the purposes of complying with the requirements of 35 U.S.C. 112, a deposit of a biological material may be made at any time before filing the application for patent or during the pendency of the application subject to the conditions of § 1.809. Where the deposit is needed to satisfy the requirement of 35 U.S.C. 112 and is made during the pendency of the application, it must be made no later than the time period set by the examiner at the time the Notice of Allowance and Issue Fee Due is mailed. A necessary deposit need not be made by applicant until the application is in condition for allowance so long as applicant provides a written assurance that an acceptable deposit will be made on or before the payment of the issue fee. This written assurance must provide sufficiently detailed information to convince the examiner that there is no outstanding issue regarding deposits that needs to be resolved.

Those applicants intending to file patent applications in a country foreign to the United States relying upon biological material that must be deposited to satisfy the requirements of 35 U.S.C. 112 when the application is filed in the United States are cautioned that in many countries the deposit must be made before the filing date of the priority application in order to obtain foreign priority rights. Thus, while the deposit of a biological material subsequent to the effective filing date of a United States application is sufficient to comply with 35 U.S.C. 112, an applicant may not be able to rely on the filing date of such a U.S. application if a patent is sought in a country foreign to the United States.

#### REPLACEMENT OR SUPPLEMENT OF DEPOSIT [ § 1.805 ]

This section relates to the deposit of a biological material to replace or supplement a previous deposit. The term "replacement" is directed to those situations where one deposit is being substituted for another. An applicant may have greater latitude in replacing a deposit during the pendency of an application than after the patent is granted. Replacement will typically take place where the earlier deposit is no longer viable. The term "supplement" is directed to those situations where the earlier deposit is still viable in the sense that it is alive and capable



of replication either directly or indirectly, but has lost a quality (e.g., purity, functionality) it allegedly possessed at the time the application was filed. The procedures in these rules contemplate that only the original depositor would have a right to replace or supplement the original deposit.

Paragraph (a) relates to the procedure for replacing or supplementing a deposit with respect to a pending application or a patent. An applicant for patent or patent owner whose patent is the subject of a reissue application or reexamination proceeding is required to notify the Office when it obtains information that the depository possessing a deposit either cannot furnish samples thereof or can furnish samples thereof but the deposit has become contaminated or has lost its capability to function as described in the specification. When the Office is so notified or otherwise becomes aware of such information, the need for making a replacement or supplemental deposit will be determined by the same considerations used to determine the need for an original deposit under § 1.802(b).

A replacement or supplemental deposit made in connection with a pending application for patent will be accepted if it meets all the requirements for making an original deposit. It should be noted that for a pending application for patent, applicant need not replace or supplement the identical material previously deposited, but may make an original deposit of a biological material which is specifically identified and described in the application as filed. Whether this alternative deposit will meet the requirements of 35 U.S.C. 112 with respect to the claimed subject matter must be resolved by the examiner on a case-by-case basis.

A replacement or supplemental deposit made in connection with a patent, whether or not it is the subject of a pending reissue application or reexamination proceeding, shall not be recognized in any Office proceeding unless a certificate of correction under § 1.323 is requested by the patent owner which meets the terms of paragraphs (b) and (c) of this section. These paragraphs specify the procedures that a patent owner must follow to ensure both that a replacement or supplemental deposit will be recognized in any Office proceeding and that a certificate of correction under this section containing "up to date" information about a deposited biological material will be granted. The term "recognized in any Office proceeding" as used in this section includes the proceeding in which a request for certificate of correction under this section is acted upon. Paragraph (b) describes the information which must be contained in the certificate of correction, whereas paragraph (c) describes when the request must be made and the information which must be provided in the request to make the correction. The rules require, *inter alia*, that replacement or supplement of a deposit be made diligently, followed by prompt request thereafter for a certificate of correction, as conditions precedent to being recognized in any Office proceeding. Thus, for example, if a patent owner learns early during the term of the patent that the depository cannot furnish samples of a deposit described in the patent and the patent owner fails to both diligently make a replacement deposit and promptly thereafter request a certificate of correction under these rules, a replacement deposit made years later when the patent becomes the subject of a reissue application or reexamination proceeding will not be recognized by the Office nor will any request for certificate of correction in connection with that deposit be granted.

Where a proper request for certificate of correction is made and has been granted, any correction made to the original patent will be automatically incorporated into any reissued or reexamined patent unless changes are made during examination of the reissue application or reexamination proceeding.

Paragraph (d) of § 1.805 sets forth the Office position that the failure to make a replacement deposit or, in the case of a patent, diligently make a replacement deposit and promptly thereafter request a certificate of correction which meets the terms of paragraphs (b) and (c) of this section, after notification that samples of an earlier deposit cannot be furnished, shall cause the application or patent involved to be treated in any Office proceeding as if no deposit were made.

Paragraph (e) thereof indicates that the Office will apply a rebuttable presumption of an identity between the replacement deposit and an original deposit where a patent making reference to the deposit is relied on during any Office proceeding. This means that where a replacement deposit is permitted and made, the examiner will assume that the same material as described

in the patent is accessible from the identified depository unless evidence to the contrary comes to the attention of the Office.

An applicant for patent may make a replacement or supplemental deposit during the pendency of the application for any reason. The provisions of paragraph (f) of § 1.805 recognize that since an original deposit may be made during the pendency of the application subject to the conditions of § 1.809, a replacement or supplemental deposit logically cannot be held to any higher standard or any further requirements. Likewise, the provisions of paragraph (g) indicate that neither a replacement nor a supplemental deposit need be made where, at the point in time when replacement or supplement would otherwise be necessary, access to the necessary biological material was otherwise available. For example, a replacement or supplemental deposit would not be required under the circumstances where access to the necessary biological material was established through commercial suppliers.

The provisions of paragraph (h) of § 1.805 indicate that a replacement deposit is not required even though the depository cannot furnish samples, under certain conditions, to those requesting a sample outside of the jurisdiction where the depository is located. The conditions are specified in this paragraph as being limited to national security, health or environmental safety reasons.

Finally, paragraph (i) of this section indicates that the Office will not recognize in any Office proceeding a replacement deposit made by the patent owner where the depository could furnish samples of the deposit being replaced. The best evidence of what was originally deposited should not be lost through destruction or replacement if made in association with an existing patent. A supplemental deposit may be accepted in an Office proceeding, however, depending on the circumstances in each case.

#### TERM OF DEPOSIT [ § 1.806 ]

The term of deposit must satisfy the requirements of the Budapest Treaty which sets a term of at least 30 years from the date of deposit and at least five (5) years after the most recent request for the furnishing of a sample of the deposit was received by the depository. In the event that the 30-year term covers the 17-year term of the patent plus six (6) years to include the Statute of Limitations, no further requirement is necessary. The mere possibility of patent term extension or extended litigation involving the patent should not be considered in this analysis.

In the event that the 30-year term of deposit measured from the date of deposit would necessarily terminate within the period of enforceability of the patent (normally the 17-year term plus six (6) years), samples must be stored under agreements that would make them available beyond the enforceable life of the patent for which the deposit was made. No requirement should be made as to any particular period of time beyond the enforceable life of the patent. The purpose of the requirement is to insure that a deposited biological material necessary for the practice of a patented invention would be available to the public after expiration of the patent for which the deposit was made. The term of the deposit must comply with the requirements of each sentence of § 1.806 whether or not the deposit is made under the Budapest Treaty. A specific statement that the deposit complies with the second sentence of this section is required only where the 30-year term would terminate within the enforceable life of the patent.

#### VIABILITY OF DEPOSITS [ § 1.807 ]

This section requires that the deposit of biological material that is capable of self-replication either directly or indirectly must be viable at the time of deposit and during the term of deposit. This requirement for viability is essentially a requirement that the deposited material is capable of reproduction. For the purpose of making a deposit under these rules, there is no requirement that evidence be provided that the deposited material is capable or has the ability to perform any function described in the patent application. However, as with any other issue of description or enablement, if the examiner has evidence or reason to question the objective statements made in the patent application, applicants may be required to demonstrate

that the deposited biological material will perform in the manner described.

Under the Budapest Treaty, there is a requirement that the deposit be tested for viability before it is accepted. Thus, a mere statement by applicant, an authorized representative of applicant or the assignee that the deposit has been accepted under the Budapest Treaty would satisfy § 1.807.

For each deposit which is not made under the Budapest Treaty, a viability statement must be filed in the patent application and contain the information listed in paragraph (b) of this section. Under paragraph (c), the examiner will accept the conclusion set forth in a viability statement which is issued by a depository recognized under § 1.803(a). If the viability test indicates that the deposit is not viable upon receipt, or the examiner cannot for scientific or other valid reasons accept the statement of viability received from the applicant, the examiner shall so notify the applicant stating the reasons for not accepting the statement and proceed with the examination process as if no deposit had been made.

#### FURNISHING OF SAMPLES [ § 1.808 ]

This section requires that the deposit of biological material be made under two (2) conditions:

- (1) access to the deposit will be available during pendency of the patent application making reference to the deposit to one determined by the Commissioner to be entitled thereto under § 1.14 and 35 U.S.C. 122, and
- (2) with one exception, that all restrictions imposed by the depository on the availability to the public of the deposited biological material will be irrevocably removed upon the granting of the patent.

The one exception that is permitted is specified in paragraph (b) of this section which permits the depositor to contract with the depository to require that samples of a deposited biological material shall be furnished only if a request for a sample, during the term of the patent meets any one or all of the three conditions specified in this paragraph. These conditions are:

- (1) the request is in writing or other tangible form and dated; and/or
- (2) the request contains the name and address of the requesting party and the accession number of the deposit; and/or
- (3) the request is communicated in writing by the depository to the depositor along with the date on which the sample was furnished and the name and address of the party to whom the sample was furnished.

It should be noted that this exception to the general rule that all restrictions will be removed must be strictly followed and that no variations of this explicit exception will be accepted as meeting the conditions of this section. This exception is consistent with the provisions in the Budapest Treaty and its implementing regulations (Rule 11.4).

Since the mere description of a deposit or identity of a deposit in a patent specification is not necessarily an indication that a requirement for deposit was made or that a deposit which complies with these rules has been made, accessibility to a deposited material referenced in a patent may depend on the satisfaction of conditions not apparent on the face of the patent. For these reasons, and upon request made to the Patent and Trademark Office, the Office will certify whether a deposit has been stated to have been made under conditions which would make it available to the public as of the issue date of the patent grant provided the request is made to the Director of Patent Examining Group 180, and contains the following information:

- (1) the name and address of the depository
- (2) the accession number given to the deposit
- (3) the patent number and issue date of the patent referring to the deposit and
- (4) the name and address of the requesting party.

For those deposits made pursuant to the Budapest Treaty, the World Intellectual Property Organization provides a form (Form BP-12) for requesting a certification of the availability of samples of deposited microorganisms pursuant to Rule 11.3(a) of the regulations under the Budapest Treaty. Copies

of this form are available from the Director of Patent Examining Group 180.

#### EXAMINATION PROCEDURES [ § 1.809 ]

This section sets forth procedures that will be used by the examiner to address a deposit issue. Deposit issues may arise in the examination of claims in applications for patent and for reissue of a patent, and in the examination of new or amended claims in a reexamination proceeding. The burden is initially on the Office to establish that access to a biological material is necessary for the satisfaction of the statutory requirements for patentability under 35 U.S.C. 112. Once the Office has met this burden, the burden shifts to the applicant or patent owner to demonstrate that access to such biological material either is not necessary or is already available, or that a deposit of such material is being or will be made, replaced or supplemented in accordance with these regulations.

Under paragraph (a) of this section, once the examiner has determined that access to a biological material is necessary, and that access is not presently available in accordance with these regulations, the examiner should make an appropriate rejection under 35 U.S.C. 112.

The applicant or patent owner may respond, pursuant to paragraph (b)(2) of this section, to a rejection made under paragraph (a) thereof by arguing why a deposit is not needed under the circumstances and/or why a deposit actually made should be acceptable. Other prescribed responses which are available to such a rejection depend upon whether the rejection is made in an application for patent, on the one hand, or in a proceeding involving a patent, i.e., an application for reissue patent or reexamination proceeding, on the other hand.

In an application for patent, applicant may respond, pursuant to paragraph (b)(1) of this section, by either making an acceptable original, replacement or supplemental deposit in accordance with these regulations, or assuring the Office in writing that an acceptable deposit will be made on or before the date of payment of the issue fee. In a proceeding involving a patent, the patent owner may respond, pursuant to paragraph (b)(1) of this section, by requesting a certificate of correction of the patent which meets the terms of paragraphs (b) and (c) of § 1.805. In all cases, any other response shall be considered non-responsive. The rejection will be repeated and made final until the requirements of paragraph (b)(1) of this section are satisfied or the examiner is convinced that a deposit is not required for the claimed subject matter.

As set forth in paragraph (c) of this section, in the event that an application for patent is otherwise in condition for allowance except for a needed deposit and the Office has received a written assurance that an acceptable deposit will be made, the Office will mail to the applicant a requirement that the needed deposit be made within three (3) months together with the Notice of Allowance and Issue Fee Due. Although the period for paying the issue fee cannot be extended under the provisions of § 1.136, the period for satisfying the requirement to make an acceptable deposit may be extended under the provisions of that section. Failure to make the needed deposit in accordance with this requirement may be considered a failure to prosecute the application under 35 U.S.C. 133 and result in abandonment of the application.

The type of written assurance which will be considered acceptable by the Office that an acceptable deposit will be made within the required time must include sufficient information to conclude that there is no outstanding issue with regard to the deposit of an appropriate biological material under conditions which satisfy these rules.

In a proceeding involving a patent, it may not be possible to request a certificate of correction of the patent which meets the terms of paragraphs (b) and (c) of § 1.805. For example, if the patent owner is on notice that samples of an original deposit can no longer be furnished by the depository, failure to diligently make a replacement deposit will preclude grant of a certificate of correction. A replacement deposit subsequently made will not be recognized by the Office nor will a request for certificate of correction, even if made promptly thereafter, be granted. It would also not be possible to request a certificate of correction of the patent which meets the terms of paragraphs (b) and (c) of § 1.805 where no original deposit was made



before or during the pendency of the application which matured into the patent.

A patent defective because of lack of a necessary deposit is necessarily fatally defective for failure to comply with the first paragraph of 35 U.S.C. 112. Reissue is not available in such cases. See *In re Hay*, 534 F.2d 917, 189 USPQ 790 (CCPA 1976). Whether reissue is available where a biological material necessary for compliance with 35 U.S.C. 112 was known and readily available at the time of issuance of the patent and subsequently ceased to be readily available is problematic. Nevertheless, the rules do not provide for post-issue original deposits.

Where an applicant for patent has any doubt whether access to a biological material specifically identified in the specification is necessary to satisfy 35 U.S.C. 112 or whether such a material, while presently freely available, may become unavailable in the future, the applicant would be well-advised to make a deposit thereof before any patent issues. Similarly, where a patent owner has any doubt whether a deposit referred to in the specification is of a biological material necessary to satisfy 35 U.S.C. 112 and, if the material is necessary, whether it is otherwise known and readily available, the patent owner would be well-advised to follow the procedures set forth in paragraphs (b) and (c) of 1.805 after receiving the notice specified in those paragraphs.

Paragraph (d) of this section sets forth the requirements for the content of the specification with respect to a deposited biological material. Specifically, the specification shall contain the accession number for the deposit, the date of the deposit, the name and address of the depository, and a description of the deposited biological material sufficient to specifically identify it and to permit examination. The description must be sufficient to permit verification that the deposited biological material is in fact that disclosed. Once the patent issues, the description must be sufficient to aid in the resolution of questions of infringement. As a general rule, the more information that is provided about a particular deposited biological material, the better the examiner will be able to compare the identity and characteristics of the deposited biological material with the prior art.

#### OTHER CONSIDERATIONS

The rules are in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel has certified to the Chief Counsel for Advocacy, Small Business Administration, that this rule change is not expected to have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The deposit practice will not impose extra work on patent applicants (whether small or large businesses or individuals).

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than \$100 million. There will be no major increases in costs or prices for consumers, individual industries, Federal, State or local government agencies, or geographic regions. There will be no adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Patent and Trademark Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rules contain a collection of information requirement subject to the Paperwork Reduction Act which has been approved by the Office of Management and Budget under Control No. 0651-0022. Public reporting burden for this collection of information is estimated to average one hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed to make a deposit or request a sample, and completing and reviewing the collection of information. It is further estimated that a respondent depository would spend about five hours collecting and submitting the necessary information to

be recognized as a suitable depository by the Office. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Organization, Patent and Trademark Office, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503 (Paperwork Reduction Project 0651-0022). No comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, were received in response to the notice of proposed rulemaking.

#### LIST OF SUBJECTS IN 37 CFR PART 1

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Reporting and record-keeping requirements, Small business.

For the reasons set out in the preamble, 37 CFR Part 1 is being amended as follows:

#### PART 1-RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6 unless otherwise noted.

2. A new Subpart G - Biotechnology Invention Disclosures, consisting of centered heading - Deposit of Biological Materials - and new §§ 1.801 to 1.809 are added to read as follows:

#### Subpart G - Biotechnology Invention Disclosures

##### Deposit of Biological Material

##### Sec.

- 1.801 Biological material.
- 1.802 Need or Opportunity to make a deposit.
- 1.803 Acceptable depository.
- 1.804 Time of making an original deposit.
- 1.805 Replacement or supplement of deposit.
- 1.806 Term of deposit.
- 1.807 Viability of deposit.
- 1.808 Furnishing of samples.
- 1.809 Examination procedures.

#### Subpart G - Biotechnology Invention Disclosures

Authority: 35 U.S.C. 6

##### Deposit of Biological Material

##### § 1.801 Biological material.

For the purposes of these regulations pertaining to the deposit of biological material for purposes of patents for inventions under 35 U.S.C. 101, the term biological material shall include material that is capable of self-replication either directly or indirectly. Representative examples include bacteria, fungi including yeast, algae, protozoa, eukaryotic cells, cell lines, hybridomas, plasmids, viruses, plant tissue cells, lichens and seeds. Viruses, vectors, cell organelles and other non-living material existing in and reproducible from a living cell may be deposited by deposit of the host cell capable of reproducing the non-living material.

##### § 1.802 Need or Opportunity to make a deposit.

(a) Where an invention is, or relies on, a biological material, the disclosure may include reference to a deposit of such biological material.

(b) Biological material need not be deposited unless access to such material is necessary for the satisfaction of the statutory requirements for patentability under 35 U.S.C. 112. If a deposit is necessary, it shall be acceptable if made in accordance with these regulations. Biological material need not be deposited, *inter alia*, if it is known and readily available to the public or can be made or isolated without undue experimentation. Once deposited in a depository complying with these regulations, a biological material will be considered to be readily available

even though some requirement of law or regulation of the United States or of the country in which the depository institution is located permits access to the material only under conditions imposed for safety, public health or similar reasons.

(c) The reference to a biological material in a specification disclosure or the actual deposit of such material by an applicant or patent owner does not create any presumption that such material is necessary to satisfy 35 U.S.C. 112 or that deposit in accordance with these regulations is or was required.

##### § 1.803 Acceptable depository.

(a) A deposit shall be recognized for the purposes of these regulations if made in

(1) any International Depository Authority (IDA) as established under the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, or

(2) any other depository recognized to be suitable by the Office. Suitability will be determined by the Commissioner on the basis of the administrative and technical competence, and agreement of the depository to comply with the terms and conditions applicable to deposits for patent purposes. The Commissioner may seek the advice of impartial consultants on the suitability of a depository. The depository must:

- (i) Have a continuous existence;
- (ii) Exist independent of the control of the depository;
- (iii) Possess the staff and facilities sufficient to examine the viability of a deposit and store the deposit in a manner which ensures that it is kept viable and uncontaminated;
- (iv) Provide for sufficient safety measures to minimize the risk of losing biological material deposited with it
- (v) Be impartial and objective;
- (vi) Furnish samples of the deposited material in an expeditious and proper manner; and
- (vii) Promptly notify depositors of its inability to furnish samples, and the reasons why.

(b) A depository seeking status under paragraph (a)(2) of this section must direct a communication to the Commissioner which shall:

- (1) Indicate the name and address of the depository to which the communication relates;
- (2) Contain detailed information as to the capacity of the depository to comply with the requirements of paragraph (a)(2) of this section, including information on its legal status, scientific standing, staff and facilities;
- (3) Indicate that the depository intends to be available, for the purposes of deposit, to any depositor under these same conditions;
- (4) Where the depository intends to accept for deposit only certain kinds of biological material, specify such kinds;
- (5) Indicate the amount of any fees that the depository will, upon acquiring the status of suitable depository under paragraph (a)(2) of this section, charge for storage, viability statements and furnishings of samples of the deposit.

(c) A depository having status under paragraph (a)(2) of this section limited to certain kinds of biological material may extend such status to additional kinds of biological material by directing a communication to the Commissioner in accordance with paragraph (b) of this section. If a previous communication under paragraph (b) of this section is of record, items in common with the previous communication may be incorporated by reference.

(d) Once a depository is recognized to be suitable by the Commissioner or has defaulted or discontinued its performance under this section, notice thereof will be published in the *Official Gazette* of the Patent and Trademark Office.

##### § 1.804 Time of making an original deposit.

(a) Whenever a biological material is specifically identified in an application for patent as filed, an original deposit thereof may be made at any time before filing the application for patent or, subject to § 1.809, during pendency of the application for patent.

(b) When the original deposit is made after the effective filing date of an application for patent, the applicant shall promptly submit a verified statement from a person in a position to corroborate the fact, and shall state, that the biological mate-

rial which is deposited is a biological material specifically identified in the application as filed, except if the person is an attorney or agent registered to practice before the Office, in which case the statement need not be verified.

##### § 1.805 Replacement or supplement of deposit.

(a) A depositor, after receiving notice during the pendency of an application for patent, application for reissue patent or reexamination proceeding, that the depository possessing a deposit either cannot furnish samples thereof or can furnish samples thereof but the deposit has become contaminated or has lost its capability to function as described in the specification, shall notify the Office in writing, in each application for patent or patent affected. In such a case, or where the Office otherwise learns, during the pendency of an application for patent, application for reissue patent or reexamination proceeding, that the depository possessing a deposit either cannot furnish samples thereof or can furnish samples thereof but the deposit has become contaminated or has lost its capability to function as described in the specification, the need for making a replacement or supplemental deposit will be governed by the same considerations governing the need for making an original deposit under the provisions set forth in § 1.802(b). A replacement or supplemental deposit made during the pendency of an application for patent shall not be accepted unless it meets the requirements for making an original deposit under these regulations, including the requirement set forth under § 1.804(b). A replacement or supplemental deposit made in connection with a patent, whether or not made during the pendency of an application for reissue patent or a reexamination proceeding or both, shall not be accepted unless a certificate of correction under § 1.323 is requested by the patent owner which meets the terms of paragraphs (b) and (c) of this section.

(b) A request for certificate of correction under this section shall not be granted unless the certificate identifies:

- (1) The accession number for the replacement or supplemental deposit;
  - (2) The date of the deposit; and
  - (3) The name and address of the depository.
- (c) A request for a certificate of correction under this section shall not be granted unless the request is made promptly after the replacement or supplemental deposit has been made and:
- (1) Includes a verified statement of the reason for making the replacement or supplemental deposit;
  - (2) Includes a verified statement from a person in a position to corroborate the fact, and shall state, that the replacement or supplemental deposit is of a biological material which is identical to that originally deposited;
  - (3) Includes a verified showing that the patent owner acted diligently—

(i) In the case of a replacement deposit, in making the deposit after receiving notice that samples could no longer be furnished from an earlier deposit, or

(ii) In the case of a supplemental deposit, in making the deposit after receiving notice that the earlier deposit had become contaminated or had lost its capability to function as described in the specification;

(4) Includes a verified statement that the term of the replacement or supplemental deposit expires no earlier than the term of the deposit being replaced or supplemented; and

(5) Otherwise establishes compliance with these regulations, except that if the person making one or more of the required statements or showing is an attorney or agent registered to practice before the Office, that statement or showing need not be verified.

(d) A depositor's failure to replace a deposit, or in the case of a patent, to diligently replace a deposit and promptly thereafter request a certificate of correction which meets the terms of paragraphs (b) and (c) of this section, after being notified that the depository possessing the deposit cannot furnish samples thereof, shall cause the application or patent involved to be treated in any Office proceeding as if no deposit were made.

(e) In the event a deposit is replaced according to these regulations, the Office will apply a rebuttable presumption of identity between the original and the replacement deposit where a patent making reference to the deposit is relied upon during any Office proceeding.



(f) A replacement or supplemental deposit made during the pendency of an application for patent may be made for any reason.

(g) In no case is a replacement or supplemental deposit of a biological material necessary where the biological material, in accordance with 1.802(b), need not be deposited.

(h) No replacement deposit of a biological material is necessary where a depository can furnish samples thereof but the depository for national security, health or environmental safety reasons is unable to provide samples to requesters outside of the jurisdiction where the depository is located.

(i) The Office will not recognize in any Office proceeding a replacement deposit of a biological material made by a patent owner where the depository could furnish samples of the deposit being replaced.

#### § 1.806 Term of deposit.

A deposit made before or during pendency of an application for patent shall be made for a term of at least thirty (30) years and at least five (5) years after the most recent request for the furnishing of a sample of the deposit was received by the depository. In any case, samples must be stored under agreements that would make them available beyond the enforceable life of the patent for which the deposit was made.

#### § 1.807 Viability of deposit.

(a) A deposit of biological material that is capable of self-replication either directly or indirectly must be viable at the time of deposit and during the term of deposit. Viability may be tested by the depository. The test must conclude only that the deposited material is capable of reproduction. No evidence is necessarily required regarding the ability of the deposited material to perform any function described in the patent application.

(b) A viability statement for each deposit of a biological material defined in paragraph (a) of this section not made under the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure must be filed in the application and must contain:

- (1) The name and address of the depository;
- (2) The name and address of the depositor;
- (3) The date of deposit;
- (4) The identity of the deposit and the accession number given by the depository;
- (5) The date of the viability test;
- (6) The procedures used to obtain a sample if the test is not done by the depository; and
- (7) A statement that the deposit is capable of reproduction.

(c) If a viability test indicates that the deposit is not viable upon receipt, or the examiner cannot, for scientific or other valid reasons, accept the statement of viability received from the applicant, the examiner shall proceed as if no deposit has been made. The examiner will accept the conclusion set forth in a viability statement issued by a depository recognized under § 1.803(a).

#### § 1.808 Furnishing of samples.

(a) A deposit must be made under conditions that assure that:

(1) Access to the deposit will be available during pendency of the patent application making reference to the deposit to one determined by the Commissioner to be entitled thereto under § 1.14 and 35 U.S.C. 122, and

(2) Subject to paragraph (b) of this section, all restrictions imposed by the depositor on the availability to the public of the deposited material will be irrevocably removed upon the granting of the patent.

(b) The depositor may contract with the depository to require that samples of a deposited biological material shall be furnished only if a request for a sample, during the term of the patent:

- (1) Is in writing or other tangible form and dated;
- (2) Contains the name and address of the requesting party and the accession number of the deposit; and
- (3) Is communicated in writing by the depository to the depositor along with the date on which the sample was furnished

and the name and address of the party to whom the sample was furnished.

(c) Upon request made to the Office, the Office will certify whether a deposit has been stated to have been made under conditions which make it available to the public as of the issue date of the patent grant provided the request contains:

- (1) The name and address of the depository;
- (2) The accession number given to the deposit;
- (3) The patent number and issue date of the patent referring to the deposit; and
- (4) The name and address of the requesting party.

#### § 1.809 Examination procedures.

(a) The examiner shall determine pursuant to § 1.104 in each application for patent, application for reissue patent or reexamination proceeding if a deposit is needed, and if needed, if a deposit actually made is acceptable for patent purposes. If a deposit is needed and has not been made or replaced or supplemented in accordance with these regulations, the examiner, where appropriate, shall reject the affected claims under the appropriate provision of 35 U.S.C. 112, explaining why a deposit is needed and/or why a deposit actually made cannot be accepted.

(b) The applicant for patent or patent owner shall respond to a rejection under paragraph (a) of this section by:

(1) In the case of an applicant for patent, making an acceptable original or replacement or supplemental deposit or assuring the Office in writing that an acceptable deposit will be made on or before the date of payment of the issue fee, or, in the case of a patent owner, requesting a certificate of correction of the patent which meets the terms of paragraphs (b) and (c) of § 1.805, or

(2) Arguing why a deposit is not needed under the circumstances of the application or patent considered and/or why a deposit actually made should be accepted. Other replies to the examiner's action shall be considered non-responsive. The rejection will be repeated until either paragraph (b)(1) of this section is satisfied or the examiner is convinced that a deposit is not needed.

(c) If an application for patent is otherwise in condition for allowance except for a needed deposit and the Office has received a written assurance that an acceptable deposit will be made on or before payment of the issue fee, the Office will mail to the applicant a Notice of Allowance and Issue Fee Due together with a requirement that the needed deposit be made within three months. The period for satisfying this requirement is extendable under § 1.136. Failure to make the needed deposit in accordance with this requirement will result in abandonment of the application for failure to prosecute.

(d) For each deposit made pursuant to these regulations, the specification shall contain:

- (1) The accession number for the deposit;
- (2) The date of the deposit;
- (3) A description of the deposited biological material sufficient to specifically identify it and to permit examination; and
- (4) The name and address of the depository.

Dated: July 21, 1989

DONALD J. QUIGG  
Assistant Secretary and Commissioner  
of Patents and Trademarks

[1106 OG 37]

#### (74) Means Or Step Plus Function Limitation Under 35 U.S.C. § 112, 6th Paragraph

The following guidelines have been distributed to patent examiners for guidance on examining practice and procedure relating to limitations falling under 35 U.S.C. § 112, 6th paragraph, after *In re Donaldson*, 29 USPQ2d 1845 (Fed. Cir. 1994). These guidelines will be incorporated into the Manual of Patent Examining Procedure.

April 20, 1994

CHARLES E. VAN HORN  
Patent Policy and Projects Administrator

#### Examination Guidelines For Claims Reciting A "Means or Step Plus Function" Limitation In Accordance With 35 U.S.C. § 112, 6th Paragraph

The purpose of this memo is to set forth guidelines for the examination of § 112, 6th paragraph "means or step plus function" limitations in a claim. The court of Appeals for the Federal Circuit, in its en banc decision *In re Donaldson*, 29 USPQ2d 1845 (Fed. Cir. 1994), decided that a "means-or-step-plus-function" limitation should be interpreted in a manner different than patent examining practice has dictated for at least the last forty-two years. The *Donaldson* decision affects only the manner in which the scope of a "means or step plus function" limitation in accordance with § 112, 6th paragraph, is interpreted during examination. *Donaldson* does not directly affect the manner in which any other section of the patent statutes is interpreted or applied. When making a determination of patentability under 35 U.S.C. §§ 102 or 103, past practice was to interpret a "means or step plus function" limitation by giving it the "broadest reasonable interpretation." Under the PTO's long-standing practice this meant interpreting such a limitation as reading on any prior art means or step which performed the function specified in the claim without regard for whether the prior art means or step was equivalent to the corresponding structure, material or acts described in the specification. However, in *Donaldson* the Federal Circuit stated that: Per our holding, the "broadest reasonable interpretation" that an examiner may give means-plus-function language is that statutorily mandated in paragraph six. Accordingly, the PTO may not disregard the structure disclosed in the specification corresponding to such language when rendering a patentability determination.<sup>1</sup> Thus, effective immediately, examiners shall interpret a § 112, 6th paragraph "means or step plus function" limitation in a claim as limited to the corresponding structure, materials or acts described in the specification and equivalents thereof in accordance with the following guidelines.

#### I. Identifying a § 112, 6th paragraph limitation

Although there is no magic language that must appear in a claim in order for it to fall within the scope of § 112, 6th paragraph, it must be clear that the element in the claim is set forth, at least in part, by the function it performs as opposed to the specific structure, material, or acts that perform the function. Limitations that fall within the scope of § 112, 6th paragraph include: (1) a jet driving device so constructed and located on the rotor as to drive the rotor...<sup>2</sup> ["means" unnecessary]

- (2) "printing means" and "means for printing" would have the same connotations<sup>3</sup>
- (3) force generating means adapted to provide...<sup>4</sup>
- (4) call cost register means, including a digital display for providing a substantially instantaneous display for...<sup>5</sup>
- (5) reducing the coefficient of friction of the resulting film<sup>6</sup> [step plus function; "step" unnecessary], and
- (6) raising the Ph of the resultant pulp to about 5.0 to precipitate...<sup>7</sup>

In the event that it is unclear whether the claim limitation falls within the scope of § 112, 6th paragraph, a rejection under § 112, 2d paragraph may be appropriate. *Donaldson* does not affect the holding of *In re Hyatt*, 708 F.2d 712, 218 USPQ 195 (Fed. Cir. 1983) to the effect that a single means claim does not comply with the enablement requirement of § 112, first paragraph. As *Donaldson* applies only to an interpretation of a limitation drafted to correspond to § 112, 6th paragraph,

<sup>1</sup>*In re Donaldson*, 29 USPQ2d 1845, 1850 (Fed. Cir. 1994).

<sup>2</sup>The term "device" coupled with a function is a proper definition of structure in accordance with the last paragraph of § 112. The addition of the words "jet driving" to the term "device" merely renders the latter more definite and specific. *Ex parte Stanley*, 121 USPQ 621 (Bd. App. 1958).

<sup>3</sup>*Ex parte Klumb*, 159 USPQ 694 (Bd. App. 1967). However, the terms "plate" and "wing", as modifiers for the structureless term "means", specify no function to be performed, and do not fall under the last paragraph of § 112.

<sup>4</sup>*De Graffheid v. U.S.*, 20 Ct. Cl. 458, 16 USPQ2d 1321 (Ct. Cl. 1990)

<sup>5</sup>*Intellicall Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 21 USPQ2d 1383 (Fed. Cir. 1992).

<sup>6</sup>*In re Roberts*, 470 F.2d 1399, 176 USPQ 313 (CCPA 1973).

<sup>7</sup>*Ex parte Zimmerley*, 153 USPQ 367 (Bd. App. 1966).

which by its terms is limited to "an element in a claim to a combination," it does not affect a limitation in a claim which is not directed to a combination.

#### II. Examining procedure

##### A. Scope of the Search and Identification of the Prior Art

As noted above, in *Donaldson* the Federal Circuit recognized that it is important to retain the principle that claim language should be given its broadest reasonable interpretation. This principle is important because it helps insure that the statutory presumption of validity attributed to each claim of an issued patent is warranted by the search and examination conducted by the examiner. It is also important from the standpoint that the scope of protection afforded by patents issued prior to *Donaldson* are not unnecessarily limited by the latest interpretation of this statutory provision. Finally, it is important from the standpoint of avoiding the necessity for a patent specification to become a catalogue of existing technology.<sup>8</sup>

The *Donaldson* decision thus does not substantially alter examining practice and procedure relative to the scope of the search. Both before and after *Donaldson*, the application of a prior art reference to a means or step plus function limitation requires that the prior art element perform the identical function specified in the claim. However, if a prior art reference teaches identity of function to that specified in a claim, then under *Donaldson* an examiner carries the initial burden of proof for showing that the prior art structure or step is the same as or equivalent to the structure, material, or acts described in the specification which has been identified as corresponding to the claimed means or step plus function.

The "means or step plus function" limitation should be interpreted in a manner consistent with the specification disclosure. If the specification defines what is meant by the limitation for the purposes of the claimed invention, the examiner should interpret the limitation as having that meaning. If no definition is provided, some judgment must be exercised in determining the scope of the limitation.

##### B. Making a prima facie case of equivalence

If the examiner finds that a prior art element performs the function specified in the claim, and is not excluded by any explicit definition provided in the specification for an equivalent, the examiner should infer from that finding that the prior art element is an equivalent, and should then conclude that the claimed limitation is anticipated by the prior art element. The burden then shifts to applicant<sup>9</sup> to show that the element shown in the prior art is not an equivalent of the structure, material or acts disclosed in the application. *In re Mulder*, 716 F.2d 1542, 219 USPQ 189 (Fed. Cir. 1983).<sup>10</sup> The factors to be considered when determining whether the applicant has successfully met the burden of proving that the prior art element is not equivalent to the structure, material or acts described in the applicant's specification are discussed below.

<sup>8</sup>A patent specification need not teach, and preferably omits, what is well known in the art. *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1384, 231 USPQ 81, 94 (Fed. Cir. 1986).

<sup>9</sup>No further analysis of equivalents is required of the examiner until applicant disagrees with the examiner's conclusion, and provides reasons why the prior art element should not be considered an equivalent.

<sup>10</sup>See also, *In re Walter*, 618 F.2d at 768, 205 USPQ at 407-08, (a case treating § 112, 6th paragraph, in the context of a determination of statutory subject matter and noting "If the functionally-defined disclosed means and their equivalents are so broad that they encompass any and every means for performing the recited functions... the burden must be placed on the applicant to demonstrate that the claims are truly drawn to specific apparatus distinct from other apparatus capable of performing the identical functions"); *In re Swinehart*, 439 F.2d 210, 212-13, 169 USPQ 226, 229 (C.C.P.A. 1971) (a case in which the CCPA treated as improper a rejection under § 112, 2d paragraph, of functional language, but noted that "where the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be an inherent characteristic of the prior art, it possesses the authority to require the applicant to prove that the subject matter shown to be in the prior art does not possess the characteristics relied on"); and *In re Fitzgerald*, 619 F.2d 67, 205 USPQ 594 (CCPA 1980) (a case indicating that the burden of proof can be shifted to the applicant to show that the subject matter of the prior art does not possess the characteristic relied on whether the rejection is based on inherency under § 102 or obviousness under § 103).



However, even where the applicant has met that burden of proof and has shown that the prior art element is not equivalent to the structure, material or acts described in the applicant's specification, the examiner must still make a § 103 analysis to determine if the claimed means or step plus function is obvious from the prior art to one of ordinary skill in the art. Thus, while a finding of non-equivalence prevents a prior art element from anticipating a means or step plus function limitation in a claim, it does not prevent the prior art element from rendering the claim limitation obvious to one of ordinary skill in the art.

Because the exact scope of an "equivalent" may be uncertain, it would be appropriate to apply a § 102/§ 103 rejection where the balance of the claim limitations are anticipated by the prior art relied on.<sup>11</sup> In addition, although it is normally the best practice to rely on only the best prior art references in rejecting a claim, alternative grounds of rejection may be appropriate where the prior art shows elements that are different from each other, and different from the specific structure, material or acts described in the specification, yet perform the function specified in the claim.

#### C. Determining whether an applicant has met the burden of proving non-equivalence after a prima facie case is made

If the applicant disagrees with the inference of equivalence drawn from a prior art reference, the applicant may provide reasons why the applicant believes the prior art element should not be considered an equivalent to the specific structure, material or acts disclosed in the specification. Such reasons may include, but are not limited to: 1) teachings in the specification that particular prior art is not equivalent, 2) teachings in the prior art reference itself that may tend to show non-equivalence, or 3) Rule 132 affidavit evidence of facts tending to show non-equivalence.

When the applicant relies on teachings in applicant's own specification, the examiner must make sure that the applicant is interpreting the "means or step plus function" limitation in the claim in a manner which is consistent with the disclosure in the specification. If the specification defines what is meant by "equivalents" to the disclosed embodiments for the purpose of the claimed means or step plus function, the examiner should interpret the limitation as having that meaning. If no definition is provided, some judgment must be exercised in determining the scope of "equivalents." Generally, an "equivalent" is interpreted as embracing more than the specific elements described in the specification for performing the specified function,<sup>12</sup> but less than any element that performs the function specified in the claim.

The scope of equivalents embraced by a claim limitation is dependent on the interpretation of an "equivalent." The interpretation will vary depending on how the element is described in the supporting specification. The claim may or may not be limited to particular structure, material or acts (e.g. steps) as opposed to any and all structure, material or acts performing the claimed function, depending on how the specification treats that question.

If the disclosure is so broad as to encompass any and all structure, material or acts for performing the claimed function, the claims must be read accordingly when determining patentability. When this happens the limitation otherwise provided by "equivalents" ceases to be a limitation on the scope of the claim in that an equivalent would be any structure, material or act other than the ones described in the specification that perform the claimed function. For example, this situation will often be found in cases where (1) the claimed invention is a combination of elements, one or more of which are selected

from elements that are old per se, or (2) apparatus claims are treated as indistinguishable from method claims.<sup>13</sup>

On the other end of the spectrum, the "equivalents" limitation as applied to a claim may also operate to constrict the claim scope to the point of covering virtually only the disclosed embodiments. This can happen in circumstances where the specification describes the invention only in the context of a specific structure, material or act that is used to perform the function specified in the claim.

When deciding whether an applicant has met the burden of proof with respect to showing non-equivalence of a prior art element that performs the claimed function, the following factors may be considered. First, unless an element performs the identical function specified in the claim, it cannot be an equivalent for the purposes of § 112, 6th paragraph.<sup>14</sup>

Second, while there is no litmus test for an "equivalent" that can be applied with absolute certainty and predictability, there are several indicia that are sufficient to support a conclusion that one element is or is not an "equivalent" of a different element in the context of § 112, 6th paragraph. Among the indicia that will support a conclusion that one element is or is not equivalent of another are:

1) Whether the prior art element performs the function specified in the claim in substantially the same way, and produces substantially the same results as the corresponding element disclosed in the specification.<sup>15</sup>

2) Whether a person of ordinary skill in the art would have recognized the interchangeability of the element shown in the prior art for the corresponding element disclosed in the specification.<sup>16</sup>

3) Whether the prior art element is a structural equivalent of the corresponding element disclosed in the specification being examined.

<sup>17</sup>That is, the prior art element performs the function specified in the claim in substantially the same manner as the function is performed by the corresponding element described in the specification.

4) Whether the structure, material or acts disclosed in the specification represents an insubstantial change which adds nothing of significance to the prior art element.<sup>18</sup>

These examples are not intended to be an exhaustive list of the indicia that would support a finding that one element is or is not an equivalent of another element for the purposes of § 112, 6th paragraph. A finding according to any of the above examples would represent a sufficient, but not the only possible, basis to support a conclusion that an element is or is not an equivalent. There could be other indicia that also would support the conclusion.

In determining whether arguments or Rule 132 evidence presented by an applicant are persuasive that the element shown in the prior art is not an equivalent, the examiner should consider and weigh as many of the above-indicated or other indicia as are presented by applicant, and should determine whether, on balance, the applicant has met the burden of proof to show non-equivalence. However, under no circumstance should an examiner accept as persuasive a bare statement or opinion that the element shown in the prior art is not an equivalent embraced by the claim limitation. Moreover, if an applicant argues that the "means" or "step" plus function language in a claim is

<sup>11</sup>See, for example, *In re Meyer*, 688 F.2d 789, 215 USPQ 193 (1982); *In re Abele*, 618 F.2d at 768, 205 USPQ at 407-08; *In re Walter*, 618 F.2d 758, 767, 205 USPQ 397, 406-07 (C.C.P.A. 1980); *In re Mancorp*, 609 F.2d 481, 203 USPQ 812 (C.C.P.A. 1979); *In re Johnson*, 589 F.2d 1070, 200 USPQ 199 (C.C.P.A. 1978); and *In re Freeman*, 573 F.2d at 1246, 197 USPQ at 471.

<sup>12</sup>*Peenwalk Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931, 4 USPQ2d 1737 (Fed. Cir. 1987), cert. denied, 484 U.S. 961 (1988).

<sup>13</sup>*Lockheed Aircraft Corporation v. United States*, 193 USPQ 449, 461 (Cl. Ct. 1977). Graver Tank concepts of equivalents are relevant to any "equivalents" determination. *Polumbo v. Don-Joy Co.*, 762 F.2d 969, 975, n. 4, 226 USPQ 5, 8-9, n. 4 (Fed. Cir. 1985).

<sup>14</sup>*Lockheed Aircraft Corporation v. United States*, 193 USPQ 449, 461 (Cl. Ct. 1977). *Data Line Corp. v. Micro Technologies, Inc.*, 813 F.2d 1196, 1 USPQ2d 2052 (Fed. Cir. 1987).

<sup>15</sup>*In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).

<sup>16</sup>*Valmont Industries, Inc. v. Reinke Manufacturing Co. Inc.*, 983 F.2d 1039, 25 USPQ2d 1451 (Fed. Cir. 1993).

<sup>17</sup>A similar approach is authorized in the case of product-by-process claims because the exact identity of the claimed product or the prior art product cannot be determined by the examiner. *In re Brown*, 450 F.2d 531, 173 USPQ 685 (CCPA 1972).

<sup>18</sup>To interpret "means plus function" limitations as limited to a particular means set forth in the specification would nullify the provisions of § 112 requiring that the limitation shall be construed to cover the structure described in the specification and equivalents thereof. *D.M.I., Inc. v. Deere & Co.*, 755 F.2d 1570, 1574, 225 USPQ 236, 238 (Fed. Cir. 1985).

limited to certain specific structural or additional functional characteristics (as opposed to "equivalents" thereof) where the specification does not describe the invention as being only those specific characteristics, the claim should not be allowed until the claim is amended to recite those specific structural or additional functional characteristics.<sup>19</sup>

Finally, as in the past, applicant has the opportunity during proceedings before the Office to amend the claims so that the claimed invention meets all the statutory criteria for patentability. An applicant may choose to amend the claim by further limiting the function so that there is no longer identity of function with that taught by the prior art element, or the applicant may choose to replace the claimed means plus function limitation with specific structure material or acts that are not described in the prior art.

#### D. Related issues under Section 112, first or second paragraphs

The *Donaldson* decision may create some uncertainty as to what applicant regards as the invention. If this issue arises, it should be addressed in a rejection under § 112, 2d paragraph. While § 112, 6th paragraph permits a particular form of claim limitation, it cannot be read as creating an exception either to the description, enablement or best mode requirements of the paragraph or the definiteness requirement of the 2d paragraph of § 112. *In re Knowlton*, 481 F.2d 1357, 178 USPQ 486 (CCPA 1973).

If a "means or step plus function" limitation recited in a claim is not supported by corresponding structure, material or acts in the specification disclosure, the following rejections should be considered: (1) under § 112, 1st paragraph, as not being supported by an enabling disclosure because the person skilled in the art would not know how to make and use the invention without a description of elements to perform the function;<sup>20</sup> (2) under § 112, 2d paragraph, as being indefinite because the element or step is not defined in the specification by corresponding structure, material or acts; and (3) under §§ 102 or 103 where the prior art anticipates or renders obvious the claimed subject matter including the means or step that performs the function specified in the claim. [Theory: since there is no corresponding structure, etc. in the specification to limit the means or step plus function limitation, an equivalent is any element that performs the specified function].

#### III. Avoid confusion with the doctrine of equivalents

An "equivalent" for the purposes of § 112, 6th paragraph, should not be confused with the doctrine of equivalents. The doctrine of equivalents, most often associated with *Graver Tank & Mfg. Co. v. Linde Air Products*, 339 U.S. 605, 85 USPQ 328 (1950), is sometimes applied to do equity among the parties before the court in an infringement action involving an issued patent. The doctrine typically involves a three-part inquiry - whether an accused device performs substantially the same function, in substantially the same way, to obtain substantially the same result as the claimed invention. Section § 112, 6th paragraph limits the scope of the broad language of "means or step plus function" limitations, in a claim to a combination, to the structures, materials and acts described in the specification and equivalents thereof. The doctrine of equivalents equitably expands exclusive patent rights beyond the literal scope of a claim.<sup>21</sup> Accordingly, decisions involving the doctrine of equivalents should not unduly influence a deter-

<sup>19</sup>Otherwise, a claim could be allowed having broad functional language which in reality is limited to only the specific structure or steps disclosed in the specification. This would be contrary to public policy of granting patents which provide adequate notice the public as to a claim's true scope.

<sup>20</sup>The description of an apparatus with block diagrams describing the function, but not the structure, of the apparatus is not fatal under the enablement requirement of § 112, 1st paragraph, as long as the structure is conventional and can be determined without an undue amount of experimentation. *In re Ghiron*, 442 F.2d 985, 991, 169 USPQ 723, 727 (CCPA 1971).

<sup>21</sup>*Valmont Industries Inc. v. Reinke Manufacturing Co., Inc.*

mination under § 112, 6th paragraph during *ex parte* examination.

[1162 OG 59]

(75)

Department of Commerce  
Patent and Trademark Office

[Docket No. 950706172-5172-01]

Utility Examination Guidelines

Agency: Patent and Trademark Office, Commerce.

Action: Notice.

Summary: The Patent and Trademark Office (PTO) is publishing the final version of guidelines to be used by Office personnel in their review of patent applications for compliance with the utility requirement. Because these guidelines govern internal practices, they are exempt from notice and comment and delayed effective date rulemaking requirements under 5 U.S.C. § 553(b)(A).

Effective Date: July 14, 1995.

For Further Information Contact: Jeff Kushan by telephone at (703) 305-9300, by fax at (703) 305-8885, by electronic mail at kushan@uspto.gov, or by mail marked to his attention addressed to the Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231.

#### Supplementary Information

##### I. Discussion of Public Comments

Forty-four comments were received by the Office in response to the request for public comment on the proposed version of utility guidelines published on January 3, 1995 (60 FR 97). All comments have been carefully considered. A number of changes have been made to the examining guidelines and the legal analysis supporting the guidelines in response to the comments received.

Many of the individuals responding to the request for public comments suggested that the Office address the relationship between the requirements of 35 U.S.C. § 112, first paragraph, and 35 U.S.C. § 101. The Office has amended the guidelines to provide a clarification consistent with these requests. The guidelines now specify that any rejection based on a "lack of utility" under § 101 should be accompanied by a rejection based upon § 112, first paragraph. The guidelines also specify that the procedures for imposition and review of rejections based on lack of utility under § 101 shall be followed with respect to the § 112 rejection that accompanies the § 101 rejection.

A suggestion was made that the guidelines should be modified to provide that an application shall be presumed to be compliant with § 112, first paragraph, if there is no proper basis for imposing a § 101 rejection. This suggestion has not been followed. Instead, the guidelines specify that § 112, first paragraph, deficiencies other than those that are based on a lack of utility be addressed separately from those based on lack of utility for the invention.

Several individuals suggested that the guidelines address how § 101 compliance will be reviewed for products that are either intermediates or whose ultimate function or use is unknown. The Office has amended the guidelines to clarify how it will interpret the "specific utility" requirement of § 101.

Some individuals suggested that the guidelines be amended to preclude Examiners from requiring that an applicant delete references made in the specification to the utility of an invention which are not necessary to support an asserted utility of the claimed invention. The guidelines have been amended consistent with this suggestion.

One individual suggested that the legal analysis be amended to emphasize that any combination of evidence from *in vitro* or *in vivo* testing can be sufficient to establish the credibility of an asserted utility. The legal analysis has been amended consistent with this recommendation.



A number of individuals questioned the legal status of the guidelines, particularly with respect to situations where an applicant believes that a particular Examiner has failed to follow the requirements of the guidelines in imposing a rejection under § 101. The guidelines and the legal analysis supporting the guidelines govern the internal operations of the Patent and Trademark Office. They are not intended to, nor do they have the force and effect of law. As such they are not substantive rules creating or altering the rights or obligations of any party. Rather, the guidelines define the procedures to be followed by Office personnel in their review of applications for § 101 compliance. The legal analysis supporting the guidelines articulates the basis for the procedures established in the guidelines. Thus, an applicant who believes his or her application has been rejected in a manner that is inconsistent with the guidelines should respond substantively to the grounds of the rejection. "Non-compliance" with the guidelines will not be a petitionable or appealable action.

Some individuals suggested that the guidelines and legal analysis be amended to specify that the Office will reject an application for lacking utility only in those situations where the asserted utility is "incredible." This suggestion has not been adopted. The Office has carefully reviewed the legal precedent governing application of the utility requirement. Based on that review, the Office has chosen to focus the review for compliance with § 101 and § 112, first paragraph, on the "credibility" of an asserted utility.

Some individuals suggested that the guidelines be amended to address how a generic claim that covers many discrete species will be assessed with regard to the "useful invention" requirements of §§ 101 and 112 when one or more, but not all, species within the genus do not have a credible utility. The guidelines have been amended to clarify how the Office will address applications in which genus claims are presented that encompass species for which an asserted utility is not credible. The legal analysis makes clear that any rejection of any claimed subject matter based on lack of utility must adhere to the standards imposed by these guidelines. This is true regardless of whether the claim defines only a single embodiment of the invention, multiple discrete embodiments of the invention, or a genus encompassing many embodiments of the invention. As cast in the legal analysis and the guidelines, the focus of examination is the invention as it has been defined in the claims.

Some individuals questioned whether the guidelines and the legal analysis govern actions taken by Examining Groups other than Group 1800 or the Board of Patent Appeals and Interferences. The guidelines apply to all Office personnel, and to the review of all applications, regardless of field of technology.

In addition to the changes made in response to comments from the public, the Office has amended the guidelines to clarify the procedure to be followed when an applicant has failed to identify a specific utility for an invention. The guidelines now provide that where an applicant has made no assertion as to why an invention is believed useful, and it is not immediately apparent why the invention would be considered useful, the Office will reject the application as failing to identify any specific utility for the invention. The legal analysis has also been amended to address evaluation of this question.

## II. Guidelines for Examination of Applications for Compliance with the Utility Requirement

### A. Introduction

The following guidelines establish the policies and procedures to be followed by Office personnel in the evaluation of any application for compliance with the utility requirements of 35 U.S.C. § 101 and § 112. The guidelines also address issues that may arise during examination of applications claiming protection for inventions in the field of biotechnology and human therapy. The guidelines are accompanied by an overview of applicable legal precedent governing the utility requirement. The guidelines have been promulgated to assist Office personnel in their review of applications for compliance with the utility requirement. The guidelines and the legal analysis do not alter the substantive requirements of 35 U.S.C. § 101 and

§ 112, nor are they designed to obviate review of applications for compliance with this statutory requirement.

### B. Examination Guidelines for the Utility Requirement

Office personnel shall adhere to the following procedures when reviewing applications for compliance with the "useful invention" ("utility") requirement of 35 U.S.C. § 101 and 35 U.S.C. § 112, first paragraph.

#### 1. Read the specification, including the claims; to:

- a) determine what the applicant has invented, noting any specific embodiments of the invention;
- a) ensure that the claims define statutory subject matter (e.g., a process, machine, manufacture, or composition of matter);
- b) note if applicant has disclosed any specific reasons why the invention is believed to be "useful."

#### 2. Review the specification and claims to determine if the applicant has asserted any credible utility for the claimed invention:

- a) If the applicant has asserted that the claimed invention is useful for any particular purpose (i.e., a "specific utility") and that assertion would be considered credible by a person of ordinary skill in the art, do not impose a rejection based on lack of utility. Credibility is to be assessed from the perspective of one of ordinary skill in the art in view of any evidence of record (e.g., data, statements, opinions, references, etc.) that is relevant to the applicant's assertions. An applicant must provide only one credible assertion of specific utility for any claimed invention to satisfy the utility requirement.

- b) If the invention has a well-established utility, regardless of any assertion made by the applicant, do not impose a rejection based on lack of utility. An invention has a well-established utility if a person of ordinary skill in the art would immediately appreciate why the invention is useful based on the characteristics of the invention (e.g., properties of a product or obvious application of a process).

- c) If the applicant has not asserted any specific utility for the claimed invention and it does not have a well established utility, impose a rejection under § 101, emphasizing that the applicant has not disclosed a specific utility for the invention. Also impose a separate rejection under § 112, first paragraph, on the basis that the applicant has not shown how to use the invention due to lack of disclosure of a specific utility. The § 101 and § 112, rejections should shift the burden to the applicant to:

- explicitly identify a specific utility for the claimed invention, and
- indicate where support for the asserted utility can be found in the specification.

Review the subsequently asserted utility by the applicant using the standard outlined in paragraph (2)(a) above, and ensure that it is fully supported by the original disclosure.

- 3. If no assertion of specific utility for the claimed invention made by the applicant is credible, and the claimed invention does not have a well-established utility, reject the claim(s) under § 101 on the grounds that the invention as claimed lacks utility. Also reject the claims under § 112, first paragraph, on the basis that the disclosure fails to teach how to use the invention as claimed. The § 112, first paragraph, rejection imposed in conjunction with a § 101 rejection should incorporate by reference the grounds of the corresponding § 101 rejection and should be set out as a rejection distinct from any other rejection under § 112, first paragraph, not based on lack of utility for the claimed invention.

To be considered appropriate by the Office, any rejection based on lack of utility must include the following elements:

- a) A *prima facie* showing that the claimed invention has no utility.

A *prima facie* showing of no utility must establish that it is more likely than not that a person skilled in the art would not

consider credible any specific utility asserted by the applicant for the claimed invention. A *prima facie* showing must contain the following elements:

- i) a well-reasoned statement that clearly sets forth the reasoning used in concluding that the asserted utility is not credible;
- ii) support for factual findings relied upon in reaching this conclusion; and
- iii) support for any conclusions regarding evidence provided by the applicant in support of an asserted utility.

#### b) Specific evidence that supports any fact-based assertions needed to establish the *prima facie* showing.

Whenever possible, Office personnel must provide documentary evidence (e.g., scientific or technical journals, excerpts from treatises or books, or U.S. or foreign patents) as the form of support used in establishing the factual basis of a *prima facie* showing of no utility according to items (a)(ii) and (a)(iii) above. If documentary evidence is not available, Office personnel shall note this fact and specifically explain the scientific basis for the factual conclusions relied on in sections (a)(ii) and (a)(iii).

#### 4. A rejection based on lack of utility should not be maintained if an asserted utility for the claimed invention would be considered credible by a person of ordinary skill in the art in view of all evidence of record.

Once a *prima facie* showing of no utility has been properly established, the applicant bears the burden of rebutting it. The applicant can do this by amending the claims, by providing reasoning or arguments, or by providing evidence in the form of a declaration under 37 CFR 1.132 or a printed publication, that rebuts the basis or logic of the *prima facie* showing. If the applicant responds to the *prima facie* rejection, Office personnel shall review the original disclosure, any evidence relied upon in establishing the *prima facie* showing, any claim amendments and any new reasoning or evidence provided by the applicant in support of an asserted utility. It is essential for Office personnel to recognize, fully consider and respond to each substantive element of any response to a rejection based on lack of utility. Only where the totality of the record continues to show that the asserted utility is not credible should a rejection based on lack of utility be maintained.

If the applicant satisfactorily rebuts a *prima facie* rejection based on lack of utility under § 101, withdraw the § 101 rejection and the corresponding rejection imposed under § 112, first paragraph, per paragraph (3) above.

Office personnel are reminded that they must treat as true a statement of fact made by an applicant in relation to an asserted utility, unless countervailing evidence can be provided that shows that one of ordinary skill in the art would have a legitimate basis to doubt the credibility of such a statement. Similarly, Office personnel must accept an opinion from a qualified expert that is based upon relevant facts whose accuracy is not being questioned; it is improper to disregard the opinion solely because of a disagreement over the significance or meaning of the facts offered.

### III. Additional Information

The PTO has prepared an analysis of the law governing the utility requirement to support the guidelines outlined above. Copies of the legal analysis can be obtained from Jeff Kushan, who can be reached using the information indicated above.

July 3, 1995

BRUCE A. LEHMAN  
Assistant Secretary of Commerce  
and Commissioner of Patents  
and Trademarks

[1177 OG 146]

(76)

Department of Commerce  
Patent and Trademark Office

37 CFR Part 1  
[Docket No. 940965 - 4265]

RIN: 0651-AA67

Revision of Affidavits Under 37 CFR 1.131

Agency: Patent and Trademark Office, Commerce

Action: Notice of proposed rulemaking

Summary: The Patent and Trademark Office (Office) proposes to amend the rules of practice relating to submission of affidavits or declarations under 37 CFR 1.131 (a) to implement the relevant provisions of Public Law No. 103 - 182 and the GATT (General Agreement on Trade and Tariffs), and to provide relief in certain circumstances where a common assignee holds both an application and a patent claiming patentably indistinct, but not identical, inventions.

Date: Written comments must be submitted on or before December 1, 1994. No oral hearing will be held.

Addressees: Address written comments to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: Charles E. Van Horn, Deputy Assistant Commissioner for Patent Policy and Projects, or by fax to (703) 305-8825.

For Further Information Contact: Charles E. Van Horn by telephone at (703) 305-9054 or Hiram Bernstein by telephone at (703) 305-9282 or by mail marked to the attention of Charles E. Van Horn, Deputy Assistant Commissioner for Patent Policy and Projects, and addressed as above.

Supplementary Information: Public Law No. 103-182 (November 4, 1993) implementing the North American Free Trade Agreement (NAFTA), amended 35 U.S.C. 104 to provide that for the purpose of obtaining a patent, an applicant can show a date of invention in the United States, or in a NAFTA country which occurred after the date of implementation (i.e., December 8, 1993). Although GATT enabling legislation has not been passed, these proposed rule changes assume that it will be passed, and therefore changes to 37 CFR 1.131(a) similar to NAFTA would be required. See Article 27, paragraph 1, of the Agreement on Trade-related Aspects of Intellectual Property Rights, Including Trade in Counterfeit Goods, of the GATT. In the event that the GATT enabling legislation is not enacted when the final rules are published, the proposed rule changes relative to the GATT will be withdrawn.

The Office proposes to amend 37 CFR 1.131(a), which is currently limited to facts showing a completion of the invention in the United States, to allow for a submission of facts in an affidavit or declaration that show completion of the invention in a NAFTA or a World Trade Organization (WTO) Member country. The WTO is established under the GATT agreement to resolve disputes between signatories to the agreement. The facts presented must demonstrate completion of the invention prior to the effective date of a reference thought to bar the grant of a patent or the patentability of a claim in a patent under reexamination.

Additionally, the Office recognizes that there is a potential conflict between existing 37 CFR 1.131(a) and 37 CFR 1.602(a). Section 1.131(a) prohibits affidavits or declarations thereunder when the same patentable invention as defined in 37 CFR 1.601(n) (i.e., patentably indistinct inventions) is claimed. An interference under 35 U.S.C. § 135, rather than antedating under § 1.131(a), is generally the available remedy. However, 37 CFR 1.602(a) provides that when the applications or the application and patent are owned by a single party, interferences are not declared or continued unless good cause is shown. This can result in a hardship where there is an issued patent that can no longer be amended as by filing a continuation-in-part application. Where there are two or more pending applications, the conflict can be avoided by filing a continuation-in-part application incorporating the conflicting inventions in a single application.

The Office proposes to amend 37 CFR 1.131 to broaden its application to a single party where inventions of a pending application and a patent held by the party are patentably indistinct but not identical. Under the proposed additions to § 1.131, an affidavit or declaration could be filed by a party to avoid



a 35 U.S.C. § 103 rejection based on a 35 U.S.C. §§ 102(a) or (e) patent owned by that party, where the patent claimed an invention that was patentably indistinct, but not identical to an invention claimed in an application or patent undergoing reexamination.

The proposed addition to § 1.131 would not affect the use of the issued patent in a rejection based on double patenting. However, where patentably indistinct but not identical inventions are claimed, a double patenting rejection can be avoided by filing an appropriate terminal disclaimer. In addition, petitions under § 1.183 will be entertained for waiver of § 1.131 requirements in appropriate instances where two pending applications claiming patentably indistinct but not identical inventions are held by a single party.

#### Discussion of Specific Rules:

Section 1.131(a), if amended to (a)(1) as proposed, would allow a § 1.131 affiant or declarant to rely upon facts occurring in a NAFTA or a WTO Member country to show completion of the invention. The term "domestic" would be changed to "U.S." The section is proposed to be amended from a single sentence to three sentences.

Section 1.131(a)(2), if added as proposed, would limit the availability of acts showing completion of the invention in a NAFTA or WTO Member country to those acts occurring subsequent to the effective date of the agreements.

Section 1.131(a)(3), if added as proposed, would allow a showing of prior invention to be made in a pending application or a patent that is undergoing reexamination where a single party holds both the application or patent undergoing reexamination and another patent where the claimed inventions were, at the time the later invention was made, both owned by the single party or subject to an obligation of assignment to that party. Further, in order to rely on proposed § 1.131(a)(3), the inventions claimed in the application or in the patent undergoing reexamination and in the other patent must not be identical as set forth in 35 U.S.C. § 102.

#### Other Considerations:

The proposed rule changes are in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 et seq., Executive Order 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. The Office of Management and Budget has determined that the proposed rule changes are not significant for the purposes of E.O. 12866.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the proposed rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)), because the proposed rules would affect only a small number of applications and would provide a streamlined and simplified procedure, eliminating the need for requesting waiver of the rules.

The Patent and Trademark Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes will not impose any additional burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

#### List of Subjects

##### 37 CFR Part 1

Administrative practice and procedure, Inventions and patents, Lawyers, Reporting and record keeping requirements.

For the reasons set forth in the preamble, and pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. § 6, the Office proposes to amend Title 37 of the Code of Federal Regulations as set forth below, with deletions indicated by brackets ([ ]) and additions indicated by arrows (►◄).

#### Part 1 - Rules of Practice in Patent Cases

1. The authority citation for 37 C.F.R., Part 1, would continue to read as follows:

Authority: 35 U.S.C. § 6, unless otherwise noted.

2. Section 1.131 is proposed to be amended by revising paragraph (a) to read as follows:

§ 1.131 Affidavit or declaration of prior invention to overcome cited patent or publication.

(a) ►(1)◄ When any claim of an application or a patent under reexamination is rejected on reference to a [domestic] ►U.S.◄ patent which substantially shows or describes but does not claim the same patentable invention, as defined in § 1.601(n), as the rejected invention, or on reference to a foreign patent or to a printed publication, [and] the inventor of the subject matter of the rejected claim, the owner of the patent under reexamination, or the person qualified under §§ 1.42, 1.43 or 1.47, [shall make] ►may overcome the patent or publication by filing an appropriate◄ oath or declaration ►.◄ [as to] ►The oath or declaration must include◄ facts showing a completion of the invention in this country ►or in a NAFTA or WTO Member country◄ before the filing date of the application on which the [domestic] ►U.S.◄ patent issued, or before the date of the foreign patent, or before the date of the printed publication [ , then] [ . ] ►When an appropriate oath or declaration is made, ◄ the patent or publication cited shall not bar the grant of a patent to the inventor or the confirmation of the patentability of the claims of the patent, unless the date of such patent or printed publication is more than one year prior to the date on which the inventor's or patent owner's application was filed in this country.

►(a)(2)◄ A date of completion of the invention may not be established under this section before December 8, 1993, in a NAFTA country, or before \_\_\_\_\_ in a WTO Member country other than a NAFTA country.

(a)(3) Notwithstanding the provisions of paragraph (a)(1), a showing may be made under this section where the inventions defined by a claim in an application or a patent under reexamination and by a claim in another U.S. patent are not identical as set forth in 35 U.S.C. 102, and where the inventions were, at the time the later invention was made, owned by the same person or subject to an obligation of assignment to the same person. ◄

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September 26, 1994

BRADFORD R. HUTHER  
Acting Assistant Secretary  
of Commerce and Acting  
Commissioner of Patents  
and Trademarks

[1167 OG 96]

#### (77) Legal Analysis to Support Proposed Examination Guidelines for Computer-Implemented Inventions

October 3, 1995

Patent and Trademark Office  
United States Department of Commerce

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#### Legal Analysis to Support Proposed Examination Guidelines for Computer-Implemented Inventions

##### I. Introduction [Guidelines § I.A.]

The Office has developed *Proposed Examination Guidelines for Computer-Implemented Inventions*<sup>1</sup> and this legal analysis (collectively, the "guidelines") to assist Office personnel in the examination of applications drawn to computer-implemented inventions. The guidelines are based on the Office's current understanding of the law, and represent the official policy of the Patent and Trademark Office. Office personnel are to rely on these guidelines in the event of any inconsistent treatment of issues between these guidelines and any earlier provided guidance from the Office.

The guidelines alter the procedures Office personnel shall employ to examine applications drawn to computer-implemented inventions.

The guidelines also clarify the Office's position on certain patentability standards related to this field of technology. The positions set forth in these guidelines are believed to be fully consistent with the binding precedent of the Supreme Court, and the Federal Circuit and its predecessor courts.

The Freeman-Walter-Abele<sup>2</sup> test, while of limited value, may still be relied upon in analyzing claims directed solely to a process for solving a mathematical algorithm. "Business methods" are to be analyzed the same way as any other process.

The appendix includes the proposed guidelines and a graphic overview of how Office personnel will conduct an examination to determine statutory subject matter.

##### II. Determine What Applicant Has Invented and Is Seeking to Patent [Guidelines § I.B.1.]

It is essential that patent applicants obtain a prompt yet complete examination of their applications. Thus, Office personnel must raise any issue that may affect patentability in the initial action on the merits. Under the principles of compact prosecution, each claim should be reviewed for compliance with every statutory requirement of patentability in the initial review of the application, even if one or more claims is found to be deficient with respect to one statutory requirement. Deficiencies should be explained clearly, particularly when they serve as a basis for a rejection. Where possible, Office personnel should indicate how rejections may be overcome and problems resolved. A failure to follow this approach can lead to unnecessary delays in the prosecution of the application.

Prior to focusing on any specific statutory requirements, Office personnel must begin examination by determining what, precisely, the applicant has invented and is seeking to patent,<sup>3</sup> and how the claims relate to and define that invention. Consequently, Office personnel will no longer begin examination by determining if a claim recites a "mathematical algorithm." Rather, they will review the complete specification, including the detailed description of the invention, any specific embodiments that have been disclosed, the claims and the specific utility that has been asserted for the invention.

##### A. Identify and Understand the Practical Utility Asserted for the Invention [Guidelines § I.B.1.(a)]

The subject matter sought to be patented must be a "useful" process, machine, manufacture or composition of matter. Accordingly, a complete disclosure should contain some indication of why the applicant believes the claimed invention is "useful." This "usefulness" of the invention is called the "specific" or "practical" utility of the invention. Specific or practical utility is simply a shorthand way of attributing "real world" value to the claimed subject matter, i.e., assuring there is some benefit to the public.<sup>4</sup> An invention that has some practical application satisfies the utility requirement.<sup>5</sup>

The applicant is in the best position to explain why an invention is believed useful. Office personnel should therefore focus their efforts on identifying statements made in the specification that identify a practical application for the invention. Office personnel should rely on such statements throughout the exami-



nation when assessing the invention for compliance with all statutory criteria. Deficiencies under the utility requirement will be rare, however. Further guidance in evaluating an asserted specific utility for compliance with § 101 is provided below and in the Utility Examination Guidelines.<sup>6</sup> If the applicant asserts a practical utility for the invention, Office personnel should review the entire disclosure to determine the features necessary to accomplish the asserted practical utility.

#### B. Review the Detailed Disclosure and Specific Embodiments of the Invention to Determine What the Applicant Has Invented [Guidelines § LB.1(a)]

The written description will provide the clearest explanation of the applicant's invention, by exemplifying the invention, explaining how it relates to the prior art and by explaining the relative significance of various features of the invention. Accordingly, Office personnel should begin their evaluation of a computer-implemented invention as follows:

- determine what the programmed computer does when it performs the processes dictated by the software (i.e., the *functionality* of the programmed computer);<sup>7</sup>

- determine how the computer is to be configured to provide that functionality (i.e., what elements constitute the programmed computer and how are those elements to be configured to provide the specified functionality); and

- if applicable, determine the *relationship* of the programmed computer to other subject matter that constitutes the invention (e.g., machines, devices, materials, or process steps other than those that are part of or performed by the programmed computer).<sup>8</sup>

Patent applicants can assist the Office by preparing applications that clearly set forth these aspects of a computer-implemented invention.

#### C. Analyze the Claims [Guidelines § LB.1(b)]

The claims define the property rights provided by a patent, and thus require careful scrutiny. The goal of claim analysis is to identify the boundaries of the protection sought by the applicant and to understand how the claims relate to and define what the applicant has indicated is the invention. Office personnel must analyze the language of a claim *before* determining if the claim complies with each statutory requirement for patentability.

Office personnel should begin claim analysis by identifying and evaluating each claim element. For processes, the claim elements will define steps or acts to be performed. For products, i.e., machines and articles of manufacture, the claim elements will define discrete physical structures. The discrete physical structures may be comprised of hardware or a combination of hardware and software.

As provided in the guidelines, Office personnel are to correlate each claim element to that portion of the disclosure that describes the claim element. This is to be done in all cases, i.e., whether or not the claimed invention is defined using means or step plus function language. The correlation step will ensure that Office personnel clearly understand the meaning and scope of each claim limitation.

The subject matter of a properly construed claim is defined by the terms that limit its scope, and it is this subject matter that must be examined. As a general matter, the grammar and intended meaning of terms used in a claim will dictate whether the language limits the claim scope. Language that *suggests* or *makes optional* but does not require steps to be performed or does not limit a claim to a particular structure does not limit the scope of a claim or claim element.

Office personnel must rely on the applicant's disclosure to properly determine the meaning of terms used in the claims.<sup>9</sup> An applicant is entitled to be his or her own lexicographer, and in many instances will provide an explicit definition for certain terms used in the claims. Where an explicit definition is provided by the applicant for a term, that definition will control interpretation of the term as it is used in the claim. Office personnel should determine if the original disclosure provides a definition consistent with the applicant's assertions.<sup>10</sup>

If the applicant asserts that a term has a meaning that conflicts with the term's art-accepted meaning, Office personnel should encourage the applicant to amend the claim to better reflect what applicant intends to claim as the invention.

Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure.<sup>11</sup> With the exception of claim elements defined in means or step plus function terminology, positive limitations on the scope of a claim cannot be read into the claims based on comments or explanations provided in the disclosure.<sup>12</sup> While it is appropriate to use the specification to determine what applicant intended a term to mean, a positive limitation from the specification cannot be read into a claim that does not impose that limitation. A broad interpretation of the claims by the Office will reduce the possibility that the claim, when issued, will be interpreted more broadly than is justified or intended. An applicant always has the opportunity to amend the claims during prosecution to better reflect the intended scope of the claim.

Finally, when evaluating the scope of a claim, every limitation in the claim must be considered.<sup>13</sup> Office personnel may not dissect a claimed invention into discrete elements and then evaluate the elements *in isolation*. Instead, each claimed element of the invention must be considered in the context of the claim as a whole.

#### III. Assess Claimed Invention for Compliance with 35 U.S.C. § 101 [Guidelines § LB.1(c)]

As the Supreme Court has held, Congress chose the expansive language of § 101 so as to include "anything under the sun that is made by man." Accordingly, § 101 of title 35, United States Code, provides:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.<sup>15</sup>

As cast, § 101 defines four categories of inventions that Congress deemed to be the appropriate subject matter of a patent; namely, processes, machines, manufactures or compositions of matter. The latter three categories define "things" while the process category defines inventions that consist of "actions" (i.e., a series of steps or acts to be performed).<sup>16</sup>

Federal courts have held that § 101 does have certain limits. First, the phrase "anything under the sun that is made by man" is limited by the text of § 101, meaning that one may only patent something that is a machine, manufacture, composition of matter or a process.<sup>17</sup> Second, § 101 requires that the subject matter sought to be patented be a "useful" invention. Accordingly, a complete definition of the scope of § 101, reflecting Congressional intent, is that any new and useful process, machine, manufacture or composition of matter under the sun that is made by man is the proper subject matter of a patent. Subject matter *not* within one of the four statutory invention categories or which is not "useful" in a patent sense, accordingly, is not eligible to and cannot be patented.

The subject matter courts have found to be outside the four statutory categories of invention is limited to abstract ideas, laws of nature and natural phenomena. While this is easily stated, determining whether an applicant is seeking to patent an abstract idea, a law of nature or a natural phenomenon has proven to be challenging. These three exclusions recognize that subject matter that is not a *practical application* or *use* of an idea, a law of nature or a natural phenomenon is not patentable.<sup>18</sup>

Courts have expressed a concern over "preemption" of ideas, law of nature or natural phenomena.<sup>19</sup> The concern over preemption serves to bolster and justify the prohibition against the patenting of such subject matter. Such concerns are only relevant to claiming a scientific truth or principle. Thus, a claim to an "abstract" idea is non-statutory because it does not represent a practical application of the idea, not because it would preempt the idea.

#### A. Determine Whether The Invention is "Useful"

To be patentable, an invention must be "useful" (i.e., it must have a practical application). The purpose of this requirement is to limit patent protection to inventions that possess a certain

level of "real world" value, as opposed to subject matter that represents nothing more than an idea or concept, or is simply a starting point for future investigation or research.<sup>20</sup> The utility of an invention must be within the "technological" arts.<sup>21</sup> This requirement can be discerned from the variously phrased prohibitions against the patenting of abstract ideas, laws of nature or natural phenomenon. Courts have indicated that any technological or utilitarian purpose may serve as an appropriate utility.<sup>22</sup>

Office personnel should confirm that the utility asserted for an invention is a practical application of the invention. If the utility of an "invention" is only as an object of philosophical inquiry or to be appreciated in terms of its literary or artistic value, the claimed invention should be rejected under § 101.

Additionally, Office personnel have struggled with claims directed to methods of doing business. A method of doing business is to be treated like any other process.

#### B. Classify the Invention as to Its Proper Statutory Category

To properly assess compliance with the statutory invention requirements of § 101, Office personnel should classify each specifically claimed invention into *one* statutory or non-statutory category. If the subject matter falls into a non-statutory category, that should not preclude complete examination of the application for all other conditions of patentability. This classification is *only an initial finding* at this point in the examination process that will be again assessed after the examination for compliance with §§ 112, 102 and 103 and before issuance of any Office action.

#### 1. Non-Statutory Subject Matter [Guidelines § LB.1(c)(i) & (ii)]

Claims that are clearly non-statutory are those that define:

- a "data structure" *per se* or computer program *per se*, i.e., information rather than a computer-implemented process or specific machine or computer readable memory manufacture;
- a compilation or arrangement of non-functional information or a known machine-readable storage medium that is encoded with such information;
- natural phenomena such as electricity and magnetism.

Claims in this form are indistinguishable from abstract ideas, laws of nature and natural phenomena and may not be patented. Claims to processes that do nothing more than solve mathematical problems or manipulate abstract ideas or concepts are more complex to analyze and are addressed below. See section 3.

#### (a) "Data Structures" Per Se or Computer Programs Per Se

Computers manage data by arranging the data in a particular order or sequence. The relationship that exists among the ordered data elements (i.e., the individual facts or data) is called a "data structure." Data structures in this sense are not statutory products because they are not physical "things" nor are they statutory processes, as they are not "acts" being performed.<sup>23</sup> In other words, when defined without any physical structure, a "data structure" is nothing more than *information* that explains a relationship that exists among ordered data, and therefore is non-statutory. In contrast, a memory circuit whose structure represents a *practical application* or *use* of a data structure is a statutory manufacture. Accordingly, it is important to distinguish claims that define information *per se* from claims that define statutory inventions that are based on or use non-statutory information.

Similarly, computer programs *per se* are not physical "things," nor are they statutory processes, as they are not "acts" being performed. In contrast, a computer process that is implemented using a computer program, a specific computer reconfigured by a computer program, or a memory circuit whose structure is defined by a computer program are statutory.

If a computer program is recited in a claim, Office personnel should determine if the computer program is being used to *describe* the physical structure of a manufacture or machine,

or steps to be performed by a computer, or is intended to be the object of the patent, *per se*.

If it is clear that the claim uses the computer program elements to define actions to be performed by a computer, Office personnel should treat the claim as a process claim. If the computer program elements are recited in conjunction with a physical structure, such as a computer memory, the claim should be treated as a product claim. If the claimed subject matter cannot be treated as a process and does not have any *physical* structure, then it is non-statutory "information."

If an applicant challenges the Office's classification of a claim containing computer program elements without any physical structure as a process rather than a product, the claim should be rejected under § 101. Office personnel should also object to the specification under 37 CFR 1.71(b) if such an assertion is made, as the complete invention contemplated by the applicant has not been cast precisely as being an invention within one of the statutory categories.

#### (b) Non-Functional Information

The term "information" is the "communication of data." It is also used to mean signals representing data. It is the latter definition that is used in these guidelines.

Certain information, such as music, literature, art, and photographs, as well as mere facts or data,<sup>24</sup> cannot impart functionality to a computer. Such "information" is not a process, machine, manufacture or composition of matter.

The policy that precludes the patenting of non-functional data would be easily frustrated if the same data could be patented as an article of manufacture. For example, music is commonly sold to consumers in the format of a compact disc. In such cases, the known compact disc acts as nothing more than a carrier for non-functional data.

The non-functional content (e.g., words, images, or other information) cannot provide the practical utility for the manufacture. Function-imparting information is necessary to create a functional and useful physical manufacture (e.g., a computer memory encoded with data that causes a computer to function in a particular manner). If the utility for the encoded medium is dependent upon a human appreciating the artistic or other value of the information content, the claimed invention should be rejected under § 101.

#### (c) Natural Phenomena Such as Electricity and Magnetism

Claims that recite nothing but the physical characteristics of a form of energy, such as a specific radio frequency, voltage, or the strength of a magnetic field, define energy or magnetism, *per se*, and as such are non-statutory. A claim directed to a natural phenomenon such as energy or magnetism, which does not recite the practical application of that phenomenon in a process or a product, is to be rejected under § 101.

#### 2. Statutory Subject Matter

##### (a) Statutory Products

If a claim defines a useful machine or manufacture by identifying the physical structure of the machine or manufacture in terms of its hardware or hardware and software combination, it defines a statutory product.<sup>25</sup>

##### (i) Product Claims—Claims Directed to Machines and Manufactures

Claims that define a computer-implemented invention as a specific machine or article of manufacture must define the physical structure of the machine or manufacture in terms of its hardware and associated functional software. The applicant may define the physical structure of a programmed computer or its hardware or software components in any manner that can be clearly understood by a person skilled in the relevant art. Generally a claim drawn to a particular programmed computer should identify the elements of the computer and indicate how those elements are configured in either hardware or a combination of hardware and software.

A computer-related "manufacture" will typically be a component of a specific computer, such as a logic circuit or a computer



memory. A manufactured computer memory containing a physical structure representing encoded computer-readable instructions, such as a computer program, is a statutory article of manufacture because the encoded computer-readable instructions give the manufactured memory a new form or structure, and new qualities or properties (e.g., the ability to cause a computer to function in a particular, predefined manner).

To adequately define a computer memory with a particular functionality, the claim must identify the physical characteristics of the memory (e.g., a logic circuit or a storage medium), and the functionality of the memory. A computer memory may be defined in a claim as:

— a logic circuit that results when a programmed computer performs a series of steps dictated by a computer program;<sup>26</sup>

— a memory defined by its functional and/or structural characteristics;<sup>27</sup> or

— a memory whose physical structure is defined by the act of storing computer-executable program code on the memory.

#### (ii) Claims that Encompass Any Machine or Manufacture Embodiment of a Process

	Applicant A
Apparatus Claim	A computer system for determining the three dimensional structure of a chemical compound comprising: (a) means for determining the three dimensional structure of a compound; (b) means for creating and displaying an image representing a three-dimensional perspective of the compound.
Disclosure	The disclosure describes computer program code segments that are to be employed in configuring a general purpose microprocessor to create specific logic circuits. These circuits are indicated to be the "means" corresponding to the claimed means elements.
Result	Claim defines specific computer, patentability stands independently from process claim.
Explanation	Disclosure identifies the specific machine capable of performing the indicated functions.

Office personnel are reminded that finding a product claim to encompass any product embodiment a "process" invention simply means that the Office will *presume* that the product claim encompasses any product in the stated class that performs the specified set of functions. Because this is *interpretive* and *nothing more*, it does not provide any information as to the *patentability* of the applicant's underlying invention or the product claim.

If a claim is found to encompass any product embodiment of the underlying process, and if the underlying process is statutory, the product claim should be classified as a statutory product. By the same token, if the underlying process invention is found to be non-statutory, Office personnel should classify the "product" claim as a "non-statutory product." If the product claim is classified as being a non-statutory product on the basis

A claim cast in product claim format that, when read in light of the specification, encompasses any computer implementation of a process should be examined on the basis of the underlying process. Such a claim can be recognized as it will:

— define the physical characteristics of a computer or computer component exclusively as functions or steps to be performed on or by a computer, and

— encompass any product in the stated class (e.g., computer, computer-readable memory) *configured in any manner* to perform that process.

The following hypotheticals illustrate this distinction. Assume two applicants present a claim to the following process:

A process for determining and displaying the structure of a chemical compound comprising:

(a) solving the wavefunction parameters for the compound to determine the structure of a compound;

(b) displaying the structure of the compound determined in step (a).

In addition, each applicant claims an apparatus, and provides the noted disclosure to support the claims.

	Applicant B
Apparatus Claim	A computer system for determining the three dimensional structure of a chemical compound comprising: (a) means for determining the three dimensional structure of a compound; (b) means for displaying the structure of the compound determined in step (a).
Disclosure	This disclosure states that it would be a matter of routine skill to select an appropriate computer system and implement the claimed process on that computer system. No specific disclosure is made regarding the two "means" elements recited in the claim (i.e., no computer program or logic circuit is described that can perform the indicated functions). The disclosure does provide an explanation of how to solve the wavefunction equations of a chemical compound, and indicates that the solutions of those wavefunction equations can be employed to determine the physical structure of the corresponding compound.
Result	Claim encompasses any computer embodiment of process claim; patent ability stands or falls with process claim.
Explanation	In this scenario, the applicant has not provided any information that can serve to distinguish the "implementation" of the process on a computer from the factors that will govern the patentability determination of the process per se. As such, the patentability of this apparatus claim will stand or fall with that of the process claim.

of the underlying process, Office personnel should emphasize that they have considered all claim limitations and are basing their finding on the analysis of the underlying process.

#### (b) Statutory Processes [Guidelines § I.B.1.(c)(iii)]

A claim that requires one or more acts to be performed defines a process. Not all processes, however, are processes that fall within the definition of a statutory process under § 101. A *statutory* process is a series of one or more acts that manipulate physical matter or energy resulting in some form of a physical transformation.<sup>28</sup> Accordingly, a claimed process is statutory if it:

— manipulates some form of physical matter or energy; and

— results in a transformation or reduction of the subject matter manipulated into a different state or into a different thing to achieve a practical application.

#### (i) Appropriate Subject Matter for Manipulation Steps of a Process

Consistent with the expansive Congressional intent behind § 101, Office personnel shall consider any form of physical "matter" or "energy" to be the appropriate subject matter of the manipulation steps of a process. Importantly, the subject matter manipulated by a process does not have to be a physical object; it may be "intangible subject matter representative of or constituting physical activity or objects."<sup>29</sup> Thus, an electrical signal representing data corresponding to a physical object or physical activity is appropriate subject matter for manipulation by a process. If the "acts" of a process manipulate only numbers, abstract concepts or ideas, the acts are not being applied to appropriate subject matter. Thus, a process consisting solely of mathematical operations does not manipulate appropriate subject matter and thus cannot constitute a statutory process.

#### (ii) Transformation or Reduction to a Different State or Thing

To be statutory, the claimed process when practiced must *physically transform* the subject matter manipulated—something must happen other than manipulating concepts or converting numbers to different numbers. The required transformation can take place during any step of the process (e.g., if a process requires three "acts" and only the last "act" transforms the subject matter to a different state or thing, a sufficient transformation has occurred). If the process does not result in any physical transformation, it is not statutory.

#### (iii) Examples of Statutory Computer-Implemented Processes

Three exemplary computer-performed processes that fully satisfy the requirements of § 101:

— A process that requires physical acts to be performed independent of the steps to be performed by a programmed computer, where those acts involve the manipulation of tangible physical objects and result in the object having a different physical attributes or structure;<sup>30</sup>

— A process that requires acts to be performed on the physical components of a computer (i.e., the process manipulates the components of the computer rather than data representing something external to the computer system) and the effect of the process is that the computer *operates* differently (such as an operating system process); and

— A process that requires acts to be performed by a computer on data in the form of an electrical or magnetic signal, where the data represents a physical object or activities external to the computer system (e.g., physical characteristics of a chemical compound or a person's heart rate), and where the process causes some transformation of the physical but intangible representation of the physical object or activities.<sup>31</sup>

#### 3. Non-Statutory Processes

In practical terms, claims define non-statutory processes if they:

— consist solely of mathematical operations (i.e., a "mathematical algorithm"); or

— simply manipulate abstract ideas without some practical application (e.g., a bid, a bubble hierarchy).

#### (a) Mathematical Algorithm That Defines a Law of Nature or Natural Phenomenon or Describes an Abstract Idea

A process that consists solely of mathematical operations is non-statutory. Mathematical algorithms do not manipulate

physical matter and cannot cause a physical effect. Courts have, however, recognized a distinction between types of mathematical algorithms, namely, some *define* a "law of nature" in mathematical terms and others merely *describe* an "abstract idea."

Certain mathematical algorithms have been held non-statutory because they represent a mathematical definition of a law of nature or a natural phenomenon. For example, the formula  $E=mc^2$  is a "law of nature"—it defines a "fundamental scientific truth" (i.e., the relationship between energy and mass). To comprehend how the law of nature relates to any object, one invariably has to perform certain steps (e.g., multiplying a number representing the mass of an object by the square of a number representing the speed of light). If an applicant defines a process to consist solely of those steps that one must follow to solve the mathematical representation of the law of nature, the "process" is indistinguishable from the law of nature and would "preempt" the law of nature. A patent cannot be granted on such a process.

Other mathematical algorithms have been held non-statutory because they merely describe an abstract idea. An "abstract idea" may simply be any sequence of mathematical operations that are combined to solve a mathematical problem. The concern addressed by holding such subject matter non-statutory is that the mathematical operations merely describe an idea and do not define a process that represents a practical application of the idea.

Accordingly, when a claim is found to define non-statutory subject matter because of a mathematical algorithm, it is important to determine whether the subject matter is a law of nature or natural phenomenon or abstract idea. A rejection under § 101 should indicate the type of deficiency relied upon to support the rejection.

#### (b) Evaluation of Certain Language Related to Mathematical Operation Steps of a Process

##### (i) Intended Use or Field of Use Statements

Claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim. Such language often will be presented in the preamble of claim, but may appear elsewhere in the body of the claim. Intended or field of use language appearing in the preamble will in most instances not limit the claim scope, and as such, Office personnel should be careful to properly interpret such language. For example, a claimed mathematical process "to be used in seismic prospecting..." is not limited by the seismic prospecting use statement (i.e., none of the steps were explicitly or implicitly limited to application to seismic prospecting activities).<sup>32</sup> In such a case, Office personnel should identify the claim language that constitutes the intended use or field of use statements and provide the basis for their findings. This will shift the burden to applicant to demonstrate otherwise.

##### (ii) Necessary Antecedent Step to Performance of A Mathematical Operation or Independent Limitation on a Claimed Process

In rare situations, certain acts of "collecting" or "selecting" data for use in a process consisting of one or more mathematical operations will not further limit a claim beyond the specified mathematical operation step(s). Such acts "merely determine values for the variables used in the mathematical operations used in making the calculations."<sup>34</sup> In other words, the acts are dictated by nothing other than the performance of a mathematical operation.<sup>35</sup>

If a claim requires acts to be performed to *create* data that will then be used in a process representing a *practical application* of one or more mathematical operations, those acts *must* be treated as further limiting the claim beyond the mathematical operation(s) per se. Such acts are data gathering steps not dictated by the algorithm but by other limitations which require certain antecedent steps and as such constitute an independent limitation on the claim.

Examples of acts that independently limit a claimed process involving mathematical operations include:



— a method of conducting seismic exploration which requires generating and manipulating signals from seismic energy waves before "summing" the values represented by the signals;<sup>36</sup> and

— a method of displaying X-ray attenuation data as a signed gray scale signal in a "field" using a particular anti-aliasing algorithm, where the antecedent steps require generating the data using a particular machine (e.g., a computed tomography scanner).<sup>37</sup>

Examples of steps that do not independently limit one or more mathematical operation steps include:

— "perturbing" the values of a set of process inputs, where the subject matter "perturbed" was a number and the act of "perturbing" consists of substituting the numerical values of variables;<sup>38</sup> and

— selecting a set of "arbitrary measurement point" values.<sup>39</sup> Such steps do not impose independent limitations on the scope of the claim beyond those required by the mathematical operation limitation.

### (iii) Post-Mathematical Operation Step Uses Solution or Merely Conveys Result of Operation

In rare instances, certain kinds of post-solution "acts" will not further limit a process claim beyond the performance of the preceding mathematical operation step even if the acts are recited in the body of a claim. If, however, the claimed acts represent some use of the solution, those acts will invariably impose an independent limitation on the claim. Thus, if a claim requires that the direct result of a mathematical operation be evaluated and transformed into something else, Office personnel cannot treat the subsequent steps as being *indistinguishable* from the performance of the mathematical operation and thus not further limiting on the claim. For example, acts that require the conversion of a series of numbers representing values of a wavefunction equation for a chemical compound into values representing an image that conveys information about the three dimensional structure of the compound cannot be treated as being part of the mathematical operations that yield the wavefunction numbers. Office personnel should be especially careful when reviewing claim language that requires the performance of "post-solution" steps to ensure that actual claim limitations are not ignored.

Examples of steps found not to independently limit a process involving one or more mathematical operation steps include:

— step of "updating an alarm limit" found to constitute changing the number value of a variable to represent the result of the calculation;<sup>40</sup>

— final step of "magnetically recording" the result of a calculation;<sup>41</sup>

— final step of "equating" the process outputs to the values of the last set of process inputs found to constitute storing the result of calculations;<sup>42</sup>

— final step of displaying result of a calculation "as a shade of gray rather than as simply a number" found to not constitute distinct step where the data were numerical values that did not represent anything;<sup>43</sup> and

— step of "transmitting electrical signals representing" the result of calculations.<sup>44</sup>

Office personnel are reminded to rely on the applicant's characterization of the significance of the "acts" being assessed to resolve questions related to their relationship to the mathematical operations recited in the claim and the invention as a whole.<sup>45</sup>

### (c) Manipulation of Abstract Ideas Without A Practical Application

A process that consists solely of the manipulation of an abstract idea without any limitation to a practical application is non-statutory.<sup>46</sup>

In order to determine whether the claim is limited to a practical application of an idea, Office personnel must analyze the claim as a whole, in light of the specification, to understand what subject matter is being manipulated and how it is being manipulated. During this procedure, Office personnel must evaluate any statements of intended use or field of use, any data gathering step and any post-manipulation activity. See section (b) above.

### IV. Issues Related to Compliance with Section 112, First and Second Paragraphs [Guidelines § I.B.2.]

Section 112 serves to ensure that the claims are clearly defined and are fully supported by the disclosure. Office personnel should focus their assessment of applications for compliance with § 112 on determining if the disclosure and claims clearly convey what the applicant has invented, permit others to determine what rights have been provided to the patentee, and enable one skilled in the art to practice the invention without undue experimentation.

When evaluating applications, Office personnel must always remember to use the perspective of one of ordinary skill in the art. Claims and disclosures are not to be evaluated in a vacuum. If elements of an invention are well known in the art, the applicant does not have to provide a disclosure that describes those elements.

Similarly, the applicant need not explicitly recite in the claims every feature of the invention. Rather, if the claims, interpreted in light of the disclosure reasonably apprise those of ordinary skill in the art what the invention is, they satisfy the requirements of § 112, second paragraph. For example, if an applicant indicates that the invention is a particular computer, the claim does not have to recite every element or feature of the computer. In fact, it is preferable for the claim to be drafted in a form that emphasizes what the applicant has invented (e.g., what is new rather than old).<sup>47</sup>

If deficiencies are discovered with respect to § 112, Office personnel must be careful to rely on the appropriate paragraph of § 112. Deficiencies under the second paragraph of § 112 exist if it is unclear what the claim defines (i.e., the claim fails to particularly point out and distinctly claim the invention),<sup>48</sup> or the claim as cast does not define what applicant has indicated to be the invention.<sup>49</sup> Deficiencies under the first paragraph of § 112 can arise where there is not an adequate written description that serves to identify what the applicant has invented, or the disclosure does not enable one skilled in the art to make and use the invention as claimed without undue experimentation. Deficiencies related to disclosure of the best mode for carrying out the claimed invention are not usually encountered during initial examination of an application.

### A. Specification Fails to Show How to Make or Use Programmed Computer Element of Invention [Guidelines § I.B.2.(b)]

The disclosure must enable a person skilled in the art to configure the computer to possess the requisite functionality, and, if relevant, integrate the computer with other elements to yield the claimed invention, without the exercise of undue experimentation. If the specification fails to identify *how* to configure a computer to possess the requisite functionality or *how* to integrate the programmed computer with other elements of the invention, the claim is likely to be deficient under § 112, first paragraph.

For many computer-implemented inventions, it is not unusual for the claimed invention to involve more than one field of technology. For such inventions, the disclosure must satisfy the enablement standard for each aspect of the invention.<sup>50</sup> As such, the disclosure must teach a person skilled in each art how to make and use the relevant aspect of the invention without undue experimentation. For example, to enable a claim to a programmed computer that determines and displays the three-dimensional structure of a chemical compound, the disclosure must

— enable a person skilled in the art of molecular modeling to

understand and practice the underlying molecular modeling processes; and

— enable a person skilled in the art of computer programming to create a program that directs a computer to create and display the image representing the three-dimensional structure of the compound.

In other words, the disclosure corresponding to each aspect of the invention must be enabling to a person skilled in each respective art.

### B. Programmed Computer Is Defined As Composite of Functional Elements

In many instances, an applicant will describe a programmed computer by outlining the significant elements of the programmed computer using a functional block diagram. Office personnel should review the specification to ensure that along with the functional block diagram the disclosure provides information that adequately describes each "element" in hardware or software. If the functionally labeled elements of a programmed computer are not described further in the specification and one skilled in the art would not know what the elements are or how to make or use them to yield the claimed invention, a claim defining an invention requiring the use of that programmed computer is likely to be deficient under one or more requirements of § 112.

### C. Elements of a Machine Defined Using Means Plus Function Language [Guidelines § I.B.2.(a) & (b)]

Where means plus function language is used to define the characteristics of a machine or manufacture invention, claim elements must be interpreted to read on only the structures or materials disclosed in the specification, and "equivalents thereof."<sup>51</sup> Thus, at the outset Office personnel must attempt to correlate means elements to some description of the elements in the written specification and drawings.

As noted earlier, there are many appropriate ways of describing the elements of a programmed computer. If the description makes it clear that a means element corresponds to the physical structure of a computer or computer component, that description will sufficiently define the claimed means element. Thus, a means element may be defined to be:

— a programmed computer with a particular functionality;

— a logic circuit or other component of a programmed computer that performs a series of specifically identified operations dictated by a computer program; or

— a computer memory encoded with executable instructions representing a computer program that can cause a computer to function in a particular fashion.

A claim patterned after a functional block diagram and defined using means plus function language may fail to particularly point out and distinctly claim the invention if the disclosure does not describe the specific materials or structures that correspond to the means elements. The scope of a "means" element is defined as the corresponding structure or material (e.g., a specific logic circuit) set forth in the written description and its equivalents. Where no structure or material is disclosed, the claim fails to particularly point out and distinctly claim the invention. For example, if the applicant discloses only the function to be performed and provides no description of hardware or software that performs the function, the application has not disclosed any "structure" to correspond to the means. Such a claim should be rejected under § 112, second paragraph. In contrast, if the corresponding structure is disclosed to be a memory or logic circuit that has been configured in some manner to perform that function (e.g., using a computer program), the claim satisfies § 112, second paragraph.

Further guidance in interpreting the scope of equivalents of means elements is provided in the *Examination Guidelines For Claims Reciting A Means or Step Plus Function Limitation In Accordance With 35 U.S.C. 112, 6th Paragraph*.<sup>52</sup>

### D. Claim Does Not Define Applicant's Invention [Guidelines § I.B.2.(a)]

To satisfy the second paragraph of § 112, the claims must define the invention in a manner consistent with the applicant's written description of the invention. If the applicant asserts a practical utility for the invention, Office personnel should review the entire disclosure to determine the features necessary to accomplish the asserted practical utility. When the claim recites a practical utility but fails to recite the necessary features to accomplish the asserted practical utility, the claim should be rejected under § 112, second paragraph. If a claim is so broad as to encompass non-statutory subject matter, the claim should be rejected under § 112 ¶ 2, as well as § 101. For example, if applicant has described the invention as a computer-implemented process, but the claim is broad enough to cover the mental performance of the process, then it should be rejected under both § 112 ¶ 2 and § 101.<sup>53</sup>

A claim as a whole that defines non-statutory subject matter is deficient under § 101, and under § 112, second paragraph. Determining the scope of a claim as a whole requires a clear understanding of what the applicant regards as the invention. If the invention as disclosed in the written description is statutory, but the claims define subject matter that is not, the deficiency can be corrected by an appropriate claim amendment. Therefore, reject the claims under §§ 101 and 112, second paragraph, but identify the features of the invention that, if recited in the claim, would render the claimed subject matter statutory.

### E. Claim Defined Using Only Computer Program Code [Guidelines § I.B.2.(a)]

A claim defined *entirely* in computer program code, whether in source or object code format, may be deficient under § 112 ¶ 2 if one of ordinary skill in the art would not be able to ascertain the metes and bounds of the claimed invention. Such a claim should also be objected to under 37 CFR 1.52(a).<sup>54</sup> A computer programming language is not the English language, despite the fact that English words may be used in that language.

In certain circumstances, as where self-documenting programming code is employed, use of programming language in a claim would be permissible, since such program source code presents sufficiently high-level language and descriptive identifiers to make it universally understood to others in the art without the programmer having to insert any comments.<sup>55</sup>

Applicants should be encouraged to functionally define the steps the computer will perform rather than simply providing source or object code.

### V. Issues Related to Compliance with § 103 [Guidelines § I.B.3.]

As is the case for inventions in any field of technology, assessment of a claimed computer-implemented invention for compliance with § 103 begins with a comparison of the claimed subject matter to what is known in the prior art. Once distinctions are identified between the claimed invention and the prior art, those distinctions must be assessed and resolved in light of the knowledge possessed by a person of ordinary skill in the art. Against this backdrop, one must determine whether the invention would have been obvious at the time the invention was made. If not, the claimed invention satisfies § 103. Factors and considerations dictated by law governing § 103 apply without modification to inventions in this field of technology.

If the difference between the prior art and the claimed invention is limited to information stored on or employed by a machine, one must determine what role the information plays with regard to the invention considered as a whole. Where the information imparts some degree of functionality to the claimed invention taken as a whole, it represents a critical element of the invention. As such, the information must be considered and addressed incident to application of § 103. Thus, a rejection of the claim as a whole under § 103 is inappropriate unless the functionality imparted by the information would have been suggested by the prior art. To establish a *prima facie* case of obviousness, Office personnel must explain why it would have been obvious to a person of ordinary skill in the art, at the



time the invention was made, to impart the functionality of the programmed computer with that specific information.

However, where the information imparts no functionality to achieve the specific utility of the invention, it cannot serve to render the claimed invention, considered as a whole, non-obvious. Generally speaking, situations where information imparts no functionality will be limited to the following:

— a computer readable storage medium that differs from the prior art solely with respect to information encoded on the medium that does not alter its functionality considered as a whole,

— a computer that differs from the prior art solely with respect to information whose content does not alter how the machine functions (i.e., the information does not reconfigure the computer), or

— a process that differs from the prior art only with respect to information that does not alter how the process steps are to be performed to achieve the utility of the invention.

Thus, if the prior art suggests storing a song on a disk, merely choosing a particular song to store on the disk would be presumed to have been obvious as being well within the level of ordinary skill in the art at the time the invention was made. Such a difference is simply a rearrangement of non-functional information.

## VI. Conclusion

Once Office personnel have concluded an analysis of the claimed invention under all the statutory provisions, including §§ 101, 112, 102 and 103, when composing any Official action, they should review all the proposed rejections and their bases to confirm their correctness. Only then should any rejection be imposed.

<sup>1</sup> See *Request for Comments on Proposed Examination Guidelines for Computer-Implemented Inventions*, 60 Fed. Reg. 28,778 (June 2, 1995).

<sup>2</sup> *In re Freeman*, 573 F.2d 1237, 1245, 197 USPQ 464, 471 (CCPA 1978); *In re Walter*, 618 F.2d 758, 767, 205 USPQ 397, 406-07 (CCPA 1980); *In re Abele*, 684 F.2d 902, 905-07, 214 USPQ 682, 685-87 (CCPA 1982).

<sup>3</sup> As the courts have repeatedly reminded the Office: "The goal is to answer the question 'What did applicants invent?'" *In re Abele*, 684 F.2d at 907, 214 USPQ at 687 (CCPA 1982). *Accord*, e.g., *Arrhythmia Research Tech. v. Corazonix Corp.*, 958 F.2d 1053, 1059, 22 USPQ2d 1033, 1038 (Fed. Cir. 1992).

<sup>4</sup> See *Brenner v. Manson*, 383 U.S. 519, 534, 148 USPQ 689, 695 ("Whatever weight is attached to the value of encouraging disclosure and of inhibiting secrecy, we believe a more compelling consideration is that a process patent in the chemical field, which has not been developed and pointed to the degree of specific utility, creates a monopoly of knowledge which should be granted only if clearly commanded by the statute.") (emphasis added). See also *Nelson v. Bowler*, 626 F.2d 853, 856, 206 USPQ 881, 883 (CCPA 1980) (Specific utility is also called "practical utility").

<sup>5</sup> E.g., *In re Alappat*, 33 F.3d 1526, 1543, 31 USPQ2d 1545, 1556-57 (Fed. Cir. 1994) (in banc) (quoting *Diamond v. Diehr*, 450 U.S. 175, 192, 209 USPQ 1, 10 (1981)). See also *id.* at 1579 (Newman, J., concurring) ("unpatentability of the principle does not defeat patentability of its practical applications") (citing *O'Reilly v. Morse*, 56 U.S. (15 How.) 62 (1854)); *Arrhythmia*, 958 F.2d at 1057, 22 USPQ2d at 1036.

<sup>6</sup> 60 Fed. Reg. 36,263 (July 14, 1995).

<sup>7</sup> *Arrhythmia*, 958 F.2d at 1057, 22 USPQ2d at 1036.

It is of course true that a modern digital computer manipulates data, usually in binary form, by performing mathematical operations, such as addition, subtraction, multiplication, division, or

bit shifting, on the data. But this is only how the computer does what it does. Of importance is the significance of the data and their manipulation in the real world, i.e., what the computer is doing.

<sup>8</sup> Many computer-implemented inventions do not consist solely of a computer. Thus, Office personnel should identify those claimed elements of the computer-implemented invention that are not part of the programmed computer, and determine how those elements relate to the programmed computer. Office personnel should look for specific information that explains the role of the programmed computer in the overall process or machine and how the programmed computer is to be integrated with the other elements of the apparatus or used in the process.

<sup>9</sup> *Markman v. Westview Instruments*, 52 F.3d 967, 980, 34 USPQ2d 1321, 1330 (Fed. Cir. 1995) (in banc).

<sup>10</sup> See, e.g., *In re Paulsen*, 30 F.3d 1475, 1480, 31 USPQ2d 1671, 1674 (Fed. Cir. 1994) (inventor may define specific terms used to describe invention, but must do so "with reasonable clarity, deliberateness, and precision" and, if done, must "set out his uncommon definition in some manner within the patent disclosure" so as to give one of ordinary skill in the art notice of the change" in meaning) (quoting *Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1387-1388, 21 USPQ2d 1383, 1386 (Fed. Cir. 1992)).

<sup>11</sup> See, e.g., *In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow . . . . The reason is simply that during patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed. . . . An essential purpose of patent examination is to fashion claims that are precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative process.").

<sup>12</sup> See, e.g., *In re Paulsen*, 30 F.3d at 1480, 31 USPQ2d at 1674 (although specification can be used to interpret what the patentee meant by a word or phrase in the claim, cannot add extraneous limitation from the specification when limitation is not needed to interpret any particular words or phrases in the claim).

<sup>13</sup> See, e.g., *Diamond v. Diehr*, 450 U.S. at 188-89, 209 USPQ at 9 ("In determining the eligibility of respondents' claimed process for patent protection under § 101, their claims must be considered as a whole. It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis. This is particularly true in a process claim because a new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination was made.").

<sup>14</sup> *Diamond v. Chakrabarty*, 447 U.S. 303, 308-09, 206 USPQ 193, 196-97 (1980).

In choosing such expansive terms as "manufacture" and "composition of matter," modified by the comprehensive "any," Congress plainly contemplated that the patent laws would be given wide scope. The relevant legislative history also supports a broad construction. The Patent Act of 1793, authored by Thomas Jefferson, defined statutory subject matter as "any new and useful art, machine, manufacture, or composition of matter, or any new or useful improvement [thereof]." Act of Feb. 21, 1793, § 1, 1 Stat. 319. The Act embodied Jefferson's philosophy that "ingenuity should receive a liberal encouragement." 5 Writings of Thomas Jefferson 75-76 (Washington ed. 1871). See *Graham v. John Deere Co.*, 383 U.S. 1, 7-10 (1966). Subsequent patent statutes in 1836, 1870, and 1874 employed this same broad language. In 1952, when the patent laws were recodified, Congress replaced the word "art" with "process," but otherwise left Jefferson's language intact. The Committee Reports accompanying the 1952 Act inform us that Congress intended statutory subject matter to "include anything under the sun that is made

by man." S. Rep. No. 1979, 82d Cong., 2d Sess. 5 (1952); H.R. Rep. No. 1923, 82d Cong., 2d Sess. 6 (1952).

This perspective has been embraced by the Federal Circuit:

The plain and unambiguous meaning of § 101 is that any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may be patented if it meets the requirements for patentability set forth in Title 35, such as those found in § 102, 103, and 112. The use of the expansive term "any" in § 101 represents Congress's intent not to place any restrictions on the subject matter for which a patent may be obtained beyond those specifically recited in § 101 and the other parts of Title 35 . . . . Thus, it is improper to read into § 101 limitations as to the subject matter that may be patented where the legislative history does not indicate that Congress clearly intended such limitations. [*In re Alappat*, 33 F.3d at 1542, 31USPQ2d at 1556.]

<sup>15</sup> 35 U.S.C. § 101 (1994).

<sup>16</sup> See 35 U.S.C. § 100(b) ("The term 'process' means process, art, or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.").

<sup>17</sup> E.g., *In re Alappat*, 33 F.3d at 1542, 31USPQ2d at 1556; *In re Warmerdam*, 33 F.3d at 1358, 31USPQ2d at 1757.

<sup>18</sup> See, e.g., *Rubber-Tip Pencil v. Howard*, 87 U.S. 498, 507 (1874) ("idea of itself is not patentable, but a new device by which it may be made practically useful is"); *Mackay Radio & Telegraph Co. v. Radio Corp. of America*, 306 U.S. 86, 94 (1939) ("While a scientific truth, or the mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be."); *In re Warmerdam*, 33 F.3d 1354, 1360, 31 USPQ2d 1754, 1759 (Fed. Cir. 1994) ("steps of 'locating' a medial axis, and 'creating' a bubble hierarchy describe nothing more than the manipulation of basic mathematical constructs, the paradigmatic 'abstract idea'").

<sup>19</sup> The concern over preemption was expressed as early as 1852. See *Le Roy v. Tatham*, 55 U.S. 156, 175 (1852) ("A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right."); *Funk Brothers Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 132, 76 USPQ 280, 282 (1988) (combination of six species of bacteria to be non-statutory subject matter).

<sup>20</sup> *In re Ziegler*, 992 F.2d 1197, 1200-03, 26 USPQ2d 1600, 1603-06 (Fed. Cir. 1993); *Brenner v. Manson*, 383 U.S. at 528-36, 148 USPQ at 693-696.

<sup>21</sup> See, e.g., *In re Musgrave*, 431 F.2d 882, 893, 167 USPQ 280, 289-90 (CCPA 1970), cited with approval in *In re Schrader*, 22 F.3d 290, 297 (Fed. Cir. 1994) (Newman, J., dissenting). The definition of "technology" is the "application of science and engineering to the development of machines and procedures in order to enhance or improve human conditions, or at least to improve human efficiency in some respect." Computer Dictionary 384 (2d ed. Microsoft Press 1994).

<sup>22</sup> E.g., *In re Waldbaum*, 457 F.2d 997, 1003, 173 USPQ 430, 434 (CCPA 1972) ("The phrase 'technological arts,' as we have used it, is synonymous with the phrase 'useful arts' as it appears in Article I, Section 8 of the Constitution.").

<sup>23</sup> See, e.g., *In re Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (holding non-statutory a claim to a data structure *per se*).

<sup>24</sup> Computer Dictionary 210 (2d ed. Microsoft Press 1994):

The meaning of data, as it is intended to be interpreted by people. Data consists of facts, which become information when they are seen in context and convey meaning to people. Computers process data without any understanding of what that data represents.

<sup>25</sup> See, e.g., *In re Lowry*, 32 F.3d 1579, 1583, 32 USPQ2d 1031, 1034-35 (Fed. Cir. 1994); *In re Warmerdam*, 33 F.3d at 1361-62, 31 USPQ2d at 1760.

<sup>26</sup> *In re Warmerdam*, 33 F.3d at 1359, 31 USPQ2d at 1759 (claim to computer having specific memory defined using product-by-process format).

<sup>27</sup> *In re Lowry*, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

<sup>28</sup> *Diamond v. Diehr*, 450 U.S. at 183, 209 USPQ at 6 ("A statutory process is . . . a mode of treatment of certain materials to produce a given result. It is an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing . . . . The process requires that certain things should be done with certain substances, and in a certain order; but the tools to be used in doing this may be of secondary consequence.").

<sup>29</sup> *In re Schrader*, 22 F.3d 290, 295, 30 USPQ2d 1455, 1459 (Fed. Cir. 1994).

<sup>30</sup> *Diamond v. Diehr*, 450 U.S. at 187, 209 USPQ at 8.

<sup>31</sup> *Arrhythmia*, 958 F.2d at 1058-59, 22 USPQ2d at 1037-38.

<sup>32</sup> See, e.g., *In re Meyer*, 688 F.2d 789, 794-95, 215 USPQ 193, 197 (CCPA 1982) ("Scientific principles, such as the relationship between mass and energy, and laws of nature, such as the acceleration of gravity, namely,  $a=32 \text{ ft/sec}^2$ , can be represented in mathematical format. However, some mathematical algorithms and formulae do not represent scientific principles or laws of nature; they represent ideas or mental processes and are simply logical vehicles for communicating possible solutions to complex problems. The presence of a mathematical algorithm or formula in a claim is merely an indication that a scientific principle, law of nature, idea or mental process may be the subject matter claimed and, thus, justify a rejection of that claim under 35 USC 101; but the presence of a mathematical algorithm or formula is only a signpost for further analysis." Cf. *In re Alappat*, 33 F.3d at 1543 n.19, 31 USPQ2d at 1556 n.19 in which the Federal Circuit recognized the confusion:

The Supreme Court has not been clear . . . as to whether such subject matter is excluded from the scope of § 101 because it represents laws of nature, natural phenomena, or abstract ideas. See *Diehr*, 450 U.S. at 186 (viewed mathematical algorithm as a law of nature); *Benson*, 409 U.S. at 71-72 (treated mathematical algorithm as an "idea"). The Supreme Court also has not been clear as to exactly what kind of mathematical subject matter may not be patented. The Supreme Court has used, among others, the terms "mathematical algorithm," "mathematical formula," and "mathematical equation" to describe types of mathematical subject matter not entitled to patent protection standing alone. The Supreme Court has not set forth, however, any consistent or clear explanation of what it intended by such terms or how these terms are related, if at all.

<sup>33</sup> *In re Walter*, 618 F.2d at 769, 205 USPQ at 409 ("Although the claim preambles relate the claimed invention to the art of seismic prospecting, the claims themselves are not drawn to methods of or apparatus for seismic prospecting; they are drawn to improved mathematical methods for interpreting the results of seismic prospecting.").

<sup>34</sup> *In re Richman*, 563 F.2d 1026, 1030, 195 USPQ 340, 343 (CCPA 1977) ("In the present case too, notwithstanding that the antecedent steps are novel and unobvious, they merely determine values for the variables used in the mathematical formulae used in making the calculations. Thus, such antecedent steps do not suffice to render the claimed methods, considered as a whole, statutory subject matter.").

<sup>35</sup> *In re Sarkar*, 588 F.2d 1330, 1335, 200 USPQ 132, 139 (CCPA the court explained why this approach must be followed:

No mathematical equation can be used, as a practical matter, without establishing and substituting values for the variables expressed therein. Substitution of values dictated by the formula



has thus been viewed as a form of mathematical step. If the steps of gathering and substituting values were alone sufficient, every mathematical equation, formula, or algorithm having any practical use would be per se subject to patenting as a "process" under § 101. Consideration of whether the substitution of specific values is enough to convert the disembodied ideas present in the formula into an embodiment of those ideas, or into an application of the formula, is foreclosed by the current state of the law.

<sup>36</sup> *In re Taner*, 681 F.2d 787, 788, 214 USPQ 678, 679 (CCPA 1982).

<sup>37</sup> *In re Abele*, 684 F.2d at 908, 214 USPQ at 687 ("The specification indicates that such attenuation data is available only when an X-ray beam is produced by a CAT scanner, passed through an object, and detected upon its exit. Only after these steps have been completed is the algorithm performed, and the resultant modified data displayed in the required format.").

<sup>38</sup> *In re Gelnovatch*, 595 F.2d 32, 41 n.7, 201 USPQ 136, 145 n.7 (CCPA 1979) ("Appellants' claimed step of perturbing the values of a set of process inputs (step 3), in addition to being a mathematical operation, appears to be a data-gathering step of the type we have held insufficient to change a nonstatutory method of calculation into a statutory process . . . . In this instance, the perturbed process inputs are not even measured values of physical phenomena, but are instead derived by numerically changing the values in the previous set of process inputs.").

<sup>39</sup> *In re Sarkar*, 588 F.2d at 1331, 200 USPQ at 135.

<sup>40</sup> *Parker v. Flook*, 437 U.S. 584, 585, 198 USPQ 193, 195 (1978).

<sup>41</sup> *In re Walter*, 618 F.2d at 770, 205 USPQ at 409 ("If § 101 could be satisfied by the mere recitation of the results of a nonstatutory process on some record medium, even the most unskilled patent draftsman could provide for such a step.").

<sup>42</sup> *In re Gelnovatch*, 595 F.2d at 41 n.7, 201 USPQ at 145 n.7.

<sup>43</sup> *In re Abele*, 684 F.2d at 909, 214 USPQ at 688 ("This claim presents no more than the calculation of a number and display of the result, albeit in a particular format. The specification provides no greater meaning to 'data in a field' than a matrix of numbers regardless of by what method generated. Thus, the algorithm is neither explicitly nor implicitly applied to any certain process. Moreover, that the result is displayed as a shade of gray rather than as simply a number provides no greater or better information, considering the broad range of applications encompassed by the claim.").

<sup>44</sup> *In re de Castelet*, 562 F.2d 1236, 1244, 195 USPQ 439, 446 (CCPA 1967) ("That the computer is instructed to transmit electrical signals, representing the results of its calculations, does not constitute the type of 'post solution activity' found in *Flook*, supra, and does not transform the claim into one for a process merely using an algorithm. The final transmitting step constitutes nothing more than reading out the result of the calculations.").

<sup>45</sup> See *In re Sarkar*, 588 F.2d at 1332 n.6, 200 USPQ at 136 n.6 ("post-solution" construction that was being modeled by the mathematical process not considered in deciding § 101 question because applicant indicated that such construction was not a material element of the invention).

<sup>46</sup> E.g., *In re Warmerdam*, 33 F.3d at 1359, 31 USPQ2d at 1759. See also *Schrader*, 22 F.3d at 295, 30 USPQ2d at 1458-59 (although the court determined that the subject matter was simply a mathematical algorithm, *Schrader's* process mere manipulated an abstract idea).

<sup>47</sup> See, e.g., *Northern Telecom, Inc. v. Datapoint Corp.*, 908 F.2d 931, 941-43, 15 USPQ 2d 1321, 1328-1330 (Fed. Cir.

1990) (judgment of invalidity reversed for clear error where expert testimony on both sides showed that a programmer of reasonable skill could write a satisfactory program with ordinary effort based on the disclosure); *DeGeorge v. Bernier*, 768 F.2d 1318, 1334, 226 USPQ 758, 762-63 (Fed. Cir. 1985) (invention was adequately disclosed for purposes of enablement even though all of the circuitry of a word processor was not disclosed, since the undisclosed circuitry was deemed inconsequential because it did not pertain to the claimed circuit); *In re Phillips*, 608 F.2d 879, 882-83, 203 USPQ 971, 975 (CCPA 1979) (computerized method of generating printed architectural specifications dependent on use of glossary of predefined standard phrases and error-checking feature enabled by overall disclosure generally defining errors); *In re Donohue*, 550 F.2d 1269, 1271, 193 USPQ 136, 137 (CCPA 1977) ("Employment of block diagrams and descriptions of their functions is not fatal under 35 U.S.C. § 112, first paragraph, providing the represented structure is conventional and can be determined without undue experimentation."); *In re Knowlton*, 481 F.2d 1357, 1366-68, USPQ 486, 493-94 (CCPA 1973) (examiner's contention that a software invention needed a detailed description of all the circuitry in the complete hardware system reversed).

<sup>48</sup> See *Miles Labs v. Shandon, Inc.*, 997 F.2d 870, 875, 27 USPQ2d 1123, 1126 (Fed. Cir. 1993) ("test for definiteness is whether one skilled in the art would understand the bounds of the claim when read in light of the specification").

<sup>49</sup> *In re Prater*, 415 F.2d 1393, 1404, 162 USPQ 541, 550 (CCPA 1969) (holding that claim did not comply with 35 U.S.C. § 112 ¶ 2 because it was admittedly beyond that which "applicant regard[ed] as his invention").

<sup>50</sup> See *In re Naquin*, 398 F.2d 86, 866, 158 USPQ 317, 319 (CCPA 1968) ("When an invention, in its different aspects, involves distinct arts, that specification is adequate which enables the adepts of each art, those who have the best chance of being enabled, to carry out the aspect proper to their specialty."); See also *Ex parte Zechall*, 194 USPQ 461, 461 (Bd. App. 1973) ("appellants' disclosure must be held sufficient if it would enable a person skilled in the electronic computer art, in cooperation with a person skilled in the fuel injection art, to make and use appellants' invention").

<sup>51</sup> Two *in banc* decisions of the Federal Circuit have made clear that the Office is to interpret means plus function language according to 35 U.S.C. § 112 ¶ 6. In the first, *In re Donaldson*, F.3d 1189, 1193, 29 USPQ2d 1845, 1848 (Fed. Cir. 1994), the court held:

The plain and unambiguous meaning of paragraph six is that one construing means-plus-function language in a claim must look to the specification and interpret that language in light of the corresponding structure, material, or acts described therein, and equivalents thereof, to the extent that the specification provides such disclosure. Paragraph six does not state or even suggest that the PTO is exempt from this mandate, and there is no legislative history indicating that Congress intended that the PTO should be. Thus, this court must accept the plain and precise language of paragraph six.

Consistent with *Donaldson*, in the second decision, *In re Alappat*, 33 F.3d at 1540, 31 USPQ2d at 1554, the Federal Circuit held:

Given Alappat's disclosure, it was error for the Board majority to interpret each of the means clauses in claim 15 so broadly as to "read on any and every means for performing the function" recited, as it said it was doing, and then to conclude that claim 15 is nothing more than a process claim wherein each means clause represents a step in that process. Contrary to suggestions by the Commissioner, this court's precedents do not support the Board's view that the particular apparatus claims at issue in this case may be viewed as nothing more than process claims.

<sup>52</sup> 1162 O.G. 59 (May 17, 1994).

<sup>53</sup> For example, in *In re Prater*, 415 F.2d at 1403-04, 162 USPQ at 549-50, the court considered a claim that was found to encompass both the mental and physical performance of a series of calculations (i.e., the claim was not limited to performance of a calculation on a machine). The applicant had argued that the invention was to be practiced using a machine. *Id.* The court found that while the claims defined a statutory process, they were deficient under the second paragraph of § 112. *Id.* The court emphasized that:

[W]hen read in the light of the specification, claim 9 does read on a mental process augmented by pencil and paper markings. We find no express limitation in claim 9 which, even when interpreted in the light of the specification, would support the conclusion that the claim is limited to a "machine process" or "machine-implemented process." This is particularly important in this case since the board noted that, in their brief before the board, appellants acknowledged that "[though] not practical for most of the needed applications, their method, theoretically, can be practiced by hand." . . . Inasmuch as claim 9, thus interpreted, reads on subject matter for which appellants do not seek coverage, and therefore tacitly admit to be beyond that which "applicant regards as his invention," we feel that the claim fails to comply with 35 USC 112 which requires that "[the] specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." (Emphasis added.) This is true notwithstanding appellants' disclosure of a machine-implemented process. [*Id.*]

The basis of this type of rejection is that the claim, as cast, is incomplete.

<sup>54</sup> If the invention, both as disclosed and as claimed, is not statutory subject matter, reject the claims under § 101 for being drawn to non-statutory subject matter, and under § 112, second paragraph, for failing to particularly point out and distinctly claim an invention entitled to protection under U.S. patent law.

<sup>55</sup> See 37 CFR § 1.52(a) ("The application, any amendments or corrections thereto, and the oath or declaration must be in the English language except as provided for in § 1.69 and paragraph (d) of this section . . . .").

<sup>56</sup> See *Computer Dictionary 353* (Microsoft Press 1994).

## APPENDIX

### I. Guidelines for Examination of Computer-Implemented Inventions

(Proposed)

60 Fed. Reg. 28,778 (June 2, 1995)

#### A. General Considerations

The following guidelines have been developed to assist Office personnel in their review of applications drawn to computer-implemented inventions. These guidelines respond to recent changes in the law that governs the patentability of computer-implemented inventions, and set forth the official policy of the Office regarding inventions in this field of technology.

It is essential that patent applicants obtain a prompt yet complete examination of their applications. The Office can best achieve this goal by raising any issue that may affect patentability in the initial action on the merits. Under the principles of compact prosecution, each claim should be reviewed for compliance with every statutory requirement of patentability in the initial review of the application, even if one or more claims is found to be deficient with respect to one statutory requirement. Deficiencies should be explained clearly, particularly when they serve as a basis of a rejection. Where possible, examiners should indicate how rejections may be overcome and problems resolved. A failure to follow this approach can lead to unnecessary delays in the prosecution of the application.

#### B. Procedures to be Followed When Evaluating Computer-Implemented Inventions

The following procedures should be used when reviewing applications drawn to computer-implemented inventions.

##### 1. Determine what the applicant has invented by reviewing the written description and the claims.

(a) Identify any specific embodiments of the invention that have been disclosed, review the detailed description of the invention and note the specific utility that has been asserted

for the invention.

(b) Analyze each claim carefully, correlating each claim element to the relevant portion of the written description that describes that element. Give claim elements their broadest reasonable interpretation that is consistent with the written description. If elements of a claimed invention are defined in means plus function format, review the written description to identify the specific structure, materials or acts that correspond to each such element.

(c) Considering each claim as a whole, classify the invention defined by each claim as to its statutory category (i.e., process, machine, manufacture or composition of matter). Rely on the following presumptions in making this classification.

(i) A computer or other programmable apparatus whose actions are directed by a computer program or other form of "software" is a statutory "machine."

(ii) A computer readable memory that can be used to direct a computer to function in a particular manner when used by the computer [1] is a statutory "article of manufacture".

(iii) A series of specific operational steps to be performed on or with the aid of a computer is a statutory "process".

A claim that clearly defines a computer-implemented process but is not cast as an element of a computer readable memory or as implemented on a computer should be classified as a statutory "process." [2] If an applicant responds to an action of the Office based on this classification by asserting that subject matter claimed in this format is a machine or an article of manufacture, reject the claim under 35 U.S.C. § 112, second paragraph, for failing to recite at least one physical element in the claims that would otherwise place the invention in either of these two "product" categories. The Examiner should also object to the specification under 37 CFR 1.71(b) if such an assertion is made, as the complete invention contemplated by the applicant has not been cast precisely as being an invention within one of the statutory categories.

A claim that defines an invention as any of the following subject matter should be classified as non-statutory:

— a compilation or arrangement of data, independent of any physical element;

— a known machine-readable storage medium that is encoded with data representing creative or artistic expression (e.g., a work of music, art or literature) [3], [4];

— a "data structure" independent of any physical element (i.e., not as implemented on a physical component of a computer such as a computer readable memory to render that component capable of causing a computer to operate in a particular manner); or

— a process that does nothing more than manipulate abstract ideas or concepts (e.g., a process consisting solely of the steps one would follow in solving a mathematical problem [5]).

Claims in this form are indistinguishable from abstract ideas, laws of nature and natural phenomena and may not be patented. Non-statutory claims should be handled in the manner described in section (2)(c) below.



2. Analyze each claim to determine if it complies with § 112, second paragraph, and with § 112, first paragraph.

(a) Determine if the claims particularly point out and distinctly claim the invention. To do this, compare the invention as claimed to the invention as it has been described in the specification. Pay particular attention to the specific utility contemplated for the invention—features or elements of the invention that are necessary to provide the specific utility contemplated for that invention must be reflected in the claims. If the claims fail to accurately define the invention, they should be rejected under § 112, second paragraph. A failure to limit the claim to reflect features of the invention that are necessary to impart the specific utility contemplated may also create a deficiency under § 112, first paragraph.

If elements of a claimed invention are defined using "means plus function" language, but it is unclear what structure, materials or acts are intended to correspond to those elements, reject the claim under § 112, second paragraph. A rejection imposed on this basis shifts the burden to the applicant to describe the specific structure, material or acts that correspond to the means element in question, and to identify the precise location in the specification where a description of that means element can be found. Interpretation of means elements for § 112, second paragraph purposed must be consistent with interpretation of such elements for §§ 102 and 103 purposes.

Computer program-related elements of a computer-implemented [6] invention may serve as the specific structure, material or acts that correspond to an element of an invention defined using a means plus function limitation. For example, a series of operations performed by a computer under the direction of a computer program may serve as "specific acts" that correspond to a means element. Similarly, a computer-readable memory encoded with data representing a computer program that can cause a computer to function in a particular fashion, or a component of a computer that has been reconfigured with a computer program to operate in a particular fashion, can serve as the "specific structure" corresponding to a means element.

Claims must be defined using the English language. See, 37 CFR 1.52(a). A computer programming language is not the English language, despite the fact that English words may be used in that language. Thus, an applicant may not use computer program code, in either source or object format, to define the metes and bounds of a claim. A claim which attempts to define elements of an invention using computer program code, rather than the functional steps which are to be performed, should be rejected under § 112, second paragraph, and should be objected to under 37 CFR 1.52(a).

(b) Construe the scope of the claimed invention to determine if it is adequately supported by an enabling disclosure. Construe any element defined in means plus function language to encompass all reasonable equivalents of the specific structure, material or acts disclosed in the specification corresponding to that means element. Special care should be taken to ensure that each claim complies with the written description and enablement requirements of 35 U.S.C. § 112.

(c) A claim as a whole that defines non-statutory subject matter is deficient under § 101, and under § 112, second paragraph. Determining the scope of a claim as a whole requires a clear understanding of what the applicant regards as the invention. The review performed in step 1 should be used to gain this understanding.

(i) If the invention as disclosed in the written description is statutory, but the claims define subject matter that is not, the deficiency can be corrected by an appropriate claim amendment. Therefore, reject the claims under §§ 101 and 112, second paragraph, but identify the features of the invention that, if recited in the claim, would render the claimed subject matter statutory.

(ii) If the invention, both as disclosed and as claimed, is not statutory subject matter, reject the claims under § 101 for being drawn to non-statutory subject matter, and under § 112, second paragraph, for failing to particularly point out and dis-

tinctly claim an invention entitled to protection under U.S. patent law.

An invention is not statutory if it falls within any of the non-statutory claim categories outlined in section (1)(c) above. Also, in rare situations, a claim classified as a statutory machine or article of manufacture may define non-statutory subject matter. Non-statutory subject matter (i.e., abstract ideas, laws of nature and natural phenomena) does not become statutory merely through a different form of claim presentation. Such a claim will (a) define the "invention" not through characteristics of the machine or article of manufacture claimed but exclusively in terms of a non-statutory process that is to be performed on or using that machine or article of manufacture, and (b) encompass any product in the stated class (e.g., computer, computer readable memory) configured in any manner to perform that process.

3. Determine if the claimed invention is novel and nonobvious under §§ 102 and 103. When evaluating claims defined using "mean plus function" language, refer to the specific guidance provided in the *In re Donaldson* guidelines [1162 OG 59] and section (3)(a) above.

#### C. Notes on the Guidelines

[1] Articles of manufacture encompassed by this definition consist of two elements: (1) a computer readable storage medium, such as a memory device, a compact disc or a floppy disk, and (2) data encoded on that storage medium in such a way that the storage medium causes a computer to operate in a specific and predefined manner. The composite of the two elements is a storage medium with a particular physical structure and function (e.g., one that will impart the functionality represented by the data onto a computer).

[2] For example, a claim that is cast as "a computer program" but which then recites specific steps to be implemented on or using a computer should be classified as a "process." A claim to simply a "computer program" that does not define the invention in terms of specific steps to be performed on or using a computer should not be classified as a statutory process.

[3] The specific words or symbols that constitute a computer program represent the expression of the computer program and as such are a literary creation.

[4] A claim in this format should also be rejected under § 103, as being obvious over the known machine-readable storage medium standing alone.

[5] A claim to a method consisting solely of the steps necessary to converting one set of numbers to another set of numbers without reciting any computer-implemented steps would be a non-statutory claim under this definition.

[6] This includes the software and any associated computer hardware that is necessary to perform the functions directed by the software.

[1180 OG 14]

(78)

#### Department of Commerce Patent and Trademark Office Interim Guidelines for Examination of Design Patent Applications For Computer-Generated Icons

RIN: 0651-XX04  
[Docket No. 950921236-5236-01]

Agency: Patent and Trademark Office, Commerce.  
Action: Notice and request for public comments.  
Summary: The Patent and Trademark Office (PTO) requests comments from any interested member of the public on interim guidelines that will be used by PTO personnel in their review

of design patent applications for computer-generated icons. Because these guidelines govern internal practices, they are exempt from notice and comment rulemaking under 5 U.S.C. 553(b)(A).

Dates: Effective Date October 5, 1995.

Written comments on the interim guidelines will be accepted by the PTO until November 6, 1995.

Written comments will be available for public inspection on November 21, 1995, in Room 8D19 of Crystal Plaza 3, 2021 Jefferson Davis Highway, Arlington, Virginia. In addition, comments provided in machine-readable format will be available through anonymous file transfer protocol (ftp) via the Internet (address: comments.uspto.gov) and through the World Wide Web (address: www.uspto.gov).

Addresses: Written comments should be addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231, marked to the attention of John Kittle, Director, Group 1100/2900, Crystal Plaza 3, 8D19. Comments may also be submitted by telefax at (703) 305-3600 or by electronic mail through the INTERNET to "icon-pat@uspto.gov."

For Further Information Contact: John Kittle by telephone at (703) 308-1495 or by mail to his attention addressed to the Assistant Commissioner for Patents, Group 1100/2900, Washington, D.C. 20231.

Supplementary Information: Written comments should include the following information:

—Name and affiliation of the individual responding;  
—An indication of whether the comments offered represent views of the respondent's organization or are the respondent's personal views; and  
—If applicable, information on the respondent's organization, including the type of organization and general areas of interest.

Parties presenting written comments are requested, where possible, to provide their comments in machine-readable format. Such submissions may be provided by electronic mail messages sent over the Internet, or on a 3.5" floppy disk formatted for use in either a Macintosh or MS-DOS based computer. Machine-readable submissions should be provided as unformatted text (e.g., ASCII or plain text).

Sept. 29, 1995

LAWRENCE J. GOFFNEY, JR.  
Acting Assistant Secretary of Commerce  
and Acting Commissioner of Patents  
and Trademarks

#### I. INTERIM GUIDELINES FOR EXAMINATION OF DESIGN PATENT APPLICATIONS FOR COMPUTER- GENERATED ICONS

The following guidelines have been primarily developed to assist PTO personnel in determining whether design patent applications for computer-generated icons comply with the "article of manufacture" requirement of 35 U.S.C. 171.<sup>1</sup>

##### A. General Principle Governing Compliance with the "Article of Manufacture" Requirement

A design for a computer-generated icon<sup>2</sup> which is embodied in an article of manufacture is statutory subject matter for a design patent under Section 171. Thus, if an application claims a computer-generated icon embodied in a computer screen, monitor, other display panel, or a portion thereof,<sup>3</sup> that is drawn in solid lines,<sup>4</sup> the claim complies with the "article of manufacture" requirement of Section 171.

##### B. Procedures for Evaluating Whether Design Patent Applications Drawn to Computer-Generated Icons Comply With the "Article of Manufacture" Requirement

PTO personnel shall adhere to the following procedures when reviewing design patent applications drawn to computer-generated icons for compliance with the "article of manufacture" requirement of Section 171.

1. Read the entire disclosure to determine what the applicant claims as the design,<sup>5</sup> and to determine whether the design is embodied in an article of manufacture. 37 CFR 1.71 and 1.152-54.

a. Review the drawing to determine whether a computer screen, monitor, other display panel, or portion thereof, is depicted in solid lines. 37 CFR 1.152.

b. Review the title to determine whether it clearly describes the claimed subject matter.<sup>6</sup> 37 CFR 1.153.

c. Review the specification to determine whether a characteristic feature statement is present. 37 CFR 1.71. If a characteristic feature statement is present, determine whether it describes the claimed subject matter as a computer-generated icon embodied in a computer screen, monitor, other display panel, or portion thereof.<sup>7</sup>

2. If the drawing does not depict a computer-generated icon embodied in a computer screen, monitor, or a portion thereof, in solid lines, reject the claimed design under Section 171 and 35 U.S.C. 112, second paragraph, for failing to: (i) comply with the article of manufacture requirement; and (ii) particularly point out and distinctly claim the subject matter which the applicant regards as the invention.<sup>8</sup>

a. If the disclosure as a whole does not suggest or describe<sup>9</sup> the claimed subject matter as a computer-generated icon embodied in a computer screen, monitor, other display panel, or portion thereof, indicate that: (i) the claim is defective under Sections 171 and 112, second paragraph; and (ii) amendments to the written description, drawings and/or claim attempting to overcome the rejections will be rejected under 35 U.S.C. 112, first paragraph, for lack of written description and changes to the written description and drawings will be disapproved under 35 U.S.C. 132 as constituting new matter.

b. If the disclosure as a whole suggests or describes the claimed subject matter as a computer-generated icon embodied in a computer screen, monitor, other display panel, or portion thereof, indicate that the drawing may be amended to overcome the rejections under Sections 171 and 112, second paragraph. Suggest amendments which would bring the claim into compliance with Sections 171 and 112, second paragraph.

3. Indicate all objections to the disclosure for failure to comply with the formal requirements of the Rules of Practice in Patent Cases. 37 CFR 1.71, 1.81-85, and 1.152-154. Suggest amendments which would bring the disclosure into compliance with the formal requirements of the Rules of Practice in Patent Cases.

4. Upon response by applicant:

a. Review applicant's arguments and any amendments;  
b. Approve entry of any amendments which have support in the original disclosure;

c. Review all arguments and evidence of record to determine whether the drawing, title, and specification clearly disclose a computer-generated icon embodied in a computer screen, monitor, other display panel, or portion thereof.

5. If a preponderance of the evidence<sup>10</sup> establishes that the computer-generated icon is embodied in a computer screen, monitor, other display panel, or portion thereof, withdraw the rejection under Sections 171 and 112, second paragraph.

#### II. Effect of the Interim Guidelines on Pending Design Applications Drawn to Computer-Generated Icons

PTO personnel shall follow the procedures set forth in Section I of these Interim Guidelines when examining design patent applications drawn to computer-generated icons which are pending in the PTO as of the date of publication of these Interim Guidelines in the Federal Register.

#### III. Treatment of Type Fonts

Traditionally, type fonts were generated by solid blocks from which each letter or symbol was produced. Consequently, the PTO has historically granted design patents drawn to type fonts.



PTO personnel should not reject claims for type fonts under Section 171 for failure to comply with the "article of manufacture" requirement on the basis that more modern methods of typesetting, including computer-generation, do not require solid printing blocks. However, PTO personnel should treat applications specifically drawn to computer-generated type fonts in accordance with the procedures set forth in Section I of these Interim Guidelines.

#### IV. Notes

1. Further procedures for search and examination of design patent applications to ensure compliance with all other conditions of patentability are found in the Manual of Patent Examining Procedure, Chapter 1500.

2. Computer-generated icons, such as full screen displays and individual icons, are two-dimensional images which alone are surface ornamentation. See, e.g., *Ex parte Strijland*, 26 USPQ2d 1259, 1262 (Bd. Pat. App. & Int. 1992) (computer-generated icon alone is merely surface ornamentation).

3. Since a patentable "design is inseparable from the object to which it is applied and cannot exist alone merely as a scheme of surface ornamentation," a computer-generated icon must be embodied in a computer screen, monitor, other display panel, or portion thereof, to satisfy Section 171. MPEP 1502.

4. *Strijland* indicated that a computer-generated icon might be statutory subject matter if the solid-line icon is displayed on a computer screen which is shown as a broken-line drawing. 26 USPQ2d at 1263, 1266. However, since broken lines may be used to show visible environmental structure and not claimed subject matter, representation of a computer screen, monitor, other display panel, or portion thereof, in broken lines does not satisfy Section 171. See, e.g., *In re Zahn*, 617 F.2d 261, 268, 204 USPQ 988, 995 (CCPA 1980) (broken lines in design drawing show environmental structure, not claim). Broken lines may, however, be used to show other environmental structure, such as a central processing unit which contains equipment to operate the computer screen, monitor, or other display panel.

5. Since the claim must be in formal terms to the design "as shown, or as shown and described," the drawing provides the best description of the claim. 37 CFR 1.153.

6. The following titles do not adequately describe a design for an article of manufacture under Section 171: "computer icon;" or "icon." On the other hand, the following titles do adequately describe a design for an article of manufacture under Section 171: "computer screen with an icon;" "display panel with a computer icon;" "portion of a computer screen with an icon image;" "portion of a display panel with a computer icon image;" or "portion of a monitor displayed with a computer icon image."

7. See *McGrady v. Aspenglas Corp.*, 487 F. Supp. 859, 861, 208 USPQ 242, 244 (S.D.N.Y. 1980) (descriptive statement in design patent application narrows claim scope).

8. A computer screen, monitor, or other display panel is clearly described by showing a larger surface area than that immediately behind the icon image.

9. A broken line drawing of a computer screen shown in the original disclosure suggests that the applicant originally had possession of the invention as embodied in an article of manufacture. Accordingly, the broken line drawing may be converted to a solid line drawing without violating the prohibition against new matter. See *In re Rasmussen*, 650 F.2d 1212, 1214, 211 USPQ 323, 326 (CCPA 1981) (An applicant is entitled to claims as broad as the original disclosure will allow). However, a solid line drawing of a computer screen in the original disclosure may not be amended to a solid line drawing of only a portion of the computer screen without support in the original disclosure for such an amendment. See, e.g., *Ballew v. Watson*, 290 F.2d 353, 355, 129 USPQ 48, 50 (Comm'r Pat. 1961) (an amendment to the claim which changes the appearance of the

original disclosure and would "create newness by the difference achieved" is new matter).

10. See *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992) ("After evidence or argument is submitted by the applicant in response, patentability is determined on the totality of the record, by a preponderance of evidence with due consideration to persuasiveness of argument.").

[1179 OG 100]

(79)

Department of Commerce  
Patent and Trademark Office  
37 CFR Parts 1 and 3

[Docket No. 9504087-5087-01]  
RIN: 0651-AA76

#### Changes to Implement 20-Year Patent Term and Provisional Applications

Agency: Patent and Trademark Office, Commerce.

Action: Final rule.

**Summary:** The Patent and Trademark Office (PTO) is amending the rules of practice in patent cases, Parts 1 and 3 of title 37, Code of Federal Regulations, to establish procedures for: (1) filing and processing provisional application papers; (2) calculating the length of any patent term extension to which an applicant is entitled where the issuance of a patent on an application filed on or after June 8, 1995 (the implementation date of the 20-year patent term provisions of the Uruguay Round Agreements Act), other than for designs, was delayed due to interference proceedings, the imposition of a secrecy order and/or appellate review; and (3) implementing certain transitional provisions contained in the Uruguay Round Agreements Act.

**Effective Date:** June 8, 1995.

**For Further Information Contact:** Magdalen Y. Greenlief or John F. Gonzales, Senior Legal Advisors, Office of the Deputy Assistant Commissioner for Patent Policy and Projects, by telephone at (703) 305-9285, by fax at (703) 308-6916 or by mail marked to their attention and addressed to the Commissioner of Patents and Trademarks, Box DAC, Washington, D.C. 20231.

**Supplementary Information:** The Uruguay Round Agreements Act (Public Law 103-465) was enacted on December 8, 1994. Public Law 103-465 amends 35 U.S.C. 154 to provide that the term of patent protection begins on the date of grant and ends 20 years from the filing date of the application. The amendment applies to all utility and plant patents issued on applications having an actual United States application filing date on or after June 8, 1995. Specifically, 35 U.S.C. 154(a)(2), as contained in Public Law 103-465, provides that the patent term will begin on the date on which the patent issues and will end twenty years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term will end twenty years from the date on which the earliest application referred to was filed. As amended by Public Law 103-465, 35 U.S.C. 154 does not take into account for determination of the patent term any application on which priority is claimed under 35 U.S.C. 119, 365(a) or 365(b).

Under 35 U.S.C. 154(b)(1), as contained in Public Law 103-465, if the issuance of an original patent is delayed due to interference proceedings under 35 U.S.C. 135(a) or because the application is placed under a secrecy order under 35 U.S.C. 181, the term of the patent shall be extended for the period of delay, but in no case more than five (5) years.

Under 35 U.S.C. 154(b)(2), as contained in Public Law 103-465, if the issuance of a patent is delayed due to appellate review by the Board of Patent Appeals and Interferences or by a Federal court and the patent is issued pursuant to a decision in the review reversing an adverse determination of patent-

ability, the term of the patent shall be extended for a period of time but in no case more than five (5) years. However, a patent shall not be eligible for extension under 35 U.S.C. 154(b)(2) if the patent is subject to a terminal disclaimer due to the issuance of another patent claiming subject matter that is not patentably distinct from that under appellate review.

Under 35 U.S.C. 154(b)(3)(B) and 154(b)(3)(C), as contained in Public Law 103-465, the period of extension under 35 U.S.C. 154(b)(2) shall be reduced by any time attributable to appellate review before the expiration of three (3) years from the filing date of the application and for any period of time during which the applicant for patent did not act with due diligence, as determined by the Commissioner.

Under 35 U.S.C. 154(b)(4), as contained in Public Law 103-465, the total duration of all extensions of a patent under 35 U.S.C. 154(b) shall not exceed five (5) years.

The provisions for patent term extension under 35 U.S.C. 154(b) are separate from and in addition to the patent term extension provisions of 35 U.S.C. 156. The patent term extension provisions of 35 U.S.C. 154(b) are designed to compensate the patent owner for delays in issuing a patent, whereas the patent term extension provisions of 35 U.S.C. 156 are designed to restore term lost to premarket regulatory review after the grant of a patent. In order to prevent a term extension under 35 U.S.C. 154(b) from precluding a term extension under 35 U.S.C. 156, Public Law 103-465 amends 35 U.S.C. 156(a)(2) to specify that the term has never been extended under 35 U.S.C. 156(e)(1).

The 20-year patent term provision is contained in 35 U.S.C. 154, as amended by Public Law 103-465. Section 154 of title 35, United States Code, applies to utility and plant patents, but not to design patents. The term of a design patent is defined in 35 U.S.C. 173 as fourteen (14) years from the date of grant. Therefore, the patent term and patent term extension provisions set forth in 35 U.S.C. 154, as amended by Public Law 103-465, do not apply to patents for designs.

In addition, Public Law 103-465 establishes a domestic priority system. In accordance with the provisions of the Paris Convention for the Protection of Industrial Property, the term of a patent cannot include the Paris Convention priority period. Public Law 103-465 provides a mechanism to enable applicants to quickly and inexpensively file provisional applications. Applicants will be entitled to claim the benefit of priority in a given application based upon a previously filed provisional application in the United States. The domestic priority period will not count in the measurement of the term.

Section 111 of title 35, United States Code, was amended by Public Law 103-465 to provide for the filing of a provisional application on or after June 8, 1995. Section 41(a)(1) of title 35, United States Code, was amended by Public Law 103-465 to provide a \$150.00 filing fee for each provisional application, subject to a fifty (50) percent reduction for a small entity. The requirements for obtaining a filing date for a provisional application are the same as those which previously existed for an application filed under 35 U.S.C. 111, except that no claim or claims as set forth in 35 U.S.C. 112, second paragraph, is required. Moreover, no oath/declaration as set forth in 35 U.S.C. 115 is required. The provisional application is also not subject to the provisions of 35 U.S.C. 131, 135 and 157, i.e., a provisional application will not be examined for patentability, placed in interference or made the subject of a statutory invention registration. Further, the provisional application will automatically be abandoned no later than twelve (12) months after its filing date and will not be subject to revival to restore it to pending status beyond a date which is after twelve (12) months from its filing date. A provisional application will not be entitled to claim priority benefits based on any other application under 35 U.S.C. 119, 120, 121 or 365.

Also, Public Law 103-465 amended 35 U.S.C. 119 to allow an applicant to claim the benefit of the filing date of one or more copending provisional applications in a later filed application for patent under 35 U.S.C. 111(a) or 363. The later filed application for patent under 35 U.S.C. 111(a) or 363 must be filed by an inventor or inventors named in the copending provisional application not later than 12 months after the date on which the provisional application was filed and must contain or be amended to contain a specific reference to the provisional application. The provisional application must disclose an invention which is claimed in the application for patent under 35

U.S.C. 111(a) or 363 in the manner provided by the first paragraph of 35 U.S.C. 112. In addition, the provisional application must be pending on the filing date of the application for patent under 35 U.S.C. 111(a) or 363 and the filing fee set forth in subparagraph (A) or (C) of 35 U.S.C. 41(a)(1) must be paid.

Since 35 U.S.C. 154(a)(3), as contained in Public Law 103-465, excludes from the determination of the patent term any application on which priority is claimed under 35 U.S.C. 119, 365(a) or 365(b), the filing date of a provisional application is not considered in determining the term of any patent.

Section 119(e)(1) of title 35, United States Code, provides that if all of the conditions of 35 U.S.C. 119(e)(1) and (e)(2) are met, an application for patent filed under 35 U.S.C. 111(a) or 363 shall have the same effect as though filed on the date of the provisional application. Thus, the effective United States filing date of an application for patent filed under 35 U.S.C. 111(a), and entitled to benefits under 35 U.S.C. 119(e), is the filing date of the provisional application. Any patent granted on such an application, is prior art under 35 U.S.C. 102(e) as of the filing date of the provisional application.

Likewise, the effective United States filing date of a patent issued on an international application filed under 35 U.S.C. 363, and entitled to benefits under 35 U.S.C. 119(e), is the filing date of the provisional application, except for the purpose of applying that patent as prior art under 35 U.S.C. 102(e). For that purpose only, 35 U.S.C. 102(e) defines the filing date of the international application as the date the requirements of 35 U.S.C. 371(c)(1), (c)(2) and (c)(4) were fulfilled.

Public Law 103-465 further includes transitional provisions for limited reexamination in certain applications pending for two (2) years or longer as of June 8, 1995, taking into account any reference to any earlier application under 35 U.S.C. 120, 121 or 365(c). The transitional provisions also permit examination of more than one independent and distinct invention in certain applications pending for three (3) years or longer as of June 8, 1995, taking into account any reference to any earlier application under 35 U.S.C. 120, 121 or 365(c). These transitional provisions are not applicable to any application which is filed after June 8, 1995, regardless of whether the application is a continuing application.

The amendments to title 35 relating to 20-year patent term, patent term extension, provisional applications and the transitional provisions are effective on the date which is six (6) months after the date of enactment, i.e., on June 8, 1995.

A Notice of Proposed Rulemaking was published in the Federal Register at 59 FR 63951 (December 12, 1994) and in the Patent and Trademark Office Official Gazette at 1170 Off. Gaz. Pat. Office 377-390 (January 3, 1995).

Forty-nine written comments were received in response to the Notice of Proposed Rulemaking. A public hearing was held at 9:30 a.m. on February 16, 1995. Fourteen individuals offered oral comments at the hearing. The forty-nine written comments and a transcript of the hearing are available for public inspection in the Special Program Law Office, Office of the Deputy Assistant Commissioner for Patent Policy and Projects, Room 520, Crystal Park I, 2011 Crystal Drive, Arlington, Virginia, and are available on the Internet through anonymous file transfer protocol (ftp), address: ftp.uspto.gov.

The following includes a discussion of the rules being added or amended, the reasons for those additions and amendments and an analysis of the comments received in response to the Notice of Proposed Rulemaking.

**Changes in text:** The final rules contain numerous changes to the text of the rules as proposed for comment. Those changes are discussed below. Familiarity with the Notice of Proposed Rulemaking is assumed.

Section 1.9(a)(1) is being changed for clarity to define a national application as a U.S. application for patent which was either filed in the Office under 35 U.S.C. 111, or which entered the national stage from an international application after compliance with 35 U.S.C. 371. Also, a new paragraph (a)(3) is being added to define the term "nonprovisional application" as a U.S. national application for patent which was either filed in the Office under 35 U.S.C. 111(a), or which entered the national stage from an international application after compliance with 35 U.S.C. 371.

The proposed deletion of § 1.60 is being withdrawn. Therefore, § 1.17(i) is being changed to retain the reference to § 1.60.



Section 1.17(q) is being changed to delete the fifty (50) percent reduction for small entities in the \$50.00 fee established for filing a petition under § 1.48 in a provisional application and a petition to accord a provisional application a filing date or to convert an application filed under § 1.53(b)(1) to a provisional application.

Sections 1.17(r) and (s) are being changed to include a fifty (50) percent reduction for small entities in the fees established for entry of a submission after final rejection under § 1.129(a) and for each additional invention requested to be examined under § 1.129(b). In the final rule, the fee required by §§ 1.17(r) and 1.17(s) from a small entity is \$365.00. The fee required from other than a small entity is \$730.00.

The elimination of the small entity reduction in § 1.17(q) and the addition of the small entity reduction in §§ 1.17(r) and (s) are the result of additional review, which resulted in the conclusion that the fees established for the transitional procedures in §§ 1.129(a) and (b) may be reduced by fifty (50) percent for small entities. However, the petition fees required by § 1.17(q) are not subject to the fifty (50) percent reduction for small entities.

The proposed deletion of the retention fee practice set forth in former § 1.53(d), now redesignated § 1.53(d)(1), is being withdrawn. Therefore, § 1.21(l) is being retained and amended to refer to § 1.53(d)(1). Also, the proposed change in the text to § 1.17(n) is being withdrawn, since § 1.60 is being retained.

Section 1.28(a) is being changed to clarify the procedure for establishing status as a small entity in a nonprovisional application claiming benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) of a prior application. In such cases, applicants may file a new verified statement or they may rely on a verified statement filed in the prior application, if status as a small entity is still proper and desired. If applicants intend to rely on a verified statement filed in the prior application, applicants must include in the nonprovisional application either a reference to the verified statement filed in the prior application or a copy of the verified statement filed in the prior application. A verified statement in compliance with existing § 1.27 is required to be filed in each provisional application in which it is desired to pay reduced fees.

Section 1.45(c), first sentence, is being changed for clarity to refer to a "nonprovisional" application.

Section 1.48 is being changed to include a new paragraph (e) setting forth the procedure for deleting the name of a person who was erroneously named as an inventor in a provisional application. The procedure requires an amendment deleting the name of the person who was erroneously named accompanied by: a petition including a statement of facts verified by the person whose name is being deleted establishing that the error occurred without deceptive intention; the fee set forth in § 1.17(q); and the written consent of any assignee. The first sentences of §§ 1.48(a)-(c) are also being changed for clarity to refer to a "nonprovisional" application.

Section 1.51(a)(2)(i) is being changed to require that the provisional application cover sheet include the residence of each named inventor and, if the invention was made by an agency of the U.S. Government or under a contract with an agency of the U.S. Government, the name of the U.S. Government agency and Government contract number. The residence of each named inventor is information which is necessary to identify those provisional applications which must be reviewed by the PTO for foreign filing licenses. If the invention disclosed in the provisional application was made by an agency of the U.S. Government or under a contract with an agency of the U.S. Government, the security review for that application should already have been done by that agency of the U.S. Government. Therefore, identification of those particular provisional applications on the cover sheet will reduce the number of applications which the PTO must forward to other agencies of the U.S. Government for security review.

Section 1.53(b)(1) is being changed to retain the reference to § 1.60.

Section 1.53(b)(2)(ii) is being changed to require that any petition and petition fee to convert a § 1.53(b)(1) application to a provisional application be filed in the § 1.53(b)(1) application prior to the earlier of the abandonment of the § 1.53(b)(1) application, the payment of the issue fee, the expiration of twelve (12) months after the filing date of the § 1.53(b)(1) application, or the filing of a request for a statutory invention

registration under § 1.293. Where the § 1.53(b)(1) application was abandoned before the expiration of twelve (12) months after the filing date of the application, a petition to convert the application to a provisional application may be filed in the § 1.53(b)(1) application if the petition to convert is filed prior to the expiration of twelve (12) months after the filing date of the § 1.53(b)(1) application and is accompanied by an appropriate petition to revive an abandoned application under § 1.137.

Section 1.53(b)(2)(iii) is being changed to indicate that the requirements of §§ 1.821-1.825 regarding application disclosures containing nucleotide and/or amino acid sequences are not mandatory for provisional applications.

Section 1.53(d)(1) is being changed to retain the retention fee practice. The proposal to delete the retention fee practice set forth in § 1.53(d) is being withdrawn.

The first sentences of §§ 1.55(a) and (b) are being changed for clarity to refer to a "nonprovisional" application. Also, §§ 1.55(a) and (b) are being changed to clarify that the nonprovisional application may claim the benefit of one or more prior foreign applications or one or more applications for inventor's certificate.

Section 1.59 is being changed to retain the reference to the retention fee set forth in § 1.21(l) and to clarify that the retention fee practice applies only to applications filed under § 1.53(b)(1).

The proposal to delete § 1.60 is being withdrawn. Therefore, § 1.60 is being retained and amended to clarify in the title of the section and in paragraph (b)(1) that the procedure set forth in the section is only available for filing a continuation or divisional application if the prior application was a nonprovisional application and complete as set forth in § 1.51(a)(1). Also, paragraph (b)(4) is being amended to delete the requirement that the statement which must accompany the copy of the prior application include the language that "no amendments referred to in the oath or declaration filed to complete the prior application introduced new matter therein." The requirement is unnecessary because any amendment filed to complete the prior application would be considered a part of the original disclosure of the prior application and, by definition, could not contain new matter. Also, paragraph (b)(4) is being amended to refer to § 1.17(i).

Section 1.62(a) is being changed to refer to a prior complete "nonprovisional" application and to clarify that a continuing application may be filed under § 1.62 after payment of the issue fee if a petition under § 1.313(b)(5) is granted in the prior application. Section 1.62(a) is also being changed to clarify the existing practice that the request for a § 1.62 application must include identification of the inventors named in the prior application.

Section 1.63(a) is being changed for clarity to refer to an oath or declaration filed as a part of a "nonprovisional" application.

Section 1.67(b) is being changed for clarity to refer to a "nonprovisional" application.

Sections 1.78(a)(1) and (a)(2) are being changed to refer to a "nonprovisional" application and to clarify that the nonprovisional application may claim the benefit of one or more prior copending nonprovisional applications or international applications designating the United States of America. Section 1.78(a)(1)(ii) is being changed to retain the reference to § 1.60. Section 1.78(a)(1)(iii) is being retained and amended to refer to §§ 1.53(b)(1) and 1.53(d)(1).

Sections 1.78(a)(3) and (a)(4) are being changed to refer to a "nonprovisional" application and to clarify that the nonprovisional application may claim the benefit of one or more prior copending provisional applications.

Section 1.78(a)(3) is also being changed to remind applicants and practitioners that when the last day of pendency of a provisional application falls on a Saturday, Sunday, or Federal holiday within the District of Columbia, any nonprovisional application claiming benefit of the provisional application must be filed prior to the Saturday, Sunday, or Federal holiday within the District of Columbia. Section 111(b)(5) of title 35, United States Code, states that a provisional application is abandoned twelve months after its filing date. Sections 119(e)(1) and (e)(2) of title 35, United States Code, require that a nonprovisional application claiming benefit of a prior provisional application be filed not later than twelve months after the date on which the provisional application was filed and that the provisional application be pending on the filing date of the nonprovisional application. Under §§ 1.6 and 1.10, no filing dates are accorded

to applications on a Saturday, Sunday, or Federal holiday within the District of Columbia. Thus, if a provisional application is abandoned by operation of 35 U.S.C. 111(b)(5) on a Saturday, Sunday, or Federal holiday within the District of Columbia, a nonprovisional application claiming benefit of the provisional application under 35 U.S.C. 119(e) must be filed no later than the preceding day which is not a Saturday, Sunday, or Federal holiday within the District of Columbia.

Section 1.78(a)(4) is also being changed to delete the requirement that the reference in the nonprovisional application to the provisional application indicate the relationship of the applications. As a result of the change, § 1.78(a)(4) provides that a nonprovisional application claiming benefit of one or more provisional applications must contain a reference to each provisional application, identifying it as a provisional application and including the provisional application number (consisting of series code and serial number). However, the section does not require the nonprovisional application to identify the nonprovisional application as a continuation, divisional or continuation-in-part application of the provisional application.

Section 1.83(a) is being changed to delete the proposed redesignation of paragraph (a) and to delete proposed paragraph (a)(2). Also, §§ 1.83(a) and (c) are being changed for clarity to refer to a "nonprovisional" application. Further, § 1.83(c) is being changed to remove the reference to paragraph (a)(1).

Section 1.101 is being changed for clarity to refer to a "nonprovisional" application.

Sections 1.129(a) and (b) are being changed to identify the effective date of 35 U.S.C. 154(a)(2) as June 8, 1995.

Further, § 1.129(a) is being changed to provide that the first and second submissions and fees set forth in § 1.17(r) must be filed prior to the filing of an Appeal Brief, rather than prior to the filing of the Notice of Appeal, and prior to abandonment of the application. The requirement that the fee set forth in § 1.17(r) be filed within one month of the notice refusing entry is being deleted. Section 1.129(a) is also being changed to provide that the finality of the final rejection is automatically withdrawn upon the timely filing of the submission and payment of the fee set forth in § 1.17(r). The language indicating that the submission would be entered and considered after timely payment of the fee set forth in § 1.17(r) "to the extent that it would have been entered and considered if made prior to final rejection" is being deleted. In view of the magnitude of the fee set forth in § 1.17(r), the next PTO action following timely payment of the fee set forth in § 1.17(r) will be equivalent to a first action in a continuing application. Under existing PTO practice, it would not be proper to make final a first Office action in a continuing application where the continuing application contains material which was presented in the earlier application after final rejection or closing of prosecution but was denied entry because (1) new issues were raised that required further consideration and/or search, or (2) the issue of new matter was raised. The identical procedure will apply to examination of a submission considered as a result of the procedure under § 1.129(a). Thus, under § 1.129(a), if the first submission after final rejection was initially denied entry in the application because (1) new issues were raised that required further consideration and/or search, or (2) the issue of new matter was raised, then the next action in the application will not be made final. Likewise, if the second submission after final rejection was initially denied entry in the application because (1) new issues were raised that required further consideration and/or search, or (2) the issue of new matter was raised, then the next action in the application will not be made final. In view of 35 U.S.C. 132, no amendment considered as a result of the payment of the fee set forth in § 1.17(r) may introduce new matter into the disclosure of the application.

Section 1.129(b)(1) is being changed to identify the date which is two months prior to the effective date of 35 U.S.C. 154(a)(2) as April 8, 1995. Section 1.129(b)(1) is also being changed to clarify in subsection (ii) that the examiner has not made a requirement for restriction in the present or parent application prior to April 8, 1995, due to actions by the applicant.

Section 1.129(b)(2) is being changed to delete the identification of the period provided for applicants to respond to a notification under § 1.129(b) as one month. The time period for response will be identified in any written notification under § 1.129(b) and will usually be one month, but in no case will it

be less than thirty days. The period may be extended under § 1.136(a). The language is also being changed to provide that applicant may respond to the notification by (i) electing the invention or inventions to be searched and examined, if no election has been made prior to the notice, and paying the fee set forth in § 1.17(s) for each independent and distinct invention claimed in the application in excess of one which applicant elects, (ii) confirming an election made prior to the notice and paying the fee set forth in § 1.17(s) for each independent and distinct invention claimed in the application in addition to the one invention which applicant previously elected, or (iii) filing a petition under § 1.129(b)(2) traversing the requirement without regard to whether the requirement has been made final. No petition fee is required. The section is also being changed to provide that if the petition under § 1.129(b)(2) is filed in a timely manner, the original time period for electing and paying the fee set forth in § 1.17(s) will be deferred and any decision on the petition affirming or modifying the requirement will set a new time period to elect the invention or inventions to be searched and examined and to pay the fee set forth in § 1.17(s) for each independent and distinct invention claimed in the application in excess of one which applicant elects.

Section 1.129(c) is being changed to clarify that the provisions of §§ 1.129(a) and (b) are not applicable to any application filed after June 8, 1995. However, any application filed on June 8, 1995 would be subject to a 20-year patent term.

Section 1.137 is being amended by revising paragraph (c) to eliminate, in all applications filed on or after June 8, 1995, except design applications, the requirement that a terminal disclaimer accompany any petition under § 1.137(a) not filed within six (6) months of the date of the abandonment of the application. The language "filed before June 8, 1995" and "filed on or after June 8, 1995" as used in the amended rule, refer to the actual United States filing date, without reference to any claim for benefit under 35 U.S.C. 120, 121 or 365. No change to § 1.137 was proposed in the Notice of Proposed Rulemaking. However, in all applications filed on or after June 8, 1995, except design applications, any delay in filing a petition under § 1.137(a) will automatically result in the loss of patent term. The loss of patent term will be the incentive for applicants to promptly file any petition to revive. Therefore, no need is seen for requiring a terminal disclaimer in such applications. It would amount to a penalty if a terminal disclaimer was required.

Section 1.316 is being amended by revising paragraph (d) to eliminate, in all applications filed on or after June 8, 1995, except design applications, the requirement that a terminal disclaimer accompany any petition under § 1.316(b) not filed within six (6) months of the date of the abandonment of the application. Acceptance of a late payment of an issue fee in a design application is specifically provided for in § 1.155. Therefore, § 1.316 does not apply to design applications. The language "filed before June 8, 1995" as used in the amended rule, refers to the actual United States filing date, without reference to any claim for benefit under 35 U.S.C. 120, 121 or 365. No change to § 1.316 was proposed in the Notice of Proposed Rulemaking. However, in all applications filed on or after June 8, 1995, except design applications, any delay in filing a petition under § 1.316(b) will automatically result in the loss of patent term. The loss of patent term will be the incentive for applicants to promptly file any petition under § 1.316(b). Therefore, no need is seen for requiring a terminal disclaimer in such applications. It would amount to a penalty if a terminal disclaimer was required.

Section 1.317 is being amended by removing and reserving paragraph (d) to eliminate the requirement that a terminal disclaimer accompany any petition under § 1.317(b) not filed within six (6) months of the date of lapse of the patent. No change to § 1.317 was proposed in the Notice of Proposed Rulemaking. However, the delay in filing a petition under § 1.317(b) does not result in any gain of patent term. Therefore, no reason is seen for requiring a terminal disclaimer in such cases.

Section 1.701(a) is being changed to identify the implementation date as June 8, 1995, and to clarify that a proceeding under 35 U.S.C. 135(a) is an interference proceeding.

Section 1.701(b) is being changed to provide that the term of a patent entitled to an extension under § 1.701 shall be extended for the sum of the periods of delay calculated under paragraphs (c)(1), (c)(2), (c)(3) and (d) of § 1.701 and the



extension will run from the expiration date of the patent. The reference to a terminal disclaimer is being deleted to be consistent with § 1.701(a)(3) and to avoid any confusion.

Section 1.701(c)(1)(i) is being changed for clarity by deleting the phrase "if any" after the first occurrence of "interference" and by inserting the same phrase after the phrase "the number of days."

Section 1.701(c)(1)(ii) is being changed to clarify that the period referred to ends on the "date of the termination of the suspension" rather than on the date of the next PTO communication reopening prosecution.

Section 1.701(d)(1) is being amended to clarify that the "time" referred to is time "during the period of appellate review."

Section 1.701(d)(2) is being amended to clarify that the Commissioner, under the broad discretion granted by 35 U.S.C. 154(b)(3)(C), has decided to limit consideration of applicant's due diligence only to acts occurring during the period of appellate review. The supplementary information published in the Notice of Proposed Rulemaking contained examples of what might be considered a lack of due diligence for purposes of § 1.701(d)(2) as proposed. Specifically, the supplementary information identified requests for extensions of time to respond to Office communications, submission of a response which is not fully responsive to an Office communication, and filing of informal applications as examples. In view of the comments received and the language adopted in the final rules, those examples are withdrawn. Acts which the Commissioner considers to constitute prima facie evidence of lack of due diligence under § 1.701(d)(2) are suspensions at applicant's request under § 1.103(a) during the period of appellate review and abandonments during the period of appellate review.

#### Discussion of Specific Rules

Title 37 of the Code of Federal Regulations, Parts 1 and 3, are being amended as indicated below:

Section 1.1 is being amended to add a paragraph (i) to provide a special "Box Provisional Patent Application" address to assist the Mail Room in separating and processing provisional applications and mail relating thereto.

Section 1.9 is being amended to redesignate paragraph (a) as paragraph (a)(1) and to define a national application as a U.S. application for patent which was either filed in the Office under 35 U.S.C. 111, or which entered the national stage from an international application after compliance with 35 U.S.C. 371. A new paragraph (a)(2) is being added to define the term "provisional application" as a U.S. national application filed under 35 U.S.C. 111(b). Also, a new paragraph (a)(3) is being added to define the term "nonprovisional application" as a U.S. national application for patent which was either filed in the Office under 35 U.S.C. 111(a), or which entered the national stage from an international application after compliance with 35 U.S.C. 371.

Sections 1.12 and 1.14 are being amended to replace the references to § 1.17(i)(1) with references to § 1.17(i).

Sections 1.16(a)-(e) and (g) are being amended to clarify that those sections do not apply to provisional applications. A complete provisional application does not require claims. However, provisional applications may be filed with one or more claims as part of the application. Nevertheless, no additional claim fee or multiple dependent claim fee will be required in a provisional application. Section 1.16(f) is being amended to insert the words "basic fee". Section 1.16(e) refers to "the basic filing fee". Current Office practice allows a design application to be filed without the design filing fee or the oath/declaration as set forth in § 1.53(d)(1). The change to § 1.16(f) is merely for clarification. In addition, § 1.16(a) is being amended to replace the word "cases" with the word "applications", since the word "applications" is used elsewhere in the rule.

Section 1.16 is also being amended to add a new paragraph (k) which lists the basic filing fee for a provisional application as \$75.00 for a small entity (see §§ 1.9(c)-(f)) or \$150.00 for other than a small entity as contained in Public Law 103-465. Since the filing fee for a provisional application is established by Public Law 103-465 as a 35 U.S.C. 41(a) fee, the filing fee

for a provisional application will be subject to the fifty (50) percent reduction provided for in 35 U.S.C. 41(h).

Further, § 1.16 is being amended to add a new paragraph (l) which establishes the surcharge required by new § 1.53(d)(2) for filing the basic filing fee or the cover sheet required by new § 1.51(a)(2) for a provisional application at a time later than the provisional application filing date as \$25.00 for a small entity or \$50.00 for other than a small entity.

Section 1.17(h) is being amended to clarify that the \$130.00 petition fee for filing a petition for correction of inventorship under § 1.48 applies to all patent applications, except provisional applications. Paragraph (i)(1) is being redesignated as paragraph (i) and paragraph (i)(2) is being removed. The fee for a petition under § 1.102 to make an application special has been placed in paragraph (i). The words "of this part", in § 1.17, paragraphs (h) and (i), are being deleted, since the paragraphs currently refer to sections in parts other than Part 1. Section 1.17(i) is also being amended to clarify that the fee set forth in paragraph (i) for filing a petition to accord a filing date under § 1.53 applies to all patent applications, except provisional applications.

A new § 1.17(q) is being added to establish a petition fee of \$50.00 for filing a petition for correction of inventorship under § 1.48 in a provisional application and for filing a petition to accord a provisional application a filing date or to convert an application filed under § 1.53(b)(1) to a provisional application. The petition fee set forth in § 1.17(q) is not reduced for a small entity.

New §§ 1.17(r) and (s) are being added to establish the fees for entry of a submission after final rejection under § 1.129(a) and for each additional invention requested to be examined under § 1.129(b), respectively. These fees have been set at \$365.00 for a small entity and \$730.00 for other than a small entity.

Section 1.21(l) is being amended to refer to § 1.53(d)(1).

Section 1.28(a) is being amended to clarify the procedure for establishing status as a small entity in a nonprovisional application claiming benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) of a prior application. In such cases, applicants may file a new verified statement or rely on a verified statement filed in the prior application, if status as a small entity is still proper and desired. If applicants intend to rely on a verified statement filed in the prior application, applicants must include in the nonprovisional application either a reference to the verified statement filed in the prior application or a copy of the verified statement filed in the prior application. Status as a small entity may be established in a provisional application by complying with existing § 1.27.

Section 1.45(c) is being amended to clarify that the first sentence applies to a "nonprovisional" application. Section 1.45(c) is also being amended to add a second sentence relating to joint inventors named in a provisional application. The second sentence states that each inventor named in a provisional application must have made a contribution to the subject matter disclosed in the provisional application. All that § 1.45(c), second sentence, requires is that if a person is named as an inventor in a provisional application, that person must have made a contribution to the subject matter disclosed in the provisional application.

Sections 1.48(a)-(c) are being amended to specify that the procedures for correcting an error in inventorship set forth in those sections apply to nonprovisional applications. New paragraph (d) is being added to establish a procedure for adding the name of an inventor in a provisional application, where the name was originally omitted without deceptive intent. Paragraph (d) does not require the verified statement of facts by the original inventor or inventors, the oath or declaration by each actual inventor in compliance with § 1.63 or the consent of any assignee as required in paragraph (a). Instead, the procedure requires the filing of a petition identifying the name or names of the inventors to be added and including a statement that the name or names of the inventors were omitted through error without deceptive intention on the part of the actual inventor(s). The statement would be required to be verified if made by a person not registered to practice before the PTO. The statement could be signed by a registered practitioner of record in the application or acting in a representative capacity under § 1.34(a). The \$50.00 petition fee set forth in § 1.17(q) would also be required. New paragraph (e) is also being added setting

forth the procedure for deleting the name of a person who was erroneously named as an inventor in a provisional application. The procedure requires an amendment deleting the name of the person who was erroneously named accompanied by: a petition including a statement of facts verified by the person whose name is being deleted establishing that the error occurred without deceptive intention; the fee set forth in § 1.17(q); and the written consent of any assignee.

Section 1.51 is being amended to redesignate § 1.51(a) as § 1.51(a)(1) and to include a new paragraph (a)(2) identifying the required parts of a complete provisional application. As set forth in § 1.51(a)(2), a complete provisional application includes a cover sheet, a specification as prescribed in 35 U.S.C. 112, first paragraph, any necessary drawings and the provisional application filing fee. A suggested cover sheet format for a provisional application is included as an Appendix A to this Notice of Final Rulemaking and is available from the PTO free of charge to the public. However, the rule does not require the applicant to use the PTO suggested cover sheet. Any paper containing the information required in § 1.51(a)(2)(i) will be acceptable. The cover sheet is required to identify the paper as a provisional application and to provide the information which is necessary for the PTO to prepare the provisional application filing receipt. Also, the residence of each named inventor and, if the invention disclosed in the provisional application was made by an agency of the U.S. Government or under a contract with an agency of the U.S. Government, the name of the U.S. Government agency and Government contract number must be identified on the cover sheet.

Section 1.51(b) is being amended to indicate that an information disclosure statement is not required and may not be filed in a provisional application. Any information disclosure statements filed in a provisional application will either be returned or disposed of at the convenience of the Office. An information disclosure statement filed in a § 1.53(b)(1) application which has been converted to a provisional application will be retained in the application after the conversion, if the information disclosure statement was filed before the petition required by § 1.53(b)(2)(ii) was filed.

The title of § 1.53 and paragraph (a) are being amended to refer to application number, rather than application serial number. The term "application number" is found in current § 1.5(a).

Section 1.53(b) is being redesignated as § 1.53(b)(1) and is being amended to refer to § 1.17(i) rather than § 1.17(i)(1) to conform to the change therein.

A new § 1.53(b)(2) is being added to set forth the requirements for obtaining a filing date for a provisional application. Section 1.53(b)(2) states that a filing date will be accorded to a provisional application as of the date the specification as prescribed by 35 U.S.C. 112, first paragraph, any necessary drawings, and the name of each inventor of the subject matter disclosed are filed in the PTO. The filing date requirements for a provisional application set forth in new paragraph (b)(2) parallel the existing requirements set forth in former paragraph (b), now redesignated paragraph (b)(1), except that no claim is required. In order to minimize the cost of processing provisional applications and to reduce the handling of provisional applications, amendments, other than those required to make the provisional application comply with applicable regulations, are not permitted after the filing date of the provisional application.

Section 1.53(b)(2)(i) is being added requiring all provisional applications to be filed with a cover sheet identifying the application as a provisional application. The section also indicates that the PTO will treat an application as having been filed under § 1.53(b)(1), unless the application is identified as a provisional application on filing. A provisional application, which is identified as such on filing, but which does not include all of the information required by § 1.51(a)(2)(i) would still be treated as a provisional application. However, the omitted information and a surcharge would be required to be submitted at a later date under new § 1.53(d)(2).

Section 1.53(b)(2)(ii) is being added to establish a procedure for converting an application filed under § 1.53(b)(1) to a provisional application. The section requires that a petition requesting the conversion and a petition fee be filed in the § 1.53(b)(1) application prior to the earlier of the abandonment of the § 1.53(b)(1) application, the payment of the issue fee, the expiration of twelve (12) months after the filing date of

the § 1.53(b)(1) application, or the filing of a request for a statutory invention registration under § 1.293. The grant of any such petition would not entitle applicant to a refund of the fees properly paid in the application filed under § 1.53(b)(1).

Section 1.53(b)(2)(iii) is being added to call attention to the provisions of Public Law 103-465 which prohibit any provisional application from claiming a right of priority under 35 U.S.C. 119 or 365(a) or the benefit of an earlier filing date under 35 U.S.C. 120, 121 or 365(c) of any other application. The section also calls attention to the provisions of Public Law 103-465 which provide that no claim for benefit of an earlier filing date may be made in a design application based on a provisional application and that no request for a statutory invention registration may be filed in a provisional application. Section 1.53(b)(2)(iii) further specifies that the requirements of §§ 1.821-1.825 are not mandatory for provisional applications. However, applicants are reminded that an invention being claimed in an application filed under 35 U.S.C. 111(a) or 365 which claims benefit under 35 U.S.C. 119(e) of a provisional application must be disclosed in the provisional application in the manner provided by the first paragraph of 35 U.S.C. 112. Voluntary compliance with the requirements of §§ 1.821-1.825 in the provisional application is recommended, in order to ensure that support for the invention claimed in the 35 U.S.C. 111(a) application can be readily ascertained in the provisional application.

Section 1.53(c) is being amended to require that any request for review of a refusal to accord an application a filing date be made by way of a petition accompanied by the fee set forth in § 1.17(i), if the application was filed under § 1.53(b)(1), or by the fee set forth in § 1.17(q), if the application was filed under § 1.53(b)(2). This reflects the current practice set forth in the Manual of Patent Examining Procedure (MPEP), section 506.02 (Sixth Edition, Jan. 1995) with regard to any request for review of a refusal to accord a filing date for an application. The PTO will continue its current practice of refunding the petition fee, if the refusal to accord the requested filing date is found to have been a PTO error.

Section 1.53(d) is being redesignated as § 1.53(d)(1).

Section 1.53(d)(2) is being added to provide that a provisional application may be filed without the basic filing fee and without the complete cover sheet required by § 1.51(a)(2). In such a case, the applicant will be notified and given a period of time in which to file the missing fee, and/or cover sheet and to pay the surcharge set forth in § 1.16(l).

Section 1.53(e) is being redesignated as § 1.53(e)(1) and amended to refer to § 1.53(b)(1). Also, a new § 1.53(e)(2) is being added to indicate that a provisional application will not be given a substantive examination and will be abandoned no later than twelve (12) months after its filing date.

Sections 1.55(a) and (b) are being amended to clarify that the sections apply to nonprovisional applications and to clarify that a nonprovisional application may claim the benefit of one or more prior foreign applications or one or more applications for inventor's certificate. Also, § 1.55(a) is being amended to replace the reference to 35 U.S.C. 119 with a reference to 35 U.S.C. 119(a)-(d). In addition, the reference to § 1.17(i)(1) in § 1.55(a) is being replaced by a reference to § 1.17(i) to be consistent with the change to § 1.17. Section 1.55(b) is also being amended to refer to 35 U.S.C. 119(d) to conform to the paragraph designations contained in Public Law 103-465.

Section 1.59 is being amended to clarify that the retention fee practice set forth in § 1.53(d)(1) applies only to applications filed under § 1.53(b)(1).

Section 1.60 is being amended to clarify in the title of the section and in paragraph (b)(1) that the procedure set forth in the section is only available for filing a continuation or divisional application if the prior application was a nonprovisional application and complete as set forth in § 1.51(a)(1). Paragraph (b)(4) is being amended to delete the requirement that the statement which must accompany the copy of the prior application include the language that "no amendments referred to in the oath or declaration filed to complete the prior application introduced new matter therein." The requirement is unnecessary because any amendment filed to complete the prior application would be considered a part of the original disclosure of the prior application and, by definition, could not contain new matter. Also, paragraph (b)(4) is being amended to refer to § 1.17(i).



Section 1.62(a) is being amended to clarify that the procedure set forth in the section is only available for filing a continuation, continuation-in-part, or divisional application of a prior nonprovisional application which is complete as defined in § 1.51(a)(1). Section 1.62(a) is also being amended to clarify that a continuing application may be filed under § 1.62 after payment of the issue fee if a petition under § 1.313(b)(5) is granted in the prior application and that the request for a § 1.62 application must include identification of the inventors named in the prior application. The phrase "Serial number, filing date" in § 1.62(a) is being changed to "application number."

Section 1.62(e) is being amended to replace the reference to § 1.17(i)(1) with a reference to § 1.17(i) to be consistent with the change to § 1.17. Also, the term "application serial number" in § 1.62(e) is being changed to "application number."

Section 1.63(a) is being amended to replace the reference to § 1.51(a)(2) with a reference to § 1.51(a)(1)(ii) in order to conform with the changes in § 1.51 and to refer to an oath or declaration filed as a part of a nonprovisional application.

Section 1.67(b) is being amended to replace the reference to § 1.53(d) with a reference to § 1.53(d)(1) in order to conform with the changes in § 1.53. Furthermore, the references to §§ 1.53(b) and 1.118 are being deleted to make clear that the new matter exclusion applies to all applications including those filed under §§ 1.60 and 1.62. Also, the section is being amended to refer to a nonprovisional application.

Sections 1.78(a)(1) and (a)(2) are being amended to clarify that the sections apply to nonprovisional applications claiming the benefit of one or more copending nonprovisional applications or international applications designating the United States of America. Section 1.78(a)(1)(iii) is being amended to refer to §§ 1.53(b)(1) and 1.53(d)(1). Section 1.78(a)(2) is also being amended to eliminate the use of serial number and filing date as an identifier for a prior application. The section will require that the prior application be identified by application number (consisting of the series code and serial number) or international application number and international filing date.

Sections 1.78(a)(3) and (a)(4) are being added to set forth the conditions under which a nonprovisional application may claim the benefit of one or more prior copending provisional applications. The later filed nonprovisional application must be an application other than for a design patent and must be copending with each provisional application. There must be a common inventor named in the prior provisional application and the later filed nonprovisional application. Each prior provisional application must be complete as set forth in § 1.51(a)(2), or entitled to a filing date as set forth in § 1.53(b)(2) and include the basic filing fee. Section 1.78(a)(3) also includes the warning that when the last day of pendency of a provisional application falls on a Saturday, Sunday, or Federal holiday within the District of Columbia, any nonprovisional application claiming benefit of the provisional application must be filed prior to the Saturday, Sunday, or Federal holiday within the District of Columbia. A provisional application may be abandoned by operation of 35 U.S.C. 111(b)(5) on a Saturday, Sunday, or Federal holiday within the District of Columbia, in which case, a nonprovisional application claiming benefit of the provisional application under 35 U.S.C. 119(e) must be filed no later than the preceding day which is not a Saturday, Sunday, or Federal holiday within the District of Columbia.

Section 1.78(a)(4) is also being added to provide that a nonprovisional application claiming benefit of one or more provisional applications must contain a reference to each provisional application, identifying it as a provisional application and including the provisional application number (consisting of series code and serial number). The section does not require the nonprovisional application to identify the nonprovisional application as a continuation, divisional or continuation-in-part application of the provisional application.

Sections 1.83(a) and (c) are being amended to clarify that the sections apply to nonprovisional applications.

Section 1.97(d) is being amended to replace the reference to § 1.17(i)(1) with a reference to § 1.17(i) to be consistent with the change to § 1.17.

Section 1.101(a) is being amended to indicate that the section applies to nonprovisional applications.

Section 1.102(d) is being amended to replace the reference to § 1.17(i)(2) with a reference to § 1.17(i) to be consistent with the change to § 1.17.

Section 1.103(a) is amended to replace the reference to § 1.17(i)(1) with a reference to § 1.17(i) to be consistent with the change to § 1.17.

Section 1.129 is being added to set forth the procedure for implementing certain transitional provisions contained in Public Law 103-465. Section 1.129(a) provides for limited reexamination of applications pending for 2 years or longer as of June 8, 1995, taking into account any reference to any earlier application under 35 U.S.C. 120, 121 or 365(c). An applicant will be entitled to have a first submission entered and considered on the merits after final rejection if the submission and the fee set forth in § 1.17(r) are filed prior to the filing of an Appeal Brief and prior to abandonment of the application. Section 1.129(a) also provides that the finality of the final rejection is automatically withdrawn upon the timely filing of the submission and payment of the fee set forth in § 1.17(r). After submission and payment of the fee set forth in § 1.17(r), the next PTO action on the merits may be made final only under the conditions currently followed by the PTO for making a first action in a continuing application final. If a subsequent final rejection is made in the application, applicant would be entitled to have a second submission entered and considered on the merits under the same conditions set forth for consideration of the first submission. Section 1.129(a) defines the term "submission" as including, but not limited to, an information disclosure statement, an amendment to the written description, claims or drawings, and a new substantive argument or new evidence in support of patentability. For example, the submission may include an amendment, a new substantive argument and an information disclosure statement. In view of the fee set forth in § 1.17(r), any information disclosure statement previously refused consideration in the application because of applicant's failure to comply with § 1.97(c) or (d) or which is filed as part of either the first or second submission will be treated as though it had been filed within one of the time periods set forth in § 1.97(b) and will be considered without the petition and petition fee required in § 1.97(d), if it complies with the requirements of § 1.98. In view of 35 U.S.C. 132, no amendment considered as a result of the payment of the fee set forth in § 1.17(r) may introduce new matter into the disclosure of the application.

Section 1.129(b)(1) is being added to provide for examination of more than one independent and distinct invention in certain applications pending for 3 years or longer as of June 8, 1995, taking into account any reference to any earlier application under 35 U.S.C. 120, 121 or 365(c). Under § 1.129(b)(1), a requirement for restriction or for the filing of divisional applications would only be made or maintained in the application after June 8, 1995, if: (1) the requirement was made in the application or in an earlier application relied on under 35 U.S.C. 120, 121 or 365(c) prior to April 8, 1995; (2) the examiner has not made a requirement for restriction in the present or parent application prior to April 8, 1995, due to actions by the applicant; or (3) the required fee for examination of each additional invention was not paid. Under § 1.129(b)(2), if the application contains claims to more than one independent and distinct invention, and no requirement for restriction or for the filing of divisional applications can be made or maintained, applicant will be notified and given a time period to (i) elect the invention or inventions to be searched and examined, if no election has been made prior to the notice, and pay the fee set forth in § 1.17(s) for each independent and distinct invention claimed in the application in excess of one which applicant elects, (ii) in situations where an election was made in response to a requirement for restriction that cannot be maintained, confirm the election made prior to the notice and pay the fee set forth in § 1.17(s) for each independent and distinct invention claimed in the application in addition to the one invention which applicant previously elected, or (iii) file a petition under § 1.129(b)(2) traversing the requirement without regard to whether the requirement has been made final. No petition fee is required. Section 1.129(b)(2) also provides that if the petition is filed in a timely manner, the original time period for electing and paying the fee set forth in § 1.17(s) will be deferred and any decision on the petition affirming or modifying the requirement will set a new time period to elect the invention or inventions to be searched and examined and to pay the fee set forth

in § 1.17(s) for each independent and distinct invention claimed in the application in excess of one which applicant elects. Under § 1.129(b)(3), each additional invention for which the required fee set forth in § 1.17(s) has not been paid will be withdrawn from consideration under § 1.142(b). An applicant who desires examination of an invention so withdrawn from consideration can file a divisional application under 35 U.S.C. 121.

Section 1.129(c) is being added to clarify that the provisions of §§ 1.129(a) and (b) are not applicable to any application filed after June 8, 1995. However, any application filed on June 8, 1995, would be subject to a 20-year patent term.

Section 1.137 is being amended by revising paragraph (c) to eliminate, in all applications filed on or after June 8, 1995, except design applications, the requirement that a terminal disclaimer accompany any petition under § 1.137(a) not filed within six (6) months of the date of the abandonment of the application. The language "filed before June 8, 1995" and "filed on or after June 8, 1995" as used in the amended rule, refer to the actual United States filing date, without reference to any claim for benefit under 35 U.S.C. 120, 121 or 365.

Section 1.139 is being added to set forth the procedure for reviving a provisional application where the delay was unavoidable or unintentional. Section 1.139(a) addresses the revival of a provisional application where the delay was unavoidable and § 1.139(b) addresses the revival of a provisional application where the delay was unintentional. Applicant may petition to have an abandoned provisional application revived as a pending provisional application for a period of no longer than twelve months from the filing date of the provisional application where the delay was unavoidable or unintentional. It would be permissible to file a petition for revival later than twelve months from the filing date of the provisional application but only to revive the application for the twelve-month period following the filing of the provisional application. Thus, even if the petition were granted to reestablish the pendency up to the end of the twelve-month period, the provisional application would not be considered pending after twelve months from its filing date. The requirements for reviving an abandoned provisional application set forth in § 1.139 parallel the existing requirements set forth in § 1.137.

Sections 1.177, 1.312(b), 1.313(a), and 1.314 are being amended to replace the references to § 1.17(i)(1) with references to § 1.17(i) to be consistent with the change to § 1.17.

Section 1.316(d) is being amended to eliminate, in all applications filed on or after June 8, 1995, except design applications, the requirement that a terminal disclaimer accompany any petition under § 1.316(b) not filed within six (6) months of the date of the abandonment of the application. Acceptance of a late payment of an issue fee in a design application is specifically provided for in § 1.155. Therefore, § 1.316 does not apply to design applications. The language "filed before June 8, 1995" as used in the amended rule, refers to the actual United States filing date, without reference to any claim for benefit under 35 U.S.C. 120, 121 or 365.

Section 1.317(d) is being removed and reserved to eliminate the requirement that a terminal disclaimer accompany any petition under § 1.317(b) not filed within six (6) months of the date of lapse of the patent.

Section 1.666 is being amended to replace the reference to § 1.17(i)(1) with a reference to § 1.17(i) to be consistent with the change to § 1.17.

Section 1.701 is being added to set forth the procedure the PTO will follow in calculating the length of any extension of patent term to which an applicant is entitled under 35 U.S.C. 154(b) where the issuance of a patent on an application, other than for designs, filed on or after June 8, 1995, was delayed due to certain causes of prosecution delay. Applicants need not file a request for the extension of patent term under § 1.701. The extension of patent term is automatic by operation of law. It is currently anticipated that applicant will be advised as to the length of any patent term extension at the time of receiving the Notice of Allowance and Issue Fee Due. Review of the length of a patent term extension calculated by the PTO under § 1.701 prior to the issuance of the patent would be by way of petition under § 1.181. If an error is noted after the patent issues, patentee and any third party may seek correction of the period of patent term granted by filing a request for Certificate of Correction pursuant to § 1.322. The PTO intends to identify

the length of any patent term extension calculated under § 1.701 on the printed patent.

Section 1.701(a) is being added to identify those patents which are entitled to an extension of patent term under 35 U.S.C. 154(b).

Section 1.701(b) is being added to provide that the term of a patent entitled to extension under § 1.701(a) shall be extended for the sum of the periods of delay calculated under §§ 1.701(c)(1), (c)(2), (c)(3) and (d), to the extent that those periods are not overlapping, up to a maximum of five years. The section also provides that the extension will run from the expiration date of the patent.

Section 1.701(c)(1) is being added to set forth the method for calculating the period of delay where the delay was a result of an interference proceeding under 35 U.S.C. 135(a). The period of delay with respect to each interference in which the application was involved is calculated under § 1.701(c)(1)(i) to include the number of days in the period beginning on the date the interference was declared or redeclared to involve the application in the interference and ending on the date that the interference was terminated with respect to the application. An interference is considered terminated as of the date the time for filing an appeal under 35 U.S.C. 141 or civil action under 35 U.S.C. 146 expired. If an appeal under 35 U.S.C. 141 is taken to the Court of Appeals for the Federal Circuit, the interference terminates on the date of receipt of the court's mandate by the PTO. If a civil action is filed under 35 U.S.C. 146, and the decision of the district court is not appealed, the interference terminates on the date the time for filing an appeal from the court's decision expires. See section 2361 of the MPEP. The period of delay with respect to an application suspended by the PTO due to interference proceedings under 35 U.S.C. 135(a) not involving the application is calculated under § 1.701(c)(1)(ii) to include the number of days in the period beginning on the date prosecution in the application is suspended due to interference proceedings not involving the application and ending on the date of the termination of the suspension. The period of delay under § 1.701(a)(1) is the sum of the periods calculated under §§ 1.701(c)(1)(i) and (c)(1)(ii), to the extent that the periods are not overlapping.

Section 1.701(c)(2) is being added to set forth the method for calculating the period of delay where the delay was a result of the application being placed under a secrecy order.

Section 1.701(c)(3) is being added to set forth the method for calculating the period of delay where the delay was a result of appellate review. The period of delay is calculated under § 1.701(c)(3) to include the number of days in the period beginning on the date on which an appeal to the Board of Patent Appeals and Interferences was filed under 35 U.S.C. 134 and ending on the date of a final decision in favor of the applicant by the Board of Patent Appeals and Interferences or by a Federal court in an appeal under 35 U.S.C. 141 or a civil action under 35 U.S.C. 145.

Section 1.701(d) is being added to set forth the method for calculating any reduction in the period calculated under § 1.701(c)(3). As required by 35 U.S.C. 154(b)(3)(B), § 1.701(d)(1) provides that the period of delay calculated under § 1.701(c)(3) shall be reduced by any time during the period of appellate review that occurred before three years from the filing date of the first national application for patent presented for examination. The "filing date" for the purpose of § 1.701(d)(1) would be the earliest effective U.S. filing date, but not including the filing date of a provisional application or the international filing date of a PCT application. For PCT applications entering the national stage, the PTO will consider the "filing date" for the purpose of § 1.701(d)(1) to be the date on which applicant has complied with the requirements of § 1.494(b), or § 1.495(b), if applicable.

As contained in Public Law 103-465, 35 U.S.C. 154(b)(3)(C) states that the period of extension referred to in 35 U.S.C. 154(b)(2) "shall be reduced for the period of time during which the applicant for patent did not act with due diligence, as determined by the Commissioner." Section 1.701(d)(2) is being added to provide that the period of delay calculated under § 1.701(c)(3) shall be reduced by any time during the period of appellate review, as determined by the Commissioner, during which the applicant for patent did not act with due diligence. Section 1.701(d)(2) also provides that in determining the due diligence of an applicant, the Commissioner may examine the



facts and circumstances of the applicant's actions during the period of appellate review to determine whether the applicant exhibited that degree of timeliness as may reasonably be expected from, and which is ordinarily exercised by, a person during a period of appellate review. Acts which the Commissioner considers to constitute *prima facie* evidence of lack of due diligence under § 1.701(d)(2) are suspension at applicant's request under § 1.103(a) during the period of appellate review and abandonment during the period of appellate review.

Section 3.21 is being amended to provide that an assignment relating to a national patent application must identify the national patent application by the application number (consisting of the series code and the serial number, e.g., 07/123,456) and to eliminate the use of serial number and filing date as an identifier for national patent applications in assignment documents. This change is intended to eliminate any confusion as to whether an application identified by its serial number and filing date in an assignment document is an application filed under § 1.53(b)(1), 1.60 or 1.62 or a design application or a provisional application since there is a different series code assigned to each of these types of applications.

Section 3.21 is also being amended to provide that if an assignment of a patent application filed under § 1.53(b)(1) or § 1.62 is executed concurrently with, or subsequent to, the execution of the patent application, but before the patent application is filed, it must identify the patent application by its date of execution, name of each inventor, and title of the invention so that there can be no mistake as to the patent application intended.

Further, § 3.21 is being amended to provide that if an assignment of a provisional application is executed before the provisional application is filed, it must identify the provisional application by name of each inventor and title of the invention so that there can be no mistake as to the provisional application intended.

Section 3.81 is being amended to replace the reference to § 1.17(i)(1) with a reference to § 1.17(i) to be consistent with the change to § 1.17.

**Responses to and Analysis of Comments:** Forty-nine written comments were received in response to the Notice of Proposed Rulemaking. These comments, along with those made at the public hearing, have been analyzed. Some suggestions made in the comments have been adopted and others have not been adopted. Responses to the comments follow:

#### General Comments

1. *Comment:* One comment questioned the use of the word "proposed" in the notice of proposed rulemaking in describing the statutory amendments contained in Public Law 103-465. *Response:* The statutory changes contained in Public Law 103-465 were described as "proposed" changes in the Notice of Proposed Rulemaking because the President had not signed the legislation at the time the notice was prepared for publication. In fact, the legislation was signed by the President on December 8, 1994, which is the date of enactment.

2. *Comment:* Several comments urged the PTO to favorably consider the 17/20 patent term specified in H.R. 359 since this proposed legislation would overcome the existing impact of extended PTO prosecution and eliminate patent term extensions for prosecution delays. Furthermore, the proposed legislation is consistent with the Uruguay Round Agreements Act, Public Law 103-465.

*Response:* The administration and the PTO strongly believe that the 20-year patent term as enacted in Public Law 103-465 is the appropriate way to implement the 20-year patent term required by the GATT Uruguay Round Agreements Act. The PTO will take steps to ensure that processing and examination of applications are handled expeditiously.

3. *Comment:* One comment stated that the proposed rules are premature in view of the Rohrabacher bill, H.R. 359.

*Response:* The proposed rules are not premature. Public Law 103-465 was signed into law on December 8, 1994, with an effective date of June 8, 1995, for the implementation of the 20-year patent term and provisional applications. The Commissioner must promulgate regulations to implement the changes required by Public Law 103-465.

4. *Comment:* One comment stated that there is nothing in the

TRIPs agreement that requires the term to be measured from filing, nor that provisional applications be provided for, nor that new fees of \$730 as set forth in §§ 1.17(r) and (s) be established. It is suggested that 35 U.S.C. 154 be amended to provide that "every patent (other than a design patent) shall be granted a term of twenty years from the patent issue date, subject to the payment of maintenance fees." It was also suggested that the section regarding maintenance fees be amended to add a new fee payable at 16.5 years of \$5000 (for large entity)/\$2500 (for small entity) for maintenance of patent between 17 and 20 years.

*Response:* The suggestion has not been adopted. The administration and the PTO strongly believe that the 20-year patent term as enacted in Public Law 103-465 is the appropriate way to implement the 20-year patent term required by the GATT Uruguay Round Agreements Act. The establishment of a provisional application is not required by GATT. The provisional application has been adopted as a mechanism to provide easy and inexpensive entry into the patent system. The filing of provisional applications is optional. Provisional applications will place domestic applicants on an equal footing with foreign applicants as far as the measurement of term is concerned because the domestic priority period, like the foreign priority period, is not counted in determining the endpoint of the patent term. As to the §§ 1.17(r) and (s) fees, the statute authorizes the Commissioner to establish appropriate fees for further limited reexamination of applications and for examination of more than one independent and distinct inventions in an application.

5. *Comment:* One comment suggested that the 20-year patent term of claims drawn to new matter in continuation-in-part (CIP) applications be measured from the filing date of the CIP application, irrespective of any reference to a parent application under 35 U.S.C. 120.

*Response:* The suggestion has not been adopted. The term of a patent is not based on a claim-by-claim approach. Under 35 U.S.C. 154(a)(2), if an application claims the benefit of the filing date of an earlier filed application under 35 U.S.C. 120, 121 or 365(a), the 20-year term of that application will be based upon the filing date of the earliest U.S. application that the application makes reference to under 35 U.S.C. 120, 121 or 365(a). For a CIP application, applicant should review whether any claim in the patent that will issue is supported in an earlier application. If not, applicant should consider canceling the reference to the earlier filed application.

6. *Comment:* One comment objected to the 20-year term provisions of Public Law 103-465 because it was believed that payment of maintenance fees would be required earlier under 20-year term than under 17-year term.

*Response:* The payment of maintenance fees are not due earlier under 20-year term than under 17-year term. Maintenance fees continue to be due at 3.5, 7.5 and 11.5 years from the issue date of the patent.

7. *Comment:* Several comments suggested that the expiration date be printed on the face of the patent.

*Response:* The suggestion has not been adopted. The expiration date will not be printed on the face of the patent. The PTO will publish any patent term extension that is granted as a result of administrative delay pursuant to § 1.701 on the face of the patent. The term of a patent will be readily discernible from the face of the patent. Furthermore, it is noted that the term of a patent is dependent on the timely payment of maintenance fees which is not printed on the face of the patent.

8. *Comment:* One comment suggested that in order to aid the bar in advising clients as to whether a provisional application has had its priority claimed in a patent, the PTO should somehow link the provisional application number with the complete application number and/or the patent number.

*Response:* It is contemplated by the PTO that all provisional applications will be given application numbers, starting with a series code "60" followed by a six digit number, e.g., "60/123,456." If a subsequent 35 U.S.C. 111(a) application claims the benefit of the filing date of the provisional application pursuant to 35 U.S.C. 119(e) and the 35 U.S.C. 111(a) application results in a patent, the provisional application would be listed by its application number and filing date on the face of the patent under the heading "Related U.S. Application Data." The public will be able to identify an application under the above-noted heading as a provisional application by checking to see if it has a series code of "60."

9. *Comment:* Several comments suggested that the PTO consider modifying the rules to permit the filing of all applications by assignees. This would promote harmonization with other patent laws throughout the world and would eliminate one of the difficulties which will occur for the PTO in considering claims for priority based on the filing of a provisional application.

*Response:* Assignee filing was recommended in the 1992 Advisory Commission Report on Patent Law Reform. The PTO is currently undertaking a project to reengineer the entire patent process. The suggestion will be taken under advisement in that project.

10. *Comment:* Several comments stated that a complete provisional application should not be forwarded to a central repository for storage.

*Response:* In view of the relatively small filing fee for a provisional application and the fact that the provisional application will not be examined, PTO handling must be kept to a minimum and these provisional applications, once complete, will be sent to the Files Repository for storage rather than being kept in the examination area of the PTO.

11. *Comment:* One comment suggested that the provisional application be maintained with the 35 U.S.C. 111(a) application because the examiner may need it to determine whether the 35 U.S.C. 111(a) application is entitled to the benefit of the prior provisional application and in the event of 18-month publication, there will be a demand for accessibility by the public to the provisional and 35 U.S.C. 111(a) applications upon publication.

*Response:* The suggestion has not been adopted. Benefit of the same provisional application may be claimed in a number of 35 U.S.C. 111(a) applications. If the PTO is to maintain the provisional application file with one of several 35 U.S.C. 111(a) applications claiming benefit of the provisional application and the 35 U.S.C. 111(a) application containing the provisional application file were to go abandoned while one of the other 35 U.S.C. 111(a) applications issues, the public would be entitled to inspect the provisional application file but not the abandoned 35 U.S.C. 111(a) application file containing the provisional application file. This would create access problems.

12. *Comment:* One comment suggested that provisional applications be available in full to the public if the benefit of priority is being claimed.

*Response:* Section 1.14 relating to access applies to all applications including provisional applications. If the benefit of a provisional application is claimed in a later filed 35 U.S.C. 111(a) application which resulted in a patent, then access to the provisional application will be available to the public pursuant to § 1.14. The mere fact that a provisional application is claimed in a later filed 35 U.S.C. 111(a) application does not give the public access to the provisional application unless the 35 U.S.C. 111(a) application issues as a patent.

13. *Comment:* Several comments requested that the PTO clarify whether a 35 U.S.C. 111(a) application will be accorded an effective date as a reference under 35 U.S.C. 102(e) as of the filing date of the provisional application for which benefit under 35 U.S.C. 119(e) is claimed. If so, the comment questioned whether pending applications will be rejected under 35 U.S.C. 102(e) on the basis that an invention was described in a patent granted on a provisional application by another filed in the U.S. before the invention thereof by the applicant for patent.

*Response:* If a patent is granted on a 35 U.S.C. 111(a) application claiming the benefit of the filing date of a provisional application, the filing date of the provisional application will be the 35 U.S.C. 102(e) prior art date. A pending application will be rejected under 35 U.S.C. 102(e) on the basis that an invention was described in a patent granted on a 35 U.S.C. 111(a) application which claimed the benefit of the filing date of a provisional application by another filed in the U.S. before the invention thereof by the applicant for patent.

14. *Comment:* One comment suggested that the PTO issue a final rule stating that if a 35 U.S.C. 111(a) application claims the benefit of the filing date of a provisional application, the "inventive entity" for the purposes of 35 U.S.C. 102(e) will be the inventors listed on the issued patent, and the list of inventors in the provisional application shall have no effect on the identity of an "inventive entity" for the purposes of 35 U.S.C. 102(e).

*Response:* The suggestion has not been adopted. The "inventive

entity" for the purpose of 35 U.S.C. 102(e) is determined by the patent and not by the inventors named in the provisional application. As long as the requirements of 35 U.S.C. 119(e) are satisfied, a patent granted on a 35 U.S.C. 111(a) application which claimed the benefit of the filing date of a provisional application has a 35 U.S.C. 102(e) prior art effect as of the filing date of the provisional application based on the inventive entity of the patent. It is clear from 35 U.S.C. 102(e) that the inventive entity is determined by the patent and a rule to this effect is not necessary.

15. *Comment:* One comment requested the PTO to express its position as to whether the filing of a provisional application with the subsequent filing of a 35 U.S.C. 111(a) application claiming benefit of the provisional application under 35 U.S.C. 119(e) creates a prior art date against other patent applicants under 35 U.S.C. 102(g).

*Response:* As to 35 U.S.C. 102(g), the filing of a provisional application with the subsequent filing of a 35 U.S.C. 111(a) application claiming benefit of the provisional application under 35 U.S.C. 119(e) creates a prior art date under 35 U.S.C. 102(g) as of the filing date of the provisional application.

16. *Comment:* One comment suggested that in view of the 20-year patent term measured from filing, § 1.103(a) should be deleted. The PTO should not have the right to suspend action on any application, thereby reducing applicant's term of protection.

*Response:* Section 1.103(a) refers to suspension of action as a result of a request by applicant. If applicant wishes to suspend prosecution and thereby reduce his/her term of protection, applicant should be permitted to do so.

17. *Comment:* One comment suggested that in order to avoid delays resulting from consideration of petitions to withdraw premature notices of abandonment, examiners should be required to contact an attorney of record prior to abandoning the application to find out if a response to an Office communication has been filed.

*Response:* The suggestion has not been adopted. However, in order to avoid loss of patent term, applicants are encouraged to check on the status in cases where applicants have not received a return postcard from the PTO within two (2) weeks of the filing of any response to a PTO action.

18. *Comment:* One comment asked whether there is a "cut-off" date after which patentees may lose the opportunity to choose 17 vs. 20-year patent term.

*Response:* The "cut-off" date is June 8, 1995. A patent that is in force on June 8, 1995, or a patent that issues after June 8, 1995, on an application filed before June 8, 1995, is automatically entitled to the longer of the 20-year patent term measured from the earliest U.S. effective filing date or 17 years from grant. This is automatic by operation of law. Patentees need not make any election to be entitled to the longer term. A patent that issues on an application filed on or after June 8, 1995 is entitled to a 20-year patent term measured from the earliest U.S. effective filing date.

19. *Comment:* One comment stated that there is no clear guidance as to a patentee's "bonus rights" that may arise because of the difference in a 17-year term vs. a 20-year term. Will parties that were previously in a licensing arrangement have to renegotiate terms for the bonus patent term?

*Response:* Section 154(c) of title 35, United States Code, states that the remedies of sections 283 (injunction), 284 (damages) and 285 (attorney fees) shall not apply to acts which were commenced or for which substantial investment was made before June 8, 1995, and became infringing by reason of the 17/20 year term and that these acts may be continued only upon the payment of an equitable remuneration to the patentee that is determined in an action brought under chapters 28 and 29 of Title 35. There is no guidance provided in the statute as to the meaning of "substantial investment" and "equitable remuneration." Licensing arrangements are between the parties to the agreement and are determined by the terms of the agreement and state law and are outside the jurisdiction of the PTO.

20. *Comment:* One comment questioned whether an international application designating the U.S. filed before June 8, 1995, with entry into the U.S. national stage on or after June 8, 1995, preserves the 17-year patent term measured from grant.

*Response:* An international application designating the U.S. that is filed before June 8, 1995, with entry into the U.S. national stage under 35 U.S.C. 371 on or after June 8, 1995,



preserves the option for a 17-year patent term measured from date of grant.

**21. Comment:** One comment suggested that 35 U.S.C. 371(c) be amended because a declaration should not be required to obtain a filing date and a prior art date under 35 U.S.C. 102(e). **Response:** The suggestion has not been adopted. This issue was not addressed in the Notice of Proposed Rulemaking. However, the suggestion will be taken under advisement as part of a comprehensive effort being conducted by the PTO to reengineer the entire patent process.

**22. Comment:** One comment suggested that §§ 1.604, 1.605 and 1.607 be amended to state that provisional applications are not subject to interference.

**Response:** The suggestion has not been adopted because it is unnecessary. By statute, 35 U.S.C. 111(b)(8), provisional applications are not subject to 35 U.S.C. 135, i.e., a provisional application will not be placed in interference.

**23. Comment:** One comment suggested that §§ 1.821-1.825 be amended so that (1) only unbranched sequences of ten or more amino acids and twenty or more nucleotides which are claimed have to be included in Sequence Listings, (2) previously published sequences can be omitted, and (3) the sequences of primers and oligonucleotide probes should not be included in a Sequence Listing if encompassed by another disclosed sequence.

**Response:** The suggestion has not been adopted. There was no change proposed to §§ 1.821-1.825 in the Notice of Proposed Rulemaking. However, the suggestion will be taken under advisement as part of a comprehensive effort being conducted by the PTO to reengineer the entire patent process.

**24. Comment:** One comment suggested that §§ 5.11 to 5.15 be amended to provide for the grant of a foreign license for a provisional application.

**Response:** The suggestion has not been adopted. The present language of §§ 5.11 to 5.15 already provides for the grant of a foreign license for a provisional application.

**25. Comment:** One comment suggested that in order to assist defense agencies in reviewing application for secrecy orders, PTO should (1) automatically impose a secrecy order on any application filed under 35 U.S.C. 111(a) if a secrecy order was previously imposed on corresponding provisional application, and (2) require applications filed under 35 U.S.C. 111(a) based on a previous provisional application to indicate changes made to the provisional application in the 35 U.S.C. 111(a) application by means of underlining and bracketing.

**Response:** The suggestions have not been adopted. The PTO cannot automatically impose a secrecy order on any 35 U.S.C. 111(a) applications even if a secrecy order was previously imposed on a provisional application, for which benefit under 35 U.S.C. 119(e) is claimed, unless the agency which imposed the secrecy order on the provisional application specifically requests the PTO to do so since the 35 U.S.C. 111(a) application could disclose subject matter which is different from that which is disclosed in the provisional application.

As to item (2), the PTO will not require applicants to identify the differences in subject matter disclosed in the 35 U.S.C. 111(a) application and the provisional application.

**26. Comment:** One comment suggested that in order to relieve defense agencies from possible liability for secrecy orders imposed for more than 5 years, the PTO should seek legislation setting patent term at 20 years from the earliest filing date or 17 years from the issue date, whichever is longer, for any patent application placed under secrecy order.

**Response:** The suggestion has not been adopted. The PTO strongly believes that the 20-year patent term as enacted in Public Law 103-465 is the appropriate way to implement the 20-year patent term required by the GATT Uruguay Round Agreements Act. The 5-year limit for patent term extension set forth in § 1.701(b) is required by statute, 35 U.S.C. 154(b).

#### Comments Directed To Specific Rules

**27. Comment:** One comment suggested that in order to eliminate the need for the expression "other than a provisional application" in other parts of the regulations, § 1.9 should be amended to identify a 35 U.S.C. 111(a) application by some term that can be used in the rules to distinguish that type of application from a provisional application.

**Response:** The suggestion has been adopted. The rules are being

amended to include a definition of the term "nonprovisional application" in § 1.9(a) to describe an application filed under 35 U.S.C. 111(a) or 371. Further, the term "nonprovisional application" is being used in the final rules where the rule applies only to applications filed under 35 U.S.C. 111(a) or 371 and not to provisional applications.

**28. Comment:** One comment suggested that the rules be simplified if a "national application" could be defined in § 1.9 to exclude a provisional application.

**Response:** The suggestion has not been adopted. Section 1.9(a), prior to this rulemaking, defined a national application to include any application filed under 35 U.S.C. 111. A provisional application is an application filed under 35 U.S.C. 111. It is appropriate to define a provisional application as a special type of national application.

**29. Comment:** One comment requested an explanation of the showing required in a petition under §§ 1.12 and 1.14 for access to pending applications and to assignment records for pending applications.

**Response:** There was no substantive change proposed to either § 1.12 or 1.14 in the Notice of Proposed Rulemaking. Thus, the showing required in a petition under § 1.12 or 1.14 remains the same after this final rulemaking as before. A discussion of such a petition can be found in section 103 of the MPEP.

**30. Comment:** Several comments objected to the definition in § 1.45(c) of joint inventors in provisional applications as being those having made a contribution to "the subject matter disclosed" in the provisional application. Various language, such as, "the subject matter which constitutes the invention," "subject matter disclosed and regarded to be the invention," "disclosed invention," "the inventive subject matter disclosed" was suggested. Another comment requested guidance as to the determination of inventorship in a provisional application.

**Response:** The suggestion has not been adopted. The term "invention" is typically used to refer to subject matter which applicant is claiming in his/her application. Since claims are not required in a provisional application, it would not be appropriate to reference joint inventors as those who have made a contribution to the "invention" disclosed in the provisional application. If the "invention" has not been determined in the provisional application because no claims have been presented, then the name(s) of those person(s) who have made a contribution to the subject matter disclosed in the provisional application should be submitted. Section 1.45(c) states that "if multiple inventors are named in a provisional application, each named inventor must have made a contribution, individually or jointly, to the subject matter disclosed in the provisional application." All that § 1.45(c) requires is that if someone is named as an inventor, that person must have made a contribution to the subject matter disclosed in the provisional application. When applicant has determined what the invention is by the filing of the 35 U.S.C. 111(a) application, that is the time when the correct inventors must be named. The 35 U.S.C. 111(a) application must have an inventor in common with the provisional application in order for the 35 U.S.C. 111(a) application to be entitled to claim the benefit of the provisional application under 35 U.S.C. 119(e).

**31. Comment:** Several comments suggested that it might be desirable to correct inventorship in a provisional application where an individual was erroneously named as an inventor and that the procedure for doing so should be set forth in § 1.48.

**Response:** Under 35 U.S.C. 119(e), as contained in Public Law 103-465, a later filed application under 35 U.S.C. 111(a) may claim priority benefits based on a copending provisional application so long as the applications have at least one inventor in common. An error in naming a person as an inventor in a provisional application would not require correction by deleting the erroneously named inventor from the provisional application since this would have no effect upon the ability of the provisional application to serve as a basis for a priority claim under 35 U.S.C. 119(e). However, in response to the comments, § 1.48 is being amended to include a new paragraph (e) which sets forth the requirements for deleting the names of the inventors incorrectly named as joint inventors in a provisional application, namely, a petition including a verified statement by the inventor(s) whose name(s) are being deleted stating that the error arose without deceptive intent, the fee set forth in § 1.17(q) and the written consent of all assignees.

**32. Comment:** One comment suggested that in order to make

the procedures for provisional applications as simple as possible, there is no need to provide any rules to add inventor(s) or change inventorship in a provisional application since the whole concept of inventorship is meaningless without a claim. Error in inventorship can be corrected by the filing of a 35 U.S.C. 111(a) application within 12 months after the filing of a provisional application.

**Response:** The suggestion has not been adopted. One of the requirements of 35 U.S.C. 119(e) is that a 35 U.S.C. 111(a) application must have at least one inventor in common with a provisional application in order for the 35 U.S.C. 111(a) application to be entitled to claim the benefit of the filing date of the provisional application. In situations where there is no inventor in common between the 35 U.S.C. 111(a) application and the provisional application due to error in naming the inventors in the provisional application, procedures must be established to permit applicant to correct the inventorship in the provisional application.

**33. Comment:** One comment suggested that an individual who is the inventor of subject matter disclosed in a provisional application, but who is not named as an inventor in the provisional application because that subject matter was not intended to be claimed in a later filed 35 U.S.C. 111(a) application, could be added as an inventor pursuant to § 1.48(d) in the provisional application if the subject matter was later claimed in the 35 U.S.C. 111(a) application.

**Response:** The individual could be added as an inventor pursuant to § 1.48(d) in the provisional application so long as the individual was originally omitted without deceptive intent.

**34. Comment:** One comment questioned whether it would be proper for a registered practitioner who did not file the provisional application to sign the statement required by § 1.48(d) that the error occurred without deceptive intention on the part of the inventors.

**Response:** It would be proper for a registered practitioner who did not file the provisional application to sign the statement required by § 1.48(d), if the registered practitioner has a reasonable basis to believe the truth of the statement being signed.

**35. Comment:** One comment suggested that there should be no diligence requirement to correct inventorship in a provisional application.

**Response:** Diligence is not a requirement to correct inventorship in a provisional application in either § 1.48(d) or 1.48(e).

**36. Comment:** One comment suggested that § 1.48(a) be amended by deleting the requirements for "a statement of facts verified by the original named inventor or inventors establishing when the error without deceptive intention was discovered and how it occurred" and for the written consent of any assignee.

**Response:** The suggestion has not been adopted. There was no substantive change proposed to § 1.48(a) in the Notice of Proposed Rulemaking. Since the correction of inventorship affects ownership rights, the existing rules are designed to provide assurances that all parties including the original named inventors and all assignees agree to the change of inventorship. If the requirements for verified statements of facts from the original named inventors and written consent of the assignees are to be deleted, the PTO would no longer have the assurances that all parties agree to the change.

**37. Comment:** One comment expressed concern that a provisional application filed without a claim will leave subsequent readers with little or no clue as to what the inventors in the provisional application considered to be their invention at the time the provisional application was filed and doubted that a provisional application filed without a claim defining the invention could ever provide a sufficient disclosure to support a claim for a foreign or U.S. priority date.

**Response:** Claims are not required by the statute to provide a specification in compliance with the requirements of 35 U.S.C. 112, first paragraph. However, if an applicant desires, one or more claims may be included in a provisional application. Any claim filed with a provisional application will, of course, be considered a part of the original provisional application disclosure.

**38. Comment:** One comment suggested that the PTO issue a specification format or guideline for a provisional application to enable an inventor to comply with 35 U.S.C. 112, first paragraph.

**Response:** The format of a provisional application is the same as for other applications and is set forth in existing § 1.77

which is applicable to provisional applications except no claims are required for provisional applications.

**39. Comment:** Several comments suggested that the PTO revise its rules to clarify that strict adherence to the enablement, description and best mode requirements of 35 U.S.C. 112, first paragraph, is not required in provisional applications.

**Response:** The suggestion has not been adopted. The substantive requirements of a specification necessary to comply with 35 U.S.C. 112, first paragraph, are established by court cases interpreting that section of the statute, not by rule. The case law applies to provisional applications as well as to applications filed under 35 U.S.C. 111(a).

**40. Comment:** Several comments suggested that the rules or comments published with the Final Rule indicate whether there is any requirement to update the best mode disclosed in the provisional application when filing the 35 U.S.C. 111(a) application.

**Response:** No rule was proposed to address the issue when going from a provisional application to a 35 U.S.C. 111(a) application because no current rule exists when going from one 35 U.S.C. 111(a) application to another 35 U.S.C. 111(a) application. The question of whether the best mode has to be updated is the same when going from one 35 U.S.C. 111(a) application to another 35 U.S.C. 111(a) application or from a provisional application to a 35 U.S.C. 111(a) application. Accordingly, the rationale of *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 U.S.P.Q.2d 1077 (Fed. Cir. 1994), would appear to be applicable. Clearly, if the substantive content of the application does not change when filing the 35 U.S.C. 111(a) application, there is no requirement to update the best mode. However, if subject matter is added to the 35 U.S.C. 111(a) application, there may be a requirement to update the best mode.

**41. Comment:** One comment suggested that § 1.51(c) be amended to permit a provisional application to be filed with an authorization to charge fees to a deposit account.

**Response:** Section 1.51(c) permits an application to be filed with an authorization to charge fees to a deposit account. Section 1.51(c) applies to provisional applications. Therefore, no change to § 1.51(c) is necessary.

**42. Comment:** One comment suggested that the PTO confirm that there will be no procedural examination of a provisional application other than to determine whether the provisional application complies with § 1.51(a)(2).

**Response:** The PTO intends to require compliance with the formal requirements of §§ 1.52(a)-(c) only to the extent necessary to permit the PTO to properly microfilm and store the application papers.

**43. Comment:** Several comments suggested that an English translation of a foreign language provisional application should not be required unless necessary in prosecution of the 35 U.S.C. 111(a) application to establish benefit. If an English translation is required, there is no useful purpose to require the translation at any time earlier than the filing of 35 U.S.C. 111(a) application claiming the benefit of the provisional application.

**Response:** Provisional applications may be filed in a language other than English as set forth in existing § 1.52(d). However, an English language translation is necessary for security screening purposes. Therefore, the PTO will require the English language translation and payment of the fee required in § 1.52(d) in the provisional application. Failure to timely submit the translation in response to a PTO requirement will result in the abandonment of the provisional application. If a 35 U.S.C. 111(a) application is filed without providing the English language translation in the provisional application, the English language translation will be required to be supplied in every 35 U.S.C. 111(a) application claiming priority of the non-English language provisional application.

**44. Comment:** One comment suggested that a new model oath or declaration form for use in claiming 35 U.S.C. 119(e) priority and a "cover sheet" for use in filing provisional applications be published as an addendum to the final rules.

**Response:** The suggestion has been adopted. See Appendix A for the sample cover sheet for filing a provisional application and Appendix B for the sample declaration for use in claiming 35 U.S.C. 119(e) priority.

**45. Comment:** One comment suggested that the statement in § 1.53(b)(2) that the provisional application will not be given a filing date if all the names of the actual inventor or inventor(s)



are not supplied be deleted and § 1.41 be amended to make an exception for provisional applications. The comment suggested that 35 U.S.C. 111(b) is satisfied as long as the name of one person who made an inventive contribution to the subject matter of the application is given.

**Response:** The suggestion has not been adopted. Section 111(b) of title 35, United States Code, states that "a provisional application shall be made or authorized to be made by the inventor." This language parallels 35 U.S.C. 111(a). The naming of inventors for obtaining a filing date for a provisional application is the same as for other applications. A provisional application filed with the inventors identified as "Jones et al." will not be accorded a filing date earlier than the date upon which the name of each inventor is supplied unless a petition with the fee set forth in § 1.17(i) is filed which sets forth the reasons the delay in supplying the names should be excused. Administrative oversight is an acceptable reason. It should be noted that for a 35 U.S.C. 111(a) application to be entitled to claim the benefit of the filing date of a provisional application, the 35 U.S.C. 111(a) application must have at least one inventor in common with the provisional application.

**46. Comment:** One comment suggested that a drawing should not be required to obtain a filing date for a provisional application. Whatever is filed should be given a serial number and filing date in order to establish status as a provisional application, regardless of what is in the specification or drawing. If the provisional application omitted drawings, has pages missing, or is otherwise incomplete, then applicant may not be able to rely on the filing date of the provisional application in a subsequently filed 35 U.S.C. 111(a) application. It should not be the job of the Application Branch to review compliance with § 1.81(a).

**Response:** Section 111(b) of title 35, United States Code, states that a provisional application must include a specification as prescribed by 35 U.S.C. 112, first paragraph and a drawing as prescribed by 35 U.S.C. 113. Drawings are required pursuant to 35 U.S.C. 113 if they are necessary to understand the subject matter sought to be patented. If a provisional application as filed omitted drawings and/or has pages missing, the provisional application is *prima facie* incomplete and no filing date will be granted. Application Branch currently reviews all applications to make sure that no filing date will be granted to an application that is *prima facie* incomplete. Application Branch will perform the same type of review with provisional applications. If a filing date is not granted to a provisional application because it is *prima facie* incomplete, applicant may petition the PTO under § 1.182 to grant a filing date to the provisional application as of the date of deposit of the application papers if it can be shown that the omitted matters are not necessary for the understanding of the subject matter.

**47. Comment:** One comment objected to the requirement in § 1.53(b)(2)(i) for a cover sheet identifying the application as a provisional application because it is unnecessarily rigid and contrary to Congress' desire to keep the filing of provisional application as simple as possible.

**Response:** The requirement that a provisional application be specifically identified on filing as a provisional application is not seen to be burdensome on the applicant and is necessary for the PTO to properly process the papers as a provisional application. All an applicant is required to do in order to comply with the requirement of § 1.53(b)(2)(i) is to include a transmittal sheet identifying the papers being filed as a PROVISIONAL application.

**48. Comment:** Several comments suggested that in § 1.53(b)(2)(ii), as proposed, the phrase "the expiration of 12 months after the filing date of the provisional application" should read "the expiration of 12 months after the filing date of the § 1.53(b)(1) application".

**Response:** The suggestion has been adopted.

**49. Comment:** One comment objected to the requirement in § 1.53(b)(2)(ii) for a petition to convert an application filed under § 1.53(b)(1) to a provisional application and suggested that any confusion concerning applicant's intention could be handled informally without a petition or petition fee.

**Response:** The requirement for a petition and fee is intended to ensure that the cost of any PTO reprocessing is borne specifically by the applicant requesting the action.

**50. Comment:** Several comments suggested that the filing fee required in an application filed under 35 U.S.C. 111(a) claiming

benefit of the filing date of an earlier 35 U.S.C. 111(a) application which has been converted to a provisional application under proposed § 1.53(b)(2)(ii) be reduced, since the \$730/\$365 filing fee was paid in the earlier application.

**Response:** The suggestion has not been adopted. The filing fee required in an application filed under 35 U.S.C. 111(a) is set by statute. The statute does not provide for the suggested reduction in the filing fee.

**51. Comment:** One comment suggested that proposed § 1.53(b)(2)(iii) should apply retroactively to permit applications filed between June 9, 1994, and June 8, 1995, to be converted to provisional applications.

**Response:** The suggestion has not been adopted. The statute does not permit a provisional application to have a filing date prior to June 8, 1995.

**52. Comment:** One comment suggested that § 1.53(b)(2)(ii) be revised to state that the petition requesting conversion must also be filed before (1) the application becomes involved in interference, or (2) notice by the PTO of intent to publish the application as a statutory invention registration. This suggestion conforms with 35 U.S.C. 111(b)(8).

**Response:** The suggestion has not been fully adopted. It is not necessary to include interference in § 1.53(b)(2)(ii) because if a 35 U.S.C. 111(a) application becomes involved in an interference proceeding and applicant files a petition requesting conversion of that 35 U.S.C. 111(a) application to a provisional application, the 35 U.S.C. 111(a) will be removed from the interference proceeding upon granting the petition to convert. When a subsequent 35 U.S.C. 111(a) application is filed based on the provisional application, the subsequent 35 U.S.C. 111(a) application could be placed in the interference proceeding if necessary. As to the reference to statutory invention registration, § 1.53(b)(2)(ii) is being amended to require the petition and the fee be filed prior to the earlier of the abandonment of the 35 U.S.C. 111(a) application, the payment of the issue fee, the expiration of 12 months after the filing date of the 35 U.S.C. 111(a) application, or the filing of a request for a statutory invention registration under § 1.293.

**53. Comment:** One comment suggested that the procedures for converting a 35 U.S.C. 111(a) application to a provisional application be explained in greater detail in § 1.53(b)(2)(ii) or in the discussion. If a 35 U.S.C. 111(a) application is converted to a provisional application on the last day of the 12-month period, and a second 35 U.S.C. 111(a) application is concurrently filed, how should this be done and how should the first sentence in the second 35 U.S.C. 111(a) application be worded. Furthermore, if a 35 U.S.C. 111(a) application is converted to a provisional application on the last day of the 12-month period, will it be necessary to file a second 35 U.S.C. 111(a) application on the same day, or else lose the priority claim.

**Response:** The suggestion has not been adopted. The language in § 1.53(b)(2)(ii) is clear relating to the requirements for converting a 35 U.S.C. 111(a) application to a provisional application. If applicant wishes to convert a 35 U.S.C. 111(a) application to a provisional application, applicant must file a petition requesting the conversion along with the petition fee set forth in § 1.17(q). The petition and the fee must be filed prior to the earlier of the abandonment of the 35 U.S.C. 111(a) application, the payment of the issue fee, the expiration of 12 months after the filing date of the 35 U.S.C. 111(a) application, or the filing of a request for a statutory invention registration under § 1.293. In the example noted in the comment, if a 35 U.S.C. 111(a) application is converted to a provisional application on the last day of the 12-month period, a second 35 U.S.C. 111(a) application must be filed on that same day, otherwise, applicant will lose the priority pursuant to 35 U.S.C. 119(e). An example of how the first sentence of the second 35 U.S.C. 111(a) application would read is, "This application claims the benefit of U.S. Provisional Application No. 60/—, filed—, which was converted from Application No.—."

**54. Comment:** One comment suggested that the PTO consider a rule mandating that any prior U.S. application that would have been eligible for conversion to a provisional application that is abandoned in favor of a continuing application within one year of the earliest priority date asserted be deemed constructively converted to a provisional application.

**Response:** The suggestion has not been adopted. Conversion of a 35 U.S.C. 111(a) application to a provisional will be permitted only by way of a petition and under the conditions

set forth in § 1.53(b)(2)(ii). One reason for this is that the PTO plans to provide sufficient information on the printed patent to determine the end date of the 20-year patent term by identifying provisional applications using a unique series code, i.e., "60". Thus, a 35 U.S.C. 111(a) application converted to a provisional application will need to be reprocessed by the PTO with a new application number. The petition fee is intended to reimburse the PTO for the extra processing necessitated by the conversion.

**55. Comment:** One comment stated that § 1.53(b)(2)(ii) permits the conversion of a 35 U.S.C. 111(a) application to a provisional application. However, it is silent as to whether such a conversion would kill any benefit the 35 U.S.C. 111(a) application had of domestic and/or foreign priority.

**Response:** Section 111(b)(7) of title 35, United States Code, specifically states that a provisional application shall not be entitled to the right of priority of any other application under 35 U.S.C. 119 or 365(a) or to the benefit of an earlier filing date in the United States under 35 U.S.C. 120, 121, or 365(c). If a 35 U.S.C. 111(a) application is converted to a provisional application, the granting of the conversion will automatically eliminate any claim of priority which could have been made in the 35 U.S.C. 111(a) application.

**56. Comment:** Several comments suggested that it was inconsistent with the purpose of the provisional application to require any compliance with the Sequence Disclosure Rules §§ 1.821-1.823 and 1.825, since the provisional applications are not examined and there is no comparison of the sequences with the prior art.

**Response:** The Office agrees with the comments that a provisional application need not comply with the requirements of §§ 1.821 through 1.825. Section 1.53(b)(2)(iii) is being amended to indicate that the requirements of §§ 1.821 through 1.825 regarding sequence listings are not mandatory for a provisional application. However, applicants are cautioned that in order for a 35 U.S.C. 111(a) application to obtain the benefit of the filing date of an earlier filed provisional application, the claimed subject matter of the 35 U.S.C. 111(a) application must have been disclosed in the provisional application in a manner provided by 35 U.S.C. 112, first paragraph. Applicants are encouraged to follow the sequence rules to ensure that support for the invention claimed in the 35 U.S.C. 111(a) application can be readily ascertained in the provisional application.

**57. Comment:** One comment suggested that the language in § 1.53(c)(2) that a provisional application will become abandoned no later than twelve months after its filing date was misleading and that the words "no later than" should be deleted because it was believed that a provisional application could not be abandoned prior to twelve months after its filing date.

**Response:** The statute does not state that a provisional application can never be abandoned prior to twelve months after its filing date. In fact, a provisional application may be abandoned as a result of applicant's failure to timely respond to a PTO requirement. For example, if a provisional application which has been accorded a filing date does not include the appropriate filing fee or the cover sheet required by § 1.51(a)(2), applicant will be so notified if a correspondence address has been provided and given a period of time within which to file the fee, cover sheet and to pay the surcharge as set forth in § 1.16(l). Failure to timely respond will result in the abandonment of the application. This may occur prior to twelve months after its filing date. Furthermore, a provisional application may also be expressly abandoned prior to twelve months from its filing date.

**58. Comment:** One comment objected to the deletion of the "retention fee" practice in § 1.53(d) since it permits an applicant in a first application claiming benefits under 35 U.S.C. 119(a)-(d) or 120 to correct inventorship by filing a second application without having to pay the full filing fee in the first application.

**Response:** Since the comment indicated that there is a benefit to retain the retention fee practice, the proposal to eliminate the practice is withdrawn.

**59. Comment:** One comment stated that the language of §§ 1.53(d)(1) and (d)(2) indicates an intent by the PTO to mail the "Notice Of Missing Parts" to applicant's post office address and argues that the "Notice" should be mailed to the registered practitioner who filed the application on behalf of the applicant.

**Response:** The language in §§ 1.53(d)(1) and (d)(2) states that the applicant will be notified of the missing part, if a correspondence address is provided. This means that the "Notice" to

applicant will be mailed to the correspondence address provided in the application papers. Under current PTO practice, if no specific correspondence address is identified in the application, the address of the registered practitioner who filed the application on behalf of the applicant is used as the correspondence address. If no specific correspondence address or registered practitioner is identified in the application, the post office address of the first named inventor is used as the correspondence address. No change in current PTO practice in this regard is required as a result of § 1.53(d)(2) nor is any change planned.

**60. Comment:** Several comments objected to the proposed deletion of § 1.60. One comment suggested that the deletion of § 1.60 was a major rule change and should have been proposed separate from the proposed rules dealing with the changes in practice required by Public Law 103-465.

**Response:** In view of the comments received, the proposal to delete § 1.60 is withdrawn. However, the proposal will be considered as part of a comprehensive effort being conducted by the PTO to reengineer the entire patent process.

**61. Comment:** One comment suggested that in view of the deletion of § 1.60, language should be incorporated in § 1.53(a)(1) to state that a copy of the prior application along with a copy of the declaration may be filed to obtain a filing date. Furthermore, full details and guidelines of the procedure should accompany the rule.

**Response:** The suggestion has not been adopted. The proposal to delete § 1.60 is withdrawn in view of several comments received objecting to the deletion.

**62. Comment:** One comment suggested that the removal of the stale oath practice be codified.

**Response:** The suggestion has not been adopted. Neither the statute nor the rules require a recent date of execution to appear on the oath or declaration. The PTO practice of objecting to an oath or declaration where the time elapsed between the date of execution and the filing date of the application is more than three months is found in section 602.05 of the MPEP. Therefore, the removal of the stale oath practice will be accomplished by amending the MPEP.

**63. Comment:** One comment questioned whether a copy of an application faxed to an attorney could be filed in the PTO as the application papers.

**Response:** Yes. While a patent application may not be faxed directly to the PTO, an application faxed to an attorney may be forwarded to the PTO by mail or courier as the application papers provided the papers meet the formal requirements of § 1.52. Effective November 22, 1993, § 1.4 was amended to include a new paragraph (d) to specify that most correspondence filed in the PTO, which requires a person's signature, may be an original, a copy of an original or a copy of a copy. Only correspondence identified in §§ 1.4(e) and (f) require the original to be filed in the PTO. Thus, an oath or declaration required by § 1.63, 1.153, 1.162 or 1.175 may be an original, a copy of an original or a copy of a copy. See 1156 Off. Gaz. Pat. Office 61 (November 16, 1993).

**64. Comment:** One comment suggested that applicant be permitted to use § 1.62 procedure to file the 35 U.S.C. 111(a) application which claims the benefit of a provisional application, at least in those situations where the 35 U.S.C. 111(a) application has been converted to a provisional application which is followed by the filing of a second 35 U.S.C. 111(a) application.

**Response:** The suggestion has not been adopted. Section 1.62 will not be amended to permit the filing a 35 U.S.C. 111(a) application based on a provisional application because the PTO sees this situation as a trap for applicants. The filing procedures would be made more complicated if an exception is provided to address situations where a 35 U.S.C. 111(a) application is converted to a provisional application and a second 35 U.S.C. 111(a) application is later filed. However, the suggestion will be taken under advisement when greater familiarity with provisional applications is developed.

**65. Comment:** One comment suggested that § 1.62 procedure be replaced with a simple petition procedure to reopen prosecution.

**Response:** The suggestion is not being adopted. However, the suggestion will be taken under advisement as part of a comprehensive effort being conducted by the PTO to reengineer the entire patent process.

**66. Comment:** One comment suggested that the language in § 1.62(a) that requires an identification of the "applicant's name



of the prior complete application" is confusing and should be clarified.

**Response:** The suggestion has been adopted. Section 1.62 is being amended to require the identification of the "applicants named in the prior complete application."

**67. Comment:** One comment suggested that § 1.62 be amended to state that the refiling procedures set forth in § 1.62 may be used after the issue fee is paid when a petition under § 1.313(b)(5) is granted. This practice is permitted pursuant to the notice published in 1138 Off. Gaz. Pat. Office 40 (May 19, 1992).

**Response:** The suggestion has been adopted.

**68. Comment:** One comment suggested that § 1.62 be amended to clarify whether applicant need to re-list, in the § 1.62 application, all the references cited by the examiner and applicant in the parent application in order to get those references printed on the eventual patent.

**Response:** The suggestion has not been adopted. Section 609 of the MPEP (Sixth Edition, Jan. 1995) has been amended to clarify that in a § 1.62 application, references submitted and cited in the parent application need not be resubmitted. These references will be printed on the patent. However, in any continuing application filed under § 1.53(b)(1) or 1.60, a list of the references must be resubmitted if applicant wishes to have the references printed in the eventual patent.

**69. Comment:** One comment suggested that § 1.67 should go into more detail on when supplemental oaths are required in § 1.53 filings of continuation and divisional applications.

**Response:** The suggestion has not been adopted because it is seen to be unnecessary and no substantive change was proposed to § 1.67 in the Notice of Proposed Rulemaking.

**70. Comment:** One comment suggested that "not but" in § 1.67(b) should read "but not".

**Response:** The suggestion has been adopted.

**71. Comment:** Several comments suggested that a rule be provided to state that an application for patent is permitted to claim the benefit of the filing date of more than one prior provisional application so long as the applicant complies with all statutory provisions.

**Response:** The suggestion has been adopted. Section 1.78(a)(3) is being amended to indicate that applicants are permitted to separately claim the benefit of the filing date of more than one prior provisional application in a later filed 35 U.S.C. 111(a) application provided all statutory requirements of 35 U.S.C. 119(e) are complied with. It is noted that current practice permits an application to claim the benefits of the filing date of more than one prior foreign application under 35 U.S.C. 119(a)-(d) and of more than one prior copending U.S. application under 35 U.S.C. 120, without an explicit statement to that effect in the rules. Since the final rules are being amended to specifically permit applications filed under 35 U.S.C. 111(a) to claim the benefits of the filing date of more than one prior copending provisional application, corresponding changes are also being made to §§ 1.55 and 1.78(a)(1) relating to claims for the benefits available under 35 U.S.C. 119(a)-(d) and 120 to be consistent with § 1.78(a)(3).

**72. Comment:** Several comments requested that the PTO specify language to use in the first sentence of an application when priority is based on more than one provisional application.

**Response:** Section 1.78(a)(4) requires that "any application claiming the benefit of a prior filed copending provisional application must contain or be amended to contain in the first sentence of the specification following the title a reference to such prior provisional application, identifying it as a provisional application, and including the provisional application number." Where a 35 U.S.C. 111(a) application claims the benefit of more than one provisional application, a suitable reference would read, "This application claims the benefit of U.S. Provisional Application No. 60V—, filed— and U.S. Provisional Application No. 60V—, filed—." In addition, for an application which is claiming the benefit under 35 U.S.C. 120 of a prior application, which in turn claims the benefit of a provisional application under 35 U.S.C. 119(e), a suitable reference would read, "This application is a continuation of U.S. application No. 08—, filed—, now abandoned, which claims the benefit of U.S. Provisional Application No. 60V—, filed—."

**73. Comment:** One comment suggested that the rules address the effect on patent term when an applicant in a continuing application deletes the reference to the prior filed application

before the patent issues.

**Response:** An applicant has full control over claims to the benefit of an earlier filing date under 35 U.S.C. 120, 121 or 365(c). The 20-year patent term will be based upon the filing date of the earliest U.S. application that the applicant makes reference to under 35 U.S.C. 120, 121 and 365(c). Whether an applicant is entitled to the benefit of the filing date of an earlier application is something that an applicant should examine before the patent is issued. The PTO is not, unless it comes up as an issue in the examination process, going to determine whether any of the claims are entitled to the earlier filing date. Applicant however, should determine whether the claims are entitled to or require the benefit of the earlier filing date. If not, the applicant should consider canceling the reference to the earlier filed application to avoid having the 20-year patent term measured from that earlier filing date. An amendment adding or deleting a reference to an earlier filed application presented prior to a final action will be entered, however, the claims may be subject to possible intervening prior art.

**74. Comment:** One comment stated that in view of the fact that a provisional application is not entitled to claim the benefit of a prior filed copending national or international application as stated in § 1.53(b)(2)(iii), the phrase "other than a provisional application" in § 1.78(a)(2) is unnecessary.

**Response:** Section 1.78(a)(2) is being amended to state that "any nonprovisional application claiming the benefit of a prior copending nonprovisional or international application must contain..." Section 1.78(a)(2) addresses a 35 U.S.C. 111(a) application which claims the benefit of a prior copending 35 U.S.C. 111(a) application or international application.

**75. Comment:** Several comments objected to the content requirements for drawings filed in a provisional application as originally set forth in proposed § 1.83(a)(2). One comment suggested that no rule was necessary to set forth the required content of drawings in a provisional application.

**Response:** In view of the comments received, the proposed amendment to § 1.83 is withdrawn. Under 35 U.S.C. 113, first sentence, applicant must furnish drawings in a provisional application "where necessary for the understanding of the subject matter sought to be patented." This requirement is also stated in existing § 1.81(a). Therefore, no further elaboration on the content of the drawings in a provisional application is believed necessary in the rules.

**76. Comment:** One comment suggested that the rules specify that formal drawings are not required in a provisional application.

**Response:** The suggestion has not been adopted. However, the PTO intends to examine provisional applications for requirements of form only to the extent that is necessary to permit normal storage and microfilming of the application papers. Formal drawings are usually not required for those purposes.

**77. Comment:** Several comments suggested that § 1.97(d) be amended to require the PTO to consider any information disclosure statement submitted after a final rejection or notice of allowance if an appropriate fee is paid.

**Response:** The suggestion has not been adopted because no substantive change to this rule was proposed in the Notice of Proposed Rulemaking. The existing rules are designed to encourage prompt submission of information to the PTO. To permit applicant to merely pay a fee to have any information disclosure statement submitted after a final rejection or Notice of Allowance would be contrary to the effort to encourage prompt submissions.

**78. Comment:** One comment suggested that § 1.97 be changed so that an Office action which uses a newly cited reference as a ground for rejection under 35 U.S.C. 102 or 103 cannot be made final.

**Response:** The suggestion has not been adopted because no substantive change to this rule was proposed in the Notice of Proposed Rulemaking.

**79. Comment:** One comment suggested that the words "which are not examined" in § 1.101 as proposed are unnecessary and could create a negative implication that some provisional applications are examined.

**Response:** The suggestion has not been adopted. By statute, provisional applications are not subject to 35 U.S.C. 131, i.e., the Commissioner is not permitted to examine a provisional application for patentability.

**80. Comment:** Several comments stated that it is unfair to

require small entities to pay the full \$730.00 fee set forth in proposed § 1.129. It is suggested that the fee be changed to \$365.00 or less.

**Response:** Pursuant to Public Law 103-465, the Commissioner has the authority to establish appropriate fees for the further limited reexamination of applications and for the examination of more than one independent and distinct invention in an application. As a result of additional review, it was concluded that these fees may be reduced by 50% for small entities. Sections 1.17(r) and (s) are being amended to indicate that the fees are reduced by 50% for small entities, that is, \$365.00 for small entities.

**81. Comment:** Several comments suggested that the transitional procedure set forth in § 1.129(a) as proposed is equivalent to filing one application, i.e., it provides for an extra examination and reexamination after the original final rejection, and, therefore, the requirement for two \$730.00 fees, which is equivalent to two filing fees, is unwarranted. Another comment suggested that if the proposed \$730.00 fee is adopted, the examiner should be instructed to treat the after-final amendment as any other initial filing, i.e., a new application, not as an amendment submitted after a non-final office action.

**Response:** Under existing PTO practice, it would not be proper to make final a first Office action in a continuing or substitute application where the continuing or substitute application contains material which was presented in the earlier application after final rejection or closing of prosecution but was denied entry because (1) new issues were raised that required further consideration and/or search, or (2) the issue of new matter was raised. The identical procedure will apply to examination of a submission considered as a result of the procedure under § 1.129(a). Thus, under § 1.129(a), if the first submission after final rejection was initially denied entry in the application because (1) new issues were raised that required further consideration and/or search, or (2) the issue of new matter was raised, then the next action in the application will not be made final. Likewise, if the second submission after final rejection was initially denied entry in the application because (1) new issues were raised that required further consideration and/or search, or (2) the issue of new matter was raised, then the next action in the application will not be made final. Thus, the fee required by § 1.129(a) has been set at the amount required for filing an application because the procedure provided by the rule is equivalent to the filing of two applications. No new matter can be entered by payment of the fee set forth in § 1.17(r).

**82. Comment:** Several comments suggested that the fees required for filing a provisional application and those fees required by §§ 1.129(a) and (b) for the transitional procedures should not be greater than the average cost of processing such matters by the PTO. Two comments stated that the fee required by § 1.129(a) is excessive relative to PTO costs.

**Response:** The fee required for filing a provisional application is set by Public Law 103-465 and the PTO has no discretion with respect to the amount of that particular fee. As to the fee required by § 1.129(a), the procedures relating to the first submission provided by § 1.129(a) is equivalent to the filing of a file wrapper continuation application under § 1.62, and therefore, the fee required with the first submission is appropriately set at the same amount as a filing fee, which is \$730.00. The \$730.00 fee is subject to a 50% reduction for small entities. The second submission is equivalent to the filing of a second file wrapper continuation application and the fee for the second submission is appropriately set at the same amount as a filing fee. As to the fee required by § 1.129(b), the procedures set forth in § 1.129(b) permit applicants to retain multiple inventions in a single application rather than having to file multiple divisional applications. The fee for each independent and distinct invention in excess of one is appropriately set at the same amount as the filing fee for a divisional application, which is \$730.00. The \$730.00 fee is subject to a 50% reduction for small entities.

**83. Comment:** One comment suggested that the time period for the payment of the \$730.00 fee for the transitional after-final practice be extended if applicant files a petition seeking reversal of the examiner's refusal to enter the amendment after final without fee, until one month after an unfavorable decision on the petition.

**Response:** If an earlier filed petition seeking reversal of the examiner's refusal to enter the amendment after final is granted by the Director finding that the final rejection was premature,

but the petition had not been decided by the time the § 1.129(a) fee was due, applicant must submit the § 1.129(a) fee so as to toll the time period for response to the final rejection. Otherwise, the application would be abandoned. Upon granting of such a petition by the Director, the § 1.129(a) fee paid will be refundable to applicant on request. Applications that fall under § 1.129(a) are under final rejection and there is a time period running against the applicant. Applicant must toll that time period by paying the transitional after-final fee set forth in § 1.129(a) and any necessary extension of time fees and Notice of Appeal fee. Section 1.129(a) is being amended to indicate that the submission and the fee set forth in § 1.17(r) may be submitted before the filing of the Appeal Brief and prior to abandonment of the application.

**84. Comment:** One comment suggested that if it is decided that the transitional after-final practice is made permanent, the PTO should seek legislative authorization to provide reduced fees for small entities.

**Response:** If it is decided that the transitional after-final practice be made permanent, the PTO will propose legislation to accomplish this change.

**85. Comment:** Several comments suggested that §§ 1.129(a) and (b) should apply to all applications regardless of whether they were filed before or after June 8, 1995. Several comments suggested that the practices set forth in §§ 1.129(a) and (b) should be made permanent.

Several comments suggested that an applicant should be permitted to have a submission entered and considered after any final rejection upon payment of a fee as set forth in § 1.17(r), not just the first and second final rejections.

**Response:** The suggestions have not been adopted at this time. However, the PTO is undertaking a project to reengineer the entire patent process. These suggestions will be taken under advisement in that project.

**86. Comment:** One comment suggested that the PTO make an effort to treat applications in which a submission under § 1.129(a) has been filed on an expedited basis.

**Response:** Once the submission is filed and the fee set forth in § 1.17(r) is paid the finality of the last PTO action is withdrawn. The filing of the submission and the fee under § 1.129(a) is equivalent to the filing of a continuing application and will be treated in the same fashion and under the same turnaround time frame as a continuing application.

**87. Comment:** One comment suggested that PTO practice be changed so that a first Office action in a continuing application cannot be made final.

One comment suggested that PTO practice regarding second action final be relaxed.

**Response:** The suggestions have not been adopted at this time. However, the PTO is undertaking a project to reengineer the entire patent process. These suggestions will be taken under advisement in that project.

**88. Comment:** One comment stated that in proposed § 1.129, there is no express provision for the finality of the previous rejection to be withdrawn if applicant complies with the proposed rule. It is suggested that the proposed rule state that the finality of the previous action would be withdrawn if applicant complied with the rule when making a first or second submission after a final action.

**Response:** The suggestion has been adopted.

**89. Comment:** One comment requested that the PTO clarify whether § 1.129(a) required the first final rejection to be specifically withdrawn and a different final (i.e., one containing a new ground of rejection) rejection made before applicant is entitled to make a second submission.

**Response:** The final rule provides that the finality of the previous final office action is automatically withdrawn upon the timely filing of the first § 1.129(a) submission and the fee set forth in § 1.17(r). If the first PTO action following the payment of the § 1.17(r) fee is a non-final office action, a further response from applicant will be entered and considered as a matter of right without payment of the fee set forth in § 1.17(r). If the next office action or any subsequent action is made final, the finality of that office action will be automatically withdrawn upon the timely filing of a second § 1.129(a) submission and the fee set forth in § 1.17(r).

**90. Comment:** One comment suggested that the PTO not permit the first PTO action following the payment of the § 1.17(r) fee to be made final under any circumstances.



**Response:** The suggestion has not been adopted. The first PTO action following the payment of the § 1.17(r) fee may be made final under the same conditions that a first office action may be made final in a continuing application (see section 706.07(b) of the MPEP). However, it would not be proper to make final a first Office action in a continuing or substitute application where the continuing or substitute application contains material which was presented in the earlier application after final rejection or closing of prosecution but was denied entry because (1) new issues were raised that required further consideration and/or search, or (2) the issue of new matter was raised. The procedure set forth in section 706.07(b) of the MPEP will apply to examination of a submission considered as a result of the procedure under § 1.129(a).

91. **Comment:** Several comments suggested that the filing of the first submission under § 1.129(a) within the statutory period for response set in final rejection should toll the running of the six-month statutory period.

**Response:** The filing of a submission, e.g., an information disclosure statement or an amendment, after a final rejection without payment of the fee set forth in § 1.17(r) will not toll the period for response set in the final rejection. However, § 1.129(a) is being amended to provide in the rule that the finality of the previous Office action is automatically withdrawn upon the filing of the submission and the payment of the fee set forth in § 1.17(r). Thus, the filing of a submission and the payment of the fee set forth in § 1.17(r) and any extension of time fees and Notice of Appeal fee, if they are necessary to avoid abandonment of the application, will automatically toll the period for response set in the final rejection. It must be kept in mind that the provisions of § 1.129 apply only to an application, other than for reissue or a design patent, that has been pending for at least two years as of June 8, 1995, taking into account any reference made in such application to any earlier filed application under 35 U.S.C. 120, 121 and 365(c).

92. **Comment:** One comment asked (1) whether it would be necessary to file a Notice of Appeal and appeal fee with or after the first submission and fee if the examiner acts on the first submission and before the end of the six months from the date of the final rejection issues (a) a notice of allowance, (b) a non-final action, or (c) a second final rejection; (2) would the Notice of Appeal and fee be due only at the end of the six months from the date of the final rejection regardless of whether the examiner has acted on the submission by then; and (3) if the Notice of Appeal and fee have once been paid following a first final rejection, would a second notice and fee need to be paid if a second final rejection were issued and applicant desired to file a second submission under § 1.129(a).

Another comment suggested that the appeal fee set forth in § 1.17(e) should not be required where the Notice of Appeal is filed with a § 1.129(a) submission and the fee set forth in § 1.17(r).

**Response:** As to questions (1) and (2) and the second comment, if the first submission and the proper fee set forth in § 1.17(r) are timely filed in response to the final rejection, the finality of the previous rejection will be automatically withdrawn and applicant need not file the Notice of Appeal or the appeal fee. For example, if the first submission and the proper fee set forth in § 1.17(r) were filed on the last day of the six-month period for response to the final rejection, applicant must also file a petition for three months extension of time with the appropriate fee in order to avoid abandonment of the application. In such case, applicant need not file the Notice of Appeal or the appeal fee if the proper fee set forth in § 1.17(r) was timely paid. However, under the same fact situation, if applicant failed to submit the proper fee set forth in § 1.17(r), the finality of the previous rejection would not be withdrawn and the time period for response would still be running against applicant. In such case, a Notice of Appeal and appeal fee must also accompany the papers filed at the six-month period in order to avoid abandonment of the application. The proper fee set forth in § 1.17(r) must be filed prior to the filing of the Appeal Brief and prior to the abandonment of the application.

As to question (3), if the Notice of Appeal and fee have once been paid following a first final rejection and applicant timely files a first submission and the proper fee set forth in § 1.17(r), the finality of the previous final rejection will be withdrawn and the appeal fee paid could be applied against any subsequent appeal. If the examiner issues a non-final rejection

in response to applicant's first submission, a further response from applicant will be entered and considered as a matter of right. If any subsequent Office action is made final, applicant may file a second submission along with the proper fee pursuant to § 1.129(a). If the second submission and the proper fee set forth in § 1.17(r) are timely filed in response to the subsequent final rejection, the finality of the previous final rejection will be withdrawn. Any submission filed after a final rejection made in the application subsequent to the fee under § 1.129(a) having been paid twice will be treated as set forth in § 1.116. Applicant may, upon payment of the appeal fee, appeal a final rejection within the time allowed for response pursuant to § 1.191.

93. **Comment:** One comment questioned whether the "first submission" under § 1.129(a) has to be the first response filed after a final rejection or could it include subsequent responses to the same final rejection.

**Response:** The "first submission" under § 1.129(a) would include all responses filed prior to and with the payment of the fee required by § 1.129(a) provided the submission and fee are filed prior to the filing of the Appeal Brief and prior to abandonment of the application.

94. **Comment:** One comment suggested that § 1.129(a) be changed to permit the procedure to be available up until the filing of an Appeal Brief since it is not uncommon to file an amendment after a Notice of Appeal is filed but before the filing of an Appeal Brief.

**Response:** The suggestion has been adopted.

Section 1.129(a) is being amended to indicate that the submission and the fee set forth in § 1.17(r) must be submitted before the filing of the Appeal Brief and prior to abandonment of the application.

95. **Comment:** One comment suggested that the transitional after-final practice be available at any time after final, including after the resolution of an appeal unfavorable to applicant in whole or in part.

**Response:** The suggestion has not been adopted. Section 1.129(a) is being amended to indicate that the submission and the fee set forth in § 1.17(r) must be submitted before the filing of the Appeal Brief and prior to abandonment of the application. The suggestion to extend the period to after the resolution of an appeal unfavorable to applicant in whole or in part has not been adopted because the suggestion would further unduly extend prosecution of the application.

96. **Comment:** One comment stated that if an examiner must withdraw the finality of the rejection as a result of the transitional provision, the examiner should be credited with two counts in order to be compensated for the additional work.

**Response:** The examiner credit system is not part of this rulemaking package. However, as part of the Public Law 103-465 implementation plan, some accommodation will be made for the extra work performed.

97. **Comment:** One comment stated that regarding the transitional after-final practice, the fee should not be required if the only reason is to have the PTO consider recently obtained art.

**Response:** Under current practice, if applicant submits prior art after final rejection but before the payment of issue fee, the art will be considered if applicant makes the required certification and submits a petition with the required petition fee of \$130.00 (see section 609 of the MPEP). If applicant can make the certification, applicant would not have to rely on the transitional after-final procedure to have the prior art considered. In the event that applicant cannot make the certification, then the procedure under § 1.129(a) is available if applicant wishes the PTO to consider the prior art without refiling the application.

98. **Comment:** One comment suggested that the PTO modify existing restriction practice to make it more difficult for examiners to require restriction, for example, by requiring every restriction requirement to show two-way distinctness and separate status in the art established by means other than reference to the PTO's classification system.

**Response:** The suggestion has not been adopted. However, the PTO is undertaking a project to reengineer the entire patent process. This suggestion will be taken under advisement in that project.

99. **Comment:** One comment suggested that the pendency periods required by §§ 1.129(a) and (b) should be 18 months rather than 2-year and 3-year, respectively.

**Response:** The pendency periods set forth in the rule which

establish eligibility for the transitional procedures are set forth in Public Law 103-465.

100. **Comment:** One comment suggested that § 1.129(a) be amended to permit prosecution to be reopened after a Notice of Allowance or final rejection upon the filing of a form requesting that prosecution be reopened and payment of the necessary fee.

**Response:** The procedures set forth in § 1.129(a) are not applicable to amendments filed after a Notice of Allowance. Amendments filed after the mailing of a Notice of Allowance are governed by § 1.312. The procedures set forth in § 1.129(a) are applicable to amendments filed after a final rejection. If applicant submits an amendment after final and the examiner notifies the applicant in writing that the amendment is not entered, § 1.129(a) permits applicant to submit a letter prior to abandonment of the application and prior to the filing of the Appeal Brief, requesting entry of the prior filed amendment along with the payment of the appropriate fee set forth in § 1.17(r). The letter requesting entry of the prior filed amendment would be equivalent to "a form" as suggested in the comment.

101. **Comment:** One comment suggested that the PTO liberalize its current practice under § 1.116 to make it easier for amendments or evidence to be entered and considered after a final rejection.

**Response:** The suggestion has not been adopted since no change was proposed to § 1.116 in the Notice of Proposed Rulemaking. However, the suggestion will be taken under advisement as part of a comprehensive effort being conducted by the PTO to reengineer the entire patent process. It should be noted that any change to liberalize the current practice under § 1.116 would necessitate increasing fees.

102. **Comment:** Several comments suggested that the transitional restriction provision be modified to state that no restriction requirement shall be made or maintained in any application pending for three years on the effective date of the legislation. The comment stated that if restriction requirements made prior to April 8, 1995, are permitted to be maintained then applicants will be forced to file divisional applications resulting in the automatic loss of term after June 8, 1995. A heavy penalty will be placed on the chemical, pharmaceutical and biotechnology industries, who have less than 4 months to search through the ancestors of all pending applications and to identify all restriction requirements and to file divisional applications before June 8, 1995. The comment further suggested that the current restriction practice be changed in view of the implementation of the 20-year term.

**Response:** The suggestion has not been adopted. The two-month date set forth in § 1.129(b)(1)(i) is from the Statement of Administrative Action, which is part of Public Law 103-465. Under section 102 of Public Law 103-465, "the statement of administrative action approved by the Congress shall be regarded as an authoritative expression by the United States concerning the interpretation and application of the Uruguay Round Agreements and this Act in any judicial proceeding in which a question arises concerning such interpretation or application." The Commissioner does not have any authority to establish rules which are inconsistent with the Act. It is noted that in cases where a restriction requirement was made prior to April 8, 1995, applicant will have sufficient time to file divisional applications prior to June 8, 1995, so as to retain the benefit of the 17-year patent term for those divisional applications.

The PTO is currently reviewing the restriction practice in view of the implementation of the 20-year patent term. It is noted that a change in restriction practice without changes to other fees would have a negative impact on funding needed to operate the PTO.

103. **Comment:** Several comments suggested that proposed exceptions (1) and (2) in § 1.129(b) ignore the mandatory language of section 532(2)(B) of Public Law 103-465 and should be deleted.

**Response:** The suggestion has not been adopted. The exceptions referred to are contained in the Statement of Administrative Action, which is part of Public Law 103-465. Under section 102 of Public Law 103-465, "the statement of administrative action approved by the Congress shall be regarded as an authoritative expression by the United States concerning the interpretation and application of the Uruguay Round Agreements and this Act in any judicial proceeding in which a question arises

concerning such interpretation or application."

104. **Comment:** One comment asked whether "restriction" under § 1.129(b) apply to election of species under § 1.146.

**Response:** "Restriction" under § 1.129(b) applies to both requirements under § 1.142 and elections under § 1.146.

105. **Comment:** Several comments requested that clarification be made as to what constitutes "actions by the applicant" in § 1.129(b)(1) and specifically, whether a request for extension of time under § 1.136(a) constitutes such "actions" by the applicant.

**Response:** Examples of what constitute "actions by the applicant" in § 1.129(b)(1) are: (1) applicant abandons the application and continues to refile the application such that no Office action can be issued in the application, and (2) applicant requests suspension of prosecution under § 1.103(a) such that no Office action can be issued in the application. Extension of time under § 1.136(a) would not constitute such "actions by the applicant" under § 1.129(b)(1).

106. **Comment:** One comment suggested that the one-month period set forth in § 1.129(b) is insufficient to give an applicant time to file a petition under § 1.144 from a restriction requirement. Several comments suggested that § 1.129(b) be amended to permit applicant to challenge the restriction requirement by way of a petition before being required to pay the fees set forth in § 1.17(s).

**Response:** Section 1.129(b)(2) is being amended in the final rule package to indicate that applicant will be given "a time period" to (1) make an election, if no election has been previously made, and pay the fee set forth in § 1.17(s), (2) confirm an earlier election and pay the fee set forth in § 1.17(s), or (3) file a petition under § 1.129(b)(2) traversing the restriction requirement. If applicant chooses not to pay the fee set forth in § 1.17(s), applicant may file a petition under § 1.129(b)(2) requesting immediate review by the Group Director of the restriction requirement. No petition fee is required. A petition under § 1.129(b)(2) rather than under § 1.144 would be more appropriate under the circumstances since a petition under § 1.144 requires the examiner to make the restriction final before the petition can be considered.

107. **Comment:** One comment suggested that if applicant elects not to pay the fee set forth in § 1.17(s), applicant should be allowed to elect the invention to be examined.

**Response:** The suggestion has been adopted. Section 1.129(b) is being amended to indicate that if applicant chooses not to pay the fees for the additional inventions, applicant must elect the invention to be examined and the claims directed to the non-elected inventions for which no fee has been paid will be withdrawn from consideration.

108. **Comment:** One comment suggested that the PTO amend the rules to permit all, or at least several, inventions to be examined in a single application upon payment of an appropriate fee.

**Response:** The suggestion has not been adopted at this time. However, the PTO is currently undertaking a project to reengineer the entire patent process. The suggestion will be taken in advisement in this project.

109. **Comment:** One comment suggested that PTO follow the wording of 35 U.S.C. 121 and only require restriction where an application claims two or more independent and distinct inventions rather than two or more independent or distinct inventions.

**Response:** In making restriction requirements, the PTO has always followed the wording of 35 U.S.C. 121 to require restriction if two or more independent and distinct inventions are claimed in an application rather than independent or distinct as suggested by the comment. The term "independent" includes species and related inventions such as combination/subcombination and process and product. Restriction is proper if these independent inventions are patentably distinct (see section 802.01 of the MPEP).

110. **Comment:** One comment suggested that the standard for determining whether an application contains independent and distinct inventions should only be the "unity of invention" standard used for PCT applications.

**Response:** The suggestion has not been adopted. The current restriction practice for 35 U.S.C. 111(a) applications is governed by 35 U.S.C. 121 and §§ 1.141, 1.142 and 1.146. The PCT "unity of invention" standard only applies to PCT applications and applications filed under 35 U.S.C. 371. The PTO



is currently reviewing the restriction practice in view of the implementation of the 20-year patent term. It is noted that a change in restriction practice without changes to other fees would have a negative impact on funding needed to operate the PTO.

**111. Comment:** One comment suggested that the PTO apply the PCT unity of invention standard as interpreted by the EPO and that § 1.475(b) be amended to permit a broad range of claims in a single application.

**Response:** The PTO is currently undertaking a project to reengineer the entire patent process. The suggestion will be taken under advisement in this project.

**112. Comment:** One comment suggested that the PTO examiner should not be permitted to issue a restriction requirement or an election of species requirement if the ISA and the IPEA have found that an application complies with the unity of invention requirement.

Another comment suggested that the PTO consider allowing applicants to retain all claims in a single application when the claims are related, e.g., method and apparatus claims.

Another comment suggested that all species be searched before the first Office action regardless of whether one species is found to be unpatentable.

Another comment suggested that election of species requirements be prohibited.

**Response:** The suggestions have not been adopted. These issues were not addressed in the Notice of Proposed Rulemaking. However, the PTO is currently undertaking a project to reengineer the entire patent process. The suggestions will be taken under advisement in that project.

**113. Comment:** One comment suggested that decisions on whether to issue a restriction requirement be made within two-three months of the application filing date, and, if the requirement is traversed, the examiner should determine within four-five months of the filing date whether to maintain the requirement. Decisions on petitions to withdraw a restriction requirement should be decided within one month.

**Response:** The suggestion has not been adopted. Current practice dictates that restriction requirements be made at the earliest appropriate time in the pendency of a given application, e.g., in the first Office action. It would be difficult to issue a restriction requirement within two-three months of the application filing date as suggested since a large number of applications are filed with missing parts and applicants are given a time period to submit the missing parts. Furthermore, applications must be processed by the Application Branch and must be screened by Licensing and Review for national security. Petitions to withdraw a restriction requirement should be acted on by the Group Director expeditiously.

**114. Comment:** One comment argued that the phrases, "so as to be pending for a period of no longer than 12 months" and "under no circumstances will the provisional application be pending after 12 months", in § 1.139 were repetitious and suggested that one or both of the phrases be deleted.

**Response:** The suggestion has not been adopted. The statements are included for emphasis.

**115. Comment:** One comment suggested that § 1.139 clearly state that if the revival petition is filed later than 12 months after filing of the provisional application, then the revival is for the sole purpose of providing copendency for a 35 U.S.C. 111(a) application filed during that 12-month period.

**Response:** The suggestion has not been adopted. The proposed language is not necessary.

**116. Comment:** One comment stated that 35 U.S.C. 154(b) as contained in Public Law 103-465 does not give the Commissioner any authority to decide the period of extension. Therefore, proposed § 1.701 is without statutory basis.

**Response:** 35 U.S.C. 6(a) gives the Commissioner authority to establish regulations not inconsistent with law.

Section 1.701 is consistent with 35 U.S.C. 154(b) and furthermore, the Commissioner has the authority under 35 U.S.C. 154(b)(3)(C) to establish regulations to address the standards for determining due diligence.

**117. Comment:** One comment questioned whether patent term extension under 35 U.S.C. 154(b) is available for patents issuing: (1) before June 8, 1995, with a 17-year patent term or a 17/20 year patent term; (2) on or after June 8, 1995, on applications filed before June 8, 1995, with a 17-year patent term or a 17/20 year patent term.

**Response:** None of the patents set forth in the examples are eligible for patent term extension. Under the terms of the statute, patent term extension is only available for patents issued on applications filed on or after June 8, 1995.

**118. Comment:** Several comments questioned whether a patent issued on a continuing application is entitled to a patent term extension under 35 U.S.C. 154(b) due to interference, secrecy order, or appellate review delays occurring in the examination of the parent application.

**Response:** If the delay in the parent application contributed to a delay in the issuance of a patent in the continuing application, the patent granted on the continuing application may be eligible for an extension under 35 U.S.C. 154(b).

**119. Comment:** One comment suggested that the patent term be extended for a period of time equal to the time necessary to revive an application improperly abandoned due to PTO error. Another comment suggested that patent term extension be available for other PTO delays.

**Response:** The suggestions have not been adopted. Section 154(b) of title 35, United States Code, only permits patent term extension for delays due to interferences, secrecy orders, and/or successful appeals.

**120. Comment:** One comment suggested that the period of an extension granted under § 1.701 be printed on the face of the patent.

**Response:** The PTO will publish on the face of the patent any patent term extension that is granted pursuant to § 1.701.

**121. Comment:** One comment suggested that the word "interference" be inserted before the word "proceedings" in § 1.701(a)(1).

**Response:** The suggestion has been adopted.

**122. Comment:** One comment stated that the last sentence of § 1.701(b) is confusing because it suggests that patent term extension will be available in cases of terminal disclaimer and that the extension begins on the terminal disclaimer date rather than the original expiration date. This statement is contrary to 35 U.S.C. 154(b)(2) which does not permit any patent term extension for appellate delay if the patent is subject to a terminal disclaimer.

**Response:** In order to reduce confusion, the last sentence of § 1.701(b) is being amended to state that the extension will run from the expiration date of the patent. The reference to "terminal disclaimer" is being deleted.

**123. Comment:** Two comments stated that if an application involved in an interference proceeding contains uninvolved claims, those uninvolved claims should not be entitled to extension of patent term under proposed § 1.701 because applicant could cancel those uninvolved claims from the application and refile those claims in a continuation application. It is suggested that if an applicant leaves conclusively uninvolved claims (where no § 1.633(c)(4) motion is filed) in the application in interference, applicant does not get the benefit of the extension for any claim.

**Response:** The suggestion has not been adopted. The statute, 35 U.S.C. 154(b), grants patent term extension to a patent if the issuance of the patent was delayed due to interference proceeding under 35 U.S.C. 135(a). The statute does not exclude applications containing uninvolved claims. The Commissioner does not have the authority to establish regulations which are inconsistent with the law. Therefore, an application involved in an interference which contains uninvolved claims will be entitled to patent term extension if the issuance of the patent was delayed due to interference proceeding under 35 U.S.C. 135(a).

**124. Comment:** One comment asked whether applicant is entitled to patent term extension regardless of whether an interference involving applicant's application is ultimately declared.

One comment asked if the PTO ends the suspension without declaring an interference, and continued prosecution results in filing of a continuation or divisional application, are such subsequent cases entitled to the extension.

**Response:** An application will not be suspended unless it is decided that an interference can be declared involving that application. If prosecution of applicant's application is suspended due to an interference not involving applicant's application and an interference involving applicant's application is later declared, applicant will be entitled to patent term extension under § 1.701(c)(1)(ii) for the suspension period and under § 1.701(c)(1)(i) for the interference period. However, if prose-

cution of applicant's application is suspended due to an interference not involving applicant's application and if the PTO ends the suspension of the application without declaring an interference involving applicant's application, that application will be entitled to patent term extension under § 1.701(c)(1)(ii). If prosecution results in filing of a continuing application and if the delay in the parent application contributed to a delay in the issuance of a patent on the continuing application, the patent granted on the continuing application may be eligible for an extension under 35 U.S.C. 154(b).

**125. Comment:** One comment stated that delays in the issuance of a patent can exceed the five-year limit provided for in proposed § 1.701(b). Where the delay was not the fault of the applicant, why should there be this maximum?

Another comment stated that in a biotechnology application, if suspension of the application results in a declared interference, the period of delay calculated under § 1.701(c)(1)(i) will likely consume most of the five-year maximum extension. This renders the value of any time period measured under § 1.701(c)(1)(ii) negligible, thus diminishing the rights of applicant due to the unregulated suspension powers of the PTO.

**Response:** The five-year limit for patent term extension set forth in § 1.701(b) is required by statute, 35 U.S.C. 154(b).

**126. Comment:** One comment suggested that § 1.701(c)(1)(i) be amended to state that an application added after an interference is declared is entitled to an extension measured only from the date of redeclaration.

**Response:** The suggestion has not been adopted. The language in § 1.701(c)(1)(i) is clear that for an application that is added to an interference, that application is entitled to an extension measured from the date of redeclaration of the interference.

**127. Comment:** One comment stated that § 1.701(c)(1)(ii) does not address the case where a suspended application is added to the interference without the suspension being lifted.

**Response:** Section 1.701(c)(1)(ii) is being amended to reference the endpoint for the suspension period to the date of termination of the suspension. Where prosecution of an application is suspended due to interference proceedings not involving the application, the suspension is made pursuant to § 1.103(b). When that application is added to an interference, the suspension pursuant to § 1.103(b) will be automatically lifted. The application is entitled to patent term extension for the period of suspension pursuant to § 1.701(c)(1)(ii) and for the period of interference pursuant to § 1.701(c)(1)(i). Under § 1.701(c)(1)(ii), the period of suspension begins on the date the application is suspended and ends on the date the suspension under § 1.103(b) is terminated, which in this case would be the same date as the date of redeclaration of the interference.

**128. Comment:** One comment suggested that the phrase "if any," in § 1.701(c)(1)(i) and (ii) is unnecessary.

**Response:** The suggestion has not been adopted. However, § 1.701(c)(1)(i) is being amended for clarity by deleting the phrase "if any" after the first occurrence of "interference" and by inserting the same phrase after the phrase "the number of days."

**129. Comment:** Several comments suggested that the phrase "was declared or redeclared" in § 1.701(c)(1)(i) be changed to "was first declared."

**Response:** The suggestion has not been adopted. The language of the rule reads "with respect to each interference in which the application was involved, the number of days in the period beginning on the date the interference was declared or redeclared to involve the application in the interference...." An interference may be declared as A vs. B and later redeclared as A vs. B vs. C. Under the rule, the period of extension would be counted, with respect to applications A and B, from the date the interference was declared to involve the applications A and B. With respect to application C, the period of extension would be counted from the date the interference was redeclared to involve the application C. No ambiguity is seen in the language as originally proposed.

**130. Comment:** One comment suggested that the use of the phrase "appellate review" in reference to an action under 35 U.S.C. 145 or 146 is incorrect, since an action under 35 U.S.C. 145 or 146 is not considered as an "appellate review" and suggests that § 1.701(a)(3) be amended so that the introductory phrase reads "Appellate review by the Board of Patent Appeals and Interferences or review by a Federal court under 35 U.S.C. 141 or 145,...."

**Response:** The suggestion has not been adopted. The use of the phrase "appellate review" in reference to an action under 35 U.S.C. 145 or 146 is technically incorrect. However, Public Law 103-465 provides for extension of patent term for "delay due to appellate review by the Board of Patent Appeals and Interferences or by a Federal court". The introductory phrase referred to in the comment uses the exact language found in the statute.

**131. Comment:** One comment suggested that § 1.701(a) be amended to specify whether extensions for appellate delays are available for reissue applications.

**Response:** The suggestion has not been adopted. Under 35 U.S.C. 251, the term of a reissue patent is "for the unexpired part of the term of the original patent." Therefore, patent term extension for appellate delays is not available for reissue applications.

**132. Comment:** One comment suggested that § 1.701(d) be deleted.

**Response:** The suggestion has not been adopted. Section 1.701(d) sets forth the language found in the statute, 35 U.S.C. 154(b)(3) and further provides a standard for determining due diligence.

**133. Comment:** Several comments suggested that the lack of due diligence set forth in § 1.701(d)(2) be limited to the acts which occurred during the appellate period (after the filing of a Notice of Appeal) and not during prosecution.

**Response:** The suggestion has been adopted. Section 1.701(d) is being amended accordingly.

**134. Comment:** One comment suggested that the rules be made clear that a suspension under § 1.103 does not constitute a lack of due diligence under § 1.701(d)(2).

**Response:** The suggestion has not been adopted. A request for suspension pursuant to § 1.103(a) during the appellate review period will be considered to be prima facie evidence of lack of due diligence.

**135. Comment:** Several comments stated that the rules permit extensions of time and the filing of informal applications. These acts should not constitute lack of due diligence since the proposed rule defined the standard for determining due diligence as whether the applicant exhibited that degree of timeliness as may reasonably be expected from, and which is ordinarily exercised by, a person. One comment suggested that the Office adopt a gross negligence standard.

**Response:** The examples of acts that may constitute lack of due diligence set forth in the Notice of Proposed Rulemaking (extensions of time, filing of nonresponsive submissions, and filing of informal applications) are being withdrawn. The suggestion regarding the adoption of a gross negligence standard has not been adopted. As set forth in § 1.701(d)(2), the standard for determining due diligence is whether applicant exhibited that degree of timeliness as may reasonably be expected from, and which is ordinarily exercised by, a person during the appellate review period.

**136. Comment:** One comment stated that the PTO list in the rule all circumstances in which an applicant will be considered not to have acted with due diligence.

Another comment suggested that objective criteria for "diligence" be set forth in § 1.701(d)(2).

**Response:** The suggestion has not been adopted. Whether an action by the applicant constitutes lack of due diligence will be determined by the facts and circumstances of each case. Since lack of due diligence is determined on a case-by-case basis, it would not be possible to list all circumstances in the rule. Examples of acts which will constitute prima facie evidence of lack of due diligence are: (1) abandonment of the application during appellate review; and (2) suspension of action under § 1.103(a) during appellate review.

**137. Comment:** One comment suggested that guidance be provided in the comments to the Notice of Final Rules identifying in what circumstance is a patent issued "pursuant to an appellate decision reversing an adverse determination of patentability."

Several comments questioned whether the reversal of all rejections on one of several appealed claims would entitle applicant to an extension under § 1.701(a)(3). Two comments suggested that the rule be redrafted to allow appropriate extension of term where the Board or a court reverses at least "in part."

**Response:** Extension of patent term under § 1.701(a)(3) is applicable if all the rejections of any one claim are ultimately



reversed. The rule is clear and no clarification is needed.

138. *Comment:* One comment stated that § 1.701 does not address the situation where applicant appeals with both allowed and rejected claims. In such case, patent term extension should be available for any claims that were allowed prior to appellate review, if the allowed claims were in the same application, whether or not the decision of the examiner on the rejected claims is ultimately reversed. Applicant should not have to refile the allowed claims and rejected claims in separate cases in order to take advantage of the patent term extension.

*Response:* If applicant chooses to keep the allowed claims with the rejected claims in the application on appeal, patent term extension pursuant to 35 U.S.C. 154(b)(2) is only available if a patent was issued pursuant to a decision reversing an adverse determination of patentability and if the patent is not subject to a terminal disclaimer due to the issuance of another patent claiming subject matter that is not patentably distinct from that under appellate review. If the appellate review is not successful, applicant will not be entitled to patent term extension.

139. *Comment:* One comment questioned whether the phrase "if the patent is not subject to a terminal disclaimer" in § 1.701(a)(3) is intended to be limited to those applications in which a terminal disclaimer has actually been filed or encompass those applications in which a double patenting rejection has been made and a terminal disclaimer suggested by an examiner.

*Response:* The calculation of any applicable extension under § 1.701 will be made prior to the mailing of the Notice of Allowance and Issue Fee Due. At that time, any double patenting rejection would have been resolved and a terminal disclaimer would have been filed if one was required.

140. *Comment:* One comment stated that § 1.701(d)(1) is inconsistent with 35 U.S.C. 154(b)(2) and (b)(3), because the period of extension for appellate review would be calculated under § 1.701(d)(1) by first subtracting the period of appellate review occurring within three years of the filing date before the five-year limit is imposed. It is suggested that § 1.701 be modified to be consistent with 35 U.S.C. 154(b)(2) which requires the five-year limit to be imposed before the subtraction for appellate review occurring within three years of the filing date.

*Response:* The suggestion has not been adopted. Section 1.701 is not inconsistent with 35 U.S.C. 154(b)(2) and (b)(3). The period of extension referred to in 35 U.S.C. 154(b)(2) is defined in 35 U.S.C. 154(b)(3). Therefore, one must determine the period of extension in 35 U.S.C. 154(b)(3)(A), then reduce that period by the time determined in 35 U.S.C. 154(b)(3)(B) and (b)(3)(C). Then, according to 35 U.S.C. 154(b)(2), the resulting time period may not be more than five years.

141. *Comment:* One comment suggested that the Commissioner identify a senior person who is charged with approving all reductions in extension of patent term rather than leaving the decision to the examiner or the SPE.

One comment questioned who will make the calculation of the period of patent term extension under § 1.701 and whether that calculation can be challenged and by whom.

*Response:* It is contemplated that the period of patent term extension calculated and any reduction in the extension of patent term will not be made by an examiner. It is noted that the period of patent term extension will be identified in the Notice of Allowance and Issue Fee Due and if applicant disagrees with the period, applicant may request further review by way of a petition under § 1.181. If an error is noted after the patent issues, patentee or any third party may seek correction of the period of patent term extension granted by filing a request for a Certificate of Correction pursuant to § 1.322.

142. *Comment:* One comment questioned whether a challenge to the period of patent term extension calculated by the PTO under § 1.701 would be required to be made within a fixed period.

*Response:* No. However, the longer applicant delays filing a petition under § 1.181 challenging the period of extension calculated by the PTO, the less likely any error will be corrected before the patent is issued with the error printed on the patent. If the patent issues with an incorrect period of extension, applicant should file a request for a Certificate of Correction pursuant to § 1.322 instead of a petition under § 1.181.

143. *Comment:* One comment suggested that § 1.701(d)(2) be amended to require PTO to notify applicant in writing of any intent to reduce the term extension for lack of due diligence,

stating the specific basis, and provide applicant with a reasonable opportunity to respond.

*Response:* The suggestion has not been adopted. The period of patent term extension will be identified in the Notice of Allowance and Issue Fee Due and if applicant disagrees with the period, applicant may request further review by way of a petition under § 1.181.

144. *Comment:* One comment suggested that a cover sheet for use in recording assignments be included in the final rules package as an addendum.

*Response:* The suggestion has not been adopted. A sample cover sheet for use in recording assignments was published as Appendix B in the Federal Register on July 6, 1992, at 57 FR 29634 and in the Official Gazette on July 28, 1992, at 1140 Off. Gaz. Pat. Office 63 and may be obtained from Assignment Branch.

#### Other Considerations

This final rule change is in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 et seq., Executive Order 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. This final rule has been determined not to be significant for the purposes of E.O. 12866.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these final rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these changes is to provide a procedure for domestic applicants to quickly and inexpensively file a provisional application. The filing date of the provisional application will not be used to measure the term of a patent granted on an application which claims the earlier filing date of the provisional application.

The Patent and Trademark Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in E.O. 12612.

These final rules contain collections of information subject to the requirements of the Paperwork Reduction Act (Act). The provisional application has been approved by the Office of Management and Budget under control numbers 0651-0031 and 0651-0032. The cover sheet is approved under OMB control number 0651-0037. The cover sheet is necessary to expedite the processing of a provisional application and improve quality. Public reporting burden for the collection of information on the cover sheet is estimated to average 12 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden to the Office of Assistance Quality and Enhancement Division, Patent and Trademark Office, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503 (ATTN: Paperwork Reduction Act Projects 0651-0031, 0651-0032, and 0651-0037).

#### List of Subjects

##### 37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of Information, Inventions and patents, Reporting and record keeping requirements, Small businesses.

##### 37 CFR Part 3

Administrative practice and procedure, Inventions and patents, Reporting and record keeping requirements.

For the reasons set forth in the preamble, 37 CFR Parts 1 and 3 are amended as follows:

#### PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6 unless otherwise noted.

2. Section 1.1 is amended by adding new paragraph (i) to read as follows:

§ 1.1 All communications to be addressed to Commissioner of Patents and Trademarks.

\*\*\*\*\*

(i) The filing of all provisional applications and any communications relating thereto should be additionally marked "Box Provisional Patent Application."

\*\*\*\*\*

3. Section 1.9 is amended by revising paragraph (a) to read as follows:

#### § 1.9 Definitions.

(a)(1) A national application as used in this chapter means a U.S. application for patent which was either filed in the Office under 35 U.S.C. 111, or which entered the national stage from an international application after compliance with 35 U.S.C. 371.

(2) A provisional application as used in this chapter means a U.S. national application for patent filed in the Office under 35 U.S.C. 111(b).

(3) A nonprovisional application as used in this chapter means a U.S. national application for patent which was either filed in the Office under 35 U.S.C. 111(a), or which entered the national stage from an international application after compliance with 35 U.S.C. 371.

\*\*\*\*\*

4. Section 1.12 is amended by revising paragraph (c) to read as follows:

#### § 1.12 Assignment records open to public inspection.

\*\*\*\*\*

(c) Any request by a member of the public seeking copies of any assignment records of any pending or abandoned patent application preserved in secrecy under § 1.14, or any information with respect thereto, must

(1) Be in the form of a petition accompanied by the petition fee set forth in § 1.17(i), or

(2) Include written authority granting access to the member of the public to the particular assignment records from the applicant or applicant's assignee or attorney or agent of record.

\*\*\*\*\*

5. Section 1.14 is amended by revising paragraph (e) to read as follows:

#### § 1.14 Patent applications preserved in secrecy.

\*\*\*\*\*

(e) Any request by a member of the public seeking access to, or copies of, any pending or abandoned application preserved in secrecy pursuant to paragraphs (a) and (b) of this section, or any papers relating thereto, must

(1) Be in the form of a petition and be accompanied by the petition fee set forth in § 1.17(i), or

(2) Include written authority granting access to the member of the public in that particular application from the applicant or the applicant's assignee or attorney or agent of record.

\*\*\*\*\*

6. Section 1.16 is amended by revising paragraphs (a)-(g) and by adding new paragraphs (k) and (l) to read as follows:

#### § 1.16 National application filing fees.

(a) Basic fee for filing each application for an original patent, except provisional, design or plant applications:

By a small entity (§ 1.9(f)) .....\$365.00  
By other than a small entity .....730.00

(b) In addition to the basic filing fee in an original application, except provisional applications, for filing or later presentation of each independent claim in excess of 3:

By a small entity (§ 1.9(f)) .....38.00  
By other than a small entity .....76.00

(c) In addition to the basic filing fee in an original application, except provisional applications, for filing or later presentation of each claim (whether independent or dependent) in excess of 20 (Note that § 1.75(c) indicates how multiple dependent claims are considered for fee calculation purposes.):

By a small entity (§ 1.9(f)) .....11.00  
By other than a small entity .....22.00

(d) In addition to the basic filing fee in an original application, except provisional applications, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:

By a small entity (§ 1.9(f)) .....120.00  
By other than a small entity .....240.00

(If the additional fees required by paragraphs (b), (c), and (d) of this section are not paid on filing or on later presentation of the claims for which the additional fees are due, they must be paid or the claims canceled by amendment, prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

(e) Surcharge for filing the basic filing fee or oath or declaration on a date later than the filing date of the application, except provisional applications:

By a small entity (§ 1.9(f)) .....65.00  
By other than a small entity .....130.00

(f) Basic fee for filing each design application:

By a small entity (§ 1.9(f)) .....150.00  
By other than a small entity .....300.00

(g) Basic fee for filing each plant application, except provisional applications:

By a small entity (§ 1.9(f)) .....245.00  
By other than a small entity .....490.00

\*\*\*\*\*

(k) Basic fee for filing each provisional application:

By a small entity (§ 1.9(f)) .....75.00  
By other than a small entity .....150.00

(l) Surcharge for filing the basic filing fee or cover sheet (§ 1.51(a)(2)(i)) on a date later than the filing date of the provisional application:

By a small entity (§ 1.9(f)) .....25.00  
By other than a small entity .....50.00

\*\*\*\*\*

7. Section 1.17 is amended by revising paragraphs (h) and (i), and by adding new paragraphs (q), (r) and (s) to read as



follows:

**§ 1.17 Patent application processing fees.**

\*\*\*\*\*

(h) For filing a petition to the Commissioner under a section listed below which refers to this paragraph.....130.00

§ 1.47 - for filing by other than all the inventors or a person not the inventor

§ 1.48 - for correction of inventorship, except in provisional applications

§ 1.84 - for accepting color drawings or photographs

§ 1.182 - for decision on questions not specifically provided for

§ 1.183 - to suspend the rules

§ 1.295 - for review of refusal to publish a statutory invention registration

§ 1.377 - for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent

§ 1.378(e) - for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in expired patent

§ 1.644(e) - for petition in an interference

§ 1.644(f) - for request for reconsideration of a decision on petition in an interference

§ 1.666(c) - for late filing of interference settlement agreement

§§ 5.12, 5.13 and 5.14 - for expedited handling of a foreign filing license

§ 5.15 - for changing the scope of a license

§ 5.25 - for retroactive license

(i) For filing a petition to the Commissioner under a section listed below which refers to this paragraph.....130.00

§ 1.12 - for access to an assignment record

§ 1.14 - for access to an application

§ 1.53 - to accord a filing date, except in provisional applications

§ 1.55 - for entry of late priority papers

§ 1.60 - to accord a filing date

§ 1.62 - to accord a filing date

§ 1.97(d) - to consider an information disclosure statement

§ 1.102 - to make application special

§ 1.103 - to suspend action in application

§ 1.177 - for divisional reissues to issue separately

§ 1.312 - for amendment after payment of issue fee

§ 1.313 - to withdraw an application from issue

§ 1.314 - to defer issuance of a patent

§ 1.666(b) - for access to interference settlement agreement

§ 3.81 - for patent to issue to assignee, assignment submitted after payment of the issue fee

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(q) For filing a petition to the Commissioner under a section listed below which refers to this paragraph.....50.00

§ 1.48 - for correction of inventorship in a provisional application

§ 1.53 - to accord a provisional application a filing date or to convert an application filed under § 1.53(b)(1) to a provisional application

(r) For entry of a submission after final rejection under § 1.129(a):

By a small entity (§ 1.9(f)) .....365.00

By other than a small entity .....730.00

(s) For each additional invention requested to be examined under § 1.129(b):

By a small entity (§ 1.9(f)) .....365.00

By other than a small entity .....730.00

8. Section 1.21 is amended by revising paragraph (l) to read as follows:

**§ 1.21 Miscellaneous fees and charges.**

The Patent and Trademark Office has established the following fees for the services indicated:

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(l) For processing and retaining any application abandoned pursuant to § 1.53(d)(1) unless the required basic filing fee has been paid .....\$130.00

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9. Section 1.28 is amended by revising paragraph (a) to read as follows:

**§ 1.28 Effect on fees of failure to establish status, or change status, as a small entity.**

(a) The failure to establish status as a small entity (§§ 1.9(f) and 1.27 of this part) in any application or patent prior to paying, or at the time of paying, any fee precludes payment of the fee in the amount established for small entities. A refund pursuant to § 1.26 of this part, based on establishment of small entity status, of a portion of fees timely paid in full prior to establishing status as a small entity may only be obtained if a verified statement under § 1.27 and a request for a refund of the excess amount are filed within two months of the date of the timely payment of the full fee. The two-month time period is not extendable under § 1.136. Status as a small entity is waived for any fee by the failure to establish the status prior to paying, at the time of paying, or within two months of the date of payment of, the fee. Status as a small entity must be specifically established in each application or patent in which the status is available and desired. Status as a small entity in one application or patent does not affect any other application or patent, including applications or patents which are directly or indirectly dependent upon the application or patent in which the status has been established. A nonprovisional application claiming benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) of a prior application may rely on a verified statement filed in the prior application if the nonprovisional application includes a reference to the verified statement in the prior application or includes a copy of the verified statement in the prior application and status as a small entity is still proper and desired. Once status as a small entity has been established in an application or patent, the status remains in that application or patent without the filing of a further verified statement pursuant to § 1.27 of this part unless the Office is notified of a change in status.

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10. Section 1.45 paragraph (c) is revised to read as follows:

**§ 1.45 Joint inventors.**

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(c) If multiple inventors are named in a nonprovisional application, each named inventor must have made a contribution, individually or jointly, to the subject matter of at least one claim of the application and the application will be considered to be a joint application under 35 U.S.C. 116. If multiple inventors are named in a provisional application, each named inventor must have made a contribution, individually or jointly, to the subject matter disclosed in the provisional application and the provisional application will be considered to be a joint application under 35 U.S.C. 116.

11. Section 1.48 is revised to read as follows:

**§ 1.48 Correction of inventorship.**

(a) If the correct inventor or inventors are not named in a nonprovisional application through error without any deceptive intention on the part of the actual inventor or inventors, the

application may be amended to name only the actual inventor or inventors. Such amendment must be diligently made and must be accompanied by:

(1) a petition including a statement of facts verified by the original named inventor or inventors establishing when the error without deceptive intention was discovered and how it occurred;

(2) an oath or declaration by each actual inventor or inventors as required by § 1.63;

(3) the fee set forth in § 1.17(h); and

(4) the written consent of any assignee. When the application is involved in an interference, the petition shall comply with the requirements of this section and shall be accompanied by a motion under § 1.634.

(b) If the correct inventors are named in the nonprovisional application when filed and the prosecution of the application results in the amendment or cancellation of claims so that less than all of the originally named inventors are the actual inventors of the invention being claimed in the application, an amendment shall be filed deleting the names of the person or persons who are not inventors of the invention being claimed. The amendment must be diligently made and shall be accompanied by:

(1) A petition including a statement identifying each named inventor who is being deleted and acknowledging that the inventor's invention is no longer being claimed in the application; and

(2) The fee set forth in § 1.17(h).

(c) If a nonprovisional application discloses unclaimed subject matter by an inventor or inventors not named in the application, the application may be amended pursuant to paragraph (a) of this section to add claims to the subject matter and name the correct inventors for the application.

(d) If the name or names of an inventor or inventors were omitted in a provisional application through error without any deceptive intention on the part of the actual inventor or inventors, the provisional application may be amended to add the name or names of the actual inventor or inventors. Such amendment must be accompanied by:

(1) a petition including a statement that the error occurred without deceptive intention on the part of the actual inventor or inventors, which statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office; and

(2) the fee set forth in § 1.17(q).

(e) If a person or persons were named as an inventor or inventors in a provisional application through error without any deceptive intention, an amendment may be filed in the provisional application deleting the name or names of the person or persons who were erroneously named. Such amendment must be accompanied by:

(1) a petition including a statement of facts verified by the person or persons whose name or names are being deleted establishing that the error occurred without deceptive intention;

(2) the fee set forth in § 1.17(q); and

(3) the written consent of any assignee.

12. Section 1.51 is amended by revising paragraphs (a) and (b) to read as follows:

**§ 1.51 General requisites of an application.**

(a) Applications for patents must be made to the Commissioner of Patents and Trademarks.

(1) A complete application filed under § 1.53(b)(1) comprises:

(i) A specification, including a claim or claims, see §§ 1.71 to 1.77;

(ii) An oath or declaration, see §§ 1.63 and 1.68;

(iii) Drawings, when necessary, see §§ 1.81 to 1.85; and

(iv) The prescribed filing fee, see § 1.16.

(2) A complete provisional application filed under § 1.53(b)(2) comprises:

(i) A cover sheet identifying:

(A) The application as a provisional application,

(B) The name or names of the inventor or inventors, (see § 1.41),

(C) The residence of each named inventor,

(D) The title of the invention,  
(E) The name and registration number of the attorney or agent (if applicable),

(F) The docket number used by the person filing the application to identify the application (if applicable),

(G) The correspondence address, and

(I) The name of the U.S. Government agency and Government contract number (if the invention was made by an agency of the U.S. Government or under a contract with an agency of the U.S. Government);

(ii) A specification as prescribed by 35 U.S.C. 112, first paragraph, see § 1.71;

(iii) Drawings, when necessary, see §§ 1.81 to 1.85; and

(iv) The prescribed filing fee, see § 1.16.

(b) Applicants are encouraged to file an information disclosure statement in nonprovisional applications. See §§ 1.97 and 1.98. No information disclosure statement may be filed in a provisional application.

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13. Section 1.53 paragraphs (a)-(e) are revised to read as follows:

**§ 1.53 Application number, filing date, and completion of application.**

(a) Any application for a patent received in the Patent and Trademark Office will be assigned an application number for identification purposes.

(b)(1) The filing date of an application for patent filed under this section, except for a provisional application, is the date on which: a specification containing a description pursuant to § 1.71 and at least one claim pursuant to § 1.75; and any drawing required by § 1.81(a), are filed in the Patent and Trademark Office in the name of the actual inventor or inventors as required by § 1.41. No new matter may be introduced into an application after its filing date (§ 1.118). If all the names of the actual inventor or inventors are not supplied when the specification and any required drawing are filed, the application will not be given a filing date earlier than the date upon which the names are supplied unless a petition with the fee set forth in § 1.17(i) is filed which sets forth the reasons the delay in supplying the names should be excused. A continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 or 121 and § 1.78(a)) may be filed under this section, § 1.60 or § 1.62. A continuation-in-part application may be filed under this section or § 1.62.

(2) The filing date of a provisional application is the date on which: a specification as prescribed by 35 U.S.C. 112, first paragraph; and any drawing required by § 1.81(a), are filed in the Patent and Trademark Office in the name of the actual inventor or inventors as required by § 1.41. No amendment, other than to make the provisional application comply with all applicable regulations, may be made to the provisional application after the filing date of the provisional application. If all the names of the actual inventor or inventors are not supplied when the specification and any required drawing are filed, the provisional application will not be given a filing date earlier than the date upon which the names are supplied unless a petition with the fee set forth in § 1.17(q) is filed which sets forth the reasons the delay in supplying the names should be excused.

(i) A provisional application must also include a cover sheet identifying the application as a provisional application. Otherwise, the application will be treated as an application filed under § 1.53(b)(1).

(ii) An application for patent filed under § 1.53(b)(1) may be treated as a provisional application and be accorded the original filing date provided that a petition requesting the conversion, with the fee set forth in § 1.17(q), is filed prior to the earlier of the abandonment of the § 1.53(b)(1) application, the payment of the issue fee, the expiration of 12 months after the filing date of the § 1.53(b)(1) application, or the filing of a request for a statutory invention registration under § 1.293. The grant of any such petition will not entitle applicant to a refund of the fees which were properly paid in the application filed under § 1.53(b)(1).



(iii) A provisional application shall not be entitled to the right of priority under § 1.55 or 35 U.S.C. 119 or 365(a) or to the benefit of an earlier filing date under § 1.78 or 35 U.S.C. 120, 121 or 365(c) of any other application. No claim for priority under § 1.78(a)(3) may be made in a design application based on a provisional application. No request under § 1.293 for a statutory invention registration may be filed in a provisional application. The requirements of §§ 1.821-1.825 regarding application disclosures containing nucleotide and/or amino acid sequences are not mandatory for provisional applications.

(c) If any application is filed without the specification, drawing or name, or names, of the actual inventor or inventors required by paragraph (b)(1) or (b)(2) of this section, applicant will be so notified and given a time period within which to submit the omitted specification, drawing, name, or names, of the actual inventor, or inventors, in order to obtain a filing date as of the date of filing of such submission. A copy of the "Notice of Incomplete Application" form notifying the applicant should accompany any response thereto submitted to the Office. If the omission is not corrected within the time period set, the application will be returned or otherwise disposed of; the fee, if submitted, will be refunded less the handling fee set forth in § 1.21(n). Any request for review of a refusal to accord an application a filing date must be by way of a petition accompanied by the fee set forth in § 1.17(i), if the application was filed under § 1.53(b)(1), or by the fee set forth in § 1.17(q), if the application was filed under § 1.53(b)(2).

(d)(1) If an application which has been accorded a filing date pursuant to paragraph (b)(1) of this section does not include the appropriate filing fee or an oath or declaration by the applicant, applicant will be so notified, if a correspondence address has been provided and given a period of time within which to file the fee, oath, or declaration and to pay the surcharge as set forth in § 1.16(e) in order to prevent abandonment of the application. A copy of the "Notice to File Missing Parts" form mailed to applicant should accompany any response thereto submitted to the Office. If the required filing fee is not timely paid, or if the processing and retention fee set forth in § 1.21(l) is not paid within one year of the date of mailing of the notification required by this paragraph, the application will be disposed of. No copies will be provided or certified by the Office of an application which has been disposed of or in which neither the required basic filing fee nor the processing and retention fee has been paid. The notification pursuant to this paragraph may be made simultaneously with any notification pursuant to paragraph (c) of this section. If no correspondence address is included in the application, applicant has two months from the filing date to file the basic filing fee, oath or declaration and to pay the surcharge as set forth in § 1.16(e) in order to prevent abandonment of the application; or, if no basic filing fee has been paid, one year from the filing date to pay the processing and retention fee set forth in § 1.21(l) to prevent disposal of the application.

(2) If a provisional application which has been accorded a filing date pursuant to paragraph (b)(2) of this section does not include the appropriate filing fee or the cover sheet required by § 1.51(a)(2), applicant will be so notified if a correspondence address has been provided and given a period of time within which to file the fee, cover sheet and to pay the surcharge as set forth in § 1.16(l) in order to prevent abandonment of the application. A copy of the "Notice to File Missing Parts" form mailed to applicant should accompany any response thereto submitted to the Office. If the required filing fee is not timely paid, the application will be disposed of. No copies will be provided or certified by the Office of an application which has been disposed of or in which the required basic filing fee has not been paid. The notification pursuant to this paragraph may be made simultaneously with any notification pursuant to paragraph (c) of this section. If no correspondence address is included in the application, applicant has two months from the filing date to file the basic filing fee, cover sheet and to pay the surcharge as set forth in § 1.16(l) in order to prevent abandonment of the application.

(e)(1) An application for a patent filed under paragraph (b)(1) of this section will not be placed upon the files for examination until all its required parts, complying with the rules relating thereto, are received, except that certain minor informalities may be waived subject to subsequent correction whenever required.

(2) A provisional application for a patent filed under paragraph (b)(2) of this section will not be placed upon the files for examination and will become abandoned no later than twelve months after its filing date pursuant to 35 U.S.C. 111(b)(1).

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14. Section 1.55 is revised to read as follows:

#### § 1.55 Claim for foreign priority.

(a) An applicant in a nonprovisional application may claim the benefit of the filing date of one or more prior foreign applications under the conditions specified in 35 U.S.C. 119(a)-(d) and 172. The claim to priority need be in no special form and may be made by the attorney or agent if the foreign application is referred to in the oath or declaration as required by § 1.63. The claim for priority and the certified copy of the foreign application specified in 35 U.S.C. 119(b) must be filed in the case of an interference (§ 1.630), when necessary to overcome the date of a reference relied upon by the examiner, when specifically required by the examiner, and in all other cases, before the patent is granted. If the claim for priority or the certified copy of the foreign application is filed after the date the issue fee is paid, it must be accompanied by a petition requesting entry and by the fee set forth in § 1.17(i). If the certified copy filed is not in the English language, a translation need not be filed except in the case of interference; or when necessary to overcome the date of a reference relied upon by the examiner; or when specifically required by the examiner, in which event an English language translation must be filed together with a statement that the translation of the certified copy is accurate. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

(b) An applicant in a nonprovisional application may under certain circumstances claim priority on the basis of one or more applications for an inventor's certificate in a country granting both inventor's certificates and patents. To claim the right of priority on the basis of an application for an inventor's certificate in such a country under 35 U.S.C. 119(d), the applicant when submitting a claim for such right as specified in paragraph (a) of this section, shall include an affidavit or declaration. The affidavit or declaration must include a specific statement that, upon an investigation, he or she is satisfied that to the best of his or her knowledge, the applicant, when filing the application for the inventor's certificate, had the option to file an application for either a patent or an inventor's certificate as to the subject matter of the identified claim or claims forming the basis for the claim of priority.

15. Section 1.59 is revised to read as follows:

#### § 1.59 Papers of application with filing date not to be returned.

Papers in an application which has received a filing date pursuant to § 1.53 will not be returned for any purpose whatever. If applicants have not preserved copies of the papers, the Office will furnish copies at the usual cost of any application in which either the required basic filing fee (§ 1.16) or, if the application was filed under § 1.53(b)(1), the processing and retention fee (§ 1.21(l)) has been paid. See § 1.618 for return of unauthorized and improper papers in interferences.

16. Section 1.60 is amended by revising paragraph (b) to read as follows:

#### § 1.60 Continuation or divisional application for invention disclosed in a prior nonprovisional application.

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(b) An applicant may omit signing of the oath or declaration in a continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 or 121 and § 1.78(a)) if:

(1) the prior application was a nonprovisional application and a complete application as set forth in § 1.51(a)(1);

(2) applicant indicates that the application is being filed pursuant to this section and files a true copy of the prior complete application as filed including the specification (with claims), drawings, oath or declaration showing the signature or an indication it was signed, and any amendments referred to in the oath or declaration filed to complete the prior application;

(3) the inventors named in the continuation or divisional application are the same or less than all the inventors named in the prior application; and

(4) the application is filed before the patenting, or abandonment of, or termination of proceedings on the prior application. The copy of the prior application must be accompanied by a statement that the application papers filed are a true copy of the prior complete application. Such statement must be by the applicant or applicant's attorney or agent and must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. Only amendments reducing the number of claims or adding a reference to the prior application (§ 1.78(a)) will be entered before calculating the filing fee and granting the filing date. If the continuation or divisional application is filed by less than all the inventors named in the prior application, a statement must accompany the application when filed requesting deletion of the names of the person or persons who are not inventors of the invention being claimed in the continuation or divisional application. Except as provided in paragraph (d) of this section, if a true copy of the prior application as filed is not filed with the application or if the statement that the application papers are a true copy is omitted, the application will not be given a filing date earlier than the date upon which the copy and statement are filed, unless a petition with the fee set forth in § 1.17(i) is filed which satisfactorily explains the delay in filing these items.

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17. Section 1.62 is amended by revising paragraphs (a) and (e) to read as follows:

#### § 1.62 File wrapper continuing procedure.

(a) A continuation, continuation-in-part, or divisional application, which uses the specification, drawings and oath or declaration from a prior nonprovisional application which is complete as defined by § 1.51(a)(1), and which is to be abandoned, may be filed under this section before the payment of the issue fee, abandonment of, or termination of proceedings on the prior application, or after payment of the issue fee if a petition under § 1.313(b)(5) is granted in the prior application. The filing date of an application filed under this section is the date on which a request is filed for an application under this section including identification of the application number and the names of the inventors named in the prior complete application. If the continuation, continuation-in-part, or divisional application is filed by less than all the inventors named in the prior application a statement must accompany the application when filed requesting deletion of the names of the person or persons who are not inventors of the invention being claimed in the continuation, continuation-in-part, or divisional application.

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(e) An application filed under this section will utilize the file wrapper and contents of the prior application to constitute the new continuation, continuation-in-part, or divisional application but will be assigned a new application number. Changes to the prior application must be made in the form of an amendment to the prior application as it exists at the time of filing the application under this section. No copy of the prior application or new specification is required. The filing of such a copy or specification will be considered improper, and a filing date as of the date of deposit of the request for an application under this section will not be granted to the application unless a petition with the fee set forth in § 1.17(i) is filed with instructions to cancel the copy or specification.

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18. Section 1.63 is amended by revising paragraph (a) to read as follows:

#### § 1.63 Oath or declaration.

(a) An oath or declaration filed under § 1.51(a)(1)(ii) as a part of a nonprovisional application must:

- (1) Be executed in accordance with either § 1.66 or § 1.68;
- (2) Identify the specification to which it is directed;
- (3) Identify each inventor and the residence and country of citizenship of each inventor; and
- (4) State whether the inventor is a sole or joint inventor of the invention claimed.

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19. Section 1.67 is amended by revising paragraph (b) to read as follows:

#### § 1.67 Supplemental oath or declaration.

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(b) A supplemental oath or declaration meeting the requirements of § 1.63 must be filed when a claim is presented for matter originally shown or described but not substantially embraced in the statement of invention or claims originally presented or when an oath or declaration submitted in accordance with § 1.53(d)(1) after the filing of the specification and any required drawings specifically and improperly refers to an amendment which includes new matter. No new matter may be introduced into a nonprovisional application after its filing date even if a supplemental oath or declaration is filed. In proper cases, the oath or declaration here required may be made on information and belief by an applicant other than inventor.

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20. Section 1.78 is amended by revising paragraphs (a)(1) and (a)(2) and by adding new paragraphs (a)(3) and (a)(4) to read as follows:

#### § 1.78 Claiming benefit of earlier filing date and cross-references to other applications.

(a)(1) A nonprovisional application may claim an invention disclosed in one or more prior filed copending nonprovisional applications or international applications designating the United States of America. In order for a nonprovisional application to claim the benefit of a prior filed copending nonprovisional application or international application designating the United States of America, each prior application must name as an inventor at least one inventor named in the later filed nonprovisional application and disclose the named inventor's invention claimed in at least one claim of the later filed nonprovisional application in the manner provided by the first paragraph of 35 U.S.C. 112. In addition, each prior application must be:

- (i) complete as set forth in § 1.51(a)(1); or
- (ii) entitled to a filing date as set forth in § 1.53(b)(1), § 1.60 or § 1.62 and include the basic filing fee set forth in § 1.16; or
- (iii) entitled to a filing date as set forth in § 1.53(b)(1) and have paid therein the processing and retention fee set forth in § 1.21(l) within the time period set forth in § 1.53(d)(1).

(2) Any nonprovisional application claiming the benefit of one or more prior filed copending nonprovisional applications or international applications designating the United States of America must contain or be amended to contain in the first sentence of the specification following the title a reference to each such prior application, identifying it by application number (consisting of the series code and serial number) or international application number and international filing date and indicating the relationship of the applications. Cross-references to other related applications may be made when appropriate. (See § 1.14(b)).

(3) A nonprovisional application other than for a design patent may claim an invention disclosed in one or more prior filed copending provisional applications. Since a provisional



application can be pending for no more than twelve months, the last day of pendency may occur on a Saturday, Sunday, or Federal holiday within the District of Columbia which for copendency would require the nonprovisional application to be filed prior to the Saturday, Sunday, or Federal holiday. In order for a nonprovisional application to claim the benefit of one or more prior filed copending provisional applications, each prior provisional application must name as an inventor at least one inventor named in the later filed nonprovisional application and disclose the named inventor's invention claimed in at least one claim of the later filed nonprovisional application in the manner provided by the first paragraph of 35 U.S.C. 112. In addition, each prior provisional application must be:

(i) complete as set forth in § 1.51(a)(2); or  
(ii) entitled to a filing date as set forth in § 1.53(b)(2) and include the basic filing fee set forth in § 1.16(k).

(4) Any nonprovisional application claiming the benefit of one or more prior filed copending provisional applications must contain or be amended to contain in the first sentence of the specification following the title a reference to each such prior provisional application, identifying it as a provisional application, and including the provisional application number (consisting of series code and serial number).

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21. Section 1.83 is amended by revising paragraphs (a) and (c) to read as follows:

#### § 1.83 Content of drawing.

(a) The drawing in a nonprovisional application must show every feature of the invention specified in the claims. However, conventional features disclosed in the description and claims, where their detailed illustration is not essential for a proper understanding of the invention, should be illustrated in the drawing in the form of a graphical drawing symbol or a labeled representation (e.g., a labeled rectangular box).

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(c) Where the drawings in a nonprovisional application do not comply with the requirements of paragraphs (a) and (b) of this section, the examiner shall require such additional illustration within a time period of not less than two months from the date of the sending of a notice thereof. Such corrections are subject to the requirements of § 1.81(d).

22. Section 1.97 is amended by revising paragraph (d) to read as follows:

#### § 1.97 Filing of information disclosure statement.

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(d) An information disclosure statement shall be considered by the Office if filed after the mailing date of either a final action under § 1.113 or a notice of allowance under § 1.311, whichever occurs first, but before payment of the issue fee, provided the statement is accompanied by:

(1) A certification as specified in paragraph (c) of this section;  
(2) A petition requesting consideration of the information disclosure statement; and  
(3) The petition fee set forth in § 1.17(i).

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23. Section 1.101 is amended by revising paragraph (a) to read as follows:

#### § 1.101 Order of examination.

(a) Nonprovisional applications filed in the Patent and Trademark Office and accepted as complete applications are assigned for examination to the respective examining groups having the classes of inventions to which the applications relate. Nonprovisional applications shall be taken up for examination by the

examiner to whom they have been assigned in the order in which they have been filed except for those applications in which examination has been advanced pursuant to § 1.102. See § 1.496 for order of examination of international applications in the national stage.

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24. Section 1.102 is amended by revising paragraph (d) to read as follows:

#### § 1.102 Advancement of examination.

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(d) A petition to make an application special on grounds other than those referred to in paragraph (c) of this section must be accompanied by the petition fee set forth in § 1.17(i).

25. Section 1.103 is amended by revising paragraph (a) to read as follows:

#### § 1.103 Suspension of action.

(a) Suspension of action by the Office will be granted for good and sufficient cause and for a reasonable time specified upon petition by the applicant and, if such cause is not the fault of the Office, the payment of the fee set forth in § 1.17(i). Action will not be suspended when a response by the applicant to an Office action is required.

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26. A new, undesignated center heading and new section 1.129 are added to Subpart B - National Processing Provisions to read as follows:

#### Transitional Provisions

#### § 1.129 Transitional procedures for limited examination after final rejection and restriction practice.

(a) An applicant in an application, other than for reissue or a design patent, that has been pending for at least two years as of June 8, 1995, taking into account any reference made in such application to any earlier filed application under 35 U.S.C. 120, 121 and 365(c), is entitled to have a first submission entered and considered on the merits after final rejection under the following circumstances: The Office will consider such a submission, if the first submission and the fee set forth in § 1.17(r) are filed prior to the filing of an appeal brief and prior to abandonment of the application. The finality of the final rejection is automatically withdrawn upon the timely filing of the submission and payment of the fee set forth in § 1.17(r). If a subsequent final rejection is made in the application, applicant is entitled to have a second submission entered and considered on the merits after the subsequent final rejection under the following circumstances: The Office will consider such a submission, if the second submission and a second fee set forth in § 1.17(r) are filed prior to the filing of an appeal brief and prior to abandonment of the application. The finality of the subsequent final rejection is automatically withdrawn upon the timely filing of the submission and payment of the second fee set forth in § 1.17(r). Any submission filed after a final rejection made in an application subsequent to the fee set forth in § 1.17(r) having been twice paid will be treated as set forth in § 1.116. A submission as used in this paragraph includes, but is not limited to, an information disclosure statement, an amendment to the written description, claims or drawings and a new substantive argument or new evidence in support of patentability.

(b)(1) In an application, other than for reissue or a design patent, that has been pending for at least three years as of June 8, 1995, taking into account any reference made in the application to any earlier filed application under 35 U.S.C. 120, 121 and 365(c), no requirement for restriction or for the filing of divisional applications shall be made or maintained in the application after June 8, 1995, except where:

(i) the requirement was first made in the application or any earlier filed application under 35 U.S.C. 120, 121 and 365(c) prior to April 8, 1995;

(ii) the examiner has not made a requirement for restriction in the present or parent application prior to April 8, 1995, due to actions by the applicant; or

(iii) the required fee for examination of each additional invention was not paid.

(2) If the application contains more than one independent and distinct invention and a requirement for restriction or for the filing of divisional applications cannot be made or maintained pursuant to this paragraph, applicant will be so notified and given a time period to:

(i) elect the invention or inventions to be searched and examined, if no election has been made prior to the notice, and pay the fee set forth in § 1.17(s) for each independent and distinct invention claimed in the application in excess of one which applicant elects;

(ii) confirm an election made prior to the notice and pay the fee set forth in § 1.17(s) for each independent and distinct invention claimed in the application in addition to the one invention which applicant previously elected; or

(iii) file a petition under this section traversing the requirement. If the required petition is filed in a timely manner, the original time period for electing and paying the fee set forth in § 1.17(s) will be deferred and any decision on the petition affirming or modifying the requirement will set a new time period to elect the invention or inventions to be searched and examined and to pay the fee set forth in § 1.17(s) for each independent and distinct invention claimed in the application in excess of one which applicant elects.

(3) The additional inventions for which the required fee has not been paid will be withdrawn from consideration under § 1.142(b). An applicant who desires examination of an invention so withdrawn from consideration can file a divisional application under 35 U.S.C. 121.

(c) The provisions of this section shall not be applicable to any application filed after June 8, 1995.

27. Section 1.137 is amended by revising paragraph (c) to read as follows:

#### § 1.137 Revival of abandoned application.

\*\*\*\*\*

(c) In all applications filed before June 8, 1995, and in all design applications filed on or after June 8, 1995, any petition pursuant to paragraph (a) of this section not filed within six months of the date of abandonment of the application, must be accompanied by a terminal disclaimer with fee under § 1.321 dedicating to the public a terminal part of the term of any patent granted thereon equivalent to the period of abandonment of the application. The terminal disclaimer must also apply to any patent granted on any continuing application entitled under 35 U.S.C. 120 to the benefit of the filing date of the application for which revival is sought.

\*\*\*\*\*

28. Section 1.139 is added to read as follows:

#### § 1.139 Revival of provisional application.

(a) A provisional application which has been accorded a filing date and abandoned for failure to timely respond to an Office requirement may be revived so as to be pending for a period of no longer than twelve months from its filing date if it is shown to the satisfaction of the Commissioner that the delay was unavoidable. Under no circumstances will the provisional application be pending after twelve months from its filing date. A petition to revive an abandoned provisional application must be promptly filed after the applicant is notified of, or otherwise becomes aware of, the abandonment, and must be accompanied by:

(1) the required response unless it has been previously filed;  
(2) the petition fee as set forth in § 1.17(l); and

(3) a showing that the delay was unavoidable. The showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office.

(b) A provisional application which has been accorded a filing date and abandoned for failure to timely respond to an Office requirement may be revived so as to be pending for a period of no longer than twelve months from its filing date if the delay was unintentional. Under no circumstances will the provisional application be pending after twelve months from its filing date. A petition to revive an abandoned provisional application must be:

(1) accompanied by the required response unless it has been previously filed;

(2) accompanied by the petition fee as set forth in § 1.17(m);

(3) accompanied by a statement that the delay was unintentional. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional information where there is a question whether the delay was unintentional; and

(4) filed either:

(i) within one year of the date on which the provisional application became abandoned; or

(ii) within three months of the date of the first decision on a petition to revive under paragraph (a) of this section which was filed within one year of the date on which the provisional application became abandoned.

(c) Any request for reconsideration or review of a decision refusing to revive a provisional application upon petition filed pursuant to paragraphs (a) or (b) of this section, to be considered timely, must be filed within two months of the decision refusing to revive or within such time as set in the decision.

(d) The time periods set forth in this section cannot be extended, except that the three-month period set forth in paragraph (b)(4)(ii) of this section and the time period set forth in paragraph (c) of this section may be extended under the provisions of § 1.136.

29. Section 1.177 is revised to read as follows:

#### § 1.177 Reissue in divisions.

The Commissioner may, in his or her discretion, cause several patents to be issued for distinct and separate parts of the thing patented, upon demand of the applicant, and upon payment of the required fee for each division. Each division of a reissue constitutes the subject of a separate specification descriptive of the part or parts of the invention claimed in such division; and the drawing may represent only such part or parts, subject to the provisions of §§ 1.83 and 1.84. On filing divisional reissue applications, they shall be referred to the Commissioner. Unless otherwise ordered by the Commissioner upon petition and payment of the fee set forth in § 1.17(i), all the divisions of a reissue will issue simultaneously; if there is any controversy as to one division, the others will be withheld from issue until the controversy is ended, unless the Commissioner orders otherwise.

30. Section 1.312 is amended by revising paragraph (b) to read as follows:

#### § 1.312 Amendments after allowance.

\*\*\*\*\*

(b) Any amendment pursuant to paragraph (a) of this section filed after the date the issue fee is paid must be accompanied by a petition including the fee set forth in § 1.17(i) and a showing of good and sufficient reasons why the amendment is necessary and was not earlier presented.

31. Section 1.313 is amended by revising paragraph (a) to read as follows:

#### § 1.313 Withdrawal from issue.

(a) Applications may be withdrawn from issue for further action at the initiative of the Office or upon petition by the



applicant. Any such petition by the applicant must include a showing of good and sufficient reasons why withdrawal of the application is necessary and, if the reason for the withdrawal is not the fault of the Office, must be accompanied by the fee set forth in § 1.17(i). If the application is withdrawn from issue, a new notice of allowance will be sent if the application is again allowed. Any amendment accompanying a petition to withdraw an application from issue must comply with the requirements of § 1.312.

\*\*\*\*\*

32. Section 1.314 is revised to read as follows:

#### § 1.314 Issuance of patent.

If payment of the issue fee is timely made, the patent will issue in regular course unless the application is withdrawn from issue (§ 1.313), or issuance of the patent is deferred. Any petition by the applicant requesting a deferral of the issuance of a patent must be accompanied by the fee set forth in § 1.17(i) and must include a showing of good and sufficient reasons why it is necessary to defer issuance of the patent.

33. Section 1.316 is amended by revising paragraph (d) to read as follows:

#### § 1.316 Application abandoned for failure to pay issue fee.

\*\*\*\*\*

(d) In all applications filed before June 8, 1995, any petition pursuant to paragraph (b) of this section not filed within six months of the date of abandonment of the application, must be accompanied by a terminal disclaimer with fee under § 1.321 dedicating to the public a terminal part of the term of any patent granted thereon equivalent to the period of abandonment of the application. The terminal disclaimer must also apply to any patent granted on any continuing application entitled under 35 U.S.C. 120 to the benefit of the filing date of the application for which revival is sought.

\*\*\*\*\*

34. Section 1.317 is amended by removing and reserving paragraph (d):

#### § 1.317 Lapsed patents; delayed payment of balance of issue fee.

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(d) [Reserved]

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35. Section 1.666 is amended by revising paragraph (b) to read as follows:

#### § 1.666 Filing of interference settlement agreements.

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(b) If any party filing the agreement or understanding under paragraph (a) of this section so requests, the copy will be kept separate from the file of the interference, and made available only to Government agencies on written request, or to any person upon petition accompanied by the fee set forth in § 1.17(i) and on a showing of good cause.

\*\*\*\*\*

36. Section 1.701 is added to Subpart F to read as follows:

#### § 1.701 Extension of patent term due to prosecution delay.

(a) A patent, other than for designs, issued on an application filed on or after June 8, 1995, is entitled to extension of the patent term if the issuance of the patent was delayed due to:

(1) interference proceedings under 35 U.S.C. 135(a); and/or

(2) the application being placed under a secrecy order under 35 U.S.C. 181; and/or

(3) appellate review by the Board of Patent Appeals and Interferences or by a Federal court under 35 U.S.C. 141 or 145, if the patent was issued pursuant to a decision reversing an adverse determination of patentability and if the patent is not subject to a terminal disclaimer due to the issuance of another patent claiming subject matter that is not patentably distinct from that under appellate review.

(b) The term of a patent entitled to extension under paragraph (a) of this section shall be extended for the sum of the periods of delay calculated under paragraphs (c)(1), (c)(2), (c)(3) and (d) of this section, to the extent that these periods are not overlapping, up to a maximum of five years. The extension will run from the expiration date of the patent.

(c)(1) The period of delay under paragraph (a)(1) of this section for an application is the sum of the following periods, to the extent that the periods are not overlapping:

(i) with respect to each interference in which the application was involved, the number of days, if any, in the period beginning on the date the interference was declared or redeclared to involve the application in the interference and ending on the date that the interference was terminated with respect to the application; and

(ii) the number of days, if any, in the period beginning on the date prosecution in the application was suspended by the Patent and Trademark Office due to interference proceedings under 35 U.S.C. 135(a) not involving the application and ending on the date of the termination of the suspension.

(2) The period of delay under paragraph (a)(2) of this section for an application is the sum of the following periods, to the extent that the periods are not overlapping:

(i) the number of days, if any, the application was maintained in a sealed condition under 35 U.S.C. 181;

(ii) the number of days, if any, in the period beginning on the date of mailing of an examiner's answer under § 1.193 in the application under secrecy order and ending on the date the secrecy order and any renewal thereof was removed;

(iii) the number of days, if any, in the period beginning on the date applicant was notified that an interference would be declared but for the secrecy order and ending on the date the secrecy order and any renewal thereof was removed; and

(iv) the number of days, if any, in the period beginning on the date of notification under § 5.3(c) and ending on the date of mailing of the notice of allowance under § 1.311.

(3) The period of delay under paragraph (a)(3) of this section is the sum of the number of days, if any, in the period beginning on the date on which an appeal to the Board of Patent Appeals and Interferences was filed under 35 U.S.C. 134 and ending on the date of a final decision in favor of the applicant by the Board of Patent Appeals and Interferences or by a Federal court in an appeal under 35 U.S.C. 141 or a civil action under 35 U.S.C. 145.

(d) The period of delay set forth in paragraph (c)(3) shall be reduced by:

(1) any time during the period of appellate review that occurred before three years from the filing date of the first national application for patent presented for examination; and

(2) any time during the period of appellate review, as determined by the Commissioner, during which the applicant for patent did not act with due diligence. In determining the due diligence of an applicant, the Commissioner may examine the facts and circumstances of the applicant's actions during the period of appellate review to determine whether the applicant exhibited that degree of timeliness as may reasonably be expected from, and which is ordinarily exercised by, a person during a period of appellate review.

#### Part 3— Assignment, Recording, and Rights of Assignee

37. The authority citation for 37 CFR Part 3 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6.

38. Section 3.21 is revised to read as follows:

#### § 3.21 Identification of patents and patent applications.

An assignment relating to a patent must identify the patent by the patent number. An assignment relating to a national patent application must identify the national patent application by the application number (consisting of the series code and the serial number, e.g., 07/123,456). An assignment relating to an international patent application which designates the United States of America must identify the international application by the international number (e.g., PCT/US90/01234). If an assignment of a patent application filed under § 1.53(b)(1) or § 1.62 is executed concurrently with, or subsequent to, the execution of the patent application, but before the patent application is filed, it must identify the patent application by its date of execution, name of each inventor, and title of the invention so that there can be no mistake as to the patent application intended. If an assignment of a provisional application is executed before the provisional application is filed, it must identify the provisional application by name of each inventor and title of the invention so that there can be no mistake as to the provisional application intended.

39. Section 3.81 is amended by revising paragraph (b) to read as follows:

#### § 3.81 Issue of patent to assignee.

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(b) If the assignment is submitted for recording after the date of payment of the issue fee, but prior to issuance of the patent, the assignee may petition that the patent issue to the

assignee. Any such petition must be accompanied by the fee set forth in § 1.17(i) of this Chapter.

April 17, 1995

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

[1174 OG 15]

#### (80) Revised Sample Cover Sheet For Filing a Provisional Application For a Patent

A sample cover sheet for filing a provisional application for a patent was published as Appendix A to the Notice of Final Rulemaking to implement 20-year patent term and provisional applications in the Federal Register on April 25, 1995 (60 FR 20195) and in the Official Gazette on May 2, 1995 (1174 OG 15). The sample cover sheet for filing a provisional application did not specifically indicate that the provisional application is an application for a patent as provided in 35 U.S.C. 111(b)(1). In order to allay any uncertainty that a provisional application filed under 37 CFR 1.53(b)(2) is indeed an application for a patent, a revised sample cover sheet for filing a provisional application for a patent is included for clarification. However, it is noted that the regulations do not require applicant to use the sample cover sheet. Any cover sheet containing the information required in 37 CFR 1.51(a)(2)(i) will be acceptable.

November 21, 1995

STEPHEN G. KUNIN  
Deputy Assistant Commissioner for  
Patent Policy and Projects



PTO/SB/16 (11-95)

Approved for use through 01/31/98. OMB 0651-0037  
Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE**PROVISIONAL APPLICATION FOR PATENT COVER SHEET**

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53 (b)(2).

Docket Number		Type a plus sign (+) inside this box →	
INVENTOR(s)/APPLICANT(s)			
LAST NAME	FIRST NAME	MIDDLE INITIAL	RESIDENCE (CITY AND EITHER STATE OR FOREIGN COUNTRY)
TITLE OF THE INVENTION (250 characters max)			
CORRESPONDENCE ADDRESS			
STATE	ZIP CODE	COUNTRY	
ENCLOSED APPLICATION PARTS (check all that apply)			
<input type="checkbox"/> Specification	Number of Pages	<input type="checkbox"/> Small Entity Statement	
<input type="checkbox"/> Drawing(s)	Number of Sheets	<input type="checkbox"/> Other (specify)	
METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT (check one)			
<input type="checkbox"/> A check or money order is enclosed to cover the filing fees			FILING FEE AMOUNT (\$)
<input type="checkbox"/> The Commissioner is hereby authorized to charge filing fees and credit Deposit Account Number:			

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☐ No.☐ Yes, the name of the U.S. Government agency and the Government contract number are: \_\_\_\_\_

Respectfully submitted,

SIGNATURE \_\_\_\_\_

Date  /  / 

TYPED or PRINTED NAME \_\_\_\_\_

REGISTRATION NO.  
(if appropriate)☐ Additional inventors are being named on separately numbered sheets attached hereto**USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT**

Burden Hour Statement: This form is estimated to take 2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Box Provisional Application, Assistant Commissioner for Patents, Washington, DC 20231.

**(81) Provisional Applications for Patent Meet Paris Convention Requirements as Foreign Priority Documents**

In view of the recent question raised in the patent community regarding the adequacy of provisional patent applications filed under 35 USC 111(b) to serve as the basis for the right of priority provided by Article 4 of the Paris Convention for the Protection of Industrial Property, Commissioner Lehman decided to seek the advice of the World Intellectual Property Organization on that issue. Below is the resulting exchange of correspondence that should lay to rest any doubt that provisional patent applications are indeed sufficient for this purpose.





UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office  
ASSISTANT SECRETARY AND COMMISSIONER  
OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

NOV 17 1995

Dr. Arpad Bogisch  
Director General  
World Intellectual Property Organization  
1211 Geneva 20  
Switzerland

Dear Arpad,

Recently, a question arose regarding the adequacy of a provisional patent application, filed in accordance with section 111(b) of title 35, United State Code, to serve as the basis for the right of priority provided by Article 4 of the Paris Convention for the Protection of Industrial Property.

Although we are convinced that such an application is indeed sufficient for this purpose, we would be very interested in your opinion on this subject and request a reply at your earliest convenience.

Sincerely,

Bruce A. Lehman  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

WORLD INTELLECTUAL PROPERTY  
ORGANIZATION

世界知识产权组织

ORGANIZACION MUNDIAL  
DE LA PROPIEDAD INTELECTUAL



ORGANISATION MONDIALE  
DE LA PROPRIÉTÉ INTELLECTUELLE

النظمة العالمية للملكية الفكرية

ВСЕМИРНАЯ ОРГАНИЗАЦИЯ  
ИНТЕЛЛЕКТУАЛЬНОЙ СОБСТВЕННОСТИ



-20  
-33

November 20, 1995

Dear Bruce,

I thank you for your letter of November 17, 1995, asking for our views concerning the claiming of priority under Article 4 of the Paris Convention for the Protection of Industrial Property, in respect of provisional patent applications filed with the USPTO.

As you know, the International Bureau is not in a position to give an official interpretation of the provisions of the Paris Convention. However, we offer the following considerations which may be helpful in order to reply to the question raised by you.

According to Article 4A(1) of the Paris Convention, the basis for priority under that Convention is a duly filed application for a patent.

Article 4A(2) of the Paris Convention states, in particular, that "Any filing that is equivalent to a regular national filing under the domestic legislation of any country of the Union ... shall be recognized as giving rise to the right of priority." In the case under consideration, the "domestic legislation" is the legislation of the United States of America. Therefore, it is that legislation which determines whether a "regular national filing" exists, subject to compliance with Article 4A(3) of the Paris Convention.

Mr. Bruce A. Lehman  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks  
Patent and Trademark Office  
Box 4  
U.S. Department of Commerce  
Washington, D.C. 20231  
United States of America



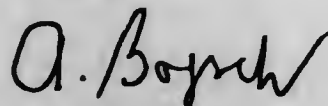
2.

Mr. Bruce A. Lehman, Assistant Secretary of Commerce and Commissioner of Patents and Trademarks, Patent and Trademark Office, Washington, D.C. - November 20, 1995

Article 4A(3) of the Paris Convention states that "By a regular national filing is meant any filing that is adequate to establish the date on which the application was filed in the country concerned, ..." As section 111(b) of title 35, United States Code, establishes such a filing date with respect to provisional patent applications, this requirement of the Paris Convention appears to be satisfied. To conclude otherwise would put into question the ability of domestic legislation to prescribe the requirements which must be fulfilled for a filing to be adequate to establish a filing date.

Article 4A(3) of the Paris Convention also states that "any filing that is adequate to establish the date on which the application was filed" is a regular national filing "whatever may be the subsequent fate of the application." Thus the question of whether a filing is to be considered as a "regular national filing" does not appear to depend on whether or not that filing may itself lead to the grant of a patent. Moreover, it is to be noted that applications for patents are recognized as giving rise to a right of priority under the Paris Convention even if it is clear from the outset that no patent can be granted upon such an application, for example, where the invention concerned is excluded from patenting.

Sincerely yours,



Arpad Bogsch  
Director General

[1180 OG 131]

(82) Department of Commerce  
Patent and Trademark Office

37 CFR Part 1  
Docket No. 950411099-5099-01  
RIN: 0651-AA52

#### Amendment to Rules for Extension of Patent Term

Agency: Patent and Trademark Office, Commerce.  
Action: Final Rule.

**Summary:** The Patent and Trademark Office (Office) is revising the rules directed to the extension of patent term to implement the provisions of Pub. L. 103-179, § 5; 107 Stat. 2040 codified at 35 U.S.C. 156(d)(5) and to clarify the requirements for eligibility. The amended rules establish procedures for the Commissioner to issue an interim extension of the term of a patent where the original term would expire before a product covered by the patent has received regulatory approval for commercial marketing or use. The amended rules also clarify that an application for patent term extension must be based on regulatory activities performed by the patent owner or its agent.

**Effective Date:** July 11, 1995.

**For Further Information Contact:** Gerald A. Dost by telephone at (703) 305-9285 or by mail addressed to Commissioner of Patents and Trademarks, Washington, D.C. 20231 marked to the attention of Mr. Dost, Office of the Deputy Assistant Commissioner for Patent Policy and Projects, or by FAX to (703) 308-6916.

**Supplementary Information:** Patent term extension has been available under 35 U.S.C. 156 for patents that claim certain products that are subject to regulatory review before being commercially marketed or used. Prior to enactment of 35 U.S.C. 156(d)(5), eligibility for patent term extension was dependent on regulatory approval of the product before the original patent term expired. 35 U.S.C. 156(d)(5) has made it possible, under appropriate circumstances, to obtain interim extensions of patent term where the regulatory process is likely to extend beyond the expiration of the patent term.

One purpose of the amended rules is to revise the present regulations contained in 37 CFR Part 1, Subpart F, to include provisions for interim extension of the patent term prior to regulatory approval of the product that can now form the basis of patent term extension. The amended rules set forth procedures that govern the content and submission of applications for an interim extension of a patent term, and procedures governing the interim extension determination and issuance of interim patent term extension certificates by the Office.

The initial guidelines directed to the preparation and filing of applications for interim extensions of patent terms as authorized by 35 U.S.C. 156(d)(5), were published as "Guidelines For Interim Extension Under 35 U.S.C. § 156(d)(5) of a Patent Term Prior To Regulatory Approval of a Product For Commercial Marketing or Use - Public Law 103-179 (December 3, 1993)" in the Official Gazette at 1159 Off. Gaz. Pat. Office 12 (February 1, 1994). The Final Rule supplements these initial guidelines. To the extent that they conflict with the interim guidelines, the Final Rule governs.

It is important to keep in mind the distinction between an interim patent term extension under § 156(e)(2) and the interim patent term extension provided for by 35 U.S.C. 156(d)(5), under § 156(d)(5). The former applies *after* regulatory approval has occurred and is addressed in 37 CFR 1.760. Interim patent term extensions under § 156(e)(2) are not affected by the amendments to the rules. The latter applies *before* regulatory approval has occurred and is addressed in 37 CFR 1.780 and 1.790.

The eligibility criteria for obtaining an interim extension under § 156(d)(5) are substantially the same as for obtaining patent term extension under § 156 after regulatory approval has occurred. Under the provisions of 35 U.S.C. 156(d)(5), a patent owner or its agent may submit an application for an interim patent term extension within six months, but not later than 15 days, of the original expiration date of the patent. At the time the application is submitted, the regulatory review period must have advanced to the approval phase as defined in § 156(g), but must not have ended. For a new drug, for example, the approval phase is defined in § 156(g)(1)(B)(ii) as the period beginning on the date a new drug application

was initially submitted for the new drug under § 505 of the Federal Food, Drug and Cosmetic Act.

The content of the application for interim extension is the same as for an application for patent term extension following regulatory review, with certain modifications necessitated by the circumstances. For example, the application for interim term extension will not be required to contain information about regulatory approval since that event has not occurred. A fee is required for each interim extension application filed before regulatory approval occurs - \$400.00 for the initial application for interim extension and \$200.00 for each supplementary application for interim extension.

The processing of an application for interim patent term extension under 35 U.S.C. 156(d)(5), will not require transmission of a copy of the application to the regulatory agency. However, it is contemplated that the Office will consult with the regulatory agency, as it has been doing for the past 10 years under § 156, on the question of eligibility for patent term extension.

If the patent is eligible for extension but for the fact that it is still under regulatory review, the Office can extend the patent term in one-year increments not to exceed five years from the expiration date. Any such extension would terminate 60 days after market approval. Before the 60-day period expires, the patentee could submit an application for patent term extension, supplying any additional information necessary to obtain any additional extension available under § 156.

The interim extension of patent term available under § 156(d)(5) cannot exceed the extension from the original patent term that would be available after regulatory approval. Thus, for example, a patent that was subject to the two-year extension limitation of § 156(g)(6)(C), could not obtain interim extension beyond two years from the original patent term expiration date. However, after an interim extension under § 156(d)(5) has been granted, the amount of patent term extension available after regulatory review is controlled by either § 156(d)(5) or § 156(g)(6)(A) or (B). In no case would the extension go beyond five years from the original expiration date of the patent. However, for those situations falling under § 156(g)(6)(C), where regulatory approval occurs within the two-year period after the original expiration date of the patent, the extension after approval is measured from the date on which the product receives permission for commercial marketing or use. § 156(d)(5)(E)(ii).

Review of recent applications for patent term extension has revealed that the provisions of 37 CFR 1.785(c) may be read as being inconsistent with 35 U.S.C. 156. The statute requires that an application for patent term extension be filed by the patent owner or its agent. 35 U.S.C. 156(d)(1). The statute further requires under § 156(d)(1)(D) a description of the activities undertaken by the applicant (i.e., the patent owner or its agent) during the regulatory review period, and specifies in § 156(d)(2)(B)(i) that the lack of due diligence by the applicant during the regulatory review period may be taken into account. Given these statutory requirements, the Office has held that in order to be eligible for patent term extension, the patent owner or its agent must have undertaken the activities that lead to regulatory approval. If a patent owner has not been involved, either directly or indirectly, in the regulatory review process, that patent owner has not lost any effective patent life since it never invested time and resources necessary to obtain approval for commercial marketing or use. Accordingly, to the extent that 37 CFR 1.785 could be interpreted to permit a patent owner to obtain a patent term extension where neither the patent owner nor its agent were responsible for activities leading to regulatory approval, it was misleading and contrary to both the letter and intent of § 156.

A notice of proposed rulemaking relating to Amendment to Rules for Extension of Patent Term was published in the Federal Register, 59 FR 56015, (November 10, 1994) and in the Official Gazette, 1169 Off. Gaz. Pat. Office 33 (December 13, 1994). A sole comment was received in response to this notice, but no change has been made in the text of the proposed amendments and additions to the rules.

The comment was directed to the proposed amendment to 37 CFR 1.785(c) when taken in light of 35 U.S.C. 156. The comment suggested that the party in interest before the regulatory agency (e.g., the Food and Drug Administration) should be the party to obtain a patent term extension, whether that party is the patent owner or licensee, and regardless of any



"agency" relationship which may exist between the two with respect to such regulatory proceedings. This may be accomplished, it was argued, by construing the term "applicant" in 35 U.S.C. 156(d)(1)(D) and (d)(2)(B)(i) to mean the "applicant for regulatory approval."

In response, it is clear that under 35 U.S.C. 156(a)(3) and (d)(1), the "applicant" for patent term extension shall be either the "owner of record of the patent" or the party which may be construed to be "its agent," which requirement is repeated in 35 U.S.C. 156(d)(5)(A) and (d)(5)(C) with regard to interim extensions. Indeed, to hold otherwise in the manner suggested in the comment would violate the plain meaning of 35 U.S.C. 156(c)(1), which requires that the patent term extension period be reduced by the time that the "applicant for patent extension did not act with due diligence during such period of the regulatory review period." This section not only cites 35 U.S.C. 156(d)(2)(B) but also is consistent with the required description of activities undertaken during the applicable regulatory period set forth in 35 U.S.C. 156(d)(1)(D). The statute thus specifically requires that the application for patent term extension contain a description of the activities performed by the patent owner or its agent before the regulatory agency with regard to such proceedings, 35 U.S.C. 156(d)(1)(D), and further specifies that the lack of due diligence by the patent owner or its agent during the regulatory review period may be taken into account, 35 U.S.C. 156(c)(1) and (d)(2)(B)(i).

In addition to the constraints of the statutory language, the comment fails to identify any justification for granting a term extension on a patent where the patent owner has not, either directly or indirectly, incurred either the significant costs associated with regulatory approval or any delay in the commercial marketing of a product. Since the patent term extension provisions of § 156 are intended to be remedial in nature, providing a patent term extension to a patent owner who has not been harmed by the delay and costs associated with regulatory approval of a product would provide an unintended benefit to such a patent owner. In addition, providing a patent term extension to a patent owner that did not participate in the regulatory review process could also frustrate an important purpose of the statute, that is, to encourage companies to make the significant investment necessary to obtain regulatory approval and distribute the pharmaceutical product to the public, rather than placing a non-participating patent owner in a position to keep the product off the market during the extended term, to the detriment of the party that made the significant investment necessary to obtain regulatory approval.

Accordingly, not only does the plain language of the statute prohibit the statutory interpretation suggested in the comment, but also the purpose of the statute would not be fulfilled by construing "applicant" to mean the applicant for regulatory review.

#### Discussion of Specific Rules:

Section 1.750 is being amended, as proposed, to provide for an eligibility determination which will be made on applications for interim extension filed in compliance with § 1.790. The section is further modified to limit the mailing of a notice of a final determination to applications filed in compliance with § 1.740 after the regulatory approval process is complete.

Section 1.760 is being amended, as proposed, to require that the title recite that the section is directed to requests for interim extensions of patent term under 35 U.S.C. 156(e)(2), to distinguish it from interim extensions available under 35 U.S.C. 156(d)(5), addressed in § 1.780.

Section 1.765(a) is being amended, as proposed, to change the phrase (two occurrences) "the Office of the Secretary" to read "the Office or the Secretary." The change provides that the applicant has a duty of disclosure to both the Patent and Trademark Office and the Secretary of Health and Human Services or the Secretary of Agriculture.

Section 1.780 is being amended, as proposed, to provide that a certificate of interim extension under 35 U.S.C. 156(d)(5) will be issued to the applicant. Section 1.780 also provides for notification of the issuance of the certificate of interim extension under 35 U.S.C. 156(d)(5), including the identity of the product currently under regulatory review, to be published in the Federal Register.

Section 1.785 is being amended, as proposed, to require the applicant for extension, i.e., the patent owner or its agent, to also have been the marketing applicant who obtained regulatory approval of the product for commercial marketing or use. While regulatory approval can be obtained by a party other than the patent owner, that other party must have been an agent of the patent owner when obtaining the regulatory approval in order for the patent owner to be eligible to apply for extension of the patent term.

Section 1.790 is being added, as proposed, to provide for one or more interim extensions for periods of up to one year for patents where the applicable regulatory review period described in paragraph (1)(B)(ii), (2)(B)(ii), (3)(B)(ii), (4)(B)(ii), or (5)(B)(ii) of 35 U.S.C. 156(g) that began for the patented product may extend beyond the expiration of the patent term in effect.

Paragraph (a) of added § 1.790 defines the time periods in which the initial interim extension application and each subsequent interim extension application must be filed in the Office. In no event will interim extensions be granted under proposed § 1.790 for a period of extension longer than that to which the applicant would be entitled to under 35 U.S.C. 156(c).

Paragraph (b) of added § 1.790 establishes that the content requirements for the initial interim extension applications are substantially the same as the content requirements for a formal application for extension of patent term under § 1.740 and a complete application under § 1.741, except that the content requirements relate to a product currently undergoing regulatory review. In other words, the interim extension applications contain information available to the patent owner or its agent at the time the application is filed.

Paragraph (c) of added § 1.790 permits each interim extension application after the initial interim extension application to be limited to a request for a subsequent interim extension along with a statement that the regulatory review period has not been completed and any materials or information required under §§ 1.740 and 1.741 not present in the preceding interim extension application.

Section § 1.791 is being added, as proposed, to provide that any interim extension granted under 35 U.S.C. 156(d)(5) terminates at the end of the 60-day period beginning on the date on which the product involved receives permission for commercial marketing or use. If within that 60-day period the patent owner or its agent files additional information required under 35 U.S.C. 156(d)(1) not contained in the applications for interim extension, the patent shall be further extended in accordance with the provisions of 35 U.S.C. 156.

#### Other Considerations:

These rule changes are in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, Executive Order 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these rules will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)), because the rules would affect only a very small number of patents eligible for interim patent term extension.

The Patent and Trademark Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes contain collection of information requirements subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 35 U.S.C. 156(d)(5) 3501 *et seq.*, which have previously been approved by the Office of Management and Budget under Control Number 0651-0020. The public reporting burden for this collection of information for Petition Extension is estimated to average 60 hours each, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collections of information. Send comments regarding this burden estimate, or any other aspect of this collection of information, including suggestions for reducing the burden, to Gerald A. Dost, Office of the Deputy Assistant Commissioner

for Patent Policy and Projects, Box DAC, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503 (ATTN: Paperwork Reduction Act Projects 0651-0020).

#### List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interest, Courts, Inventions and patents, Lawyers.

For the reasons set forth, the preamble, Part 1 of Title 37 of the Code of Federal Regulations is amended to read as follows:

#### PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 C.F.R. Part 1, Subparts A and F continues to read as follows:

Authority: 35 U.S.C. § 6, unless otherwise noted.

2. Section 1.20 is amended by revising paragraph (j) to read as follows:

#### § 1.20 Post-issuance fees.

• • • • •

(j) For filing an application for extension of the term of a patent

(1) Application for extension under § 1.740.....	\$1,030.00
(2) Initial application for interim extension under § 1.790.....	\$400.00
(3) Subsequent application for interim extension under § 1.790.....	\$200.00

3. Section 1.750 is revised to read as follows:

#### § 1.750 Determination of eligibility for extension of patent term

A determination as to whether a patent is eligible for extension may be made by the Commissioner solely on the basis of the representations contained in the application for extension filed in compliance with § 1.740 or § 1.790. This determination may be delegated to appropriate Patent and Trademark Office officials and may be made at any time before the certificate of extension is issued. The Commissioner or other appropriate officials may require from applicant further information or make such independent inquiries as desired before a final determination is made on whether a patent is eligible for extension. In an application for extension filed in compliance with § 1.740, a notice will be mailed to applicant containing the determination as to the eligibility of the patent for extension and the period of time of the extension, if any. This notice shall constitute the final determination as to the eligibility and any period of extension of the patent. A single request for reconsideration of a final determination may be made if filed by the applicant within such time as may be set in the notice of final determination or, if no time is set, within one month from the date of the final determination. The time periods set forth herein are subject to the provisions of § 1.136.

4. In § 1.760, the heading is revised to read as follows:

#### § 1.760 Interim extension of patent term under 35 U.S.C. 156(e)(2)

5. Section 1.765(a) is revised to read as follows:

#### § 1.765 Duty of disclosure in patent term extension proceedings

(a) A duty of candor and good faith toward the Patent and Trademark Office and the Secretary of Health and Human Services or the Secretary of Agriculture rests on the patent owner or its agent, on each attorney or agent who represents the

patent owner and on every other individual who is substantively involved on behalf of the patent owner in a patent term extension proceeding. All such individuals who are aware, or become aware, of material information adverse to a determination of entitlement to the extension sought, which has not been previously made of record in the patent term extension proceeding must bring such information to the attention of the Office or the Secretary, as appropriate, in accordance with paragraph (b) of this section, as soon as it is practical to do so after the individual becomes aware of the information. Information is material where there is a substantial likelihood that the Office or the Secretary would consider it important in determinations to be made in the patent term extension proceeding.

6. Section 1.780 is revised to read as follows:

#### § 1.780 Certificate of extension of patent term

If a determination is made pursuant to § 1.750 that a patent is eligible for extension and that the term of the patent is to be extended, a certificate of extension, under seal, or certificate of interim extension under 35 U.S.C. 156(d)(5) will be issued to the applicant for the extension of the patent term. Such certificate will be recorded in the official file of the patent and will be considered as part of the original patent. Notification of the issuance of the certificate of extension will be published in the Official Gazette of the Patent and Trademark Office. Notification of the issuance of the certificate of interim extension under 35 U.S.C. 156(d)(5), including the identity of the product currently under regulatory review, will be published in the Official Gazette of the Patent and Trademark Office and in the Federal Register. No certificate of extension will be issued if the term of the patent cannot be extended, even though the patent is otherwise determined to be eligible for extension. In such situations the final determination made pursuant to § 1.750 will indicate that no certificate will issue.

7. Section 1.785 is revised to read as follows:

#### § 1.785 Multiple applications for extension of term of the same patent or of different patents for the same regulatory review period for a product

(a) Only one patent may be extended for a regulatory review period for any product § 1.720 (h)). If more than one application for extension of the same patent is filed, the certificate of extension of patent term, if appropriate, will be issued based upon the first filed application for extension.

(b) If more than one application for extension is filed by a single applicant which seeks the extension of the term of two or more patents based upon the same regulatory review period, and the patents are otherwise eligible for extension pursuant to the requirements of this subpart, in the absence of an election by the applicant, the certificate of extension of patent term, if appropriate, will be issued upon the application for extension of the patent term having the earliest date of issuance of those patents for which extension is sought.

(c) If an application for extension is filed which seeks the extension of the term of a patent based upon the same regulatory review period as that relied upon in one or more applications for extension pursuant to the requirements of this subpart, the certificate of extension of patent term will be issued on the application only if the patent owner or its agent is the holder of the regulatory approval granted with respect to the regulatory review period.

(d) An application for extension shall be considered complete and formal regardless of whether it contains the identification of the holder of the regulatory approval granted with respect to the regulatory review period. When an application contains such information, or is amended to contain such information, it will be considered in determining whether an application is eligible for an extension under this section. A request may be made of any applicant to supply such information within a non-extendable period of not less than one (1) month whenever multiple applications for extension of more than one patent are received and rely upon the same regulatory review period. Failure to provide such information within the period for response set shall be regarded as conclusively establishing that the applicant is not the holder of the regulatory approval.



(e) Determinations made under this section shall be included in the notice of final determination of eligibility for extension of the patent term pursuant to § 1.750 and shall be regarded as part of that determination.

8. Section 1.790 is added to read as follows:

**§ 1.790 Interim extension of patent term under 35 U.S.C. 156(d)(5)**

(a) An owner of record of a patent or its agent who reasonably expects that the applicable regulatory review period described in paragraph (1)(B)(ii), (2)(B)(ii), (3)(B)(ii), (4)(B)(ii), or (5)(B)(ii) of subsection (g) that began for a product that is the subject of such patent may extend beyond the expiration of the patent term in effect may submit one or more applications for interim extensions for periods of up to one year each. The initial application for interim extension must be filed during the period beginning 6 months and ending 15 days before the patent term is due to expire. Each subsequent application for interim extension must be filed during the period beginning 60 days before and ending 30 days before the expiration of the preceding interim extension. In no event will the interim extensions granted under this section be longer than the maximum period of extension to which the applicant would be entitled under 35 U.S.C. 156(c).

(b) A complete application for interim extension under this section shall include all of the information required for a formal application under § 1.740 and a complete application under § 1.741. Sections (a)(1), (a)(2), (a)(4), and (a)(6) - (a)(17) of § 1.740 and § 1.741 shall be read in the context of a product currently undergoing regulatory review. Sections (a)(3) and (a)(5) of § 1.740 are not applicable to an application for interim extension under this section.

(c) The content of each subsequent interim extension application may be limited to a request for a subsequent interim extension along with a statement that the regulatory review period has not been completed along with any materials or information required under § 1.740 and § 1.741 that are not present in the preceding interim extension application.

9. Section 1.791 is added to read as follows:

**§ 1.791 Termination of interim extension granted prior to regulatory approval of a product for commercial marketing or use**

Any interim extension granted under 35 U.S.C. 156(d)(5) terminates at the end of the 60-day period beginning on the date on which the product involved receives permission for commercial marketing or use. If within that 60-day period the patent owner or its agent files an application for extension under § 1.740 and § 1.741 including any additional information required under 35 U.S.C. 156(d)(1) not contained in the application for interim extension, the patent shall be further extended in accordance with the provisions of 35 U.S.C. 156.

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May 8, 1995

BRUCE A. LEHMAN  
Assistant Secretary of Commerce  
and Commissioner of Patents and Trademarks

[1175 OG 15]

**(83) GUIDELINES FOR INTERIM EXTENSION UNDER 35 U.S.C. § 156(d)(5) OF A PATENT TERM PRIOR TO REGULATORY APPROVAL OF A PRODUCT FOR COMMERCIAL MARKETING OR USE - PUBLIC LAW 103-179 (December 3, 1993)**

This notice is intended to establish initial guidelines for patent owners who are seeking interim extensions of patent terms pursuant to newly enacted 35 U.S.C. § 156(d)(5). These guidelines will be in effect until further notice. These guidelines do not affect the rights of a patent owner or the procedures to request interim extensions under 35 U.S.C. § 156(e)(2).

Section 156(d)(5)(A) of Title 35, United States Code, provides that a patent owner seeking an interim extension of the terms of a patent pursuant to its provisions must submit an application to the Commissioner of Patents and Trademarks (Commissioner) within a certain defined period of time. Section 156(d)(5) specifies certain components the application is to contain, including "such patent or other information as the Commissioner may require." See 35 U.S.C. § 156(d)(5)(A)(v). Section 156(h) provides that the "Commissioner may establish such fees as the Commissioner determines appropriate to cover the costs to the Office of receiving and acting upon applications under this section." The purpose of this notice is to provide guidelines which a patent owner or its agent should use in (1) deciding whether the requirements for the submission of an application for an interim extension of the term of a patent are satisfied, and (2) making the submission of such an application to the Patent and Trademark Office.

This notice includes guidelines as to the actual content of an application for interim extension of the term of a patent. The guidelines should be used in determining whether a patent is subject to, and meets the conditions for interim extension of its term under section 156(d)(5). The guidelines should also be used in preparing and filing an application for interim extension of the patent term. If any application for interim extension of the term of a patent is filed in accordance with 35 U.S.C. § 156(d)(5), but is not in compliance with the requirements of this notice, applicant will be notified of the deficiencies in the application and will be given a period of time within which to correct the deficiencies.

**GUIDELINES**

**A. Patents eligible for interim extension of the patent term.**

(a) Any patent which claims a product as defined in paragraph (b) of this section, or a method of using such a product, is eligible for an interim extension of its patent term in accordance with 35 U.S.C. § 156(d)(5).

(b) The term "product" referred to in paragraph (a) of this section means a product as defined in 35 U.S.C. 156(f).

**§ B. Conditions for interim extension of patent term.**

A patent may be granted an interim extension of its term if:

(a) the patent claims a product or a method of using or manufacturing a product as defined in § A of this notice;

(b) the term of the patent has been extended under 35 U.S.C. § 156(e);

(c) an application for interim extension under § 156(d) is submitted pursuant to § E of this notice;

(d) the product is currently undergoing a regulatory review as described in paragraph (1)(B)(ii), (2)(B)(ii), (3)(B)(ii), (4)(B)(ii), or (5)(B)(ii) of 35 U.S.C. § 156(g);

(e) the product has not received permission for commercial marketing or use; or, in the case of a patent claiming a method of manufacturing a product which primarily uses recombinant DNA technology in the manufacture of the product, no permission for commercial marketing or use has been granted for a product manufactured under the process claimed in the patent; and,

(f) the application is submitted during the period beginning 6 months, ending 15 days, before the expiration of the patent term; or, in the case of a subsequent interim extension, during the period beginning 60 days before, and ending 30 days before, the expiration of the preceding interim extension.

**§ C. Applicant for interim extension of patent term.**

Any application for interim extension of a patent term must be submitted by the owner of record of the patent or its agent and must comply with the requirements of § E of this notice.

**§ D. Filing date of application for interim extension of patent term.**

(a) The filing date of an application for interim extension of patent term is the date on which a complete application is received in the Patent and Trademark Office, or filed pursuant to the "Certificate of Mailing" provisions of 37 CFR § 1.8 or "Express Mail" provisions of 37 CFR § 1.10.

A complete application shall include:

(1) identification of the product then under regulatory review;

(2) identification of each Federal statute under which regulatory review is occurring;

(3) identification of the patent for which an interim extension is sought;

(4) identification of each claim of the patent which claims the product or a method of using or manufacturing the product then under regulatory review;

(5) sufficient information to enable the Commissioner to determine that, except for permission to market or use the product commercially, the patent would be eligible for an extension of its term under 35 U.S.C. § 156; and,

(6) a brief description of the activities undertaken by the applicant during the applicable regulatory review period with respect to the product or a method of using or manufacturing the product then under regulatory review and the significant dates applicable to such activities.

(b) If any application submitted pursuant to this section is held to be incomplete, applicant may seek to have this holding reviewed under 37 CFR § 1.181.

**§ E. Application for interim extension of patent term.**

(a) An application for interim extension of a patent term must be made in writing to the Commissioner of Patents and Trademarks.

(b) A formal application for interim extension of the patent term shall include:

(1) a complete identification of the product under regulatory review as by appropriate chemical and generic name, physical structure or characteristics, and, where the requested extension is based on a method claim, the method of using or method of manufacturing the product then under regulatory review;

(2) a complete identification of the Federal statute including the applicable provision of law under which the regulatory review is occurring;

(3) in the case of a human drug product, an identification of each active ingredient in the product and as to each active ingredient, a statement that it has not been previously approved for commercial marketing or use under the Federal Food, Drug and Cosmetic Act, the Public Health Service Act, or the Virus-Serum-Toxin Act, or a statement of when the active ingredient was approved for commercial marketing or use (either alone or in combination with other active ingredients) the use for which it was approved, and the provision of law under which it was approved;

(4) a statement that the application is being submitted within the period permitted for submission pursuant to § B of this notice, and an identification of the date of the first and last days on which the application could be submitted;

(5) a complete identification of the patent for which an interim extension is sought by the name of the inventor, the patent number, the date of issue, and the date of expiration;

(6) a copy of the patent for which an interim extension is sought including the entire specification (with claims) and drawings;

(7) a copy of any disclaimer, certificate of correction, receipt of maintenance fee payment, or reexamination certificate issued in the patent;

(8) a statement that the patent claims the product or a method of using or manufacturing the product under regulatory review, and a showing which lists each applicable patent claim and demonstrates the manner in which each applicable patent claim reads on the product or a method of using or manufacturing the product under regulatory review;

(9) a statement beginning on a new page, of the relevant dates and information pursuant to 35 U.S.C. § 156(g) of the applicable current regulatory review period as follows:

(i) for a patent that claims a human drug, antibiotic, or human biological product, the effective date of the investigational new drug (IND) application and the IND number, and the date on which a new drug application (NDA) or a Product License Application (PLA) was initially submitted and the NDA or PLA number;

(ii) for a patent claiming a new animal drug, the date a major health or environmental effects test on the drug was initiated and any available substantiation of the date or the date of an exemption under subsection (j) of section 512 of the Federal Food, Drug and Cosmetic Act became effective for such animal drug; and the date on which a new animal drug application (NADA) was initially submitted and the NADA number;

(iii) for a patent claiming a veterinary biological product, the date the authority to prepare an experimental biological product under the Virus-Serum-Toxin Act became effective; and the date an application for license was submitted under the Virus-Serum-Toxin Act;

(iv) for a patent claiming a food or color additive, the date a major health or environment effects test on the additive was initiated and any available substantiation of that date; and the date on which a petition for product approval under the Federal Food, Drug and Cosmetic Act was initially submitted and the petition number;

(v) for a patent claiming a medical device, the effective date of the investigational device exemption (IDE) and the IDE number, if applicable, or the date on which the applicant began the first clinical investigation involving the device if no IDE was submitted and any available substantiation of that date; and the date on which any application for product approval or notice of completion of a product development protocol under section 515 of the Federal Food, Drug and Cosmetic Act was initially submitted and the number of the application;

(10) a brief description beginning on a new page of the significant activities undertaken by the applicant during the applicable regulatory review period with respect to the product under regulatory review and the significant dates applicable to such activities;

(11) a statement that applicant acknowledges a duty to disclose to the Commissioner of Patents and Trademarks any information which is material to the determination of entitlement to the interim extension sought;

(12) the prescribed fee for receiving and acting upon the application for extension (see § F of this notice);

(13) the name, address, and telephone number of the person to whom inquires and correspondence relating to the application for interim patent term extension are to be directed;

(14) a duplicate of the application papers, certified as such; and,

(15) an oath or declaration as set forth in paragraph (c) of this section.



(c) Any oath or declaration submitted in compliance with paragraph (b) of this section must be signed by the owner of record of the patent or its agent, specifically identify the papers and the patent for which an interim extension is sought and aver that the person signing the oath or declaration;

(1) is the owner, an official of a corporate owner authorized to obligate the corporation, or a patent attorney or agent authorized to practice before the Patent and Trademark Office and who has general authority from the owner to act on behalf of the owner in patent matters;

(2) has reviewed and understands the contents of the application being submitted pursuant to this section;

(3) believes the patent is eligible for extension pursuant to § A of this notice;

(4) believes an interim extension is justified under 35 U.S.C. § 156(d)(5) and the guidelines of this notice; and,

(5) believes the patent for which the extension is being sought meets the conditions for interim extension of the term of a patent as set forth in § B on this notice.

(d) If any application for interim extension of patent term submitted pursuant to this section is held to be informal, applicant may seek to have that holding reviewed by filing a petition with the required fee, as necessary, pursuant to 37 C.F.R. §§ 1.181, 1.182 or 1.183, as appropriate, within such time as may be set in the notice that the application has been held to be informal, or if no time is set, within one month of the date on which the application was held informal. The time periods set forth herein are subject to the provisions of 37 C.F.R. § 1.136.

#### § F. Fees for receiving and acting on application filed pursuant to 35 U.S.C. § 156(d)(5).

Pursuant to 35 U.S.C. § 156(h), the Commissioner has determined that the following fees are appropriate to cover the costs to the Patent and Trademark Office of receiving and acting upon applications for interim patent terms extension filed pursuant to 35 U.S.C. § 156(d)(5):

(a) for an initial application for "interim extension" under 35 U.S.C. § 156(d)(5)(A): \$400.00; and,

(b) for each application requesting a "subsequent interim extension" under 35 U.S.C. § 156(d)(5)(C): \$200.00.

The appropriate fee should accompany the application when filed. If a fee in a different amount is adopted in Title 37 of the Code of Federal Regulations, applicant will be refunded any excess or required to submit any deficiency.

#### § G. Address for filing applications pursuant to 35 U.S.C. § 156(d)(5).

All applications for interim extension of the term of a patent and any communications relating thereto should be addressed to the Commissioner of Patents and Trademarks, Box Patent Ext., Washington, D.C., 20231. When appropriate, the communication should be marked to the attention of a particular individual.

#### § H. Termination of Interim Extension.

Any interim extension granted under 35 U.S.C. § 156(d)(5) terminates at the end of the 60-day period beginning on the date on which the product involved receives permission for commercial marketing or use. If within that 60-day period the patent owner or its agent files additional information required under 35 U.S.C. § 156(d)(1) not contained in the application for interim extension, the patent shall be further extended in accordance with the provisions of 35 U.S.C. § 156.

#### § I. For further information contact:

Charles E. Van Horn by telephone at (703) 305-9054 or Gerald A. Dost by telephone at (703) 305-8813; or by mail

marked to their attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

#### Summary

The initial guidelines set forth above are considered to be appropriate and authorized by 35 U.S.C. § 156. They will provide appropriate guidelines to patent owners and their agents pending appropriate changes which will be made in Title 37 of the Code of Federal Regulations.

Jan. 6, 1994

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

[1159 OG 12]

(84)

Department of Commerce  
Patent and Trademark Office  
37 CFR Parts 1, 3 and 5

[Docket #: ]  
RIN 0651-AA75

#### Changes to Implement 18-Month Publication of Patent Applications

Agency: Patent and Trademark Office, Commerce.

Action: Notice of proposed rulemaking.

Summary: The Patent and Trademark Office (Office) is proposing to amend the rules of practice in patent cases primarily to implement changes related to the 18-month publication of patent applications in title 35, United States Code, contained in the Patent Application Publication Act of 1995 (H.R. 1733). Among the changes that are contained in H.R. 1733 would be the publication of patent applications after 18 months from the earliest filing date for which a benefit is sought, and the addition of provisional rights to the rights provided in a patent. These changes would apply to utility and plant applications other than provisional applications, but not to design applications. H.R. 1733 was introduced in the House of Representatives on May 25, 1995. The amendments to title 35 relating to 18-month publication, if enacted as proposed, would be effective on January 1, 1996.

Dates: A public hearing will be held on Tuesday, September 19, 1995, at the Holiday Inn - National Airport, 15th Street and Jefferson Davis Highway, Arlington, Virginia, at 9:30 a.m. Those wishing to present oral testimony must request an opportunity to do so no later than September 14, 1995. Written comments must be submitted on or before September 19, 1995. Addresses: Address written comments and requests to present oral testimony to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: Stephen G. Kunin, Deputy Assistant Commissioner for Patent Policy and Projects. In addition, written comments may also be sent by facsimile transmission to (703) 305-8825, with a confirmation copy mailed to the above address, or by electronic mail messages over the Internet to early-pub@uspto.gov.

Written comments should include the following information:

- name and affiliation of the individual responding;
- an indication of whether comments offered represent views of the respondent's organization or are the respondent's personal views; and
- if applicable, information on the respondent's organization, including the type of organization (e.g., business, trade group, university, non-profit organization).

Parties mailing written comments are asked to provide their comments in machine readable format. Machine-readable submissions may be provided on a 3 1/2 inch floppy disk formatted for use in either a Macintosh or MSDOS-based computer. Machine-readable submissions should be provided as unformatted text (e.g., ASCII or plain text), or as formatted text in one of the following file formats: Microsoft Word (Macintosh,

DOS or Windows versions) or WordPerfect (Macintosh, DOS or Windows versions).

Written comments and transcripts of the hearings will be available for public inspection on or about October 2, 1995, in Room 520 of Crystal Park One, 2011 Crystal Drive, Arlington, Virginia, and will be available on or about October 2, 1995, through anonymous file transfer protocol (ftp) via the Internet (address: ftp.uspto.gov).

For Further Information Contact: Stephen G. Kunin by telephone at (703) 305-8850, by facsimile at (703) 305-8825, by electronic mail at rbahr@uspto.gov, or Jeffrey V. Nase by telephone at (703) 305-9285, or by mail marked to the attention of Stephen G. Kunin, addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

#### Supplementary Information

This proposed rule change is designed primarily to implement the changes in practice related to the publication of patent applications provided for in H.R. 1733. A copy of this legislation may be obtained from the individuals identified in the "For Further Information Contact" section of the notice.

Section 122 of title 35, United States Code, currently provides that patent applications are maintained in confidence until a patent is granted. H.R. 1733, if enacted, would amend 35 U.S.C. 122 to provide that each application for patent, except for design applications filed under 35 U.S.C. 171 and provisional applications filed under 35 U.S.C. 111(b), shall be published "as soon as possible after the expiration of a period of 18 months from the earliest filing date for which a benefit is sought," but provides that applications that are no longer pending and applications that are subject to a secrecy order under 35 U.S.C. 181 shall not be published.

H.R. 1733 includes a provision (35 U.S.C. 122(b)(2)) that, upon request, an application of an independent inventor who has been accorded status under 35 U.S.C. 41(h) will not be published until three months after an Office action under 35 U.S.C. 132; however, applications filed under 35 U.S.C. 363 and applications claiming the benefit of an earlier filing date under 35 U.S.C. 119, 120, 121, 365(a) or 365(c) are not eligible for such a request. In addition, H.R. 1733 provides that an applicant making such a request must certify that the invention disclosed in the application was not or will not be the subject of an application filed in a foreign country. H.R. 1733 provides that the Commissioner may establish appropriate procedures and fees for such a request.

H.R. 1733, if enacted, would further amend 35 U.S.C. 119 to provide that the claim and certified copy of the original foreign application must be filed in the Office at such time during the pendency of the application as required by the Commissioner, and that the Commissioner may consider the failure of the applicant to file a timely claim for priority as a waiver of any such claim. H.R. 1733, if enacted, would likewise amend 35 U.S.C. 120 to provide that the Commissioner may determine the time period during the pendency of the application within which an amendment containing the specific reference to the earlier filed application shall be submitted, and that the Commissioner may consider the failure of the applicant to file a timely claim for priority as a waiver of any such claim.

H.R. 1733, if enacted, would further amend 35 U.S.C. 102(e) to include applications published pursuant to 35 U.S.C. 122(b) within its scope. H.R. 1733, if enacted, would provide that the costs of early publication shall be recovered by adjusting the filing, issue and maintenance fees, by charging a separate publication fee, or by any combination of these methods. H.R. 1733, if enacted, would also provide that, upon issuance of the application as a patent, the patent shall, where the invention claimed in the patent is identical to the invention claimed in the published application, include provisional rights during the period from publication until issuance of the patent.

H.R. 1733 also includes amendments relating to 20-year patent term and provisional applications. Specifically, H.R. 1733 includes an amendment to 35 U.S.C. 119(e) to provide that if the day that is twelve months after the filing date of a provisional application falls on a Saturday, Sunday, or Federal holiday within the District of Columbia, the period of pendency of the provisional application shall be extended to the next succeeding secular or business day. H.R. 1733 also includes

an amendment to 35 U.S.C. 154(b) to: (1) include an unusual administrative delay by the Office in issuing the patent as a basis for patent term extension; (2) provide that the total duration of all extensions under 35 U.S.C. 154(b) shall not exceed ten years, as opposed to the five year limit currently provided in Public Law 103-465; (3) provide that no patent that has issued before the expiration of three years after the filing date of the application or entry of the application into the national stage under 35 U.S.C. 371 shall be extended under 35 U.S.C. 154(b); (4) provide that no patent whose term has been disclaimed beyond a specified date shall be extended under 35 U.S.C. 154(b) beyond the expiration date specified in the terminal disclaimer, and (5) provide that any period of extension under 35 U.S.C. 154(b) shall be reduced by the period during which the applicant for patent did not engage in reasonable efforts to conclude processing or examination of the application, rather than the "due diligence" provision applicable to extensions under 35 U.S.C. 154(b)(2) in Public Law 103-465.

The current planning approach to the implementation of early publication is to create an electronic data base which captures the technical content, i.e., the specification, abstract, claims and drawings, of the application-as-filed. A data capturing operation will enable the creation of a data base containing image and text equivalent of the technical contents of the application-as-filed. Application materials will be digital image and/or optical character recognition (OCR) scanned by the Office for entry into this electronic data base. This electronic data base will be used to provide a source for (a) meeting publication requirements for the applications, (b) providing a basis for electronic searching and retrieval of applications, and (c) providing a basis for producing copies of the technical contents of the application-as-filed. The publication of an application will take the form of publishing information necessary to identify the applicant and the technical subject matter of the application, i.e., a Gazette Entry, in a separate *Gazette of Patent Application Notices*, with a one-page printed publication, i.e., a Patent Application Notice or PAN, containing similar information for placement in the paper search files. Published applications will be assigned a sequential Patent Application Notice (PAN) number in the manner that issued patents are assigned a sequential patent number. In addition, a document including the Patent Application Notice and the technical contents of the application-as-filed, designated as the Technical Contents Publication, will be available to the public upon publication.

The digital images of the technical contents of the application-as-filed, i.e., the Technical Contents Publication, will be available for public review. Paper copies of the Patent Application Notice and Technical Contents Publication will also be available for purchase similar to the way paper copies of patents are currently available for purchase. When budgetary and process considerations permit, text searching of the Patent Application Notice and Technical Contents Publication will be implemented.

The information provided to Patent and Trademark Depository Libraries will be expanded to include weekly issues of the *Gazette of Patent Application Notices* (provided by the Government Printing Office), and a CD-ROM collection of facsimile images of the Patent Application Notices and Technical Contents Publications. The public would also be able to place subscription orders to receive weekly paper copies of the Patent Application Notices and Technical Contents Publications published in specific classes and subclasses similar to the way such orders are currently placed for issued patents, as well as subscription orders to receive the CD-ROM collection of facsimile images of the Patent Application Notices and Technical Contents Publications.

H.R. 1733, as proposed, does not specifically exclude applications that are national security classified from those applications to be published. Executive Order 12356 and a number of statutes, e.g., 42 U.S.C. 2011 *et seq.* (the Atomic Energy Act of 1954), 15 U.S.C. 1155 (provides that the Secretary of Commerce shall respect and preserve the security classification of inventions in the possession or control of the Department of Commerce), and 18 U.S.C. 798 (provides criminal sanctions for the disclosure of classified information) preclude the publication of a national security classified application. Further, the publication requirement in H.R. 1733, as proposed, provides some latitude to the Commissioner to publish applications later than 18 months from the earliest filing date for which a benefit



is sought. Therefore, the publication of a national security classified application will be delayed until such application is either declassified, which will permit publication of the application, or subjected to a secrecy order pursuant to 35 U.S.C. 181, which will exclude the application from publication by the express terms of H.R. 1733, as proposed. In view of national security considerations, and the current statutory prohibitions on the disclosure of classified information, it is appropriate to specifically exclude those applications that are national security classified from publication under the provisions of H.R. 1733.

While H.R. 1733, if enacted, would not directly affect design applications, this notice of proposed rulemaking includes a proposed amendment to § 1.154 such that the arrangement for a design application will be consistent with the arrangements for a utility (§ 1.77) or plant (§ 1.163) application, as well as a proposed amendment to § 1.5 to provide that a paper concerning a provisional application must identify the provisional application as such and by application number. In addition, while this proposed rule change is designed primarily to implement the changes in practice related to the publication of patent applications provided for in H.R. 1733, a number of proposed rule changes set forth in this notice of proposed rulemaking would be desirable even in the absence of an 18-month publication system. Specifically, this proposed rule change is also designed to: (1) clarify which applications claiming the benefit of prior applications or prior applications for which a benefit is claimed in a later application will be preserved in confidence; (2) amend the rules pertaining to the format and standards for application papers and drawings to improve the standardization of patent applications; (3) broaden the application of § 1.131 to instances in which inventions of a pending application or patent under reexamination and a patent held by a single party are not identical, but not patentably distinct; (4) broaden the application of §§ 1.78(c) and (d) to patents under reexamination; (5) clarify the practice for the delivery or mailing of patents; (6) provide for the treatment of national security classified applications; (7) expedite the entry of international applications into the national stage; and (8) amend a number of rules for consistency and clarity. Since these proposed rule changes may be adopted as final rules even in the absence of an 18-month publication system, interested persons are advised to comment on any proposed rule change, regardless of whether H.R. 1733 is enacted. If H.R. 1733 is amended during the legislative process, the final rules will comply with this legislation as enacted. If H.R. 1733 is not enacted, the proposed rules that would implement publication of patent applications would be withdrawn.

In a Notice of Public Hearing and Request for Comments on 18-Month Publication of Patent Applications (18-Month Publication Notice) published in the *Federal Register* at 59 FR 63966 (December 12, 1994) and in the Patent and Trademark Office *Official Gazette* at 1170 Off. Gaz. Pat. Office 390-94 (January 3, 1995), the Office requested public comment on the procedures the Office should adopt if an 18-month publication system was enacted. The 18-Month Publication Notice set forth the Office's planning approach for the implementation of 18-month (pre-grant) publication of patent applications, and specifically presented fourteen (14) questions on which comment was invited. An oral hearing was conducted on February 15, 1995.

Sixty-five (65) written comments, as well as two (2) Law Review articles concerning the pre-grant publication of pending patent applications, were submitted. Of the sixty-five (65) comments, forty (40) submitted comments directed to at least one of the questions presented in the 18-Month Publication Notice. Sixteen (16) persons testified at the public hearing conducted on February 15, 1995.

#### Response to Comments on the 18-Month Publication Notice

The following questions were presented in the 18-Month Publication Notice. Each question is followed by a summary of the comments submitted in response to the question, and the proposed disposition of the issue presented in the question.

1. Should the PTO require that all official application-related materials be delivered to a central location? Specifically, what problems would a requirement that all official application-related materials be delivered to a central location cause?

**Summary:** A slight majority of the comments opposed a requirement that all official application-related materials be delivered to a central location.

**Response:** As the Office currently considers the delivery of all official application-related materials to a central location to be unnecessary to the currently planned approach to implementation of 18-month publication, no change to the rules of practice to require that all official application-related materials be delivered to a central location will be proposed.

2. Should the PTO adopt a standard application format? If so, what portions of the application papers should the PTO require be submitted in a standard size and/or format, and what sanction (e.g., surcharge) should be established for the failure to comply with these requirements?

**Summary:** A majority of the comments favored the implementation of a standard application format, so long as an applicant was given a time period in which to comply with this format, i.e., failure to comply with the standard application format did not deprive the application of a filing date. In addition, a number of comments indicated that any additional requirements should not be inconsistent with European Patent Office (EPO) or Patent Cooperation Treaty (PCT) requirements, or in excess of those requirements necessary for the implementation of 18-month publication.

**Response:** The Office is proposing to change the rules of practice to institute only those additional standardizations which are consistent with the requirements set forth in PCT Rule 11, and are considered necessary for the digital image and OCR scanning of application materials into an electronic data base. Those additional standardizations are that: (1) applications be submitted on flexible, strong, smooth, non-shiny, durable and white paper (PCT Rule 11.3); (2) the papers be typewritten by a typewriter or word-processor, i.e., hand-written application materials would no longer be acceptable, with 1 1/2 or double spaced lines (PCT Rule 11.9(c)), and in permanent "dark" ink (PCT Rule 11.9(d)) and portrait orientation, i.e., with the shorter sides of the paper on the top and bottom (PCT Rule 11.2(d)); (3) the sheets of papers be the same size and either 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches) (PCT Rule 11.5), with a top margin of at least 2.0 cm. (3/4 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 2.0 cm. (3/4 inch), and a bottom margin of at least 2.0 cm. (3/4 inch) (PCT Rule 11.6(a)); (4) the pages of the application be numbered consecutively, with the numbers being centrally located above or below the text (PCT Rule 11.7); and (5) the claims be on a separate sheet (PCT Rule 11.4). Finally, §§ 1.52(b) and 1.84(x) are proposed to be amended to provide that no holes should be provided in the paper or drawing sheets due to the potential for their interference with the scanning operation.

Section 1.52(b) currently requires that application papers be written on but one side, and § 1.72(b) currently requires that the abstract be on a separate sheet. In an application filed without: (1) typewritten application papers on flexible, strong, smooth, non-shiny, durable and white paper; (2) 1 1/2 or double spaced lines in portrait orientation; (3) permanent "dark" ink typing; (4) sheets of papers of the same size and either 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches), with a top margin of at least 2.0 cm. (3/4 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 2.0 cm. (3/4 inch), and a bottom margin of at least 2.0 cm. (3/4 inch); (5) the pages of the application including claims and abstract be numbered consecutively, starting with page one, with the numbers being centrally located above or below the text; (6) application papers typed on but one side; and (7) an abstract and claims on a separate sheet, the applicant will be given a time period, non-extendable under § 1.136(a), in which to file a substitute specification in compliance with § 1.125 on application papers in compliance with §§ 1.52(a) and (b). The Office, however, does not propose to require a surcharge for the failure to comply with these standardizations on filing.

Additional standardizations to the rules of practice concerning drawings requirements are also being proposed. Currently, § 1.84(f) permits paper sizes of 21.6 cm. by 35.6 cm. (8 1/2 by 14 inches), 21.6 cm. by 33.1 cm. (8 1/2 by 13 inches), 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches), and 21.0 cm. by

29.7 cm. (DIN size A4). Section 1.84(f), as proposed, would permit paper sizes of only 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches). The use of these paper sizes, which correspond to the paper sizes required under § 1.52(b), as proposed, would not impact the current Automated Patent System (APS) database, and would permit a fully automatic scanning operation due to their similar size. To electronically store, display, and print drawings paper sheet sizes up to 21.6 cm. by 35.6 cm. (8 1/2 by 14 inches) would require modifications of the APS system hardware, software, displays, and printers. In addition, the digital image scanning of drawing paper sheet sizes up to 21.6 cm. by 35.6 cm. (8 1/2 by 14 inches) would require a semi-automatic scanning operation, thus increasing scanning costs significantly. Therefore, § 1.84(f), as proposed, would permit paper sheet sizes of only 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches), with a top margin of at least 2.5 cm. (1 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 1.5 cm. (9/16 inch), and a bottom margin of at least 1.0 cm. (3/8 inch), thereby leaving a sight no greater than 17.0 cm. by 26.2 cm. by 29.7 cm. (DIN size A4) sheets, and a sight no greater than 17.6 cm. by 24.4 cm. (6 15/16 by 9 5/8 inches) on 21.6 cm. by 27.9 cm. (8 1/2 by 11 inch) sheets (PCT Rule 11.6(c)). As PCT Rule 11.6(d) provides that the margin requirements apply to 21.0 cm. by 29.7 cm. (DIN size A4) sheets such that a copy of the drawings sheet on a 21.0 cm. by 29.7 cm. (DIN size A4) sheet leaves the required margin, the requirement for drawing sheet sizes of only 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches) or 21.0 cm. by 29.7 cm. (DIN size A4) is not a substantive drawing limitation in excess of PCT Rule 11.

Currently, formal drawings are not required until an application has been allowed. As a drawing figure will be included in the Gazette Entry in the *Gazette of Patent Application Notices*, as well as the Patent Application Notice, drawings of sufficient quality for digital image scanning into an electronic data base will be necessary for the initial processing of the application. In instances in which an application is filed with drawings of such poor quality as to preclude their digital image scanning into the electronic data base, it will be necessary to set a time period, non-extendable under § 1.136(a), in which to file drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction by digital imaging.

Currently, a complete application under § 1.51(a) does not require an abstract on a separate sheet, claims on a separate sheet, application papers typed on but one side of the paper, or application papers or drawings of sufficient clarity, contrast, or quality or in the proper size or format for electronic reproduction, and, as such, an application may be filed under § 1.60 from a prior application not in a format necessary for the image and/or OCR scanning of the application materials into an electronic data base. Therefore, an amendment to § 1.60(d) is necessary to assure the prompt filing of application papers including an abstract and claims on a separate sheet, application papers typed on but one side of the paper, and application papers and drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction.

Currently, the filing of the copy of the specification from the prior application, or a new specification, in an application filed under § 1.62 is considered improper. As applications filed prior to January 1, 1996, will not have been image- or OCR-scanned into the electronic data base, the technical contents of an application filed under § 1.62 in which the prior application was itself filed prior to January 1, 1996, will not be contained in the electronic data base. For applications under § 1.62 which do not add additional disclosure, i.e., continuation or divisional applications, the Office will obtain the microfiche copy of the prior application and image or OCR scan it into the electronic data base. For applications under § 1.62 which add additional disclosure, i.e., continuation-in-part applications, a substitute specification and drawings will be necessary for image or OCR scanning into the electronic data base. Therefore, an amendment has been proposed to § 1.62 to provide that, where the application is a continuation-in-part application, a substitute specification in compliance with § 1.125 and drawings will be required.

Section 1.62 currently provides that no copy of the prior application or new specification is required, and further provides that the filing of such a copy or specification will be

considered improper, and a petition is necessary to obtain the date of deposit of the request for an application under § 1.62 as the filing date. Section 1.62, as proposed, would provide that the failure to provide any required substitute specification would not affect the filing date of the application, but a time period, non-extendable under § 1.136(a), would be set for its filing. Section 1.62, as proposed, would further provide that any new specification filed in an application under § 1.62 would not be considered part of the original application papers, but would be treated as a substitute specification under § 1.125. Any request to treat a new specification filed in an application under § 1.62 as part of the original application papers may be by way of petition under § 1.182.

Finally, amendments to §§ 1.77, 1.154, and 1.163 have been proposed to provide a standard arrangement for utility, design, and plant applications, respectively. This standard arrangement will include, *inter alia*, a Fee Transmittal form for utility, design, and plant applications, a Utility Patent Application Transmittal form, a Design Patent Application Transmittal form, a Plant Patent Application Transmittal form, and a Plant Color Coding Sheet for plant applications. Standardized versions of the Fee Transmittal form, Utility Patent Application Transmittal form, Design Patent Application Transmittal form, Plant Patent Application Transmittal form, Plant Color Coding Sheet, as well as a standard Declaration form and Plant Patent Application Declaration form, are included as an Appendix A to this notice of proposed rulemaking.

3. Assuming that the entire application is not published, what information concerning the application should be published in the *Gazette of Patent Application Notices*?

**Summary:** A slight majority of the comments indicated that the printed publication should include the entire application, or at least the claims, each independent claim, or a claim of each statutory class in the application. The remaining comments that did not oppose pre-grant publication indicated that any Patent Application Notice should contain information similar to what is published in the *Official Gazette* or sufficient information to determine whether further investigation was warranted. Those comments that opposed any pre-grant publication opposed publication of any information other than the applicant's name, address and a "non-enabling" abstract of the invention.

**Response:** The Technical Contents Publication will include a copy of the Patent Application Notice, and the specification, abstract, claims and drawings of the application-as-filed. The Technical Contents Publication will be available for public review through video display terminals in the Public Search Room and through CD-ROM collections of facsimile images of Patent Application Notices and Technical Contents Publications in the Patent and Trademark Depository Libraries. Copies of the Patent Application Notices and Technical Contents Publications will also be available for purchase under the conditions that paper copies of patents are currently available for purchase. When budgetary and process constraints permit, text searching of the Patent Application Notices and Technical Contents Publications will be implemented.

H.R. 1733, if enacted, would not provide any appropriations to cover the costs of early publication, but would provide that these costs are to be recovered by adjusting the filing, issue and maintenance fees, by charging a separate publication fee, or by any combination of these methods, i.e., that the patent applicant is to bear the costs of publication. A number of comments have criticized this method of allocating the publication costs as pre-grant publication provides no benefit to the patent applicant. The Office was required to balance the requests for a printed publication conveying the greatest amount of application information with those comments opposing additional publication costs. To provide the maximum amount of application information at the lowest cost to applicant, the specification, abstract, claims and drawings of the application-as-filed will be available for public review in the Technical Contents Publication.

4. Should the patent applicant receive a copy of the published application—either published notice and/or application content at time of publication?

**Summary:** A majority of the comments indicated that the



applicant should receive a copy of the Patent Application Notice.

**Response:** The Office proposes to provide for the delivery of the Patent Application Notice similar to the current delivery of patents.

5. Should the PTO permit an accelerated examination? If so, under what conditions?

**Summary:** A majority of the comments favored permitting accelerated examination. A number of comments indicated that accelerated examination should be provided for applicants who either: (1) meet the current conditions for accelerated examination; or (2) pay a relatively high fee, i.e., that the Office should add the payment of a high accelerated examination fee to the current conditions for providing an accelerated examination. A number of comments, however, indicated that adding the payment of a high accelerated examination fee to those conditions for providing an accelerated examination would benefit large companies at the expense of small entities.

**Response:** The Office will provide accelerated examination only under the current conditions set forth in § 1.102, as described in MPEP 708.02. Accelerated examination is currently provided depending upon the subject matter of the invention, medical condition of the applicant, business circumstances, or the willingness of the applicant to participate in a special accelerated examination procedure. Increasing the number of applications receiving accelerated examinations could diminish the availability or speed of accelerated examination to an individual applicant because there will be more applications receiving an accelerated examination. It would further delay the examination of applications not provided with accelerated examination. Adding a condition for providing accelerated examination which bears no relationship to the merits of the application or circumstances of the applicant, i.e., for the mere payment of a fee, is not considered appropriate. Therefore, the Office does not propose to change the conditions under which the examination of an application will be accelerated.

The Office, however, will continue to make special an application under the conditions currently set forth in MPEP 708.02 (VIII), special examining procedures for certain new applications - accelerated examination. MPEP 708.02 (VIII) provides that a new application may be granted special status provided that the applicant: (1) submits a written petition to make special accompanied by the fee set forth in § 1.17(i); (2) presents all claims directed to a single invention, or if the Office determines that all the claims presented are not obviously directed to a single invention, will make an election without traverse as a prerequisite to the grant of special status; (3) submits a statement that a pre-examination search was made; (4) submits one copy each of the references deemed most closely related to the subject matter encompassed by the claims; (5) submits a detailed discussion of the references pointing out with the particularity required by § 1.111(b) and (c) how the claimed subject matter is distinguishable over the references; and (6) submits any affidavit or declaration under § 1.131 that is necessary to overcome the references before the application is taken up for action, but in no event later than one month after request for special status. An application granted special status under MPEP 708.02 (VIII) will be taken up by the examiner before all other categories of applications except those clearly in condition for allowance and those with set time limits, such as examiner's answers, etc., and will be given a complete first action which will include all essential matters of merit as to all claims.

6. Since the cost for publishing applications must be recovered from fees, how should the cost of publication be allocated among the various fees, including the possibility of charging a separate publication fee?

**Summary:** The overwhelming majority of comments opposed a separate publication fee. Most comments indicated that the costs of publication should be spread over the existing fees, with the remaining comments indicating that these costs should be absorbed by those accessing the published applications or the Office.

**Response:** H.R. 1733, if enacted, would not provide appropriations for the Office to absorb the publication cost, but provides

that the "Commissioner shall recover the costs of early publication ... by adjusting the filing, issue, and maintenance fees, by charging a separate publication fee, or by any combination of these methods." Notwithstanding that H.R. 1733, if enacted, would not authorize the Office to recover the costs of publication through those seeking access to the published application, the demand for publication products, e.g., Patent Application Notices and Technical Contents Publications, would not be consistent, and it would not be possible to project the demand for publication products with the degree of precision necessary to recover a substantial portion of the publication costs through the inclusion of such costs in the fees charged for the publication products. In addition, the Office will supply, *inter alia*, CD-ROM collections of facsimile images of the Patent Application Notices and Technical Contents Publications under the condition that CD-ROM collections of patent images are currently supplied. As the Office has no authority to control the further duplication of such images, it would not be practicable to attempt to recover publication costs through increases in the fees charged for publication products, since those persons desiring copies of Patent Application Notices or Technical Contents Publications would simply obtain them from the original purchasers of the CD-ROM collections, who need not include any publication costs in their prices. Therefore, the Office proposes to adjust the filing, issue, and maintenance fees to recover the costs of publication.

In a Notice of Proposed Rulemaking published in the *Federal Register* at 60 FR 27934 (May 26, 1995) and in the Patent and Trademark Office *Official Gazette* at 1174 Off. Gaz. Pat. Office 134-50 (May 30, 1995), a number of changes to the rules of practice to, *inter alia*, adjust patent and trademark fees to reflect the fluctuations in the Consumer Price Index (CPI) pursuant to 35 U.S.C. 41(f) were proposed (Patent and Trademark Fee Notice of Proposed Rulemaking). The proposed patent and trademark fee adjustments, if adopted in final rules, would take effect on October 2, 1995 (October 1, 1995 being a Sunday), prior to the effective date of the fee increase in this notice of proposed rulemaking to recover the costs of publication. The proposed amendments to §§ 1.19(b)(1)(i) and 1.19(b)(1)(ii) are repeated in this notice of proposed rulemaking for clarity. The Office estimates that it will cost about \$9 million to publish applications in Fiscal Year 1996. To allocate these costs among the filing fees of those applications which the Office anticipates will be filed in Fiscal Year 1996, the issue fee for those applications for which the Office anticipates payment of an issue fee in Fiscal Year 1996, and maintenance fees due at three (3) years and six (6) months, seven (7) years and six (6) months, and eleven (11) years and six (6) months for those patents for which the Office anticipates payment of the respective maintenance fees in Fiscal Year 1996, a further increase in the filing fee for an original nonprovisional (35 U.S.C. 111(a)) or reissue application to \$780 (\$390 for a small entity) and a plant application to \$540 (\$270 for a small entity), issue fee for an original or reissue application to \$1280 (\$640 for a small entity) and a plant application to \$660 (\$330 for a small entity), maintenance fee due at three (3) years and six (6) months to \$1020 (\$510 for a small entity), maintenance fee due at seven (7) years and six (6) months to \$2020 (\$1010 for a small entity), and maintenance fee due at eleven (11) years and six (6) months to \$3020 (\$1510 for a small entity) is necessary to recover the costs of publication in Fiscal Year 1996. A comparison of existing fee amounts, fee amounts proposed in the Patent and Trademark Fee Notice of Proposed Rulemaking, and fee amounts proposed in this notice of proposed rulemaking is included as an Appendix B to this notice of proposed rulemaking.

7. Should the PTO require an affirmative communication from a patent applicant indicating that the applicant does not wish the application to be published, or should failure to timely submit a publication fee be taken as instruction not to publish the application? That is, should an application be published unless the applicant affirmatively indicates that the application is not to be published, regardless of whether a publication fee has been submitted?

What latitude should the PTO permit for late submission of a publication fee?

**Summary:** An overwhelming majority of the comments (except for those who opposed any pre-grant publication) favored a requirement that an applicant affirmatively communicate that an application is being expressly abandoned to avoid publication of the application at 18 months.

**Response:** The Office does not process applications as abandoned until seven (7) months after the mailing date of an Office action to allow for extensions of time under § 1.136(a) and mailing delays. Where no response to an Office action setting a shortened statutory period for response of three (3) months mailed at 13 months after filing in an application is received, the application becomes abandoned by operation of 35 U.S.C. 133 at 16 months after filing, but is not recognized or processed by the Office as an abandoned application until 20 months after filing, and thus would be published in regular course at 18 months. Therefore, an applicant intending to permit an application to become abandoned for failure to respond to an Office action mailed within seven (7) months of the projected publication date must take affirmative action to avoid publication of the application.

The Office intends to indicate the projected date of publication on the filing receipt. Any person who wants to avoid publication of the application at 18 months must submit a letter of express abandonment in sufficient time to permit the Office to act on the letter. Likewise, any person who considers the projected date of publication on the filing receipt to be incorrect must submit a request to correct the projected date of publication in sufficient time to permit the Office to act on the request.

Currently, the Office considers two (2) months to be the minimum time necessary to avoid publication of an application. Therefore, any letter of express abandonment or request to withdraw the application from publication submitted less than two (2) months from the projected date of publication will not be considered effective to avoid publication of the application at the projected date of publication. The Office also intends to indicate on the filing receipt the date by which an application must be expressly abandoned to avoid its publication.

8. The delayed filing of either a claim for priority under 35 U.S.C. 119 or 120 may result in the delayed publication of the application. Should priority or benefit be lost if not made within a reasonable time after filing? What latitude should the PTO permit for late claiming of priority or benefit?

**Summary:** A large majority of the comments indicated that claims for priority under 35 U.S.C. 119 and 120 should be lost if not timely filed. A number of comments also indicated that there should be provisions for the acceptance of late claims for priority.

**Response:** The submission of a claim for priority under 35 U.S.C. 119 or 120 later than four (4) months prior to the publication date appropriate for an application claiming that priority date will result in delays in the publication of the application and will interfere with the publication process. Therefore, the Office proposes to change the rules of practice to provide that claims for priority under 35 U.S.C. 119 or 120 must be made within two (2) months of filing, or fourteen (14) months from the filing date for which a benefit is desired, whichever is later. To avoid a potential loss of patent rights to an applicant who inadvertently failed to present a timely claim for priority, the Office further proposes to provide for the acceptance of late claims for priority submitted during the pendency of the application with a surcharge, so long as the delay in submitting the claim for priority was unintentional.

9. Once the patent has issued, should the paper document containing information similar to that published in the *Gazette of Patent Application Notices*, i.e., the Patent Application Notice, be removed from the search files, and should publication information be included on the issued patent?

**Summary:** A majority of the comments indicated that the Patent Application Notice should not be removed from the search files.

**Response:** The Office will not remove the Patent Application Notice from the search files upon issuance of the patent.

10. After publication, should access to the content of the appli-

cation file be limited to the originally filed application papers? If not, what degree of access should be permitted? Should access be limited to the content before publication, or should it extend to materials added after publication?

**Summary:** A majority of the comments indicated that, upon publication, the access to the content of the application file should not be limited.

**Response:** The Office proposes to change the rules of practice to provide that, upon publication, access to the entire content of the application file would be permitted. To avoid undue interference with the examination of the application, however, the public access to the application file of a pending published application is proposed to be limited to obtaining, upon the payment of the fee set forth in § 1.19(b)(2), a copy of the application file produced during non-working hours by the Office when the application file is made available by the appropriate patent application processing organization. The Office also proposes to provide, upon the payment of the fee(s) set forth in § 1.19(b)(4), as proposed, a copy of specifically identified document(s) contained in a pending published application.

The Office will provide public access to a database containing information concerning the status of a pending published application and the content of the application file similar to that contained in the Patent Application Location and Monitoring (PALM) system. Using this database, interested members of the public will be able to ascertain the status of a pending published application to determine whether obtaining a copy of the file wrapper and content of the application or any document(s) in the file wrapper is warranted. In addition, this database can also be used to permit specific identification of the document(s) of which a copy is desired, assuming that obtaining a copy of the entire file wrapper and content is not considered warranted.

The Office specifically proposes to provide a copy of a specifically identified document contained in a pending published application for a fee of \$75.00. Each paper in the application file to which a separate paper number is assigned constitutes a document in the application. As the cost of obtaining a pending published application from its location in the various patent application processing organizations throughout the Office is a substantial portion of the cost of providing a copy of the file wrapper and content of a pending published application, the fee for providing a copy of the first requested document from a pending published application must recover the cost of obtaining the application. The Office, however, will provide copies of additional documents from the same application in the same request for a fee of \$25.00 per document.

11. After publication, should assignment records of a published application also be made accessible to the public?

**Summary:** An overwhelming majority of the comments indicated that, upon publication, the assignment records of an application should be accessible to the public.

**Response:** The Office proposes to change the rules of practice to provide that, upon publication, the assignment records of the application would be available by both application and Patent Application Notice (PAN) number and open to public inspection through the existing Patent Assignment Search System. The Office further proposes to permit applicants to indicate on the assignment cover sheet whether they want assignment information to be printed on the Patent Application Notice. The Office, however, does not propose to require that any assignment information be printed on the Patent Application Notice.

12. After publication, should access include the deposit of biological materials as set forth in § 1.802 *et seq.*?

**Summary:** A majority of the comments indicated that, upon publication, any deposit of biological materials should be accessible to the public. A number of comments, however, indicated that such access should be limited in the manner similar to that in European or Japanese laws, or that such access should be limited to experimental use.

**Response:** Section 1.809(c) currently provides that the applicant need not provide any necessary deposit of biological materials until three (3) months from the mailing of the Notice of



Allowance and Issue Fee Due. The deposit of biological materials on filing of an application are often required by foreign laws. Applicants may not be able to claim priority under these laws based upon an earlier United States application filed without any necessary deposit of biological materials. The laws and rules of practice of the United States, however, do not require an applicant to make any deposit of biological materials until the application is allowed. See, *In re Lundak*, 723 F.2d 1216, 227 USPQ 90 (Fed. Cir. 1985). Accordingly, the Office proposes to change the rules of practice to provide that, upon publication, any deposit of biological materials that has been made would be available after deposit under the same conditions that such deposit of biological material would be available for an issued patent.

13. What types of problems will be encountered if all amendments must be made by (a) substitute paragraphs and claims, (b) substitute pages, or (c) replacement of the entire application?

**Summary:** A majority of the comments indicated that, if the rules of practice regarding the submission of amendments were changed, a requirement for substitute paragraphs and claims, or substitute pages would be acceptable.

**Response:** The Office currently considers changes in the procedures for entering amendments into applications to be unnecessary to the current planning approach to implementation of 18-month publication, and, as such, no change to the rules of practice to require substitute paragraphs and claims, substitute pages, or replacement of the entire application is being proposed.

14. Should protest procedures be modified to permit the third-party submission of prior art only prior to a specific period after publication of the application? What action should be taken with respect to untimely submissions by a third party?

**Summary:** A majority of comments indicated that third party submissions of prior art patents and publications should be permitted for a limited period upon publication, but the overwhelming majority of comments opposed any pre-grant opposition procedure.

**Response:** The Office does not intend to institute any procedures that would amount to pre-grant opposition. H.R. 1732 was also introduced in the House of Representatives on May 25, 1995, and, if enacted, will expand reexamination, i.e., post-grant opposition, proceedings to provide a third party requester with increased participation rights, including the right to appeal any decisions favorable to patentability to the Board of Patent Appeals and Interferences and to the courts. In view of the opposition to pre-grant third party participation, i.e., support for the continued *ex parte* examination of pending applications, the Office proposes to change the rules of practice to limit the period for filing protests and petitions for the institution of public use proceedings.

The Office proposes to change the rules of practice concerning protests to provide that a submission by a third party in a pending application would be considered if: (1) it is submitted within two months of the date the application was published or prior to the mailing of a notice of allowance under § 1.311, whichever occurs first; (2) the submission has been served on the applicant in accordance with § 1.248 if filed after the date the application was published, and the submission indicates such service; (3) the submission is accompanied by a \$220 fee if submitted after publication of the application; and (4) the application is still pending when the submission and application file is brought before the examiner.

The \$220 fee for a protest submitted after publication of the application is considered appropriate. Any party submitting a protest after publication has benefitted by the publication of the application. The third party should not obtain this benefit solely at the expense of the patent applicant, but should obtain this benefit only upon payment of a fee. In addition, it is expected that any protest submitted after publication of the application will be considered late in the prosecution of the application, which will cause inconvenience both to the patent applicant and the Office. Therefore, the requirement for the payment of a fee is considered appropriate to defray the costs

of the belated consideration of any such submission and discourage the submission of protests having questionable merit.

Third parties may continue to submit information concerning prior public use of the invention in accordance with § 1.292.

Currently, § 1.292 does not set forth a time period within which a petition for the institution of public use proceedings must be filed. The Office proposes to further amend § 1.292 to provide that the public use petition will be entered if submitted within two months of the publication date of the application or prior to the mailing of a notice of allowance under § 1.311, whichever occurs first.

The proposed changes to §§ 1.291 and 1.292 are intended to limit any right of third parties to have information entered and considered in a pending application. They do not vest the applicant with any right to prevent the Office from *sua sponte* making such information of record in the application or relying upon such information in subsequent proceedings in the application, i.e., they do not limit the authority of the Office to reopen the prosecution of an application to consider any information deemed relevant to the patentability of any claim.

A number of miscellaneous comments concerning the 18-month publication of patent applications were also received.

**Comment 1:** A number of comments opposed any pre-grant publication of pending applications as an improper limiting of the right of a patent applicant to maintain trade secrets, or argued that any pre-grant publication should not occur prior to 24 or 60 months from the earliest filing date.

**Response:** H.R. 1733, if enacted, would require the Commissioner to publish pending applications at 18 months. The proposed changes to the rules of practice concern the implementation of an 18-month publication system mandated by statute, not the advisability of an 18-month publication system. If legislation containing provisions for the publication of pending applications is enacted, it is not expected that the Office would have the discretion to determine whether or when pending applications are to be published. That is, it is expected that any legislation containing provisions for the publication of pending applications will mandate whether and when applications are to be published.

**Comment 2:** A number of comments indicated that the publication of pending applications should be joined with provisional rights.

**Response:** H.R. 1733, as proposed, provides for provisional rights. This issue, however, was not treated in the 18-Month Publication Notice or this notice of proposed rulemaking since it does not affect the way business is conducted with or within the Office.

**Comment 3:** One comment indicated that the requirement under 35 U.S.C. 112, first paragraph, for a disclosure of a best mode should be eliminated in view of 18-month publication.

**Response:** The requirement in 35 U.S.C. 112, first paragraph, for a disclosure of a best mode is a statutory, not regulatory, requirement. Therefore, the Office has no authority to eliminate or limit this requirement of the patent statutes.

**Comment 4:** One comment indicated that any publication of patent applications should address the situation in which: (1) an applicant files a continuing application prior to receiving a patent, and then maintains the pendency of continuing application(s), which are maintained in confidence, to obtain claims of various scope; (2) a second party invests resources in developing a product which does not infringe the claims of the patent, but which the applicant could draft claims in the continuing application(s) to cover; and (3) the applicant then permits a continuing application having claims which covers the second party's product to issue, thus checkmating the second party.

**Response:** H.R. 1733, if enacted, would provide that applications shall be published "as soon as possible after the expiry of a period of 18 months from the earliest filing date for which a benefit is sought." Any continuing application which claims priority from any prior application would be published either 18 months after the filing date of the earliest filed prior application or as soon as possible after filing of the continuing application, and thus would not be maintained in confidence.

**Comment 5:** One comment indicated that applicants should obtain the defensive benefit of their filing date in a published application regardless of whether the application issues as a patent, either by statute or rule.

**Response:** H.R. 1733, if enacted, would provide that a pub-

lished application is prior art under 35 U.S.C. 102(e) as of its filing date. As prior art is defined by statute, i.e., 35 U.S.C. 102, the Office has no authority to promulgate regulations defining what does or does not constitute prior art.

**Comment 6:** One comment indicated that any rulemaking should be postponed until there is pending legislation, and it is clear as to what form 18-month publication will take.

**Response:** As legislation has been introduced, it is now appropriate to initiate the rulemaking process, the form that 18-month publication will likely take is known. As such, in light of the changes that would be necessitated by this legislation, the requirement for a rapid implementation, if enacted, and a desire on the part of the Office to receive public input prior to initiating the rulemaking process. If H.R. 1733 is amended during the legislative process, the final rules will comply with this legislation as enacted. If H.R. 1733 is not enacted, the proposed rules that would implement publication of patent applications would be withdrawn.

**Comment 7:** One comment indicated that it is unclear as to whether, when a restriction requirement is applied, each application will require a separate publication fee.

**Response:** No separate publication fee has been proposed. In accordance with current practice, each application would require separate filing, issue, and maintenance fees, which fees will be increased to recover the costs of publication.

**Comment 8:** Several comments indicated that the Office should not impose access fees for either copying the paper application files, or searching and copying a published application from any electronic data base.

**Response:** As discussed *supra*, the Office intends to provide free public access to images of the Patent Application Notices and Technical Contents Publications through video display terminals in the Public Search Room and through CD-ROM collections of facsimile images of Patent Application Notices and Technical Contents Publications in the Patent and Trademark Depository Libraries. Copies of the Patent Application Notices, Technical Contents Publications, or copies of the file wrapper and contents of the application will be available for a fee. The costs of publication have been allocated primarily to those applicants whose applications are being published. Since publication primarily benefits those seeking access to the published applications, it is reasonable to require such persons to pay a fee for making copies of the Patent Application Notices and Technical Contents Publications, or obtaining a copy of the file wrapper and application contents of a published application from the Office.

**Comment 9:** One comment indicated that the publication of applications may result in instances in which third parties will submit information to the applicant directly, rather than to the Office. In instances in which the applicant was previously aware of the information, but did not consider it material, the applicant cannot submit the information to the Office in that application (if after final or allowance), but will be charged with a § 1.56 violation if they do not file a continuation application to have it considered. Thus, § 1.56 should be amended such that an applicant in this situation no longer has a duty to submit information to the Office.

**Response:** Section 1.56 expressly provides that there is no duty to submit information which is not material to the patentability of any existing claim. Since the applicant previously determined that the information was not material, the fact that a third party has provided this previously known material to the applicant has no effect on the applicant's compliance with § 1.56. Second, since the applicant was previously aware of this information, the applicant is under a duty to bring such information to the attention of the Office if it is material, regardless of the actions of any third party, and the applicant is not under a duty to bring such information to the attention of the Office if it is not material, again regardless of the actions of any third party. In either instance, the third party's actions have no bearing on whether the applicant is in compliance with § 1.56. Therefore, no change to § 1.56 is being proposed.

**Comment 10:** One comment indicated that § 1.56 should be modified or abolished. Where information is brought to the attention of the applicant after allowance, the applicant should be considered to have met his or her duty of disclosure under § 1.56 if the applicant simply chooses to permit the patent to issue, as the public can take care of itself through reexamination or whatever opposition proceedings are instituted.

**Response:** As indicated *supra*, no change to § 1.56 is being proposed. In addition, the Office is proposing to limit third party protest procedures, and is not proposing to develop any procedures amounting to pre-grant opposition. Since the Office is continuing the *ex parte* examination of applications, the proposed modification or abolition of § 1.56 is not considered appropriate.

**Comment 11:** One comment indicated that an applicant should be allowed to request early publication.

**Response:** Section 1.306(d) is being proposed to provide for petitions requesting early publication.

**Comment 12:** One comment indicated that the Office should require that the text of all applications be filed in digital form, and the publication of applications should be purely digital, i.e., that Office should not print any publication.

**Response:** 35 U.S.C. 22 provides that "[t]he Commissioner may require papers filed in the Patent and Trademark Office to be printed or typewritten." Therefore, the Office does not currently have the authority to require that application papers be submitted in digital form. The Office is considering the legislative and regulatory changes that would be necessary to permit purely digital filing of application papers; however, requiring all applicants to submit application papers in digital form at this time would place an unnecessary burden on those applicants lacking word-processing resources. In addition, the Office received a substantial number of comments requesting a printed publication containing more information, as well as a number of comments opposing the promulgation of any regulations concerning a standard application format which were in excess of EPO and PCT regulations and not necessary to 18-month publication.

**Comment 13:** One comment indicated that the Office should clearly define or eliminate the "formal" pre-examination search requirement in MPEP 708.02.

**Response:** MPEP 708.02(VIII) provides that an application may be granted special status under the condition that, *inter alia*, the applicant:

Submits a statement that a pre-examination search was made, and specifying whether by the inventor, attorney, agent, professional searchers, etc., and listing the field of search by class and subclass, publication, Chemical Abstracts, foreign patents, etc. A search made by a foreign patent office satisfies this requirement.

This definition of a pre-examination search is reasonably clear as to what actions are necessary for an applicant to have satisfied this requirement of MPEP 708.02(VIII), and the requirement for a pre-examination search is basic to the justification for granting special status to an application on that basis. No changes to 37 CFR 1.102 are being proposed.

**Comment 14:** One comment indicated that the publication of applications at 18 months will create a security review problem, especially where a nonprovisional, i.e., 35 U.S.C. 111(a), application claiming the benefit of a prior provisional application not subject to a secrecy order contains additional material which must be reviewed. Therefore, the Office should require that any nonprovisional applications claiming the benefit of a prior provisional application indicate any additional material by underlining and bracketing.

**Response:** Provisional applications will increase the number of applications requiring security screening. All provisional applications will require security screening immediately after filing in the same manner as nonprovisional applications due to the licensing provision of 35 U.S.C. 184. Any subsequent U.S. patent application claiming the benefit of a prior provisional application will also require security screening unless it is evident on its face that no additional subject matter is contained in the application beyond that in the provisional application. It would be beneficial for the applicant to provide this information to the Office upon filing of the nonprovisional application. Thus, the Office is considering suggesting that applicants employ a standard application transmittal letter similar to the standard transmittal letter for transmitting an international application to the United States Receiving Office (PTO-1382). This standard transmittal letter would indicate, *inter alia*: (1) any difference between a provisional application and a nonprovisional application claiming the benefit of the provisional application; (2) the residence of the inventor(s) to avoid



the unnecessary screening of foreign origin applications; and (3) any Government interests in the application, which applications should be screened through contract provisions.

**Comment 15:** One comment indicated that the Office should automatically place a secrecy order on any nonprovisional application in which the prior provisional application was under a secrecy order.

**Response:** The Office does not have the authority to impose a secrecy order without a specific recommendation from a defense agency. 35 U.S.C. 181. Additionally, all secrecy orders include the provision that any other patent application already or hereafter filed in this or any foreign country which contains any significant part of the subject matter of the application under secrecy order also falls within the scope of the secrecy order and must be brought to the immediate attention of Licensing and Review. See § 5.2(d). All papers pertaining to such applications must be filed under the provisions of § 5.33, i.e., to the attention of Licensing and Review. Thus, the applicant is obligated to maintain proper security of any nonprovisional application that claims benefit of a prior provisional application under a secrecy order.

**Comment 16:** One comment expressed concern that the defense agencies may not have sufficient time to complete national security review of applications made available to them under 35 U.S.C. 181 prior to publication at 18 months from the earliest filing date for which a benefit is sought, and suggested that applications not be published until they have been cleared by the defense agencies.

**Response:** H.R. 1733, if enacted, would provide for withholding an application from publication beyond 18 months from the earliest filing date for which a benefit is sought if the application is under a secrecy order or abandoned. There is no provision for delaying the publication of an application until a completion of all reviews under 35 U.S.C. 181. In addition, 35 U.S.C. 184 authorizes foreign filing of an application without the need for a license once the application has been on file for at least six (6) months. In view of 35 U.S.C. 184, the defense agencies must complete all security reviews within six (6) months of filing to prevent public disclosure. Thus, security review must be completed within six (6) months of the actual U.S. filing date. For those applications due for publication prior to six (6) months from the actual filing date, e.g., those claiming the benefit of an earlier application filed more than 18 months prior and those which a petition for early publication has been granted, considerations of national security mandate a limited delay in publication. The Office will not pass an application for publication that is still under review by a defense agency unless it has been on file for at least six (6) months and the defense agency has been provided a minimum of three (3) months to review the application.

**Comment 17:** One comment indicated that the digitized images of the application file contents should be available in magnetic tape form in the morning of the day of publication.

**Response:** Digitized images of the Patent Application Notice and Technical Contents Publication will be available in magnetic tape form for a fee to all parties as soon as possible after publication similar to the way in which digitized images of granted patents are provided, assuming that there is interest in such products.

**Comment 18:** One comment indicated that it is unclear as to whether an examiner can cite the Patent Application Notice, and whether the examiner will be required to supply the full application specification.

**Response:** When an examiner cites a published application, a copy of the Technical Contents Publication will be provided with the Office action under the same conditions that a copy of the entire patent of any cited patent would currently be provided. That is, where an examiner would provide only those portions of a patent relied upon, rather than a copy of the entire patent due to its size, i.e., in instances of jumbo patents, the examiner would similarly be expected to provide only those portions of a published application relied upon in instances of jumbo applications.

**Comment 19:** One comment indicated that the entire application as filed should be published, otherwise the abandoned published application must be permanently stored in a manner that would permit on-site retrieval.

**Response:** The Technical Contents Publication of any published application will be electronically available, without any

necessity for retrieval of the actual application file. Therefore, a printed publication of the application-as-filed would not provide any information not electronically available. Nevertheless, the actual file of an abandoned application may be readily obtained regardless of where it is stored.

**Comment 20:** One comment indicated that the 18-Month Publication Notice did not set forth the capacity of Patent and Trademark Depository Libraries (PTDLs) to: (1) collect fees, (2) provide librarians of assistance, and (3) house new publications.

**Response:** Each PTDL sets its own service standard procedures. Any customer must directly contact the PTDL to ascertain its customer service standards and requirements. Nevertheless, as the Office proposes to publish only a Patent Application Notice, rather than the entire application-as-filed, in printed form, and further proposes to provide the Patent Application Notices and Technical Contents Publications to PTDLs through CD-ROM collections of facsimile images, this publication of applications would appear to alleviate, rather than exacerbate, any publication storage housing problems.

**Comment 21:** One comment indicated that the Office should provide a first Office action on the merits in all patent applications within 14 months of the actual filing date of the application in the United States.

**Response:** The ability of the Office to process application within any established time frame is entirely dependent upon the staff and resources allocated by Congress, the Office of Management and Budget (OMB), and the Department of Commerce (DoC). In January of 1995, the first Office action was mailed within 14 months of the actual filing date of the application in the United States in ninety-two (92) percent of all applications in which a first Office action was mailed. Any applicant who absolutely needs a first Office action on the merits mailed within 14 months of the actual filing date of the application should consider a petition to make special using the special examining procedure for certain new applications set forth in MPEP 708.02(VIII). In addition, any independent inventor meeting the requirements set forth in 35 U.S.C. 122(b)(2) and § 1.306(e), as proposed, may wish to consider filing the application with a petition under § 1.306(e).

**Comment 22:** One comment noted the current procedure of permitting applicants to submit trade secret material and later expunge the material if it is not necessary to patentability, and indicated that new procedures should be implemented in the content of pre-grant publication of pending applications.

**Response:** The current procedures for the treatment of petitions to expunge trade secret, proprietary, or protective order material are set forth in MPEP 724.05. Applicants are cautioned, in MPEP 724.05, that in instances in which a decision on the petition is not made prior to the date on which the application issues as a patent, any material in the application file will remain open to public inspection, and, as such, petitions to expunge must be filed as soon as possible. Under an 18-month publication system, any material in the application file on the date the application is published would likewise remain open to public inspection. However, as petitions to expunge are considered under § 1.182, i.e., petitions not otherwise provided for, no change to the rules of practice regarding petitions to expunge is being proposed.

#### Discussion of Specific Rules

Title 37 of the Code of Federal Regulations, Parts 1, 3 and 5, are proposed to be amended as follows:

Section 1.4(a), as proposed, would add Patent Application Notices and Technical Contents Publications to those services and facilities which correspondence with the Office may comprise.

Section 1.5(a), as proposed, would provide that any letter concerning an application must identify on the top page in a conspicuous location, the application number (consisting of the series code and the serial number) or serial number and filing date assigned to that application by the Office, or the international application number of the international application, regardless of whether the application is a published application. That is, the identification required for a pending or abandoned application would not change due to its status as a published application.

Section 1.5(f), as proposed, would provide that a paper concerning a provisional application must identify the application as such and by the application number.

Section 1.5(g), as proposed, would provide that a paper relating to a Patent Application Notice should identify it as such and by the Patent Application Notice number. That is, a paper concerning a published application must identify the application by application number, not Patent Application Notice number; however, a paper concerning the Patent Application Notice *per se* must identify it by Patent Application Notice number.

Section 1.9(a), as proposed, would define an international application in subparagraph (a)(4), rather than in paragraph (b).

Section 1.9(b), as proposed, would now define a published application as an application for patent which has been published pursuant to 35 U.S.C. 122(b).

A new § 1.9(h), as proposed, would define national security classified as specifically authorized under criteria established by Act of Congress or Executive Order to be kept secret in the interest of national defense or foreign policy and in fact properly classified pursuant to Act of Congress or Executive Order.

Section 1.11, as proposed, would provide that, like an issued patent or a statutory invention registration, the specification, drawings, and all papers relating to the case in the file of an abandoned published application would be open to inspection by the public. Section 1.11, as proposed, would further provide that a copy of the specification, drawings, and all papers relating to the case in the file of any published application, a patent, or statutory invention registration may be obtained upon the payment of the fee set forth in § 1.19(b)(2). That is, while the actual application file of an abandoned published application, patent, and statutory invention registration would be available for public inspection, the actual application file of a pending published application would not be available for public inspection, but a copy of the specification, drawings, and all papers relating to a pending published application would, upon the payment of the fee set forth in § 1.19(b)(2), be provided to any member of the public.

Section 1.12, as proposed, would provide that the assignment records relating to published applications are available and open to public inspection at the Office, and copies of those assignment records may be obtained upon request and payment of the fee. Section 1.12 would further exclude the assignment records of published applications from those records that are preserved in confidence. Finally, § 1.12, as proposed, would revise paragraph (c) to read "preserved in confidence under § 1.14" for consistency with § 1.14.

Section 1.13, as proposed, would provide that, like an issued patent, certified and non-certified copies of Patent Application Notices, Technical Contents Publications, and the file wrapper and contents of published applications would, upon payment of a fee, be furnished to any person.

Section 1.14, as proposed, would revise the title and paragraphs (a) and (c) to read "preserved in confidence" for consistency with the language in 35 U.S.C. 122.

Section 1.14(a), as proposed, would provide that published applications are excluded from those pending and abandoned applications which are maintained in confidence. Section 1.14(a), as proposed, would further change "the United States of America has been indicated as a Designated State in a published international application" to "a published international application in which the United States of America has been indicated as a Designated State" for clarity, and add "U.S. published application" to those documents in which identification of an application by application number or serial number and filing date would entitle the public to status information concerning the application. Section 1.14(a), as proposed, would further provide that reference to an application in a U.S. published application or patent, or identification of an application by application number or serial number and filing date in a published patent document or a published international application in which the United States of America has been indicated as a Designated State would entitle the public to the application number, filing date, and status information concerning any application claiming the benefit of the identified or referenced application. Finally, § 1.14(a), as proposed, would replace the phrase "serial number" with "application number or serial number and filing date" since the mere reference to a serial

number without the series code (application number) or filing date would not constitute a reference to a specific single application.

Section 1.14(b), as proposed, would provide that published applications, as well as applications that are referred to in a published application, are excluded from those abandoned applications which are not open to public inspection. Section 1.14(b), as proposed, would further provide that applications that are referred to in applications open to public inspection pursuant to this section and applications which claim the benefit of an application open to public inspection pursuant to this section are also excluded from those abandoned applications which are not open to public inspection. Finally, § 1.14(b), as proposed, would further remove applications that have been published pursuant to 35 U.S.C. 122(b) from those abandoned applications that may be destroyed after 20 years from their filing date.

Section 1.16(a), (h) and (g), as proposed, would increase the filing fee for an original nonprovisional (35 U.S.C. 111(a)) or reissue application to \$780 (\$390 for small entities), and plant application to \$540 (\$270 for small entities). The filing fee for a design application would not be affected by this proposed rule change.

Section 1.17(i), as proposed, would add petitions under § 1.306(d) for early publication of an application, petitions under § 1.306(e) for deferred publication of an application, and under § 1.701(f) for patent term extension based upon administrative delays not specifically provided for to the list of petitions for which the fee set forth in § 1.17(i) is required.

A new § 1.17(t), as proposed, would be added to establish the fee for submitting a protest under § 1.291 after publication of an application.

A new § 1.17(u), as proposed, would be added to establish the surcharge for accepting a late claim for priority under 35 U.S.C. 119(a)-(d) or for the benefit of a prior application under 35 U.S.C. 119(e), 120 or 121 filed during the pendency of the application.

Section 1.18(a) and (c), as proposed, would increase the issue fee for an original or reissue application to \$1280 (\$640 for small entities), and plant application to \$660 (\$330 for small entities). The issue fee for a design application would not be affected by this proposed rule change.

Section 1.19(a)(1), as proposed, would add Patent Application Notices to the documents that the Office would supply in the manner of a patent upon payment of a fee.

A new § 1.19(a)(4), as proposed, would add Technical Contents Publications to the documents that the Office would supply upon payment of a fee.

Section 1.19(b)(2), as proposed, would add the file wrapper and contents of published applications to the files that the Office would supply a copy of upon payment of a fee.

Current § 1.19(b)(4), as proposed, would be redesignated as § 1.19(b)(5), and would add the assignment records of published applications to the assignment records that the Office would supply upon payment of a fee.

A new § 1.19(b)(4), as proposed, would provide the fees for a certified or uncertified copy of documents contained in a pending application. Section 1.19(b)(4)(i), as proposed, would provide that the fee for a certified or uncertified copy of the first document contained in a pending application would be \$75.00. Section 1.19(b)(4)(ii), as proposed, would provide that the fee for a copy of each commonly requested additional document contained in such pending application would be \$25.00. That is, while the fee for the first document contained in a pending application would be \$75.00, the fee for a copy of each additional document contained in the same pending application and requested together with the first document would be \$25.00. Where, however, a person requests a first document from a pending published application, and subsequently requests an additional document, the additional document was not commonly requested with the first document, and the fee for the additional document would be \$75.00. Nevertheless, the fee for any further additional document(s) commonly requested with the additional document would be \$25.00 per additional document.

Section 1.19(c), as proposed, would provide that copies of all Technical Contents Publications published annually would also be provided to libraries upon payment of the fee for copies of all patents issued annually.



Section 1.20(e)-(g), as proposed, would increase the fee for maintaining an original or reissue patent in force beyond four years, eight years, and twelve years, respectively, to \$1020, \$2020, and \$3020, respectively (\$510, \$1010, and \$1510, respectively, for small entities).

Section 1.24, as proposed, would add the purchase of copies of Patent Application Notices and Technical Contents Publications to those documents for which the coupons set forth therein may be used.

Section 1.51(a)(1), as proposed, would further provide that a complete application comprises, *inter alia*, an abstract.

Section 1.52(a), as proposed, would provide that all papers which are to become a part of the permanent records of the Office must be legibly typed in permanent dark ink in portrait orientation on flexible, strong, smooth, non-shiny, durable and white paper. Currently, § 1.52(a) permits such papers to be hand-written, and does not limit the color of the ink or paper, quality of the paper, or orientation of the typing. Section 1.52(a), as proposed, would further provide that the application papers must be presented in a form having sufficient clarity and contrast between the paper and the typing thereon to permit electronic reproduction by use of digital imaging and optical character recognition, as well as the direct reproduction currently provided for. Section 1.52(a), as proposed, would further provide that substitute typewritten papers "will," rather than "may," be required if the original application papers are not of the required quality. As any substitute typewritten papers containing the subject matter of the originally filed application papers would constitute a substitute specification, the provisions of § 1.125 governing the entry of a substitute specification would be applicable, and § 1.52(a), as proposed, would include a specific reference to § 1.125.

Section 1.52(b), as proposed, would provide that the claims must be set forth on a separate sheet. Section 1.72(b) currently provides that the abstract must be set forth on a separate sheet. Thus, §§ 1.52(b), as proposed, and 1.72(b) would require that the abstract and claims be set forth on a separate sheet. Section 1.52(b), as proposed, would further provide that the sheets of paper must be the same size and either 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches), with a top margin of at least 2.0 cm. (3/4 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 2.0 cm. (3/4 inch), and a bottom margin of at least 2.0 cm. (3/4 inch), and that no holes should be provided in the paper sheets. Section 1.52(b) currently provides that papers must be written on but one side, but this phrase is proposed to be changed to "typed on but one side" to conform to § 1.52(a) which, as proposed, would no longer permit hand-written or hand-printed ("written or printed") papers. Section 1.52(b), as proposed, would further provide that the lines "must," rather than "should," be 1 1/2 or double spaced, and that the pages "must," rather than "should," be numbered consecutively, starting with page one, with the numbers being centrally located above or below the text. Finally, § 1.52(b), as proposed, would specifically reference drawings to clarify that drawings are part of the application papers, but that the standards for drawings are set forth in § 1.84.

Section 1.52(d), as proposed, would provide that where an application is filed in a language other than English, the verified English translation of the non-English-language application and the fee set forth in § 1.17(k) are required to be filed with the application or within such time period as may be set by the Office, and that extensions of time pursuant to § 1.136(a) would not be available for submitting the English translation.

Section 1.53(d)(1), as proposed, would further provide that the applicant will be given a time period within which to file an abstract and claims on a separate sheet, or substitute specification in compliance § 1.125 with papers typed on but one side of the paper or new sheets of drawings, each of the substitute specification and sheets of drawings of sufficient clarity, contrast, and quality, and in a proper size and format for electronic reproduction in instances in which the application papers did not comply with §§ 1.52(a) and (b), as proposed, or the drawings were of such poor quality as to preclude their digital image scanning into the electronic data base. Section 1.53(d)(1), as proposed, would further provide that extensions of time pursuant to § 1.136(a) would not be available for filing an abstract and claims on a separate sheet, and a substitute specification with papers typed on but one side of the paper

and sheets of drawings, each of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction.

Section 1.54(b), as proposed, would provide that the applicant will be informed of the application number, filing date, and projected publication date on a filing receipt. The phrase "application serial number" would be changed to "application number" for consistency with § 1.5(a).

Section 1.55(a), as proposed, would provide that any claim to priority under 35 U.S.C. 119(a)-(d) must be stated within two months of filing or within fourteen months of the date of the prior foreign application, whichever is later, and must identify the prior foreign application by specifying its application number, country, and day, month and year of its filing. The proposed amendment to § 1.55, however, would not affect claims to priority under 35 U.S.C. 172, and would not affect the time periods set forth in § 1.55(a) for the perfection of any claim for priority under 35 U.S.C. 119 (a)-(d), i.e., the filing of a certified copy of the foreign application.

Section 1.55(c), as proposed, would provide a procedure for the acceptance of claim to priority under 35 U.S.C. 119(a)-(d) presented after the time period set in § 1.55(a). The procedure would require the filing of a petition during the pendency of the application requesting acceptance of the delayed claim, the surcharge set forth in § 1.17(u), and a statement that the delay was unintentional.

Section 1.55(d), as proposed, would provide that the time periods set forth in this section, i.e., two months of filing or within fourteen months of the filing date of the prior foreign application as set forth in § 1.55(a), and during the pendency of the application as set forth in § 1.55(c), cannot be extended.

Section 1.58(b), as proposed, would be removed and reserved as unnecessary in view of the proposed amendments to §§ 1.52(a) and (b).

Section 1.58(c), as proposed, would delete the sentence "[i]f it is not possible to limit the width of a formula or table to 5 inches (12.7 cm.), it is permissible to present the formula or table with a maximum width of 10 3/4 inches (27.3 cm.) and to place it sideways on the sheet" and "[h]and lettering must be neat, clean, and have a minimum character height of 0.08 inch (2.1 mm.)" to conform to the typing and paper size and orientation limitations in §§ 1.52(a) and (b), as proposed. Section 1.58(c), as proposed, would further provide metric dimensions with English equivalents in parentheses, rather than *vice versa*.

Section 1.60(d), as proposed, would provide that the applicant will be given a time period, which is not extendable under § 1.136(a), within which to file an abstract and claims on a separate sheet, and a substitute specification in compliance with § 1.125 with papers typed on but one side of the paper and sheets of drawings, each of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction where the papers of the prior application did not comply with §§ 1.52(a) and (b), as proposed, or the drawings of the prior application were of such poor quality as to preclude their digital image scanning into the electronic data base.

Section 1.62(d), as proposed, would provide that the applicant will be given a time period, which is not extendable under § 1.136(a), within which to file any substitute specification and drawings required under § 1.62(e)(2), discussed *infra*.

Section 1.62(e), as proposed, would be subdivided into paragraphs (e)(1) and (e)(2) for clarity. Section 1.62(e)(1), as proposed, would contain the first two (2) sentences of § 1.62(e) without change. Section 1.62(e)(2), as proposed, would provide that a substitute specification and drawings would be required when the application being filed under § 1.62 is a continuation-in-part application. Section 1.62(e) currently provides that no copy of the prior application or new specification is required, that the filing of a copy of the prior application or new specification is in fact considered improper, and that a petition with instructions to cancel the copy of the prior application or new specification is necessary to obtain the date of deposit of the request for an application under § 1.62 as the filing date. Section 1.62(e)(2), as proposed, would provide that any new specification filed will not be considered part of the original application papers, but will be treated as a substitute specification in accordance with § 1.125.

Section 1.62(f), as proposed, would amend "35 U.S.C. 122" to read "35 U.S.C. 122(a)" to reflect the changes in H.R. 1733,

if enacted, would change "secrecy" to "confidence" as is found in § 1.14, as proposed, and would change "37 CFR 1.14" to "§ 1.14" for consistency.

Section 1.72(b), as proposed, would provide that the abstract should be prior to the first page of the specification, rather than following the claims, to conform to § 1.77, as proposed.

Section 1.75, as proposed, would include an amendment to paragraph (g), and would add two new paragraphs. Section 1.75(g), as proposed, would add the phrase "the least restrictive claim should be presented as claim number 1" to paragraph (g) to facilitate the selection of a representative claim. Section 1.75(h), as proposed, would provide that the claim or claims must be set forth on a separate sheet. Section 1.75(i), as proposed, would provide that where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation to facilitate the digital image and/or OCR scanning of the claim into the electronic data base.

Section 1.77, as proposed, would provide that the elements of the application, if applicable, should appear in the following order: (1) Utility Application Transmittal Form; (2) Fee Transmittal Form; (3) abstract of the disclosure; (4) title of the invention; or an introductory portion stating the name, citizenship, and residence of the applicant, and the title of the invention may be used; (5) cross-reference to related applications; (6) statement regarding federally sponsored research or development; (7) reference to a "Microfiche appendix; (8) background of the invention; (9) brief summary of the invention; (10) brief description of the several views of the drawing; (11) detailed description; (12) claim or claims; (13) drawings; (14) executed oath or declaration; and (15) sequence listing. The phrase "if applicable" is proposed to be inserted in the heading, rather than associated with any particular listed element, to clarify that § 1.77 does not *per se* require that an application include all of the listed elements, but merely provides that any listed element included in the application should appear in the order set forth in § 1.77. Section 1.77, as proposed, would further provide that the (1) abstract of the disclosure; (2) title of the invention; (3) cross-reference to related applications; (4) statement regarding federally sponsored research or development; (5) background of the invention; (6) brief summary of the invention; (7) brief description of the several views of the drawing; (8) detailed description; (9) claim or claims; and (10) sequence listing, should appear in upper case, without underlining or bold type, as section headings, and if no text follows the section heading, the phrase "Not Applicable" should follow the section heading. Finally, § 1.77, as proposed, would be amended to change the reference to § 1.96(b) in § 1.77(c)(2), § 1.77(a)(7) as proposed, to § 1.96(c) for consistency with § 1.96, as proposed.

Section 1.78(a)(2), as proposed, would provide that any claim to the benefit of any prior filed copending nonprovisional application or international application designating the United States of America must be stated within two months of filing or fourteen months from the filing date of the prior application, whichever is later, and must include an identification of the prior application by application number.

Section 1.78(a)(3), as proposed, would delete the sentence "[s]ince a provisional application can be pending for no more than twelve months, the last day of pendency may occur on a Saturday, Sunday, or Federal holiday within the District of Columbia which for copendency would require the nonprovisional application to be filed prior to the Saturday, Sunday, or Federal holiday." In view of the proposed amendment in H.R. 1733 to 35 U.S.C. 119(e), the provisions of § 1.7 would be applicable to a nonprovisional application claiming the benefit of a prior provisional application.

Section 1.78(a)(4), as proposed, would provide that any claim to the benefit of any prior filed copending provisional application must be stated within two months of filing or within fourteen months of the filing date of the prior application, whichever is later, and must include an identification of the prior application by application number.

Section 1.78(a)(5), as proposed, would provide a procedure for the acceptance of a delayed claim to priority under 35 U.S.C. 119(e), 120 or 121. The procedure would require the filing of a petition during the pendency of the application requesting acceptance of the delayed claim, the surcharge set forth in § 1.17(u), and a statement that the delay was unintentional.

Section 1.78(a)(6), as proposed, would provide that the time periods set forth in this paragraph, i.e., two months of filing or within fourteen months of the filing date of the prior application as set forth in §§ 1.78(a)(2) and (a)(4), and during the pendency of the application as set forth in § 1.78(a)(5), cannot be extended.

Section 1.78(c), as proposed, would change "two or more applications or an application and a patent" to "an application or a patent under reexamination and an application or a patent" such that the provisions of § 1.78(c) will also be applicable to a patent under reexamination. Section 1.78(c), as proposed, would further correct "inventors and owned by the same party contain conflicting claims" to read "inventors are owned by the same party and contain conflicting claims."

Section 1.78(d), as proposed, would change "obviousness-type double patenting rejection" to "non-statutory double patenting rejection" as current examining procedures authorize non-obviousness-type double patenting rejections, as well as obviousness-type double patenting rejections (MPEP 804(II)), and either may be obviated by filing a terminal disclaimer in accordance with § 1.321(b). Section 1.78(d), as proposed, would further change each instance of "application" to "application or a patent under reexamination" for consistency with § 1.321(b) and to clarify that double patenting is a proper consideration in reexamination (*Ex parte Obiaya*, 227 USPQ 58, 60-61 (Bd. Pat. App. & Inter. 1985)), and that a non-statutory double patenting rejection in a patent under reexamination may be obviated by filing a terminal disclaimer in accordance with § 1.321(b).

Section 1.84(c), as proposed, would provide that a reference to the application number, or, if an application number has not been assigned, the inventor's name, may be included in the left-hand corner of the drawing sheet, provided that reference appears within 1.5 cm. (9/16 inch) from the top of the sheet. As the back side of a drawing sheet will not be scanned into the electronic data base, an applicant can include other identifying indicia on the back side of the drawing sheet.

Section 1.84(f), as proposed, would provide that the size of all drawing sheets in an application must be either 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches) to conform to the requirement in § 1.52(b) concerning papers in an application.

Section 1.84(g), as proposed, would be amended to delete the margin requirements for the sheet sizes that would no longer be acceptable if the proposed change to § 1.84(f) were adopted. Section 1.84(g), as proposed, would be further amended to provide that, to facilitate digital image scanning of the drawing sheets, the sheets should have scan targets (cross-hairs) on two cater-corner margin corners. Finally, § 1.84(g), as proposed, would increase the bottom and side margins such that each sheet must include a top margin of at least 2.5 cm. (1 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 1.5 cm. (9/16 inch), and a bottom margin of at least 1.0 cm. (3/8 inch), thereby leaving a sight no greater than 17.0 cm. by 26.2 cm. on 21.0 cm. by 29.7 cm. (DIN size A4) drawing sheets, and a sight no greater than 17.6 cm. by 24.4 cm. (6 15/16 by 9 5/8 inches) on 21.6 cm. by 27.9 cm. (8 1/2 by 11 inch) drawing sheets.

Section 1.84(j), as proposed, would provide that one of the views should be suitable for publication in the Patent Application Notice, and the *Gazette of Patent Application Notices*, as well as the *Official Gazette*, as the illustration of the invention.

Section 1.84(x), as proposed, would be amended to delete the provisions indicating the proper location for holes in a drawing sheet, and provide that no holes should be provided in the drawing sheets.

Section 1.85, as proposed, would provide that drawings must be suitable for "electronic" reproduction "by digital imaging" before being admitted for examination. As discussed *supra*, as a drawing figure will be included in the *Gazette Entry* in the *Gazette of Patent Application Notices* and the Patent Application Notice, drawings suitable for electronic reproduction by digital imaging would be necessary for the initial processing of the application.

Section 1.96, as proposed, would be amended to designate the text preceding current paragraph (a) as paragraph (a), and would redesignate current paragraphs (a) and (b) as paragraphs (b) and (c), respectively. New § 1.96(a), as proposed, would be further amended to insert a period between "specification"



and "[a] computer," to change "these rules" to "this section," and to change "may be submitted in patent applications in the following forms" to "may be submitted in patent applications as set forth in paragraphs (b) and (c) of this section."

New § 1.96(b), as proposed, would be further amended to change the sentences "[t]he listing may be submitted as part of the specification in the form of computer printout sheets (commonly 14 by 11 inches in size) for use as 'camera ready copy' when a patent is subsequently printed" and "[s]uch computer printout sheets must be original copies from the computer with dark solid black letters not less than 0.21 cm high, on white, unshaded and unlined paper, the printing on each sheet must be limited to an area 9 inches high by 13 inches wide, and the sheets should be submitted in a protective cover" to "[a]ny listing submitted as part of the specification must be original copies from the computer with dark solid black letters not less than 0.21 cm high, on white, unshaded and unlined paper, and the sheets should be submitted in a protective cover," to delete the sentence "[w]hen printed in patents, such computer printout sheets will appear at the end of the description but before the claims and will usually be reduced about 1/2 in size with two printout sheets being printed as one patent specification page," and to delete the phrase "if the copy is to be used for camera ready copy." Section 1.96(a)(1), new § 1.96(b)(1) as proposed, currently provides that the requirements of § 1.84 apply to computer program listings submitted as sheets of drawings, and § 1.96(a)(2), new § 1.96(b)(2) as proposed, currently provides that the requirements of § 1.52 apply to computer program listings submitted as part of the specification. Section 1.52(b), as proposed, would require that the sheets of paper be the same size and either 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches), with a top margin of at least 2.0 cm. (3/4 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 2.0 cm. (3/4 inch), and a bottom margin of at least 2.0 cm. (3/4 inch), and § 1.52(a), as proposed, would require that application papers be legibly typed in permanent dark ink in portrait orientation.

New § 1.96(c), as proposed, would be amended to change the references to § 1.77(c)(2) in new § 1.96(c) to § 1.77(a)(7) for consistency with § 1.77, as proposed, to change "may" and "should" to "must," to delete the sentence "[a]ll computer program listings submitted on paper will be printed as part of the patent," to relocate the phrase "except as modified or clarified below" in subsection (c)(2), to change the phrase "computer-generated information submitted as an appendix to an application for patent shall be in the form of microfiche in accordance with the standards" to "computer-generated information submitted as a 'microfiche appendix' to an application shall be in accordance with the standards" for clarity, to change to sentences "[e]ither Computer-Output-Microfilm (COM) output or copies of photographed paper copy may be submitted" and "[i]f the former case, NMA standards MS1 and MS2 apply; in the latter case, standard MS5 applies" to "[c]omputer-Output-Microfilm (COM) output may be submitted in accordance with either NMA standard MS1 or MS2," to change "serial number" to "application number," and to provide metric dimensions with English equivalents in parentheses, rather than *vice versa*.

Section 1.97(a)-(d), as proposed, would be amended to include the phrase "for an applicant for patent or for reissue of a patent, or an owner of a patent under reexamination" in paragraph (a) and "by the applicant or patent owner" to clarify that § 1.97 is not available for any third party seeking to have information considered in a pending application. Any third party seeking to have information considered in a pending application must proceed under §§ 1.291 or 1.292, both discussed *infra*. Section 1.97(c), as proposed, would be further amended to correct the phrase "certification as specified in paragraph (3) of this section" to read "certification as specified in paragraph (e) of this section."

Section 1.98, as proposed, would provide that any Patent Application Notice or Technical Contents Publication listed in an information disclosure statement must be identified by applicant, Patent Application Notice number or Technical Contents Publication number and publication date. Section 1.98, as proposed, would also limit those U.S. patent applications of which a copy need not be included to unpublished applications.

Section 1.107, as proposed, would provide that if domestic published applications are cited by the examiner, their Technical Contents Publication number, publication date, the names

of the applicants must be stated. Section 1.107, as proposed, would be amended to delete the phrase "and the classes of inventions."

Section 1.108, as proposed, would further except published applications from those abandoned applications that will not be cited as references.

Section 1.131(a), as proposed, would include pending or patented U.S. published applications which substantially show or describe but do not claim the same patentable invention, as defined in § 1.601(n), and abandoned U.S. published applications as references to which the provisions of § 1.131 apply. Pending or patented U.S. applications would be treated in the same manner that U.S. patents are currently treated, i.e., § 1.131 would apply only if the pending or patented application does not claim the same patentable invention. Abandoned U.S. published applications would be treated in the manner that foreign patents or printed publications are currently treated. As U.S. published applications, either pending, abandoned or patented, may constitute prior art under 35 U.S.C. 102(a) or (e), this change, and the change to § 1.132 *infra*, are necessary to accommodate such references.

In a Notice of Proposed Rulemaking published in the Federal Register at 59 FR 49876 (September 30, 1994) and in the *Official Gazette* at 1167 Off. Gaz. Office 96-97 (October 25, 1994) (§ 1.131 Notice of Proposed Rulemaking), § 1.131(a) was proposed to be amended to *inter alia* broaden its application to instances in which inventions of a pending application or patent under reexamination and a patent held by a single party are not identical as set forth in 35 U.S.C. 102, but not patentably distinct, and changes to § 1.131 were adopted as a final rule. 60 FR 21043 (May 1, 1995); 1174 Off. Gaz. Pat. Office 155 (May 30, 1995).

An amendment to § 1.131(a) was proposed to avoid a potential conflict between § 1.131(a) and § 1.602(a) in instances in which § 1.131(a) prohibits the filing of affidavits or declarations thereunder when the same patentable invention as defined in § 1.601(n) is being claimed, but § 1.602(a) prohibits, unless good cause is shown, the declaration or continuance of an interference when the application(s) and patent are owned by a single party. While this conflict between two pending applications can be avoided by filing a continuation-in-part application merging the conflicting inventions into a single application, this conflict can result in hardship where there is a pending application and an issued patent that can no longer be merged by filing a continuation-in-part application.

Specifically, the proposed amendment to § 1.131(a) in the § 1.131 Notice of Proposed Rulemaking would have permitted the filing of an affidavit or declaration thereunder in a pending application or patent under reexamination to avoid a rejection under 35 U.S.C. 103 based upon a patent which qualifies as prior art only under 35 U.S.C. 102(a) or (e) where the pending application or patent under reexamination and patent upon which the rejection was based were owned by a single party. This proposed amendment to § 1.131(a) in the § 1.131 Notice of Proposed Rulemaking, however, was withdrawn in the final rule to permit further study.

Section 1.131(a), as currently proposed, would permit a showing of prior invention in a pending application or patent under reexamination to avoid a rejection under 35 U.S.C. 103 based upon a patent which qualifies as prior art only under 35 U.S.C. 102(a) or (e), where the application or patent under reexamination and the patent upon which the rejection is based are both owned by a single party, so long as the invention claimed in the pending application or patent under reexamination and in the other patent are not identical as set forth in 35 U.S.C. 102. Section 1.131(a)(3), as proposed, would not require common ownership at the time the latter invention was made, but consistent with § 1.602(a), would require only that there be common ownership when the § 1.131 affidavit or declaration is under consideration.

Where the patent upon which the rejection is based is not prior art under 35 U.S.C. 102(a) or (e), but is prior art only under 35 U.S.C. 102(f) or (g), to the pending application or patent under reexamination, and the invention claimed in the pending application or patent under reexamination is not identical as set forth in 35 U.S.C. 102, the issue is whether the subject matter of the other patent and the invention claimed in the pending application or patent under reexamination were, at the time the invention was made, owned by the same person

or subject to an obligation of assignment to the same person, i.e., whether the patent upon which the rejection is based is disqualified as prior art under the second paragraph of 35 U.S.C. 103, and §§ 1.78(c) and (d) are applicable to this issue. Where, however, the patent upon which the rejection is based is prior art under 35 U.S.C. 102(a) or (e), it cannot be disqualified as prior art under the second paragraph of 35 U.S.C. 103, and as such §§ 1.78(c) and (d) are inapplicable. Section 1.131(a)(3), as currently proposed, would permit a showing of prior invention in an application or patent under reexamination where the application or patent under reexamination and patent upon which the rejection was based were owned by a single party.

As the conflict between two pending applications can be avoided by filing a continuation-in-part application merging the conflicting inventions into a single application, § 1.131(a)(3), as proposed, provides only for a showing of prior invention to avoid a rejection based upon a patent. In situations in which two pending applications claiming patentably indistinct but not identical inventions are held by a single party but cannot be merged into a single application, petitions under § 1.183 will be entertained for waiver of the § 1.131 requirement that the rejection be based upon a patent.

Section 1.131, as proposed, would not affect a statutory or non-statutory double patenting rejection. Specifically, affidavits or declarations under § 1.131 will continue to be ineffective where the claims of the pending application or the patent undergoing reexamination are rejected under 35 U.S.C. 101 for double patenting and the claims of the pending application or the patent under reexamination claim the identical invention of a patent. However, where patentably indistinct but not identical inventions are claimed, a non-statutory double patenting rejection can be overcome by filing an appropriate terminal disclaimer.

Section 1.132, as proposed, would change "domestic" to "U.S." for consistency with § 1.131, and would include U.S. pending published applications which substantially show or describe but do not claim the invention, and abandoned published applications as references to which the provisions of § 1.132 apply for the reasons discussed *supra*.

Section 1.136(a), as proposed, would provide that extensions under § 1.136(a) are not available where the response is to a requirement for an English translation, an abstract or claims on a separate sheet, or substitute specification or sheets of drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction submitted pursuant to §§ 1.52(d), 1.53(d), 1.60(d), 1.62(d), 1.494(c), or 1.495(c), or an oath or declaration submitted pursuant to §§ 1.494(c) or 1.495(c).

Section 1.138, as proposed, would add "or publication" to the end of the sentence that "express abandonment of the application may not be recognized by the Office unless it is actually received by appropriate officials in time to act thereon before the date of issue" to clarify that the express abandonment must be filed in sufficient time to permit its correlation with the application file and the termination of the publication process. Section 1.138, as proposed, would further provide that an applicant seeking to abandon an application to avoid publication of the application must submit a proper letter of express abandonment at least two months prior to the projected date of publication to allow sufficient time to permit the appropriate officials to recognize the abandonment and remove the application from the publication process, and that unless an applicant receives written acknowledgement of the letter of express abandonment prior to the projected date of publication, applicant should expect that the application will be published in due course.

Section 1.154, as proposed, would provide that the elements of a design application, if applicable, should appear in the following order: (1) Design Application Transmittal Form; (2) Fee Transmittal Form; (3) preamble, stating name of the applicant and title of the design; (4) cross-reference to related applications; (5) statement regarding federally sponsored research or development; (6) description of the figure or figures of the drawing; (7) description; (8) claim; (9) drawings or photographs; and (10) executed oath or declaration. The phrase "[t]he following order of arrangement should be observed in framing design specifications" is proposed to be changed to "[t]he elements of the design application, if applicable, should appear in the following order" to clarify that § 1.154 does not *per se* require that an application include all of the listed elements,

but merely provides that any listed element included in the application should appear in the order set forth in § 1.154.

A new § 1.163(c), as proposed, would be added to provide that the elements of a plant application, if applicable, should appear in the following order: (1) Plant Application Transmittal Form; (2) Fee Transmittal Form; (3) abstract of the disclosure; (4) title of the invention; (5) cross-reference to related applications; (6) statement regarding federally sponsored research or development; (7) background of the invention; (8) brief summary of the invention; (9) brief description of the drawing; (10) detailed botanical description; (11) claim; (12) drawings (in duplicate); (13) executed oath or declaration; and (14) Plant Color Coding Sheet. The phrase "if applicable" is proposed to be included in the heading, rather than associated with any particular listed element, to clarify that § 1.163 does not *per se* require that an application include all of the listed elements, but merely provides that any listed element included in the application should appear in the order set forth in § 1.163.

A new § 1.163(d), as proposed, would be added to define a plant color coding sheet. A plant color coding sheet is a sheet that specifies a color coding system as designated in a recognized color dictionary, and lists every plant structure to which color is a distinguishing feature and the corresponding color code which best represents that plant structure. The plant color coding sheet will provide a means for applicants to uniformly convey detailed color characteristics of the plant. Providing this information in a systematic manner will facilitate the examination of the application.

Section 1.291, as proposed, would provide that a protest must be filed within two months of the date the application is published or prior to the mailing of a Notice of Allowance, whichever occurs first, to be considered timely, and that any protest submitted after publication must be accompanied by the fee set forth in § 1.17(t). In addition, § 1.291(a)(2), as proposed, would require that any protest filed after the date the application was published be served upon the applicant in accordance with § 1.248, i.e., filing two copies of the protest in the Office would not be acceptable. As a protest cannot be considered subsequent to issuance of the application as a patent, § 1.291(b), as proposed, would provide that the protest will be considered if the application is still pending when the protest and application file is brought before the examiner, i.e., that the application was pending at the time the protest was filed would be immaterial to its ultimate consideration. Finally, § 1.291, as proposed, would further locate the sentences "[p]rotests raising fraud or other inequitable conduct issues will be entered in the application file, generally without comment on those issues" and "[p]rotests which do not adequately identify a pending patent application will be disposed of and will not be considered by the Office" in paragraph (b).

Section 1.292, as proposed, would be amended to delete the phrase "is filed by one having information of the pendency of an application" as applications will no longer necessarily be maintained in confidence throughout their entire pendency, and would move the requirement for the fee set forth in § 1.17(j) from paragraph (a) to paragraph (b) where the conditions for entry of a petition for the institution of public use proceedings are set forth. Section 1.292, as proposed, would further require that any petition filed after the date the application was published be served on the applicant in accordance with § 1.248. Finally, § 1.292, as proposed, would provide that a petition to institute public use proceedings must be filed within two months of the date the application is published or prior to the mailing of a Notice of Allowance, whichever occurs first, to be considered timely.

Sections 1.305 through 1.309 are proposed to be added to set forth the procedures for the 18-month publication of patent applications.

Section 1.305, as proposed, would provide that applications may be withdrawn from publication at the initiative of the Office or upon request by the applicant. The basis for the withdrawal of an application from publication would be limited to: (1) a mistake on the part of the Office, e.g., the application is abandoned or has issued as a patent, or the projected publication date is not at 18 months from the earliest filing date for which a benefit is sought; (2) the application is either national security classified or subject to a secrecy order pursuant to 35 U.S.C. 181; or (3) express abandonment of the application.



Section 1.306(a), as proposed, would provide that applications under 35 U.S.C. 111(a), 161 or 371 will be published as soon as possible after the expiration of a period of 18 months from the filing date, including the earliest filing date for which a benefit is sought, but excludes applications that: (1) are national security classified or subject to a secrecy order pursuant to 35 U.S.C. 181; (2) have issued as a patent; (3) are recognized by the Office as no longer pending, i.e., are abandoned; or (4) were previously published through early publication.

Section 1.306(b), as proposed, would provide that the publication of an application will include a notice designated as a "Gazette Entry" containing information such as the application number, filing date, title, inventor's name, abstract, a drawing figure, a representative claim, and U.S. and IPC classification in a *Gazette of Patent Application Notices*, and a printed publication designated as a Patent Application Notice or PAN containing information such as the application number, filing date, title, inventor's name, correspondence address, abstract, a drawing figure, a representative claim, and U.S. and IPC classification. In addition, § 1.306(b), as proposed, would provide that the publication of an application will include a document designated as a Technical Contents Publication containing the Patent Application Notice, and the specification, abstract, claims, and drawings of the original application papers. Finally, § 306(b), as proposed, would provide that publication would include public access to a copy of the specification, drawings, and all papers relating to the application file in accordance with § 1.11.

Section 1.306(c), as proposed, would provide that provisional applications under 35 U.S.C. 111(b) shall not be published, and that design applications under 35 U.S.C. 171 and reissue applications under 35 U.S.C. 251 shall not be published pursuant to § 1.306. H.R. 1733, if enacted, would not authorize the publication of design applications (prior to their issuance as patents) or provisional applications. Reissue applications are currently published through the announcement in the *Official Gazette* of the filing of the reissue application, and the opening of the application to public inspection in accordance with § 1.11(b).

Section 1.306(d), as proposed, would provide for the early publication of applications. Any request for early publication of an application should be filed as soon as possible, and must be by way of petition, including the fee set forth in § 1.17(i). In addition, any application must include an abstract and claims on a separate sheet, any substitute specification or drawings required pursuant to §§ 1.53(d), 1.60(d), or 1.62(d), and any English translation required pursuant to § 1.52(d). The Office cannot assure publication of an application on any certain date, and, as such, requests for publication on a date certain will be treated as a request for publication as soon as possible. Finally, as H.R. 1733, if enacted, would not authorize the publication of provisional applications, no consideration will be given to any request for the early publication of a provisional application.

Section 1.306(e), as proposed, would implement the provisions in H.R. 1733 (35 U.S.C. 122(b)(2)) for, under limited circumstances, not publishing an application under 35 U.S.C. 122(b) until three months after an Office action under 35 U.S.C. 132. Section 1.306(e), as proposed, would specifically provide that an applicant who is an independent inventor and has been accorded status under 35 U.S.C. 41(b) in an application that does not claim the benefit of an earlier filing date under 35 U.S.C. 119, 120, 121, 365(a) or 365(c) may request that the application not be published until three months after an action on the merits, and that a petition requesting that the application not be published until three months after an action on the merits must be submitted on filing, and accompanied by the petition fee set forth in § 1.17(i) and a certification that the invention disclosed in the application was not or will not be the subject of an application filed in a foreign country, which certification must be verified if made by a person not registered to practice before the Patent and Trademark Office.

Section 1.307, as proposed, would provide for the delivery of the printed publication, i.e., the Patent Application Notice or PAN, to the correspondence address of record, which is the manner in which a patent is currently delivered to the patentee.

Section 1.308, as proposed, would provide for the correction of the printed publication, but such correction would be granted

only for a significant mistake made by the Office which is apparent from Office records.

Section 1.315, as proposed, would change "the attorney or agent of record, if there be one; or if the attorney or agent so requests, to the patentee or assignee of an interest therein; or, if there be no attorney or agent, to the patentee or to the assignee of the entire interest, if he so requests" to "the correspondence address of record. See § 1.33(a)" for simplicity as patents are currently mailed to the patentee at the correspondence address of record.

Section 1.321(c), as proposed, would change "double patenting rejection" to "non-statutory double patenting rejection" for consistency with § 1.78(c), as proposed, and to clarify that the filing of a terminal disclaimer is ineffective to overcome a statutory double patenting rejection.

Section 1.492(a), as proposed, would increase the basic national fee for international applications entering the national stage under 35 U.S.C. 371 to: (1) \$710 (\$355 for a small entity) where an international preliminary examination fee as set forth in § 1.482 has been paid on the international application to the Office; (2) \$780 (\$390 for a small entity) where no international preliminary examination fee as set forth in § 1.482 has been paid to the Office, but an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the Office as an International Searching Authority; (3) \$1040 (\$520 for a small entity) where no international preliminary examination fee as set forth in § 1.482 has been paid and no international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the Office; (4) \$120 (\$60 for a small entity) where the international preliminary examination fee as set forth in § 1.482 has been paid to the Office and the international preliminary examination report states that the criteria of novelty, inventive step (non-obviousness), and industrial applicability, as defined in PCT Article 33(1) to (4) have been satisfied for all the claims presented in the application entering the national stage (see § 1.496(b)); and (5) \$910 (\$455 for a small entity) where a search report on the international application has been prepared by the European Patent Office or the Japanese Patent Office.

Section 1.494(c) and (g), as proposed, would provide that the applicant will be given a time period within which to file an abstract and claims on a separate sheet, or substitute specification in compliance § 1.125 with papers typed on but one side of the paper or new sheets of drawings, each of the substitute specification and sheets of drawings of sufficient clarity, contrast, and quality, and in a proper size and format for electronic reproduction in instances in which the application papers did not comply with §§ 1.52(a) and (b), as proposed, or the drawings were of such poor quality as to preclude their digital image scanning into the electronic data base. Section 1.494(c), as proposed, would further provide that extensions of time pursuant to § 1.136(a) would not be available for filing an English translation, oath or declaration, abstract and claims on a separate sheet, and a substitute specification with papers typed on but one side of the paper and sheets of drawings, each of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction.

Section 1.495(c) and (h), as proposed, would provide that the applicant will be given a time period within which to file an abstract and claims on a separate sheet, or substitute specification in compliance § 1.125 with papers typed on but one side of the paper or new sheets of drawings, each of the substitute specification and sheets of drawings of sufficient clarity, contrast, and quality, and in a proper size and format for electronic reproduction in instances in which the application papers did not comply with §§ 1.52(a) and (b), as proposed, or the drawings were of such poor quality as to preclude their digital image scanning into the electronic data base. Section 1.495(c), as proposed, would further provide that extensions of time pursuant to § 1.136(a) would not be available for filing an English translation, oath or declaration, abstract and claims on a separate sheet, and a substitute specification with papers typed on but one side of the paper and sheets of drawings, each of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction.

The proposed rules to implement 18-month publication provide that extensions of time pursuant to § 1.136(a) are not available for submissions which will affect the publication of the application. Section 1.53(d)(1), as proposed, does not

exclude extensions of time pursuant to § 1.136(a) for the filing of an oath or declaration as the absence of an oath or declaration for an application filed under 35 U.S.C. 111(a) does not affect the publication of the application. Section 1.306(a), as proposed, does not provide for the publication of a national application for patent which resulted from an international application until after compliance with 35 U.S.C. 371, and an international application is not in compliance with 35 U.S.C. 371 until an oath or declaration is filed. See 35 U.S.C. 371(c)(4). Therefore, the absence of an oath or declaration will affect the publication of an application under 35 U.S.C. 371. Accordingly, §§ 1.494(c) and 1.495(c), unlike § 1.53(d)(1), provide that the period for filing the oath or declaration cannot be extended pursuant to § 1.136(a) to consistently provide that extensions of time pursuant to § 1.136(a) are not available for submissions which will affect the publication of the application.

Section 1.497(a), as proposed, would be amended to provide that an applicant in an international application must file an oath or declaration that: (1) is executed in accordance with either §§ 1.66 or 1.68, (2) identifies the specification to which it is directed, (3) identifies each inventor and the country of citizenship of each inventor, and (4) states that the person making the oath or declaration believes the named inventor or inventors to be the original and first inventor or inventors of the subject matter which is claimed and for which a patent is sought, rather than an oath or declaration in accordance with § 1.63, to enter the national stage pursuant to §§ 1.494 or 1.495. Currently, the failure to file an oath or declaration in strict compliance with § 1.63 results in non-compliance with § 1.497, and thus 35 U.S.C. 371, which in turn delays the entry of the international application into the national stage. To expedite the entry of international applications into the national stage, § 1.497(a), as proposed, would require only an oath or declaration that is properly executed, identifies the specification to which it is directed, and, as required by 35 U.S.C. 115, identifies each inventor and the country of citizenship of each inventor and states that the person making the oath or declaration believes the named inventor or inventors to be the original and first inventor or inventors of the subject matter which is claimed and for which a patent is sought.

Section 1.497(b), as proposed, would be subdivided into paragraphs (b)(1) and (b)(2). Section 1.497(b)(1), as proposed, would provide that the oath or declaration must be made by all of the actual inventors except as provided for in §§ 1.42, 1.43 or 1.47. Section 1.497(b)(2), as proposed, would change "[i]f the international application was made as provided in §§ 1.422, 1.423 or 1.425, the applicant shall state his or her relationship to the inventor and, upon information and belief, the facts which the inventor is required by § 1.63 to state" to "[i]f the person making the oath or declaration is not the inventor (§§ 1.42, 1.43 or 1.47), the oath or declaration shall state the relationship of the person to the inventor and, upon information and belief, the facts which the inventor is required to state" such that § 1.497(b), as proposed, would be parallel to § 1.64.

Section 1.497(c), as proposed, would be added to provide that the oath or declaration must comply with the requirements of § 1.63. Section 1.497(c), as proposed, would further provide that in instances in which the oath or declaration does not comply with § 1.63, but meets the requirements of § 1.497(a) and (b), as proposed, the oath or declaration will be accepted as complying with 35 U.S.C. 371(c)(4) and §§ 1.494(c) or 1.495(c), thus permitting the application to enter the national stage and the assignment of dates under 35 U.S.C. 102(e) and 371(c). A supplemental oath or declaration in compliance with § 1.63, however, will be required in accordance with § 1.67.

Section 1.701(a), as proposed, would add "an unusual administrative delay by the Office" to the bases for extension of patent term due to prosecution delay. H.R. 1733 provides that the Commissioner shall prescribe regulations to govern the particular circumstances deemed to be an unusual administrative delay. Section 1.701(a)(4)(i), as proposed, would set forth the failure to act on a reply under § 1.111 or appeal brief under § 1.192 within six months of the date it was filed; the failure to act on an application within six months of the date of a decision under § 1.196 by the Board of Patent Appeals and Interferences where claims stand allowed in an application or the nature of the decision requires further action by the examiner; and the failure to issue a patent within six months of the date that the issue fee was paid and all outstanding requirements

were satisfied as circumstances constituting a *prima facie* unusual administrative delay. In an application entitled to an extension under § 1.701(a)(3), however, any unusual administrative delay during the appellate proceeding would be disregarded under § 1.701(a)(4) in accordance with the "not overlapping" provision in § 1.701(b). Requests for patent term extension based upon circumstances not specifically set forth in § 1.701(a)(4)(i) as a *prima facie* unusual administrative delay must be specifically requested by petition and would be considered on a case-by-case basis. Section 1.701(a), as proposed, would further add "subject to the provisions of this section" and delete the phrase "if the patent is not subject to a terminal disclaimer due to the issuance of another patent claiming subject matter that is not patentably distinct from that under appellate review" from paragraph (a)(3).

Section 1.701(b), as proposed, would add paragraph (c)(4) to those paragraphs summed in calculating the period of extension, and change the maximum extension from five years to ten years in accordance with H.R. 1733.

Section 1.701(c), as proposed, would provide that the period of delay is the sum of the number of days, if any, in the period of unusual delay by the Office. That is, the ordinary delay in processing and examining an application would not be included under § 1.701(c), as proposed, in determining the extension under § 1.701(b). For example, (1) where there was a failure to act on a reply under § 1.111 within six months of the date it was filed, the period of delay is the number of days in excess of six months, if any, in the period beginning on the date a reply under § 1.111 was filed and ending on the mailing date of an action in response thereto, (2) where there was a failure to act on an appeal brief under § 1.192 within six months of the date it was filed, and the application is not entitled to an extension under § 1.701(a)(3), the period of delay is the number of days in excess of six months, if any, in the period beginning on the date an appeal brief under § 1.192 was filed and ending on the mailing date of either a notification under § 1.192(d) or examiner's answer under § 1.193, and (3) where there was a failure to issue a patent within six months of the date that the issue fee was paid and all outstanding requirements were satisfied, § 1.701(a)(3), the period of delay is the number of days in excess of six months, if any, in the period beginning on the date the issue fee was paid or all outstanding requirements were satisfied, whichever is later, and the date the patent was issued.

Section 1.701(d), as proposed, would change "[t]he period of delay set forth in paragraph (c)(3)" to "[t]he period set forth in paragraph (c)," as the limitation on patent term extension in H.R. 1733 based upon an applicant's failure to engage in reasonable efforts to conclude processing or examination of the application is not limited to extension under 35 U.S.C. 154(b)(2), i.e., delays during appellate proceedings. Section 1.701(d), as proposed, would further delete "any time during the period of appellate review that occurred before three years from the filing date of the first national application for a patent presented for examination." Public Law 103-465 provides that extensions under 35 U.S.C. 154(b)(2) shall be reduced by any time during the period of appellate review that occurred before three years from the filing date of the first national application for patent presented for examination, where H.R. 1733 provides only that no patent shall be extended under 35 U.S.C. 154(b) that has issued before the expiration of three years after the filing date of the application or entry of the application into the national stage under 35 U.S.C. 371, whichever is later, not taking into account any claim to the benefit of the filing date of any application under 35 U.S.C. 120, 121, or 365(c).

Section 1.701(d), as proposed, would further change "any time during the period of appellate review, as determined by the Commissioner, during which the applicant for patent did not act with due diligence" and "[i]n determining the due diligence of an applicant, the Commissioner may examine the facts and circumstances of the applicant's actions during the period of appellate review to determine whether the applicant exhibited that degree of timeliness as may reasonably be expected from, and which is ordinarily exercised by, a person during a period of appellate review" to "any time during the processing or examination of the application, as determined by the Commissioner, during which the applicant for patent failed to engage in reasonable efforts to conclude processing or examination of the application," "[i]n determining whether an applicant failed



to engage in reasonable efforts to conclude processing or examination of the application, the Commissioner may examine the facts and circumstances of the applicant's actions during the entire prosecution of the application to determine whether the applicant exhibited that degree of timeliness as may reasonably be expected from, and which is ordinarily exercised by, an applicant for patent seeking to conclude the processing or examination of the application," and "[c]ircumstances constituting a failure to engage in reasonable efforts to conclude processing or examination of the application include: (1) requesting suspension of action under § 1.103, and (2) abandonment of the application."

H.R. 1733 provides that the period of extension under 35 U.S.C. 154(b) shall be reduced by a period equal to the time during the processing or examination of the application leading to the patent in which the applicant failed to engage in reasonable efforts to conclude processing or examination of the application and that the Commissioner shall prescribe regulations establishing the circumstances that constitute a failure of an applicant to engage in reasonable efforts to conclude processing or examination of an application. Section § 1.701(d) specifically sets forth requesting suspension of action under § 1.103 and abandonment of the application as examples of *prima facie* failures to engage in reasonable efforts to conclude processing or examination of the application. In determining whether an applicant engaged in reasonable efforts to conclude processing or examination of the application, however, the facts and circumstances of applicant's actions during the entire prosecution of the application will be considered on a case-by-case basis to determine whether the applicant exhibited that degree of timeliness as may reasonably be expected from, and which is ordinarily exercised by, an applicant for patent seeking to conclude the processing or examination of the application. As such, it is not possible to list all of the specific circumstances in § 1.701(d). That is, circumstances other than the examples specifically set forth § 1.701(d) may, on a case-by-case basis, be considered the failure to engage in reasonable efforts to conclude the processing or examination of the application.

A new § 1.701(e), as proposed, would provide that no patent shall be extended under this section: (1) beyond the expiration date specified in a terminal disclaimer in a patent whose term has been disclaimed in such terminal disclaimer, or (2) an instance in which the patent issued before the expiration of three years after the filing date of the application or entry of the application into the national stage under 35 U.S.C. 371, whichever is later, not taking into account any claim to the benefit of the filing date of any application under 35 U.S.C. 120, 121, or 365(c). H.R. 1733 provides these limitations on extensions under 35 U.S.C. 154(b).

A new § 1.701(f), as proposed, would provide that any extension of patent term under § 1.701(a)(4) on the basis of an administrative delay other than one specifically set forth in §§ 1.701(a)(4)(i)(A)-(C) must be requested by petition. Due to the necessity for individualized determinations of patent term extensions based upon prosecution delay due to an unusual administrative delay by the Office not specifically provided for, such extensions of patent term under § 1.701(a)(4) must be specifically requested by petition in a timely manner. Section 1.701(f), as proposed, would specifically provide that any petition for patent term extension based upon § 1.701(a)(4) for an unusual administrative delay by the Office other than one specifically set forth in §§ 1.701(a)(4)(i)(A)-(C) cannot be filed prior to the mailing of a notice of allowance under § 1.311 and must be accompanied by a statement of the facts involved, the administrative delay by the Office to be reviewed, the period of extension requested, and the fee set forth in § 1.17(i). The petition may include a request that the petition fee be refunded if an extension of the patent term under § 1.701(a)(4) is granted.

Section 1.808(a), as proposed, would provide that upon the publishing of the application, all restrictions imposed by the depositor on the availability to the public of the deposited material will be irrevocably removed, subject to provisions of § 1.808(b).

Section 3.31, as proposed, would provide that the assignment cover sheet may, but need not, include an indication that the assignment information is to be printed on the Patent Application Notice. Section 3.31, as proposed, would further provide that, due to constraints in the publication process, any such indication not submitted within two months of filing or fourteen

months from the earliest filing date for which a benefit is claimed, whichever is later, may result in the assignment information not being printed on the Patent Application Notice.

Section 5.1, as proposed, would include a new paragraph (c) which would provide defense agencies adequate time to complete national security review under 35 U.S.C. 181 before an application would be released for publication under § 1.306. Specifically, the period for completion of a defense agency review would be six (6) months from the actual U.S. filing date for applications filed under 35 U.S.C. 111(a) or three (3) months from the date the application was made available to the defense agency for review, whichever is later.

Section 5.1, as proposed, would further include a new paragraph (d) which would set forth the current practice that applications on inventions not made in the United States and on inventions in which the Federal Government has a known property interest are not made available to defense agencies under § 5.2(b).

A new § 5.9, as proposed, would set forth the procedures for the treatment of national security classified applications. The procedures set forth in this section, except for those pertaining to the publication of applications pursuant to § 1.306, are the current procedures for the treatment of national security classified applications. It is, however, considered appropriate to implement these procedures through the rulemaking process.

35 U.S.C. 181 authorizes the withholding of the grant of a patent on an application that has been placed under a secrecy order; however, title 35, United States Code, does not specifically authorize the withholding of the grant of a patent on an application that is national security classified, but not placed under a secrecy order. Nevertheless, the Office is prohibited by Executive Order and statute from disclosing a national security classified application. Therefore, procedures for obtaining a secrecy order pursuant to 35 U.S.C. 181 on a national security classified application, or the declassification of such application, are necessary.

Section 5.9(a), as proposed, would provide that patent applications and papers that are national security classified and contain authorized national security markings of "Confidential," "Secret" or "Top Secret" are accepted by the Office, that national security classified documents mailed to the Office must be addressed in compliance with § 5.33, and that national security classified documents may be hand-carried to Licensing and Review.

Section 5.9(b), as proposed, would provide that a national security classified patent application will not be published pursuant to § 1.306 or allowed pursuant to § 1.311 of this chapter until the application is declassified.

Section 5.9(c), as proposed, would clarify that, in a national security classified application, it is the applicant's responsibility to either obtain a secrecy order pursuant to § 5.2, or have the application declassified by the relevant department or agency. Section 5.9(c), as proposed, would further provide that in a national security classified patent application filed without a notification pursuant to § 5.2(a), i.e., a recommendation for imposition of a secrecy order from the relevant department or agency, the Office will set a time period within which the application must be declassified, a secrecy order must be obtained, or evidence of a good faith effort to obtain a secrecy order from the relevant department or agency must be presented in order to prevent abandonment of the application.

Section 5.9(d), as proposed, would provide for instances in which, after an effort to obtain a secrecy order, the national security classified application has not been declassified and a secrecy order has not been obtained, but the applicant has presented evidence of a good faith effort to obtain a secrecy order, the Office will again set a time period within which the application must be declassified, a secrecy order pursuant to § 5.2 must be obtained, or evidence of a good faith effort to again obtain a secrecy order pursuant to § 5.2 from the relevant department or agency must be presented in order to prevent abandonment of the application. This process will reiterate until the application becomes abandoned, e.g., through a lack of a good faith effort to obtain a secrecy order or failure to prosecute under 35 U.S.C. 133, the application is declassified,

or a secrecy order is obtained.

#### Other Considerations

The proposed rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Order 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these proposed rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these proposed changes is to require that application papers be filed in a format which permits their digital image and OCR scanning into an electronic data base, and that claims for the benefit of the filing date of prior foreign and domestic applications be submitted promptly to permit publication of the application at 18 months from the earliest filing date for which a benefit is sought.

The Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These proposed rule changes contain a collection of information requirements subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.* The initial patent application filing is currently approved by the Office of Management and Budget under Control No. 0651-0032. Public reporting burden for the collection of information for filing the initial patent application is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The Fee Transmittal form, Utility Patent Application Transmittal form, Design Patent Application Transmittal form, Plant Patent Application Transmittal form, Plant Color Coding Sheet, Declaration form, and Plant Patent Application Declaration form will reduce the burden and uncertainty associated with the submission of an application and related information, and enhance the Office's ability to use standardized automation routines (optical character recognition, etc.) to record and process information concerning applications. Public reporting burden for these collections of information is estimated to average: (1) 12 minutes per response for the Fee Transmittal form, (2) 12 minutes per response for the Utility Patent Application Transmittal form, (3) 12 minutes per response for the Design Patent Application Transmittal form, (4) 12 minutes per response for the Plant Patent Application Transmittal form, (5) 12 minutes per response for the Plant Color Coding Sheet, (6) 24 minutes per response for the Declaration form, and (7) 24 minutes per response for the Plant Patent Application Declaration. These estimates include the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collections of information.

The assignment cover sheet is currently approved by the Office of Management and Budget under Control No. 0651-0027. Public reporting burden for the collection of information on the assignment cover sheet is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Office of Assistance Quality and Enhancement Division, Patent and Trademark Office, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503 (ATTN: Paperwork Reduction Act Projects 0651-0027 and 0651-0032). The Fee Transmittal form, Utility Patent Application Transmittal form, Design Patent Application Transmittal form, Plant Patent Application Transmittal form, Plant Color Coding Sheet, Declaration form, and Plant Patent Application Declaration form have been submitted to the Office of Management and Budget for clearance under the Paperwork Reduction Act. See 60 FR 35174 (July 6, 1995).

Written comments and recommendations for the proposed information collection should be sent to Maya A. Bernstein, OMB Desk Officer, room 10236, New Executive Office Building, Washington, D.C. 20230.

Notice is hereby given that pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, the Patent and Trademark Office proposed to amend Title 37 of the Code of Federal Regulations as set forth below.

#### List of Subjects

##### 37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of Information, Inventions and patents, Reporting and record keeping requirements, Small Businesses.

##### 37 CFR Part 3

Administrative practice and procedure, Inventions and patents, Reporting and record keeping requirements.

##### 37 CFR Part 5

Classified information, foreign relations, inventions and patents.

For the reasons set forth in the preamble, 37 CFR Parts 1, 3 and 5 are proposed to be amended as follows, with removals indicated by brackets ([]) and additions by arrows (▶◀):

#### PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.4 is proposed to be amended by revising paragraph (a)(1) to read as follows:

##### § 1.4 Nature of correspondence and signature requirements.

(a) Correspondence with the Patent and Trademark Office comprises:

(1) Correspondence relating to services and facilities of the Office, such as general inquiries, requests for publications supplied by the Office, orders for printed copies of patents ▶, patent application notices, technical contents publications ▶ or trademark registrations, orders for copies of records, transmission of assignments for recording, and the like, and

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3. Section 1.5 is proposed to be amended by revising paragraph (a) and adding paragraphs (f) and (g) to read as follows:

##### § 1.5 Identification of application, patent, or registration.

(a) No correspondence relating to an application should be filed prior to when notification of the application number is received from the Patent and Trademark Office. When a letter directed to the Patent and Trademark Office concerns a previously filed application for a patent, ▶ including a published application, ▶ it must identify on the top page in a conspicuous location, the application number (consisting of the series code and the serial number; e.g., 07/123,456), or the serial number and filing date assigned to that application by the Patent and Trademark Office, or the international application number of the international application. Any correspondence not containing such identification will be returned to the sender where a return address is available. The returned correspondence will be accompanied with a cover letter which will indicate to the sender that if the returned correspondence is resubmitted to the Patent and Trademark Office within two weeks of the mail date on the cover letter, the original date of receipt of the correspondence will be considered by the Patent and Trademark Office as the date of receipt of the correspondence. Applicants may use either the Certificate of Mailing or Transmission procedure under § 1.8 or the Express Mail procedure under § 1.10 for resubmissions of returned correspondence if they desire to have the benefit of the date of deposit in the United States



Postal Service. If the returned correspondence is not resubmitted within the two-week period, the date of receipt of the resubmission will be considered to be the date of receipt of the correspondence. The two-week period to resubmit the returned correspondence will not be extended. If for some reason, returned correspondence is resubmitted with proper identification later than two weeks after the return mailing by the Patent and Trademark Office, the resubmitted correspondence will be accepted but given its date of receipt. In addition to the application number, all letters directed to the Patent and Trademark Office concerning applications for patents should also state "PATENT APPLICATION," the name of the applicant, the title of the invention, the date of filing the same, and, if known, the group art unit or other unit within the Patent and Trademark Office responsible for considering the letter and the name of the examiner or other person to which it has been assigned.

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►(f) When a paper concerns a provisional application, it should identify the application as such and include the application number.

(g) A paper relating to a patent application notice should identify it as such and include the patent application notice number. ◀

4. Section 1.9 is proposed to be amended by revising paragraphs (a) and (b) and adding a paragraph (h) to read as follows:

#### § 1.9 Definitions.

(a)(1) A national application as used in this chapter means a U.S. national application for patent which was either filed in the Office under 35 U.S.C. 111, or which entered the national stage from an international application after compliance with 35 U.S.C. 371.

(2) A provisional application as used in this chapter means a U.S. national application for patent filed in the Office under 35 U.S.C. 111(b).

(3) A nonprovisional application as used in this chapter means a U.S. national application for patent which was either filed in the Office under 35 U.S.C. 111(a), or which entered the national stage from an international application after compliance with 35 U.S.C. 371.

►(4)◀(b) An international application as used in this chapter means an international application for patent filed under the Patent Cooperation Treaty prior to entering national processing at the Designated Office stage.

►(b) A published application as used in this chapter means an application for patent which has been published pursuant to 35 U.S.C. 122(b). ◀

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►(h) National security classified as used in this chapter means specifically authorized under criteria established by Act of Congress or Executive order to be kept secret in the interest of national defense or foreign policy and in fact properly classified pursuant to Act of Congress or Executive order. ◀

5. Section 1.11 is proposed to be amended by revising paragraph (a) to read as follows:

#### § 1.11 Files open to the public.

(a) [After a patent has been issued or a statutory invention registration has been published, the] ►The◀ specification, drawings, and all papers relating to the case in the file of ►an abandoned published application, a◀ [the] patent ►, ◀ or ►a◀ statutory invention registration are open to inspection by the public ►. ◀ [, and copies may be obtained upon paying the fee therefor.] ►A copy of the specification, drawings, and all papers relating to the case in the file of a published application, a patent, or statutory invention registration may be obtained upon the payment of the fee set forth in § 1.19(b)(2).◀ See § 2.27 for trademark files.

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6. Section 1.12 is proposed to be amended by revising paragraphs (a)-(c) to read as follows:

#### § 1.12 Assignment records open to public inspection.

(a)(1) Separate assignment records are maintained in the Patent and Trademark Office for patents and trademarks. The assignment records, relating to original or reissue patents, including digests and indexes, for assignments recorded on or after May 1, 1957, ►published applications,◀ and assignment records relating to pending or abandoned trademark applications and to trademark registrations, for assignments recorded on or after January 1, 1955, are open to public inspection at the Patent and Trademark Office, and copies of those assignment records may be obtained upon request and payment of the fee set forth in § 1.19 and § 2.6 of this chapter.

(2) All records of assignments of patents recorded before May 1, 1957, and all records of trademark assignments recorded before January 1, 1955, are maintained by the National Archives and Records Administration (NARA). The records are open to public inspection. Certified and uncertified copies of those assignment records are provided by NARA upon request and payment of the fees required by NARA.

(b) Assignment records, digests, and indexes relating to any pending or abandoned application ►which has not been published pursuant to 35 U.S.C. 122(b)◀ are not available to the public. Copies of any such assignment records and information with respect thereto shall be obtainable only upon written authority of the applicant or applicant's assignee or attorney or agent or upon a showing that the person seeking such information is a bona fide prospective or actual purchaser, mortgagee, or licensee of such application, unless it shall be necessary to the proper conduct of business before the Office or as provided by these rules.

(c) Any request by a member of the public seeking copies of any assignment records of any pending or abandoned patent application preserved in ►confidence◀ [secret] under § 1.14, or any information with respect thereto, must

(1) Be in the form of a petition accompanied by the petition fee set forth in § 1.17(i), or

(2) Include written authority granting access to the member of the public to the particular assignment records from the applicant or applicant's assignee or attorney or agent of record.

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7. Section 1.13 is proposed to be revised to read as follows:

#### § 1.13 Copies and certified copies.

(a) Non-certified copies of patents ►, patent application notices, technical contents publications, file wrapper and contents of published applications,◀ and trademark registrations and of any records, books, papers, or drawings within the jurisdiction of the Patent and Trademark Office and open to the public, will be furnished by the Patent and Trademark Office to any person, and copies of other records or papers will be furnished to persons entitled thereto, upon payment of the fee therefor.

(b) Certified copies of the patents ►, patent application notices, technical contents publications, file wrapper and contents of published applications,◀ and trademark registrations and of any records, books, papers, or drawings within the jurisdiction of the Patent and Trademark Office and open to the public or persons entitled thereto will be authenticated by the seal of the Patent and Trademark Office and certified by the Commissioner, or in his name attested by an officer of the Patent and Trademark Office authorized by the Commissioner, upon payment of the fee for the certified copy.

8. Section 1.14 is proposed to be amended by revising paragraphs (a)-(b) and (e) to read as follows:

#### § 1.14 Patent applications preserved in ►confidence◀ [secret].

(a) Except as provided in § 1.11(b) ►,◀ pending patent applications ►which have not been published pursuant to 35 U.S.C. 122(b)◀ are preserved in ►confidence◀ [secret]. No

information will be given by the Office respecting the filing by any particular person of an application for a patent, the pendency of any particular case before it, or the subject matter of any particular application, nor will access be given to or copies furnished of any pending application or papers relating thereto, without written authority in that particular application from the applicant or his assignee or attorney or agent of record, unless the application has been identified by ►application number or◀ serial number ►and filing date◀ in a published patent document ►, a U.S. published application,◀ or ►a published international application in which◀ the United States of America has been indicated as a Designated State [in a published international application], in which case status information such as whether it is pending, abandoned, or patented may be supplied, ►or unless the application claims the benefit of the filing date of an application that has been referred to in a U.S. published application or patent, or identified by application number or serial number and filing date in a published patent document or a published international application in which the United States of America has been indicated as a Designated State, in which case the application number, filing date, and status information such as whether it is pending, abandoned, or patented may be supplied,◀ or unless it shall be necessary to the proper conduct of business before the Office or as provided by this part. Where an application has been patented, the patent number and issue date may also be supplied.

(b) [Except as provided in § 1.11(b), abandoned] ►Abandoned◀ applications ►which have not been published pursuant to 35 U.S.C. 122(b)◀ are likewise not open to public inspection, except ►as provided in § 1.11(b) and as set forth below.◀ [that if] ►If◀ an application referred to in a U.S. ►published application or◀ patent, ►application open to public inspection pursuant to this section, application which claims the benefit of the filing date of an application open to public inspection pursuant to this section,◀ or in an application in which the applicant has filed an authorization to open the complete application to the public, is abandoned and is available, it may be inspected or copies obtained by any person on written request, without notice to the applicant. Complete applications (§ 1.51(a)) which are abandoned ►and have not been published pursuant to 35 U.S.C. 122(b)◀ may be destroyed after 20 years from their filing date, except those to which particular attention has been called and which have been marked for preservation. Abandoned applications will not be returned.

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(c) Any request by a member of the public seeking access to, or copies of, any pending or abandoned application preserved in ►confidence◀ [secret] pursuant to paragraphs (a) and (b) of this section, or any papers relating thereto, must

(1) Be in the form of a petition and be accompanied by the petition fee set forth in § 1.17(i), or

(2) Include written authority granting access to the member of the public in that particular application from the applicant or the applicant's assignee or attorney or agent of record.

9. Section 1.16 is proposed to be amended by revising paragraphs (a) and (g)-(h) to read as follows:

#### § 1.16 National application filing fees

(a) Basic fee for filing each application for an original patent, except provisional, design or plant cases:

By a small entity (§ 1.9(f)) .....►\$390.00◀ [365.00]  
By other than a small entity .....►780.00◀ [730.00]

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(g) Basic fee for filing each plant application, except provisional applications:

By a small entity (§ 1.9(f)) .....►270.00◀ [245.00]  
By other than a small entity .....►540.00◀ [490.00]

(h) Basic fee for filing each reissue application:

By a small entity (§ 1.9(f)) .....►390.00◀ [365.00]

By other than a small entity .....►780.00◀ [730.00]

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10. Section 1.17 is proposed to be amended by revising paragraph (i) and adding new paragraphs (l) and (n) to read as follows:

#### § 1.17 Patent application processing fees

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(i) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph .....130.00

§ 1.12 - for access to an assignment record.  
§ 1.14 - for access to an application.  
§ 1.53 - to accord a filing date.  
§ 1.55 - for entry of late priority papers.  
§ 1.60 - to accord a filing date.  
§ 1.62 - to accord a filing date.  
§ 1.97(d) - to consider an information disclosure statement.  
§ 1.102 - to make application special  
§ 1.103 - to suspend action in application.  
§ 1.177 - for divisional reissues to issue separately.  
§ 1.312 - for amendment after payment of issue fee.  
§ 1.313 - to withdraw an application from issue.  
►§ 1.306(d) - for early publication of an application.  
§ 1.306(e) - to defer publication of an application.◀  
§ 1.314 - to defer issuance of a patent.  
§ 1.666(b) - for access to interference settlement agreement.  
►§ 1.701(f) - for patent term extension based upon administrative delay not specifically provided for.◀  
§ 3.81 - for patent to issue to assignee, assignment submitted after payment of the issue fee.

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►(t) For filing a protest under § 1.291 in an application after the date the application was published .....220.00

(u) For the acceptance of a late claim for priority under 35 U.S.C. 119(a)-(d) or for acceptance of a late claim for the benefit of a prior application under 35 U.S.C. 119(e), 120 or 121 filed during the pendency of the application.....1500.00◀

11. Section 1.18 is proposed to be amended by revising paragraphs (a) and (c) to read as follows:

#### § 1.18 Patent Issue Fees

(a) Issue fee for issuing each original or reissue patent, except a design or plant patent:

By a small entity (§ 1.9(f)) .....►\$640.00◀ [605.00]  
By other than a small entity .....►1280.00◀ [1210.00]

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(c) Issue fee for issuing a plant patent:

By a small entity (§ 1.9(f)) .....►330.00◀ [305.00]  
By other than a small entity .....►660.00◀ [610.00]

12. Section 1.19 is proposed to be amended by revising paragraphs (a)-(d) to read as follows:

#### § 1.19 Document supply fees.

The Patent and Trademark Office will supply copies of the following documents upon payment of the fees indicated:

(a) Uncertified copies of patents ►, patent application notices, and technical contents publications◀:

(1) Printed copy of a ►patent application notice,◀ patent, including a design patent, statutory invention registration, or defensive publication document, except plant or statutory invention registration containing color drawing:



(i) Regular service.....\$3.00  
(ii) Overnight delivery to PTO Box or overnight fax...6.00  
(iii) Expedited service for copy ordered by expedited mail or fax delivery service and delivered to the customer within two workdays.....25.00

(2) Printed copy of a plant patent in color.....12.00  
(3) Copy of a utility patent or statutory invention registration containing color drawing (see § 1.84(a)(2)).....24.00  
▶(4) Copy of a technical contents publication.....9.00◀

(b) Certified and uncertified copies of Office documents:

(1) Certified or uncertified copy of patent application as filed:

(i) Regular service.....▶15.00◀ [12.00]  
(ii) Expedited local service.....▶30.00◀ [24.00]

(2) Certified or uncertified copy of ▶published application or ▶patent-related file wrapper and contents.....150.00  
(3) Certified or uncertified copy of Office records, per document ▶, except ▶those contained in a pending application and ▶as otherwise provided in this section.....25.00  
▶(4) Certified or uncertified copy of documents contained in a pending application:

(i) First document contained in a pending application.....75.00  
(ii) For each commonly requested additional document contained in such pending application.....25.00

(5)▶[(4)] For assignment records, abstract of title and certification, per ▶published application or ▶patent.....25.00

(c) Library service (35 U.S.C. 13): For providing to libraries copies of all patents issued annually ▶and technical contents publications published annually▶, per annum.....50.00

(d) For list of all United States ▶published applications, ▶patents and statutory invention registrations in a subclass.....3.00

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13. Section 1.20 is proposed to be amended by revising paragraphs (e)-(g) to read as follows:

§ 1.20 Post-issuance fees

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(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond four years; the fee is due by three years and six months after the original grant

By small entity (§ 1.9(f)).....▶510.00◀ [480.00]  
By other than a small entity.....▶1020.00◀ [960.00]

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond eight years; the fee is due by seven years and six months after the original grant

By a small entity (§ 1.9(f)).....▶1010.00◀ [965.00]  
By other than a small entity.....▶2020.00◀ [1930.00]

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond twelve years; the fee is due by eleven years and six months after the original grant

By a small entity (§ 1.9(f)).....▶1510.00◀ [1450.00]  
By other than a small entity.....▶3020.00◀ [2900.00]

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14. Section 1.24 is proposed to be revised to read as follows:

§ 1.24 Coupons.

Coupons in denominations of three dollars, for the purchase of patents, ▶patent application notices and technical contents publications, ▶designs, defensive publications, statutory invention registrations, and trademark registrations are sold by the Patent and Trademark Office for the convenience of the general public; these coupons may not be used for any other purpose. The three-dollar coupons are sold individually and in books of 50 for \$150.00. These coupons are good until used; they may be transferred but cannot be redeemed.

15. Section 1.51 is proposed to be amended by revising paragraph (a)(1) to read as follows:

§ 1.51 General requisites of an application.

(a) Applications for patents must be made to the Commissioner of Patents and Trademarks.

(1) A complete application filed under § 1.53(b)(1) comprises:

(i) A specification, including ▶an abstract and ▶a claim or claims, see §§ 1.71 to 1.77;  
(ii) An oath or declaration, see §§ 1.63 and 1.68;  
(iii) Drawings, when necessary, see §§ 1.81 to 1.85; and  
(iv) The prescribed filing fee, see § 1.16.

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16. Section 1.52 is proposed to be amended by revising paragraphs (a)-(b) and (d) to read as follows:

§ 1.52 Language, paper, writing, margins.

(a) The application, any amendments or corrections thereto, and the oath or declaration must be in the English language except as provided for in § 1.69 and paragraph (d) of this section, or be accompanied by a verified translation of the application and a translation of any corrections or amendments into the English language. All papers which are to become a part of the permanent records of the Patent and Trademark Office must be legibly [written,] typed [, or printed] in permanent ▶dark▶ ink ▶in portrait orientation on flexible, strong, smooth, non-shiny, durable and white paper.▶ [or its equivalent in quality.] All of the application papers must be presented in a form having sufficient clarity and contrast between the paper and the [writing,] typing [, or printing] thereon to permit the direct reproduction of readily legible copies in any number by use of photographic, electrostatic, photo-offset, and micro-filing processes ▶and electronic reproduction by use of digital imaging and optical character recognition▶. If the papers are not of the required quality, substitute typewritten [or printed] papers of suitable quality ▶will▶ [may] be required.▶ See § 1.125 for filing substitute typewritten papers constituting a substitute specification.▶

(b) ▶Except for drawings, the▶ [The] application papers (specification, including claims, abstract, oath or declaration, and papers as provided for in §§ 1.42, 1.43, 1.47, etc.) and also papers subsequently filed, must be plainly ▶typed▶ [written] on but one side of the paper ▶, with the abstract and claims set forth on a separate sheet. See §§ 1.72(b) and 1.75(h)▶. The [size of all] sheets of paper ▶must be the same size and either 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches)▶ [should be 8 to 8 1/2 by 10 1/2 to 13 inches (20.3 to 21.6 cm. by 26.6 to 33.0 cm.)] ▶Each sheet must include a top margin of at least 2.0 cm. (3/4 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 2.0 cm. (3/4 inch), and a bottom margin of at least 2.0 cm. (3/4 inch), and no holes should be provided in the sheets.▶ [A margin of at least approximately one inch (2.5 cm.) must be reserved on the left-hand of each page. The top of each page of the application, including claims, must have a margin of at least approximately 3/4 inch (2 cm.)] The lines must [not be crowded too closely together; typewritten lines should] be 1 1/2 or double spaced. The pages of the application including claims and abstract ▶must▶ [should] be

numbered consecutively, starting with 1, the numbers being centrally located above or preferably, below, the text.▶ See § 1.84 for drawings.▶

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(d) An application may be filed in a language other than English. A verified English translation of the non-English-language application and the fee set forth in § 1.17(k) are required to be filed with the application or within such time ▶period▶ as may be set by the Office.▶ The period for filing the verified English translation cannot be extended pursuant to § 1.136(a).▶

17. Section 1.53 is proposed to be amended by revising paragraph (d)(1) to read as follows:

§ 1.53 Serial Number, filing date, and completion of application.

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(d)(1) If an application which has been accorded a filing date pursuant to paragraph (b)(1) of this section does not include the appropriate filing fee ▶,▶[or]an oath or declaration by the applicant,▶an abstract on a separate sheet, claims on a separate sheet, papers typed on but one side of the paper, or application papers or sheets of drawings of sufficient clarity, contrast, and quality, and in the proper size and format for electronic reproduction,▶ applicant will be so notified, if a correspondence address has been provided ▶. The applicant will be▶ [and] given a period of time within which to ▶correct the deficiencies▶ [file the fee, oath or declaration] and to pay the surcharge as set forth in § 1.16(e) ▶if the application did not include the basic filing fee or the oath or declaration by the applicant▶ in order to prevent abandonment of the application. A copy of the "Notice to File Missing Parts" form mailed to applicant should accompany any response thereto submitted to the Office. If the required filing fee is not timely paid, or if the processing and retention fee set forth in § 1.21(l) is not paid within one year of the date of mailing of the notification required by this paragraph, the application will be disposed of. No copies will be provided or certified by the Office of an application which has been disposed of or in which neither the required basic filing fee nor the processing and retention fee has been paid. The notification pursuant to this paragraph may be made simultaneously with any notification pursuant to paragraph (c) of this section. If no correspondence address is included in the application, applicant has two months from the filing date to file the basic filing fee, oath or declaration ▶, abstract or claims on a separate sheet, papers typed on but one side of the paper, papers and sheets of drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction,▶ and to pay the surcharge as set forth in § 1.16(e) ▶if the application did not include the basic filing fee or the oath or declaration by the applicant▶ in order to prevent abandonment of the application; or, if no basic filing fee has been paid, one year from the filing date to pay the processing and retention fee set forth in § 1.21(l) to prevent disposal of the application.▶ The period for filing an abstract and claims on a separate sheet, and a substitute specification and sheets of drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction cannot be extended pursuant to § 1.136(a).▶

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18. Section 1.54 is proposed to be amended by revising paragraph (b) to read as follows:

§ 1.54 Parts of application to be filed together; filing receipt.

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(b) Applicant will be informed of the application [serial] number ▶,▶[and] filing date ▶, and projected publication date▶ by a filing receipt.

19. Section 1.55 is proposed to be amended by revising paragraph (a) and adding paragraphs (c)-(d) to read as follows:

§ 1.55 Claim for foreign priority.

(a) An applicant in a nonprovisional application may claim the benefit of the filing date of a prior foreign application under the conditions specified in 35 U.S.C. 119 (a)-(d) and 172. The claim to priority ▶under 35 U.S.C. 172▶ need be in no special form and may be made by the attorney or agent if the foreign application is referred to in the oath or declaration as required by § 1.63.▶ The claim to priority under 35 U.S.C. 119(a)-(d) must be presented within two months of filing or fourteen months from the filing date of the prior foreign application, whichever is later, must identify the prior foreign application by specifying its application number, country, and the day, month and year of its filing, and may be made by the attorney or agent if the foreign application is referred to in the oath or declaration as required by § 1.63.▶ The [claim for priority and the] certified copy of the foreign application specified in 35 U.S.C. 119(b) must be filed in the case of an interference (§ 1.630), when necessary to overcome the date of a reference relied upon by the examiner, when specifically required by the examiner, and in all other cases, before the patent is granted. If the [claim for priority or the] certified copy of the foreign application is filed after the date the issue fee is paid, it must be accompanied by a petition requesting entry and by the fee set forth in § 1.17(i). If the certified copy filed is not in the English language, a translation need not be filed except in the case of interference; or when necessary to overcome the date of a reference relied upon by the examiner; or when specifically required by the examiner, in which event an English language translation must be filed together with a statement that the translation of the certified copy is accurate. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

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▶(c) If a claim to priority under 35 U.S.C. 119(a)-(d) is presented after the time period provided by paragraph (a) of this section, the claim may be accepted if the claim identifying the prior foreign application by specifying its application number, country, and the day, month and year of its filing is filed during the pendency of the application and the delay in stating the claim was unintentional. A petition to accept a delayed claim to priority under 35 U.S.C. 119(a)-(d) must be accompanied by:

(1) The surcharge set forth in § 1.17(u); and,  
(2) A statement that the delay was unintentional. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional information where there is a question whether the delay was unintentional.

(d) The time periods set forth in this section cannot be extended.▶

20. Section 1.58 is proposed to be amended by removing and reserving paragraph (b) and revising paragraph (c) to read as follows:

§ 1.58 Chemical and mathematical formulas and tables.

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(b)▶[Reserved]▶ [All tables and chemical and mathematical formulas in the specification, including claims, and amendments thereto, must be on paper which is flexible, strong, white, smooth, non-shiny, durable in order to permit use as camera copy when printing any patent which may issue. A good grade of bond paper is acceptable; watermarks should not be prominent. India ink or its equivalent, or solid black typewriter, should be used to secure perfectly black solid lines.]

(c) To facilitate camera copying when printing, the width of formulas and tables as presented should be limited normally to ▶12.7 cm. (5 inches)▶ [5 inches (12.7 cm.)] so that it may appear as a single column in the printed patent. [If it is not



possible to limit the width of a formula or table to 5 inches (12.7 cm.), it is permissible to present the formula or table with a maximum width of 10 3/4 inches (27.3 cm.) and to place it sideways on the sheet. Typewritten characters used in such formulas and tables must be from a block (nonscript) type font or lettering style having capital letters which are at least 2.1 mm. (0.08 inch) [0.08 inch (2.1 mm.)] high (e.g., elite type). [Hand lettering must be neat, clean, and have a minimum character height of 0.08 inch (2.1 mm.).] A space at least .64 cm. (1/4 inch) [1/4 inch (6.4 mm.)] high should be provided between complex formulas and tables and the text. Tables should have the lines and columns of data closely spaced to conserve space, consistent with high degree of legibility.

21. Section 1.60 is proposed to be amended by revising paragraph (d) to read as follows:

**§ 1.60 Continuation or divisional application for invention disclosed in a prior application.**

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(d) If an application filed pursuant to paragraph (b) of this section is otherwise complete, but does not include the appropriate filing fee, a true copy of the oath or declaration from the prior complete application, showing the signature or an indication it was signed, or the prior application did not include an abstract and claims on a separate sheet, and application papers typed on but one side of the paper with application papers or sheets of drawings of sufficient clarity, contrast, or quality in the proper size and format for electronic reproduction, a filing date will be granted and applicant will be so notified and given a period of time within which to file the fee, or the true copy of the oath or declaration, an abstract and claims on a separate sheet, substitute specification in compliance with § 1.125 with papers typed on but one side of the paper and sheets of drawings, each of the substitute specification and sheets of drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction, and to pay the surcharge as set forth in § 1.16(e) if the application did not include the basic filing fee or the copy of the oath or declaration from the prior application in order to prevent abandonment of the application. The notification pursuant to this paragraph may be made simultaneously with any notification pursuant to paragraph (c) of this section. The period for filing an abstract and claims on a separate sheet and a substitute specification and sheets of drawings of sufficient clarity, contrast, and quality for electronic reproduction cannot be extended pursuant to § 1.136(a).

22. Section 1.62 is proposed to be amended by revising paragraphs (d)-(f) to read as follows:

**§ 1.62 File wrapper continuing procedure.**

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(d) If an application which has been accorded a filing date pursuant to paragraph (a) of this section does not include the appropriate basic filing fee pursuant to paragraph (b) of this section, or an oath or declaration by the applicant in the case of a continuation-in-part application pursuant to paragraph (c) of this section, or any substitute specification and drawings pursuant to subparagraph (e)(2) of this section, applicant will be so notified and given a period of time within which to file the fee, oath, or declaration, substitute specification, and drawings, and to pay the surcharge as set forth in § 1.16(e) if the application did not include the basic filing fee or oath or declaration in order to prevent abandonment of the application. The notification pursuant to this paragraph may be made simultaneously with any notification of a defect pursuant to paragraph (a) of this section. The period for filing a substitute specification cannot be extended pursuant to § 1.136(a).

(e)(1) An application filed under this section will utilize the file wrapper and contents of the prior application to constitute the new continuation, continuation-in-part, or divisional application but will be assigned a new application [serial] number. Changes to the prior application must be made in the

form of an amendment to the prior application as it exists at the time of filing the application under this section.

(2) No copy of the prior [application or new] specification or drawings is required, unless the application is a continuation-in-part application containing any additional disclosure, in which case a substitute specification in compliance with § 1.125 and drawings are required. Any new specification filed will not be considered part of the original application papers, but will be treated as a substitute specification in accordance with § 1.125. [The filing of such a copy or specification will be considered improper, and a filing date as of the date of deposit of the request for an application under this section will not be granted to the application unless a petition with the fee set forth in § 1.17(i) is filed with instructions to cancel the copy or specification.]

(f) The filing of an application under this section will be construed to include a waiver of confidence [secret] by the applicant under 35 U.S.C. 122(a) to the extent that any member of the public who is entitled under the provisions of [37 CFR] 1.14 to access to, or information concerning either the prior application or any continuing application filed under the provisions of this section may be given similar access to, or similar information concerning, the other application(s) in the file wrapper.

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23. Section 1.72 is proposed to be amended by revising paragraph (b) to read as follows:

**§ 1.72 Title and abstract.**

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(b) A brief abstract of the technical disclosure in the specification must be set forth on a separate sheet, preferably prior to the first page of the specification [following the claims] under the heading "Abstract of the Disclosure". The purpose of the abstract is to enable the Patent and Trademark Office and the public generally to determine quickly from a cursory inspection the nature and gist of the technical disclosure. The abstract shall not be used for interpreting the scope of the claims.

24. Section 1.75 is proposed to be amended by revising paragraph (g) and adding paragraphs (h) and (i) to read as follows:

**§ 1.75 Claim(s).**

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(g) The least restrictive claim should be presented as claim number 1, and all [All] dependent claims should be grouped together with the claim or claims to which they refer to the extent possible.

(h) The claim or claims must be set forth on a separate sheet.

(i) Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation.

25. Section 1.77 is proposed to be revised to read as follows:

**§ 1.77 Arrangement of application elements.**

(a) The elements of the application, if applicable, should appear in the following order:

(1) Utility Application Transmittal Form.

(2) Fee Transmittal Form.

(3) Abstract of the disclosure.

(4) Title of the invention; or an introductory portion stating the name, citizenship, and residence of the applicant, and the title of the invention may be used.

(5) [(c)(1)] Cross-reference to related applications [if any].

(6) [(2)] Statement regarding federally sponsored research or development.

(7) Reference to a "Microfiche appendix" [if any].

(See § 1.96 (c) [(b)]). The total number of microfiche and total number of frames should be specified.

(8) [(d)] Background of the invention

(9) brief summary of the invention.

(10) [(e)] Brief description of the several views of the drawing [if there are drawings].

(11) [(f)] Detailed description.

(12) [(g)] Claim or claims.

(13) [(h)] Abstract of the disclosure.

(i) Signed oath or declaration.

(j) Drawings.

(14) Executed oath or declaration.

(15) Sequence Listing (See § 1.821 et seq.).

(b) The elements set forth in subparagraphs (a)(3)-(a)(6), (a)(8)-(a)(12) and (a)(15) should appear in upper case, without underlining or bold type, as section headings. If no text follows the section heading, with the phrase "Not Applicable" should follow the section heading.

26. Section 1.78 is proposed to be amended by revising paragraphs (a) and (c)-(d) to read as follows:

**§ 1.78 Claiming benefit of earlier filing date and cross-references to other applications.**

(a)(1) A nonprovisional application may claim an invention disclosed in one or more prior filed copending nonprovisional applications or international applications designating the United States of America. In order for a nonprovisional application to claim the benefit of a prior filed copending nonprovisional application or international application designating the United States of America, each prior application must name as an inventor at least one inventor named in the later filed nonprovisional application and disclose the named inventor's invention claimed in at least one claim of the later filed nonprovisional application in the manner provided by the first paragraph of 35 U.S.C. 112. In addition, each prior application must be:

(i) complete as set forth in § 1.51(a)(1); or  
(ii) entitled to a filing date as set forth in § 1.53(b)(1), § 1.60 or § 1.62 and include the basic filing fee set forth in § 1.16; or

(iii) entitled to a filing date as set forth in § 1.53(b)(1) and have paid therein the processing and retention fee set forth in § 1.21(l) within the time period set forth in § 1.53(d)(1).

(2) Any nonprovisional application claiming the benefit of one or more prior filed copending nonprovisional applications or international applications designating the United States of America must, within two months of filing or within fourteen months of the filing date of the prior application, whichever is later, contain or be amended to contain in the first sentence of the specification following the title a reference to each such prior application, identifying it by application number (consisting of the series code and serial number) or international application number and international filing date and indicating the relationship of the applications. Cross-references to other related applications may be made when appropriate. (See § 1.14(b)).

(3) A nonprovisional application other than for a design patent may claim an invention disclosed in one or more prior filed copending provisional applications. [Since a provisional

application can be pending for no more than twelve months, the last day of pendency may occur on a Saturday, Sunday, or Federal holiday within the District of Columbia which for copendency would require the nonprovisional application to be filed prior to the Saturday, Sunday, or Federal holiday.] In order for a nonprovisional application to claim the benefit of one or more prior filed copending provisional applications, each prior provisional application must name as an inventor at least one inventor named in the later filed nonprovisional application and disclose the named inventor's invention claimed in at least one claim of the later filed nonprovisional application in the manner provided by the first paragraph of 35 U.S.C. 112. In addition, each prior provisional application must be:

(i) complete as set forth in § 1.51(a)(2); or  
(ii) entitled to a filing date as set forth in § 1.53(b)(2) and include the basic filing fee set forth in § 1.16(k).

(4) Any nonprovisional application claiming the benefit of one or more prior filed copending provisional applications must, within two months of filing or within fourteen months of the filing date of the prior application, whichever is later, contain or be amended to contain in the first sentence of the specification following the title a reference to each such prior provisional application, identifying it as a provisional application, and including the provisional application number (consisting of series code and serial number).

(5) If a claim to the benefit of any prior filed copending nonprovisional application or international application designating the United States of America is presented in a nonprovisional application after the time period provided by subparagraph (a)(2) of this section, or if a claim to the benefit of any prior filed copending provisional application is presented in a nonprovisional application other than for a design patent after the time period provided by subparagraph (a)(4) of this section, the claim may be accepted in the application if the claim identifying the prior application by application number or international application number and international filing date is filed during the pendency of the application and the delay in stating the claim was unintentional. A petition to accept a delayed claim to the benefit of a prior filed copending application must be accompanied by:

(i) The surcharge set forth in § 1.17(u); and  
(ii) A statement that the delay was unintentional. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional information where there is a question whether the delay was unintentional.

(6) The time periods set forth in this paragraph cannot be extended.

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(c) Where an [two or more] application[s], or a patent under reexamination [or an application] and an application or a patent naming different inventors are [and] owned by the same party and contain conflicting claims, and there is no statement of record indicating that the claimed inventions were commonly owned or subject to an obligation of assignment to the same person at the time the later invention was made, the assignee may be called upon to state whether the claimed inventions were commonly owned or subject to an obligation of assignment to the same person at the time the later invention was made, and if not, indicate which named inventor is the prior inventor. In addition to making said statement, the assignee may also explain why an interference should or should not be declared.

(d) Where an application or a patent under reexamination claims an invention which is not patentably distinct from an invention claimed in a commonly owned patent with the same or a different inventive entity, a double patenting rejection will be made in the application or a patent under reexamination. A non-statutory [An obviousness-type] double patenting rejection may be obviated by filing a terminal disclaimer in accordance with § 1.321(b).



27. Section 1.84 is proposed to be amended by revising paragraphs (c), (f)-(g), (j) and (x) to read as follows:

#### § 1.84 Standards for drawings.

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(e) *Identification of drawings.* Identifying indicia, if provided, should include the application number or the title of the invention, inventor's name, docket number (if any), and the name and telephone number of a person to call if the Office is unable to match the drawings to the proper application. This information should be placed on the back of each sheet of drawings a minimum distance of 1.5 cm. (5/8 inch) down from the top of the page. In addition, a reference to the application number, or, if an application number has not been assigned, the inventor's name, may be included in the left-hand corner, provided that the reference appears within 1.5 cm. (9/16 inch) from the top of the sheet.

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(f) *Size of paper.* All drawing sheets in an application must be the same size. One of the shorter sides of the sheet is regarded as its top. The size of the sheets on which drawings are made must be:

- (1) 21.6 cm. by 35.6 cm. (8 1/2 by 14 inches),
- (2) 21.6 cm. by 33.1 cm. (8 1/2 by 13 inches),
- (3) 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches), or
- (4) (1) 21.0 cm. by 29.7 cm. (DIN size A4), or
- (2) 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches).

(g) *Margins.* The sheets must not contain frames around the sheet; i.e., the usable surface, but should have scan target points, i.e., cross-hairs, printed on two catercorner margin corners. The following margins are required:

- (1) On 21.6 cm. by 35.6 cm. (8 1/2 by 14 inches) drawing sheets, each sheet must include a top margin of 5.1 cm. (2 inches), and bottom and side margins of .64 cm. (1/4 inch) from the edges, thereby leaving a sight no greater than 20.3 cm. by 29.8 cm. (8 by 11 3/4 inches).
- (2) On 21.6 cm. by 33.1 cm. (8 1/2 by 13 inches) drawing sheets, each sheet must include a top margin of 2.5 cm. (1 inch) and bottom and side margins of .64 cm. (1/4 inch) from the edges, thereby leaving a sight no greater than 20.3 cm. by 29.8 cm. (8 by 11 3/4 inches).
- (3) On 21.6 cm. by 27.9 cm. (8 1/2 by 11 inch) drawing sheets, each sheet must include a top margin of 2.5 cm. (1 inch) and bottom and side margins of .64 cm. (1/4 inch) from the edges, thereby leaving a sight no greater than 20.3 cm. by 24.8 cm. (8 by 9 3/4 inches).
- (4) On 21.0 cm. by 29.7 cm. (DIN size A4) drawing sheets, each sheet must include a top margin of at least 2.5 cm. (1 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 1.5 cm. (9/16 inch), and a bottom margin of at least 1.0 cm. (3/8 inch), thereby leaving a sight no greater than 17.0 cm. by 26.2 cm. on 21.0 cm. by 29.7 cm. (DIN size A4) drawing sheets, and a sight no greater than 17.6 cm. by 24.4 cm. (6 15/16 by 9 5/8 inches) on 21.6 cm. by 27.9 cm. (8 1/2 by 11 inch) drawing sheets.

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(j) *View for Official Gazette.* One of the views should be suitable for publication in the *Official Gazette*, the patent application notice, and the *Gazette of Patent Application Notices* as the illustration of the invention.

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(x) *Holes.* No holes should be provided in the drawing sheets. The drawing sheets may be provided with two holes in the top margin. The holes should be equally spaced from the respective side edges, and their center lines should be spaced 7.0 cm. (2 3/4 inches) apart.

(See § 1.152 for design drawings, § 1.165 for plant drawings, and § 1.174 for reissue drawings.)

28. Section 1.85 is proposed to be amended by revising paragraph (a) to read as follows:

#### § 1.85 Corrections to drawings.

(a) The requirements of § 1.84 relating to drawings will be strictly enforced. A drawing not executed in conformity thereto, if suitable for electronic reproduction by digital imaging, may be admitted for examination but in such case a new drawing must be furnished.

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29. Section 1.96 is proposed to be revised to read as follows:

#### § 1.96 Submission of computer program listings.

(a) Descriptions of the operation and general content of computer program listings should appear in the description portion of the specification. A computer program listing for the purpose of this section [these rules] is defined as a printout that lists in appropriate sequence the instructions, routines, and other contents of a program for a computer. The program listing may be either in machine or machine-independent (object or source) language which will cause a computer to perform a desired procedure or task such as solve a problem, regulate the flow of work in a computer, or control or monitor events. Computer program listings may be submitted in patent applications as set forth in paragraphs (b) and (c) of this section. [in the following forms:]

(b) (a) Material which will be printed in the patent. If the computer program listing is contained on 10 printout pages or less, it must be submitted either as drawings or as part of the specification.

(1) Drawings. The listing may be submitted in the manner and complying with the requirements for drawings as provided in § 1.84.

At least one figure numeral is required on each sheet of drawing.

(2) Specification. (i) The listing may be submitted as part of the specification in accordance with the provisions of § 1.52, at the end of the description but before the claims.

(ii) Any [The] listing [may be] submitted as part of the specification [in the form of computer printout sheets (commonly 14 by 11 inches in size) for use as "camera ready copy" when a patent is subsequently printed. Such computer printout sheets] must be original copies from the computer with dark solid black letters not less than 0.21 cm high, on white, unshaded and unlined paper, [the printing on each sheet must be limited to an area 9 inches high by 13 inches wide,] and the sheets should be submitted in a protective cover. [When printed in patents, such computer printout sheets will appear at the end of the description but before the claims and will usually be reduced about 1/2 in size with two printout sheets being printed as one patent specification page.] Any amendments must be made by way of submission of a substitute sheet. [if the copy is to be used for camera ready copy.]

(c) (b) As an appendix which will not be printed. If a computer program listing printout is 11 or more pages long, applicants must [may] submit such listing in the form of microfiche, referred to in the specification (see § 1.77 (a)(7) (c)(2)). Such microfiche filed with a patent application is to be referred to as a "microfiche appendix." The "microfiche appendix" will not be part of the printed patent. Reference in the application to the "microfiche appendix" must [should] be made at the beginning of the specification at the location indicated in § 1.77 (a)(7) (c)(2). Any amendments thereto must be made by way of revised microfiche. [All computer program listings submitted on paper will be printed as part of the patent.]

(1) *Availability of appendix.* Such computer program listings on microfiche will be available to the public for inspection, and microfiche copies thereof will be available for purchase with the file wrapper and contents, after a patent based on such application is granted or the application is otherwise made publicly available.

(2) *Submission requirements.* Except as modified or clarified below, computer-generated [Computer-generated] information submitted as a "microfiche appendix" [an appendix] to an application [for patent] shall be in [the form of microfiche] in accordance with the standards set forth in the following American National Standards Institute (ANSI) or National Micrographics Association (NMA) standards (Note: As new editions of these standards are published, the latest shall apply):

- ANSI PH 1.28-1976-Specifications for Photographic Film for Archival records, Silver-Gelatin Type, on Cellulose Ester Base.
- ANSI PH 1.41-1976 Specifications for Photographic Film for Archival Records, Silver-Gelatin Type, on Polyester Base.
- NMA-MSI (1971) Quality Standards for Computer Output-Microfilm.
- ANSI/NMA MS2 (1978) Format and Coding Standards for Computer Output Microfilm.
- NMA MS5 (ANSI PH 5.9-1975) Microfiche of Documents.
- ANSI PH 2.19 (1959)-Diffuse Transmission Density.

[except as modified or clarified below:]

(i) [Either] Computer-Output-Microfilm (COM) output [or copies of photographed paper copy] may be submitted in accordance with either [In the former case,] NMA standard [standards] MS1 or [and] MS2 [apply; in the latter case, standard MS5 applies.]

(ii) Film submitted shall be first generation (camera film) negative appearing microfiche (with emulsion on the back side of the film when viewed with the images right reading).

(iii) Reduction ratio of microfiche submitted should be 24:1 or a similar ratio where variation from said ratio is required in order to fit the documents into the image area of the microfiche format used.

(iv) Film submitted shall have a thickness of at least 0.13 mm (.005 inches) [0.005 inches (0.13 mm)] and not more than 0.23 mm (.009 inches) [0.009 inches (0.23 mm)] for either cellulose acetate base or polyester base type.

(v) Both microfiche formats A1 (98 frames, 14 columns x 7 rows) and A3 (63 frames, 9 columns x 7 rows) which are described in NMA standard MS2 (A1 is also described in MS5) are acceptable for use in preparation of microfiche submitted.

(vi) At least the left-most 1/3 (50 mm x 12 mm) of the header or title area of each microfiche submitted shall be clear or positive appearing so that the Patent and Trademark Office can apply application [serial] number and filing date thereto in an eye-readable form. The middle portion of the header shall be used by applicant to apply an eye-readable application identification such as the title and/or the first inventor's name. The attorney's docket number may be included. The final right-hand portion of the microfiche shall contain sequence information for the microfiche, such as 1 of 4, 2 of 4, etc.

(vii) Additional requirements which apply specifically to microfiche of filmed paper copy:

(A) The first frame of each microfiche submitted shall contain a standard test target which contains five NBS Micro-copy Resolution Test Charts (No. 1010A), one in the center and one in each corner. See illustration on page 2 of NMA Recommended Practice MS104, Inspection and Quality Control of First Generation Silver Halide Microfilm. See also paragraph 7 of NMA-MS5.

(B) The second frame of each microfiche submitted must contain a fully descriptive title and the inventor's name as filed.

(C) The pages or lines appearing on the microfiche frames should be consecutively numbered.

(D) Pagination of the microfiche frames shall be from left to right and from top to bottom.

(E) At a reduction of 24:1 resolution of the original microfilm shall be at least 120 lines per mm (5.0 target) so that reproduc-

tion copies may be expected to comply with provisions of paragraph 7.1.4 of NMA Standard MS5.

(F) Background density of negative appearing camera master microfiche of filmed paper documents shall be within the range of 0.9 to 1.2 and line density should be no greater than 0.08. The density shall be visual diffuse density as measured using the method described in ANSI Standard PH 2.19.

(G) An index, when included, should appear in the last frame (lower right hand corner when data is right-reading) of each microfiche. See NMA-MS5, paragraph 6.6.

(viii) Microfiche generated by Computer Output Microfilm (COM).

(A) Background density of negative-appearing COM-generated camera master microfiche shall be within the range of 1.5 to 2.0 and line density should be no greater than 0.2. The density shall be visual diffuse density as described in ANSI PH2.19.

(B) The first frame of each microfiche submitted should contain a resolution test frame in conformance with NMA standard MS1.

(C) The second frame of each microfiche submitted must contain a fully descriptive title and the inventor's name as filed.

(D) The pages or lines appearing on the microfiche frames should be consecutively numbered.

(E) It is preferred that pagination of the microfiche frames be from left to right and top to bottom but the alternative, i.e., from top to bottom and from left to right, is also acceptable.

(F) An index, when included, should appear on the last frame (lower right hand corner when data is right reading) of each microfiche.

(G) Amendment of microfiche must be made by way of replacement microfiche.

30. Section 1.97 is proposed to be amended by revising paragraphs (a)-(d) to read as follows:

#### § 1.97 Filing of an information disclosure statement.

(a) In order for an applicant for patent or for reissue of a patent, or an owner of a patent under reexamination to have information considered by the Office during the pendency of a patent application, an information disclosure statement in compliance with § 1.98 should be filed in accordance with this section.

(b) An information disclosure statement shall be considered by the Office if filed by the applicant or patent owner.

(1) Within three months of the filing date of a national application;

(2) Within three months of the date of entry of the national stage as set forth in § 1.491 in an international application; or

(3) Before the mailing date of a first Office action on the merits, whichever event occurs last.

(c) An information disclosure statement shall be considered by the Office if filed by the applicant or patent owner after the period specified in paragraph (b) of this section, but before the mailing date of either:

(1) A final action under § 1.113 or

(2) A notice of allowance under § 1.311, whichever occurs first, provided the statement is accompanied by either a certification as specified in paragraph (e) of (3) of this section or the fee set forth in § 1.17(p).

(d) An information disclosure statement shall be considered by the Office if filed by the applicant or patent owner after the mailing date of either:

(1) A final action under § 1.113 or

(2) A notice of allowance under § 1.311, whichever occurs first, but before payment of the issue fee, provided the statement is accompanied by:

(i) A certification as specified in paragraph (e) of this section,

(ii) A petition requesting consideration of the information disclosure statement, and



(iii) The petition fee set forth in § 1.17(i).

31. Section 1.98 is proposed to be amended by revising paragraphs (a)-(b) to read as follows:

#### § 1.98 Content of information disclosure statement.

(a) Any information disclosure statement filed under § 1.97 shall include:

- (1) list of all patents, publications or other information submitted for consideration by the Office;
- (2) A legible copy of:

- (i) Each U.S. patent application notice, technical contents publication and U.S. patent;
- (ii) Each publication or that portion which caused it to be listed; and
- (iii) All other information or that portion which caused it to be listed, except that no copy of an unpublished U.S. patent application need be included; and

(3) A concise explanation of the relevance, as it is presently understood by the individual designated in § 1.56(c) most knowledgeable about the content of the information, of each patent, publication, or other information listed that is not in the English language. The concise explanation may be either separate from the specification or incorporated therein.

(b) Each U.S. patent listed in an information disclosure statement shall be identified by patentee, patent number and issue date. Each U.S. patent application notice or technical contents publication listed in an information disclosure statement shall be identified by applicant, patent application notice number or technical contents publication number and publication date. Each foreign patent or published foreign patent application shall be identified by the country or patent office which issued the patent or published the application, an appropriate document number, and the publication date indicated on the patent or published application. Each publication shall be identified by author (if any), title, relevant pages of the publication, date, and place of publication.

32. Section 1.107 is proposed to be amended by revising paragraph (a) to read as follows:

#### § 1.107 Citation of references.

(a) If domestic patents are cited by the examiner, their numbers and dates, and the names of the patentees [and the classes of inventions] must be stated. If domestic published applications are cited by the examiner, their technical contents publication number, publication date, and the names of the applicants must be stated. If foreign published applications or patents are cited, their nationality or country, numbers and dates, and the names of the patentees must be stated, and such other data must be furnished as may be necessary to enable the applicant, or in the case of a reexamination proceeding, the patent owner, to identify the published applications or patents cited. In citing foreign published applications or patents, in case only a part of the document is involved, the particular pages and sheets containing the parts relied upon must be identified. If printed publications are cited, the author (if any), title, date, pages or plates, and place of publication, or place where a copy can be found, shall be given.

33. Section 1.108 is proposed to be revised to read as follows:

#### § 1.108 Abandoned applications not cited.

Abandoned applications as such will not be cited as references, except those which are published applications

or have been opened to inspection by the public following a defensive publication.

34. Section 1.131 is proposed to be amended by revising paragraph (a) to read as follows:

#### § 1.131 Affidavit or declaration of prior invention to overcome cited patent or publication.

(a)(1) When any claim of an application or a patent under reexamination is rejected under 35 U.S.C. 102(a) or (e), or 35 U.S.C. 103 based on a U.S. patent or pending or patented published application to another which is prior art under 35 U.S.C. 102(a) or (e) and which substantially shows or describes but does not claim the same patentable invention, as defined in § 1.601(n), or on reference to a foreign patent, an abandoned U.S. published application, or to a printed publication, the inventor of the subject matter of the rejected claim, the owner of the patent under reexamination, or the party qualified under §§ 1.42, 1.43, or 1.47, may submit an appropriate oath or declaration to overcome the patent, published application or publication. The oath or declaration must include facts showing a completion of the invention in this country or in a NAFTA or WTO member country before the filing date of the U.S. published application or the application on which the U.S. patent issued, or before the date of the foreign patent, or before the date of the printed publication. When an appropriate oath or declaration is made, the patent, published application or publication cited shall not bar the grant of a patent to the inventor or the confirmation of the patentability of the claims of the patent, unless the date of such patent, published application or publication is more than one year prior to the date on which the inventor's or patent owner's application was filed in this country.

(2) A date of completion of the invention may not be established under this section before December 8, 1993, in a NAFTA country, or before January 1, 1996, in a WTO member country other than a NAFTA country.

(3) Notwithstanding the provisions of paragraph (a)(1), a showing may be made under this section where the inventions defined by a claim in an application or a patent under reexamination and by a claim in U.S. patent or pending or patented published application are not identical as set forth in 35 U.S.C. 102, and where the inventions are owned by the same party, unless the date of such patent or published application is more than one year prior to the date on which the inventor's or patent owner's application was filed in this country.

35. Section 1.132 is proposed to be revised to read as follows:

#### § 1.132 Affidavits or declarations traversing grounds of rejection.

When any claim of an application or a patent under reexamination is rejected on reference to a [domestic] U.S. patent or pending U.S. published application which substantially shows or describes but does not claim the invention, or on reference to a foreign patent, an abandoned U.S. published application, or to a printed publication, or to facts within the personal knowledge of an employee of the Office, or when rejected upon a mode or capability of operation attributed to a reference, or because the alleged invention is held to be inoperative or lacking in utility, or frivolous or injurious to public health or morals, affidavits or declarations traversing these references or objections may be received.

36. Section 1.136 is proposed to be amended by revising paragraph (a) to read as follows:

#### § 1.136 Filing of timely responses with petition and fee for extension of time and extensions of time for cause.

(a)(1) If an applicant is required to respond within a nonstatutory or shortened statutory time period, applicant may respond up to four months after the time period set if a petition for an extension of time and the fee set in § 1.17 are filed prior to or with the response, unless:

(i) Applicant is notified otherwise in an Office action,  
(ii) The response is to a requirement for an English translation, an abstract or claims on a separate sheet, or substitute specification or sheets of drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction submitted pursuant to §§ 1.52(d), 1.53(d), 1.60(d), 1.62(d), 1.494(c) or 1.495(c), or an oath or declaration submitted pursuant to §§ 1.494(c) or 1.495(c),

(iii) The response is a reply brief submitted pursuant to § 1.193(b),

(iv) The response is a request for an oral hearing submitted pursuant to § 1.194(b),

(v) The response is to a decision by the Board of Patent Appeals and Interferences pursuant to § 1.196, § 1.197 or § 1.304, or

(vi) The application is involved in an interference declared pursuant to § 1.611.

(2) The date on which the response, the petition, and the fee have been filed is the date of the response and also the date for purposes of determining the period of extension and the corresponding amount of the fee. The expiration of the time period is determined by the amount of the fee paid. In no case may an applicant respond later than the maximum time period set by statute, or be granted an extension of time under paragraph (b) of this section when the provisions of this paragraph are available. See § 1.136(b) for extensions of time relating to the filing of an English translation pursuant to §§ 1.52(d), 1.494(c) or 1.495(c), the filing of an abstract or claims on a separate sheet, substitute specification or sheets of drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction pursuant to §§ 1.53(d), 1.60(d), 1.62(d), 1.494(c), or 1.495(c), the filing of an oath or declaration pursuant to §§ 1.494(c) or 1.495(c), or proceedings pursuant to §§ 1.193(b), 1.194, 1.196 or 1.197. See § 1.304 for extension of time to appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action. See § 1.550(c) for extension of time in reexamination proceedings and § 1.645 for extension of time in interference proceedings.

37. Section 1.138 is proposed to be revised to read as follows:

#### § 1.138 Express abandonment.

An application may be expressly abandoned by filing in the Patent and Trademark Office a written declaration of abandonment signed by the applicant and the assignee of record, if any, and identifying the application. An application may also be expressly abandoned by filing a written declaration of abandonment signed by the attorney or agent of record. A registered attorney or agent acting under the provision of § 1.34(a), or of record, may also expressly abandon a prior application as of the filing date granted to a continuing application when filing such a continuing application. Express abandonment of the application may not be recognized by the Office unless it is actually received by appropriate officials in time to act thereon before the date of issue or publication. An applicant seeking to abandon an application to avoid publication of the application must submit a proper letter of express abandonment more than two months prior to the projected date of publication to allow sufficient time to permit the appropriate officials to recognize the abandonment and remove the application from the publication process, and unless an applicant receives written acknowledgement of the letter of express abandonment prior to the projected date of publication, applicant should expect that the application will be published in regular course.

38. Section 1.154 is proposed to be revised to read as follows:

#### § 1.154 Arrangement of specification.

(a) The elements of the design application, if applicable, should appear in the following order [The following order of arrangement should be observed in framing design specifications]:

- (1) Design Application Transmittal Form.
- (2) Fee Transmittal Form.

(3) [(a)] Preamble, stating name of the applicant and title of the design.

(4) Cross-reference to related applications.

(5) Statement regarding federally sponsored research or development.

(6) [(b)] Description of the figure or figures of the drawing.

(7) [(c)] Description [if any].

(8) [(d)] Claim.

(9) Drawings or photographs

(10) [(e)] Executed oath or declaration (See § 1.153(b)).

39. Section 1.163 is proposed to be amended by adding new paragraphs (c) and (d) to read as follows:

#### § 1.163 Specification

(c) The elements of the plant application, if applicable, should appear in the following order:

- (1) Plant Application Transmittal Form.
- (2) Fee Transmittal Form.
- (3) Abstract of the disclosure.
- (4) Title of the invention.
- (5) Cross-reference to related applications.
- (6) Statement regarding federally sponsored research or development.
- (7) Background of the invention.
- (8) Brief summary of the invention.
- (9) Brief description of the drawing.
- (10) Detailed Botanical Description.
- (11) Claim.
- (12) Drawings (in duplicate).
- (13) Executed oath or declaration.
- (14) Plant color coding sheet.

(d) A plant color coding sheet as used in this section means a sheet that specifies a color coding system as designated in a recognized color dictionary, and lists every plant structure to which color is a distinguishing feature and the corresponding color code which best represents that plant structure.

40. Section 1.291 is proposed to be amended by revising paragraphs (a)-(b) to read as follows:

#### § 1.291 Protests by the public against pending applications.

(a) Protests by a member of the public against pending applications will be referred to the examiner having charge of the subject matter involved. A protest specifically identifying the application to which the protest is directed will be entered in the application file if:

- (1) The protest is [timely] submitted:

(i) prior to the date the application was published or the mailing of a notice of allowance under § 1.311, whichever occurs first, or

(ii) within two months of the date the application was published or prior to the mailing of a notice of allowance under § 1.311, whichever occurs first, if accompanied by the fee set forth in § 1.17(t); and

(2) The protest is either served upon the applicant in accordance with § 1.248, or, if submitted prior to the date the application was published, filed with the Office in duplicate in the event service is not possible.

[Protests raising fraud or other inequitable conduct issues will be entered in the application file, generally without comment on those issues. Protests which do not adequately identify a pending patent application will be disposed of and will not be considered by the Office.]

(b) A protest submitted in accordance with the second sentence of paragraph (a) of this section will be considered by the Office if the application is still pending when the protest and application file are brought before the examiner and it includes (1) a listing of the patents, publications, or other



information relied upon; (2) a concise explanation of the relevance of each listed item; (3) a copy of each listed patent or publication or other item of information in written form or at least the pertinent portions thereof; and (4) an English language translation of all the necessary and pertinent parts of any non-English language patent, publication, or other item of information in written form relied upon. ▶ Protests raising fraud or other inequitable conduct issues will be entered in the application file, generally without comment on those issues. Protests which do not adequately identify a pending patent application will be disposed of and will not be considered by the Office. ◀

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41. Section 1.292 is proposed to be amended by revising paragraphs (a)-(b) to read as follows:

#### § 1.292 Public use proceedings.

(a) When a petition for the institution of public use proceedings, supported by affidavits or declarations [and the fee set forth in § 1.17(j)], is filed by one having information of the pendency of an application and] is found, on reference to the examiner, to make a *prima facie* showing that the invention claimed in an application believed to be on file had been in public use or on sale more than one year before the filing of the application, a hearing may be had before the Commissioner to determine whether a public use proceeding should be instituted. If instituted, the Commissioner may designate an appropriate official to conduct the public use proceeding, including the setting of times for taking testimony, which shall be taken as provided by §§ 1.671 through 1.685. The petitioner will be heard in the proceedings but after decision therein will not be heard further in the prosecution of the application for patent.

(b) The petition and accompanying papers [should either: (1) Reflect that a copy of the same has been served upon the applicant or upon his attorney or agent of record; or (2) be filed with the Office in duplicate in the event service is not possible. The petition and accompanying papers], or a notice that such a petition has been filed, shall be entered in the application file [.] ▶ if:

(1) The petition is accompanied by the fee set forth in § 1.17(j);

(2) The petition is served on the applicant in accordance with § 1.248, or, if submitted prior to the date the application was published, filed with the Office in duplicate in the event service is not possible; and,

(3) The petition is submitted within two months of the date the application was published or prior to the mailing of a notice of allowance under § 1.311, whichever occurs first. ◀

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42. A new, undesignated center heading and new sections 1.305 through 1.308 are proposed to be added to Subpart B-National Processing Provisions to read as follows:

#### ▶ PUBLICATION OF APPLICATIONS

#### § 1.305 Withdrawal from publication.

Applications may be withdrawn from publication at the initiative of the Office or upon request by the applicant. An application will not be withdrawn from publication for any reason except:

(a) A mistake on the part of the Office;

(b) The application is either national security classified (see § 5.9(b)) or subject to a secrecy order pursuant to 35 U.S.C. 181; or,

(c) Express abandonment of the application pursuant to § 1.138.

#### § 1.306 Publication of application.

(a) A U.S. national application for patent which was either filed in the Office under 35 U.S.C. 111(a) or which resulted from an international application after compliance with 35

U.S.C. 371, or an application filed in the Office under 35 U.S.C. 161 will be published as soon as possible after the expiration of a period of 18 months from the filing date, including the earliest filing date for which a benefit is sought, unless:

(1) The application is national security classified (see § 5.9(b)) or subject to a secrecy order pursuant to 35 U.S.C. 181;

(2) The application has issued as a patent;

(3) The application is recognized by the Office as no longer pending; or,

(4) The application was previously published pursuant to paragraph (d) of this section.

(b) The publication of an application shall consist of:

(1) A notice designated as a "Gazette Entry" containing information such as the application number, filing date, title, inventor's name, abstract, a drawing figure (if appropriate), a representative claim, and U.S. and International Patent Classification (IPC) classification(s) in a *Gazette of Patent Application Notices*;

(2) A printed publication designated as a "patent application notice" containing information such as the application number, filing date, title, inventor's name, correspondence address, abstract, a drawing figure (if appropriate), a representative claim, and U.S. and International Patent Classification (IPC) classification(s);

(3) A document designated as a "technical contents publication" containing the patent application notice and the specification, abstract, claim(s), and drawing(s); and

(4) Public access to a copy of the specification, drawings, and all papers relating to the application file in accordance with § 1.11(a).

(c) Provisional applications filed in the Office under 35 U.S.C. 111(b) shall not be published, and design applications filed in the Office under 35 U.S.C. 171 and reissue applications filed in the Office under 35 U.S.C. 251 shall not be published pursuant to this section.

(d) Applications that will be published pursuant to paragraph (a) of this section may be published earlier than as set forth in paragraph (a) upon petition by the applicant. Any petition requesting early publication of an application must be accompanied by the fee set forth in § 1.17(i) and filed as soon as possible. No consideration will be given to requests for early publication in an application lacking an abstract or claims on a separate sheet, any English translation required pursuant to § 1.52(d), or substitute specification or drawings required pursuant to §§ 1.53(d), 1.60(d), or 1.62(d). No consideration will be given to requests for publication on a certain date, and such requests will be treated as a request for publication as soon as possible.

(e) An applicant who is an independent inventor and has been accorded status under 35 U.S.C. 41(h) in an application that will be published pursuant to paragraph (a) of this section and does not claim the benefit of an earlier filing date under 35 U.S.C. 119, 120, 121, 365(a) or 365(c) may request that the application not be published until three months after an action on the merits. A petition requesting that the application not be published until three months after an action on the merits must be submitted with the filing of the application and be accompanied by:

(1) The petition fee set forth in § 1.17(i); and,

(2) A certification that the invention disclosed in the application was not or will not be the subject of an application filed in a foreign country. The certification must be verified if made by a person not registered to practice before the Patent and Trademark Office.

#### § 1.307 Delivery of the printed publication.

The patent application notice will be delivered or mailed on the day of its publication to the correspondence address of record. See § 1.33(a).

#### § 1.308 Correction of the printed publication.

A request for a certificate of correction for the patent application notice will only be granted when the Office makes a

significant mistake which is apparent from Office records. ◀

43. Section 1.315 is proposed to be revised to read as follows:

#### § 1.315 Delivery of patent.

The patent will be delivered or mailed ▶ upon issuance ◀ [on the day of its date] to ▶ the correspondence address of record. See § 1.33(a). ◀ [the attorney or agent of record, if there be one; or if the attorney or agent so requests, to the patentee or assignee of an interest therein; or, if there be no attorney or agent, to the patentee or to the assignee of the entire interest, if he so requests.]

44. Section 1.321 is proposed to be amended by revising paragraph (c) to read as follows:

#### § 1.321 Statutory disclaimers, including terminal disclaimers.

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(c) A terminal disclaimer, when filed to obviate a ▶ non-statutory ◀ double patenting rejection in a patent application or in a reexamination proceeding, must:

(1) Comply with the provisions of paragraphs (b)(2) through (b)(4) of this section;

(2) Be signed in accordance with paragraph (b)(1) of this section if filed in a patent application or in accordance with paragraph (a)(1) of this section if filed in a reexamination proceeding; and

(3) Include a provision that any patent granted on that application or any patent subject to the reexamination proceeding shall be enforceable only for and during such period that said patent is commonly owned with the application or patent which formed the basis for the rejection.

45. Section 1.492 is proposed to be amended by revising paragraph (a) to read as follows:

#### § 1.492 National stage fees.

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(a) \*\*\*\*\*

(1) Where an international preliminary examination fee as set forth in § 1.482 has been paid on the international application to the United States Patent and Trademark Office:

By a small entity (§ 1.9(f)) .....▶\$355.00◀ [330.00]  
By other than a small entity .....▶710.00◀ [660.00]

(2) Where no international preliminary examination fee as set forth in § 1.482 has been paid to the United States Patent and Trademark Office, but an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority:

By a small entity (§ 1.9(f)) .....▶390.00◀ [365.00]  
By other than a small entity .....▶780.00◀ [730.00]

(3) Where no international preliminary examination fee as set forth in § 1.482 has been paid and no international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office:

By a small entity (§ 1.9(f)) .....▶520.00◀ [490.00]  
By other than a small entity .....▶1040.00◀ [980.00]

(4) Where the international preliminary examination fee as set forth in § 1.482 has been paid to the United States Patent and Trademark Office and the international preliminary examination report states that the criteria of novelty, inventive step (non-obviousness), and industrial applicability, as defined in PCT Article 33(1) to (4) have been satisfied for all the claims

presented in the application entering the national stage (see § 1.496(b)):

By a small entity (§ 1.9(f)) .....▶60.00◀ [46.00]  
By other than a small entity .....▶120.00◀ [92.00]

(5) Where a search report on the international application has been prepared by the European Patent Office or the Japanese Patent Office:

By a small entity (§ 1.9(f)) .....▶455.00◀ [425.00]  
By other than a small entity .....▶910.00◀ [850.00]

46. Section 1.494 is proposed to be amended by revising paragraphs (c) and (g) to read as follows:

#### § 1.494 Entering the national stage in the United States of America as a Designated Office.

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(c) If applicant complies with paragraph (b) of this section before expiration of 20 months from the priority date but omits:

(1) A translation of the international application, as filed, into the English language, if it was originally filed in another language (35 U.S.C. 371(c)(2)) ▶, ◀ [and/or]

(2) The oath or declaration of the inventor (35 U.S.C. 371(c)(4); see § 1.497),

▶(3) An abstract or claims on a separate sheet (see §§ 1.72(b) and 1.75(h)),

(4) Papers typed on but one side of the paper (see § 1.52(b)), and/or

(5) Application papers or sheets of drawings of sufficient clarity, contrast, and quality, and in the proper size and format for electronic reproduction (see §§ 1.52(a) and (b) and 1.85(a)), ◀ applicant will be so notified and given a period of time within which to file the ▶English◀ translation ▶, ◀ [and/or] oath or declaration ▶, abstract or claims on a separate sheet, and a substitute specification in compliance with § 1.125 with papers typed on but one side of the paper and sheets of drawings, each of the substitute specification and sheets of drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction ◀ in order to prevent abandonment of the application. The payment of the processing fee set forth in § 1.492(f) is required for acceptance of an English translation later than the expiration of 20 months after the priority date. ▶The period for filing the English translation, oath or declaration, an abstract and claims on a separate sheet, and a substitute specification and sheets of drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction cannot be extended pursuant to § 1.136(a). ◀ A copy of the notification mailed to applicant should accompany any response thereto submitted to the Office.

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(g) An international application becomes abandoned as to the United States 20 months from the priority date if the requirements of paragraph (b) of this section have not been complied with within 20 months from the priority date where the United States has been designated but not elected by the expiration of 19 months from the priority date. If the requirements of paragraph (b) of this section are complied with within 20 months from the priority date but any required translation of the international application as filed ▶, ◀ [and/or] the oath or declaration ▶, abstract or claims on a separate sheet, and/or substitute specification in compliance with § 1.125 with papers typed on but one side of the paper and sheets of drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction ◀ are not timely filed, an international application will become abandoned as to the United States upon expiration of the time period set pursuant to paragraph (c) of this section.



47. Section 1.495 is proposed to be amended by revising paragraphs (c) and (h) to read as follows:

**§ 1.495 Entering the national stage in the United States of America as an Elected Office**

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(c) If applicant complies with paragraph (b) of this section before expiration of 30 months from the priority date but omits:

(1) A translation of the international application, as filed, into the English language, if it was originally filed in another language (35 U.S.C. 371(c)(2)) ▶, ◀ [and/or]

(2) The oath or declaration of the inventor (35 U.S.C. 371(c)(4); see § 1.497).

▶(3) An abstract or claims on a separate sheet (see §§ 1.72(b) and 1.75(h)),

(4) Papers typed on but one side of the paper (see § 1.52(b)), and/or

(5) Application papers or sheets of drawings of sufficient clarity, contrast, and quality, and in the proper size and format for electronic reproduction (see §§ 1.52(a) and (b) and 1.85(a)), ◀ applicant will be so notified and given a period of time within which to file the ▶English◀ translation ▶, ◀ [and/or] oath or declaration ▶, abstract or claims on a separate sheet, and a substitute specification in compliance with § 1.125 with papers typed on but one side of the paper and sheets of drawings, each of the substitute specification and sheets of drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction◀ in order to prevent abandonment of the application. The payment of the processing fee set forth in § 1.492(f) is required for acceptance of an English translation later than the expiration of 30 months after the priority date. The payment of the surcharge set forth in § 1.492(e) is required for acceptance of the oath or declaration of the inventor later than the expiration of 30 months after the priority date. ▶The period for filing the English translation, oath or declaration, an abstract and claims on a separate sheet, and a substitute specification and sheets of drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction cannot be extended pursuant to § 1.136(a).◀ A copy of the notification mailed to applicant should accompany any response thereto submitted to the Office.

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(h) An international application becomes abandoned as to the United States 30 months from the priority date if the requirements of paragraph (b) of this section have not been complied with within 30 months from the priority date where the United States has been elected by the expiration of 19 months from the priority date. If the requirements of paragraph (b) of this section are complied with within 30 months from the priority date but any required translation of the international application as filed ▶, ◀ [and/or] the oath or declaration ▶, abstract or claims on a separate sheet, and/or a substitute specification in compliance with § 1.125 with papers typed on but one side of the paper and sheets of drawings, each of the substitute specification and sheets of drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction◀ are not timely filed, an international application will become abandoned as to the United States upon expiration of the time period set pursuant to paragraph (c) of this section.

48. Section 1.497 is proposed to be revised to read as follows:

**§ 1.497 Oath or declaration under 35 U.S.C. 371(c)(4).**

(a) When an applicant of an international application [ , if the inventor,] desires to enter the national stage under 35 U.S.C. 371 pursuant to §§ 1.494 or 1.495, he or she must file an oath or declaration ▶that:

(1) Is executed in accordance with either §§ 1.66 or 1.68,

(2) Identifies the specification to which it is directed,

(3) Identifies each inventor and the country of citizenship of each inventor, and

(4) States that the person making the oath or declaration believes the named inventor or inventors to be the original and

first inventor or inventors of the subject matter which is claimed and for which a patent is sought.◀ [in accordance with § 1.63.]

(b) ▶(1) The oath or declaration must be made by all of the actual inventors except as provided for in §§ 1.42, 1.43 or 1.47.

(2)◀ If the ▶person making the oath or declaration is not the inventor (§§ 1.42, 1.43 or 1.47),◀ [international application was made as provided in §§ 1.422, 1.423 or 1.425,] the ▶oath or declaration shall state the relationship of the person◀ [applicant shall state his or her relationship] to the inventor and, upon information and belief, the facts which the inventor is required [by § 1.63] to state.

▶(c) The oath or declaration must comply with the requirements of § 1.63; however, if the oath or declaration meets the requirements of paragraphs (a) and (b) of this section, the oath or declaration will be accepted as complying with 35 U.S.C. 371(c)(4) and §§ 1.494(c) or 1.495(c). If the oath or declaration does not meet the requirements of § 1.63, a supplemental oath or declaration in compliance with § 1.63 will be required in accordance with § 1.67.◀

49. Section 1.701 is proposed to be revised as follows:

**§ 1.701 Extension of patent term due to prosecution delay.**

(a) A patent, other than for designs, issued on an application filed on or after June 8, 1995, is ▶, subject to the provisions of this section,◀ entitled to extension of the patent term if the issuance of the patent was delayed due to:

(1) interference proceedings under 35 U.S.C. 135(a); and/or  
(2) the application being placed under a secrecy order under 35 U.S.C. 181; and/or

(3) appellate review by the Board of Patent Appeals and Interferences or by a Federal court under 35 U.S.C. 141 or 145, if the patent was issued pursuant to a decision reversing an adverse determination of patentability ▶; and/or◀ [and if the patent is not subject to a terminal disclaimer due to the issuance of another patent claiming subject matter that is not patentably distinct from that under appellate review.]

▶(4) an unusual administrative delay by the Office.

(i) Circumstances constituting an unusual administrative delay by the Office include the failure to:

(A) act on a reply under § 1.111 or appeal brief under § 1.192 within six months of the date it was filed;

(B) act on an application within six months of the date of a decision under § 1.196 by the Board of Patent Appeals and Interferences where claims stand allowed in an application or the nature of the decision requires further action by the examiner (§ 1.197); and

(C) issue a patent within six months of the date that the issue fee was paid or all outstanding requirements were satisfied, whichever is later.◀

(b) The term of a patent entitled to extension under paragraph (a) of this section shall be extended for the sum of the periods of delay calculated under paragraphs (c)(1), (c)(2), (c)(3) ▶, (c)(4)◀ and (d) of this section, to the extent that these periods are not overlapping, up to a maximum of ▶ten◀ [five] years. The extension will run from the expiration date of the patent.

(c)(1) The period of delay under paragraph (a)(1) of this section for an application is the sum of the following periods, to the extent that the periods are not overlapping:

(i) with respect to each interference in which the application was involved, the number of days, if any, in the period beginning on the date the interference was declared or redeclared to involve the application in the interference and ending on the date that the interference was terminated with respect to the application; and

(ii) the number of days, if any, in the period beginning on the date prosecution in the application was suspended by the Patent and Trademark Office due to interference proceedings

under 35 U.S.C. 135(a) not involving the application and ending on the date of the termination of the suspension.

(2) The period of delay under paragraph (a)(2) of this section for an application is the sum of the following periods, to the extent that the periods are not overlapping:

(i) the number of days, if any, the application was maintained in a sealed condition under 35 U.S.C. 181;

(ii) the number of days, if any, in the period beginning on the date of mailing of an examiner's answer under § 1.193 in the application under secrecy order and ending on the date the secrecy order and any renewal thereof was removed;

(iii) the number of days, if any, in the period beginning on the date applicant was notified that an interference would be declared but for the secrecy order and ending on the date the secrecy order and any renewal thereof was removed; and

(iv) the number of days, if any, in the period beginning on the date of notification under § 5.3(c) and ending on the date of mailing of the notice of allowance under § 1.311.

(3) The period of delay under paragraph (a)(3) of this section is the sum of the number of days, if any, in the period beginning on the date on which an appeal to the Board of Patent Appeals and Interferences was filed under 35 U.S.C. 134 and ending on the date of a final decision in favor of the applicant by the Board of Patent Appeals and Interferences or by a Federal court in an appeal under 35 U.S.C. 141 or a civil action under 35 U.S.C. 145.

▶(4) The period of delay under paragraph (a)(4) of this section is the sum of the number of days, if any, in the period of unusual delay by the Office.◀

(d) The period [of delay] set forth in paragraph (c)[(3)] shall be reduced by ▶any time during the processing or examination of the application, as determined by the Commissioner, during which the applicant for patent failed to engage in reasonable efforts to conclude processing or examination of the application. In determining whether an applicant failed to engage in reasonable efforts to conclude processing or examination of the application, the Commissioner may examine the facts and circumstances of the applicant's actions during the entire prosecution of the application to determine whether the applicant exhibited that degree of timeliness as may reasonably be expected from, and which is ordinarily exercised by, an applicant for patent seeking to conclude the processing or examination of the application. Circumstances constituting a failure to engage in reasonable efforts to conclude processing or examination of the application include:

(1) requesting suspension of action under § 1.103, and  
(2) abandonment of the application.◀ [:

(1) any time during the period of appellate review that occurred before three years from the filing date of the first national application for patent presented for examination; and

(2) any time during the period of appellate review, as determined by the Commissioner, during which the applicant for patent did not act with due diligence. In determining the due diligence of an applicant, the Commissioner may examine the facts and circumstances of the applicant's actions during the period of appellate review to determine whether the applicant exhibited that degree of timeliness as may reasonably be expected from, and which is ordinarily exercised by, a person during a period of appellate review.]

▶(e) No patent term shall be extended under this section:

(1) beyond the expiration date specified in a terminal disclaimer in a patent whose term has been disclaimed in such terminal disclaimer;

(2) in a patent issued before the expiration of three years after the filing date of the application or entry of the application into the national stage under 35 U.S.C. 371, whichever is later, not taking into account any claim to the benefit of the filing date of any application under 35 U.S.C. 120, 121, 365(c).

(f) Any extension of patent term under paragraph (a)(4) of this section on the basis of an administrative delay other than one specifically set forth in paragraphs (a)(4)(i)(A)-(C) must

be requested by petition. A petition for an extension of patent term based upon unusual administrative delay by the Office other than one specifically set forth in paragraphs (a)(4)(i)(A)-(C) cannot be filed prior to the mailing of a notice of allowance under § 1.311 and must be accompanied by:

(1) a statement of the facts involved, the administrative delay by the Office to be reviewed, and the period of extension requested; and,

(2) the fee set forth in § 1.17(i). The petition may include a request that the petition fee be refunded if an extension of the patent term under paragraph (a)(4) of this section is granted.◀

50. Section 1.808 is proposed to be amended by revising paragraph (a) to read as follows:

**§ 1.808 Furnishing of samples.**

(a) A deposit must be made under conditions that assure that:

(1) Access to the deposit will be available during pendency of the patent application making reference to the deposit to one determined by the Commissioner to be entitled thereto under § 1.14 and 35 U.S.C. 122▶(a)◀, and

(2) Subject to paragraph (b) of this section, all restrictions imposed by the depositor on the availability to the public of the deposited material will be irrevocably removed upon the ▶publication of the application under § 1.306 or◀ granting of the patent.

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**PART 3 - ASSIGNMENT, RECORDING, AND RIGHTS OF ASSIGNEE**

51. The authority citation for 37 CFR Part 3 would continue to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6.

52. Section 3.31 is proposed to be amended by redesignating paragraph (b) as paragraph (c) and adding a new paragraph (b) to read as follows:

**§ 3.31 Cover sheet content.**

\*\*\*\*\*

(b) ▶For a patent application, the cover sheet may include an indication that the assignment information is to be printed on the patent application notice. If the assignment and cover sheet containing the above-mentioned indication is not submitted within two months of filing or fourteen months from the earliest filing date for which a benefit is claimed, whichever is later, the assignment information may not be printed on the patent application notice.

(c)◀ A cover sheet may not refer to both patents and trademarks.

**PART 5 - SECRECY OF CERTAIN INVENTIONS AND LICENSES TO EXPORT AND FILE APPLICATIONS IN FOREIGN COUNTRIES**

53. The authority citation for 37 CFR Part 5 would continue to read as follows:

Authority: 35 U.S.C. 6, 41, 181-188, as amended by the Patent Law Foreign Filing Amendments Act of 1988, Pub. L. 100-418, 102 Stat. 1567; the Arms Export Control Act, as amended, 22 U.S.C. 2751 *et seq.*; the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 *et seq.*; and the Nuclear Non-Proliferation Act of 1978, 22 U.S.C. 3201 *et seq.*; and the delegations in the regulations under these Acts to the Commissioner (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7).

54. Section 5.1 is proposed to be amended by adding new paragraphs (c) and (d) to read as follows:



**§ 5.1 Defense inspection of certain applications.**

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►(c) Defense agency inspection must be promptly completed to enable those applications due for publication under § 1.306 of this chapter to be published in regular course. Applications under defense agency review will be released for publication six months from the actual U.S. filing date or three months from the date the application was made available to a defense agency under paragraph (b) of this section, whichever is later.

►(d) Applications on inventions not made in the United States and on inventions in which the U.S. Government has a property interest will not be made available to defense agencies under § 5.2(b). ◀

55. A new section 5.9 is proposed to be added to Part 5 to read as follows:

**►§ 5.9 National security classified applications.**

(a) Patent applications and papers relating thereto that are national security classified and contain authorized national security markings of "Confidential," "Secret" or "Top Secret," as appropriate, are accepted by the Office. National security classified documents mailed to the Office must be addressed in compliance with § 5.33. National security classified documents may be hand-carried to Licensing and Review.

(b) A national security classified patent application will not be published pursuant to § 1.306 or allowed pursuant to § 1.311 of this chapter until the application is declassified.

(c) The applicant in a national security classified patent application must obtain a secrecy order pursuant to § 5.2. In a national security classified patent application filed without a notification pursuant to § 5.2(a), the Office will set a time period within which the application must be declassified, a secrecy order pursuant to § 5.2 must be obtained, or evidence of a good faith effort to obtain a secrecy order pursuant to § 5.2 from the relevant department or agency must be presented in order to prevent abandonment of the application.

(d) Where evidence of a good faith effort to obtain a secrecy order pursuant to § 5.2 from the relevant department or agency is presented within the time period set by the Office, but the application has not been declassified and a secrecy order pursuant to § 5.2 has not been obtained, the Office will again set a time period within which the application must be declassified, a secrecy order pursuant to § 5.2 must be obtained, or evidence of a good faith effort to again obtain a secrecy order pursuant to § 5.2 from the relevant department or agency must be presented in order to prevent abandonment of the application. ◀

July 27, 1995

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

[1177 OG 61]

**(85) Applicant Aid for Biotechnology  
Computer Readable Form (CRF) Sequence Listings Submissions**

The Patent and Trademark Office (PTO) has developed a computer program, called Checker, that will aid applicants in identifying and correcting errors prior to making submissions for compliance with the Requirements for Patent Applications Containing Nucleotide Sequence and/or Amino Acid Sequence Disclosures (sequence rules: 37 CFR 1.821 through 1.825). (Final rules were published in the *Federal Register* (55 FR 18230) on May 1, 1990, and in the *PTO Official Gazette* (1114 Off.Gaz.PatOffice 29) on May 15, 1990.)

Checker is a DOS-based software program that is intended to assist users in determining whether errors may be present in the sequence listings, and is not intended to guarantee that the submission is error-free.

The most current version of the software will be available via computer downloading (details below). Copies on diskette

are also available. Updated software versions will not be automatically mailed out; any updates will be announced in the *PTO Official Gazette*.

The software can be accessed/requested in the following locations:

1) Dial-up access to the Patent and Trademark Office Bulletin Board System. Phone number: 703-305-8950

Cost: Free-of-charge

2) Dial-up access through the Internet. FTP site: ftp.uspto.gov Login as "anonymous". Software is in directory /pub/checker

Cost: Free-of-charge

3) For diskette copies, telephone requests to 703-308-0322.

Cost: \$25.00

For Further Information Contact: Meredith Beckhardt at 703-308-4212.

February 14, 1995

STEPHEN G. KUNIN  
Deputy Assistant Commissioner for  
Patent Policy and Projects

[1172 OG 33]

**(86) Petitioning to Make Applications Relating  
to Biotechnology Special**

This notice is intended to highlight the procedures which are available to applicants and, in particular, to applicants seeking patents on inventions relating to biotechnology, so as to have their applications accorded "special" status. A new interim procedure is also hereby established. Applications which have been made special will be advanced out of turn for examination and, subject alone to diligent prosecution by the applicant, will continue to be treated as special throughout the entire course of prosecution in the Patent and Trademark Office.

The Office accords special status to patent applications by granting petitions to make special on a number of grounds. These grounds include, for example, prospective manufacture of the invention, actual infringement of the invention, that the invention will materially enhance the quality of the environment and for inventions relating to safety of research in the field of recombinant DNA. See 37 CFR 1.102 and Manual of Patent Examining Procedure (MPEP) section 708.02 for details. Applicants seeking patents on inventions relating to biotechnology may petition based on any of the above grounds if they meet the appropriate criteria.

A new application (one which has not received any examination by the examiner) may be granted special status under the accelerated examination program. As set forth in MPEP 708.02, applicants are not subject to any of the above-mentioned criteria under this program but merely must 1) submit a written petition and the fee set forth in 37 CFR 1.17(i) which presently is \$72.00; 2) present all claims directed to a single invention; 3) submit a statement that a pre-examination search was made, specifying by whom the search was made and listing the field of search; 4) submit one copy of each of the references deemed most closely related to the subject matter encompassed by the claims; and 5) submit a detailed discussion of the references pointing out how the claimed subject matter is distinguishable over the references. In those instances where the petition for this special status does not meet all the prerequisites set forth above, applicant will be notified of the defects and will be given an opportunity to perfect the petition.

In addition to the above-noted procedures to have biotechnology applications accorded special status, a new interim procedure is hereby established whereby applicants who are small entities may request that their biotechnology applications be granted special status. To take advantage of this interim special status for biotechnology inventions, an applicant must file a petition with the petition fee under 37 CFR 1.17(i) requesting the special status and must (1) state that small entity status has been established or include a verified statement establishing small entity status; (2) state that the subject of the patent application is a major asset of the small entity; and (3) state that the development of the technology will be significantly impaired if examination of the patent application is delayed including

an explanation of the basis for making the statement. This newly established interim procedure will remain in effect until further notice in the *Official Gazette*. It is intended that a notice discontinuing this procedure will be published as the average pendency approaches the 18 month goal in this area. If the number of requests for making applications special under this procedure is too great, the procedure may have to be limited or discontinued.

The Office is continuing to work to reduce the pendency time for all applications. Special efforts are being made to reduce the pendency of biotechnology applications where filings are increasing rapidly and an already large backlog exists. Meanwhile, applicants who so desire can petition to have their applications made special as noted above. Questions concerning petitions to make special should be directed as follows:

- 1) to the Office of the Assistant Commissioner for Patents for petitions based on the grounds of prospective manufacture or infringement;
- 2) to the Board of Patent Appeals and Interferences for petitions on applications within the jurisdiction of the Board; or
- 3) to the appropriate Examining Group for petitions to make special on all other grounds.

June 22, 1988

DONALD J. QUIGG  
Assistant Secretary and  
Commissioner of Patents and Trademarks

[1092 OG 55]

**(87) Petitioning to Make Patent Applications  
Relating to HIV/AIDS and Cancer Special**

Pursuant to 37 CFR 1.102, new patent applications are taken up for examination in the order of their effective United States filing date and are not advanced out of turn unless the Commissioner has so ordered to expedite the business of the Office, the head of some department of the Government requests immediate action on a patent application deemed of peculiar importance to some branch of the public service under 37 CFR 1.102(b), or a petition to make a patent application special under 37 CFR 1.102(c) or (d) has been granted. In view of the importance of developing treatments and cures for HIV/AIDS and cancer and the desirability of prompt disclosure of advances made in these fields, the Patent and Trademark Office is establishing a new category for petitions to accord "special" status to patent applications relating to HIV/AIDS and cancer. Applications which have been made special will advanced out of turn for examination and will continue to be treated as special throughout their pendency by the Patent and Trademark Office.

Applicants who desire that an application relating to HIV/AIDS or cancer be made special should file a petition, with the fee under 37 CFR 1.17(i) which is presently \$130.00, requesting the Patent and Trademark Office to make the application special. The petition for special status should be made in writing, should identify the application by serial number and filing date, and should be accompanied by a statement explaining how the invention contributes to the diagnosis, treatment or prevention of HIV/AIDS or cancer. Such statement must be set forth in oath or declaration form unless it is signed by a registered practitioner. The petition will be decided by the Director of the patent examining group to which the application is assigned.

This new category for a petition to make an application special will be added to the other categories discussed in section 708.02 of the Manual of Patent Examining Procedure.

February 23, 1995

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

[1172 OG 57]

(88)

**Department of Commerce  
Patent and Trademark Office  
37 CFR Part 5  
Patent Law Foreign Filing Amendments**

Agency: Patent and Trademark Office, Commerce  
Action: Notice of Final Rulemaking

**Summary:** The Patent and Trademark Office (Office) is amending the rules of practice in patent cases to implement the Patent Law Foreign Filing Amendments Act of 1988, Subtitle B of Public Law 100-418. The rules reflect changes made to 35 U.S.C. 184 which specify that a license is not required to, file amendments, modifications, and supplements containing additional subject matter to a previously licensed foreign patent application if such amendments, modifications, and supplements do not change the general nature of the invention disclosed in the application in a manner which would require a corresponding United States patent application to be made available for national security inspection under 35 U.S.C. 181. These regulatory changes are applicable to most existing foreign filing license holders if their patent application did not undergo security inspection under 35 U.S.C. 181. Also, under the rules, a retroactive foreign filing license may be granted in situations where a proscribed foreign filing occurred through error and without deceptive intent as opposed to the earlier standard of inadvertence.

**Effective Date:** Feb. 19, 1991.

**Supplementary Information:** A notice of proposed rulemaking was published in the *Federal Register* at 55 Fed. Reg. 24270-24275 (June 15, 1990) and at 1116 *Official Gazette* 21-25 (July 10, 1990). No oral hearing was held. Three written comments on the proposed rulemaking were received. The comments received and replies thereto are listed below.

The rules are intended to implement the Patent Law Foreign Filing Amendments Act of 1988, Subtitle B of Public Law 100-418 (hereinafter the Act), which amended §§ 184, 185 and 186 of Title 35, United States Code, in order to simplify the procedures for United States inventors filing and prosecuting patent applications in foreign countries. The Office has not made any rule changes to implement the amendments to 35 U.S.C. 185 or 186 since these changes affect matters outside its jurisdiction.

Section 184 of Title 35 is intended to protect United States national security interests by preventing the disclosure of potentially sensitive inventions made in the United States to foreign nationals by the act of filing a patent application in foreign countries. An inventor may not apply for a foreign patent on an invention made in the United States until at least six (6) months after the inventor has filed a United States patent application unless the inventor receives a license from the Office permitting an earlier foreign filing. This six month period assures the Office the opportunity to screen applications for information the disclosure of which might be detrimental to the national security. Also, § 184, as originally enacted, authorized the Office to grant a retroactive license for an unlicensed foreign filing of a patent application if the foreign filing was inadvertent and if the disclosure of the subject matter in the application would not be detrimental to United States security interests.

The original regulatory implementation of 35 U.S.C. 184 required applicants to obtain a license not only for the original foreign patent application but also for the filing of almost any information in support of the application, thereby creating administrative problems for United States inventors seeking foreign patent protection. For example, foreign patent offices often demand that additional technical data, such as the melting point of a chemical, be added to a patent application. An additional foreign filing license was usually required before the inventor could submit modifications, amendments, or supplements to a previously licensed foreign patent application, regardless of how trivial the change might be.

Recognizing the problems involved in obtaining these additional licenses, the Office promulgated rules in 1984 (see § 5.15(a) and 49 Fed. Reg. 13456 (April 4, 1984)) to streamline the licensing procedure. The 1984 rule change provided that an inventor could obtain in applications, the disclosure of the content of which is not potentially detrimental to United States security interests, a license which permitted the foreign filing of modifications, amendments, and supplements without further



licensing if such changes were within the scope or character of the originally licensed invention (§ 5.15(a)). The 1984 rule change, however, could not be made retroactive, and therefore had no effect on licenses granted under the old system. If an applicant wished to broaden a pre-April 4, 1984, foreign filing license to the scope allowed by § 5.15(a), this involved filing a separate petition under § 5.15(c) in each application.

The present Act clarifies the statutory basis for the current Patent and Trademark Office rules by providing that inventors, in most circumstances, are not required to obtain an additional license to file modifications, amendments, and supplements to their foreign applications for which a foreign filing license has been obtained under § 5.15(a). Unlike the previous Office rules, these rules broaden the scope of most existing licenses, provided that the conditions contained in the Act are met.

The Act and these rules also address difficulties associated with attempts to procure a retroactive foreign filing license. Some applicants faced loss of their patent rights due to improper foreign filings even though they believed, in good faith, that a license was not necessary for certain minor changes to their foreign application. Court decisions have held that supplemental information filed abroad was exempt from the license requirement only when it was recited *verbatim* in the United States patent application, or was so commonly known that it could have been said to have been expressly disclosed in the United States application. *In re Gaertner*, 604 F.2d 1348, 202 USPQ 714 (CCPA 1979). If a patent applicant did not obtain a foreign filing license from the Office, any corresponding United States patent was at risk of being held invalid under 35 U.S.C. 185 if technical information was added to the foreign application, even if the technical information was completely unrelated to United States security interests.

Loss of United States patent rights subsequent to an "inadvertent" unlicensed foreign filing could be avoided if a retroactive license was obtained under 35 U.S.C. 184. *Twin Disc, Inc. v. United States*, 10 Cl. Ct. 713, 231 USPQ 417 (Cl. Ct. 1986) and *Minnesota Mining and Manufacturing Co. v. Norton Co.*, 366 F.2d 238, 151 USPQ 1 (6th Cir. 1966), cert. denied, 385 U.S. 1005 (1967). While the *Gaertner* decision defined a broad range of circumstances under which a foreign filing license would be required, other court decisions made correction of licensing errors difficult by setting forth various strict interpretations of the standard of "inadvertence." Compare *Iron Ore Co. of Canada v. Dow Chemical Co.*, 177 USPQ 34 (D. Utah 1972), *aff'd*, 500 F.2d 189, 182 USPQ 520 (10th Cir. 1974) and *Reese v. Dann*, 391 F. Supp. 12, 185 USPQ 492 (D.D.C. 1975). An inventor could fail to meet the standard of "inadvertence" even if the information disclosed was not significant in nature and did not contain any sensitive national security information. For example, one decision suggested that the filing of information abroad was intentional because the inventor first considered the applicability of § 184. *Shelco, Inc. v. Dow Chemical Co.*, 322 F. Supp. 485, 168 USPQ 395 (N.D. Ill. 1970), *aff'd*, 466 F.2d 613, 173 USPQ 451 (7th Cir. 1972), cert. denied, 409 U.S. 876 (1972). Under the *Shelco* standard, if supplemental information had been filed abroad as a considered, willful act, even though done through error in the belief that the information disclosed abroad did not exceed the scope of the disclosure in the United States patent application, the filing would not be "inadvertent"; and, therefore, the subject information could not qualify for a retroactive license.

The Act addresses these problems, and the rules implement the intention of the Act. The Act changes the language of the statute to provide that an inventor may receive a retroactive license if the inventor can show that the premature filing of a foreign patent application, or the submission of supplemental information in support of a foreign patent application, was made "through error and without deceptive intent." This criterion is equivalent to that for reissue of a patent under 35 U.S.C. 251 to correct errors made without any deceptive intention. The reissue error requirement has been considered by the courts. See, e.g., *In re Weiler*, 790 F.2d 1576, 229 USPQ 673 (Fed. Cir. 1986) and *In re Wadlinger* 496 F.2d 1200, 181 USPQ 826 (CCPA 1974). The applicant for a retroactive license also must show that the foreign filing did not disclose any information detrimental to the national security and that diligence was exercised in seeking a retroactive license once the applicant became aware of the proscribed foreign filing.

The Act became effective on August 23, 1988, but it does not affect any final decision made by the Office or a court, nor the rights or liabilities of any party under a patent in a case pending before a court on the above date or under any subsequent patent deriving priority rights from such patent under 35 U.S.C. 120 or 121. Therefore, the retroactive effect of the Act and the rules is limited.

#### Comments on the Proposed Rules

##### Comment

One comment stated that the discussion in the proposed rulemaking of the modification of the standard for obtaining a retroactive license from inadvertence to "through error and without deceptive intent" should have included a reference to *In re Wadlinger*, 492 F.2d 1200, 181 USPQ 826 (CCPA 1974) rather than to *In re Weiler*, 790 F.2d 1576, 229 USPQ 673 (Fed. Cir. 1986). The comment stated that *Wadlinger* was a more appropriate and illustrative case because it discusses more fully the meaning of the term "error" as encompassing "inadvertence, accident or mistake" and as having a very broad meaning. The comment also noted that *Wadlinger* was referenced in comments made in the hearing on the proposed legislation as indicative of the reissue standard being applied to retroactive license requests.

##### Reply

A citation to *In re Wadlinger* has been added to the citation of *In re Weiler* in the discussion of the final rules. It was not the intent of the Office by citing the *Weiler* case to suggest that decisions on petitions for the grant of retroactive licenses would be limited by that case. Decisions are based on the particular facts in each case and the entire body of law with respect to the standard of "through error and without deceptive intent."

##### Comment

A comment stated that the Office should provide additional examples in the explanatory text in the final rule as to changes that may be made to foreign applications that have been licensed under 37 CFR 5.15(a) without obtaining any additional license. The comment pointed out that examples were given in the 1984 rulemaking.

##### Reply

The list of examples presented at the time that 37 CFR 5.15(a) was adopted in 1984 was not intended to be all-inclusive. The Office is not aware of any judicial decisions setting limits to changes that may be made under a 5.15(a) license. Depending on the nature and the criticality, changes in temperature, portions, size, etc., outside of a previously disclosed value or range that do not change the general nature of the invention from what was previously disclosed are within the scope of a § 5.15(a) license. However, if the newly disclosed value or range does change the general nature of the invention from that of the originally disclosed value or range, then a separate license is required. Likewise, new species or subcombinations of a previously disclosed genus or combination would appear to require an additional license to include such a change in a foreign application.

##### Comment

One comment stated that the Office should provide clarification of the attorney's ability to make decisions as to whether or not the added-subject matter, in his opinion, changes the general nature of the invention.

##### Reply

Not only does the attorney have the ability to make the decision as to whether or not the additional subject matter changes the general nature of the invention, the attorney has the responsibility to do so. The Office will not give advisory opinions on whether an additional license is necessary, and will treat any provisional requests for a prospective or retroactive license as a request for a license. The procedure of the Office resolving any questions as to the security inspection status of any changes to previously licensed material is intended to apply only to those changes that have been submitted to the Office, i.e., the Office will reply to any inquiry as to whether previously submitted subject matter underwent, or should have undergone, security review.

##### Comment

One comment questioned what would happen if an attorney on considered judgment, honestly believed that a supplement

did not change the general nature of a licensed invention, but that judgment later proved to be erroneous.

##### Reply

The Act and the rules now provide for a retroactive license to be granted in situations where it can be shown that a filing was made without a license through error and without deceptive intent. Thus, a retroactive license could be sought under § 5.25.

#### Discussion Of Specific Rule Changes

Section 5.11(a), as amended, specifies when a license is required before filing any foreign application for patent, including any modifications, amendments and supplements or divisions thereof. Section 5.11(a) adopts the statutory definition of "application" in 35 U.S.C. 184. Also, the rule, as amended, clarifies that the provisions of this section apply only to inventions made in the United States as stated in 35 U.S.C. 184. However, where an improvement or modification to a foreign-origin invention is made in the United States, a license would be required for the additional subject matter. The language proposed for § 5.11(e)(3) has been redrafted for clarity but still provides that an inventor need not obtain a supplemental license to file modifications, amendments and supplements containing subject matter not disclosed in, or divisions of, a foreign application for which an initial foreign filing license was not required, as long as the corresponding United States application was not required to be made available for inspection under 35 U.S.C. 181 and § 5.1 and the changes did not alter the general nature of the invention in a manner which would require the United States application to have been made available for inspection under 35 U.S.C. 181 and § 5.1. The need for a supplemental license depends on whether the changes altered the general nature of the invention, rather than the label applied to the changes, i.e., "Continuation", "Continuation In-Part", "Division", etc.

Authorized parties may determine whether a particular application was forwarded to the defense agencies for inspection under 35 U.S.C. 181 either by reviewing the filing receipt to determine if a license is or was granted, in which case security inspection did not occur, or by reviewing the file wrapper to determine if an access acknowledgment under 35 U.S.C. 181 is present, in which case security inspection did occur. If verification of the security inspection status of an application is needed, the authorized parties may submit a written request therefor to the Office, directed to the attention of Licensing and Review. A written response from the Office will be issued. In the event Office records are not available, a *de novo* determination by the Office will be made of the need for defense agency inspection under the present national security standards. If security inspection was not required under 35 U.S.C. 181, then the provisions of the Act will convert a previously granted or implied license into one having the scope of proposed § 5.15(a).

Section 5.15(a), as amended, adopts the specific provisions of the Act and clarifies the existing rules by expressly stating that the license provisions of the paragraph are applicable to United States applications which were not required to be made available for inspection under 35 U.S.C. 181 and § 5.1. The inspection provisions of 35 U.S.C. 181 delegate to the Commissioner of Patents and Trademarks the authority to decide which applications will be forwarded to United States defense agencies for national security inspection when the Government has no property interest in the invention. The fact that an application was forwarded to the defense agencies does not necessarily mean that the application was properly within the inspection scope of 35 U.S.C. 181. Thus, if an application was not required to be inspected but was inspected by mistake, it is eligible for such a license. The changes to the regulation expressly apply to modifications, amendments, and supplements to a previously licensed foreign application, and divisions thereof, provided the not alter the general nature of the invention in a manner which would require a corresponding United States application to have been made available for inspection under 35 U.S.C. 181.

The language of § 5.15(a)(1) also has been clarified. If the filing of the foreign application was pursuant to a license granted under § 5.15 and issued prior to publication of the notice in the Federal Register at 49 Fed. Reg. 13456 (April 4, 1984) for subject matter which was not appropriate for inspec-

tion under 35 U.S.C. 181, the license is now expanded to cover amendments, modifications, and supplements thereto, or divisions thereof, which do not change the general nature of the invention in a manner which would require such application to be made available for security inspection under 35 U.S.C. 181. Also, paragraphs (a)(3) and (a)(4) of § 5.15 have been merged in order to more clearly define the type of subsequent changes to a previously licensed foreign patent application which may be filed without any additional license. In particular, it is made clear that these changes must not be such as to require the application to be made available for security inspection. Any questions about the security inspection status of any application or amendments, modifications, and supplements thereto, or divisions thereof, will be handled in the manner as described above.

Section 5.15(b), as amended, clarifies the existing rule by expressly stating that the license provisions of § 5.12(b) are applicable to United States applications which were required to be made available for inspection under 35 U.S.C. 181 and § 5.1. The amendments also clarify the language of the paragraph and indicate that the more restrictive license under this paragraph includes authority to take actions in the foreign or international application, provided subject matter additional to that covered by the license is not involved. Section 5.15(c), as amended, clarifies the existing rule by expressly stating that the granting of a § 5.15(a) scope to a license under § 5.15(b) and conversion provisions of this paragraph are only applicable to material submitted under § 5.13 or United States applications, which are not, or were not, required to be made available for inspection under 35 U.S.C. 181 and § 5.1.

Sections 5.15(e) and (f), as amended, substitute a reference to § 5.15(a)(3) rather than to § 5.15(a)(4) which has been eliminated as a separate paragraph. Paragraph (e) also has been amended to state that changes to the general nature of the invention, which would require the application to have been made available for inspection under 35 U.S.C. 181 and § 5.1, require a separate license.

Section 5.25(a), as amended, provides that the inventor may receive a retroactive license if the inventor can show that the premature filing of papers in a foreign patent office was made through error and without deceptive intent. This criterion is the same as that for "error without any deceptive intention" for reissue of a patent and replaces the previous standard of inadvertence. This section also has been amended to clarify that each country in which a proscribed filing occurred must be listed in a petition for retroactive license. Also, the rule has been amended to define a verified statement as being in the form of either an oath or a declaration. Finally, the rule has been clarified by defining the period over which error without deceptive intent must be shown as being the time leading up to and including the proscribed foreign filing.

#### Other Considerations

The rule change is in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Acting Chief Counsel for Advocacy, Small Business Administration, that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)) because the rules simplify the procedures for all United States inventors who file and prosecute applications in foreign countries.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers, individuals, industries, Federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of the United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Patent and Trademark Office has also determined that this notice has no Federalism implications affecting the relation-



ship between the National Government and the States as outlined in Executive Order 12612.

These rules contain a collection of information requirement subject to the Paperwork Reduction Act which has previously been approved by the Office of Management and Budget under Control No. 0651-0011 with an expiration date of March 31, 1993. The average time for each petition for license under § 5.12(b) or § 5.25 is estimated to be approximately thirty (30) minutes, including time for reviewing instructions, gathering and maintaining data needed, and completing and reviewing the petition submission. Send comments regarding this burden estimate to the Patent and Trademark Office, Office of Management and Organization, Washington, D.C. 20231, and the Office of Management and Budget, Washington, D.C. 20503 (Attention: Paperwork Reduction Project 0651-0011).

#### List Of Subjects

#### 37 CFR Part 5

Classified information, Exports, Foreign relations, Inventions and patents.

For the reasons set forth in the preamble, 37 CFR Part 5 is amended as set forth below.

#### PART 5 - SECRECY OF CERTAIN INVENTIONS AND LICENSES TO EXPORT AND FILE APPLICATIONS IN FOREIGN COUNTRIES

1. The authority citation for Part 5 is revised to read as follows:

Authority: 35 U.S.C. 6, 41, 181-188, as amended by the Patent Law Foreign Filing Amendments Act of 1988, Pub. L. 100-418 102 Stat. 1567; the Arms Export Control Act, as amended, 22 U.S.C. 2751 *et seq.*, the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 *et seq.*, and the Nuclear Non-Proliferation Act of 1978, 22 U.S.C. 3201 *et seq.*, and the delegations in the regulations under these acts to the Commissioner (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7).

2. Section 5.11, paragraphs (a) and (c), are revised to read as follows:

**§ 5.11 License for filing in a foreign country an application on an invention made in the United States or for transmitting an international application.**

(a) A license from the Commissioner of Patents and Trademarks under 35 U.S.C. 184 is required before filing any application for patent including any modifications, amendments, or supplements thereto or divisions thereof or for the registration of a utility model, industrial design, or model, in a foreign patent office or any foreign patent agency or any international agency other than the United States Receiving Office, if the invention was made in the United States and:

(1) An application on the invention has been on file in the United States less than six months prior to the date on which the application is to be filed, or

(2) No application on the invention has been filed in the United States.

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(c) No license pursuant to paragraph (a) of this section is required:

(1) If the invention was not made in the United States, or  
(2) If the corresponding United States application is not subject to a secrecy order under § 5.2, and was filed at least six months prior to the date on which the application is filed in a foreign country, or

(3) For subsequent modifications, amendments and supplements containing additional subject matter to, or divisions of, a foreign patent application if:

(i) a license is not, or was not, required under paragraph (c)(2) of this section for the foreign patent application;

(ii) the corresponding United States application was not required to be made available for inspection under 35 U.S.C. 181 and § 5.1; and

(iii) such modifications, amendments, and supplements do not, or did not, change the general nature of the invention in a manner which would require any corresponding United States application to be or have been available for inspection under 35 U.S.C. 181 and § 5.1.

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3. Section 5.15, paragraphs (a), (b), (c), (e) and (f), are revised to read as follows:

#### § 5.15 Scope of license.

(a) Applications or other materials reviewed pursuant to § 5.12 through 5.14, which were not required to be made available for inspection by defense agencies under 35 U.S.C. 181 and § 5.1, will be eligible for a license of the scope provided in this paragraph. This license permits subsequent modifications, amendments, and supplements containing additional subject matter to, or divisions of, a foreign patent application, if such changes to the application do not alter the general nature of the invention in a manner which would require the United States application to have been made available for inspection under 35 U.S.C. 181 and § 5.1. This license also covers the inventions disclosed in foreign applications which had been granted a license under this part prior to April 4, 1984, and which were not subject to security inspection under 35 U.S.C. 181 and § 5.1. Grant of this license authorizes the export and filing of an application in a foreign country or the transmitting of an international application to any patent agency or international patent agency when the subject matter of the foreign or international application corresponds to that of the domestic application. This license includes authority:

(1) To export and file all duplicate and formal application papers in foreign countries or with international agencies;

(2) To make amendments, modifications, and supplements, including divisions, changes or supporting matter consisting of the illustration, exemplification, comparison, or explanation of subject matter disclosed in the application; and

(3) To take any action in the prosecution of the foreign or international application provided that the adding of subject matter or taking of any action under paragraphs (a)(1) and (2) of this section does not change the general nature of the invention disclosed in the application in a manner which would require such application to have been made available for inspection under 35 U.S.C. 181 and § 5.1 by including technical data pertaining to:

(i) Defense services or articles designated in the United States Munitions List applicable at the time of foreign filing, the unlicensed exportation of which is prohibited pursuant to the Arms Export Control Act, as amended, and 22 CFR Parts 121 through 130; or

(ii) Restricted Data, sensitive nuclear technology or technology useful in the production or utilization of special nuclear material or atomic energy, the dissemination of which is subject to restrictions of the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978, as implemented by the regulations for Unclassified Activities in Foreign Atomic Energy Programs, 10 CFR Part 810, in effect at the time of foreign filing.

(b) Applications or other materials which were required to be made available for inspection under 35 U.S.C. 181 and § 5.1 will be eligible for a license of the scope provided in this paragraph. Grant of this license authorizes the export and filing of an application in a foreign country or the transmitting of an international application to any foreign patent agency or international patent agency. Further, this license includes authority to export and file all duplicate and formal papers in foreign countries or with foreign and international patent agencies and to make amendments, modifications, and supplements to, file divisions of, and take any action in the prosecution of the foreign or international application, provided subject matter additional to that covered by the license is not involved.

(c) A license granted under § 5.12(b) pursuant to § 5.13 or § 5.14 shall have the scope indicated in paragraph (a) of this section, if it is so specified in the license. A petition, accompanied by the required fee (1.17(h)), may also be filed to change a license having the scope indicated in paragraph (b) of this section to a license having the scope indicated in paragraph

(a) of this section. No such petition will be granted if the copy of the material filed pursuant to § 5.13 or any corresponding United States application was required to be made available for inspection under 35 U.S.C. 181 and § 5.1. The change in the scope of a license will be effective as of the date of the grant of the petition.

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(c) Any paper filed abroad or transmitted to an international patent agency following the filing of a foreign or international application which changes the general nature of the subject matter disclosed at the time of filing in a manner which would require such application to have been made available for inspection under 35 U.S.C. 181 and § 5.1 or which involves the disclosure of subject matter listed in paragraphs (a)(3)(i) or (ii) of this section must be separately licensed in the same manner as a foreign or international application. Further, if no license has been granted under § 5.12(a) on filing the corresponding United States application, any paper filed abroad or with an international patent agency which involves the disclosure of additional subject matter must be licensed in the same manner as a foreign or international application.

(f) Licenses separately granted in connection with two or more United States applications may be exercised by combining or dividing the disclosures, as desired, provided:

(1) Subject matter which changes the general nature of the subject matter disclosed at the time of filing or which involves subject matter listed in paragraphs (a)(3)(i) or (ii) of this section is not introduced, and

(2) In the case where at least one of the licenses was obtained under § 5.12(b), additional subject matter is not introduced.

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4. Section 5.25, paragraph (a), is revised to read as follows:

#### § 5.25 Petition for retroactive license

(a) A petition for a retroactive license under 35 U.S.C. 184 shall be presented in accordance with § 5.13 or § 5.14 (a), and shall include:

(1) A listing of each of the foreign countries in which the unlicensed patent application material was filed,

(2) The dates on which the material was filed in each country,

(3) A verified statement (oath or declaration) containing:

(i) An averment that the subject matter in question was not under a secrecy order at the time it was filed abroad, and that it is not currently under a secrecy order,

(ii) A showing that the license has been diligently sought after discovery of the proscribed foreign filing, and

(iii) An explanation of why the material was filed abroad through error and without deceptive intent without the required license under § 5.11 first having been obtained, and

(4) The required fee (§ 1.17(h)).

The above explanation must include a showing of facts rather than a mere allegation of action through error and without deceptive intent. The showing of facts as to the nature of the error should include statements by those persons having personal knowledge of the acts regarding filing in a foreign country and should be accompanied by copies of any necessary supporting documents such as letters of transmittal or instructions for filing. The acts which are alleged to constitute error without deceptive intent should cover the period leading up to and including each of the proscribed foreign filings.

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Nov. 28, 1990

HARRY F. MANBECK, JR.  
Assistant Secretary and Commissioner  
of Patents and Trademarks

[1123 OG 20]

(89)

Department of Commerce  
Patent and Trademark Office  
37 CFR Part 150  
[Docket No. 71038-8108]

#### Requests for Presidential Proclamations Under the Semiconductor Chip Protection Act of 1984, 17 U.S.C. 902(a)(2)

Agency: Patent and Trademark Office, Commerce  
Action: Final Rule

**Summary:** The Patent and Trademark Office (PTO) is adding a new Subchapter C, Part 150 to its rules to implement the Presidential proclamation provisions of the Semiconductor Chip Protection Act of 1984, 17 U.S.C. 902(a)(2). The rules establish procedures for the evaluation of requests by foreign governments for the issuance of Presidential proclamations granting protection in the United States to mask works of foreign origin. The rules also permit the Commissioner of Patents and Trademarks independently to initiate an evaluation. The effect of the rules will be to establish a regime of protection for foreign mask works in the United States, provided mask works of U.S. origin are adequately protected in the country requesting a Presidential proclamation.

Effective Date: August 1, 1988

**For Further Information Contact:** Michael K. Kirk, Assistant Commissioner for External Affairs, by telephone at (703)557-3065, or by mail marked to his attention and addressed to Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231.

**Supplementary Information:** The Semiconductor Chip Protection Act of 1984 (SCPA) established a new form of intellectual property protection for mask works that are fixed in semiconductor chips. Mask works are defined as a "series of related images, however fixed or encoded," that represent the three-dimensional pattern in the layers of a semiconductor chip. Thus, the subject matter of protection under the SCPA are the layout designs of semiconductor chips, known in some countries as "integrated circuit layout designs" or as "semiconductor topographies." The SCPA provides a ten-year term of protection for original mask works measured from their date of registration or first commercial exploitation anywhere in the world. To maintain protection, mask works must be registered in the United States Copyright Office within two years of first commercial exploitation.

Protection for foreign mask works may be granted under both section 902 and section 914 of the SCPA. Section 902 sets out three different ways that foreign mask works may become eligible for protection in the United States. First, on the date the work is registered or is first commercially exploited anywhere in the world, the mask work is protectible if its owner is a national, domiciliary or sovereign authority of a foreign nation that is a party to a treaty that provides protection of mask works and to which the United States is also a party, or if a stateless person, wherever domiciled. Second, foreign mask works may be protected when they are first commercially exploited in the United States. The third way, set forth in section 902(a)(2), is where the foreign mask work comes within the scope of a Presidential proclamation. The President may issue a proclamation upon finding that a foreign nation extends to mask works of owners who are U.S. nationals or domiciliaries, protection (1) on substantially the same basis as that on which the foreign nation extends protection to mask works of its own nationals and domiciliaries and mask works first commercially exploited in that nation, or (2) on substantially the same basis as provided in the SCPA. Pursuant to Executive Order 12504, 50 FR 4849 (Feb. 4, 1985), requests for issuance of Presidential proclamations are to be presented to the President by the Secretary of Commerce.

Section 914 was included in the SCPA as a transitional provision, intended by Congress to encourage other countries to pass laws extending protection to this new form of intellectual property. Once laws were in place, it was reasoned, permanent protection for foreign mask works could be conferred under section 902 or through a multilateral treaty that extended coverage to mask works. Section 914 gives the Secretary of Commerce authority to issue orders extending interim protection to foreign mask work owners upon the satisfaction of certain conditions. First, the Secretary must find that the foreign nation



is making good faith efforts and reasonable progress toward entering into a treaty with the United States, or toward enacting legislation that will protect U.S. mask works on the same basis as domestic mask works, or at a level similar to that provided under the SCPA. Second, the Secretary must determine that nationals, domiciliaries and sovereign authorities of the foreign nation are not engaged in the misappropriation, unauthorized distribution, or unauthorized commercial exploitation of mask works. Finally, the Secretary must determine that issuance of an interim order would promote the purposes of the SCPA and international comity with respect to the protection of mask works.

By Amendment 1 to Department Organization Order 10-14, issued Dec. 3, 1984, the Secretary of Commerce delegated to the Assistant Secretary and Commissioner of Patents and Trademarks the authority under section 914 to make pertinent findings and to issue orders for the interim protection of foreign mask works. Amendment 2 to Department Organization Order 10-14, issued Sept. 28, 1987, expanded the earlier delegation to include responsibility for prescribing regulations for the presentation to the President of requests for issuance of proclamations under section 902.

The Commissioner has issued orders granting interim protection under section 914 for mask works produced in Australia, Belgium, Canada, Denmark, Finland, France, the Federal Republic of Germany, Greece, Ireland, Italy, Japan, Luxembourg, the Netherlands, Portugal, Spain, Sweden, Switzerland, and the United Kingdom. All of the interim protection orders were recently extended until May 31, 1989. See *Extension of Previously-Granted Interim Orders Under the Semiconductor Chip Protection Act of 1984*, 53 FR 16308 (May 6, 1988).

This proceeding was initiated by a Notice of Proposed Rulemaking published at 53 FR 5588-90 (Feb. 25, 1988). The notice set forth proposed regulations for the submission and evaluation of requests that the Secretary of Commerce recommend the issuance or revocation of a Presidential proclamation granting U.S. protection to foreign mask works under section 902(a)(2) of the SCPA. Comments on the proposed rules were received from the Commission of the European Communities and the U.S. Semiconductor Industry Association.

#### Discussion of Specific Rules

Section 150.1 of the new rules sets forth relevant definitions. Section 150.2 specifies the conditions under which an evaluation of recommending the issuance, revision, suspension or revocation of a section 902 proclamation will be initiated by the Commissioner. Section 150.2(a) provides that the Commissioner must initiate an evaluation of the propriety of recommending the issuance of a section 902 proclamation upon receipt of a request from a foreign government. Section 150.2(b) gives the Secretary the discretion to initiate independently an evaluation concerning issuance, revision, suspension or revocation of a proclamation, or as directed by the Secretary of Commerce.

Section 150.3(a) states that requests for the issuance of a section 902 Presidential proclamation shall be made by "foreign governments." The definition of "foreign government" in section 150.1 of the rules makes clear that international intergovernmental organizations may request Presidential proclamations on behalf of their member states.

Section 150.3(b) lists the documentation that must accompany requests for issuance of a proclamation. The laws, legal rulings, regulations, and administrative orders submitted must be in unedited, full-text form. Where possible, the materials submitted should be reproduced from the original document, e.g., from court reports or statutory instruments. Abstracts, summaries and commentaries are not acceptable. If the documents are not in English, a certified English translation must accompany them.

Section 150.4 sets out the procedure the Commissioner will follow after a request for issuance of a proclamation has been submitted, or following a decision independently to initiate an evaluation. If a foreign government requests a section 902 proclamation before a section 914 proceeding has taken place, under section 150.4(a) the Commissioner may initiate such a proceeding to compile a record of necessary information and, where appropriate, to provide interim protection in the United States while the section 902 request is pending. Section 150.4(b)

provides that the information obtained during a section 914 proceeding, if one has been held, will be considered by the Commissioner in determining whether to recommend the issuance of a Presidential proclamation.

Section 150.4(c) provides that requests for Presidential proclamations, and notices of the Commissioner's determination independently to initiate section 902 evaluations, will be published in the *Federal Register*. Written comments will be requested. Section 150.4(d) requires the Commissioner to notify the Register of Copyrights and the Committees on the Judiciary of the Senate and the House of Representatives of the initiation of an evaluation. Under section 150.4(e), a hearing may be scheduled if the written comments raise issues that cannot be resolved through informal contacts. Section 150.4(f) provides that the record to be considered by the Commissioner in determining whether to recommend a Presidential proclamation will be the request from a foreign government, if any, written comments received, the record of any section 914 proceedings, and the information obtained in a hearing, if one is held.

Sections 150.4(g) and (h) provide that the Commissioner will forward the draft recommendation to the Secretary, who will then forward a recommendation regarding issuance of a proclamation to the President. Section 150.5(a) makes clear that the recommendation for issuance of a proclamation may include terms and conditions regarding the duration of the proclamation. Section 150.5(b) provides that interested parties may request the revision, suspension or revocation of Presidential proclamations.

#### Comments on the Proposed Rules

Comments on the proposed rules were submitted by the Commission of the European Communities and the U.S. Semiconductor Industry Association (SIA). The Commission of the European Communities noted that any request for a proclamation in favor of mask works produced in the Member States will be made by the Commission. The Commission requested a clarification that the term "foreign governments" as used in section 150.3(a) includes international intergovernmental organizations which have been empowered by their member states to request Presidential proclamations granting U.S. protection to mask works produced in such states.

The PTO adopts the Commission's suggestion. The rules are not intended to preclude foreign governments from having requests for Presidential proclamations presented on their behalf by an international or regional intergovernmental organization. Accordingly, a definition of "foreign government" is added as section 150.1(b) of the rules, making clear that international intergovernmental organizations may request Presidential proclamations on behalf of their member states.

In its comments, the SIA requested that section 150.4(c) be amended to require that the Commissioner hold a public hearing when requested by any interested party after an evaluation has begun. As proposed, section 150.4(e)(2)(ii) gives the Commissioner discretion to hold a hearing to gather additional information if material issues raised in written comments cannot be resolved less formally. SIA also requested that section 150.4(f) be amended to include information obtained in public hearings in the list of materials to be evaluated by the Commissioner. SIA suggested that section 150.4(c) specify a time period of thirty (30) days after publication of a request for comments in the *Federal Register* during which written comments and requests for a hearing may be submitted.

The PTO does not agree that the Commissioner should be required to hold a hearing as part of every section 902 evaluation whenever requested. Section 150.4(b) provides that information obtained during section 914 proceedings will be used in evaluating requests for Presidential proclamations. Moreover, under section 150.4(a) the Commissioner may institute section 914 proceedings if an interim order has not been issued in favor of mask works from such a requesting nation. Given the thoroughness with which section 914 proceedings are generally conducted, the Commissioner is expected to have available a substantial record concerning the degree of protection for U.S. mask works in the subject country. A separate hearing might only serve to cause delay in such cases.

Moreover, effective public participation in the section 902 evaluation process is not dependent on whether the Commissioner holds a hearing. The rules proceed from the assumption

that any material issues relating to protection of U.S. mask works in a requesting foreign country can be raised in written comments, and that these issues can be resolved flexibly through informal *inter partes* contacts. Where issues cannot be resolved through such informal contacts, section 150.4(e)(ii) gives the Commissioner discretion to hold a hearing to obtain additional views and to assist in resolving the issues. It is not evident that a mandatory hearing upon request of interested parties would provide an opportunity for exchange of views or information that is not otherwise available under section 150.4(e).

The PTO agrees that, if the Commissioner elects to hold a hearing, the information obtained should be included in the record. Accordingly, section 150.4(f) is amended to make this clarification. It is also proper that the rules specify a time period for the submission of comments following publication in the *Federal Register* of the request for a proclamation or the Commissioner's determination to initiate independently a section 902 evaluation. Thus, to ensure that all interested parties have sufficient time to investigate and prepare complete written comments, section 150.4(c) is amended to specify that comments must be submitted within sixty (60) days of *Federal Register* publication.

#### Discussion of Principal Changes

A new section 150.1(b) has been added to the rules as proposed to clarify that international or regional intergovernmental organizations may request Presidential proclamations on behalf of their member states, provided the member states have empowered the organization to make such requests. Proposed sections 150.1(c)-(g) have been redesignated as sections 150.1(d)-(h). The definition of "mask work" in section 150.1(d) (proposed section 150.1(c)) has been modified slightly to conform to the language in section 901(a)(2) of the SCPA. The definition of "Presidential proclamation" in section 150.1(e) (proposed section 150.1(d)) has been changed slightly by substituting the words "applying for" for the word "making" before the word "registrations." The purpose of this change is to conform the language of the rule to section 908 of the SCPA, which relates to mask work registration. The definition of "request" in section 150.1(f) (proposed section 150.1(e)) has been changed to indicate that the Commissioner is not required to treat request revision, suspension or revocation of a Presidential proclamation in the same way as requests for issuance of such proclamations (see discussion of section 150.5(b), *infra*).

Section 150.2(a) has been expanded to make clear that the Commissioner may initiate independently an evaluation of recommending the revision, suspension, or revocation of a Presidential proclamation, as well as an evaluation of recommending the issuance of a proclamation. This change reflects the amendment to section 902(a)(2) made by the Semiconductor Chip Protection Act Extension of 1987, which clarifies that the President has the authority to revise, suspend or revoke, as well as issue, proclamations extending protection to foreign mask works.

Section 150.3(b) has been changed to state that requests for issuance of a Presidential proclamation must be accompanied by "a copy" of laws, legal rulings, regulations or administrative orders, rather than "an official copy" of such materials, as was proposed. This change is made to avoid confusion arising from the fact that the meaning of "official copy" may vary from country to country. Section 150.3(b)(5) has been redesignated as section 150.3(b)(6), and a new section 150.3(b)(5) has been added to specify that the copies submitted to the PTO must be in full text, unedited, and where possible, be reproduced from the original document.

Section 150.4(c) has also been changed. The proposed rule stated that notices of requests by foreign governments for the issuance of Presidential proclamations will be published in the *Federal Register*. Language has been added to make clear that notices of the Commissioner's determination independently to initiate evaluations will also be published in the *Federal Register*. Section 150.4(c) has also been changed to provide that comments shall be submitted to the Commissioner within sixty (60) days of publication of the *Federal Register* notice. Section 150.4(f) has been modified to include information obtained in a public hearing held pursuant to section 150.4(e)(ii), if such

a hearing is held, in the list of materials to be evaluated by the Commissioner.

Section 150.5(b) has been changed to reflect the amendment to section 902(a)(2) made by the Semiconductor Chip Protection Act Extension of 1987. The first sentence provides that any interested party may request the "revision, suspension or revocation" of a proclamation. The second sentence has been modified to provide that "requests for revision, suspension or revocation of a proclamation will be considered in substantially the same manner as requests for the issuance of a section 902 proclamation." The word "substantially" has been added to indicate that the Commissioner need not initiate a formal evaluation in every case where a request is made for the revision, suspension or revocation of a Presidential proclamation, in contrast to situations where a foreign government requests the issuance of such a proclamation. While good faith requests for the revision, suspension or revocation of a proclamation will be accorded fair procedural treatment, it is proper that the Commissioner have flexibility at the outset to consider such requests on a case-by-case basis as experience is gained under these rules. If necessary, the PTO may amend the rules at a later time to provide additional procedures for consideration of requests for revision, suspension or revocation of Presidential proclamations.

Stylistic changes have also been made in sections 150.2(a), 150.3(b)(6) (proposed section 150.3(b)(5)) and 150.5(a), but these changes are for purposes of clarity and are not substantive in nature.

#### Other Considerations

This rule does not have a significant impact on the quality of the human environment or the conservation of natural resources. This rule is in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Small Business Administration that the proposed rule will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*) The economic impact of a Presidential proclamation on small entities will be beneficial, since such proclamations may be issued only upon a finding that a foreign nation extends reciprocal protection to U.S. mask works.

The Patent and Trademark Office has determined that this rule is not a major rule under Executive Order 12291. The annual effect on the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. By extending protection to foreign mask work owners, the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets will be enhanced.

The Patent and Trademark Office has also determined that this notice has no federalism implications affecting the relationship between the national government and the states as outlined in Executive Order 12612.

The rule will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3510 *et seq.*, since no record-keeping or reporting requirements within the coverage of the Act are placed upon the public.

#### List of Subjects in 37 CFR Subchapter C

Administrative practice and procedure, Authority delegations, Semiconductor chips, Mask works.

For the reasons set out in the preamble, Chapter 1 of Title 37 CFR is amended by adding a new Subchapter C, Part 150, as follows:

#### Subchapter C - PROTECTION OF FOREIGN MASK WORKS

##### Part 150 - REQUESTS FOR PRESIDENTIAL PROCLAMATIONS PURSUANT TO 17 U.S.C. 902(a)(2)

###### Sec.

###### 150.1 Definitions.

###### 150.2 Initiation of Evaluation.



150.3 Submission of Requests.  
150.4 Evaluation.  
150.5 Duration of Proclamation.  
150.6 Mailing Address.

Authority: 35 U.S.C. 6; E.O. 12504, 50 FR 4849, 3 CFR, 1985 Comp., p. 335.

Section 150.1 Definitions.

- (a) "Commissioner" means Assistant Secretary and Commissioner of Patents and Trademarks.
- (b) "Foreign government" means the duly-constituted executive of a foreign nation, or an international or regional intergovernmental organization which has been empowered by its member states to request issuance of Presidential proclamations on their behalf under this part.
- (c) "Interim order" means an order issued by the Secretary of Commerce under 17 U.S.C. 914.
- (d) "Mask work" means a series of related images, however fixed or encoded—
  - (1) having or representing the predetermined, three dimensional pattern of metallic, insulating, or semiconductor material present or removed from the layers of a semiconductor chip product; and
  - (2) in which series the relation of the images to one another is that each image has the pattern of the surface of one form of the semiconductor chip product.
- (e) "Presidential proclamation" means an action by the President extending to foreign nationals, domiciliaries and sovereign authorities the privilege of applying for registrations for mask works pursuant to 17 U.S.C. 902.
- (f) "Request" means a request by a foreign government for the issuance of a Presidential proclamation.
- (g) "Proceeding" means a proceeding to issue an interim order extending protection to foreign nationals, domiciliaries and sovereign authorities under 17 U.S.C. Chapter 9.
- (h) "Secretary" means the Secretary of Commerce.

Section 150.2 Initiation of Evaluation.

- (a) The Commissioner independently or as directed by the Secretary, may initiate an evaluation of the propriety of recommending the issuance, revision, suspension or revocation of a section 902 proclamation.
- (b) The Commissioner shall initiate an evaluation of the propriety of recommending the issuance of a section 902 proclamation upon receipt of a request from a foreign government.

Section 150.3 Submission of Requests.

- (a) Requests for the issuance of a section 902 proclamation shall be submitted by foreign governments for review by the Commissioner.
- (b) Requests for issuance of a proclamation shall include:
  - (1) A copy of the foreign law or legal rulings that provide protection for U.S. mask works which provide a basis for the request.
  - (2) A copy of any regulations or administrative orders implementing the protection.
  - (3) A copy of any laws, regulations or administrative orders establishing or regulating the registration (if any) of mask works.
  - (4) Any other relevant laws, regulations or administrative orders.
  - (5) All copies of laws, legal rulings, regulations or administrative orders submitted must be in unedited, full-text form, and if possible, must be reproduced from the original document.
  - (6) All material submitted must be in the original language, and if not in English, must be accompanied by a certified English translation.

Section 150.4 Evaluation.

- (a) Upon submission of a request by a foreign government for the issuance of a section 902 proclamation, if an interim order

under section 914 has not been issued, the Commissioner may initiate a section 914 proceeding if additional information is required.

- (b) If an interim order under section 914 has been issued, the information obtained during the section 914 proceeding will be used in evaluating the request for a section 902 proclamation.
- (c) After the Commissioner receives the request of a foreign government for a section 902 proclamation, or after a determination is made by the Commissioner to initiate independently an evaluation pursuant to section 150.2(a) of this part, a notice will be published in the Federal Register to request relevant and material comments on the adequacy and effectiveness of the protection afforded U.S. mask works under the system of law described in the notice. Comments should include detailed explanations of any alleged deficiencies in the foreign law or any alleged deficiencies in its implementation. If the alleged deficiencies include problems in administration such as registration, the respondent should include as specifically as possible full detailed explanations, including dates for and the nature of any alleged problems. Comments shall be submitted to the Commissioner within sixty (60) days of publication of the *Federal Register* notice.
- (d) The Commissioner shall notify the Register of Copyrights and the Committees on the Judiciary of the Senate and the House of Representatives of the initiation of an evaluation under these regulations.
- (e) If the written comments submitted by any party present relevant and material reasons why a proclamation should not issue, the Commissioner will:
  - (1) Contact the party raising the issue for verification and any needed additional information;
  - (2) Contact the requesting foreign government to determine if the issues raised by the party can be resolved; and,
    - (i) If the issues are resolved, continue with the evaluation; or,
    - (ii) If the issues cannot be resolved on this basis, hold a public hearing to gather additional information.
- (f) The comments, the section 902 request, information obtained from a section 914 proceeding, if any, and information obtained in a hearing held pursuant to subsection (e)(ii) of this section, if any, will be evaluated by the Commissioner.
- (g) The Commissioner will forward the information to the Secretary, together with an evaluation and a draft recommendation.
- (h) The Secretary will forward a recommendation regarding the issuance of a section 902 proclamation to the President.

Section 150.5 Duration of Proclamation.

- (a) The recommendation for the issuance of a proclamation may include terms and conditions regarding the duration of the proclamation.
- (b) Requests for the revision, suspension or revocation of a proclamation may be submitted by any interested party. Requests for revision, suspension or revocation of a proclamation will be considered in substantially the same manner as requests for the issuance of a section 902 proclamation.

Section 150.6 Mailing Address.

Requests and all correspondence submitted pursuant to these guidelines shall be addressed to:

Commissioner of Patents and Trademarks  
Box 4  
Washington, D.C. 20231

June 23, 1988

DONALD J. QUIGG  
Assistant Secretary and  
Commissioner of Patents  
and Trademarks

[1092 OG 52]

(90) Errors in Notice of Allowance

The purpose of this notice is to clarify existing Office practice with respect to providing a new issue fee due date. Sometimes errors appear on the Notice of Allowance, such as an incorrect number of claims, the misspelling of an inventor's name, an incorrect inventorship, or an incorrect title. A duplicate Notice of Allowance correcting the errors may be requested from the Group that mailed the Notice. However, a new issue fee due date will not be provided if the information on the original Notice of Allowance is sufficient to allow a reasonable practitioner to timely file a proper issue fee in the correct application. Specifically, the mere filing of a request for a corrected or duplicate Notice of Allowance will not act to stay the period for paying the issue fee.

June 12, 1985

JAMES E. DENNY  
Deputy Assistant Commissioner  
for Patents

[1056 OG 35]

(91) Public Law 98-622  
Signed November 8, 1984  
Ninety-eighth Congress of the United States of America  
AT THE SECOND SESSION

*Begun and held at the City of Washington on Monday, the twenty-third day of January, one thousand nine hundred and eighty-four*

An Act

To amend title 35, United States Code, to increase the effectiveness of the patent laws, and for other purposes.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,*

SHORT TITLE

SECTION 1. This Act may be cited as the "Patent Law Amendments Act of 1984".

TITLE I—PATENT IMPROVEMENT PROVISIONS

USE OF PATENTED INVENTIONS OUTSIDE

THE UNITED STATES

SEC. 101.(a) Section 271 of title 35, United States Code, is amended by adding at the end thereof the following new subsection:

"(f)(1) Whoever without authority supplies or causes to be supplied in or from the United States all or a substantial portion of the components of a patented invention, where such components are uncombined in whole or in part, in such manner as to actively induce the combination of such components outside of the United States in a manner that would infringe the patent if such combination occurred within the United States, shall be liable as an infringer.

"(2) Whoever without authority supplies or causes to be supplied in or from the United States any component of a patented invention that is especially made or especially adapted for use in the invention and not a staple article or commodity of commerce suitable for substantial noninfringing use, where such component is uncombined in whole or in part, knowing that such component is so made or adapted and intending that such component will be combined outside of the United States in a manner that would infringe the patent if such combination occurred within the United States, shall be liable as an infringer."

STATUTORY INVENTION REGISTRATION

SEC. 102.(a) Chapter 14 of title 35, United States Code, is amended by adding at the end thereof the following new section:

§ 157. Statutory invention registration

"(a) Notwithstanding any other provision of this title, the Commissioner is authorized to publish a statutory invention registration containing the specification and drawings of a regularly filed application for a patent without examination if the applicant:

- "(1) meets the requirements of section 112 of this title;
- "(2) has complied with the requirements for printing, as set forth in regulations of the Commissioner;
- "(3) waives the right to receive a patent on the invention within such period as may be prescribed by the Commissioner; and
- "(4) pays application, publication, and other processing fees established by the Commissioner.

If an interference is declared with respect to such an application, a statutory invention registration may not be published unless the issue of priority of invention is finally determined in favor of the applicant.

"(b) The waiver under subsection (a)(3) of this section by an applicant shall take effect upon publication of the statutory invention registration.

"(c) A statutory invention registration published pursuant to this section shall have all of the attributes specified for patents in this title except those specified in section 183 and sections 271 through 289 of this title. A statutory invention registration shall not have any of the attributes specified for patents in any other provision of law other than this title. A statutory invention registration published pursuant to this section shall give appropriate notice to the public, pursuant to regulations which the Commissioner shall issue, of the preceding provisions of this subsection. The invention with respect to which a statutory invention certificate is published is not a patented invention for purposes of section 292 of this title.

"(d) The Secretary of Commerce shall report to the Congress annually on the use of statutory invention registrations. Such report shall include an assessment of the degree to which agencies of the Federal Government are making use of the statutory invention registration system, the degree to which it aids the management of federally developed technology, and an assessment of the cost savings to the Federal Government of the use of such procedures."

"(b) The table of sections at the beginning of chapter 14 of title 35, United States Code, is amended by adding at the end thereof the following:

"157. Statutory invention registration."

"(c) The amendments made by this section shall take effect six months after the date of the enactment of this Act.

PRIOR ART

SEC. 103. Section 103 of title 35, United States Code, is amended by adding at the end thereof the following:

"Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person."

JOINT INVENTORS

SEC. 104. (a) Section 116 of title 35, United States Code, is amended by amending the first paragraph to read as follows:

"When an invention is made by two or more persons jointly, they shall apply for patent jointly and each make the required oath, except as otherwise provided in this title. Inventors may apply for a patent jointly even though (1) they did not physically work together or at the same time, (2) each did not make the same type or amount of contribution, or (3) each did not make a contribution to the subject matter of every claim of the patent."



(b) Section 120 of title 35, United States Code, is amended by striking out "by the same inventor" and inserting in lieu thereof "which is filed by an inventor or inventors named in the previously filed application".

#### ARBITRATION OF INTERFERENCES

SEC. 105. Section 135 of title 35, United States Code, is amended by adding at the end thereof the following new subsection:

"(d) Parties to a patent interference, within such time as may be specified by the Commissioner by regulation, may determine such contest or any aspect thereof by arbitration. Such arbitration shall be governed by the provisions of title 9 to the extent such title is not inconsistent with this section. The parties shall give notice of any arbitration award to the Commissioner, and such award shall, as between the parties to the arbitration, be dispositive of the issues to which it relates. The arbitration award shall be unenforceable until such notice is given. Nothing in this subsection shall preclude the Commissioner from determining patentability of the invention involved in the interference."

#### EFFECTIVE DATE

SEC. 106. (a) Subject to subsections (b), (c), (d), and (e) of this section, the amendments made by this Act shall apply to all United States patents granted before, on, or after the date of enactment of this Act, and to all applications for United States patents pending on or filed after the date of enactment.

(b) The amendments made by this Act shall not affect any final decision made by the court or the Patent and Trademark Office before the date of enactment of this Act with respect to a patent or application for patent, if no appeal from such decision is pending and the time for filing an appeal has expired.

(c) Section 271(f) of title 35, United States Code, added by section 101 of this Act shall apply only to the supplying, or causing to be supplied, of any component or components of a patented invention after the date of enactment of this Act.

(d) No United States patent granted before the date of enactment of this Act shall abridge or affect the right of any person or his successors in business who made, purchased, or used prior to such effective date anything protected by the patent, to continue the use of, or to sell to others to be used or sold, the specific thing so made, purchased, or used, if the patent claims were invalid or otherwise unenforceable on a ground obviated by section 103 or 104 of this Act and the person made, purchased, or used the specific thing in reasonable reliance on such invalidity or unenforceability, the court before which such matter is in question may provide for the continued manufacture, use, or sale of the thing made, purchased, or used as specified, or for the manufacture, use, or sale of which substantial preparation was made before the date of enactment of this Act, and it may also provide for the continued practice of any process practiced, or for the practice of which substantial preparation was made, prior to the date of enactment, to the extent and under such terms as the court deems equitable for the protection of investments made or business commenced before the date of enactment.

(e) The amendments made by this Act shall not affect the right of any party in any case pending in court on the date of enactment to have their rights determined on the basis of the substantive law in effect prior to the date of enactment.

#### TITLE II-PATENT AND TRADEMARK OFFICE PROCEDURES

##### BOARD OF PATENT APPEALS AND INTERFERENCES

SEC. 201. (a) Section 7 of title 35, United States Code, is amended to read as follows:

#### § 7. Board of Patent Appeals and Interferences

"(a) The examiners-in-chief shall be persons of competent legal knowledge and scientific ability, who shall be appointed to the competitive service. The Commissioner, the Deputy

Commissioner, the Assistant Commissioners, and the examiners-in-chief shall constitute the Board of Patent Appeals and Interferences.

"(b) The Board of Patent Appeals and Interferences shall, on written appeal of an applicant, review adverse decisions of examiners upon applications for patents and shall determine priority and patentability of invention in interferences declared under section 135(a) of this title. Each appeal and interference shall be heard by at least three members of the Board of Patent Appeals and Interferences, who shall be designated by the Commissioner. Only the Board of Patent Appeals and Interferences has the authority to grant hearings.

"(c) Whenever the Commissioner considers it necessary, in order to keep current the work of the Board of Patent Appeals and Interferences, the Commissioner may designate any patent examiner of the primary examiner grade or higher, having the requisite ability, to serve as examiner-in-chief for periods not exceeding six months each. An examiner so designated shall be qualified to act as a member of the Board of Patent Appeals and Interferences. Not more than one of the members of the Board of Patent Appeals and Interferences hearing an appeal or determining an interference may be an examiner so designated. The Secretary of Commerce is authorized to fix the pay of each designated examiner-in-chief in the Patent and Trademark Office at not to exceed the maximum rate of basic pay payable for grade GS 16 of the General Schedule under section 5332 of title 5. The rate of basic pay of each individual designated examiner-in-chief shall be adjusted, at the close of the period for which that individual was designated to act as examiner-in-chief, to the rate of basic pay which that individual would have been receiving at the close of such period if such designation had not been made."

(b) The item relating to section 7 in the table of sections at the beginning of chapter 1 of title 35, United States Code, is amended by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

#### INTERFERENCES

SEC. 202. Section 135(a) of title 35, United States Code, is amended to read as follows:

"(a) Whenever an application is made for a patent which, in the opinion of the Commissioner, would interfere with any pending application, or with any unexpired patent, an interference may be declared and the Commissioner shall give notice of such declaration to the applicants, or applicant and patentee, as the case may be. The Board of Patent Appeals and Interferences shall determine questions of priority of the inventions and may determine questions of patentability. Any final decision, if adverse to the claim of an applicant, shall constitute the final refusal by the Patent and Trademark Office of the claims involved, and the Commissioner may issue a patent to the applicant who is adjudged the prior inventor. A final judgment adverse to a patentee from which no appeal or other review has been or can be taken or had shall constitute cancellation of the claims involved in the patent, and notice of such cancellation shall be endorsed on copies of the patent distributed after such cancellation by the Patent and Trademark Office."

#### APPEALS AND CIVIL ACTIONS

SEC. 203. (a) Section 141 of title 35, United States Code, is amended-

(1) in the first sentence-

(A) by striking out "of the Board of Patent Appeals may appeal" and inserting in lieu thereof "in an appeal to the Board of Patent Appeals and Interferences under section 134 of this title may appeal the decision"; and

(B) by striking out, "thereby waiving his right" and inserting in lieu thereof, "By filing such an appeal the applicant waives his or her right";

(2) in the second sentence-

(A) by striking out "board of patent interferences on the question of priority may appeal" and inserting in lieu thereof "Board of Patent Appeals and Interferences on the interference may appeal the decision";

(B) by striking out "according to" and inserting in lieu thereof "in accordance with"; and

(C) by striking out "he" and inserting in lieu thereof "the party"; and

(3) by amending the last sentence to read as follows: "If the appellant does not, within thirty days after the filing of such notice by the adverse party, file a civil action under section 146, the decision appealed from shall govern the further proceedings in the case."

(b) Section 145 of title 35, United States Code, is amended-

(1) in the first sentence by striking out "Appeals may" and inserting in lieu thereof "Patent Appeals and Interferences in an appeal under section 134 of this title may," and

(2) in the second sentence by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

(c) Section 146 of title 35, United States Code, is amended by striking out "board of patent interferences on the question of priority" and inserting in lieu thereof "Board of Patent Appeals and Interferences on the interference".

#### TECHNICAL AND CONFORMING AMENDMENTS

SEC. 204. (a) Section 41(a)(6) of title 35, United States Code, is amended-

(1) by striking out "Appeals" each place it appears and inserting in lieu thereof "Patent Appeals and Interferences"; and

(2) by inserting "in the appeal" "after oral hearing".

(b)(1) Section 134 of title 35, United States Code, is amended-

(A) in the section caption by striking out "APPEALS" and inserting in lieu thereof "PATENT APPEALS AND INTERFERENCES"; and

(B) by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

(2) The item relating to section 134 in the table of sections at the beginning of chapter 12 of title 35, United States Code, is amended by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

(c) Section 305 of title 35, United States Code, is amended by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

#### AMENDMENTS TO OTHER PROVISIONS OF LAW

SEC. 205. (a) Section 1295(a)(4)(A) of title 28, United States Code, is amended by striking out "Appeals or the Board of Patent" and inserting in lieu thereof "Patent Appeals and".

(b) Section 152 of the Atomic Energy Act of 1954 (42 U.S.C. 2182) is amended in the third paragraph-

(1) by striking out "Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences";

(2) by striking out "the Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences".

(c)(1) Section 305(d) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457(d)) is amended-

(A) by striking out "a Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences"; and

(B) by striking out "the Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences".

(2) Section 305(e) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457(e)) is amended by striking out "a Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences".

#### SAVINGS PROVISION

SEC. 206. Any individual who, on the effective date of this title, is an examiner-in-chief of the Board of Patent Appeals of the Patent and Trademark Office or an examiner of interfe-

ences of the Board of Patent Interferences of such office shall be entitled to continue in office as a member of the Board of Patent Appeals and Interferences of the Patent and Trademark Office as of such effective date.

#### EFFECTIVE DATE

SEC. 207. Section 206 of this Act and the amendments made by this title shall take effect three months after the date of the enactment of this Act.

#### TITLE III-NATIONAL COMMISSION ON INNOVATION AND PRODUCTIVITY

#### ESTABLISHMENT

SEC. 301. There is hereby established a National Commission on Innovation and Productivity (hereinafter in this title referred to as the "Commission").

#### MEMBERSHIP OF COMMISSION

SEC. 302. (a) The Commission shall be composed of

(1) three Members of the Senate appointed by the President of the Senate;

(2) three Members of the House of Representatives appointed by the Speaker of the House of Representatives; and

(3) three members appointed by the President of the United States, one of whom the President shall designate as Chairman. Of the members appointed by the President, one member should be an appropriate officer or employee of the United States, one member should be an employer who employs inventors, and one member should be an employed inventor.

(b) At no time shall more than two of the members appointed under paragraph (1), (2), or (3) of subsection (a) be persons who are members of the same political party.

(c) Any vacancy in the Commission shall not affect its powers but shall be filled in the same manner in which the original appointment was made, and subject to the limitation set forth in subsection (b) with respect to the original appointment.

(d) Six members of the Commission shall constitute a quorum, but a lesser number may conduct hearings.

#### DUTIES OF THE COMMISSION

SEC. 303. The Commission shall make a full and complete review and study of the level of innovation and productivity of employed inventors. Such study shall include an analysis of the various methods available to inspire or stimulate individual and corporate innovation and productivity, including an assessment of the techniques used in other countries to achieve this objective. Such study may include an assessment of those aspects of other areas of intellectual property law that inspire or stimulate such innovation and productivity. The Commission shall make recommendations for such revisions of the laws of the United States, including the repeal of unnecessary or undesirable statutes, and such other changes as the Commission considers will better foster innovation and productivity.

#### COMPENSATION OF MEMBERS OF THE COMMISSION

SEC. 304. (a) A member of the Commission who is a Member of Congress or a full-time officer or employee of the United States shall receive no additional compensation by reason of his or her service on the Commission.

(b) Subject to amounts provided in advance in appropriations Acts, a member of the Commission from private life shall receive the daily equivalent of the annual rate of basic pay payable for level III of the Executive Schedule for each day (including traveltime) during which such member is engaged in the actual performance of duties vested in the Commission, plus reimbursement for travel, subsistence, and other necessary expenses incurred in the performance of such duties, in accordance with subchapter I of chapter 57 of title 5, United States Code.



## DIRECTOR AND STAFF

SEC. 305. (a) The Commission shall have a Director who shall be appointed by the Commission and who shall be paid at a rate not to exceed the rate of basic pay payable for level IV of the Executive Schedule. The Director, subject to the direction of the Commission, shall supervise the activities of persons employed by the Commission and the preparation of the reports of the Commission and shall perform such other duties as may be assigned to the Director by the Commission.

(b) The Commission may appoint and fix the pay of such additional personnel as it considers appropriate.

(c) The staff of the Commission may be appointed without regard to the provisions of title 5, United States Code, governing appointments in the competitive service, and may be paid without regard to the provisions of chapter 51 and subchapter III of chapter 53 of such title relating to classification and General Schedule pay rates, except that no individual so appointed may receive pay in excess of the maximum annual rate of basic pay payable for GS-16 of the General Schedule.

(d) The Chairman of the Commission may procure temporary and intermittent services under section 3109(b) of title 5, United States Code.

## GOVERNMENT AGENCY COOPERATION

SEC. 306. The Commission is authorized to request from any department, agency, or independent instrumentality of the Government any information and assistance it considers necessary to carry out its functions under this title. Each such department, agency, and instrumentality is authorized to cooperate with the Commission and, to the extent permitted by law, to furnish such information and assistance to the Commission.

## REPORT OF THE COMMISSION; TERMINATION

SEC. 307. The Commission shall submit interim reports on its activities to the President and the Congress at such times as the Commission considers appropriate, except that at least one such report shall be so submitted within one year after the date of the enactment of this Act. The Commission shall submit its final report on its activities to the President and the Congress within two years after such date of enactment. The Commission shall cease to exist sixty days after the date of the submission of its final report.

## ADMINISTRATIVE SERVICES

SEC. 308. The General Services Administration shall provide administrative services for the Commission on a reimbursable basis.

## AUTHORIZATION OF APPROPRIATIONS

SEC. 309. There is authorized to be appropriated \$250,000 to carry out this title.

## EFFECTIVE DATE

SEC. 310. This title shall take effect on January 21, 1985.

## TITLE IV- MISCELLANEOUS PROVISIONS

## INTERNATIONAL STAGE

SEC. 401. (a) Section 361(d) of title 35, United States Code, is amended in the first sentence by inserting "or within one month after the date of such filing" after "application".

(b) Section 366 of title 35, United States Code, is amended—

(1) in the first sentence—

(A) by inserting "after the date of withdrawal," after "effect"; and

(B) by inserting before the period the following: "unless a claim for the benefit of a prior filing date under section 365(c) of this part was made in a national application, or an international application designating the United States, filed before the date of such withdrawal"; and

(2) in the second sentence by inserting "withdrawn" after "such".

## NATIONAL STAGE

SEC. 402. (a) Section 371(a) of title 35, United States Code, is amended—

(1) by striking out "is" and inserting in lieu thereof "may be"; and

(2) by striking out "except those filed in the Patent Office".

(b) Section 371(b) of title 35, United States Code, is amended to read as follows:

"(b) Subject to subsection (f) of this section, the national stage shall commence with the expiration of the applicable time limit under article 22(1) or (2) of the treaty."

(c) Section 371(c)(2) of title 35, United States Code, is amended—

(1) by striking out "received from" and inserting in lieu thereof "communicated by"; and

(2) by striking out "verified" before "translation".

(d) Section 371(d) of title 35, United States Code, is amended to read as follows:

"(d) The requirements with respect to the national fee referred to in subsection (c)(1), the translation referred to in subsection (c)(2), and the oath or declaration referred to in subsection (c)(4) of this section shall be complied with by the date of the commencement of the national stage or by such later time as may be fixed by the Commissioner. The copy of the international application referred to in subsection (c)(2) shall be submitted by the date of the commencement of the national stage. Failure to comply with these requirements shall be regarded as abandonment of the application by the parties thereof, unless it be shown to the satisfaction of the Commissioner that such failure to comply was unavoidable. The payment of a surcharge may be required as a condition of accepting the national fee referred to in subsection (c)(1) or the oath or declaration referred to in subsection (c)(4) of this section if these requirements are not met by the date of the commencement of the national stage. The requirements of subsection (c)(3) of this section shall be complied with by the date of the commencement of the national stage, and failure to do so shall be regarded as a cancellation of the amendments to the claims in the international application made under article 19 of the treaty."

(e) Section 372(b) of title 35, United States Code, is amended—

(1) by striking out the period at the end of paragraph (2) and inserting in lieu thereof "; and"; and

(2) by adding at the end thereof the following:

"(3) The Commissioner may require a verification of the translation of the international application or any other document pertaining to the application if the application or other document was filed in a language other than English."

(f) Section 372 of title 35, United States Code, is amended by striking out subsection (c).

(g) Section 376(a) of title 35, United States Code, is amended by striking out paragraph (5) and redesignating paragraph (6) as paragraph (5).

## TECHNICAL AMENDMENTS

SEC. 403. (a) Title 35, United States Code, is amended by striking out "Patent Office" each place it appears and inserting in lieu thereof "Patent and Trademark Office".

(b) The table of parts at the beginning of title 35, United States Code, is amended by adding at the end thereof the following:

"TV. Patent Cooperation Treaty.....351"

## PATENT FEES

SEC. 404. (a) Notwithstanding section 41 of title 35, United States Code, as in effect before the enactment of Public Law 97-247 (96 Stat. 317), no fee shall be collected for maintaining a plant patent in force.

(b) Notwithstanding section 41(c) of title 35, United States Code, as in effect before the enactment of Public Law 97-247 (96 Stat. 317), the Commissioner of Patents and Trademarks may accept, after the six-month grace period referred to in such section 41(c), the payment of any maintenance fee due on any patent based on an application filed in the Patent and Trademark Office on or after December 12, 1980, and before August 27, 1982, to the same extent as in the case of patents based on

applications filed in the Patent and Trademark Office on or after August 27, 1982.

## TRADEMARK TRIAL AND APPEAL BOARD

SEC. 405. Section 3 of title 35, United States Code, is amended by adding at the end thereof the following:

"(e) The members of the Trademark Trial and Appeal Board of the Patent and Trademark Office shall each be paid at a rate not to exceed the maximum rate of basic pay payable for GS-16 of the General Schedule under section 5332 of title 5."

## EFFECTIVE DATE

SEC. 406. (a) Section 404 of this Act and the amendments made by section 403 of this Act shall take effect on the date of the enactment of this Act.

(b) The amendments made by sections 401, 402, and of this Act shall take effect six months after the date of the enactment of this Act.

[1050 OG 316]

(92) DEPARTMENT OF COMMERCE  
Patent and Trademark Office  
37 CFR Part 1, Part 5 and Part 10  
[Docket No. 920779-3226]  
RIN 0651-AA34

## Miscellaneous Changes in Patent Practice

Agency: Patent and Trademark Office, Commerce.  
Action: Final Rule.

**Summary:** The Patent and Trademark Office (Office) is amending the rules of practice in patent cases to: expand the authority to sign a terminal disclaimer in a patent application or a disclaimer in a patent; eliminate some formal requirements for an appeal brief for an appellant appearing without counsel; prohibit fee extensions of time to file reply briefs and requests for oral hearing; clarify the requirements for claiming foreign priority; specify the manner in which the fee deficiency is computed when applicants seek to correct an error in claiming small entity status; and correct errors in published regulations.

**Effective Date:** Jan. 3, 1994. The time periods and extension of time provisions of §§ 1.193 and 1.194 for filing reply briefs and requests for oral hearing will be applicable where the examiner's answer was mailed on or after the effective date.

**For Further Information Contact:** Abraham HersHKovitz by telephone at (703) 305-9282, or by facsimile transmission at (703) 305-8825, or by mail marked to his attention and addressed to: Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231.

**Supplementary Information:** In a Notice of Proposed Rulemaking published in the Federal Register at 57 FR 43412 (September 21, 1992) and in the Patent and Trademark Office Official Gazette at 1143 Off. Gaz. Pat. Office 33-40 (October 13, 1992), the Office proposed to amend several rules of practice in patent and trademark cases. This rulemaking includes changes in § 1.9(d) which were not part of the proposed rules. The changes in § 1.9(d) were made in order to update the information pertaining to establishing small entity status as a small business. No substantive changes have been made in § 1.9(d). The proposed rule requiring that the specification of a design application describe the nature and intended use of the article being claimed has been withdrawn. Additionally, the proposed rule prohibiting a fee extension of time to file corrected drawings after allowance has been withdrawn.

Written comments were submitted by 13 firms, one association and one individual. An oral hearing was not conducted. The following includes a discussion of the rules being changed and the reasons for those changes and an analysis of the comments received in response to the notice of proposed rulemaking.

## Discussion of Specific Sections to be Changed or Added:

## (1) Definitions (Section 1.9)

Section 1.9(d) is amended in order to update the information therein regarding the regulations of the Small Business Administration (SBA). The SBA's rule for defining a small business has been modified. Section 1.9(d) will no longer repeat the SBA rule in its entirety. Rather, § 1.9(d), as adopted, contains a short summary of the SBA definitions. The size limit of 500 employees (including those of its affiliates) for a small business concern has not been changed. Information on size standards for a small business concern may be obtained from the Small Business Administration by calling (202) 205-6618, or by writing to: Small Business Administration, Size Standards Staff, 409 Third Street, S.W., Washington, D.C. 20416.

## (2) Copies of Papers (Section 1.13)

Section 1.13(a) is amended to clarify that the paragraph pertains to non-certified copies, and that copies of patents, trademark registrations and other papers within the jurisdiction of the Office, as opposed to being within the jurisdiction of another agency, may be obtained from the Office upon payment of the fee therefor.

Section 1.13(b) is amended to clarify that certified copies of the above items may be obtained from the Office upon payment of the fee for a certified copy.

## (3) Patent Applications Preserved in Secrecy (Section 1.14)

Section 1.14(b) is amended to correct a typographical error in that the second and third sentences of this section were inadvertently deleted during an earlier revision of this section. See 50 Fed. Reg. 9378 (March 7, 1985) and 1053 Off. Gaz. Pat. Office 10-26 (April 2, 1985). Section 1.14(b) is amended by restoring the deleted sentences and by changing, in the first sentence, the plural "applicants" to the singular "applicant".

## (4) Effect on Fees of Failure to Establish Status, or Change Status, as Small Entity (Section 1.28)

Section 1.28(c) is amended to reflect Office practice in calculating fee deficiencies when fees have been improperly paid as a small entity. The Office receives deficiency payments that differ based on varying interpretations of § 1.28(c). Some simply double the small entity fee in effect when the fee was originally paid in error in the small entity amount, while others compute the difference between the fee already paid and the other than small entity fee level in effect at the time the deficiency is paid. The Office requires payments to be based on fee levels in effect at the time the other than small entity fee is paid.

Since 1989, fee levels have been adjusted annually. In view of these adjustments, there are frequently situations where the fee amount has changed since it was originally paid erroneously at the small entity rate. Calculation of deficiency amounts based on fee levels in effect at the time the deficiency is paid conforms with the general concept that fees to be paid are those in effect at the time of receipt of the fees. Section 1.28(c) is amended to reflect this practice of calculating the amount of the deficiency based on the fee level in effect at the time of the deficiency payment.

## (5) Claim for Foreign Priority (Section 1.55)

Section 1.55(a) is amended to incorporate the limitations of 35 U.S.C. 119, which provides that the claim for priority and the appropriate copy of the foreign application must be filed before the patent is granted. Additionally, some applicants did not realize that submission of priority papers after payment of the issue fee, but before the grant of the patent, required the filing of a petition to accept submission of priority papers after payment of the issue fee. After a patent is granted, applicants may still be able to establish priority benefits by filing a reissue application to correct the failure to perfect the claim for priority. *Brenner v. State of Israel*, 400 F.2d 789, 158 USPQ 584 (D.C. Cir. 1968). Section 1.55(a) lists separately those instances when priority documents must be filed prior to payment of the issue fee to receive the benefit of the filing date of a prior foreign application. Furthermore, § 1.55(a) is amended to clarify when



a verified English language translation of priority application not in the English language must be filed and to require a statement from the translator that the translation of the priority document is accurate. *Krenitsky v. Utagawa*, 215 USPQ 713 (Comm'r Pat. 1981).

(6) Claiming Benefit of Earlier Filing Date and Cross References to other Applications (Section 1.78)

Section 1.78(a) is amended to correct a typographical error. In the reference to the fee in § 1.21(l), the letter (l) should have appeared instead of the numeral (1). Section 1.78(a) is further amended to be consistent with § 1.5(a), by permitting the identification of the prior application by application number or serial number and filing date.

(7) Prohibition of Fee Extensions of Time (Section 1.136(a))

Section 1.136(a) is amended by adding two additional situations in which applicants would no longer be able to use fee extensions. Section 1.136(a) is rearranged so that referenced sections appear in numerical order. The new prohibitions will apply to situations where the request to extend the time is: (1) to permit filing reply briefs under § 1.193(b); and (2) to permit filing requests for oral hearing under § 1.194(b) before the Board of Patent Appeals and Interferences (Board). Fee extensions of time to file reply briefs or requests for oral hearing delay transfer of jurisdiction of the appeal to the Board and unnecessarily delay final disposition of the appeal.

The Office has considered changing the practice to require payment of the fee and filing the request for an extension of time before the period set for response expires in the situations addressed in this rulemaking, but did not adopt that approach because of the complexity that it would introduce into the system.

Under the previous rules, applicants could request a maximum four-month extension of time under § 1.136(a) to file reply briefs or request oral hearings. Since the backlog of cases awaiting a decision by the Board has been reduced, these extension requests have resulted in unnecessary delays in transmitting appeals to the Board and increased pendency of applications. The periods specified in 1.193(b) and 1.194(b), as adopted, are considered sufficient to file a reply brief or request an oral hearing. Extensions of time for cause may be available under § 1.136(b). Therefore, § 1.136(a) is amended to prohibit fee extensions of time to file a reply brief or request an oral hearing.

(8) Appeal to the Board of Patent appeals and Interferences (Section 1.191)

Section 1.191(d) is amended to be consistent with the changes to 1.136(a).

(9) Appellant's Brief (Section 1.192)

Sections 1.192(a) and (d) are amended by moving the last sentence of current § 1.192(d) to § 1.192(a) to highlight that the Board may refuse consideration of any arguments or authorities not included in the brief.

Section 1.192(c) is amended to eliminate some of the formal requirements for an appeal brief for a pro se appellant, that is, an appellant appearing without counsel. An appellant appearing without counsel means there is no attorney or agent of record in the application or reexamination proceeding, the brief was not prepared by a registered practitioner, and the brief was not signed by a registered practitioner. Paragraph (c) is amended to allow a pro se appellant's brief to be accepted provided it is at least in substantial compliance with the requirements of subparagraphs (1), (2), (6) and (7) of paragraph (c). If a pro se appellant's brief is accepted, it will be presumed that a rejected group of claims stand or fall together unless an argument is included in the brief that presents reasons as to why appellant considers one or more claims in the rejected group of claims to be separately patentable from the other claims in the group.

(10) Examiner's Answer (Section 1.193)

Section 1.193(b) is amended to clarify the consequence of failure to file a reply brief in response to an expressly stated new ground of rejection made in an examiner's answer. The failure to file a reply brief will result in dismissal of the appeal as to the claims made subject to the expressly stated new ground of rejection. If the dismissal of the appeal applies to all claims in the application, the application will be abandoned. Additionally, this section is amended to change the period for filing a reply brief to two months from the date of the examiner's answer, regardless of whether the examiner's answer includes a new ground of rejection. The change to two months will avoid confusion in those cases in which there is a disagreement as to whether the examiner's answer in fact states a new ground of rejection and will provide an adequate period of time to file a reply brief without the need to request an extension of time. Finally, this section is amended to be consistent with the changes to § 1.136(a).

(11) Oral Hearing (Section 1.194)

Section 1.194(b) is amended to be consistent with the changes to 1.136(a). Under the previous rule, if a new ground of rejection was made in an examiner's answer, two months were permitted for filing a reply brief and, if a reply brief was filed, an applicant was permitted three months after the date of filing a reply brief to file a request for an oral hearing. In order to provide a more consistent approach vis-a-vis time periods for filing reply briefs and requests for oral hearing and to permit earlier decisions of issues on appeal, the period for filing a request for oral hearing has been changed to two (2) months from the date of an examiner's answer, regardless of whether the examiner's answer includes a new ground of rejection. This period should be sufficient to request an oral hearing without the need to request an extension of time.

(12) Decision by the Board of Patent Appeals and Interferences (Section 1.196)

Section 1.196(f) is amended to refer to § 1.550(c) for extensions of time in reexamination proceedings.

(13) Action Following Decision (Section 1.197)

Section 1.197(b) is amended to refer to § 1.550(c) for extensions of time in reexamination proceedings.

(14) Amendments After Allowance (Section 1.312)

Section 1.312(b) is amended to clarify that the fee required for a petition under this section is that specified in § 1.17(i)(1).

(15) Statutory Disclaimers, Including Terminal Disclaimers (Section 1.321)

The title of section 1.321 is amended to clarify that this section applies to terminal disclaimers, as well as to statutory disclaimers in general. Section 1.321 is further amended to permit the signing of a disclaimer in a patent by the patentee, or an attorney or agent of record, whereas, persons permitted to sign a disclaimer in a patent application will be any person specified in § 1.33(a)(1)-(4). The person signing the disclaimer must state the present extent of the disclaiming party's (i.e., patentee's or assignee's) interest in the patent or patent application. Naturally, a disclaimer signed on behalf of a party who no longer has an ownership interest in the patent or patent application cannot be accepted since 35 U.S.C. 253 requires a disclaimer to be signed by the owner of the whole or any sectional interest in the patent or patent application.

Section 253 of Title 35 of the United States Code states that disclaimer of any complete claim in a patent may be made by the patentee. Furthermore, any terminal part of the patent granted or to be granted may be disclaimed by the patentee, or applicant, respectively. It was the recent policy of the Office to accept disclaimers only if signed by the owner of record. This policy was too restrictive in that it precluded authorized patent practitioners from signing disclaimers. Furthermore, it was often difficult to ascertain whether the person signing was in fact an officer of the entity owning rights to the application. Accord-

ingly, the rules as adopted, permit an attorney or agent of record to sign terminal disclaimers.

If the patent or patent application is assigned to an organization, such as a corporation, partnership, university, Government agency, or similar entity, and the disclaimer is signed by the assignee, the assignee must comply with § 3.73(b). See "Taking Action in a Patent Matter Before the Office by the Assignee under 37 CFR 3.73", at 1150 Off. Gaz. Pat. Office 62 (May 25, 1993). However, the rules, as adopted, permit an attorney or agent of record to sign a terminal disclaimer without the need to comply with § 3.73(b). Paragraph (a) of this section is further amended to refer only to disclaimers filed in patents. The Office does not record a disclaimer of part of a claim or claims. Hence, paragraph (a) of this section is amended to indicate that a disclaimer which does not disclaim a complete claim or claims will be refused recordation, rather than "may be refused recordation" as the rule read previously.

Paragraph (b) of this section is amended to refer only to terminal disclaimers filed in a patent application. Section 1.321(b) is also amended to include a reminder that the disclaimer is binding upon the grantee and its successors or assigns.

Paragraph (c) of this section incorporates the language of former paragraph (b) of this section concerning terminal disclaimers to obviate a double patenting rejection. This paragraph also includes reference to terminal disclaimers filed in reexamination proceedings for the same purpose.

(16) Publication of Notice of Proposed Amendments (Section 1.352(a))

Section 1.352(a) is amended to delete the language "and in other cases whenever practicable" so that the Office may engage in expedited rulemaking when publication of a notice of proposed amendments to regulations is not required by law.

(17) Time for Payment of Maintenance Fees (Section 1.362)

Section 1.362 is amended to clarify applicability and due dates for payment of maintenance fees. Paragraph (c)(3) of § 1.362 indicates that the actual filing date of a continuing application determines applicability of maintenance fees, while paragraph (c)(4) indicates that in the case of a reissue application, the filing date of the original non-reissue application determines applicability of maintenance fees. Some patentees and patent practitioners expressed confusion with respect to applicability of maintenance fees in the case of a continuing application of a reissue application. Uncertainty has been expressed as to whether this type of application would fall within paragraph (c)(3) or (c)(4). The amendment to 1.362(c)(4) clarifies that continuing reissue application of a reissue application is subject to maintenance fees only if the original (non-reissue) patent would be subject to such fees. These amendments also remove any confusion that may have existed with regard to the due dates for payment of maintenance fees in reissued patents by adding § 1.362(h) to specify that the due dates for payment of maintenance fees in such reissued patents are computed from the date of grant of the original (non-reissue) patent. The due dates for payment of maintenance fees in a reissued patent are computed from the date of grant of the original (non-reissue) patent. Note the distinction between a continuing reissue application of a reissue application, and a regular continuing application of a reissue application as discussed in *re Bauman*, 683 F.2d 405, 214 USPQ 585 (CCPA 1982).

In a notice entitled "Revision of Patent and Trademark Fees" published in the Federal Register at 56 FR 65142 (December 13, 1991), the Office announced an amendment to its rules of practice. Included in that notice was a change to paragraph (e) of § 1.362 which was not intended. See 56 FR at 65146. The portion of paragraph (e) which was not intended to be amended is changed back to its earlier version.

(18) Request by Applicant for Interference With Patent (Section 1.607)

Section 1.607(a)(5) (i) is amended to correct a typographical error in the spelling of the word "count".

(19) Export of Technical data (Section 5.19)

Section 5.19(a) is amended to correct the citations set forth in the rule and to update the name of the office in the Department of Commerce.

(20) Sharing legal fees (Section 10.48)

Section 10.48(b) is amended to correct a typographical error in the spelling of the word "deceased".

#### Response to Comments on the Rules

The comments received in response to the notice of proposed rulemaking have been given careful consideration and a number of the suggested modifications have been adopted. The comments and responses are discussed below.

**Comment:** One comment inquired as to why the phrase by "serial number and filing date" was used in § 1.78(a), where as the phrase "application number (consisting of the series code and serial number, e.g., 07/123,456), or the serial number and filing date" was used in § 1.5(a).

**Response:** The inconsistency has been removed by having section 1.78(a) changed to use terminology consistent with § 1.5(a).

**Comment:** A number of comments directed to § 1.85(c) expressed concern that applications would become abandoned as a result of the proposal that fee extensions of time under § 1.136(a) could not be obtained for filing corrected drawings.

**Response:** The proposal that fee extensions of time under § 1.136(a) not be permitted for filing corrected drawings has been withdrawn.

**Comment:** Regarding § 1.85(c), one comment recommended that the Notice of Draftman's Patent Drawing Review (PTOL-948) include separate boxes for each drawing objection (e.g., a separate box for each of "pale," "rough," "blurred," and "jagged"); that drafting personnel be better trained to more completely communicate the objection to any particular drawing; and that the Notice of Allowability indicate for which specific figure formal drawings are required.

**Response:** The proposed rule change to § 1.85(c) has been withdrawn. Questions concerning the Notice of Draftman's Patent Drawing Review may be referred to the Official Draftman at (703) 305-8335, and questions concerning any requirement on a Notice of Allowability should be directed to the examiner.

**Comment:** Regarding §§ 1.153 and 1.154, a number of comments objected to the proposed requirement that the specification of a design application contain a statement of the nature and intended use of the article claimed.

**Response:** The proposed rule change regarding §§ 1.153 and 1.154 has been withdrawn. The Office will continue its current practice of mailing a request for information where the nature or intended use of the article is not evident in the application file.

**Comment:** Regarding § 1.153, one comment stated that the language of the proposed rule is unclear as to whether an abstract is required. The comment recommended that the Office should require an abstract and require it to provide the necessary information.

**Response:** As discussed above, the proposed rule change regarding §§ 1.153 and 1.154 has been withdrawn. The present rules do not require an Abstract. Suggestions concerning this issue may be directed to the Director of Examining Group 2900.

**Comment:** Regarding §§ 1.193(b) and 1.194(b), one comment opposed the elimination of fee extensions in the filing of reply briefs and requests for oral hearings, as one month, while often a sufficient time to file a reply brief, is insufficient where counsel must communicate with a patent department or foreign applicants, especially where there is a delay between the time the Office mails the communication and it is received by counsel.

**Response:** The period for filing a reply brief or request for oral hearing has been changed to two months from the date of the examiner's answer. The period was extended to two months in this rulemaking, as adopted, to provide appellants adequate time to take appropriate action, and to provide a uniform period in the rules to file a reply brief or request an oral hearing.



Extensions of time for cause under § 1.136(b) will be available for those rare situations when an extension is necessary.

**Comment:** Regarding §§ 1.193(b) and 1.194(b), one comment opposed the elimination of fee extensions in the filing of reply briefs and requests for oral hearings, as a one-month period for response is insufficient for sole practitioners and persons who do not maintain offices for the sole purpose of responding to Office communications.

**Response:** As discussed above, the period for filing a reply brief or request for oral hearing has been changed to two months from the date of the examiner's answer. This two-month period should be an adequate period of time for filing a reply brief or a request for an oral hearing. Extensions of time for cause under § 1.136(b) will be available for those rare situations when an extension is necessary.

**Comment:** Regarding §§ 1.193(b) and 1.194(b), one comment deemed it reasonable and necessary that the Board have at its disposal all possible arguments. The refusal to enter a reply brief was characterized as an impediment to a decision based upon a complete record. Additionally, the comment argued that the refusal to enter a reply brief would result in attempts to enter the arguments under another guise, such as during oral argument or by filing a memorandum of oral argument.

**Response:** An appellant should present all arguments for patentability in the appeal brief. A reply brief should not be necessary to present a complete record, and would be inappropriate except in those cases where the examiner has introduced a new point of argument or new ground of rejection in the examiner's answer.

**Comment:** Regarding §§ 1.193(b) and 1.194(b), one comment noted that fee extensions for filing reply briefs and requests for oral hearings do not create any more of a delay in the final disposition of an appeal than a fee extension for filing the Notice of Appeal or the brief in support of the appeal.

**Response:** The comment reflects a misunderstanding of the appeal process and the handling of applications in which an appeal has been filed. Under the existing rules before this rulemaking, appellants were able, with the maximum four-month fee extension, to file reply briefs or request oral hearings up to six months after an examiner's answer. As a result, appeals otherwise ready for a decision were either held in the examining group for that period of time before transmittal to the Board or when transmitted to the Board earlier, were occasionally acted upon by a Board panel before the reply briefs or requests for oral hearing were filed, requiring the Board to vacate its decision. As the backlog of appeals awaiting a decision by the Board has been reduced, retaining applications in the examining group has resulted in unnecessarily prolonging the pendency of applications. Under the rules as adopted, appellants are generally given more time (two months instead of one month) to file a reply brief or request an oral hearing, and the Office minimizes the delay necessary before transmitting the appeal to the Board for decision.

**Comment:** Regarding § 1.193(b), one comment stated that an appeal should not be dismissed for failure to file a reply brief to a new ground of rejection made in the examiner's answer, unless the examiner's answer expressly states that there is a new ground of rejection. The comment suggests that this rule should recite "If the examiner's answer expressly states a new ground of rejection is being made...."

**Response:** The proposal has been adopted to the extent that the final rule, as adopted, states "If the examiner's answer expressly states that it includes a new ground of rejection, appellant must file a reply thereto within two months from the date of such answer to avoid dismissal of the appeal as to the claims subject to the new ground of rejection."

**Comment:** Regarding § 1.193(b), one comment recommended that appellants should be given three months to respond to a new ground of rejection in an examiner's answer, as the current two-month time period is inadequate, and this period would be equal to the period given for response to rejections under § 1.106.

**Response:** This recommendation is not adopted. The Office experience has shown that the two-month period from the date of an examiner's answer has been an adequate period of time for filing a reply brief in response to a new ground of rejection. Also, it is desirable to set a uniform period of time in the rules to file a reply brief. Extensions of time for cause under §

1.136(b) will be available for those rare situations when an extension is necessary.

**Comment:** One comment recommended that appellants should be permitted to obtain fee extensions where the examiner's answer includes a new ground of rejection.

**Response:** This recommendation is not adopted. As indicated above, fee extensions for filing reply briefs have resulted in unnecessarily prolonging the pendency of applications. Extensions of time for cause under § 1.136(b) will be available for those rare situations when an extension is necessary.

**Comment:** Regarding §§ 1.193(b) and 1.194(b), one comment suggested that the rule be modified to permit the filing of a request for an oral hearing concurrently with a reply brief as one cannot appropriately determine the necessity for an oral hearing until a reply brief is drafted.

**Response:** Under the proposed rules, the time period for filing a request for an oral hearing was the later of one month from the date of an examiner's answer, or the date of filing a timely reply brief. Under the rules as adopted, an appellant has two months from the date of the examiner's answer to file a reply brief and request an oral hearing. Therefore, a request for oral hearing may be filed concurrently with a reply brief.

**Comment:** Regarding § 1.312, one comment recommended that amendments under § 1.312 be processed expeditiously, as the current system for the processing of such amendments is inadequate.

**Response:** Examiners are instructed to act promptly on all amendments under § 1.312. Any problems should be brought to the attention of the Group Director.

#### OTHER CONSIDERATIONS

The rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these changes is to permit persons other than the assignee of a patent application or patent to sign certain disclaimers, incorporate existing Office policy into the regulations and eliminate the opportunity to pay for extensions of time in certain situations where the extensions substantially interfere with the efficient operation of the Office.

The Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers; individuals; industries; Federal, state or local government agencies; or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes contain collection-of-information requirements subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, which has previously been approved by the Office of Management and Budget under Control No. 0651-0011. Public reporting burden for these collections of information is estimated to average 0.1 hours each for fee extensions of time under § 1.136(a), and 0.2 hours each for disclaimers under § 1.321, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding these burden estimates, or any other aspect of this collection of information, including suggestions for reducing the burden, to Abraham HersHKovitz, Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503 (ATTN: Paperwork Reduction Act Project No. 0651-0031).

#### LIST OF SUBJECTS 37 CFR Part 1

Administrative practice and procedure, Freedom of information, Inventions and patents, Reporting and recordkeeping requirements.

#### 37 CFR Part 5

Classified information, Exports, Foreign relations, Inventions and patents.

#### 37 CFR Part 10

Administrative practice and procedure, Conflicts of interest, Courts, Inventions and patents, Lawyers.

For the reasons set out in the preamble, Parts 1, 5 and 10 of title 37 of the Code of Federal Regulations are amended as set forth below.

#### PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.9, paragraph (d) is revised to read as follows:

#### § 1.9 Definitions.

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(d) A small business concern as used in this chapter means any business concern as defined by the regulations of the Small Business Administration in 13 CFR 121.1301 through 121.1305, which define a small business concern as one whose number of employees, including those of its affiliates, does not exceed 500 persons and which has not assigned, granted, conveyed, or licensed, and is under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor if that person had made the invention, or to any concern which would not qualify as a small business concern or a nonprofit organization under this section. Questions related to size standards for a small business concern may be directed to: Small Business Administration, Size Standards Staff, 409 Third Street, S.W., Washington, D.C. 20416.

(e) \*\*\*

3. Section 1.13 is revised to read as follows:

#### § 1.13 Copies and certified copies.

(a) Non-certified copies of patents and trademark registrations and of any records, books, papers, or drawings within the jurisdiction of the Patent and Trademark Office and open to the public, will be furnished by the Patent and Trademark Office to any person, and copies of other records or papers will be furnished to persons entitled thereto, upon payment of the fee therefor.

(b) Certified copies of the patents and trademark registrations and of any records, books, papers, or drawings within the jurisdiction of the Patent and Trademark Office and open to the public or persons entitled thereto will be authenticated by the seal of the Patent and Trademark Office and certified by the Commissioner, or in his name attested by an officer of the Patent and Trademark Office authorized by the Commissioner, upon payment of the fee for the certified copy.

4. Section 1.14, paragraph (b) is revised to read as follows:

#### § 1.14 Patent applications preserved in secrecy.

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(b) Except as provided in § 1.11(b) abandoned applications are likewise not open to public inspection, except that if an application referred to in a U.S. patent, or in an application in

which the applicant has filed an authorization to open the complete application to the public, is abandoned and is available, it may be inspected or copies obtained by any person on written request, without notice to the applicant. Complete applications (§ 1.51(a)) which are abandoned may be destroyed after 20 years from their filing date, except those to which particular attention has been called and which have been marked for preservation. Abandoned applications will not be returned.

5. Section 1.28, paragraph (c) is revised to read as follows:

#### § 1.28 Effect on fees of failure to establish status, or change status, as a small entity.

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(c) If status as a small entity is established in good faith, and fees as a small entity are paid in good faith, in any application or patent, and it is later discovered that such status as a small entity was established in error or that through error the Patent and Trademark Office was not notified of a change in status as required by paragraph (b) of this section, the error will be excused (1) if any deficiency between the amount paid and the amount due is paid within three months after the date the error occurred or (2) if any deficiency between the amount paid and the amount due is paid more than three months after the date the error occurred and the payment is accompanied by a statement explaining how the error in good faith occurred and how and when the error was discovered. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The deficiency is based on the amount of the fee, for other than a small entity, in effect at the time the deficiency is paid in full.

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6. Section 1.55, paragraph (a) is revised to read as follows:

#### § 1.55 Claim for foreign priority.

(a) An applicant may claim the benefit of the filing date of a prior foreign application under the conditions specified in 35 U.S.C. 119 and 172. The claim to priority need be in no special form and may be made by the attorney or agent if the foreign application is referred to in the oath or declaration as required by § 1.63. The claim for priority and the certified copy of the foreign application specified in the second paragraph of 35 U.S.C. 119 must be filed:

- (1) in the case of an interference (§ 1.630);
- (2) when necessary to overcome the date of a reference relied upon by the examiner;
- (3) when specifically required by the examiner; and
- (4) in all cases, before the patent is granted. If the claim for priority or the certified copy of the foreign application is filed after the date the issue fee is paid, it must be accompanied by a petition requesting entry and by the fee set forth in § 1.17(i)(1). If the certified copy filed is not in the English language, a translation need not be filed except in the case of an interference; or when necessary to overcome the date of a reference relied upon by the examiner; or when specifically required by the examiner, in which event an English language translation must be filed together with a statement that the translation of the certified copy is accurate. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

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7. Section 1.78, paragraph (a) is revised to read as follows:

#### § 1.78 Claiming benefit of earlier filing date and cross references to other applications.

(a)(1) An application may claim an invention disclosed in a prior filed copending national application or international application designating the United States of America. In order for an application to claim the benefit of a prior filed copending national application, the prior application must name as an inventor at least one inventor named in the later filed application and disclose the named inventor's invention claimed in at least



one claim of the later filed application in the manner provided by the first paragraph of 35 U.S.C. 112. In addition, the prior application must be

- (i) complete as set forth in § 1.51; or
  - (ii) entitled to a filing date as set forth in § 1.53(b) and include the basic filing fee set forth in § 1.16; or
  - (iii) entitled to a filing date as set forth in § 1.53(b) and have paid therein the processing and retention fee set forth in § 1.21 (1) within the time period set forth in § 1.53(d).
- (a)(2) Any application claiming the benefit of a prior filed copending national or international application must contain or be amended to contain in the first sentence of the specification following the title a reference to such prior application, identifying it by application number (consisting of the series code and serial number), or serial number and filing date or international application number and international filing date and indicating the relationship of the applications. Cross-references to other related applications may be made when appropriate. (See § 1.14(b)).

\*\*\*\*\*

8. Section 1.136, paragraph (a) is revised to read as follows:

**§ 1.136 Filing of timely responses with petition and fee for extension of title for cause.**

(a)(1) If an applicant is required to respond within a nonstatutory or shortened statutory time period, applicant may respond up to four months after the time period set if a petition for an extension of time and the fee set in § 1.17 are filed prior to or with the response, unless

- (i) applicant is notified otherwise in an Office action,
- (ii) the response is a reply brief submitted pursuant to § 1.193(b),
- (iii) the response is a request for an oral hearing submitted pursuant to § 1.194(b),
- (iv) response is to a decision by the Board of Patent Appeals and Interferences pursuant to §§ 1.196, 1.197 or 1.304, or
- (v) the application is involved in an interference declared pursuant to § 1.611.)

(a)(2) The date on which the response, the petition, and the fee have been filed is the date of the response and also the date for purposes of determining the period of extension and the corresponding amount of the fee. The expiration of the time period is determined by the amount of the fee paid. In no case may an applicant respond later than the maximum time period set by statute, or be granted an extension of time under paragraph (b) of this section when the provisions of this paragraph are available. See § 1.136(b) for extensions of time relating to proceedings pursuant to §§ 1.193(b), 1.194, 1.196 or 1.197. See § 1.304 for extension of time to appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action. See § 1.550(c) for extension of time in reexamination proceedings and § 1.645 for extension of time in interference proceedings.

\*\*\*\*\*

9. Section 1.191, paragraph (d) is revised to read as follows:

**§ 1.191 Appeal to Board of Patent Appeals and Interferences.**

\*\*\*\*\*

(d) The time periods set forth in §§ 1.191 and 1.192 are subject to the provisions of § 1.136 for patent applications and § 1.550(c) for reexamination proceedings. The time periods set forth in §§ 1.193, 1.194, 1.196 and 1.197 are subject to the provisions of § 1.136(b) for patent applications or § 1.550(c) for reexamination proceedings. See § 1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action.

\*\*\*\*\*

10. Section 1.192, paragraphs (a), (c) introductory text and (d) are revised to read as follows:

**§ 1.192 Appellant's brief**

(a) The appellant shall, within 2 months from the date of the notice of appeal under § 1.191 in an application, reissue application, or patent under reexamination, or within the time allowed for response to the action appealed from, if such time is later, file a brief in triplicate. The brief must be accompanied by the requisite fee set forth in § 1.17(f) and must set forth the authorities and arguments on which the appellant will rely to maintain the appeal. Any arguments or authorities not included in the brief may be refused consideration by the Board of Patent Appeals and Interferences.

(b) \*\*\*

(c) The brief shall contain the following items under appropriate headings and in the order here indicated unless there is no attorney or agent of record in the application or reexamination proceeding, the brief was not prepared by a registered practitioner, and the brief was not signed by a registered practitioner, wherein the brief will be accepted as complying with this paragraph provided it is at least in substantial compliance with the requirements of paragraphs (1), (2), (6) and (7):

\*\*\*\*\*

(d) If a brief is filed which does not comply with the requirements of paragraph (c) of this section, the appellant will be notified of the reasons for non-compliance and provided with a period of one month within which to file an amended brief. If the appellant does not file an amended brief during the one-month period, or files an amended brief which does not overcome all the reasons for non-compliance stated in the notification, the appeal will be dismissed.

11. Section 1.193, paragraph (b) is revised to read as follows:

**§ 1.193 Examiner's answer.**

\*\*\*\*\*

(b) The appellant may file a reply brief directed only to such new points of argument as may be raised in the examiner's answer, within two months from the date of such answer. The new points of argument shall be specifically identified in the reply brief. If the examiner determines that the reply brief is not directed only to new points of argument raised in the examiner's answer, the examiner may refuse entry of the reply brief and will so notify the appellant. If the examiner's answer expressly states that it includes a new ground of rejection, appellant must file a reply thereto within two months from the date of such answer to avoid dismissal of the appeal as to the claims subject to the new ground of rejection; such reply may be accompanied by any amendment or material appropriate to the new ground. See § 1.136(b) for extensions of time for filing a reply brief in a patent application and § 1.550(c) for extensions of time in a reexamination proceeding.

\*\*\*\*\*

12. Section 1.194, paragraph (b) is revised to read as follows:

**§ 1.194 Oral hearing.**

\*\*\*\*\*

(b) If appellant desires an oral hearing, appellant must file a written request for such hearing accompanied by the fee set forth in § 1.17(g) within two months after the date of the examiner's answer. If appellant requests an oral hearing and submits therewith the fee set forth in § 1.17(g), an oral argument may be presented by, or on behalf of, the primary examiner if considered desirable by either the primary examiner or the Board. See § 1.136(b) for extensions of time for requesting an oral hearing in patent application and § 1.550(c) for extensions of time in a reexamination proceeding.

\*\*\*\*\*

13. Section 1.196, paragraph (f) is revised to read as follows:

**§ 1.196 Decision by the Board of Patent Appeals and Interferences**

\*\*\*\*\*

(f) See 1.136(b) for extensions of time to take action under this section in a patent application and § 1.550(c) for extensions of time in a reexamination proceeding.

14. Section § 1.197, paragraph (b) is revised to read as follows:

**§ 1.197 Action following decision.**

\*\*\*\*\*

(b) A single request for reconsideration or modification of the decision may be made if filed within one month from the date of the original decision, unless the original decision is so modified by the decision on reconsideration as to become, in effect, a new decision, and the Board of Patent Appeals and Interferences so states. The request for reconsideration shall state with particularity the points believed to have been misapprehended or overlooked in rendering the decision and also state all other grounds upon which reconsideration is sought. See § 1.136(b) for extensions of time for seeking reconsideration in a patent application and § 1.550(c) for extensions of time in a reexamination proceeding.

\*\*\*\*\*

15. Section 1.312, paragraph (b) is revised to read as follows:

**§ 1.312 Amendments after allowance.**

\*\*\*\*\*

(b) Any amendment pursuant to paragraph (a) of this section filed after the date the issue fee is paid must be accompanied by a petition including the fee set forth in § 1.17(i)(1) and a showing of good and sufficient reasons why the amendment is necessary and was not earlier presented.

16. Section 1.321 is revised to read as follows:

**§ 1.321 Statutory Disclaimers, including Terminal Disclaimers.**

(a) A patentee owning the whole or any sectional interest in a patent may disclaim any complete claim or claims in a patent. In like manner any patentee may disclaim or dedicate to the public the entire term, or any terminal part of the term, of the patent granted. Such disclaimer is binding upon the grantee and its successors or assigns. A notice of the disclaimer is published in the *Official Gazette* and attached to the printed copies of the specification. The disclaimer, to be recorded in the Patent and Trademark Office, must:

- (1) be signed by the patentee, or an attorney or agent of record;
- (2) identify the patent and complete claim or claims, or term being disclaimed. A disclaimer which is not a disclaimer of a complete claim or claims, or term will be refused recordation;
- (3) state the present extent of patentee's ownership interest in the patent; and
- (4) be accompanied by the fee set forth in § 1.20(d).

(b) An applicant or assignee may disclaim or dedicate to the public the entire term, or any terminal part of the term, of a patent to be granted. Such terminal disclaimer is binding upon the grantee and its successors or assigns. The terminal disclaimer, to be recorded in the Patent and Trademark Office, must:

- (1) be signed: (i) by the applicant, or
- (ii) if there is an assignee of record of an undivided part interest, by the applicant and such assignee, or
- (iii) if there is an assignee of record of the entire interest, by such assignee, or
- (iv) by an attorney or agent of record;

(2) specify the portion of the term of the patent being disclaimed;

(3) state the present extent of applicant's or assignee's ownership interest in the patent to be granted; and

(4) be accompanied by the fee set forth in § 1.20(d).

(c) A terminal disclaimer, when filed to obviate a double patenting rejection in a patent application or in a reexamination proceeding, must:

- (1) comply with the provisions of paragraphs (b)(2) through (b)(4) of this section;
- (2) be signed in accordance with paragraph (b)(1) of this section if filed in a patent application, or in accordance with paragraph (a)(1) of this section if filed in a reexamination proceeding; and
- (3) include a provision that any patent granted on that application or any patent subject to that reexamination proceeding shall be enforceable only for and during such period that said patent is commonly owned with the application or patent which formed the basis for the rejection.

17. Section 1.352 is amended by revising paragraph (a) to read as follows:

**§ 1.352 Publication of notice of proposed amendments.**

(a) Whenever required by law, notice of proposed amendments to the regulations in this part will be published in the *Official Gazette* and in the *FEDERAL REGISTER*. If not published with the notice, copies of the text will be furnished to any person requesting the same. All comments, suggestions, and briefs received within a time specified in the notice will be considered before adoption of the proposed amendments which may be modified in the light thereof.

\*\*\*\*\*

18. Section 1.362 is amended by revising paragraphs (c)(4) and (e) and adding paragraph (h) to read as follows:

**§ 1.362 Time for maintenance fees.**

\*\*\*\*\*

(c) \*\*\*

(4) For a reissue application, including a continuing reissue application claiming the benefit of a reissue application under 35 USC 120, the United States filing date of the original non-reissue application on which the patent reissued is based.

\*\*\*\*\*

(e) Maintenance fees may be paid with the surcharge set forth in 1.20(h) during the respective grace periods after:

- (1) 3 years and 6 months and through the day of the 4th anniversary of the grant for the first maintenance fee.
- (2) 7 years and 6 months and through the day of the 8th anniversary of the grant for the second maintenance fee, and
- (3) 11 years and 6 months and through the day of the 12th anniversary of the grant for the third maintenance fee.

\*\*\*\*\*

(b) The periods specified in §§ 1.362(d) and (e) with respect to a reissue application, including a continuing reissue application thereof, are counted from the date of grant of the original non-reissue application on which the reissued patent is based.

19. Section 1.607, paragraph (a)(5)(i) is revised to read as follows:

**§ 1.607 Request by applicant for interference with patent.**

(a) \*\*\*

(5) \*\*\*

(i) Identified as corresponding to the count, and

\*\*\*\*\*



## PART 5 - CLASSIFIED INFORMATION, FOREIGN RELATIONS, INVENTIONS, AND PATENTS

20. The authority citation for 37 CFR Part 5 continues to read as follows:

Authority: 35 U.S.C. 6, 41, 181-188, as amended by the Patent Law Foreign Filing Amendments Act of 1988, Pub. L. 100-418, 102 Stat. 1567; the Arms Export Control Act, as amended, 22 U.S.C. 2751 *et seq.*, the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 *et seq.*, and the Nuclear Non-Proliferation Act of 1978, 22 U.S.C. 3201 *et seq.*, and the delegations in the regulations under these acts to the Commissioner (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7).

21. Section 5.19, paragraph (a) is revised to read as follows:

## § 5.19 Export of technical data

(a) Under regulations (15 CFR 770.10(j)) established by the U.S. Department of Commerce, Bureau of Export Administration, Office of Export Licensing, a validated export license is not required in any case to file a patent application or part thereof in a foreign country if the foreign filing is in accordance with the regulations (37 CFR 5.11 through 5.33) of the Patent and Trademark Office.

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## PART 10 - REPRESENTATION OF OTHERS BEFORE THE PATENT AND TRADEMARK OFFICE

22. The authority citation for 37 CFR Part 10 continues to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

23. Section 10.48, paragraph (b) is revised to read as follows:

## § 10.48 Sharing legal fees

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(b) A practitioner who undertakes to complete unfinished legal business of a deceased practitioner may pay to the estate of the deceased practitioner that proportion of the total compensation which fairly represents the services rendered by the deceased practitioner.

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Oct. 15, 1993

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

[1156 OG 54]

(93)

U.S. Department of Commerce  
Patent and Trademark Office  
Special Status for Patent Applications  
Relating to Superconductivity

On Commercial Applications of Superconductivity, the President stated that "We need to strengthen patent laws to increase protection for manufacturing processes and speed up the patent process so that it can keep pace with the fast-paced world of high technology." The President also noted that "to most of us laymen, superconductivity was a completely new term, but it wasn't long before we learned of the great promise it held out to alter our world for the better - a quantum leap in energy efficiency that would bring with it a host of benefits, not least among them a reduced dependence on foreign oil, a cleaner environment, and a stronger national economy." The President's Superconductivity Initiative of even date included, as a major administrative component, a proposal "Directing the Patent and Trademark Office to accelerate the processing of patent applications and adjudication of disputes involving

superconductivity technologies when requested by the applicants to do so."

In accordance with the President's proposal, the Patent and Trademark Office will, on request, accord "special" status to all patent applications for inventions involving superconductive materials. Examples of such inventions would include those directed to the superconductive materials themselves as well as to their manufacture and application. In order that the Patent and Trademark Office may implement this procedure, we invite all applicants desiring to participate in this program to request that their applications be accorded "special" status. Such requests should be in writing, should identify the application by serial number and filing date, and should be accompanied by a statement under 37 CFR 1.102 that the invention involves superconductive materials. No fee is required. The statement must be verified if made by a person not registered to practice before the Patent and Trademark Office. Decisions whether to accord "special" status on the basis of a request will be made by the appropriate Group Director.

Requests should be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Aug. 5, 1987

DONALD J. QUIGG  
Assistant Secretary of  
Commerce and Commissioner of  
Patents and Trademarks

[1082 TMOG 7]

## (94) Preparation for Processing High Temperature Superconductor Technology

In response to the President's Superconductivity Initiative announced on July 28, 1987 and with the expectation of the filing of increasing numbers of patent applications relating to higher temperature superconductors, the U.S. Patent and Trademark Office has taken a number of steps to prepare for the effective handling of applications on this subject matter.

These actions include (1) establishing a special Task Force to prepare for the processing of patent applications for higher temperature superconductor technology; (2) making patent applications relating to this technology special on request of the applicant and (3) renewing support for legislation providing for an expanded scope of protection for process patents to cover products made by the patented process.

The responsibilities of the Task Force are to (1) coordinate the development of a Patent and Trademark Office capability to examine the expected large number of patent applications in this area and (2) provide an information resource and sounding board for legal and practice questions and policy development in this area. The Task Force has been assigned a number of specific tasks, such as developing a complete search file on superconductivity technology for the use of Examiners and the public, establishing a training program for examiners on the technology and assuring a uniform and consistent application of the patent law to the technology in the U.S. Patent and Trademark Office.

Sept. 16, 1987

RENE D. TEGTMEYER, for  
DONALD J. QUIGG  
Assistant Secretary and  
Commissioner of Patents and Trademarks

[1083 OG 16]

(95) DEPARTMENT OF COMMERCE  
Patent and Trademark Office  
37 CFR Parts 1 and 2  
[Docket No. 90143-9144]  
RIN 0651-AA35

Amendment of Patent and Trademark Rules  
concerning Judicial Review of Decisions of the Board  
of Patent Appeals and Interferences and the

Trademark Trial and Appeal Board and other  
Miscellaneous Matters.

Agency: Patent and Trademark Office, Commerce.

Action: Final Rule.

Summary: The Patent and Trademark Office (PTO) is amending the rules of practice in patent and trademark cases, Parts 1 and 2 of Title 37, Code of Federal Regulations, relating to (1) decisions of the Board of Patent Appeals and Interferences (BPAI), (2) requests for reconsideration of decisions of the BPAI and the Trademark Trial and Appeal Board (TTAB), (3) extensions of time in proceedings after a decision by the BPAI under §§ 1.196 and 1.197, (4) practices concerning judicial review of final decisions of the BPAI and TTAB, (5) extensions of time for seeking judicial review of BPAI and TTAB decisions and (6) miscellaneous changes in the practice before the BPAI and housekeeping amendments.

Two recent decisions of the U.S. Court of Appeals for the Federal Circuit have held that even though the BPAI includes a new ground for rejection in its decision under 37 CFR § 1.196(b)(3), appellants may appeal directly to the Federal Circuit without first seeking reconsideration at the BPAI. Where judicial review is sought without requesting reconsideration, the arguments against the new ground of rejection are developed for the first time during court proceedings. The amendments require that appellants seek reconsideration of the new ground of rejection prior to appeal or commencement of a civil action.

Experience under the previous rules relating to judicial review of final board decisions indicated that the rules may have been confusing in certain respects relating to the time in which judicial review must be sought and the manner in which extensions of time for seeking judicial review may be obtained. The rules eliminate any confusion as to when judicial review must be sought and standardize the manner of obtaining extensions of time to seek judicial review.

The rules also make clarifying and housekeeping amendments with respect to practice before the BPAI.

Effective Date: August 20, 1989.

For Further Information Contact: Richard E. Schafer by telephone at (703) 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

## Supplementary Information:

## Background

A notice of proposed rulemaking was published in the *Federal Register* at 54 Fed. Reg. 11009 (March 16, 1989) and at 1101 *Official Gazette* 6 (April 4, 1989). No oral hearing was held and no written comments were received.

## Discussion of Specific Rules

## (1) Decisions of the BPAI and requests for reconsideration of BPAI and TTAB decisions

Only final decisions of the BPAI and TTAB are subject to judicial review. 35 U.S.C. §§ 141, 145; U.S.C. § 1071; 28 U.S.C. § 1295 (a)(4)(A) and (B).

Section 1.196(b) provides that if the BPAI has knowledge of any grounds, not involved in the appeal, for rejecting any appealed claim, it may include in its decision a statement to that effect. The statement then constitutes a new rejection of the claims. The previous rules permitted appellants to treat the decision as a final decision in the case and thus immediately appealable. 37 CFR § 1.196(b)(3) (1988). Therefore, when an appellant proceeded under this option, arguments against the new rejection were presented for the first time to the reviewing court.

A recent decision by the U.S. Court of Appeals for the Federal Circuit rejected the Commissioner's argument that an appellant should not be permitted to contest the BPAI's new ground for rejection because it had not requested reconsideration of that ground by the BPAI. *In re Evanega*, 829 F.2d 1110, 1113, 4 USPQ 2d 1249, 1252 (Fed. Cir. 1987). See also *In re Nielson*, 816 F.2d 1567, 1570, 2 USPQ 2d 1525, 1527 (Fed. Cir. 1987). In *Evanega*, the Commissioner urged that requiring appellants to request reconsideration, where the BPAI adopts

a new ground for rejection, would provide the BPAI with an opportunity to consider appellant's arguments and correct any errors while the case was still in the PTO. This conserves judicial resources, and in any event, obtains the benefit of the BPAI's view should judicial review ultimately be sought. The court held, however, that in view of PTO regulations (37 CFR § 1.196(b)(3)) which "expressly provide that the board's decision, even if based on a new ground, is a final determination and thus may be appealed without seeking reconsideration," appellant could not be required to request reconsideration by the BPAI. *Id.*

The new rule changes eliminate 37 CFR § 1.196(b)(3). By removing § 1.196(b)(3), appellants no longer have the option of treating a new ground of rejection as final and immediately appealable. Appellants' options are limited to requesting remand to the examiner or requesting reconsideration by the BPAI as set forth in §§ 1.196(b)(1) and 1.196(b)(2). The preamble of § 1.196(b) has been amended to specifically recite that a new ground of rejection shall not be considered a final decision for judicial review.

Appellants still may elect further prosecution before the examiner under 37 CFR § 1.196(b)(1) or request reconsideration under 1.196(b)(2). The option of § 1.196(b)(2) requires that any request for reconsideration address the new ground of rejection and specifically state the reasons why the new ground was in error. Section 1.196(b)(2) also provides that the BPAI will reconsider the new rejection and, if necessary, render a new decision. The decision on reconsideration will be deemed to incorporate the earlier decision except for any portions of the earlier decision specifically withdrawn.

Reconsideration or remand need not be requested if appellant does not contest the new ground. Appellants may seek judicial review as to claims not subject to the new ground.

Section 1.196(a) expressly provides for remands to the examiner for further consideration. The BPAI has inherent authority, as part of its role in reviewing standards of patentability applied in the PTO, to remand applications to the examiner for further consideration. Cf. Manual of Patent Examining Procedure (MPEP) §§ 1211 and 1212. The change merely makes express that which is inherent.

The amendments also delete the portion of former § 1.196(d) which provides (1) that any decision which includes a remand shall not be a final decision for the purposes of judicial review and (2) that upon conclusion of the proceedings on remand the BPAI may enter an order making its decision final. Those provisions have been included as new § 1.196(e). Under this paragraph, decisions pursuant to § 1.196(b) would not be final as to the claims subject to a new rejection.

The last sentence of former § 1.196(b)(1) has been deleted and placed in new § 1.196(e).

## (2) Requests for reconsideration of BPAI and TTAB decisions

Section 1.197(b) provides that any request for reconsideration must specifically state the points believed to have been misapprehended or overlooked in the BPAI's decision. Experience has shown that many requests for reconsideration are nothing more than reargument of appellant's position on appeal. The provision, as adopted, limits requests to the points of law or fact which appellant feels were overlooked or misapprehended by the BPAI.

The amendments also clarify the exception found in the first sentence of § 1.197(b) by including specific references to the "original decision" and the "decision on reconsideration." Some confusion had been noted with respect to the meaning of the current language. In order to simplify calculation of times for requesting reconsideration of the decisions of the boards, §§ 1.658(b), 2.129(c), and 2.144 specify a period of one month rather than the periods expressed in days. Section 1.197(a) already specified a one-month period.

## (3) Extensions of time after a decision by the BPAI to take action under §§ 1.196 and 1.197

Appellants in patent cases may no longer use fee extensions under § 1.136(a) to extend the time for making an election under § 1.196(b) or seeking reconsideration under § 1.197.

Under previous rules appellants could request reconsideration of a BPAI decision up to five months after a decision or



file a response to a new ground of rejection up to six months after the decision. This inordinately delayed final disposition of appeals. Section 1.136(a) provides that fee extensions are not available to file responses to a BPAI decision pursuant to §§ 1.196, 1.197 or 1.304. One month is deemed to be ample time to submit a request for reconsideration. Note that Fed. R. Civ. P. 59 provides 10 days and Fed. R. App. P. 40 provides 14 days for similar requests. Extensions under § 1.136(b) will be available to extend the time to file a response under §§ 1.196 and 1.197. Section 1.304(a) exclusively governs extensions of time to file a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action. See further discussion below.

Section 1.136(a) specifically refers to § 1.136(b) for extensions of time to file responses under §§ 1.196 and 1.197 and refers to § 1.304 for extensions of time to initiate judicial review. Sections 1.196(f) and 1.197(b) correlatively reference § 1.136(b) for extensions of time.

Fee extensions are not available to extend the time for electing further prosecution before the examiner under § 1.196(b)(1). Where an appellant elects further prosecution before the examiner, fee extensions under § 1.136(a) remain available to respond to the primary examiner's Office actions.

#### (4) Time for seeking judicial review of decisions of the BPAI and TTAB

Under previous rules, judicial review of final decisions of the BPAI or TTAB had to be sought within sixty days of the decision or thirty days after a decision on reconsideration. However, where a decision on reconsideration was, in effect, a new decision, it was not always clear whether the time for appeal was thirty or sixty days. Sections 1.304(a) and 2.146(d)(1) provide a two-month period to appeal from either the date of the decision or the decision on a timely filed request for reconsideration.

Some problems have been noted with respect to the time for seeking judicial review in days. Miscalculations of the statutory sixty-day time period have resulted in filing untimely requests for judicial review. In order to simplify calculation of the time for seeking judicial review, §§ 1.304(a) and 2.145(d)(1) specify two months. The two-month period meets the sixty-day requirement of 35 U.S.C. §§ 142, 145 and 146 and 15 U.S.C. §§ 1071(a)(2) and (b)(1) except for time periods which include February 28. In order to comply with the sixty-day requirement, §§ 1.304(b) and 2.145(d)(2) provide that an additional day shall be added to any two-month period for initiating judicial review which includes February 28. Appeals will always be timely if the judicial review is initiated within two months of the final decision.

Previously, the rules did not specify a time period for filing a cross-appeal or cross-action in *inter partes* cases. The absence of such a time period made it difficult for parties and their attorneys to make appropriate plans for judicial review. For example, in an interference where there has been a split judgment, one of the parties may be satisfied with the judgment but may desire to appeal the adverse judgment only if an appeal is noted by the other party. Where the appeal is filed on the last possible day, a cross-appeal is precluded. Sections 1.304(a) and 2.145(d)(1) specify that the time for filing a cross-appeal or commencing a cross-action expires (1) fourteen days after service of the notice of appeal or the summons and complaint or (2) two months after the decision to be reviewed, whichever is later.

Similarly, no provision for filing a cross-action was provided where an appellee elects to have further proceedings conducted in the district court pursuant to 35 U.S.C. § 146 or 15 U.S.C. § 1071(a)(1). Section 1.304(c) and 2.145(d)(3) provide that the time for filing a cross-action expires 14 days after service of the summons and complaint. The district court will determine whether any cross-action was timely filed since neither the complaint nor cross-action is filed in the PTO.

#### (5) Extensions of time to seek judicial review

In the past, standards for granting requests for extensions of time to take an appeal or commence a civil action varied depending upon which board was involved and upon the particular type proceeding before the board. For example, extensions

relating to patent applications could be obtained by paying the appropriate fee under 1.136(a). However, in reexamination proceedings or when judicial review was sought from a decision of the TTAB, the requester must demonstrate sufficient cause under § 1.550(c) or § 2.145(d)(1). The rules standardize the manner in which an extension of time to initiate judicial review may be obtained. The PTO has adopted a standard which is similar to the standard used in the Federal courts for granting extensions. Under the rules the Commissioner may extend the time (1) for good cause if requested before the expiration of the time provided for initiating judicial review or (2) upon a showing of excusable neglect in failing to initiate judicial review if requested after the expiration of the time period. This standard will be applicable in both trademark and patent proceedings (§§ 1.304(a) and 2.145(e)) once the "last" decision, i.e., either the decision (in circumstances where no timely reconsideration is sought) or the decision on reconsideration, of either board has been entered. In patent cases, extensions of time under § 1.136(b) and § 1.550(c) and fee extensions under 37 CFR § 1.136(a) are no longer available to extend the time for the purpose of judicial review once a decision or a decision on reconsideration has been entered. Section 1.304(a) states that the provisions of §§ 1.136 and 1.550(c) are not available to extend the time to initiate judicial review. Sections 1.136(a), 1.136(b), 1.191(d), 1.550(c), 1.645(a) and (b) refer to § 1.304 for extensions of time for seeking judicial review after a decision has been entered. Section 1.645(a) has been amended by (1) adding the introductory phrase "Except to extend the time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action," to the first sentence and (2) deleting the references to filing a notice of appeal or commencing a civil action in the second sentence. In view of the amendments to §§ 1.197 and 1.304, relating to extensions of time to seek reconsideration or initiate judicial review, § 1.191(d) does not refer to §§ 1.196 and 1.197.

#### (6) Miscellaneous amendments

In the past, appellants could use fee extensions to delay the time for requesting an oral hearing at the BPAI. This delays final disposition of the appeal and causes administrative problems and duplication of effort due to the transfer of the appeal to the hearing docket. Section 1.191(d) no longer refers to § 1.194. Fee extensions are no longer available to extend the time for requesting an oral hearing. Extensions under § 1.136(b) are available to extend the time to request an oral hearing.

Section 1.191(b) has been rewritten as one sentence without any change in substance.

Some confusion has resulted as to who has jurisdiction over a patent application after a notice of appeal to the BPAI has been filed. Problems arose, for example, as to the appropriate PTO official to decide certain petitions and other matters after an appeal has been filed. MPEP § 1210 indicates that jurisdiction over the application normally passes at one of five possible times listed therein. Section 1.191 includes a new section (e) which provides that jurisdiction transfers to the BPAI when the application or reexamination file including all briefs and examiner's answers is transmitted to the BPAI. Thus, jurisdiction transfers to the BPAI when all written submissions by the applicant and the examiner have been entered and the application papers have been forwarded to the BPAI.

New paragraph 1.191(e) also includes a provision that the Commissioner, prior to the time the BPAI renders its decision, may *sua sponte* order that an application be remanded to the examiner for further consideration. This provision merely makes explicit the inherent authority of the Commissioner to direct and supervise the examination of patent applications.

Under previous rules there was some confusion as to when "termination of proceedings" occurs. Section 1.197(c) provides that proceedings are "terminated" when the Federal Circuit's mandate is received by the PTO or after the time for appeal from the judgment of the district court in a civil action under 35 U.S.C. § 145 has expired. The language "In such cases," in the second sentence of former 1.197(c) has been eliminated since it was superfluous and may have been confusing.

The rules delete the phrase "that he or she elects" and substitutes "electing" therefor in §§ 1.304(c) and 2.145(c)(3), as amended. The amendment merely changes wording without any change in substance.

Section 1.196(b) changes the verb "make" to "makes" to conform the verb to the singular subject of the sentence.

Sections 1.301, 1.303, 2.145(a)(2) and 2.145(c)(3) no longer refer to transmittal of the certified list and certified copies of the notice of election to the U.S. Court of Appeals for the Federal Circuit under 35 U.S.C. § 141 or 15 U.S.C. § 1071(a)(1). These procedures are required by applicable statutes or Court Rules and are unnecessary in the PTO's regulations.

Sections 1.304(a), 1.304(c), 2.145(c)(3) and 2.145(d)(1) include a statement that the certificate of mailing provisions of § 1.8 are *not applicable*. No substantive change is involved since the inapplicability of § 1.8 is already stated in §§ 1.8(a)(2)(viii) and (ix).

Sections 1.304(b) and 2.145(d)(2) recite "Federal holiday in the District of Columbia" rather than "legal holiday." These changes merely conform the language of these sections with the language of 35 U.S.C. § 21(b) and 37 CFR § 1.7.

Section 2.145(c)(2) and (3) include changes in wording without any change in substance.

#### Other Considerations

These rules will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 350 et seq.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities [Regulatory Flexibility Act, Pub. L. 96-354]. The rule change requiring appellants to request reconsideration under the specific circumstances set forth is not expected to result in an increase of fees charged by attorneys and agents to entities, including small entities, since the rule change is intended to eliminate erroneous grounds for rejection prior to appeal and in some instances is expected to eliminate the need for appeal.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect to the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The PTO has also determined that this notice has no Federalism implications affecting the relationship between the national government and the states as outlined in Executive Order 12612. The rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

#### List of Subjects in 37 CFR, Part 1:

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Reporting and record keeping requirements, Small businesses.

#### List of Subjects in 37 CFR, Part 2:

Administrative practice and procedure, Courts, Lawyers, Trademarks.

For the reasons given in the preamble and pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, Parts 1 and 2 of Title 37 of the Code of Federal Regulations are amended as set forth below.

#### PART 1-RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.136 is revised to read as follows:

#### § 1.136 Filing of timely responses with petition and fee for extension of time and extensions of time for cause.

(a) If an applicant is required to respond within a non-statutory or shortened statutory time period, applicant may respond up to four months after the time period set if a petition for an extension of time and the fee set in § 1.17 are filed prior to or with the response, unless (1) applicant is notified otherwise in an Office action, (2) the application is involved in an interference declared pursuant to § 1.611 or (3) the response is to a decision by the Board of Patent Appeals and Interferences pursuant to §§ 1.196, 1.197 or 1.304. The date on which the response, the petition, and the fee have been filed is the date of the response and also the date for purposes of determining the period of extension and the corresponding amount of the fee. The expiration of the time period is determined by the amount of the fee paid. In no case may an applicant respond later than the maximum time period set by statute, or be granted an extension of time under paragraph (b) of this section when the provisions of this paragraph are available. See § 1.136(b) for extensions of time relating to proceedings pursuant to §§ 1.196 or 1.197, § 1.304 for extension of time to appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action, § 1.645 for extension of time in interference proceedings and § 1.550(c) for extension of time in reexamination proceedings.

(b) When a response with petition and fee for extension of time cannot be filed pursuant to paragraph (a) of this section, the time for response will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the applicant is due, but in no case will the mere filing of the request effect any extension. In no case can any extension carry the date on which response to an Office action is due beyond the maximum time period set by statute or be granted when the provisions of paragraph (a) of this section are available. See § 1.304 for extension of time to appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action, § 1.645 for extension of time in interference proceedings and § 1.550(c) for extension of time in reexamination proceedings.

3. Section 1.191 is amended by revising paragraphs (b) and (d) and adding paragraph (e) to read as follows:

#### § 1.191 Appeal to Board of Patent Appeals and Interferences

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(b) The appeal in an application or reexamination proceeding must identify the rejected claim or claims appealed, and must be signed by the applicant, patent owner or duly authorized attorney or agent.

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(d) The time periods set forth in §§ 1.191 through 1.193 are subject to the provisions of § 1.136 for patent applications or § 1.550(c) for reexamination proceedings. See § 1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action.

(e) Jurisdiction over the application or patent under reexamination passes to the Board of Patent Appeals and Interferences upon transmittal of the file, including all briefs and examiner's answers, to the Board. Prior to the entry of a decision on the appeal, the Commissioner may *sua sponte* order the application remanded to the examiner.

4. Section 1.196 is amended by revising paragraphs (a), (b) and (d) and adding new paragraphs (e) and (f) to read as follows:

#### § 1.196 Decision by the Board of Patent Appeals and Interferences

(a) The Board of Patent Appeals and Interferences, in its decision, may affirm or reverse the decision of the examiner



in whole or in part on the grounds and on the claims specified by the examiner or remand the application to the examiner for further consideration. The affirmation of the rejection of a claim on any of the grounds specified constitutes a general affirmation of the decision of the examiner on that claim, except as to any ground specifically reversed.

(b) Should the Board of Patent Appeals and Interferences have knowledge of any grounds not involved in the appeal for rejecting any appealed claim, it may include in the decision a statement to that effect with its reasons for so holding, which statement shall constitute a new rejection of the claims. A new rejection shall not be considered final for the purpose of judicial review. When the Board of Patent Appeals and Interferences makes a new rejection of an appealed claim, the appellant may exercise either of the following two options with respect to the new ground:

(1) The appellant may submit an appropriate amendment of the claims so rejected or a showing of facts, or both, and have the matter reconsidered by the examiner in which event the application will be remanded to the examiner. The statement shall be binding upon the examiner unless an amendment or showing of facts not previously of record be made which, in the opinion of the examiner, overcomes the new ground for rejection stated in the decision. Should the examiner again reject the application the applicant may again appeal to the Board of Patent Appeals and Interferences.

(2) The appellant may have the case reconsidered under § 1.197(b) by the Board of Patent Appeals and Interferences upon the same record. The request for reconsideration shall address the new ground for rejection and state with particularity the points believed to have been misapprehended or overlooked in rendering the decision and also state all other grounds upon which reconsideration is sought. Where request for such reconsideration is made the Board of Patent Appeals and Interferences shall reconsider the new ground for rejection and, if necessary, render a new decision which shall include all grounds upon which a patent is refused. The decision on reconsideration is deemed to incorporate the earlier decision, except for those portions specifically withdrawn on reconsideration, and is final for the purpose of judicial review.

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(d) Although the Board of Patent Appeals and Interferences normally will confine its decision to a review of rejections made by the examiner, should it have knowledge of any grounds for rejecting any allowed claim it may include in its decision a recommended rejection of the claim and remand the case to the examiner. In such event, the Board shall set a period, not less than one month, within which the appellant may submit to the examiner an appropriate amendment, a showing of facts or reasons, or both, in order to avoid the grounds set forth in the recommendation of the Board of Patent Appeals and Interferences. The examiner shall be bound by the recommendation and shall enter and maintain the recommended rejection unless an amendment or showing of facts not previously of record is filed which, in the opinion of the examiner, overcomes the recommended rejection. Should the examiner make the recommended rejection final the applicant may again appeal to the Board of Patent Appeals and Interferences.

(e) Whenever a decision of the Board of Patent Appeals and Interferences includes or allows a remand, that decision shall not be considered a final decision. When appropriate, upon conclusion of proceedings on remand before the examiner, the Board of Patent Appeals and Interferences may enter an order otherwise making its decision final.

(f) See § 1.136(b) for extensions of time to take action under this section.

5. Section 1.197 is amended by revising paragraphs (b) and (c) to read as follows:

#### § 1.197 Action following decision

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(b) A single request for reconsideration or modification of the decision may be made if filed within one month from the date of the original decision, unless the original decision is so

modified by the decision on reconsideration as to become, in effect, a new decision, and the Board of Patent Appeals and Interferences so states. The request for reconsideration shall state with particularity the points believed to have been misapprehended or overlooked in rendering the decision and also state all other grounds upon which reconsideration is sought. See 37 CFR § 1.136(b) for extensions of time for seeking reconsideration.

(c) Termination of proceedings. Proceedings are considered terminated by the dismissal of an appeal or the failure to timely file an appeal to the court or a civil action (§ 1.304) except: (1) where claims stand allowed in an application or (2) where the nature of the decision requires further action by the examiner. The date of termination of proceedings is the date on which the appeal is dismissed or the date on which the time for appeal to the court or review by civil action (§ 1.304) expires. If an appeal to the court or a civil action has been filed, proceedings are considered terminated when the appeal or civil action is terminated. An appeal to the U.S. Court of Appeals for the Federal Circuit is terminated when the mandate is received by the Office. A civil action is terminated when the time to appeal the judgment expires.

6. Section 1.301 is revised to read as follows:

#### § 1.301 Appeal to U.S. Court of Appeals for the Federal Circuit.

Any applicant or any owner of a patent involved in a reexamination proceeding dissatisfied with the decision of the Board of Patent Appeals and Interferences, and any party to an interference dissatisfied with the decision of the Board of Patent Appeals and Interferences, may appeal to the U.S. Court of Appeals for the Federal Circuit. The appellant must take the following steps in such an appeal: (a) In the Patent and Trademark Office file a written notice of appeal directed to the Commissioner (see §§ 1.302 and 1.304); and (b) in the Court, file a copy of the notice of appeal and pay the fee for appeal, as provided by the rules of the Court.

7. Section 1.303 is amended by revising paragraph (c) to read as follows:

#### § 1.303 Civil Action under 35 U.S.C. 145, 146, 306.

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(c) If any adverse party to an appeal taken to the U.S. Court of Appeals for the Federal Circuit by a defeated party in an interference proceeding files notice with the Commissioner within twenty days after the filing of the defeated party's notice of appeal to the court (§ 1.302), that he or she elects to have all further proceedings conducted as provided in 35 U.S.C. 146. The notice of election must be served as provided in § 1.646.

8. Section 1.304 is revised to read as follows:

#### § 1.304 Time for appeal or civil action.

(a) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (§ 1.302) or for commencing a civil action (§ 1.303) is two months from the date of the decision of the Board of Patent Appeals and Interferences. If a request for reconsideration or modification of the decision is filed within the time provided under § 1.197(b) or § 1.658, the time for filing an appeal or commencing a civil action shall expire two months after action on the request. In interferences, the time for filing a cross-appeal or cross-action expires (1) 14 days after service of the notice of appeal or the summons and complaint or (2) two months after the date of decision of the Board of Patent Appeals and Interferences, whichever is later. The time periods set forth in this section are not subject to the provisions of §§ 1.136, 1.550(c) or 1.645(a) or (b). The Commissioner may extend the time for filing an appeal or commencing a civil action (1) for good cause shown if requested in writing before the expiration of the period for filing an appeal or commencing a civil action, or (2) upon written request after

the expiration of the period for filing an appeal or commencing a civil action upon a showing that the failure to act was the result of excusable neglect. The certificate of mailing practice of § 1.8 is not available for filing a notice of appeal or cross-appeal. See 1.8(a)(2)(ix).

(b) The times specified in this section in days are calendar days. The times specified herein in months are calendar months except that one day shall be added to any two-month period which includes February 28. If the last day of the time specified for appeal of commencing a civil action falls on a Saturday, Sunday or Federal holiday in the District of Columbia, the time is extended to the next day which is neither a Saturday, Sunday nor a Federal holiday.

(c) If a defeated party to an interference has taken an appeal to the U.S. Court of Appeals for the Federal Circuit and an adverse party has filed notice under 35 U.S.C. 141 electing to have all further proceedings conducted under 35 U.S.C. 146 (§ 1.303(c)), the time for filing a civil action thereafter is specified in 35 U.S.C. 141. The time for filing a cross-action expires 14 days after service of the summons and complaint. The certificate of mailing practice of § 1.8 is not available for filing a notice of appeal of cross-appeal. See 1.8(a)(2)(viii).

9. Section 1.550 is amended by revising paragraph (c) to read as follows:

#### § 1.550 Conduct of reexamination proceedings

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(c) The time for taking any action by a patent owner in a reexamination proceeding will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the patent owner is due, but in no case will the mere filing of the request effect any extension. See § 1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action.

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10. Section 1.645 is amended by revising paragraphs (a) and (b) to read as follows:

#### § 1.645 Extension of time, late papers, stay of proceedings

(a) Except to extend the time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action, a party may file a motion (§ 1.635) seeking an extension of time to take action in an interference. See § 1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action. The motion shall be filed within sufficient time to actually reach the examiner-in-chief before expiration of the time for taking action. A moving party should not assume that the motion will be granted even if there is no objection by any other party. The motion will be denied unless the moving party shows good cause why an extension should be granted. The press of other business arising after an examiner-in-chief sets a time for taking action will not normally constitute good cause. A motion seeking additional time to take testimony because a party has not been able to procure the testimony of a witness shall set forth the name of the witness, any steps taken to procure the testimony of the witness, the dates on which the steps were taken, and the facts expected to be proven through the witness.

(b) Any paper belatedly filed, will not be considered except upon motion (§ 1.635) which shows sufficient cause why the paper was not timely filed. See § 1.304(a) for exclusive procedures relating to belated filing of a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or belated commencement of a civil action.

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11. Section 1.658 is amended by revising paragraph (b) to read as follows:

#### § 1.658 Final Decision

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(b) Any request for reconsideration of a decision under paragraph (a) of this section shall be filed within one month after the date of the decision. The request for reconsideration shall specify with particularity the points believed to have been misapprehended or overlooked in rendering the decision. Any reply to a request for reconsideration shall be filed within 14 days of the date of service of the request for reconsideration. Where reasonably possible, service of the request for reconsideration shall be such that delivery is accomplished by hand or "Express Mail." The Board shall enter a decision on the request for reconsideration. If the Board shall be of the opinion that the decision on the request for reconsideration significantly modifies its original decision under paragraph (a) of this section, the Board may designate the decision on the request for reconsideration as a new decision.

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#### PART 2 - RULES OF PRACTICE IN TRADEMARK CASES

12. The authority citation for 37 CFR Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

13. Section 2.129 is amended by revising paragraph (c) to read as follows:

#### § 2.129 Oral argument; reconsideration

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(c) Any request for rehearing or reconsideration or modification of a decision issued after final hearing must be filed within one month from the date of the decision. A brief in response must be filed within fifteen days from the date of service of the request. The times specified may be extended by order of the Trademark Trial and Appeal Board on motion for good cause.

14. Section 2.144 is revised to read as follows:

#### § 2.144 Reconsideration of decision on ex parte appeal

Any request for rehearing or reconsideration, or modification of the decision, must be filed within one month from the date of the decision. Such time may be extended by the Trademark Trial and Appeal Board upon a showing of sufficient cause.

15. Section 2.145 is amended by revising paragraphs (a), (c)(2), (c)(3), (d)(1), (d)(2) and (d)(3) and adding new paragraph (e) to read as follows:

#### § 2.145 Appeal to court and civil action.

(a) Appeal to U.S. Court of Appeals for the Federal Circuit. An applicant for registration, or any party to an interference, opposition, or cancellation proceeding or any party to an application to register as a concurrent user, hereinafter referred to as inter partes proceedings, who is dissatisfied with the decision of the Trademark Trial and Appeal Board and any registrant who has filed an affidavit or declaration under section 8 of the Act or who has filed an application for renewal and is dissatisfied with the decision of the Commissioner (§§ 2.165, 2.184), may appeal to the U.S. Court of Appeals for the Federal Circuit. The appellant must take the following steps in such an appeal:

(1) In the Patent and Trademark Office give written notice of appeal to the Commissioner (see paragraphs (b) and (d) of this section);

(2) In the court, file a copy of the notice of appeal and pay the fee for appeal, as provided by the rules of the Court.



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(c) \*\*\*

(2) Any applicant or registrant in an ex parte case who takes an appeal to the U.S. Court of Appeals for the Federal Circuit waives any right to proceed under section 21(b) of the Act.

(3) Any adverse party to an appeal taken to the U.S. Court of Appeals for the Federal Circuit by a defeated party in an inter partes proceeding may file a notice with the Commissioner within twenty days after the filing of the defeated party's notice of appeal to the court (paragraph (b) of this section), electing to have all further proceedings conducted as provided in section 21(b) of the Act. The notice of election must be served as provided in § 2.119. The certificate of mailing practice of § 1.8 is not available for filing a notice of election. See § 1.8(a)(2)(viii).

(d) Time for appeal or civil action. (1) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (paragraph (b) of this section), or for commencing a civil action (paragraph (c) of this section), is two months from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, as the case may be. If a request for rehearing or reconsideration or modification of the decision is filed within the time specified in §§ 2.127(b), 2.129(c) or 2.144, or within any extension of time granted thereunder, the time for filing an appeal or commencing a civil action shall expire two months after action on the request. In inter partes cases, the time for filing a cross-action or a notice of a cross-appeal expires (1) 14 days after service of the notice of appeal or the summons and complaint or (2) two months from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, whichever is later. The certificate of mailing practice of § 1.8 is not available for filing a notice of appeal or cross-appeal. See § 1.8(a)(2)(ix).

(2) The times specified in this section in days are calendar days. The times specified herein in months are calendar months except that one day shall be added to any two-month period which includes February 28. If the last day of time specified for an appeal, or commencing a civil action falls on a Saturday, Sunday or Federal holiday in the District of Columbia, the time is extended to the next day which is neither a Saturday, Sunday nor a Federal holiday.

(3) If a party to an inter partes proceeding has taken an appeal to the U.S. Court of Appeals for the Federal Circuit and an adverse party has filed notice under section 21(a)(1) of the Act electing to have all further proceedings conducted under section 21(b) of the Act, the time for filing a civil action thereafter is specified in section 21(a)(1) of the Act. The time for filing a cross-action expires 14 days after service of the summons and complaint.

(e) Extensions of time to commence judicial review. The Commissioner may extend the time for filing an appeal or commencing a civil action (1) for good cause shown if requested in writing before the expiration of the period for filing an appeal or commencing a civil action, or (2) upon written request after the expiration of the period for filing an appeal or commencing a civil action upon a showing that the failure to act was the result of excusable neglect.

June 21, 1989

DONALD J. QUIGG  
Assistant Secretary and  
Commissioner of Patents  
and Trademarks

[1105 OG 5]

(96)

#### Advance Notice of Changes to MPEP § 1206 and § 2309

This memorandum is to provide advance notice of changes that will be made to MPEP § 1206 and § 2309 relating, respectively, to the requirements for an appeal brief and preparation of interference papers by an examiner. These changes will appear in the next revision of the Manual. The changes will be based on the final rules relating to patent appeal and interference

proceedings, which were published in the *Federal Register* on March 17, 1995 at 60 FR 14488 and in the *Official Gazette* on April 11, 1995 at 1173 Off. Gaz. Pat. Office 36. The effective date of these rule changes is April 21, 1995.

37 CFR 1.192(c) relating to the content of an appeal brief has been changed so that it does not apply to *pro se* applicants, and in that two additional items have been added. In particular, the appellant must identify in the brief, the real party in interest and any related appeals and interferences. Accordingly, examiners must review appeal briefs filed on or after April 21, 1995 for the presence of the following items under appropriate headings: (1) Real party in interest; (2) Related appeals and interferences; (3) Status of claims; (4) Status of amendments; (5) Summary of invention; (6) Issues; (7) Grouping of claims; (8) Argument; and (9) Appendix. Examiners should continue to refer to MPEP § 1206 (6th ed., Jan. 1995) for the standards for reviewing items (3) through (9). Under the revised rules, a brief filed by a *pro se* applicant should be evaluated on a case-by-case basis.

Examiners should not be unduly rigid in reviewing appeal briefs for compliance with the requirements of the rule. For example, if no amendment has been filed after final rejection, a new brief should not be required solely because the brief omits having some statement after the heading for item (4), status of amendments.

37 CFR 1.192(d) has been amended to indicate that "the appeal will stand dismissed" if the appellant does not timely file an amended brief, or files an amended brief which does not overcome all the reasons for noncompliance of which the appellant was notified.

Regarding the preparation of interference papers by the examiner, 37 CFR 1.609(b)(1) has been amended to require the examiner to explain why the counts define different patentable inventions if there is more than one count proposed. 37 CFR 1.609(b)(2) has been amended to require the examiner to identify the claims of any application or patent which correspond to each count and explain why each claim designated as corresponding to a count is directed to the same patentable invention as the count. 37 CFR 1.609(b)(3) has been amended to require the examiner to identify the claims in any application or patent which do not correspond to each count and to explain why each claim designated as not corresponding to any count is not directed to the same patentable invention as any count.

The above changes will take effect on April 21, 1995.

April 18, 1995

J. MICHAEL THESZ, Editor  
Manual of Patent  
Examining Procedure

[1174 OG 91]

(97)

#### Patent and Trademark Office 37 CFR Part 1 Patent Interference Practice - Separate Patentability of Claims

Agency: Patent and Trademark Office, Commerce  
Action: Notice of Proposed Rulemaking

Summary: The Patent and Trademark Office (PTO) proposes to amend its rules of practice in patent interference cases. In *re Van Geuns*, interpreted patent interference rules in a manner different from the manner in which the rules are interpreted by the Commissioner. The Federal Circuit held that the rules authorize a party to argue the separate patentability of claims that the PTO designates as corresponding to a single count. Under PTO rules, however, every claim designated to correspond to a count shall be directed to a single inventive concept. PTO proposes to amend the interference rules to specifically overcome the Federal Circuit's interpretation of the rules in *Van Geuns*. PTO proposes to specify that unless a party files a preliminary motion to contest the designation of a claim as corresponding to a count, the party shall be deemed to have conceded that all claims designated as corresponding to a count are unpatentable if any claim designated as corresponding to the count is held to be unpatentable and may not argue to an examiner-in-chief or the separate patentability of claims designated to correspond to the count. PTO also proposes to

specify that when an examiner-in-chief in an interference becomes aware of a reason why a claim corresponding to a count may not be patentable, the examiner-in-chief may enter an order notifying the parties of the reason and set a time within which each party may present its views, which may include a preliminary motion. The rules would further specify that an opponent may file an opposition to any preliminary motion and that the party would file a reply to an opposition.

These rules will apply prospectively except when an examiner-in-chief notifies a party in an interference to the contrary. If a party is notified, the party will be given an opportunity to respond regarding the patentability of a count in the interference.

Dates: Comments must be submitted on or before Sept. 24, 1993.

Addresses: Address written comments to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231, marked to the attention of Fred E. McKelvey, Solicitor. Written comments will be available for public inspection in Suite 918, on the 9th floor of Crystal Park II, located at 2121 Crystal Drive, Arlington, Va.

For Further Information Contact: Fred E. McKelvey by telephone at (703) 305-9035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information: The Patent and Trademark Office (PTO) conducts interference proceedings to determine who, as between two or more applicants for patent or one or more applicants and one or more patentees, is the first inventor of a patentable invention.

A primary examiner determines in the first instance whether the claims in an application interfere with the claims in another application or a patent. When the examiner is of the view that an interference exists, the Board of Patent Appeals and Interferences (Board) is notified. 37 CFR § 1.609. An examiner-in-chief, i.e., a member of the Board, is assigned to each interference. The interference is declared by the examiner-in-chief. 37 CFR § 1.610(a).

Each separately patentable invention involved in the interference is defined by a count. The count is a vehicle for contesting priority of invention (i.e., who made the invention defined by the count first) and determining the evidence relevant to the issue of priority. *Squires v. Corbett*, 560 F.2d 424, 433, 194 USPQ 513, 519 (CCPA 1977); *Case v. CPC Int'l, Inc.*, 730 F.2d 745, 749, 221 USPQ 196, 200 (Fed. Cir.), cert. denied, 469 U.S. 872 (1984); *In re Van Geuns*, 988 F.2d at 1184, 26 USPQ2d at 1058-59 (Fed. Cir. 1993).

Each claim of any application or patent to be involved in the interference is designated to correspond to the count or not to correspond to the count. A preliminary determination is made by the PTO as to which claims should be designated to correspond to the count. The claims that are initially determined to define the same patentable invention as the count are designated to correspond to the count. All other claims are designated as not corresponding to the count. The designation of claims as corresponding or not corresponding provides a starting point in an interference. Under PTO practice, there is a presumption that the designation of a claim as corresponding or not corresponding to a count is correct.

The rules authorize a party to file a preliminary motion to redefine an interference by designating a claim as corresponding or not corresponding to a count. 37 CFR § 1.633(c)(3) and (4). Prior to *Van Geuns*, the PTO had interpreted the rules to require a preliminary motion to designate a claim as not corresponding to a count as a condition to being able to argue to an examiner-in-chief or the Board that the claim is separately patentable from the other claims designated to correspond to the count. See *Brooks v. Street*, 16 USPQ2d 1374, 1378, (Bd. Pat. App. & Int. 1990); *Flehmig v. Gies* 13 USPQ2d 1052, 1054, (Bd. Pat. App. & Int. 1989); *Kwon v. Perkins*, 6 USPQ2d 1747, 1751 (Bd. Pat. App. & Int. 1988), *aff'd on other grounds*, 886 F.2d 325, 12 USPQ2d 1308 (Fed. Cir. 1989); see also *Lamont v. Berquer*, 7 USPQ2d 1580, 1582 (Bd. Pat. App. & Int. 1988). In *Van Geuns*, however, the Federal Circuit interpreted the rules differently, stating:

"[T]he position of the Commissioner that claims designated as corresponding to a count stand or fall with the patentability of the subject matter of the count is overbroad."

988 F.2d at 1185, 26 USPQ2d at 1060. The Federal Circuit further stated:

"[W]e conclude that a party to an interference, who has failed to timely contest the designation of claims corresponding to a count, has not conceded that the claims corresponding to a count are anticipated or made obvious [i.e., are unpatentable] by the prior art when the subject matter of the count is determined to be unpatentable for obviousness. The PTO must determine, based on the actual prior art reference or references, whether claims not [designated as] corresponding exactly to the count are unpatentable."

Id. at \_\_, 26 USPQ2d at 1060. The Federal Circuit still further stated:

"The interference rules do not specify whether a party may argue the patentability of claims separately to the EIC [examiner-in-chief] and the board."

Id. at \_\_, 26 USPQ2d at 1060.

The changes proposed to the interference rules are designed to overcome the Federal Circuit's statement.

Subsection (f) of 37 CFR § 1.601, as proposed to be amended, would clarify that claims are designated to correspond to a count. The designation constitutes a rebuttable presumption that, with respect to patentability, the claims stand or fall with the count.

Subsection (f) would also eliminate the "but which defines the same patentable invention as the count" language, thereby eliminating the definition of "same patentable invention" in 37 CFR § 1.601(n) from the designation of claims that correspond substantially to a count. The purpose of the proposed changes is to overcome the Federal Circuit's *Van Geuns* statement that "[i]f a party does not timely contest the designation of claims, there is in effect a concession that all of the designated claims would be anticipated or made obvious if the count were actually prior art." Id. at \_\_, 26 USPQ2d at 1060.

Finally, the definition of a "phantom count" would be revised to clarify that it is unpatentable to the parties under 35 U.S.C. § 112.

Subsection (k) of 37 CFR § 1.633, as proposed to be amended, would provide that a party who fails to contest, by way of a timely preliminary motion under 37 CFR § 1.633, the designation of a claim as corresponding to a count may not subsequently argue to an examiner-in-chief or the Board the separate patentability of claims designated to correspond to a count.

The first sentence of section 1.641, as proposed to be amended, would be redesignated subsection (a) and would clarify that the Examiner-in-Chief would notify the parties by order of the unpatentability of claims designated as corresponding to a count. The word "corresponding" would be changed to "designated to correspond" to conform with the proposed revision to subsection 1.601(f). Proposed subsection (a) would also indicate that responses to the order may include argument and any preliminary motion permitted under § 1.633(c), (d), or (h) as well as any supporting evidence.

A new subsection (b) would be added to section 1.641 that would specify that the opposition and reply practice under section 1.638 applies to a preliminary motion filed in response to the Examiner-in-Chief's order under subsection (a) of this section.

Finally, the last sentence of the current section, 1.641 would be redesignated as subsection (c) and would include a reference to the preliminary motions under section 1.633 permitted under the revision to subsection (a) of this section.

These rules will apply prospectively except when an examiner-in-chief notifies a party in an interference to the contrary. If a party is notified, the party will be given an opportunity to respond regarding the patentability of a count in the interference.

#### OTHER CONSIDERATIONS

The proposed rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these proposed rule changes will not have a significant economic impact on a substantial number of small



entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these proposed changes would be to clarify the procedure for arguing the patentability of claims corresponding to a count in patent interferences and thereby eliminate any confusion, delay, or redundancy that might result from misinterpretation of the current rules.

The Office has determined that this proposed rule change is not a major rule change, under Executive Order 12291. The annual effect on the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers; individuals; industries; Federal, state or local government agencies; or geographic regions. There will be no significant effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The rule change will not impose a burden under the Paperwork Reduction Act, 1980, 44 U.S.C. 3501 *et seq.*, since no record-keeping or reporting requirements within the coverage of the Act are placed upon the public.

#### List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Courts, Inventions and patents. For the reasons set out in the preamble, it is proposed to amend 37 CFR part 1 wherein removals are indicated by brackets ([ ]) and additions by arrows (cb) as follows:

#### PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.601 is proposed to be amended by revising Paragraph (f) to read as follows:

#### § 1.601 Scope of rules, definitions.

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(f) A "count" defines the interfering subject matter between:

- (1) two or more applications or
- (2) one or more applications and one or more patents.

When there is more than one count, each count shall define a separate patentable invention. Any claim of an application or patent [which] that is designated to correspond to a count is a claim involved in an interference within the meaning of 35 U.S.C. 135(a). A claim of a patent or invention thatb [which] is identical to a count is said to "correspond exactly" to the count. A claim of a patent or application thatb [which] is not identical to a count [, but which defines the same patentable invention as the count,] is said to correspond substantially to the count. When a count is broader in scope than all claims thatb [which] correspond to the count, the count is a "phantom count." A phantom count is not patentable to any party under 35 U.S.C. 112.

\*\*\*\*\*

3. Section 1.633 is proposed to be amended by adding a new paragraph (k) to read as follows:

#### § 1.633 Preliminary motions.

\*\*\*\*\*

(k) A party who fails to contest, by way of a timely filed preliminary motion under § 1.633(c), the designation of a claim as corresponding to a count may not subsequently argue to an Examiner-in-Chief or the Board the separate patentability or the lack of separate patentability of claims designated to correspond to the count.

4. Section 1.641 is proposed to be revised as follows:

#### Unpatentability Discovered by Examiner-in-Chief

c(a)b During the pendency of an interference, if the examiner-in-chief becomes aware of a reason why a claim designated to correspond to a count may not be patentable, the examiner-in-chief may [notify] center an order notifyingb the parties of the reason and set a time within which each party may present its views, cwhich may include argument and any appropriate preliminary motion under § 1.633(c), (d), or (h), including any supporting evidenceb.

c(b) If a party timely files a preliminary motion in response to the order of the examiner-in-chief, any opponent may file an opposition pursuant to § 1.638(a). If an opponent files an opposition, the party may file a reply pursuant to § 1.638(b).b

c(c)b After considering any timely filed views, concluding any timely filed preliminary motions under § 1.633, the examiner-in-chief shall decide how the interference shall proceed.

July 16, 1993

MICHAEL K. KIRK  
Acting Assistant Secretary  
and Acting Commissioner  
of Patents and Trademarks

[1153 OG 59]

(98) Department of Commerce  
Patent and Trademark Office

37 CFR Part 1  
[Docket No. 950207044-5044-01]  
RIN: 0651-AA71

#### Patent Appeal and Interference Practice

Agency: Patent and Trademark Office, Commerce.

Action: Final Rule

**Summary:** The Patent and Trademark Office (PTO) is amending the rules of practice in patent cases relating to patent appeal and interference proceedings. The changes include amendments to conform the interference rules to new legislative requirements and a number of clarifying and housekeeping amendments.

**Effective Date:** This document is effective April 21, 1995, except section 1.11(e), which is effective March 17, 1995.

**For Further Information Contact:** Fred E. McKelvey by telephone at (703) 603-3361 or by mail marked to the attention of Fred E. McKelvey at P. O. Box 15647, Arlington, Virginia 22215.

**Supplementary Information:** A Notice of Proposed Rulemaking was published in the *Federal Register* (59 FR 50181) on October 3, 1994, and in the *Official Gazette* of the Patent and Trademark Office (1167 Off. Gaz. Pat. Office 98) on October 25, 1994. In response to a request for written comments, twenty-six written comments were received. A public hearing was held on December 7, 1994, at which four witnesses testified. The written comments and the suggestions made at the public hearing represent the views of fifteen individuals and corporations and three patent law associations, namely, the Committee on Interferences of the American Bar Association, the Interference Committee of the American Intellectual Property Law Association and the Japan Intellectual Property Association. These comments and suggestions are addressed below in the discussion of the rule changes to which they pertain. A number of suggested rule changes, though meritorious, cannot be adopted at this time because they are believed to be outside the scope of the present rulemaking. Accordingly, those suggestions will be the subject of a future rulemaking.

The provisions of the rules, as amended, will be applied in pending interferences to the extent reasonably possible. However, it is the desire of PTO to avoid applying the rules, as adopted, to pending interferences where substantial prejudice would result. For example, generally speaking, in cases where the periods for filing preliminary motions and preliminary statements have been set, the current preliminary motion and preliminary statement rules will apply, although parties are free to voluntarily comply with the rules as amended. Generally speaking, in cases where the testimony periods have been set, the current testimony and record rules will apply. The question of whether substantial prejudice will result in a particular case is a matter within the discretion of the administrative patent judge or the Board.

#### L Amendments Responsive to Adoption of Public Laws 103-182 and 103-465.

As indicated in the Notice of Proposed Rulemaking, several of the amendments to the interference rules (i.e., 37 CFR 1.601 *et seq.*) are responsive to Public Law 103-182, 107 Stat. 2057 (1993) (North American Free Trade Agreement Implementation Act, hereinafter NAFTA Implementation Act), which amended 35 U.S.C. 104 to permit an applicant or patentee, with respect to an application filed on or after December 8, 1993, to rely on activities occurring in a "NAFTA country" to prove a date of invention no earlier than December 8, 1993, except as provided in 35 U.S.C. 119 and 365. On December 8, 1994, which was subsequent to publication of the Notice of Proposed Rulemaking, Public Law 103-465, 108 Stat. 4809 (1994) (Uruguay Round Agreements Act) was signed into law, which further amended 35 U.S.C. 104 to permit an applicant or a patentee, with respect to an application filed on or after January 1, 1996, to rely on activities occurring in a WTO member country to prove a date of invention no earlier than January 1, 1996, except as provided in 35 U.S.C. 119 and 365. Section 104, as amended by Public Law 103-465, reads as follows:

§ 104. Invention made abroad

#### (a) IN GENERAL.—

(1) PROCEEDINGS.—In proceedings in the Patent and Trademark Office, in the courts, and before any other competent authority, an applicant for a patent, or a patentee, may not establish a date of invention by reference to knowledge or use thereof, or other activity with respect thereto, in a foreign country other than a NAFTA country or a WTO member country, except as provided in sections 119 and 365 of this title.

(2) RIGHTS.—If an invention was made by a person, civil or military—

(A) while domiciled in the United States, and serving in any other country in connection with operations by or on behalf of the United States,

(B) while domiciled in a NAFTA country and serving in another country in connection with operations by or on behalf of that NAFTA country, or

(C) while domiciled in a WTO member country and serving in another country in connection with operations by or on behalf of that WTO member country,

that person shall be entitled to the same rights of priority in the United States with respect to such invention as if such invention had been made in the United States, that NAFTA country, or that WTO member country, as the case may be.

(3) USE OF INFORMATION.—To the extent that any information in a NAFTA country or a WTO member country concerning knowledge, use, or other activity relevant to proving or disproving a date of invention has not been made available for use in a proceeding in the Patent and Trademark Office, a court, or any other competent authority to the same extent as such information could be made available in the United States, the Commissioner, court, or such other authority shall draw appropriate inferences, or take other action permitted by statute,

rule, or regulation, in favor of the party that requested the information in the proceeding.

#### (b) DEFINITIONS.—As used in this section—

(1) the term "NAFTA country" has the meaning given that term in section 2(4) of the North American Free Trade Agreement Implementation Act; and

(2) the term "WTO member country" has the meaning given that term in section 2(10) of the Uruguay Round Agreements Act.

Section 2(4) of the NAFTA Implementation Act is codified at 19 U.S.C. 3301; § 2(10) of the Uruguay Round Agreements Act is codified at 19 U.S.C. 3501.

The Notice of Proposed Rulemaking proposed adding a new paragraph (r) to § 1.601 defining "NAFTA country" to mean "NAFTA country" as defined in section 2(4) of the NAFTA Implementation Act and "non-NAFTA country" to mean a country other than a NAFTA country. One comment questioned whether "NAFTA country" should be defined in the rules to include the United States. The answer is no. "NAFTA country" as used in 35 U.S.C. 104 has the meaning given that term in section 2(4) of the NAFTA Implementation Act, which refers to only Canada and Mexico. Another comment observed that the proposed terms "NAFTA country" and "non-NAFTA country" do not appear to contemplate that inventive acts may occur in a foreign place that is not part of any "country" and suggested either using the phrase "outside the United States or a NAFTA country" instead of "non-NAFTA country" or else defining "non-NAFTA country" to mean "a place other than the United States or a NAFTA country." The comment is well taken. In view of the comment and the amendment of 35 U.S.C. 104 by the Uruguay Round Agreements Act to permit reliance on activities in WTO member countries, the proposed term "NAFTA country" is replaced in §§ 1.622, 1.623, 1.624 and 1.628, which set forth the requirements for preliminary statements and for correcting preliminary statements, by the phrase "NAFTA country or WTO member country" and the proposed term "non-NAFTA country" is replaced by the phrase "place other than the United States, a NAFTA country or a WTO member country." Furthermore, the references in §§ 1.622(b) and 1.623(a) to the "second sentence of 35 U.S.C. 104" have been changed to "35 U.S.C. 104(a)(2)" to reflect the fact that 35 U.S.C. 104 as amended by the Uruguay Round Agreements Act includes paragraphs (a)(1), (2) and (3). For example, § 1.622(b) is revised to read:

(b) The preliminary statement shall state whether the invention was made in the United States, a NAFTA country (and, if so, which NAFTA country), a WTO member country (and, if so, which WTO member country), or in a place other than the United States, a NAFTA country, or a WTO member country. If made in a place other than the United States, a NAFTA country, or a WTO member country, the preliminary statement shall state whether the party is entitled to the benefit of 35 U.S.C. 104(a)(2).

For the above-stated reasons, § 1.601 is revised by adding new paragraph (r), which, as proposed, defines "NAFTA country" to have the meaning given that term in section 2(4) of the North American Free Trade Agreement Implementation Act, Pub. L. 103-182, 107 Stat. 2060 (1993). However, since, as noted above, the term "non-NAFTA country" is not being adopted, the proposal to also define that term in § 1.601(r) is hereby withdrawn. Section 1.601 is also revised to include a new paragraph (s) that defines "WTO member country" to have the meaning given that term in section 2(10) of the Uruguay Round Agreements Act, Pub. L. 103-465, 108 Stat. 4813 (1994).

Section 1.684, which relates to the taking of testimony in a foreign country, is removed and reserved in view of the amendments to §§ 1.671-72. Section 1.672 is amended by revising paragraph (a), revising current paragraph (b) and redesignating parts of it as new paragraphs (b), (c) and (d), removing and reserving paragraph (c) and redesignating it as new paragraph (e), revising paragraphs (d) and (e) and redesignating them as new paragraphs (f) and (g), and redesignating paragraph (f) as new paragraph (h).



Specifically, the Notice of Proposed Rulemaking proposed amending § 1.672(a) to require that "testimony not compelled under 35 U.S.C. 24 or compelled from a party or in another country" be taken only by affidavit. Several comments questioned whether the term "compelled" also applies to the phrase "in another country" and suggested inserting "compelled" before that phrase if that is the intent. Inasmuch as the comment correctly states the intent, the suggestion in the comment is being adopted.

One comment supported limiting non-compelled direct testimony to affidavits on the ground that it will reduce the cost of submitting testimony-in-chief and will eliminate economic harassment by a more affluent party of a less affluent opponent, since the less affluent opponent will no longer be required to pay the expense of counsel to attend depositions called by the more affluent party for taking direct testimony. Several comments were opposed, maintaining that affidavits are inherently less credible than live testimony. One comment states:

Ours is the only country that supports interferences and we should be proud of it, because it demonstrates our commitment to the concept that it is more important to seek right and justice than to settle for a single arbitrary rule of convenience, no matter how convenient. Even if we don't always secure the right result, at least we try. As we invite the rest of the world to become full participants in this uncommon philosophy, we should endeavor to present it in its best light.

How we conduct a trial is a centerpiece of our judicial system. Our interference trial by deposition is a reasonable compromise from a trial in a courtroom type setting. But a trial by affidavit is no trial at all! Affidavits are inevitably contrived, artificial, and often argumentative. They cannot substitute for the extemporaneous words of a witness (even if well coached), and cross-examination is not likely to reconstruct the real truth. Even if it is just in a nuance of expression, it is gone.

The current approach of providing a choice between deposition and affidavit testimony is difficult to accept, but at least it is justifiable on the basis that so many patent attorneys simply don't know how to conduct a deposition, while they do have some experience with affidavits. But the proposal to make affidavits mandatory for direct testimony is contrary to my understanding of American jurisprudence.

Direct testimony on behalf of a party by oral deposition is said to be advantageous to the opponent in that the testimony is the witness' own, the demeanor of the witness can be observed by the opponent (but demeanor is not observed by any member of the Board), and cross-examination can be carried out without a period during which it is said that the witness can be coached in preparation for cross-examination. However, under current practice a party can elect to deprive its opponent of these advantages by electing to use affidavits. Deposition testimony is also said to be advantageous to the party offering the testimony, who may find it more convenient to present the witness at a single deposition for direct and cross-examination than to first prepare an affidavit for direct testimony and later produce the witness at a deposition for cross-examination by an opponent. These supposed advantages are believed to be outweighed by the advantages of requiring that direct non-compelled testimony be in affidavit form. As recognized by those who favor direct testimony by affidavit, there are at least two advantages to taking direct testimony by affidavit, i.e., (1) reducing the cost of presenting a party's own direct testimony and (2) avoiding the expense of attending an opponent's depositions for direct testimony. There are a number of other advantages when direct testimony is taken by affidavit rather than deposition. First, because an opponent will have seen all of the party's direct testimony prior to beginning cross-examination, the opponent should be able to carry out a more pointed and efficient cross-examination, thereby avoiding the need to recall a witness for further examination during the opponent's rebuttal case, which can be costly in time and expense to both the party and the opponent. Second, a party presenting direct testimony by affidavit is less likely to inadvertently, and perhaps fatally, omit an essential part of its proofs than when presenting direct testimony by oral deposition. Third, affidavit testimony

will be advantageous to the Board because affidavit testimony can be evaluated more expeditiously than can deposition transcripts, which frequently present the facts in an incoherent manner and too often include a considerable amount of disruptive attorney colloquy. Fourth, in the case of direct testimony by persons testifying in a foreign language, testimony by affidavit (in the English language) should be considerably less cumbersome than testimony by oral deposition through translators.

Two comments suggested that there may be cases in which both parties find it mutually convenient to present their direct testimony by oral deposition and that under these circumstances the administrative patent judge should be allowed to authorize such depositions. The suggestion is not being adopted, because it would eliminate the above-noted advantages of reducing the likelihood of omitting an essential part of the proofs and having the Board consider direct testimony presented in a more coherent form.

Another comment suggested that there appears to be no need why all testimony abroad must be by oral deposition, noting, for example, that a third-party witness may be willing to give an affidavit comprising the direct testimony, provided cross-examination will be conducted in the witness's home country. Still another comment asked how the parties should handle a situation where a party's witness residing in a foreign country, due to health or other serious impediment, is unable to travel to the United States for cross-examination, but is willing to testify in the foreign country, which allows testimony, for example, only by written interrogatories. The answer in both situations, as well as in other unusual situations not provided for by the rules, is to file a motion (§ 1.635) for permission to take the testimony in a manner other than by deposition. The motion may or may not be granted depending on the particular circumstances. In order to make it clear that the administrative patent judge and the Board have discretion in unusual circumstances to grant appropriate relief, § 1.672 is further revised by adding a new paragraph (i) reading as follows:

(i) In an unusual circumstance and upon a showing that testimony cannot be taken in accordance with the provisions of this subpart, an administrative patent judge upon motion (§ 1.635) may authorize testimony to be taken in another manner.

Section 1.672(b), as it was proposed to be revised in the Notice of Proposed Rulemaking, includes a requirement that a party presenting testimony of a witness by affidavit, within the time set by the administrative patent judge for serving affidavits, file a copy of the affidavit. Since, for reasons discussed *infra*, § 1.671(e) is being retained in modified form rather than being removed and reserved, as was proposed, § 1.672(b) as adopted, like current § 1.672(b), permits a party to file a copy of the affidavit or, if appropriate, a notice under 1.671(e). If the affidavit relates to a party's case-in-chief, it shall be filed or noticed no later than the date set by an administrative patent judge for the party to file affidavits for its case-in-chief. If the affidavit relates to a party's case-in-rebuttal, it shall be filed or noticed no later than the date set by an administrative patent judge for the party to file affidavits for its case-in-rebuttal. A party shall not be entitled to rely on any document referred to in the affidavit unless a copy of the document is filed with the affidavit. A party shall not be entitled to rely on any thing mentioned in the affidavit unless the opponent is given reasonable access to the thing. A thing is something other than a document.

As proposed in the Notice of Proposed Rulemaking, a new paragraph (c) is added to § 1.672 stating that where an opponent objects to the admissibility of any evidence contained in or submitted with an affidavit, the opponent must file and serve objections stating with particularity the nature of the objection. Any objection should identify the specific Federal Rule of Evidence that renders the evidence inadmissible and shall explain why the Rule applies to the evidence sought to be introduced. No oppositions to the objections are authorized. Rather, the party may respond by filing supplemental evidence in the form of affidavits, official records and printed publications. Alternatively, the party may determine that the objection is without merit and do nothing. One comment suggested that "supplemental affidavits and supplemental official records and

printed publications" in the third sentence of § 1.672(c) as proposed be changed to "one or more supplemental affidavits, official records or printed publications." The suggestion is being adopted. The same or similar changes have been made in the third sentence of § 1.682(c) and in the third sentence of § 1.683(b); in the third sentence of § 1.688(b) "supplemental affidavits" has been changed to "one or more supplemental affidavits." Section 1.672(c) further provides that any objections to the admissibility of any evidence contained in or submitted with a supplemental affidavit shall be made only by a motion to suppress under § 1.656(h).

As proposed in the Notice of Proposed Rulemaking, § 1.672 is revised by adding a new paragraph (d) requiring any cross-examination of an affiant to be by deposition at a reasonable location within "the United States," which is defined in § 1.601(p) and 35 U.S.C. 100(c) to mean "the United States of America, its territories and possessions." For purposes of the interference rules, the term "territories and possessions" is broadly construed to refer to all territories and possessions of the United States, including, for example, the Commonwealth of Puerto Rico.

An opponent who believes that a party is producing an affiant for cross-examination in an "unreasonable" location may move (§ 1.635) for entry of an order by an administrative patent judge to set the location of the deposition for cross-examination. Paragraph (d) also requires that the party whose witness is to be cross-examined give notice of the deposition under § 1.673(e), obtain a court reporter and provide a translator if the witness will not testify in English. Although not expressly set forth in the rules as amended, it should be understood that any party attending the deposition can bring its own translator or the parties can agree to share the cost of a single mutually agreeable translator.

Comments were received against the proposal that § 1.672(d) require cross-examination of affiants to be conducted by oral deposition "at a reasonable location within the United States." One comment suggested that requiring a witness who resides in a foreign country to travel to the United States for cross-examination will be extremely inconvenient where the witness is a key person for a company. The comment also suggested that the term "United States" be amended to additionally include U.S. embassies and/or consulates in foreign countries, at least for purposes of conducting cross-examination. The suggestion is not being adopted. Given the time differences between the United States and Europe or the United States and Asia, it is highly likely that administrative patent judges would not be on duty to rule on telephonic requests for admissibility of evidence. Furthermore, a party whose witness is to testify on cross-examination at a "trial" (i.e., interference proceeding) in the United States should produce the witness for cross-examination at a reasonable location within the United States. Finally, in view of PTO's general lack of experience regarding procedures for, and difficulties which may arise in, taking deposition testimony in a foreign country, PTO has decided, at least for the time being, to take a conservative approach regarding taking testimony in a foreign country. The approach will be reevaluated after PTO gains some experience with foreign deposition testimony taken pursuant to § 1.671(h).

One comment suggested inserting a comma after "reporter" in the fifth sentence of proposed § 1.672(d), as well as in the fifth sentences of proposed §§ 1.682(d), 1.683(c) and 1.688(c). The suggestion is being adopted.

The Notice of Proposed Rulemaking proposed to redesignate current § 1.672(d) ("When a deposition is authorized under this subpart, if the parties agree in writing, the deposition may be taken before any person authorized to administer oaths, at any place, upon any notice, and in any manner, and when so taken may be used like other depositions.") as § 1.672(f). One comment questioned whether § 1.672(f) (former § 1.672(d)) applies to cross-examination deposition testimony authorized by §§ 1.672(d), 1.673(a), 1.682(d), 1.683(c) and 1.688(c). Implicit in the comment is a question of whether proposed § 1.672(f) would authorize the parties, with respect to deposition testimony that has been authorized by the rules or by an administrative patent judge to be taken in the United States, to agree to take the deposition outside the United States. For the reasons discussed above, the parties may not agree, absent the permission of an administrative patent judge or the Board, to take a deposition outside the United States. Accordingly, § 1.672(f),

as amended, provides that depositions authorized to be taken within the United States are to be taken within the United States: "When a deposition is authorized to be taken within the United States under this subpart and if the parties agree in writing, the deposition may be taken in any place within the United States, before any person authorized to administer oaths, upon any notice, and in any manner, and when so taken may be used like other depositions."

Current § 1.672(e), which is being redesignated as § 1.672(g), reads as follows: "If the parties agree in writing, the testimony of any witness may be submitted in the form of an affidavit without opportunity for cross-examination. The affidavit shall be filed in the Patent and Trademark Office." Although not proposed in the Notice of Proposed Rulemaking, this section is revised to be consistent with the other amendments to §§ 1.671-73 so as to read as follows: "If the parties agree in writing, the affidavit testimony of any witness may be submitted without opportunity for cross-examination."

As proposed in the Notice of Proposed Rulemaking, current § 1.672(f), which concerns the filing of agreed statements setting forth how a particular witness would testify if called or the facts in the case of one or more of the parties, is redesignated as § 1.672(h).

In addition to the proposed amendments discussed above, current § 1.672(b) is revised, as proposed in the "Miscellaneous Amendments" part of the Notice of Proposed Rulemaking, by deleting the third sentence, which specifies the type of paper to be used for affidavits, as superfluous in view of § 1.677(a); and in paragraph (d), the fifth sentence ("A party electing to present testimony of a witness by deposition shall notice a deposition of the witness under § 1.673(a).") is removed as superfluous in view of the second sentence of new § 1.672(d).

In § 1.671, the Notice of Proposed Rulemaking proposed to amend paragraph (a) to read as follows: "Evidence consists of testimony and exhibits, official records and publications filed under § 1.682, testimony from another interference, proceeding, or action filed under § 1.683, and discovery relied upon under § 1.688, and the specification (including claims) and drawings of any application or patent: . . ." One comment suggested that "and discovery" be changed to "discovery" in order to remove an unnecessary "and." The suggestion is being adopted. Another comment suggested inserting "and exhibits" after "testimony" in the phrase "testimony from another interference, proceeding, or action under § 1.683." The suggestion is being adopted, but with the term "exhibits" prefaced by "referenced" to make it clear that it relates only to exhibits referred to by a witness in an affidavit or during an oral deposition. Clarification is necessary because, as noted in the discussion of § 1.653(c)(5), *infra*, the term "exhibit" also includes official records and printed publications relied on under § 1.682, which are not referred to by a witness in an affidavit or during an oral deposition. For the same reason, "referenced" is also inserted before the first occurrence of "exhibits" in § 1.671(a). A similar clarifying amendment is also made to § 1.683(a).

The Notice of Proposed Rulemaking proposed to revise § 1.671(f) to state that "[t]he significance of documentary and other exhibits identified by a witness in an affidavit or during oral deposition shall be discussed with particularity by the witness" (emphasis added) in order to clarify that the requirement for the significance of documentary and other exhibits to be discussed with particularity by a witness applies only to documentary and other exhibits identified by a witness in an affidavit or during oral deposition. One comment indicated that proposed § 1.671(f) fails to recognize that a witness may be called merely to authenticate a piece of evidence, e.g., a photograph, which is to be discussed with particularity by another witness. The comment is well taken. Accordingly, § 1.671(f) is revised to read as follows: "The significance of documentary and other exhibits identified by a witness in an affidavit or during oral deposition shall be discussed with particularity by a witness." Thus, § 1.671(f) does not apply to official records and printed publications submitted into evidence pursuant to § 1.682(a).

The Notice of Proposed Rulemaking proposed that § 1.671(g), which currently requires a party to file a motion (§ 1.635) to obtain permission prior to taking testimony or seeking documents or things "under 35 U.S.C. 24," be revised to require a motion "prior to compelling testimony or production of documents or things under 35 U.S.C. 24 or from a party." One



comment suggested that the requirement to obtain permission from an administrative patent judge before noticing an employee of one's opponent as a hostile witness is important. Another comment took issue with the requirement and the statement in the Notice of Proposed Rulemaking that "all depositions for a case-in-chief would have to be approved by an administrative patent judge" (59 FR at 50191), stating:

I suppose that means by motion with an explanation of what the deposition will cover. Such a procedure will destroy the ability to obtain effective testimony from an adverse witness, because of the need to reveal the strategy. Particularly in a derivation contest, the ability to obtain unrehearsed testimony of the adverse party will be lost, and he [sic; his testimony] may be the only corroboration available. Heretofore, taking the deposition of one's adverse party to obtain evidence for one's case-in-chief has been a matter of right on serving proper notice. It is essential that this right be preserved. Obviously, this procedure should not be used to discover a senior party's case-in-chief, and that limitation is easily protected by objection to any such questions that are not also related to the junior party's case-in-chief, and then either (a) calling the judge for an immediate ruling, or (b) refusing to answer the question.

Assuming for the sake of argument that the current interference rules permit a party to notice the deposition of an opponent's witness in order to take direct testimony of the type described above without first obtaining permission from an administrative patent judge, the interference rules do not provide any sanction for the failure of the witness to appear at a noticed deposition. Consequently, even under the current rules the party seeking the testimony of an opponent's witness, as a practical matter, must obtain an order from an administrative patent judge or the Board requiring the witness to appear so that the opponent can be sanctioned under § 1.616 if the witness fails to appear.

One comment suggested that the proposed new last sentence for § 1.671(g) ("The testimony of the witness shall be taken on oral deposition.") be omitted as superfluous in view of § 1.672(a) as amended. The suggestion is being adopted.

A comment suggested that § 1.671(g) be modified to expressly apply to an entity or witness under the opponent's control. The modification is not believed to be necessary. The term "party" is defined in § 1.601(l) to include an inventor's legal representative or assignee. The term "opponent," while not defined per se in the rules, is a "party" who happens to be a "second" party opponent of a "first" party. Section 1.671(g) applies where a witness is under the control of a party opponent's assignee.

As proposed in the Notice of Proposed Rulemaking, a new paragraph (h) is added to § 1.671 providing that a party seeking to compel testimony or production of documents or things in a foreign country must file a motion (§ 1.635) to obtain permission from an administrative patent judge. The motion must show that the witness has been asked to testify in the United States and has refused to do so or that the individual or entity having possession, custody, or control of the document or thing has refused to produce the document or thing in the United States, even though the moving party has offered to pay the expenses involved in bringing the witness or the document or thing to the United States. When permission has been obtained from the administrative patent judge, the party, after also complying with the requirements for an oral conference (§ 1.673(g)), and service of documents and a proffer of access to things (§ 1.673(h)), must notice the deposition under § 1.673(a).

With respect to the requirements for a motion to compel testimony or production of documents or things in a foreign country, one comment suggested that the phrase "possession, custody and control" in proposed § 1.671(h)(2)(iii) appears to include a typographical error and should be changed to read "possession, custody or control." The suggestion is being adopted.

Another comment suggested that the administrative patent judge would benefit from being additionally advised of (1) the foreign country where the witness, document or thing is located, (2) a summary of the procedures proposed to be followed to compel the testimony or production of documents or things in the foreign country, and (3) the time likely to be required to

complete the procedures. In support, the comment notes that compelling testimony or production of documents in a foreign country can be so time-consuming that it may outweigh the benefit of allowing the testimony or documents to be obtained, considering their likely probative value and other relevant considerations. The comment continues that in order to allow the administrative patent judge to supervise the progress of the interference and to allow establishment of an appropriate schedule for the interference, the rules should require the suggested procedural information. These suggestions are being adopted. Adoption of these suggestions, however, should not be construed as a policy determination by PTO that it intends to approve of, or tolerate, unwarranted delays in obtaining testimony in a foreign country. The spirit of 35 U.S.C. 104 requires that evidence be obtainable in a foreign country essentially on the same basis that it is obtainable in the United States. When the laws and procedures in a foreign country make it so time-consuming to obtain evidence that the evidence is essentially not available in a reasonable manner, then the "adverse inferences" provision of new § 1.616(c) may be appropriately applied.

Another comment notes that proposed § 1.671(h)(1)(iv) for witnesses and § 1.671(h)(2)(iii) for documents and things assume that it will be possible to request the holder of the evidence to voluntarily produce it and obtain a definitive response to the request, whereas it is said that discovery experience in foreign countries shows that those possessing evidence often evade contact or, when contacted, evade giving a definitive response. Accordingly, the comment suggested that these provisions be reworded as follows:

§ 1.671(h)(1)(iv). Demonstrate that the party has made reasonable efforts to secure the agreement of the witness to testify in the United States but has been unsuccessful in obtaining the agreement, even though the party has offered to pay the expenses of the witness to travel to and testify in the United States.

§ 1.671(h)(2)(iii). Demonstrate that the party has made reasonable efforts to obtain the agreement of the individual or entity having possession, custody, or control of the document to produce the document or thing in the United States but has been unsuccessful in obtaining that agreement, even though the party has offered to pay the expenses of producing the document or thing in the United States.

The suggestion is being adopted. The expenses of a witness traveling to the United States means the round-trip travel expenses.

The Notice of Proposed Rulemaking proposed the addition to § 1.671 of a new paragraph (j), which is patterned on paragraph (e) of § 1.684 (removed and reserved). Section 1.671(j), as it was proposed, reads as follows:

(j) The weight to be given testimony taken in a foreign country will be determined on a case-by-case basis. Little, if any, weight may be given to testimony taken in a foreign country unless the party taking the testimony proves by clear and convincing evidence (1) that giving false testimony in an interference proceeding is punishable as perjury under the laws of the foreign country where the testimony is taken and (2) that the punishment in a foreign country for giving such false testimony is similar to the punishment for perjury committed in the United States.

A number of comments were received in response to the proposal. Two comments questioned whether § 1.671(j) is intended to apply to affidavit testimony as well as deposition testimony. One comment suggested that the rule be expressly limited to deposition testimony, since testimony by affidavit (including declarations) can be taken in foreign countries under the perjury provisions of 28 U.S.C. 1746(1), and is additionally subject to the safeguard of cross-examination in the United States under proposed § 1.672(d). For these reasons, and also because current § 1.684(e), on which § 1.671(j) is patterned, applies only to deposition testimony in a foreign country in the form of interrogatories answered under oath, the suggestion

to expressly limit § 1.671(j) to deposition testimony is being adopted.

Two comments stated that the party taking testimony in a foreign country should not have the burden of proving that the giving of false testimony is punishable as perjury under the law of the foreign country, as it may be difficult or impossible to prove or may not even be in dispute, and that the burden is especially unfair where a party is being forced to take testimony abroad by circumstances beyond its control. Both comments suggested putting the burden instead on the opponent to show that the requirements are not similar, such as by moving under § 1.635 to accord the testimony little weight or moving under § 1.656(h) to suppress the testimony altogether. Section 1.671(j), as proposed in the Notice of Proposed Rulemaking, does not alter who has the burden of proof with respect to testimony in a foreign country; the burden remains on the party offering the testimony, just as under current § 1.684(e).

Another comment questioned whether the first sentence of the rule as it was proposed, because it states that the weight of testimony "will be determined on a case-by-case basis," might be construed as allowing the effect to be given testimony in a particular foreign country in a given interference to be decided without regard to the effect given in prior interferences to testimony given in that country. The comment stated that the rule as proposed might be contrary to the goals of equal treatment of similarly situated parties and predictability of outcome, which would best be served by a system in which the Board publishes decisions making findings as to the adequacy of the testimonial procedures in particular foreign countries and then follows those decisions in subsequent cases, and suggested changing "on a case-by-case basis" to read "in view of all the circumstances, including the laws of the foreign country governing the testimony." The suggestion is being adopted.

Another comment suggested that the "clear and convincing evidence" standard in the second sentence of proposed § 1.671(j) inappropriately implies that the determination of content of the law of a foreign country is a question of fact. PTO intends to treat the determination of the content of the law of a foreign country as a question of fact. Accordingly, the language "as a matter of fact" is inserted in § 1.671(j). The same comment further indicates that the proposed second sentence is troublesome because it (1) requires a showing that giving false testimony is punishable as "perjury" under the laws of the foreign country rather than under some other name, (2) does not on its face allow the foreign offense to be applicable only when false testimony is given with the appropriate intent, and (3) requires that the foreign punishment be "similar to" United States punishment, when comparable or greater punishment would seem to serve the purpose of the proposed rule. The comment suggested that the foregoing problems can be avoided by replacing the proposed second sentence with the following sentence:

Little, if any, weight may be given to oral testimony given in a foreign country unless it is demonstrated (1) that the giving of false testimony in the interference proceeding would be punishable under the laws of the foreign country where the testimony was taken under circumstances similar to those defined as perjury under the laws of the United States and (2) that the punishment in the foreign country for giving such false testimony is comparable to or greater than the punishment for perjury committed under the laws of the United States.

The comment additionally suggested adding a third sentence patterned on the second and third sentences of Fed. R. Civ. P. 44.1 and reading as follows: "Such a demonstration may be made by any relevant material or source, including testimony, whether or not admissible under this subpart." To address the comments, which are believed to be well taken, the proposed second sentence is replaced with the following two sentences:

Little, if any, weight may be given to deposition testimony taken in a foreign country unless the party taking the testimony proves by clear and convincing evidence, as a matter of fact, that knowingly giving false testimony in that country in connection with an interference proceeding in the United States Patent and Trademark Office is punishable under the laws of that country and that the punishment in that country

for such false testimony is comparable to or greater than the punishment for perjury committed in the United States. The administrative patent judge and the Board, in determining foreign law, may consider any relevant material or source, including testimony, whether or not submitted by a party or admissible under the Federal Rules of Evidence.

The finally adopted language is also responsive to another comment requesting clarification of the term "similar" in order to assist practitioners, and possibly foreign governments in promulgating laws in harmony with 35 U.S.C. 104 and § 1.671.

In addition to the above amendments, § 1.671(a), which identifies the various types of testimony, is revised as proposed in the "Miscellaneous Amendments" part of the Notice of Proposed Rulemaking, by changing "evidence from another interference, proceeding, or action filed under § 1.683" to "testimony from another interference, proceeding, or action filed under § 1.683" in order to be consistent with the terminology of § 1.683. Sections 1.671(c)(6) and (c)(7) are revised by changing "by oral deposition or affidavit" to "by affidavit or oral deposition."

Section 1.673 is also amended as proposed in the "Miscellaneous Amendments" part of the Notice of Proposed Rulemaking. Specifically, § 1.673(b) is revised by (1) changing the time for service of evidence to be relied on at an oral deposition from "at least three days" prior to the conference required by § 1.673(g) when service is by hand or by Express Mail to "at least three working days" prior to the conference, (2) changing the time for service by any other means from 10 days to 14 days prior to the conference and (3) removing the quotation marks around "Express Mail."

The second sentence of § 1.673(d) is removed, as proposed in the Notice of Proposed Rulemaking, as unnecessary, because all depositions for a case-in-chief require approval by an administrative patent judge.

Section 1.673(e) is revised, as proposed, by changing "party electing to present testimony by affidavit" to "party who has presented testimony by affidavit."

One comment suggested amending § 1.673(g) to state that a party, prior to serving a notice of deposition and after complying with paragraph (b) of § 1.673, shall contact the administrative patent judge, who shall then have an oral conference with the party and all opponents. The suggestion, which is outside the scope of the present rulemaking, is not being adopted. In any event, it is expected that in most cases the parties will be able to agree on a time and place for depositions without the need for participation by an administrative patent judge.

Concerning the first sentence of § 1.673(a), one comment suggested deleting the term "single" from "single notice of deposition" on the ground that the current language might be construed to mean that a party must file only a single notice of deposition listing all depositions. The same suggestion was offered with respect to paragraph (e) of § 1.673. The suggestion, which is outside the scope of the present rulemaking, is not being adopted.

The Notice of Proposed Rulemaking proposed to amend § 1.616 by adding a new paragraph (c), patterned after 35 U.S.C. 104(b), stating that to the extent that any information under the control of an individual or entity located in a NAFTA country or a WTO member country concerning knowledge, use, or other activity relevant to proving or disproving a date of invention has been ordered to be produced by an administrative patent judge or the Board (§ 1.671(h)), but is not produced for use in the interference to the same extent as such information could be made available in the United States, the administrative patent judge or the Board shall draw such adverse inferences as may be appropriate under the circumstances, or take such other action permitted by statute, rule, or regulation, in favor of the party that requested the information in the interference. Section 1.616(c) further provides that this "other action" may include the imposition of appropriate sanctions under § 1.616(a).

One comment questioned whether the failure of an individual or entity located in a NAFTA country or a WTO member country to provide the information requested by a party can result in the imposition of sanctions against an opponent from that country even though the opponent is not at fault. The answer is yes. One purpose of 35 U.S.C. 104 is to ensure that evidence for interferences is available in foreign countries in



essentially the same manner that it is available in the United States. If the evidence is not available, then the appropriate inference provisions of 35 U.S.C. 104 shall be applied by PTO.

After the Notice of Proposed Rulemaking was published, it became apparent that the term "ordered" in the phrase "to the extent that any information under the control of an individual or entity located in a NAFTA country or a WTO member country . . . has been ordered to be produced by an administrative patent judge or the Board" may not be appropriate. Neither an administrative patent judge nor the Board can order testimony or production of documents and things in a foreign country from a witness who, or an entity that, is neither a party nor under the control of a party. Instead, an administrative patent judge or the Board can only authorize a party to seek to compel testimony or production in a foreign country from a witness or entity not under the control of a party. Accordingly, § 1.616(c) as adopted reads instead as follows:

(c) To the extent that an administrative patent judge or the Board has authorized a party to compel the taking of testimony or the production of documents or things from an individual or entity located in a NAFTA country or a WTO member country concerning knowledge, use, or other activity relevant to proving or disproving a date of invention (§ 1.671(h)), but the testimony, documents or things have not been produced for use in the interference to the same extent as such information could be made available in the United States, the administrative patent judge or the Board shall draw such adverse inferences as may be appropriate under the circumstances, or take such other action permitted by statute, rule, or regulation, in favor of the party that requested the information in the interference, including imposition of appropriate sanctions under paragraph (a) of this section.

As proposed in the Notice of Proposed Rulemaking, § 1.647, which currently requires a party who relies on a non-English language document to provide an English-language translation and an affidavit attesting to its accuracy, is revised to extend these requirements to any non-English language documents that a party is required to produce via discovery. One comment expressed the concern that the proposed amendment might impose an unnecessary financial burden on a non-U.S. party by requiring translations of compelled documents that are very long and have little or no relevance. The concern is believed to be misplaced. First, discovery in interferences, like discovery under the Federal Rules of Civil Procedure, is limited to evidence that is relevant. Second, as to relevant evidence, the scope of discovery under the interference rules is considerably narrower than the discovery available under the Federal Rules of Civil Procedure. Another comment stated that the general practice is that a party proffering a document is responsible for the cost of translation. The comment nevertheless suggested that in the case of documents offered to be produced during discovery, including cross-examination discovery pursuant to § 1.687(b), the documents be produced in the foreign language, with the recipient then indicating which documents it wishes to have translated and costs to be borne equally by the parties. The suggestion is not being adopted. In implementing practice under 35 U.S.C. 104, as amended, it is PTO's initial view that a correct policy is the one which the commentator says is the "general practice." Whether a different policy might be appropriate at some future time is something that will be tested with experience.

## II. Compensatory Attorney Fees and Expenses.

Section 1.616, in addition to the amendments discussed above, also is revised by redesignating current paragraphs (a) through (e) as paragraphs (a)(1) through (a)(4) and (a)(6) and adding new paragraphs (a)(5) and (b).

Section 1.616(a)(5), as amended, authorizes the award of compensatory (as opposed to punitive) expenses and/or compensatory attorney fees as a sanction for failing to comply with the rules or an order. This sanction shall apply only to conduct occurring in an interference on or after the effective date of § 1.616 as amended. It is believed that there may be occasions when an award of compensatory expenses and/or compensatory attorney fees would be more commensurate in scope with the infraction than the sanctions that are currently authorized.

There are administrative decisions which seemingly hold that the tribunals of PTO do not have authority to award expenses and attorney fees. See, e.g., *Driscoll v. Cebalo*, 5 USPQ2d 1477, 1481 (Bd. Pat. Int. 1982) (the rules do not provide us with the jurisdiction to award expenses and we know of no authority which does), *aff'd in part, rev'd in part*, 731 F.2d 878, 221 USPQ 745 (Fed. Cir. 1984); *Clevenger v. Martin*, 1 USPQ2d 1793, 1797 (Bd. Pat. App. & Int. 1986) (we do not have authority under the rules to award attorney's fees); *MacMillan Bloedel, Ltd. v. Arrow-M Corp.*, 203 USPQ 952, 953 (TTAB 1979) (the TTAB is without authority to award expenses and attorney's fees); *Fisons, Ltd. v. Capability Brown, Ltd.*, 209 USPQ 167, 171 (TTAB 1980) (request for attorney's fees denied because good cause not shown and the TTAB has no authority to grant such requests); *Jonerger Co. v. Jonerger Vermont, Inc.*, 222 USPQ 337, 340-41 (Comm'r Pat. 1983) (TTAB did not err in refusing to award reasonable expenses and attorney's fees under 37 CFR 2.116(a), 2.120 and Fed. R. Civ. P. 37(a)(4)); *Anheuser-Busch, Inc. v. Major Mud & Chemical Co.*, 221 USPQ 1191, 1195 n.9 (TTAB 1984) (request for costs and attorneys fees was denied, inter alia, on the ground that the TTAB had no authority to award such fees and costs); *Luehrmann v. Kwik Kopy Corp.*, 2 USPQ2d 1303, 1305 n.4 (TTAB 1987) (the TTAB has no authority to grant monetary relief); *Fort Howard Paper Co. v. G.V. Gambina, Inc.*, 4 USPQ2d 1552, 1554 (TTAB 1987) (the TTAB has no authority to order costs or attorney's fees); *Paolo's Associates Ltd. Partnership v. Bodo*, 21 USPQ2d 1899, 1904 n.3 (Comm'r Pat. 1990) (the TTAB was correct in holding that 37 CFR 2.127(f) denies the TTAB authority to either award attorney's fees or costs to any party in a cancellation and opposition proceeding); *Nabisco Brands, Inc. v. Keebler Co.*, 28 USPQ2d 1237, 1238 (TTAB 1993) (the TTAB held, inter alia, that it did not have authority to award fees under 37 CFR 2.127(f)).

None of the decisions mentioned above provide any reasoned analysis or rationale to explain why the Commissioner lacks authority to promulgate a rule which would authorize imposition of monetary sanctions in appropriate cases. In view of the existence of the decisions, however, it is believed that a discussion of the Commissioner's authority to promulgate a rule authorizing the Board to award compensatory monetary sanctions is appropriate.

The Commissioner has been delegated the authority by the Congress to "establish regulations, not inconsistent with law, for the conduct of proceedings in the Patent and Trademark Office." 35 U.S.C. 6(a).

The U.S. Court of Appeals for the Federal Circuit upheld the authority of the Commissioner to issue regulations imposing sanctions in interference cases. In *Gerritsen v. Shirai*, 979 F.2d 1524, 24 USPQ2d 1912 (Fed. Cir. 1992), the Federal Circuit noted that 37 CFR 1.616 was a permissible exercise of the Commissioner's authority under 35 U.S.C. 6(a) and complied with the limitation on sanctions of the Administrative Procedure Act. The court stated (979 F.2d at 1527 n.3, 24 USPQ2d at 1915 n.3):

35 U.S.C. § 6(a) (1988) permits the Commissioner of Patents and Trademarks to "establish regulations, not inconsistent with law, for the conduct of proceedings in the Patent and Trademark Office." Congress thus delegated plenary authority over PTO practice, including interference proceedings, to the Commissioner. On its face, 37 CFR § 1.616 represents a permissible exercise of that authority. Since the decision to impose a sanction . . . was authorized by law, it comports with the Administrative Procedure Act, 5 U.S.C. § 558(b) (1988).

In *Gerritsen*, the Federal Circuit held that the particular rule violation was sanctionable, but that the specific sanction chosen by the Board was too severe. Accordingly, the sanction was vacated and the case was remanded to the Board for imposition of a more appropriate sanction.

In *Abrutyn v. Giovanniello*, 15 F.3d 1048, 1050, 29 USPQ2d 1615, 1617 (Fed. Cir. 1994), the Federal Circuit again upheld the authority of the Board or an administrative patent judge to impose sanctions, including imposition of the most severe sanction, granting judgment against one of the parties:

The Board or EIC [Examiner-in-Chief, now administrative patent judge] may impose an appropriate sanction, including granting judgment in an interference, against a party who fails to comply with the rules governing interferences, including filing deadlines. 37 CFR § 1.616 (1993).

*Gerritsen* and *Abrutyn* judicially establish that the Commissioner has authority under 35 U.S.C. 6(a) to promulgate regulations which impose a spectrum of sanctions, including imposition of the ultimate sanction of judgment or dismissal.

As a general matter, agencies are given broad authority in the selection of an appropriate sanction. The choice of sanction within agency statutory limits will be upheld unless it constitutes an abuse of discretion. *Butz v. Glover Livestock Comm'n Co.*, 411 U.S. 182 (1973); *Lawrence v. Commodity Futures Trading Comm'n*, 759 F.2d 767, 774 (9th Cir. 1985). Current § 1.616 authorizes an administrative patent judge or the Board to impose a spectrum of sanctions. The sanctions range from holding certain facts established for purposes of the interference (37 CFR § 1.616(a)) to granting judgment against the party who violated a regulation or an order (37 CFR § 1.616(e)). As indicated above, the Federal Circuit has upheld the Commissioner's authority to promulgate § 1.616 and impose the specified sanctions (*Gerritsen*, 979 F.2d at 1527 n.3, 24 USPQ2d at 1915 n.3), including granting judgment against a party (*Abrutyn*, 15 F.3d at 1050, 29 USPQ2d at 1617). Judgment and dismissal are the most severe forms of sanction. See *National Hockey League v. Metropolitan Hockey Club*, 427 U.S. 639, 643 (1976); *Poulis v. State Farm Fire and Casualty Co.*, 747 F.2d 863, 867 (3d Cir. 1984); *Cine Forty-Second St. Theatre Corp. v. Allied Artists Pictures Corp.*, 602 F.2d 1062, 1066 (2d Cir. 1979). Consistent with these cases, the Federal Circuit has held that a holding by the Board that a party is not entitled to a patent directed to certain claims is an extreme sanction. *Gerritsen*, 979 F.2d at 1532 n.12, 24 USPQ2d at 1919 n.12.

The imposition of monetary sanctions is manifestly a lesser sanction than judgment or dismissal. Indeed, reimbursement of expenses incurred as a result of inappropriate action by the opposing party has been held to be a mild form of sanction. *Cine Forty-Second St.*, 602 F.2d at 1066. More stringent sanctions include orders striking out portions of a pleading, orders prohibiting the introduction of evidence on a particular point, and orders deeming a disputed issue determined adversely to the position of a disobedient party. *Id.*

Since the imposition of a monetary sanction is a lesser sanction than judgment against a party, the inclusion of an "appropriate" monetary sanction in § 1.616, as adopted, is not outside the Commissioner's rulemaking authority and would not be inconsistent with the sanctions already present in § 1.616.

Whether a monetary sanction is appropriate depends on the purpose of the sanction. Civil sanctions may be categorized as penal and remedial. One is not to be subjected by an agency to a penal sanction unless the words of the statute plainly authorize imposition of a penal sanction. *Commissioner v. Acker*, 361 U.S. 87, 91 (1959). Thus, a statute must plainly authorize an agency's power to impose penalties. *Pender Peanut Corp. v. United States*, 20 Cl. Ct. 447, 453-55 (1990). Agencies have no inherent authority, based solely on their enabling statute, to impose penal sanctions. That authority must be expressly given in the statute. *Pender Peanut Corp.*, 20 Cl. Ct. at 453-55 (1990); *Gold Kist, Inc. v. Department of Agriculture*, 741 F.2d 344, 348 (11th Cir. 1984); *Koch, Administrative Law and Practice* § 6.81 (1985). A penal sanction has been defined as one which inflicts a punishment. *United States v. Frame*, 885 F.2d 1119, 1142 (3d Cir. 1989).

On the other hand, an explicit grant of power from Congress need not underpin each exercise of agency authority. See *Zola v. Interstate Commerce Commission*, 889 F.2d 508, 516 (3d Cir. 1989), citing *Amoskeag Co. v. Interstate Commerce Commission*, 590 F.2d 388, 392 (1st Cir. 1979). Where the enabling statute authorizes the agency to make such rules and regulations as may be necessary to carry out the provisions of an act — the regulation will be sustained so long as it is reasonably related to the purpose of the act. *Mourning v. Family Publications Service, Inc.*, 411 U.S. 356, 369 (1973). Under its enabling legislation, an agency has inherent power to impose administrative sanctions that are not "penalties" as long as the sanctions are reasonably related to the purpose of the enabling statute. *Gold Kist*, 741 F.2d at 348. Accordingly, in evaluating whether

the imposition of a sanction is within an agency's inherent powers, it is necessary to determine whether the sanction is remedial or punitive. *Frame*, 885 F.2d at 1142. Remedial sanctions may be within the agency's inherent powers if reasonably related to the purpose of enabling legislation. A remedial sanction is one whose purpose is not to stigmatize or punish wrongdoers. *Frame*, 885 F.2d at 1143.

Thus, in the absence of express statutory authority, the Commissioner's authority to impose monetary sanctions is limited to sanctions which are remedial in nature rather than punitive. In addition, the sanctions must be reasonably related to the purpose of enabling statute under which PTO operates. Under these guidelines, the Commissioner would appear to be without authority to issue a regulation which permits a penal sanction to be imposed against a party or an attorney for violation of a rule or order. Fines payable to Government, including PTO, are manifestly intended to punish wrongdoing and are thus punitive in nature. Assessment to redress an injury to the public is in the nature of a penalty. *Republic Steel Corp. v. National Labor Relations Board*, 311 U.S. 7, 12-13 (1940). On the other hand, the imposition of costs or expenses, including attorneys' fees, incurred by an opposing party due to the violation of a rule or order, may properly be considered remedial. Imposing costs or attorneys' fees serves to defray the expenses actually incurred by the opposing party for the violation of a rule or order by an opponent. See *Poulis*, 747 F.2d at 869 (non-dilatory party will not have to bear the brunt of the attorney's delay). Monetary sanctions would enhance the Board's ability to protect the integrity of its proceedings. See *Zola* 889 F.2d at 516 (ICC justified in imposing monetary sanctions in acting to protect the integrity of its jurisdiction). Monetary sanctions would also allow the Board to maintain control of its docket to maximize the use of limited resources. See *Griffin & Dickson v. United States*, 16 Cl. Ct. 347, 351 (1989) (case management responsibilities require broad inherent authority to impose [non-penal] sanctions). Imposition of monetary sanctions is the only sanction both mild enough and flexible enough to use in day-to-day enforcement of orderly and expeditious litigation. *Eash v. Riggins Trucking, Inc.*, 757 F.2d 557, 567 (3d Cir. 1985) (in banc). Thus, monetary sanctions are reasonably related to the Commissioner's plenary authority to promulgate regulations for the conduct of proceedings, including interference proceedings in PTO.

Section 1.616(b), as proposed to be amended, would have authorized the imposition of a sanction, including a sanction in the form of compensatory expenses and/or attorney fees, against a party for taking or maintaining a frivolous position. A number of comments were received opposing the authorization of sanctions for taking or maintaining frivolous positions (§ 1.616(b)). Several comments suggested that the question of what is "frivolous" is inherently highly subjective and will therefore be frequently raised, substantially increasing costs and delaying decisions on more substantive issues. PTO believes, however, consistent with other comments received during the comment period, that inasmuch as a groundless motion for sanctions would itself be grounds for sanctioning the movant for taking or maintaining a frivolous position, it is expected that motions for sanctions will only be filed in clear cases. One comment suggested that § 1.616(b) be reworded to parallel Rule 11 of the Federal Rules of Civil Procedure so that sanctions would only be imposed upon motion by an opponent, subject to a twenty-one day "safe harbor" withdrawal provision, and would explicitly apply only to frivolous positions taken in writing. Another comment, while supportive of the proposed amendment on the ground that it should reduce the number of frivolous papers, cautioned against treating as frivolous "that which is simply born of ignorance." The suggestion to have § 1.616(b) authorize sanctions imposed only on motion by a party is not being adopted. There may be situations in which the Board believes it would be appropriate to award compensatory fees or expenses even in the absence of a motion by a party. The suggestion that Fed. R. Civ. P. 11 permits sanctions only upon motion is believed to be incorrect; for example, Fed. R. Civ. P. 11(c)(1)(b) authorizes sanctions on the court's initiative. The suggestion to use the "safe harbor" approach of Fed. R. Civ. P. 11(c)(1)(A), which provides that a motion for sanctions shall be served but not filed unless, within 21 days after service of the motion, the challenged position is not withdrawn or appropriately corrected, is not being adopted. The administra-



tive patent judge and the Board should know the reason why a party has withdrawn or corrected a position. Nevertheless, in order to make it clear that sanctions will not be imposed for mistakenly taking an erroneous position that is withdrawn or corrected as soon as the error becomes apparent, the proposed phrase "for taking or maintaining a frivolous position" is changed to "for taking and maintaining a frivolous position."

The suggestion that § 1.616(b) sanctions be limited to frivolous positions taken in writing is based on the Advisory Committee Note on the 1993 amendments to Fed. R. Civ. P. 11. The Note states in pertinent part: "The rule applies only to assertions contained in papers filed with or submitted to the court. It does not cover matters arising for the first time during oral presentations to the court, when counsel may make statements that would not have been made if there had been more time for study and reflection." For the reason given in the Advisory Committee Note, the suggestion is being adopted. Accordingly, § 1.616(b) as adopted is limited to a frivolous position taken and maintained in papers filed in the interference and shall apply only to frivolous positions taken and maintained after the effective date of § 1.616 as amended.

Other comments questioned how the Board intends to handle proof of amounts of compensatory expenses and/or attorney fees and expressed the hope that attorney fee awards will not be *de facto* discriminatory as between highly paid outside counsel and in-house counsel without fees or billing records. The matter of how to prove amounts of compensatory expenses and/or attorney fees will be handled on a case-by-case basis. Another comment suggested that an administrative patent judge or the Board be required to issue an order to show cause prior to imposing a sanction, since a party may be able to explain why a sanction should not be imposed. The suggestion is presumably based on Fed. R. Civ. P. 11(c)(1)(B) and directed to cases in which an administrative patent judge or the Board on its own initiative determines that a sanction is appropriate. The suggestion is being adopted and implemented in a new paragraph, § 1.616(d). In addition, paragraph (d) expressly provides that a party may file a motion (§ 1.635) requesting the imposition of sanctions, the drawing of adverse inferences or other action under paragraph (a), (b) or (c) of § 1.616.

### III. Certificates of Prior Consultation.

Section 1.637(b) currently requires that a miscellaneous motion under § 1.635 contain a certificate stating that the moving party has conferred with all opponents in a good faith effort to resolve by agreement the issues raised by the motion and indicating whether any other party plans to oppose the motion. In the Notice of Proposed Rulemaking, it was proposed to amend paragraph (b) to extend the requirement for such a certificate to preliminary motions filed under § 1.633 and other motions filed under § 1.634. It also was proposed to require the certificate to indicate that the reasons and facts in support of the motion were discussed with each opponent and, if an opponent has indicated that it will oppose the motion, to identify the issues and/or facts believed to be in dispute.

The rationale offered in the Notice of Proposed Rulemaking for the amendment was an expectation that consultation would result in a reduction in the number of issues raised by motions under §§ 1.633-34, as well as a reduction in the number of motions filed under those rules. All but one of many comments received in response to the proposal urged that the proposed rule not be adopted. In support, it was said that the proposed rule would unnecessarily increase the time and costs required to file motions under §§ 1.633-34, particularly preliminary motions. PTO, upon reflection, agrees with the comments. Accordingly, the proposal to extend the consultation requirement of § 1.637(b) to §§ 1.633-34 motions is withdrawn. The withdrawal of the proposed rule, however, should not be interpreted as precluding an administrative patent judge from holding a conference call prior to the date preliminary motions are due for the purpose of discussing which preliminary motions the parties plan to file or from entering an order requiring prior consultation as to a particular motion.

Several comments, citing experience with the consultation requirement for § 1.635 motions, suggested that § 1.637(b) be dropped altogether, or be limited at most to motions requesting extensions of time. The suggestion is not being adopted. How-

ever, there are circumstances where it may be appropriate to suspend the requirements of § 1.637(b). An example is a multi-party interference where one party may need to consult with a large number of opponents. Another example is a motion filed after a hearing before an administrative patent judge, where filing of the motion was authorized at the hearing. Accordingly, while the suggestion to delete the requirement for consultation altogether is not being adopted, the language "Unless otherwise ordered by an administrative patent judge or the Board" is added at the beginning of the first sentence of § 1.637(b).

Several comments were received which were also critical of the proposal to amend § 1.637(b), even if applied only to § 1.635 motions, to require that the certificate "indicate that the reasons and facts in support of the motion were discussed with each opponent and, if an opponent has indicated that it will oppose the motion, identify the issues and/or facts believed to be in dispute." One comment suggested that the proposal is unworkably vague with respect to: (1) the form of the information a party must provide to the opponent (e.g., a draft motion, an outline of the motion, a verbal statement of the motion, the evidence in support of the motion); (2) what form the opponent must use to provide its reasons for opposing (i.e., written or oral); and (3) whether the moving party can change the arguments in the motion in response to the reasons given by the opposing party without the need for another consultation. Other comments noted that an opponent may not have sufficient time before the due date for motions in which to take a reasoned position on the motion. Another comment observed that it is very difficult for the movant to identify the issues or facts believed to be in dispute, unless it is a very cursory exercise. According to the comment, the party cannot know what the opponent is really thinking, and suggested instead that there be an in-person conference involving the parties and the administrative patent judge in order to discuss all intended (or filed) motions. The comments are believed to be well taken and the proposal in the Notice of Proposed Rulemaking to amend § 1.637(b) to require that the motion, "if an opponent has indicated that it will oppose the motion, identify the issues and/or facts believed to be in dispute" is withdrawn.

### IV. Service of a "Developing Record."

In addition to the amendments to § 1.672 discussed above under the heading "Amendments responsive to adoption of Public Laws 103-182 and 103-465," §§ 1.672, 1.682, 1.683 and 1.688 are amended, as proposed (with a few minor modifications discussed *infra*), to require each party to serve on each opponent a "developing record" that will evolve into the record required to be filed under § 1.653.

As noted above, the Notice of Proposed Rulemaking proposed to amend paragraph (b) of § 1.672 to provide that a party presenting testimony of a witness by affidavit shall, no later than the time set by the administrative patent judge for serving affidavits, file (and serve) the affidavit, whether it is a new affidavit or an affidavit previously filed by that party during ex parte prosecution of an application or under § 1.608 or 1.639(b). Furthermore, in view of the proposed amendment to § 1.672(b), it was also proposed to remove and reserve, as superfluous, § 1.671(e), which requires a party to give notice of intent to rely on an affidavit filed by that party during ex parte prosecution of an application or an affidavit under § 1.608 or 1.639(b). An oral comment suggested that § 1.671(e) notice practice be retained with respect to § 1.639(b) affidavits, so that a party does not have to refile (and re-serve) a previously submitted § 1.639(b) affidavit on which it intends to rely at final hearing. The comment further suggested that for the same reason § 1.671(e) notice practice should be extended to patents and printed publications filed and served pursuant to § 1.639(b). The suggestions are being adopted. Section 1.671(e) thus revised reads as follows:

(e) A party may not rely on an affidavit (including any exhibits), patent or printed publication previously submitted by the party under § 1.639(b) unless a copy of the affidavit, patent or printed publication has been served and a written notice is filed prior to the close of the party's relevant testimony period stating that the party intends to rely on the affidavit, patent or printed publication. When proper notice

is given under this paragraph, the affidavit, patent or printed publication shall be deemed as filed under §§ 1.640(b), 1.640(e)(3), 1.672(b) or 1.682(a), as appropriate.

Furthermore, in order to ensure that the evidence submitted under § 1.639(b) includes sequential numbering of the type required of other evidence filed under § 1.672(b), § 1.639(b) is revised to require the use of sequential numbering, which, for the reasons discussed *infra*, is required to be used only to the extent possible.

As explained *supra*, in view of the retention of § 1.671(e) in amended form, § 1.672(b), as adopted, permits a party to file an affidavit or, if appropriate, a notice under § 1.671(e).

Sections 1.682, 1.683 and 1.688 are revised, substantially as proposed, to parallel the amendments to § 1.672. Section 1.682(a) as proposed to be amended provides that a party may introduce into evidence, if otherwise admissible, an official record or printed publication not identified in an affidavit or on the record during an oral deposition of a witness, by filing (and serving) a copy of the official record or publication no later than the time set for filing affidavits under § 1.672(b), thereby eliminating the current requirement for filing a notice of intent to rely on the official record or printed publication. In view of the retention of § 1.671(e) in amended form to permit a party to file a notice of intent to rely on patents and publications previously filed by the party under § 1.639(b), § 1.682(a), as adopted, permits a party to file a copy of an official record or printed publication or, if appropriate, a notice under § 1.671(e). Section 1.683(a) is amended, as proposed, to provide that a party may introduce into evidence, if otherwise admissible, testimony by affidavit or oral deposition from another interference, proceeding, or action involving the same parties by filing (and serving) a copy of the affidavit or a copy of the deposition transcript no later than the time set for filing affidavits under § 1.672(b), thereby eliminating the current requirement for a party to file a motion under § 1.635 for leave to rely on such testimony. Section 1.688(a) is amended, as proposed, to provide that, if otherwise admissible, a party may introduce into evidence an answer to a written request for an admission or an answer to a written interrogatory obtained by discovery under § 1.687 by filing a copy of the request for admission or the written interrogatory and the answer no later than the time set for filing affidavits under § 1.672(b). Thus, all evidence filed under §§ 1.672, 1.682, 1.683 and 1.688 that relates to a party's case-in-chief should be filed (and served) or noticed under § 1.671(e) no later than the date set by an administrative patent judge for the party to serve affidavits under § 1.672(b) for its case-in-chief and all evidence under those sections that relates to the party's rebuttal should be filed (and served) or noticed under § 1.671(e) no later than the date set for the party to serve affidavits under § 1.672(b) for its case-in-rebuttal.

The Notice of Proposed Rulemaking proposed that the pages of all affidavits and deposition transcripts that a party enters into evidence pursuant to §§ 1.672, 1.682, 1.683 and 1.688 shall include sequential page numbers, which shall also serve as the record page numbers for the affidavits and deposition transcripts in the party's record when it is filed under § 1.653. Likewise, the Notice of Proposed Rulemaking proposed that exhibits identified in the affidavits and deposition transcripts and any official records and printed publications served under § 1.682(a) shall be given sequential numbers, which shall serve as the exhibit numbers when the exhibits are filed under § 1.653(i) with the party's record. The major benefit of sequential page numbering is that a particular page of an affidavit or exhibit will be referred to in a consistent manner throughout the record. Thus, when an affiant is subject to cross-examination about the affiant's affidavit or another person's affidavit, the record will be clear as to the material which is the subject of the cross-examination. Correlation of pages of affidavits and/or exhibits will no longer be necessary.

Regarding the sequential numbering of affidavits, one comment noted that:

while this might be of some minor convenience to the PTO, it is inconvenient for the public, and may be difficult to be accomplished in practice. Due to severe PTO time constraints in preparing affidavits, it is usually essential to amend, add to, rewrite and execute declarations and affidavits

in parallel. Often, the declarants are in different physical locations. Modern offices do not have the old fashioned manual impact typewriters that would be required to superpose new page numbers on executed documents. Declarations are already clearly identifiable, by the name of the declarant and the page of his or her declaration. . . .

The comment apparently assumes, incorrectly, that the required sequential numbers are to be used in lieu of the usual page numbers that appear in affidavits and deposition transcripts. The sequential numbers are in addition to the usual page numbers and are typically added to the pages by a sequential numbering device (e.g., a "Bates" stamp).

Since a party may decide not to rely at final hearing on a previously filed § 1.639(b) affidavit (including any exhibits), or on patents and printed publications that it previously filed under § 1.639(b) in connection with a motion, there may be gaps in the sequential numbers of the affidavit pages and exhibits that are relied on at final hearing. Compare, e.g., Federal Circuit Rule 30(c)(2) with respect to pages omitted from an appendix. Furthermore, due to circumstances beyond the party's control it may not be possible to submit the § 1.639(b) affidavits and accompanying exhibits into evidence in the proper order. Finally, the exhibits referred to in testimony under § 1.683 from another proceeding will obviously already have the exhibit numbers assigned to them in that proceeding. When possible, those planning to use exhibits and testimony from a previous interference may wish to avoid using an exhibit number used in the previous interference, thereby minimizing the possibility of confusion which can exist when two exhibits in the same record have the same exhibit number. For these reasons, the proposal to amend § 1.672 to require that testimony pages and exhibits "shall be given sequential numbers" is changed to a requirement that testimony and exhibits "shall be given sequential numbers to the extent possible." This change also applies to evidence submitted under §§ 1.682, 1.683 and 1.688 as amended, which state that the pages of affidavits and deposition transcripts served under those paragraphs and any new exhibits served therewith shall be assigned sequential numbers by the party in the manner set forth in § 1.672(b). In order to take into account that there may be gaps in page numbers in the record and in the exhibit numbers, § 1.653(d) is revised to state that the pages of the record shall be consecutively numbered "to the extent possible." Sections 1.677(a) and (b) are revised in a similar manner. That is, paragraph (a) is revised to limit its requirement for consecutive page numbering, which the rule currently applies to "the entire record of each party," to the pages of each transcript. Paragraph (b) is revised to require that exhibits be numbered consecutively "to the extent possible."

Section 1.672(a) affidavits and § 1.683(a) testimony shall be accompanied by an index giving the name of each witness and the number of the page where the testimony of each witness begins. The exhibits shall be accompanied by an index briefly describing the nature of each exhibit and giving the number of the page of affidavit or § 1.683(a) testimony where each exhibit identified in an affidavit or during an oral deposition is first identified and offered into evidence.

An opponent who objects to the admissibility of any evidence filed under §§ 1.672(b), 1.682(b), 1.683(a) and 1.688(a) must file objections under §§ 1.672(c), 1.682(c), 1.683(b) and 1.688(b) no later than the date set by the administrative patent judge for filing objections to affidavits under paragraph § 1.672(c). An opponent who fails to challenge the admissibility of the evidence on a ground that could have been raised in a timely objection under §§ 1.672(c), 1.682(c), 1.683(b) or 1.688(b) will not be permitted to move under § 1.656(h) to suppress the evidence on that ground. If an opponent timely files an objection to evidence filed under §§ 1.672(b), 1.682(b), 1.683(a) or 1.688(a), the party may respond by filing one or more supplemental affidavits and, in the case of objections to evidence filed under §§ 1.672(b), 1.682(b) and 1.683(a), may also file supplemental official records or printed publications. No objection to the admissibility of supplemental evidence shall be made except as provided by § 1.656(h). A party submitting evidence in response to an objection is aware of the objection and should take whatever steps are necessary in presenting supplemental evidence to overcome the objection. Whether the steps were sufficient is determined at final hearing on the basis of a motion to suppress the evidence under § 1.656(h).



The pages of the supplemental affidavits shall be sequentially numbered beginning with the number following the last page number of the testimony served under §§ 1.672(b), 1.683(a) and 1.688(a), if possible. Likewise, any additional exhibits identified in the supplemental affidavits and any supplemental official records and printed publications shall be given sequential numbers beginning with the number following the last number of the previously identified exhibits, if possible. After the time expires for filing objections and supplemental affidavits, or earlier when appropriate, the administrative patent judge shall set a time within which any opponent may file a request to cross-examine an affiant on oral deposition.

If any opponent requests cross-examination of an affiant, the party shall notice a deposition at a reasonable location within the United States under § 1.673(e) for the purpose of cross-examination. Ordinarily, the parties should be able to agree on a "reasonable" place within the United States. Whether a place is a reasonable place depends on the circumstances. Generally a reasonable place within the United States would be the place where a witness resides or the office of one of the counsel of record in the interference. In assessing the reasonableness of a place, the convenience of both parties should be considered. For example, in a two-party interference if an affiant normally resides in Ohio and counsel are located respectively in Illinois and New York, noticing a deposition for Arizona may not be reasonable. In the event agreement cannot be reached, a place will be set by the administrative patent judge for taking the deposition.

Any redirect and recross shall take place at the deposition. Within 45 days of the close of the period for taking cross-examination (§ 1.678 is revised to change the time for filing certified transcripts from 45 days to one month), the party shall serve (but not file) a copy of each deposition transcript on each opponent together with copies of any additional documentary exhibits identified by a witness during a deposition. The pages of the transcripts served under this paragraph and the accompanying exhibits shall be sequentially numbered in the manner discussed above. The deposition transcripts shall be accompanied by an index of the names of the witnesses, giving the number of the page where cross-examination, redirect and recross of each witness begins, and an index of exhibits of the type specified in § 1.672(b). At this point in time, the opponent will have been served with all of the testimony that will appear in the party's record (with the same page numbers) as well as all of the documentary exhibits that will accompany the record (with the same exhibit numbers).

In the first sentence of § 1.688(a), the comma proposed to be inserted after "evidence" is inserted instead after "admissible."

#### V. Miscellaneous Amendments.

Although not proposed in the Notice of Proposed Rulemaking, the authority citation for 37 CFR Part 1 is revised by changing it from "35 U.S.C. 6" to "35 U.S.C. 6 and 23."

Throughout the rules, the term "examiner-in-chief" is replaced by "administrative patent judge" to reflect the change in the title of the members of the Board. See Commissioner's Notice of October 15, 1993, "New Title for Examiners-in-Chief," 1156 Off. Gaz. Pat. Office 332 (Nov. 9, 1993). One comment correctly noted that the Notice of Proposed Rulemaking failed to apply the change to § 1.610(b). The omission has been corrected. Another comment, citing possible confusion over the meaning of the term "administrative patent judge," suggested adding one of the following provisions to § 1.601 to define "administrative patent judge" in either of the following ways:

An administrative patent judge is a member of the Board of Patent Appeals and Interferences, or

An administrative patent judge is an examiner-in-chief (35 U.S.C. 7) or the Commissioner, the Deputy Commissioner or, an Assistant Commissioner when acting as a member of the Board of Patent Appeals and Interferences.

Neither suggestion is being adopted. The members of the Board of Patent Appeals and Interferences are the Commissioner [Assistant Secretary and Commissioner of Patents and Trademarks], the Deputy Commissioner [Deputy Assistant Sec-

retary and Deputy Commissioner of Patents and Trademarks] and the Assistant Commissioners [the Assistant Commissioner for Patents and the Assistant Commissioner for Trademarks], and the examiners-in-chief, now administrative patent judges, including the Chief Administrative Patent Judge and the Vice-Chief Administrative Patent Judge, 35 U.S.C. 7(a). While the rules talk in terms of administrative patent judge, it must be recognized that any member of the Board, including a Commissioner-member, may take action in an interference which can be taken by an administrative patent judge.

Section 1.11(e) is revised to allow access to the file of an interference involving a reissue application once the interference has terminated or an award of priority or judgment has been entered as to all counts. Although it was intended that the public have access to any interference that involves a case which is open to the public, and § 1.11(b) provides that a reissue application is open to the public, interferences involving reissue applications were inadvertently not included in current § 1.11(e).

Section 1.192(a), which specifies the contents of the brief of an appellant for final hearing in an ex parte appeal, is revised to state that arguments or authorities not included in the brief will be refused consideration by the Board unless good cause is shown. The rule previously stated that such arguments and authorities may be refused consideration by the Board, without specifying how the Board decides whether or not it should be considered. One comment suggested that the amendment, if adopted, would make PTO less "user friendly" and would increase the burden of mere technicalities on applicants. It is believed that the comment misapprehends the nature of the proposed change, inasmuch as the change would merely codify the "good cause" standard that is currently applied by the Board in determining whether a new argument or authority will be considered.

Section 1.192(c) is revised in several respects. A first amendment simplifies the language used in the rule to refer to a brief filed by an applicant who is not represented by a registered practitioner. A second amendment removes from paragraph (c) the requirement that such a brief be in substantial compliance with the requirements of paragraphs (c)(1), (2), (6) and (7). Experience has shown that it is better to evaluate pro se briefs on a case-by-case basis. Section 1.192(c) is also revised to redesignate current paragraphs (c)(1) through (c)(7) as paragraphs (c)(3) through (c)(9), and to add new paragraphs (c)(1) and (c)(2). The added paragraphs (c)(1) and (c)(2) require an appellant who has filed an appeal to the Board to identify the real party in interest and any related appeals and interferences. It is necessary to know the identity of the real party in interest so that members of the Board can comply with applicable ethics regulations associated with working on matters in which the member has an interest. The requirement to identify related appeals and interferences is derived in part from Federal Circuit Rule 47.5 and will minimize the chance that the Board will enter inconsistent decisions in related cases.

One comment suggested that the term "real party in interest" be replaced by "owner" in order to avoid confusion with the term "party in interest of record," which appears in PTO's Notice of Allowance and Issue Fee Due (PTO-85B). The suggestion is not being adopted, since it appears unlikely that any confusion will occur.

A comment on behalf of a large U.S. corporation having extensive overseas operations noted that the proposed requirement to identify the real party in interest will impose a substantial burden in appeals to the Board where the real party in interest is a corporation with international operations and many diverse and frequently changing affiliates. The comment was accompanied by a copy of a "Certificate of Interest" previously filed by the corporation in an appeal to the Federal Circuit, which named some three hundred subsidiaries and affiliates in which the corporation had an ownership interest of five percent or more. According to the comment, if ownership interests of less than five percent had been included, the list would have been about twice as long. The comment explained that because the corporation's business interests worldwide are frequently changing, the list would require updating for each and every appeal brief, and questioned whether this burden is justified. Upon consideration of the comment, it is believed, at this particular time, that the proposed rule would be burdensome on the public. Whether in the future more information might

be required to the nature of a real party in interest is a matter which can await experience under a rule which requires identification only of the real party in interest. Accordingly, the suggestion is being adopted to the extent of requiring appellants to the Board to identify only the real party in interest. In this respect, § 1.192(c)(1) will parallel an equivalent requirement for briefs in inter partes cases. See § 1.656(b)(1)(ii), as amended.

One comment suggested revising proposed § 1.192(c)(9), which calls for an appendix including the claims on appeal, to include a statement that the rule sets forth the minimum requirements for a brief. According to the comment, the statement would make it clear that § 1.192 does not prohibit inclusion of other materials which an appellant may consider necessary or desirable, a point which the comment noted is explained in the Manual of Patent Examining Procedure § 1206, at 1200-6. The suggestion is not being adopted, since it is believed to be apparent from the rule that the requirements set forth therein are the minimum requirements.

Section 1.192 as proposed to be amended in the Notice of Proposed Rulemaking includes an amendment to current paragraph (a)(5) ("Grouping of claims"), proposed to be redesignated as paragraph (a)(7), that inadvertently was not discussed in the commentary in the Notice of Proposed Rulemaking. Specifically, it was proposed to amend that paragraph to state that for each ground of rejection which an appellant contests and which applies to more than one claim, the rejected claims shall stand or fall together with the broadest claim, and that only the broadest claim would be considered by the Board of Patent Appeals and Interferences unless a statement is included that the rejected claims do not stand or fall together and, in the argument under paragraph (c)(8), appellant presents reasons as to why appellant considers the rejected claims to be separately patentable from the broadest claim; merely pointing out what a claim covers is not an argument as to why the claim is separately patentable from the broadest claim. One comment suggested that it is not always clear which is the broadest claim, such as where there are two broad independent claims of differing scope (e.g., claims to ABCDE and ABCDF). The comment suggested that simply saying that the claims stand or fall together, as the current rule does, is probably the best one can do on a generic basis. The points raised by the comment are partly well taken. Paragraph (c)(7), as adopted, therefore reads as follows:

*Grouping of claims.* For each ground of rejection which appellant contests and which applies to a group of two or more claims, the Board shall select a single claim from the group and shall decide the appeal as to the ground of rejection on the basis of that claim alone unless a statement is included that the claims of the group do not stand or fall together and, in the argument under paragraph (c)(8) of this section, appellant explains why the claims of the group are believed to be separately patentable. Merely pointing out differences in what the claims cover is not an argument as to why the claims are separately patentable.

Where there is a "broadest" claim, that claim will normally be selected. Where there are two broad claims, such as ABCDE and ABCDF, as mentioned in the comment, the panel assigned to the case will select which claim to consider. The same would be true in a case where there are both broad method and apparatus claims. The rationale behind the rule, as amended, is to make the appeal process as efficient as possible. Thus, while the Board will consider each separately argued claim, the work of the Board can be done in a more efficient manner by selecting a single claim when the appellant does not meet the conditions of paragraph (c)(7) of § 1.192, as adopted. The choice of whether each claim will be considered separately or whether all claims will be considered on the basis of a single claim is a choice to be made by the appellant.

The term "subparagraph," which appeared in §§ 1.192(c)(7) and (c)(8) in their originally proposed form, has been replaced by "paragraph" in those sections as amended.

Section 1.601 in general defines a number of terms used throughout the interference rules. One comment noted that a consistent format is not used throughout the definitions. For example, in § 1.601(q) all defined terms are italicized and in § 1.601(n) the defined terms are in quotation marks. The comment is well taken that there should be uniformity. Accordingly,

paragraphs (l), (m) and (n) are revised by italicizing the first occurrence of each of the following defined terms: "junior party", "same patentable invention" and "separate patentable invention."

The Notice of Proposed Rulemaking proposed amending paragraph (f) of § 1.601 in a number of respects, including adding the following sentence: "A count should be broad enough to encompass the broadest corresponding patentable claim of each of the parties." One comment questioned whether the requirement is to be applied only at the time the interference is declared or throughout the interference. The comment notes that after an interference is declared, prior art may come to light which renders unpatentable all of the parties' claims that correspond to the count. The comment suggests that under these circumstances, requiring a count to be patentable over the prior art could mean that there might not be a proper count. According to the comment, a result might be that the Board, whose authority to enter judgments under the rules is limited to claims that correspond to a count (§§ 1.658 and 1.659), would be unable to enter judgment against the claims on the ground of unpatentability. Furthermore, since the Notice of Proposed Rulemaking was published, it has become apparent that § 1.601(f) could also be clarified in two other respects. First, the count should be broad enough to encompass all of the patentable claims that are designated as corresponding to the count, as opposed to solely each party's broadest corresponding patentable claim, i.e., where a party claims ABCDE in one claim and ABCDF in another claim and both claims are designated to correspond to the count. The current language of the rule can be argued to overlook the situation where a party has specific claims but no generic claim. Second, it should be made clear that the term "patentable" as used in § 1.601(f) in describing the scope of the count means patentable in view of the prior art, as opposed to unpatentability based on non-prior art grounds, e.g., the written description requirement of 35 U.S.C. 112, first paragraph. Accordingly, in lieu of the sentence proposed in the Notice of Proposed Rulemaking, § 1.601(f) is revised to include the following sentence: "At the time the interference is initially declared, a count should be broad enough to encompass all of the claims that are patentable over the prior art and designated to correspond to the count." A similar change is made in §§ 1.603 and 1.606. That is, instead of revising these rules to require that each application "must contain, or be amended to contain, at least one patentable claim that corresponds to the count," as proposed in the Notice of Proposed Rulemaking, these rules as amended require that each application "must contain, or be amended to contain, at least one claim that is patentable over the prior art and corresponds to the count."

The Notice of Proposed Rulemaking also proposed adding to § 1.601(f) a sentence stating: "A count may not be so broad as to be unpatentable over the prior art." Several comments questioned the meaning of the proposed sentence on the ground that a count, unlike a claim, does not have an effective filing date for purposes of establishing what is available against it as prior art. In view of the comments, the proposal to add the sentence is hereby withdrawn.

The Notice of Proposed Rulemaking proposed to amend the second sentence of § 1.601(f) by changing "which corresponds" to read "that is designated to correspond." This proposal should have referred instead to the third sentence, which is revised in the manner proposed. It was also proposed to revise the fourth and fifth sentences to read as follows, except that, for the reasons given above, the terms "correspond exactly" and "correspond substantially" are italicized rather than set off by quotation marks:

A claim of a patent or application which is designated to correspond to a count that is identical to a count is said to *correspond exactly* to the count. A claim of a patent or application designated to correspond to a count that is not identical to a count is said to *correspond substantially* to the count.

On oral comment suggested that these sentences could be made clearer by revising them to read as follows:

A claim of a patent or application that is designated to correspond to a count and is identical to the count is said



to correspond exactly to the count. A claim of a patent or application that is designated to correspond to a count but is not identical to the count is said to correspond substantially to the count.

This suggestion is being adopted.

As proposed in the Notice of Proposed Rulemaking, the fifth sentence of § 1.601(f) is revised by removing the phrase "but which defines the same patentable invention as the count," which is used to describe a claim that corresponds to the count but is not identical to the count. The phrase is superfluous because a claim that corresponds to the count by definition is directed to the same patentable invention as the count.

The Notice of Proposed Rulemaking proposed to revise the last sentence of § 1.601(f) to state that: "A phantom count is unpatentable to all parties under the written description requirement of the first paragraph of 35 U.S.C. 112." One comment said that the sentence as proposed to be revised is inaccurate supposedly because a phantom count is not necessarily unpatentable to all parties for lacking written description support. According to the comment, a party may have written description support for a new claim identical to the count, yet choose not to present such a claim during the interference for tactical reasons, such as the desire to keep the count narrow enough to prevent an opponent from presenting priority evidence it might be able to produce with respect to a broader count. Another comment suggested that a phantom count be defined as a count that is "broader than the disclosure of any party to the interference." A third comment suggested that patentability under the enablement and best mode requirements be addressed along with patentability under the written description requirement. Apart from the comments, since patentability affects claims rather than counts, the proposal to amend the last sentence of § 1.601(f) is hereby withdrawn and the last sentence in its current form is removed.

One comment suggested counts serve little, if any, purpose under the new rules. The comment states that if PTO nevertheless feels compelled by tradition to have counts, each count should be the alternative union of all the parties' claims that are designated to correspond to the same invention. The suggestion that counts be abolished altogether, while superficially appearing to have considerable merit, is believed to be outside the scope of the present rulemaking and, for that reason, is not being adopted at this time. The suggestion that a count be the alternative union of all of the parties' claims that define the same patentable invention would not appear to require any change in the rules. The formulation of the count, whether by reference to particular claims in the parties' applications/patents or by describing the subject matter of the interference, is a matter within the discretion of PTO at this time.

The Notice of Proposed Rulemaking proposed amending § 1.601(g). Specifically, it was proposed to define the effective filing date of an application as the filing date of an earlier application accorded to the application or patent under 35 U.S.C. 119, 120, 121 or 365, or, if no benefit is accorded, the filing date of the application, and to define the effective filing date of a patent as the filing date of an earlier application accorded to the patent under 35 U.S.C. 120, 121, or 365(c) or, if no benefit is accorded, the filing date of the application which matured into the patent. The purpose of including the reference to 35 U.S.C. 121 is to eliminate any doubt that a divisional application may be entitled to an earlier filing date in accordance with 35 U.S.C. 121.

One comment suggested that the definition of effective filing date in § 1.601(g) should be expressly keyed to the claims rather than to the applications and patents, since different claims in the same application or patent may have different effective filing dates. The comment also suggested that the rules should be revised to make it clear that a motion under § 1.633(h) to add a reissue application need not be accompanied by a motion under § 1.633(f) for benefit of the patent sought to be reissued. Another comment suggested that the rule be revised to state that the effective filing date referred to in § 1.601(g) is the effective filing date of an application which constitutes a constructive reduction to practice of the subject matter of the count so as to make it clear that the rule is not referring to the effective filing date of an involved claim. These comments demonstrate that there is considerable uncertainty with respect to the interrelationship between benefit issues and priority proof issues,

including, among other issues, (a) benefit for a claim, (b) benefit for a count, (c) constructive reductions to practice based on a species disclosed in an earlier application (foreign or domestic) when claims of the U.S. application are not supported under § 119 in the priority document (see *In re Gosteli*, 872 F.2d 1008, 10 USPQ2d 1614 (Fed. Cir. 1989) and *In re Scheiber*, 587 F.2d 59, 199 USPQ 782 (CCPA 1978), and compare to the so-called one species is sufficient for priority "rule"), and (d) the fact that under interference practice since 1985, patentability is an issue which can be raised, whereas prior to 1985, priority was "not ancillary" and could not be raised. A notice of proposed rulemaking will be issued in due course to address the issue, as well as other issues raised in comments responding to the current Notice of Proposed Rulemaking. A comment that the language of the proposed amendment to § 1.601(g) fails to take into account the fact that a patent may be accorded benefit of the filing date of an earlier foreign application during the interference is, however, well taken. Accordingly, § 1.601(g) is revised to make clear that a patent may be entitled to benefit under 35 U.S.C. 119.

As proposed in the Notice of Proposed Rulemaking, § 1.601(j) is revised by changing "which" to "that." One comment suggested changing "that corresponds to a count" to "that is designated to correspond to a count" for clarity and consistency with the language in § 1.601(f). The suggestion is being adopted.

In § 1.601, paragraph (l) is revised, as proposed, by changing "assignee" to "assignee of record in the Patent and Trademark Office."

Paragraph (q) of § 1.601 is revised by deleting "a panel of" as superfluous.

Section 1.602 is revised by changing "within 20 days of" to "within 20 days after." One comment suggested clarification of the meaning of "any right, title and interest," noting involvement in several disputes over whether this includes a relationship such as a non-exclusive license, and also questioned whether the rule requires a party in a three-party interference to disclose that it is paying another party's expenses or attorney fees. The suggestion, which is outside the scope of the present rulemaking, is not being adopted at this time. The suggestion will be made the subject of a future notice of proposed rulemaking.

Sections 1.603 and 1.606 are revised, as proposed, by deleting the third sentence ("Each count shall define a separate patentable invention.") as redundant in view of the identical sentence in § 1.601(f) and by requiring that each application to be put into interference contain, or be amended to contain, at least one claim which is patentable over the prior art and which corresponds to each count. The introductory language in each of these sections ("Before an interference is declared . . .") makes it clear that the patentability requirement applies at the time that the interference is declared, as opposed to at all times during the interference.

One comment suggested that §§ 1.603 and 1.606 be further revised to require the examiner to examine all of the prior art in all of the potential parties' application and patent files in making a patentability determination. The suggestion is not being adopted. Ordinarily, the examiner determines that claims are patentable before an interference is declared. While there may be no express statement, consideration of whether claims are patentable in one application to be placed in an interference normally would involve consideration of prior art in a second application to be placed in the same interference.

In § 1.604, paragraph (a)(1) is revised by changing "his or her" to "its."

In § 1.605, paragraph (a) is revised for clarification essentially in the manner set forth in the Notice of Proposed Rulemaking. Part of the last sentence of the rules, however, is revised to require an applicant to "explain why the other claims would be more appropriate to be designated to correspond to a count in any interference which may be declared." In responding to a request by an examiner to copy a claim for purpose of a possible interference, an applicant should present the exact claim requested by the examiner. Often, however, an applicant may believe that the claim suggested by the examiner is not appropriate. For example, an applicant may believe it cannot support the exact claim requested by the examiner. Accordingly, while the applicant must present the exact claim requested by the examiner, the applicant is also free to suggest

that the exact claim is inappropriate, but that other claims proposed by the applicant are more appropriate to be designated as corresponding to a count of any possible interference. Obviously, the applicant is also free to make a suggestion to the examiner as to what the count should be in any interference. The examiner can then determine whether an applicant's alternatively proposed claims are more appropriate than the exact claim suggested.

One comment suggested that § 1.605 further be revised "to include a reminder of the statutory prohibition against an interference copying claims from a patent issued more than one year, (as Rule 607 already does for applicants), since some examiners have been doing it" (original emphasis). The comment is understood to mean that examiners have suggested that applicants copy patent claims in violation of 35 U.S.C. 135(b). The suggested reminder is not incorporated into the rule, because it would not implement or interpret any requirement of law, and, while plausibly legitimate, is better made in administrative instructions, such as the Manual of Patent Examining Procedure.

Section 1.606 is also revised, as proposed, by adding a sentence stating that the claim in the application need not be, and most often will not be, identical to a claim in the patent.

One comment suggested that the last sentence of § 1.606, which the Notice of Proposed Rulemaking did not propose to revise, be revised to apply to application claims as well as patent claims and that the sentence be broken into two sentences for clarity, so as to read as follows:

At the time an interference is initially declared (§ 1.611), a count shall not be narrower in scope than (i) any application claim designated to correspond to the count and indicated in the form PTO-850 as allowable or (ii) any patent claim designated to correspond to the count. Any single patent claim designated to correspond to the count will be presumed, subject to a motion under § 1.633(c), not to contain separate patentable inventions.

The suggestion is being adopted; however, because it is inappropriate to refer to a PTO form in a rule, the following language is used:

At the time an interference is initially declared (§ 1.611), a count shall not be narrower in scope than any application claim that is patentable over the prior art and designated to correspond to the count or any patent claim designated to correspond to the count. Any single patent claim designated to correspond to the count will be presumed, subject to a motion under § 1.633(c), not to contain separate patentable inventions.

One comment questioned why the declaration of interferences under § 1.606 is limited to unexpired patents, suggesting that there are rare cases where it would be very desirable to have an interference between an application and either a patent that has expired or a patent that has lapsed for failure to pay a maintenance fee. The enabling statute, however, authorizes interferences involving patents which are "unexpired." 35 U.S.C. 135(a).

In § 1.607, paragraph (a)(4) is revised to change "his or her" to "its" and to add a new paragraph (a)(6) requiring an applicant seeking an interference with a patent to demonstrate compliance with 35 U.S.C. 135(b), which provides:

A claim which is the same as, or for the same or substantially the same subject matter as, a claim of an issued patent may not be made in any application unless such a claim is made prior to one year from the date on which the patent was granted.

Requiring an applicant to show compliance with 35 U.S.C. 135(b) before an interference is declared should prevent an interference from being declared where the applicant cannot satisfy § 135(b) with respect to any claim alleged to correspond to the proposed count. One comment suggested that requiring an applicant who has requested an interference with a patent to demonstrate compliance with § 135(b) is ultra vires. The comment argues that *In re Sasse*, 629 F.2d 675, 207 USPQ 107 (CCPA 1980), precludes an examiner from relying on §

135(b) to refuse to declare an interference and that *Sasse* can only be overruled by statute or decision of the Federal Circuit in banc, citing *Chevron U.S.A., Inc. v. Natural Resources Defense Council, Inc.*, 467 U.S. 837 (1984). The argument in the comment is not persuasive. *Sasse* held that a claim added in violation of § 135(b) cannot be rejected by PTO under that statute; it did not hold that PTO cannot refuse to declare an interference where all of an applicant's claims that are proposed to correspond to the count fail to satisfy the statute. In fact, the court specifically held that the effect of § 135(b) is that "a procedural statutory bar arises proscribing the instigation of interferences after a specified time interval." 629 F.2d at 680, 207 USPQ at 110 (original emphasis).

In § 1.608, paragraphs (a) and (b) are revised in several respects, as proposed. First, both paragraphs are revised by removing the information about effective filing dates, which appears instead in § 1.601(g), as amended. Second, the current requirement of paragraph (a) for an affidavit filed by the applicant has been relaxed. Paragraph (a), as amended, permits a statement to be filed by the applicant or a practitioner of record. Third, "sufficient cause" in paragraph (b) of § 1.608 and in other interference rules is changed to "good cause" in order to make it clear that only one "cause" standard is intended. Fourth, "8 1/2 x 11 inches (21.8 by 27.9 cm.)" is changed to "21.8 by 27.9 cm. (8 1/2 x 11 inches)" to put the emphasis on the metric measurements. Fifth, the phrase "(§ 1.653(g) and (h))" is revised to read "(§ 1.653(g))" in view of the removal and reservation of § 1.653(h).

One comment stated a belief that there may be some confusion regarding the application of § 1.608(b) when the basis upon which an applicant is entitled to judgment is not priority of invention. According to the comment, while § 1.608(b) appears to include derivation as a basis, it is uncertain whether it applies in a situation where the applicant believes the patent claims are unpatentable over prior art that does not also render unpatentable the applicant's claims. The suggested change is not necessary. The comment's statement that derivation (35 U.S.C. 102(f)) provides a basis for a showing under § 1.608(b) is correct. Section 1.608(b) requires an applicant to explain why the applicant is entitled to judgment vis-a-vis the patentee. As explained in the Notice of Final Rule, 49 FR 48416, 48421 (Dec. 12, 1984), "[t]he evidence may relate to patentability and need not be restricted to priority." Such evidence could be, for example, evidence relating to derivation as noted by the comment.

The Notice of Proposed Rulemaking proposed that § 1.609(b)(2), be revised to require the examiner's statement (i.e., currently Form PTO-850, also known as the initial interference memorandum) to explain why each claim designated as corresponding to a count is directed to the same patentable invention as the count. It was also proposed that § 1.609(b)(3) be revised to require the examiner's statement to explain "why each claim designated as not corresponding to a count is not directed to the same patentable invention as the count." The purpose of these amendments is to provide the Board and the parties with the benefit of the examiner's reasoning and to provide a better foundation for considering preliminary motions to designate claims as corresponding or as not corresponding to a count.

Paragraph (b)(2) is revised essentially as proposed in the Notice of Proposed Rulemaking. Upon further reflection, no need is seen for the examiner to indicate whether a claim corresponds exactly or substantially to a count.

One comment suggested that the proposed requirement of § 1.609(b)(3) may be unduly burdensome in multi-count interferences if it requires an examiner to explain not only why an involved claim corresponds to one count, but also why that claim does not correspond to each other count. Another comment, apparently construing the proposed language in the same way, suggested that the requirement could be made clearer by modifying the proposed language to read, "why each claim designated as not corresponding to each (or the) count is not directed to the same patentable invention as the count." To make it clear that such a requirement is not intended, the proposed amendment is withdrawn and paragraph (b)(3) is instead revised to read, "why each claim designated as not corresponding to any count is not directed to the same patentable invention as any count." Under § 1.609(b)(3), as adopted, the examiner's statement need not explain why a claim that is



designated as corresponding to one count is not directed to the same patentable invention as another count in the interference.

One comment suggested that interferences involving patentees who are incontestably junior could be shortened by amending the rules to require a junior party patentee, prior to the preliminary motion period, to make a prima facie case of priority of the type currently required of junior party applicants by § 1.608. The suggestion is outside the scope of the present rulemaking and is not being adopted, but may be considered in a future notice of proposed rulemaking.

One comment suggested that §§ 1.609(b)(1) and 1.611(c)(6) also be revised to require that the examiner and the declaration notice explain, when there will be more than one count, why each count is patentably distinct from the other counts. The suggestion is being adopted.

Section § 1.610(a) is revised by deleting the language "a panel consisting of at least three members of" as superfluous and by deleting the reference to § 1.640(c), which is revised to allow a request for reconsideration under § 1.640(c) to be decided by an individual administrative patent judge rather than by the Board. Section 1.610(b) is also revised by deleting "Unless otherwise provided in this section," as unnecessary in light of the amendment to paragraph (a).

One comment suggested that § 1.610(a) be revised to provide that an interference is handled throughout, including final hearing, by a single administrative patent judge, thereby avoiding the delays that occur when an issue is deferred to final hearing for decision by a three-member panel. The comment also suggested that § 1.610(b) be revised to provide that, at the discretion of the administrative patent judge, a panel consisting of two or more administrative patent judges may sit at final hearing (as well as deciding interlocutory orders). The suggestions have not been adopted. First, the suggestions are outside the scope of the present rulemaking. Second, the suggestions could not be implemented without amendment of 35 U.S.C. 7(b), which requires that an interference must be decided by at least three members of the Board.

One comment suggested that the second sentence of § 1.610(c) ("Times for taking action shall be set, and the administrative patent judge shall exercise control over the interference such that the pendency of the interference before the Board does not normally exceed two years.") be removed as wishful thinking that only confuses district court judges confronted with a motion to stay a civil action pending the outcome of an interference. The suggestion is not being adopted. The two-year period, while not always attainable, is nevertheless believed to be realistic.

The Notice of Proposed Rulemaking proposed amending § 1.611 by redesignating paragraph (c)(8) as paragraph (c)(9) and adding a new paragraph (c)(8) requiring that a notice of declaration of interference state "[w]hy each claim designated as corresponding to a count is directed to the same patentable invention as the count and why each claim designated as not corresponding to a count is not directed to the same patentable invention as the count." For the reasons given above in the discussion of § 1.609(b)(3), the proposed language is changed to read, "[t]he examiner's explanation as to why each claim designated as corresponding to a count is directed to the same patentable invention as the count and why each claim designated as not corresponding to any count is not directed to the same patentable invention as any count." The examiner's explanation should assist the parties in deciding whether to move to have claims designated as corresponding or not corresponding to the count. Normally, parties can expect that a copy of the examiner's explanation will accompany the notice declaring the interference. It should be understood that in declaring the interference, the administrative patent judge is neither agreeing nor disagreeing with the examiner's explanation and that the explanation is not binding on the administrative patent judge or the Board in further proceedings in the interference. As proposed in the Notice of Proposed Rulemaking, the first word in each of paragraphs (d)(2) and (d)(3) is also capitalized.

One comment suggested deleting "oppositions to the motions, and replies to the motions" from § 1.611(d)(3) as surplusage. The suggestion is being adopted. In addition, paragraphs (d)(1), (d)(2) and (d)(3) are revised to be separately indented under paragraph (d).

Paragraph (a) of § 1.612 is revised to change "opposing party's" to "opponent's" and to add a sentence referring to

§ 1.11(e) concerning public access to interference files. One comment suggested amending § 1.612(a) to provide for automatic access to an application referred to in an opponent's involved case rather than requiring a motion for access under § 1.635, as under the current rule. The suggestion, which is outside the scope of the present rulemaking, is not being adopted.

Regarding § 1.613, one comment suggested that paragraph (c) be revised to give an administrative patent judge the authority to decide disqualification questions rather than requiring such questions to be referred to the Commissioner. Under current practice, the authority to decide motions for disqualification of counsel in cases before the Board of Patent Appeals and Interference has been delegated by the Commissioner to the Chief Administrative Patent Judge. Administratively, it is more appropriate that authority to decide disqualification matters be capable of being delegated to specific individuals rather than being assigned to administrative patent judges generally through a rule. The comment also suggested that paragraph (d) be revised to clarify whether "attorney or agent of record" includes an attorney or agent who is merely "of counsel." The term "attorney or agent of record" in the interference rules should be construed in the manner it is defined in 37 CFR 1.34(b). The rules do not recognize, or use, the term "of counsel." Accordingly, the suggestions are not being adopted. Furthermore, each suggestion is outside the scope of the present rulemaking.

Paragraph (a) of § 1.614 is clarified, as proposed in the Notice of Proposed Rulemaking, by changing "the Board shall assume jurisdiction" to "the Board acquires jurisdiction." One comment suggested amending § 1.614(c) ("An administrative patent judge, where appropriate, may for a limited purpose restore jurisdiction to the examiner over any application involved in the interference.") by deleting the current language "when appropriate," as surplusage in view of "may." The suggestion is being adopted.

In addition to amending § 1.616 to authorize an award of compensatory attorney fees and expenses in appropriate circumstances, as discussed above, current paragraph (b), which is redesignated as paragraph (a)(2), is revised to permit a party to be sanctioned for failing to comply with the rules or an order by entering an order precluding the party from filing "a paper." Current paragraph (b) permits entry of an order precluding the filing only of a motion or a preliminary statement. The term "paper" will be given a broad construction, and includes a motion, a preliminary motion, a preliminary statement, evidence in the form of documents, a brief, or any other paper.

Section 1.617(b) is revised, as proposed, to authorize a party against whom a § 1.617(a) order to show cause has been issued to respond with an appropriate preliminary motion under § 1.633(c), (f) or (g). The reason is that a preliminary motion under § 1.633(c) to redefine the interference, under § 1.633(f) for benefit of the filing date of an earlier application or under § 1.633(g) attacking the benefit accorded a patentee may be appropriate where the count set forth in the notice declaring the interference is not the same as the count proposed in the applicant's showing under § 1.608(b). A preliminary motion under § 1.633(f) or (g) may also be appropriate where the count set forth in the notice declaring the interference is the same as the count proposed in the applicant's showing under § 1.608(b), but the notice either fails to accord the applicant the benefit of the filing date of an earlier application whose benefit was requested in the § 1.608(b) showing or accords the patentee the benefit of the filing date of an earlier application whose benefit the § 1.608(b) showing argued should not be accorded the patentee.

One comment suggested that § 1.617(b) be revised to state that a change of counsel is not "good cause" for presenting additional evidence in response to a § 1.617(a) show cause order, noting the similar amendment proposed in the Notice of Proposed Rulemaking for § 1.655(b). The suggestion is not being adopted. Moreover, the statement that a change of attorney is not generally good cause is not being added to § 1.655(b) as proposed. Upon reflection, it is better to leave the term "good cause" to be decided on a case-by-case basis. The proposed amendments to the rules to state that a change of attorney is generally not good cause for considering an issue belatedly raised by a new attorney is generally correct. In fact, recent experience shows that parties often retain new counsel

after they find that "they are in trouble in the interference." Retaining new counsel midway through the case is almost never a reason to subject the opponent to starting over again. On the other hand, the rules use the term "good cause" in various places and PTO does not want to incorrectly give the impression that change of attorney is not good cause only when specifically stated in a rule which uses the phrase "good cause." Nor does PTO want to have a per se rule which says that a change of attorney cannot be good cause in any instance, although it would be rare for a change of attorney to be good cause.

One comment suggested that the second sentence of § 1.617(d) be revised to indicate that any statement filed by an opponent may set forth views as to why any (c), (f) or (g) motion filed by the applicant should be denied. The suggestion is not being adopted. The first sentence of § 1.617(d) as revised authorizes an opponent to file an opposition to any (c), (f) or (g) motion filed by the applicant, which opposition should include views as to why any (c), (f) or (g) motion filed by the applicant should be denied.

Another comment suggested that § 1.617(d), which currently prohibits an opponent from requesting a hearing, be revised to permit such a request on the ground that a hearing is the opponent's best chance to pretermitt the whole interference process. The suggestion, which is outside the scope of the present rulemaking, is not being adopted.

The Notice of Proposed Rulemaking proposed amending the first sentence of § 1.618(a), which currently reads "The Patent and Trademark Office shall return to a party any paper presented by the party when the filing of the paper is unauthorized by, or not in compliance with the requirements of, this subpart" to read: "An administrative patent judge or the Board shall enter an order directing the return to a party of any paper presented by the party when the filing of the paper is not authorized by, or is not in compliance with the requirements of, this subpart." The Notice of Proposed Rulemaking also proposed amending the second sentence of paragraph (a), which currently states that any paper returned "will not thereafter be considered by the Patent and Trademark Office in the interference," by deleting "by the Patent and Trademark Office." One comment questioned why the phrase "by the Patent and Trademark Office" is proposed to be removed. The reason is that the phrase is superfluous. Another comment questioned who is being ordered to return the paper and suggested that § 1.618(a) be revised to simply provide that the administrative patent judge shall return the unauthorized papers, with the understanding that it is the administrative patent judge's secretary who actually mails orders, opinions, etc. The suggestion is being adopted, but with the rule stating that the paper shall be returned by an administrative patent judge or the Board. Although not proposed in the Notice of Proposed Rulemaking, the last sentence of § 1.618(a), which states that a party may be permitted to file a corrected paper under such conditions as may be deemed appropriate by an administrative patent judge, is revised to also allow the Board to set such conditions.

One comment suggested an amendment to § 1.622(a) to clarify that the inventors named in the preliminary statement do not have to be all of the inventors named in the party's case in interference, citing *Larson v. Johanning*, 17 USPQ2d 1610 (Bd. Pat. App. & Int. 1990). The comment alternatively suggested dropping preliminary statements altogether on the grounds that they are (a) useless and (b) a snare and a delusion. These suggestions are outside the scope of the present rulemaking and are not being adopted.

Section 1.625(a) is revised, as proposed, by deleting "the invention was made in the United States or abroad and" as surplusage.

Section 1.626 is revised, as proposed, by revising "earlier application filed in the United States or abroad" to read "earlier filed application." The same change is made in §§ 1.630, 1.633(f), 1.633(g), 1.637(c)(1)(vi), 1.637(e)(1)(viii), 1.637(e)(2)(vii) and 1.637(h)(4).

Section 1.628(a) is revised, as proposed, to change "ends of justice" to "interest of justice" to be consistent with the language used in §§ 1.628(a) and 1.687(c), since a single standard is intended. The "interest of justice" requirement will be applied only to corrected preliminary statements that are filed on or after the due date for serving preliminary statements. Where the moving party has not yet seen the opponent's statement, an opponent normally will not be prejudiced by the filing

of a corrected statement. One comment raised the following question:

What is the standard if the motion is filed before the time set by the APJ for service of preliminary motions [sic, statements]? If, as implied by the comments, amendments prior to that date can be made freely, why not simply provide that the preliminary statements (if they are to be retained at all) are to be filed and served on the date set by the APJ pursuant to 37 CFR 1.628(a)? Particularly where it is obvious that the count(s) is or are going to be changed anyway, all of the parties' work preparing and the PTO's work in processing the original preliminary statement is wasted effort anyway.

(Original emphasis; footnote omitted.) The standard for a motion to amend that is filed before service of preliminary statements is that it be accompanied by an affidavit stating when the error occurred and be filed "as soon as practical after discovery of the error." The suggestion that preliminary statements be filed and served on the date set by the administrative patent judge pursuant to 37 CFR 1.628(a) is not understood, since that rule does not provide for setting such a date. Instead, the provisions relating to filing and serving preliminary statements appear in §§ 1.621(a) and 1.631, respectively. To the extent the comment is suggesting that these provisions be revised, the suggestion is outside the scope of the present rulemaking and is not being adopted.

As proposed in the Notice of Proposed Rulemaking, paragraphs (a), (c)(1) and (d) of § 1.629 are revised to make each consistent with the amendment of the definition of "effective filing date" in § 1.601(g). One comment suggested that in § 1.629(a), second sentence, the comma between "statement" and "as," which was proposed to be removed, be retained for clarity. As suggested, the comma is retained.

The first sentence of § 1.631(a) is revised by removing "by the examiner-in-chief" (first occurrence) as superfluous. The Notice of Proposed Rulemaking incorrectly proposed to remove the second occurrence of this phrase. Thus revised and with the remaining occurrences of "examiner-in-chief" changed to "administrative patent judge," the first sentence of § 1.631(a), as it was proposed to be revised, reads as follows: "Unless otherwise ordered by an administrative patent judge, concurrently with entry of a decision on preliminary motions filed under § 1.633, any preliminary statement filed under § 1.621(a) shall be opened to inspection by the senior party and any junior party who filed a preliminary statement." (The proposed language set forth in the Notice of Proposed Rulemaking inadvertently omitted the phrase, "concurrently with entry of a decision on preliminary motions filed under § 1.633," which appears in the current rule and was not proposed to be removed.) In order to make it clear that the phrase "concurrently with entry of a decision on preliminary motions filed under § 1.633" modifies the succeeding phrase rather than the preceding phrase, the second comma is removed, so that the first sentence of § 1.631(a) as revised reads as follows: "Unless otherwise ordered by an administrative patent judge, concurrently with entry of a decision on preliminary motions filed under § 1.633 any preliminary statement filed under § 1.621(a) shall be opened to inspection by the senior party and any junior party who filed a preliminary statement."

Section 1.632 is revised, as proposed, to more precisely state that a notice of intent to argue abandonment, suppression or concealment must be filed "within ten days after," rather than "within ten days of," the close of the testimony-in-chief of the opponent. One comment suggested that § 1.632 be further revised to (1) state what happens next and (2) provide a period for shifting the burden of proof. The suggestion is outside the scope of the present rulemaking, and is not being adopted.

Several comments were received with respect to § 1.633 in general. Two of the comments noted that § 1.642, which presumably was intended to allow an administrative patent judge to add a new party to an interference, has also been used to "request" addition of an application or patent of an already involved party, citing *Theeuwes v. Bogentoft*, 2 USPQ2d 1378 (Comm'r Pat. 1986). The two comments suggested that § 1.633 be revised to specifically provide for a motion to request addition of an application or patent of a party in order to make it clear that the standards for preliminary motions apply. Two



other comments suggested amending §§ 1.633 and 1.637(h) to authorize a motion to add a claim to a party's application or an opponent's application (including a reissue application) to be designated as not corresponding to the count, thereby removing what is alleged to be one of the major drawbacks of the current rules. Still another comment suggested that in order to avoid the inefficiencies that result when prior art surfaces for the first time in a motion under § 1.633(a), which may render moot other preliminary motions, the parties should be required to file and serve all relevant prior art of which they are aware prior to the preliminary motion period. While some of the suggestions have merit, all are outside the scope of the present rulemaking and are not being adopted.

As proposed in the Notice of Proposed Rulemaking, paragraph (a) of § 1.633 is revised in several respects. The first is to specify that a claim shall be construed in light of the specification of the application or patent in which it appears. The amendment clarifies an ambiguity in PTO interference practice. Previously, the Federal Circuit had interpreted § 1.633 to require an ambiguous claim to be interpreted in light of the patent from which it was copied. *In re Spina*, 975 F.2d 854, 856, 24 USPQ2d 1142, 1144 (Fed. Cir. 1992). While this interpretation was a possible interpretation of previous § 1.633, PTO had intended that a copied claim be interpreted in light of the specification of the application or patent in which it appears. The rule, as adopted, will make ex parte and inter partes practice the same. A claim that has been added to a pending application for any purpose, including to provoke an interference, will be given the broadest reasonable interpretation consistent with the disclosure of the application to which it is added, as are claims which are added during ex parte prosecution. As explained *In re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989):

[d]uring patent examination the pending claims must be interpreted as broadly as their terms reasonably allow. When the applicant states the meaning that the claim terms are intended to have, the claims are examined with that meaning, in order to achieve a complete exploration of the applicant's invention and its relation to the prior art. See *In re Prater*, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969) (before the application is granted, there is no reason to read into the claim the limitations of the specification). The reason is simply that during patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed. *Burlington Industries, Inc. v. Quigg*, 822 F.2d 1581, 1583, 3 USPQ2d 1436, 1438 (Fed. Cir. 1987); *In re Yamamoto*, 740 F.2d 1569, 1571, 222 USPQ 934, 936 (Fed. Cir. 1984).

If a party believes an opponent's claim corresponding to the count is ambiguous when construed in light of the opponent's disclosure, the party should move under § 1.633(a) for judgment against the claim on the ground of unpatentability under the second paragraph of 35 U.S.C. 112. In paragraph (a), "by reference to the prior art of record" is removed as unnecessary. Paragraphs (a)(1) and (a)(2) of § 1.633 are revised by deleting some unnecessary language from each paragraph and by changing "derivation" to "Derivation" in paragraph (a)(2). One comment suggested changing "corresponding to a count" in § 1.633(a) to "designated to correspond to a count" for consistency with § 1.601(f), as amended. The suggestion is being adopted.

Although not proposed in the Notice of Proposed Rulemaking, § 1.633(a) is also revised by adding a sentence requiring that the motion separately address each claim alleged to be unpatentable. For example, where a plurality of claims are alleged to be unpatentable over prior art, the motion must compare each of those claims to the prior art. As a result, a party would not be allowed to allege that all of the opponent's claims that correspond to the count are unpatentable simply because the opponent's claim that corresponds exactly to the count is anticipated by, or would have been obvious in view of, the prior art. At the time an interference is declared, it may appear (and the parties may then believe) that all claims designated as corresponding to a count are directed to the same patentable invention. Once additional prior art is discovered in the preliminary motion period, however, what was the case

when the interference was declared may no longer be the case. Hence, a preliminary motion under § 1.633(a) alleging unpatentability over the prior art should address each claim believed to be unpatentable. In the case where a party has two claims, e.g., a genus and a species, if a preliminary motion under § 1.633(a) is filed by an opponent which argues that only the genus is unpatentable, the party will need only respond to the argument relative to the genus. Thus, to the extent there ever was a perception that all claims designated to correspond to a count stand or fall with the "patentability of the count," the rule as adopted attempts to overcome that perception. There is no presumption in an interference that because one claim designated to correspond to a count is unpatentable over the prior art (35 U.S.C. 102(a), (b) and (e)), that all claims are unpatentable over the same prior art. On the other hand, in deciding priority of invention, all claims designated to correspond to a count at the time priority is decided will stand or fall together on the issue of priority.

Section 1.633(b), which concerns motions for judgment on the ground of no interference-in-fact, was proposed to be revised to state that it is possible for claims of opponents presented in "means plus function" format to define separate patentable inventions even though the claims of the opponents contain the same literal wording. The reason is that the sixth paragraph of 35 U.S.C. 112, which is applicable to "means plus function" limitations in application claims and patent claims, provides that such limitations are to be construed as covering the corresponding structure disclosed in the associated application or patent and equivalents thereof. *In re Donaldson Co.*, 16 F.3d 1189, 29 USPQ2d 1845 (Fed. Cir. 1994). The proposed change has been adopted, but with the proposed term "opponents" being replaced by "different parties." One comment suggested that in addition to *Donaldson*, support for the amendment can be found in *Blackmore v. Hall*, 1905 Dec. Comm'r Pat. 561 (Comm'r Pat. 1905), and the withdrawn opinion in *Rion v. Ault*, 455 F.2d 570, 172 USPQ 588 (1972) (Rion I), modified, 482 F.2d 948 (CCPA 1973) (Rion II), which the comment says stand for a proposition even broader than the one set forth in the proposed amendment. Inasmuch as *Blackmore* predates the statutory language in question and *Rion I* was withdrawn by the CCPA, the suggestion is not being adopted.

Paragraph (i) of § 1.633, which in its current form authorizes a party who opposes a preliminary motion under § 1.633(a), (b) or (g) to file a preliminary motion under § 1.633(c) or (d), is revised to additionally authorize a party-patentee to file a preliminary motion under § 1.633(h) to add to the interference an application for reissue of the party's involved patent. Because a reissue application can include an amended or new claim to be designated as corresponding to a count, paragraph (i) as revised gives a patentee an option similar to that afforded in the same situation to a party-applicant, who can file a preliminary motion under § 1.633(c)(2) to amend a claim in, or add a claim to, its involved application to be designated as corresponding to a count. One comment suggested further amending § 1.633(i) to authorize a § 1.633(c)(1) motion in response to an opponent's § 1.633(c)(1) motion. The suggestion, which is outside the scope of the present rulemaking, is not being adopted.

One comment suggested that § 1.636, as proposed to be revised, which requires that a motion under § 1.634 to correct inventorship of a patent or application "be diligently filed after an error is discovered," is ultra vires with respect to patents. The suggestion is outside the scope of the present rulemaking and is not being adopted. The suggestion will be considered in a future rulemaking.

The Notice of Proposed Rulemaking proposed amending paragraph (a) of § 1.637 to incorporate the essence of a notice of August 10, 1990, published as "Interferences - Preliminary Motions for Judgment," 1118 Off. Gaz. Pat. Office 19 (Sept. 11, 1990). Specifically, the Notice of Proposed Rulemaking proposed adding the following language at the end of the paragraph:

If a party files a motion for judgment under § 1.633(a) against an opponent based on the ground of unpatentability over prior art, and the dates of the cited prior art are such that the prior art appears to be applicable to the party, it will be presumed, without regard to the dates alleged in the preliminary statement of the party, that the cited prior art is appli-

cable to the party unless there is included with the motion an explanation, and evidence if appropriate, as to why the prior art does not apply to the party. If the motion fails to include a sufficient explanation or evidence, the party will not be permitted to rely on any such explanation or evidence in response to or in any subsequent action in the interference.

Two comments suggested that the proposed last sentence is imprecise in that although it is presumably intended to preclude a party whose motion an administrative patent judge has held to include an insufficient explanation or evidence from later supplementing the explanation or evidence offered in the motion, the sentence is broad enough to be construed as also precluding the party from relying on the arguments and evidence that were offered in the motion. Accordingly, one of the comments suggested that the proposed last sentence be replaced by the following two sentences: "If the administrative patent judge holds that the motion fails to include a sufficient explanation or evidence as to why the cited prior art is not applicable to the party, the party will not be permitted to supplement any such explanation or evidence in any subsequent action in the interference. However, the party is not precluded from subsequently arguing that the administrative patent judge's decision was incorrect." The substance of the suggestions is believed to be correct, but the suggested language will not be adopted. Instead, § 1.637(a) is revised to read:

A party filing a motion has the burden of proof to show that it is entitled to the relief sought in the motion. Each motion shall include a statement of the precise relief requested, a statement of the material facts in support of the motion, in numbered paragraphs, and a full statement of the reasons why the relief requested should be granted. If a party files a motion for judgment under § 1.633(a) against an opponent based on the ground of unpatentability over prior art, and the dates of the cited prior art are such that the prior art appears to be applicable to the party, it will be presumed, without regard to the dates alleged in the preliminary statement of the party, that the cited prior art is applicable to the party unless there is included with the motion an explanation, and evidence if appropriate, as to why the prior art does not apply to the party.

Rather than specify a particular sanction for failure of a party to comply with § 1.637(a), as adopted, it is more appropriate to rely on application of the provisions of § 1.618. A party who fails to timely include the explanation and/or evidence required by the rule runs a considerable risk that an explanation and/or evidence presented at a future time will be returned as untimely. See § 1.618(a). Papers which are returned are not considered part of the record.

Section 1.637(a) was proposed to be revised to state that the statement of material facts be "preferably in numbered paragraphs." One comment suggested that numbered paragraphs be a requirement, because it would make matters easier for opponents as well as administrative patent judges. The suggestion is being adopted. Ordinarily, it will be expected that each numbered paragraph will recite a single fact which can easily be "admitted" or "denied." The use of numbered paragraphs should make the decision-making process of the administrative patent judge easier.

Another comment suggested that § 1.637(a) be revised to require that motions, oppositions and replies be numbered sequentially, so that party X's opposition No. 1 will be its opposition to party Y's motion No. 1, etc. The suggestion, while having considerable merit, is outside the scope of the present rulemaking, and is not being adopted. The suggestion will be made the subject of a future rulemaking effort. In papers filed in PTO in interference cases, there is an increasing tendency for parties to use "long" titles, e.g., PARTY SMITH'S PRELIMINARY MOTION FOR DECLARATION OF PARTY OPPONENT RAYMOND'S CLAIMS TO BE UNPATENTABLE UNDER 37 CFR § 1.633(a). The opponent then responds with an opposition styled PARTY RAYMOND'S OPPOSITION TO PARTY SMITH'S PRELIMINARY MOTION FOR DECLARATION OF PARTY OPPONENT RAYMOND'S CLAIMS UNPATENTABLE UNDER 37 CFR § 1.633(a). The reply then tends to be PARTY SMITH'S REPLY TO PARTY RAYMOND'S OPPOSITION TO

PARTY SMITH'S PRELIMINARY MOTION FOR DECLARATION OF PARTY OPPONENT RAYMOND'S CLAIMS UNPATENTABLE UNDER 37 CFR § 1.633(a). It should be apparent that the styling of the paper loses its significance. Accordingly, pending a further rulemaking effort parties in interference can simplify matters by voluntarily adopting the essence of the suggestion by replacing the styling of the three papers identified above with the following: (1) SMITH'S PRELIMINARY MOTION NO. 1; (2) RAYMOND'S OPPOSITION NO. 1; and (3) SMITH'S REPLY NO. 1. If numerous motions are filed, then sequential numbers can be used. In a two-party interference, if the parties can agree, one can use numbers and the other letters. In any event, it would be of considerable help to the Board if the style of a paper does not exceed a single line.

As proposed in the Notice of Proposed Rulemaking, § 1.637(a) is also revised by changing "Every" in the second sentence to "Each."

Section 1.637(c)(1) sets forth the requirements for a preliminary motion to add or substitute a proposed count. The Notice of Proposed Rulemaking proposed amending paragraph (c)(1)(v) in two respects: (1) to require a moving party to show that the proposed count is patentable over the prior art; and (2) to specify that a proposed substitute count need only be shown to be patentably distinct from the other counts proposed to remain in the interference, since a proposed substitute count need not be patentably distinct from the count it is to replace. Several comments opposed amending § 1.637(c)(1)(v) to require a party to show that a proposed new count is patentable over the prior art, stating, *inter alia*, that the date of a count for purposes of determining what is available as prior art is not clear. The statements in the comment are well taken for the reasons given above in the discussion of § 1.601(f). Accordingly, the proposal to amend paragraph (c)(1)(v) to require the moving party to show the patentability of a proposed new count over the prior art is withdrawn. Paragraph (c)(1)(v) is revised only to require that a proposed substitute count must be shown to be patentably distinct from the other counts proposed to remain in the interference.

As proposed in the Notice of Proposed Rulemaking, § 1.637(c)(1)(vi) is revised to clarify that a preliminary motion under § 1.633(c)(1) need not be accompanied by a preliminary motion for benefit under § 1.633(f) unless the moving party seeks benefit with respect to the proposed count.

In order to eliminate the need for an opponent to respond to a § 1.633(c)(1) motion with a preliminary motion under § 1.633(f) claiming benefit, which has the effect of delaying a decision on the § 1.633(c)(1) motion, the Notice of Proposed Rulemaking also proposed amending § 1.637 by adding a new paragraph (c)(1)(vii) reading as follows:

If an opponent is accorded the benefit of the filing date of an earlier filed application in the notice of declaration of the interference, show why the opponent is not also entitled to benefit of the earlier filed application with respect to the proposed count. Otherwise, the opponent will be presumed to be entitled to the benefit of the earlier filed application with respect to the proposed count.

One comment suggested clarifying the first sentence by inserting "and if the movant desires a holding that its opponent is not entitled to the benefit of the filing date of the earlier filed application for the proposed count" after "interference." The same change was suggested for proposed new §§ 1.637(c)(1)(ix) and 1.637(c)(2)(viii), which are identical to § 1.637(c)(1)(vii). The suggestion is not being adopted. The rule, as amended, states that a moving party must take a positive action if it believes an opponent is not entitled to benefit for a new count. Failure to take the positive action creates a presumption. The rule, as amended, also states the consequences of not taking a positive action. Taking the positive action is the manner to procedurally attempt to overcome the presumption. Hence, the suggested "clarification" is not necessary.

As proposed, minor housekeeping amendments are made to §§ 1.637(c)(2)(ii) and (iii) for clarification, and §§ 1.637(c)(2)(iv) and 1.637(c)(3)(iii), which relate to § 1.633(f) motions for benefit, are removed and reserved as unnecessary, since motions under § 1.633(c)(2) and (3) do not affect the count. Section 1.637(c)(3)(ii), which applies to motions under



§ 1.633(c)(3) to designate a claim as corresponding to a count, is revised to have claims compared to claims, as is the case in § 1.633(c)(4)(ii), which applies to motions filed under § 1.633(c)(4) to designate a claim as not corresponding to a count. The amendment avoids the need to compare claims to counts.

Section 1.637(c)(4)(ii) was proposed to be revised to require that a party moving to designate a claim as not corresponding to a count must show that the claim could not serve as the basis for a preliminary motion under § 1.633(c)(1) to add a new count. As proposed to be, the rule precludes a party from moving to designate one of its claims as not corresponding to the count where an opponent's disclosure would support a similar claim. The supporting rationale is that the party could file a § 1.633(c)(1) preliminary motion proposing a claim to be added to the opponent's application and suggesting that the proposed claim and the party's claim in question be designated as corresponding to a proposed new count. One comment argues that the proposed amendment would unduly burden a party by requiring it to propose claims to be added to an opponent's application, whereas under the current rule the opponent, who has the option to propose such a count and add such a claim in a motion under § 1.633(c)(1), runs the risk of interference estoppel by not pursuing an interference on common patentable subject matter. Thus, the comment notes that the effect of the proposed requirement would be to require a party to prevent its opponent from possibly getting itself into an estoppel situation. The point of the comment is well taken. Accordingly, the proposal to amend § 1.637(c)(4) in the manner criticized by the comment hereby withdrawn.

As proposed in the Notice of Proposed Rulemaking, § 1.637(d)(4), which authorizes a party to file a motion for benefit together with a motion under § 1.633(d), is removed and reserved as unnecessary. Motions filed under § 1.633(d) do not affect the count. Sections 1.637(e)(1)(viii) and (e)(2)(vii) are revised to make it clear that a preliminary motion under §§ 1.633(e)(1) or (e)(2) need not be accompanied by a preliminary motion for benefit under § 1.633(f) unless the moving party seeks benefit with respect to the proposed count. As proposed, §§ 1.637(e)(1)(ix) and (e)(2)(viii) are added specifying that where a party is accorded the benefit of the filing date of an earlier filed application in the notice of declaration of the interference, that party is presumed to be entitled to the benefit of the earlier filed application with respect to the proposed count.

Section 1.637(f)(2) is revised, as proposed, by changing "abroad" to "in a foreign country" and removing both occurrences of "filed abroad" as superfluous.

The Notice of Proposed Rulemaking proposed to amend § 1.637(h) by adding a sentence stating that "[a] patentee may not move under § 1.633(h) to add a reissue application that includes new or amended claims to be designated as *not* corresponding to a count." The purpose of the proposal was to make clear that a preliminary motion to add a reissue application that includes a new or amended claim to be designated as not corresponding to a count will be given the same treatment as a preliminary motion proposing to amend a claim in, or add a new claim to, an involved application to be designated as not corresponding to the count, i.e., the preliminary motion will be dismissed. See *L'Esperance v. Nishimoto*, 18 USPQ2d 1534, 1537 (Bd. Pat. App. & Int. 1991) (interference rules do not authorize a motion by party-applicant to amend or add a claim to be designated as not corresponding to the count). Several comments were received in opposition to this proposal, one of which stated:

As understood, this would prevent moving to add any reissue application to an interference if even a single claim of that reissue was independently patentable, i.e., properly not subject to the interference, even if some or most of the other claims were the same as, or patentably indistinct from, claims already subject to the interference.

It is not seen why patent owners should be deprived of their statutory and normal ex parte right to have and maintain reissue applications with appropriate claims to inventions disclosed in their specifications, simply to meet a new interference rule requirement that appears to be solely for administrative convenience for the interference proceeding.

The statement in the comment is justified. The rule as proposed to be revised would unfairly preclude a patentee whose involved claims are all held to be unpatentable during the interference (e.g., under 35 U.S.C. 112, first paragraph, for lack of written description support) from adding a reissue application that contains new or amended claims to be designated as corresponding to a count simply because the reissue application also happens to include a new or amended claim to be designated as not corresponding to a count. Accordingly, the proposed amendment to paragraph (h) is hereby withdrawn.

As proposed in the Notice of Proposed Rulemaking, § 1.638(b) is revised by changing "a reply" to "any reply."

One comment suggested amending § 1.638(a) to take into account that an opposition may be based on material facts that are not set forth in the motion, by changing "(2) include an argument why the relief requested in the motion should be denied" to "(2) set forth in numbered paragraphs any material facts in support of the opposition not set forth in the motion and include an argument why the relief requested in the motion should be denied." A similar amendment was suggested for paragraph (b) as to replies. The suggestions, which are outside the scope of the present rulemaking, are not being adopted. The suggestions would appear to have considerable merit and will be made the subject of a future rulemaking effort.

Paragraph (a) of § 1.639, which currently requires that a motion, opposition or reply be accompanied by the evidence on which a party intends to rely in support of or in opposition to a motion, is revised as proposed in the Notice of Proposed Rulemaking to be consistent with paragraphs (c) through (g), which permit some types of evidence to be filed after filing of the motion, opposition or reply. In addition, paragraph (d)(1) is revised, as proposed, by changing "call" to "use."

One comment expressed concern about § 1.639(a) to the extent it is construed as requiring that all available evidence in support of a motion, opposition or reply must be filed and served with the motion, opposition or reply, which is presumed to be a reference to the construction given § 1.639 in *Irikura v. Petersen*, 18 USPQ2d 1362, 1368 (Bd. Pat. App. & Int. 1990):

A good faith effort must be made to submit evidence to support a preliminary motion or opposition when the evidence is available. *Orikasa v. Oonishi*, [10 USPQ2d 1996, 2000 n.12 (Comm'r Pat. 1989)]. Note the commentary [*Patent Interference Proceedings; Final Rule*], 49 F.R. [48416], at 48442 (Dec. 12, 1984), 1050 O.G. [385], at 411 (Jan. 29, 1985), [corrections] 50 F.R. 23122 (May 31, 1985), 1059 O.G. 27 (Oct. 22, 1985).

See also *Okada v. Hitotsumachi*, 16 USPQ2d 1789, 1790 (Comm'r Pat. 1990). Specifically, the comment notes that:

[t]o permit testimony beyond the evidence filed with the motion, has been likened to "two bites of the apple". I think there is a misunderstanding here, it is not two bites.

For example, a motion for summary judgment that is denied, [sic] does not preclude the party from proving his case at trial with additional evidence. Two bites comes if, after decision on motion, a party tries to bring a second motion with additional evidence or argument, or "after trial and judgment, the loser wants to introduce more evidence that was available all along. I see nothing wrong with an interference party submitting the prior art and arguing that "any fool can plainly see" the subject matter of the count is obvious. That's a sort of motion for summary judgment on the issue. If the APJ does not perceive the obviousness to be apparent, he or she should invite the parties to present additional testimony on obviousness during the testimony time, *not block it*. Obviously, the same reasoning would apply to enablement, operability, same patentable invention, etc.

(Original emphasis.) The suggestion that the rules be revised to permit a party to later submit evidence that it could have submitted in support of or in opposition to a preliminary motion is declined for the reasons given in *Hanagan v. Kimura*, 16 USPQ2d 1791, 1793 (Comm'r Pat. 1990) ("the new interference rules were not intended to permit routine requests to take testimony in lieu of presenting timely affidavits and other available

proof of material [facts] with the motion"). See also *Stachelin v. Secher*, 24 USPQ2d 1513, 1515 n.3 (Bd. Pat. App. & Int. 1992).

Another comment suggested amending the rules to permit the filing of a motion for "summary judgment" shortly (e.g., within two months) after the interference is declared on a matter that may be dispositive of the interference, such as the absence of an interference-in-fact, unpatentability of all of the parties' claims that correspond to the count or unpatentability of all of the opponent's claims that correspond to the count, with testimony being restricted to affidavits and counter-affidavits. Compare Fed. R. Civ. P. 56. The comment continues that if the motion is denied by the administrative patent judge, there would be no right of appeal; if the motion is granted, the opponent could appeal to a three-member panel of the board and, if the panel concurs with the decision of the administrative patent judge, the opponent could seek judicial review. To the extent the suggestion is seeking a rule authorizing motions for summary judgment like those provided for in Fed. R. Civ. P. 56, the suggestion is outside the scope of the present rulemaking and is therefore not being adopted. In a future rulemaking effort, PTO will consider whether there is an advantage to be gained by some form of "summary judgment" motion.

The Notice of Proposed Rulemaking proposed to amend § 1.640(b) in several respects. First, it was proposed to add a first sentence providing that "[u]nless an administrative patent judge or the Board is of the opinion that a decision on a preliminary motion would materially advance the resolution of the interference, decision on a preliminary motion shall be deferred to final hearing." One comment indicated that requiring deferral of non-dispositive motions may adversely affect settlement of interferences:

Under the current procedure, where most motions are initially decided, if a party is faced with a particular decision on a non-dispositive motion, that decision may affect the party's willingness to settle with the opposing party, even knowing that the decision may be changed at final hearing. For example, if a party has proposed a new count that better fits its proofs and the motion proposing the new count is denied, the party may be willing to request adverse judgment (e.g., in exchange for a license) rather than try to prove invention of the original count for which its proofs are not as good, even knowing that there is a chance that the proposed count may be adopted at final hearing. Similarly, a party that has succeeded in having important claims designated as not corresponding to the count may be willing to settle on that basis, even though it may lose certain other claims. To the extent that early decisions on preliminary motions motivate settlement in that way, the proposed amendments will decrease the settlement rate of interferences, adding to the workload of the Board and of practitioners.

While the comment can be correct in some interferences, it may not be true in other interferences. In those interferences where decision on a preliminary motion is likely to lead to settlement, the parties should approach the administrative patent judge and discuss the matter. The administrative patent judge will then be in a position to make an informed decision on an "opinion that an earlier decision on a preliminary motion would materially advance the resolution of the interference." Amending the rule, as proposed, will advance resolution of interferences where settlement is not likely, while at the same time giving the parties a means by which to inform the administrative patent judge that a decision on a particular motion would assist the settlement process.

One comment suggested that the proposed language could be clarified by changing "a decision" (first occurrence) to "an earlier decision" so that the sentence reads: "Unless an administrative patent judge or the Board is of the opinion that an earlier decision on a preliminary motion would materially advance the resolution of the interference, decision on a preliminary motion shall be deferred to final hearing." The suggestion is being adopted.

Another comment stated that the second sentence of § 1.640(b) as proposed to be revised ("Motions otherwise will be decided by an administrative patent judge.") is somewhat confusing and asks whether it is intended to mean that if the administrative patent judge decides not to defer a motion to

final hearing, the administrative patent judge will then decide the motion. Any possible ambiguity is avoided by changing "otherwise" to "not deferred to final hearing."

Although not proposed in the Notice of Proposed Rulemaking, the sentence in § 1.640(b) which currently reads "[a]n administrative patent judge may consult with an examiner in deciding motions involving a question of patentability" is changed to "[a]n administrative patent judge may consult with an examiner in deciding motions" to avoid any uncertainty that the administrative patent judge is free to consult with an examiner on any preliminary motion.

Still another comment suggested that the fourth sentence of § 1.640(b) as proposed to be revised ("An administrative patent judge may take up motions for decision in any order and may grant or deny any motion or take such other action which will secure the just, speedy, and inexpensive determination of the interference.") be changed to read as follows to make it clear that the goal of ensuring a just, speedy, and inexpensive determination of the interference applies to the choice of order of deciding motions: "An administrative patent judge may take up motions for decision in any order, may grant or deny any motion, and may take such other action which will secure the just, speedy, and inexpensive determination of the interference." The suggestion is being adopted. The rule is also revised to make absolutely clear that, among other things, an administrative patent judge may dismiss a motion, e.g., when a motion does not comply with a rule. The addition of the possibility of "dismissing" a motion augments the sanction available under § 1.618(a), i.e., return of a paper.

One comment suggested adding a provision to § 1.640(b) specifically recognizing the authority of the administrative patent judge, for the purpose of promoting the just, speedy and inexpensive resolution of the interference, "to schedule a final hearing on deferred preliminary motions prior to the time of testimony on priority, etc. See also § 1.654(a)." The suggestion, which is outside the scope of the present rulemaking, is not being adopted. The suggestion will be considered in a future rulemaking effort, although it should be noted that nothing in the rules should be construed as precluding an administrative patent judge or the Board from ordering a "final" hearing on a particular issue. Whether such a "final hearing" is ordered is within the sound discretion of the administrative patent judge or the Board.

As proposed in the Notice of Proposed Rulemaking, § 1.640(b) is also revised to state that "[a] matter raised by a party in support of, or in opposition to, a motion that is deferred to final hearing will not be entitled to consideration at final hearing unless the matter is raised in the party's brief at final hearing." One comment questioned whether it will be sufficient to simply incorporate the deferred motion and reply into the brief. The answer is no. With the exception of a motion to suppress, which may be filed as a separate paper together with a party's brief (§ 1.656(b)), and papers properly belatedly filed after the brief has been filed, the brief must satisfy the requirements of § 1.656(b) with respect to all issues to be decided at final hearing, including the requirement for a statement of the issue (§ 1.656(b)(4)), a statement of the relevant facts (§ 1.656(b)(5)), and an argument (§ 1.656(b)(6)). It will be noted at this point, that the Board generally discourages the practice of incorporating an argument in one paper into a second paper. The reason is that the argument in the first paper can easily be overlooked in considering the second paper, i.e., when an administrative patent judge studies a motion, opposition, or reply at home only to find that the "incorporated paper" is not available.

As proposed in the Notice of Proposed Rulemaking, § 1.640(b) is revised to state that "[i]f the administrative patent judge determines that the interference shall proceed to final hearing on the issue of priority or derivation, a time shall be set for each party to file a paper identifying any decisions on motions or on matters raised sua sponte by the administrative patent judge that the party wishes to have reviewed at final hearing as well as identifying any deferred motions that the party wishes to have considered at final hearing." One comment questioned why the statement of matters to be reviewed at final hearing is limited to final hearings on "priority or derivation." The reason is that final hearings on priority and/or derivation are the only types of final hearing that will be scheduled pursuant to § 1.640(b). Final hearings that are requested in response to



show cause orders under § 1.640(d) are set pursuant to § 1.640(e), which, as amended likewise requires statements identifying the matters to be reviewed at final hearing.

Section 1.640(b) was also proposed to be revised by adding as the last sentence: "Any evidence that a party wishes to have considered with respect to the decisions and motions identified by the party or by an opponent for consideration or review at final hearing, including any affidavit filed by the party under § 1.608 or 1.639(b), shall be served on the opponent during the testimony-in-chief period of the party." In order to be consistent with the terminology in the preceding sentence of § 1.640(b), the phrase "decisions and motions" in the proposed last sentence is replaced by "decisions and deferred motions." Furthermore, the last sentence, as adopted, has been worded to take into account the retention and amendment of § 1.671(e) to permit a party to file a notice of intent to rely on affidavits, patents and printed publications previously submitted under § 1.639(b). Accordingly, the last sentence, as adopted, reads: "Any evidence that a party wishes to have considered with respect to the decisions and deferred motions identified by the party or by an opponent for consideration or review at final hearing shall be filed or, if appropriate, noticed under § 1.671(e) during the testimony-in-chief period of the party."

As proposed in the Notice of Proposed Rulemaking, the last sentence of § 1.640(b)(1) ("After the time expires for filing any amendment and supplemental preliminary statement, the examiner-in-chief will, if necessary, redeclare the interference.") is changed to read: "At an appropriate time in the interference, and when necessary, an order will be entered redeclaring the interference." One comment requested clarification of the meaning of "when necessary" and suggested that redeclaration should be required when the order of parties is changed but the count remains the same, in order to make it clear who is junior and who is senior. The suggestion, which included no specific language for its implementation and is outside the scope of the present rulemaking, is not being adopted. It will be considered in a future rulemaking effort.

Section 1.640(b)(2), which currently states that a preliminary motion filed after a decision is entered on preliminary motions under § 1.633 will not be considered except as provided by § 1.655(b), is revised to state that a preliminary motion filed after the time expires for filing preliminary motions will not be considered except as provided by § 1.645(b) by changing "1.655(b)" to "1.645(b)." Section 1.645(b) relates to consideration of belatedly filed papers in general.

The Notice of Proposed Rulemaking proposed to amend § 1.640(c), which currently requires an administrative patent judge or the Board to specifically authorize an opposition to a request for reconsideration of a decision by an administrative patent judge, to authorize an opponent to file an opposition, thereby saving the administrative patent judge or the Board the time it would otherwise take to determine whether to authorize an opposition. An opposition is normally required before the Board will modify the decision of an administrative patent judge. One comment suggested that because the Board frequently dismisses or denies requests for reconsideration without requesting an opposition, the proposed amendment will have the effect of unnecessarily increasing costs by encouraging the filing of oppositions that the Board may frequently find unnecessary to consider. The point is well taken and the proposal to amend § 1.640(c) to authorize oppositions to be filed without leave of the administrative patent judge is therefore withdrawn.

As proposed in the Notice of Proposed Rulemaking, the last sentence of § 1.640(c) is removed in order to authorize a single individual administrative patent judge to decide a request for reconsideration and is also revised to require that a request for reconsideration be filed by hand or Express Mail. The amendment of the rule should not be construed as limiting the authority of the Board, in the discretion of an administrative patent judge or the Board, to decide a request for reconsideration.

One comment suggested amending the second sentence of § 1.640(c) to permit service by next-business-day courier, arguing that hand delivery is often impractical and Express Mail unduly difficult. The comment also suggested that paragraph (c) be revised to allow reconsideration of a decision on motions, which is currently limited to identifying points that have been "misapprehended or overlooked," on the additional ground that the

decision is simply wrong on the merits, noting that decisions on reconsideration in several interferences agreed that a decision is wrong on the merits but refused to change it on the grounds that nothing was overlooked or misapprehended. Both of these suggestions are outside the scope of the present rulemaking and are not being adopted. However, pending a future rulemaking effort, the word "served by hand" in § 1.640(c) and elsewhere in the rules should be construed to include service by next-business-day courier. In using a next-business-day courier, a party is serving the paper by hand, the "hand" being the courier service. Hence, service by hand will be construed to include service by any commercial courier which performs a service essentially equivalent to the Express Mail service provided by the U.S. Postal Service. Pending further rulemaking, the date of service shall be the date of delivery to the courier.

Section 1.640(d)(1), which currently states that an order to show cause under that section may be based on a decision on a motion which is dispositive of the interference against a party as to any count, is revised, as proposed in the Notice of Proposed Rulemaking, to also include decisions on dispositive matters raised sua sponte by an administrative patent judge.

Section 1.640(e) is revised, as proposed, to incorporate the substance of the Notice of December 8, 1986, published as "Interference Practice: Response to Order to Show Cause Under 37 CFR 1.640," 1074 Off. Gaz. Pat. Office 4 (Jan. 6, 1987), 1086 Off. Gaz. Pat. Office 282 (Jan. 5, 1988). Specifically, § 1.640(e), as amended, provides that where the order to show cause was issued under § 1.640(d)(1), the party may file a paper (i) requesting that final hearing be set to review the decision which is the basis for the order and identifying every other decision of the administrative patent judge that the party wishes to have reviewed by the Board at a final hearing, or (ii) fully explaining why judgment should not be entered. Any opponent is permitted to file a response to the paper within 20 days of the date of service of the paper. Where the order was issued under § 1.640(d)(1), and the paper includes a request for final hearing, the opponent's response must identify every decision of the administrative patent judge that the opponent wishes to have reviewed by the Board at a final hearing. Where the order was issued under § 1.640(d)(1) and the paper does not include a request for final hearing, the opponent's response may include a request for final hearing, which must identify every decision of the administrative patent judge that the opponent wishes to have reviewed by the Board at a final hearing. Where an opponent's response includes a request for a final hearing, the party who filed the paper shall have 14 days from the date of service of the opponent's response in which to file a supplemental paper identifying any other decision of the administrative patent judge that the party wishes to have reviewed by the Board at a final hearing. The paper or the response thereto shall be accompanied by a motion (§ 1.635) requesting a testimony period if a party wishes to introduce any evidence to be considered at final hearing (§ 1.671), such as affidavits previously filed under § 1.639(b). A request for a testimony period will be construed as including a request for final hearing. If the paper contains an explanation of why judgment should not be entered in accordance with the order and no party has requested a final hearing, the decision that is the basis for the order shall be reviewed based on the contents of the paper and the response. If the paper fails to show good cause, the Board shall enter judgment against the party against whom the order issued.

One comment suggested that in view of the proposed addition to § 1.640(b) to create a presumption of deferral of nondispositive preliminary motions, a provision should be added allowing the parties to request that the Board also consider deferred preliminary motions at a § 1.640(e) final hearing. The comment has merit and, while not being adopted specifically at this time, will be made the subject of future rulemaking. In the interim, and consistent with the second sentence of § 1.601, the rules should be construed to give the administrative patent judge the maximum discretion to determine what issues might be considered at any final hearing set as a result of entry of an order to show cause.

One comment suggested that § 1.640(e)(1) be revised to automatically authorize the party who filed a paper in response to a § 1.640(d) show cause order to file a reply to an opponent's response in order to avoid the need for motions to file such replies. The suggestion is outside the scope of the present

rulemaking and is not being adopted. Another comment suggested adding a provision to § 1.640(e) similar to the last sentence of proposed § 1.640(b) so that parties can include § 1.639 preliminary motion proofs in the record for consideration at a § 1.640(e) final hearing. The suggestion is being adopted. Accordingly, the penultimate sentence of § 1.640(e)(3), as adopted, reads: "Any evidence that a party wishes to have considered with respect to the decisions and deferred motions identified by the party or by an opponent for consideration or review at final hearing shall be filed or, if appropriate, noticed under § 1.671(e) during the testimony period of the party."

One comment suggested modifying the first sentence of proposed § 1.640(e)(4) ("If the paper contains an explanation of why judgment should not be entered in accordance with the order and no party has requested a final hearing . . .") by changing "order and" to read "order, and if." The suggestion is being adopted.

Two comments suggested that interferences can be expedited and the costs reduced by amending the rules to formalize the procedure of having an administrative patent judge conduct a hearing after the filing of motions, oppositions and replies on issues that are potentially dispositive of the interference, as has been done on an experimental basis in several interferences. The comment indicates that such a procedure should reduce time and costs, encourage settlements, reduce issues, and help parties reach stipulations. The suggestion, which is outside the scope of the present rulemaking, is not being adopted. The suggestion will be the subject of future rulemaking. In the interim, there is nothing in the rules to preclude a party from requesting a hearing on a dispositive motion. Whether a hearing is conducted is a matter within the discretion of the administrative patent judge.

Section 1.641 currently provides that an administrative patent judge who becomes aware of a reason why a claim designated to correspond to a count may not be patentable should notify the parties of the reason and set a time within which each party may present its views. After considering the views, the administrative patent judge determines how the interference shall proceed. The Notice of Proposed Rulemaking proposed to amend § 1.641 to state that a party's views "may include argument or appropriate preliminary motions under § 1.633(c), (d) or (h), including any supporting evidence." After the Notice of Proposed Rulemaking was published it became apparent that the proposed language is ambiguous as to (1) whether evidence can be submitted in support of argument as well as in support of appropriate motions and (2) as to whether a party who agrees with the administrative patent judge's determination of unpatentability is entitled to file motions under §§ 1.633(c), (d) and (h). These possible ambiguities are avoided by amending the rule to state that a party's views may include argument, including any supporting evidence, and in the case of the party whose claim may be unpatentable, may also include one or more appropriate preliminary motions under § 1.633(c), (d) and (h), including any supporting evidence. The Notice of Proposed Rulemaking also proposed amending § 1.641 to state that "[a]fter considering any timely filed views, including any timely filed preliminary motions under § 1.633, the administrative patent judge shall decide how the interference shall proceed." Inasmuch as the proposed language fails to take into account any oppositions and replies to the motions, the rule is instead revised to read: "After considering any timely filed views, including any timely filed preliminary motions under § 1.633, oppositions and replies, the administrative patent judge shall decide how the interference shall proceed."

"One comment responded to the proposed amendments of § 1.641 as follows:

The action taken by an administrative patent judge under this rule should be described as, in effect, a section 1.633(a) motion by the administrative patent judge. The action should point out that any party disagreeing with the administrative patent judge should respond in the same fashion as it would in opposing a section 1.633(a) motion including the submission of all available evidence under rule 1.639. By taking action under this rule, an administrative patent judge\* becomes the (or an) adversary to at least one party in the interference and therefore any decision on such a motion by an administrative patent judge should be deferred to final hearing and the administrative patent judge who took the

action should not be a member of the panel at final hearing. Other possibilities would be to remand the matter to the primary examiner for his or her decision as to whether there is any merit to the purported ground of unpatentability. If the purported ground of unpatentability applies to the claims of a patent involved in the interference, the primary examiner could determine whether the purported ground of unpatentability is sufficient to institute a reexamination proceeding with respect to the patent. If the primary examiner's decision is adverse to one or more of the parties, that party or those parties would have the burden of showing that the primary examiner's decision was incorrect. Another possibility would be for the administrative patent judge to merely notice the issue and provide the parties with a period of time within which to submit a motion under section 1.633(a). If none of the parties submits a section 1.633(a) motion and the administrative patent judge considers the matter to be of sufficient importance, he or she could then remand to the attention of the primary examiner for his or her decision as previously indicated.

\* Cf. *In re Van Geuns*, 20 USPQ2d 1291, 1295 (Fed. Cir.1991) "[a]s in all *ex parte* cases, the entity adverse to Van Geuns is the PTO Commissioner."

The suggestion that § 1.641 be revised to characterize an administrative patent judge's determination that a party's claim may be unpatentable as, in effect, a § 1.633(a) motion is not being adopted. Section 1.641, as proposed to be revised by the comment, could be construed as precluding an opponent who agrees with the determination from submitting argument and appropriate motions, including evidence, in support of the determination. The suggestion that the administrative patent judge who initially made the determination of unpatentability be precluded from serving as a member of the reviewing panel at final hearing is not adopted. Judges in various courts and judges in administrative proceedings routinely issue orders to show cause and consider views presented in response to those orders. In the case of a dispositive matter which results in the issuance of an order to show cause, the party receiving the order to show cause knows that in addition to the administrative patent judge issuing the order, at least two other administrative patent judges will consider the response. Moreover, it should be noted that resolving patentability in an interference and in *ex parte* proceedings is not the same. In *ex parte* examination of a patent application, the statute specifically contemplates an administrative appeal to the Board. 35 U.S.C. 134. In the case of interferences, the statute authorizes the Board, in the first instance, to make a patentability determination. 35 U.S.C. 135(a). Hence, the statute does not require that an administrative patent judge issuing an order to show cause not participate in ruling on the sufficiency of any response to the order. Efficient administration of interferences in PTO dictates that the administrative patent judge most likely to be familiar with the record participate in evaluating responses to orders to show cause.

Another comment suggested that a § 1.641 order authorizing views be identified in the rule as an order to show cause. The suggestion is not being adopted. If, after considering the parties' arguments, motions, oppositions and replies, the administrative patent judge concludes that all of the involved claims or one or both parties are unpatentable, the administrative patent judge may issue an order to show cause pursuant to § 1.640(d)(1) as amended, which expressly provides for a show cause order based on a decision on a matter raised sua sponte by an administrative patent judge.

Section 1.643(b) is revised, as proposed in the Notice of Proposed Rulemaking, for clarification and also to change "ends of justice" to "interest of justice" to be consistent with the language used in other interference rules, including §§ 1.628(a) and 1.687(c).

As proposed in the Notice of Proposed Rulemaking, § 1.644(a) is revised by changing "a panel consisting of more than one examiner-in-chief" to "the Board" and paragraphs (a)(1), (b) and (c) are revised by changing both occurrences of "panel" to "Board."

Section 1.644(a)(2) is revised by removing the statement concerning when parties are authorized to file a petition seeking to invoke the supervisory authority of the Commissioner. The times for filing petitions are set out in § 1.644(b).



Section 1.644(b) is revised to provide that a petition seeking to invoke the supervisory authority of the Commissioner shall not be filed prior to the party's brief for final hearing. Sections 1.644(a)(2) and (b) currently provide that such a petition shall not be filed "prior to the decision of the Board awarding judgment." Since promulgation of the "new" rules, 49 FR 48416 (Dec. 12, 1984), reprinted in 1050 Off. Gaz. Pat. Office 385 (Jan. 29, 1985), there have been relatively few petitions filed in interference cases, particularly petitions seeking to invoke supervisory authority. Thus, a result sought to be achieved under the "new" rules has been, in fact, achieved, i.e., fewer petitions. Under the rules, there should be few, if any, petitions to invoke supervisory authority. Section 1.644(a)(1), which authorizes important questions to be certified to the Commissioner, should be sufficient in most cases to resolve questions of interpretation of the rules. Section 1.644(a)(2) provides a vehicle for rule interpretation in those cases where certification is declined by the administrative patent judge and there remains, at the time briefs are filed for final hearing, a need to resolve the interpretation. The time for filing a petition to invoke supervisory authority is believed to be more appropriate before the Board enters a final decision, as opposed to after entry of a final decision—as required by current practice. Parties should not file petitions seeking to invoke supervisory authority in cases involving routine interlocutory orders which do not involve an interpretation of a rule. As noted in the notice of final rule:

[a] final decision of the Board is reviewable in the U.S. Court of Appeals for the Federal Circuit or an appropriate U.S. district court. Any reviewing court can review all aspects of the decision including patentability, priority, and all relevant interlocutory orders, such as denials of discovery.

49 FR 48416, 48418 (Dec. 12, 1984), reprinted in 1050 Off. Gaz. Pat. Office 385, 387 (Jan. 29, 1985).

Section 1.644(b) is also revised, as proposed, by revising it to state that a petition under § 1.644(a) shall be considered timely if it is filed simultaneously with a proper motion under §§ 1.633, 1.634, or 1.635 when granting the motion would require waiver of a rule. In other words, a petition under § 1.644(a)(3) should seek waiver of a rule prospectively rather than retroactively. Parties should recognize that waiver of a rule is reserved for unusual circumstances. *Myers v. Feigelman*, 455 F.2d 596, 601, 172 USPQ 580, 584 (CCPA 1972) (waiver of rules on routine basis would defeat the purpose of the rules and substantially confuse interference practice). Nevertheless, since PTO cannot possibly contemplate all circumstances which can arise in interferences at the time a rule is promulgated, waiver of a rule may be entirely appropriate in unusual circumstances. By encouraging parties to file a petition when they know a rule must be waived, the opponent is put in the best position to address the matter and to take whatever action might be in the opponent's interest in the event a petition is granted. On the other hand, parties should not expect many petitions to be granted which seek to waive the rules.

The time for responding to a petition under § 1.644(a)(1) or (a)(2) is changed from (a) 15 to days (b) to 20 days. The time for responding to a petition under § 1.644(a)(3) is changed from (a) 15 days to (b) 20 days or the date an opposition is due to the accompanying motion, whichever is earlier. The change will permit an opponent to file an opposition to the motion and the petition on the same day and should eliminate different, but related, time periods from running concurrently.

Section 1.644(b), as proposed, would have authorized the petition to be made part of the motion, as does § 1.644(b) in its current form. Upon reflection, since the petition is decided by one PTO official and the motion by another, it will be more efficient for PTO if the petition and motion are filed as separate papers. Additionally, the fact that a petition has been filed is less likely to be inadvertently overlooked if the petition and motion appear in separate papers.

In § 1.644(d), the second sentence, as proposed, is removed as unnecessary. The Notice of Proposed Rulemaking also proposed amending this paragraph to provide that the statement of facts in a petition preferably should be in numbered paragraphs. One comment suggested that numbered paragraphs be required, rather than just preferred. The suggestion is being adopted. Another comment suggested inserting a comma after

"Board" in the second sentence of § 1.644(d), as proposed to be revised. The suggestion is being adopted.

As proposed in the Notice of Proposed Rulemaking, § 1.644(f) is revised to change the "15 days" in which to request reconsideration of a decision by the Commissioner to "14 days."

In § 1.644(g), the quotation marks around "Express Mail" are removed, as proposed.

Section 1.645(b), which in its current form permits consideration of a belatedly filed paper only if accompanied by a motion under § 1.635 showing sufficient cause (§ 1.645(b)) for the belatedness, is revised in several respects, as proposed in the Notice of Proposed Rulemaking. First, "sufficient cause" is changed to "good cause" in order to provide a single "cause" standard throughout the interference rules. Second, paragraph (b) is revised to permit consideration of a belatedly filed paper if an administrative patent judge or the Board, sua sponte, is of the opinion that it would be in the interest of justice to consider the paper. An example would be where the delay is short (e.g., one day) and there is no prejudice to an opponent or where all parties and the Board act as though a paper is timely only to discover later that it was not. For purposes of sections other than § 1.645, a belatedly filed paper is considered "timely filed" if accompanied by a motion under § 1.635 to excuse the belatedness, which is granted.

Section 1.645(d) is revised, as proposed, by deleting "In an appropriate circumstance" as superfluous in view of the language "may stay proceedings," which indicates that the administrative patent judge has the discretion to stay an interference.

Section 1.646 is revised in the manner proposed in the Notice of Proposed Rulemaking. Specifically, § 1.646(a)(2) is revised by deleting the reference to § 1.684, which is removed. Section 1.646(c)(1) is revised by inserting "or causing a copy of the paper to be handed" after "By handing a copy of the paper" to make it clear that the paper need not be personally delivered by the party, i.e., that delivery by hand can be effected by a commercial courier, for example. When a next-business-day commercial courier is used, it should be understood that the party normally will deliver the paper to the courier on one day and the paper will be delivered to the office of counsel for the opponent on the next day. A certificate of service that states that the paper is being served "via the following commercial courier: [insert name]" is deemed to be a proper service within the meaning of § 1.646(c)(1), as amended. Pending further rulemaking, the date of service will be considered the date the paper is delivered to the courier.

In § 1.646(c)(4), "mail" (second occurrence) is changed to "first class mail" to make it clear that the service date specified in that paragraph applies only to first class mail.

Section 1.646(c)(5) is redesignated as § 1.646(c)(6) and a new § 1.646(c)(5) is added which explains that a party may serve by Express Mail and that when service is effected by Express Mail, the date of service is considered to be the date of deposit with the U.S. Postal Service.

Section 1.646(d) is revised by removing the quotation marks around "Express Mail."

Section 1.646(e) is revised to state that the due date for serving a paper is the same as the due date for filing the paper in the Patent and Trademark Office.

One comment suggested amending § 1.646 to authorize service by next-business-day courier, with the date of service being the day the paper is given to the courier. The suggestion is not being adopted at this time, but will be considered in future rulemaking. In the interim, for the reasons given above, service by a next-business-day courier may be regarded as service by hand.

Section 1.651(a)(2) is revised, as proposed, by removing "(testimony includes testimony to be taken abroad under § 1.684)" in order to be consistent with the proposal to remove and reserve § 1.684 and by amending §§ 1.651(c)(2) and (c)(3) to be consistent with the amendment to the definition of "effective filing date" in § 1.601(g).

The Notice of Proposed Rulemaking proposed further amending § 1.651(d) by changing "abroad under § 1.684" to "in a foreign country." One comment noted that the term "foreign country" is unduly restrictive in that it does not include a foreign place that is not part of a "country" and suggested that the phrase "in a place outside the United States" be used instead. The suggestion is being adopted.

Section 1.653(a) is revised as proposed in the Notice of Proposed Rulemaking. First, the references to certain paragraphs of § 1.672 are revised to reflect the redesignation of those paragraphs. Second, "of fact" in the clause "agreed statements of fact under § 1.672(f)" is removed, because agreed statements under § 1.672(f), redesignated as § 1.672(h), can set forth either (1) how a particular witness would testify if called or (2) the facts in the case of one or more of the parties. Third, "under § 1.684(c)" is removed in view of the removal of § 1.684. Fourth, § 1.653(a) is revised to indicate that in addition to the types of testimony already set forth therein, testimony includes copies of written interrogatories and answers and written requests for admissions and answers, which might be obtained where a motion for additional discovery under § 1.687(c) is granted.

One comment suggested deleting "transcripts of interrogatories, cross interrogatories, and recorded answers" on the ground that this language is from § 1.684, which is removed. The suggestion is not being adopted, since there may be occasions when such testimony would be appropriate and authorized by an administrative patent judge or the Board.

Another comment suggested amending § 1.653 to provide that a party's record can include copies of videotapes of depositions and inter partes tests (in addition to the transcripts of the depositions), citing disparate treatment of this matter said to be occurring with different administrative patent judges. The suggestion, which is outside the scope of the present rulemaking, is not being adopted. The matter of videotapes and other forms of proof will be considered in a future rulemaking effort.

As proposed in the Notice of Proposed Rulemaking, § 1.653(b) is revised to be consistent with the redesignation of certain paragraphs of § 1.672 and to remove the reference to § 1.684(c), which is removed. Section 1.653(b) is also revised for clarity, while §§ 1.653(c)(1) and (4) are revised to make it clear that the only testimony to be included in a party's record is testimony submitted on behalf of the party. Having copies of the same testimony appear in both parties' records unnecessarily encumbers the records and is confusing in that a given page of testimony will have different page numbers in the different records, with the result that the briefs of the parties will refer to different record pages for the same testimony.

One comment suggested that either § 1.653(b) or § 1.672(h) be revised to specify when an "an original agreed statement under § 1.672(h)" is to be filed, since the due date for filing such a statement is not provided in the current rules. The suggestion is outside the scope of the current rulemaking and is not being adopted. In the interim, parties should plan on filing an agreed statement as soon as practical after it is agreed to, but an administrative patent judge shall have discretion to accept the agreed statement at any reasonable time.

Section 1.653(c)(5), which currently requires that the record filed by each party include each notice, official record and printed publication relied upon by the party and filed under § 1.682(a), is removed and reserved, as proposed. The requirement is unnecessary because notices, official records and printed publications are in the nature of exhibits under § 1.653(i), which are submitted with but not included in the record. The inclusion of exhibits in the record merely increases the size of the record without serving any useful purpose.

As proposed in the Notice of Proposed Rulemaking, § 1.653(g) is revised, and §§ 1.653(f) and (h) removed and reserved, to eliminate the current distinction between typewritten and printed records. Specifically, § 1.653(g) is revised by changing "8 1/2 x 11 inches (21.8 by 27.9 cm.)" to "21.8 by 27.9 cm. (8 1/2 x 11 inches)" in order to emphasize the metric dimension, by removing the requirement for justified margins, by requiring that the records be bound with covers at their left edges in such manner as to lie flat when open to any page and in one or more volumes of convenient size (approximately 100 pages per volume is suggested) and by requiring that when there is more than one volume, the numbers of the pages contained in each volume must appear at the top of the cover for each volume. Section 1.653(i) is revised, as proposed, to state that exhibits include documents and things identified in affidavits or on the record during the taking of oral depositions as well as official records and publications submitted pursuant to § 1.682(a).

Section 1.654(a) is revised, as proposed, by changing "shall" in the second sentence to "may" for clarity and also to reduce the time for oral argument by a party from 60 minutes to 30 minutes. Most hearings require no more than 30 minutes per side. A panel hearing oral argument retains discretion to grant more time at a hearing.

The Notice of Proposed Rulemaking proposed amending § 1.655(a) to state that the standard of review for interlocutory orders is "an abuse of discretion" rather than "erroneous or an abuse of discretion." As explained in the Notice of Proposed Rulemaking, the recitation of a separate "error" standard is believed to be superfluous, because legal error is one of the alternative bases for finding an abuse of discretion. Specifically, an abuse of discretion may be found when (1) the decision of an administrative patent judge is clearly unreasonable, arbitrary or fanciful, (2) the decision is based on an erroneous conclusion of law, (3) the findings of the administrative patent judge are clearly erroneous, or (4) the record contains no evidence upon which the administrative patent judge rationally could have based the decision. Compare, e.g., *Heat and Control, Inc. v. Hester Industries, Inc.*, 785 F.2d 1017, 1022, 228 USPQ 926, 930 (Fed. Cir. 1986); *Western Electric Co. v. Piezo Technology, Inc. v. Quigg*, 860 F.2d 428, 430-31, 8 USPQ2d 1853, 1855 (Fed. Cir. 1988); *Abrutyn v. Giovanniello*, 15 F.3d 1048, 1050-51, 29 USPQ2d 1615, 1617 (Fed. Cir. 1994), all of which define the phrase "abuse of discretion." One comment stated that the rule, as proposed to be amended, in effect raises the standard of review because "abuse of discretion" includes "clear error" but not mere "error." In view of the above-cited Federal Circuit decisions, it is believed that the statement in the comment is not correct.

One comment suggested inserting a comma after "correct" in the penultimate sentence of § 1.655(a). The suggestion is being adopted.

Section 1.655(b) is revised to clarify the language concerning matters that a party is not entitled to raise for consideration at final hearing. Specifically, § 1.655(b), as amended, provides that a party shall not be entitled to raise for consideration at final hearing any matter which properly could have been raised by a motion under § 1.633 or 1.634 unless (1) the matter was properly raised in a motion that was timely filed by the party under § 1.633 or 1.634 and the motion was denied or deferred to final hearing, (2) the matter was properly raised by the party in a timely filed opposition to a motion under § 1.633 or 1.634 and the motion was granted over the opposition or deferred to final hearing, or (3) the party shows good cause why the issue was not properly raised by a timely filed motion or opposition. It was proposed in the Notice of Proposed Rulemaking to amend § 1.655(b) to state that "[a] change of attorneys during the interference generally does not constitute good cause." For the reasons already given, it has been decided not to adopt the proposed amendment to § 1.655(b).

The Notice of Proposed Rulemaking also proposed to amend § 1.655(b) to create a rebuttable presumption that all claims of a party that are designated as corresponding to a count are directed to the same patentable invention for the purpose of determining unpatentability in view of prior art. The Federal Circuit had interpreted the former rule to suggest that the presumption applied only where a party's claim corresponded exactly to a count and was anticipated by prior art. In *re Van Geuns*, 988 F.2d 1181, 1185, 26 USPQ2d 1057, 1060 (Fed. Cir. 1993). The proposed revised rule would have made it clear that the rebuttable presumption applies to all claims that are designated as corresponding to the count, regardless of whether the count is anticipated by (§ 102) or would have been obvious view of (§ 103) the prior art. Specifically, the Notice of Proposed Rulemaking proposed adding the following sentence: "A party who fails to contest, by way of a timely filed preliminary motion under § 1.633(c), the designation of a claim as corresponding to a count may not subsequently argue to an administrative patent judge or the Board the separate patentability or lack of separate patentability of claims designated to correspond to the count." Comments were filed in opposition to the proposed amendment. One comment, for example, stated that the proposed amendment, as well as the accompanying commentary in the Notice of Proposed Rulemaking,

falsely assumes that claims cannot be separately patentable merely because they have been designated as corresponding



to the count, i.e., merely because the claims are patentably indistinct from each other. The falsity of this proposition is apparent from the practice of the Patent and Trademark Office of designating as corresponding to the count both the patentable and unpatentable claims of a party.

Two different comparisons are relevant: a party's claims with other claims of the party and the claims of a party with the prior art. The claims may be patentably indistinct from each other and, thus, provide no basis for a motion under § 1.633(c)(4), yet be separately patentable over the prior art.

Accordingly, for example, a party should be able to respond to a motion for judgment on grounds of unpatentability over the prior art by arguing that some, but not necessarily all, of the designated claims are patentable over the prior art, even though the party had not previously moved to designate the separately patentable claims as not corresponding to the count. Indeed, it is entirely possible that no basis existed for making such a previous motion. The proposed amended rule, however, forecloses a party from responding to an attack on patentability of its claims by arguing that some, but not all, of the claims are patentable over the prior art.

(Emphasis in original.) The comment included several illustrative examples, including the following example said to be from an actual interference:

The count is directed to a broad generic class of compounds. While the compounds are useful herbicides, the count and corresponding claims are directed to compounds per se. The applications of both parties contain designated claims substantially corresponding to the count as well as claims directed to species falling within the count.

The application of party A contains a designated claim directed specifically to a species with [sic; within] the genus that possesses ordinary activity for compounds of the claimed class; i.e., the species compound is not separately patentable over the genus. Thus, the claim to the species is not patentable over the count if the count were prior art and is properly designated as corresponding to the count.

Party B, during the motion period, moves for judgment under § 1.633(a) on the basis of a reference that is not prior art against party B, only against party A. That reference discloses a single compound falling squarely within the genus of the count \* \* \*, but that is significantly different structurally from the species claimed in A's application. Furthermore, the reference does not indicate that the disclosed compound has herbicidal properties and it is shown in opposition to the motion for judgment that the compound, in fact, possesses virtually no herbicidal activity.

Under this set of facts, the compound of the reference anticipates party A's claim that corresponds \* \* \* [exactly] to the count. Nevertheless, the reference has no significance with regard to the patentability of the species claim in party A's application.

In this particular case, the EIC [Examiner-in-Chief] had no difficulty in partially granting the motion for judgment against party A as to the generic claim, but denying the motion as to the species claim. The interference was continued with the count unchanged (because the reference was not prior art as to party B), with party A ultimately prevailing on the issue of priority. Thus, neither party received a generic claim, but party A ultimately obtained a species claim that was patentably indistinct from the genus of the count. Presumably under the new rules, party B would have retained all its claims while all of party A's claims would be found unpatentable.

This case clearly illustrates that a claim that is patentably indistinct from the count and from a claim corresponding \* \* \* [exactly] to the count (i.e., a claim that cannot be designated as not corresponding to the count), nevertheless can

be patentable over prior art that renders unpatentable a claim corresponding precisely to the count. This case also illustrates that failure to file a motion to designate certain claims as not corresponding to the count cannot be taken as a concession that all of the designated claims are unpatentable merely because the count (or a claim corresponding precisely to the count) is unpatentable over the prior art. Moreover, this situation is not an unusual one. It happens often in chemical cases, particularly chemical cases dealing with biologically active compounds.

Another comment questioned when a party that has failed to contest the designation of a claim as corresponding to a count would ever have occasion to later argue a lack of separate patentability.

The above comments are well taken. Accordingly, the proposal to amend § 1.655(b) to preclude a party from arguing separate patentability or a lack of separate patentability of claims over prior art in the absence of a § 1.633(c) motion is hereby withdrawn. Instead, the rule is revised to read as follows: "A party that fails to contest, by way of a timely filed preliminary motion under § 1.633(c), the designation of a claim as corresponding to a count, or fails to timely argue the separate patentability of a particular claim when the ground for unpatentability is first raised, will not be permitted to later argue the separate patentability of that claim with respect to that ground." Thus, a party that fails to timely argue the separate patentability of a particular claim when the ground for unpatentability is first raised will not be permitted to later argue the separate patentability of that claim with respect to that ground. As noted in the comment, often the first opportunity to address patentability is in an opposition to a preliminary motion for judgment under § 1.633(a). In addition, inasmuch as a party filing a motion under § 1.633(a) must separately address each claim alleged to be unpatentable, the opponent will be in a position to know how to prepare an opposition, whereas under the current rules preparation of an opposition separately addressing each claim is not clearly required by the rules. The basic idea is that an opponent should have a fair opportunity to address the patentability of any of the opponent's claims when a patentability issue is first raised. Patentability can be raised, for example, by a preliminary motion under § 1.633(a) or sua sponte by an administrative patent judge. However, a party is not entitled to wait until the 11th hour in an interference to belatedly raise for the first time an issue of separate patentability of claims corresponding to a count.

As proposed in the Notice of Proposed Rulemaking, § 1.655(c) is revised by changing "To prevent manifest injustice" to "In the interest of justice" to be consistent with the language used in other interference rules.

Section 1.656 is revised, as proposed, by redesignating paragraphs (b)(1) through (b)(6) as paragraphs (b)(3) through (b)(8), respectively, and adding new paragraphs (b)(1) and (b)(2) requiring the brief to include (1) a statement of interest identifying every party represented by the attorney in the interference and the real party in interest if the party named in the caption is not the real party in interest and (2) a statement of related cases indicating whether the interference was previously before the Board for final hearing and identifying any related appeal or interference which is pending before, or which has been decided by, the Board, or which is pending before, or which has been decided by, the Court of Appeals for the Federal Circuit or a district court in a proceeding under 35 U.S.C. 146. A related appeal or interference is one which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending interference. Appeals are mentioned because there have been numerous situations where related issues have been present before the Board simultaneously or sequentially in an ex parte appeal and an interference and vice versa. It was also proposed to amend current paragraph (b)(3), redesignated as paragraph (b)(5), to specify that statements of fact preferably should be presented in numbered paragraphs. One comment suggested that numbered paragraphs be required. The suggestion is being adopted.

As explained in the Notice of Proposed Rulemaking, § 1.656(b)(4), which is redesignated as § 1.656(b)(6), requires that the opening brief of the junior party contain the contentions of the party with respect to the "issues to be decided," which has been construed to include the matter of whether some of

the senior party's evidence of conception was inadmissible hearsay. *Suh v. Hoeft*, 23 USPQ2d 1321, 1323 (Bd. Pat. App. & Int. 1991). As support, the Board in *Suh* relied on *Fisher v. Bouzard*, 3 USPQ2d 1677 (Bd. Pat. App. & Int. 1987), and *Moller v. Harding*, 214 USPQ 730 (Bd. Pat. Int. 1982). Both of these cases concern interferences declared under the "old" interference rules (i.e., § 1.201 et seq.), of which § 1.254 specified that the opening brief of the junior party shall "present a full, fair statement of the questions involved, including his position with respect to the priority evidence on behalf of other parties." Current § 1.656(b)(4) does not expressly require, and was not intended to imply, that the opening brief of the junior party must address the evidence of any other party with respect to the issue of priority or any other issue. In order to clarify that the opening brief of a junior party need not address the evidence of the other parties, § 1.656(b)(6), as adopted, is revised to require only that the junior party's opening brief contain the contentions of the party "with respect to the issues it is raising for consideration at final hearing." These issues would include the junior party's case-in-chief for priority with respect to an opponent or derivation by an opponent as well as matters raised in any denied or deferred motions of the junior party that are to be reviewed or considered at final hearing. Where the reply brief of the junior party is believed to include a new argument in response to the case-in-chief of the senior party as presented in the senior party's opening brief, the senior party may move under § 1.635 for leave to file a reply to the junior party's reply brief. The motion must be accompanied by a copy of the senior party's reply.

Section 1.656(d) is revised, as proposed, to state that unless ordered otherwise by an administrative patent judge, briefs shall be double-spaced (except for footnotes, which may be single-spaced) and shall comply with the requirements of § 1.653(g) for records except the requirement for binding. As a result, the current distinctions between printed and typewritten briefs are eliminated. Recent briefs filed in interference cases have been fairly long, e.g., 150 pages. The parties should make every effort to file briefs which, to borrow the words in one section of the patent statute, 35 U.S.C. 112, are "full, clear, concise, and exact." Consideration will be given in a future rulemaking effort as to whether it might be appropriate to require a party to submit both (1) findings of fact and conclusions of law and (2) a brief, wherein it might be presumed that the reader of the brief is familiar with the proposed findings/conclusions. So that members of the bar practicing before the Board in interference cases can be apprised of how briefs are used at the Board, the following comments are made. Briefs serve two purposes. First, briefs enable all three panel members to prepare for oral argument. During the time a member prepares for oral argument, often there is not time to become fully familiar with the record, particularly where the brief is being read at a location outside PTO, e.g., home. Second, when an opinion is authored by one panel member and reviewed by the other two panel members, the brief serves as a road map during the necessarily more thorough and more complete review of the record. Whereas there may not be time to "check" the record during the preparation phase before oral argument, there is time to "check" the record during the opinion writing and review period. An effective brief, with or without proposed findings/conclusions, is one which permits the members of the Board to accomplish both purposes mentioned above.

In § 1.656, paragraphs (e), (g) and (h) are revised, as proposed, to require an original and four copies (currently an original and three copies are required) of each brief, any proposed findings of fact and conclusions of law, any motion under 37 CFR 1.635 to suppress evidence and any opposition to a motion to suppress evidence.

The Notice of Proposed Rulemaking proposed amending the third sentence of § 1.656(g) to read as follows: "Any proposed findings of fact shall be in numbered paragraphs and supported by specific references to the record." One comment suggested that "and supported" be changed to "and shall be supported." The suggestion is being adopted.

Section 1.656(h) is revised, as proposed, to state that a party's failure to challenge the admissibility of the evidence of an opponent on a ground that could have been raised in a timely objection under §§ 1.672(c), 1.682(c), 1.683(b) or 1.688(b) constitutes a waiver of the right to move under § 1.656(h) to suppress the evidence on that ground at final hearing.

Section 1.656(i) currently provides that if a junior party fails to file an opening brief for final hearing, an order may be issued by the administrative patent judge requiring the junior party to show cause why the failure to file a brief should not be treated as a concession of priority, and further provides that judgment may be rendered against the junior party if the junior party "fails to respond" within a time period set in the order. The expression "fails to respond" has been misinterpreted by some junior parties as meaning that the mere filing of a response of any kind to the order to show cause should be sufficient to avoid the entry of judgment. Such an interpretation was not intended and, if adopted, would effectively nullify § 1.656(i). As proposed in the Notice of Proposed Rulemaking, "respond" is changed to "show good cause" to make it clear that a junior party's failure to file a timely opening brief will not be excused unless good cause is shown to explain or justify the failure to file a brief. The language of the rule will then be consistent with the other interference rules concerning orders to show cause, e.g., §§ 1.640(c) and 1.652.

Section 1.657 is revised, as proposed, to be consistent with the changes to the definition of "effective filing date" in § 1.601(g). As revised, § 1.657 will also state that in an interference involving an application and a patent where the effective filing date of the application is after the date the patent issued, a junior party has the burden of establishing priority by clear and convincing evidence. In other interferences the junior party has the burden of establishing priority by a preponderance of the evidence. The amendment codifies the holding of *Price v. Symsek*, 988 F.2d 1187, 1190-91, 26 USPQ2d 1031, 1033 (Fed. Cir. 1993), as clarified by *Bosies v. Benedict*, 27 F.3d 539, 541-42, 30 USPQ2d 1862, 1864 (Fed. Cir. 1994).

Section 1.658(a) is revised, as proposed, to state that when the Board enters a decision awarding judgment as to all counts, the decision shall be regarded as a final decision for the purpose of judicial review (35 U.S.C. 141-44, 146) unless a request for reconsideration under paragraph (b) of this section is timely filed.

Section 1.658(b) is revised, as proposed, by removing the phrases "[w]here reasonably possible" and "such that delivery is accomplished" as unnecessary, so that the sentence as revised reads as follows: "Service of the request for reconsideration shall be by hand or Express Mail." As proposed, a sentence is also added specifying that a decision on reconsideration is a final decision for the purpose of judicial review (35 U.S.C. 141-44, 146). Section 1.658(b) is further revised, as proposed, by changing "reply to a request for reconsideration" to "opposition to a request for reconsideration" in order to be consistent with the terminology employed in § 1.640(c), which concerns requests for reconsideration of decisions on preliminary motions.

One comment suggested amending § 1.658(b) to permit service of requests for reconsideration by next-business-day commercial courier. The suggestion is not being adopted at this time, but will be the subject of a future rulemaking effort. In the interim, see the discussion above concerning the interpretation to be given the phrase "service . . . by hand."

As proposed in the Notice of Proposed Rulemaking, § 1.660 has been revised by adding a new paragraph (e) explaining that the failure of a party to comply with the notice provisions of § 1.660 may result in sanctions under § 1.616 and that knowledge by, or notice to, an employee of the Office other than an employee of the Board, of the existence of the reexamination, application for reissue, protest, or litigation shall not be sufficient. It was also proposed to provide that the notice contemplated by this section is notice addressed specifically to an administrative patent judge or the Board. One comment suggested that rather than requiring the notice to be "addressed specifically to an administrative patent judge or the Board," the rule require that it be "addressed to the administrative patent judge in charge of the interference in which the application or patent is involved." The suggestion is being adopted.

Section 1.662(a) is revised, as proposed, by changing "filing by an applicant or patentee" in the second sentence to "filing by a party" to make it clear that a request for adverse judgment, including a written disclaimer of the invention defined by a count, a concession of priority or unpatentability of the subject matter of a count, abandonment of the invention defined by a count and abandonment of the contest as to a count, can be signed by the party's attorney or agent of record. For the same



reason, in the third sentence of paragraph (a), which concerns abandonment of an involved application "by an applicant" is removed and "applicant" is revised to read "application."

In § 1.662(b), the first sentence is revised, as proposed, by changing "omits all claims of the patent corresponding to the counts of the interference for the purpose of avoiding the interference" to read "does not include a claim that corresponds to a count" in order to make it clear that judgment may not be entered where the reissue application includes any claim that corresponds to a count, including a new or amended claim that should be designated as corresponding to the count. Similarly, "reissue other than for the purpose of avoiding the interference" is changed to "reissue which includes a claim that corresponds to a count," which means corresponds to the count or should be designated to correspond to the count.

Section 1.674(a), which specifies before whom depositions may be taken, the reference to "United States or a territory or insular possession of the United States" is removed, as proposed, in order to make the paragraph applicable to depositions for testimony compelled in foreign countries.

Section § 1.675(d), which concerns reading and signing of a transcript by the witness, is revised, as proposed, to take into account that the witness might refuse to read and/or sign the transcript of the deposition, in which case the circumstances under which the witness refused to sign must be noted on the certificate by the officer who prepared the certified transcript (§ 1.676(c)). One comment suggested that § 1.675 be revised to recognize the witness's right to make corrections to the transcript prior to signing, as in Fed. R. Civ. P. 30(e), second sentence. The suggestion, which is outside the scope of the present rulemaking, is not being adopted. The substance of the suggestion will be considered in a future rulemaking effort.

Section 1.676(a)(4) is revised, as proposed, by changing "opposing party" to "opponent."

Section 1.677(a), which in its current form specifies the required form for transcripts of depositions, is revised, as proposed, to also apply to affidavits, by removing the reference to "typewritten" matter, changing "pica-type" to "11 point type," and changing "8 1/2 x 11 inches (21.8 by 27.9 cm.)" to "21.8 by 27.9 cm. (8 1/2 x 11 inches)." For the reasons given above in the discussion of a "developing record," § 1.677(b), which concerns numbering of exhibits submitted with affidavits and deposition transcripts, is revised to change "consecutively" to "consecutively to the extent possible."

In § 1.678, the section heading is changed, as proposed, from "Transcript of deposition must be filed" to "Time for filing transcript of deposition" for clarity. The text is revised by changing the time for filing the certified transcript from 45 days to one month after the deposition.

Section 1.679 is revised as proposed by changing "transcript" to "transcript of a deposition" for clarity and "for printing (§ 1.653(g))" is removed as unnecessary.

In § 1.682, paragraph (a) is revised, as proposed, in the "Miscellaneous Amendments" part of the Notice of Proposed Rulemaking in the following respects. First, "identified during the taking of testimony of a witness" is changed to "identified in an affidavit or on the record during an oral deposition of a witness" for clarity. Second, § 1.682(a)(4) ("where appropriate, be accompanied by a certified copy of the official record or a copy of the printed publication (§ 1.671(d))") is removed and reserved as superfluous in view of Rules 901 and 902 of the Federal Rules of Evidence, which apply to interference proceedings (§ 1.671(b)), and require authentication of evidence that is not self-authenticating. Third, the first word in each of paragraphs (a)(2), (a)(3) and (a)(4) is capitalized.

Section 1.685(d) is revised, as proposed, for clarification. Section 1.687(c) is revised, as proposed, to refer to § 1.647 concerning translations of documents in a foreign language.

One comment stated that the lack of discovery available under § 1.687(c) has prevented some interferences from reaching the "correct" result. According to the comment, a different result might have been reached if the discovery available under the Federal Rules of Civil Procedure had been allowed. The comment suggests that PTO consider authorizing discovery similar to the Fed. R. Civ. P. in interferences. The suggestion, which is outside the scope of the present rulemaking, is not being adopted.

In § 1.690(a), "37 CFR, Subpart E of Part 1" is revised to read "this subpart."

**Other Considerations:** These rules conform with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, Executive Order 12866, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.* The Office of Management and Budget has determined that these rule changes are not significant for the purposes of Executive Order 12866.

The Assistant Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)), because the changes clarify existing rules setting forth the procedures used in patent appeals and interferences.

PTO has determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes will not impose any additional burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

#### List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Courts, Inventions and Patents.

For the reasons set out in the preamble, Part 1 of Title 37 of the Code of Federal Regulations is amended as set forth below:

#### PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 is revised to read as follows:

Authority: 35 U.S.C. 6 and 23, unless otherwise noted.

2. Section 1.11(e) is revised to read as follows:

#### § 1.11 Files open to the public.

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(e) The file of any interference involving a patent, a statutory invention registration, a reissue application, or an application on which a patent has been issued or which has been published as a statutory invention registration, is open to inspection by the public, and copies may be obtained upon paying the fee therefor, if:

(1) The interference has terminated or  
(2) An award of priority or judgment has been entered as to all parties and all counts.

3. In § 1.192, paragraphs (c)(1) through (c)(7) are redesignated as paragraphs (c)(3) through (c)(9); paragraphs (a), (c) introductory text, newly designated paragraph (c)(7), introductory text of (c)(8), and (c)(8)(v), and (d) are revised; and paragraphs (c)(1) and (c)(2) are added to read as follows:

#### § 1.192 Appellant's brief.

(a) Appellant shall, within 2 months from the date of the notice of appeal under § 1.191 or within the time allowed for response to the action appealed from, if such time is later, file a brief in triplicate. The brief must be accompanied by the requisite fee set forth in § 1.17(f) and must set forth the authorities and arguments on which appellant will rely to maintain the appeal. Any arguments or authorities not included in the brief will be refused consideration by the Board of Patent Appeals and Interferences, unless good cause is shown.

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(c) The brief shall contain the following items under appropriate headings and in the order indicated below unless the brief is filed by an applicant who is not represented by a registered practitioner:

(1) *Real party in interest.* A statement identifying the real party in interest, if the party named in the caption of the brief is not the real party in interest.

(2) *Related appeals and interferences.* A statement identifying by number and filing date all other appeals or interferences known to appellant, the appellant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) *Status of claims.* A statement of the status of all the claims, pending or canceled, and identifying the claims appealed.

(4) *Status of amendments.* A statement of the status of any amendment filed subsequent to final rejection.

(5) *Summary of invention.* A concise explanation of the invention defined in the claims involved in the appeal, which shall refer to the specification by page and line number, and to the drawing, if any, by reference characters.

(6) *Issues.* A concise statement of the issues presented for review.

(7) *Grouping of claims.* For each ground of rejection which appellant contests and which applies to a group of two or more claims, the Board shall select a single claim from the group and shall decide the appeal as to the ground of rejection on the basis of that claim alone unless a statement is included that the claims of the group do not stand or fall together and, in the argument under paragraph (c)(8) of this section, appellant explains why the claims of the group are believed to be separately patentable. Merely pointing out differences in what the claims cover is not an argument as to why the claims are separately patentable.

(8) *Argument.* The contentions of appellant with respect to each of the issues presented for review in paragraph (c)(6) of this section, and the basis therefor, with citations of the authorities, statutes, and parts of the record relied on. Each issue should be treated under a separate heading.

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(v) For any rejection other than those referred to in paragraphs (c)(8)(i) to (iv) of this section, the argument shall specify the errors in the rejection and the specific limitations in the rejected claims, if appropriate, or other reasons, which cause the rejection to be in error.

(9) *Appendix.* An appendix containing a copy of the claims involved in the appeal.

(d) If a brief is filed which does not comply with all the requirements of paragraph (c) of this section, appellant will be notified of the reasons for non-compliance and provided with a period of one month within which to file an amended brief. If appellant does not file an amended brief during the one-month period, or files an amended brief which does not overcome all the reasons for non-compliance stated in the notification, the appeal will stand dismissed.

4. Section 1.601 is amended by revising paragraphs (f), (g), (j), (k), (l), (m), (n), and (q) and adding new paragraphs (r) and (s) to read as follows:

#### § 1.601 Scope of rules, definitions.

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(f) A *count* defines the interfering subject matter between two or more applications or between one or more applications and one or more patents. At the time the interference is initially declared, a count should be broad enough to encompass all of the claims that are patentable over the prior art and designated to correspond to the count. When there is more than one count, each count shall define a separate patentable invention. Any claim of an application or patent that is designated to correspond to a count is a claim involved in the interference within the meaning of 35 U.S.C. 135(a). A claim of a patent or application that is designated to correspond to a count and is identical to the count is said to correspond exactly to the count. A claim of a patent or application that is designated to correspond to a count but is not identical to the count is said to correspond substantially to the count. When a count is broader in scope than all claims which correspond to the count, the count is a phantom count.

(g) The *effective filing date* of an application is the filing date of an earlier application, benefit of which is accorded to the application under 35 U.S.C. 119, 120, 121, or 365 or, if

no benefit is accorded, the filing date of the application. The effective filing date of a patent is the filing date of an earlier application, benefit of which is accorded to the patent under 35 U.S.C. 119, 120, 121, or 365 or, if no benefit is accorded, the filing date of the application which issued as the patent.

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(j) An *interference-in-fact* exists when at least one claim of a party that is designated to correspond to a count and at least one claim of an opponent that is designated to correspond to the count define the same patentable invention.

(k) A *lead attorney* or agent is a registered attorney or agent of record who is primarily responsible for prosecuting an interference on behalf of a party and is the attorney or agent whom an administrative patent judge may contact to set times and take other action in the interference.

(l) A *party* is an applicant or patentee involved in the interference or a legal representative of an assignee of record in the Patent and Trademark Office of an applicant or patentee involved in an interference. Where acts of a party are normally performed by an attorney or agent, "party" may be construed to mean the attorney or agent. An inventor is the individual named as inventor in an application involved in an interference or the individual named as inventor in a patent involved in an interference.

(m) A *senior party* is the party with the earliest effective filing date as to all counts or, if there is no party with the earliest effective filing date as to all counts, the party with the earliest filing date. A *junior party* is any other party.

(n) Invention "A" is the *same patentable invention* as an invention "B" when invention "A" is the same as (35 U.S.C. 102) or is obvious (35 U.S.C. 103) in view of invention "B" assuming invention "B" is prior art with respect to invention "A". Invention "A" is a *separate patentable invention* with respect to invention "B" when invention "A" is new (35 U.S.C. 102) and non-obvious (35 U.S.C. 103) in view of invention "B" assuming invention "B" is prior art with respect to invention "A".

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(q) A *final decision* is a decision awarding judgment as to all counts. An *interlocutory order* is any other action taken by an administrative patent judge or the Board in an interference, including the notice declaring an interference.

(r) *NAFTA country* means NAFTA country as defined in section 2(4) of the North American Free Trade Agreement Implementation Act, Pub. L. 103-182, 107 Stat. 2060 (19 U.S.C. 3301).

(s) *WTO member country* means WTO member country as defined in section 2(10) of the Uruguay Round Agreements Act, Pub. L. 103-465, 108 Stat. 4813 (19 U.S.C. 3501).

5. Section 1.602 is amended by revising paragraph (c) to read as follows:

#### § 1.602 Interest in applications and patents involved in an interference.

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(c) If a change of any right, title, and interest in any application or patent involved or relied upon in the interference occurs after notice is given declaring the interference and before the time expires for seeking judicial review of a final decision of the Board, the parties shall notify the Board of the change within 20 days after the change.

6. Section 1.603 is revised to read as follows:

#### § 1.603 Interference between applications; subject matter of the interference.

Before an interference is declared between two or more applications, the examiner must be of the opinion that there is interfering subject matter claimed in the applications which is patentable to each applicant subject to a judgment in the interference. The interfering subject matter shall be defined



by one or more counts. Each application must contain, or be amended to contain, at least one claim that is patentable over the prior art and corresponds to each count. All claims in the applications which define the same patentable invention as a count shall be designated to correspond to the count.

7. Section 1.604(a)(1) is revised to read as follows:

**§ 1.604 Request for interference between applications by an applicant.**

(a) \*\*\*

(1) Suggesting a proposed count and presenting at least one claim corresponding to the proposed count or identifying at least one claim in its application that corresponds to the proposed count.

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8. Section 1.605(a) is revised to read as follows:

**§ 1.605 Suggestion of claim to applicant by examiner.**

(a) If no claim in an application is drawn to the same patentable invention claimed in another application or patent, the examiner may suggest that an applicant present a claim drawn to an invention claimed in another application or patent for the purpose of an interference with another application or a patent. The applicant to whom the claim is suggested shall amend the application by presenting the suggested claim within a time specified by the examiner, not less than one month. Failure or refusal of an applicant to timely present the suggested claim shall be taken without further action as a disclaimer by the applicant of the invention defined by the suggested claim. At the time the suggested claim is presented, the applicant may also call the examiner's attention to other claims already in the application or presented with the suggested claim and explain why the other claims would be more appropriate to be designated to correspond to a count in any interference which may be declared.

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9. Section 1.606 is revised to read as follows:

**§ 1.606 Interference between an application and a patent; subject matter of the interference.**

Before an interference is declared between an application and an unexpired patent, an examiner must determine that there is interfering subject matter claimed in the application and the patent which is patentable to the applicant subject to a judgment in the interference. The interfering subject matter will be defined by one or more counts. The application must contain, or be amended to contain, at least one claim that is patentable over the prior art and corresponds to each count. The claim in the application need not be, and most often will not be, identical to a claim in the patent. All claims in the application and patent which define the same patentable invention as a count shall be designated to correspond to the count. At the time an interference is initially declared (§ 1.611), a count shall not be narrower in scope than any application claim that is patentable over the prior art and designated to correspond to the count or any patent claim designated to correspond to the count. Any single patent claim designated to correspond to the count will be presumed, subject to a motion under § 1.633(c), not to contain separate patentable inventions.

10. Section 1.607 is amended by revising paragraph (a)(4) and adding a new paragraph (a)(6) to read as follows:

**§ 1.607 Request by applicant for interference with patent.**

(a) \*\*\*

(4) Presenting at least one claim corresponding to the proposed count or identifying at least one claim already pending in its application that corresponds to the proposed count, and, if any claim of the patent or application identified as corres-

ponding to the proposed count does not correspond exactly to the proposed count, explaining why each such claim corresponds to the proposed count, and

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(6) Explaining how the requirements of 35 U.S.C. 135(b) are met, if the claim presented or identified under paragraph (a)(4) of this section was not present in the application until more than one year after the issue date of the patent.

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11. Section 1.608 is revised to read as follows:

**§ 1.608 Interference between an application and a patent; prima facie showing by applicant.**

(a) When the effective filing date of an application is three months or less after the effective filing date of a patent, before an interference will be declared, either the applicant or the applicant's attorney or agent of record shall file a statement alleging that there is a basis upon which the applicant is entitled to a judgment relative to the patentee.

(b) When the effective filing date of an application is more than three months after the effective filing date of a patent, the applicant, before an interference will be declared, shall file evidence which may consist of patents or printed publications, other documents, and one or more affidavits which demonstrate that applicant is *prima facie* entitled to a judgment relative to the patentee and an explanation stating with particularity the basis upon which the applicant is *prima facie* entitled to the judgment. Where the basis upon which an applicant is entitled to judgment relative to a patentee is priority of invention, the evidence shall include affidavits by the applicant, if possible, and one or more corroborating witnesses, supported by documentary evidence, if available, each setting out a factual description of acts and circumstances performed or observed by the affiant, which collectively would *prima facie* entitle the applicant to judgment on priority with respect to the effective filing date of the patent. To facilitate preparation of a record (§ 1.653(g)) for final hearing, an applicant should file affidavits on paper which is 21.8 by 27.9 cm. (8 1/2 x 11 inches). The significance of any printed publication or other document which is self-authenticating within the meaning of Rule 902 of the Federal Rules of Evidence or § 1.671(d) and any patent shall be discussed in an affidavit or the explanation. Any printed publication or other document which is not self-authenticating shall be authenticated and discussed with particularity in an affidavit. Upon a showing of good cause, an affidavit may be based on information and belief. If an examiner finds an application to be in condition for declaration of an interference, the examiner will consider the evidence and explanation only to the extent of determining whether a basis upon which the application would be entitled to a judgment relative to the patentee is alleged and, if a basis is alleged, an interference may be declared.

12. Section 1.609 is amended by revising paragraphs (b)(1), (b)(2) and (b)(3) to read as follows:

**§ 1.609 Preparation of interference papers by examiner.**

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(b) \*\*\*

(1) The proposed count or counts and, if there is more than one count proposed, explaining why the counts define different patentable inventions;

(2) The claims of any application or patent which correspond to each count, explaining why each claim designated as corresponding to a count is directed to the same patentable invention as the count;

(3) The claims in any application or patent which do not correspond to each count and explaining why each claim designated as not corresponding to any count is not directed to the same patentable invention as any count; and

\*\*\*\*\*

13. Section 1.610 is revised to read as follows:

**§ 1.610 Assignment of interference to administrative patent judge, time period for completing interference.**

(a) Each interference will be declared by an administrative patent judge who may enter all interlocutory orders in the interference, except that only the Board shall hear oral argument at final hearing, enter a decision under §§ 1.617, 1.640(e), 1.652, 1.656(i) or 1.658, or enter any other order which terminates the interference.

(b) As necessary, another administrative patent judge may act in place of the one who declared the interference. At the discretion of the administrative patent judge assigned to the interference, a panel consisting of two or more members of the Board may enter interlocutory orders.

(c) Unless otherwise provided in this subpart, times for taking action by a party in the interference will be set on a case-by-case basis by the administrative patent judge assigned to the interference. Times for taking action shall be set and the administrative patent judge shall exercise control over the interference such that the pendency of the interference before the Board does not normally exceed two years.

(d) An administrative patent judge may hold a conference with the parties to consider simplification of any issues, the necessity or desirability of amendments to counts, the possibility of obtaining admissions of fact and genuineness of documents which will avoid unnecessary proof, any limitations on the number of expert witnesses, the time and place for conducting a deposition (§ 1.673(g)), and any other matter as may aid in the disposition of the interference. After a conference, the administrative patent judge may enter any order which may be appropriate.

(e) The administrative patent judge may determine a proper course of conduct in an interference for any situation not specifically covered by this part.

14. Section 1.611 is amended by redesignating paragraph (c)(8) as paragraph (c)(9); adding a new paragraph (c)(8); and revising paragraphs (b), (c)(6), (c)(7), and (d) to read as follows:

**§ 1.611 Declaration of interference.**

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(b) When a notice of declaration is returned to the Patent and Trademark Office undelivered, or in any other circumstance where appropriate, an administrative patent judge may send a copy of the notice to a patentee named in a patent involved in an interference or the patentee's assignee of record in the Patent and Trademark Office or order publication of an appropriate notice in the *Official Gazette*.

(c) \*\*\*

(6) The count or counts and, if there is more than one count, the examiner's explanation why the counts define different patentable inventions;

(7) The claim or claims of any application or any patent which correspond to each count;

(8) The examiner's explanation as to why each claim designated as corresponding to a count is directed to the same patentable invention as the count and why each claim designated as not corresponding to any count is not directed to the same patentable invention as any count; and

\*\*\*\*\*

(d) The notice of declaration may also specify the time for:

(1) Filing a preliminary statement as provided in § 1.621(a);

(2) Serving notice that a preliminary statement has been filed as provided in § 1.621(b); and

(3) Filing preliminary motions authorized by § 1.633.

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15. Section 1.612 is amended by revising paragraph (a) to read as follows:

**§ 1.612 Access to applications.**

(a) After an interference is declared, each party shall have access to and may obtain copies of the files of any application set out in the notice declaring the interference, except for affidavits filed under § 1.131 and any evidence and explanation under § 1.608 filed separate from an amendment. A party seeking access to any abandoned or pending application referred to in the opponent's involved application or access to any pending application referred to in the opponent's patent must file a motion under § 1.635. See § 1.11(e) concerning public access to interference files.

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16. Section 1.613 is amended by revising paragraphs (c) and (d) to read as follows:

**§ 1.613 Lead attorney, same attorney representing different parties in an interference, withdrawal of attorney or agent.**

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(c) An administrative patent judge may make necessary inquiry to determine whether an attorney or agent should be disqualified from representing a party in an interference. If an administrative patent judge is of the opinion that an attorney or agent should be disqualified, the administrative patent judge shall refer the matter to the Commissioner. The Commissioner will make a final decision as to whether any attorney or agent should be disqualified.

(d) No attorney or agent of record in an interference may withdraw as attorney or agent of record except with the approval of an administrative patent judge and after reasonable notice to the party on whose behalf the attorney or agent has appeared. A request to withdraw as attorney or agent of record in an interference shall be made by motion (§ 1.635).

17. Section 1.614 is amended by revising paragraphs (a) and (c) to read as follows:

**§ 1.614 Jurisdiction over interference.**

(a) The Board acquires jurisdiction over an interference when the interference is declared under § 1.611.

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(c) The examiner shall have jurisdiction over any pending application until the interference is declared. An administrative patent judge may for a limited purpose restore jurisdiction to the examiner over any application involved in the interference.

18. Section 1.615 is revised to read as follows:

**§ 1.615 Suspension of ex parte prosecution.**

(a) When an interference is declared, ex parte prosecution of an application involved in the interference is suspended. Amendments and other papers related to the application received during pendency of the interference will not be entered or considered in the interference without the consent of an administrative patent judge.

(b) Ex parte prosecution as to specified matters may be continued concurrently with the interference with the consent of the administrative patent judge.

19. Section 1.616 is revised to read as follows:

**§ 1.616 Sanctions for failure to comply with rules or order or for taking and maintaining a frivolous position.**

(a) An administrative patent judge or the Board may impose an appropriate sanction against a party who fails to comply with the regulations of this part or any order entered by an administrative patent judge or the Board. An appropriate sanction may include among others entry of an order:

(1) Holding certain facts to have been established in the interference;

(2) Precluding a party from filing a paper;



(3) Precluding a party from presenting or contesting a particular issue;

(4) Precluding a party from requesting, obtaining, or opposing discovery;

(5) Awarding compensatory expenses and/or compensatory attorney fees; or

(6) Granting judgment in the interference.

(b) An administrative patent judge or the Board may impose a sanction, including a sanction in the form of compensatory expenses and/or compensatory attorney fees, against a party for taking and maintaining a frivolous position in papers filed in the interference.

(c) To the extent that an administrative patent judge or the Board has authorized a party to compel the taking of testimony or the production of documents or things from an individual or entity located in a NAFTA country or a WTO member country concerning knowledge, use, or other activity relevant to proving or disproving a date of invention (§ 1.671(h)), but the testimony, documents or things have not been produced for use in the interference to the same extent as such information could be made available in the United States, the administrative patent judge or the Board shall draw such adverse inferences as may be appropriate under the circumstances, or take such other action permitted by statute, rule, or regulation, in favor of the party that requested the information in the interference, including imposition of appropriate sanctions under paragraph (a) of this section.

(d) A party may file a motion (§ 1.635) for entry of an order imposing sanctions, the drawing of adverse inferences or other action under paragraph (a), (b) or (c) of this section. Where an administrative patent judge or the Board on its own initiative determines that a sanction, adverse inference or other action against a party may be appropriate under paragraph (a), (b) or (c) of this section, the administrative patent judge or the Board shall enter an order for the party to show cause why the sanction, adverse inference or other action is not appropriate. The Board shall take action in accordance with the order unless, within 20 days after the date of the order, the party files a paper which shows good cause why the sanction, adverse inference or other action would not be appropriate.

20. Section 1.617 is amended by revising paragraphs (a), (b), (d), (e), (g) and (h) to read as follows:

**§ 1.617 Summary judgment against applicant.**

(a) An administrative patent judge shall review any evidence filed by an applicant under § 1.608(b) to determine if the applicant is *prima facie* entitled to a judgment relative to the patentee. If the administrative patent judge determines that the evidence shows the applicant is *prima facie* entitled to a judgment relative to the patentee, the interference shall proceed in the normal manner under the regulations of this part. If in the opinion of the administrative patent judge the evidence fails to show that the applicant is *prima facie* entitled to a judgment relative to the patentee, the administrative patent judge shall, concurrently with the notice declaring the interference, enter an order stating the reasons for the opinion and directing the applicant, within a time set in the order, to show cause why summary judgment should not be entered against the applicant.

(b) The applicant may file a response to the order, which may include an appropriate preliminary motion under § 1.633(c), (f) or (g), and state any reasons why summary judgment should not be entered. Any request by the applicant for a hearing before the Board shall be made in the response. Additional evidence shall not be presented by the applicant or considered by the Board unless the applicant shows good cause why any additional evidence was not initially presented with the evidence filed under § 1.608(b). At the time an applicant files a response, the applicant shall serve a copy of any evidence filed under § 1.608(b) and this paragraph.

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(d) If a response is timely filed by the applicant, all opponents may file a statement and may oppose any preliminary motion filed under § 1.633(c), (f) or (g) by the applicant within a time set by the administrative patent judge. The statement may set

forth views as to why summary judgment should be granted against the applicant, but the statement shall be limited to discussing why all the evidence presented by the applicant does not overcome the reasons given by the administrative patent judge for issuing the order to show cause. Except as required to oppose a motion under § 1.633(c), (f) or (g) by the applicant, evidence shall not be filed by any opponent. An opponent may not request a hearing.

(e) Within a time authorized by the administrative patent judge, an applicant may file a reply to any statement or opposition filed by any opponent.

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(g) If a response by the applicant is timely filed, the administrative patent judge or the Board shall decide whether the evidence submitted under § 1.608(b) and any additional evidence properly submitted under paragraphs (b) and (e) of this section shows that the applicant is *prima facie* entitled to a judgment relative to the patentee. If the applicant is not *prima facie* entitled to a judgment relative to the patentee, the Board shall enter a final decision granting summary judgment against the applicant. Otherwise, an interlocutory order shall be entered authorizing the interference to proceed in the normal manner under the regulations of this subpart.

(h) Only an applicant who filed evidence under § 1.608(b) may request a hearing. If that applicant requests a hearing, the Board may hold a hearing prior to entry of a decision under paragraph (g) of this section. The administrative patent judge shall set a date and time for the hearing. Unless otherwise ordered by the administrative patent judge or the Board, the applicant and any opponent will each be entitled to no more than 30 minutes of oral argument at the hearing.

21. Section 1.618 is amended by revising paragraph (a) to read as follows:

**§ 1.618 Return of unauthorized papers.**

(a) An administrative patent judge or the Board shall return to a party any paper presented by the party when the filing of the paper is not authorized by, or is not in compliance with the requirements of, this subpart. Any paper returned will not thereafter be considered in the interference. A party may be permitted to file a corrected paper under such conditions as may be deemed appropriate by an administrative patent judge or the Board.

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22. Section 1.621 is amended by revising paragraph (b) to read as follows:

**§ 1.621 Preliminary statement, time for filing, notice of filing.**

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(b) When a party files a preliminary statement, the party shall also simultaneously file and serve on all opponents in the interference a notice stating that a preliminary statement has been filed. A copy of the preliminary statement need not be served until ordered by the administrative patent judge.

23. Section 1.622 is amended by revising paragraph (b) to read as follows:

**§ 1.622 Preliminary statement, who made invention, where invention made.**

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(b) The preliminary statement shall state whether the invention was made in the United States, a NAFTA country (and, if so, which NAFTA country), a WTO member country (and, if so, which WTO member country), or in a place other than the United States, a NAFTA country, or a WTO member country. If made in a place other than the United States, a NAFTA country, or a WTO member country, the preliminary statement shall

state whether the party is entitled to the benefit of 35 U.S.C. 104(a)(2).

24. Section 1.623 is amended by revising the section heading and paragraph (a) introductory text to read as follows:

**§ 1.623 Preliminary statement; invention made in United States, a NAFTA country, or a WTO member country.**

(a) When the invention was made in the United States, a NAFTA country, or a WTO member country, or a party is entitled to the benefit of 35 U.S.C. 104(a)(2), the preliminary statement must state the following facts as to the invention defined by each count:

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25. Section 1.624 is amended by revising the section heading and paragraphs (a) and (c) to read as follows:

**§ 1.624 Preliminary statement; invention made in a place other than the United States, a NAFTA country, or a WTO member country.**

(a) When the invention was made in a place other than the United States, a NAFTA country, or a WTO member country and a party intends to rely on introduction of the invention into the United States, a NAFTA country, or a WTO member country, the preliminary statement must state the following facts as to the invention defined by each count:

(1) The date on which a drawing of the invention was first introduced into the United States, a NAFTA country, or a WTO member country.

(2) The date on which a written description of the invention was first introduced into the United States, a NAFTA country, or a WTO member country.

(3) The date on which the invention was first disclosed to another person in the United States, a NAFTA country, or a WTO member country.

(4) The date on which the inventor's conception of the invention was first introduced into the United States, a NAFTA country, or a WTO member country.

(5) The date on which an actual reduction to practice of the invention was first introduced into the United States, a NAFTA country, or a WTO member country. If an actual reduction to practice of the invention was not introduced into the United States, a NAFTA country, or a WTO member country, the preliminary amendment shall so state.

(6) The date after introduction of the inventor's conception into the United States, a NAFTA country, or a WTO member country when active exercise of reasonable diligence in the United States, a NAFTA country, or a WTO member country toward reducing the invention to practice began.

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(c) When a party alleges under paragraph (a)(1) of this section that a drawing was introduced into the United States, a NAFTA country, or a WTO member country, a copy of that drawing shall be filed with and identified in the preliminary statement. When a party alleges under paragraph (a)(2) of this section that a written description of the invention was introduced into the United States, a NAFTA country, or a WTO member country, a copy of that written description shall be filed with and identified in the preliminary statement. See § 1.628(b) when a copy of the first drawing or first written description introduced in the United States, a NAFTA country, or a WTO member country cannot be filed with the preliminary statement.

26. Section 1.625 is amended by revising paragraph (a) introductory text to read as follows:

**§ 1.625 Preliminary statement; derivation by an opponent.**

(a) When a party intends to prove derivation by an opponent from the party, the preliminary statement must state the following as to the invention defined by each count:

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27. Section 1.626 is revised to read as follows:

**§ 1.626 Preliminary statement; earlier application.**

When a party does not intend to present evidence to prove a conception or an actual reduction to practice and the party intends to rely solely on the filing date of an earlier filed application to prove a constructive reduction to practice, the preliminary statement may so state and identify the earlier filed application with particularity.

28. Section 1.627(b) is revised to read as follows:

**§ 1.627 Preliminary statement; sealing before filing, opening of statement.**

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(b) A preliminary statement may be opened only at the direction of an administrative patent judge.

29. Section 1.628 is revised to read as follows:

**§ 1.628 Preliminary statement; correction of error.**

(a) A material error arising through inadvertence or mistake in connection with a preliminary statement or drawings or a written description submitted therewith or omitted therefrom may be corrected by a motion (§ 1.635) for leave to file a corrected statement. The motion shall be supported by an affidavit stating the date the error was first discovered, shall be accompanied by the corrected statement and shall be filed as soon as practical after discovery of the error. If filed on or after the date set by the administrative patent judge for service of preliminary statements, the motion shall also show that correction of the error is essential to the interest of justice.

(b) When a party cannot attach a copy of a drawing or written description to the party's preliminary statement as required by § 1.623(c), § 1.624(c) or § 1.625(c), the party shall show good cause and explain in the preliminary statement why a copy of the drawing or written description cannot be attached to the preliminary statement and shall attach to the preliminary statement the earliest drawing or written description made in or introduced into the United States, a NAFTA country, or a WTO member country which is available. The party shall file a motion (§ 1.635) to amend its preliminary statement promptly after the first drawing, first written description, or drawing or written description first introduced into the United States, a NAFTA country, or a WTO member country becomes available. A copy of the drawing or written description may be obtained, where appropriate, by a motion (§ 1.635) for additional discovery under § 1.687 or during a testimony period.

30. Section 1.629 is amended by revising paragraphs (a), (c)(1) and (d) to read as follows:

**§ 1.629 Effect of preliminary statement.**

(a) A party shall be strictly held to any date alleged in the preliminary statement. Doubts as to definiteness or sufficiency of any allegation in a preliminary statement or compliance with formal requirements will be resolved against the party filing the statement by restricting the party to its effective filing date or to the latest date of a period alleged in the preliminary statement, as may be appropriate. A party may not correct a preliminary statement except as provided by § 1.628.

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(c) \*\*\*

(1) Shall be restricted to the party's effective filing date and

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(d) If a party files a preliminary statement which contains an allegation of a date of first drawing or first written description and the party does not file a copy of the first drawing or written description with the preliminary statement as required by § 1.623(c), § 1.624(c), or § 1.625(c), the party will be restricted



to the party's effective filing date as to that allegation unless the party complies with § 1.628(b). The content of any drawing or written description submitted with a preliminary statement will not normally be evaluated or considered by the Board.

31. Section 1.630 is revised to read as follows:

**§ 1.630 Reliance on earlier application.**

A party shall not be entitled to rely on the filing date of an earlier filed application unless the earlier application is identified (§ 1.611(c)(5)) in the notice declaring the interference or the party files a preliminary motion under § 1.633 seeking the benefit of the filing date of the earlier application.

32. Section 1.631(a) is revised to read as follows:

**§ 1.631 Access to preliminary statement, service of preliminary statement.**

(a) Unless otherwise ordered by an administrative patent judge, concurrently with entry of a decision on preliminary motions filed under § 1.633 any preliminary statement filed under § 1.621(a) shall be opened to inspection by the senior party and any junior party who filed a preliminary statement. Within a time set by the administrative patent judge, a party shall serve a copy of its preliminary statement on each opponent who served a notice under § 1.621(b).

33. Section 1.632 is revised to read as follows:

**§ 1.632 Notice of intent to argue abandonment, suppression or concealment by opponent.**

A notice shall be filed by a party who intends to argue that an opponent has abandoned, suppressed, or concealed an actual reduction to practice (35 U.S.C. 102(g)). A party will not be permitted to argue abandonment, suppression, or concealment by an opponent unless the notice is timely filed. Unless authorized otherwise by an administrative patent judge, a notice is timely when filed within ten (10) days after the close of the testimony-in-chief of the opponent.

34. Section 1.633 is amended by revising paragraphs (a), (b), (f), (g) and (i) to read as follows:

**§ 1.633 Preliminary motions.**

(a) A motion for judgment against an opponent's claim designated to correspond to a count on the ground that the claim is not patentable to the opponent. The motion shall separately address each claim alleged to be unpatentable. In deciding an issue raised in a motion filed under this paragraph (a), a claim will be construed in light of the specification of the application or patent in which it appears. A motion under this paragraph shall not be based on:

(1) Priority of invention by the moving party as against any opponent or

(2) Derivation of the invention by an opponent from the moving party. See § 1.637(a).

(b) A motion for judgment on the ground that there is no interference-in-fact. A motion under this paragraph is proper only if the interference involves a design application or patent or a plant application or patent or no claim of a party which corresponds to a count is identical to any claim of an opponent which corresponds to that count. See § 1.637(a). When claims of different parties are presented in "means plus function" format, it may be possible for the claims of the different parties not to define the same patentable invention even though the claims contain the same literal wording.

(f) A motion to be accorded the benefit of the filing date of an earlier filed application. See § 1.637 (a) and (f).

(g) A motion to attack the benefit accorded an opponent in the notice declaring the interference of the filing date of an earlier filed application. See § 1.637 (a) and (g).

(i) When a motion is filed under paragraph (a), (b), or (g) of this section, an opponent, in addition to opposing the motion, may file a motion to redefine the interfering subject matter under paragraph (c) of this section, a motion to substitute a different application under paragraph (d) of this section, or a motion to add a reissue application to the interference under paragraph (h) of this section.

35. Section 1.636 is revised to read as follows:

**§ 1.636 Motions, time for filing.**

(a) A preliminary motion under § 1.633 (a) through (h) shall be filed within a time period set by an administrative patent judge.

(b) A preliminary motion under § 1.633 (i) or (j) shall be filed within 20 days of the service of the preliminary motion under § 1.633 (a), (b), (c)(1), or (g) unless otherwise ordered by an administrative patent judge.

(c) A motion under § 1.634 shall be diligently filed after an error is discovered in the inventorship of an application or patent involved in an interference unless otherwise ordered by an administrative patent judge.

(d) A motion under § 1.635 shall be filed as specified in this subpart or when appropriate unless otherwise ordered by an administrative patent judge.

36. Section 1.637 is amended by revising paragraphs (a), (b), (c)(1)(v), (c)(1)(vi), (c)(2)(ii), (c)(2)(iii), (c)(3)(ii), (c)(4)(ii), (d) introductory text, (e)(1)(viii), (e)(2)(vii), (f)(2), and (h)(4); removing paragraphs (c)(2)(iv), (c)(3)(iii), and (d)(4); and adding paragraphs (c)(1)(vii), (e)(1)(ix), and (e)(2)(viii) to read as follows:

**§ 1.637 Content of motions.**

(a) A party filing a motion has the burden of proof to show that it is entitled to the relief sought in the motion. Each motion shall include a statement of the precise relief requested, a statement of the material facts in support of the motion, in numbered paragraphs, and a full statement of the reasons why the relief requested should be granted. If a party files a motion for judgment under § 1.633(a) against an opponent based on the ground of unpatentability over prior art, and the dates of the cited prior art are such that the prior art appears to be applicable to the party, it will be presumed, without regard to the dates alleged in the preliminary statement of the party, that the cited prior art is applicable to the party unless there is included with the motion an explanation, and evidence if appropriate, as to why the prior art does not apply to the party.

(b) Unless otherwise ordered by an administrative patent judge or the Board, a motion under § 1.635 shall contain a certificate by the moving party stating that the moving party has conferred with all opponents in an effort in good faith to resolve by agreement the issues raised by the motion. The certificate shall indicate whether any opponent plans to oppose the motion. The provisions of this paragraph do not apply to a motion to suppress evidence (§ 1.656(h)).

(c) \*\*\*  
(1) \*\*\*

(v) Show that each proposed count defines a separate patentable invention from every other count proposed to remain in the interference.

(vi) Be accompanied by a motion under § 1.633(f) requesting the benefit of the filing date of any earlier filed application, if benefit of the earlier filed application is desired with respect to a proposed count.

(vii) If an opponent is accorded the benefit of the filing date of an earlier filed application in the notice of declaration of

the interference, show why the opponent is not also entitled to benefit of the earlier filed application with respect to the proposed count. Otherwise, the opponent will be presumed to be entitled to the benefit of the earlier filed application with respect to the proposed count.

(2) \*\*\*

(ii) Show that the claim proposed to be amended or added defines the same patentable invention as the count.

(iii) Show the patentability to the applicant of each claim proposed to be amended or added and apply the terms of the application; when necessary a moving party applicant shall file with the motion a proposed amendment to the application amending the claim corresponding to the count or adding the proposed additional claim to the application.

(3) \*\*\*

(ii) Show the claim defines the same patentable invention as another claim whose designation as corresponding to the count the moving party does not dispute.

(4) \*\*\*

(ii) Show that the claim does not define the same patentable invention as any other claim whose designation in the notice declaring the interference as corresponding to the count the party does not dispute.

(d) A preliminary motion under § 1.633(d) to substitute a different application of the moving party shall:

(e) \*\*\*

(1) \*\*\*

(viii) Be accompanied by a motion under § 1.633(f) requesting the benefit of the filing date of an earlier filed application, if benefit is desired with respect to a proposed count.

(ix) If an opponent is accorded the benefit of the filing date of an earlier filed application in the notice of declaration of the interference, show why the opponent is not also entitled to benefit of the earlier filed application with respect to the proposed count. Otherwise, the opponent will be presumed to be entitled to the benefit of the earlier filed application with respect to the proposed count.

(2) \*\*\*

(vii) Be accompanied by a motion under § 1.633(f) requesting the benefit of the filing date of an earlier filed application, if benefit is desired with respect to a proposed count.

(viii) If an opponent is accorded the benefit of the filing date of an earlier filed application in the notice of declaration of the interference, show why the opponent is not also entitled to benefit of the earlier filed application with respect to the proposed count. Otherwise, the opponent will be presumed to be entitled to the benefit of the earlier filed application with respect to the proposed count.

(f) \*\*\*

(2) When the earlier application is an application filed in the United States, certify that a complete copy of the file of the earlier application, except for documents filed under § 1.131 or § 1.608, has been served on all opponents. When the earlier application is an application filed in a foreign country, certify that a copy of the application has been served on all opponents. If the earlier filed application is not in English, the requirements of § 1.647 must also be met.

(h) \*\*\*

(4) Be accompanied by a motion under § 1.633(f) requesting the benefit of the filing date of any earlier filed application, if benefit is desired.

37. Section 1.638 is revised to read as follows:

**§ 1.638 Opposition and reply; time for filing opposition and reply.**

(a) Unless otherwise ordered by an administrative patent judge, any opposition to any motion shall be filed within 20 days after service of the motion. An opposition shall identify any material fact set forth in the motion which is in dispute and include an argument why the relief requested in the motion should be denied.

(b) Unless otherwise ordered by an administrative patent judge, any reply shall be filed within 15 days after service of the opposition. A reply shall be directed only to new points raised in the opposition.

38. Section 1.639 is amended by revising paragraphs (a), (b), (c) and (d)(1) to read as follows:

**§ 1.639 Evidence in support of motion, opposition, or reply.**

(a) Except as provided in paragraphs (c) through (g) of this section, proof of any material fact alleged in a motion, opposition, or reply must be filed and served with the motion, opposition, or reply unless the proof relied upon is part of the interference file or the file of any patent or application involved in the interference or any earlier application filed in the United States of which a party has been accorded or seeks to be accorded benefit.

(b) Proof may be in the form of patents, printed publications, and affidavits. The pages of any affidavits filed under this paragraph shall, to the extent possible, be given sequential numbers, which shall also serve as the record page numbers for the affidavits in the event they are included in the party's record (§ 1.653). Any patents and printed publications submitted under this paragraph and any exhibits identified in affidavits submitted under this paragraph shall, to the extent possible, be given sequential exhibit numbers, which shall also serve as the exhibit numbers in the event the patents, printed publications and exhibits are filed with the party's record (§ 1.653).

(c) If a party believes that additional evidence in the form of testimony that is unavailable to the party is necessary to support or oppose a preliminary motion under § 1.633 or a motion to correct inventorship under § 1.634, the party shall describe the nature of any proposed testimony as specified in paragraphs (d) through (g) of this section. If the administrative patent judge finds that testimony is needed to decide the motion, the administrative patent judge may grant appropriate interlocutory relief and enter an order authorizing the taking of testimony and deferring a decision on the motion to final hearing.

(d) \*\*\*

(1) Identify the person whom it expects to use as an expert;

39. Section 1.640 is amended by revising paragraphs (a), (b), (c), (d) introductory text, (d)(1), (d)(3) and (e) to read as follows:

**§ 1.640 Motions, hearing and decision, redeclaration of interference, order to show cause.**

(a) A hearing on a motion may be held in the discretion of the administrative patent judge. The administrative patent judge shall set the date and time for any hearing. The length of oral argument at a hearing on a motion is a matter within the discretion of the administrative patent judge. An administrative patent judge may direct that a hearing take place by telephone.

(b) Unless an administrative patent judge or the Board is of the opinion that an earlier decision on a preliminary motion would materially advance the resolution of the interference, decision on a preliminary motion shall be deferred to final hearing. Motions not deferred to final hearing will be decided by an administrative patent judge. An administrative patent judge may consult with an examiner in deciding motions. An administrative patent judge may take up motions for decision in any order, may grant, deny, or dismiss any motion, and may take such other action which will secure the just, speedy, and inexpensive determination of the interference. A matter raised by a party in support of or in opposition to a motion that is deferred to final hearing will not be entitled to consideration at final hearing unless the matter is raised in the party's brief at final hearing. If the administrative patent judge determines that the interference shall proceed to final hearing on the issue



of priority or derivation, a time shall be set for each party to file a paper identifying any decisions on motions or on matters raised sua sponte by the administrative patent judge that the party wishes to have reviewed at final hearing as well as identifying any deferred motions that the party wishes to have considered at final hearing. Any evidence that a party wishes to have considered with respect to the decisions and deferred motions identified by the party or by an opponent for consideration or review at final hearing shall be filed or, if appropriate, noticed under § 1.671(e) during the testimony-in-chief period of the party.

(1) When appropriate after the time expires for filing replies to oppositions to preliminary motions, the administrative patent judge will set a time for filing any amendment to an application involved in the interference and for filing a supplemental preliminary statement as to any new counts which may become involved in the interference if a preliminary motion to amend or substitute a count has been filed. Failure or refusal of a party to timely present an amendment required by an administrative patent judge shall be taken without further action as a disclaimer by that party of the invention involved. A supplemental preliminary statement shall meet the requirements specified in §§ 1.623, 1.624, 1.625, or 1.626, but need not be filed if a party states that it intends to rely on a preliminary statement previously filed under § 1.621(a). At an appropriate time in the interference, and when necessary, an order will be entered redeclaring the interference.

(2) After the time expires for filing preliminary motions, a further preliminary motion under § 1.633 will not be considered except as provided by § 1.645(b).

(c) When a decision on any motion under §§ 1.633, 1.634, or 1.635 or on any matter raised sua sponte by an administrative patent judge is entered which does not result in the issuance of an order to show cause under paragraph (d) of this section, a party may file a request for reconsideration within 14 days after the date of the decision. The request for reconsideration shall be filed and served by hand or Express Mail. The filing of a request for reconsideration will not stay any time period set by the decision. The request for reconsideration shall specify with particularity the points believed to have been misapprehended or overlooked in rendering the decision. No opposition to a request for reconsideration shall be filed unless requested by an administrative patent judge or the Board. A decision ordinarily will not be modified unless an opposition has been requested by an administrative patent judge or the Board. The request for reconsideration normally will be acted on by the administrative patent judge or the panel of the Board which issued the decision.

(d) An administrative patent judge may issue an order to show cause why judgment should not be entered against a party when:

(1) A decision on a motion or on a matter raised sua sponte by an administrative patent judge is entered which is dispositive of the interference against the party as to any count;

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(3) The party is a junior party whose preliminary statement fails to overcome the effective filing date of another party.

(e) When an order to show cause is issued under paragraph (d) of this section, the Board shall enter judgment in accordance with the order unless, within 20 days after the date of the order, the party against whom the order issued files a paper which shows good cause why judgment should not be entered in accordance with the order.

(1) If the order was issued under paragraph (d)(1) of this section, the paper may:

(i) Request that final hearing be set to review any decision which is the basis for the order as well as any other decision of the administrative patent judge that the party wishes to have reviewed by the Board at final hearing or

(ii) Fully explain why judgment should not be entered.

(2) Any opponent may file a response to the paper within 20 days of the date of service of the paper. If the order was issued under paragraph (d)(1) of this section and the party's paper includes a request for final hearing, the opponent's response must identify every decision of the administrative patent judge that the opponent wishes to have reviewed by the Board at a final hearing. If the order was issued under paragraph

(d)(1) of this section and the paper does not include a request for final hearing, the opponent's response may include a request for final hearing, which must identify every decision of the administrative patent judge that the opponent wishes to have reviewed by the Board at a final hearing. Where only the opponent's response includes a request for a final hearing, the party filing the paper shall, within 14 days from the date of service of the opponent's response, file a reply identifying any other decision of the administrative patent judge that the party wishes to have reviewed by the Board at a final hearing.

(3) The paper or the response should be accompanied by a motion (§ 1.635) requesting a testimony period if either party wishes to introduce any evidence to be considered at final hearing (§ 1.671). Any evidence that a party wishes to have considered with respect to the decisions and deferred motions identified for consideration or review at final hearing shall be filed or, if appropriate, noticed under § 1.671(e) during the testimony period of the party. A request for a testimony period shall be construed as including a request for final hearing.

(4) If the paper contains an explanation of why judgment should not be entered in accordance with the order, and if no party has requested a final hearing, the decision that is the basis for the order shall be reviewed based on the contents of the paper and the response. If the paper fails to show good cause, the Board shall enter judgment against the party against whom the order issued.

40. Section 1.641 is revised to read as follows:

#### § 1.641 Unpatentability discovered by administrative patent judge.

(a) During the pendency of an interference, if the administrative patent judge becomes aware of a reason why a claim designated to correspond to a count may not be patentable, the administrative patent judge may enter an order notifying the parties of the reason and set a time within which each party may present its views, including any argument and any supporting evidence, and, in the case of the party whose claim may be unpatentable, any appropriate preliminary motions under §§ 1.633(c), (d) and (h).

(b) If a party timely files a preliminary motion in response to the order of the administrative patent judge, any opponent may file an opposition (§ 1.638(a)). If an opponent files an opposition, the party may reply (§ 1.638(b)).

(c) After considering any timely-filed views, including any timely filed preliminary motions under § 1.633, oppositions and replies, the administrative patent judge shall decide how the interference shall proceed.

41. Section 1.642 is revised to read as follows:

#### § 1.642 Addition of application or patent to interference.

During the pendency of an interference, if the administrative patent judge becomes aware of an application or a patent not involved in the interference which claims the same patentable invention as a count in the interference, the administrative patent judge may add the application or patent to the interference on such terms as may be fair to all parties.

42. Section 1.643(b) is revised to read as follows:

#### § 1.643 Prosecution of interference by assignee.

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(b) An assignee of a part interest in an application or patent involved in an interference may file a motion (§ 1.635) for entry of an order authorizing it to prosecute the interference. The motion shall show the inability or refusal of the inventor to prosecute the interference or other cause why it is in the interest of justice to permit the assignee of a part interest to prosecute the interference. The administrative patent judge may allow the assignee of a part interest to prosecute the interference upon such terms as may be appropriate.

43. Section 1.644 is amended by revising paragraphs (a) introductory text, (a)(1), (a)(2), (b), (c), (d), (f) and (g) to read as follows:

#### § 1.644 Petitions in interferences.

(a) There is no appeal to the Commissioner in an interference from a decision of an administrative patent judge or the Board. The Commissioner will not consider a petition in an interference unless:

(1) The petition is from a decision of an administrative patent judge or the Board and the administrative patent judge or the Board shall be of the opinion that the decision involves a controlling question of procedure or an interpretation of a rule as to which there is a substantial ground for a difference of opinion and that an immediate decision on petition by the Commissioner may materially advance the ultimate termination of the interference;

(2) The petition seeks to invoke the supervisory authority of the Commissioner and does not relate to the merits of priority of invention or patentability or the admissibility of evidence under the Federal Rules of Evidence; or

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(b) A petition under paragraph (a)(1) of this section filed more than 15 days after the date of the decision of the administrative patent judge or the Board may be dismissed as untimely. A petition under paragraph (a)(2) of this section shall not be filed prior to the party's brief for final hearing (see § 1.656). Any petition under paragraph (a)(3) of this section shall be timely if it is filed simultaneously with a proper motion under §§ 1.633, 1.634, or 1.635 when granting the motion would require waiver of a rule. Any opposition to a petition under paragraphs (a)(1) or (a)(2) of this section shall be filed within 20 days of the date of service of the petition. Any opposition to a petition under paragraph (a)(3) of this section shall be filed within 20 days of the date of service of the petition or the date an opposition to the motion is due, whichever is earlier.

(c) The filing of a petition shall not stay the proceeding unless a stay is granted in the discretion of the administrative patent judge, the Board, or the Commissioner.

(d) Any petition must contain a statement of the facts involved, in numbered paragraphs, and the point or points to be reviewed and the action requested. The petition will be decided on the basis of the record made before the administrative patent judge or the Board, and no new evidence will be considered by the Commissioner in deciding the petition. Copies of documents already of record in the interference shall not be submitted with the petition or opposition.

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(f) Any request for reconsideration of a decision by the Commissioner shall be filed within 14 days of the decision of the Commissioner and must be accompanied by the fee set forth in § 1.17(h). No opposition to a request for reconsideration shall be filed unless requested by the Commissioner. The decision will not ordinarily be modified unless such an opposition has been requested by the Commissioner.

(g) Where reasonably possible, service of any petition, opposition, or request for reconsideration shall be such that delivery is accomplished within one working day. Service by hand or Express Mail complies with this paragraph.

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44. Section 1.645 is amended by revising paragraphs (a), (b) and (d) to read as follows:

#### § 1.645 Extension of time, late papers, stay of proceedings.

(a) Except to extend the time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action, a party may file a motion (§ 1.635) seeking an extension of time to take action in an interference. See § 1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action. The motion shall be filed within

sufficient time to actually reach the administrative patent judge before expiration of the time for taking action. A moving party should not assume that the motion will be granted even if there is no objection by any other party. The motion will be denied unless the moving party shows good cause why an extension should be granted. The press of other business arising after an administrative patent judge sets a time for taking action will not normally constitute good cause. A motion seeking additional time to take testimony because a party has not been able to procure the testimony of a witness shall set forth the name of the witness, any steps taken to procure the testimony of the witness, the dates on which the steps were taken, and the facts expected to be proved through the witness.

(b) Any paper belatedly filed will not be considered except upon motion (§ 1.635) which shows good cause why the paper was not timely filed, or where an administrative patent judge or the Board, sua sponte, is of the opinion that it would be in the interest of justice to consider the paper. See § 1.304(a) for exclusive procedures relating to belated filing of a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or belated commencement of a civil action.

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(d) An administrative patent judge may stay proceedings in an interference.

45. Section 1.646 is amended by revising paragraphs (a)(1), (a)(2), (b), (c) introductory text, (c)(1), (c)(4), (d) and (e); redesignating paragraph (c)(5) as paragraph (c)(6) and revising it; and adding a new paragraph (c)(5) to read as follows:

#### § 1.646 Service of papers, proof of service.

(a) \*\*\*\*\*

(1) Preliminary statements when filed under § 1.621; preliminary statements shall be served when service is ordered by an administrative patent judge.

(2) Certified transcripts and exhibits which accompany the transcripts filed under § 1.676; copies of transcripts shall be served as part of a party's record under § 1.653(c).

(b) Service shall be on an attorney or agent for a party. If there is no attorney or agent for the party, service shall be on the party. An administrative patent judge may order additional service or waive service where appropriate.

(c) Unless otherwise ordered by an administrative patent judge, or except as otherwise provided by this subpart, service of a paper shall be made as follows:

(1) By handing a copy of the paper or causing a copy of the paper to be handed to the person served.

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(4) By mailing a copy of the paper by first class mail; when service is by first class mail the date of mailing is regarded as the date of service.

(5) By mailing a copy of the paper by Express Mail; when service is by Express Mail the date of deposit with the U.S. Postal Service is regarded as the date of service.

(6) When it is shown to the satisfaction of an administrative patent judge that none of the above methods of obtaining or serving the copy of the paper was successful, the administrative patent judge may order service by publication of an appropriate notice in the *Official Gazette*.

(d) An administrative patent judge may order that a paper be served by hand or Express Mail.

(e) The due date for serving a paper is the same as the due date for filing the paper in the Patent and Trademark Office. Proof of service must be made before a paper will be considered in an interference. Proof of service may appear on or be affixed to the paper. Proof of service shall include the date and manner of service. In the case of personal service under paragraphs (c)(1) through (c)(3) of this section, proof of service shall include the names of any person served and the person who made the service. Proof of service may be made by an acknowledgment of service by or on behalf of the person served or a statement signed by the party or the party's attorney or agent containing the information required by this section. A statement of an attorney or agent attached to, or appearing in, the paper



stating the date and manner of service will be accepted as *prima facie* proof of service.

46. Section 1.647 is revised to read as follows:

**§ 1.647 Translation of document in foreign language.**

When a party relies on a document or is required to produce a document in a language other than English, a translation of the document into English and an affidavit attesting to the accuracy of the translation shall be filed with the document.

47. Section 1.651 is amended by revising paragraphs (a), (c)(1), (c)(2), (c)(3) and (d) to read as follows:

**§ 1.651 Setting times for discovery and taking testimony, parties entitled to take testimony.**

(a) At an appropriate stage in an interference, an administrative patent judge shall set a time for filing motions (§ 1.635) for additional discovery under § 1.687(c) and testimony periods for taking any necessary testimony.

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(c) \*\*\*

(1) The administrative patent judge orders the taking of testimony under § 1.639(c);

(2) The party alleges in its preliminary statement a date of invention prior to the effective filing date of the senior party;

(3) A testimony period has been set to permit an opponent to prove a date of invention prior to the effective filing date of the party and the party has filed a preliminary statement alleging a date of invention prior to that date; or

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(d) Testimony, including any testimony to be taken in a place outside the United States, shall be taken and completed during the testimony periods set under paragraph (a) of this section. A party seeking to extend the period for taking testimony must comply with §§ 1.635 and 1.645(a).

48. Section 1.652 is revised to read as follows:

**§ 1.652 Judgment for failure to take testimony or file record.**

If a junior party fails to timely take testimony authorized under § 1.651, or file a record under § 1.653(c), an administrative patent judge, with or without a motion (§ 1.635) by another party, may issue an order to show cause why judgment should not be entered against the junior party. When an order is issued under this section, the Board shall enter judgment in accordance with the order unless, within 15 days after the date of the order, the junior party files a paper which shows good cause why judgment should not be entered in accordance with the order. Any other party may file a response to the paper within 15 days of the date of service of the paper. If the party against whom the order was issued fails to show good cause, the Board shall enter judgment against the party.

49. Section 1.653 is amended by removing and reserving paragraphs (c)(5), (f) and (h) and by revising paragraphs (a), (b), (c) introductory text, (c)(1), (c)(4), (d), (g) and (i) to read as follows:

**§ 1.653 Record and exhibits.**

(a) Testimony shall consist of affidavits under §§ 1.672(b), (c) and (g), 1.682(c), 1.683(b) and 1.688(b), transcripts of depositions under §§ 1.671(g) and 1.672(a) when a deposition is authorized by an administrative patent judge, transcripts of depositions under §§ 1.672(d), 1.682(d), 1.683(c) and 1.688(c), agreed statements under § 1.672(h), transcripts of interrogatories, cross-interrogatories, and recorded answers and copies of written interrogatories and answers and written requests for admissions and answers under § 1.688(a).

(b) An affidavit shall be filed as set forth in § 1.677. A certified transcript of a deposition, including a deposition cross-

examining an affiant, shall be filed as set forth in §§ 1.676, 1.677 and 1.678. An original agreed statement shall be filed as set forth in § 1.672(h).

(c) In addition to the items specified in paragraph (b) of this section and within a time set by an administrative patent judge, each party shall file three copies and serve one copy of a record consisting of:

(1) An index of the names of the witnesses for the party, giving the pages of the record where the direct testimony and cross-examination of each witness begins.

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(4) Each affidavit by a witness for the party, transcript, including transcripts of cross-examination of any affiant who testified for the party and transcripts of compelled deposition testimony by a witness for the party, agreed statement relied upon by the party, and transcript of interrogatories, cross-interrogatories and recorded answers.

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(d) The pages of the record shall be consecutively numbered to the extent possible.

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(g) The record may be produced by standard typographical printing or by any other process capable of producing a clear black permanent image. All printed matter except on covers must appear in at least 11 point type on opaque, unglazed paper. Footnotes may not be printed in type smaller than 9 point. The page size shall be 21.8 by 27.9 cm. (8 1/2 by 11 inches) (letter size) with printed matter 16.5 by 24.1 cm. (6 1/2 by 9 1/2 inches). The record shall be bound with covers at their left edges in such manner as to lie flat when open to any page and in one or more volumes of convenient size (approximately 100 pages per volume is suggested). When there is more than one volume, the numbers of the pages contained in each volume shall appear at the top of the cover for each volume.

(i) Each party shall file its exhibits with the record specified in paragraph (c) of this section. Exhibits include documents and things identified in affidavits or on the record during the taking of oral depositions as well as official records and publications filed by the party under § 1.682(a). One copy of each documentary exhibit shall be served. Documentary exhibits shall be filed in an envelope or folder and shall not be bound as part of the record. Physical exhibits, if not filed by an officer under § 1.676(d), shall be filed with the record. Each exhibit shall contain a label which identifies the party submitting the exhibit and an exhibit number, the style of the interference (e.g., Jones v. Smith), and the interference number. Where possible, the label should appear at the bottom right-hand corner of each documentary exhibit. Upon termination of an interference, an administrative patent judge may return an exhibit to the party filing the exhibit. When any exhibit is returned, an order shall be entered indicating that the exhibit has been returned.

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50. Section 1.654 is amended by revising paragraphs (a) and (d) to read as follows:

**§ 1.654 Final hearing.**

(a) At an appropriate stage of the interference, the parties will be given an opportunity to appear before the Board to present oral argument at a final hearing. An administrative patent judge may set a date and time for final hearing. Unless otherwise ordered by an administrative patent judge or the Board, each party will be entitled to no more than 30 minutes of oral argument at final hearing. A party who does not file a brief for final hearing (§ 1.656(a)) shall not be entitled to appear at final hearing.

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(d) After final hearing, the interference shall be taken under advisement by the Board. No further paper shall be filed except

under § 1.658(b) or as authorized by an administrative patent judge or the Board. No additional oral argument shall be had unless ordered by the Board.

51. Section 1.655 is revised to read as follows:

**§ 1.655 Matters considered in rendering a final decision.**

(a) In rendering a final decision, the Board may consider any properly raised issue, including priority of invention, derivation by an opponent from a party who filed a preliminary statement under § 1.625, patentability of the invention, admissibility of evidence, any interlocutory matter deferred to final hearing, and any other matter necessary to resolve the interference. The Board may also consider whether entry of any interlocutory order was an abuse of discretion. All interlocutory orders shall be presumed to have been correct, and the burden of showing an abuse of discretion shall be on the party attacking the order. When two or more interlocutory orders involve the same issue, the last entered order shall be presumed to have been correct.

(b) A party shall not be entitled to raise for consideration at final hearing any matter which properly could have been raised by a motion under §§ 1.633 or 1.634 unless the matter was properly raised in a motion that was timely filed by the party under §§ 1.633 or 1.634 and the motion was denied or deferred to final hearing, the matter was properly raised by the party in a timely filed opposition to a motion under §§ 1.633 or 1.634 and the motion was granted over the opposition or deferred to final hearing, or the party shows good cause why the issue was not properly raised by a timely filed motion or opposition. A party that fails to contest, by way of a timely filed preliminary motion under § 1.633(c), the designation of a claim as corresponding to a count, or fails to timely argue the separate patentability of a particular claim when the ground for unpatentability is first raised, may not subsequently argue to an administrative patent judge or the Board the separate patentability of claims designated to correspond to the count with respect to that ground.

(c) In the interest of justice, the Board may exercise its discretion to consider an issue even though it would not otherwise be entitled to consideration under this section.

52. In § 1.656, paragraphs (a), (d), (e), (g), (h) and (i) are revised; paragraphs (b)(1) through (b)(6) are redesignated as paragraphs (b)(3) through (b)(8); newly designated paragraphs (b)(5) and (b)(6) are revised; and new paragraphs (b)(1) and (b)(2) are added to read as follows:

**§ 1.656 Briefs for final hearing.**

(a) Each party shall be entitled to file briefs for final hearing. The administrative patent judge shall determine the briefs needed and shall set the time and order for filing briefs.

(b) \*\*\*

(1) A statement of interest indicating the full name of every party represented by the attorney in the interference and the name of the real party in interest if the party named in the caption is not the real party in interest.

(2) A statement of related cases indicating whether the interference was previously before the Board for final hearing and the name and number of any related appeal or interference which is pending before, or which has been decided by, the Board, or which is pending before, or which has been decided by, the U.S. Court of Appeals for the Federal Circuit or a district court in a proceeding under 35 U.S.C. 146. A related appeal or interference is one which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending interference.

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(5) A statement of the facts, in numbered paragraphs, relevant to the issues presented for decision with appropriate references to the record.

(6) An argument, which may be preceded by a summary, which shall contain the contentions of the party with respect to the issues it is raising for consideration at final hearing, and

the reasons therefor, with citations to the cases, statutes, other authorities, and parts of the record relied on.

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(d) Unless ordered otherwise by an administrative patent judge, briefs shall be double-spaced (except for footnotes, which may be single-spaced) and shall comply with the requirements of § 1.653(g) for records except the requirement for binding.

(e) An original and four copies of each brief must be filed.

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(g) Any party, separate from its opening brief, but filed concurrently therewith, may file an original and four copies of concise proposed findings of fact and conclusions of law. Any proposed findings of fact shall be in numbered paragraphs and shall be supported by specific references to the record. Any proposed conclusions of law shall be in numbered paragraphs and shall be supported by citation of cases, statutes, or other authority. Any opponent, separate from its opening or reply brief, but filed concurrently therewith, may file a paper accepting or objecting to any proposed findings of fact or conclusions of law; when objecting, a reason must be given. The Board may adopt the proposed findings of fact and conclusions of law in whole or in part.

(h) If a party wants the Board in rendering its final decision to rule on the admissibility of any evidence, the party shall file with its opening brief an original and four copies of a motion (§ 1.635) to suppress the evidence. The provisions of § 1.637(b) do not apply to a motion to suppress under this paragraph. Any objection previously made to the admissibility of the evidence of an opponent is waived unless the motion required by this paragraph is filed. A party that failed to challenge the admissibility of the evidence of an opponent on a ground that could have been raised in a timely objection under § 1.672(c), 1.682(c), 1.683(b) or 1.688(b) may not move under this paragraph to suppress the evidence on that ground at final hearing. An original and four copies of an opposition to the motion may be filed with an opponent's opening brief or reply brief as may be appropriate.

(i) When a junior party fails to timely file an opening brief, an order may issue requiring the junior party to show cause why the Board should not treat failure to file the brief as a concession of priority. If the junior party fails to show good cause within a time period set in the order, judgment may be entered against the junior party.

53. Section 1.657 is revised to read as follows:

**§ 1.657 Burden of proof as to date of invention.**

(a) A rebuttable presumption shall exist that, as to each count, the inventors made their invention in the chronological order of their effective filing dates. The burden of proof shall be upon a party who contends otherwise.

(b) In an interference involving copending applications or involving a patent and an application having an effective filing date on or before the date the patent issued, a junior party shall have the burden of establishing priority by a preponderance of the evidence.

(c) In an interference involving an application and a patent and where the effective filing date of the application is after the date the patent issued, a junior party shall have the burden of establishing priority by clear and convincing evidence.

54. Section 1.658 is amended by revising paragraphs (a) and (b) to read as follows:

**§ 1.658 Final decision.**

(a) After final hearing, the Board shall enter a decision resolving the issues raised at final hearing. The decision may enter judgment, in whole or in part, remand the interference to an administrative patent judge for further proceedings, or take further action not inconsistent with law. A judgment as to a count shall state whether or not each party is entitled to a patent containing the claims in the party's patent or application



which correspond to the count. When the Board enters a decision awarding judgment as to all counts, the decision shall be regarded as a final decision for the purpose of judicial review (35 U.S.C. 141-144, 146) unless a request for reconsideration under paragraph (b) of this section is timely filed.

(b) Any request for reconsideration of a decision under paragraph (a) of this section shall be filed within one month after the date of the decision. The request for reconsideration shall specify with particularity the points believed to have been misapprehended or overlooked in rendering the decision. Any opposition to a request for reconsideration shall be filed within 14 days of the date of service of the request for reconsideration. Service of the request for reconsideration shall be by hand or Express Mail. The Board shall enter a decision on the request for reconsideration. If the Board shall be of the opinion that the decision on the request for reconsideration significantly modifies its original decision under paragraph (a) of this section, the Board may designate the decision on the request for reconsideration as a new decision. A decision on reconsideration is a final decision for the purpose of judicial review (35 U.S.C. 141-144, 146).

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55. Section 1.660 is amended by adding paragraph (c) to read as follows:

**§ 1.660 Notice of reexamination, reissue, protest, or litigation.**

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(c) The notice required by this section is designed to assist the administrative patent judge and the Board in efficiently handling interference cases. Failure of a party to comply with the provisions of this section may result in sanctions under § 1.616. Knowledge by, or notice to, an employee of the Office other than an employee of the Board, of the existence of the reexamination, application for reissue, protest, or litigation shall not be sufficient. The notice contemplated by this section is notice addressed to the administrative patent judge in charge of the interference in which the application or patent is involved.

56. Section 1.662 is amended by revising paragraphs (a) and (b) to read as follows:

**§ 1.662 Request for entry of adverse judgment; reissue filed by patentee.**

(a) A party may, at any time during an interference, request and agree to entry of an adverse judgment. The filing by a party of a written disclaimer of the invention defined by a count, concession of priority or unpatentability of the subject matter of a count, abandonment of the invention defined by a count, or abandonment of the contest as to a count will be treated as a request for entry of an adverse judgment against the applicant or patentee as to all claims which correspond to the count. Abandonment of an application, other than an application for reissue having a claim of the patent sought to be reissued involved in the interference, will be treated as a request for entry of an adverse judgment against the applicant as to all claims corresponding to all counts. Upon the filing by a party of a request for entry of an adverse judgment, the Board may enter judgment against the party.

(b) If a patentee involved in an interference files an application for reissue during the interference and the reissue application does not include a claim that corresponds to a count, judgment may be entered against the patentee. A patentee who files an application for reissue which includes a claim that corresponds to a count shall, in addition to complying with the provisions of § 1.660(b), timely file a preliminary motion under § 1.633(h) or show good cause why the motion could not have been timely filed or would not be appropriate.

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57. Section 1.664 is revised to read as follows:

**§ 1.664 Action after interference.**

(a) After termination of an interference, the examiner will promptly take such action in any application previously involved in the interference as may be necessary. Unless entered by order of an administrative patent judge, amendments presented during the interference shall not be entered, but may be subsequently presented by the applicant subject to the provisions of this subpart provided prosecution of the application is not otherwise closed.

(b) After judgment, the application of any party may be held subject to further examination, including an interference with another application.

58. Section 1.671 is amended by revising paragraphs (a) introductory text, (c)(1), (c)(2), (c)(6), (c)(7), (e), (f) and (g); redesignating paragraph (b) as paragraph (i) and revising it; and adding new paragraphs (h) and (j) to read as follows:

**§ 1.671 Evidence must comply with rules.**

(a) Evidence consists of testimony and referenced exhibits, official records and publications filed under § 1.682, testimony and referenced exhibits from another interference, proceeding, or action filed under § 1.683, discovery relied upon under § 1.688, and the specification (including claims) and drawings of any application or patent:

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(c) \*\*\*  
(1) *Courts of the United States, U.S. Magistrate, court, trial court, or trier of fact* means administrative patent judge or Board as may be appropriate.

(2) *Judge* means administrative patent judge.

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(6) *Before the hearing* in Rule 703 of the Federal Rules of Evidence means before giving testimony by affidavit or oral deposition.

(7) *The trial or hearing* in Rules 803(24) and 804(5) of the Federal Rules of Evidence means the taking of testimony by affidavit or oral deposition.

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(e) A party may not rely on an affidavit (including any exhibits), patent or printed publication previously submitted by the party under § 1.639(b) unless a copy of the affidavit, patent or printed publication has been served and a written notice is filed prior to the close of the party's relevant testimony period stating that the party intends to rely on the affidavit, patent or printed publication. When proper notice is given under this paragraph, the affidavit, patent or printed publication shall be deemed as filed under §§ 1.640(b), 1.640(e)(3), 1.672(b) or 1.682(a), as appropriate.

(f) The significance of documentary and other exhibits identified by a witness in an affidavit or during oral deposition shall be discussed with particularity by a witness.

(g) A party must file a motion (§ 1.635) seeking permission from an administrative patent judge prior to compelling testimony or production of documents or things under 35 U.S.C. 24 or from an opposing party. The motion shall describe the general nature and the relevance of the testimony, document, or thing. If permission is granted, the party shall notice a deposition under § 1.673 and may proceed to take testimony.

(h) A party must file a motion (§ 1.635) seeking permission from an administrative patent judge prior to compelling testimony or production of documents or things in a foreign country.

(i) In the case of testimony, the motion shall:

(i) Describe the general nature and relevance of the testimony;

(ii) Identify the witness by name or title;

(iii) Identify the foreign country and explain why the party believes the witness can be compelled to testify in the foreign country, including a description of the procedures that will be used to compel the testimony in the foreign country and an estimate of the time it is expected to take to obtain the testimony; and

(iv) Demonstrate that the party has made reasonable efforts to secure the agreement of the witness to testify in the United States but has been unsuccessful in obtaining the agreement, even though the party has offered to pay the expenses of the witness to travel to and testify in the United States.

(2) In the case of production of a document or thing, the motion shall:

(i) Describe the general nature and relevance of the document or thing;

(ii) Identify the foreign country and explain why the party believes production of the document or thing can be compelled in the foreign country, including a description of the procedures that will be used to compel production of the document or thing in the foreign country and an estimate of the time it is expected to take to obtain production of the document or thing; and

(iii) Demonstrate that the party has made reasonable efforts to obtain the agreement of the individual or entity having possession, custody, or control of the document to produce the document or thing in the United States but has been unsuccessful in obtaining that agreement, even though the party has offered to pay the expenses of producing the document or thing in the United States.

(i) Evidence which is not taken or sought and filed in accordance with this subpart shall not be admissible.

(j) The weight to be given deposition testimony taken in a foreign country will be determined in view of all the circumstances, including the laws of the foreign country governing the testimony. Little, if any, weight may be given to deposition testimony taken in a foreign country unless the party taking the testimony proves by clear and convincing evidence, as a matter of fact, that knowingly giving false testimony in that country in connection with an interference proceeding in the United States Patent and Trademark Office is punishable under the laws of that country and that the punishment in that country for such false testimony is comparable to or greater than the punishment for perjury committed in the United States. The administrative patent judge and the Board, in determining foreign law, may consider any relevant material or source, including testimony, whether or not submitted by a party or admissible under the Federal Rules of Evidence.

59. Section 1.672 is revised to read as follows:

**§ 1.672 Manner of taking testimony.**

(a) Unless testimony must be compelled under 35 U.S.C. 24, compelled from a party, or compelled in a foreign country, testimony of a witness shall be taken by affidavit in accordance with this subpart. Testimony which must be compelled under 35 U.S.C. 24, compelled from a party, or compelled in a foreign country shall be taken by oral deposition.

(b) A party presenting testimony of a witness by affidavit shall, within the time set by the administrative patent judge for serving affidavits, file a copy of the affidavit or, if appropriate, notice under § 1.671(c). If the affidavit relates to a party's case-in-chief, it shall be filed or noticed no later than the date set by an administrative patent judge for the party to file affidavits for its case-in-chief. If the affidavit relates to a party's case-in-rebuttal, it shall be filed or noticed no later than the date set by an administrative patent judge for the party to file affidavits for its case-in-rebuttal. A party shall not be entitled to rely on any document referred to in the affidavit unless the opponent is given reasonable access to the thing. A thing is something other than a document. The pages of affidavits filed under this paragraph and of any other testimony filed therewith under §§ 1.683(a) and 1.688(a) shall, to the extent possible, be given sequential numbers which shall also serve as the record page numbers for the affidavits and other testimony in the party's record to be filed under § 1.653. Exhibits identified in the affidavits or in any other testimony filed under §§ 1.683(a) and 1.688(a) and any official records and printed publications filed under § 1.682(a) shall, to the extent possible, be given sequential exhibit numbers, which shall also serve as the exhibit numbers when the exhibits are filed with the party's record. The affidavits, testimony filed under §§ 1.683(a) and 1.688(a) and exhibits shall be accompanied by an index of the names

of the witnesses, giving the number of the page where the testimony of each witness begins, and by an index of the exhibits briefly describing the nature of each exhibit and giving the number of the page where each exhibit is first identified and offered into evidence.

(c) If an opponent objects to the admissibility of any evidence contained in or submitted with an affidavit filed under paragraph (b) of this section, the opponent must, no later than the date set by the administrative patent judge for filing objections under this paragraph, file objections stating with particularity the nature of each objection. An opponent that fails to object to the admissibility of the evidence contained in or submitted with an affidavit on a ground that could have been raised in a timely objection under this paragraph will not be entitled to move under § 1.656(h) to suppress the evidence on that ground. If an opponent timely files objections, the party may, within 20 days of the due date for filing objections, file one or more supplemental affidavits, official records or printed publications to overcome the objections. No objection to the admissibility of the supplemental evidence shall be made, except as provided by § 1.656(h). The pages of supplemental affidavits filed under this paragraph shall, to the extent possible, be sequentially numbered beginning with the number following the last page number of the party's testimony submitted under paragraph (b) of this section. The page numbers assigned to the supplemental affidavits shall also serve as the record page numbers for the supplemental affidavits in the party's record filed under § 1.653. Additional exhibits identified in supplemental affidavits and any supplemental official records and printed publications shall, to the extent possible, be given sequential numbers beginning with the number following the last number of the exhibits submitted under paragraph (b) of this section. The exhibit numbers shall also serve as the exhibit numbers when the exhibits are filed with the party's record. The supplemental affidavits shall be accompanied by an index of the names of the witnesses and an index of exhibits of the type specified in paragraph (b) of this section.

(d) After the time expires for filing objections and supplemental affidavits, or earlier when appropriate, the administrative patent judge shall set a time within which any opponent may file a request to cross-examine an affiant on oral deposition. If any opponent requests cross-examination of an affiant, the party shall notice a deposition at a reasonable location within the United States under § 1.673(e) for the purpose of cross-examination by any opponent. Any redirect and recross shall take place at the deposition. At any deposition for the purpose of cross-examination of a witness, the party shall not be entitled to rely on any document or thing not mentioned in one or more of the affidavits filed under paragraphs (b) and (c) of this section, except to the extent necessary to conduct proper redirect. The party who gives notice of a deposition shall be responsible for providing a translator if the witness does not testify in English, for obtaining a court reporter, and for filing a certified transcript of the deposition as required by § 1.676. Within 45 days of the close of the period for taking cross-examination, the party shall serve (but not file) a copy of each transcript on each opponent together with copies of any additional documentary exhibits identified by the witness during the deposition. The pages of the transcripts served under this paragraph shall, to the extent possible, be sequentially numbered beginning with the number following the last page number of the party's supplemental affidavits submitted under paragraph (c) of this section. The numbers assigned to the transcript pages shall also serve as the record page numbers for the transcripts in the party's record filed under § 1.653. Additional exhibits identified in the transcripts, shall, to the extent possible, be given sequential numbers beginning with the number following the last number of the exhibits submitted under paragraphs (b) and (c) of this section. The exhibit numbers assigned to the additional exhibits shall also serve as the exhibit numbers when those exhibits are filed with the party's record. The deposition transcripts shall be accompanied by an index of the names of the witnesses, giving the number of the page where cross-examination, redirect and recross of each witness begins, and an index of exhibits of the type specified in paragraph (b) of this section.

(e) [Reserved]

(f) When a deposition is authorized to be taken within the United States under this subpart and if the parties agree in



writing, the deposition may be taken in any place within the United States, before any person authorized to administer oaths, upon any notice, and in any manner, and when so taken may be used like other depositions.

(g) If the parties agree in writing, the affidavit testimony of any witness may be submitted without opportunity for cross-examination.

(h) If the parties agree in writing, testimony may be submitted in the form of an agreed statement setting forth how a particular witness would testify, if called, or the facts in the case of one or more of the parties. The agreed statement shall be filed in the Patent and Trademark Office. See § 1.653(a).

(i) In an unusual circumstance and upon a showing that testimony cannot be taken in accordance with the provisions of this subpart, an administrative patent judge upon motion (§ 1.635) may authorize testimony to be taken in another manner.

60. Section 1.673 is amended by revising paragraphs (a), (b) introductory text, paragraphs (c) through (e) and (g) to read as follows:

#### § 1.673 Notice of examination of witness.

(a) A party authorized to take testimony of a witness by deposition shall, after complying with paragraphs (b) and (g) of this section, file and serve a single notice of deposition stating the time and place of each deposition to be taken. Depositions to be taken in the United States may be noticed for a reasonable time and place in the United States. A deposition may not be noticed for any other place without approval of an administrative patent judge. The notice shall specify the name and address of each witness and the general nature of the testimony to be given by the witness. If the name of a witness is not known, a general description sufficient to identify the witness or a particular class or group to which the witness belongs may be given instead.

(b) Unless the parties agree or an administrative patent judge or the Board determine otherwise, a party shall serve, but not file, at least three working days prior to the conference required by paragraph (g) of this section, if service is made by hand or Express Mail, or at least 14 days prior to the conference if service is made by any other means, the following:

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(c) A party shall not be permitted to rely on any witness not listed in the notice, or any document not served or any thing not listed as required by paragraph (b) of this section:

(1) Unless all opponents agree in writing or on the record to permit the party to rely on the witness, document or thing, or

(2) Except upon a motion (§ 1.635) promptly filed which is accompanied by any proposed notice, additional documents, or lists and which shows good cause why the notice, documents, or lists were not served in accordance with this section.

(d) Each opponent shall have a full opportunity to attend a deposition and cross-examine.

(e) A party who has presented testimony by affidavit and is required to notice depositions for the purpose of cross-examination under § 1.672(b), shall, after complying with paragraph (g) of this section, file and serve a single notice of deposition stating the time and place of each cross-examination deposition to be taken.

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(g) Before serving a notice of deposition and after complying with paragraph (b) of this section, a party shall have an oral conference with all opponents to attempt to agree on a mutually acceptable time and place for conducting the deposition. A certificate shall appear in the notice stating that the oral conference took place or explaining why the conference could not be had. If the parties cannot agree to a mutually acceptable place and time for conducting the deposition at the conference, the parties shall contact an administrative patent judge who shall then designate the time and place for conducting the deposition.

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61. Section 1.674 is amended by revising paragraph (a) to read as follows:

#### § 1.674 Persons before whom depositions may be taken.

(a) A deposition shall be taken before an officer authorized to administer oaths by the laws of the United States or of the place where the examination is held.

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62. Section 1.675 is amended by revising paragraph (d) to read as follows:

#### § 1.675 Examination of witness, reading and signing transcript of deposition.

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(d) Unless the parties agree in writing or waive reading and signature by the witness on the record at the deposition, when the testimony has been transcribed a transcript of the deposition shall, unless the witness refuses to read and/or sign the transcript of the deposition, be read by the witness and then signed by the witness in the form of:

- (1) An affidavit in the presence of any notary or
- (2) A declaration.

63. Section 1.676 is amended by revising paragraph (a)(4) to read as follows:

#### § 1.676 Certification and filing by officer, marking exhibits.

(a) \* \* \*

(4) The presence or absence of any opponent.

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64. Section 1.677 is revised to read as follows:

#### § 1.677 Form of an affidavit or a transcript of deposition.

(a) An affidavit or a transcript of a deposition must be on opaque, unglazed, durable paper approximately 21.8 by 27.9 cm. (8 1/2 by 11 inches) in size (letter size). The printed matter shall be double-spaced on one side of the paper in not smaller than 11 point type with a margin of 3.8 cm. (1 1/2 inches) on the left-hand side of the page. The pages of each transcript must be consecutively numbered and the name of the witness shall appear at the top of each page (§ 1.653(e)). In transcripts of depositions, the questions propounded to each witness must be consecutively numbered unless paper with numbered lines is used and each question must be followed by its answer.

(b) Exhibits must be numbered consecutively to the extent possible and each must be marked as required by § 1.653(i).

65. Section 1.678 is revised to read as follows:

#### § 1.678 Time for filing transcript of deposition.

Unless otherwise ordered by an administrative patent judge, a certified transcript of a deposition must be filed in the Patent and Trademark Office within one month after the date of deposition. If a party refuses to file a certified transcript, the administrative patent judge or the Board may take appropriate action under § 1.616. If a party refuses to file a certified transcript, any opponent may move for leave to file the certified transcript and include a copy of the transcript as part of the opponent's record.

66. Section 1.679 is revised to read as follows:

#### § 1.679 Inspection of transcript.

A certified transcript of a deposition filed in the Patent and Trademark Office may be inspected by any party. The certified transcript may not be removed from the Patent and Trademark Office unless authorized by an administrative patent judge upon such terms as may be appropriate.

67. Section 1.682 is revised to read as follows:

#### § 1.682 Official records and printed publications.

(a) A party may introduce into evidence, if otherwise admissible, an official record or printed publication not identified in an affidavit or on the record during an oral deposition of a witness, by filing a copy of the official record or printed publication or, if appropriate, a notice under § 1.671(e). If the official record or printed publication relates to the party's case-in-chief, it shall be filed or noticed together with any affidavits filed by the party under § 1.672(b) for its case-in-chief or, if the party does not serve any affidavits under § 1.672(b) for its case-in-chief, no later than the date set by an administrative patent judge for the party to file affidavits under § 1.672(b) for its case-in-chief. If the official record or printed publication relates to rebuttal, it shall be filed or noticed together with any affidavits filed by the party under § 1.672(b) for its case-in-rebuttal or, if the party does not file any affidavits under § 1.672(b) for its case-in-rebuttal, no later than the date set by an administrative patent judge for the party to file affidavits under § 1.672(b) for its case-in-rebuttal. Official records and printed publications filed under this paragraph shall be assigned sequential exhibit numbers by the party in the manner set forth in § 1.672(b). The official record and printed publications shall be accompanied by a paper which shall:

- (1) Identify the official record or printed publication;
- (2) Identify the portion thereof to be introduced in evidence; and
- (3) Indicate generally the relevance of the portion sought to be introduced in evidence.

(b) [Reserved]

(c) Unless otherwise ordered by an administrative patent judge, any written objection by an opponent to the paper or to the admissibility of the official record or printed publication shall be filed no later than the date set by the administrative patent judge for the opponent to file objections under § 1.672(c) to affidavits submitted by the party under § 1.672(b). An opponent who fails to object to the admissibility of the official record or printed publication on a ground that could have been raised in a timely objection under this paragraph will not be entitled to move under § 1.656(h) to suppress the evidence on that ground. If an opponent timely files an objection, the party may respond by filing one or more supplemental affidavits, official records or printed publications, which must be filed together with any supplemental evidence filed by the party under § 1.672(c) or, if the party does not file any supplemental evidence under § 1.672(c), no later than the date set by an administrative patent judge for the party to file supplemental affidavits under § 1.672(c). No objection to the admissibility of the supplemental evidence shall be made, except as provided by § 1.656(h). The pages of supplemental affidavits and the exhibits filed under this section shall be sequentially numbered by the party in the manner set forth in § 1.672(c). The supplemental affidavits and exhibits shall be accompanied by an index of witnesses and an index of exhibits of the type required by § 1.672(b).

(d) Any request by an opponent to cross-examine on oral deposition the affiant of a supplemental affidavit submitted under paragraph (c) of this section shall be filed no later than the date set by the administrative patent judge for the opponent to file a request to cross-examine an affiant with respect to an affidavit served by the party under § 1.672(b) or (c). If any opponent requests cross-examination of an affiant, the party shall file notice of a deposition for a reasonable location within the United States under § 1.673(e) for the purpose of cross-examination by any opponent. Any redirect and recross shall take place at the deposition. At any deposition for the purpose of cross-examination of a witness, the party shall not be entitled to rely on any document or thing not mentioned in one or more of the affidavits filed under this paragraph, except to the extent necessary to conduct proper redirect. The party who gives notice of a deposition shall be responsible for providing a translator if the witness does not testify in English, for obtaining a court reporter, and for filing a certified transcript of the deposition as required by § 1.676. Within 45 days of the close of the period for taking cross-examination, the party shall serve (but not file) a copy of each deposition transcript on each opponent together with copies of any additional documentary

exhibits identified by the witness during the deposition. The pages of deposition transcripts and exhibits served under this paragraph shall be sequentially numbered by the party in the manner set forth in § 1.672(d). The deposition transcripts shall be accompanied by an index of the names of the witnesses, giving the number of the page where cross-examination, redirect and recross of each witness begins, and an index of exhibits of the type specified in § 1.672(b).

68. Section 1.683 is revised to read as follows:

#### § 1.683 Testimony in another interference, proceeding, or action.

(a) A party may introduce into evidence, if otherwise admissible, testimony by affidavit or oral deposition and referenced exhibits from another interference, proceeding, or action involving the same parties by filing a copy of the affidavit or a copy of the transcript of the oral deposition and the referenced exhibits. If the testimony and referenced exhibits relate to the party's case-in-chief, they shall be filed together with any affidavits served by the party under § 1.672(b) for its case-in-chief or, if the party does not file any affidavits under § 1.672(b) for its case-in-chief, no later than the date set by an administrative patent judge for the party to file affidavits under § 1.672(b) for its case-in-chief. If the testimony and referenced exhibits relate to rebuttal, they shall be filed together with any affidavits served by the party under § 1.672(b) for its case-in-rebuttal or, if the party does not file any affidavits under § 1.672(b) for its case-in-rebuttal, no later than the date set by an administrative patent judge for the party to file affidavits under § 1.672(b) for its case-in-rebuttal. Pages of affidavits and deposition transcripts served under this paragraph and any new exhibits served therewith shall be assigned sequential numbers by the party in the manner set forth in § 1.672(b). The testimony shall be accompanied by a paper which specifies with particularity the exact testimony to be used and demonstrates its relevance.

(b) Unless otherwise ordered by an administrative patent judge, any written objection by an opponent to the paper or the admissibility of the testimony and referenced exhibits filed under this section shall be filed no later than the date set by the administrative patent judge for the opponent to file any objections under § 1.672(c) to affidavits submitted by the party under § 1.672(b). An opponent who fails to challenge the admissibility of the testimony or referenced exhibits on a ground that could have been raised in a timely objection under this paragraph will not be entitled to move under § 1.656(h) to suppress the evidence on that ground. If an opponent timely files an objection, the party may respond with one or more supplemental affidavits, official records or printed publications, which must be filed together with any supplemental evidence filed by the party under § 1.672(c) or, if the party does not file any supplemental evidence under § 1.672(c), no later than the date set by an administrative patent judge for the party to file supplemental evidence under § 1.672(c). No objection to the admissibility of the evidence contained in or submitted with a supplemental affidavit shall be made, except as provided by § 1.656(h). The pages of supplemental affidavits and the exhibits filed under this section shall be sequentially numbered by the party in the manner set forth in § 1.672(c). The supplemental affidavits and exhibits shall be accompanied by an index of witnesses and an index of exhibits of the type required by § 1.672(b).

(c) Any request by an opponent to cross-examine on oral deposition the affiant of an affidavit or supplemental affidavit submitted under paragraph (a) or (b) of this section shall be filed no later than the date set by the administrative patent judge for the opponent to file a request to cross-examine an affiant with respect to an affidavit filed by the party under § 1.672(b) or (c). If any opponent requests cross-examination of an affiant, the party shall file a notice of deposition for a reasonable location within the United States under § 1.673(e) for the purpose of cross-examination by any opponent. Any redirect and recross shall take place at the deposition. At any deposition for the purpose of cross-examination of a witness, the party shall not be entitled to rely on any document or thing not mentioned in one or more of the affidavits filed under this paragraph, except to the extent necessary to conduct proper redirect. The party who gives notice of a deposition shall be



responsible for providing a translator if the witness does not testify in English, for obtaining a court reporter, and for filing a certified transcript of the deposition as required by § 1.676. Within 45 days of the close of the period for taking cross-examination, the party shall serve (but not file) a copy of each deposition transcript on each opponent together with copies of any additional documentary exhibits identified by the witness during the deposition. The pages of deposition transcripts and exhibits served under this paragraph shall be sequentially numbered by the party in the manner set forth in § 1.672(d). The deposition transcripts shall be accompanied by an index of the names of the witnesses, giving the number of the page where cross-examination, redirect and recross of each witness begins, and an index of exhibits of the type specified in § 1.672(b).

69. Section 1.684 is removed and reserved.

70. Section 1.685 is amended by revising paragraphs (d) and (e) to read as follows:

#### § 1.685 Errors and irregularities in depositions.

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(d) An objection to the deposition on any grounds, such as the competency of a witness, admissibility of evidence, manner of taking the deposition, the form of questions and answers, any oath or affirmation, or conduct of any party at the deposition, is waived unless an objection is made on the record at the deposition stating the specific ground of objection. Any objection which a party wishes considered by the Board at final hearing shall be included in a motion to suppress under § 1.656(h).

(e) Nothing in this section precludes taking notice of plain errors affecting substantial rights although they were not brought to the attention of an administrative patent judge or the Board.

71. Section 1.687 is amended by revising paragraph (c) to read as follows:

#### § 1.687 Additional discovery.

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(c) Upon a motion (§ 1.635) brought by a party within the time set by an administrative patent judge under § 1.651 or thereafter as authorized by § 1.645 and upon a showing that the interest of justice so requires, an administrative patent judge may order additional discovery, as to matters under the control of a party within the scope of the Federal Rules of Civil Procedure, specifying the terms and conditions of such additional discovery. See § 1.647 concerning translations of documents in a foreign language.

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72. Section 1.688 is revised to read as follows:

#### § 1.688 Use of discovery.

(a) If otherwise admissible, a party may introduce into evidence an answer to a written request for an admission or an answer to a written interrogatory obtained by discovery under § 1.687 by filing a copy of the request for admission or the written interrogatory and the answer. If the answer relates to a party's case-in-chief, the answer shall be served together with any affidavits served by the party under § 1.672(b) for its case-in-chief or, if the party does not serve any affidavits under § 1.672(b) for its case-in-chief, no later than the date set by an administrative patent judge for the party to serve affidavits under § 1.672(b) for its case-in-chief. If the answer relates to the party's rebuttal, the answer shall be served together with any affidavits served by the party under § 1.672(b) for its case-in-rebuttal or, if the party does not serve any affidavits under § 1.672(b) for its case-in-rebuttal, no later than the date set by an administrative patent judge for the party to serve affidavits under § 1.672(b) for its case-in-rebuttal.

(b) Unless otherwise ordered by an administrative patent judge, any written objection to the admissibility of an answer

shall be filed no later than the date set by the administrative patent judge for the opponent to file any objections under § 1.672(c) to affidavits submitted by the party under § 1.672(b). An opponent who fails to challenge the admissibility of an answer on a ground that could have been raised in a timely objection under this paragraph will not be entitled to move under § 1.656(h) to suppress the evidence on that ground. If an opponent timely files an objection, the party may respond with one or more supplemental affidavits, which must be filed together with any supplemental evidence filed by the party under § 1.672(c) or, if the party does not file any supplemental evidence under § 1.672(c), no later than the date set by an administrative patent judge for the party to file supplemental affidavits under § 1.672(c). No objection to the admissibility of the evidence contained in or submitted with a supplemental affidavit shall be made, except as provided by § 1.656(h). The pages of supplemental affidavits and the exhibits filed under this section shall be sequentially numbered by the party in the manner set forth in § 1.672(c). The supplemental affidavits and exhibits shall be accompanied by an index of witnesses and an index of exhibits of the type required by § 1.672(b).

(c) Any request by an opponent to cross-examine on oral deposition the affiant of a supplemental affidavit submitted under paragraph (b) of this section shall be filed no later than the date set by the administrative patent judge for the opponent to file a request to cross-examine an affiant with respect to an affidavit filed by the party under § 1.672(b) or (c). If any opponent requests cross-examination of an affiant, the party shall file a notice of deposition for a reasonable location within the United States under § 1.673(e) for the purpose of cross-examination by any opponent. Any redirect and recross shall take place at the deposition. At any deposition for the purpose of cross-examination of a witness, the party shall not be entitled to rely on any document or thing not mentioned in one or more of the affidavits filed under this paragraph, except to the extent necessary to conduct proper redirect. The party who gives notice of a deposition shall be responsible for providing a translator if the witness does not testify in English, for obtaining a court reporter, and for filing a certified transcript of the deposition as required by § 1.676. Within 45 days of the close of the period for taking cross-examination, the party shall serve (but not file) a copy of each deposition transcript on each opponent together with copies of any additional documentary exhibits identified by the witness during the deposition. The pages of deposition transcripts and exhibits served under this paragraph shall be sequentially numbered by the party in the manner set forth in § 1.672(d). The deposition transcripts shall be accompanied by an index of the names of the witnesses, giving the number of the page where cross-examination, redirect and recross of each witness begins, and an index of exhibits of the type specified in § 1.672(b).

(d) A party may not rely upon any other matter obtained by discovery unless it is introduced into evidence under this subpart.

73. Section 1.690 is amended by revising paragraphs (a), (b) and (c) to read as follows:

#### § 1.690 Arbitration of interferences.

(a) Parties to a patent interference may determine the interference or any aspect thereof by arbitration. Such arbitration shall be governed by the provisions of Title 9, United States Code. The parties must notify the Board in writing of their intention to arbitrate. An agreement to arbitrate must be in writing, specify the issues to be arbitrated, the name of the arbitrator or a date not more than thirty (30) days after the execution of the agreement for the selection of the arbitrator, and provide that the arbitrator's award shall be binding on the parties and that judgment thereon can be entered by the Board. A copy of the agreement must be filed within twenty (20) days after its execution. The parties shall be solely responsible for the selection of the arbitrator and the rules for conducting proceedings before the arbitrator. Issues not disposed of by the arbitration will be resolved in accordance with the procedures established in this subpart, as determined by the administrative patent judge.

(b) An arbitration proceeding under this section shall be conducted within such time as may be authorized on a case-by-case basis by an administrative patent judge.

(c) An arbitration award will be given no consideration unless it is binding on the parties, is in writing and states in a clear and definite manner the issue or issues arbitrated and the disposition of each issue. The award may include a statement of the grounds and reasoning in support thereof. Unless otherwise ordered by an administrative patent judge, the parties shall give notice to the Board of an arbitration award by filing within twenty (20) days from the date of the award a copy of the award signed by the arbitrator or arbitrators. When an award is timely filed, the award shall, as to the parties to the arbitration, be dispositive of the issue or issues to which it relates.

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March 3, 1995

BRUCE A. LEHMAN  
Assistant Secretary of Commerce  
and Commissioner of Patents  
and Trademarks

[1173 OG 36]

(99) **DEPARTMENT OF COMMERCE**  
**Patent and Trademark Office**  
**37 CFR Part 1**  
**[Docket No. 910514-1195]**  
**[RIN: 0651-AA49]**

#### Patent Interference Proceedings

Agency: Patent and Trademark Office, Commerce.

Action: Final Rule

**Summary:** The Patent and Trademark Office (PTO) is amending its rules of practice in patent interference cases. The U.S. District Court for the District of Columbia recently decided *Kochler v. Mustonen*, Civil Action No. 90-1074 (D.D.C. Apr. 23, 1991). The District Court held that PTO practice regarding taking of testimony abroad was not clear. PTO rules require that a testimony period be set. The rules also require that testimony be taken during the testimony period. Rule 684 authorizes testimony to be taken abroad. However, rule 684 requires that a motion be filed for leave to take testimony abroad and that the motion be filed before the close of a party's testimony period. The District Court suggested that a motion to take testimony abroad, filed in PTO on the last day of the testimony period, could be considered timely even though taking of the testimony might occur after the testimony period. By this amendment, PTO will continue to authorize the filing of a motion to take testimony abroad. However, a party will have to file the motion within a time such that the testimony can be taken during the testimony period set under PTO rule 651.

**Effective Date:** Sept. 27, 1991

**For Further Information Contact:** Fred E. McKelvey by telephone at (703) 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, DC 20231.

**Supplementary Information:** The PTO conducts interference proceedings to determine who as between two or more applicants for patent or one or more applicants and one or more patentees is the first inventor of a patentable invention. As part of its proofs in an interference, a party may request leave to take testimony abroad. 37 CFR § 1.684 (1990).

The U.S. District Court for the District of Columbia recently decided *Kochler v. Mustonen*, Civil Action No. 90-1074 (D.D.C. Apr. 23, 1991). The District Court held that PTO practice regarding taking of testimony abroad was not clear. PTO rule 651 (37 CFR § 1.651 (1990)) requires that a testimony period be set. Rule 651 also requires that testimony be taken during the testimony period. Rule 684 (37 CFR § 1.684 (1990)) authorizes testimony to be taken abroad. However, rule 684 requires that a motion be filed for leave to take testimony abroad and that the motion be filed before the close of a party's testimony period. The District Court suggested that a motion to take testimony abroad, filed in PTO on the last day of the testimony period, could be considered timely even though taking of the testimony might occur after the testimony period.

In a notice of proposed rule making published in the FEDERAL REGISTER on June 12, 1991 56 FR 26949, paragraphs

(a) and (d) of rule 651 and rule 684 were proposed to be revised to require a party to file the motion to take testimony abroad within a time such that the testimony could be taken during the testimony period set under PTO rule 651.

One written comment was submitted by a Chief Executive Officer who stated his support of the proposed amendment. An attorney commented that the proposed amendment of § 1.684 appeared to foreclose the taking of testimony beyond any original time set under § 1.651. The attorney suggested language be added to paragraph (c) stating the alternative that testimony abroad must be completed within the time set under § 1.651 or by the Examiner-in-Chief. This suggestion has been adopted.

**Other Considerations:** The rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 et. seq.), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et. seq.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these rule changes will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these changes is to clarify the need for taking testimony abroad during the testimony period. The rule changes include no additional or increased fees. Substantive rights are not adversely affected.

The Office has determined that these rule changes are not a major rule under Executive Order 12291. The annual effect on the economy will be less than \$100 million. Because most of the changes do not change burdens, there will be no major increase in costs or prices for consumers; individual industries; Federal, state or local government agencies; or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity or innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The rule change will not impose any additional burden under the paperwork Reduction Act of 1980, 44 U.S.C. 3501 et. seq.

The Office has also determined that this rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

#### List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Courts, Inventions and patents.

For the reasons set forth in the preamble and pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and 135, the PTO is amending 37 CFR part 1 as follows:

#### Part 1—Rules of Practice in Patent Cases

1. The authority citation for 37 CFR part 1, Suspart E, continues to read as follows:

Authority: 35. U.S.C. 6, 23, 41 and 135.

2. Section 1.651 is revised as follows:

#### § 1.651 Setting times for discovery and taking testimony, parties entitled to take testimony.

(a) At an appropriate stage in an interference, an examiner-in-chief shall set (1) a time for filing motions (§ 1.635) for additional discovery under § 1.687(c) and (2) testimony periods for taking any necessary testimony (testimony includes testimony to be taken abroad under § 1.684).

(b) Where appropriate, testimony periods will be set to permit a party to:

(1) Present its case-in-chief and/or case-in-rebuttal and/or

(2) Cross-examine an opponent's case-in-chief and/or a case-in-rebuttal.

(c) A party is not entitled to take testimony to present a case-in-chief unless:



(1) The examiner-in-chief orders the taking of testimony under § 1.639(c);

(2) The party alleges in its preliminary statement a date of invention prior to the earlier of the filing date or effective filing date of the senior party;

(3) A testimony period has been set to permit an opponent to prove a date of the invention prior to the earlier of the filing date or effective filing date of the party and the party has filed a preliminary statement alleging a date of invention prior to the date; or

(4) A motion (§ 1.635) is filed showing good cause why a testimony period should be set.

(d) Testimony, including any testimony to be taken abroad under § 1.684, shall be taken and completed during the testimony periods set under paragraph (a) of this section. A party seeking to extend the period for taking testimony must comply with § 1.635 and § 1.645(a).

3. Section 1.684 is revised as follows:

#### § 1.684 Testimony in a foreign country.

(a) An examiner-in-chief may authorize testimony of a witness to be taken in a foreign country. A party seeking to take testimony in a foreign country shall, promptly after the testimony period is set, file a motion (§ 1.635):

(1) Naming the witness  
(2) Describing the particular facts to which it is expected that the witness will testify.

(3) Stating the grounds on which the moving party believes that the witness will testify.

(4) Demonstrating that the expected testimony is relevant.

(5) Demonstrating that the testimony cannot be taken in this country at all or cannot be taken in this country without hardship to the moving party greatly exceeding the hardship to which all opposing parties will be exposed by the taking of the testimony in a foreign country.

(6) Accompanied by an affidavit stating that the motion is made in good faith and not for the purpose of delay or harassing any party.

(7) Accompanied by written interrogatories to be asked of the witness.

(b) Any opposition under § 1.638(a) shall state any objection to the written interrogatories and shall include any cross-interrogatories to be asked of the witness. A reply under § 1.638(b) may be filed and shall be limited to stating any objection to any cross-interrogatories proposed in the opposition.

(c) If the motion is granted, taking of the testimony abroad must be completed within the testimony period set under § 1.651 or within such time as may be set by the Examiner-in-Chief. The moving party shall be responsible for obtaining answers to the interrogatories and cross-interrogatories before an officer qualified to administer oaths in the foreign country under the laws of the United States or the foreign country. The officer shall prepare a transcript of the interrogatories, cross-interrogatories, and recorded answers to the interrogatories and cross-interrogatories and shall transmit the transcript to BOX INTERFERENCE, Commissioner of Patents and Trademarks, Washington, DC 20231, with a certificate signed and sealed by the officer and showing:

(1) The witness was duly sworn by the officer before answering the interrogatories and cross-interrogatories.

(2) The recorded answers are a true record of the answers given by the witness to the interrogatories and cross-interrogatories.

(3) The name of the person by whom the answers were recorded and, if not recorded by the officer, whether the answers were recorded in the presence of the officer.

(4) The presence or absence of any party.

(5) The place, day, and hour that the answers were recorded.

(6) A copy of the recorded answers was read by or to the witness before the witness signed the recorded answers and that the witness signed the recorded answers in the presence of the officer. The officer shall state the circumstances under which a witness refuses to read or sign recorded answers.

(7) The officer is not disqualified under § 1.674.

(d) If the parties agree in writing, the testimony may be taken before the officer on oral deposition.

(e) A party taking testimony in a foreign country shall have the burden of proving that false swearing in the giving of testimony is punishable as perjury under the laws of the foreign country. Unless false swearing in the giving of testimony before the officer shall be punishable as perjury under the laws of the foreign country where testimony is taken, the testimony shall be entitled to the same weight as testimony taken in the United States. The weight of the testimony shall be determined in each case.

Aug. 22, 1991

HARRY F. MANBECK, JR.  
Assistant Secretary and Commissioner  
of Patents and Trademarks

[1136 OG 40]

(100)

Department of Commerce  
Patent and Trademark Office  
37 CFR Part 1  
[Docket No. 921118-3184]  
RIN: 0651-AA63

#### Patent Interference Practice Burden of Proof

Agency: Patent and Trademark Office, Commerce

Action: Final Rule

Summary: The Patent and Trademark Office (PTO) is amending its rules of practice in patent interference cases. The amended rules specify that a party filing a motion has the burden of proof for that motion. The amended rules also more clearly state the nature of expert-witness and fact-witness evidence that must accompany a preliminary motion. Moreover, a definition of "interlocutory order," as contrasted with a final decision, is added to clarify the meaning of "interlocutory order."

Effective Date: Oct. 25, 1993. These rules will apply to all papers filed with the PTO on or after the effective date.

For Further Information Contact: Fred E. McKelvey by telephone at (703) 305-9035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington D.C. 20231.

Supplementary Information: A Notice of Proposed Rulemaking was published in the *Federal Register* (58 FR 528) on Jan. 6, 1993, and in the *Official Gazette* of the PTO (1147 Off. Gaz. 11) on Feb. 2, 1993. Comments were due Mar. 8, 1993. Four comments were received.

The PTO proposed moving the presumption of correctness of an interlocutory order, which is presently in 37 CFR § 1.655(a), to a proposed new subsection 1.601(q). The PTO also proposed to make explicit in 37 CFR § 1.637(a) that a party filing a motion has the burden of proving why it is entitled to the relief sought in the motion.

The PTO proposed to amend 37 CFR § 1.639 to incorporate guidance provided in *Hanagan v. Kimura*, 16 USPQ2d 1791, 1794 (Comm'r Pat. 1990). Subsection (c) of § 1.639 was proposed to be amended to refer to "additional evidence in the form of testimony" so as to distinguish the evidence needed under subsection (c) from evidence submitted under subsections (a) and (b). Subsection (d) to 37 CFR § 1.639 was proposed to be added to specify that the nature of evidence that must be submitted when an opinion of an expert is needed. Subsection (e) was proposed to be added to specify the nature of evidence that must be submitted when a statement of a fact witness is to be relied upon. Subsection (f) was proposed to be added to specify the nature of a showing that should be made when a statement of an opponent is needed or evidence in possession of an opponent is needed. Subsection (g) was proposed to be added to specify the nature of evidence that must be supplied if inter partes tests are to be conducted.

Present 37 CFR 1.655(a) was proposed to be amended by deleting the last sentence, which would be moved to and be included in the proposed definition of interlocutory order in proposed subsection 1.601(g).

The PTO received one comment that endorsed the proposed rulemaking, but was otherwise directed to an earlier rulemaking.

The PTO received two comments regarding proposed subsection 1.601(q). One comment suggested that procedural rules should not be placed in a definition. The comment suggested

that the last two sentences of proposed subsection 1.601(q), which deal with the presumed correctness of interlocutory orders, be in a new subsection of section 1.655. This suggestion is adopted in part. The last two sentences of subsection 1.601(q) will be moved to the end of subsection 1.655(a).

A second comment challenged the sufficiency of the notice in the proposed rulemaking. The comment noted that the word "manifest" was omitted from the portion of existing subsection 1.655(a) that was moved to new subsection 1.601(q) and that the word "manifestly" was omitted from the remainder of subsection 1.655(a). The comment argued that the Notice of Proposed Rulemaking did not provide sufficient notice of these omissions, which the comment characterized as substantive changes, and thus violates the requirements of 5 U.S.C. § 553. This comment is not adopted.

The Notice of Proposed Rulemaking gave specific notice of the actual terms of the proposed rule. Cf. § 553(b) (requiring "[g]eneral notice" of "either the terms or substance of the proposed rule or a description of the subjects and issues involved.") In any case, no change actually occurs because the omitted words, "manifest" and "manifestly", in 37 CFR § 1.655(a) are unnecessary. No board decision is known to have relied on the distinction between "error", "clear error", and "manifest error". In appellate courts, manifest error is an extremely deferential standard of review that is closely tied to the abuse-of-discretion standard. See e.g., *Datascope Corp. v. SMEC, Inc.*, 879 F.2d 820, 827-28, 11 USPQ2d 1321, 1326 (Fed. Cir. 1989) (finding no manifest error). Board review of an examiner-in-chief's interlocutory orders is not an independent review of a final decision by a lower tribunal. The board is the only entity that may decide interferences, 35 U.S.C. § 135(a), and the examiner-in-chief, who is a member of the board, 35 U.S.C. § 7(a), is almost always a member of the panel that ultimately decides the interference. Thus, an extremely deferential standard of appeal in this context is inappropriate.

The PTO received one comment regarding proposed subsection 1.637(a). The comment noted that subsection 1.637(a) had been misprinted so that the text "a statement of the precise relief requested, (2)" had been omitted following the "(1)". The comment is correct, the omission was a misprint, and the omitted text has been restored.

The PTO received one comment regarding 37 CFR § 1.639(b). The comment suggested that all proofs introduced under subsection 1.639(b) remain in the record after the decision on the preliminary motions unless the proofs are expressly withdrawn. The opposing party could treat such proofs as subsection 1.672(b) declarations and request an opportunity to cross examine the declarants. The suggestion is not adopted because it is beyond the scope of the present rulemaking.

The PTO received one comment regarding subsection 1.639(e). The comment assumed that the word "needed" had been intentionally deleted from the end of the first sentence of subsection 1.639(c), but noted that the deletion was not mentioned in the summary. The assumption is correct. This deletion is grammatically required after the addition of the text amending subsection 1.639(c).

The PTO received two comments regarding codification of the *Hanagan* guidelines in subsections 1.639(d)-(g). One comment endorsed codification of the *Hanagan* guidelines, but suggested that the codification be reformulated to increase flexibility. In particular, the comment pointed to the unusual case described in the Notice of Proposed Rulemaking where an opponent to a preliminary motion was overwhelmed with evidence. The comment suggested that the mandatory requirements of subsection 1.639, as amended, be revised to state that the information required under the *Hanagan* guidelines "should ordinarily" be provided. The comment is not adopted.

When necessary, a party opposing a preliminary motion should request an extension of time to submit the information described in subsections 1.639(d) through (g), which do not require the submission of the actual testimony or evidence. In contrast, in the example discussed in the Notice of Proposed Rulemaking, the examiner-in-chief deferred consideration of the preliminary motion until the final hearing to allow the opponent time to prepare a full opposition, which included the actual evidence the opponent relied upon to support the opposition. As the Notice of Proposed Rulemaking pointed out, examiners-in-chief have, and should exercise, discretion to extend time or otherwise remedy problems that may arise

when applying the requirements of section 1.639 in specific cases.

A second comment suggested that the requirements of subsections 1.639(d) and (e) duplicate the declarations submitted under 37 CFR § 1.672(b). The comment recommends that the rules be revised to require a subsection 1.672(b) declaration be submitted once, during the motions period, in support of an opposition to a preliminary motion. The recommendation is not adopted.

Subsection 1.672(b) is directed to the technical requirements for submitting affidavits or depositions for testimony that will not be compelled. Subsection 1.639(c), which invokes the requirements of subsections 1.639(d) and (e), requires a description of the proposed testimony, not an affidavit or deposition of the testimony itself. A request under subsection 1.639(c) must describe the nature of the testimony being sought so the examiner-in-chief can determine whether the testimony is actually needed. *Hanagan*, 16 USPQ2d at 1794. Subsection 1.639(c) is intended to address the situation where evidence in the form of testimony is not available to the party asserting a need for the evidence. The *Hanagan* guidelines require such a party to justify the delay and inconvenience that may result by explaining what the party expects the testimony to prove. To this end, subsection 1.639(c) is revised to clarify that it only applies to testimony that is unavailable to the party seeking the testimony.

#### OTHER CONSIDERATION

The rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 et seq.), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principle impact of these changes would be to clarify procedure in patent interferences and thereby eliminate ambiguity that may exist in current rules.

The Office has determined that these rule changes are not a major rule under Executive Order 12291. The annual effect on the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers; individuals; industries; Federal, state or local government agencies; or geographic regions. There will be no significant effects on competition, employment, investment, productivity, innovation, or on the ability of the United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no recordkeeping or reporting requirements within the coverage of the Act are placed upon the public.

#### List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Courts, Inventions and patents.

#### PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:  
Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.601 is amended by adding paragraph (q) to read as follows:

#### § 1.601 Scope of rules, definitions.

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(q) A final decision is a decision awarding judgement as to all counts. An interlocutory order is any other action taken by



an examiner-in-chief or a panel of the Board in an interference, including the notice declaring an interference.

3. Section 1.637 is amended by revising paragraph (a) to read as follows:

#### § 1.637 Content of motions.

(a) A party filing a motion has the burden of proof to show that it is entitled to the relief sought in the motion. Every motion shall include (1) a statement of the precise relief requested, (2) a statement of the material facts in support of the motion, and (3) a full statement of the reasons why the relief requested should be granted.

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4. Section 1.639 is amended by revising paragraph (c) and by adding paragraphs (d) through (g) as follows:

#### § 1.639 Evidence in support of motion, opposition, or reply.

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(c) If a party believes that additional evidence in the form of testimony that is unavailable to the party is necessary to support or oppose a preliminary motion under § 1.633 or a motion to correct inventorship under § 1.634, the party shall describe the nature of any proposed testimony as specified in paragraphs (d) through (g) of this section. If the examiner-in-chief finds that testimony is needed to decide the motion, the examiner-in-chief finds that testimony is needed to decide the motion, the examiner-in-chief may grant appropriate interlocutory relief and enter an order authorizing the taking of testimony and deferring a decision on the motion to final hearing.

(d) When additional evidence in the form of expert-witness testimony is needed in support of or opposition to a preliminary motion, the moving party or opponent should:

(1) identify the person whom it expects to call as an expert;  
(2) state the field in which the person is alleged to be an expert; and

(3) state:  
(i) the subject matter on which the person is expected to testify;

(ii) the facts and opinions to which the person is expected to testify; and

(iii) a summary of the grounds and basis for each opinion.

(e) When additional evidence in the form of fact-witness testimony is necessary, state the facts to which the witness is expected to testify.

(f) If the opponent is to be called, or if evidence in the possession of the opponent is necessary, explain the evidence sought, what it will show, and why it is needed.

(g) When inter partes tests are to be performed, describe the tests stating what they will be expected to show.

5. Section 1.655 is amended by revising paragraph (a) to read as follows:

#### § 1.655 Matters considered in rendering a final decision.

(a) In rendering a final decision, the Board may consider any properly raised issue including (1) priority of invention, (2) derivation by an opponent from a party who filed a preliminary statement under § 1.625, (3) patentability of the invention, (4) admissibility of evidence, (5) any interlocutory matter deferred to final hearing, and (6) any other matter necessary to resolve the interference. The Board may also consider whether any interlocutory order was erroneous or an abuse of discretion. All interlocutory orders shall be presumed to have been correct and the burden of showing error or an abuse of discretion shall be on the party attacking the order. When two or more

interlocutory orders involve the same issue, the last entered order shall be presumed to have been correct.

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Sept. 16, 1993

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

[1155 OG 65]

#### (101) Interference Practice: Matters Relating to Related Preliminary Motions

In some interference proceedings, evidence which would provide a basis for a preliminary motion under 37 CFR 1.633 does not come to light until after a decision on preliminary motions has been entered. For example, a party may conclude, after hearing the opponent's testimony, that the opponent's application or patent does not comply with the "best mode" requirement of 35 USC § 112, first paragraph; or a prior art reference may be found which the party could not previously have located. The purpose of this notice is to clarify the policy of the Board of Patent Appeals and Interferences as to what steps the party must take if it wishes to have an issue based on such evidence considered by the Board.

If the time for filing preliminary motions has expired, and then evidence comes to light which in the opinion of a party would provide basis for a preliminary motion under 37 CFR 1.633, that party may not simply raise the matter in its brief at final hearing for the Board's consideration. Rather, it is the policy of the Board that it will not consider the matter unless the party files promptly after the evidence becomes available:

(1) the appropriate preliminary motion under 37 CFR 1.633; and

(2) a motion under 37 CFR 1.635 showing sufficient cause why the preliminary motion was not timely filed, as required by 37 CFR 1.645(b). This motion must include the certificate required by 37 CFR 1.637(b).

If either party believes that additional evidence or discovery concerning the matter raised by the motion(s) is necessary, motions (1) and (2) should also be accompanied by or responded to by such other motions as may be appropriate, as for example, motions under 37 CFR 1.651(b) (4) or 1.687(c).

Oct. 6, 1992

SAUL I. SEROTA  
Chairman, Board of Patent  
Appeals and Interferences

[1144 OG 8]

#### (102) Department of Commerce Patent and Trademark Office 37 CFR Part 1 [Docket No. 50103-7058]

#### Arbitration of Patent Interference Cases

Agency: Patent and Trademark Office, Commerce.

Action: Final rule.

Summary: The Patent and Trademark Office is amending its rules to implement the arbitration provisions of section 105 of the Patent Law Amendments Act of 1984, Pub. L. 98-622.

Effective Date: May 27, 1987.

For Further Information Contact: Ian A. Calvert or Michael Sofocleous by telephone at (703) 557-4000 or by mail marked to the attention of either and addressed to Box Interference, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information: Section 105 of the Patent Law Amendments Act of 1984, enacted Nov. 8, 1984, provides for the arbitration of patent interference cases. Section 105, codified as 35 U.S.C. 135(d), provides:

Parties to a patent interference, within such time as may be specified by the Commissioner by regulation, may determine

such contest or any aspect thereof by arbitration. Such arbitration shall be governed by the provisions of title 9 to the extent such title is not inconsistent with this section. The parties shall give notice of any arbitration award to the Commissioner, and such award shall, as between the parties to the arbitration, be dispositive of the issues to which it relates. The arbitration award shall be unenforceable until such notice is given. Nothing in this subsection shall preclude the Commissioner from determining patentability of the invention involved in the interference.

The Patent and Trademark Office (PTO) conducts interference proceedings to determine any question of patentability and priority of invention between two or more parties claiming the same patentable invention. An interference may be declared between two or more pending applications naming different inventors when, in the opinion of an examiner, the applications contain claims for the same patentable invention. An interference may be declared between one or more pending applications and one or more unexpired patents naming different inventors when, in the opinion of an examiner, any application and any unexpired patent contain claims for the same patentable invention. Patent interference cases can be quite expensive. Arbitration may prove useful to minimize expenses in interference cases. The arbitration rule applies to all pending interferences.

The PTO published an advance notice of rulemaking in the Federal Register of Jan. 16, 1985 (50 FR 2294-2296). The notice was also published in the *Official Gazette* on Feb. 12, 1985 (1051 O.G. 9-10). The notice also appeared in the Bureau of National Affairs' Patent, Trademark and Copyright Journal, Vol. 29, p. 310 (Jan. 24, 1985), hereinafter "BNA." Five written comments were received in response to the advance notice.

A notice of proposed rulemaking was published in the Federal Register on Sept. 15, 1986 (51 FR 32756-32762), in the *Official Gazette* on Oct. 21, 1986 (1071 O.G. 25-31), and in BNA's Patent, Trademark and Copyright Journal, Vol. 32, pp. 552-558 (Sept. 18, 1986). In response to the notice, three comments, two in writing and one by telephone, were received. These comments are discussed herein.

All written comments are available for public inspection in Rm. 10C01, Crystal Gateway 2, 1225 Jefferson Davis Hwy., Arlington, Va.

#### Discussion of the Rule

Under § 1.690 the arbitrator can determine issues of patentability as between the parties but a determination by him or her that the subject matter is patentable would not be binding upon the PTO. If the arbitrator's award holds that a party's claims corresponding to the count are unpatentable over prior art or under 35 U.S.C. 112, that determination would be binding on that party vis-a-vis the party's opponent and would result in a judgment adverse to that party. The judgment, however, would not discharge the duty that each party has under 37 CFR 1.56 to bring to the attention of the examiner in charge of its respective application any prior art and/or reason relied upon by the arbitrator in the determination of unpatentability.

It is the longstanding practice of the PTO to favor the settlement of interferences and the PTO looks with favor on all proper efforts in that direction as being conducive to the termination of the proceeding. See 4 Revise and Caesar, *Interference Law and Practice*, section 861, p. 2956 (Michie Co. 1948) and the Commissioner's Notice of Nov. 9, 1976, titled, "Extensions of Time and Filing of Papers in Interferences," 953 *Official Gazette* 2 (Dec. 7, 1976). In this regard, the notice states that:

\*\*\* stipulation or motions for extensions of time under 37 CFR 1.245 will not henceforth be approved or granted, respectively, unless accompanied by a detailed showing of facts sufficient to establish that the action for which the extension is sought could not have been or cannot be taken or completed during the time previously set therefor, and that the entire extension appears necessary for the taking or completion of that action. Since the Office favors the amicable settlement of interferences, the foregoing requirement will be liberally applied in the case of a first request for extension of time for the purpose of negotiating settlement.

Consequently, the examiner-in-chief may give favorable consideration to a motion for an extension of time for purposes of settlement; however, a further motion for an extension for that purpose would not be granted unless it is accompanied by a schedule of specific dates showing that the parties will make a good faith effort to promptly terminate the proceeding. If preliminary motions under 37 CFR 1.633 have not been filed, the examiner-in-chief would not normally extend the time for their filing merely for purposes of settlement. In these circumstances, the examiner-in-chief would require that the preliminary motions be filed or that their filing be waived.

If the proceeding is in the testimony stage, the examiner-in-chief could grant the parties' motion to extend all the unexpired testimony times to close concurrently on the date the record is due provided they file a stipulation that any evidence to be submitted will be in one of the forms specified in 37 CFR 1.672(e) and (f), i.e., affidavit testimony or a stipulation either as to what a particular witness would testify to if called or the facts in the case of any party.

Analogously, the aforesaid practice would apply to arbitration. Section 1.690 requires that parties who intend to arbitrate an interference notify the examiner-in-chief in writing of their intention to arbitrate and file a copy of the arbitration agreement within 20 days of its execution. Pursuant to 35 U.S.C. 135(c) an agreement to arbitrate is considered to be one "made in connection with and in contemplation of the termination of the interference". The agreement must be in writing a copy filed in the PTO within 20 days after its execution. The notification of intention to arbitrate must be made in a separate paper. Merely incorporating the notification in the agreement is not sufficient to comply with § 1.690(a). The parties also will be required to adhere to a time schedule approved by the examiner-in-chief such that the interference proceeding can be expeditiously resolved so as to prevent the unnecessary postponement of the beginning of the running of the term of any patent resulting from an application involved in the interference. *Pritchard v. Loughlin*, 361 F.2d 483, 149 USPQ 841 (CCPA 1966).

If the parties desire to arbitrate an interference prior to the close of the motion period, the examiner-in-chief will not normally grant an extension of time for the purpose. The parties will be required to file their preliminary motions under 37 CFR 1.633. After the motions are filed, the examiner-in-chief could grant an extension only upon compliance with 37 CFR 1.645 which requires a showing of "good cause." Such a "good cause" showing would normally include a schedule, agreed to by the parties, setting forth, *inter alia*, the dates for (1) executing the arbitration agreement, (2) determining priority and (3) terminating the interference.

Section 1.690(a) requires that an arbitration agreement include the following:

(1) The name of the arbitrator or a date certain (not more than 30 days after the execution of the agreement) for his or her selection.

(2) The issues to be decided by the arbitrator.

(3) A provisions that the arbitrator's award is binding on the parties and that the Board can enter a judgment based thereon.

Section 1.690(c) requires that a copy of the arbitration award be filed within 20 days from the date of the award or by a date set by the examiner-in-chief.

If the proceeding is in the testimony stage and the parties desire to arbitrate, the examiner-in-chief could grant a reasonable extension for that purpose. A motion for a further extension for that purpose would not be granted unless it were accompanied by a schedule, agreed to by the parties, setting forth, *inter alia*, the dates for (1) executing the arbitration agreement, (2) determining priority, and (3) terminating the interference. If the parties are to submit the required schedule, a motion for a further extension could be granted. If the parties file a copy of the arbitration agreement and they agree that any evidence submitted in the proceeding will be in one of the forms specified by 37 CFR 1.672(e) or (f), the examiner-in-chief could give favorable consideration to the parties' motion that all the unexpired times be extended to close concurrently on the date the record is due. By that date, the parties would be required to



file the arbitrator's award and their records, if necessary for the resolution of any issue not decided by the arbitrator. If the award is not dispositive of all the issues in the interference, the examiner-in-chief would set brief times so that parties could explain their evidence relating to any issues which the arbitrator did not, or was unable to decide. For example, the award might be dispositive of the issue of priority between the parties and leave for the Board's determination the question of substituting a new count raised in a preliminary motion under 37 CFR 1.633.

The arbitration award, filed by the parties, would be in the nature of a final decision and should include the following:

- (1) The style (e.g., *Jones v. Smith*), the number of the interference and the names of the real parties in interest.
- (2) The subject matter in issue, i.e., the counts and a table of counts, if necessary, indicating the relationship of the parties' claims corresponding to each count and those claims not corresponding thereto.
- (3) The issues for decision before the arbitrator.
- (4) The arbitrator's decision. The decision may also include a statement of the grounds and reasoning in support thereof.
- (5) A summary, if appropriate, indicating, inter alia, that judgment should be awarded to one of the parties.

Any party to the arbitration can attack the award only in the manner provided by 9 U.S.C. 10 and 11.

9 U.S.C. 10 reads as follows:

In either of the following cases the United States court in and for the district wherein the award was made may make an order vacating the award upon the application of any party to the arbitration—

- (a) Where the award was procured by corruption, fraud, or undue means.
- (b) Where there was evident partiality or corruption in the arbitrators, or either of them.
- (c) Where the arbitrators were guilty of misconduct in refusing to postpone the hearing, upon sufficient cause shown, or in refusing to hear evidence pertinent and material to the controversy; or of any other misbehavior by which the rights of any part have been prejudiced.
- (d) Where the arbitrators exceeded their powers, or so imperfectly executed them that a mutual, final, and definite award upon the subject matter submitted was not made.
- (e) Where an award is vacated and the time within which the agreement required the award to be made has not expired the court may, in its discretion, direct a rehearing by the arbitrators.

9 U.S.C. 11 reads as follows:

In either of the following cases, the United States court in and for the district wherein the award was made may make an order modifying or correcting the award upon the application of any party to the arbitration—

- (a) Where there was an evident material miscalculation of figures or an evident material mistake in the description of any person, thing, or property referred to in the award.
- (b) Where the arbitrators have awarded upon a matter not submitted to them, unless it is a matter not affecting the merits of the decision upon the matter submitted.
- (c) Where the award is imperfect in matter of form not affecting the merits of the controversy.

The order may modify and correct the award, so as to effect the intent thereof and promote justice between the parties.

See, for example, *Fairchild and Co., Inc. v. Richmond, F. and P. R. Co.*, 516 F.Supp. 1305 (D.D.C. 1981). If such an attack were to be made by one of the parties while the interference is pending before the Board, the Board would not stay the interference. Rather, the Board would issue its judgment in accordance with the award. So long as the award is in compliance with § 1.690, it would carry the presumption that the arbitrator acted correctly in making his decision and accordingly, the party designated by the award as the prevailing party would be entitled *prima facie* to a judgment in its favor. If the dissatisfied party brings an action in an appropriate United States district court and if the court vacates, modifies or corrects the award, the Board would take action consistent with the

court's findings. No action would lie in the PTO to vacate or correct an arbitration award, unless all parties agreed in writing.

The following examples illustrate the practice of the PTO concerning arbitration.

#### Example 1

##### Arbitration Practice—Preliminary Stage

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The parties decide to arbitrate the interference in accordance with § 1.690 and file a motion for an extension of time so that they can "freely" arbitrate the interference, but do not file a waiver of their right to file motions.

The examiner-in-chief would deny the motion because the parties' intention to arbitrate, in and of itself, does not constitute a showing of "good cause" within the meaning of 37 CFR 1.645(a). Even if the parties file an agreement to arbitrate, the PTO would not grant any extension of time to permit the parties to "freely" arbitrate an interference prior to the expiration of the time for filing preliminary motions.

#### Example 2

##### Arbitration Practice—Testimony Stage

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633. The parties file preliminary motions; the examiner-in-chief renders a decision thereon and sets the testimony times. The parties file a notice of intent to arbitrate the interference under § 1.690(a) and a motion for a one month extension of the testimony times. The examiner-in-chief could grant the motion, but would indicate that if the parties file another motion for an extension for that purpose, the motion must be accompanied by a schedule, agreed to by the parties, setting forth the dates for (1) executing the arbitration agreement, (2) determining priority and (3) terminating the interference.

The parties file a motion for an additional one month extension of time to permit the parties to arbitrate the interference. Accompanying the motion is a proposed schedule of times and a copy of the arbitration agreement which provides, inter alia, (i) the name of the arbitrator or a date certain for his selection, (ii) that the arbitrator's award will be binding on the parties, (iii) the issues to be decided by the arbitrator and (iv) that the award will be filed by the date the record is due. The parties also indicate that the evidence to be filed in the proceeding will be in one of the forms specified by 37 CFR 1.672(e) or (f). The examiner-in-chief could grant the motion and indicate that he will give favorable consideration to a motion to extend all the unexpired times to close concurrently on the date the record is due should the parties request such.

On the date for filing the record, the parties file the arbitrator's award and their evidentiary records, if necessary. The award states (i) the style and number of the interference and the real parties in interest, (ii) the subject matter in issue and the parties' claims which correspond thereto and which do not correspond thereto, (iii) the issues for decision before the arbitrator, (iv) the arbitrator's decision (which may include a statement of the grounds and reasoning in support thereof) and (v) that judgment should be awarded to one of the parties. The examiner-in-chief examines the award to ensure that it complies with § 1.690 and is dispositive of the issues in the interference which can be decided by the arbitrator. If the award is otherwise acceptable, the Board would issue a judgment based on the award. If the award is not dispositive of all the issues in the interference, the examiner-in-chief would determine how the interference will proceed.

#### Example 3

##### Arbitration Practice—Award Decides Interference-in-Fact Issue and Junior Party Takes No Testimony

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion for judgment under 37 CFR 1.633(b) on the ground that there is no interference-in-fact between his claims corresponding to the count and his opponent's claims corresponding thereto. The examiner-in-chief denies the motion, examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intent to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief. On the date for filing the record, the junior party files the award together with a motion requesting that the interference be terminated in view of the award. He does not file a record. In his award the arbitrator holds that no interference-in-fact exists between the parties' claims corresponding to the count.

The motion would be denied because the award decides a matter of patentability which would not result in a judgment adverse to one of the parties. Consequently, the junior party would be placed under an order to show cause why judgment under 37 CFR 1.652 should not be entered against him for his failure to file an evidentiary record by the time set therefore. In response to the order, the junior party requests final hearing to review the examiner-in-chief's denial of the motion for judgment and a testimony period to show no interference-in-fact. The examiner-in-chief would grant the junior party's request to the extent that final hearing is set and would deny the request for testimony because the junior party already had the opportunity to take testimony on the matter.

#### Example 4

##### Arbitration Practice—Cannot Decide Patentability

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion for judgment under 37 CFR 1.633(a) on the ground that the claims corresponding to the count are unpatentable over prior art. In his decision on motions, the examiner-in-chief grants the motion and places both parties under an order pursuant to 37 CFR 1.640(d)(1) to show cause why judgment should not be entered against them as to the count. In response to the order, the senior party files a paper in accordance with 37 CFR 1.640(e) purportedly showing good cause why judgment should not be entered in accordance with the order and a motion requesting permission to arbitrate the patentability issue. The examiner-in-chief would deny the motion. The arbitrator is without authority to establish vis-a-vis the public that the subject matter of the count is patentable. Thus, the arbitration will serve no useful purpose. The Board would consider the senior party's paper and enter an appropriate order.

#### Example 5

##### Arbitration Practice—Award After Decision on Motions

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion for judgment under 37 CFR 1.633(a) on the ground that the claims corresponding to counts 1 and 2 are unpatentable over prior art. In his decision on motions, the examiner-in-chief grants the motion with respect to count 1, denies the motion with respect to count 2 and places both parties under an order pursuant to 37 CFR 1.640(d)(1) to show cause why judgment should not be entered against them as to count 1. The senior party files a paper in accordance with 37 CFR 1.640(e); the junior party, a response thereto. The Board considers the paper and the response thereto and based on the record enters judgment adverse to both parties as to count 1. Thereafter, the examiner-in-chief examines the preliminary statements and sets dates for taking testimony and filing the record.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intent to

arbitrate and file an arbitration agreement which is approved by the examiner-in-chief. In his award, the arbitrator decides that judgment should be awarded to the junior party. On the date for filing the record, both parties file the award together with a motion requesting that the interference be terminated in view of the award. No record is filed.

The motion would be granted and accordingly it would be held that the senior party is not entitled to a patent containing his claims corresponding to count 2.

#### Example 6

##### Arbitration Practice—Award Decides Patentability

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No motions for judgment under 37 CFR 1.633 are filed and after the examination of the preliminary statements, the examiner-in-chief sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intent to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief. In his award, the arbitrator finds (1) that the evidence is insufficient to establish a prior public use bar under 35 U.S.C. 102(b) against the junior party, (2) that the claims of the junior party corresponding to the count are patentable under 35 U.S.C. 103 over the prior art cited by the senior party to the junior party, and (3) that judgment on priority should be awarded to junior party. On the date for filing together with a motion requesting that the interference be terminated in view of the award.

The motion would be granted and accordingly it would be held that the senior party is not entitled to a patent containing his claims corresponding to the count. After the termination of the proceeding, each party has the duty under 37 CFR 1.56 to bring before the primary examiner the evidence concerning the purported public use bar and the prior art cited by the senior party and/or considered by the arbitrator.

#### Example 7

##### Arbitration Practice—Award Grants Priority to Junior Party Contingent Upon Granting of Preliminary Motion Under 1.633(C)

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion under 37 CFR 1.633(c)(1) to substitute another count. The examiner-in-chief denies the motion, examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intention to arbitrate and enter into an arbitration agreement which is approved by the examiner-in-chief. The agreement provides that any evidence to be submitted by the parties will be in the form of a stipulation under 37 CFR 1.672(e) and (f). The parties file a motion requesting that all the unexpired testimony times be extended to close concurrently on the date the record is due. The motion would be granted.

On the date for filing the record, the junior party files his record and the award. The award states, inter alia, that if the Board at final hearing should grant the junior party's motion under 37 CFR 1.633(c)(1) to substitute a new count, judgment should be awarded to the junior party based on the evidence. Otherwise, the award states that judgment should be awarded to the senior party.

The examiner-in-chief sets the brief times and after the filing thereof the interference would be set for final hearing so that the Board can review the examiner-in-chief's denial of the junior party's motion under 37 CFR 1.633(c) and issue an appropriate judgment based on the award.

#### Example 8

##### Arbitration Practice—Award Attacked



An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No preliminary motions are filed. The examiner-in-chief examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intention to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief.

On the date for filing the record, both parties file their records. The junior party files the award which states that judgment should be awarded to him and a motion for judgment based on that award. The senior party files an opposition to the motion for judgment on the grounds (i) that the award contains errors of law, (ii) that the award was procured by "corruption, fraud or undue means" in violation of 9 U.S.C. 10(a), and (iii) that the arbitrator exhibited "evident partiality" in violation of 9 U.S.C. 10(b) and was "guilty of misconduct" in refusing to hear evidence pertinent and material to the interference, citing 9 U.S.C. 10(c).

The Board would grant the judgment based on the award, holding that the senior party is not entitled to a patent containing his claims corresponding to the count. So long as the award is in compliance with the provisions of § 1.690, it would carry a presumption that the arbitrator acted properly in all respects. Consequently, before the PTO the award is binding upon the parties and the junior party is *prima facie* entitled to a judgment in its favor. Thus, no action lies in the PTO as regards the matter raised by the senior party. The senior party's action lies in an appropriate United States district court and the PTO would take any action consistent with the court's decision.

#### Example 9

#### Arbitration Practice—Award Cannot Modify Board's Final Decision

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No motions are filed. The examiner-in-chief examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference and enter into an arbitration agreement. Neither party notifies the examiner-in-chief of their intent to arbitrate nor do they file a copy of the agreement in the interference. Both parties timely file their records and briefs. Both waive oral argument. The Board enters a final decision after consideration of the evidence in favor of the senior party.

The junior party requests reconsideration of the Board's final decision, submits a copy of the arbitration award and moves that the Board set aside its final decision and enter judgment in his favor based on the award. In support of its request, the junior party cites 9 U.S.C. 9, which provides that "any party to the arbitration may apply to the court so specified for an order confirming the award" and 35 U.S.C. 135(d) which provides that title 9 applies to interference arbitrations.

The Board would deny the motion to set aside. The parties did not comply with § 1.690(a), i.e., notify the examiner-in-chief in writing of their intention to arbitrate and file a copy of the arbitration agreement within twenty (20) days of its execution. The denial of the motion is an appropriate sanction under 37 CFR 1.616. Such action by the Board is considered consistent with long-standing interference practice. Cf. *Humphrey v. Fickert*, 1904 Dec. Comm'r. Pat. 447 (Comm'r. 1904) wherein the Board, after it had considered the evidence, refused to set aside its award of priority to Fickert and act upon the Fickert's concession of priority in favor of Humphrey, the losing party.

#### Example 10

#### Arbitration Award Filed With Record—No Notice to Examiner-In-Chief

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611

for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No motions are filed. The examiner-in-chief examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference and enter into an arbitration agreement. Neither party notifies the examiner-in-chief of the agreement. The junior party timely files its record together with a copy of the arbitration award and a motion for judgment based on the award.

The motion would be denied. Under the provisions of 37 CFR 1.616, the examiner-in-chief would place both parties under an order to show cause why judgment should not be rendered against them for their failure to comply with 1.690(a), i.e., failing to notify him of their intent to arbitrate and file a copy of the arbitration agreement.

#### Discussion of Comments

One commentator suggested that the expression "An interference or any aspect thereof shall be arbitrated" in part (b) of proposed § 1.690 might be construed as going beyond the terms of the statute by authorizing an examiner-in-chief to require the parties to arbitrate an interference, and proposed that the quoted language be changed to "An arbitration proceeding under this section shall be conducted." To eliminate any possible misconstruction of the rule, this proposal has been adopted.

A second commentator suggested, by telephone, that a provision be added to proposed § 1.690 requiring that the arbitrator be familiar with United States interference practice, and that United States law be applied by the arbitrator in making the determination. He expressed the fear that a foreign arbitrator might reach a result contrary to established domestic law.

This suggestion has not been adopted. It is incumbent upon the parties to select the arbitrator, and to satisfy themselves as to his or her qualifications. Presumably if the arbitrator's decision is contrary to established law, any resulting patent would be subject to attack on that ground by a third party in subsequent litigation.

Another commentator stated that, with the arbitration rule, the PTO was "attempting to apply a band-aid to a system which cannot be cured by application of a band-aid," and that the first-to-file system should be adopted in place of the first-to-invent system. This suggestion is obviously far beyond the scope of the rule change under consideration. The first-to-invent system is mandated by statute and could not be replaced merely by a change in the rules. The purpose of § 1.690 is to establish a specific procedure governing the optional arbitration of interferences provided by section 105 of Pub. L. 98-622.

#### Other Considerations

This rule does not have a significant impact on the quality of the human environment or the conservation of natural resources.

The rule is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354) because arbitration intended to minimize expenses in interference cases.

The Patent and Trademark Office has determined that this rule is not a major rule under Executive Order 12291. The annual effects on the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The rule will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no record

keeping or reporting requirements within the coverage of the Act are placed upon the public.

#### List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations, Conflicts of interest, Courts, Inventions and patents, Lawyers.

For the reasons set out in the preamble and under the authority given to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and 135, Part 1 of Title 37 CFR is amended as follows:

#### PART 1—RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6 unless otherwise noted.

2. New § 1.690 is added to Subpart E to read as follows:

#### § 1.690 Arbitration of Interferences.

(a) Parties to a patent interference may determine the interference or any aspect thereof by arbitration. Such arbitration shall be governed by the provisions of Title 9, United States Code. The parties must notify the Board in writing of their intention to arbitrate. An agreement to arbitrate must be in writing, specify the issues to be arbitrated, the name of the arbitrator or a date not more than thirty (30) days after the execution of the agreement for the selection of the arbitrator, and provide that the arbitrator's award shall be binding on the parties and that judgment thereon can be entered by the Board. A copy of the agreement must be filed within twenty (20) days after its execution. The parties shall be solely responsible for the selection of the arbitrator and the rules for conducting proceedings before the arbitrator. Issues not disposed of by arbitration will be resolved in accordance with the procedures established in 37 CFR, Subpart E of Part 1, as determined by the examiner-in-chief.

(b) An arbitration proceeding under this section shall be conducted within such time as may be authorized on a case-by-case basis by an examiner-in-chief.

(c) An arbitration award will be given no consideration unless it is binding on the parties, is in writing and states in a clear and definite manner (1) the issue or issues arbitrated and (2) the disposition of each issue. The award may also include a statement of the grounds and reasoning in support thereof. Unless otherwise ordered by an examiner-in-chief, the parties shall give notice to the Board of an arbitration award by filing within twenty (20) days from the date of the award a copy of the award signed by the arbitrator or arbitrators. When an award is timely filed, the award shall, as to the parties to the arbitration, be dispositive of the issue or issues to which it relates.

(d) An arbitration award shall not preclude the Office from determining patentability of any invention involved in the interference.

Mar. 16, 1987

DONALD J. QUIGG  
Assistant Secretary and  
Commissioner of Patents  
and Trademarks

[FR Doc. 87-9373 Filed 4-24-87; 8:45 am]  
BILLING CODE 3510-16-M

[1080 OG 15]

#### (103) Disclosure Document Program

This notice consolidates and supersedes the notices of Mar. 26, 1969 (862 O.G. 1) and Aug. 11, 1970 (878 O.G. 1) relating to the Patent Office Disclosure Document Program. Under this program the Patent Office accepts and preserves, for a period of two years, papers referred to as "Disclosure Documents."

These papers may be used as evidence of the dates of conception of inventions.

#### The Program

A paper disclosing an invention and signed by the inventor or inventors may be forwarded to the Patent Office by the inventor (or by any one of the inventors when there are joint inventors), by the owner of the invention, or by the attorney or agent of the inventor(s) or owner. It will be retained for two years and then be destroyed unless it is referred to in a separate letter in a related patent application within said two years.

A Disclosure Document is not a patent application and the date of its receipt in the Patent Office will not become the effective filing date of any patent application subsequently filed. However, like patent applications, these documents will be kept in confidence by the Patent Office. If patent protection is desired, a patent application should be filed as soon as possible.

This program does not diminish the value of conventional witnessed and notarized records as evidence of conception of an invention, but it should provide a more credible form of evidence than that provided by the popular practice of mailing a disclosure to oneself or another person by registered mail. The program is made available as a service to those persons desiring to use it.

#### Content of Disclosure Document

Although there are no restrictions as to content and claims are not necessary, the benefits afforded by a Disclosure Document will depend directly upon the adequacy of the disclosure. Therefore, it is strongly urged that the document contain a clear and complete explanation of the manner and process of making and using the invention in sufficient detail to enable a person having ordinary knowledge in the field of the invention to make and use the invention. When the nature of the invention permits, a drawing or sketch should be included. The use or utility of the invention should be described, especially in chemical inventions.

The Disclosure Document must be limited to written matter or drawings on paper or other thin, flexible material, such as linen or plastic drafting material, having dimensions or being folded to dimensions not to exceed 8 1/2 by 13 inches. Photographs also are acceptable. Each page should be numbered. Text and drawings should be sufficiently dark to permit reproduction with commonly used office copying machines.

A \$10 fee is charged for filing a Disclosure Document. Payment must accompany the Disclosure Document when it is submitted to the Patent Office.

In addition to the \$10 fee, the Disclosure Document must be accompanied by a stamped, self-addressed envelope and a separate paper in duplicate, signed by the inventor, stating that he is the inventor and requesting that the material be received for processing under the Disclosure Document Program. The papers will be stamped by the Patent Office with an identifying number and date of receipt, and the duplicate request will be returned in the self-addressed envelope together with a warning notice indicating that the Disclosure Document may be relied upon only as evidence and that a patent application should be diligently filed if patent protection is desired. The inventor's request may take the following form:

"The undersigned, being the inventor of the disclosed invention, requests that the enclosed papers be accepted under the Disclosure Document Program, and that they be preserved for a period of two years."

#### Retention

The Disclosure Document will be preserved in the Patent Office for two years after its receipt and will then be destroyed unless it is referred to in a separate letter in a related patent application filed within the two-year period. The Disclosure Document must be referred to in the separate letter by title, number, and date of receipt. Acknowledgment of receipt of such letters will be made in the next official communication or in separate letter from the Patent Office. Unless it is desired to have the Patent Office retain the Disclosure Document



beyond the two-year period, it is not required that it be referred to in a patent application.

#### Warning as to Limitations

The two-year retention period should not be considered to be a "grace period" during which the inventor can wait to file his patent application without possible loss of benefits. It should be recognized that in establishing priority of invention an affidavit or testimony referring to a Disclosure Document must usually also establish diligence in completing the invention or in filing the patent application since the filing of the Disclosure Document.

Inventors are also reminded that any public use or sale in the United States, or publication of the invention anywhere in the world, more than one year prior to the filing of a patent application on that invention will prohibit the granting of a patent on that invention.

If the inventor is not familiar with what is considered to be "diligence in completing the invention" or "reduction to practice" under the patent law, or if he has other questions about patent matters, the Patent Office advises him to consult an attorney or agent registered to practice before the Patent Office. Patent attorneys and agents may be found in the telephone directories of most major cities. Also, many large cities have associations of patent attorneys which may be consulted.

Jan. 4, 1971

RICHARD A. WAHL  
Assistant Commissioner  
of Patents

[883 OG 3]

#### (104) Changes to Disclosure Document Program

The PTO is revising and clarifying the Disclosure Document Program to improve processing and to simplify customer requirements. The following changes to the Disclosure Document Program are effective upon publication:

- Duplicate copies of documents are no longer required. Only the original document is required for submission.
- The original Disclosure Document will not be returned to the customer.
- A self addressed, stamped envelope is no longer required.
- A standard format for the disclosure Document is required:

1) The document must be written on one side only, on white letter-size (21.6 cm x 27.9 cm or 8 1/2 by 11 inches) or DIN Size A4 (21.0 x 29.7 cm) paper. (Oversized paper, although foldable to the above dimensions, is not acceptable.) 2) Drawings or sketches must be on paper the same size as the rest of the document.

• The fee for filing a Disclosure Document is \$10.00. Documents submitted without the full fee will be returned.

• A copy of a Disclosure Document will be furnished upon receipt of a written request (from the inventor or attorney/agent only) and with a fee of \$25.00. 37 CFR § 1.19(b)(3).

Section 1706 of the Manual of Patent Examining Procedures (MPEP) will be revised in accordance with this notice. The section also contains further information regarding the Disclosure Document Program.

July 21, 1995

JAMES O. THOMAS, JR.  
Deputy Assistant Commissioner  
for Patent Process Services

[1177 O.G. 60]

#### (105) Service of Process and Testimony of Employees of the Patent and Trademark Office and Production of Documents in Legal Proceedings

The Patent and Trademark Office (PTO) is adding Parts 15 and 15a to Title 37 of the Code of Federal Regulations. Part 15 concerns service of process on the Commissioner, the Patent and Trademark Office, and employees of the Patent and Trademark Office in their official capacity. Part 15a concerns the testimony of PTO employees regarding official matters and the production of official documents in legal proceedings. Parts 15 and 15a were effective upon publication in the Federal Register. 54 FR 3976-8 (Jan. 26, 1989).

In addition, §§ 1701 and 1701.01 of the Manual of Patent Examining Procedure and §§ 1801 and 1801.01 of the Trademark Manual of Examining Procedure are amended, as indicated below, effective immediately.

Parts 15 and 15a, §§ 1701 and 1701.01 of the Manual of Patent Examining Procedure and §§ 1801 and 1801.01 of the Trademark Manual of Examining Procedure are published in this notice as a convenience to the public. In addition to these materials, the Patent and Trademark Office alerts the public to its position with respect to *Standard Packaging Corp. v. Curwood, Inc.*, 365 F. Supp. 134, 180 USPQ 234 (N.D. Ill. 1973). In the past, parties have attempted, based on *Standard Packaging*, to obtain answers to questions which the Patent and Trademark Office has regarded to be improper. While the Patent and Trademark Office believes *Standard Packaging* accurately states the law, the Office believes that the court misapplied the law to the precise questions in issue. Accordingly, the Office agrees with the Federal Circuit's observation in *Western Electric Co. v. Piezo Technology, Inc. v. Quigg*, 860 F.2d 428, 432, 8 USPQ 2d 1853, 1857 (Fed. Cir. 1988), that there is considerable doubt whether *Standard Packaging* was correctly decided. The Patent and Trademark Office will not permit examiners to answer questions similar to those which the *Standard Packaging* court found acceptable.

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#### Department of Commerce Patent and Trademark Office 37 CFR Parts 15 and 15a

#### [Docket No. 9106-9006] Service of Process and Testimony of Employees of the Patent and Trademark Office and Production of Documents in Legal Proceedings

Agency: Patent and Trademark Office.  
Action: Final rule.

**Summary:** The Patent and Trademark Office is adding 37 CFR Parts 15 and 15a to supplement 15 CFR Parts 15 and 15a. These new parts prescribe policies and procedures to be followed with respect to service of process on the Patent and Trademark Office, the Commissioner of Patents and Trademarks, and employees of the Office, the testimony of Office employees regarding official matters, and the production of official documents in legal proceedings. These regulations serve as a statement of Office policy and provide comprehensive guidelines for the Office and its employees, outside agencies, and other persons regarding the appropriate procedures for service of process, testimony, and production of documents.

**Effective date:** Jan. 26, 1989.

**For Further Information Contact:** Associate Solicitor John W. Dewhurst by mail at Box 8, U.S. Patent and Trademark Office, Washington, D.C. 20231 and by phone at (703) 557-4035.

**Supplementary Information:** These regulations are designed to supplement, and be construed consistent with, 15 CFR Parts 15 and 15a. The regulations in Part 15a state the views of the Office with respect to the permissible scope of testimony which may be given by Office employees in connection with their performance of quasi-judicial patent and trademark matters. These Office views are consistent with *United States v. Morgan*, 313 U.S. 409, 422 (1941); *Western Electric Co., Inc. v. Piezo Technology, Inc. v. Quigg*, No. 88-1216, 860 F.2d 428, 8 USPQ 2d 1853 (Fed. Cir. Nov. 1, 1988); *In re Mayewsky*, 162 USPQ

86, 89 (E.D. Va. 1969), and *Shaffer Tool Works v. Joy Mfg. Co.*, 167 USPQ 170 (S.D. Tex. 1970).

Because these regulations concern agency management and personnel, they are not rules or regulations within the meaning of section 1(a) of Executive Order 12291, and they are not subject to the requirements of that Order. Accordingly, no preliminary or final regulatory impact analysis has to be or will be prepared.

These regulations, relating to agency management and personnel, are exempt from all requirements of section 553 of the Administrative Procedure Act [5 USC 553] (including a delayed effective date and therefore will be effective immediately upon publication in the Federal Register).

Because a notice of proposed rule making and an opportunity for public comments are not required to be given for these regulations by section 553 of the APA, or by any other law, no regulatory flexibility analysis has to be or will be prepared for purposes of the Regulatory Flexibility Act [5 U.S.C. 603(a) and 604(a)].

This final rule does not contain policies with Federalism implications sufficient to warrant preparation of a Federalism assessment under Executive Order 12612.

This rule does not contain collections of information for purposes of the Paperwork Reduction Act.

#### List of subjects in 37 CFR Parts 15 and 15a:

Attorneys, Administrative practice and procedure, Courts, Government employees.

For the reasons set forth in the preamble, 37 CFR is amended as follows:

#### 1. Part 15 is added to read as follows:

#### Part 15 Service of Process

Sec.

15.1 Scope and purpose

15.2 Definitions

15.3 Acceptance of service of process

**Authority:** 5 U.S.C. 301; 15 U.S.C. 1501, 1512, 1513, 1515, and 1518; Reorganization Plan No. 5 of 1950; 44 U.S.C. 3101; 15 CFR 15.2(a).

#### § 15.1 Scope and Purpose.

(a) This part supplements 15 CFR Part 15 and sets forth the procedures to be followed when a summons or complaint is served on the Office or the Commissioner or an employee of the Office in his or her official capacity. This part is to be construed consistent with 15 CFR Part 15.

(b) This part is intended to ensure the orderly execution of the affairs of the Office and not to impede any legal proceeding.

(c) This part does not apply to subpoenas. The procedures to be followed with respect to subpoenas are set out in Part 15a of this Title.

(d) This part does not apply to service of process made on an Office employee personally on matters not related to official business of the Office or to the official responsibilities of the Office employee.

#### § 15.2 Definitions.

For the purpose of this part:

(a) "Commissioner" means Assistant Secretary and Commissioner of Patents and Trademarks.

(b) "Legal proceeding" means a proceeding before a tribunal constituted by law, including a court, an administrative body or commission, or an administrative law judge or hearing officer.

(c) "Office" means Patent and Trademark Office.

(d) "Office employee" means any officer or employee of the Office.

(e) "Official business" means the authorized business of the Office.

(f) "Solicitor" means the chief legal officer of the Office or other Office employee to whom the Solicitor has delegated authority to act under this part.

#### § 15.3 Acceptance of service of process

(a) Any summons or complaint to be served in person or by registered or certified mail or as otherwise authorized by law on the Office or the Commissioner or an Office employee in his or her official capacity, shall be served on the Solicitor or an Office employee designated by the Solicitor.

(b) Any summons or complaint to be served by mail may be addressed to Solicitor, P.O. Box 15667, Arlington, Va. 22215. Any summons or complaint to be served by hand may be delivered to the Office of the Solicitor.

(c) Any Office employee served with a summons or complaint shall immediately notify and deliver the summons or complaint to the Office of the Solicitor.

(d) Any Office employee receiving a summons or complaint shall note on the summons or complaint the date, hour, and place of service and whether service was by personal delivery or by mail.

(e) When a legal proceeding is brought to hold an Office employee personally liable in connection with an action taken in the conduct of official business, rather than liable in an official capacity, the Office employee by law is to be served personally with process. Service of process in this case is inadequate when made upon the Solicitor or the Solicitor's designee. Any Office employee sued personally for an action taken in the conduct of official business shall immediately notify and deliver a copy of the summons or complaint to the Office of the Solicitor.

(f) An Office employee sued personally in connection with official business may be represented by the Department of Justice at its discretion. See 28 CFR 50.15 and 50.16 (1987).

(g) The Solicitor or Office employee designated by the Solicitor, when accepting service of process for an Office employee in an official capacity, shall endorse on the Marshal's or server's return of service form or receipt for registered or certified mail the following statement: "Service accepted in official capacity only." The statement may be placed on the form or receipt with a rubber stamp.

(h) Upon acceptance of service or receiving notification of service, as provided in this section, the Solicitor shall take appropriate steps to protect the rights of the Commissioner or Office employee involved.

#### 2. Part 15a is added to read as follows:

#### Part 15a Testimony by Employees and the Production of Documents in Legal Proceedings

Sec.

15a.1 Scope

15a.2 Definitions

15a.3 Office policy

15a.4 Testimony or production of documents; general rule

15a.5 Testimony of Office employees in proceedings involving the United States

15a.6 Legal proceedings between private litigants

15a.7 Procedures when an Office employee receives a subpoena

**Authority:** 5 U.S.C. 301; 15 U.S.C. 1501, 1512, 1513, 1515, and 1518; Reorganization Plan No. 5 of 1950; 44 U.S.C. 3101; 15 CFR 15a.1(e) and 15a.2(f).

#### § 15a.1 Scope

(a) This part supplements 15 CFR Part 15a and prescribes the policies and procedures of the Office with respect to the testimony of Office employees as witnesses in legal proceedings and the production of documents of the Office for use in legal proceedings pursuant to a request, order, or subpoena. This part is issued pursuant to 15 CFR 15a.1(e) and is to be construed consistent with 15 CFR Part 15a.

(b) This part does not apply to any legal proceeding in which an Office employee is to testify, while on leave status, as to facts or events that are in no way related to the official business of the Office.



(c) This part is intended to ensure the orderly execution of the affairs of the Office and not to impede any legal proceeding and in no way affects the rights and procedures governing public access to records pursuant to the Freedom of Information Act or the Privacy Act. See 15 CFR 15a.4 and 37 CFR 1.15.

### § 15a.2 Definitions.

For the purpose of this part:

- (a) "Commissioner" means Assistant Secretary and Commissioner of Patents and Trademarks.
- (b) "Demand" means a request, order, or subpoena for testimony or documents for use in a legal proceeding.
- (c) "Document" means any record, paper, and other property held by the Office, including without limitation official patent and trademark files, official letters, telegrams, memoranda, reports, studies, calendar and dairy entries, maps, graphs, pamphlets, notes, charts, tabulations, analyses, statistical or informational accumulations, any kind of summaries of meetings and conversations, film impressions, magnetic tapes, and sound or mechanical reproductions.
- (d) "Legal proceeding" means a proceeding before a tribunal constituted by law, including a court, an administrative body or commission, an administrative law judge or hearing officer or any discovery proceeding in support thereof.
- (e) "Office" means Patent and Trademark Office.
- (f) "Office employee" means any officer or employee of the Office.
- (g) "Official business" means the authorized business of the Office.
- (h) "Solicitor" means the chief legal officer of the Office or other Office employee to whom the Solicitor has delegated authority to act under this part.
- (i) "Testimony" means a statement given in person before a tribunal or by deposition for use before the tribunal or any other statement given for use before a tribunal in a legal proceeding, including an affidavit, declaration under 35 U.S.C. 25, or declaration under 28 U.S.C. 1746.
- (j) "United States" means the Federal Government, its departments and agencies, and individuals acting on behalf of the Federal Government.

### § 15a.3 Office policy.

The Office policy is that its documents will not be voluntarily produced and Office employees will not voluntarily appear as witnesses or give testimony in a legal proceeding. The reasons for this policy include:

- (a) To conserve the time of Office employees for conducting official business.
- (b) To minimize the possibility of involving the Office in controversial or other issues which are not related to the mission of the Office.
- (c) To prevent the possibility that the public will misconstrue variances between personal opinions of Office employees and Office policy.
- (d) To avoid spending the time and money of the United States for private purposes.
- (e) To preserve the integrity of the administrative process, minimize disruption of the decision-making process, and prevent interference with the Office's administrative functions.

### § 15a.4 Testimony or production of documents; general rule

(a) No Office employee shall give testimony concerning the official business of the Office or produce any document in any legal proceeding without the prior authorization of the Solicitor. Where appropriate, an Office employee may be instructed in writing by the Commissioner, Solicitor, or other appropriate Office employee not to give testimony or produce a document. Without prior approval, no Office employee shall answer inquiries from a person not employed by the Department of Commerce regarding testimony or documents subject to a demand or a potential demand under the provisions of this Part. All inquiries involving a demand or potential demand on an Office employee shall be referred to the Solicitor.

(b) A certified copy of a document, not otherwise available under Chapter I of this Title, will be provided for use in a legal proceeding upon written request and payment of applicable fees required by law.

(c)(1) *Request for testimony or document.* A request for testimony of an Office employee or document shall be mailed or hand-delivered to the Office of the Solicitor. The mailing address of the Office of the Solicitor is Box 8, Patent and Trademark Office, Washington, D.C. 20231.

(2) *Subpoenas.* A subpoena for testimony by an Office employee or a document shall be served in accordance with the Federal Rules of Civil or Criminal Procedure as appropriate, or applicable state procedure, and a copy of the subpoena shall be sent to the Solicitor.

(3) *Affidavit.* Every request and subpoena shall be accompanied by an affidavit or declaration under 28 U.S.C. 1746 or, if an affidavit or declaration is not feasible, a written statement setting forth the title of the legal proceeding, the forum, the requesting party's interest in the legal proceeding, the reasons for the request or subpoena, a showing that the desired testimony or document is not reasonably available from any other source, and if testimony is requested, the intended use of the testimony, a general summary of the testimony desired, and a showing that no document could be provided and used in lieu of testimony. The purpose of this requirement is to permit the Solicitor to make an informed decision as to whether testimony or production of a document should be authorized.

(d) Any Office employee who is served with a demand shall immediately notify the Office of the Solicitor.

(e) The Solicitor may consult or negotiate with an attorney for a party or the party, if not represented by an attorney, to refine or limit a demand so that compliance is less burdensome or obtain information necessary to make the determination required by paragraph (c) of this section. Failure of the attorney or party to cooperate in good faith to enable an informed determination to be made under this part may serve as the basis for a determination not to comply with the demand.

(f) A determination under this part to comply or not to comply with a demand is not an assertion or waiver of privilege, lack of relevance, technical deficiencies or any other ground for noncompliance. The Commissioner reserves the right to oppose any demand on any legal ground independent of any determination under this part.

### § 15a.5 Testimony of Office employees in proceedings involving the United States.

- (a) An Office employee may not testify as an expert or opinion witness for any party other than the United States.
- (b) When appropriate, the Solicitor may authorize an Office employee to give testimony as an expert or opinion witness on behalf of the United States. Expert or opinion testimony on behalf of the United States will not be authorized in any legal proceeding involving the validity or enforceability of a patent or registered trademark.
- (c) Whenever, in any legal proceeding involving the United States, a request is made by an attorney representing or acting under the authority of the United States, the Solicitor will make all necessary arrangements for the Office employee to give testimony on behalf of the United States. Where appropriate, the Solicitor may require reimbursement to the Office of the expenses associated with an Office employee giving testimony on behalf of the United States.

### § 15a.6 Legal proceedings between private litigants

- (a) Testimony by an Office employee and production of documents in a legal proceeding not involving the United States shall be governed by § 15a.4.
- (b) If an Office employee is authorized to give testimony in a legal proceeding, the testimony, if otherwise proper, shall be limited to facts within the personal knowledge of the Office employee. An Office employee is prohibited from giving expert or opinion testimony, answering hypothetical or speculative questions, or giving testimony with respect to subject matter which is privileged. If an Office employee is authorized to testify in connection with the employee's involvement or assistance in a quasi-judicial proceeding which took place before

the Office, that employee is further prohibited from giving testimony in response to questions which seek:

- (1) Information about that employee's:
  - (i) Background.
  - (ii) Expertise.
  - (iii) Qualifications to examine or otherwise consider a particular patent or trademark application.
  - (iv) Usual practice or whether the employee followed a procedure set out in any Office manual of practice in a particular case.
  - (v) Consultation with another Office employee.
  - (vi) Understanding of:
    - (A) A patented invention, an invention sought to be patented, or patent application, patent, reexamination or interference file.
    - (B) Prior art.
    - (C) Registered subject matter, subject matter sought to be registered, or a trademark application, registration, opposition, cancellation, interference or concurrent use file.
    - (D) Any Office manual of practice.
    - (E) Office regulations.
    - (F) Patent, trademark, or other law.
    - (G) The responsibilities of another Office employee.
  - (vii) Reliance on particular facts or arguments.
- (2) To inquire into the manner in and extent to which the employee considered or studied material in performing the quasi-judicial function.
- (3) To inquire into the bases, reasons, mental processes, analyses, or conclusions of that Office employee in performing the quasi-judicial function.

### § 15a.7 Procedures when an Office employee receives a subpoena.

- (a) Any Office employee who receives a subpoena shall immediately forward the subpoena to the Office of the Solicitor. The Solicitor will determine the extent to which an Office employee will comply with the subpoena.
- (b) If the Office employee is not authorized to comply with the subpoena, the Office employee shall appear at the time and place stated in the subpoena, produce a copy of Part 15a of Title 15 and a copy of this part, and respectfully refuse to provide any testimony or produce any document. *United States ex rel. Touhy v. Ragen*, 340 U.S. 462 (1951).
- (c) When necessary or appropriate, the Solicitor will request assistance from the Department of Justice or a U.S. Attorney or otherwise assure the presence of an attorney to represent the interests of the Office or an Office employee.

Dec. 23, 1988

DONALD J. QUIGG  
Assistant Secretary and  
Commissioner of Patents  
and Trademarks

### Revisions to §§ 1701 and 1701.01 of MPEP

#### § 1701 Office personnel not to express opinion on validity or patentability of patent

Every patent is presumed to be valid. 35 U.S.C. § 282, first sentence. Public policy demands that every employee of the Patent and Trademark Office refuse to express to any person any opinion as to the validity or invalidity of, or the patentability or unpatentability of any claim in any U.S. Patent, except to the extent necessary to carry out (a) examination of an application seeking to reissue the patent, (b) a reexamination proceeding to reexamine the patent, or (c) an interference involving the patent.

The question of validity or invalidity is otherwise exclusively a matter to be determined by a court. Members of the patent examining corps are cautioned to be especially wary of any inquiry from any person outside the Patent and Trademark Office, including an employee of another Government agency, the answer to which might indicate that a particular patent should not have issued.

When a field of search for an invention is requested, examiners should routinely inquire whether the invention has been

patented in the United States. If the invention has been patented, no field of search should be suggested.

Employees of the Patent and Trademark Office, particularly patent examiners who examined an application which matured into a patent or a reissued patent or who conducted a reexamination proceeding, should not discuss or answer inquiries from any person outside the Patent and Trademark Office as to whether or not a certain reference or other particular evidence was considered during the examination or proceeding and whether or not a claim would have been allowed over that reference or other evidence had it been considered during the examination or proceeding. Likewise, employees are cautioned against answering any inquiry concerning any entry in the patent or reexamination file, including the extent of the field of search and any entry relating thereto. The record of the file of a patent or reexamination proceeding must speak for itself.

Practitioners can be of material assistance in this regard by refraining from making improper inquiries of members of the patent examining corps. Inquiries from members of the public relating to the matters discussed above must of necessity be refused and such refusal should not be considered discourteous or an expression of opinion as to validity or patentability.

#### § 1701.01 Office personnel not to testify

[Reprint: 37 CFR 15a.1  
37 CFR 15a.2  
37 CFR 15a.3  
37 CFR 15a.4  
37 CFR 15a.5  
37 CFR 15a.6  
37 CFR 15a.7]

It is the policy of the Patent and Trademark Office that its employees, including patent examiners, will not appear as witnesses or give testimony in legal proceedings, except under the conditions specified in 37 CFR Part 15a. Any employee who testifies contrary to this policy will be *dismissed or removed*. The reasons for this policy are set out in 37 CFR 15a.3.

Whenever an employee of the Patent and Trademark Office, including a patent examiner, is asked to testify or receives a subpoena, the employee shall immediately notify the Office of the Solicitor. Inquiries requesting testimony shall be also referred immediately to the Office of the Solicitor.

Patent examiners and other Patent and Trademark Office employees performing or assisting in the performance of quasi-judicial functions, are forbidden to testify as experts or to express opinions as to the validity of any patent.

Any individual desiring the testimony of an employee of the Patent and Trademark Office, including the testimony of a patent examiner or other quasi-judicial employee, must comply with the provisions of 37 CFR Part 15a.

A request for testimony of an employee of the Patent and Trademark Office should be made to the Office of the Solicitor at least *ten working days* prior to the date of the expected testimony.

If an employee is authorized to testify, the employee will be limited to testifying about facts within the employee's personal knowledge. Employees are prohibited from giving expert or opinion testimony. *Fischer & Porter Co. v. Corning Glass Works*, 61 F.R.D. 321, 181 USPQ 329 (E.D. Pa. 1974). Likewise, employees are prohibited from answering hypothetical or speculative questions. *In re Mayewsky*, 162 USPQ 86, 89 (E.D. Va. 1969) (deposition of an examiner must be restricted to relevant matters of fact and must avoid any hypothetical or speculative questions or conclusions based thereon); *Shaffer Tool Works v. Joy Mfg. Co.*, 167 USPQ 170 (S.D. Tex. 1970) (deposition of examiner should be limited to matters of fact and must not go into hypothetical or speculative areas or the bases, reasons, mental processes, analyses, or conclusions of the examiner in acting upon a patent application). Employees will not be permitted to give testimony with respect to subject matter which is privileged. Several court decisions limit testimony with respect to quasi-judicial functions performed by employees. Those decisions include *United States v. Morgan*, 313 U.S. 409, 422 (1941) (improper to inquire into mental processes of quasi-judicial officer or to examine the manner and extent to which the officer considered an administrative record); *Western Electric Co. v. Piezo Technology, Inc. v.*



*Quigg*, 860 F.2d 428, 8 USPQ 2d 1853 (Fed. Cir. 1988) (patent examiner may not be compelled to answer questions which probe the examiner's technical knowledge of the subject matter of a patent); *McCulloch Gas Processing Co. v. Department of Energy*, 650 F.2d 1216, 1229 (Temp. Emer. Ct. App. 1981) (discovery of degree of expertise of individuals performing governmental functions not permitted); *In re Nilssen*, 851 F.2d 1401, 7 USPQ 2d 1500 (Fed. Cir. 1988) (technical or scientific qualifications of examiners-in-chief are not legally relevant in appeal under 35 U.S.C. § 134 since board members need not be skilled in the art to render obviousness decision); *Lange v. Commissioner*, 352 F. Supp. 166, 176 USPQ 162 (D.D.C. 1972) (technical qualifications of examiners-in-chief not relevant in § 145 action).

In view of the discussion above, if an employee is authorized to testify in connection with the employee's involvement or assistance in a quasi-judicial proceeding which took place before the Patent and Trademark Office, the employee will not be permitted to give testimony in response to questions which seek:

- (1) Information about that employee's:
    - (A) Background.
    - (B) Expertise.
    - (C) Qualifications to examine or otherwise consider a particular patent or trademark application.
    - (D) Usual practice or whether the employee followed a procedure set out in any Office manual of practice (including the MPEP or TMEP) in a particular case.
    - (E) Consultation with another Office employee.
    - (F) Understanding of:
      - (i) A patented invention, an invention sought to be patented, or patent application, patent, reexamination or interference file.
      - (ii) Prior art.
      - (iii) Registered subject matter, subject matter sought to be registered, or a trademark application, registration, opposition, cancellation, interference or concurrent use file.
      - (iv) Any Office manual of practice.
      - (v) Office regulations.
      - (vi) Patent, trademark, or other law.
      - (vii) The responsibilities of another Office employee.
    - (G) reliance on particular facts or arguments.
  - (2) To inquire into the manner in and extent to which the employee considered or studied material in performing a quasi-judicial function.
  - (3) To inquire into the bases, reasons, mental processes, analyses, or conclusions of that Office employee in performing the quasi-judicial function.
- Any request for testimony addressed or delivered to the Office of the Solicitor shall comply with 37 CFR 15a.4(c). All requests must be in writing. The need for a subpoena may be obviated where the request complies with 37 CFR 15a.4(c) if the party requesting the testimony further meets the following conditions:

- (1) The party requesting the testimony identifies the civil action or other legal proceeding for which the testimony is being taken. The identification shall include:
  - (a) the style of the case,
  - (b) the civil action number,
  - (c) the district in which the civil action is pending,
  - (d) the judge assigned to the case, and
  - (e) the name, address, and telephone number of counsel for all parties in the civil action.
- (2) The party agrees not to ask questions seeking information which is precluded by 37 CFR 15a.6(b).
- (3) The party shall comply with applicable provisions of the Federal Rules of Civil Procedure, including Rule 30, and give ten working days notice to the Office of the Solicitor prior to the date a deposition is desired. Fifteen working days notice is required for any deposition which is desired to be taken between Nov. 15 and Jan. 15.
- (4) The party agrees to notice the deposition at a place convenient to the Patent and Trademark Office. The Conference Room in the Office of the Solicitor is deemed to be a

place convenient to the Office.

(5) The party agrees to supply a copy of the transcript of the deposition to the Patent and Trademark Office for its records.

Absent a written agreement meeting the conditions specified in paragraphs (1) through (5), a party must comply with the precise terms of 37 CFR 15a.4(c) and the Patent and Trademark Office will not permit a deposition without issuance of a subpoena.

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#### Revisions to §§ 1801 and 1801.01 of TMEP

##### § 1801 Office personnel not to express opinion on validity of registered trademark

A certificate of registration of a trademark on the Principal Register is prima facie evidence of the validity of the registration. 15 U.S.C. § 1057(b). Public policy demands that every employee of the Patent and Trademark Office refuse to express to any person any opinion as to the validity of any registered trademark, except to the extent necessary to carry out *inter partes* proceedings at the Trademark Trial and Appeal Board in cancellation and similar proceedings authorized by law.

The question of validity of a registered trademark is otherwise exclusively a matter to be determined by a court. Members of the trademark examining operation are cautioned to be especially wary of any inquiry from any person outside the Patent and Trademark Office, including an employee of another Government agency, the answer to which might indicate that a particular registration should not have been published or issued.

Employees of the Patent and Trademark Office, particularly trademark examining attorneys who examined an application should not discuss or answer inquiries from any person outside the Patent and Trademark Office as to whether or not a certain registration or other particular evidence was considered during the examination of the application or whether a trademark would have been published or registered if the registration or other evidence had been considered during the examination. Likewise, employees are cautioned against answering any inquiry concerning any entry in the trademark registration file, including the extent of the field of search and any entry relating thereto. The record of the file of a trademark registration or *inter partes* proceedings before the Trademark Trial and Appeal Board must speak for itself.

Practitioners can be of material assistance in this regard by refraining from making improper inquiries of members of the trademark examining operation. Inquiries from members of the public relating to the matters discussed above must of necessity be refused and such refusal should not be considered discourteous or an expression of opinion as to validity of any registration.

##### § 1801.01 Office personnel not to testify

[Reprint: 37 CFR 15a.1]

- 37 CFR 15a.2
- 37 CFR 15a.3
- 37 CFR 15a.4
- 37 CFR 15a.5
- 37 CFR 15a.6
- 37 CFR 15a.7]

It is the policy of the Patent and Trademark Office that its employees, including trademark examining attorneys, will not appear as witnesses or give testimony in legal proceedings, except under the conditions specified in 37 CFR Part 15a. Any employee who testifies contrary to this policy will be *dismissed* or *removed*. The reasons for this policy are set out in 37 CFR 15a.3.

Whenever an employee of the Patent and Trademark Office, including a trademark examining attorney, is asked to testify or receives a subpoena, the employee shall immediately notify the Office of the Solicitor. Inquiries requesting testimony shall be also referred immediately to the Office of the Solicitor.

Trademark examining attorneys and other Patent and Trademark Office employees performing or assisting in the performance of quasi-judicial functions, are forbidden to testify as

experts or to express opinions as to the validity of any registration.

Any individual desiring the testimony of an employee of the Patent and Trademark Office, including the testimony of a trademark examining attorney or other quasi-judicial employee, must comply with the provisions of 37 CFR Part 15a.

A request for testimony of an employee of the Patent and Trademark Office should be made to the Office of the Solicitor at least ten working days prior to the date of the expected testimony.

If an employee is authorized to testify, the employee will be limited to testifying about facts within the employee's personal knowledge. Employees are prohibited from giving expert or opinion testimony. *Fischer & Porter Co. v. Corning Glass Works*, 61 F.R.D. 321, 181 USPQ 329 (E.D. Pa. 1974). Likewise, employees are prohibited from answering hypothetical or speculative questions. *In re Mayewsky*, 162 USPQ 86, 89 (E.D. Va. 1969) (deposition of an examiner must be restricted to relevant matters of fact and must avoid any hypothetical or speculative questions or conclusions based thereon); *Shaffer Tool Works v. Joy Mfg. Co.*, 167 USPQ 170 (S.D. Tex. 1970) (deposition of examiner should be limited to matters of fact and must not go into hypothetical or speculative areas or the bases, reasons, mental processes, analyses, or conclusions of the examiner in acting upon an application). Employees will not be permitted to give testimony with respect to subject matter which is privileged. Several court decisions limit testimony with respect to quasi-judicial functions performed by employees. Those decisions include *United States v. Morgan*, 313 U.S. 409, 422 (1941) (improper to inquire into mental processes of quasi-judicial officer or to examine the manner and extent to which the officer considered an administrative record); *Western Electric Co. v. Piezo Technology, Inc. v. Quigg*, 860 F.2d 428, 8 USPQ 2d 1583 (Fed. Cir. 1988) (patent examiner may not be compelled to answer questions which probe the examiner's technical knowledge of the subject matter of a patent); *McCulloch Gas Processing Co. v. Department of Energy*, 650 F.2d 1216, 1229 (Temp. Emer. Ct. App. 1981) (discovery of degree of expertise of individuals performing governmental functions not permitted); *In re Nilssen*, 851 F.2d 1401, 7 USPQ 2d 1500 (Fed. Cir. 1988) (technical or scientific qualifications of examiners-in-chief are not legally relevant in appeal under 35 U.S.C. § 134 since board members need not be skilled in the art to render obviousness decision); *Lancev.-Commissioner*, 352 F. Supp. 166, 176 USPQ 162 (D.D.C. 1972) (technical qualifications of examiners-in-chief not relevant in Sec. 145 action).

In view of the discussion above, if an employee is authorized to testify in connection with the employee's involvement or assistance in a quasi-judicial proceeding which took place before the Patent and Trademark Office, the employee will not be permitted to give testimony in response to questions which seek:

- (1) Information about that employee's:
  - (A) Background.
  - (B) Expertise.
  - (C) Qualifications to examine or otherwise consider a particular patent or trademark application.
  - (D) Usual practice or whether the employee followed a procedure set out in any Office manual of practice (including the MPEP or TMEP) in a particular case.
  - (E) Consultation with another Office employee.
  - (F) Understanding of:
    - (i) A patented invention, an invention sought to be patented, or patent application, patent, reexamination or interference file.
    - (ii) Prior art.
    - (iii) Registered subject matter, subject matter sought to be registered, or a trademark application, registration, opposition, cancellation, interference or concurrent use file.
    - (iv) Any Office manual of practice.
    - (v) Office regulations.
    - (vi) Patent, trademark, or other law.
    - (vii) The responsibilities of another Office employee.
  - (G) Reliance on particular facts or arguments.

(2) To inquire into the manner in and extent to which the employee considered or studied material in performing a quasi-judicial function.

(3) To inquire into the bases, reasons, mental processes, analyses, or conclusions of that Office employee in performing the quasi-judicial function.

Any request for testimony addressed or delivered to the Office of the Solicitor shall comply with 37 CFR 15a.4(c). All requests must be in writing. The need for a subpoena may be obviated where the request complies with 37 CFR 15a.4(c) only if the party requesting the testimony further meets the following conditions:

- (1) The party requesting the testimony identifies the civil action or other legal proceeding for which the testimony is being taken. The identification shall include:
  - (a) the style of the case,
  - (b) the civil action number,
  - (c) the district in which the civil action is pending,
  - (d) the judge assigned to the case, and
  - (e) the name, address, and telephone number of counsel for all parties in the civil action.

(2) The party agrees not to ask questions seeking information which is precluded by 37 CFR 15a.6(b).

(3) The party shall comply with applicable provisions of the Federal Rules of Civil Procedure, including Rule 30, and give ten working days notice to the Office of the Solicitor prior to the date a deposition is desired.

Fifteen working days notice is required for any deposition which is desired to be taken between Nov. 15 and Jan. 15.

(4) The party agrees to notice the deposition at a place convenient to the Patent and Trademark Office. The Conference Room in the Office of the Solicitor is deemed to be a place convenient to the Office.

(5) The party agrees to supply a copy of the transcript of the deposition to the Patent and Trademark Office for its records.

Absent a written agreement meeting the conditions specified in paragraphs (1) through (5), a party must comply with the precise terms of 37 CFR 15a.4(c) and the Patent and Trademark Office will not permit a deposition without issuance of a subpoena.

Feb. 7, 1989

FRED E. McKELVEY  
Solicitor

[1099 OG 36]

(106)

#### Department of Commerce Patent and Trademark Office

#### United States Adherence to the International Union for the Protection of New Varieties of Plants (UPOV)

On Nov. 12, 1980, the United States deposited its instrument of acceptance of the 1978 text of the UPOV Convention. The United States was the second State to adhere to this text, New Zealand having earlier done so.

The UPOV Convention will take effect with respect to the United States and the other adherents to the 1978 text upon a total of five adherences, three of which must be by present member States (States adhering to the text of the Convention). We expect at least three present member States to adhere shortly and the 1978 text to take effect, therefore, during 1981.

The United States deposited its instrument of acceptance on the basis of the legal protection offered for asexually reproduced plants under the plant patent law (35 U.S.C. 161-164). Accordingly, the Convention will apply only to asexually reproduced plants protected under this law. Steps are now being taken, however, by the Plant Variety Protection Office of the Department of Agriculture to conform the implementation of the Plant Variety Protection Act (7 U.S.C. 2321 et seq.) to the Conven-



tion's requirements. When this is done, the United States will notify the UPOV Secretariat that the Convention is also applicable in the United States to sexually reproduced plants protected under that Act.

Questions concerning the UPOV Convention may be directed to the Office of Legislation and International Affairs of the Patent and Trademark Office. This Office may be addressed as follows: Box 4, Commissioner of Patents and Trademarks, Washington, D.C. 20231. The Office's telephone number is (703) 557-3065.

Dec. 16, 1980

SIDNEY A. DIAMOND  
Commissioner of Patents  
and Trademarks

[1002 O.G. 102]

(107) **Taking Effect in the United States  
of the International Convention for  
the Protection of New Varieties of Plants**

The International Convention for the Protection of New Varieties of Plants (the UPOV Convention) will take effect in the United States on Nov. 8, 1981. It will apply to all applications for the patenting of plants under the provisions of Title 35, United States Code, which are filed on or after Nov. 8, 1981. The actual filing date will govern in determining whether the Convention will apply to an application, even though the application may be entitled to an earlier effective date under section 119 or 120 of Title 35, United States Code.

In addition to the United States, the UPOV Convention will be in effect as of Nov. 8, 1981, in the following fourteen States: Belgium, Denmark, Federal Republic of Germany, France, Ireland, Israel, Italy, Netherlands, New Zealand, Republic of South Africa, Spain, Sweden, Switzerland, and the United Kingdom.

No changes in the patent law are needed to implement the UPOV Convention in the United States. An applicant for a plant patent will be required, however, to submit for registration a variety name for the plant to be patented. Registration is required by Article 13 of the UPOV Convention.

Registrability shall be determined in accordance with the International Code of Nomenclature for Cultivated Plants (1980). As an interim procedure pending the promulgation of an appropriate rule, inclusion of the variety name in the application will be accepted as a submission of the name for registration. No plant patent as a result of an application filed on or after Nov. 8, 1981, shall be issued without the registration of a variety name. Questions concerning this variety naming requirement or the UPOV Convention may be addressed to:

Mr. Michael K. Kirk, Director  
Office of Legislation and  
International Affairs Box 4  
U.S. Patent and Trademark Office Washington, D.C. 20231

Mr. Kirk's telephone number is (703) 557-3065.

Oct. 15, 1981

GERALD J. MOSSINGHOFF  
Commissioner of Patents  
and Trademarks

[1011 O.G. 27]

(108) **Patent and Trademark Office  
37 CFR Part 10  
Cross Appeals in Patent and Trademark  
Office Disciplinary Proceedings**

Agency: Patent and Trademark Office, Commerce.  
Action: Notice of proposed rulemaking.

Summary: The Patent and Trademark Office (PTO) proposes to amend its rules of practice in practitioner disciplinary proceedings. The proposed rule change provides for a time period for a party to a disciplinary proceeding to file a cross-appeal, after the other party (the respondent or the Director of the

Office of Enrollment and Discipline) to the proceeding has appealed from an initial decision of the administrative law judge to the Commissioner. Currently, PTO rules do not provide for a time period for filing a cross-appeal in a disciplinary case. A party in a disciplinary case may be interested in appealing only if the other party has appealed. Allowing a time period for filing a cross-appeal will give parties to disciplinary cases more flexibility after an initial decision by the administrative law judge. A party need not file a contingent appeal simply to preserve rights in the event the other party files an appeal. Dates: Written comments must be received on or before Aug. 20, 1993 to ensure consideration. An oral hearing will not be conducted.

Addresses: Address written comments to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231, marked to the attention of Fred E. McKelvey, Solicitor. Written comments will be available for public inspection in suite 918, on the 9th floor of Crystal Park II, located at 2121 Crystal Drive, Arlington, Va.

For Further Information Contact: Fred E. McKelvey by telephone at (703) 305-9035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information: Pursuant to 37 CFR § 10.132 *et seq.*, the Director of the Office of Enrollment and Discipline within the PTO may initiate a disciplinary proceeding against a practitioner. If the proceeding is contested by the practitioner and the Director continues to prosecute, an administrative law judge for the Department of Commerce enters an initial decision which includes findings of fact, conclusions of law and an order. 37 CFR § 10.154.

Either party to the proceeding may appeal from the initial decision of the administrative law judge to the Commissioner within thirty (30) days of the date of the decision. 37 CFR § 10.155(a). However, § 10.155(a) does not currently address the filing of a cross-appeal. That is, no period of time is specified for the non-appealing party to file a cross-appeal.

With regard to interference proceedings, 37 CFR § 1.304(a) addresses the filing of cross-appeals by stating in pertinent part that:

the time for filing a cross-appeal [to the Court of Appeals for the Federal Circuit] or cross-action [in a district court] expires (1) 14 days after service of the notice of appeal or the summons and complaint or (2) two months after the date of decision of the Board of Patent Appeals and Interferences, whichever is later.

The proposed rule change is similar to the cross-appeal authorized in interference proceedings.

**OTHER CONSIDERATIONS**

The proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the proposed rule change will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principle impact of the proposed change is to provide a time period to file a cross-appeal in a PTO disciplinary proceeding.

The PTO has determined that the proposed rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers; individuals; industries; Federal, state or local government agencies; or geographic regions. There will be no significant effects on competition, employment, investment, productivity, innovation, or on the ability of the United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The PTO has also determined that this notice has no federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The proposed rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*,

since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

**List of Subjects in 35 CFR Part 10**

Administrative practice and procedure, Inventions and patents, Lawyers, Reporting and record keeping requirements.

For the reasons set out in the preamble, and pursuant to the authority contained in 35 U.S.C. 6, the PTO proposes to amend 37 CFR part 10 as follows, wherein deletions are indicated by brackets ([]) and additions by arrows (cb):

**PART 10-REPRESENTATION OF OTHERS BEFORE THE  
PATENT AND TRADEMARK OFFICE**

1. The authority citation for 37 CFR part 10 would continue to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

2. Section 10.155 is proposed to be amended by revising paragraph (a) to read as follows:

**§ 10.155 Appeal to the Commissioner**

(a) Within thirty (30) days from the date of the initial decision of the administrative law judge under § 10.154, either party may appeal to the Commissioner. If an appeal is taken, the time for filing a cross-appeal expires (1) 14 days after service of the appeal or (2) 30 days after the date of the initial decision of the administrative law judge, whichever is later. b An appeal or cross-appeal by the respondent will be filed with the Director in duplicate and will include exceptions to the decisions of the administrative law judge and supporting reasons for those exceptions. If the Director files the appeal or cross-appeal, the director shall serve a copy of the appeal or cross-appeal, within thirty (30) days after receipt of an appeal c, cross-appeal or copy thereof, the other party may file a reply brief, in duplicate with the Director. If the Director files the reply brief, the Director shall serve a copy of the reply brief. Upon the filing of an appeal c, cross-appeal or copy thereof, the other party may file a reply brief, in duplicate with the Director. If the Director files the reply brief, the Director shall serve a copy of the reply brief. Upon the filing of an appeal c, cross-appeal, if any, b and [a] reply brief csb, if any, the Director shall transmit the entire record to the Commissioner.

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July 15, 1993

MICHAEL K. KIRK  
Acting Assistant Secretary  
and Acting Commissioner of  
Patents and Trademarks

[1153 OG 32]

(109) **Department of Commerce  
Patent and Trademark Office**

37 CFR Part 10  
[Docket No. 930366-4319]  
RIN 0651-AA65

**Cross-Appeals in Patent and Trademark  
Office Disciplinary Proceedings**

Agency: Patent and Trademark Office, Commerce.

Action: Proposed Rulemaking.

Summary: On July 21, 1993, the Patent and Trademark Office (PTO) proposed amending a rule of practice in practitioner disciplinary proceedings. 58 FR 38994. The proposed rule change provides for a time period for a party to a disciplinary proceeding to file a cross-appeal, after the other party (the

respondent or the Director of the Office of Enrollment and Discipline) to the proceeding has appealed from the initial decision of the administrative law judge (ALJ) to the Commissioner. Currently, PTO rules do not provide for such a time period. A party in a disciplinary proceeding may be interested in appealing only if the other party has appealed. Allowing a time period for filing a cross-appeal will give parties to disciplinary cases more flexibility after an initial decision by the administrative law judge and will avoid the necessity of filing a contingent appeal simply to preserve rights in the event the other party files an appeal.

One comment to the rule change proposed on July 21, 1993, was received suggesting substantive changes. This second notice adopts that suggested change.

Dates: Written comments must be received on or before [March 16, 1995] to ensure consideration. An oral hearing will not be conducted.

Addresses: Address written comments to Commissioner of Patents and Trademarks, Box OED, Washington, D.C. 20231, marked to the attention of Harry I. Moatz. Written comments will be available for public inspection in Suite 518, on the 5th floor of Crystal Park I, located at 2011 Crystal Drive, Arlington, Virginia.

For Further Information Contact: Harry I. Moatz by telephone at (703) 308-5273 or by mail marked to his attention and addressed to Commissioner of Patents and Trademarks, Box OED, Washington, D.C. 20231.

Supplementary Information: A Notice of Proposed Rulemaking was published in the Federal Register (58 FR 38994) on July 21, 1993, and in the Official Gazette of the PTO (1153 Off. Gaz. 32) on August 10, 1993. Comments were due August 20, 1993. One comment was received. The comment suggested a substantive change to the original proposed rulemaking. The PTO has adopted the change and is now publishing a second notice requesting comments on the amended notice.

Pursuant to 37 CFR § 10.132 *et seq.*, the Director of the Office of Enrollment and Discipline within the PTO may initiate a disciplinary proceeding against a practitioner. If the proceeding is contested by the practitioner and the Director continues to prosecute, an ALJ for the Department of Commerce enters an initial decision which includes findings of fact, conclusions of law and an order. 37 CFR § 10.154.

Either party to the proceeding may appeal from the initial decision of the ALJ to the Commissioner within thirty (30) days of the date of the decision. 37 CFR § 10.155(a). However, prior to this proposed rule change, § 10.155(a) did not provide for the filing of a cross-appeal.

With regard to interference proceedings, 37 CFR § 1.304(a) addresses the filing of cross-appeals by stating in pertinent part that:

the time for filing a cross-appeal [to the Court of Appeals for the Federal Circuit] or cross-action [in a district court] expires (1) 14 days after service of the notice of appeal or the summons and complaint or (2) two months after the date of decision of the Board of Patent Appeals and Interferences, whichever is later.

The proposed rule change is similar to the cross-appeal authorized in interference proceedings.

Response to and Analysis of Comment: The single comment suggested that the second sentence of the proposed § 10.155(a) be modified by adding "pursuant to § 10.142" after "(1) 14 days after service of the appeal" to make clear that the period for filing a cross-appeal or reply brief runs from service pursuant to § 10.142. The suggestion is being adopted. The comment further suggested that the fifth sentence in the rule proposed on July 21, 1993, be separated into three new sentences. The first and second new sentences make clear that "the other party to an appeal or cross-appeal may file a reply brief," and that a "reply brief by the respondent" is to be "served in duplicate with the Director." The third new sentence provides a date certain for filing any reply brief by avoiding uncertainty as to when "receipt" of an appeal, cross-appeal or copy thereof



occurs, and by relying on the date of "service pursuant to § 10.142" of an appeal, cross-appeal, or a copy thereof. The suggestions have been adopted in the proposed rules.

**Other Considerations:** This rule change conforms with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Orders 12612 and 12866, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule change will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of the rule change is to provide a time period to file a cross-appeal in a PTO disciplinary proceeding. See the original notice of proposed rulemaking published in the *Federal Register*, 58 FR at 38996.

The PTO has determined that the rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612. The Office of Management and Budget has determined that the rule change is not significant for the purposes of Executive Order 12866.

The rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

#### List of Subjects in 37 CFR Part 10

Administrative practice and procedure, Inventions and patents, Lawyers, Reporting and recordkeeping requirements.

For the reasons set out in the preamble, and pursuant to the authority contained in 35 U.S.C. 6, the PTO proposes to amend 37 CFR part 10 as follows, wherein deletions are indicated by brackets (I) and additions by arrows (cb):

#### Part 10-Representation of Others Before The Patent and Trademark Office

1. The authority citation for 37 CFR part 10 would continue to read as follows:

**Authority:** 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

2. Section 10.155 is amended by revising paragraph (a) to read as follows:

#### § 10.155 Appeal to the Commissioner.

(a) Within thirty (30) days from the date of the initial decision of the administrative law judge under § 10.154, either party may appeal to the Commissioner. If an appeal is taken, the time for filing a cross-appeal expires (1) 14 days after the date of service of the appeal pursuant to § 10.142 or (2) 30 days after the date of the initial decision of the administrative law judge, whichever is later. b An appeal or cross appeal by the respondent will be filed and served with the Director in duplicate and will include exceptions to the decisions of the administrative law judge and supporting reasons for those exceptions. If the Director files the appeal or cross-appeal, the Director shall serve on the other party a copy of the appeal or cross-appeal. c The other party to an appeal or cross-appeal may file a reply brief. A respondent's reply brief shall be filed and served in duplicate with the Director. The time for filing any reply brief expires [Within] thirty (30) days after the date of [receipt] service pursuant to § 10.142b of an appeal or cross-appeal or copy thereof, the other party may file a reply brief, in duplicate with the Director. If the Director files [the] reply brief, the Director shall serve on the other party a copy of the reply brief. Upon

the filing of an appeal or cross appeal, if any, b and [a] reply briefs, if any, the Director shall transmit the entire record to the Commissioner.

January 13, 1995

MICHAEL K. KIRK  
Deputy Assistant Secretary  
of Commerce and Deputy  
Commissioner of Patents  
and Trademarks

[1171 OG 33]

(110) Department of Commerce  
Patent and Trademark Office  
37 CFR Part 501

[Docket No. 80627-8127]

#### Uniform Patent Policy for Domestic Rights in Inventions Made by Government Employees

**Agency:** Under Secretary for Economic Affairs, Department of Commerce.

**Action:** Final rule.

**Summary:** Executive Order 10096, as amended by Executive Order 10930, sets forth the policies and procedures for determining the rights in Federal employee inventions with respect to the Federal employee and the Government employer. The Delegation of Authority from the Secretary of Commerce dated Sept. 15, 1988 and effective Nov. 1, 1988, transferred administration of the provisions of Executive Order 10096 as amended by Executive Order 10930 from the Commission of Patents and Trademarks to the Under Secretary for Economic Affairs in the Department of Commerce. This final rule establishes 37 CFR Part 501 which sets forth this delegation of authority to the Under Secretary. In addition, each Government agency is authorized to determine whether the results of research, development or other activity constitute an invention with the purview of Executive Order 10096, as amended by Executive Order 10930 and to determine initially the rights therein in accordance with the provisions of section 501.6 and 501.7 herein. By separate notice in today's *Federal Register* the Patent and Trademark Office is deleting 37 CFR Part 100.

**Effective Date:** Nov. 1, 1988.

However, all rights, determinations, and appeals submitted to the Commissioner prior to the effective date, will be reviewed by the Commissioner under the procedures of 37 CFR Part 100.

**Address:** Comments may be sent to Mr. Joseph P. Allen, Acting Director, Federal Technology Management Division, Office of the Under Secretary for Economic Affairs, United States Department of Commerce, Room 4839, Herbert C. Hoover Bldg., Washington, D.C. 20230.

**For Further Information Contact:** Mr. Joseph P. Allen, by telephone at (202) 377-8100 or Robert B. Ellert by telephone at (202) 377-5394.

**Supplementary Information:** Executive Order 10096, as amended by Executive Order 10930, sets forth the policies and procedures for determining the rights in Federal Employee inventions with respect to the Federal employer and the Government employer. The Under Secretary for Economic Affairs of the Department of Commerce was delegated responsibility for oversight of the Executive Order on Sept. 15, 1988. Functions required by the Executive Order were previously performed by the Commissioner of Patents and Trademarks. This final rule is substantially the same as the rule set out in 37 CFR Part 100, except, the Secretary of Commerce is substituted for the Commissioner of Patents and Trademarks, and advance approval is given to agency heads to make final determinations relating to determinations of rights decisions of Government employee inventions, subject to employee appeal to the Secretary.

President Reagan in Executive Order 12591, on April 10, 1987 directed all Government agencies to facilitate the transfer of technology developed at federal laboratories to the private sector and to promote its commercialization. To accomplish the goals of E.O. 12591 it is necessary that rights to inventions

made by government employees by determined as expeditiously as possible. Accordingly, the Secretary has reviewed the existing procedures and policies under 37 CFR Part 100 and concluded that administration of the functions thereunder could be performed on a more efficient basis by confining the role of the Department of Commerce to appeals by employees from disputed agency determinations. Accordingly, under 37 CFR Part 501, each Government agency is given the authority to determine whether the results of research, development or other activities within the agency constitute an invention by an employee, and to determine initially the rights relating to ownership within the provisions of Executive Order 10096 as amended by Executive Order 10930. If no appeal is taken to the secretary by an employee under section 501.8, the initial determination of the agency will be final.

Notwithstanding the fact that this is a final rule, comments are requested.

Because this rule concerns agency management and personnel, it is not a rule or regulation within the meaning of section 1(a) of Executive Order 12291, and it is not subject to the requirements of the Order. Accordingly, no preliminary or final regulatory impact analysis has to be or will be prepared.

Because notice of proposed rulemaking and an opportunity for public comments are not required to be given for this rule by section 553 of the Administrative Procedure Act (5 U.S.C. 553), or by any other law, no regulatory flexibility analysis has to be or will be prepared for purposes of the Regulatory Act (5 U.S.C. 603(a) and 604(a)).

This final rule does not contain policies with Federalism implications sufficient to warrant preparation of a Federalism assessment under Executive Order 12612. This rule does not contain collections of information for purposes of the Paperwork Reduction Act.

The changes in the process of determining employee rights to inventions made by this rule do not have takings implications sufficient to require preparation of a Taking Implications Assessment under Executive Order 12630.

#### List of Subjects in 37 CFR Part 501

Uniform patent policy, domestic Rights in inventions, Inventions made by Government employees.

Oct. 3, 1988

ROBERT ORTNER  
Under Secretary for  
Economic Affairs

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For reasons set forth in the preamble 37 CFR is amended by adding Chapter V, consisting of Part 501, to read as follows:

#### CHAPTER V UNDER SECRETARY FOR ECONOMIC AFFAIRS, DEPARTMENT OF COMMERCE

#### PART 501 UNIFORM PATENT POLICY FOR DOMESTIC RIGHTS IN INVENTIONS MADE BY GOVERNMENT EMPLOYEES

Sec.

- 501.1 Purpose.
- 501.2 Scope.
- 501.3 Definitions.
- 501.4 Determination of Inventions and Rights therein.
- 501.5 Agency Liaison Officer.
- 501.6 Criteria for The Determination of Rights in and to Inventions.
- 501.7 Agency Determination.
- 501.8 Appeals by employees.
- 501.9 Patent protection.
- 501.10 Dissemination of this part and of implementing regulations.

Authority: Sec. 4, E.O. 10096, 3 CFR 1949-1953 Comp., p. 292, as amended by E.O. 10930, 3 CFR 1959-1963 Comp., p.

456; and Delegation of Authority by the Secretary of Commerce, Sept. 15, 1988, DOO 10-9.

#### § 501.1 Purpose

The purpose of this part is to provide for the administration of a uniform patent policy for the Government with respect to the domestic rights in inventions made by Government employees and to prescribe rules and regulations for implementing and effectuating such policy.

#### § 501.2 Scope

This part applies to any invention made by a Government employee and to any action taken with respect thereto.

#### § 501.3 Definitions

(a) The term "Secretary," as used in this part, means the Under Secretary of Commerce for Economic Affairs.

(b) The term "Government agency" as used in this part, means and Executive department or independent establishment of the Executive branch of the Government (including any independent regulatory commission or board, any corporation wholly owned by the United States, and the Smithsonian Institution), but does not include the Department of Energy for inventions made or conceived under the provisions of 42 U.S.C. 2182.

(c) The term "Government employee," as used in this part, means any officer or employee, civilian or military, of any Government agency, including any part-time consultant or part-time employee except as may otherwise be provided for by agency regulation approved by the Secretary.

(d) The term "invention," as used in this part, means any art, machine, manufacture, design or composition of matter, or any new and useful improvement thereof, or any variety of plant, which is or may be patentable under the Patent laws of the United States.

#### § 501.4 Determination of Inventions and rights therein.

Each Government agency has the approval of the Secretary to determine whether the results of research, development, or other activity in the agency constitute an invention within the purview of E.O. 10096, as amended by E.O. 19030 and to determine the rights therein in accordance with the provisions of § 501.6 and 501.7 herein.

#### § 501.5 Agency Liaison Officer

Each Government agency shall designate a liaison officer to represent the agency before the secretary. Provided, however, that the Departments of the Army, the Navy, and the Air Force may each designate a liaison officer.

#### § 501.6 Criteria for the Determination of Rights In and To Inventions.

(a) The following rules shall be applied in determining the respective rights of the Government and of the inventor in and to any invention that is subject to the provisions of this part:

- (1) The Government shall obtain, except as herein otherwise provided, the entire domestic right, title and interest in and to any invention made by any Government employee:
  - (i) During working hours, or
  - (ii) With a contribution by the Government of facilities, equipment, materials, funds or information, or of time or services or other Government employees on official duty, or
  - (iii) Which bears a direct relation to or is made in consequence of the official duties of the inventor.

Foreign patent rights are governed by the provisions of 37 CFR Part 101.

(2) In any case where the contribution of the Government, as measured by any one or more of the criteria set forth in paragraph (a)(1) of this section, to the inventor is insufficient



equitable to justify a requirement of assignment to the Government of the entire domestic right, title, and interest in and to such invention, or in any case where the Government has insufficient interest in an invention to obtain the entire domestic right, title, and interest therein (although the Government could obtain same under paragraph(a)(1) of this section), the Government agency concerned shall leave title to such invention in the employees subject however, to the reservation of the government of a non-exclusive, irrevocable, royalty-free license in the invention with power to grant licenses for all governmental purposes, such reservation, in the terms thereof, to appear, where practicable, in any patent, domestic or foreign, which may issue on such invention. Reference is made to section 15 of the Federal Technology Transfer Act of 1986 (15 U.S.C. 3710d) which requires a Government agency to allow the inventor to retain title to any covered invention where the agency does not intend to file a patent application or otherwise promote commercialization.

(3) In applying the provisions of paragraph (a)(1) and (2) of this section to the facts and circumstances relating to the making of a particular invention it shall be presumed that an invention made by an employee who is employed or assigned:

- (i) To invent or improve or perfect any art, machine, design, manufacture or composition of matter,
- (ii) To conduct or perform research, development work, or both
- (iii) To supervise, direct, coordinate, or review Government financed or conducted research, development work, or both, or
- (iv) To act in a liaison capacity among governmental or non-governmental agencies or individuals engaged in such research or development work, falls within the provisions of paragraph (a)(1) of this section, and shall be presumed that any invention made by any other employee falls within the provision of paragraph (a)(2) of this section. Either presumption may be rebutted by a showing of the facts and circumstances in the case and shall not preclude a determination that these facts and circumstances justify leaving the entire right, title, and interest in and to the invention in the Government employees, subject to the law.

(4) In any case wherein the Government neither:

- (i) Obtains the entire domestic right, title and interest in and to an invention pursuant to the provisions of paragraph (a)(1) of this section nor
- (ii) Reserves a non-exclusive, irrevocable, royalty-free license in the invention, with power to grant licenses for all governmental purposes, pursuant to the provisions of paragraph (a)(2) of this section.

The Government shall leave the entire right, title and interest in and to the invention in the government employee, subject to law.

#### § 501.7 Agency determination.

(a) If the agency determines that the Government is entitled to obtain title pursuant to § 501.6(a)(1) and the employee does not appeal, no further review is required.

(b) In the event that a Government agency determines, pursuant to paragraph (a)(2) or (a)(4) of § 501.6, that title to an invention shall be left with the employee, the agency shall notify the employee of this determination.

(c) In the case of a determination under either paragraph (a) or (b) of this section, the agency shall promptly prepare, and preserve in appropriate files, accessible to the Secretary, a written, signed, and dated statement concerning the invention including the following:

- (1) A description of the invention in sufficient detail to identify the invention and show its relationship to the employee's duties and work assignments;
- (2) The name of the employee and employee status, including a detailed statement of official duties and responsibilities at the time the invention was made, and

(3) An explanation of the agency determination and reasons therefor. The agency shall, subject to considerations of national security, or public health, safety, or welfare, submit to the Secretary, if an appeal is taken, a copy of this written statement.

#### § 501.8 Appeals by employees.

(a) Any Government employee who is aggrieved by a Government agency determination pursuant to § 501.6(a)(1) or (a)(2), may obtain a review of any agency determination by filing, within 30 days (or such longer period as the Secretary may, for good cause shown in writing, fix in any case) after receiving notice of such determination, two copies of an appeal with the Secretary. The Secretary shall then forward one copy of the appeal to the Government agency.

(b) On receipt of a copy of an appeal filed pursuant to paragraph (a) of this section, the agency official who made the agency determination being appealed shall, subject to considerations of national security or public health, safety, or welfare, promptly furnish both the Secretary and the inventor with a copy of a report containing the following information about the invention involved in the appeal:

- (1) A copy of a statement by the agency containing the information specified in § 501.7, and
- (2) A detailed statement of the points of dispute or controversy, together with copies of any statements or written arguments filed with the agency, and of any other relevant evidence that the agency considered in making its determination of Government interest. Within 25 days (or such longer period that the Secretary may, for good cause shown, fix in any case) after the transmission of a copy of the agency report of the employee, the employee may file a reply thereto with the Secretary and file one copy thereof with the appropriate agency decision maker.

(c) After the time for the inventor's reply to the Government agency's report has expired and if the inventor has so requested in his or her appeal, a date will be set for hearing of oral arguments before the Secretary, by the employee (or by an attorney whom he or she designates by written power of attorney filed before, or at the hearing) and a representative of the Government agency involved. Unless it shall be otherwise ordered before the hearing begins, oral arguments shall be limited to thirty minutes for each side. The employee need not retain an attorney or request an oral hearing to secure full consideration of the facts and his or her arguments. The employee may expedite such consideration by notifying the Secretary when he or she does not intend to file a reply to the agency report.

(d) After a hearing on the appeal, if a hearing was requested, or after expiration of the period for the inventor's reply to the agency report if no hearing is set, the Secretary shall issue a decision on the matter within 120 days, which decision shall be final after a thirty day period for requesting reconsideration expires or on the date that a decision on a petition for reconsideration is finally disposed of. Any request for reconsideration or modification of the decision must be filed within 30 days from the date of the original decision (or within such an extension thereof as may be set by the Secretary before the original period expires). The decision of the Secretary shall be made after consideration of the statements of fact in the employee's appeal, the agency's report, and the employee's reply, but the Secretary at his or her discretion and with due respect to the rights and convenience of the inventor and the Government agency, may call for further statements on specific questions of fact or may request additional evidence in the form of affidavits or depositions on specific facts in dispute.

#### § 501.9 Patent protection.

(a) A Government agency, upon determination that an invention coming within the scope of § 501.6(a)(1) or (a)(2) has been made, shall thereupon determine whether patent protection will be sought in the United States by the Agency for such invention. A controversy over the respective rights of the Government and the employee in any case shall not delay the taking of the actions provided for in this section. In cases coming within the scope of § 501.6(a)(2), agency action looking toward

such patent protection shall be contingent upon the consent of the employee.

(b) Where there is an appealed dispute as to whether § 501.6(a)(1) or (a)(2) applies in determining the respective rights of the Government and of an employee in and to any invention, the agency will determine whether patent protection will be sought in the United States pending the Secretary's decision on the dispute and, if it decides that an application for patent should be filed, will take such rights as are specified in § 501.6(a)(2), but this shall be without prejudice to acquiring the rights specified in paragraph (a)(1) of that section should the Secretary so decide.

(c) Where an agency has determined to leave title to an invention with an employee under § 501.6(a)(2), the agency will, upon the filing of an application for patent take the rights specified in that paragraph without prejudice to the subsequent acquisition by the Government of the rights specified in paragraph (a)(1) of that section should the Secretary so decide.

#### § 501.10 Dissemination of this part and of implementing regulations.

Each Government agency shall disseminate to its employees the provisions of this part, and any appropriate implementing agency regulations and decisions. Copies of any such regulations shall be sent to the Secretary. If the Secretary identifies an inconsistency between this part and the agency regulations or delegation, the agency, upon being informed by the Secretary of the inconsistency, shall take prompt action to correct it.

[F.R. Doc. 88-23239 Filed 10-7-88; 8:45 am]  
Billing Code 3510-EA-M

#### (111) Practitioner's Responsibility to Avoid Prejudice to the Rights of a Client/Patent Applicant

Under 37 CFR Part 10, a practitioner is responsible for taking reasonable steps to avoid foreseeable prejudice to the rights of a client/patent applicant. This responsibility exists in all circumstances including those where the practitioner is operating through a corporate liaison or foreign agent and has no direct contact with the client/patent applicant, who in most cases is the one being represented.

This notice is intended to clarify the appropriate course of action for a practitioner to follow when the practitioner is operating through such a corporate liaison or foreign agent. In such arrangements, the registered practitioner may rely upon the advice of the corporate liaison or the client/patent applicant's foreign agent as to the action to be taken so long as the practitioner is aware that the client/patent applicant has consented after full disclosure to be represented by the liaison or agent. It will be assumed by the Patent and Trademark Office that the client/patent applicant has an agreement with the liaison or agent, arrived at after full disclosure, to be represented by the liaison or agent. Registered practitioners, if they wish, however, may maintain a copy of the agreement in this regard between the client/patent applicant and the liaison or agent in practitioner's file of the application or other proceeding before the Office. If there is, in fact, no such agreement between the client/patent applicant and the liaison or agent, the registered practitioner must communicate to the client/patent applicant.

In circumstances where the practitioner is aware that there is an agreement between the client/patent applicant and the liaison or agent, the practitioner may fully rely upon the advice of the liaison or agent as to the wishes of the client/patent applicant. For example, if the registered practitioner is instructed by the client/patent applicant's liaison or agent to allow an application to go abandoned rather than to respond to an Office action within a set period for response, the practitioner may properly do so without any further notice to the client/patent applicant.

It is assumed that withdrawal from employment by a practitioner will remain a relatively rare occurrence, particularly in view of this clarification. This notice should not be taken to require or encourage withdrawal. If a practitioner should decide to withdraw, however, the practitioner must take reasonable steps to avoid foreseeable prejudice to the rights of the client/

patent applicant including allowing time for employment of another practitioner (37 CFR 10.40). Therefore, at least thirty days would be required between the date of approval by the Office of the withdrawal and the later of the expiration date of the response period or the expiration date of the period which can be obtained by a petition for extension of time and fee under 37 CFR 1.136(a). This is necessary so that the client/patent applicant would have sufficient time to obtain other representation or to take other action. If a period has been set for response and the period may be extended without a showing of cause pursuant to 37 CFR 1.136(a) by filing a petition for extension of time and fee, the practitioner will not be required to seek such extension of time for withdrawal to be approved. In such a situation, however, withdrawal will not be approved unless at least thirty days would remain between the date of approval and the last date on which such a petition for extension of time and fee could properly be filed.

Dec. 10, 1987

DONALD J. QUIGG  
Assistant Secretary and  
Commissioner of Patents  
and Trademarks

[1086 OG 457]

#### (112) Responsibilities of Practitioners Representing Clients in Proceedings Before The Patent and Trademark Office

This notice is intended to remind practitioners of certain aspects of their responsibilities in representing clients in proceedings before the Office. The Notice is also intended to supplement the discussion set forth in the *Official Gazette* Notice published at 1086 *Official Gazette* 457 (Jan. 12, 1988) entitled "Practitioner's Responsibility to Avoid Prejudice to the Rights of a Client/Patent Applicant" and to amplify and supersede the Helpful Hint published at 1084 *Official Gazette* 34 (Nov. 24, 1987) titled "Correspondence Address and/or Fee Address of Maintenance Fees."

Part 10 of title 37, Code of Federal Regulations, sets forth the Patent and Trademark Office (PTO) Code of Professional Responsibility. Each attorney or agent who practices before the PTO is subject to the rules set forth in Part 10 and should carefully study the rules promulgation originally published at 50 *Federal Register* 5158 (Feb. 6, 1985) and at 1052 *Official Gazette* 4 (Mar. 5, 1985) and reproduced as item number 172 in the Consolidated Listing of *Official Gazette* Notices, published at 1086 *Trademark Official Gazette* 3 (Jan. 5, 1988).

#### Practitioner's Client

During the promulgation of Part 10, 37 CFR, several individuals suggested that "it may be difficult to determine the identity of the 'client' . . . particularly in corporate patent departments." The response to that suggestion was that "[t]he PTO will presume that practitioners know the identities of their clients . . ." 50 *Federal Register* 5163 (Feb. 6, 1985); 1086 *Trademark Official Gazette* 356 (Jan. 5, 1988). For example, in a patent application, practitioner's client is ordinarily the inventor who gives practitioner a power of attorney to prosecute the application (37 CFR 1.31). A practitioner may represent only the assignee of the entire interest in a patent application if the assignee has filed a power of attorney and the assignee is conducting the prosecution of the application to the exclusion of the inventor. (37 CFR 1.32).

In the promulgation of Part 10, 37 CFR, a commenter raised a question of who is the client when an application is filed on behalf of an individual, but the individual's assignee pays practitioner's bill. The question was answered in the following manner:

"Practitioners are expected to know the identities of their clients. If a practitioner is hired by a corporation and wishes to make that fact plain on the record of a patent application, the practitioner may file an assignment and a power of attorney signed by the assignee. If a dispute should then occur between the individual and the assignee, the record would be clear that the assignee is the client." 50 *Federal*



Register 5164 (Feb. 6, 1985); 1086 *Trademark Official Gazette* 357 (Jan. 5, 1988).

In some instances, practitioners deal with a corporate liaison or foreign agent. Such arrangements do not automatically change the person whom practitioner represents, e.g., the inventor or trademark owner. The fact that a U.S. practitioner receives instructions from the inventor or trademark owner through a foreign attorney or agent does not change the fact that the client is still the inventor or trademark owner rather than the foreign attorney or agent. See *Strojenski v. Toyoda*, 2 USPQ 2d 1222 (Comm'r Pat. 1986), which at 1223 cited *Yetter Manufacturing Co. v. Hiniker Co.*, 213 USPQ 119, 120 (D. Minn. 1981) for the principle that "when attorney served as local counsel for a law firm representing Hiniker Co., the attorney represented Hiniker and not the law firm" and also cited *Toulmin v. Becker*, 105 USPQ 511 (Ohio Ct. App. 1954) for the principle that "foreign patent agents or attorneys were not clients of U.S. patent attorney." The PTO expects practitioners to know the identities of their clients and to take reasonable steps to avoid foreseeable prejudice to the rights of their clients.

#### Obtaining Instructions Through Persons Other Than The Client

In practice, it is common for instructions relating to the application of an inventor or trademark owner, who is the client of the U.S. practitioner, to be passed to the U.S. practitioner through intermediaries, such as corporate liaisons or foreign agents. Clearly, a client may choose to use a corporate liaison or a foreign agent to convey instructions, etc., to a practitioner. In such an arrangement, the practitioner may rely upon instructions of, and accept compensation from, the corporate liaison or the foreign agent as to the action to be taken in a proceeding before the Office so long as the practitioner is aware that the client has consented to have instructions conveyed through the liaison or agent. See 37 CFR 10.68(a) and (b). An agreement between the client and the liaison or agent establishes an agency relationship between the liaison or agent and the client such that the U.S. practitioner can rely upon the liaison or agent as the representative of the client for the purpose of communicating the client's instructions about the proceeding to the U.S. practitioner. The PTO will assume that the client has an agreement with the liaison or agent to be represented by the liaison or agent. It is the responsibility of the client to notify the practitioner that the agency relationship between the client and the liaison or agent has ceased to exist and that instructions from the liaison or agent should no longer be accepted.

A practitioner could secure evidence that such an agreement exists by having a patent or trademark applicant sign a statement to that effect at the same time that the power of attorney is executed. For example, the following language could be inserted in an oath, declaration, or power of attorney form:

"The undersigned hereby authorizes the U.S. attorney or agent named herein to accept and follow instructions from as to any action to be taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. attorney or agent and the undersigned. In the event of a change in the persons from whom instructions may be taken, the U.S. attorney or agent named herein will be so notified by the undersigned."

Without an agency relationship between the liaison or agent and the client, a practitioner would be bound by 37 CFR 10.68(b) to "not permit a person who recommends, employs, or pays the practitioner to render legal services for another, to direct or regulate the practitioner's professional judgment in rendering such legal services."

#### Practitioner's Responsibility to a Client After the Client's Patent Issues or Trademark is Registered

The Office has received inquiries from practitioners as to their responsibilities to a client (patent or trademark applicant) after the client's patent was issued or trademark has been registered. In response thereto, it is pointed out that a power of attorney given during prosecution of a patent or trademark application is considered to be viable after the patent is issued

or the trademark is registered. See 50 *Federal Register* 5164 (Feb. 6, 1985); 1086 *Trademark Official Gazette* 357 (Jan. 5, 1988). While the Office considers such a power of attorney to be viable for purposes of the practitioner taking actions in proceedings before the Office if practitioner and the client so desire, the existence of the power of attorney to file and/or prosecute the application through issuance of the patent or registration of the trademark does not establish whether practitioner has a responsibility, and a dutaffirmatively in a proceeding before the Office on behalf of the client after the patent issues or the trademark is registered.

Practitioner's responsibility to take affirmative action in a proceeding before the Office after the patent issues or the trademark is registered depends upon whether practitioner still has a practitioner-client relationship with the client which has continued after the patent issued or trademark is registered. The mere existence of the power of attorney to file and/or prosecute the application through issuance of the patent or registration of the trademark would not establish such a practitioner-client relationship in the absence of other facts establishing such a relationship since the purpose for which the power of attorney was originally given has been accomplished.

#### Practitioner's Responsibility to a Former Client

While practitioner may no longer have a practitioner-client relationship with a client and therefore has no duty to represent the client in a proceeding before the Office, a practitioner nevertheless has certain obligations to a former client. These obligations are placed upon practitioner by the Office rules and are necessary for the proper conduct of proceedings before the Office. Under 37 CFR 10.23(c)(8), practitioners have a duty to inform a client or former client or timely notify the Office of an inability to notify a client or former client of certain correspondence received from the Office and also from the client's or former client's opponent in an *inter partes* proceeding before the Office. Practitioners have an obligation whether the client is a present client or a former client. Included among the items of correspondence of which practitioners have the obligation to inform clients or former clients are notices regarding maintenance fees, reexamination proceedings, and institution of *inter partes* patent and trademark proceedings.

#### Address to Which Correspondence is Sent Regarding Patent Maintenance Fees and Reexamination Proceedings

Under 37 CFR 1.33(d), a "correspondence address" or a change thereto may be filed with the Office during the enforceable life of a patent. This "correspondence address" will be used in any correspondence relating to maintenance fees unless a separate "fee address" has been specified solely for maintenance fee purposes as provided by 37 CFR 1.363. Practitioners who do not wish to receive correspondence relating to maintenance fees must change the correspondence address in the patented file or provide the PTO with a fee address to which the correspondence should be sent. It is not required that a practitioner file a request for permission to withdraw pursuant to 37 CFR 1.36 solely for the purpose of changing the correspondence address in a patent even though a withdrawal of a practitioner would change the correspondence address.

Since 37 CFR 1.33(c) specifies that all notices, official letters and other communications for the patent owner or owners in a reexamination proceeding will be directed to the attorney or agent of record in the patent file, a request for permission to withdraw pursuant to 37 CFR 1.36 must be filed in the patent if the attorney or agent of record does not desire to receive correspondence relating to reexamination. For information on requests to withdraw, see the discussion in the Jan. 12, 1988 *Official Gazette* Notice cited above.

#### Contact Points For Information

If a practitioner has questions about the conduct of, or requirements relating to a particular proceeding before the Office, those questions should be directed to the particular area of the Office responsible for the proceeding. If practitioners have questions about their responsibilities to their clients, those questions should be directed to the Office of Enrollment and

Discipline. The telephone number of that Office is (703) 557-2012.

May 25, 1988

DONALD J. QUIGG  
Assistant Secretary and Commissioner  
of Patents and Trademarks

[1091 OG 26]

(113)

Department of Commerce  
Patent and Trademark Office  
37 CFR § 1.15  
[Docket No. 80515 - 8209]

#### Requests for Identifiable Records

Agency: Patent and Trademark Office, Commerce  
Action: Final Rule.

**Summary:** This final rule sets forth changes that the Patent and Trademark Office (PTO) is making to the rules governing requests for records not disclosed to the public as part of the regular informational activity of the PTO. The prior rule sets out the PTO Freedom of Information Act (FOIA) procedures. The final rule updates these procedures and specifies that FOIA requests will be processed in accordance with Department of Commerce regulations contained in Part 4 of 15 CFR (Public Information).

**Effective Date:** Dec. 30, 1988.

**For Further Information Contact:** Albin F. Drost by telephone at (703) 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

**Supplementary Information:** As presently written, 37 CFR 1.15 describes procedures for obtaining documents under the Freedom of Information Act that have been superseded. The purpose of this rule change is to bring the PTO FOIA procedures into conformity with the Department of Commerce FOIA rules. The final rule directly advises requesters that the PTO will follow the Department of Commerce rules for disclosure of information under FOIA.

A notice of proposed rulemaking was published on July 19, 1988 (53 Fed. Reg. 27 177). Interested parties were requested to submit written comments on or before Sept. 20, 1988. No comments were received.

#### Other Considerations

This rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources. This rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. § 3501 et seq.

The General Counsel of the Department of Commerce has certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities [Regulatory Flexibility Act, Pub. L. 96-354] because no increase in fees or paperwork should result from this rule change.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12991. The annual effect to the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers,

(114)

#### Patent Cooperation Treaty Update

The International Bureau of the World Intellectual Property Organization has informed the U.S. Patent and Trademark Office that, due to changes in the exchange rates of the U.S. dollar with regard to the Swiss franc and the German mark, the dollar amount of the international applications filed in the United States Receiving Office will increase, effective January 1, 1996. The PCT Assembly, in a meeting held from September 25 to October 3, 1995, decided that PCT designation fees would be due for the first 11 (instead of the present 10) countries or regions designated, also with effect from January 1, 1996.

Effective January 1, 1996, the amount of the international fees for international applications filed in the United States Receiving Office will be:

Basic fee (first 30 pages).....	\$677.00
Basic supplemental fee (for each page over 30).....	\$13.00
Designation fee (per country or region up to 11).....	\$164.00

individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The PTO has also determined that this notice has no federalism implications affecting the relationship between the National Government and the states as outlined in Executive Order 12612.

The rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. § 3501 et seq., since no record keeping or reporting requirement within the coverage of the Act are placed upon the public.

#### List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of Information, Records.

For the reasons set out in the preamble and under the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. § 6, the Patent and Trademark Office amends Title 37 of the Code of Federal Regulations as set forth below:

#### PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 continues to read as follows:

AUTHORITY: 35 U.S.C. § 6 unless otherwise noted.

2. Section 1.15 is revised as follows:

#### § 1.15 Requests for identifiable records.

(a) Requests for records, not disclosed to the public as part of the regular informational activity of the Patent and Trademark Office and which are not otherwise dealt with in the rules in this part, shall be made in writing, with the envelope and the letter clearly marked "Freedom of Information Request." Each such request, so marked, should be submitted by mail addressed to the "Patent and Trademark Office, Freedom of Information Request Control Desk, Box 8, Washington, D.C. 20231," or hand delivered to the Office of the Solicitor, Patent and Trademark Office, Arlington, Virginia. The request will be processed in accordance with the procedures set forth in Part 4 of Title 15, Code of Federal Regulations.

(b) Any person whose request for records has been initially denied in whole or in part, or has not been timely determined, may submit a written appeal as provided in § 4.8 of Title 15, Code of Federal Regulations.

(c) Procedures applicable in the event of service of process or in connection with testimony of employees on official matters and production of official documents of the Patent and Trademark Office in civil legal proceedings not involving the United States shall be those established in parts 15 and 15a of Title 15, Code of Federal Regulations.

Nov. 21, 1988

DONALD J. QUIGG  
Assistant Secretary and  
Commissioner of Patents  
and Trademarks

[1097 OG 15]



Handling fee .....\$207.00  
Search fee required by European Patent Office (EPO) when acting as International Searching Authority .....\$1700.00

November 27, 1995

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

## Accession by Azerbaijan

The United States Patent and Trademark Office received notification from the World Intellectual Property Organization (WIPO) that Azerbaijan deposited its instrument of accession to the Patent Cooperation Treaty (PCT) on September 25, 1995. Azerbaijan will become the 82nd Contracting State of the PCT on December 25, 1995. Consequently, nationals and residents of Azerbaijan are entitled to file international applications under the PCT on and after December 25, 1995, and from the same date it is possible to file international applications designating and electing Azerbaijan (country code: AZ).

## Accession by Turkey

The United States Patent and Trademark Office received notification from the World Intellectual Property Organization (WIPO) that Turkey deposited its instrument of accession to the Patent Cooperation Treaty (PCT) on October 1, 1995. Turkey will become the 83rd Contracting State of the PCT on January 1, 1996. Consequently, nationals and residents of Turkey are entitled to file international applications under the PCT on and after January 1, 1996, and from the same date it is possible to file international applications designating and electing Turkey (country code: TR).

## Listing of PCT Member Countries

Country	Instrument	Date of Deposit of Instrument	Entry into Force <sup>1</sup>
(1) Central African Republic <sup>2</sup>	Accession	15 September 1971	24 January 1978
(2) Senegal <sup>2</sup>	Ratification	08 March 1972	24 January 1978
(3) Madagascar	Ratification	27 March 1972	24 January 1978
(4) Malawi <sup>3</sup>	Accession	16 May 1972	24 January 1978
(5) Cameroon <sup>2</sup>	Accession	15 March 1973	24 January 1978
(6) Chad <sup>2</sup>	Accession	12 February 1974	24 January 1978
(7) Togo <sup>2</sup>	Ratification	28 January 1975	24 January 1978
(8) Gabon <sup>2</sup>	Accession	06 March 1975	24 January 1978
(9) United States of America	Ratification	26 November 1975	24 January 1978
(10) Germany <sup>3</sup>	Ratification	19 July 1976	24 January 1978
(11) Congo <sup>2</sup>	Accession	08 August 1977	24 January 1978
(12) Switzerland <sup>3</sup>	Ratification	14 September 1977	24 January 1978
(13) United Kingdom <sup>3</sup>	Ratification	24 October 1977	24 January 1978
(14) France <sup>3</sup>	Ratification	25 November 1977	25 February 1978
(15) Russian Federation	Ratification	29 December 1977	29 March 1978
(16) Brazil	Ratification	09 January 1978	09 April 1978
(17) Luxembourg <sup>3</sup>	Ratification	31 January 1978	30 April 1978
(18) Sweden <sup>3</sup>	Ratification	17 February 1978	17 May 1978
(19) Japan	Ratification	01 July 1978	01 October 1978
(20) Denmark <sup>3</sup>	Ratification	01 September 1978	01 December 1978
(21) Austria <sup>3</sup>	Ratification	23 January 1979	23 April 1979
(22) Monaco <sup>3</sup>	Ratification	22 March 1979	22 June 1979
(23) Netherlands <sup>3</sup>	Ratification	10 April 1979	10 July 1979
(24) Romania	Ratification	23 April 1979	23 July 1979
(25) Norway	Ratification	01 October 1979	01 January 1980
(26) Liechtenstein <sup>3</sup>	Accession	19 December 1979	19 March 1980
(27) Australia	Accession	31 December 1979	31 March 1980
(28) Hungary	Ratification	27 March 1980	27 June 1980
(29) Democratic People's Republic of Korea (North Korea)	Accession	08 April 1980	08 July 1980
(30) Finland	Ratification	01 July 1980	01 October 1980
(31) Belgium <sup>3</sup>	Ratification	14 September 1981	14 December 1981
(32) Sri Lanka	Accession	26 November 1981	26 February 1982
(33) Mauritania <sup>2</sup>	Accession	13 January 1983	13 April 1983
(34) Sudan <sup>2</sup>	Accession	16 January 1984	16 April 1984
(35) Bulgaria	Accession	21 February 1984	21 May 1984
(36) Republic of Korea (South Korea)	Accession	10 May 1984	10 August 1984
(37) Mali <sup>2</sup>	Accession	19 July 1984	19 October 1984
(38) Barbados	Accession	12 December 1984	12 March 1985
(39) Italy <sup>3</sup>	Ratification	28 December 1984	28 March 1985
(40) Benin <sup>2</sup>	Accession	26 November 1986	26 February 1987
(41) Burkina Faso <sup>2</sup>	Accession	21 December 1988	21 March 1989
(42) Spain <sup>3</sup>	Accession	16 August 1989	16 November 1989
(43) Canada	Ratification	02 October 1989	02 January 1990
(44) Greece <sup>2</sup>	Accession	09 July 1990	09 October 1990
(45) Poland	Accession	25 September 1990	25 December 1990
(46) Côte d'Ivoire <sup>2</sup>	Ratification	31 January 1991	30 April 1991
(47) Guinea <sup>2</sup>	Accession	27 February 1991	27 May 1991
(48) Mongolia	Accession	27 February 1991	27 May 1991

(49) Czech Republic	Declaration <sup>4</sup>	18 December 1992	01 January 1993
(50) Ireland <sup>3</sup>	Ratification	01 May 1992	01 August 1992
(51) Portugal <sup>3</sup>	Accession	24 August 1992	24 November 1992
(52) New Zealand	Accession	01 September 1992	01 December 1992
(53) Ukraine	Declaration <sup>4</sup>	21 September 1992	25 December 1991
(54) Viet Nam	Accession	10 December 1992	10 March 1993
(55) Slovakia	Declaration <sup>4</sup>	30 December 1992	01 January 1993
(56) Niger <sup>2</sup>	Accession	21 December 1992	21 March 1993
(57) Kazakhstan	Declaration <sup>4</sup>	16 February 1993	25 December 1991
(58) Belarus	Declaration <sup>4</sup>	14 April 1993	25 December 1991
(59) Latvia	Accession	07 June 1993	07 September 1993
(60) Uzbekistan	Declaration <sup>4</sup>	18 August 1993	25 December 1991
(61) China	Accession	01 October 1993	01 January 1994
(62) Slovenia	Accession	01 December 1993	01 March 1994
(63) Trinidad and Tobago	Accession	10 December 1993	10 March 1994
(64) Georgia	Declaration <sup>4</sup>	18 January 1994	25 December 1991
(65) Kyrgyzstan	Declaration <sup>4</sup>	14 February 1994	25 December 1991
(66) Republic of Moldova	Declaration <sup>4</sup>	14 February 1994	25 December 1991
(67) Tajikistan	Declaration <sup>4</sup>	14 February 1994	25 December 1991
(68) Kenya <sup>2</sup>	Accession	08 March 1994	08 June 1994
(69) Lithuania	Accession	05 April 1994	05 July 1994
(70) Armenia	Declaration <sup>4</sup>	17 May 1994	25 December 1991
(71) Estonia	Accession	24 May 1994	24 August 1994
(72) Liberia	Accession	27 May 1994	27 August 1994
(73) Swaziland <sup>2</sup>	Accession	20 June 1994	20 September 1994
(74) Mexico	Accession	01 October 1994	01 January 1995
(75) Uganda <sup>2</sup>	Accession	09 November 1994	09 February 1995
(76) Singapore	Accession	23 November 1994	23 February 1995
(77) Iceland	Accession	23 December 1994	23 March 1995
(78) Turkmenistan	Declaration <sup>4</sup>	01 March 1995	25 December 1991
(79) The former Yugoslav Republic of Macedonia	Accession	10 May 1995	10 August 1995
(80) Albania	Accession	04 July 1995	04 October 1995
(81) Lesotho <sup>2</sup>	Accession	21 July 1995	21 October 1995
(82) Azerbaijan	Accession	25 September 1995	25 December 1995
(83) Turkey	Accession	01 October 1995	01 January 1996

<sup>1</sup>Although the PCT entered into force on January 24, 1978, the Assembly of the PCT Union fixed June 1, 1978, as the date from which international applications could be filed and demands for international preliminary examination could be submitted.

<sup>2</sup>Member of African Intellectual Property Organization (OAPI) regional patent system.

<sup>3</sup>Member of European Patent Convention (EPC) regional patent system.

<sup>4</sup>Declaration of continued application.

<sup>5</sup>Member of African Regional Industrial Property Organization (ARIPO) regional patent system.

November 27, 1995

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

[1181 OG 49]

(115) Minimum Requirements for Acceptance  
of Applications Under 35 U.S.C. 371  
(the National Stage of PCT)

The Patent and Trademark Office is continuing to receive application papers which do not clearly identify whether the papers (1) are being submitted to enter the national stage of the Patent Cooperation Treaty (PCT) under 35 U.S.C. 371 or (2) are being filed as a regular national application under 35 U.S.C. 111.

Attention is directed to the notice in the Official Gazette at 1070 O.G. 11 titled "Unity of Invention Practice in International Applications and National Phase Applications Entered Under 35 U.S.C. 371" wherein at item eight it is stated

"(8) Applicants should clearly indicate on all application papers filed forentry under 35 U.S.C. 371 and 37 CFR 1.61 that the filing is being made under § 35 U.S.C. 371. Otherwise, the application papers will be treated as having been filed under 35 U.S.C. 111."

To clearly indicate an international application is being filed under 35 U.S.C. 371 the applicant should use the "Transmittal Letter for United States Designated Office" (Form PTO-1390) as the transmittal letter.

Alternatively, one of the following indications may be used:

1) the applicant shall clearly state in the transmittal or cover letter that he or she is filing under 35 U.S.C. 371 or entering the national stage under the PCT; or

2) the applicant clearly identifies in the oath or declaration the specification to which it is directed by referring to a particular international application by PCT Serial Number and International Filing Date and that he or she is executing the declaration as, and seeking a U.S. Patent as, the inventor of the invention described in the identified international application.

Applicants are cautioned that the identification of the international application, in the oath or declaration or otherwise, as a prior filed application for priority purposes is not considered to be an indication of an intention to file under 35 U.S.C. 371.



If there are any conflicting instructions as to which section of the statute (371 or 111) is intended the application will be accepted under 35 U.S.C. 111. It is strongly recommended that applicant use the Form PTO-1390 in all cases where a filing under 35 U.S.C. 371 is intended.

Mar. 16, 1987

RENE D. TEGTMEYER  
Assistant Commissioner  
for Patents

[1077 OG 13]

(116)

Department of Commerce  
Patent and Trademark Office  
37 CFR Parts 1 and 10  
[Docket No. 920539-2313]  
RIN: 0651-AA51

### Revision of Patent Cooperation Treaty Provisions

Agency: Patent and Trademark Office, Commerce  
Action: Final Rule

**Summary:** The Patent and Trademark Office (Office) is amending the rules of practice relating to applications filed under the Patent Cooperation Treaty (PCT): (1) to amend the rules in accordance with revised regulations under the PCT; (2) to bring the rules regarding applications entering the national stage under 35 U.S.C. 371 more in line with existing regulations applicable to national applications filed under 35 U.S.C. 111; and (3) to clarify existing practice under the PCT. The changes will result in more streamlined and simplified procedures for filing and prosecuting international and national stage applications under the PCT.

**Effective Date:** May 1, 1993.

**For Further Information Contact:** Vincent Turner by telephone at (703) 305-9384 or by mail addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 and marked to the attention of Vincent Turner (Crystal Park 2, room 919).

**Supplementary Information:** The Office published a notice of proposed rulemaking relating to revision of the Patent Cooperation Treaty provisions, in the *Federal Register*, 57 Fed. Reg. 29248 (July 1, 1992) and in the *Official Gazette*, 1140 Off. Gaz. Pat. Office 27 (July 14, 1992). No oral hearing was held. Eight individuals or organizations submitted written comments in response to the notice of proposed rulemaking. The eight written comments are available for public inspection in the Office of the Assistant Commissioner for Patents, room 919, Crystal Park II, 2121 Crystal Drive, Arlington, Va.

Familiarity with the notice of proposed rulemaking is assumed. Changes in the text of the rules published for comment in the notice of proposed rulemaking are discussed. Comments received in writing in response to the notice of proposed rulemaking are discussed.

This rule change will improve filing and processing procedures for applicants both in the filing of international applications and in the filing of national stage applications under 35 U.S.C. 371.

### Background

During the first 14 years under the PCT, the annual volume of international patent applications filed in the U.S. Receiving Office has increased from just under 100 to almost 10,000 in fiscal year 1991. The volume of U.S. national stage applications has shown similar growth to the point that the U.S. is now designated more than 10,000 times each year by applicants filing international applications under the PCT. Historically, approximately 60% of those applicants that designate the U.S. enter the national stage in the United States.

On July 8 to 12, 1991, representatives of the patent offices of the member countries, in a series of meetings held in Geneva, Switzerland, agreed upon several changes to the PCT regulations which are designed to make the PCT more user-friendly. These adopted changes require corresponding changes in Title 37, CFR.

The practice under the revised PCT regulations will permit an applicant to provide, in addition to at least one specified designation, a precautionary designation of all other PCT member countries and regions so that any intended designation which may have been overlooked on filing can be corrected within 15 months of the priority date by confirmation of the designation. Applicants are cautioned, however, that in order for the confirmation of a designation of the U.S. to be valid, the inventor must have been named in the application papers as filed, 37 CFR 1.421(b).

International applications are searched and published prior to the 20-month deadline for entry into the national stage. If a demand for preliminary examination is filed before expiration of 19 months from the priority date the time for entry into the national stage is extended to 30 months from the priority date and the international application will be subject to preliminary examination under Chapter II of the PCT. The practice under the revised PCT regulations permits an applicant to indicate in the demand that preliminary examination is to be based on an accompanying PCT Article 34 amendment and, if the amendment is not received with the demand, the applicant will be notified and given a time period within which to file the missing amendment. This new procedure will ensure that examination will go forward based on the desired PCT Article 34 amendment.

Also, the Office is aware that certain applicants have had difficulty in properly filing national stage applications due to the different requirements in the rules for PCT and U.S. national applications. Some differences cannot be avoided due to different procedures required under the PCT from U.S. national practice. It is desirable, however, to minimize these differences and to simplify national stage filing procedures.

International applications have become abandoned for failure to timely provide an oath or declaration, a filing fee and/or an accurate translation. In national practice under 35 U.S.C. 111, if any of these items was not presented at the time of filing, a notice would be mailed to the applicant setting a period of time to provide the missing item(s) and to pay a fee. The amendments to the rules governing entering the national stage will establish a greater degree of uniformity of practice and requirements for filing an application under 35 U.S.C. 111 and entering the national stage in an international application under 35 U.S.C. 371.

Amending sections 1.494 and 1.495 results in regulations much like the present section 1.53. The major exception is that a notification of any missing parts in sections 1.494 and 1.495 will only be mailed in those instances where the applicant has paid the basic national fee within 20 or 30 months from the priority date depending on whether election of the U.S. under Chapter II of the PCT has been made prior to 19 months. Applicants can no longer pay the basic national fee with a surcharge after the 20/30 months deadline. Failure to pay the basic national fee within 20/30 months from the priority date will result in abandonment of the application. Paying the fee gives a clear indication to the Office that the applicant desires to enter the national stage. If the required oath, declaration or translation has not been filed within 20/30 months from the priority date, as appropriate, the Office will send applicant a notice and provide a period of time to supply the deficiency. Upon paying the basic national fee within 20/30 months from the priority date, the applicant will have the opportunity to inform the Office of a U.S. correspondence address, if any. Thus, the Office will avoid unnecessary handling of approximately 40% of those applications that designate the U.S. but do not enter the national stage, and will be able to send a notice to a U.S. correspondence address in most cases.

Often at 20 or 30 months from the priority date, the only communication which has been received by the Office is a copy of the international application from the International Bureau with the address of the foreign attorney or agent who represented the applicant in the international stage. The foreign attorney or agent may not be conversant in English or knowledgeable about U.S. practice, factors which often contribute to complicating the processing of applications. Thus, the new practice, which requires payment of the basic national fee on or before 20 or 30 months from the priority date, has several advantages: (1) it will enable the applicant to identify the U.S. attorney or agent for correspondence from the Office; (2) the Office, after a check of the national stage papers at 20 or 30

months, will mail a notice identifying any deficiencies and affording applicant a period for correction of those deficiencies; and (3) as in national practice under section 1.53, it will enable applicants to extend the period of time under section 1.136 for submission of a proper oath, declaration or translation.

The changes to sections 1.494 and 1.495 address the problems which have been most frequently encountered in entering the national stage in the United States. The new practice of notifying applicants of the omission of a proper oath, declaration or translation and setting an extendable period of time for correction will allow applicants greater flexibility in the time for submission of these documents, thus avoiding the consequence of abandonment and potential loss of rights in the United States.

### Implementation

The rule changes which reflect corresponding amendments in the PCT regulations were implemented on 01 July 1992 when the amendments became effective. The remaining rule changes will be effective on 01 May 1993. Setting a date for the rules to take effect several months in the future will allow time for applicants to change their procedures to conform to these rules.

Those international applications entering the national stage under section 1.494 where 20 months from the priority date expires on, or before, 30 April 1993 are under the old rule (section 1.494 effective 01 July 1987) and those international applications entering the national stage under section 1.495 where 30 months from the priority date expires on, or before, 30 April 1993 are under the old rule (section 1.495 effective 01 July 1987). Those international applications entering the national stage under section 1.494 where 20 months from the priority date expires on, or after, 01 May 1993 are under the new rule (section 1.494 effective 01 May 1993) and those international applications entering the national stage under section 1.495 where 30 months from the priority date expires on, or after, 01 May 1993 are under the new rule (section 1.495 effective 01 May 1993). For example:

1) If a copy of an international application (which designates the U.S.) that has a priority date of 30 August 1991 is filed in the Office by 30 April 1993 (within 20 months from the priority date), applicant may enter the national stage under 37 CFR 1.494 by submitting any required English translation, the basic national fee and the oath or declaration not later than 30 June 1993. Of course, the payment of the surcharge and processing fee (37 CFR 1.492(e) and (f)) would also be due.

2) If a copy of an international application (which elected the U.S. before expiration of 19 months from the priority date) that has a priority date of 30 October 1990 is filed in the Office by 30 April 1993 (within 30 months from the priority date), applicant may enter the national stage by submitting any required English translation, the basic national fee and the oath or declaration not later than 30 June 1993. Of course, the payment of the surcharge and processing fee (37 CFR 1.492(e) and (f)) would also be due.

3) If a copy of an international application (which designates the U.S.) that has a priority date of 01 September 1991 is filed in the Office by 03 May 1993 (within 20 months from the priority date - 01-02 May 1993 being a Saturday and Sunday, respectively), then applicant must pay the basic national fee by 03 May 1993 to avoid abandonment of the application. If the basic national fee is timely paid, a notice will then be sent to applicant giving a time period within which to file the oath or declaration and any required translation (new section 1.494(c)).

4) Any international application having a priority date of 01 September 1991 or later, is under the new rule. Thus, if applicant files papers for the national stage indicated to be under the procedure of the old rule (section 1.494) in the Office before 01 May 1993 (i.e., before expiration of 20 months from the priority date) but omits the basic national fee, the application will, nonetheless, become abandoned at midnight on 03 May 1993 (after 20 months from the priority date - 01-02 May 1993 being a Saturday and Sunday, because applications where the 20-month deadline expires on after 01 May 1993 come under the

new practice. In accordance with new section 1.494 (i) copy of the international application must be furnished to the Office, and (ii) the basic national fee must be paid before expiration of 20 months from the priority date.

### Response to Comments on the Rules

Eight written comments were received in response to the notice of proposed rulemaking. All of the comments were considered in adopting the changes set forth herein. The comments and responses to the comments follow.

**Comment 1.** One comment stated that "The proposed addition to section 1.431(b)(1) of 'and the papers filed at the time of receipt of the international application [so] indicate' goes beyond the requirements set forth in the PCT and is contrary to PCT Administrative Instructions, Section 329." Two other similar comments were received and urged, in effect, that section 1.431(b)(1) be revised to adopt the procedure set forth in Section 329 of the PCT Administrative Instructions.

**Response:** The suggestion has not been adopted. The provisions adopted in section 1.431(b)(1) are consistent with, and required by, Article 11 of the PCT as interpreted by the Office. Section 329 of the PCT Administrative Instructions was issued by the International Bureau after the Bureau was advised that the Office believed new section 329 to be inconsistent with requirements of Article 11 of the Treaty and inconsistent with over 13 years of practice in the United States. In the opinion of the Office, PCT Administrative Instruction 329 is inconsistent with PCT Article 11 and Rule 20.4(a), which require the Office to promptly determine whether the applicant does not obviously lack, by reasons of residence or nationality, the right to file an international application. In accordance with PCT Rule 89.1(b), "The Administrative Instructions shall not be in conflict with the provisions of the Treaty, these regulations, . . ." The United States will not follow Administrative Instruction 329.

**Comment 2.** One comment stated that in section 1.431(c), the reference to "PCT Rule 15.2" should be to "PCT Rule 15" because PCT Rule 15.1 is also relevant, and the reference to section 1.445 "should be changed to refer to" PCT Rules 14 and 16.1" because section 1.445 does not cover the European Patent Office (EPO) search fee which is also paid to the USPTO.

**Response:** The suggestion has not been adopted. The references to Rule 15.2 and section 1.445 are considered proper in the context in which they are used. The references to Rule 15.2 and section 1.445 are not new and have worked well in directing applicants regarding international application requirements. The EPO search fee is not mentioned in section 1.431, but is published in each issue of the *Official Gazette* for applicant's information.

**Comment 3.** One comment stated that in section 1.431(d), the words "one designation fee" should be deleted since this is covered by section 1.432(b) and that "timely made" in line 5 be changed to "paid within the one-month period" for clarity.

**Response:** The first suggestion in the comment is not adopted. The reference to "one designation fee" in section 1.431(d) is repeated in section 1.432(b) to add clarity on this important point. The second suggestion in the comment is not adopted since it would introduce error into section 1.431(d). Indeed, all the fees must be paid timely, and need not be paid within the one-month period set pursuant to section 1.431(c), e.g., some fee(s) may be paid prior to the one-month period. Presumably the one-month period mentioned in the comment refers to a period set pursuant to section 1.431(c) which may not need to be set in every case.

**Comment 4.** One comment indicated that (in the fourth paragraph of the Supplementary Information section) the discussion of new section 1.432 includes a reference to a "generic" designation of all countries which, instead, should refer to a precautionary designation of all countries except the required specified designation(s).

**Response:** The appropriate change has been made to the discussion of section 1.432 to clarify that an applicant may provide, in addition to at least one specified designation, a precautionary designation of all other PCT member countries and regions so that any intended designation which may have been overlooked on filing can be corrected within 15 months of the priority date.



**Comment 5.** One comment stated that in section 1.432(a) and (b) the word "request" should be capitalized in view of section 1.401(d). A corresponding comment was made with respect to section 1.451(a).

**Response:** This suggestion is adopted since PCT Rule 4.10 requires the designations to appear on the Request (form RO/101) and section 1.432 continues to require that the designation(s) be indicated in the Request on filing. Similarly, with respect to section 1.451(a), the suggestion is adopted.

**Comment 6.** One comment stated that in section 1.432(a) "or regions" should be changed to "for the purpose of obtaining national or regional patents."

**Response:** The suggestion is adopted to the extent that section 1.432(a) has been changed by replacing "or regions" with "including an indication that applicant wishes to obtain a regional patent, where applicable." The adopted wording is preferable since it is the same as the wording of PCT Rule 4.9(a)(ii).

**Comment 7.** One comment objected to the requirement contained in section 1.432(a) that designations in the international application shall be stated as provided in PCT Rule 4.9(a) and Section 115 of the Administrative Instructions Under the PCT. Also, the comment urged that the PCT Administrative Instructions should be reproduced in sections 1.432 and 1.451 so that applicants have access to them.

**Response:** Section 115 of the PCT Administrative Instructions makes reference to the names and abbreviations of all countries. Inclusion of such a long list would unnecessarily encumber section 1.432(a). The Administrative Instructions are readily available, and a list of countries is provided in the Manual of Patent Examining Procedure (Chapter 200). Applicants using a current Request form will inherently comply with PCT Rule 4.9(a) and Sections 110 and 115 of the PCT Administrative Instructions.

**Comment 8.** One comment asked "If an applicant does not pay the fee(s) set out in section 1.432(c)(2) or (3), will he/she be given an additional month to pay the fees described in section 1.432(b)(1) and (2)?"

**Response:** No extension of time is available to the 15-month deadline of section 1.432(c). The time period set under section 1.432(b) does not apply to section 1.432(c). If payment for the designations to be confirmed under section 1.432(c) is not received by 15 months from the priority date, those precautionary designations are considered to be withdrawn, PCT Rule 4.9(b).

**Comment 9.** One comment suggested adding references to PCT Rule 4.9(a) and (b) in various locations in section 1.432.

**Response:** The suggestion is adopted by adding appropriate references to PCT Rule 4.9(a) and (b).

**Comment 10.** One comment suggested that the last sentence in section 1.432(b) be moved to become the second sentence of section 1.432(b) and the third sentence be moved to become the last sentence of section 1.432(b).

**Response:** These suggestions are not adopted since they would not constitute an improvement to section 1.432(b).

**Comment 11.** One comment suggested that, in section 1.432(c)(3) unconfirmed designations indicated to be "considered withdrawn" should be changed to "regarded as withdrawn by the applicant."

**Response:** This suggestion has not been adopted because it does not further clarify section 1.432(c)(3). Unconfirmed designations are considered to be withdrawn by the applicant under PCT Rule 4.9(b)(ii) and are also considered to be withdrawn by the Office.

**Comment 12.** One comment suggested that section 1.446(d) should be expanded to indicate that a refund of the search fee will be given even after the search copy has been transmitted just so long as the withdrawal is effective before start of the international search.

**Response:** This suggestion has not been adopted since refunds may or may not be appropriate in the noted instance. For example, if the EPO acting as an international searching authority begins the search after withdrawal but before receipt of the withdrawal from the U.S. receiving office, a refund may not be made.

**Comment 13.** One comment suggested that in section 1.446(e) "demand" should be capitalized in view of section 1.401(g).

**Response:** This suggestion is adopted.

**Comment 14.** One comment suggested that the reference in section 1.451(a) to Section "201" of the Administrative Instructions should be changed to "115."

**Response:** This suggestion is adopted since Section "201" of the Administrative Instructions has been changed effective July 1, 1992, and is now Section "115."

**Comment 15.** One comment noted that the proposed change in section 1.455(a) does not reflect that a common representative need not be "appointed."

**Response:** A new sentence has been inserted into section 1.455(a) to address the situation where no common representative or agent has been appointed. Where no common representative or agent has been appointed, the first mentioned applicant who is entitled to file in the U.S. receiving office is considered to be the common representative, PCT Rules 2.2bis and 90.2(b).

**Comment 16.** One comment noted that the proposed change in section 1.455(a) does not reflect that if a new common representative is appointed, the previous common representative is automatically revoked.

**Response:** The last sentence of section 1.455(a) has been changed to reflect that the later appointment of an attorney, agent or common representative revokes any earlier appointment unless otherwise indicated.

**Comment 17.** One comment suggested that "In sections 1.475(a), 1.488(a) and 1.499(e) reference should be added to PCT Rule 13, Administrative Instructions, Section 206, and possibly to Annex B of the Administrative Instructions."

**Response:** The suggestion is not adopted because it gives no reasons for the proposed change and it is not evident that the change is needed.

**Comment 18.** One comment stated that in the Supplementary Information discussion of section 1.475(b), the explanation of "specially adapted" was different from the explanation in Annex B, Part I of the Administrative Instructions.

**Response:** The discussion of section 1.475(b) has been revised to conform to Annex B, Part I of the Administrative Instructions.

**Comment 19.** One comment stated that in section 1.484(b) no need is seen for adding the last two sentences because "The provision relates only to International Searching Authority practice and is set forth in more detail by the PCT Rules."

**Response:** Section 1.484(b) is directed to conduct of the International Preliminary Examining Authority rather than the International Searching Authority. The explanation in section 1.484(b) is retained because, although it parallels PCT Rule 69.1(e), it informs applicants that delay in submission of an amendment will delay the start of examination. Applicants should be aware that, since the time for issuance of the final report is fixed by PCT Rule 69.2 and may not change, any delay in the start of examination may work to applicants' disadvantage. For example, the minimum time may have to be set for response to any opinions, there may be time for only one opinion and/or there may be less time for interviews.

**Comment 20.** One comment suggested that section 1.485 should be amended to take into account that amendments are permitted under PCT Rule 66.4b is even after the time period set by the International Preliminary Examining Authority.

**Response:** This suggestion is not adopted. Section 1.485 sets forth when an amendment may be filed so that it will be considered. Amendments filed at other times may not be considered.

**Comment 21.** One comment suggested that the beginning of section 1.492 should be changed to reflect that, in view of H.R. 3531, the national stage fees are under 35 U.S.C. 41(a) rather than under 35 U.S.C. 376.

**Response:** H.R. 3531 was enacted into law (Public Law 102-204). Accordingly, the suggestion in the comment has been adopted by revising the introductory language in section 1.492 to remove the reference to 35 U.S.C. 376.

**Comment 22.** One comment urged that in the Discussion of Specific Rules for sections 1.494(b) and 1.495(b), the discussion should be modified to clarify that the applicant need only check "his or her" files to be sure that the Bureau's notice regarding transmittal of a copy of the international application has been received.

**Response:** The language has been revised to eliminate any ambiguity.

**Comment 23.** One comment suggested that "as filed" in section 1.494(c) should be set off by commas as in section 1.495(c).

**Response:** Section 1.494(c) has been changed as suggested.

**Comment 24.** One comment questioned the phrases "accurate translation" and "proper translation" as used in the Supplementary Information discussion and stated that these phrases do not further explain the word "translation" as used in the statute. Another comment suggested that the rule should provide for correction of errors in the translation without penalty of abandonment or surcharge.

**Response:** The statute (35 U.S.C. 371(c)(2)) requires that applicant file a translation of the international application to avoid abandonment (35 U.S.C. 371(d)). The Office has received purported translations which include amendments to the text of the international application and other inconsistencies with the text of the non-English language document. It is helpful to explain that a translation must be accurate and a proper translation. The Office does not inspect a purported translation for all errors, it only inspects for errors which are apparent on the face of the document. For example, where the non-English language international application has 6 claims and the purported translation has 8 claims, obviously the requirement for a proper translation has not been met. Submission of inaccurate translations require additional processing by the Office, thus the requirement for a processing fee is appropriate.

**Comment 25.** One comment stated that in the Supplementary Information discussion of sections 1.494 and 1.495 the reference to the U.S. correspondence address should be modified to add "if any" since none is required.

**Response:** The suggestion has been adopted.

**Comment 26.** One comment stated that in the preamble of section 1.495(e) there appears to be a contradiction in that the first sentence suggests a translation of the annex may be filed within the time period set under 1.495(c) whereas the second sentence suggests the translation of the annex must be filed by 30 months or "be considered cancelled."

**Response:** The sentences are compatible. The first sentence applies to the case where the translation, oath or declaration have not been submitted by 30 months. In such case, they (and any annex) may be submitted within the time period of paragraph (c). The second sentence applies to the case where the translation and oath or declaration have been submitted by 30 months, whereupon no additional time is set under paragraph (c). Thus, in the first instance, if applicants are given additional time to submit the translation or oath or declaration, they may also submit the annex in that same additional time. But where the translation and oath or declaration have been submitted by 30 months, an additional time period will not be provided simply for submitting a translation of the annex. Of course, applicant may submit a preliminary amendment under 37 CFR 1.121 including the subject matter of the annex.

**Comment 27.** One comment suggested that sections 1.494(b)(3) and 1.495(b)(3) should be amended to permit an extension of time for the basic national fee so that it may be submitted, like the declaration and translation, after 20 and 30 months.

**Response:** The suggestion is not adopted. Submission of the basic national fee gives the Office a clear indication that applicant intends to enter the national stage. This helps the Office to avoid processing of those 40% of the international applications which designate the U.S. but do not enter the national stage. Also, filing of the basic national fee by 20 or 30 months will ordinarily provide the Office with the correspondence address of the person prosecuting the national stage application. Without this correspondence address, the Office would send any notice of missing parts to the correspondence address in the international application (e.g., the person who prosecuted the international stage and who may not be qualified to prosecute the U.S. national stage). The rules as amended address the greatest hurdle for entry into the national stage which has been submission of the oath or declaration by the 22 or 32-month deadline.

**Comment 28.** One comment suggested that sections 1.494(d) and 1.495(d) should indicate that the PCT Article 19 amendments (which have not been received) are not only considered to be cancelled, but are also "disregarded under PCT Rule 49.5(c-bis)."

**Response:** The suggestion is not adopted because this additional reference to PCT Rule 49.5(c-bis) is not helpful. The indication that the PCT Article 19 amendments are cancelled is in accordance with 35 U.S.C. 371(d). It is standard practice in the examination of a patent application in the United States to disregard amendments that have been cancelled.

**Comment 29.** One comment suggested that, with respect to section 1.494, "The proposed rules do not make clear the relationship between paragraphs (c) and (g) as to the time period set for later furnishing of the translation into English."

**Response:** Paragraph (c) provides that applicant will be provided a period of time to file the translation (if the requirements of paragraph (b) have been met) and paragraph (g) provides that the application becomes abandoned if any required translation is not filed within the time period set in paragraph (c). Thus, where the other requirements have been met but the translation has not been provided, paragraph (c) provides a time period for submission of the translation and paragraph (g) provides the sanction (abandonment) for failing to comply within the set period.

**Comment 30.** One comment questioned whether the time period for translation of any PCT Article 19 amendments should be extendable with any extension for translation of the international application. A corresponding comment was made with respect to section 1.495.

**Response:** An extension of time for submission of the translation of any PCT Article 19 amendment is not possible in view of the provisions of 35 U.S.C. 371(d).

**Comment 31.** One comment suggested that sections 1.494(g) and 1.495(h) should be modified by replacing "the translation" with "any required translation."

**Response:** The suggestion is adopted. Translations are not required where the international application was filed in English.

**Comment 32.** One comment suggested that at the beginning of section 1.495(c) after "paragraph (b)" the word "of" should be added.

**Response:** The suggestion is adopted.

**Comment 33.** One comment suggested that section 1.495(d) could be deleted since under PCT Rules 70.16 and 74.1 relevant amendments under PCT Article 19 must be annexed to the international preliminary examining report and therefore must be translated under section 1.495(e). It was further noted that superseded PCT Article 19 amendments need not be translated.

**Response:** The suggestion is not adopted. Section 1.495(d) covers the situation where the PCT Article 19 amendment is not annexed. For example, where applicant enters the national stage in the U.S. and withdraws the international application before issuance of the final report. In this instance, translation of the PCT Article 19 amendments would have to be submitted by the date of commencement of the national stage (which cannot be later than 30 months) or be considered cancelled.

**Comment 34.** One comment observed that under section 1.495(e) if there is no time period to be set for submission of the translation of the international application and/or the oath or declaration, there is no possibility for extra time (after the 30-month deadline) for submission of translation of the annex. It was suggested that section 1.495(e) be reworded to permit extra time (after the 30-month deadline) for submission of a translation of the annex even where the translation of the international application and/or the oath or declaration had been submitted by 30 months.

**Response:** The suggestion is not adopted. Where the translation of the international application and/or the oath or declaration have been submitted by 30 months, it is appropriate to promptly forward the application for examination rather than delay examination for a translation of the annex (especially since often it appears that applicant does not wish to proceed on the basis of the annex). Some applicants prefer to submit preliminary amendments under section 1.121 (which may be done even after 30 months) rather than to submit a translation of the annex.

**Comment 35.** One comment urged that section 1.495(e) is inconsistent in that it states that the 30-month time limit may not be extended, and then states that if the translation of the international application is not filed within 30 months from the priority date additional time may be set under paragraph (c) of this section.



**Response:** The two statements are not contradictory. The time period for submission of the translation and oath or declaration is a new time period and is not an extension of the 30-month time limit. The fixed time limit for submission of the basic national fee is 30 months from the priority date. If the basic national fee is not paid by this 30-month deadline, the application is abandoned. If, on the other hand, the basic national fee is paid by 30 months from the priority date, the pendency of the international application continues past 30 months. If the translation or oath or declaration have not been filed by the 30-month deadline (but the basic national fee has been paid), the application is not abandoned and a time period is set for submission of the missing translation and oath or declaration.

**Comment 36.** One comment asked "Is it the intention of the Patent and Trademark Office to affect, in any way, the current practice of assigning a date on which the Section 371(c)(4) requirement (oath or declaration) will be deemed to have been met, if an applicant submits an oath or declaration in response to a Notice of Missing Parts, thereby ultimately affecting the Section 102(e) date to which the eventually granted U.S. patent will be entitled?"

**Response:** Nothing in the new rule will affect the 35 U.S.C. 102(e) date which will continue to be the date that the last of the 35 U.S.C. 371(c)(1), (2) and (4) requirements are fulfilled.

**Comment 37.** One comment suggested that section 1.821 be clarified to reflect that the notice requiring compliance with paragraphs (b) through (f) is sent by the international searching authority.

**Response:** The suggestion is not adopted. Section 1.821 does not specify who will send the notice and there is no need to do so in the rule.

**Comment 38.** One comment questioned as to section 10.9 whether a pro se applicant from Brazil, who is either an individual or a company, would have the right to practice before the U.S. as an international searching or international preliminary examining authority.

**Response:** Section 10.9 has been amended to clarify that it is not directed to pro se applicants.

#### Discussion of Specific Rules

The following is a table correlating PCT Rule changes with the new 37 CFR changes. Sections 1.431(b)(1), 1.431(b)(3)(ii), 1.451(a), 1.482(a)(2)(i), 1.492(e), 1.494 and 1.495, which are also amended, are not shown in the table because they are changes that are not required by PCT Rule changes.

Rule Correlation Table

37 CFR Change	PCT Rule Change
1.431(c)-(e)	16bis, 27.1
1.432(a)	4.1(b)(iv), 4.9
1.432(b)	5.5, 16bis
1.432(c)	15.5
1.434(a)	3.1
1.445(a)(4)	15.5
1.446(d)	15.6, 16.2
1.446(e)	57.6
1.455(a)	90, 2.2bis
1.475	13
1.476(a)	13
1.480(b)	53.1
1.482(b)	57.5
1.484(b)	60.1(g), 66, 69.1
1.485	60.1(g)
1.487	13
1.488(a)	13
1.499	13
1.821(h)	13ter.1(c)
10.9(c)	90

Section 1.431(b)(1) is amended to clarify that an international

filing date will be accorded to an International application filed in the United States where at least one applicant is indicated to be a resident or national of the United States in the papers as filed. If the papers, as filed, indicate a residence or nationality for at least one applicant, the United States Receiving Office can promptly determine whether, as required by PCT Article 11, "the applicant does not obviously lack" the requisite residence or nationality to file an international application in the United States Patent and Trademark Office.

Section 1.431(b)(3)(ii) is amended to add a cross-reference to section 1.432 which sets forth the requirements regarding designations.

Section 1.431(c) is amended to reflect that the United States Receiving Office, rather than the International Bureau, will be responsible for collecting fees not paid in full at the time of filing the international application or within one month thereafter. The change reflects the procedural change under the new PCT Regulations that the Receiving Office, rather than the International Bureau, will be responsible for communicating deficiency notices to the applicant and collecting the necessary fees. Under the procedure in paragraph (c), a notice of any fee deficiency will be mailed by the Receiving Office setting a time period of one month for payment of the fee deficiency and a late payment fee equal to the greater of (1) 50% of the amount of the deficient fees up to a maximum amount equal to the basic fee, or (2) an amount equal to the transmittal fee. The time period of one month for response to this notice cannot be extended.

Section 1.431(d) is eliminated as unnecessary since the United States Receiving Office will take over the responsibility for collecting fees in place of the International Bureau.

Section 1.431(e) is redesignated as 1.431(d) and clarifies that the failure to timely pay the fees pursuant to paragraph (c) will result in the withdrawal of the international application.

Section 1.432(a) is amended to clarify that the applicant must specify, on filing, at least one national or regional designation in order to be granted a filing date for the international application. This specific designation is required whether or not all designations are indicated pursuant to paragraph (c) of this section. The reference to Section 201 of the Administrative Instructions has been changed to Section 115 to correspond to the change in the Administrative Instructions.

Section 1.432(b) is amended to establish a procedure for the late payment of fees for designations that were specified on filing an international application, and a procedure, pursuant to PCT Rule 16bis.1(c), in accordance with section 321 of the PCT Administrative Instructions for allocating fees, where the amount paid is insufficient to cover all the fees. The payment of the designation fees with a late payment fee (previously termed a "surcharge") is not new. Under the revised PCT regulations, however, the Receiving Office, rather than the International Bureau, will be responsible for communicating deficiency notices to the applicant. The designation fees may be paid, without necessity for a late payment fee, within one year from the priority date or within one month from the date of receipt of the international application if that month expires after the expiration of one year from the priority date. The applicant will be notified and given one month within which to pay any deficient designation fees plus a late payment fee. The amount of the late payment fee is equal to 50% of the deficient fees, but will not be less than the amount of the transmittal fee (currently \$200) and will not exceed the amount of the basic fee (currently \$525). The one-month time limit for payment of the deficient designation fees and late payment fee may not be extended. If, after expiration of the one-month time period, at least one designation fee has not been paid (with any late payment fee which is due), the international application will be withdrawn. If, after expiration of the one-month time period, at least one designation fee has been paid (with any late payment fee which is due) but the amount paid is not sufficient to cover the late payment fee and all the designation fees, the amount paid will be allocated, pursuant to PCT Rule 16bis.1(c), in accordance with section 321 of the Administrative Instructions. Section 321 of the Administrative Instructions provides that the amount will be allocated in accordance with any instructions received from the applicant or, if no instructions have been received, in the order in which the designations appear in the request part of the international application. Designations for which no designation fee is timely

filed will be withdrawn. In section 1.432(b), the reference to parenthetical numbers (1) and (2) used to describe the late payment fee as proposed has been deleted in the final rule to improve clarity.

New section 1.432(c) establishes a procedure wherein, in addition to the designation(s) under paragraph (a), the applicant could indicate, on filing, all designations permitted under the Treaty and confirm desired designations of countries or regions up to 15 months from the priority date. Section 1.432(c) as promulgated requires that applicant's indication of all designations permitted under the Treaty in addition to the designation(s) under paragraph (a) be made in the Request in accordance with PCT Rule 4.9(b). The confirmation must include both a written notice of the countries or regions being confirmed, the appropriate designation fees and a confirmation fee based on the number of countries or regions being confirmed. If the amount of the fees is insufficient, the Receiving Office will allocate the amount paid in accordance with any priority of designations specified by the applicant or, if no priority is specified, in accordance with section 321 of the Administrative Instructions. A notice reminding applicant of the 15-month deadline will not be provided. Unconfirmed designations will be considered withdrawn.

Section 1.434 is amended to allow applicants to develop their own computer-generated Request form so long as the forms comply with the requirements of sections 102(h) and (i) of the Administrative Instructions. Printed Request form will continue to be available from the United States Patent and Trademark Office.

New section 1.445(a)(4) defines the amount of the confirmation fee required for the designations confirmed under section 1.432(c). The confirmation fee is equal to 50% of the sum of the designation fees for the designations being confirmed. For example, a confirmation of four additional designations (at \$127 per designation, or \$508) would require a \$254 confirmation fee. The total amount of the fees due would be \$762, which is the sum of \$508 and \$254.

Section 1.446(d) is amended to clarify that the international (basic and designation, PCT Rule 15.1) and search fees may be refunded under certain circumstances linked to whether the record copy or search copy has been transmitted to the International Bureau or International Searching Authority, respectively. The transmittal fee and any late payment fees will not be refunded, but will be retained to cover Office processing costs. If the record copy or search copy has been transmitted, the Receiving Office cannot refund or authorize the refund of the international or search fees. Any request for a refund filed after the record copy or search copy has been transmitted should be directed to the International Bureau (for the international fee) or the International Searching Authority (for the international search fee) for consideration of whether a refund should be made.

New section 1.446(e) indicates that a refund of the handling fee by the International Preliminary Examining Authority is permitted only in the situations where the demand is considered not to have been submitted or upon withdrawal of the demand before the demand has been sent to the International Bureau. If the demand has been sent to the International Bureau, requests for refund of the handling fee should be directed to the International Bureau.

Section 1.451(a) is amended to clarify that the applicant must specify, on filing, the priority of a previously filed application in order to be granted priority in the international application. The right to priority is not necessarily lost if the claim is not on the Request form, but will be lost if the claim does not appear in the papers presented on filing of the application.

Section 1.455(a) is amended to clarify that the term "common representative" means an applicant appointed by the other applicants or considered to be the representative of the other applicants. Further, since attorneys and agents are registered to practice before the Office rather than licensed, section 1.455(a) has been amended by replacing the word "licensed" with "registered." The paragraph also clarifies who can represent applicants in an international application before the U.S. International Searching Authority or the U.S. International Preliminary Examining Authority, e.g., (1) an attorney or agent registered to practice before the Office, and (2) an attorney or agent not registered to practice before the Office, but authorized to practice before the national office with which the interna-

tional application was filed and for which the United States is an International Searching Authority or International Preliminary Examining Authority. In the latter case, representation is restricted to practicing before the U.S. International Searching Authority and/or the U.S. International Preliminary Examining Authority. For example, if an international application is filed in the Brazilian Patent Office, an agent authorized to practice before the Brazilian Patent Office may prosecute that application before the U.S. International Searching Authority or the U.S. International Preliminary Examining Authority. Paragraph (a) also provides that, unless otherwise indicated, the appointment of an attorney, agent or common representative revokes any earlier appointment as specified in PCT Rule 90.6(b).

Section 1.475 is amended to adopt the unity of invention principles of PCT Rule 13, as amended. Section 1.475 is further amended to reflect that the same unity of invention principles are applied by the international searching and preliminary examining authorities and during the national stage. Duplicative provisions in sections 1.487 and 1.499 are deleted.

The principles of unity of invention are used to determine the types of claimed subject matter and the combinations of claims to different categories of invention that are permitted to be included in a single international or national stage patent application. The basic principle is that an application should relate to only one invention or, if there is more than one invention, that applicant would have a right to include in a single application only those inventions which are so linked as to form a single general inventive concept.

Section 1.475(a) is amended to contain both the definition of the requirement for unity of invention, and the unity of invention criteria that must be satisfied, where a group of inventions is claimed, in order to have a right to include multiple inventions in a single application. A group of inventions is linked to form a single general inventive concept where there is a technical relationship among the inventions that involves at least one common or corresponding special technical feature. The expression "special technical features" is defined as meaning those technical features that define the contribution which each claimed invention, considered as a whole, makes over the prior art. For example, a compound is the common technical feature in an application claiming (1) the compound per se, (2) a method of making the compound and (3) a method of using the compound. A corresponding technical feature is exemplified by a key defined by certain claimed structural characteristics which correspond to the claimed features of a lock to be used with the claimed key.

Section 1.475(b) is amended to define several combinations of different categories of claims which always fulfill the unity of invention requirements of section 1.475(a) where the same or corresponding special technical feature is claimed. There may be other combinations of different categories of claims which fulfill the requirement for unity of invention, but the determination of unity must be made under section 1.475(a), not section 1.475(b).

In section 1.475(b), a process is "specially adapted" for the manufacture of a product if the claimed process inherently produces the claimed product with the technical relationship defined in section 1.475(a) being present between the claimed process and the claimed product. The expression "specially adapted" as used in this section does not imply that the product could not also be manufactured by a different process.

In section 1.475(b), an apparatus or means is "specifically designed" for carrying out the process when the apparatus or means is suitable for carrying out the process with the technical relationship defined in section 1.475(a) being present between the claimed apparatus or means and the claimed process. The expression "specifically designed" does not imply that the apparatus or means could not be used for carrying out another process, nor does it imply that the process could not be carried out using an alternative apparatus or means.

Section 1.475(c) is amended to require that unity of invention might not be present if a combination of categories of invention different from those described in section 1.475(b) are presented in an application. The requirements of section 1.475(a) are always met by the combinations described in section 1.475(b) where the same or corresponding special technical feature is claimed. All other combinations must be tested against the unity of invention standard of section 1.475(a).



Section 1.475(d) is amended by deleting reference to the different combinations of categories of invention that always meet the unity of invention standard (now set forth in section 1.475(b)), and to make reference to the determination of the main invention where multiple products, processes of manufacture or uses are claimed. The significance of determining the main invention is set forth in section 1.476(c).

Section 1.475(e) is amended to require that the determination regarding unity of invention be made without regard to whether a group of inventions is claimed in separate claims or as alternatives within a single claim. The basic criteria for unity of invention are the same, regardless of the manner in which applicant chooses to draft a claim or claims.

Section 1.475(f) is deleted since PCT Rule 13 has been amended and the basic principles of unity of invention are incorporated into other portions of section 1.475.

Section 1.476(a) is amended to delete the reference to section 1.475(f) (which is deleted) and PCT Rule 13.

Section 1.480(b) is amended to allow applicants to develop their own computer-generated Demand form so long as the limitations in sections 102(h) and (i) of the Administrative Instructions are met. Printed Demand forms will continue to be available from the Office.

Section 1.482(a)(2)(i) is amended to clarify that an additional preliminary examination fee may be charged for lack of unity in Chapter II irrespective of whether there was a similar charge in Chapter I. Normally there will be a charge for lack of unity both in Chapter I and in Chapter II. In some instances, although a charge for the search of an additional invention is justified in Chapter I, the examiner chooses to proceed without charging for the search of the additional invention(s). However, circumstances may change (e.g., an amendment submitted with the Demand expanding the claims to the additional invention(s)) in Chapter II so as to warrant the examiner's requirement for an additional fee for examination of the additional invention(s).

Section 1.482(b) is amended to remove the reference to the supplement to the handling fee which had been collected for the benefit of the International Bureau and which has been deleted from the PCT regulations. At present, applicants must pay as many supplements to the handling fee as there are languages into which the elected Offices require translations of the international preliminary examination report. Under the new PCT regulations, all countries will accept an English translation of the international preliminary examination report, thus limiting the International Bureau's translation costs. Accordingly only one handling fee will need to be paid by the applicant, without any supplement, irrespective of the need for a translation of the report.

Section 1.484(b) is amended to permit an applicant to indicate in the demand that international preliminary examination is to begin based on the application as amended rather than on the application as filed. If a PCT Article 19 amendment is not received by the Office by 20 months from the priority date, preliminary examination will proceed. Where the demand indicates examination is to be based on an accompanying PCT Article 34 amendment, but the PCT Article 34 amendment has not been provided to the Office with the demand, the applicant will be notified and given a time period to submit the amendment. Thus, if the applicant wishes preliminary examination based on an amended version of the international application, the demand must so indicate and the amendment (PCT Article 19 or 34) must (1) accompany the demand; or (2) in the case of a PCT Article 19 amendment, be received by 20 months from the priority date; or (3) in the case of a PCT Article 34 amendment, be submitted within the non-extendable time period set by the Office.

Section 1.485 is amended to be consistent with section 1.484 and provides for amendments to be filed with the demand or within a time period set by the International Preliminary Examining Authority.

Section 1.487 is removed as unnecessary because the amendments to section 1.475 address the unity of invention principles to be applied by the International Preliminary Examining Authority.

Section 1.488(a) is amended to replace the reference to section 1.487, which is removed, with a reference to section 1.475.

Section 1.492 is amended to revise the introductory clause to eliminate the reference to 35 U.S.C. 376.

Section 1.492(e) is amended to eliminate the surcharge for filing the basic national fee after 20 or 30 months from the priority date. In accordance with the new practice under sections 1.494 and 1.495, the basic national fee must be filed no later than 20 months, or 30 months if a timely election was filed, from the priority date in order to avoid abandonment of the application.

Sections 1.494 and 1.495 is amended to modify the practice for entering the national stage as a designated or elected office by more closely aligning it with national application practice under section 1.53.

Section 1.494(a) is amended to clarify that absence of a Demand form is no longer the controlling event, but rather failure to elect the United States within 19 months of the priority date will trigger the time periods set forth in paragraphs (b) and (c) of this section.

Section 1.494(b) is amended to require that the basic national fee and a copy of the international application must be filed with the Office by 20 months from the priority date to avoid abandonment. The 22-month period for filing the basic national fee with a surcharge in previous rule 1.494(c) has been eliminated. The International Bureau normally provides the copy of the international application to the Office in accordance with PCT Article 20. At the same time, the International Bureau notifies the applicant of the communication to the Office. In accordance with PCT Rule 47.1, that notice shall be accepted by all designated offices as conclusive evidence that the communication has duly taken place. Thus, if the applicant desires to enter the national stage and applicant has received the notice from the International Bureau, applicant need only pay the basic national fee by 20 months from the priority date. The 20-month time limit for submission of the basic national fee and a copy of the international application is not extendable.

Section 1.494(c) is amended to provide that applicants who have provided the basic national fee and a copy of the international application by 20 months from the priority date but who omit a proper translation, oath or declaration will receive a notification setting a time period for submission of the omitted requirements. The time period set in the notice can be extended pursuant to section 1.136. Filing of the oath or declaration later than 20 months will require the payment of the surcharge set forth in section 1.492(e). Filing of the translation later than 20 months will require the payment of the processing fee set forth in section 1.492(f).

Section 1.494(d) is amended to clarify the existing practice that PCT Article 19 amendments must be submitted by 20 months from the priority date, which time may not be extended. Of course, the failure to do so does not result in loss of the subject matter of the PCT Article 19 amendments. The applicant may submit that subject matter in a preliminary amendment filed under section 1.121. In many cases, filing an amendment under section 1.121 is preferable since grammatical or idiomatic errors may be corrected.

Section 1.494(g) is removed in view of the amendments to sections (b), (c) and (d).

Section 1.494(h) is redesignated as 1.494(g) and is amended to specify when an application that fails to enter the national stage becomes abandoned. Abandonment occurs at 20 months from the priority date if the basic national fee and a copy of the international application have not been provided to the Office. If they have been provided to the Office within 20 months and the translation and/or oath or declaration are not filed timely, abandonment occurs upon expiration of the time limit set in the notification pursuant to paragraph (c). Thus, in the latter situation, abandonment would occur at the expiration of the time period set in the notice to file the missing translation, and/or oath or declaration. The phrase "where the United States has been designated but not elected prior to 19 months from the priority date" (emphasis added) has been changed to "where the United States has been designated but not elected by the expiration of 19 months from the priority date" (emphasis added) for clarity. A corresponding change has been made in section 1.495(h).

Section 1.495(a) is amended to clarify that the election of the U.S. need not be made in the Demand, but can be made subsequently if filed before expiration of 19 months from the priority date to start the time periods set forth in paragraphs (b) and (c) of this section.

Section 1.495(b) is amended to require that the basic national fee and a copy of the international application must be filed with the Office by 30 months from the priority date to avoid abandonment. The 32-month period for filing the basic national fee with a surcharge in previous rule 1.495(c) has been eliminated. The International Bureau normally provides the copy of the international application to the Office in accordance with PCT Article 20. At the same time the International Bureau notifies applicant of the communication to the Office. In accordance with PCT Rule 47.1, that notice shall be accepted by all designated offices as conclusive evidence that the communication has duly taken place. Thus, if the applicant desires to enter the national stage, the applicant normally need only check to be sure the notice from the International Bureau has been received and then pay the basic national fee by 30 months from the priority date. The 30-month time limit for submission of the basic national fee and a copy of the international application is not extendable.

Section 1.495(c) is amended to provide that applicants who have provided the basic national fee and a copy of the international application by 30 months from the priority date, but who omit a proper translation, oath or declaration, will receive a notification setting a time period for submission of the omitted requirements. The time period set in the notice can be extended pursuant to section 1.136. Filing of the oath or declaration later than 30 months will require the payment of the surcharge set forth in section 1.492(e). Filing of the translation later than 30 months will require the payment of the processing fee set forth in section 1.492(f).

Section 1.495(d) is amended to clarify the existing and continuing practice that the PCT Article 19 amendments must be submitted by 30 months from the priority date. The deadline for submitting PCT Article 19 amendments may not be extended. The failure to do so will not result in loss of the subject matter of the PCT Article 19 amendments. Applicant may submit that subject matter in a preliminary amendment filed under section 1.121. In many cases, filing an amendment under section 1.121 is preferable since grammatical or idiomatic errors may be corrected.

Section 1.495(e) is amended to specify that a translation into English of any annexes to the international preliminary examining report which are not received by 30 months from the priority date may only be submitted within the time period set in paragraph (c) for submission of any omitted translation of the international application, or oath or declaration. If any required translation of the international application and oath or declaration have been provided to the Office by 30 months, a notice under paragraph (c) will not be sent, and if the translation of annexes is not submitted within 30 months, the annexes will be considered cancelled.

Section 1.495(h) is removed in view of the amendments to sections (b), (c), (d) and (e).

Section 1.495(i) is redesignated as 1.495(h) and specifies when an application that fails to enter the national stage becomes abandoned if the United States was elected prior to 19 months from the priority date. Abandonment occurs at 30 months from the priority date if the basic national fee and a copy of the international application have not been provided to the Office. If they have been provided to the Office within 30 months and the translation and/or oath or declaration are not filed timely, abandonment occurs upon expiration of the time limit set in the notification pursuant to paragraph (c). Thus, in the latter situation, abandonment would occur at the expiration of the time period set in the notice to file the missing translation, and/or oath or declaration.

Section 1.499 is amended by removing paragraphs (a) through (e) because the amendments to section 1.475 address the unity of invention principles to be applied in the national stage. The reference to the official action being called a requirement for restriction has been eliminated as unnecessary.

Section 1.821(b) is amended to provide that if applicant fails to timely provide the required computer-readable form, the United States International Searching Authority shall search only to the extent that a meaningful search can be carried out.

Section 10.9 is amended to add a new paragraph (c) to be consistent with section 1.455, clarifying that an attorney or agent having the right to act before the national office with which the international application is filed may represent the applicant before the U.S. International Searching Authority or

the U.S. International Preliminary Examining Authority. An individual who has the right to practice before the national office with which an international application is filed, and who is not registered under section 10.6, may not prosecute patent applications in the national stage in the Office.

#### Other Considerations:

The rule changes are in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601, *et seq.*, Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501, *et seq.*

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)), because the rules provide more streamlined and simplified procedures for filing and prosecuting international and national stage applications under the PCT.

The Patent and Trademark Office has determined that these rule changes are not a major rule under Executive Order 12291. The annual effect on the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers; individual industries; Federal, state or local government agencies; or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Patent and Trademark Office has also determined that this notice has no federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes will not impose any additional burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501, *et seq.* The paperwork burden imposed by adherence to the PCT is currently approved by the Office of Management and Budget under control number 0651-0021.

Notice is hereby given that pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, the Patent and Trademark Office amends Title 37 of the Code of Federal Regulations as set forth below.

#### List of Subjects 37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of Information, Inventions and patents, Reporting and record keeping requirements, Small businesses.

#### 37 CFR Part 10

Administrative practice and procedure, Inventions and patents, Lawyers, Reporting and record keeping requirements, Trademarks.

For the reasons set forth in the preamble, 37 CFR Parts 1 and 10 are amended as follows:

#### Part 1 - Rules of Practice in Patent Cases

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6 unless otherwise noted.

2. Section 1.431 is amended by removing paragraph (e) and revising paragraphs (b)(1) through (b)(3)(ii), (c) and (d) to read as follows:

#### § 1.431 International application requirements

\* \* \* \* \*

(b) An international filing date will be accorded by the United States Receiving Office, at the time of receipt of the international application, provided that:



(1) At least one applicant (§ 1.421) is a United States resident or national and the paper filed at the time of receipt of the international application so indicate (35 U.S.C. 361(a), PCT Art. 11(1)(i)).

(2) The international application is in the English language (35 U.S.C. 361(c), PCT Art. 11(1)(ii)).

(3) The international application contains at least the following elements (PCT Art. 11(1)(iii)):

(i) An indication that it is intended as an international application (PCT Rule 4.2);

(ii) The designation of at least one Contracting State of the International Patent Cooperation Union (§ 1.432);

\*\*\*\*\*

(c) Payment of the basic portion of the international fee (PCT Rule 15.2) and the transmittal and search fees (§ 1.445) may be made in full at the time the international application papers required by paragraph (b) of this section are deposited or within one month thereafter. If the basic, transmittal and search fees are not paid within one month from the date of receipt of the international application, applicant will be notified and given one month within which to pay the deficient fees plus a late payment fee equal to the greater of (1) 50% of the amount of the deficient fees up to a maximum amount equal to the basic fee, or (2) an amount equal to the transmittal fee (PCT Rule 16bis). The one-month time limit set in the notice to pay deficient fees may not be extended.

(d) If the payment needed to cover the transmittal fee, the basic fee, the search fee, one designation fee and the late payment fee pursuant to paragraph (c) of this section is not timely made, the Receiving Office will declare the international application withdrawn under PCT Article 14(3)(a).

Section 1.432 is revised to read as follows:

#### § 1.432 Designation of States and payment of designation fees.

(a) The designation of States including an indication that applicant wishes to obtain a regional patent, where applicable, shall appear in the Request upon filing and must be indicated as set forth in PCT Rule 4.9 and Section 115 of the Administrative Instructions. Applicant must specify at least one national or regional designation on filing of the international application for a filing date to be granted.

(b) If the fees necessary to cover all the national and regional designations specified in the Request are not paid by the applicant within one year from the priority date or within one month from the date of receipt of the international application if that month expires after the expiration of one year from the priority date, applicant will be notified and given one month within which to pay the deficient designation fees plus a late payment fee equal to the greater of 50% of the amount of the deficient fees up to a maximum amount equal to the basic fee, or an amount equal to the transmittal fee (PCT Rule 16bis). The one-month time limit set in the notification of deficient designation fees may not be extended. Failure to timely pay at least one designation fee will result in the withdrawal of the international application. The one designation fee may be paid:

(1) within one year from the priority date,

(2) within one month from the date of receipt of the international application if that month expires after the expiration of one year from the priority date, or

(3) with the late payment fee defined in this paragraph within the time set in the notification of the deficient designation fees. If after notification of deficient designation fees the applicant makes timely payment, but the amount paid is not sufficient to cover the late payment fee and all designation fees, the Receiving Office will, after allocating payment for the basic, search, transmittal and late payment fees, allocate the amount paid in accordance with PCT Rule 16bis.1(c) and withdraw the unpaid designations. The notification of deficient designation fees pursuant to this paragraph may be made simultaneously with any notification pursuant to § 1.431(c).

(c) On filing the international application, in addition to specifying at least one national or regional designation under PCT Rule 4.9(a), applicant may also indicate under PCT Rule 4.9(b) that all other designations permitted under the Treaty

are made. The latter indication under PCT Rule 4.9(b) must be made in a statement on the Request that any designation made under this paragraph is subject to confirmation (PCT Rule 4.9(c)) not later than the expiration of 15 months from the priority date by:

(1) filing a written notice with the United States Receiving Office specifying the national and/or regional designations being confirmed;

(2) paying the designation fee for each designation being confirmed; and

(3) paying the confirmation fee specified in § 1.445(a)(4). Unconfirmed designations will be considered withdrawn. If the amount submitted is not sufficient to cover the designation fee and the confirmation fee for each designation being confirmed, the Receiving Office will allocate the amount paid in accordance with any priority of designations specified by applicant. If applicant does not specify any priority of designations, the allocation of the amount paid will be made in accordance with PCT Rule 16bis.1(c).

4. Section 1.434 is amended by revising paragraph (a) to read as follows:

#### § 1.434 The request.

(a) The request shall be made on a standardized form (PCT Rules 3 and 4). Copies of printed Request forms are available from the Patent and Trademark Office. Letters requesting printed forms should be marked "Box PCT."

\*\*\*\*\*

5. Section 1.445 is amended by adding new paragraph (a)(4) to read as follows:

#### § 1.445 International application filing, processing and search fees.

(a) \*\*\*

(4) A confirmation fee (PCT Rule 96) equal to 50% of the sum of designation fees for the national and regional designations being confirmed (§ 1.432(c)).

\*\*\*\*\*

6. Section 1.446 is amended by revising paragraph (d) and adding paragraph (e) to read as follows:

#### § 1.446 Refund of international application filing and processing fees.

\*\*\*\*\*

(d) The international and search fees will be refunded if no international filing date is accorded or if the application is withdrawn before transmittal of the record copy to the International Bureau (PCT Rules 15.6 and 16.2). The search fee will be refunded if the application is withdrawn before transmittal of the search copy to the International Searching Authority. The transmittal fee will not be refunded.

(e) The handling fee (§ 1.482(b)) will be refunded (PCT Rule 57.6) only if:

(1) the Demand is withdrawn before the Demand has been sent by the International Preliminary Examining Authority to the International Bureau, or

(2) the Demand is considered not to have been submitted (PCT Rule 54.4(a)).

7. Section 1.451 is amended by revising paragraph (a) to read as follows:

#### § 1.451 The priority claim and priority document in an international application.

(a) The claim for priority must be made on the Request (PCT Rule 4.10) in a manner complying with Sections 110 and 115 of the Administrative Instructions.

\*\*\*\*\*

8. Section 1.455 is amended by revising paragraph (a) to read as follows:

#### § 1.455 Representation in international applications.

(a) Applicants of international applications may be represented by attorneys or agents registered to practice before the Patent and Trademark Office or by an applicant appointed as a common representative (PCT Art. 49, Rules 4.8 and 90 and § 10.10). If applicants have not appointed an attorney or agent or one of the applicants to represent them, and there is more than one applicant, the applicant first named in the request and who is entitled to file in the U.S. Receiving Office shall be considered to be the common representative of all the applicants. An attorney or agent having the right to practice before a national office with which an international application is filed and for which the United States is an International Searching Authority or International Preliminary Examining Authority may be appointed to represent the applicants in the international application before that authority. An attorney or agent may appoint an associate attorney or agent who shall also then be of record (PCT Rule 90.1(d)). The appointment of an attorney or agent, or of a common representative, revokes any earlier appointment unless otherwise indicated (PCT Rule 90.6(b) and (c)).

9. Section 1.475 is revised to read as follows:

#### § 1.475 Unity of invention before the International Searching Authority, the International Preliminary Examining Authority and during the national stage.

(a) An international and a national stage application shall relate to one invention only or to a group of inventions so linked as to form a single general inventive concept ("requirement of unity of invention"). Where a group of inventions is claimed in an application, the requirement of unity of invention shall be fulfilled only when there is a technical relationship among those inventions involving one or more of the same or corresponding special technical features. The expression "special technical features" shall mean those technical features that define a contribution which each of the claimed inventions, considered as a whole, makes over the prior art.

(b) An international or a national stage application containing claims to different categories of invention will be considered to have unity of invention if the claims are drawn only to one of the following combinations of categories:

(1) a product and a process specially adapted for the manufacture of said product; or

(2) a product and a process of use of said product; or

(3) a product, a process specially adapted for the manufacture of the said product, and a use of the said product; or

(4) a process and an apparatus or means specifically designed for carrying out the said process or

(5) a product, a process specially adapted for the manufacture of the said product, and an apparatus or means specifically designed for carrying out the said process.

(c) If an application contains claims to more or less than one of the combinations of categories of invention set forth in paragraph (b) of this section, unity of invention might not be present.

(d) If multiple products, processes of manufacture or uses are claimed, the first invention of the category first mentioned in the claims of the application and the first recited invention of each of the other categories relate thereto will be considered as the main invention in the claims, see PCT Article 17(3)(a) and § 1.476(c).

(e) The determination whether a group of inventions is so linked as to form a single general inventive concept shall be made without regard to whether the inventions are claimed in separate claims or as alternatives within a single claim.

10. Section 1.476 is amended by revising paragraph (a) to read as follows:

#### § 1.476 Determination of unity of invention before the International Searching Authority.

(a) Before establishing the international search report, the International Searching Authority will determine whether the international application complies with the requirement of unity of invention as set forth in § 1.475.

\*\*\*\*\*

11. Section 1.480 is amended by revising paragraph (b) to read as follows:

#### § 1.480 Demand for international preliminary examination.

\*\*\*\*\*

(b) The Demand shall be made on a standardized form. Copies of printed Demand forms are available from the Patent and Trademark Office. Letters requesting printed Demand forms should be marked "Box PCT".

\*\*\*\*\*

12. Section 1.482 is amended by revising paragraphs (a)(2)(i) and (b) to read as follows:

#### § 1.482 International preliminary examination fees.

(a) \*\*\*

(2) An additional preliminary examination fee when required, per additional invention:

(i) Where the International Searching Authority for the international application was the United States Patent and Trademark Office.....\$140.00

\*\*\*\*\*

(b) The handling fee is due on filing the Demand.

13. Section 1.484 is amended by revising paragraph (b) to read as follows:

#### § 1.484 Conduct of international preliminary examination.

\*\*\*\*\*

(b) International preliminary examination will begin promptly upon receipt of a Demand which requests examination based on the application as filed, or as amended by an amendment which has been received by the United States International Preliminary Examining Authority. Where a Demand requests examination based on a PCT Article 19 amendment which has not been received, examination may begin at 20 months without receipt of a PCT Article 19 amendment. Where a Demand requests examination based on a PCT Article 34 amendment which has not been received, applicant will be notified and given a time period within which to submit the amendment. Examination will begin after the earliest of:

(1) receipt of the amendment;

(2) receipt of applicant's statement that no amendment will be made; or

(3) expiration of the time period set in the notification.

No international preliminary examination report will be established prior to issuance of an international search report.

\*\*\*\*\*

14. Section 1.485 is revised to read as follows:

#### § 1.485 Amendments by applicant during international preliminary examination.

(a) The applicant may make amendments at the time of filing of the Demand and within the time limit set by the International Preliminary Examining Authority for response to any notification under § 1.484(b) or to any written opinion. Any such amendments must:

(1) Be made by submitting a replacement sheet for every sheet of the application which differs from the sheet it replaces unless an entire sheet is cancelled, and



(2) Include a description of how the replacement sheet differs from the replaced sheet.

(b) If an amendment cancels an entire sheet of the international application, that amendment shall be communicated in a letter.

15. Section 1.487 is removed.

#### § 1.487 [Removed]

16. Section 1.488 is amended by revising paragraph (a) to read as follows:

#### § 1.488 Determination of unity of invention before the International Preliminary Examining Authority:

(a) Before establishing any written opinion or the international preliminary examination report, the International Preliminary Examining Authority will determine whether the international application complies with the requirement of unity of invention as set forth in § 1.475.

\*\*\*\*\*

17. Section 1.492 is amended by revising the introductory clause and paragraph (e) to read as follows:

#### § 1.492 National stage fees.

The following fees and charges are established for international applications entering the national stage under 35 U.S.C. 371:

\*\*\*\*\*

(e) Surcharge for filing the oath or declaration later than 20 months from the priority date pursuant to § 1.494(c) or later than 30 months from the priority date pursuant to § 1.495(c):

By a small entity (§ 1.9(f)) .....	\$65.00
By other than a small entity .....	\$130.00

\*\*\*\*\*

18. Section 1.494 amended by removing paragraph (h) and by revising paragraphs (a), (b), (c), (d) and (g) to read as follows:

#### § 1.494 Entering the national stage in the United States of America as a Designated Office.

(a) Where the United States of America has not been elected by the expiration of 19 months from the priority date (see § 1.495), the applicant must fulfill the requirements of PCT Article 22 and 35 U.S.C. 371 within the time periods set forth in paragraphs (b) and (c) of this section in order to prevent the abandonment of the international application as to the United States of America. International applications for which those requirements are timely fulfilled will enter the national stage and obtain an examination as to the patentability of the invention in the United States of America.

(b) To avoid abandonment of the application, the applicant shall furnish to the United States Patent and Trademark Office not later than the expiration of 20 months from the priority date:

(1) a copy of the international application, unless it has been previously communicated by the International Bureau or unless it was originally filed in the United States Patent and Trademark Office; and

(2) the basic national fee (see § 1.492(a)).  
The 20-month time limit may not be extended.

(c) If applicant complies with paragraph (b) of this section before expiration of 20 months from the priority date but omits (1) a translation of the international application, as filed, into the English language, if it was originally filed in another language (35 U.S.C. 371(c)(2)) and/or (2) the oath or declaration of the inventor (35 U.S.C. 371(c)(4); see § 1.497), applicant will be so notified and given a period of time within which to file the translation and/or oath or declaration in order to prevent abandonment of the application. The payment of the processing

fee set forth in § 1.492(f) is required for acceptance of an English translation later than the expiration of 20 months after the priority date. The payment of the surcharge set forth in 1.492(e) is required for acceptance of the oath or declaration of the inventor later than the expiration of 20 months after the priority date. A copy of the notification mailed to applicant should accompany any response thereto submitted to the Office.

(d) A copy of any amendments to the claims made under PCT Article 19, and a translation of those amendments into English, if they were made in another language, must be furnished not later than the expiration of 20 months from the priority date. Amendments under PCT Article 19 which are not received by the expiration of 20 months from the priority date will be considered to be cancelled. The 20-month time limit may not be extended.

\*\*\*\*\*

(g) An international application becomes abandoned as to the United States 20 months from the priority date if the requirements of paragraph (b) of this section have not been complied with within 20 months from the priority date where the United States has been designated but not elected by the expiration of 19 months from the priority date. If the requirements of paragraph (b) of this section are complied with within 20 months from the priority date but any required translation of the international application as filed and/or the oath or declaration are not timely filed, an international application will become abandoned as to the United States upon expiration of the time period set pursuant to paragraph (c) of this section.

19. Section 1.495 is amended by removing paragraph (i) and by revising paragraphs (a), (b), (c), (d), (e) and (h) to read as follows:

#### § 1.495 Entering the national stage in the United States of America as an Elected Office.

(a) Where the United States of America has been elected by the expiration of 19 months from the priority date, the applicant must fulfill the requirements of 35 U.S.C. 371 within the time periods set forth in paragraphs (b) and (c) of this section in order to prevent the abandonment of the international application as to the United States of America. International applications for which those requirements are timely fulfilled will enter the national stage and obtain an examination as to the patentability of the invention in the United States of America.

(b) To avoid abandonment of the application the applicant shall furnish to the United States Patent and Trademark Office not later than the expiration of 30 months from the priority date:

(1) a copy of the international application, unless it has been previously communicated by the International Bureau or unless it was originally filed in the United States Patent and Trademark Office; and

(2) the basic national fee (see § 1.492(a)).

The 30-month time limit may not be extended.

(c) If applicant complies with paragraph (b) of this section before expiration of 30 months from the priority date but omits:

(1) a translation of the international application, as filed, into the English language, if it was originally filed in another language (35 U.S.C. 371(c)(2)) and/or

(2) the oath in another or declaration of the inventor (35 U.S.C. 371(c)(4); see § 1.497), applicant will be so notified and given a period of time within which to file the translation and/or oath or declaration in order to prevent abandonment of the application. The payment of the processing fee set forth in § 1.492(f) is required for acceptance of an English translation later than the expiration of 30 months after the priority date. The payment of the surcharge set forth in § 1.492(e) is required for acceptance of the oath or declaration of the inventor later than the expiration of 30 months after the priority date. A copy of the notification mailed to applicant should accompany any response thereto submitted to the Office.

(d) A copy of any amendments to the claims made under PCT Article 19, and a translation of those amendments into English, if they were made in another language, must be furnished not later than the expiration of 30 months from the priority date. Amendments under PCT Article 19 which are

not received by the expiration of 30 months from the priority date will be considered to be cancelled. The 30-month time limit may not be extended.

(e) A translation into English of any annexes to the international preliminary examination report, if the annexes were made in another language, must be furnished not later than the expiration of 30 months from the priority date. Translations of the annexes which are not received by the expiration of 30 months from the priority date may be submitted within any period set pursuant to paragraph (c) of this section accompanied by the processing fee set forth in § 1.492(f). Annexes for which translations are not timely received will be considered cancelled. The 30-month time limit may not be extended.

\*\*\*\*\*

(h) An international application becomes abandoned as to the United States 30 months from the priority date if the requirements of paragraph (b) of this section have not been complied with within 30 months from the priority date and the United States has been elected by the expiration of 19 months from the priority date. If the requirements of paragraph (b) of this section are complied with within 30 months from the priority date but any required translation of the international application as filed and/or the oath or declaration are not timely filed, an international application will become abandoned as to the United States upon expiration of the time period set pursuant to paragraph (c) of this section.

20. Section 1.499 is revised to read as follows:

#### § 1.499 Unity of invention during the national stage.

If the examiner finds that a national stage application lacks unity of invention under § 1.475, the examiner may in an Office action require the applicant in the response to that action to elect the invention to which the claims shall be restricted. Such requirement may be made before any action on the merits but may be made at any time before the final action at the discretion of the examiner. Review of any such requirement is provided under § 1.143 and 1.144.

21. Section 1.821 is amended by revising paragraph (h) to read as follows:

#### § 1.821 Nucleotide and/or amino acid sequence disclosures in patent applications.

\*\*\*\*\*

(h) If any of the requirements of paragraphs (b) through (f) of this section are not satisfied at the time of filing, in the United States Receiving Office, an international application under the Patent Cooperation Treaty (PCT), applicant has one month from the date of a notice which will be sent requiring compliance with the requirements, or such other time as may be set by the Commissioner, in which to comply. Any submission in response to a requirement under this paragraph must be accompanied by a statement that the submission does not include new matter or go beyond the disclosure in the international application as filed. Such a statement must be a verified statement if made by a person not registered to practice before the Office. If applicant fails to timely provide the required computer readable form, the United States International Searching Authority shall search only to the extent that a meaningful search can be performed.

\*\*\*\*\*

22. The authority citation for 37 CFR Part 10 will continue to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

23. Section 10.9 is amended by adding new paragraph (c) to read as follows:

#### 10.9 Limited recognition in patent cases.

\*\*\*\*\*

(c) An individual not registered under § 10.6 may, if appointed by applicant to do so, prosecute an international application only before the U.S. International Searching Authority and the U.S. International Preliminary Examining Authority, provided: the individual has the right to practice before the national office with which the international application is filed (PCT Art. 49, Rule 90 and § 1.455).

Jan. 7, 1993

DOUGLAS B. COMER  
Acting Assistant Secretary  
and Acting Commissioner  
of Patent and Trademarks

[1147 OG 29]

#### (117) Information Disclosure Statements in PCT National Stage Applications

The purpose of this notice is to announce a change in practice with regard to the need for applicants in a national stage application to file an information disclosure statement with respect to documents cited in an international search report under certain circumstances.

When an international application is filed under the Patent Cooperation Treaty (PCT), prior art documents may be cited by the examiner in the international search report and/or the international preliminary examination report. When a national stage application is filed under 35 U.S.C. 371, or a national application is filed under 35 U.S.C. 111 claiming benefit of the filing date of the international application, it is often desirable to have the examiner consider the documents cited in the international application when examining the national application.

As a result of an agreement among the European Patent Office (EPO), Japanese Patent Office (JPO) and the United States Patent and Trademark Office (USPTO), copies of documents cited in the international search report issued by any one of these International Searching Authority Offices generally are being sent to the other Offices when designated in the international application. Accordingly, in many national stage applications where the international search was conducted by the EPO, JPO, or USPTO, copies of the documents cited in the international search report are made available to the examiner in the national stage application.

At this time, when all the requirements for a national stage application have been completed, applicant is notified (Form PCT/DO/EO/903) of the acceptance of the application under 35 U.S.C. 371, including an itemized list of the items received. The itemized list includes an indication of whether a copy of the international search report and copies of the references cited therein are present in the national stage file. The examiner will consider the documents cited in the international search report, without any further action by applicant under 37 CFR 1.97 and 1.98, when both the international search report and copies of the documents are indicated to be present in the national stage file. Otherwise, applicant must follow the procedures set forth in 37 CFR 1.97 and 1.98 in order to ensure that the examiner considers the documents cited in the international search report.

This notice applies only to documents cited in the international search report relative to a national stage application filed under 35 U.S.C. 371. It does not apply to documents cited in an international preliminary examination report that are not cited in the search report. It does not apply to applications filed under 35 U.S.C. 111 claiming the benefit of an international application filing date.

Practice relating to documents cited in a search report in an international application filed under the Patent Cooperation Treaty as set forth in § 609 of the Manual of Patent Examining Procedure will be modified in accordance with this notice.

Oct. 27, 1993

CHARLES E. VAN HORN  
Patent Policy and Projects Administrator  
Office of the Assistant Commissioner for Patents

[1156 OG 91]



(118) Department of Commerce  
Patent and Trademark Office

37 CFR Parts 1 and 10  
[Docket No. 950403086-5086-01]  
RIN 0651-AA72

# Revisions of Patent Cooperation Treaty Provisions

Agency: Patent and Trademark Office, Commerce  
Action: Final Rule

**Summary:** The Patent and Trademark Office (Office) is amending the rules of practice relating to applications filed under the Patent Cooperation Treaty (PCT) in accordance with revised regulations under the PCT. The changes will result in a procedure whereby international applications improperly filed with the United States Receiving Office (RO/US) will, for a fee, be forwarded for processing to the International Bureau as Receiving Office.

**Effective Date:** June 1, 1995

**For Further Information Contact:** Charles Pearson at (703) 308-6515.

**Supplementary Information:** In a Notice of Proposed Rule-making published in the *Federal Register* at 59 FR 33707 (June 30, 1994) and in the Patent and Trademark Office *Official Gazette* at 1164 Off. Gaz. Pat. Office 77 (July 26, 1994), the Office proposed to amend several rules of practice in patent cases. Recent changes to the PCT Regulations include the addition of a new section (PCT Rule 19.4) which provides for transmittal of an international application to the International Bureau, acting in its capacity as Receiving Office, in certain instances. Under the regulations currently in effect, at least one applicant is required, on filing the international application in the United States, to be a resident or national of the United States.

The practice under the revised PCT Regulations permits an international application filed with the United States Receiving Office to be forwarded to the International Bureau for processing in its capacity as a Receiving Office if the international application does not name an applicant who is indicated as being a U.S. resident or national, but names an applicant who is indicated as a resident or national of another PCT Contracting State or if the indication of residence or nationality of the applicant is missing. The Receiving Office of the International Bureau will consider the international application to be received as of the date accorded by the United States Receiving Office. This practice will avoid the loss of a filing date in those instances where the United States Receiving Office is not competent to act, but where the international application is filed by an applicant who is a national or resident of a PCT Contracting State. Where questions arise regarding residence and nationality, e.g., where residence and nationality are not clearly set forth, the application will be forwarded to the International Bureau as Receiving Office. If all applicants are indicated to be residents and nationals of non-PCT Contracting States, PCT Rule 19.4 does not apply and the application is denied an international filing date.

## Discussion of Specific Rules

Section 1.412(c)(6) is added to reflect that the United States Receiving Office, where it is not a competent Receiving Office under PCT Rule 19.1 or 19.2, could transmit the international application to the International Bureau for processing in its capacity as a Receiving Office.

Section 1.421(a) is amended to clarify that applications filed by applicants who are not residents or nationals of the United States, but who are residents or nationals of a PCT Contracting State or who indicate no residence or nationality, will, upon timely payment of the proper fee, be forwarded to the International Bureau for processing in its capacity as a Receiving Office.

Section 1.445(a)(5) is added to establish a fee equivalent to the transmittal fee in paragraph (a)(1) of this section for transmittal of an international application to the International Bureau for processing in its capacity as a Receiving Office.

Section 10.9 is amended to add a new provision consistent with PCT Rule 90.1, clarifying that an attorney or agent having the right to practice before the International Bureau when acting

as Receiving Office may represent the applicant before the U.S. International Searching Authority or the U.S. International Preliminary Examining Authority. An individual who has the right to practice before the International Bureau when acting as Receiving Office, and who is not registered under § 10.6, may not prosecute patent applications in the national stage in the Office.

## Response to Comments on The Rules

The comments received in response to the notice of proposed rulemaking have been given careful consideration. The comments and responses are discussed below.

**Comment:** One comment was received which approved of the proposed rule changes but noted other aspects of the U.S. National Phase filing procedures that could be changed to make the PCT more user-friendly.

**Response:** The Office is interested in making the PCT more user-friendly. Amendments to §§ 1.494 and 1.495, which were effective on May 1, 1993, removed many of the differences in practice involving the filing of a regular U.S. application under 35 U.S.C. 111 and the entry of the national stage under 35 U.S.C. 371. These regulations now provide for a notice of missing requirements, similar to a notice under § 1.53(d), where a defective oath or declaration or a defective translation is filed.

**Comment:** Regarding § 1.412(c), one comment suggested that the proposed rule should be made consistent with PCT Rule 19.4(b) which provides for the transmittal of international applications to the International Bureau as Receiving Office "unless prescriptions concerning national security prevent the international application from being so transmitted" by incorporating such language into the proposed rule.

**Response:** The Office has adopted the suggestion and modified the rule by incorporating the suggested language from PCT Rule 19.4(b) in the regulation.

**Comment:** One comment regarding § 1.445(a)(5) mentioned that the word "competent" should be deleted because it is not "necessary and may be inaccurate" when no applicant in an international application is a "resident or national of a PCT Contracting State."

**Response:** The Office has adopted the suggestion and modified the rule by deleting "competent" from § 1.445(a)(5). The second occurrence of the word "competent" has also been deleted from 37 CFR § 1.412(c)(6), for the same reasons.

**Comment:** Regarding § 10.9(c), there were a few comments which focus on the wording. Specifically, one comment noted that the word "appointed" is confusing because it is not clear if it includes "an officer or employee of a legal-entity patent applicant" in cases where the United States of America is not designated. An example was provided which noted "if the only applicant was XYZ Company, would the president of the Company be authorized to prosecute the application before the USPTO as an International Searching and Preliminary Examining Authority? In countries permitting assignee filing it is normal for any authorized officer or employee of the company to be able to represent the company without regard as to whether he is authorized to practice as an agent or attorney before the patent office."

**Response:** The proposed regulation is sufficiently clear on this point. If a person has the authority to represent an applicant, either a legal entity applicant or a real person, before the International Bureau as Receiving Office, then that person has the right to represent that applicant before the United States International Searching Authority and the United States International Preliminary Examining Authority.

**Comment:** Another comment about Rule 10.9(c) is that the word "only" is overlimiting and should be deleted from the Rule because it excludes Article 19 amendments filed before the International Bureau. It was suggested that the Rule be changed as follows: "... prosecute an International Application before the United States Patent and Trademark Office acting as an International Searching or Preliminary examining Authority, ..."

**Response:** The Office will not adopt the suggestion. The word "only" in the Rule signifies that such persons may not prosecute an international application in the national stage before the USPTO. The rule is not meant to control who may practice before the International Bureau. Such a person would

clearly be allowed to file Article 19 amendments with the International Bureau by virtue of PCT Rule 90.1(a)

**Comment:** A final comment made about Rule 10.9(c) is that the last phrase added is "too broad" because it does not recite who is entitled to act before the International Bureau. It was suggested that the rule should be changed to include the phrase "... for a national Office of a Contracting State of which an applicant is a resident or national— at the end of the rule."

**Response:** The Office has adopted the suggestion to the extent that an explicit reference to PCT Rule 83.1<sup>1a</sup> has been inserted in the regulation. Since PCT Rule 83.1<sup>1a</sup> clearly sets forth who may practice before the International Bureau, it is not necessary to repeat that information here. Thus, the regulation clearly sets forth who may practice before the United States International Searching and Preliminary Examining Authorities.

## Other Considerations:

The rule changes are in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 et seq., Executive Order 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. These rule changes have been determined to be not significant for the purposes of Executive Order 12866.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)), because the rules would affect only a small number of international applications and would provide more streamlined and simplified procedures for filing and prosecuting international applications under the PCT.

The Office has also determined that these rule changes have no federalism implications affecting the relationship between the National government and the States as outlined in Executive Order 12612.

These rule changes will not impose any additional burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. The paperwork burden imposed by adherence to the PCT is currently approved by the Office of Management and Budget under control number 0651-0021.

## List of Subjects 37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Reporting and record keeping requirements, Small businesses.

## 37 CFR Part 10

Administrative practice and procedure, Inventions and patents, Lawyers, Reporting and record keeping requirements, Trademarks.

For the reasons set forth in the preamble, 37 CFR Parts 1 and 10 are amended to read as follows:

## Part 1 - Rules of Practice in Patent Cases

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6 unless otherwise noted.

2. Section 1.412 is amended by adding new paragraph (c)(6) to read as follows:

## § 1.412 The United States Receiving Office.

\*\*\*\*\*

(c) \*\*\*

(6) Reviewing and, where the United States Receiving Office is not the competent Receiving Office under § 1.421(a) and PCT Rule 19.1 or 19.2, transmitting the international application to the International Bureau for processing in its capacity as a

Receiving Office unless prescriptions concerning national security prevent the application from being so transmitted (PCT Rule 19.4).

3. Section 1.421 is amended by revising paragraph (a) to read as follows:

## § 1.421 Applicant for International Application.

(a) Only residents or nationals of the United States of America may file international applications in the United States Receiving Office. If an international application does not include an applicant who is indicated as being a resident or national of the United States of America, and at least one applicant:

(1) has indicated a residence or nationality in a PCT Contracting State, or

(2) has no residence or nationality indicated; applicant will be so notified and, if the international application includes a fee amount equivalent to that required by § 1.445(a)(5), the international application will be forwarded for processing to the International Bureau acting as a Receiving Office. (See also § 1.412(c)(6)).

4. Section 1.445 is amended by adding new paragraph (a)(5) to read as follows:

## § 1.445 International application filing, processing and search fees.

(a) \*\*\*

(5) A fee equivalent to the transmittal fee in paragraph (a)(1) of this section for transmittal of an international application to the International Bureau for processing in its capacity as a Receiving Office (PCT Rule 19.4).

\*\*\*\*\*

5. The authority citation for 37 CFR Part 10 would continue to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

6. Section 10.9 is amended by revising paragraph (c) to read as follows:

## § 10.9 Limited recognition in patent cases.

\*\*\*\*\*

(c) An individual not registered under § 10.6 may, if appointed by applicant to do so, prosecute an international application only before the U.S. International Searching Authority and the U.S. International Preliminary Examining Authority, provided: the individual has the right to practice before the national office with which the international application is filed (PCT Art. 49, Rule 90 and § 1.455) or before the International Bureau when acting as Receiving Office pursuant to PCT Rules 83.1<sup>1a</sup> and 90.1.

April 25, 1995 LAWRENCE J. GOFFNEY, JR.  
Acting Assistant Secretary of Commerce and  
Acting Commissioner of Patents and Trademarks



(119) Department of Commerce  
Patent and Trademark Office  
[Docket #:951019254-5254-01]  
RIN 0651-XX05

# Proposed Changes in Procedures Relating to an Application Filing Date

Agency: Patent and Trademark Office, Commerce.  
Action: Notice; Request for Comments.

Summary: The Patent and Trademark Office (PTO) requests written public comment on a proposed change in procedures relating to the treatment of *prima facie* incomplete applications. Currently, applications filed without all the pages of the specification or without all of the figures of the drawings are treated as *prima facie* incomplete and not accorded a filing date. The PTO is considering changing this procedure to accord a filing date to any application that contains something that can be construed as a written description, any necessary drawing, and a claim.

Dates: Written comments will be accepted by the PTO until January 12, 1996.

Addresses: Written comments should be addressed to Box DAC, Assistant Commissioner for Patents, Washington, D.C. 20231. Comments may also be sent by facsimile transmission to (703) 308-6916, with a confirmation copy mailed to the above address, or by electronic mail over the Internet to [filedate@uspto.gov].

For Further Information Contact: Robert W. Bahr by telephone at (703) 305-9285, by facsimile at (703) 308-6916, or Jeffrey V. Nase by telephone at (703) 305-9285, or by mail addressed as indicated above.

## Supplementary Information

The PTO is considering changes in procedures relating to the treatment of *prima facie* incomplete applications. Currently, applications filed without all the pages of the specification (Section 608.01 of the Manual of Patent Examining Procedure (MPEP)) (e.g., with page numbering revealing that page(s) are missing), or without all of the figures of the drawings (MPEP 608.02) (e.g., without drawing figures that are mentioned in the specification), are treated as *prima facie* incomplete and not accorded a filing date. The Initial Application Examination Division (formerly the Application Processing Division) in the Office of Initial Patent Examination (formerly the Office of National Application Review) mails a Notice of Incomplete Application indicating that a filing date has not been assigned to the application, and indicating that: (1) the filing date will be the date of receipt of the missing items, and (2) any assertion that the missing item was submitted, or not necessary for a filing date, must be by way of petition (with the \$130 fee). MPEP 506.02. To obtain the date of deposit of the application as the filing date, the applicant must: (1) establish receipt in the PTO of the allegedly missing item (generally by way of postcard receipt in accordance with MPEP 503), in which case the petition fee is refunded, or (2) petition to have the application accepted as deposited, in which case the petition fee is not refunded.

A petition to have the application accepted as deposited requires: (a) an amendment deleting all references to the missing item and correcting the sequential numbering of the pages or drawings in the application, (b) a request to cancel the missing item, if such missing item has been submitted after the date of deposit, and (c) a supplemental oath or declaration by the applicant stating that the invention is adequately disclosed in, and a wish to rely on, the application as thus amended without the missing item and the references thereto in the specification, for purposes of an original disclosure and filing date. The supplemental oath or declaration by the applicant is a statement in writing evidencing that the applicant has been informed of the content of his or her application as filed on the original date of deposit and that the actual content has been reviewed and understood.

As a significant number of applicants are willing to accept the application without the "missing part," the procedure of requiring the applicant to file a petition to obtain the date of deposit as the filing date results in numerous filing date petitions. The preparation by applicants and the consideration by

the PTO of some 3000 such petitions a year is time consuming and burdensome. In addition, in most instances there is no controversy as to the content of the *prima facie* incomplete application (i.e., a grantable petition requires only the above-mentioned corrective amendment(s) and supplemental oath or declaration). Finally, the \$130 petition fee does not cover the administrative cost of treating such *prima facie* incomplete applications and petitions.

Accordingly, the PTO is considering changing the procedure for the treatment of applications filed without all the pages of the specification or without all of the figures of the drawings. These changes in practice would not require any amendment to the rules of practice.

The Initial Application Examination Division will continue to review application papers for completeness in the manner that such papers are currently reviewed.

## Applications Filed Without All Drawings or Pages of Specification

There is no requirement in the statutes or regulations that an application include sequentially numbered pages, or all of the pages, or all of the drawings referred to in the specification to obtain a filing date. That is, while 37 CFR 1.52(b) provides that the pages of the application should be numbered consecutively, the regulations do not provide that compliance with 37 CFR 1.52 is necessary to obtain a filing date. Therefore, applications which contain something that can be construed as a written description, where drawing figure(s) are referred to in the written description, at least one drawing figure, and at least one claim, but are filed with page numbering revealing that page(s) are missing or without all of the drawing figures which are mentioned in the specification will be treated by mailing a notice that indicates that the application papers so deposited have been accorded a filing date, but are lacking some of the pages of specification or drawings described in the specification. The mailing of such a notice will permit applicants to either: (1) promptly establish prior receipt in the PTO of the item(s), or (2) promptly submit the omitted item(s) and request a later filing date.

The notice will also indicate that:

(a) an applicant asserting that the mentioned item was in fact deposited in the PTO with the application papers must file a petition (and \$130 petition fee, which will be refunded if it is determined that the item was in fact received by the PTO) with evidence of such deposit within two months of the date of the notice (37 CFR 1.181(f)).

(b) an applicant desiring to "complete" the application and accept the date of completion as the filing date must file any missing items (with a supplemental declaration referring to such items) and a petition under 37 CFR 1.182 (with the \$130 petition fee) requesting the later filing date within two months of the date of the notice (37 CFR 1.181(f)), and

(c) an applicant willing to accept the application as deposited in the PTO need not respond to the notice, and the failure to file a petition (and \$130 petition fee) under options (a) or (b) above within two months of the date of the notice (37 CFR 1.181(f)) will be treated as a constructive acceptance by the applicant of the application as deposited in the PTO.

The application will be retained in the Initial Application Examination Division for a period of two months from the mailing date of such a notice to permit the applicant to either establish prior receipt in the PTO of the item(s), or submit the omitted item(s) and request a later filing date within this two-month time period. As an applicant may, but is not required to, respond to such a notice, extensions of time under 37 CFR 1.136 will not be applicable to this two-month time period. At the expiration of this two-month non-extendable time period the application will be forwarded to the appropriate examining group for examination of the application. The application will be accorded a filing date as of the date of deposit of the application papers in the PTO. The original application papers (i.e., the original disclosure of the invention) will include only those application papers present in the PTO on the date of deposit.

Due to the effect that a loss of filing date can have on an application, currently the PTO generally treats untimely filing date petitions on their merits since the application, as incomplete, will have undergone no further processing or examina-

## (120) Training Materials on the Final Utility Examination Guidelines are Available

Copies of materials developed to train Examiners on how to apply the Final Utility guidelines are now available to the public.

On January 3, 1995 the Patent and Trademark Office (PTO) published in the Federal Register (60 FR 97) proposed utility examination guidelines establishing the policies and procedures to be followed by Examiners when examining applications for compliance with the utility requirement of 35 U.S.C. § 101. Comments from interested members of the public were requested at that time. On July 14, 1995 the PTO published in the Federal Register (60 FR 36263) the final version of the guidelines to be used by Office personnel in their review of patent applications for compliance with the utility requirement of 35 U.S.C. § 101 and 35 U.S.C. § 112, first paragraph.

Training materials to supplement the Legal Analysis and Utility Examination Guidelines are now available. The training materials include a brief synopsis designed to give quick generic guidance with regard to the most common situations where a question of utility under 35 U.S.C. § 101 and 35 U.S.C. § 112, first paragraph might arise. Examples which are frequent in the examining groups are presented for each of the six categories identified and have been drafted as raising various questions concerning the utility examination guidelines.

Requests for paper copies submitted by mail should be addressed to the Commissioner of Patents and Trademarks, marked to the attention of Jeff Kushan, Box 4, Patent and Trademark Office, Washington, D.C. 20231. Requests in person may be submitted in Room 902, Two Crystal Park, 2121 Crystal Drive, Arlington, Virginia. Requests may also be submitted by telephone at (703) 305-9300 and by telefax at (703) 305-8885.

The training materials are available for retrieval from the Internet (address: www.uspto.gov) or File Transfer Protocol (address: ftp.uspto.gov). This material can also be accessed on the PTO Bulletin Board System at (703) 305-8950 by using a computer with a modem and telecommunication software set at any speed from 1200 to 9600 baud, 8 character bits, no parity, and 1 start/stop bit.

August 4, 1995

STEPHEN G. KUNIN  
Deputy Assistant Commissioner for  
Patent Policy and Projects

[1177 OG 171]

## (121) Patent Examiner Legal Training

In a notice which first appeared in the *Official Gazette* dated April 25, 1995 (1173 OG 426), the Patent and Trademark Office (PTO) set forth its intention to establish a Juris Masters (JM) Program to improve the legal competency of its patent professionals. That notice described the Program concept and requested public comment. In response to the notice, a total of four (4) written comments were received.

Based upon the comments received, PTO has determined that a legal studies program consisting of 6 or 7 core law school courses such as contracts, evidence and constitutional law should be offered as part of a JM Program. Consequently, the PTO has entered into an interagency agreement with the Department of Agriculture Graduate School (hereafter USDA) to arrange for an accredited law school to teach the courses and administer the JM Program.

Any accredited law school interested in participating in the Program or seeking further information should contact John Wells of the USDA Graduate School at (703) 308-5306 no later than October 31, 1995.

EDWARD R. KAZENSKE  
Deputy Assistant Commissioner  
for Patents

[1179 OG 56]

tion. In the procedure set forth in this notice, however, the PTO will strictly adhere to the two-month period set forth in 37 CFR 1.181(f), and dismiss as untimely any petition not filed within this two-month period. This strict adherence to the two-month period set forth in 37 CFR 1.181(f) is necessary since: (1) such applications will now be forwarded for examination at the end of this two-month period, (2) according to the application a filing date later than the date of deposit may affect the date of expiration of any patent issuing on the application under Public Law 103-465, and (3) the filing of a continuation-in-part application is a sufficiently equivalent mechanism for adding additional subject matter to avoid the loss of patent rights.

## Applications Filed Without at Least One Claim

35 U.S.C. 111(a)(2) provides, in part, that an "application shall include (A) a specification as prescribed by section 112 of this title; (B) a drawing as prescribed by section 113 of this title; and (C) an oath by the applicant as prescribed by section 115 of this title," and 35 U.S.C. 111(a)(4) provides that the "filing date of an application shall be the date on which the specification and any required drawing are received in the Patent and Trademark Office." 35 U.S.C. 112, second paragraph, provides that "[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." Therefore, 35 U.S.C. 111 and 112, second paragraph, provide that the filing date of an application is that date on which a specification including at least one claim(s) is filed in the PTO. *In re Mattson*, 208 USPQ 168 (Comm'r Pat 1980). Since a claim is a statutory requirement for a filing date, applications filed without a claim will not be accorded a filing date. In situations in which an application is filed without a claim, the Initial Application Examination Division will continue to mail a notice of Incomplete Application, and the treatment of such applications will remain unchanged.

## Applications Filed Without Any Drawings

35 U.S.C. 111(a)(2) provides, in part, that an "application shall include . . . a drawing as prescribed by section 113 of this title" and 35 U.S.C. 111(a)(4) provides, in part, that the "filing date of an application shall be the date on which the specification and any required drawing are received in the Patent and Trademark Office." 35 U.S.C. 113 in turn provides that an "applicant shall furnish a drawing where necessary for the understanding of the subject matter sought to be patented." Drawings are usually not necessary for an understanding of the subject matter in process and composition applications (i.e., applications having claims directed to a process or composition (MPEP 608.02)). As such, applications having at least one process or composition claim and describing drawing figures in the specification, but filed without drawings, will be treated as an application filed without all of the drawings referred to in the specification as discussed above and processed for examination. Applications having at least one process or composition claim which do not describe drawing figures in the specification will simply be processed for examination. In a situation in which the appropriate examining group determines that drawings are necessary under 35 U.S.C. 113, the filing date issue will then be reconsidered on reference from the examining group.

In design applications, the Initial Application Examination Division will continue to mail a notice of Incomplete Application indicating that the application lacks the drawings required under 35 U.S.C. 113, and the applicant may: (a) file a petition (and \$130 fee) asserting that the missing item was submitted, or not necessary for a filing date, or (b) "complete" the application and accept the date of completion as the filing date.

November 3, 1995

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

[1181 OG 12]



**TRADEMARK APPLICATION  
EXAMINATION AND CONTENT**

**(122) Interviews Involving Trademark Application**

Interviews frequently result in a better understanding of the issues involved, shorten the prosecution and facilitate disposal of applications.

Interviews for discussion of registrability of the mark of a pending application will not be had before the first official Office action thereon and ordinarily not before filing the first response. Arrangements for an interview should be made in advance so that the Examiner may review the case and be familiar with the details involved.

Interviews on Friday will no longer be prohibited as a matter of policy but all interviews should be set at a time satisfactory to all parties concerned.

A memorandum summarizing the conclusions reached at the interview should be prepared by the Examiner and placed in the application file. The memorandum will be retained in the application file until the prosecution is completed. Such procedure will not, however, relieve the applicant of the responsibility of complying with the requirements of Trademark Rule 2.62.

July 6, 1964

HORACE B. FAY, JR.  
*Assistant Commissioner  
of Patents*

This supersedes the notice of Feb. 10, 1958. (728 O.G. TM 1)

[804 O.G. TM 147]

**(123) Trademark Examining Procedure for  
Amended Applications; Reporting Oldest  
Dates of Amended Trademark Applications**

Effective immediately, the order in which amendments to trademark applications are examined is changed. Previously, Examiners have usually acted on amended cases in order of filing date of the application which the amendment concerned, i.e., amended cases with the oldest filing date were examined first. Under the new procedure, amended cases will normally be examined in the order in which the amendment or other response is received, i.e., amendments that are received first will normally be examined first.

Effective with this issue of the *Official Gazette* (Trademark Section) in order to reflect more accurately the condition of division dockets, the column reporting the date of the oldest amended application in each division has been changed to indicate the date of receipt of the oldest filed amendment. Under this new method of reporting the oldest date of receipt of a filed amendment upon which no action has been taken by an Examiner will be indicated for each division of the Trademark Examining Operation.

July 15, 1971

RENE D. TEGTMEYER  
*Assistant Commissioner*

[889 O.G. TM 6]

**(124) Trademark Office Actions**

Effective immediately Applicants or their attorneys will be provided with only one carbon copy of any office action, and the mailing of an additional carbon copy will be discontinued.

This change is consistent with the current practice in the patent examining operations and should result in greater efficiency in the preparation and mailing of office actions.

Feb. 7, 1972

ROBERT GOTTSCHALK  
*Commissioner of Patents*

[895 O.G. TM 238]

(125)

**Petition to Make Trademark  
Applications Special**

The practice of expediting the prosecution of new trademark applications on request of the applicant (accelerated prosecution) was rescinded, effective Aug. 1, 1971 (36 F.R. 13231, July 16, 1971; 825 O.G. 2). This action was taken after a careful study of the practice, including a recommendation of the Public Advisory Committee for Trademark Affairs that the Patent Office terminate accelerated prosecution of trademark applications. The study considered both the effect of the procedure on the workload of the Trademark Operations and the broader interest of examining trademark applications in an order which is equitable to all applicants.

Since the termination of this practice, the Office has experienced some increase in the number of petitions requesting the Commissioner to invoke his supervisory authority pursuant to Rule 2.146 in order to advance the examination of applications out of their regular order. This was to be expected since applicants who might have been able to show special circumstances entitling them to advanced examination could previously achieve this special treatment without resorting to a petition. However, some of the petitions now being received are not considered sufficient to justify the extraordinary relief of invoking the supervisory authority of the Commissioner for the purpose of advancing the applications out of their regular order.

In particular, a number of such petitions have been based on the ground that the applicant is about to embark on an advertising campaign or to commit advertising or promotional expenditures in which the mark applied for is material. Such a ground is not considered to constitute appropriate circumstances justifying the advancement of the application out of its regular turn and the petitions based on such ground have been and will continue to be denied. The principal reason for the denial is that these circumstances are applicable to a substantial portion of the trademark applications filed in the Patent Office. The supervisory authority of the Commissioner should be exercised only where an extraordinary reason for such action has been disclosed. See *Anderson & Dyer v. Lewry*, 89 O.G. 1861, 1899 C.D. 230, and *Wilputte v. Van Ackeren*, 103 USPQ 235. Thus, the extraordinary remedy of invoking the supervisory authority of the Commissioner is not considered appropriate under these circumstances.

In the interest of equitable treatment of all applicants, the policy of the Office in granting such petitions will be restricted to those cases in which particular and very special circumstances exist, such as a demonstrable possibility of loss of substantial rights, rather than circumstances which would be equally applicable to a large number of other applicants for trademark registration.

Mar. 13, 1972

ROBERT GOTTSCHALK  
*Commissioner of Patents*

[897 O.G. TM 2]

(126)

**Title 37-Patents, Trademarks,  
and Copyrights**

Chapter I-Patent Office, Department of Commerce

Parts 2 and 6-Rules of Practice in Trademark Cases  
*International Trademark Classification*

A proposal was published at 37 F.R. 6404 to revise § 6.1 of the Rules of Practice in Trademark Cases. The Patent Office proposed to establish the "International Classification of Goods and Services to Which Trademarks Are Applied" (the subject of the "Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks" of 1957, as revised at Stockholm on July 14, 1967) as the primary classification of goods and services for registration of trademarks and service marks. Pursuant to the Notice, written comments have been received, and a public hearing was held on June 14, 1972. Full consideration has been given to all matter presented, and changes in the text of the



original proposal have been made in view thereof. It has been determined that adoption of the international classification system is desirable.

The Patent Office has studied the international classification and, since Mar. 5, 1968, has indicated the appropriate international class in all publications and on all issued registrations and renewals as a subsidiary classification. Based on this experience and the comments received, it is now believed that adoption of the international schedule as the primary classification system is desirable. The international system is easier to administer because of fewer classes of goods and the availability of an alphabetical listing of goods and services.

The Nice Agreement provides for an International Committee of Experts whose objective is to keep the classification current. The classification of specific goods and services is set forth in the Alphabetical List entitled "International Classification of Goods and Services to Which Trademarks Are Applied" (published by the World Intellectual Property Organization). In addition, the International Trademark Classification List contains the names of the classes setting forth the basic contents of each class. The Alphabetical List also comprises explanatory notes which serve as guidelines for determining the appropriate international class for a specific product or service.

The alphabetical listing within the International Trademark Classification Manual is currently used by the Office as a guideline for determining the degree of particularity of identification of goods. See "Identification of Goods and Services in Trademark Applications," 36 F.R. 13232; July 16, 1971.

Applications for registrations filed on or after Sept. 1, 1973, and registrations issuing thereon, will be classified according to the international classification set forth in the new § 6.1. Accordingly, the international classification is adopted under Section 30 of the Trademark Act of all purposes under the statute and rules; and, therefore, will be the criterion for determining, inter alia, fees.

Applications for the registration of marks filed on or before Aug. 31, 1973, appeals or petitions to revive or oppositions filed in connection with said applications, and affidavits, renewals and petitions for cancellation filed in connection with registrations issuing thereon, will continue to be processed under the classification system existing at the time the mark was registered.

All applications which are published and registrations which are issued will carry both the appropriate international classification and existing U.S. classification number.

An insufficient fee, in connection with an appeal or opposition on any application or in connection with an affidavit or renewal filed in connection with any registration, will not render the same unacceptable, if the proper fee is submitted within a time limit set forth in a notification of the defect, providing the proper fee for at least one class has been originally submitted within the applicable time limit. This will be the case even if the full fee is not received within the sixth year in the case of an affidavit filed under Section 8 or before the end of the twentieth year, including the grace period, in the case of renewal applications, or within the six-month statutory response period in the case of an appeal, or within the thirty-day opposition period, or any extension thereof in the case of the filing of an opposition.

The existing classification system will continue to be used for searching registered and pending marks until all documents in the search file are organized on the basis of the international system of classification. Until this changeover is effected, the U.S. class designation will continue to be printed on all published applications and registrations issued under the existing or the international classification system to facilitate searching on the basis of the existing U.S. system of classification.

Until all applications filed on or before Aug. 31, 1973, have been disposed of, the trademark sections of the *Official Gazette*, which are organized by class, will include two sections: one for applications published or registrations issued on the basis of applications filed on or before Aug. 31, 1973, organized by class according to the U.S. schedule of classes; the other section for applications published or registrations issued on the basis of applications filed on or after Sept. 1, 1973, organized by class according to the new international schedule.

Certification marks and collective membership marks will continue to be classified as set forth in redesignated §§ 6.3 and 6.4.

Efforts will be made to have the International Trademark Classification List printed by the Government Printing Office or otherwise assure the availability of the List from local sources. Notification will appear in the *Official Gazette* when the List is available from local sources of the Government Printing Office.

The English edition of the "International Classification of Goods and Services to Which Trademarks Are Applied" can presently be ordered from:

Sales Branch, The Patent Office, Block C  
Station Square House, St. Mary Cray  
Orpington, Kent, England

Certain modifications and additions to the international trademark classification have been published as supplements and are also available from the British Office. In addition, and inasmuch as the World Intellectual Property Organization (WIPO) has issued the List in several languages, it is anticipated that an English version will be published by that organization.

We have been advised by the Patent Office of the United Kingdom that the only acceptable methods of payment for the International Trademark Classification List are by International Postal Money Order or by banker's draft payable in sterling and drawn on a bank in the United Kingdom.

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May 14, 1973

ROBERT GOTTSCHALK  
Commissioner of Patents

BETSY ANCKER-JOHNSON  
Assistant Secretary for  
Science and Technology

Published in 38 F.R. 41681, June 4, 1973

[911 O.G. TM 210]

(Note: Rule 2.85 (Classification schedules) was revised and Rule 6.1 (International schedule of classes of goods and services) was established as of September 1, 1973 by this notice: prior U.S. schedule of classes was redesignated as Rule 6.2.)

#### (127) Wording in Verification or Declaration of Trademark Application

Applicants and attorneys are requested to use the following wording in the part of the verification or declaration of the trademark application which indicates the signer's belief that the mark applied for does not resemble another person's mark:

—that no other person; firm, corporation, or association, to the best of his knowledge and belief, has the right to use such mark in commerce either in the identical form thereof or in such near resemblance thereto as to be likely when applied to the goods of such other person, to cause confusion, or cause likely, mistake, or to deceive: —

The wording emphasized conforms to the language of both Sections 1(a)(1) and 2(d) of the Trademark Act of 1946.

Some applicants and attorneys, instead of using the wording emphasized above, are still using the now obsolete wording "as might be calculated to deceive" which was promulgated in the forms under the Trademark Act of 1905 and inadvertently continued by the Act of 1946 up to October 1962 in Section 1(a)(1) and in the forms connected with the Act. Section 1(a)(1) of the 1946 Act was amended by Act of October 9, 1962 (Public Law 772, 87th Congress, 76 Stat. 769) to conform it to the language of Section 2(d) of the 1946 Act, since the language of Section 2(d) reflects the thinking at the time the 1946 Act was written. The wording of the trademark forms for the 1946 Act has also been amended appropriately.

It is desirable that proper wording be used. However, since the differences in wording referred to above are considered to be differences of form rather than of substance. Examiners will not require new verifications or declarations. When the obsolete

wording is observed and a letter is to be written for other reasons, Examiners will at that time call attention to the fact that the wording is obsolete and should be modified in applications in the future.

Mar. 25, 1974

RENE D. TEGTMEYER  
Assistant Commissioner  
for Trademarks

[921 O.G. TM 186]

(128)

#### Standardized Disclaimers

Beginning with the Nov. 9, 1982 issue of the *Official Gazette*, disclaimers in marks published for opposition and in those registered on the Supplemental Register will be printed in a standardized form, regardless of the text submitted. Certificates of registration for marks issued on the Supplemental Register will also contain the standardized disclaimer as of that date. Certificates of registration for marks issued on the Principal Register will contain the uniform statement beginning Feb. 1, 1983. The disclaimed matter will be taken from the disclaimer of record and inserted into a standardized disclaimer for printing and data base purposes. The new disclaimer text will take the following form:

No claim is made to the exclusive right to use apart from the mark as shown.

Aug. 30, 1982

MARGARET M. LAURENCE  
Assistant Commissioner  
for Trademarks

[1022 TMOG 44]

#### (129) Trademark "Revivals" and "Reinstatements"

It would be of great assistance to the Office if the heading or caption of "Petitions to Revive" or "Requests for Reinstatement" of abandoned trademark applications carried the following identifying data:

1. Address Paper to the Attention of:  
Office of Director, Trademark Examining Operation
2. Serial Number
3. Mark
4. Applicant's Name
5. A title indicating the nature of the paper

Use of this heading for "Petitions to Revive" or "Requests for Reinstatement" of abandoned trademark applications will help ensure that the papers are promptly routed to the proper Office, which will prevent needless delay in its consideration.

Aug. 13, 1984

MARK M. NEWMAN  
Director, Trademark  
Examining Operation

[1046 TMOG 13]

#### (130) T-Search Printouts as Section 2(d) References

As part of its ongoing automation program, the PTO is pleased to announce that on or about July 1, 1986, Trademark Examining Attorneys will use the automated Trademark search system (T-Search) exclusively for searching word marks. The Examining Attorneys will use computer printouts to advise applicants about Section 2(d) references. The printouts will include computer-generated facsimiles of the drawing where appropriate. The printouts will be used for word marks, whether the word is depicted in a typed drawing or in stylized form. Photocopies of certificates of registration will continue to be used for design marks.

The Patent and Trademark Office, in consultation with the Public Advisory Committee for Trademark Affairs, has established accuracy standards for the computerized data. Data elements which are not essential for examiner searching are being systematically checked and corrected. The following data elements which are essential for examiner searching purposes are essentially complete:

1. MARK
2. SERIAL NUMBER
3. REGISTRATION NUMBER
4. FILING DATE
5. REGISTRATION DATE
6. GOODS AND SERVICES
7. INTERNATIONAL CLASS
8. U.S. CLASS

Subject to the above caveat, the printouts will contain all the information that appears on the certificate of registration with one exception. If an application for registration was based on Section 44, 15 U.S.C. 1126, the printout will indicate that the registration or application was filed under the provisions of Section 44 (using the notation "SECT 44"). The printout will also show the priority date if the application was filed under the provisions of Section 44(d). However, it will not indicate the country or certificate number of the foreign registration on which the U.S. registration was based.

The printouts will also contain additional registration information which was not provided under the non-automated system, as follows:

- A. Change in registration—This will indicate that a registration was changed after registration, such as by an amendment of the mark or identification of goods/services. The current information will be displayed in the printout.
- B. Affidavits—This indicates that a Section 8 affidavit of continued use was accepted, that a Section 15 affidavit of incontestability was acknowledged, or that a mark was republished under the provisions of Section 12(c).
- C. Renewals—Applicable renewal information, such as "1st Renewal" or "2nd Renewal" will be shown.
- D. Owner—In addition to listing the original registrant, the last known owner, as the change of ownership is acknowledged by the Office by virtue of examining an affidavit or renewal, will be included.

The following provides an explanation of the terms/symbols used in the printout:

1. Goods or services appearing in double parentheses ("()") were not included in a Section 15 affidavit.
2. Goods or services appearing in brackets "[ ]" were deleted after registration by amendment, correction, restriction or at the time of renewal.
3. Dates will appear as year, month and day. For example, June 20, 1983 will appear as 1983.06.20.
4. Goods and services will be indicated with the international class (IC), the prior U.S. classification (US), the identification, date of first use and date of first use in commerce.
5. Registrants (OWNER) will be listed showing the owner's name, entity designation (e.g., individual, partnership, corporation), country of citizenship or state or country of incorporation, and address.
6. Pseudo mark—This material is merely a search aid and has no bearing on the registration information.
7. Design search code—This is also merely an aid for computerized searching of design marks, by which a number is assigned to describe a particular design element. It has no bearing on the registration information.
8. Mark drawing code—This indicates the appearance of the mark, and again is not part of the registration data. There are six mark drawing codes.
  - 1—typed drawing
  - 2—design only
  - 3—words, letters and/or numbers and design



- 4—words, letters and/or number in block form (block letters; not typed drawing)  
5—words, letters and/or numbers in a stylized form  
6—sound marks

An example of a computer printout and a facsimile of a stylized word mark follow.

June 23, 1986

MARGARET M. LAURENCE  
Assistant Commissioner  
for Trademarks

Document 1 of 1 for SS 1: FD 1351766/RN,SN

WORD MARK  
TRANSLATION

GOODS AND SERVICES

MARK DRAWING CODE

SERIAL NUMBER

FILING DATE

CHANGE IN REGISTRATION

REGISTRATION NUMBER

REGISTRATION DATE

OWNER NAME AND ADDRESS

SECTION 44 INDICATOR

FOREIGN PRIORITY DATES

DISCLAIMER

TYPE OF MARK

REGISTER

LINEA ADRIANO  
THE WORDS "LINEA ADRIANO" IN THE MARK MAY BE  
TRANSLATED INTO ENGLISH AS "LINE HADRIAN"  
IC 025; US 039; G & S; ARTICLES OF CLOTHING  
FOR MEN, NAMELY JACKETS, COATS, SUITS,  
TROUSERS, JUMPERS, SHIRTS AND TIES  
(5) WORDS, LETTERS, AND/OR NUMBERS IN  
STYLIZED FORM  
73-446250  
1983.10.06  
CHANGE IN REGISTRATION HAS OCCURRED:  
1351766  
1985.07.20  
(REGISTRANT) RITEX AG KLEIDERFABRIK ZOFINGEN  
CORPORATION, SWITZERLAND FUNKENSTRASSE 10  
ZOFINGEN AARGAU SWITZERLAND  
SECT 44  
1983.06.20  
NO CLAIM IS MADE TO THE EXCLUSIVE RIGHT TO  
USE "LINEA" APART FROM THE MARK AS SHOWN  
TRADEMARK  
PRINCIPAL

TME59136

73446250

Linea Adriano

[1068 TMOG 7]

(131) Nonregistrability of Misleading Geographic  
Indications—Amendment of the Trademark Act  
by the North American Free Trade  
Agreement Implementation Act

Article 1712 of the North American Free Trade Agreement (NAFTA) requires the United States, Canada and Mexico to prohibit the use or Trademark registration of geographical indications in connection with goods that do not originate in the indicated territory, region or locality, if the public would be misled as to the geographical origin of the goods.<sup>1</sup>

President Clinton signed the "North American Free Trade Agreement Implementation Act," Public Law 103-182, 107 Stat. 2057, on Dec. 8, 1993. The legislation, amending Sections 2(e), 2(f) and 23(a) of the Trademark Act, applies to applications filed on or after Dec. 8, 1993, and took effect on Jan. 1, 1994. The Act, entitled "An Act to provide for the registration and protection of trademarks in commerce, to carry out the provisions of certain international conventions, and for other purposes," approved July 5, 1946, commonly referred to as the Trademark Act of 1946, has been amended as indicated. Amendments are shown in italics:

## I. Subsection 2(e) (15 U.S.C. 1052(e)):

"(e) Consists of a mark which (1) when used on or in connection with the goods of the applicant is merely descriptive or deceptively misdescriptive of them, (2) when used on or in connection with the goods of the applicant is primarily geographically descriptive of them, except as indications of regional origin may be registrable under section 4, (3) when used on or in connection with the goods of the applicant is primarily geographically deceptively misdescriptive of them, or (4) is primarily merely a surname."

## II. Subsection (f) (15 U.S.C. 1052(f)):

"(f) Except as expressly excluded in paragraphs (a), (b), (c), (d), and (e)(3) of this section, nothing herein shall prevent the registration of a mark used by the applicant which has become distinctive of the applicant's goods in commerce. The Commissioner may accept as prima facie evidence that the mark has become distinctive, as used on or in connection with the applicant's goods in commerce, proof of substantially exclusive and continuous use thereof as a mark by the applicant in commerce for the five years before the date on which the claim of distinctiveness is made. *Nothing in this section shall prevent the registration of a mark which, when used on or in connection with the goods of the goods of the applicant, is primarily geographically deceptively misdescriptive of them, and which became distinctive of the applicant's goods in commerce before the date of the enactment of the North American Free Trade Agreement Implementation Act.*"

## III. Section 23(a)(15 U.S.C 1091(a)):

"(a) In addition to the principle register, the Commissioner shall keep a continuation of the register provided in paragraph (b) of section 1 of the Act of March 19, 1920, entitled "An Act to give effect to certain provisions of the convention for the protection of trademarks and commercial names, made and signed in the city of Buenos Aires, in the Argentine Republic, August 20, 1910, and for other purposes", to be called the supplemental register. All marks capable of distinguishing applicant's goods or services and not register herein provided, except those declared to be unregistrable under subsections (a), (b), (c), (d), and (e)(3) of section 2 of this Act, which are in lawful use in commerce by the owner thereof, on or in connection with any goods or services may be registered on the supplemental register upon the payment of the prescribed fee and compliance with the provisions of subsections (a) and (e) of section 1 so far as they are applicable. *Nothing in this section shall prevent the registration on the supplemental register of a mark, capable of distinguishing the applicant's goods or services and not registrable on the principal register under this Act, that is declared to be unregistrable under section 2(e)(3), if such mark has been in lawful use in commerce by the owner thereof, on or in connection with any goods or*

services, since before the date of the enactment of the North American Free Trade Agreement Implementation Act."

A mark which is unregistrable on the Principal Register under 2(e)(3) of the Trademark Act, as amended, on the ground that it is primarily geographically deceptively misdescriptive of the goods or services, may be registered under 2(f) only if it became distinctive of the goods or services in commerce before December 8, 1993. Similarly, such a mark, capable of distinguishing the applicant's goods or services, may be registered on the Supplemental Register only if it has been in lawful use in commerce by the owner since before December 8, 1993. A mark that is unregistrable under 2 (e)(3) because it contains matter which is primarily geographically deceptively misdescriptive of the goods or services will not be rendered registrable by a disclaimer of the geographically deceptively misdescriptive component. Matter which is primarily geographically deceptively misdescriptive may be omitted or deleted from the drawing in appropriate cases.

1 The Article also prohibits any use constituting unfair competition within the meaning of Article 10bis (Unfair Competition) of the Paris Convention.

April 1, 1994

ROBERT ANDERSON  
Acting Assistant Commissioner  
for Trademarks

[1162 TMOG 15]

(132)

Department of Commerce  
Patent and Trademark Office

U.S. Patent and Trademark Office  
Trademark Examining Groups

EXAMINATION GUIDE NO. 1 - 95

Issued April 14, 1995

- A. Examiner's Amendments  
B. Assertion of Use in "Interstate Commerce" by Foreign Applicants  
C. Prior U.S. Classification  
D. Disclaimers  
E. Signatory Identified as Officer of Corporate Applicant  
F. Apparent Discrepancies Between Dates of Use and Execution Dates

## A. Examiner's Amendments

Previously, in order to initiate most examiners amendments, examining attorneys were required to contact the applicant or its attorney for approval. Examiner's amendments without the applicant's or attorney's authorization were permitted only for changes in classification prior to publication. TMEP §§ 1111 and 1111.02. Examining attorneys may now exercise discretion to amend applications by examiner's amendment without the applicant's prior approval in the following situations:

1. changes to international classification, except where the change is made after publication and the change would require republication of the mark;
2. deletion of "TM," "SM," "®" or "©" from the drawing;
3. addition of a formal description of the mark where it is necessary and where the record already contains an informal indication of what the mark comprises;

example: The cover letter with the application refers to the mark as a stylized golf ball design. If appropriate, the examining attorney could enter an amendment that "the mark consists of the stylized design of a golf ball."



4. amendment of the application to clarify that the mark is in typed form when the record clearly indicates that the drawing is supposed to be in typed form;

5. amendment of the method-of-use clause to insert a reference to the use shown by the specimens (including substitute specimens), when the application includes a method-of-use clause that does not refer to such use (The method-of-use clause need not be amended, however, if it specifies use "in other ways customary in the trade," and the specimens show a type of use customary in the trade, or if the clause includes other language that encompasses the use shown by the specimens.);

6. addition of lining and stippling statements, other than color lining statements, where such a statement is necessary, and where the significance of the lining or stippling is indicated by specimens or other information of record;

7. correction of obvious misspellings in the identification of goods and services.

**example:** The goods are recited as "T-shirt." The examining attorney could amend to "T-shirts." However, "shirt" could not be amended to "shirts" without calling the applicant, because "shirt" might also be a misspelling of "shorts."

Disregard TMEP § 1111 to the extent that it conflicts with the above policy. Examining attorneys should continue to secure the applicant's approval for the above changes if calling the applicant on other matters, or if the record contains any ambiguity as to the applicant's intent.

Any applicant who disagrees with any of these changes should contact the examining attorney promptly after receipt of the examiner's amendment. See: TMEP § 804.10(d).

#### B. Assertion of Use in "Interstate Commerce" by Foreign Applicants

Examining Attorneys should discontinue issuing inquiries concerning the assertion of use in "interstate commerce" by foreign applicants under TMEP § 904.03(c).

#### C. Prior U.S. Classification

Examining attorneys no longer need to determine or enter the "correct" U.S. classes for goods and services. Effective March 2, 1995, all U.S. classes are automatically assigned by TRAM-2 based upon the International Class that has been assigned to the goods or services.

Whenever an International Class is added, dropped, or changed, TRAM-2 will update the U.S. Class with an automated table. Examining attorneys not only are not expected to modify the U.S. Class listing, but are not able to amend this field. This applies whether the amendment arises in a response or through an examiner's amendment.

#### D. Disclaimers

A disclaimer may be limited to pertain to only certain classes or certain goods or services.

#### E. Signatory Identified as Officer of Corporate Applicant

If the individual who signed an application or other document on behalf of a corporate applicant is identified as an officer of the applicant, the examining attorney need not require that the applicant specify the particular office held by that person. Disregard TMEP § 803.09 to the extent that it conflicts with this policy.

#### F. Apparent Discrepancies Between Dates of Use and Execution Dates

If an application, amendment to allege use or statement of use specifies a date of first use or first use in commerce only by the year, or by the month and year, and the date would be

interpreted, according to TMEP § 904.07, as later than the date on which the document was signed, the Office will now presume that the date specified is the date of signing of the application, amendment to allege use or statement of use. In this case, it is unnecessary to amend to indicate the date more specifically or to secure a new declaration.

April 17, 1995

PHILIP G. HAMPTON, II  
Assistant Commissioner  
for Trademarks

[1175 TMOG 64]

#### (133) Trademark Drawings

Effective July 3, 1989, the requirement of Trademark Rule 2.52(c) (37 CFR 2.52(c)) that drawings in trademark applications be limited in size to 4 inches by 4 inches will be strictly enforced for the purpose of assigning a filing date, pursuant to Trademark Rule 2.21(a)(3) (37 CFR § 2.21(a)(3)). [This notice rescinds the prior notice concerning this issue in the *Official Gazette* of June 30, 1987, at 1079 TMOG 12.]

The drawing size limitation is necessary to permit entry of the drawing in the automated trademark search system (T-Search) as soon as possible after receipt of the application by the Patent and Trademark Office (PTO). Oversized or poor quality drawings require additional processing before they can be digitized (copied) and entered in T-Search. If the PTO must reduce a drawing, not only is there often a loss of detail and overall drawing quality, but drawing reduction processing lengthens the time before the mark and information about the application are available to the public. Furthermore, an oversized drawing that is not reduced by the PTO cannot be scanned in its entirety for entry in T-Search, resulting in the possible loss of portions of the mark.

Enforcement of the drawing size limitation rule as a requirement for receipt of a filing date will permit the PTO to expedite application processing and permit the applicant to control the reduction process and, thus, control the quality of the representation of the mark as it will appear in T-Search, in the *Official Gazette*, and on the registration certificate.

The Trademark Law Revision Act of 1988 [Title 1 of Pub. L. 100-667, 102 Stat. 3935 (15 U.S.C. 1051)] will be implemented on Nov. 16, 1989. Two important provisions of the new law are that (1) an application for registration of the Principal Register may be filed based upon a bona fide intention to use a mark in commerce (15 U.S.C. 1051(b), as amended), and (2) for all applications filed on or after Nov. 16, 1989, upon the registration of a mark on the Principal Register, the application filing date becomes a constructive date of first use of the mark (15 U.S.C. 1057(c), as amended). Therefore, expedited processing to permit timely public notification of the filing of an application on the Principal Register will be particularly important.

Apr. 3, 1989

JEFFERY M. SAMUELS  
Assistant Commissioner  
for Trademarks

[1102 TMOG 6]

#### (134) Trademark Drawing Requirements Trademark Rule 2.52, 37 C.F.R. § 2.52

For an application to satisfy the filing date requirement under Trademark Rule 2.21(a)(3), 37 C.F.R. § 2.21(a)(3), it must include a drawing of the mark substantially meeting all the requirements of Trademark Rule 2.52, 37 C.F.R. § 2.52. Because the granting of a filing date to an application potentially establishes a date of constructive use of the mark, timely public notification of the filing of applications is important. Marks must be accurately and expeditiously entered into the automated search system and filed in the Trademark Search Library.

The purpose of this notice is to identify recurring problems which have resulted in the loss of filing dates for failure to

comply with Rule 2.21(a)(3).

#### Color in the Mark

Rule 2.52(a) requires that every line and letter in a drawing, including color lining and lines used for shading, must be black. Color in a mark can be shown only by using the linings depicted in the color chart in Rule 2.52(e). This requirement is strictly enforced. The Office denies filing dates to applications where color appears on the drawing.

#### Drawing Size

The requirement of Rule 2.52(c) that the mark on a drawing be limited in size to 4 inches wide by 4 inches high continues to be strictly enforced. *In re Fuller-Jeffrey Broadcasting Corp. of Santa Rosa*, 16 USPQ2d 1456 (Comm'r Pats. 1990). See *Official Gazette Notice* at 1102 TMOG 6.

#### Two Drawings Submitted With One Application

A single application may seek registration of only one mark. Therefore, as a matter of policy, the Office denies a filing date to any application which is accompanied by two drawings, each displaying a different mark.

#### Heading

Rule 2.52(d) requires that the drawing include a heading which lists the applicant's name and address, the goods and services, the dates of first use of the mark for an application based on use in commerce under 15 U.S.C. § 1051(a), and the priority filing date for an application based upon a foreign application under 15 U.S.C. § 1126(d). If the heading is omitted in its entirety, a filing date is denied to the application. See *In re Hackmack*, 16 USPQ2d 1895 (Comm'r Pats. 1990).

#### Two Page Drawings in Trademark Applications

The Office denies a filing date to any application in which the mark does not appear on the first page of the drawing.

Rule 2.52(d) requires that the drawing include a heading which lists, among other things, the goods and services for which registration is sought; and Rule 2.52(c) requires that there be a margin of at least one inch on the sides and bottom of the paper, and at least one inch between the mark and the heading.

Implicit in Rule 2.52 is a requirement that the mark and heading appear on a single page, in all but the most exceptional circumstances. There is an administrative need for a filing system that utilizes single page drawings, to expedite filing of mark drawings in the Trademark Search Library and entry of accurate information into the automated database. More importantly, there is a risk that the individual pages from multi-page drawings might become detached and separated in the Index of Pending Applications.

Historically, the Office has permitted the filing of drawings in which the heading continues onto a second page only where the goods and services covered by the application are so numerous that they cannot be listed within the heading margins on a single page. *Trademark Manual of Examining Procedure* § 807.02.

Although the Office prefers that the identification of goods or services in such cases be abbreviated so that the entire drawing will fit onto one page, the Office will continue to accept drawings on which the list of goods or services continues onto a second page, in appropriate circumstances.

If the goods and services are abbreviated in the drawing heading, as recommended here, this will in no way limit the goods and services covered by the application. For purposes of determining the goods and services covered by an application, the written application is always controlling. See *In re Tokiwa Mfg. Co. Ltd.*, 21 USPQ2d 1395 (Comm'r Pats. 1991).

If an applicant deems it to be necessary, the heading of a drawing may be continued onto a second page. However, in all cases, the mark and a portion of the heading must appear on the first sheet. The Office denies a filing date to any application which fails to display the mark, in accordance with the size and margin requirements of Rule 2.52(c), on the first page of the drawing. This requirement is strictly enforced.

May 8, 1992

JEFFREY M. SAMUELS  
Assistant Commissioner  
for Trademarks

[1139 TMOG 24]

#### (135) Waiver of Trademark Rule 2.76(a)

Trademark Rule 2.76(a) now provides that an intent-to-use application under Section 1(b) of the Trademark Act may be amended to allege use of the mark in commerce, under Section 1(c) of the Act, at any time between the filing date of the application and either (1) the date the examining attorney approves the mark for publication or (2) the date of the expiration of the six-month period after issuance of a final refusal. Thus, if the examining attorney issues a final refusal and the applicant files an appeal to the Trademark Trial and Appeal Board six months thereafter, any amendment to allege use filed subsequently is considered untimely.

The Patent and Trademark Office has now had several years' experience with intent-to-use applications and with the filing of amendments to allege use and has had an opportunity to observe the effect of this rule in connection with the appeal process. We have found that the strict time limit set by the rule has forced some applicants to pursue appeals that might otherwise have been dismissed as moot. Thus, a Section 1(b) intent-to-use applicant cannot under the present rule, obtain a remand of its application from the Board to the examining attorney to allow consideration of an amendment to the Supplemental Register or a claim of acquired distinctiveness under Section 2(f). Even though such a remand is likely to lead to registration or to publication of the mark for opposition the Board may not grant the request for remand unless the applicant filed an amendment to allege use before the expiration of the unable to grant remand, because use of the mark is a prerequisite to registration on the Supplemental Register and Rule 2.76(a) precludes the applicant from filing an amendment to allege use. The same result would follow where an intent-to-use applicant sought to assert acquired distinctiveness under Section 2(f). Because the Board has no discretion to remand applications in such situations, the rule has worked to delay or frustrate the registration process.

Accordingly, application of Rule 2.76(a) is hereby waived, in pertinent part, to eliminate the time limit during which an amendment to allege use may be filed after the examining attorney's final refusal to register. It should be noted that, although an amendment to allege use will now be considered timely even if filed during the pendency of an ex parte appeal, the Board retains jurisdiction over the application once an appeal is filed. The Board may, in its discretion, suspend action on the appeal and remand the application to the examining attorney for consideration of the amendment to the allege use; or it may continue action on the appeal, thus deferring examination of the amendment to allege use until after disposition of the appeal.

The Patent and Trademark Office will, in due course, publish a notice of proposed rulemaking to amend Trademark Rule 2.76(a).

Oct. 6, 1993

ROBERT M. ANDERSON  
Acting Assistant Commissioner for  
Trademarks

[1156 TMOG 12]



## Questions and Answers

## L. New Trademark Application Filing Requirements

The Trademark Law Revision Act of 1988, which was implemented on Nov. 16, 1989, contains the most significant amendments to the Lanham Act since its enactment in 1947. The Patent and Trademark Office has significantly revised the Trademark Rules of Practice to reflect the changes in the law. Additionally, the PTO has issued a supplement to Revision 7 of the *Trademark Manual of Examining Procedure* that reflects the changes in the law, rules, and Office policy and is available from the Government Printing Office.

The PTO's Office of the Assistant Commissioner for Trademarks has prepared a series of "Questions and Answers" about Office practice under the new law and rules. This first in the series concerns the requirements for the initial filing of an application. Subsequent "Questions and Answers" will address various examination issues, the statement of use, requests for extension of time to file the statement of use, the amendment to allege use and notice of allowance.

## Q. What is an intent-to-use application?

A. The Trademark Law Revision Act of 1988 became effective on Nov. 16, 1989. It amended the Trademark Act to add a new basis for filing an application for Federal trademark registration on the Principal Register. A party with a bona fide intention to use a specific mark in commerce in relation to specific goods or services may now file an application. However, before the mark will be registered, the applicant must use the mark in commerce in connection with the specified goods or services and submit specimens evidencing use and a verified allegation concerning that use.

First, an intent-to-use application will be examined in relation to all substantive and procedural requirements, except use-related issues, and, if acceptable, published for opposition. If there is no opposition, or any opposition is resolved in the applicant's favor, the applicant will receive a notice of allowance.

The applicant must submit a statement of use within six months of that date, or request a six-month extension of time. The applicant may then request up to four additional six-month extensions of time in which to file the statement of use. The grant of such extensions is predicated, in part, upon the applicant's showing of "good cause" as to why the mark has not yet been used. Thus, an applicant may have up to 36 months from the mailing of the notice of allowance within which to file a statement of use. (See Trademark Rules 2.88 and 2.89 concerning the requirements for a statement of use and extension requests.) Upon filing, the statement of use will be examined and, if accepted, the mark will register.

## Q. How does an intent-to-use application differ from an application based upon use in commerce?

A. The primary difference between the two types of applications is the basis for filing. Because of that difference, the filing requirements and processing of the two types of applications differ.

A party may not file an application based upon use of a mark in commerce until after that use has occurred. Instead of asserting a bona fide intent to use the mark in commerce, the use-based application must include allegations concerning dates of use and specimens evidencing use as a filing requirement. The use-based application will be examined and, if acceptable, published for opposition. If the mark is not opposed, or any opposition is resolved in the applicant's favor, the mark will register. This procedure differs from the application procedure for an intent-to-use application, as noted above.

However, in all other respects the legal reasons for refusing registration (such as descriptiveness, likelihood of confusion, etc.) and the procedural requirements (such as specificity of identifications of goods, signature by applicant, etc.) are exactly the same for the two types of applications. Additionally, upon registration, the filing date of any application on the Principal Register is a constructive date of first use of the mark.

## Q. What are the requirements for filing an intent-to-use application?

A. A complete intent-to-use application consists of a written application, a drawing of the mark, and the required filing fee for each class of goods. The requirements for a written intent-to-use application are set forth in Trademark Rule 2.33. The application must be made to the Commissioner of Patents and Trademarks, must include a request for registration, and must be signed and verified (sworn to) by the applicant.

The application must specify: the name and address of the applicant; information about the applicant's legal entity; a claim that the applicant has a bona fide intention to use the mark in commerce; the particular goods or services on or in connection with which the applicant has a bona fide intention to use the mark; the class of goods or services according to the official classification, if known to the applicant; and the intended mode, manner or method of applying, affixing or otherwise using the mark on or in connection with the goods or services specified.

The applicant must sign a verification of the application which includes, in part, averments that the applicant is believed to be entitled to use the mark sought to be registered; that to the best of the declarant's knowledge and belief no other entity has the right to use the mark in commerce, either in the identical form or in such near resemblance as to be likely, when applied to the goods or services of such other entity, to cause confusion, or to cause mistake, or to deceive; and that the facts set forth in the application are true.

Please note that Rule 2.33 differs from section 1(b) of the Act because the rule requires the above verification to include a statement that "the applicant is the owner of the mark" rather than that "the applicant believes it is entitled to use the mark." This specific requirement of the rule should be disregarded to the extent that it differs from the statute. The rule will be amended in due course.

## Q. What are the minimum requirements for receipt of a filing date for an intent-to-use application?

A. Trademark Rule 2.21 sets forth the minimum requirements for receipt of a filing date for intent-to-use applications, as well as other types of applications. These minimum formal requirements do not include all of the requirements which may ultimately be necessary to obtain registration, but merely those which must be satisfied to receive a filing date.

An intent-to-use application must include the following elements in order to receive a filing date: the name of the applicant, the name and address to which communications can be directed, a drawing of the mark substantially meeting all of the requirements of Trademark Rule 2.52, an identification of goods or services, a claim of a bona fide intention to use the mark in commerce, a verification or declaration under Trademark Rule 2.33(b) signed by the applicant, and the required filing fee for at least one class of goods or services. If an application lacks any one of these elements, it will be denied a filing date and all papers will be returned to the applicant as informal.

## Q. Is there any change in the requirements for applications based upon either use in commerce or Section 44 of the Trademark Act?

A. Yes. Effective Nov. 16, 1989, an application must be signed in order to receive a filing date. Trademark Rule 2.21 has been amended to require that an application include a verification or declaration in accordance with Trademark Rule 2.33(b), signed by the applicant, to receive a filing date. This requirement applies to all applications filed after Nov. 16, 1989, regardless of the basis for filing. Unsigned applications will be returned to the applicant as informal. A verified assertion, signed by the applicant, of the basis for filing, is believed to be essential because of the importance of the filing date as a constructive date of first use of the mark for registration of the Principal Register.

All other filing requirements for use-based applications remain unchanged.

Concerning Section 44 which permits, under certain circumstances, the filing of an application in the United States based upon an application or registration in another country, there are two additional changes. Effective Nov. 16, 1989, an application

filed under Section 44(d) or Section 44(e) of the Trademark Act must include an allegation that the applicant has a bona fide intention to use the mark in commerce. However, Section 44 applicants will still be exempt from any use requirement as a condition to registration. In other words, Section 44 applicants are not required to file specimens evidencing use of the mark or an allegation of use in order to obtain registration.

As a requirement for obtaining a filing date, an application filed pursuant to Section 44(d) must include in the heading of the drawing the date of the foreign filing which forms the basis of its priority claim.

## Q. Who can sign an application?

A. There are two issues that may arise with respect to the signature on an application: (1) whether the signature is sufficient for receipt of a filing date, and (2) whether the signature is that of the applicant.

The following persons can properly sign an application for an applicant: an individual applicant, a general partner of a partnership, or an officer of a corporation or association.

If an application is signed by an improper party, but the improper party had "color of authority" to act for applicant, the Office will require re-execution of the application, but will not invalidate the filing date. (See Trademark Rule 2.71(c) concerning "color of authority.") The Examining Attorney will determine whether the signatory had color of authority to sign the application for the applicant. A person has such color of authority if he or she has firsthand knowledge of the relevant facts and implied or actual authority to act on behalf of the applicant. A general manager may qualify under this standard. The applicant's attorney will not ordinarily be regarded as possessing color of authority to sign on behalf of a client. Attorneys, who are not employees of a corporate applicant, do not usually have firsthand knowledge of a client's business or the authority to act on behalf of a client, other than as legal representative.

If the signature is acceptable for the purpose of receiving a filing date (i.e., if the signatory had color of authority), but is not the signature of the applicant, a substitute verification by the applicant of the facts in the application will be required. If the person who signed did not have even color of authority, the Examining Attorney will refuse registration because the applicant did not meet the minimum requirements of Rule 2.21 for receipt of a filing date. An application signed by a party without color of authority is void *ab initio* and cannot be corrected by submission of a substitute declaration.

## Q. Are "fax" copies of signatures acceptable?

A. The Trademark Operation does not have the equipment to accept documents transmitted by "fax" for purposes of receiving a filing date. However, the signature on a properly filed application may be a photocopy or "fax" copy of the original signature. The subsequent submission of the original document will be required by the Examining Attorney.

## Q. What is the significance of the filing date?

A. Section 7 of the Trademark Act has been amended to provide that the filing date of an application of the Principal Register is a constructive date of first use of the mark in commerce, provided the application matures into a registration. Thus, filing affords the applicant nationwide priority over others, with the exception of parties who had used the mark before the applicant's filing date, parties who had filed before the applicant, or parties who are entitled to an earlier priority filing date based upon the filing of a foreign application under Section 44(d) of the Trademark Act.

## Q. Can an application be based upon both use and intent-to-use?

A. No. Section 1(a) of the Trademark provides for the filing of applications based upon actual use in commerce, while Section 1(b) provides for the filing of applications based upon intent-to-use. Trademark Rule 2.33(d) states that an applicant may not file under both Sections 1(a) and 1(b) of the Act in

a single application, nor may an applicant in an application under Section 1(a) of the Act amend to seek registration under Section 1(b). Any application filed under both Sections 1(a) and 1(b) of the Trademark Act will be denied a filing date and returned to the applicant.

## Q. Can an applicant assert both a Section 44 claim and an intent-to-use or use claim in the same application?

A. Yes. Section 44(d) provides for applications based upon an application for registration filed in an applicant's country of origin, and section 44(e) provides for applications based upon a registration in applicant's country of origin. An application may be based upon both a foreign application or registration under Section 44 and either use in commerce under Section 1(a) or intent-to-use under Section 1(b).

## Q. Since a Section 44 application contains a statement of a bona fide intent to use the mark in commerce, isn't this also an intent-to-use application?

A. No. The statement of a bona fide intent to use a mark is one of the statutory requirements for a Section 44 filing and the PTO will not consider the mere inclusion of such a statement to constitute the assertion of a basis for filing under Section 1(b) of the Act. In other words, once the requirements for Section 44 are met and the application successfully completes the opposition period, the mark will register (rather than a notice of allowance issuing in the application).

A Section 44 applicant may also assert an intent-to-use basis by explicitly stating, after its statement of a bona fide intent to use the mark in commerce, that it is also asserting a Section 1(b) basis for filing.

## Q. Can an intent-to-use application be filed on the Supplemental Register?

A. No. An intent-to-use application initially filed on the Supplemental Register will be denied a filing date and returned to the applicant. No amendment of an intent-to-use application to the Supplemental Register will be accepted until after use has commenced and after the filing and acceptance of an amendment to allege use or a statement of use. In such a case, the effective filing date of the application will be changed to the date on which the applicant filed the amendment to allege use under Section 1(c) of the Trademark Act or the statement of use under Section 1(d) of the Act.

## Q. Must an intent-to-use applicant begin using the mark before a registration will issue?

A. Yes. An intent-to-use application may not mature into a registration until use of the mark has begun. After use begins, the applicant must verify such use in either (1) an amendment to allege use or (2) a statement of use. In addition, applicant must submit specimens evidencing use and a fee of \$100 per class of goods or services in the application.

## Q. What is the difference between an amendment to allege use and a statement of use?

A. The primary difference between the amendment to allege use and the statement of use is the time of filing. The amendment to allege use may be filed during initial examination of the application, i.e., after the filing date of the application and before the date on which the Examining Attorney approves the mark for publication. If the amendment to allege use is accepted, the application will then be processed for publication and issuance in the same manner as a use-based application.

If no amendment to allege use is filed before the Examining Attorney approves the mark for publication, the mark will be published for opposition. After the successful completion of the opposition period, the PTO will issue a notice of allowance. The applicant will then have six months from the date of the notice of allowance in which it must file a statement of use, or file a written request for an extension of time in which to file the statement of use. Successive extensions of time,



aggregating no more than 36 months from the notice of allowance, may be obtained pursuant to Trademark Rule 2.89.

Nov. 27, 1989

JEFFREY M. SAMUELS  
Assistant Commissioner  
for Trademarks

[1110 TMOG 622]

(137) **Receipt of a Filing Date Under Section 44  
of the Trademark Act -  
Claim of a Bona Fide Intention  
to Use the Mark in Commerce Required**

For purposes of receiving a filing date, applications filed in the United States based on prior registrations in an applicant's country of origin under Section 44(e) of the Trademark Act, 15 U.S.C. § 1126(e), and applications claiming the benefit of a priority filing date in the United States based on prior application in a Paris Convention country under Section 44(d) of the Act, 15 U.S.C. § 1126(d), must include a statement "that the applicant has a bona fide intention to use the mark in commerce." 15 U.S.C. 1126(d) and (e); Trademark Rules 2.21(a) (5) (ii) and (iii); 37 C.F.R. § 2.21(a) (5) (ii) and (iii).

The claim of a bona fide intention to use the mark in commerce is expressly required by the statute and cannot be waived by the Commissioner for any reason. The claim is required in all applications filed under Section 44, even if the applicant has commenced use of the mark in commerce, and even if the applicant is also filing on the basis of use in commerce under Section 1(a) of the Act.

Where a Section 44 applicant has used the mark in commerce, it may choose to submit for the record an additional statement regarding actual use. For example, an applicant could state that it "has a bona fide intention to use the mark in commerce, as evidenced by the fact that actual use in commerce with the United States has commenced." In this way, the application will contain the statutorily required language of a "bona fide intention to use the mark in commerce," as well as the additional clarifying language that, in this particular instance, the mark is actually in use in commerce.

Jan. 8, 1992

JEFFREY M. SAMUELS  
Assistant Commissioner  
for Trademark

[1135 TMOG 44]

(138) **Reminders Concerning the Revised Rules  
of Practice in Trademark Cases**

The Office offers the following reminders concerning certain requirements under the revised Rules of Practice in Trademark Cases to ensure proper and efficient processing of trademark papers.

**1. Statement of A Bona Fide Intention to Use in Commerce**

The Office has received a number of applications filed based on Trademark Act Section 44 which contain no claim of bona fide intention to use the mark in commerce. Sections 44(d)(2) and 44(e), and revised Trademark Rule 2.21 state the requirements for filing a trademark application based on a foreign application or registration. These sections require, among other things, that all applications filed pursuant to Section 44 state a bona fide intention to use the mark in commerce. Therefore if the application is filed based only on Section 44, and applicant has not recited a claim of bona fide intention to use the mark in commerce, the application will not be accorded a filing date and will be returned to the applicant.

This statement must include the words "in commerce." The statement should be set forth in its entirety prominently in the opening statement of the application to ensure that the application is accorded a filing date. The applicant may repeat the statement in the application declaration, if desired.

**2. Assertion of Two Bases**

If the applicant wishes to file based on both a bona fide intention to use the mark in commerce under Trademark Act Section 1(b) and a foreign application or registration under Trademark Act Section 44, the applicant must clearly indicate its intention to do so. In a Section 44 filing the Office will not presume Trademark Act Section 1(b) as an additional basis for filing by the mere statement of a bona fide intention to use the mark in commerce. If the applicant wishes to claim an additional basis under Section 1(b) of the Act it should indicate its intention with a separate statement claiming a basis under Section 1(b).

**3. Filing Papers Before Notification of Serial Number**

The Office recommends that applicants wait until they have received the filing fee receipt before filing any papers related to a trademark application. The filing fee receipt includes the assigned application serial number. The applicant should refer to the serial number in filing any paper to ensure that the paper is associated with the correct application file. For example, if applicant has filed a photocopy of its application in order to receive a filing date and follows up the photocopy with an original document, the applicant should wait for the filing fee receipt in order to have a serial number with which to reference the second document. Without the reference number, the papers may be returned to the applicant or the papers may be identified as a new filing, and accorded a new serial number.

In the same manner, it is preferable that amendments to allege use under Trademark Act Section 1(c) should not be filed until a filing fee receipt has issued and applicant can reference the serial number of the appropriate application when it submits its amendment to allege use.

The filing of an amendment to allege use has important ramifications in the publication of the mark and production of the *Official Gazette*. Therefore it is especially important that the Office be able to identify and process those papers promptly.

If the applicant files an amendment to allege use along with other amendments, it would be helpful if the applicant provides some indication that the filing is both an amendment to allege use and other amendments.

**4. Section 8 Affidavit Requirements**

Trademark Act Section 8, as amended, and revised Trademark Rule 2.162 requires, among other things, that registrants set forth the "goods or services recited in the registration on or in connection with which the mark is in use in commerce." The goods and services must also be set forth in any affidavit asserting excusable nonuse. Formerly, applicants were not required to set forth the specific goods and services. Applicant may meet the requirement to specify the goods or services either by listing the goods or services or by incorporating the goods and services by reference, e.g., "The registered mark is in use in commerce with all the goods and services listed in the registration." The list of goods and services or applicant's incorporation of the goods and services by reference should appear somewhere in the body of the affidavit.

Applicants should also take note of the revised requirement for a specimen or facsimile for each class of goods or services in the registration. The specimen or facsimile for each class must be filed prior to the end of the sixth year. Failure to meet these revised requirements may result in cancellation of all or part of a registration.

**5. Filing of Miscellaneous Papers**

Every paper filed with the Office which relates to an application or registration should include the serial number of the application or the registration number of the registration. The best practice would be to have the application number or registration number appear on every single sheet of paper which an applicant or registrant files with the Office, including any

substitute specimens which applicant may file. Those papers filed with the Office which do not have the application serial number or the registration number reference on them must be identified by Office personnel using alternative means such as looking up the mark or owner in the automated search system. However, if papers become detached, the information which the Office needs to join a particular piece of correspondence to the correct file may not be available.

**6. Time for Filing Corrections to Amendments to Allege Use**

Applicants should note that Rule 2.76(a) provides that filing an amendment to allege use of a mark in commerce under section 1(c) is only permitted between the time of filing the application and the time the examiner approves the mark for publication. If applicant's amendment to allege use fails to meet the minimum requirements for an amendment to allege use as set out in Rule 2.76(e)(3), applicant must correct those defects prior to approval of the mark for publication or the application will be published without any consideration of the amendment to allege use. If the file is approved for publication before applicant can correct its amendment to allege use, applicant will be required to wait until a notice of allowance issues before it can file its affidavit of use. In these circumstances the fee applicant submitted for its original amendment to allege use will not be refunded or applied to the later filed statement of use.

Apr. 12, 1990

JEFFREY M. SAMUELS  
Assistant Commissioner  
for Trademarks

[1114 TMOG 31]

(139) **Department of Commerce  
Patent and Trademark Office**

37 CFR Parts 1, 2, and 7  
[Docket No. 950501124-5185-02]  
RIN 0651-AA74

**Revision of Patent and Trademark Fees**

Agency: Patent and Trademark Office, Commerce.  
Action: Final Rule.

**Summary:** The Patent and Trademark Office (PTO) is amending the rules of practice in patent and trademark cases, Parts 1, 2 and 7 of title 37, Code of Federal Regulations, to adjust certain patent and trademark fee amounts to reflect fluctuations in the Consumer Price Index (CPI) and to recover costs of operation, and is amending the requirements for recording documents on the Government Register. This rule also includes information relating to the availability of patent and trademark information products provided by the PTO.

**Effective Date:** October 1, 1995.

**For Further Information Contact:** Robert Kopson by telephone at (703) 305-8510, fax at (703) 305-8525, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

**Supplementary Information:** This rule change is designed to adjust PTO fees in accordance with the applicable provisions of title 35, United States Code; section 31 of the Trademark (Lanham) Act of 1946 (15 U.S.C. 1113); and section 10101 of the Omnibus Budget Reconciliation Act of 1990 (as amended by section 8001 of Public Law 103-66), all as amended by the Patent and Trademark Office Authorization Act of 1991 (Public Law 102-204).

The cover sheet referenced in 37 CFR 7.1 (c) must be in a format approved by the Office. The Office of Public Records will maintain a list of approved formats that will meet this requirement. Contact the Office of Public Records at (703) 308-9743 regarding specific questions relating to this requirement and to seek approval of additional formats.

**BACKGROUND**

**Statutory Provisions**

Patent fees are authorized by 35 U.S.C. 41 and 35 U.S.C. 376. A fifty percent reduction in the fees paid under 35 U.S.C. 41(a) and (b) by independent inventors, small business concerns, and nonprofit organizations who meet prescribed definitions is required by 35 U.S.C. 41(h).

Subsection 41(f) of title 35, United States Code, provides that fees established under 35 U.S.C. 41(a) and (b) may be adjusted on October 1, 1992, and every year thereafter, to reflect fluctuations in the Consumer Price Index (CPI) over the previous 12 months.

Section 10101 of the Omnibus Budget Reconciliation Act of 1990 (amended by section 8001 of Public Law 103-66) provides that there shall be a surcharge on all fees established under 35 U.S.C. 41(a) and (b) to collect \$111 million in fiscal year 1996.

Subsection 41(d) of title 35, United States Code, authorizes the Commissioner to establish fees for all other processing, services, or materials related to patents to recover the average cost of providing these services or materials, except for the fees for recording a document affecting title, for each photocopy, and for each black and white copy of a patent.

Section 376 of title 35, United States Code, authorizes the Commissioner to set fees for patent applications filed under the Patent Cooperation Treaty (PCT).

Subsection 41(g) of title 35, United States Code, provides that new fee amounts established by the Commissioner under section 41 may take effect thirty days after notice in the *Federal Register* and the *Official Gazette of the Patent and Trademark Office*.

Section 31 of the Trademark (Lanham) Act of 1946, as amended (15 U.S.C. 1113), authorizes the Commissioner to establish fees for the filing and processing of an application for the registration of a trademark or other mark, and for all other services and materials relating to trademarks and other marks.

Section 31(a) of the Trademark (Lanham) Act of 1946 (15 U.S.C. 1113(a)), as amended, allows trademark fees to be adjusted once each year to reflect, in the aggregate, any fluctuations during the preceding 12 months in the CPI.

Section 31 also allows new trademark fee amounts to take effect thirty days after notice in the *Federal Register* and the *Official Gazette of the United States Patent and Trademark Office*.

**Recovery Level Determinations**

This rule adjusts patent and trademark fees for a planned recovery of \$643,014,000 in fiscal year 1996, as proposed in the Administration's budget request to the Congress.

The patent statutory fees established by 35 U.S.C. 41(a) and (b) are being adjusted on October 1, 1995, to reflect any fluctuations occurring during the previous 12 months in the Consumer Price Index (CPI-U). In calculating these fluctuations, the Office of Management and Budget (OMB) has determined that the PTO should use CPI-U data as determined by the Secretary of Labor. However, the Department of Labor does not make public the CPI-U until approximately 21 days after the end of the month being calculated. Therefore, the latest CPI-U information available is for the month of May 1995. In accordance with previous rulemaking methodology, the PTO uses the Administration's projected CPI-U for the 12-month period ending September 30, 1995, which is 3.2 percent. Based on this projection, patent statutory fees will be adjusted by 3.2 percent. Before the final fee schedule is published, the fees may be slightly adjusted based on actual data available from the Department of Labor.

Certain non-statutory patent processing fees established under 35 U.S.C. 41(d) and PCT processing fees established under 35 U.S.C. 376 are being adjusted to recover their estimated average costs in fiscal year 1996. Three patent service fees that are set by statute will not be adjusted. The three fees that are not being adjusted are assignment recording fees, printed patent copy fees and photocopy charge fees.



Certain trademark service fees established under 15 U.S.C. 1113 are being adjusted to recover their estimated average costs in fiscal year 1996.

The fee amounts were rounded by applying standard arithmetic rules so that the amounts rounded would be convenient to the user. Fees of \$100 or more were rounded to the nearest \$10. Fees between \$2 and \$99 were rounded to an even number so that the comparable small entity fee would be a whole number.

#### Workload Projections

Determination of workloads varies by fee. Principal workload projection techniques are as follows:

Patent application workloads are projected from statistical regression models using recent application filing trends. Patent issues are projected from an in-house patent production model and reflect examiner production achievements and goals. Patent maintenance fee workloads utilize patents issued 3.5, 7.5 and 11.5 years prior to payment and assume payment rates of 79 percent, 55 percent and 32 percent, respectively. Service fee workloads follow linear trends from prior years' activities.

#### General Procedures

Any fee amount that is paid on or after the effective date of the fee increase would be subject to the new fees then in effect. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing or Transmission, where authorized under 37 CFR 1.8, will be considered to be the date of receipt in the PTO. A Certificate of Mailing or Transmission under Section 1.8 is not "proper" for items which are specifically excluded from the provisions of Section 1.8. Section 1.8 should be consulted for those items for which a Certificate of Mailing or Transmission is not "proper." Such items include, inter alia, the filing of national and international applications for patents and the filing of trademark applications. However, the provisions of 37 CFR 1.10 relating to filing papers and fees with an "Express Mail" certificate do apply to any paper or fee (including patent and trademark applications) to be filed in the PTO. If an application or fee is filed by "Express Mail" with a proper certificate dated on or after the effective date of the rules, as amended, the amount of the fee to be paid would be the fee established by the amended rules.

A notice of final rulemaking was published at 60 FR 20195 (April 25, 1995) wherein several new fee provisions were made to implement the 20-year patent term and provisional applications. Language changes were made in 37 CFR 1.16(a), (b), (d), (f), and (g) which are reproduced in this final rule package. In addition, fees involving 37 CFR 1.17(r) and (s) are being adjusted by changes in the CPI to remain equal to the basic filing fee for a utility patent application.

#### PTO Information Dissemination Products

The PTO provides information to the public in the Patent Search Room and the Trademark Search Library in Arlington, Virginia, and at 78 Patent and Trademark Depository Libraries around the country. A list of the libraries is included in each issue of the *Official Gazette of the Patent and Trademark Office*. In addition, a number of patent and trademark search tools and document-delivery products, published on paper and on various machine-readable media, are sold directly to the public.

Printed PTO publications may be ordered from the Government Printing Office (GPO) or one of its Book Stores located throughout the country. A list of patent and trademark-related publications with current prices and ordering information is available from the GPO (Subject Bibliography SB 021).

Superintendent of Documents  
P.O. Box 371984  
Pittsburgh, Pa. 15250-7954  
Voice: 202-512-1800  
Fax: 202-512-2250

Machine-readable publications, including magnetic tapes and CD-ROMs, may be ordered directly from the PTO. A printed catalog of machine-readable products, including current prices and ordering information, is available from the Office of Information Products Development.

US Patent and Trademark Office  
Office of Information Products Development  
Crystal Park 3, Room 412  
Washington, D.C. 20231  
Voice: 703-308-0322  
Fax: 703-308-0493

The catalog of machine-readable products is published in the *Official Gazette of the Patent and Trademark Office* in late December each year and may also be viewed on, or downloaded from, the PTO electronic bulletin board (703-305-8950, 8/no/1) or from the PTO's home page on the Internet (<http://www.uspto.gov/>).

In order to ensure clarity in the implementation of the new fees, a discussion of specific sections is set forth below.

#### Discussion of Specific Rules

##### 37 CFR 1.16 National application filing fees.

Section 1.16, paragraphs (a), (b), (d), and (f)-(i), is revised to adjust fees established therein to reflect fluctuations in the CPI.

Section 1.16, paragraphs (a), (b), (d), and (g) include language changes relating to provisional patent applications (see 60 FR 20195, dated April 25, 1995).

##### 37 CFR 1.17 Patent application processing fees.

Section 1.17, paragraphs (b)-(g) (m), (r), and (s), is revised to adjust fees established therein to reflect fluctuations in the CPI.

Section 1.17, paragraphs (j) and (n)-(p), is revised to adjust fees established therein to recover costs.

##### 37 CFR 1.18 Patent issue fees.

Section 1.18, paragraphs (a)-(c), is revised to adjust fees established therein to reflect fluctuations in the CPI.

##### 37 CFR 1.19 Document supply fees.

Section 1.19, paragraphs (a)(1)(ii) and (a)(1)(iii), is revised to amend the language to reflect the PTO's most recent business practices.

Section 1.19, paragraph (b)(1), is revised to adjust fees established therein to reflect fluctuations in the CPI.

##### 37 CFR 1.20 Post-issuance fees.

Section 1.20, paragraphs (c), (i), and (j), is revised to adjust fees established therein to recover costs.

Section 1.20, paragraphs (e)-(g), is revised to adjust fees established therein to reflect fluctuations in the CPI.

##### 37 CFR 1.21 Miscellaneous fees and charges.

Section 1.21, paragraph (a)(1), is revised to adjust fees established therein to recover costs.

##### 37 CFR 1.445 International application filing, processing, and search fees.

Section 1.445, paragraph (a), is revised to adjust the fees authorized by 35 U.S.C. 376 to recover costs.

##### 37 CFR 1.482 International preliminary examination fees.

Section 1.482, paragraphs (a)(1)(i), (a)(1)(ii), and (a)(2)(ii), is revised to adjust the fees authorized by 35 U.S.C. 376 to recover costs.

##### 37 CFR 1.492 National stage fees.

Section 1.492, paragraphs (a), (b) and (d), is revised to adjust fees established therein to reflect fluctuations in the CPI.

##### 37 CFR 2.6 Trademark fees.

Section 2.6, paragraphs (b)(1)(ii) and (b)(1)(iii), is revised to amend the language to reflect the PTO's most recent business practices.

Section 2.6, paragraph (b)(2), is revised to adjust fees therein to recover costs.

##### 37 CFR 7.1 Requirements

Section 7.1, is revised to designate the current language as paragraph (a), and to add new paragraphs (b)-(j) to clarify that the requirements for patent and patent application assignment documents, including the requirement for the fee set forth in § 1.21(h), submitted for recording also apply to instruments submitted for recording on the Government Register. Sections 7.1(b)-(d) and (f)-(i) contain language similar to that in §§ 3.21, 3.28, 3.31, 3.34, 3.26, 3.27, and 3.41, respectively.

Section 7.1(b), is added to provide that an instrument relating to a patent must identify the patent by the patent number, that an instrument relating to a national patent application must identify the national patent application by the application number (consisting of the series code and the serial number, e.g., 07/123,456) or the serial number and filing date, that an instrument relating to an international patent application which designates the United States of America must identify the international application by the international application number (e.g., PCT/US90/01234), and that if an assignment is executed concurrently with, or subsequent to, the execution of the patent application, but before the patent application is filed, it must identify the patent application by its date of execution, name of each inventor, and title of the invention so that there can be no mistake as to the patent application intended.

Section 7.1(c), is added to provide that each instrument submitted to the PTO for recording must be accompanied by a cover sheet referring to those patent applications and patents against which the instrument is to be recorded, that one set of instruments and cover sheets to be recorded should be filed, and that if an instrument to be recorded is not accompanied by a completed cover sheet, the instrument and any incomplete cover sheet will be returned for proper completion of a cover sheet and resubmission of the instrument and a completed cover sheet.

Section 7.1(d), is added to provide that each cover sheet must contain: (1) the name of the party conveying the interest; (2) the name and address of the party receiving the interest; (3) a description of the interest conveyed or transaction to be recorded; (4) each application number or patent number against which the instrument is to be recorded, or an indication that the instrument is filed together with a patent application; (5) the name and address of the party to whom correspondence concerning the request to record the instrument should be mailed; (6) the number of applications or patents identified in the cover sheet and the total fee; (7) the date the instrument was executed; (8) a statement by the party submitting the instrument that to the best of the person's knowledge and belief, the information contained on the cover sheet is true and correct and any copy submitted is a true copy of the original instrument; and (9) the signature of the party submitting the instrument.

Section 7.1(e), is added that each patent cover sheet required by paragraph (c) of this section seeking to record a governmental interest as provided by paragraph (a) of this section must: (1) indicate that the instrument is to be recorded on the governmental register, and, if applicable, that the instrument is to be recorded on the Secret Register. See § 7.7, and (2) indicate, if applicable, that the instrument to be recorded is not an instrument affecting title. See paragraph (j) of this section.

Section 7.1(f), is added to provide for the correction of errors in the cover sheet. Specifically, § 7.1(e), provides that an error in a cover sheet recorded pursuant to this Part will be corrected only if: (1) the error is apparent when the cover sheet is compared with the recorded instrument to which it pertains, and (2) a corrected cover sheet accompanied by the recording fee set forth in paragraph (i) of this section and either the original recorded instrument or a copy of the original recorded instrument is filed for recordation.

Section 7.1(g), is added to provide that the Office will accept and record non-English language instruments only if accompanied by a verified English translation signed by the individual making the translation.

Section 7.1(h), is added to provide that instruments and cover sheets to be recorded should be addressed to the Commissioner of Patents and Trademarks, Box Assignment, Washington, D.C. 20231.

Section 7.1(i), is added to provide that all requests, except as provided by paragraph (j) of this section, to record instruments must be accompanied by the recording fee set forth in § 1.21(h) of this chapter, and that the fee set forth in § 1.21(h) of this chapter is required for each application and patent against which the instrument is recorded as identified in the cover sheet.

Section 7.1(j), is added to provide that no fee is required for each patent application and patent against which an instrument required by Executive Order 9424 (3 CFR 1943-1948 Comp.) to be filed if: (1) the instrument does not affect title and is so identified in the cover sheet (see paragraph (e) of this section); and (2) the cover sheet is filed in a format approved by the Office.

#### Response to Comments on the Rules

A notice of proposed rulemaking to adjust certain patent and trademark fee amounts and to amend the requirements for recording an assignment to apply to documents forwarded for recording on the Government Register was published in the *Federal Register* on May 26, 1995, at 60 FR 27934, and in the *Official Gazette of the United States Patent and Trademark Office* on May 30, 1995, at 1174 OG 134.

A public hearing was held June 29, 1995. Nine comments were received and considered in adopting the rules set forth herein. No oral testimony was presented.

**Comments:** Two respondents stated that the proposed inflationary increase of patent and trademark fees is unnecessary because the PTO is already operating at a surplus.

**Response:** Current PTO resources include carryover funds from fiscal year 1994. These carryover funds are partly unobligated balances to be carried forward, but primarily advanced fee payments for work to be done in fiscal year 1995. Furthermore, this carryover includes fee income generated from trademark-related products and services which, according to 35 U.S.C. 42(c), may be used only for trademark-related activities. Therefore, to recover all costs associated with the processing of patent applications, and to remain consistent with the current rate of inflation, the PTO is increasing certain patent fees by 3.2 percent as authorized by 35 U.S.C. 41(f).

In addition, two trademark service fees were proposed to be increased. The adopted fee amounts will recover the average cost of providing the service as authorized by 35 U.S.C. 41(d), and will also remain consistent with the equivalent patent service fee amounts.

**Comments:** Seven respondents objected to the proposal to amend the requirements for recording an assignment to apply to documents forwarded for recording on the Government Register. The respondents stated that not only are Government agencies required by Executive Order 9424 to forward an assignment to the PTO for recordation, but also the PTO lacks the authority under Title 35 of the United States Code to impose a fee for recording an assignment on the Government Register. **Response:** 35 U.S.C. 41(d)(1) provides that the Commissioner shall charge a fee of \$40 per property for recording any document affecting title. An assignment is a document affecting title. Therefore, the Office must require a \$40 recording fee for recording any assignment, even those being recorded on the Government Register. If a document to be recorded on the Government Register does not affect title and if it is accompanied by the appropriate cover sheet, then no fee is required.

#### Other Considerations

This final rule change is in conformity with the requirements of Executive Order 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501, et seq. This rulemaking contains no information collection within the meaning of the Paperwork



Reduction Act. This final rule has been determined not to be significant for purposes of Executive Order 12866.

The PTO has determined that this final rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the final rule change would not have a significant impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The final rule change increases fees to reflect the change in the CPI as authorized by 35 U.S.C. 41(f). Further, the principal impact of the major patent fees has already been taken into account in 35 U.S.C. 41(h), which provides small entities with a 50-percent reduction in the major patent fees.

A comparison of existing and new fee amounts is included as an Appendix to this notice of final rulemaking.

#### Lists of Subjects

##### 37 CFR Part 1

Administrative practice and procedure, Inventions and patents, Reporting and record keeping requirements, Small businesses.

##### 37 CFR Part 2

Administrative practice and procedure, Courts, Lawyers, Trademarks.

##### 37 CFR Part 7

Administrative practice and procedure, Inventions and patents, Reporting and record keeping requirements.

For the reasons set forth in the preamble, the PTO is amending title 37 of the Code of Federal Regulations, Chapter 1, Part 1, as set forth below.

#### Part 1 - Rules of Practice in Patent Cases

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.16 is amended by revising paragraphs (a), (b), (d), and (f) through (i), to read as follows:

#### *§ 1.16 National application filing fees.*

(a) Basic fee for filing each application for an original patent, except provisional, design or plant applications:

By a small entity (§ 1.9(f)) .....\$375.00  
By other than a small entity .....\$750.00

(b) In addition to the basic filing fee in an original application, except provisional applications, for filing or later presentation of each independent claim in excess of 3:

By a small entity (§ 1.9(f)) .....\$39.00  
By other than a small entity .....\$78.00

\*\*\*\*\*

(d) In addition to the basic filing fee in an original application, except provisional applications, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:

By a small entity (§ 1.9(f)) .....\$125.00  
By other than a small entity .....\$250.00

(If the additional fees required by paragraphs (b), (c), and (d) of this section are not paid on filing or on later presentation of the claims for which the additional fees are due, they must

be paid or the claims canceled by amendment prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

\*\*\*\*\*

(f) Basic fee for filing each design application

By a small entity (§ 1.9(f)) .....\$155.00  
By other than a small entity .....\$310.00

(g) Basic fee for filing each plant application, except provisional applications:

By a small entity (§ 1.9(f)) .....\$255.00  
By other than a small entity .....\$510.00

(b) Basic fee for filing each reissue application:

By a small entity (§ 1.9(f)) .....\$375.00  
By other than a small entity .....\$750.00

(i) In addition to the basic filing fee in a reissue application, for filing or later presentation of each independent claim which is in excess of the number of independent claims in the original patent:

By a small entity (§ 1.9(f)) .....\$39.00  
By other than a small entity .....\$78.00

\*\*\*\*\*

3. Section 1.17 is amended by revising paragraphs (b) through (g), (j), (m) through (p), (r), and (s) to read as follows:

#### *§ 1.17 Patent application processing fees.*

\*\*\*\*\*

(b) Extension fee for response within second month pursuant to § 1.136(a):

By a small entity (§ 1.9(f)) .....\$190.00  
By other than a small entity .....\$380.00

(c) Extension fee for response within third month pursuant to § 1.136(a):

By a small entity (§ 1.9(f)) .....\$450.00  
By other than a small entity .....\$900.00

(d) Extension fee for response within fourth month pursuant to § 1.136(a):

By a small entity (§ 1.9(f)) .....\$700.00  
By other than a small entity .....\$1,400.00

(e) For filing a notice of appeal from the examiner to the Board of Patent Appeals and Interferences:

By a small entity (§ 1.9(f)) .....\$145.00  
By other than a small entity .....\$290.00

(f) In addition to the fee for filing a notice of appeal, for filing a brief in support of an appeal:

By a small entity (§ 1.9(f)) .....\$145.00  
By other than a small entity .....\$290.00

(g) For filing a request for an oral hearing before the Board of Patent Appeals and Interferences in an appeal under 35 U.S.C. 134:

By a small entity (§ 1.9(f)) .....\$125.00  
By other than a small entity .....\$250.00

\*\*\*\*\*

(j) For filing a petition to institute a public use proceeding

under § 1.292 .....\$1,430.00

\*\*\*\*\*

(m) For filing a petition:

(1) For revival of an unintentionally abandoned application, or

(2) For the unintentionally delayed payment of the fee for issuing a patent:

By a small entity (§ 1.9(f)) .....\$625.00  
By other than a small entity .....\$1,250.00

(n) For requesting publication of a statutory invention registration prior to the mailing of the first examiner's action pursuant to § 1.104—\$870.00 reduced by the amount of the application basic filing fee paid.

(o) For requesting publication of a statutory invention registration after the mailing of the first examiner's action pursuant to § 1.104—\$1,740.00 reduced by the amount of the application basic filing fee paid.

(p) For submission of an information disclosure statement under § 1.97(c) .....\$220.00

\*\*\*\*\*

(r) For entry of a submission after final rejection under § 1.129(a):

By a small entity (§ 1.9(f)) .....\$375.00  
By other than a small entity .....\$750.00

(s) For each additional invention requested to be examined under § 1.129(b):

By a small entity (§ 1.9(f)) .....\$375.00  
By other than a small entity .....\$750.00

4. Section 1.18 is revised to read as follows:

#### *§ 1.18 Patent issue fees.*

(a) Issue fee for issuing each original or reissue patent, except a design or plant patent:

By a small entity (§ 1.9(f)) .....\$625.00  
By other than a small entity .....\$1,250.00

(b) Issue fee for issuing a design patent:

By a small entity (§ 1.9(f)) .....\$215.00  
By other than a small entity .....\$430.00

(c) Issue fee for issuing a plant patent:

By a small entity (§ 1.9(f)) .....\$315.00  
By other than a small entity .....\$630.00

5. Section 1.19 is amended by revising paragraphs (a)(1)(ii), (a)(1)(iii), (b)(1)(i), and (b)(1)(ii) to read as follows:

#### *§ 1.19 Document supply fees.*

\*\*\*\*\*

(a) \*\*\*

(1) \*\*\*

\*\*\*\*\*

(ii) Overnight delivery to PTO Box or overnight fax .....\$6.00

(iii) Expedited service for copy ordered by expedited mail or fax delivery service and delivered to the customer

within two workdays .....\$25.00

\*\*\*\*\*

(b) \*\*\*

(1) \*\*\*

(i) Regular service .....\$15.00

(ii) Expedited regular service .....\$30.00

\*\*\*\*\*

6. Section 1.20 is amended by revising paragraphs (c), (e) through (g), (i)(1), (i)(2), and (j) to read as follows:

#### *§ 1.20 Post issuance fees.*

\*\*\*\*\*

(c) For filing a request for reexamination (§ 1.510(a)) .....\$2,390.00

\*\*\*\*\*

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond four years; the fee is due by three years and six months after the original grant

By a small entity (§ 1.9(f)) .....\$495.00  
By other than a small entity .....\$990.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond eight years; the fee is due by seven years and six months after the original grant

By a small entity (§ 1.9(f)) .....\$995.00  
By other than a small entity .....\$1,990.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond twelve years; the fee is due by eleven years and six months after the original grant

By a small entity (§ 1.9(f)) .....\$1,495.00  
By other than a small entity .....\$2,990.00

\*\*\*\*\*

(i) \*\*\*

(1) unavoidable .....\$660.00  
(2) unintentional .....\$1,550.00

\*\*\*\*\*

(j) For filing an application for extension of the term of a patent (§ 1.740) .....\$1,060.00

7. Section 1.21 is amended by revising paragraph (a)(1) to read as follows:

#### *§ 1.21 Miscellaneous fees and charges.*

\*\*\*\*\*

(a) \*\*\*

(1) For admission to examination for registration to practice; fee payable upon application .....\$310.00

\*\*\*\*\*

8. Section 1.445 is amended by revising paragraph (a) to read as follows:

#### *§ 1.445 International application filing, processing and search fees.*

(a) The following fees and charges for international applications



are established by the Commissioner under the authority of 35 U.S.C. 376:

- (1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14).....\$220.00  
(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16) where:

- (i) No corresponding prior United States national application with basic filing fee has been filed.....\$660.00  
(ii) A corresponding prior United States national application with basic filing fee has been filed.....\$430.00

- (3) A supplemental search fee when required, per additional invention.....\$190.00

\*\*\*\*\*

9. Section 1.482 is amended by revising paragraphs (a)(1)(i), (a)(1)(ii), and (a)(2)(ii) to read as follows:

**§ 1.482 International preliminary examination fees.**

(a) \*\*\*

- (1) A preliminary examination fee is due on filing the Demand:

- (i) Where an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority, a preliminary examination fee of.....\$470.00  
(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office, a preliminary examination fee of.....\$710.00

(2) \*\*\*

- (ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office.....\$250.00

\*\*\*\*\*

10. Section 1.492 is amended by revising paragraphs (a), (b), and (d) to read as follows:

**§ 1.492 National stage fees.**

\*\*\*\*\*

- (a) The basic national fee:

- (1) Where an international preliminary examination fee as set forth in § 1.482 has been paid on the international application to the United States Patent and Trademark Office:

- By a small entity (§ 1.9(f)).....\$340.00  
By other than a small entity.....\$680.00

- (2) Where no international preliminary examination fee as set forth in § 1.482 has been paid to the United States Patent and Trademark Office, but an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority:

- By a small entity (§ 1.9(f)).....\$375.00  
By other than a small entity.....\$750.00

- (3) Where no international preliminary examination fee as set forth in § 1.482 has been paid and no international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office:

- By a small entity (§ 1.9(f)).....\$505.00  
By other than a small entity.....\$1,010.00

- (4) Where an international preliminary examination fee as set forth in § 1.482 has been paid to the United States Patent and Trademark Office and the international preliminary examination report states that the criteria of novelty, inventive step (non-obviousness), and industrial applicability, as defined in PCT Article 33 (1) to (4) have been satisfied for all the claims presented in the application entering the national stage (see § 1.496(b)):

- By a small entity (§ 1.9(f)).....\$47.00  
By other than a small entity.....\$94.00

- (5) Where a search report on the international application has been prepared by the European Patent Office or the Japanese Patent Office:

- By a small entity (§ 1.9(f)).....\$440.00  
By other than a small entity.....\$880.00

- (b) In addition to the basic national fee, for filing or later presentation of each independent claim in excess of 3:

- By a small entity (§ 1.9(f)).....\$39.00  
By other than a small entity.....\$78.00

\*\*\*\*\*

- (d) In addition to the basic national fee, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:

- By a small entity (§ 1.9(f)).....\$125.00  
By other than a small entity.....\$250.00

\*\*\*\*\*

**Part 2 - Rules of Practice in Trademark Cases**

1. The authority citation for 37 CFR Part 2 would continue to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

2. Section 2.6 is amended by revising paragraphs (b)(1)(ii), (b)(1)(iii), (b)(2)(i), and (b)(2)(ii) to read as follows:

**§ 2.6 Trademark fees.**

\*\*\*\*\*

(b) \*\*\*

(1) \*\*\*

\*\*\*\*\*

- (ii) Overnight delivery to PTO Box or overnight fax.....\$6.00

- (iii) Expedited service for copy ordered by expedited mail or fax delivery service and delivered to the customer within two work days.....\$25.00

\*\*\*\*\*

(2) \*\*\*

- (i) Regular service.....\$15.00  
(ii) Expedited local service.....\$30.00

\*\*\*\*\*

**Part 7 - Register of Government Interests in Patents**

1. The authority citation for 37 CFR Part 7 would continue to read as follows:

Authority: E.O. 9424, February 18, 1944, 9 FR 1959; 3 CFR 1943-1948 Comp.

2. Section 7.1 is revised to read as follows:

- a) Executive Order 9424 (3 CFR 1943-1948 Comp.) requires the several departments and other executive agencies of the Government, including Government-owned or Government-controlled corporations, to forward promptly to the Commissioner of Patents and Trademarks for recording all licenses, assignments, or other interests of the Government in or under patents or applications for patents.

- (b) An instrument relating to a patent must identify the patent by the patent number. An instrument relating to a national patent application must identify the national patent application by the application number (consisting of the series code and the serial number, e.g., 07/123,456) or the serial number and filing date. An instrument relating to an international patent application which designates the United States of America must identify the international application by the international application number (e.g., PCT/US90/01234). If an assignment is executed concurrently with, or subsequent to, the execution of the patent application, but before the patent application is filed, it must identify the patent application by its date of execution, name of each inventor, and title of the invention so that there can be no mistake as to the patent application intended.

- (c) Each instrument submitted to the Office for recording must be accompanied by at least one cover sheet as specified in paragraph (d) of this section referring to those patent applications and patents against which the instrument is to be recorded. Only one set of instruments and cover sheets to be recorded should be filed. If an instrument to be recorded is not accompanied by a completed cover sheet, the instrument and any incomplete cover sheet will be returned for proper completion of a cover sheet and resubmission of the instrument and a completed cover sheet.

- (d) Each cover sheet required by paragraph (c) of this section must contain:

- (1) the name of the party conveying the interest;  
(2) the name and address of the party receiving the interest;  
(3) a description of the interest conveyed or transaction to be recorded;  
(4) each application number or patent number against which the instrument is to be recorded, or an indication that the instrument is filed together with a patent application;  
(5) the name and address of the party to whom correspondence concerning the request to record the instrument should be mailed;  
(6) the number of applications or patents identified in the cover sheet and the total fee;  
(7) the date the instrument was executed;  
(8) a statement by the party submitting the instrument that to the best of the person's knowledge and belief, the information contained on the cover sheet is true and correct and any copy submitted is a true copy of the original instrument; and  
(9) the signature of the party submitting the instrument.

- (e) Each patent cover sheet required by paragraph (c) of this section seeking to record a governmental interest as provided by paragraph (a) of this section must:

- (1) indicate that the instrument is to be recorded on the governmental register, and, if applicable, that the instrument is to be recorded on the Secret Register. See § 7.7.  
(2) indicate, if applicable, that the instrument to be recorded is not an instrument affecting title. See paragraph (j) of this section.

- (f) An error in a cover sheet recorded pursuant to this Part will be corrected only if:

- (1) the error is apparent when the cover sheet is compared with the recorded instrument to which it pertains, and  
(2) a corrected cover sheet accompanied by the recording fee set forth in paragraph (i) of this section and either the original recorded instrument or a copy of the original recorded instrument is filed for recordation.

- (g) The Office will accept and record non-English language instruments only if accompanied by a verified English translation signed by the individual making the translation.

- (h) Instruments and cover sheets to be recorded should be addressed to the Commissioner of Patents and Trademarks, Box Assignment, Washington, D.C. 20231.

- (i) All requests to record instruments must be accompanied by the appropriate fee. Except as provided in paragraph (j) of this section, a recording fee set forth in § 1.21(h) of this chapter fee is required for each application and patent against which the instrument is recorded as identified in the cover sheet.

- (j) No fee is required for each patent application and patent against which an instrument required by Executive Order 9424 (3 CFR 1943 - 1948 Comp.) to be filed if:

- (1) the instrument does not affect title and is so identified in the cover sheet (see paragraph (e) of this section); and  
(2) the cover sheet is filed in a format approved by the Office.

August 4, 1995

BRUCE A. LEHMAN  
Secretary of Commerce and  
Commissioner of Patents and Trademarks

[1177 TMOG 171]

**TRADEMARK POST REGISTRATION**

- (140) **Trademark Rule 2.165 Requirement Where A Section 8 Affidavit Or Declaration Is Held Insufficient**

Several recent Petitions to the Commissioner have indicated a failure on the part of registrants and their attorneys to follow the requirements of Trademark Rule 2.165. Therefore, reviewing certain basic elements of this rule is considered timely so as to alert registrants and attorneys to technical errors which might lead to the cancellation of a valuable trademark registration.

Part (a) of Rule 2.165 indicates that the examiner will notify the registrant when an affidavit or declaration of use under Section 8 of the Statute is insufficient and the reasons therefor. When the registrant wishes the examiner to reconsider the affidavit or declaration, or when the registrant has taken additional steps to rectify the deficiencies and desires to have the examiner reconsider the affidavit or declaration in light of those steps, the request for reconsideration must be submitted within 6 months of the date of mailing of the notice of insufficiency.

Note, however, that a supplemental or substitute affidavit or declaration required by Section 8 cannot be considered unless it is received before the expiration of the six year anniversary of the registration. Consequently, registrants should file their affidavits as early as possible during the sixth year following registration.

There are situations where correcting the deficiency in the affidavit or declaration requires recording an assignment with the Assignment Division of this Office. If the recording cannot be completed within 6 months, the registrant must at least respond to the examiner's notice of insufficiency within that period. The response must indicate the steps being taken to correct the deficiency. The examiner can then allow the registrant additional time or suspend action depending on the circumstances. Registrants must always observe the "six month response" period whenever responding to the examiner from an adverse action.

Part (b) of Rule 2.165 permits a registrant to request the Commissioner to review the action of the examiner when he is dissatisfied with that action. Review by the Commissioner should be sought only where it is believed that the examiner has erred in his action. In other words, the Commissioner's role is to review the correctness of the examiner's action and



not to serve as an alter ego of the examiner before whom the registrant may seek to correct deficiencies.

When review by the Commissioner has been sought, the decision on that request constitutes the final action of the Patent and Trademark Office. If no review by the Commissioner is sought and if no request for reconsideration of an examiner's action is timely filed, the Commissioner will notify the registrant of the deficiency in the affidavit or declaration after the sixth year has expired. Such notice is never mailed prior to the expiration of the sixth year following registration nor until a reasonable time has elapsed following a six month period from the last action mailed by this Office. This notice constitutes the final action of the Patent and Trademark Office in those cases where the Commissioner's review has not been sought. Once this notice has been mailed, it is too late (under the Rules of Practice) to request the Commissioner to review the action of the examiner. Review would only be proper if an affiant could show circumstances sufficient to suspend the finality element of Rule 2.165(b) pursuant to Rule 2.148.

Registrants will be held to strict compliance with Rule 2.165 as it has been briefed above. Therefore, parties are urged to respond fully as soon as possible after an action is received from the examiner.

Dec. 12, 1977

BERNARD A. MEANY  
Assistant Commissioner  
for Trademarks.

[966 TMOG 80]

## (141) Late-Filed Renewal Fees

Sections 9 and 31 of the Lanham Act (15 U.S.C. §§ 1095 and 1113) require that an additional five dollar (\$5.00) fee be submitted by a registrant who files a renewal application during the three-month period following expiration of its registration. The language of the statute requires that this additional fee be submitted within the three-month grace period. A number of registrants who have failed to submit the additional fee within the prescribed period have petitioned the Commissioner to allow their renewal applications. The Commissioner has granted petitions of this kind where the registrant or its attorney maintained a Patent and Trademark Office deposit account which contained, on the date the renewal application was filed, sufficient funds to cover the additional fee. Specifically, the Commissioner has exercised discretion under Trademark Rules 2.146(a)(3) and 2.147 to deem the authorizations to charge the deposit accounts to have taken place at the time the registrants filed their renewal applications, even though the authorizations were not confirmed until a later date. This Office policy was established by the Commissioner's decision in *In re Ralston Purina Co.*, 191 USPQ154 (Comr. Pats. 1976).

The policy established by the *Ralston Purina* decision is being changed. Henceforth, the Commissioner will no longer exercise discretion to charge deposit accounts *nunc pro tunc* for trademark renewal application fees. To allow an authorization to charge a deposit account to relate back to a date on which no actual authorization existed is, in effect, to allow late payment. It is inequitable to permit those registrants who have deposit accounts (or those whose attorneys have such accounts) to make late payment of renewal fees, while those without deposit accounts may not.

Petitions relying on *Ralston Purina* will, after the date of this notice, be denied, unless the events that gave rise to those petitions occurred before publication of this notice.

Feb. 20, 1981

MARGARET M. LAURENCE  
Assistant Commissioner  
for Trademarks

[1004 TMOG 29]

## (142) Renewal Applications and Section 8 Affidavits

There has been a noticeable increase in the number of petitions requesting provisional acceptance of defectively executed

Section 8 Affidavits and Renewal Applications under 35 U.S.C. § 26, the most common problem being a lack of notarization or a Rule 2.20 declaration. Often, such petitions are necessitated by the failure of registration owners to file the documents early enough to leave time in which to correct should they prove defective.

Section 8 Affidavits may be filed beginning with the fifth anniversary of the registration. The period for filing expires on the sixth anniversary of the registration. The period for filing Renewal Applications begins six months before the twentieth anniversary of the registration and extends three months beyond the expiration of the twenty year term. While the Post Registration Division may allow up to six months to respond to a notice of defect, it may not allow corrective action beyond the period for filing established by the Trademark Act. It is therefore in the registrant's best interest to file such documents as close to the opening date as possible to allow time for correction, if necessary. Provisional acceptance under 35 U.S.C. § 26 has been, and will continue to be, given narrow application. Registrants should not rely on 35 U.S.C. § 26 as a means of acquiring an extension of time.

We have also become aware of many delays caused by defects in the chain of title. Registrants are encouraged to keep Patent and Trademark Office assignment records current with regard to ownership of registrations.

The filing of Post Registration documents at the earliest date and maintenance of assignment records will help to avoid the cancellation or expiration of registrations of trademarks currently in use, and will result in a savings of time and expense for both the registrant and the Patent and Trademark Office.

Apr. 19, 1983

MARGARET M. LAURENCE  
Assistant Commissioner  
for Trademarks

[1030 TMOG 37]

## (143) Trademark Examining Operation

Effective Dec. 1, 1983, all requests presented to the Patent and Trademark Office under the provisions of Section 7 of the trademark statute (15 U.S.C. 1057) will be considered by the Post Registration Section of the Trademark Examining Operation.

Necessary telephone inquiries concerning procedure or status should be directed to 703-557-1986.

Dec. 2, 1983

MARGARET M. LAURENCE  
Assistant Commissioner  
for Trademarks

[1038 TMOG 256]

## (144) Helpful Hints

**Trademark Post Registration - Failure to Specify Type of Commerce in Section 8 Affidavits or Declarations**—Section 8(a) of the Trademark Act requires that before the end of the sixth year following registration, an affidavit must be filed showing that the "mark is in use in commerce." [15 U.S.C. 1058a].

The Trademark Rules require that all Section 8(a) affidavits or declarations "state that the registered mark is in use in commerce and specify the nature of such commerce." [37 C.F.R. Section 2.162(e)].

The affidavit or declaration must be filed between the fifth and sixth year following the date of registration and it must contain a statement that the "mark is in use in commerce," with evidence thereof. There may be no extensions of time beyond the sixth year for submission of this statement and evidence of use of the mark in commerce. However, if the timely-filed affidavit or declaration does not set forth the type of commerce, the registrant will be given six months to submit that information even though the sixth year may have expired. The rules do not provide for any further exten-

sions of time beyond the six months. (Carlisle Walters, 703-557-3061)

- **Backlogs in Trademark Renewals and Section 8 Affidavits and Declarations**—Registrants are advised that a backlog currently exists in the processing of Trademark Renewals and Section 8 affidavits and declarations. While the Patent and Trademark Office conducts a preliminary review of critical elements in order to notify registrants of statutory deficiencies prior to the expiration of the statutory period for the submission of required documents, the ultimate responsibility for complying with the requirements of the statute and the rules rests with the registrant. (Carlisle Walters, 703-557-3061)

July 1, 1988

THERESA A. BRELSFORD  
Assistant Commissioner  
for Administration

[1092 TMOG 11]

## (145) Section 8 Requirements For Trademark Registrations

Any registrant who files in the Patent and Trademark Office, on or after November 16, 1989, an affidavit or declaration under Section 8 of the Trademark Act will be required to comply with the requirements of the Trademark Law Revision Act of 1988 [Title 1 of Pub. L. 100-667, 102 Stat. 3935 (15 U.S.C. 1051)], which takes effect on November 16, 1989: The Trademark Law Revision Act amends 15 U.S.C. 1058(a) by adding the requirement that a registrant submit an affidavit "setting forth those goods or services recited in the registration on or in connection with which the mark is in use in commerce and attaching to the affidavit a specimen or facsimile showing current use of the mark...."

For Section 8 affidavits or declarations filed on or after November 16, 1989, the Patent and Trademark Office will require registrants to specify the goods and services to which the Section 8 affidavit or declaration pertains. The registrant may comply with the requirement for specification of its goods and services by listing each of the goods and services to which the Section 8 affidavit or declaration pertains or by making an all-encompassing reference to the goods and services recited in the registration (e.g., "The mark is in use in connection with all the goods and services recited in the registration." or "The mark is in use in connection with all the goods and services recited in the registration, with the exception of..."). The Patent and Trademark Office prefers that the registrant use an all-encompassing reference to its goods and services as the method of specification, especially where the mark is registered for numerous goods and services.

If the registrant fails to file, before the end of the sixth year following registration, a Section 8 affidavit or declaration that sets forth goods and services in connection with which the mark is in use, the registration will be cancelled. Similarly, those goods or services recited in the registration but not specified in a Section 8 affidavit or declaration filed before the end of the sixth year following registration will be deleted from the registration. After the end of the sixth year following registration, the Patent and Trademark Office will not accept a substitute Section 8 affidavit or declaration filed to correct registrant's failure to specify, or to specify completely, the goods and services on or in connection with which the mark is in use.

A Section 8 affidavit or declaration filed on or after November 16, 1989 must include a specimen or facsimile showing current use of the registered mark. The registrant will be required to file one specimen or facsimile for each class of goods or services to which the registration pertains. For a single-class registration covering multiple goods or services, only one specimen or facsimile showing current use of the mark on one of the goods or services in that class will be required. Similarly, for a multiple-class registration, the registrant will be required to file, for each class of goods or services covered by the multiple-class registration, one specimen or facsimile showing current use of the mark on one of the goods or services in that class.

If the registrant fails to file, before the end of the sixth year following registration, an affidavit or declaration that includes a proper specimen or facsimile for each class of goods or services to which the registration pertains, the registration will be cancelled as to that class of goods or services. After the end of the sixth year following registration, the Patent and Trademark Office will not accept a substitute Section 8 affidavit or declaration filed to correct the omission of a proper specimen or facsimile.

June 15, 1989

Jeffery M. Samuels  
Assistant Commissioner for Trademarks

[1104 TMOG 22]

## (146) Renewal of Trademark Registrations (Revised)

This supersedes the notice that appeared in the *Official Gazette* on May 2, 1989; (1102 TMOG 5):

The Trademark Law Revision Act of 1988 [Title 1 of Pub. L. 100-667, 102 Stat. 3935 (15 U.S.C. 1051)], which takes effect on November 16, 1989, amends 15 U.S.C. 1059(a) to reduce the renewal term of a registration from twenty years to ten years from the end of the expiring period of the registration.

Any registration whose expiration date is prior to November 16, 1989, shall be renewed, upon proper application, from the end of the expiring period for:

- (a) twenty years if the renewal is granted prior to November 16, 1989, or
- (b) ten years if the renewal is granted on or after November 16, 1989, regardless of the renewal application filing date.

Any registration whose expiration date is on or after November 16, 1989, shall be renewed, upon proper application, for ten years from the end of the expiring period, regardless of the renewal application filing date.

The present practice of notification of renewal will continue. However, the updated renewal certificate issued by the PTO will be modified to specifically indicate the length of the renewal period. The notice of renewal appearing in the *Trademark Official Gazette* will be modified to indicate the date of the acceptance of renewal.

August 16, 1989

JEFFREY M. SAMUELS  
Assistant Commissioner  
for Trademarks

[1106 TMOG 25]

## TRADEMARK INFORMATION AND CORRESPONDENCE

## (147) Powers of Attorney in Registered Trademark Files

On and after Feb. 1, 1967, communications advising of changes in the powers of attorney for registered trademarks will be placed in the registration files, but will not be acknowledged by the Patent Office. The information will thus be available to those who inspect the files, but since these powers of attorney do not directly concern the Patent Office, acknowledgments are not believed to be necessary.

Jan. 30, 1967

C.M. WENDT  
Director

[835 TMOG 95]



## (148) Patent and Trademark Office Services

In order to provide improved services to trademark applicants, registrants, and the general public, the Patent and Trademark Office plans to implement a pilot program called the "Trademark Assistance Center." The Center will provide general information about the trademark registration process and will respond to inquiries pertaining to the status of specific trademark applications and registrations. The location of the Center is 2900 Crystal Drive, 4B10, Arlington, Va. 22202-3513. Assistance may be obtained in-person or by dialing (703) 308-9000, Monday through Friday, 8:30 a.m. to 5:00 p.m. Eastern time, except holidays. Opening of the Center is planned for October 3, 1994. Please note that personal assistance concerning trademark as well as patent matters will continue to be available at 308-HELP and recorded information will continue to be available at (703) 557-INFO. Also, automated information about the status of trademark applications and registrations will continue to be available at (703) 305-8747.

September 7, 1994

PHILIP G. HAMPTON, II  
Assistant Commissioner  
for Trademarks

[1167 TMOG 27]

## (149) Initial Processing of Application

On Feb. 1, 1972, the operations of the Trademark Application Section of the Patent Office will be reorganized. The purpose of the reorganization is to provide the public and applicants with more current information concerning newly filed applications.

The prompt initial processing of trademark applications is necessary in order to fulfill one of the main Patent Office functions, that of producing a record, accessible to the public, of new trademark activity to facilitate the clearance of new marks for use, determine the registrability of proposed marks, and avoid conflicts with the rights of others. In order to maintain a record of marks applied for which reflects the most current information available to the Office concerning them, the early processing of drawings in order to have them placed in the search room is considered as a first priority. The processing of these drawings includes the assignment of serial numbers, initial classification, duplication of the drawing and the forwarding of copies of the drawing to the search room. Other functions which are necessary in the processing of applications, such as the processing and mailing of filing receipts, are secondary to the processing of drawings.

In past years, there have been delays in processing applications and forwarding application drawings to the search room. These delays have varied from several weeks to several months. In view of the importance, both to applicants and the public, of recording essential information concerning newly filed applications as quickly as possible, a reorganization of the workflow in the Application Section is being effected.

There is no change in the processing of applications through the mail room and finance branch to the Application Section. However, under the new plan, upon receipt in the Trademark Application Section, all applications will be stamped with a serial number, and the drawing of the mark will be reproduced immediately and placed in the search file. This processing will occur as soon as the application files reach the Application Section. Such procedures as determining whether or not an application will receive a filing date, preparation of the file jackets, and mailing of the filing receipt will take place at a later time.

Applicants who wish to be notified promptly of the date their papers were received in the office and their serial number, may send two self-addressed postcards with their application papers. The mail room will stamp both postcards with the date of receipt and return one to the applicant; the second postcard will be stamped with the serial number and forwarded to the applicant from the Application Section. The postcards should contain the applicant's name and the trademark which is the subject of the application. When more than one set of applica-

tion papers are forwarded under one cover, postcards should be attached to each set of papers for which a receipt is desired.

Under the new system of processing application papers, your particular attention is directed to the following changes as compared to the present procedure.

1. Application drawings will be placed in the public search file prior to the mailing of the filing receipt.

2. By using the postcard system described above, applicants will be notified sooner of the date of receipt of their papers and the serial number of their application. Applicants are encouraged to use the postcard system.

3. Additional papers sent in by the applicant or attorney should be identified by serial number, thereby enabling the office to process these papers quickly.

4. When an application is accompanied by a petition to the Commissioner under § 2.146, the petition will not be considered until processing by the Application Section is complete.

*Effective date.* The procedure outlined in this notice will become effective Feb. 1, 1972.

Jan. 11, 1972

RICHARD A. WAHL  
Acting Commissioner of Patents

JAMES H. WAKELIN, JR.  
Assistant Secretary for  
Science and Technology

Published in 37 F.R. 942; Jan. 21, 1972

[895 O.G. TM 193]

## (150) Dissemination Of Trademark Information

In order to clarify the policy regarding Trademark Examiners giving out Trademark information to the general public, the following directive has been promulgated:

Trademark Examiners are reminded that they may only be responsive to questions regarding applications pending before them. All other questions regarding Trademark matters must be directed to the Director of the Trademark Examining Operation, 703-557-3268.

Feb. 15, 1978

BERNARD A. MEANY  
Assistant Commissioner  
for Trademarks

[968 TMOG 9]

## (151) Responsibility to Diligently Monitor Trademark Applications and Registrations

The purpose of this notice is to remind trademark applicants and registrants of their responsibility to monitor the status of their application or registration in cases where a notice or action from the PTO is expected; and to apprise these parties that the *Trademark Manual of Examining Procedure*, (TMEP), will be revised to indicate that inquiries regarding the status of pending matters should be made within six months of the filing or receipt of any document for which further action by the Office is expected.

The TMEP is under revision in its entirety. As a part of that revision, Section 411, entitled "Status Inquiries," will be amended. The current language of § 411 indicates that a party awaiting action by the Office should file a status inquiry within eighteen months from the filing date of the application, or from the filing of a response to an Office action. This eighteen-month period was based on Office pendency in 1971, which was approximately fourteen months to mailing of the first Office action. Currently, the Office is mailing first actions within three months. Accordingly, the eighteen month period is no longer appropriate and is being reduced to six months to more realisti-

cally reflect Office pendency. Adoption of a six-month due diligence standard may have implications with respect to filing petitions and requests for other relief.

The Office of the Assistant Commissioner for Trademarks receives a number of requests to reactivate applications and registrations occasioned by the loss of papers mailed to or from the PTO. In many of these cases, the applicant or registrant may have proof that papers mailed to the PTO were actually received, or can aver that notices sent from the PTO were never received. However, in some of these cases the request will be denied because the party seeking relief has waited too long before investigating the problem. The rationale for denial is that third parties may have relied to their detriment on the information available in the PTO files and databases that an application was abandoned or that a registration has been cancelled or expired.

The PTO generally processes applications, responses and other papers in the order in which they are received in the Office. Accordingly, applicants and registrations can expect to receive notice concerning these filings within predictable time periods. For example, a party filing an application for registration should expect to receive a filing receipt within four to six weeks and, in most cases, a "first action" within four to five months of the date of filing. Similarly, a registrant should expect to receive a notice of acceptance or rejection of a Section 8 affidavit of use or excusable nonuse within four to five months of submission, and a notice of acceptance or rejection of a renewal application within two to three months of submission. Only in rare cases would any of these time periods be longer than six months.

Since it is reasonable to expect some notice from the PTO about a pending matter within six months of the filing or receipt of any document, a party who has not received the expected written action or telephone call from the PTO within that time frame should be put on notice that the filing may have become lost. The party awaiting notification has the burden of inquiring as to the cause of the delay. **In order to be considered diligent in the monitoring of its application or registration, the party expecting notification from the PTO should inquire within six months.** Waiting until the end of the six-month period is not recommended. Parties should inquire as soon as they suspect that a problem exists.

Written status inquiries are discouraged. Whenever possible, status inquiries should be made by calling the Trademark Status Line, at (703) 305-8747 through 8752. The Status Line provides the current status and status date of all active federal applications and registrations, and is available from 6:30 a.m. until midnight, Eastern Time, Monday through Friday.

*Examples of Situations Requiring Diligent Action*

Applicant/registrant files an application, Section 8 affidavit, or Section 9 renewal application, accompanied by an acknowledgment postcard:

(a) No acknowledgement postcard, filing receipt or other acknowledgment is received within a reasonable time.

**Diligent Action:** Inquire within six months of mailing of the document to PTO.

(b) Acknowledgement post card received but no filing receipt or other acknowledgment is received within a reasonable time.

**Diligent Action:** Inquire within six months of receipt of the acknowledgement postcard.

(c) A filing receipt for the application is received but no Office action, telephone call from the examining attorney, or notice of publication is received within a reasonable time.

**Diligent Action:** Inquire within six months of receipt of the filing receipt.

(d) A response to an Office action is mailed to the PTO but no further Office action, telephone call, notice of publication, or other acknowledgment is received within a reasonable time.

**Diligent Action:** Inquire within six months of mailing of the response.

(e) A notice of publication is received for an application under Section 1(b), 15 U.S.C. § 1051(b) but no Notice of Allowance or notification of potential opposition is received within a reasonable time.

**Diligent Action:** Inquire within a six months of receipt of the notice of publication.

In the event that the party discovers that its application or registration is no longer active, or that a required paper has not been received by the PTO, the applicant or registrant should promptly file a petition to the Commissioner or take other appropriate action to rectify the situation. The time limits for filing petitions are strictly applied. A certificate of mailing in accordance with Trademark Rules 1.8 or 1.10, 37 C.F.R. §§ 1.8 or 1.10, is recommended.

To summarize, applicants and registrants have a duty to monitor the status of their applications and registrations. If nothing has been heard from the PTO within a six month period, the party awaiting notification has the burden of inquiring as to the status. Status inquiries should be made via the Trademark Status Line. Should the status inquiry reveal that the relevant document is lost, or some other problem exists, a petition to the Commissioner or other required action should be filed within 60 days. Trademark Rule 2.146(d), 37 C.F.R. § 2.146(d). Failure to act diligently and follow up with the appropriate action may result in denial of the requested relief.

Oct. 2, 1992

JEFFREY M. SAMUELS  
Assistant Commissioner  
for Trademarks

[1143 TMOG 73]

## (152) Availability of Trademark Status Line

Beginning on Feb. 20, 1990, the U.S. Patent and Trademark Office provided access, via push button telephone, to current status and status date information for all federal trademark application and registration records maintained in the automated Trademark Reporting and Monitoring (TRAM) System. The Trademark Status Line will be available on (703)557-8747 from 6:30 a.m. until midnight, Eastern Time, Monday through Friday.

The Trademark Status Line may be used from any push button telephone by entering a seven-digit registration number and the "W" symbol or an eight-digit serial number and the "W" symbol after the welcoming message and the tone. All calls will be answered in the order received. Callers may request information for up to five serial number or registration number records per call.

When requesting information for registration numbers under one million, add sufficient leading zeros to the registration number so that a total of seven digits are entered. For example, to get status information for Reg. No. 88,725 enter 0088725#.

When requesting information for applications, enter an eight-digit serial number that consists of the two-digit series code followed by the six-digit serial number PTO. The series code is determined by the filing date of the application. All applications filed before Mar. 31, 1905 are series code 70. Applications filed between Apr. 1, 1905 and Dec. 31, 1955 are series code 71. Applications filed between Jan. 1, 1956 and Aug. 31, 1973 are series code 72. Applications filed between Sept. 1, 1973 and Nov. 15, 1989 are series code 73. All applications filed on or after November 16, 1989 are series code 74.

When requesting information for serial numbers under 100,000 in any series code, add sufficient leading zeros to the serial number so that a total of six digits are entered after the series code. For example, to get status information for serial number 92,132 in series code 73, enter 73092132#.

The TRAM System contains records for all active federal trademark registration and pending applications. The TRAM System also contains records for all federal trademark registrations and applications which became inactive after Mar. 31, 1982. Some earlier inactive records are also available.

The Trademark Status Line will provide current status information for all federal trademark application and registration records included in the TRAM System. The date that the record entered the current status is provided also. If additional information regarding the status of a trademark application or registra-



tion is required, call the Trademark Services division at (703)557-5249 and request a status check.

Feb. 8, 1990

JEFFREY M. SAMUELS  
Assistant Commissioner  
for Trademarks

[1112 TMOG 49]

(153) **New Telephone Numbers for the  
Trademark Status Line**

On November 18, 1991, the local telephone company in Arlington, Va. will change many of the telephone numbers used by the U.S. Patent and Trademark Office, including the numbers for the Trademark Status Line. Effective on that date, the new telephone numbers for the Trademark Status Line will be (703) 305-8747 through (703) 305-8752.

The Trademark Status Line provides access, via touch tone telephone, to current status and status date information for all federal trademark application and registration records maintained in the automated Trademark Reporting and Monitoring (TRAM) System. The Trademark Status Line is available from 6:30 a.m. until midnight, Eastern Time, Monday through Friday.

The Trademark Status Line may be used from any touch tone telephone by entering a seven-digit registration number and the "\*" symbol or an eight-digit serial number and the "#"

symbol after the welcoming message and the tone. All calls will be answered in the order received. Callers may request information for up to five serial number or registration number records per call. If additional information regarding the status of a trademark application or registration is required, call the Office of Trademark Services at (703) 308-9400 and request a status check.

Oct. 23, 1991

JEFFREY M. SAMUELS  
Assistant Commissioner  
for Trademarks

[1132 TMOG 33]

(154) **TRADEMARK STATUS INFORMATION  
AVAILABLE ON THE TRADEMARK STATUS LINE**

The Trademark Status Line (703) 557-8747 provides status and status date information for all Trademark applications and registrations to users with touch tone telephones. The Trademark Status Line is available from 6:30 A.M. to midnight (Eastern Standard Time), Monday through Friday.

The following is a listing of the status text provided by the Trademark Status Line for each corresponding status code in the TRAM system and the usual location of the file when it is in each status. All information in parenthesis is explanatory and is not part of the status text. All status codes followed by a "\*" are within the blackout period for filing Amendments to Allege Use in Intent to Use applications. All status codes followed by a "^" apply to Intent to Use applications only.

Status Code	Status Text	Usual File Location
600	Abandoned-Incomplete Response	Warehouse
601	Abandoned-Express	Warehouse
602	Abandoned-Failure to Respond	Warehouse
603	Abandoned-After ex parte Appeal	Warehouse
604	Abandoned-After inter partes decision	Warehouse
605	Abandoned-After Publication	Warehouse
606^	Abandoned-No Statement of Use filed	Warehouse
607^	Abandoned-Defective Statement of use	Warehouse
608	Abandoned-After Petition Decision	Warehouse
609	Abandoned-Defective Divided Application	Warehouse
612	Petition to Revive-received	TMO Dir
614	Abandoned-Petition to revive denied	Warehouse
616	Revived-Awaiting Further Action	Law Office
618	Abandoned File-Backfile (Indicates the application existed when the TRAM database was created and it is abandoned but the reason for the abandonment is unknown.)	Warehouse
620	Backfile application added to database Status not recorded. (Indicates the application existed when the TRAM database was created and the status is unknown at this time.)	
622	Misassigned Serial Number (Indicates that the subject serial number was assigned in error and cancelled. File contents were returned to submitter or transferred to another serial number.)	File Cover Destroyed
624	Registered-Backfile (Indicates the registration existed when the TRAM database was created and remains registered at this time.)	Warehouse
625	Registration added to the data base Status unclear (Indicates the registration status is unknown at this time.)	Warehouse
626	Registered-Backfile cancelled or expired (Indicates the registration is no longer active but the reason for this is unknown.)	Warehouse
630	New Application-Record initialized not assigned to examiner	Law Office
631	New Application-Divided-Initial processing (Indicates a divisional request has been received and is being processed.)	ITU Unit

632	Informal Application (Indicates that the application filed was incomplete.)	Pre-Exam
638	New Application-Assigned to an examiner	Law Office
640	Non-final action counted-Not mailed	Law Office
641	Non-final action-Mailed	Law Office
643	Previous action/approval count withdrawn (Indicates the Examiner has withdrawn an Office Action or approval.)	Law Office
644	Final refusal counted-Not mailed	Law Office
645	Final refusal-Mailed	Law Office
646	Examiner's amendment counted-Not mailed	Law Office
647	Examiner's amendment-Mailed	Law Office
648	Action continuing Final counted-Not mailed	Law Office
649	Action continuing Final-Mailed	Law Office
650	Suspension inquiry counted-Not mailed	Law Office
651	Suspension inquiry-Mailed	Law Office
652	Suspension letter counted-Not mailed	Law Office
653	Suspension letter-Mailed	Law Office
654	Report completed suspension check-Case still suspended	Law Office
661	Response after non-Final action-Entered	Law Office
663	Response after Final rejection-Entered	Law Office
665	Notice of unresponsive amendment-Counted	Law Office
666	Notice of unresponsive amendment-Mailed	Law Office
667	Refusal withdrawal letter-Counted (Refers to an Office Action which withdraws a refusal after an ex parte appeal has been filed.)	Law Office
668	Refusal withdrawal letter-Mailed (Refers to an Office Action which withdraws a refusal after an ex parte appeal has been filed.)	Law Office
672	Reinstated-Awaiting further action (Refers to an application which was reinstated after an abandonment due to PTO error.)	Law Office
680*	Approved for publication (By the examiner)	Law Office
681*	Publication/Registration review complete (By the Law Office Clerk)	Pub. and Issue
686*	Published for Opposition	Pub. and Issue
688^	Notice of Allowance-Issued	ITU Unit
689^A	Notice of Allowance-Withdrawn	Pub. and Issue
690^A	Notice of Allowance-Cancelled	Pub. and Issue
692*	Withdrawn from publication	
693*	Withdrawn from registration-Jurisdiction restored (To Examiner)	Law Office
694*	Withdrawn from registration	
700	Registered	Warehouse
701	Section 8-Accepted	Post Reg.
702	Section 8 and 15-accepted and acknowledged	Post Reg.
703	Section 15-acknowledged	Post Reg.
704	Partial Section 8 accepted	Post Reg.
705	Partial Section 8 and 15 accepted and acknowledged	Post Reg.
710	Cancelled-Section 8	Warehouse
711	Cancelled-Section 7(d)	Warehouse
712	Cancelled by court Order under Section 37	Warehouse
713	Cancelled-Section 18	Warehouse
714	Cancelled-Section 24	Warehouse
715	Cancelled-Restored to Pendency (Indicates the subject registration number was assigned in error and correction requires restoration of the application to pendency)	Law Office
716	Inadvertently issued registration number-Cancelled (Indicates the subject registration number was assigned in error and has been cancelled.)	
718^	Request for first extension-Filed	ITU Unit
719^	Request for second extension-Filed	ITU Unit
720^	Request for third extension-Filed	ITU Unit
721^	Request for fourth extension-Filed	ITU Unit
722^	Request for fifth extension-Filed	ITU Unit
724^	Extension request refusal-Counted not mailed	ITU Unit
725^	Extension request refusal-Mailed	ITU Unit
730^	First Extension-Granted	ITU Unit
731^	Second Extension-Granted	ITU Unit
732^	Third Extension-Granted	ITU Unit
733^	Fourth Extension-Granted	ITU Unit
734^	Fifth Extension-Granted	ITU Unit
740	Post registration paper filed-Assigned to paralegal	Post Reg.
744^	Statement of Use-Filed	ITU Unit
745^	Statement of Use-Informal-Letter mailed	ITU Unit
746^	Statement of Use-Informal-Response entered	ITU Unit



747^	Statement of Use-ITU processing complete (Indicates pre-exam processing of the Statement of Use at the ITU Unit is complete.)	Law Office
748^	Statement of Use-To examiner(For Examination)	Law Office
752^	Statement of Use-Examiner statement counted-Not mailed	Law Office
753^	Statement of Use-Examiner Statement-Mailed	Law Office
756	Examiner statement counted-Not mailed	Law Office
757	Examiner statement-Mailed	Law Office
760	Ex parte appeal pending	TTAB
762	Ex parte appeal-Refusal reversed	TTAB
763	Ex parte appeal-Refusal affirmed	TTAB
764	Ex parte appeal dismissed as moot	TTAB
765*	Concurrent use proceeding terminated-Granted	TTAB
766*	Concurrent use proceeding terminated-Denied	TTAB
771*	Concurrent use proceeding pending	TTAB
772*	Interference proceeding pending	TTAB
773*	Interference proceeding terminated	TTAB
774*	Opposition pending	TTAB
775*	Opposition dismissed	TTAB
777*	Opposition terminated-See TTAB records	TTAB
778	Cancellation dismissed	TTAB
779*	Opposition sustained	TTAB
780	Cancellation terminated-See TTAB records	TTAB
782^	Statement of Use-Opposition Decided-Entry of Judgement Deferred	TTAB
783^	Statement of Use-Cancellation Decided-Entry of Judgement Deferred	TTAB
784^	Statement of Use-Interference Decided-Entry of judgement deferred	TTAB
785^	Statement of Use-Concurrent Use Decided-Entry of Judgement Deferred	TTAB
790	Cancellation Pending	TTAB
794	Jurisdiction restored to examiner	Law Office
800	Renewed	Post Reg.
801*	Opposition instituted	TTAB
802*	Request for extension of time to file opposition	TTAB
803*	Amendment after publication	TM Service Division
806^	Statement of Use-Non-final action counted-Not mailed	Law Office
807^	Statement of Use-Non-final action-Mailed	Law Office
808^	Statement of Use-Final refusal counted-Not mailed	Law Office
809^	Statement of Use-Final refusal-Mailed	Law Office
810^	Statement of Use-Examiner's amendment counted-Not mailed	Law Office
811^	Statement of Use-Examiner's amendment-Mailed	Law Office
812^	Statement of Use-Action continuing final counted-Not mailed	Law Office
813^	Statement of Use-Action continuing final-Mailed	Law Office
814^	Statement of Use-Response after non-final action-Entered	Law Office
815^	Statement of Use-Response after final rejection-Entered	Law Office
816^	Statement of Use-Notice of unresponsive amendment-Counted-Not mailed	Law Office
817^	Statement of Use-Notice of unresponsive amendment-Mailed	Law Office
818^	Statement of Use accepted-Approved for Registration (By the Examiner)	Law Office
819^	Statement of Use-Registration review complete (By the Law Office Clerk)	Pub. and Issue
900	Expired (Refers to registration that were not renewed.)	Warehouse

December 3, 1990

JEFFREY M. SAMUELS  
Assistant Commissioner for Trademarks

[1122 TMOG 568]

(155) Transmittals for Use of  
Deposit Accounts

When statutory fees are to be charged to a deposit account, the processing of the application can be facilitated by submitting the applicant's transmittal letter or other correspondence specifying the account to be charged in triplicate. Submission of these documents in triplicate will eliminate the need for the

Mail Room to photocopy the document and thereby reduce the processing time of incoming mail.

Nov. 21, 1983

THERESA A. BRELSFORD  
Assistant Commissioner  
for Administration

[1037 TMOG 15]

## (156) Availability of Deposit Account Status Line

Beginning on February 20, 1990, the U.S. Patent and Trademark Office will provide access, via push button telephone, to the current account balance information, and last deposit for the current month, if any. The Deposit Account status line will be available on (703)557-8735 or (703)557-8746 from 6:30 A.M. until midnight, Eastern time, Monday thru Friday.

The Deposit Account status line may be used from any push button telephone by entering your six digit account number and the pound sign after being told to do so by the greeting message that you receive whenever you dial in. All six digits and the pound sign must be entered.

Questions that may arise pertaining to the information received thru use of the status line must be referred to the Deposits Account Division at (703) 557-3227 during the hours 8 A.M. until 5 P.M. Eastern time, Monday thru Friday, except for Federal holidays.

Feb. 5, 1990

BRADFORD HUTHER  
Assistant Commissioner  
for Finance and Planning

[1112 TMOG 49]

(157) Telephone Changes for Deposit Account  
Status Line

Effective Nov. 18, 1991, new telephone exchange numbers will be made for the Deposit Account Status Line. On that date, Deposit Account Balance information can be obtained by calling (703) 305-8735 or (703) 305-8746 from 6:30 a.m. until midnight, Eastern time, Monday thru Friday, except for Federal holidays.

Questions that may arise pertaining to the information received through use of the status line may be referred to the Deposit Account Division at (703) 308-0902. Calls will be received on the answering machine 24 hours a day, seven days a week.

Oct. 31, 1991

BRADFORD HUTHER  
Assistant Commissioner for  
Finance and Planning

[1132 TMOG 48]

## (158) Notices of Abandonment

The Trademark Operation has begun notifying trademark applicants when their pending applications have been abandoned by the Office. Under this new procedure, a computer-generated post card bearing the notice, serial number, applicant name and abandonment date will be sent to the correspondence address designated by the applicant. The post cards will be mailed within 2 to 4 weeks after the application is declared abandoned.

Jan. 13, 1986

MARGARET M. LAURENCE  
Assistant Commissioner  
for Trademarks

[1063 TMOG 4]

(159) Change of Correspondence Address in  
Trademark Applications

Applicants are reminded that when an application is filed and a correspondence address is entered in the Official record, correspondence will continue to be sent to such address until the applicant or party, or the attorney-at-law or other authorized representative of the applicant or party, indicates in writing that correspondence is to be sent to another address. 37 CFR Section 2.18. The filing of a response to an Office action on letterhead stationery that indicates a different address from the

correspondence address of record is insufficient notice that correspondence is to be sent to another address. Specific language is needed which can reasonably be interpreted to be a request to change the address. See TMEP Section 603.

If a power of attorney has been filed in an application, a subsequently filed power of attorney will be regarded as a written request to change the correspondence address, even if there is no specific language changing the address or revoking the prior power of attorney. See TMEP Section 603.

May 15, 1986

MARGARET M. LAURENCE  
Assistant Commissioner  
for Trademarks

[1067 TMOG 7]

(160) Use of Restricted Deposit Account for  
Electronic Ordering of Patent and Trademark Copies

Effective July 1, 1986, the restricted deposit account will be made available to those members of the public who wish to use it for electronic ordering of patent and trademark copies. The restricted deposit account requires maintenance of a minimum balance of \$300.00 at the end of each month, as compared to the unrestricted account which requires a minimum balance of \$1,000.00.

In FY 1986, the Office established the restricted deposit account for use in charging subscriptions for copies of newly issued patents by subject matter classification. Establishment of a PTO deposit account is a prerequisite for subscription service.

Recently, the Office established an electronic ordering service (EOS), a method of ordering copies of patents and trademarks through the use of a computer terminal and modem. EOS is available only to PTO deposit account holders.

Many people who are interested in using EOS to order copies of patents and trademarks and who do not have PTO deposit accounts find the \$1,000.00 balance required for the unrestricted account prohibitive. Therefore, the use of restricted account is being expanded to incorporate EOS ordering. Subscriptions and EOS ordering are the only two services for which restricted accounts may be used. If you have any questions on subscriptions or EOS, please call Mary Brown on (703) 557-3236. If you have questions on deposit accounts, please call Delores Riley on (703) 557-3227.

June 23, 1986

THERESA A. BRELSFORD  
Assistant Commissioner  
for Administration

[1068 TMOG 4]

(161) CD-ROM PRODUCTS NOW AVAILABLE  
FROM THE U.S. PATENT AND TRADEMARK OFFICE

## Trademark Information on CD-ROM

The U.S. Patent and Trademark Office is pleased to announce the availability of trademark information on Compact Disc-Read Only Memory (CD-ROM). These discs, previously available only at U. S. Patent and Trademark Depository Libraries, may now be purchased by the general public. Subscription to any trademark title below will begin with the first disc issued after October 1, 1994. Orders may be placed now.

**Trademark Registrations:** Contains the text of all active registered trademarks from 1884 through the date specified with each issue. Twenty-nine search fields are available, including Word Mark, International and U. S. Classifications, Goods & Services, Design Search Code, Dates of Filing, Publication for Oppositions, and Registration, and more. Cost: \$300/subscription.

**Trademarks Pending:** Contains the text of trademark applications which have been filed but not yet approved for registration as of the date specified with each issue. Twenty-four search



fields are available, including most of the same fields present on the Trademark Registrations disc. Cost: \$300/subscription.

**Trademark Assignments:** Contains the text of bibliographic data from trademark assignment deeds recorded at the U.S. Patent and Trademark Office from 1955 through the date specified with each issue. Ten search fields are available, including Assignor, Assignee, Mark, Date Recorded, and others. Cost: \$300/subscription.

All Trademark CD-ROM products also currently contain the *Trademark Manual of Examining Procedure* and a Goods and Services manual which are updated when electronic versions of revisions are made available. All search results can be viewed on screen, printed, or downloaded to diskette.

Each product title will be sold individually on a yearly subscription basis consisting of approximately six discs. Updated discs issue approximately every two months. Back issues are not available once superseded by current issues.

#### SNAP (Serial Numbers for Allowed Patents) CD-ROM

This CD-ROM provides a concordance between U.S. patent numbers and their application serial number. Kinds of patent documents included are: utility, design, plant, reissue, Statutory Invention Registration and Defensive Publication, filed after December 31, 1976, which were granted by the U.S. Patent and Trademark Office through the date specified with each disc. Search fields are: Serial Number, Application Year, Series Code, Patent Title and Patent Number. Updated discs issues on an irregular basis. Cost per disc: \$50. Back issues are not available once superseded by an updated disc. Orders may be placed now for the next disc to issue.

#### USAPat

USAPat contains facsimile images on CD-ROM of all documents issued weekly by the U.S. Patent and Trademark Office. These include: utility patents, design patents, plant patents, reissue patents, reexamined patents, Statutory Invention Registrations, and Certificates of Correction. Each week's issue consists of 2 or 3 discs.

This product allows users to view and print all patents. Images shown on the screen can be "zoomed" for better viewing. Excellent copies can be obtained using a laser printer.

As a document delivery system, patents on CD-ROM offer advantages over traditional formats. Storage requirements will be reduced, fast retrieval of documents will be possible, and excellent laser-printed copies will be available immediately for your use.

USAPat will be sold on a calendar year subscription basis at a cost of \$2,400. You may elect to begin your subscription with the first issue of 1995, or with the first issue of 1994.

The price for all CD-ROM products includes the discs, retrieval software, and appropriate printed user documentation, which are the only user support available from the PTO. The discs are mailed first class domestic or air mail overseas. Payment may be made by check or money order payable to the Commissioner of Patents and Trademarks, or charged to your PTO deposit account. Cash, credit cards and purchase orders are not accepted.

For further information or to request an order form, please contact:

U.S. Patent and Trademark Office  
Office of Information Products Development  
Crystal Plaza 2, Room 9D30  
Washington, D.C. 20231

Voice: (703) 308-0322  
Fax: (703) 308-0493

[1165 TMOG 112]

#### (162) Filing of a Notice of Appeal to the Court of Appeals for the Federal Circuit in the Patent and Trademark Office

This notice supersedes a notice entitled Filing of a Notice of Appeal to the Federal Circuit and Service of Court Papers

on the Commissioner of Patents and Trademarks published at 1079 Off. Gaz. Office 72 (June 30, 1987).

A notice of appeal to the Court of Appeals for the Federal Circuit may be filed in the Patent and Trademark Office in any one of the following ways:

A. By first-class mail addressed as follows, in which case the notice of appeal must actually reach the Patent and Trademark Office by the due date:

Box 8  
Commissioner of Patents and Trademarks  
Washington, D.C. 20231  
Attention: Office of the Solicitor

B. By "Express Mail" (U.S. Postal Service only) under 37 CFR § 1.10 addressed as follows, in which case the notice of appeal is deemed filed on the date of the Express Mail certificate:

Box 8  
Commissioner of Patents and Trademarks  
Washington, D.C. 20231  
Attention: Office of the Solicitor

C. By hand (on or before the due date) to the Office of the Solicitor. The Office of the Solicitor is located at:

Crystal Park II  
Suite 918  
2121 Crystal Drive  
Arlington, Va.

D. By facsimile transmission to the Office of the Solicitor. The telephone number for accessing the Office of the Solicitor facsimile machine is (703) 557-9373. A notice of appeal will be deemed timely filed on the date the facsimile transmission is received by the Office of the Solicitor, provided an original notice of appeal is subsequently received in either of the following ways:

- (1) An original, signed copy of the notice of appeal is actually received in the Office of the Solicitor within five calendar days of the facsimile transmission; or,
- (2) An original, signed copy of the notice of appeal is mailed by "Express Mail" (U.S. Postal Service only) under 37 CFR § 1.10 on the day of the facsimile transmission.

The facsimile machine for receiving a notice of appeal is located in the Office of the Solicitor and is staffed during the business hours of 8:30 a.m. to 5:00 p.m., Monday through Friday, excluding holidays. Due to possible equipment failure or maintenance requirements, precautions must be taken when relying on the availability of this service near the end of the time for filing a notice of appeal.

March 22, 1990 FRED E. McKELVEY  
Solicitor

[1113 TMOG 29]

#### (163) Service of Court Papers on the Commissioner of Patents and Trademarks

Court papers other than a notice of appeal to the U.S. Court of Appeals for the Federal Circuit may be served on the Commissioner in either of the following ways:

A. By hand between 8:30 a.m. and 5:00 p.m. at the Office of the Solicitor, located in Crystal Park II, Suite 918, 2121 Crystal Drive, Arlington, Va.

B. By mail in an envelope addressed as follows:  
Office of the Solicitor  
P.O. Box 15667  
Arlington, Va. 22215

While the above mail service address may be supplemented to include the name of the particular attorney assigned to the court case, it must not be supplemented to refer to either the Commissioner of Patents and Trademarks or the U.S. Patent and Trademark Office (PTO).

Court papers mailed to an address other than the above mail service address and court papers delivered by hand are deemed to have been served on the Commissioner when actually received in the Office of the Solicitor.

Papers which are not court papers and are intended to be filed in the PTO in connection with an application or other proceeding pending in the Office shall not be mailed to the Solicitor's mail service address. Any such papers which are mailed to the Solicitor's mail service address will not be considered to have been filed in the PTO. Instead, all such papers will be returned. No exceptions will be made to this policy.

Mar. 22, 1990

FRED E. McKELVEY  
Solicitor

[1113 TMOG 30]

#### (164) Appeals to the Federal Circuit from the PTO

This notice was originally prepared by the Solicitor and Associate Solicitor Richard E. Schafer for presentation at the Eighth Annual Judicial Conference of the U.S. Court of Appeals for the Federal Circuit. The notice discusses litigation philosophy of the Office of the Solicitor of the Patent and Trademark Office and other matters which may be helpful to appellants and others seeking judicial review of PTO decisions in the U.S. Court of Appeals for the Federal Circuit.

October 5, 1990

FRED E. McKELVEY  
Solicitor

#### I. Introduction

This notice discusses the philosophy of the Office of the Solicitor when representing the Commissioner before the Federal Circuit and other courts. The notice is also designed to assist appellants and others seeking judicial review of Patent and Trademark Office (PTO) decisions in the Federal Circuit. Much of what is said in the notice is also applicable to those instances where judicial review is sought of PTO decisions in a district court.

#### II. Solicitor's litigation philosophy

The Office of the Solicitor and its attorneys start with the proposition that justice is done when the right result is reached. The Solicitor is not an advocate who needs to win to be satisfied. Rather, the public interest is served when:

- (1) a patent issues on a patentable invention;
- (2) a patent is refused on an unpatentable invention;
- (3) a trademark is registered if entitled to registration under Title 15;
- (4) a trademark is refused registration if not entitled to registration under Title 15; or
- (5) PTO rules are properly applied within PTO and by reviewing courts.

Our litigation philosophy is expressed in *Berger v. United States*, 295 U.S. 78, 88 (1935):

The . . . [Government attorney] is the representative not of an ordinary party to a controversy, but of a sovereignty whose obligation to govern impartially is as compelling as its obligation to govern at all; and whose interest . . . is not that it shall win a case, but that justice shall be done. As such, he is in a peculiar and very definite sense the servant of the law, the twofold aim of which is that guilt shall not escape or innocence suffer.

The Office of the Solicitor does more than simply "defend" an appeal. Rather, it will determine whether:

- (a) appeals are ripe for judicial consideration;
  - (b) there are steps a party might take in PTO to obviate the appeal, e.g., amendments which might be made to claims to conform an argument to the subject matter being claimed - we often find that arguments in a brief are based on limitations which do not appear in the claims;
  - (c) there is material not in the record which might provide a full answer to an argument - particularly a new one - made in a brief; and/or
  - (d) the deciding official or board should be approached to see if it wishes to reevaluate its decision in view of a change in the law, a credible argument that the decision may not be correct, or a matter which may have been overlooked.
- Most of the time, it takes more effort to implement this philosophy than it would take simply to brief and argue a matter.

Generally, in a Federal Circuit matter, the Office of the Solicitor - apart from designating an appendix - does not "get deeply into" a case until appellant's brief is filed. Exceptions occur, i.e., *inter partes* patent and trademark cases where the board opinion is reviewed to see if an *amicus* brief might be appropriate to assist the Federal Circuit with PTO practice.<sup>1</sup> This is not to say that an appellant should not feel free to discuss an appeal with an attorney in the Solicitor's Office. But, ordinarily in an *ex parte* case, we do not spend time until we see appellant's brief. The reason is that a large number of appeals are simply dismissed without the need for us to do much, if any, work.

Table 1, below, shows the disposition of appeals from October 1985 through April 1990. About 23%, i.e., 146, of the cases were dismissed with little, if any, work having been done by the Office of the Solicitor on the appeal. If we conducted a review of all appeals when filed, our Federal Circuit "workload" would increase about 23%. We do not have the resources to effectively carry on 23% more work.

We find a lot of cases are not ripe or otherwise ready for judicial review. When we determine that more work needs to be done before the Federal Circuit should consider a case, we generally move to remand. Fed. Cir. R. 27(c) provides that a remand generally should be requested prior to briefing. However, since we generally cannot efficiently take up cases until appellant's brief is filed, we now file motions to remand along with our brief. A merits panel is then in a position to evaluate whether it should hear the case on the merits or order a remand.

There are a variety of reasons why we seek remands.

Table 1  
Disposition of cases in the Courts of Appeals  
in which the Solicitor has appeared  
October 1985 through September 1990

	Pat	TM	Total
Disposed cases:			
Affirmed	300	47	347
Modified	10	0	10
Reversed	47	17	64
Remanded <sup>2</sup>	40	8	48
Dismissed	120	26	146
Amicus/intervene	7	2	9
Examiner testimony	1	0	1
Transfer	6 <sup>3</sup>	0	6
Mandamus granted	0	0	0
Mandamus granted-in-Part	1	0	1
Mandamus denied	6	2	8
Mandamus dismissed	3	0	3
Totals:	541	102	643

<sup>1</sup>See e.g., *Fujie v. Verhagen*, Fed. Cir. No. 89-1126; *Hahn v. Wong*, 13 USPQ2d 1211 (Bd. Pat. App. & Int.), *aff'd*, 892 F.2d 1028, 13 USPQ2d 1313 (Fed. Cir. 1989); *Perkins v. Kwon*, 886 F.2d 325, 12 USPQ2d 1308 (Fed. Cir. 1989); and *Winkler v. Guglielmino*, Fed. Cir. No. 89-1571. See also *Copelands' Enterprises, Inc. v. CNV, Inc.*, 887 F.2d 1065, 12 USPQ2d 1562 (Fed. Cir. 1989) (en banc) and *Kellogg Co. v. Pack'em Enterprises, Inc.*, Fed. Cir. No. 90-1336.



## A.

An appellant may argue that a certain feature of a claim is not shown in the prior art. Such an argument may prompt us to determine whether the feature is known. If we find the feature, we will probably ask for a remand for the purpose of making an additional rejection.<sup>4</sup> In like manner, based on our respective backgrounds or other cases handled by the Office of the Solicitor, we may know of prior art which strengthens a rejection.<sup>5</sup>

## B.

Similarly, an appellant may argue that a certain fact is true. Upon looking into the matter, we have found literature from the appellant's assignee or other evidence which, in our opinion, demonstrates that the argument may not be factually correct.<sup>6</sup> Since the literature or other evidence is not part of the record, we have asked for a remand so that the case may be fully developed before a merits panel is required to consider the case. We have also filed a brief on the merits asking the Federal Circuit to take judicial notice of a fact while concurrently filing a contingent motion to remand in the event the merits panel believes that judicial notice is not appropriate.<sup>7</sup>

## C.

We have had cases where the sole issue is whether a Rule 131, 37 CFR § 1.131, affidavit is sufficient to antedate a reference. When the sufficiency of a Rule 131 affidavit is in issue, we search for a foreign or other equivalent statutory bar. When an equivalent statutory bar is found, we move to remand suggesting that the issue on appeal may well be moot.<sup>8</sup>

## D.

In *re Steele*, 305 F.2d 859, 134 USPQ 292 (CCPA 1962), suggests that indefiniteness should be taken care of prior to considering obviousness. There have been cases in which the claims are so indefinite that judicial review of an obviousness issue simply would not make sense. Remands, over appellant's objection, have been ordered.<sup>9</sup>

## E.

There have been occasions where the Board, TTAB, or the Commissioner decides to change or reconsider a decision. A change of decision can occur, *inter alia*, due to:

1. new "law" as announced in a court or administrative decision,<sup>10</sup> or
2. a deciding official or tribunal determines that:
  - (a) a decision may not be correct,
  - (b) a matter was overlooked,<sup>11</sup> or
  - (c) a decision otherwise needs to be reconsidered.<sup>12</sup>

## F.

There have been cases where, although not argued by the appellant, it did not make sense to apply existing law in a particular context. We have moved to remand. In one instance, the Board reconsidered its position, established new law, and granted relief.<sup>13</sup>

<sup>4</sup>Approximately 80% of the remands were ordered based on motions to remand filed by the Office of the Solicitor. See the discussion on remands, *infra*.

<sup>5</sup>All transfers were from a regional court of appeals to the Federal Circuit.

<sup>6</sup>In *re Yashuhara*, Fed. Cir. No. 85-889. The reference added on remand was relied upon by the Federal Circuit in a later decision affirming the rejection made on remand. In *re Yashuhara*, Fed. Cir. No. 86-1634. See also *In re Merz*, Fed. Cir. No. 86-615, and *R. D. Werner Co. v. Quigg*, Civil Action No. 85-0945 (D.D.C.).

<sup>7</sup>See e.g., *In re Trogan*, Fed. Cir. No. 85-2724; *Flexiwat v. Quigg*, Civil Action No. 86-2666 (D.D.C.); *In re Nilssen*, Fed. Cir. No. 87-1349; *In re Nilssen*, Fed. Cir. No. 87-1392, and *Hepar Chimie v. Mossinghoff*, Civil Action No. 85-1912 (D.D.C.).

<sup>8</sup>In *re Weitz*, Fed. Cir. No. 85-879; *In re Lowrance Electronics, Inc.*, Fed. Cir. No. 88-1180.

<sup>9</sup>In *re Klang*, Fed. Cir. No. 85-2825.

<sup>10</sup>In *re Lockner*, Fed. Cir. No. 86-1269.

<sup>11</sup>In *re Jacobs*, Fed. Cir. No. 85-2210.

<sup>12</sup>In *re Eastin*, Fed. Cir. No. 90-1439.

<sup>13</sup>In *re Giordano*, Fed. Cir. No. 87-1029; *In re Raleigh Stores Corp.*, Fed. Cir. No. 87-1183; *In re Whaleco*, Fed. Cir. No. 87-1522.

<sup>14</sup>In *re Brown*, Fed. Cir. No. 86-617; *Groz v. Quigg*, Civil Action No. 87-1340 (D.D.C.); *London Laboratories v. Commissioner*, Civil Action No. 86-0914 (D.D.C.); *Hashimoto v. Quigg*, Civil Action No. 86-1595 (D.D.C.); and *Katrapat AG v. Quigg*, Civil Action No. 87-0250 (D.D.C.).

<sup>15</sup>*Papst-Motoren GmbH & Co. v. Quigg*, Civil Action No. 86-1168 (D.D.C.). The Board's decision on remand is published. *Ex Parte Papst-Motoren*, 1 USPQ2d 1655 (Bd. Pat. App. & Int. 1986).

## G.

In its opinion, the Board - without entering a new ground of rejection under Rule 196(b), 37 CFR § 1.196 - may suggest that if there is to be further prosecution, an examiner may wish to look into several possible rejections. Generally in such a case the appellant will abandon or refile under 35 U.S.C. § 120. On occasion, however, an appellant will seek judicial review. Ordinarily, we seek remands in such a case in order to avoid piecemeal judicial review.<sup>14</sup>

## H.

We had one case in which an appellant "dropped" an appeal as to all but a dependent claim - only the independent claim had been discussed in appellant's brief to the Board and the Board discussed only the independent claim. We sought a remand - after the appellant's brief had been filed - so that PTO could articulate a rationale as to the sole claim left in appeal.<sup>15</sup> Alternatively, we could have argued the appeal on the basis of the independent claim. However, in the context of the particular case, that alternative did not make sense.

## I.

We had a case where the application on appeal was deemed to be abandoned. We moved to remand to clarify the status of the application.<sup>16</sup> We also had a trademark appeal in which registration in the United States could not occur until registration took place abroad.<sup>17</sup> Obviously, there was no reason to proceed in the Federal Circuit until registration occurred in the foreign country. When an appeal is taken in a trademark case, we always check to be sure that the registration relied upon is "alive." Appellant also should be sure that the registration has not expired. In one trademark appeal, the likelihood of confusion issue became moot on appeal when we discovered that the registration cited against the appellant expired without being renewed.

Most attorneys representing appellants will agree to a remand when approached by an attorney in the Office of the Solicitor - regardless of the time a suggestion to remand is made. A remand saves appellant, the Federal Circuit and our office time and money and in the long run contributes to the effective administration of justice within PTO and the Federal Circuit. In some cases, our motions to remand have been opposed. In one published opinion, an opposed motion was granted notwithstanding appellant has filed its principal brief;<sup>18</sup> in another opinion, relief was denied.<sup>19</sup> It appears the Federal Circuit has adopted, as a general rule, the latter opinion. See Fed. Cir. R. 27(c).

We will not attempt to reconcile Fed. Cir. R. 27(c) with what we regard to be the better policy expressed in *In re Gould*. We will point out, however, that if an appeal proceeds in the face of a motion to remand,

(a) an appellant will have to spend money to have its attorney appear for oral argument,

(b) the merits panel will have to spend time preparing for oral argument, holding oral argument, and writing an opinion,

(c) PTO will have to expend resources preparing for and presenting oral argument, and

(d) prosecution on the merits may be reopened after a mandate is entered if a viable rejection remains to be considered.

It is possible, of course, that we might prevail on the merits, thereby obviating any need for a remand. However, if we do not prevail, PTO can - and often does - reopen prosecution of the application upon entry of the Federal Circuit's mandate to consider the matter raised by a motion to remand.<sup>20</sup>

<sup>14</sup>See *Tofe v. Winchell*, 645 F.2d 58, 63 [headnote 6], 209 USPQ 379, 384 (CCPA 1981). See also *Paradis v. Quigg*, Civil Action No. 87-1486 (D.D.C.) and *Clough v. Quigg*, Civil Action No. 87-2304 (D.D.C.).

<sup>15</sup>In *re Hyatt*, Fed. Cir. No. 85-2224.

<sup>16</sup>In *re Goodman*, Fed. Cir. No. 87-1056. The Commissioner's decision reviving the application is reported. *In re Goodman*, 3 USPQ2d 1866 (Comm'r Pat. 1987). See also *In re Greven*, Fed. Cir. No. 87-2341.

<sup>17</sup>In *re Matsushita Electric*, Fed. Cir. No. 89-1526.

<sup>18</sup>In *re Gould*, 673 F.2d 1385, 213 USPQ 628 (CCPA 1982). Relief in this case was ultimately granted in PTO. *Ex parte Gould*, 6 USPQ2d 1680 (Bd. Pat. App. & Int. 1987).

<sup>19</sup>In *re Hester*, 838 F.2d 1193, 5 USPQ2d 1832 (Fed. Cir. 1988). Relief on the merits was ultimately granted by the Federal Circuit in an unpublished opinion.

<sup>20</sup>In *re Ruschig*, 379 F.2d 990, 154 USPQ 118 (CCPA 1967); *In re Fisher*, 448 F.2d 1406, 171 USPQ 292 (CCPA 1971).

Sometimes an appellant will decide to file a second application, i.e., a continuation application or another trademark application, and simultaneously pursue the appeal. We believe appellant has a responsibility to call our attention to the fact that a second application has been filed. Knowledge of the second application is material to steps we might take.

First, perhaps any appeal (or civil action) should be suspended pending outcome of proceedings on the second application or dismissed without prejudice to another appeal in the event a final adverse Board decision is entered in the second application. In effect, by filing a second application, appellant admits that there are available administrative remedies and that those remedies have not been exhausted.

Second, it is in PTO's best interest that the examiner handling the second application be aware of the existence of an appeal. The examiner may ask our office for assistance, as may the Board, during prosecution of the second application.

## III. Notice of appeal

Recent amendments have been made to conform PTO practice as much as possible to Fed. R. App. 4. See 54 Fed. Reg. 29548 (July 13, 1989), reprinted in, 1105 Off. Gaz. Pat. Office 5 (Aug. 1, 1989).

## A. Time for appeal

If an appeal from a PTO decision to the Federal Circuit is authorized by law, the time for filing a notice of appeal in PTO was changed in August 1989 to two (2) months or 60 days, whichever is longer. The time for seeking judicial review by civil action under 35 U.S.C. 145 or 146 is also two (2) months or 60 days, whichever is longer.

The filing of a request for reconsideration in PTO tolls the time for filing a notice of appeal. After a decision on reconsideration is entered in PTO, the two month period begins to run.

The time for appeal to the Federal Circuit is set by the Commissioner. 35 U.S.C. § 142; 15 U.S.C. § 1071(a)(2). The period for appeal must be at least 60 days. A notice of final rule was effective in August 1989 setting the time for appeal to two months or 60 days - whichever is longer. The dichotomy which used to exist between the 60-day period for initial decisions and the 30-day period for decisions on reconsideration<sup>21</sup> no longer exists.

## B. Cross appeals

In *inter partes* cases, a cross-appeal may be filed within fourteen (14) days of service of an appeal or two months after the PTO decision being appealed, whichever is later.

## C. Requests to extend time to appeal

A request for an extension of time to file a notice of appeal before the appeal period expires can be granted by the Commissioner upon a showing of good cause.

A request after the appeal period expires must establish excusable neglect. The "excusable neglect" standard applied by PTO is the same as that applied by the courts of appeals.

All requests for an extension of time to appeal should be directed to the attention of the Office of the Solicitor.

## D. Where to file a notice of appeal

The original notice must be filed in PTO - filing only in the Federal Circuit does not perfect an appeal. However, a copy must also be filed in the Federal Circuit. Fed. Cir. R. 15. A copy of the decision being appealed, and any decision on reconsideration, should be attached to the copy of the notice of appeal filed in PTO and with the Federal Circuit.

The original notice may be filed in any of the following ways:

1. By hand-delivery to the Office of the Solicitor between 8:30 a.m. and 5:00 p.m. at:  
Office of the Solicitor  
2121 Crystal Drive  
Suite 918  
Arlington, Virginia

2. By first-class mail addressed to:  
Box 8

<sup>21</sup>37 CFR § 1.304(a) (1989); 37 CFR 2.145(d) (1989).

Commissioner of Patents and Trademarks  
Washington, D.C. 20231  
Attention: Office of the Solicitor

3. By Express Mail under 37 CFR § 1.10 addressed to:  
Box 8  
Commissioner of Patents and Trademarks  
Washington, D.C. 20231  
Attention: Office of the Solicitor

A certificate of mailing under 37 CFR § 1.8 cannot be used to file a notice of appeal. A notice of appeal filed in PTO using a certificate of mailing under 37 CFR § 1.8 is deemed filed when received in PTO. *In re Thrifty Corp.*, 231 USPQ 560 (Comm'r Pat. 1986).

A notice of appeal mailed to the Solicitor's Postal Box in Arlington, Virginia is deemed filed when received in the Office of the Solicitor.

## E. Content of notice of appeal

A notice of appeal should identify all parties appealing. Fed. R. App. P. 15(a). See *Torres v. Oakland Scavenger Co.*, 487 U.S. 312, 317 (1988) [construing similar requirement of Fed. R. App. P. 3(c)].

Thus, in a case where there are joint inventors, the notice of appeal should identify all inventors. The notice of appeal should not identify John Doe et al. as appellants; rather, it should identify as appellants all named inventors, i.e., "John Doe and Richard Roe appeal . . ."

A notice of appeal need simply state that:

John Doe and Richard Roe appeal to the U.S. Court of Appeals for the Federal Circuit from a final decision entered by the Board of Patent Appeals and Interferences on June 15, 1990, and from a decision on reconsideration entered by the Board on July 15, 1990.

There is no need to give reasons in the notice of appeal. See 37 CFR §§ 1.4 and 1.5 for material which should appear in the "heading" of the notice of appeal.

## IV. Transmittal of certified list

After a notice of appeal is received, a determination is made whether the notice was timely filed.

Appellant will be advised if the appeal is untimely. Fed. Cir. R. 15(b)(1) governs proceedings when a notice of appeal is not timely filed.

If the Commissioner notifies the clerk that the notice of appeal was not timely, the clerk shall order the appellant to show cause why the appeal should not be dismissed, and thereupon refer the response to the court.

In order to properly respond to the Federal Circuit, an appellant may wish to file a request for an extension of time, which should be filed in the Office of the Solicitor, and establish that the untimely filing of the notice of appeal was a result of excusable neglect. Any decision on the request will be copied to the Clerk of the Federal Circuit for such action as may be appropriate. A decision by the Commissioner granting a request to extend the time for filing the notice of appeal will discharge the show cause order entered by the Clerk.

A certified list, consisting of the contents of the application, interference, opposition, cancellation, or other proceeding is copied and forwarded to the Federal Circuit with a statement indicating whether the notice of appeal was considered timely filed. In *ex parte* patent appeals the certified list usually does not include the contents to any "parent" applications unless the application involved in the appeal is a "file wrapper continuation" under 37 CFR § 1.62.

A copy of the certified list is mailed to the appellant or, in the case of an *inter partes* proceeding, all parties.

In *ex parte* patent or trademark appeals, an attorney in the Office of the Solicitor is assigned to the appeal at the time the certified list is forwarded to the Federal Circuit. Counsel for appellant should initiate a discussion with the Solicitor's Office attorney assigned to the case to determine the contents of the appendix.

Upon receipt of the certified list, the appeal will be docketed by the Federal Circuit. An appeal number is assigned to each appeal by the Federal Circuit. Appellant's 60-day period for filing a brief runs from the later of the date the appeal is docketed by the Federal Circuit or the certified list is served.



Fed. Cir. R. 31(a). Since the appeal is docketed after the certified list is served in the case of PTO appeals, the 60-day period almost always runs from the date the appeal is docketed.

#### V. Service of court papers on the Solicitor

The mail service address for the Solicitor is:  
Office of the Solicitor  
P. O. Box 15667  
Arlington, Virginia 22215

Only litigation papers should be mailed to the Post Office box address. Other papers intended for filing in PTO should be addressed as specified in 37 CFR § 1.1. Non-litigation papers will be returned and will not be forwarded to the Mail Room.

Litigation papers not served by hand must be mailed to our Post Office box. Litigation papers mailed or delivered to the Mail Room of PTO, left in PTO's night deposit box, or left with a PTO employee in an office other than the Office of the Solicitor, are deemed served when received in the Office of the Solicitor.

The Office of the Solicitor is open from 8:30 a.m. to 5:00 p.m. Litigation papers served by hand must be delivered between 8:30 a.m. and 5:00 p.m. to:

Office of the Solicitor  
2121 Crystal Drive  
Suite 918  
Arlington, Virginia

Unless permitted by court rules or order, delivery does not include facsimile transmission.

#### VI. Motions

Motions are inevitable in Federal Circuit and other court practice. Before a motion is filed, appellant should contact the Solicitor's Office to see if there is agreement on the requested relief and the proposed order. If there is no opposition to a procedural order, it can be entered by the Clerk, thereby obtaining prompt relief and obviating the need for a judge or motions panel to consider the matter.

#### VII. Appendix

##### A. Designation

The Office of the Solicitor typically designates the following items for inclusion in the appendix in addition to the mandatory items specified in Fed. Cir. R. 30.

In *ex parte* patent cases, we generally designate:

- (1) the specification;
- (2) any drawings;
- (3) the prior art supporting the rejection;
- (4) the final rejection and any Office action referenced in the final rejection;
- (5) the examiner's answer; and
- (6) any evidence submitted to support patentability.

In *ex parte* trademark cases, we generally designate:

- (1) the trademark application, including the drawing;
- (2) specimens;
- (3) the trademark examining attorney's statement; and
- (4) registrations supporting the refusal and any other evidence relied upon by the examining attorney or the TTAB.

It should be noted that Fed. Cir. R. 30(a)(2)(iii) prohibits the inclusion of briefs filed by an applicant in PTO without leave of the court. However, the examiner's answer and examining attorney's statement may be designated and included without leave. Fed. Cir. R. 30(a)(2).

While the items in the appendix differ from case to case, a typical appendix in an *ex parte* patent appeal contains the following items in the following order:

- (1) table of contents;
- (2) the initial decision of the Board;
- (3) any decision on reconsideration;
- (4) a copy of the certified list, which corresponds to the docket entries mentioned in Fed. R. App. P. 29(a)(1);
- (5) the specification;
- (6) the final rejection;
- (7) the examiner's answer;
- (8) any prior art relied upon by PTO;
- (9) any rebuttal evidence, e.g., affidavits under Rule 131, 37 CFR § 1.131, or Rule 132, 37 CFR § 1.132; and
- (10) a copy of the rejected claims.

With respect to the last item, Fed. Cir. R. 30(a)(3) provides:

In appeals from . . . [PTO], the appendix shall, unless the parties mutually agree to the contrary, include a copy of all rejected claims in an *ex parte* patent appeal, a copy of all counts in a patent interference appeal, and both a copy of the trademark sought to be registered or cancelled and a copy of any registration relied upon to refuse or oppose registration or to seek cancellation of a registered mark in an *ex parte* or an inter partes trademark appeal.

If the material designated as the appendix exceeds 100 pages, a draft copy of the appendix, with page numbers, should be sent to the Office of the Solicitor. Upon receipt, if we see any problem with the appendix, including any failure to comply with Federal Circuit rules, we promptly advise appellant. Preparation of a draft appendix will also insure that all briefs properly refer to pages of the appendix.

##### B. Page numbering

Fed. Cir. R. 30(c)(2) requires that page numbers be centered in the bottom margin of each page and that other pagination marks be redacted if necessary to avoid confusion. Numbering the appendix pages with a format such as "0001" generally avoids confusion with other page numbers.

If the designated appendix is less than 100 pages (which should be copied on both the front and back), the appendix is bound with appellant's principal brief. If the designated appendix is more than 100 pages, the appendix is filed separately within seven (7) days of the date the last reply brief is filed. Fed. Cir. R. 30(a)(4).

##### C. Legible materials

An appendix will often contain copies of materials which are illegible. In cases where counsel for an appellant does not have legible copies of materials which are available in PTO, contact the Office of the Solicitor and we will arrange to send a legible copy.

Handwritten notes in the margin of counsel's copy of Office actions should be removed. The proper place to argue a case is in a brief — not in notes in the margin.

#### VIII. Briefs

##### A. Statement of the facts

Fed. R. App. P. 28(a)(3) requires that an appellant file a statement of facts relevant to the issues presented for review. Fed. Cir. R. 28(b) provides that the appellee's statement of the case should be limited to the specific areas of disagreement with those of the appellant. Absent disagreement the appellee shall not include a statement of the case in his brief. *Id.* In our view these rules place the responsibility to provide a complete and neutral statement of facts on the appellant. Appellant should remember that it *lost* below. Hence, the "facts" are not those the appellant would like them to be; rather, the "facts" are those found by the Board. The statement of the facts in a brief is not the place to argue that the Board was clearly erroneous in making a finding of fact.

In our experience, appellants' statement of the facts invariably include argument; fail to describe all the facts relevant to the issues; state the facts in a light most favorable to appellant despite contrary findings below; or state conclusions — often without citation to the appendix. As a result, we typically find it necessary to include a detailed and, we believe, a complete and neutral statement of facts — with full citations to the appendix.

We particularly note that when "new" counsel is retained to handle the Federal Circuit appeal, the arguments on appeal often bear no resemblance to the arguments made to the Board. As a matter of logic, it would seem that the Board could not possibly have erred below on the basis of an argument made for the first time in the Federal Circuit. See *Keebler Co. v. Murray Bakery Products*, 866 F.2d 1386, 9 USPQ2d 1736 (Fed. Cir. 1989) (since Keebler failed to tell the TTAB it was interested in Murray's "intent," it could not use intent as a basis for showing "error" by the TTAB; prescience is not a required characteristic of the board and the board need not divine all possible afterthoughts of counsel that might be asserted for the first time on appeal).

##### B. References in brief to the appendix

All factual assertions made in the brief should be supported with citation to the appendix. How the Federal Circuit is supposed to know that an assertion is correct, when no reference is made to the appendix in support of the assertion, is something we have not been able to figure out. The Federal Circuit has often noted, with apparent disapproval, the absence of a citation to the appendix in support of a party's position.<sup>22</sup> Failure to cite to the appendix may affect an attorney's credibility before the Federal Circuit and diminish the impact of otherwise meritorious arguments. If counsel feels that it is necessary to make factual assertions and cannot point to the specific portion of the appendix supporting the assertion, consideration should be given to refiling the application. Argument which depends on factual assertions not supported by the record cannot have any relevance to any error in the decision under review.

Moreover, to the extent that we have influence within PTO to bring about a favorable result by way of settlement, we need to be convinced. Allegations, not supported by references to the appendix, are not likely to convince any attorney in the Office of the Solicitor of the merits of an appellant's position.

#### IX. Oral argument

##### A. When we appear

An attorney from the Solicitor's Office will appear and present argument in cases in which the appellant intends to present oral argument. We will submit on the briefs only (1) where appellant submits on brief and (2) no reply brief has been filed or we conclude that the reply brief does not require comment at the oral hearing. On the other hand, if a reply brief raises a substantial issue, particularly a "new" issue, we will appear even if appellant waives oral argument.

##### B. Discussing the [alleged] error

An appellant has a burden of showing that the Board erred in its decision.<sup>23</sup> Factual findings below must be shown to be clearly erroneous,<sup>24</sup> while legal conclusions are reviewed for correctness or error as a matter of law.<sup>25</sup> Having only a short time for oral hearing, typically fifteen minutes, appellants should direct their remarks to the purported errors in the Board's decision. Based upon the 60 to 80 cases we argue annually, we can assure appellants that Federal Circuit merits panels are familiar with the record and the proceedings under review. Counsel may not want to use part of the 15 minutes normally allocated for oral argument by:

- (1) explaining that the case is an appeal from the Patent and Trademark Office (the merits panel already knows that because the briefs have been read),
- (2) identifying the appellant or assignee (because it is essentially irrelevant),
- (3) reviewing the facts of the case, etc.

However, counsel should be thoroughly familiar with the record and be prepared to identify the portions which support their arguments.

We suggest oral argument by an appellant should start by saying "The error below was . . ." and here's why.

##### C. Visual aids

Fed. Cir. R. 34(c) encourages the use of visual aids. If the visual aid was not used during the administrative proceeding, written notice of the proposed use must be given at least 15 days prior to the hearing. Any written objections must be filed at least 5 days before the hearing. The rule also provides that counsel may agree on the use of visual aids.

Whether or not we will agree depends on the particular facts. We ordinarily do not disagree with enlargements ("blow-ups") of portions of the record. Where the proposed visual aid is not

part of the record, we will not agree until we have had an opportunity to see the visual aid.

##### X. Petitions for rehearing

Petitions for rehearing can be useful if properly used. But, in our experience, petitions for rehearing filed by appellants simply reargue the case. We do not believe this is a proper function of a petition for rehearing.

Generally we will file a petition for rehearing only when (a) we believe the merits panel has made a genuine mistake — not merely a "judgment" call which happens to differ from our judgment, or (b) even where the result is correct, an opinion contains language which we believe will seriously and adversely affect PTO's ability to properly and effectively administer the patent or trademark laws. See *Markey*, "Semantic Antics in Patent Cases," 88 F.R.D. 103, 108 (1980) (suggesting rehearing should be requested to modify opinion language which confuses the law of patents).

We suggest, and do not believe, that there is such a thing as a "routine" petition for rehearing. A truly extraordinary situation must exist before a petition for rehearing can be deemed proper.<sup>26</sup> The Office of the Solicitor has been relatively successful with petitions for rehearing. In a 20-year period before the CCPA and Federal Circuit, we can recall filing approximately 12 petitions for rehearing. Some form of relief has been granted in nine, i.e., claims found patentable in the original decision were found unpatentable on rehearing,<sup>27</sup> language was changed in the opinion,<sup>28</sup> relief was granted in part,<sup>29</sup> etc.

##### XI. Issuance of mandates/termination of proceedings

As provided in Fed. R. App. P. 41(a), the Court's mandate usually issues 21 days after the entry of its decision. A request for rehearing stays the mandate until seven days after an order by the merits panel denying rehearing. Unless there are allowable claims or the Court's decision requires further proceedings by the Office, the receipt of the mandate by PTO "terminates the proceedings" for purposes of continuity under 35 U.S.C. § 120. 37 CFR § 1.197(c), 54 Fed. Reg. 29548, 29552 (July 13, 1989) reprinted in, 1105 Off. Gaz. Pat. Office 5, 9 (Aug. 1, 1989). If an appellant contemplates filing a "continuing" application, it should be filed prior to the receipt of the mandate by PTO to preserve the benefit of the filing date of the parent application. Proceedings terminate on receipt of the mandate, not upon the expiration of the period for applying for certiorari to the Supreme Court.<sup>30</sup>

##### XII. Costs

In *ex parte* patent and trademark appeals from PTO, costs are not awarded for or against the Commissioner. See Fed. Cir. Practice Note to Fed. Cir. R. 39.<sup>31</sup> Hence, we do not file bills of costs in *ex parte* cases.

[1120 TMOG 22]

<sup>22</sup>See e.g., *Datascope Corp. v. SMEC, Inc.*, 879 F.2d 820, 827, 11 USPQ2d 1321, 1325 (Fed. Cir. 1989), cert. denied, 110 S.Ct. 729 (1990).

<sup>23</sup>In *re Darden*, 763 F.2d 1406, 1409, 226 USPQ 359, 361 (Fed. Cir. 1985) (The burden is on appellant to persuade the court that the Board was wrong).

<sup>24</sup>*Stock Pot Restaurant v. Stockpot, Inc.*, 737 F.2d 1576, 1578, 222 USPQ 665, 667 (Fed. Cir. 1984) (findings of fact of the TTAB are reviewed under the clearly erroneous standard); *In re Caveney*, 761 F.2d 671, 674, 225 USPQ 1, 3 (Fed. Cir. 1985) (findings of fact by the Board of Patent Appeals and Interferences are reviewed under the clearly erroneous standard).

<sup>25</sup>In *re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

<sup>26</sup>In the case of a suggestion for rehearing en banc, we obtain approval from the Solicitor General.

<sup>27</sup>In *re Tiffin*, 448 F.2d 791, 171 USPQ 294 (CCPA 1971).

<sup>28</sup>*Parks v. Fine*, 773 F.2d 1577, 227 USPQ 432 (Fed. Cir. 1985), opinion amended, 783 F.2d 1036, 228 USPQ 677 (Fed. Cir. 1986).

<sup>29</sup>*Newman v. Quigg*, 877 F.2d 1575, 11 USPQ2d 1340 (Fed. Cir.), reh'g on costs granted in part, 886 F.2d 329 (Fed. Cir. 1989).

<sup>30</sup>In *re Jones*, 542 F.2d 65, 69, 191 USPQ 249, 252 (CCPA 1976) (when PTO receives CCPA mandate, proceedings in patent application are terminated); *Continental Can Co. v. Schuyler*, 326 F. Supp. 283, 168 USPQ 625 (D.D.C. 1970) (proceedings terminate within meaning of 35 U.S.C. § 120 when mandate of CCPA was issued). See also *In re Willis*, 537 F.2d 513, 515, 190 USPQ 327, 329 (CCPA 1976). Once a mandate is issued, it is our experience that a motion to withdraw the mandate to secure "competency" with a continuation will not be granted. *In re Iwashita*, Fed. Cir. No. 90-1162, *In re Nakahama*, Fed. Cir. No. 90-1166, and *In re Nakahama*, Fed. Cir. No. 90-1187.

<sup>31</sup>See also *In re Kochan*, Fed. Cir. No. 83-502 (May 25, 1983); *In re Lobdell*, Fed. Cir. No. 83-674 (Sept. 22, 1983); *In re Piasecki*, Fed. Cir. No. 84-775 (Nov. 9, 1984); *In re Shivers*, Fed. Cir. No. 85-1544 (Dec. 19, 1985); *In re Wrenn*, Fed. Cir. No. 86-743 (July 17, 1986); and *In re Dow Chemical*, Fed. Cir. No. 87-1406 (Feb. 11, 1988).



**Waiver of Certificate of Mailing Requirement Under 37 CFR 1.10**

The Patent and Trademark Office (PTO) will propose to amend 37 CFR 1.10, regarding the "Filing of papers and fees by 'Express Mail' with certificate" by, among other things, deleting the requirement for a "Certificate of Mailing by Express Mail" currently necessary to obtain the benefit of the date of deposit with the United States Postal Service (U.S.P.S.) as the filing date of the paper.

**Background of 37 CFR 1.10 and Rationale for Amendment**

35 U.S.C. § 21 authorizes the Commissioner "by rule [to] prescribe that any paper or fee required to be filed in the Patent and Trademark Office will be considered filed in the Office on the date on which it was deposited with the United States Postal Service." 37 CFR 1.10 was promulgated to implement this provision.

Pursuant to 37 CFR 1.6, papers are stamped with the date of receipt in the PTO. An exception is made for papers filed in accordance with 37 CFR 1.10, which provides for the filing of papers and fees by Express Mail with a certificate. However, in order to claim the benefits of 37 CFR 1.10, a party must comply with its specific requirements that the papers have the number of the Express Mail label placed thereon prior to mailing, be properly addressed to the PTO (see "Change of Address For Trademark Applications and Trademark Related Papers," 1163 TMOG 80 (June 28, 1994), which waived 37 CFR 1.10 to the extent that certain trademark related papers could be addressed to the Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Va. 22202-3513; and "Change of Address For Patent Applications and Patent Related Papers," 1173 OG 13 (April 4, 1995), which waived 37 CFR 1.10 to the extent that patent related papers could be addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231), and include a Certificate of Mailing by Express Mail which states the date of mailing and is signed by the person mailing the papers.

37 CFR 1.10 was promulgated in response to concerns that mail service was sometimes subject to delay and, except for hand-delivery, that there was no way to ensure the timely filing of time-critical documents with the PTO. "Express Mail" was chosen because, among other things, a person other than the filer, that is a disinterested third party working for the U.S.P.S., enters the date of deposit on the Express Mail label.

Under the current rule, the filer is required to include a Certificate of Mailing by Express Mail, certifying the date of deposit as Express Mail. Some papers filed with the PTO, although deposited as Express Mail with the U.S.P.S., have been denied the filing date of the date of deposit as Express Mail because the required Certificate of Mailing by Express Mail was omitted or deficient. The lost filing date for a significant number of these papers has resulted in the loss of substantive rights. For example, a trademark registration may be canceled if the required affidavit of continued use or excusable non-use is not filed by the end of the sixth year of registration. 15 U.S.C. § 1058.

In light of the problematic nature of the requirement for a Certificate of Mailing by Express Mail and its apparent redundancy in purpose, inasmuch as the date of deposit has already been entered by a disinterested third party, the PTO will propose to delete this requirement from 37 CFR 1.10.

This notice applies *only* to correspondence actually received (not to papers lost or misplaced by the U.S.P.S.) at the PTO via Express Mail Post Office to Addressee service where there is a clear indication of the "date in" on the Express Mail label by the U.S.P.S. Filers are encouraged to continue the practice of placing a Certificate of Mailing by Express Mail on papers filed in the PTO by Express Mail since, in some cases, the certificate may provide useful evidence.

**Interim Waiver of 37 CFR 1.10 for Documents Filed without Certificate of Express Mail**

Because a significant period of time will elapse before any final rule change can be promulgated, and because there appears to be no harmful consequence to any party, effective as of the publication date of this notice, the PTO will, *sua sponte*, waive

37 CFR 1.10 to the extent of granting a filing date as of the "date in" entered on the Express Mail label by the U.S.P.S. employee (unless the "date in" is a Saturday, Sunday or Federal holiday within the District of Columbia; see § 1.6(a)) for all papers actually received at the PTO via Express Mail, regardless of whether the requirement for a Certificate of Mailing by Express Mail has been met provided all other requirements of 37 CFR 1.10 are met.

For all papers filed prior to the date of this notice, which were not in compliance with the Certificate of Mailing by Express Mail requirements under 37 CFR 1.10, a petition to the Commissioner will be required to request that the date of deposit as shown by the "date in" entered on the Express Mail label be accorded as the filing date of the paper. The petition should include a copy of the Express Mail label showing the "date in" entered by the U.S.P.S. employee and a declaration attesting to the contents of the envelope to which the Express Mail label was attached. See 37 CFR 1.183 or 2.146.

**Summary**

In summary, the PTO is waiving, *sua sponte*, the requirement of 37 CFR 1.10 for a Certificate of Mailing by Express Mail and will propose to amend 37 CFR 1.10 to delete the requirement for a Certificate of Mailing by Express Mail. This waiver becomes effective upon the publication of this notice. For all documents filed by Express Mail prior to this notice, but not in compliance with the Certificate of Mailing by Express Mail requirement, a petition to the Commissioner under either 37 CFR 1.183 or 2.146 must be filed to request that the date of deposit as shown by the "date in" entered on the Express Mail label be accorded as the filing date of the paper.

PHILIP G. HAMPTON, II      EDWARD R. KAZENSKE  
Assistant Commissioner      Deputy Assistant Commissioner  
for Trademarks              for Patents

[1174 TMOG 92]

(166)      Department of Commerce  
Patent and Trademark Office  
37 CFR Parts 1, 5 and 10  
[Docket No. 951006247-5247-01]  
RIN 0651-AA70

**Communications with the Patent and Trademark Office**

Agency: Patent and Trademark Office, Commerce.

Action: Notice of Proposed Rulemaking.

Summary: The Patent and Trademark Office (Office) is proposing to amend the rules of practice in patent and trademark cases to: (1) require that patent-related mail be addressed to the Assistant Commissioner for Patents; (2) require that most trademark-related mail be addressed to the Assistant Commissioner for Trademarks; (3) specify a separate address for mail related to disciplinary proceedings pending before the Administrative Law Judge or the Commissioner in the Office of the Solicitor; (4) provide a definition of "Federal holiday within the District of Columbia"; and (5) delete the requirement for a certificate for "Express Mail" in section 1.10 and incorporate requirements for the resubmission of misplaced correspondence which parallel section 1.8.

Dates: Comments must be received by January 2, 1996. No hearing will be held.

Addresses: Address written comments to Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513, marked to the attention of Lynne G. Beresford. In addition, written comments may also be sent by facsimile transmission to (703) 308-7220 with a confirmation copy mailed to the above address, or by electronic mail messages over the Internet to mail-rule@uspto.gov.

Written comments will be available for public inspection on [Insert date 75 days after date of publication in the FEDERAL REGISTER], in the Assistant Commissioner for Trademarks' suite on the 10th floor of the South Tower Building, 2900 Crystal Drive, Arlington, Virginia 22202-3513.

For Further Information Contact: Lawrence E. Anderson (for

patent-related matters) by telephone at (703) 305-9285, by electronic mail at landerso@uspto.gov, or by mail to his attention addressed to the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231; or Lynne G. Beresford (for trademark-related matters) by telephone at (703) 308-8900, extension 44, or by mail marked to her attention and addressed to the Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513.

Supplementary Information: Addresses for correspondence with the Office are proposed to be changed to reflect the creation of a mailroom site at the South Tower Building for processing most trademark-related mail; to distinguish correspondence intended for organizations reporting to the Assistant Commissioner for Patents from other correspondence; and to add a separate mailing address in the Office of the Solicitor for disciplinary matters.

The proposed rulemaking entitled "Changes in Requirements for Addressing Trademark Applications and Trademark-Related Papers" (0651-AA73) has been merged with this notice of proposed rulemaking.

The Office will now have three separate general mailing addresses: (1) Assistant Commissioner for Patents for correspondence processed by organizations reporting to the Assistant Commissioner for Patents; (2) Assistant Commissioner for Trademarks for all trademark-related mail, except for trademark documents sent to the Assignment Division for recordation and requests for certified and uncertified copies of trademark documents which should be addressed to the Commissioner of Patents and Trademarks; and (3) Commissioner of Patents and Trademarks for all other correspondence. Notwithstanding the above, it is proposed that there will be separate mailing addresses in the Office of the Solicitor for certain disciplinary matters and cases involving pending litigation.

Those who correspond with the Office are requested to use separate envelopes directed to the different areas.

Because patent-related mail will be sent to the Assistant Commissioner for Patents, the requirement to designate patent application correspondence as "PATENT APPLICATION" is proposed to be deleted from section 1.5(a).

In addition, it is proposed that "Federal holiday within the District of Columbia" be defined as including Official closings.

It is further proposed that a "Certificate of Mailing by Express Mail" (currently necessary to obtain the benefit of the date of deposit with the United States Postal Service (U.S.P.S.) as the filing date of the paper) no longer be required for correspondence actually received in the Office.

**PATENT-RELATED MAIL**

Section 1.1 is proposed to be amended to provide for correspondence which is processed by organizations reporting to the Assistant Commissioner for Patents to be addressed to the "Assistant Commissioner for Patents, Washington, D.C. 20231." The Office first announced the new address for patent-related mail in a notice (Change of Address for Patent Applications and Patent Related Papers) published in the *Official Gazette* at 1173 Off. Gaz. Pat. Office 13 (April 4, 1995).

This change will affect correspondence such as: patent applications, responses to notices of informality, requests for extension of time, notices of appeal to the Board of Patent Appeals and Interferences (the Board), briefs in support of an appeal to the Board, requests for oral hearing before the Board, extensions of term of patent, requests for reexamination, statutory disclaimers, certificates of correction, petitions to the Commissioner, submission of information disclosure statements, petitions to institute a public use proceeding, petitions to revive abandoned patent applications, and other correspondence related to patent applications and patents which is processed by organizations reporting to the Assistant Commissioner for Patents. When patent-related documents are filed with a certificate of mailing, pursuant to section 1.8, the certificate of mailing should be completed with the new address: Assistant Commissioner for Patents, Washington, D.C. 20231.

Unless otherwise specified, correspondence not processed by organizations reporting to the Assistant Commissioner for Patents, such as communications with the Board, patent services including patent copy sales, assignments, requests for lists of patents and SIRs in a subclass, requests for the status of maintenance fee payments, as well as patent practitioner enrollment

matters including admission to examination, registration to practice, certificates of good standing, and financial service matters including establishing a deposit account should continue to be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231. Documents to be recorded with the Assignment Division, except those filed with new applications, should be addressed to: Box Assignment, Commissioner of Patents and Trademarks, Washington, D.C. 20231. Orders for certified and uncertified copies of Office documents should be addressed to: Box 10, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Special Office mail boxes as currently listed in each issue of the *Official Gazette* should continue to be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Use of special box designations will facilitate the Office's timely and accurate identification and processing of the designated correspondence.

Checks should continue to be made payable to the Commissioner of Patents and Trademarks.

**TRADEMARK-RELATED MAIL**

Most trademark-related mail should be sent directly to the Trademark Operation at: Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513. When trademark-related documents are filed with a certificate of mailing, pursuant to section 1.8, the certificate of mailing should be completed with the new address: Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513. Use of the correct address will avoid processing delays. Trademark documents to be recorded with the Assignment Division, except those filed with new applications, should be addressed to: Box Assignment, Commissioner of Patents and Trademarks, Washington, D.C. 20231. Orders for certified and uncertified copies of trademark documents should be addressed to: Box 10, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

The Office announced the new address for trademark-related mail in a notice (Change of Address for Trademark Applications and Trademark Related Papers) published in the *Federal Register* at 59 FR 29275 (June 6, 1994) and in the *Trademark Office Official Gazette* at 1163 Off. Gaz. Trademark Office 80 (June 28, 1994) (republished in 1170 Off. Gaz. Pat. Office 303 (January 3, 1995)).

The Office will continue to maintain the special box designations and FEE/NO FEE indicators for trademark mail as currently listed in each issue of the *Official Gazette*. In addition to addressing trademark-related mail as set forth above, the boxes should also be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible.

Checks should continue to be made payable to the Commissioner of Patents and Trademarks.

Mail intended for the Trademark Trial and Appeal Board should be addressed to: Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513, including BOX TTAB/FEE or BOX TTAB/NO FEE, whichever is applicable.

**HAND-CARRIED CORRESPONDENCE**

All correspondence with the Office, except for communications relating to pending litigation as specified currently in section 1.1(g), may continue to be filed directly at the Attorney's Window located in Room 1B03 of Crystal Plaza Building 2, 2011 South Clark Place, Arlington, Virginia. Trademark-related papers may also be filed at the "walk-up" window located on the third floor of the South Tower Building, 2900 Crystal Drive, Arlington, Virginia.

**FEDERAL HOLIDAYS WITHIN THE DISTRICT OF COLUMBIA**

When the Patent and Trademark Office is officially closed for an entire day (for reasons due to weather or other causes), the Office will consider each such day a "Federal holiday within the District of Columbia" under 35 U.S.C. § 21. Any action or fee due on such a day may be taken, or fee paid, on the next succeeding business day the Office is open.



Legal holidays considered "Federal holidays within the District of Columbia" are New Year's Day (January 1), Martin Luther King, Jr.'s Birthday (third Monday in January), Presidential Inauguration Day, Washington's Birthday (third Monday in February), Memorial Day (last Monday in May), Independence Day (July 4), Labor Day (first Monday in September), Columbus Day (second Monday in October), Veterans Day (November 11), Thanksgiving Day (fourth Thursday in November) and Christmas Day (December 25). In the past, the Office has published notices concerning unscheduled closings. See, e.g., "Closing of Patent and Trademark Office on Thursday, January 20, 1994 and Friday, February 11, 1994," 1161 Off. Gaz. Pat. Office 12 (April 5, 1994) (republished in 1170 Off. Gaz. Pat. Office 8 (January 3, 1995)) and "Filing of Papers During Unscheduled Closings of the Patent and Trademark Office," 1097 Off. Gaz. Pat. Office 53 (December 20, 1988) (republished in 1170 Off. Gaz. Pat. Office 8 (January 3, 1995)). The proposed rule change will further implement the existing policy.

#### EXPRESS MAIL PROVISIONS

Section 1.10 is proposed to be amended by deleting the requirement for a "Certificate of Mailing by Express Mail" to obtain the benefit of the date of deposit with the United States Postal Service (U.S.P.S.) as the filing date of the paper. The title of section 1.10 is proposed to be revised and section 1.10 is also proposed to be amended to incorporate requirements for the resubmission of misplaced correspondence which parallel section 1.8.

Under the current rule, the filer is required to include a Certificate of Mailing by Express Mail, certifying the date of deposit as Express Mail. Some papers filed with the Office, although deposited as Express Mail with the U.S.P.S., have been denied the filing date of the date of deposit as Express Mail because the required Certificate of Mailing by Express Mail was omitted or deficient. The lost filing date for a significant number of these papers has resulted in the loss of substantive rights. For example, a trademark registration may be canceled if the required affidavit of continued use or excusable non-use is not filed by the end of the sixth year of registration. 15 U.S.C. § 1058.

In light of the problematic nature of the requirement for a Certificate of Mailing by Express Mail, inasmuch as the date of deposit has already been entered by a disinterested third party, the Office proposes to delete this requirement from section 1.10.

#### MISCELLANEOUS CHANGES

Miscellaneous changes are proposed to change the word "communications" to "correspondence" for purposes of consistency. Also, since the certificate of mailing by "Express Mail" will no longer be a requirement of the proposed rules, the provisions of Part 10 relating to misconduct are proposed to be amended to delete reference to this requirement.

#### DISCUSSION OF SPECIFIC RULES

If revised as proposed, the heading of section 1.1 will be changed to state that the section contains the addresses for correspondence to the Patent and Trademark Office.

Section 1.1 is proposed to be revised to set out all pertinent Office mailing addresses in paragraph (a) and in added paragraphs (a)(1), (a)(2), and (a)(3). It should be noted that the remaining paragraphs of section 1.1 contain directions for using box designations rather than addresses. Paragraph (a)(1) is proposed to be added to set out the new mailing address to which most patent-related documents should be sent. Paragraph (a)(2) is proposed to be added to set out the new mailing address to which most trademark-related documents should be sent. The Solicitor's mailing address, formerly set out in paragraph (g) of the section is moved to a new paragraph (a)(3). Paragraph 1.1(g) is proposed to be removed and reserved.

Sections 1.1 and 1.3 are proposed to be amended so that the word "communications" is changed to "correspondence."

Section 1.5(a) is proposed to be amended by removing the requirement of the words "PATENT APPLICATION" on letters concerning patent applications.

Section 1.8 (a) is proposed to be revised to state that papers and fees must be addressed as set out in section 1.1 (a). For the purposes of 1.8 (a) (1) (i) (A), first class mail is interpreted as including "Express Mail" and "Priority Mail" deposited with the U.S.P.S.

Section 1.9 is proposed to be amended to add a definition of "Federal holiday within the District of Columbia" to include Federal holidays and days when the Patent and Trademark Office is officially closed for the entire day (for reasons due to adverse weather or other causes).

Section 1.10 is proposed to be revised to state that "Express Mail" must be addressed as set out in § 1.1(a). The title of section 1.10 is proposed to be revised to reflect this change. Further, for all correspondence *actually received* in the Office, the Office will consider the correspondence filed on the date shown by the "date in" notation on the "Express Mail" label unless the "date in" is a Saturday, Sunday or Federal holiday within the District of Columbia. Because of the reliance on the "date in" marked by the Postal Service, correspondence should be deposited directly with a person at the United States Postal Service, rather than in a drop box, to ensure that the person making the deposit receives a copy of the "Express Mail" label at the time of making the deposit to verify that the "date in" is accurately and clearly written by the Postal Service employee. Persons using an Express mail receptacle (such as a drop box) do so at the risk of not receiving an accurate and legible copy of the Express mail label at the time of deposit from which the Office may determine the "Express mail" "date in," and, therefore, may not later argue that they should be entitled to the date on which they deposited the correspondence into a receptacle. Moreover, if the "date in" is found to be illegible or unclear, a person dealing directly with a Postal Service employee must take corrective action to ensure that a clear and accurate date is marked at the time of deposit. Persons choosing to use a receptacle (or the like) obviously do not oversee the marking by a Postal Service employee and thus may not later argue for the benefit of a section 1.10 filing date if the "date in" on the "Express Mail" label is improperly or not clearly marked. The determinative factor is when the Postal Service marks the "date in" and the mere deposit into a receptacle does not entitle one to an "Express Mail" "date in" under section 1.10.

Paragraph (b) of section 1.10 is proposed to be amended by deleting the requirement for a "Certificate of Mailing by Express Mail" currently necessary to obtain the benefit of the date of deposit with the United States Postal Service (U.S.P.S.) express mail service as the filing date of the paper.

Paragraph (c) of section 1.10 is proposed to be amended to set forth the requirements for the treatment of correspondence not received by the Office for which the "Express Mail" procedure was utilized. Correspondence not received by the Office will be considered filed in the Office on the date shown by the "date in" notation entered by the Postal Service if the party who forwards the correspondence:

- (1) Places the number of the "Express Mail" mailing label on the correspondence prior to the original mailing by "Express Mail,"
- (2) Informs the Office of the previous deposit of the correspondence promptly after becoming aware that the Office has no evidence of receipt of the correspondence,
- (3) Supplies an additional copy of the previously deposited correspondence showing the number of the "Express Mail" label thereon,
- (4) Supplies a copy of the "Express Mail" label clearly displaying the "date in" entered by the United States Postal Service, and
- (5) Includes a statement which establishes, to the satisfaction of the Commissioner, the previous deposit and that the copies of the correspondence and "Express Mail" label are true copies of the original correspondence and "Express Mail" label. Such statement must be on the basis of personal knowledge, whenever possible, and must be a verified statement if made by a person other than a practitioner as defined in section 10.1(r) of this chapter.

In addition, although the requirement for a certificate of express mail has been proposed to be eliminated from section 1.10, applicants are strongly encouraged to continue using the

certificate of express mail, as well as the placement of the Express Mail label number in the upper right corner of the first page of each separate piece of correspondence and to retain a clearly marked Express Mail label, to facilitate complying with the requirements of paragraph (c) if the correspondence is not received in the Office or if reliance on the U.S.P.S. "date in" is not possible. Moreover, paragraph (d) is proposed to be added so that additional evidence may be required if the Office so determines.

Section 5.33 (entitled "Correspondence") is proposed to be amended to change the correspondence address to "Assistant Commissioner for Patents (Attention: Licensing and Review), Washington, D.C. 20231."

Section 10.23(c)(9) is proposed to be revised to reflect the proposed change to section 1.10 that the certificate of mailing by "Express Mail" is no longer a requirement of the rules.

#### OTHER CONSIDERATIONS

The proposed rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Order 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.* Information collection requirements are not affected by the change of address. This proposed rule has been determined to not be significant for the purposes of Executive Order 12866.

The Office has determined that this proposed rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the proposed rule changes would not have a significant impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The proposed rule change has no effect on patent fees.

These proposed rule changes contain collections of information subject to the requirements of the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, which are currently approved by the Office of Management and Budget under Control No. 0651-0009 and 0651-0031. The public reporting burden for these collections of information for certificate of mailing is estimated to average six minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Office of System Quality and Enhancement Division, Patent and Trademark Office, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503. (ATTN: Paperwork Reduction Act Projects 0651-0009 and 0651-0031).

#### List of Subjects

##### 37 CFR Part 1

Administrative practice and procedure, Freedom of information, Inventions and patents, Reporting and record keeping requirements.

##### 37 CFR PART 5

Classified information, Foreign relations, Inventions and patents.

##### 37 CFR PART 10

Administrative Practice and procedure, Conflicts of interest, Courts, Inventions and patents, Lawyers.

For the reasons set forth in the preamble and under the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and 15 U.S.C. 1123, 37 CFR Parts 1, 5 and 10 are proposed to be amended as follows:

#### PART 1—RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 continues to read as follows:  
Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.1 is proposed to be amended by removing and reserving paragraph (g) and by revising the title and paragraph (a) to read as follows:

#### § 1.1 Addresses for correspondence with the Patent and Trademark Office.

(a) Except for those documents identified in paragraphs (1), (2) and (3) of this section, all correspondence intended for the Patent and Trademark Office must be addressed to "Commissioner of Patents and Trademarks, Washington, D.C. 20231." When appropriate, correspondence should also be marked for the attention of a particular office or individual.

(1) *Patent correspondence.* All correspondence concerning patent matters processed by organizations reporting to the Assistant Commissioner for Patents should be addressed to "Assistant Commissioner for Patents, Washington, D.C. 20231."

(2) *Trademark correspondence.* All correspondence concerning trademark matters, except for trademark-related documents sent to the Assignment Division for recordation and requests for certified and uncertified copies of trademark application and registration documents, should be addressed to "Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513." This includes correspondence intended for the Trademark Trial and Appeal Board.

(3) *Office of Solicitor correspondence.*

(i) Correspondence relating to pending litigation required by court rule or order to be served on the Solicitor shall be hand-delivered to the Office of the Solicitor or shall be mailed to: Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215; or such other address as may be designated in writing in the litigation. See §§ 1.302(c) and 2.145(b)(3) for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit.

(ii) Correspondence relating to disciplinary proceedings pending before an Administrative Law Judge or the Commissioner shall be mailed to: Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.

(iii) All other correspondence to the Office of the Solicitor shall be addressed to: Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

(iv) Correspondence addressed to the wrong Post Office Box will not be filed elsewhere in the Patent and Trademark Office and might be returned.

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(g) [Reserved]

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3. Section 1.3 is proposed to be revised to read as follows:

#### § 1.3 Business to be conducted with decorum and courtesy.

Applicants and their attorneys or agents are required to conduct their business with the Patent and Trademark Office with decorum and courtesy. Papers presented in violation of this requirement will be submitted to the Commissioner and will be returned by the Commissioner's direct order. Complaints against examiners and other employees must be made in correspondence separate from other papers.

4. Section 1.5(a) is proposed to be revised to read as follows:

#### § 1.5 Identification of application, patent, or registration.

(a) No correspondence relating to an application should be filed prior to when notification of the application number is received from the Patent and Trademark Office. When a letter directed to the Patent and Trademark Office concerns a previously filed application for a patent, it must identify on the top page in a conspicuous location, the application number



(consisting of the series code and the serial number; e.g., 07/123,456), or the serial number and filing date assigned to that application by the Patent and Trademark Office, or the international application number of the international application. Any correspondence not containing such identification will be returned to the sender where a return address is available. The returned correspondence will be accompanied with a cover letter which will indicate to the sender that if the returned correspondence is resubmitted to the Patent and Trademark Office within two weeks of the mail date on the cover letter, the original date of receipt of the correspondence will be considered by the Patent and Trademark Office as the date of receipt of the correspondence. Applicants may use either the Certificate of Mailing or Transmission procedure under § 1.8 or the Express Mail procedure under § 1.10 for resubmissions of returned correspondence if they desire to have the benefit of the date of deposit in the United States Postal Service. If the returned correspondence is not resubmitted within the two-week period, the date of receipt of the resubmission will be considered to be the date of receipt of the correspondence. The two-week period to resubmit the returned correspondence will not be extended. If for some reason returned correspondence is resubmitted with proper identification later than two weeks after the return mailing by the Patent and Trademark Office, the resubmitted correspondence will be accepted but given its date of receipt. In addition to the application number, all letters directed to the Patent and Trademark Office concerning applications for patent should also state the name of the applicant, the title of the invention, the date of filing the same, and, if known, the group art unit or other unit within the Patent and Trademark Office responsible for considering the letter and the name of the examiner or other person to which it has been assigned.

5. Section 1.8(a)(1)(i)(A) is proposed to be revised to read as follows:

#### § 1.8 Certificate of mailing or transmission.

- (a) \*\*\*  
(1) \*\*\*  
(i) \*\*\*  
(A) Addressed as set out in § 1.1(a) and deposited with the U.S. Postal Service with sufficient postage as first class mail; or

\*\*\*\*\*

6. Section 1.9 is proposed to be revised by adding a new paragraph (h) to read as follows:

#### § 1.9 Definitions.

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(h) A "Federal holiday within the District of Columbia" as used in this chapter means any day, except Saturdays and Sundays, when the Patent and Trademark Office is officially closed for business.

7. Section 1.10 is proposed to be revised to read as follows:

#### § 1.10 Filing of correspondence by "Express Mail."

(a) Any correspondence received by the Patent and Trademark Office utilizing the "Express Mail Post Office to Addressee" service of the United States Postal Service will be considered filed in the Office on the date shown by the "date in" notation entered by the United States Postal Service on the "Express Mail" label, unless the "date in" is a Saturday, Sunday or Federal holiday within the District of Columbia. See § 1.6(a). This procedure can be used to file any correspondence in the Office.

(b) Any correspondence filed by "Express Mail" must be addressed as set out in § 1.1(a) and should be deposited directly with the United States Postal Service to ensure that the person depositing the correspondence receives a copy of the "Express Mail" label at the time of deposit with the "date in" clearly marked thereon. Persons dealing indirectly with the United States Postal Service (such as by deposit in an Express Mail

drop box) do so at the risk of not receiving their copy of the "Express Mail" label with the "date in" clearly marked.

(c) Any correspondence mailed to the Patent and Trademark Office utilizing the "Express Mail Post Office to Addressee" service of the United States Postal Service, but not received by the Office, will be considered filed in the Office on the date shown by the "date in" notation entered by the United States Postal Service on the "Express Mail" label, unless the "date in" is a Saturday, Sunday or Federal holiday within the District of Columbia (see § 1.6(a)), if the party who forwarded such correspondence:

- (1) Places the number of the "Express Mail" mailing label on the correspondence prior to the original mailing by "Express Mail."
- (2) Informs the Office of the previous deposit of the correspondence promptly after becoming aware that the Office has no evidence of receipt of the correspondence.
- (3) Supplies a copy of the previously deposited correspondence showing the number of the "Express Mail" label thereon.
- (4) Supplies a copy of the "Express Mail" label clearly displaying the "date in" entered by the United States Postal Service, and
- (5) Includes a statement which establishes, to the satisfaction of the Commissioner, to the previous deposit and that the copies of the correspondence and "Express Mail" label are true copies of the original correspondence and "Express Mail" label. Such statement must be on the basis of personal knowledge, whenever possible, and must be a verified statement if made by a person other than a practitioner as defined in § 10.1(r) of this chapter.

(d) The Office may require additional evidence to determine if the correspondence was deposited as "Express Mail" with the United States Postal Service on the date in question.

#### Part 5 - SECRECY OF CERTAIN INVENTIONS AND LICENSES TO EXPORT AND FILE APPLICATIONS IN FOREIGN COUNTRIES

8. The authority citation for 37 CFR Part 5 continues to read as follows:

Authority: 35 U.S.C. 6, 41, 181-188, as amended by the Patent Law Foreign Filing Amendments Act of 1988, Pub. L. 100-418, 102 Stat. 1567; the Arms Export Control Act, as amended, 22 U.S.C. 2751 *et seq.*, the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 *et seq.*, and the Nuclear Non-Proliferation Act of 1978, 22 U.S.C. 3201 *et seq.*, and the delegations in the regulations under these acts to the Commissioner (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7).

9. Section 5.33 is proposed to be revised to read as follows:

#### § 5.33 Correspondence.

All correspondence in connection with this part, including petitions, should be addressed to "Assistant Commissioner for Patents (Attention: Licensing and Review), Washington, D.C. 20231."

#### Part 10 - REPRESENTATION OF OTHERS BEFORE THE PATENT AND TRADEMARK OFFICE

10. The authority citation for 37 CFR Part 10 continues to read as follows:  
Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

11. Section 10.23(c)(9) is proposed to be revised to read as follows:

#### § 10.23 Misconduct.

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(c) \*\*\*

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(9) Knowingly misusing a "Certificate of Mailing or Transmission" under § 1.8 of this chapter.

October 26, 1995

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

[1180 TMOG 122]

(167)

#### Helpful Hints

• *Correspondence with Certificate of Mailing Delivered by Commercial Carrier*—The benefits of 37 CFR 1.8 or 1.10 apply only to documents delivered to the PTO by the U.S. Postal Service.

A number of instances have been uncovered where individuals are certifying that documents were deposited with the U.S. Postal Service when, in fact, the documents were hand carried or delivered to the PTO via commercial mail service, e.g., "Federal Express," "DHL," "Purolator," "Air Borne," "UPS," etc. In those instances where documents include a certificate of mailing under 37 CFR 1.8 or 1.10, but were delivered to the PTO by other than U.S. Postal Service, Mail Room personnel are placing a notice indicating that fact on the correspondence involved to alert PTO personnel that the benefits of 37 CFR 1.8 or 1.10 do not apply.

[1080 TMOG 6]

(168)

#### Helpful Hints

• *Certificate of Mailing AND Return Post Card*—Use of the Certificate of Mailing Procedure is strongly encouraged.

37 CFR 1.8(a) provides for the use of a Certificate of Mailing on most correspondence with the PTO, whereby the correspondence (and/or fee) will be considered as timely filed if deposited with the U.S. Postal Service within the set time period. Consistent use of this procedure is extremely beneficial to practitioners, whether or not the Post Card Receipt provision of MPEP 503 is used.

In those instances where the PTO never receives the correspondence, no post card receipt will be available to evidence the filing and/or timeliness of the correspondence. However, in those instances where a Certificate of Mailing is properly used, 37 CFR 1.8(b) provides relief, even if the correspondence is not received in the PTO at all. Under 37 CFR 1.8(b) the party who forwarded the correspondence need only (1) inform the PTO of the previous mailing of the correspondence, (2) supply a copy of the previously mailed correspondence and Certificate, and (3) include a declaration which adequately attests to the previous timely mailing.

[1082 TMOG 8]

(169)

#### DEPARTMENT OF COMMERCE

##### Patent and Trademark Office

#### Change of Address For Trademark Applications and Trademark Related Papers

Agency: Patent and Trademark Office, Commerce.  
Action: Notice.

Summary: Commencing July 5, 1994, trademark applications and other trademark-related mail, except for trademark-related documents sent to the Assignment Branch for recordation and requests for certified copies of trademark documents, should be addressed to: Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Va. 22202-3513.

Dates: This new address will be effective July 5, 1994.  
For Further Information Contact: Lynne G. Beresford at (703) 305-9464 or by mail marked to her attention and addressed to: Assistant Commissioner for Trademarks, Washington, D.C. 20231. After July 5, 1994, mail should be addressed to: Assistant Commissioner for Trademarks, 2900 Crystal Drive,

Arlington, Va. 22202-3513.

*Supplemental Information:* As part of its emphasis on better service for trademark applicants and registrants, the responsibility for receiving, opening and routing of trademark mail is being transferred to the Assistant Commissioner for Trademarks. In order to more efficiently process the mail, the Assistant Commissioner has determined that trademark-related mail, except for trademark-related documents sent to the Assignment Branch for recordation and requests for certified copies of trademark application and registration documents, should be sent directly to the Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Va. 22202-3513, which is the location of the Trademark Operation. Having mail sent directly to that address should speed up processing and reduce the amount of lost or misrouted mail. The mail room at the South Tower Building will begin to receive and process mail on July 5, 1994. For a period after July 5, 1994, the Patent and Trademark Office (Office) will receive trademark-related mail at both the old address, Commissioner of Patents and Trademarks, Washington, D.C. 20231, and at the new address, Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Va., 22202-3513. The Office is currently preparing a notice of proposed rulemaking to formally change the address for trademark-related papers. The Office will continue to maintain the following special boxes, Box Trademark Application, Box ITU, Box AAU, and Box 5, for expedited processing and distribution of specific types of documents. The Office encourages the continued use of these boxes with the new address.

People may continue to file both patent and trademark-related papers directly at the Attorneys' Window located in Room 1B03 of Crystal Plaza Building 2, Arlington, Va.

Sections 1.8 and 1.10 of Title 2 of Section 37 of the Code of Federal Regulations are waived, to the extent that, on or after July 5, 1994, a certificate of mailing under §§ 1.8 or 1.10, for trademark applications and other trademark-related mail, except for trademark-related documents sent to the Assignment Branch for recordation and requests for certified copies of trademark application and registration documents, may be addressed either to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, or to the Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Va., 22202-3513. Patent-related mail should continue to be sent to: Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Authority: 35 U.S.C. 6, 15 U.S.C. 1123

May 26, 1994

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

[1163 TMOG 80]

#### (170) Special Boxes And "Fee/No Fee" Indicators For Trademark-Related Mail

##### And Guidelines For Filing Requests To Extend Time To Oppose With The Trademark Trial And Appeal Board (TTAB)

On July 5, 1994, the Patent and Trademark Office opened a mailroom to receive mail related to trademark applications, registrations and matters before the Trademark Trial and Appeal Board at the following addresses:

Assistant Commissioner for Trademarks  
2900 Crystal Drive  
Arlington, Virginia 22202-3513

To facilitate mail-handling in the new mailroom, the special box designations have been expanded so that incoming mail can be presorted more efficiently. In addition to these box designations, filers are encouraged to indicate whether the contents of an envelope contain a "FEE" or "NO FEE." As shown below, the "FEE" and "NO FEE" indicators should be set forth on the line below the box designation for easy visibility. Envelopes will be batched based on the "FEE/NO FEE" indi-



cator and box designation and sent unopened to the appropriate employee in the Pre-exam area for processing.

The "SPECIAL BOXES FOR MAIL" page in the *Official Gazette* will be changed. Please note that the "BOX 5" designation for "No fee" mail related to trademarks has been discontinued. Furthermore, the box designation "Box Trademark Application" has been changed to "BOX NEW APP."

The following box designations and "FEE/NO FEE" indicators will now be available:

<b>BOX NEW APP FEE</b>	for any new trademark application. [All applications require fees; therefore a "NO FEE" indicator should not be used.]
<b>BOX ITU FEE</b>	for papers such as Statements of Use (SOU), and extensions requests therefor, to be filled with the Intent to Use (ITU) Unit. [All ITU papers require fees; therefore a "NO FEE" indicator should not be used.]
<b>BOX TTAB FEE</b>	for papers such as oppositions, cancellation petitions and ex parte appeals filed with the Trademark Trial and Appeal Board (TTAB).
<b>BOX TTAB NO FEE</b>	for TTAB papers with no fee, such as extension requests, interferences and motions.
<b>BOX STATUS NO FEE</b>	for written status inquiries. [Status inquiries do not require a fee; therefore a "FEE" indicator should not be used.]
<b>BOX POST REG FEE</b>	for post registration documents such as Section 8 affidavits and Section 9 renewals.
<b>BOX RESPONSES NO FEE</b>	for responses to Examining Attorneys' Office actions; and for responses to Post Registration Examiners' rejections.

For best results, these box designations and "FEE/NO FEE" indicators should appear on the envelope as well as on the cover sheet or first page of any document. However, although not preferred procedure, filers may continue to include documents destined for more than one location in a single envelope, provided each document references the box designation and "FEE/NO FEE" indicator on the cover sheet or first page of the document; and provided each complete filing is stapled or secured in some fashion. The envelope should list all the box designations and "FEE/NO FEE" indicators for its contents.

This notice does not apply to trademark-related documents intended for recordation with the Assignment Branch or for requests for certified and uncertified copies of trademark application and registration documents. These papers and patent-related mail should continue to be sent to: Commissioner of Patents and Trademarks, Washington, D.C. 20231.

#### Labeling First Requests for Extensions of Time to Oppose

Although the Trademark Trial and Appeal Board reports to the Office of the Deputy Assistant Secretary of Commerce and Deputy Assistant Commissioner of Patents and Trademarks, it is located and receives its mail at the Arlington address of the Assistant Commissioner for Trademarks. As noted above, requests for extensions of time to oppose should be sent to BOX TTAB, including the "NO FEE" indicator.

Because first requests for extensions of time to oppose are critically time-sensitive documents, filers are encouraged to indicate on the cover sheet or first page of the extension request that the paper is a first request. The suggested title for these documents is: **First Request for Extension of Time to File a Notice of Oppositions.**

October 25, 1994

PHILIP G. HAMPTON, II  
Assistant Commissioner  
for Trademarks

[1168 TMOG 89]

#### (171) Changes in How Papers May be Filed in the Patent and Trademark Office

Beginning April 21, 1992, an improved service will be offered to people who wish to file papers directly with the Patent and Trademark Office (PTO) by extending the hours of operation for the Attorneys' Window located in Room 1B03 of Crystal Plaza Building 2, Arlington, Virginia. The current hours of operation are from 8:30 a.m. to 5:00 p.m., Monday through Friday, except Federal holidays within the District of Columbia. The change will extend the hours of operation until 12:00 midnight on Monday through Friday, except holidays, on a trial basis. If, after six months, usage does not warrant retaining operations until midnight, the hours of operation will be reduced.

This change will provide walk-up, personalized service to firms and individuals who are filing documents with the PTO. The PTO will continue to stamp postcard-type receipts to acknowledge the receipt of papers filed at the Attorneys' Window.

Also, effective on April 21, 1992, the PTO is discontinuing the use of drop boxes in the lobby of Crystal Plaza Building 3, Arlington, Virginia, and at the main entrance of the Department of Commerce Building, Washington, D.C. (37 CFR 1.6(c)) as means for receiving papers.

These changes will provide improved services with respect to receipt and processing of documents while, at the same time, overcoming problems with the present arrangement.

Problems encountered with the present arrangement for the drop boxes have occasionally made it difficult to determine the dates of actual deposit of papers. For example, there have been many incidents of papers being found outside of the drop boxes (e.g., on the floor of the main lobby of the Department of Commerce Building, on the guard's desk, on a nearby table, etc.). On occasion, the PTO and/or filers have been denied access to the drop box at the Department of Commerce by building security guards due to a special event taking place in the lobby.

Provisions are also available for filing papers through the use of the certificate of mailing (37 CFR 1.8) and the Express Mail (37 CFR 1.10) procedures.

March 17, 1992

HARRY F. MANBECK, Jr.  
Assistant Secretary and Commissioner  
of Patents and Trademarks

[1137 TMOG 7]

#### (172) DEPARTMENT OF COMMERCE Patent and Trademark Office 37 CFR Parts 1, 2 and 10

[Docket No. 90671-3225]  
RIN: 0651-AA55

#### Changes in Signature and Filing Requirements for Correspondence Filed in the Patent and Trademark Office

Agency: Patent and Trademark Office, Commerce.  
Action: Final Rule.

**Summary:** The Patent and Trademark Office (Office) is amending the rules of practice in patent and trademark cases to: specify the types of correspondence which will no longer require original signatures; provide for facsimile transmission of certain correspondence to the Office; discontinue use of the drop boxes at Crystal Plaza Building 3 and at the Department of Commerce building in Washington, D.C.; and clarify other provisions with respect to practice before the Office.

**Effective Date:** November 22, 1993. These rules will be applicable to all correspondence filed with the Office on or after the effective date.

**For Further Information Contact:** Abraham Herschkovitz by telephone at (703) 305-9282, by facsimile transmission at (703) 305-8825, or by mail marked to his attention and addressed to Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231.

**Supplementary Information:** In a Notice of Proposed Rule-

aking published in the Federal Register at 57 FR 36034 (August 12, 1992) and in the Patent and Trademark Office Official Gazette at 1142 Off. Gaz. Pat. Office 8-13 (September 1, 1992), the Office proposed to amend the rules of practice in patent and trademark cases to simplify the manner in which correspondence may be transmitted to the Office and clarify other provisions with respect to practice before the Office. This rulemaking includes changes to expand those situations where a party can use the Certificate of Mailing or Transmission procedure, and minor technical modifications in Part 2 of Title 37 of the Code of Federal Regulations which were not part of the proposed rulemaking. This rule making also expands the acceptability of facsimile transmissions to certain trademark documents which were not part of the proposed rulemaking.

Written comments were submitted by twenty-two law firms, five individuals, nine corporations, two organizations and three agencies. An oral hearing was not conducted.

The following includes a discussion of the rules being changed and the reasons for those changes, and an analysis of the comments received in response to the notice of proposed rulemaking.

#### Discussion of Specific Sections to be Changed or Added:

##### (1) Types of Correspondence No longer Requiring Original Signatures (Section 1.4)

Section 1.4 is amended to include a new paragraph (d) to specify that most correspondence filed in the Office, which requires a person's signature, may be an original, or a copy thereof. See §§ 1.4 (e) and (f) for types of correspondence where the original must be filed in the Office. The word original, as used in this rulemaking, is defined as correspondence which is personally signed in permanent ink by the person whose signature appears thereon. Where copies of correspondence are acceptable, photocopies or facsimile transmissions may be filed. For example, a photocopy or facsimile transmission of an original of an amendment, declaration, petition, issue fee transmittal form, authorization to charge a deposit account, etc., may be submitted in a patent or trademark application. Furthermore, where copies are permitted, second and further generation copies (i.e., copy of a copy) are acceptable. The original, if not submitted to the Office, should be retained as evidence of proper execution in the event that questions arise as to the authenticity of the signature reproduced on the photocopy or facsimile-transmitted correspondence. If a question of authenticity arises, the Office may require submission of the original.

Section 1.4(e) identifies types of correspondence in which an original must be submitted to the Office. Where an original is required, copies are not acceptable and will not be accorded a receipt date. Correspondence, as referred to in this section, includes application forms for registration to practice before the Office and data sheets for the register of patent attorneys and agents.

Section 1.4(f) provides that when a document that is required by statute to be certified must be filed (such as a certified copy of a foreign patent application, pursuant to 35 U.S.C. 119; a certified copy of an international application, pursuant to 35 U.S.C. 365; a certified copy of a foreign trademark registration, pursuant to 15 U.S.C. 1126(e); a certified copy of a final court order, pursuant to 15 U.S.C. 1119; or a certified copy of a U.S. trademark registration), a copy of the certification, including a photocopy or facsimile transmission, will not be acceptable. The requirement for an original certification does not apply to certifications such as required under §§ 1.8, 1.10, 1.60, 1.97(e) and 3.73(b), since these certifications are not required by statute.

##### (2) Identification of Applications (Section 1.5)

Section 1.5(a) is amended to make reference to the certificate procedure under § 1.8 consistent with the new title for § 1.8.

##### (3) Receipt of Correspondence (Section 1.6)

A descriptive heading is added to each paragraph of § 1.6 to identify the content of that paragraph.

The phrase "correspondence" is used in § 1.6 since the terms "papers", "letters" and "fees" all fall within the generic definition of "correspondence".

Section 1.6(a) is amended to clarify that correspondence transmitted by facsimile on weekends or Federal holidays within the District of Columbia, will be accorded the next business day as the date of receipt.

Sections 1.6 (b) and (c) are amended to clarify that weekdays refer to any day except a Saturday, Sunday, or Federal holiday within the District of Columbia.

Section 1.6(c) is amended to delete reference to the box locations in the lobby of Crystal Plaza Building 3, Arlington, Virginia, and at the Department of Commerce Building in Washington, D.C. The use of the drop boxes was discontinued on April 21, 1992, and the hours of operation for the attorney's window were extended to midnight, the same hours the drop boxes were available. The public can now deposit correspondence with the Office and obtain an acknowledgment of receipt after normal business hours. See "Changes in How Papers May Be Filed in the Patent and Trademark Office", 1137 Off. Gaz. Pat. Office 7 (April 7, 1992).

Use of the drop boxes at Crystal Plaza Building 3 and Department of Commerce Building locations had caused problems for both the public and the Office. Occasionally, it had been difficult to determine the dates of actual deposit of correspondence in the boxes. On occasion, Office employees and/or members of the public had been denied access to the drop box at the Department of Commerce by building security guards.

due to a special event taking place at the Department. Additionally, there were instances of correspondence being found outside of the drop boxes (e.g., on the floor of the main lobby of the Department of Commerce Building, on the guard's desk, on a nearby table, etc.). As a result, on occasion, the Office lacked confidence in assigning correct dates of receipt to correspondence deposited in the boxes at Crystal Plaza Building 3 and at the Department of Commerce Building. Given these difficulties, and the fact that the necessity for these boxes has been greatly diminished as a result of the facsimile transmission and certificate of mailing procedures, § 1.6(c) is amended by deleting reference to the drop boxes at Crystal Plaza Building 3 and the Department of Commerce Building.

A new section 1.6(d) is added to specify the types of correspondence which may be transmitted by facsimile and former § 1.6(d) is revised to be consistent with § 1.8(b) and redesignated as § 1.6(e). The widespread use of facsimile transmission and the resulting time saved in correspondence between applicants and the Office prompted the Office to establish a trial program to accept facsimile transmission of certain correspondence. The policy on "Filing of Certain Papers and Authorizations to Charge Deposit Accounts by Facsimile Transmission" was published at 1096 Off. Gaz. Pat. Office 30 (November 15, 1988) and was supplemented in the notice "Filing of Certain Papers with the Board of Patent Appeals and Interferences by Facsimile Transmission" published at 1108 Off. Gaz. Pat. Office 15 (November 14, 1989). The policy on "Filing of Certain Trademark Papers and Authorizations to Charge Deposit Accounts by Facsimile Transmission" was published at 1123 Off. Gaz. TM. Office 18 (February 12, 1991). In light of the success of the trial program, a policy on acceptance of facsimile transmission is incorporated into § 1.6(d). The situations where transmission of correspondence by facsimile is permitted have been increased over those permissible under the trial program outlined above. The situations where transmissions by facsimile remain prohibited are identified in § 1.6(d)(1)-(9). Prohibitions cover situations where originals are required as specified in §§ 1.4 (e) and (f), and situations where accepting a facsimile transmission would be unduly burdensome on the Office. As a courtesy, the Office will attempt to notify senders whenever correspondence is sent to the Office by facsimile transmission that falls within one of these prohibitions. Senders are cautioned against submitting correspondence by facsimile transmission which is not permitted under § 1.6(d) since such correspondence will not be accorded a receipt date.

This final rulemaking expands the acceptability of facsimile transmission to certain patent interference proceedings, not included in the proposed rulemaking, to reflect the practice set forth at 1108 Off. Gaz. Pat. Office 15 (November 14, 1989).

This final rulemaking also expands the acceptability of facsimile transmission to certain trademark documents, not include in the proposed rulemaking. These additional documents are:

(1) An affidavit showing that a mark is still in use or containing an excuse for nonuse under section 8 (a) or (b) or section 12(c) of the Trademark Act, 15 U.S.C. 1058(a), 1058(b), 1062(c);



(2) An application for renewal of a registration under section 9 of the Trademark Act, 15 U.S.C. 1059;

(3) In an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), the filing of an amendment to allege use in commerce under section 1(c) of the Trademark Act, 15 U.S.C. 1051(c); or the filing of a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051(d)(1).

The Certificate of Mailing or Transmission provisions of § 1.8 do not apply to correspondence listed in (1)-(3) above, nor to the filing of correspondence in an international application before the U.S. Receiving Office, the U.S. International Searching Authority, or the U.S. International Preliminary Examining Authority or to the filing, in an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), of a request under section 1(d)(2) of the Trademark Act, 15 U.S.C. 1051(d)(2), for an extension of time to file a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051(d)(1). See § 1.8(a)(2)(i)(E) and 1.8(a)(2)(ii)(B), (C), (E) and (F). If the transmission of any of these documents is completed after midnight (Eastern time) of the due date, the papers are untimely.

Under § 1.6(d)(4) as adopted in this final rulemaking, drawings submitted under §§ 1.81, 1.83-1.85, 1.152, 1.165, 1.174, 1.437, or 2.21 may not be filed by facsimile in patent and trademark applications. The experience of the Office is that the quality of the drawings received by facsimile transmission is generally not sufficient to comply with the drawing requirements set forth in these rules. However, applicants may submit by facsimile transmission proposed drawing corrections for approval by the Office.

In trademark proceedings, the facsimile transmission of specimens in response to an Office action will be permitted. Facsimile-transmitted specimens must be legible in order to be accepted and examined as specimens. This final rulemaking also expands the acceptability of specimens filed in conjunction with amendments to allege use under section 1(c); statements of use under section 1(d); affidavits of use or excusable nonuse under section 8(a) or (b) or 12(c); and applications for renewal under section 9 of the Trademark Act, 15 U.S.C. 1051(c) and (d); 1058(a) and (b); 1062(c) and 1059.

The date of receipt accorded to any correspondence permitted to be sent by facsimile transmission is the date the complete transmission is received by an Office facsimile unit, unless the transmission is completed on a Saturday, Sunday, or Federal holiday within the District of Columbia. Correspondence for which transmission was completed on a Saturday, Sunday, or Federal holiday within the District of Columbia, will be accorded a receipt date of the next succeeding day which is not a Saturday, Sunday, or Federal holiday within the District of Columbia. For example, a facsimile transmission to the Office from California starting on a Friday at 8:45 p.m. Pacific time and taking 20 minutes, would be completed at 9:05 p.m. Pacific time. The complete transmission would be received in the Office around 12:05 a.m. Eastern time on Saturday. The receipt date accorded to the correspondence is the date of the following business day, which in this case, would be Monday (assuming that Monday was not a Federal holiday within the District of Columbia).

The following lists itemize types of correspondence which may not be filed by facsimile transmission, and, if submitted by facsimile, will not be accorded a date of receipt:

#### Correspondence Relative to Patents and Patent Applications Where Filing by Facsimile Transmission is Not Permitted

- (1) A document that is required by statute to be certified;
- (2) A national patent application specification and drawing or other correspondence for the purpose of obtaining an application filing date;
- (3) Drawings submitted under §§ 1.81, 1.83-1.85, 1.152, 1.165, 1.174, or 1.437;
- (4) Correspondence in an interference which an examiner-in-chief orders to be filed by hand or "Express Mail";
- (5) Agreements between parties to an interference under 35 U.S.C. 135(c);
- (6) Correspondence to be filed in an interference proceeding which consists of a preliminary statement under § 1.621; a transcript of a deposition under § 1.676 or of interrogatories,

cross-interrogatories, or recorded answers under § 1.684(c); or an evidentiary record and exhibits under § 1.653;

(7) Correspondence to be filed in a patent application subject to a secrecy order under §§ 5.1-5.8 of this chapter and directly related to the secrecy order content of the application;

(8) An international application for patent;

(9) A copy of the international application and the basic national fee necessary to enter the national stage, as specified in § 1.494(b) or § 1.495(b);

(10) A request for reexamination under § 1.510.

#### Correspondence Relative to Trademark Registrations and Trademark Applications Where Filing by Facsimile Transmission is Not Permitted

- (1) The filing of a trademark application;
- (2) Drawings submitted under § 2.21;
- (3) A petition to cancel a registration of a mark under section 14, subsection (1) or (2) of the Trademark Act, 15 U.S.C. 1064;
- (4) Request for cancellation or amendment of a registration under section 7(e) of the Trademark Act, 15 U.S.C. 1057(e); and certificates of registration surrendered for cancellation or amendment under section 7(e) of the Trademark Act, 15 U.S.C. 1057(e);
- (5) Correspondence to be filed with the Trademark Trial and Appeal Board, except the notice of ex parte appeal.

#### Correspondence Relative to Practitioner Registrations, Investigations, and Disciplinary Proceedings Where Filing by Facsimile Transmission is Not Permitted

Correspondence requiring a person's signature and relating to:

- (1) Registration to practice before the Patent and Trademark Office in patent cases;
- (2) Enrollment and disciplinary investigations; or
- (3) Disciplinary proceedings.

(4) Certificate of Mailing or Transmission Procedure (Section 1.8)

The title of § 1.8 is changed from Certificate of Mailing to Certificate of Mailing or Transmission so as to include facsimile transmission.

Section 1.8(a) prescribes procedures for the use of a certificate of mailing or transmission to file papers or fees in the Office by first class mail or by facsimile transmission. The description of the Certificate of Mailing or Transmission practice is set forth in § 1.8(a)(1), and the list of exceptions to the certificate practice is found in § 1.8(a)(2). The phrase "papers or fees" in § 1.8(a) is changed to "correspondence" since both "papers" and "fees" fall within the generic definition of "correspondence". Paragraphs (a) and (b) of § 1.8 are amended to include correspondence transmitted by facsimile. In the event that correspondence is filed by facsimile transmission, it is recommended that the sending facsimile machine generate a report confirming transmission for each transmission session. This report should be retained by the applicant, along with the correspondence used as the original, as evidence of content and date of transmission. Paragraph (a)(2) of § 1.8 is amended to include separate headings for correspondence which relate to patents, trademarks and disciplinary proceedings. The sequence of some of the paragraphs found in § 1.8(a)(2) has been changed in order to have those paragraphs listed under the appropriate heading. The ability to use the Certificate of Mailing or Transmission procedures has been expanded to the filing of an affidavit under section 15, subsection (3) of the Trademark Act, 15 U.S.C. 1065(3), the filing of a notice of election to proceed by civil action in an inter partes proceeding under 35 U.S.C. 141 or 15 U.S.C. 1071(a)(1), in response to another party's appeal to the Court of Appeals for the Federal Circuit, the filing of a notice and reasons of appeal under 35 U.S.C. 142 or a notice of appeal under 15 U.S.C. 1071(a)(2), and the filing of a statement under 42 U.S.C. 2182 or 42 U.S.C. 2457(c).

Paragraph (a)(2)(vi) of § 1.8 is redesignated as paragraph (a)(2)(x) and amended to refer to section 14(1) or 14(2) of the Trademark Act, 15 U.S.C. 1064, to conform with the numbering of the Trademark Law Revision Act of 1988. Other sections of paragraph (a)(2) of § 1.8 are amended to identify the types

of correspondence which will not receive the benefit of a certificate of mailing or transmission.

Paragraph (b) of § 1.8 outlines procedures to be followed to document the timely filing of correspondence in accordance with § 1.8(a) where such correspondence is not received by the Office. The phrase "correspondence or fees" in § 1.8(b) is changed to "correspondence" since "fees" fall within the generic definition of "correspondence". Before adoption of this final rule, § 1.8(b) required that the party forwarding the correspondence or fee include a declaration, under §§ 1.68 or 2.20 of this chapter, attesting to the previous timely mailing or transmission. In order to be consistent with other sections in Parts 1 and 2 of this chapter, the practice under § 1.8(b) is amended to permit a practitioner, as defined in § 10.1(r), to submit a statement rather than an oath or declaration under §§ 1.68 or 2.20 of this chapter. New paragraph (c) of § 1.8 is added to explicitly provide for a requirement for additional evidence relating to the mailing or transmission of correspondence in accordance with paragraph (a) of this section. The Office may invoke this requirement when it is deemed appropriate to establish an actual date of mailing or transmission. See, e.g., *In re Klein*, 6 USPQ2d 1547 (Comm'r Pat. 1987), *aff'd sub nom. Klein v. Peterson*, 696 F. Supp. 695, 8 USPQ2d 1434 (D.D.C. 1988), *aff'd* 866 F.2d 412, 9 USPQ2d 1558 (Fed. Cir.), cert. denied, 490 U.S. 1091 (1989).

(5) Time for Appeal or Civil Action (Section 1.304) In section 1.304, paragraphs (a) and (c) are amended to delete a statement that use of the certificate procedure under § 1.8 is prohibited so as to be consistent with changes to § 1.8. Also, a cross reference to 1.658 in paragraph (a) is clarified.

(6) Submission of Maintenance Fees (Section 1.366) Section 1.366(b) is amended by deleting the words "of mailing" to conform with the new title for § 1.8.

(7) Filing Date of Application for Extension of Patent Term Section 1.741(a) Section 1.741(a) is amended to conform with the new title for the certificate procedure under § 1.8.

(8) Appeal to Court and Civil Action (Section 2.145) Sections 2.145(c)(3) and 2.145(d)(1) are amended to conform with the revised list of types of correspondence excluded from the certificate of mailing or transmission procedure set out in § 1.8. Formerly, the notice of election to proceed by civil action in an inter partes proceeding under 35 U.S.C. 141 or section 21(a)(1) of the Trademark Act, 15 U.S.C. 1071(a)(1), and the filing of notice and reasons of appeal under 35 U.S.C. 142 or a notice of appeal under section 21(a)(2) of the Trademark Act, 15 U.S.C. 1071(a)(2), were specifically excluded, under §§ 1.8(a)(2) (viii) and (ix), respectively, from the certificate of mailing procedure. Since these notices are no longer excluded under amended § 1.8(a)(2), sections 2.145(c)(3) and 2.145(d)(1) are amended to conform with § 1.8 by deleting the last sentence which provided that the certificate of mailing procedure was not available.

(9) Reconsideration of Affidavit or Declaration (Section 2.165) Section 2.165(a)(1) is amended to refer to the new title for the certificate procedure under § 1.8 of this chapter.

(10) Signature and Certificate of Practitioner (Section 10.18) Section 10.18 is modified to clarify signature requirements for correspondence signed by practitioners. The reference to § 1.4 of this chapter will make it apparent that copies, including photocopies or facsimile transmissions, of correspondence signed by practitioners will be accepted under appropriate circumstances.

(11) Misconduct (Section 10.23(c)) Section 10.23(c) is amended to refer to the new title for the certificate procedure under § 1.8 of this chapter.

#### Response to Comments on the Rules

The comments received in response to the notice of proposed rulemaking have been given careful consideration and a number of the suggested modifications have been adopted. The comments and responses are discussed below.

**Comment:** In order to clarify how the Office will treat a copy of a paper, one comment suggested changing the second sentence in proposed § 1.4(d) to indicate that, except as provided in §§ 1.4(e) and (f), a copy would be treated by the Office as if the original had been filed.

**Response:** While the suggested language was not adopted, the rule was modified to clarify that, except as provided in §§ 1.4

(e) and (f), an original or a copy thereof may be filed. The rules as stated in this final rulemaking are clear that, where an original is not required, a paper filed will be treated in the same way regardless of whether it is an original or a copy.

**Comment:** Five comments objected to a perceived requirement in § 1.4(d) that the color of ink used for signing a paper be different from the printing on the paper.

**Response:** Proposed § 1.4(d) did not require that the color of ink used for signing a paper be different from the printing on the paper. The suggested use of different colors of ink is a preferred procedure for distinguishing between an original and a copy. However, in order to avoid further confusion, the suggestion that a different color of ink be used has been deleted.

**Comment:** One comment recommended that the issue of signature authenticity end upon issuance of a patent in order to reduce the need to keep files in storage for long periods of time and to remove the burden on applicants of having to retrieve files from storage.

**Response:** Once a patent issues, the Office is not likely to inquire into any matters related to signature authenticity of correspondence filed in that patent application. Nevertheless, on rare occasions, a question of signature authenticity might arise after issuance of a patent. Applicants must therefore make their own decisions as to how long to retain originals.

**Comment:** Two comments questioned the justification for proposed § 1.4(e) requiring originals to be submitted in international patent applications.

**Response:** Section 1.4(e), as adopted, does not prohibit the filing of photocopies in an international patent application. With regard to facsimile transmissions, Patent Cooperation Treaty (PCT) Rule 92.4, as revised on July 1, 1992, permits the filing by facsimile of certain correspondence related to an international patent application. However, as indicated in §§ 1.6(d)(3), 1.8(a)(2)(iv) and 1.8(a)(2)(vi), the filing by facsimile is not permitted in the following situations relative to international applications for patent: (1) the filing of an international application for patent and (2) the filing of a copy of the international application and the basic national fee necessary to enter the national stage, as specified in §§ 1.494(b) or 1.495(b).

Applicants are cautioned, however, that the Certificate of Mailing or Transmission provisions of § 1.8 do not apply to correspondence filed in an international application before the U.S. Receiving Office, the U.S. International Searching Authority, or the U.S. International Preliminary Examining Authority, regardless of whether the correspondence was filed by mail or facsimile transmission. See § 1.8(a)(2)(5).

**Comment:** One comment suggested that, in applications filed under § 1.60, the certification that the application and papers being filed are true copies of those filed in the parent application should be excluded from the original signature requirement.

**Response:** Filing of copies of statements under § 1.60 as well as certifications under §§ 1.8, 1.10, 1.97(e) and 3.73(b) will be permitted. The certified documents referred to in § 1.4(f) are those which are required to be certified by statute (e.g., certified documents under 35 U.S.C. 119).

**Comment:** One comment questioned whether routine papers could be photocopied with a practitioner's signature thereon with appropriate information being filled in later by another person.

**Response:** Section 10.18(a) states that the signature of a practitioner, on correspondence filed, constitutes a certificate that the correspondence has been read by the practitioner. Accordingly, the photocopying of papers with a practitioner's signature thereon and subsequently having appropriate information filled in by another person, is not authorized or permitted under the rules.

**Comment:** One comment questioned whether a docket clerk could use a signature stamp of a registered attorney on a transmittal letter.

**Response:** Section 10.18(a) states that correspondence filed by a practitioner must be personally signed by that practitioner. Accordingly, use of a signature stamp of a registered attorney by a docket clerk would not be permitted.

**Comment:** Two comments suggested that the facsimile transmission practice be further liberalized to permit scanned-in signatures to be affixed to facsimile or electronically transmitted correspondence. The personal, handwritten signature would be affixed on a copy of the transmitted correspondence which would be kept by the applicant or his or her representative.



**Response:** The Office is actively considering acceptance of electronically filed applications and papers related thereto. See "Electronic Filing of Patent and Trademark Applications" published at 57 FR 56537 (November 30, 1992) and 1145 Off. Gaz. Pat. Office 378 (December 22, 1992). Until an acceptable program is established, every paper, requiring a signature, filed in the Office, regardless of the manner in which it was transmitted, will have to be a paper which was signed by the person whose signature appears thereon, or be a copy thereof. Scanned signatures affixed to papers which were not personally signed will not be permitted at this time.

**Comment:** One comment indicated that proposed § 1.5(a) appeared to be contrary to PCT Article 27(1) in that it added the additional requirement not set forth in the PCT of requiring correspondence concerning an international application to identify the international application number.

**Response:** PCT Rule 92.1 requires any paper relating to an international application to identify the international application to which it relates. In order to ensure prompt and proper association of correspondence with the intended application file, it is essential to use the application number on all papers. The practice (which was not a new one added in this rulemaking) is a mere implementation of the requirement in PCT Rule 92.1 and is not contrary to PCT Article 27(1) as no additional requirement is being placed on applicants.

**Comment:** Two comments recommended an increase from two weeks to 30 days or one month in the period provided in § 1.5(a) for resubmission of correspondence.

**Response:** The two-week period provided in § 1.5(a) is to enable applicants to provide the necessary identifying data where such data was not provided during the original submission. This is intended to permit immediate resubmission and no additional time is deemed to be necessary. Extending this period to 30 days would unnecessarily delay prosecution of applications.

**Comment:** Section 1.5(a) suggests that all letters directed to the Office concerning applications for patents should also state "Patent Application". One comment suggested that § 1.5(a) be amended to replace the restrictive reference to a "Patent Application" to read "identifying the correspondence a relating to a patent application".

**Response:** In order to make it easier for Office employees handling incoming correspondence to direct mail, § 1.5(a) recommends that letters relating to a patent application should state "Patent Application". The suggestion in the comment was not adopted since uniformity in the reference to "Patent Application" is desirable. Furthermore, this suggested labeling is not a requirement as evidenced by the use of the word "should" rather than "must".

**Comment:** Section 1.5(a) states that "No correspondence relating to an application should be filed prior to when notification of the application number is received from the Patent and Trademark Office". One comment suggested that the phrase "notification of the application number" was not adequately defined as it was not clear if applicants had to wait for the official filing receipt before information disclosure statements or other papers could be filed.

**Response:** The phrase "notification of the application number" as used in § 1.5(a) includes any manner in which an applicant becomes aware of the application number. The phrase is purposely broad and is not limited to the mailing of an official filing receipt. Rather, it includes a return post card which has an application number stamped thereon. The reasoning behind the statement in § 1.5(a) that no correspondence should be filed prior to notification of the application number is that correspondence received without an application number is difficult to match with the appropriate file. Further defining the phrase "notification of the application number" in § 1.5(a) is not warranted.

**Comment:** One comment suggested defining a business day as Monday through Friday, except for Federal holidays in the District of Columbia.

**Response:** It is not clear which section the comment was directed to, but § 1.6 indicates that no correspondence will be received by the Office on Saturdays, Sundays or Federal holidays within the District of Columbia. Since the language has not created problems in the past, the suggestion will not be adopted.

**Comment:** Two comments suggested amending § 1.6(c) to indicate the hour of operation of the "walk-up window".

**Response:** Specifying in the regulations the hours of operation of the "walk-up window" is unnecessary. The hours of operation have been published in Official Gazette announcements and if those hours are changed in the future, the new schedule will be published. Should the hours of operation of the "walk-up window" be changed due to unforeseen circumstances (i.e., snow emergency, etc.), a sign will be posted at the "walk-up window" giving an alternate location to deposit correspondence for the Office.

**Comment:** Two comments requested that the Office reconsider and withdraw the proposal to eliminate the mail drop box at the guard's desk at the Department of Commerce Building in Washington, D. C.

**Response:** As indicated in the notice of proposed rulemaking, members of the public were occasionally denied access to the drop box at the Department of Commerce. Additionally, the Office lacked confidence in assigning correct dates of receipt to correspondence deposited in the box as a result of instances when correspondence was found outside of the drop box. Further, since there are many ways to file papers with the Office (i.e., certificate of mailing or transmission, Express Mail, facsimile transmission, longer hours at the "walk-up-window"), there is no need to maintain an off-site drop box.

**Comment:** One comment suggested that the Office publish phone numbers for facsimile machines at various locations, (i.e., Publishing Division, various examining groups, etc.), in order to enable the public to direct their transmissions to a particular location, rather than a central location.

**Response:** The suggestion has been adopted. See "Patent and Trademark Office (PTO) Information Contacts", 1149 Off. Gaz. Pat. Office 67 (April 27, 1993). The Office will publish in the Official Gazette periodic updates of this list.

**Comment:** Three comments advocated a further expansion of the facsimile transmission practice to permit transmission of any paper which did not require an original signature. According to the comment, it was difficult to understand why the Office would not permit facsimile transmission of certain papers directly to the Office, but would accept those same papers if transmitted by facsimile to a third party who then hand-delivered the papers to the Office.

**Response:** The only papers, not requiring an original signature or certification, which the Office will not accept by facsimile transmission are those which, for various reasons, would cause an undue burden on the Office. For example, papers submitted for the purpose of obtaining an application filing date are often rather voluminous difficult to collate and would create inefficiencies in tying up the Office facsimile machines for long periods of time. In addition, there is a time and content criticality to papers filed for the purpose of obtaining a filing date which is not shared by other types of papers. Another example would be drawings submitted under §§ 1.81, 1.83-1.85, 1.152, 1.165, 1.174, 1.437, or 2.21. Experience has shown that the quality of drawings received by facsimile transmission would typically result in an objection by the Official Draftsman. Disputes might arise at that point as to whether the cause of the poor quality was applicant's transmitting unit or the receiving unit of the Office. Hence, the Office will continue to prohibit facsimile transmission of certain papers as specified in § 1.6(d). However, the suggestion has been adopted to the extent that the office will accept, via facsimile transmission, an affidavit showing that a mark is still in use or containing an excuse for nonuse under section 8(a) or (b) or section 12 (c) of the Trademark Act, 15 U.S.C. 1058(a), 1058(b), 1062(c); an application for renewal of a registration under section 9 of the Trademark Act, 15 U.S.C. 1059; and in an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), the filing of an amendment to allege use in commerce under section 1(c) of the Trademark Act, 15 U.S.C. 1051(c); or the filing of a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051 (d)(1).

**Comment:** Section 1.6(d) states that the receipt date accorded to a paper transmitted by facsimile will be the date on which the complete transmission is received in the Office. Three comments objected to this language by arguing that this practice discriminated against West Coast practitioners and gave an advantage to East Coast practitioners because the West Coast practitioners had only until 9 P.M. to complete a transmission in order to receive the benefit of that day's filing.

**Response:** The facsimile transmission practice is similar to

regular mail practice. Thus, a West Coast practitioner depositing correspondence with the local postal service without a certificate of mailing will receive as a receipt date the date on which the Office receives the correspondence, rather than the date on which the correspondence was deposited. Similarly, a paper transmitted by facsimile will be accorded, as the date of receipt, the date on which the complete transmission was received in the Office, unless the date of receipt is a Saturday, Sunday, or Federal holiday within the District of Columbia, in which case, the date of receipt will be the next business day.

The certificate practice provided in § 1.8, on the other hand, permits the sender to indicate on the correspondence the date of mailing or transmission from the sender's perspective, which date would then be effective to meet a deadline set for response. Use of the certificate of mail or transmission is applicable to correspondence submitted by mail and correspondence transmitted by facsimile. If transmitted by facsimile, the person signing the certificate certifies the expectation that the transmission would be initiated before midnight, local time.

By way of example, a West Coast practitioner preparing a response on the last day of the period for response would have to use the § 1.8 certificate of mailing procedure or the § 1.10 Express Mail procedure, for the response to be considered timely, if the correspondence was sent by way of the U. S. Postal Service. If the practitioner chose to send the correspondence by facsimile on the last day for response and the transmission was started before 9:00 p.m. Pacific time, but was completed after 9:00 p.m. Pacific time, the Office would accord that correspondence a receipt date as of the next business day, which would be after the period for response expired because the Office would have received the correspondence after midnight Eastern time of the last day for response. However, if the practitioner affixed a certificate of transmission to the correspondence sent by facsimile transmission, indicating that the correspondence was being transmitted on the last day in the period for response, then the correspondence would be considered timely filed.

As another example, a transmission started before midnight, Pacific time, on the last day for response and having a certificate of transmission affixed thereto, would be considered timely filed even though the transmission was completed after midnight, Pacific time and was received in the Office the day after the deadline for response.

**Comment:** One comment suggested replacing "drawings" in § 1.6(d)(4) with "formal drawings" for clarity.

**Response:** The suggestion has not been adopted because the phrase "formal drawings" does not find support or antecedent basis in sections referred to in § 1.6(d)(4).

**Comment:** One comment objected to the perceived requirement for a certificate of transmission in order for a facsimile-transmitted document to be accorded a date of receipt.

**Response:** The receipt date accorded to correspondence eligible for facsimile transmission, whether containing a certificate of transmission or not, will be the date of receipt in the Office of the complete transmission (unless that date is a Saturday, Sunday, or Federal holiday within the District of Columbia, in which case the date accorded will be the next business day). The certificate of transmission, if used, is for purposes of establishing timely filing if the correspondence is transmitted within the period for response but is (1) received in the Office after expiration of the period for response, or (2) lost or (3) not received by the Office.

**Comment:** One comment requested clarification as to what constituted a "complete transmission" as used in §§ 1.6(d).

**Response:** The context in which the phrase "complete transmission" was used in § 1.6(d) was to indicate that the transmission was finished. For example, if page 1 of a ten-page facsimile transmission is received in the Office at 11:55 p.m. on a Tuesday and page 10 of that transmission is received at 12:05 a.m. Wednesday, the receipt date accorded to that correspondence will be the date of that Wednesday. (This example assumes that Wednesday is not a Federal holiday within the District of Columbia).

**Comment:** One comment questioned whether a confirmation in the sender's facsimile machine that the entire facsimile was received constituted sufficient proof that a transmission was complete.

**Response:** A confirmation by the sender's facsimile machine is evidence that a transmission was made. As such, the confirmation will be considered together with any other evidence

presented when questions of filing by facsimile transmission arise. It is therefore suggested that a certificate of transmission be used to enable the sender to rely on the procedures set forth in § 1.8(b).

**Comment:** One comment requested clarification as to what constituted an incomplete, faulty or illegible facsimile. Also, if an incomplete transmission was sent near the end of the period for response, will the sender be able to rely on the date the facsimile was initially transmitted, or would the sender have to rely on § 1.137 to revive the application if it became abandoned?

**Response:** If an incomplete, faulty or illegible facsimile transmission is received, that correspondence will be treated by the Office in the same manner that a comparably incomplete, faulty or illegible piece of correspondence would be treated if the correspondence were hand-delivered or mailed to the Office. Whether the application would be held abandoned upon receipt of an incomplete facsimile transmission or whether an opportunity would be provided to complete the transmission will be decided on a case-by-case basis using the same standards that are currently used - for example, for incomplete responses to Office actions, see § 1.135(c).

**Comment:** One comment indicated that the proposed practice of not accepting papers related to international applications if transmitted by facsimile and the indication that papers transmitted by facsimile, when prohibited, may be disposed of is contrary to PCT practice wherein PCT expressly provides for facsimile transmission of such papers and when not acceptable, an opportunity to correct is provided.

**Response:** PCT does not mandate acceptance of facsimile transmissions; it merely authorizes their acceptance. See PCT Rule 92.4(h). Additionally, as indicated above, the suggestion that the Office permit facsimile transmission of correspondence relative to an already filed international application has been adopted to a large extent.

There is no provision in PCT to provide an opportunity for correction when correspondence is filed by facsimile in spite of a refusal by a national Office to accept that type of correspondence by facsimile. As with national applications, the Office will attempt to notify senders whenever a facsimile transmission received is of a type which the Office has not agreed to accept by facsimile. Senders are cautioned against submitting such correspondence by facsimile transmission since the correspondence will not be accorded a filing date or date of receipt in the Office.

**Comment:** One comment suggested changing the phrase "Certificate of Transfer" in § 1.8 to "Certificate of Transmittal" or "Certificate of Sending" because "transfer" typically implies transfer of ownership interest in patents or trademarks.

**Response:** While each phrase has its own advantages and drawbacks, the suggestion will not be adopted. Nevertheless, in order to avoid confusion, this rulemaking leaves the old "Certificate of Mailing" intact, while adding "or Transmission" to include correspondence filed by facsimile transmission.

**Comment:** In the notice of proposed rulemaking, it was recommended that the facsimile machine transmission report be retained by the sender along with the correspondence used as the original, as evidence of content and date of transfer. One comment indicated that the correspondence used as the original can only be retained using the older stand-alone type of facsimile machine, since there is no such physical document with the newer in-computer facsimile cards.

**Response:** Section 1.4(d)(2) provides for submission of copies, e.g., by facsimile, of originals as defined in § 1.4(d)(1). Section 1.4(d)(2) does not provide for transmission of unsigned correspondence from a computer. While § 1.4(d)(2) does not require the sender to retain the original, there may be occasions when the sender will have to document the date and content of a document previously filed by facsimile transmission. The recommendation made in the notice of proposed rulemaking will apply to any situation where a paper document served as the original from which a facsimile was transmitted. If a facsimile transmission by using a computer is desired, a paper copy of the document to be transmitted may be printed out, signed and retained by the sender as evidence of content of the document transmitted. Once signed, if filing of a copy is permitted, the document could be scanned into the computer and facsimile transmitted to the Office.

**Comment:** In proposed section 1.8(a)(1) published in the Fed-



eral Register, paragraphs (i) and (ii) were joined with the alternative "or" to indicate that correspondence could be filed by being deposited with the U. S. Postal Service or transmitted by facsimile. This same section was published in the Official Gazette, by having paragraphs (i) and (ii) joined with the connective "and". Numerous comments, received apparently from individuals who saw the proposed rules in the Official Gazette, objected to the requirement that, in order to receive benefits under § 1.8, correspondence transmitted by facsimile also had to be mailed.

**Response:** Section 1.8(a)(1) as published in the Federal Register was correct, while the version published in the Official Gazette contained a typographical error. Hence, §§ 1.8(a)(1)(i) (A) and (B), as adopted in this rulemaking, make clear that the certificate of mailing or transmission practice will be applicable to correspondence mailed or sent by facsimile. The Office discourages the practice of having the same papers submitted by both methods as this practice would result in unnecessary duplication of papers and processing requirements.

**Comment:** One comment indicated that since all facsimile transmissions include the date and time of the actual facsimile transmission, the Office should not require a certificate of transmission, in order to get the benefit of an earlier filing date under § 1.8(a), when correspondence is transmitted by facsimile.

**Response:** The Office is concerned that some older machines may not print the date and time of the actual transmission. Furthermore, even on the new machines the date and time printed by the sending unit may not always be correct, particularly after a temporary electrical disconnection, change in time, etc. Hence, for purposes of being considered timely filed, if the sender wishes to obtain the benefits of a date earlier than the date the complete transmission is received in the Office, the correspondence must include a certification in accordance with § 1.8(a). A suggested format for a Certificate of Mailing and a Certificate of Transmission under § 1.8, to be included with the correspondence, is reproduced below:

#### Certificate of Mailing

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to:

Commissioner of Patents and Trademarks  
Washington, D.C. 20231  
on \_\_\_\_\_

Date _____	Signature _____
	Typed or printed name of person signing certificate

#### Certificate of Transmission

I hereby certify that this correspondence is being facsimile transmitted to the Patent and Trademark Office:

Date _____	Signature _____
	Typed or printed name of person signing certificate

#### OTHER CONSIDERATIONS

The rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 et seq.), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these changes is to incorporate existing Office policy

into the regulations, permit the filing of certain correspondence without an original signature and permit the filing of certain correspondence by facsimile transmission.

The Office has determined that these rule changes are not major rules under Executive Order 12291. The annual effect on the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers, individuals, industries, Federal, state or local government agencies, or geographic regions because most of the changes reduce procedural burdens. There will be no significant effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Office has also determined that these changes have no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes contain collection-of-information requirements subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., which have previously been approved by the Office of Management and Budget under Control Nos. 0651-0009 and 0651-0011. The public reporting burden for these collections of information for Certificates of Mailing or Transmission is estimated to average 0.1 hours each, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collections of information. Send comments regarding these burden estimates, or any other aspect of these collections of information, including suggestions for reducing the burden, to Abraham HersHKovitz, Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503 (ATTN: Paperwork Reduction Act Projects 0651-0009 and 0651-0011).

#### List of Subjects

##### 37 CFR Part 1

Administrative practice and procedure, Freedom of information, Inventions and patents, Reporting and record keeping requirements.

##### 37 CFR Part 2

Administrative practice and procedure, Courts, Lawyers, Trademarks.

##### 37 CFR Part 10

Administrative practice and procedure, Conflicts of interest, Courts, Inventions and patents, Lawyers.

For the reasons set out in the preamble, and pursuant to the authority contained in 15 U.S.C. 1123 and 35 U.S.C. 6, parts 1, 2 and 10 of title 37 of the Code of Federal Regulations are amended as set forth below:

#### PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. In Section 1.4, the title is revised and paragraphs (d) through (f) are added to read as follows:

##### § 1.4 Nature of correspondence and signature requirements.

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(d) Each piece of correspondence, except as provided in paragraphs (e) and (f) of this section, filed in a patent or trademark application, reexamination proceeding, patent or trademark interference proceeding, patent file or trademark registration file, trademark opposition proceeding, trademark cancellation proceeding, or trademark concurrent use proceeding, which requires a person's signature, must either:

(1) be an original, that is, have an original signature personally signed in permanent ink by that person; or

(2) be a copy, such as a photocopy or facsimile transmission (§ 1.6(d)), of an original. In the event that a copy of the original is filed, the original should be retained as evidence of authenticity. If a question of authenticity arises, the Patent and Trademark Office may require submission of the original.

(e) Correspondence requiring person's signature and relating to registration to practice before the Patent and Trademark Office in patent cases, enrollment and disciplinary investigations, or disciplinary proceedings must be submitted with an original signature personally signed in permanent ink by that person.

(f) When a document that is required by statute to be certified must be filed, a copy, including a photocopy or facsimile transmission, of the certification is not acceptable.

3. Section 1.5(a) is revised to read as follows:

##### § 1.5 Identification of application, patent or registration.

(a) No correspondence relating to an application should be filed prior to when notification of the application number is received from the Patent and Trademark Office. When a letter directed to the Patent and Trademark Office concerns a previously filed application for a patent, it must identify on the top page in a conspicuous location, the application number (consisting of the series code and the serial number, e.g., 07/123,456), or the serial number and filing date assigned to that application by the Patent and Trademark Office, or the international application number of the international application. Any correspondence not containing such identification will be returned to the sender where a return address is available. The returned correspondence will be accompanied with a cover letter which will indicate to the sender that if the returned correspondence is resubmitted to the Patent and Trademark Office within two weeks of the mail date on the cover letter, the original date of receipt of the correspondence will be considered by the Patent and Trademark Office as the date of receipt of the correspondence. Applicants may use either the Certificate of Mailing or Transmission procedure under § 1.8 or the Express Mail procedure under § 1.10 for resubmissions of returned correspondence if they desire to have the benefit of the date of deposit in the United States Postal Service. If the returned correspondence is resubmitted within the two-week period, the date of receipt of resubmission will be considered to be the date of receipt of the correspondence. The two-week period to resubmit the returned correspondence will not be extended. If for some reason returned correspondence is resubmitted with proper identification later than two weeks after the return mailing by the Patent and Trademark Office, the resubmitted correspondence will be accepted but given its date of receipt. In addition to the application number, all letters directed to the Patent and Trademark Office concerning applications for patent should also state "PATENT APPLICATION," the name of the applicant, the title of the invention, the date of filing the same, and if known, the group art unit or other unit within the Patent and Trademark Office responsible for considering the letter and the name of the examiner or other person to which it has been assigned.

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4. In section 1.6, is revised, to read as follows:

##### § 1.6 Receipt of correspondence.

(a) Date of receipt and Express Mail date of deposit.

Correspondence received in the Patent and Trademark Office is stamped with the date of receipt except as follows:

(1) No correspondence is received in the Patent and Trademark Office on Saturdays, Sundays or Federal holidays within the District of Columbia;

(2) Correspondence filed in accordance with § 1.10 will be stamped with the date of deposit as "Express Mail" with the United States Postal Service unless the date of deposit is a Saturday, Sunday, or Federal holiday within the District of Columbia in which case the date stamped will be the next

succeeding day which is not a Saturday, Sunday, or Federal holiday within the District of Columbia;

(3) Correspondence transmitted by facsimile to the Patent and Trademark Office will be stamped with the date on which the complete transmission is received in the Patent and Trademark Office unless that date is a Saturday, Sunday, or Federal holiday within the District of Columbia, in which case the date stamped will be the next succeeding day which is not a Saturday, Sunday, or Federal holiday within the District of Columbia.

(b) Patent and Trademark Office Post Office pouch.

Mail placed in the Patent and Trademark Office pouch up to midnight on any day, except Saturdays, Sundays and Federal holidays within the District of Columbia, by the post office at Washington, D.C., serving the Patent and Trademark Office, is considered as having been received in the Patent and Trademark Office on the day it was so placed in the pouch by the U.S. Postal Service.

(c) Correspondence delivered by hand.

In addition to being mailed, correspondence may be delivered by hand during hours the Office is open to receive correspondence.

(d) Facsimile transmission.

Except in the cases enumerated below, correspondence, including authorizations to charge a deposit account, may be transmitted by facsimile. The receipt date accorded to the correspondence will be the date on which the complete transmission is received in the Patent and Trademark Office, unless that date is a Saturday, Sunday, or Federal holiday within the District of Columbia. See § 1.6(a)(3). To facilitate proper processing, each transmission session should be limited to correspondence to be filed in a single application or other proceeding before the Patent and Trademark Office. The application number of a patent or trademark application, the control number of a reexamination proceeding, the interference number of an interference proceeding, the patent number of a patent, or the registration number of a trademark should be entered as a part of the sender's identification on a facsimile cover sheet. Facsimile transmissions are not permitted and if submitted, will not be accorded a date of receipt, in the following situations:

(1) Correspondence as specified in § 1.4(e), requiring an original signature;

(2) Certified documents as specified in § 1.4(f);

(3) Correspondence which cannot receive the benefit of the certificate of mailing or transmission as specified in § 1.8(a)(2)(i)(A) through (D) and (F); 1.8(a)(2)(ii)(A) and (D); and 1.8(a)(2)(iii)(A);

(4) Drawings submitted under §§ 1.81, 1.83 through 1.85, 1.152, 1.165, 1.174, 1.437, 2.51, 2.52, or 2.72;

(5) A request for reexamination under § 1.510;

(6) Correspondence to be filed in a patent application subject to a secrecy order under §§ 5.1 through 5.8 of this chapter and directly related to the secrecy order content of the application;

(7) Requests for cancellation or amendment of a registration under section 7(e) of the Trademark Act, 15 U.S.C. 1057(e); and certificates of registration surrendered for cancellation or amendment under section 7(e) of the Trademark Act, 15 U.S.C. 1057(e);

(8) Correspondence to be filed with the Trademark Trial and Appeal Board, except the notice of ex parte appeal;

(9) Correspondence to be filed in an interference proceeding which consists of a preliminary statement under § 1.621; a transcript of a deposition under § 1.676 or of interrogatories, cross-interrogatories, or recorded answers under § 1.684(c); or an evidentiary record and exhibits under § 1.653.

(e) Interruptions in U.S. Postal Service.

If interruptions or emergencies in the United States Postal Service which have been so designated by the Commissioner occur, the Patent and Trademark Office will consider as filed on a particular date in the Office any correspondence which is:

(1) Promptly filed after the ending of the designated interruption or emergency; and

(2) Accompanied by a statement indicating that such correspondence would have been filed on that particular date if it were not for the designated interruption or emergency in the United States Postal Service. Such statement must be a verified statement if made by a person other than a practitioner as defined in § 10.1(r) of this chapter.



5. Section 1.8 is revised to read as follows:

### § 1.8 Certificate of mailing or transmission.

(a) Except in the cases enumerated in paragraph (a)(2) of this section, correspondence required to be filed in the Patent and Trademark Office within a set period of time will be considered as being timely filed if the procedure described in this section is followed. The actual date of receipt will be used for all other purposes.

(1) Correspondence will be considered as being timely filed if:

(i) the correspondence is mailed or transmitted prior to expiration of the set period of time by being:

(A) deposited with the U.S. Postal Service with sufficient postage as first class mail addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231; or

(B) transmitted by facsimile to the Patent and Trademark Office in accordance with § 1.6(d); and

(ii) the correspondence includes a certificate for each piece of correspondence stating the date of deposit or transmission. The person signing the certificate should have reasonable basis to expect that the correspondence would be mailed or transmitted on or before the date indicated.

(2) The procedure described in paragraph (a)(1) of this section does not apply to, and no benefit will be given to a Certificate of Mailing or Transmission on the following:

(i) Relative to Patents and Patent Applications

A. The filing of a national patent application specification and drawing or other correspondence for the purpose of obtaining an application filing date;

B. The filing of correspondence in an interference which an examiner-in-chief orders to be filed by hand or "Express Mail";

C. The filing of agreements between parties to an interference under 35 U.S.C. 135(c);

D. The filing of an international application for patent;

E. The filing of correspondence in an international application before the U.S. Receiving Office, the U.S. International Searching Authority, or the U.S. International Preliminary Examining Authority;

F. The filing of a copy of the international application and the basic national fee necessary to enter the national stage, as specified in § 1.494(b) or § 1.495(b).

(ii) Relative to Trademark Registrations and Trademark Applications

A. The filing of a trademark application;

B. The filing of an affidavit showing that a mark is still in use or containing an excuse for nonuse under section 8 (a) or (b) or section 12(c) of the Trademark Act, 15 U.S.C. 1058(a), 1058(b), 1062(c);

C. The filing of an application for renewal of a registration under section 9 of the Trademark Act, 15 U.S.C. 1059;

D. The filing of a petition to cancel a registration of a mark under section 14, subsection (1) or (2) of the Trademark Act, 15 U.S.C. 1064;

E. In an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), the filing of an amendment to allege use in commerce under section 1(c) of the Trademark Act, 15 U.S.C. 1051(c); or the filing of a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051(d)(1);

F. In an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), the filing of a request under section 1(d)(2) of the Trademark Act, 15 U.S.C. 1051(d)(2), for an extension of time to file a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051(d)(1).

(iii) Relative to Disciplinary Proceedings

A. Correspondence filed in connection with a disciplinary proceeding under Part 10 of this chapter.

B. Reserved.

(b) In the event that correspondence is considered timely filed by being mailed or transmitted in accordance with paragraph (a) of this section, but not received in the Patent and Trademark Office, and the application is held to be abandoned or the proceeding dismissed, terminated, or decided with prejudice, the correspondence will be considered timely if the party who forwarded such correspondence:

(1) informs the Office of the previous mailing or transmission of the correspondence promptly after becoming aware that the Office has no evidence of receipt of the correspondence;

(2) supplies an additional copy of the previously mailed or transmitted correspondence and certificate; and

(3) includes a statement which attests on a personal knowledge basis or to the satisfaction of the Commissioner to the previous timely mailing or transmission. Such statement must be a verified statement if made by a person other than a practitioner as defined in § 10.1(r) of this chapter. If the correspondence was sent by facsimile transmission, a copy of the sending unit's report confirming transmission may be used to support this statement.

(c) The Office may require additional evidence to determine if the correspondence was timely filed.

6. Section 1.304 paragraphs (a) and (c) are revised to read as follows:

### § 1.304 Time for appeal or civil action.

(a)(1) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (§ 1.302) or for commencing a civil action (§ 1.303) is two months from the date of the decision of the Board of Patent Appeals and Interferences. If a request for reconsideration or modification of the decision is filed within the time period provided under § 1.197(b) or § 1.658(b), the time for filing an appeal or commencing a civil action shall expire two months after action on the request. In interferences, the time for filing a cross-appeal or cross-action expires:

(i) 14 days after service of the notice of appeal or the summons and complaint; or

(ii) Two months after the date of decision of the Board of Patent Appeals and Interferences, whichever is later.

(a)(2) The time periods set forth in this section are not subject to the provisions of §§ 1.136, 1.550(c) or § 1.645 (a) or (b).

(a)(3) The Commissioner may extend the time for filing an appeal or commencing a civil action:

(i) For good cause shown if requested in writing before the expiration of the period for filing an appeal or commencing a civil action; or

(ii) Upon written request after the expiration of the period for filing an appeal or commencing a civil action upon a showing that the failure to act was the result of excusable neglect.

\*\*\*\*\*

(c) If a defeated party to an interference has taken an appeal to the U.S. Court of Appeals for the Federal Circuit and an adverse party has filed notice under 35 U.S.C. 141 electing to have all further proceedings conducted under 35 U.S.C. 146 (§ 1.303(c)), the time for filing a civil action thereafter is specified in 35 U.S.C. 141. The time for filing a cross-action expires 14 days after service of the summons and complaint.

7. Section 1.366(b) is revised to read as follows:

### § 1.366 Submission of maintenance fees.

\*\*\*\*\*

(b) A maintenance fee and any necessary surcharge submitted for a patent must be submitted in the amount due on the date the maintenance fee and any necessary surcharge are paid and may be paid in the manner set forth in § 1.23 or by an authorization to charge a deposit account established pursuant to § 1.25. Payment of a maintenance fee and any necessary surcharge or the authorization to charge a deposit account must be submitted within the periods set forth in § 1.362 (d), (e) or (f). Any payment or authorization of maintenance fees and surcharges filed at any other time will not be accepted and will not serve as a payment of the maintenance fee except insofar as a delayed payment of the maintenance fee is accepted by the Commissioner in an expired patent pursuant to a petition filed under § 1.378. Any authorization to charge a deposit account must authorize the immediate charging of the maintenance fee and any necessary surcharge to the deposit account. Payment of less than the required amount, payment in a manner other than that set forth in § 1.23, or the filing of an authorization to

charge a deposit account having insufficient funds will not constitute payment of a maintenance fee or surcharge on a patent. The certificate procedures of either § 1.8 or § 1.10 may be utilized in paying maintenance fees and any necessary surcharges.

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8. Section 1.741, paragraph (a) is revised to read as follows:

### § 1.741 Filing date of application.

(a) The filing date of an application for extension of patent term is the date on which a complete application is received in the Patent and Trademark Office or filed pursuant to the "Certificate of Mailing or Transmission" provisions of 37 CFR 1.8 or "Express Mail" provisions of 37 CFR 1.10.

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### PART 2- RULES OF PRACTICE IN TRADEMARK CASES

9. The authority citation for 37 CFR Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

10. Section 2.145 is amended by revising Paragraphs C(3) and D(1) to read as follows:

### § 2.145 Appeal to Court and Civil Action.

\*\*\*\*\*

(c) \*\*\*

(3) Any adverse party to an appeal taken to the U.S. Court of Appeals for the Federal Circuit by a defeated party in an inter partes proceeding may file a notice with the Commissioner within twenty days after the filing of the defeated party's notice of appeal to the court (paragraph (b) of this section), electing to have all further proceedings conducted as provided in section 21(b) of the Act. The notice of election must be served as provided in § 2.119.

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(d) Time for appeal or civil action.

(1) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (paragraph (b) of this section), or for commencing a civil action (paragraph (c) of this section), is two months from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, as the case may be. If a request for rehearing or reconsideration or modification of the decision is filed within the time specified in §§ 2.127(b), 2.129(c) or § 2.144, or within any extension of time granted thereunder, the time for filing an appeal or commencing a civil action shall expire two months after action on the request. In inter partes cases, the time for filing a cross-action or a notice of a cross-appeal expires (i) 14 days after service of the notice of appeal or the summons and complaint; or

(ii) two months from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, whichever is later.

\*\*\*\*\*

11. Section 2.165(a)(1) is revised to read as follows:

### § 2.165 Reconsideration of Affidavit or Declaration

(a)(1) If the affidavit or declaration filed pursuant to § 2.162 is insufficient or defective, the affidavit or declaration will be refused and the registrant will be notified of the reason. Reconsideration of the refusal may be requested within six months from the date of the mailing of the action. The request for reconsideration must state the grounds for the request. A supplemental or substitute affidavit or declaration required by section 8 of the Act of 1946 cannot be considered unless it is filed before the expiration of six years from the date of the

registration or from the date of publication under section 12(c) of the Act. The Certificate of Mailing or Transmission procedure provided by § 1.8 does not apply to affidavits or declarations or to supplemental or substitute affidavits or declarations filed under section 8(a) or (b) of the Act, but the certificate by "Express Mail" procedure provided by § 1.10 does apply thereto.

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### PART 10- REPRESENTATION OF OTHERS BEFORE THE PATENT AND TRADEMARK OFFICE

12. The authority citation for 37 CFR Part 10 continues to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32 41.

13. Section 10.18, is revised to read as follows:

### § 10.18 Signature and certificate of practitioner.

(a) Except where a copy, including a photocopy or facsimile transmission, of a personally signed piece of correspondence is permitted to be filed pursuant to § 1.4 of this chapter, every piece of correspondence filed by a practitioner on behalf of himself or herself or representing an applicant or a party to a proceeding in the Patent and Trademark Office must bear an original signature personally signed in permanent ink by such practitioner except for correspondence which is required to be signed by the applicant or party. The signature of a practitioner on correspondence filed by the practitioner, regardless of whether the correspondence has an original signature or is a copy, including a photocopy or facsimile transmission, of correspondence bearing an original signature, constitutes a certificate that:

(1) The correspondence has been read by the practitioner;

(2) The filing of the correspondence is authorized;

(3) To the best of practitioner's knowledge, information, and belief, there is good ground to support the correspondence, including any allegations of improper conduct contained or alleged therein; and

(4) The correspondence is not interposed for delay.

(b) Any practitioner knowingly violating the provisions of this section is subject to disciplinary action. See § 10.23(c)(15).

14. Section 10.23, paragraph (c)(9), is revised to read as follows:

### § 10.23 Misconduct

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(c) \*\*\*

(9) Knowingly misusing a "Certificate of Mailing or Transmission" under § 1.8 of this chapter or a certificate of "Express Mail" under § 1.10 of this chapter.

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Oct. 15, 1993

BRUCE A. LEHMAN  
Assistant Secretary of Commerce  
and Commissioner of Patents  
and Trademarks

1157 TMOG 87]

(173)

### Unpaid Fee Checks

Beginning Dec. 1, 1987, the Office will change the procedure for handling fee checks of attorneys and agents that are returned to the Office unpaid. Presently, when a check submitted as payment for an application, a processing, an issue or any other fee is returned to the Office unpaid, the Office of Finance sends a letter to the attorney or agent who represents the applicant, or to the applicant if unrepresented by an attorney or agent, enclosing the check and calling attention to the fact that the check was returned unpaid. Beginning Dec. 1, 1987, the Office of Finance will send a copy of its letter to the applicant if the



letter is addressed to an attorney or agent. The prohibition of 37 CFR §§ 1.33 and 2.18 against double correspondence is waived in view of the submission of a check that is returned unpaid to the Office.

A registered patent attorney or agent who repeatedly submits checks that are returned unpaid through no fault of the bank may expect to have the matter referred to the Office of Enrollment and Discipline.

Oct. 5, 1987

DONALD W. PETERSON  
Deputy Commissioner

[1083 TMOG 7]

(174)

### Weekly Summaries of Trademark Trial and Appeal Board Final Decisions

The Patent and Trademark Office will begin publishing, in each issue of the Trademark Official Gazette, a weekly summary of final decisions issued by the Trademark Trial and Appeal Board. Publication of the summary is being undertaken on a discretionary basis, as a courtesy to interested members of the public.

Mar. 21, 1988

JEFFREY M. SAMUELS  
Assistant Commissioner  
for Trademarks

[1091 TMOG 6]

### (175) Filing Receipt for Trademark Applications

Effective immediately, the Trademark Examining Operation will replace its existing "FILING RECEIPT FOR TRADEMARK APPLICATIONS," PTO Form 100 (Rev. 8/78), with a filing receipt using a new format. The revised filing receipt will be printed on a single sheet of 8 1/2" x 11" paper and will contain information regarding the mark, applicant, International and U.S. classes, goods and/or services, and dates of use. If all of the information relating to a new application cannot be printed on the 8 1/2" x 11" filing receipt, it will be noted that additional information was contained in the application but was not printed. The addressee's name and address will be printed on the back of the filing receipt.

Sept. 6, 1988

JEFFREY M. SAMUELS  
Assistant Commissioner  
for Trademarks

[1095 TMOG 6]

### (176) DEPARTMENT OF COMMERCE Patent and Trademark Office 37 CFR Parts 1 and 2 [Docket No. 90363-9221] RIN: 0651-AA40

#### Patent and Trademark Automated Search System Fees

Agency: Patent and Trademark Office, Commerce  
Action: Final Rule

Summary: The Patent and Trademark Office (Office) is amending the rules of practice in patent and trademark cases, Parts 1 and 2 of Title 37, Code of Federal Regulations, to set forth fees for public access to the text data bases resident on the Automated Patent System (APS) and the automated trademark search system (T-Search). Pub. L. 100-703, enacted on November 19, 1988, allows the Commissioner to establish reasonable fees for on-line access to the automated search systems.

The Office will provide on-line access to its USPAT data base (full text of U.S. patents issued after 1974), the U.S. classification data from 1790 to the present, and to English abstracts of Japanese and Chinese patents (to the extent they are available), hereinafter referred to as APS-Text, in its Patent Search Room and to T-Search in its Trademark Search Library, located in Arlington, Virginia. Except for a series of pilot experiments which may occur over the next one or two years, the Office does not plan to provide routine remote on-line access to these data bases at any other facilities at the present time. A separate rulemaking process will be followed when the Office determines to provide such remote on-line access.

Both search systems have been made available to the public free of charge since April 3, 1989, for the purposes of education and training (familiarization).

The paper and/or microfilm collections of U.S. patents, foreign patents documents and U.S. trademark registrations continue to be available to the public free of charge, as provided by section 104(b) of Pub. L. 100-703. The Office reaffirms its commitment to hold a public hearing prior to making any decision concerning the elimination of the paper files.

This final rule establishes fees for use of the on-line automated search systems. In addition, procedures for public use of the automated search systems, including training and charging of fees, are presented.

In response to the notice of proposed rulemaking published in the *Federal Register* on May 3, 1989 (54 FR 18907), and at a public hearing held on June 30, 1989, the Office received many comments regarding problems encountered by the public in the use of T-Search. The Office believes that T-Search has proven effective for searches performed by Trademark examining attorneys in connection with their examination of applications for the registration of marks. Although the Office is establishing a fee for accessing the T-Search system, the Commissioner is immediately suspending collection of that fee to provide additional time for the public to familiarize themselves with T-Search. The Office will provide the public with sixty days notice before starting to collect the fee.

Effective Date: February 12, 1990. Rule 2.6(w) will take effect February 12, 1990 but immediately be suspended by the Commissioner. The Office will provide written notice in the *Federal Register* sixty days before starting to collect fees for accessing T-Search.

For Further Information: Frances Michalkewicz by telephone at (703) 557-1610 or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information: The purpose of this final rule is to establish new fees for the on-line use by the public of APS-Text, and T-Search that are to be provided in the Office's facilities in Arlington, Virginia. This final rule is consistent with the Office's Electronic Data Dissemination Policies and Guidelines, which were published in final form in the *Federal Register* on May 3, 1989, at 54 FR 18920. Establishment and adjustment of patent fees is provided for by section 6 and section 41 of Title 35, United States Code, and section 103(b) of Pub. L. 100-703. Establishment and adjustment of trademark fees is authorized by section 31 of the Trademark (Lanham) Act 1946, as amended (15 U.S.C. 1113), and section 103(a) of Pub. L. 100-703. Information on the procedures for public use of the automated systems, including training, waivers, and the charging of fees, also is presented.

Background: In response to Pub. L. 96-517, the 1980 legislation which amended patent and trademark laws, the Office prepared and submitted a plan for the automation of its operations to Congress on December 13, 1982. The plan centered on two basic concepts: the creation of electronic data bases that (1) would eventually replace the Office's all-paper patent and trademark files, and thereby improve the integrity and quality of Office records; and (2) would support searches, examinations, Office actions and other Office functions through electronic workstations which would provide text and image retrieval capabilities and perform other automation functions.

Over 700,000 active Federal trademark registrations have been converted to an electronic data base of textual and digital image data. A computer system has been installed to enable trademark examining attorneys to search the data base for registered and pending trademarks and associated textual data, including marks containing designs, and to retrieve, display

and print all information as a substitute for paper file searches. Trademark examining attorneys have been using T-Search exclusively since January 1988 via a network of approximately 40 terminals. After a six-month experimental T-Search evaluation program conducted between June and December 1988, the capability was deployed for public use in the Trademark Search Library on April 3, 1989.

The T-Search "dead data base", trademarks cancelled, expired or abandoned since March 1984, also is available to the public, but approximately 17,000 images are missing and an additional 184,000 registrations and applications have not been quality checked. Trademark examining attorneys do not search this data base in connection with examining activities.

An Automated Patent System (APS) was installed for test and evaluation purposes, using one patent examining group as an operational testbed. Major operational components of APS, that is, large scale computers with conventional magnetic storage devices, a high-speed local data communications network, and electronic workstations equipped with two high resolution graphic displays and laser printers were interconnected on July 1, 1986, to enable system test and evaluation to begin in the testbed group.

On-line access to the full-text of all U.S. patents granted after 1974 and then to English language abstracts of Japanese patents was deployed to the patent examining staff beginning in 1986. On-line access to APS-Text permits examiners to search the text of approximately one million U.S. patents containing more than five billion words. Today, all examiners have been trained in the use of the full-text searching tool, and it has become a routine part of the patent examination process for many examiners. Searches are conducted from approximately 71 single screen text terminals located throughout the Office. The APS-Text capability was deployed to the public in the Patent Search Room on April 3, 1989.

The Office intends to enter the text of virtually all U.S. patents issued after 1970. In addition, selected tubular data and chemical and mathematical equations will be added to the current full text file. Ultimately, approximately 1.2 million U.S. patents will be available to both patent examiners and the public for search in full text form.

Public evaluation of the APS full-text search capability was conducted between January 11 and April 15, 1988. Forty-two (42) public users were trained an APS-Text during January 1988, and allowed first-come/first-serve access to several terminals. Reactions of public users to APS-Text were positive. Public users found APS-Text useful for pre-application and state-of-the-art searches. A total of 38 public users were trained on T-Search during a public evaluation period conducted between June and December 1988. Preliminary review indicated that public users considered T-Search to be useful both as a source for registrability searching and for verifying paper searches. In addition, T-Search was found to facilitate searches by class and ownership.

Pub. L. 100-703, enacted on November 19, 1988, allows the Commissioner to establish reasonable fees for public access to the automated search systems while it continues the requirements that no more than 30 percent of automation resources may be from user fees and that the Office may not enter into exchange agreements relating to automatic data processing resources.

Section 104(c) of Pub. L. 100-703 allows the Commissioner to waive the payment by an individual of fees for accessing the automated search systems upon a showing of need or hardship, and if such waiver is in the public interest.

The information contained in the automated data bases, which will be available to the public at the Patent and Trademark Office in Arlington, Virginia, is available free of charge at that location in paper form, and is substantially available through commercial vendors. The Office believes it to be in the public interest to waive the fee for public access to its text data bases in situations where access to the data base is needed for a personal, educational purpose by an individual or member of an educational or non-profit organization, or where payment of the fee would pose a genuine financial hardship to the user.

A personal, educational purpose is one in which the person using the data base is attempting to satisfy a personal need, and is not conducting a search or otherwise using the data base for compensation in any form. Examples of appropriate waiver situations would include students or teachers doing a term

paper, a university professor collecting background information for the preparation of an application for a research grant. An example of a situation where a waiver would not be appropriate would include an individual doing work for remuneration - e.g., a law student doing a pre-examination or infringement search for a law firm.

The Commissioner will further consider a fee waiver based on a genuine financial hardship. The person requesting a waiver will be required to provide information that would demonstrate a clear inability to pay the fee.

A waiver for the payment of fees is intended to be granted sparingly, and generally only when terminals are available. It is not anticipated that fees will be waived for any one individual more than once or twice each year. The Commissioner reserves the authority to control access to the data bases and deny a waiver to any individual. The waiver policy would apply only to use of the automated system, and not to the printing or sale of copies. Any abuse of the waiver policy could lead to a ban on the use of any public search facility for that individual.

Cost Calculations: The Office calculated unit costs for all fees based on OMB Circular A-25 "User Fees", and OMB Circular A-130, "Management of Federal Information Resources." Costs were determined from the best available records (for example, financial statements for the Office) and included direct and indirect costs to the Office of carrying out the activity, as directed by OMB Circular A-25. User charges for both APS-Text and T-Search were based on the marginal costs of providing these services to the public.

In calculating the costs of providing access to T-Search and APS-Text to the public, the Office followed Congressional direction that fees be reasonable by reflecting the marginal cost for providing the new service, and not include the costs of designing or installing the automated system for use by Office examiners, or the development of the new systems.

Prior to preparation of this final rule, all of the cost assumptions and cost calculations were reviewed and modified to ensure that they included the Office's best estimates and projections.

#### APS-Text

The Office is establishing the \$40.00 fee for each hour of terminal session time on APS-Text. The marginal costs for one hour terminal session time on APS-Text include a portion of the lease cost of a new computer mainframe which originally was to be acquired in fiscal year 1990 for use by Office patent examiners. To meet public search requirements, the mainframe is being leased earlier than originally planned. That portion of lease costs for the three (3) month period March 1990 through May 1990 over and above the lease costs for a mainframe sized to meet only examiner needs is being passed on to the user. After May 1990, the mainframe was intended to be procured and installed to support APS. Therefore, no costs are being passed on to the public user after that time. When public usage reaches the level where a mainframe dedicated for public use is required, fee adjustments will be proposed to pass all of the costs of that mainframe on to the public.

The level of public use will affect the amount of main memory needed to support the additional search sessions. It is projected that an additional increment of main memory will be required in fiscal years 1991 and 1992. This increment would not be required to support the examiner workload alone.

The fee calculations for public access also include the costs for equipment: network interface units, text terminals, printer noise dampeners and text terminal printers.

Other costs include a portion of the license fees that must be paid to Chemical Abstracts Service for its proprietary text and structure search software; additional personnel for the Patent Search Room, and the Office of Information Systems; computer installation costs; supplies and equipment dedicated to public use; and general and administrative overhead.

The Office is providing free access time during training on the automated search systems in accordance with 104(c) of Public Law 100-703 which reads, "...a limited amount of free access shall be made available to all users of the systems for purposes of education and training."

The usage rate estimates are based on the three-month public user study performed from January through March 1988. For this study, 42 frequent Patent Search Room users were selected



to be trained in the use of APS-Text. Three text terminals were made available to the trained public users at no charge. During the three-month study period, use of the three terminals averaged approximately 50 percent. While it is impossible to accurately predict future use by a more diverse group of public users, the cost calculations attempted to take into account the following factors and assumptions:

1. Future public users, on average, would use APS-Text less frequently than the 42 frequent users selected for the 1988 study, many of whom routinely used commercially available automated text search tools.

2. Collection of a fee for use (as opposed to the absence of any charge during the study) would reduce demand for text search services when compared with usage data obtained during the study period.

3. The potential universe of public users is expected to average no more than 300 per day.

4. The average length of a public user search session is projected to be approximately 22 minutes - the average length of a search session during the 1988 test of public use.

5. Based on the preceding assumptions, if all 300 potential public users conducted a single search session during a workday, a total of 110 hours of access would be required. Twenty-five text terminals available five days a week, twelve hours a day, would provide a maximum potential of 300 hours of available text search time. Under these assumptions, the number of text terminals appeared to be adequate for the foreseeable future.

6. For purposes of actual use of available text terminals, the following estimates were used:

(a) In fiscal year 1990, between four (4) and six (6) terminals would be available during the first quarter. An estimate of 45 percent utilization of available text terminal time was projected. By increasing the number of text terminals to 10 in January 1990 and 20 in April 1990, an estimate of 40 percent utilization of available text terminal time was projected. By increasing the number of text terminals to 25 in July 1990, an estimate of 35 percent utilization of available text terminal time was projected.

(b) During fiscal year 1991 and beyond, stable levels of usage were projected to be achieved, yielding an estimated 35 percent average utilization of the 25 available terminals. This utilization rate equates to 105 session hours per day, or an average of 4.2 session hours per terminal per day. At an average of 22 minutes per session, a total of 286 search sessions per day.

Although usage rates since the system was made available to the public in April 1989 have been higher than projected, the Office believes these projections are valid for the three-year fee cycle.

A summary of the fee calculations is as follows:

APS-Text Marginal Cost of One-Hour of Terminal Session Time (December 1989-November 1992)	
Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	\$ 918,196
Hardware & Maintenance	\$ 691,289
Software (license fees)	\$ 295,676
Site Preparation	\$ 38,118
Non-capital Furniture	\$ 8,750
Supplies & Forms	\$ 3,500
Sub-Total	\$ 1,955,529
General & Administrative Overhead	\$ 361,773
TOTAL COST	\$ 2,317,302
Estimated Use (hours)	65,946
UNIT COST (per hour)	\$ 35.14

The marginal cost for one hour of Office staff search assistance on APS-text includes the costs of personnel compensation and benefits.

A summary of the fee calculation is as follows:

APS-Text

Marginal Cost of One-Hour of  
Office Staff Search Assistance  
(December 1989-November 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Annual Compensation and Benefits	
TOTAL COST	\$ 45,659
Work Hours (per annum)	1,776
UNIT COST (per hour)	\$ 25.71

The marginal cost for a printed copy generated from APS-Text includes costs for compensation and benefits, printers, furniture for the printers, supplies and forms, and general and administrative overhead.

A summary is as follows:

APS-Text Marginal Cost of Each Printed Page (December 1989-November 1992)	
Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	\$ 173,472
Hardware & Maintenance	\$ 13,483
Non-capital Furniture	\$ 5,000
Supplies & Forms	\$ 35,882
Sub-Total	\$ 227,837
General & Administrative Overhead	\$ 42,150
TOTAL COST	\$ 269,987
Estimated Use (pages)	4,496,325
UNIT COST (per page)	\$0.060

T-Search

The marginal cost for one hour of terminal session time on T-Search includes the costs of personnel in the Trademark Search Library, maintenance of the T-Search terminals, routine site preparation, supplies and forms, and general and administrative overhead. The Office is establishing the \$40.00 fee for each hour of terminal session time on T-Search, but is immediately suspending collection of that fee in order to provide public users additional time to familiarize themselves with the system.

The comments submitted in response to the proposed rulemaking indicate that the public users have not adequately adjusted to the T-Search system. During the period collection of the fee is suspended, the public will have an opportunity to better learn the system so as to perform more effective searches than they may be experiencing now. The Office will publish a notice in the *Federal Register* sixty days before it begins collecting a fee for public access to T-Search.

Usage rates for T-Search during fiscal years 1990-1992 were projected to be 28 percent of the hours the system would be available to the public. This rate was extrapolated from actual usage rates during the T-Search public user pilot program which was conducted from June through December 1988. A total of 38 members of the public were trained on T-Search, and about 24 to 28 public users were active on T-Search each month. The overall usage rate of these active users was 14 percent of the hours the system was available to the public. In projecting usage rates on which to base a fee amount, it was anticipated that the overall number of users and the usage rate would double once T-Search was made available in the Trademark Search Library to all users of that search facility and training was provided on a routine basis. Although usage rates since the system was made available to the public in April 1989 have been higher projected, the Office believes these projections are valid for the three-year fee cycle.

A summary of the fee calculations are as follows:

T-Search Marginal Cost of One-Hour of Terminal Session Time (December 1989-November 1992)	

Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	\$ 154,451
Hardware & Maintenance	\$ 28,809
Site Preparation	\$ 1,000
Supplies & Forms	\$ 3,298
Sub-Total	\$ 187,558
General & Administrative Overhead	\$ 34,698
TOTAL COST	\$ 222,256
Estimated Use (hours)	5,985
UNIT COST (per hour)	\$ 37.14

The marginal cost for a printed copy generated from T-Search includes costs for compensation, and supplies and forms. A summary of the costs is as follows:

T-Search Marginal Cost of Each Printed Page (December 1989-November 1992)	
Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	\$ 27,862
Hardware & Maintenance	\$ 5,274
Supplies & Forms	\$ 3,579
Sub-Total	\$ 36,715
General & Administrative Overhead	\$ 6,792
TOTAL COST	\$ 43,507
Estimated Use (pages)	448,875
UNIT COST (per page)	\$ 0.097

The proposed fee of \$25.00 for each hour of Office staff search assistance to conduct a search using T-Search has been withdrawn. The T-Search system can be used by the public with routine assistance provided by the regular staff of the Trademark Search Library. This is similar to assistance on how to use the paper files now provided free of charge by the Trademark Search Library staff. Office employees will neither work one-on-one with members of the public in conducting searches, nor conducted searches for members of the public.

Rounding Procedures: Fee amounts were rounded so that the amount rounded would be de minimis and convenient to the user. This procedure is consistent with section 103(b) of Pub. L. 100-703 which allows the Office to adjust patent fees in the aggregate, and with section 103(a) of Pub. L. 100-703 which allows the Office to adjust trademark fees in the aggregate. The Office has detailed cost calculation worksheets for each fee item, which are available for public inspection in Suite 904 of Building 2, Crystal Park at 2121 Crystal Drive, Arlington, Virginia.

PROCEDURES FOR PUBLIC USE OF APS-TEXT AND T-SEARCH

Patent Search Room Configuration

Initially four (4) text search terminals will be installed and available for public use in the Patent Search Room. A printer will be associated with each text search terminal. An additional terminal will be located in Patent Search Room employee office space for control and administrative activities. Up to twenty-one (21) more terminals and printers are planned to be added for public use during fiscal year 1990, if necessary.

Trademark Search Library Configuration

Initially three (3) T-Search terminals with associated printers all be installed and available for public use in the Trademark Search Library. The terminals will be clustered in one area of the Trademark Search Library. An additional terminal will be located in Trademark Search Library employee office space

for control and administration activities. Additional terminals and printers will be added as demand warrants and space permits.

Training

To enable prospective public users to become effective on APS-Text, approximately fourteen (14) hours of free basic training is being offered. For those familiar with automated search systems, a shorter course of six (6) hours is provided. Ten (10) members of the public can be trained during each class. Training is being held at the Office's Arlington, Va. complex during normal work hours.

Four (4) hours of basic training is being offered on the use of T-Search. For those familiar with automated search systems, a shorter course of one (1) hour is available. T-Search training is being held in the Office's Arlington, Va. complex during morning, evening and weekend hours.

Enrollment in all training classes initially was on a lottery basis. Public users who wished to be trained on APS-Text or T-Search were required to submit an application form. The Office is now accepting requests for training and adding the names to the list. As of August 31, 1989, 696 people or 70 percent of all those requesting training have been trained.

System Use and Fee Procedures

To ensure equity of public access to the automated systems, as well as efficient operations, rules for use will be posted at the terminals. Users of the systems will be expected to comply with the rules and with all other regulations regarding the use of facilities.

Users are strongly encouraged to register in advance for system use. Each week, the next week's schedule will be available in the Patent Search room and the Trademark Search Library. Should requests for blocks of terminal time exceed the availability of terminals, limits on the amount of reserved time may be instituted. Up to three (3) of the initial four (4) terminals in the Patent Search Room and up to two (2) of the initial three (3) terminals in the Trademark Search Library will be allocated to public users with advance reserved times. The remaining terminal in the Patent Search Room will be available for walk-up users and for assisted searches for infrequent users. The remaining terminal in the Trademark Search Library will be available for walk-up users. The terminal time reservation system and the number of terminals available for walk-up public use and for assisted searches (in the Patent Search Room) is subject to change based upon operational experience.

All public use of APS-Text and T-Search, with the exception of scheduled training classes, is on a pre-payment basis. In pre-paying for use of the systems, the public may use a blank signed check, major credit card or charge to a deposit account. At the end of the search or the pre-paid amount of time, users will receive an accounting from Patent Search Room or Trademark Search Library staff for terminal time used and prints produced. The user must then finalized payment.

Discussion of Specific Rules

37 CFR 1.21 Miscellaneous fees and charges.

Section 1.21 is amended to add new paragraph (o) to set the fees for access to the Automated Patent System full-text search capability (APS-Text) and to provide for the waiver of fees under certain circumstances.

Section 1.21 is amended to add new paragraph (p) to set the fees for APS-Text search assistance by Office staff.

Section 1.21 is amended to add new paragraph (q) to set the fee for a printed copy from APS-Text.

37 CFR 2.6 Trademark fees

Section 2.6 is amended to add new paragraph (w) to set the fees for access to the automated trademark search system (T-Search) and to provide for the waiver of fees under certain circumstances.

Section 2.6 is amended to add new paragraph (x) to set the fee for a printed copy from T-Search.



A final rule package establishing two new fees under the provisions of Pub. L. 100-667, the Trademark Law Revision Act of 1988, has been published which added paragraphs (u) and (v) to section 2.6. Therefore, the rule has been modified from the proposal to add paragraphs (w) and (x) instead of paragraphs (u), (v) and (w).

#### Response to Comments on the Rules

A notice of proposed rulemaking to establish a basis for the charges for use of the on-line automated search systems in the Patent Search Room and Trademark Search Library located at the Patent and Trademark Office in Arlington, Virginia was published in the *Federal Register* on May 3, 1989, at 54 FR 18907. Corrections were published in the *Federal Register* on May 12, 1989, at 54 FR 20670. A notice also was published on May 30, 1989, in volume 1102 of the *Official Gazette* of the United States Patent and Trademark Office, pages 94 through 98 for patents, and pages 96 through 100 for trademarks.

A public hearing was conducted on June 30, 1989. A total of 25 comments were received: 24 respondents submitted written comments and five people presented oral testimony (four of whom also submitted written comments) at the public hearing. On the 25 comments, twelve (12) were from individuals, seven (7) from libraries, five (5) from organizations and one (1) from business. All of the written and oral comments were considered in adopting the rules set forth herein.

Many of the comments from the representatives of the Patent Depository Libraries raised questions or commented on the proposed rules from the perspective of their impact on Patent Depository Libraries. The proposed rules and policies set forth in the *Federal Register* Notice of May 3, 1989 are applicable only to the automated search systems provided in PTO's facilities located in Arlington, Virginia. When the Office is prepared to offer the automated search systems at the Patent Depository Libraries, a proposed notice will be published for public comment. Therefore, any comments relating to procedures for accessing the automated search systems in the Patent Depository Libraries will not be addressed at this time.

**Comment:** Overall, nine respondents acknowledged the usefulness of the automated search systems, particularly APS-Text. Although seven respondents alleged that T-Search is not adequate to meet the needs of the public, that its response time is too slow, and that it is not sufficiently accurate to meet the specific needs of the commentor, most of these respondents acknowledged that T-Search had the potential for being a useful tool. Documentation of specific problems, for example, those associated with conducting a phonetic search, were provided. Two respondents said that T-Search is flawed and the decision to require examiners to use the system on an exclusive basis was ill-advised and regrettable.

**Response:** Trademark examining attorneys have been using T-Search for word mark searches since August 1987, and for word mark and design searches since January 1988. The public has been using the system since April 3, 1989.

The minutes to the September 27, 1988, meeting of the Public Advisory Committee for Trademark Affairs, express the view that: "...T-Search searches are more thorough than manual searches." The transcript to that meeting contains the following comments: "I don't think there is any question, but a T-Search [sic] properly done gives an excellent result" and "...from the corporate point of view, ... I am pleased to say that I like what I see. I like the very fast action we're getting on the first action." From the transcript to the February 23, 1988 meeting: "I'd like to start with a glowing report. I think that the registration process is working very well. From my own personal experience in terms of what the examiners are doing, they get an A plus. They're really doing a good job."

The consensus of the management of the Trademark Examining Operation is that the T-Search system meets the needs of the Office at this time. There is no indication in any records or activities in the PTO which would indicate that the use of T-Search has caused a deterioration in the quality of searches conducted by Trademark examining attorneys.

The difference between the perceptions of the Trademark examining attorneys and the public may be attributed to several factors; Trademark examining attorneys use the system on a daily basis; they know what the system can do and what it cannot do and avoid the latter; and they know how to utilize

the system's functionalities to perform the best search possible. Further, Trademark examining attorneys do different types of searches, and have different needs, than the public. T-Search use statistics for the period April 1989 through August 1989 demonstrate that the public is making extensive use of the system. Following is a summary of those statistics:

Month	Available Hours	Hours Used By Public	Rate of Usage	Average Session Time
April	513	108	21%	13.02 min.
May	513	126	24%	12.25 min.
June	627	183	29%	10.84 min.
July	570	186	33%	12.51 min.
August	656	217	33%	9.66 min.

This usage rate compares favorably to the projected usage rate of 28 percent.

**Comment:** Seven respondents claimed that the paper Trademark files have been allowed to deteriorate and, therefore, are not reliable for use by the public.

**Response:** The Office contracts for file maintenance services in both the Trademark Search Library and the Patent Search Room. Among the tasks performed by the contractor in the Trademark Search Library are maintaining the pending files, filing newly registered Trademarks, pulling erroneous registrations from the file, etc. The contract for the Trademark Search Library includes a monitoring system based on MIL-STD 105, which is a sampling plan that provides a 97 percent accuracy level. Once the contractor completes a task, Office staff check the required sample levels to ensure that filing was performed accurately. The Office is constantly monitoring the status of the paper files, but notes that maintenance of paper file integrity is subject to inherent limitations.

**Comment:** In view of the above comments about the inadequacy of the Trademark paper search files and T-Search, six respondents advocated the need for T-Search, at no charge to the user, as an adjunct or back-up to the paper files. One respondent suggested a similar arrangement in the Patent Search Room.

**Response:** The Office has adopted the \$40.00 fee amount for one hour of terminal session time on both APS-Text and T-Search. In order to give the public more time to become familiar with the T-Search system, the Commissioner is immediately suspending collection of that fee. This will enable users to learn the system so as to perform more effective searches. The Office will publish a notice in the *Federal Register* announcing its decision regarding the imposition of the fee at least 60 days before starting to collect the fee amount. At that time, the Office also will publish validated cost estimates based on usage rates and actual costs documented from the present time to the time the decision to collect a fee is made.

**Comment:** Two respondents claimed that the objective of automation necessarily contemplated a free search system to give meaning to the constructive notice provisions of the Trademark Act.

**Response:** Registration of a trademark constitutes constructive notice and records of all active trademark registrations and pending applications are available for searching free of charge in the paper file and on TRAM (Trademark Reporting and Monitoring System) data base.

**Comment:** One respondent claimed that PTO is required to provide access to disclosed patent information as the information is made public; four respondents were opposed to the Office charging fees for accessing the automated search systems; two other respondents commented that the Office should not charge fees for using systems designed to be the sole searching source of the public records which the Office is charged by law to provide; and one respondent commented that the proposal to limit access to the automated data bases only to those who can pay a fee is deplorable policy at a time when there is concern about industrial competitiveness with Japan.

**Response:** The Office will continue to make the paper and/or microfilm collections of U.S. patents, foreign patent documents and U.S. trademark registrations available for public access free of charge. The Office also has adopted a policy whereby the hourly terminal session fee for access to the data base can be waived when it is needed for a personal, educational purpose

by an individual or member of an educational or non-profit organization, or where payment of the fee would pose a genuine financial hardship to the user. In this way, the Office will continue to provide public access to all available information free of charge.

**Comment:** One respondent commented that user fees for electronic data is a form of dual taxation when information was gathered, organized and produced at taxpayers expense; and two respondents claimed that users of information have contributed up to 30 percent of the \$120 million for development of the APS system to date — in other words, the public already has paid for APS.

**Response:** In calculating the proposed fees, the Office is consistent with the Office of Management and Budget's proposed policy on user charges for Government information products, as clarified in the June 15, 1989 *Federal Register* notice entitled "Second Advance Notice of Further Policy Development on Dissemination of Information." In that notice, OMB's stated policy is that user charges for Government Information products should be no higher than a level sufficient to recover the costs of disseminating, not collecting, the information.

The costs associated with the fees for accessing APS-Text and T-Search are directly related to the public's use of the systems; for example, the costs associated with the acquisition of the APS-Text terminals that are being used by the public. No costs associated with designing or installing the automated system for use by Office examiners, or the development of the new systems have been included. Neither have costs been included for gathering, organizing or producing information.

The *Federal Register* notice of June 15, 1989 (54 FR 25554, 25558) dealing with policy development on dissemination of information states that: "As to double taxation, OMB notes that user charges policy has a basis in statute (31 U.S.C. 9701), and the Congress has not viewed user charges as double taxation because they are applied when the recipient receives special benefits."

**Comment:** Two respondents stated that Government information is the same, whether it is provided in printed or electronic form.

**Response:** Charging fees for access to the automated search systems is consistent with PTO's fee policy. For example, fees are charged for manual search services (e.g., for a search of Office records or for a search of assignment records), and for printed copies of patents and trademarks and for copies of Office documents.

**Comment:** The Japanese system is available at four locations at no cost, and includes U.S. information made available at U.S. taxpayer expense.

**Response:** The Japanese automated search system, like the automated search systems in the PTO's search facilities, is being made available free of charge at the present time. The costs of such use, however, are being paid from general fee revenues collected by the Japanese Patent Office. Additionally, the APS-Text system currently includes Japanese English language abstracts and the Office is in the process of acquiring Japanese patent information in digital facsimile form.

**Comment:** One respondent commented that PTO has no responsibility to provide an expensive, complex, internal Government on-line value-added computer service, that this is far beyond the requirements of public access to patent files; and another respondent commented that it is in the public interest to have the same system that is being used by the examiners also available to the public.

**Response:** The Office agrees that it is in the public interest to provide the same search system capability to the public that is being used by the examiners.

**Comment:** One respondent stated that providing free access is not competing with the private sector, and that there always is a place for the private sector to provide value-added information.

**Response:** The user charges adopted for public access to the APS-Text and T-Search systems are consistent with OMB Circulars A-25 "User Charges" and A-130 "Management of Federal Information Resources", and with the PTO's Electronic Data Dissemination Policies and Guidelines. The PTO's user's fees are designed to recover the marginal costs associated with providing access to the automated search systems to the public.

**Comment:** Five respondents stated that the proposed fees are not "reasonable" and the Office does not have documented

cost estimates and usage rates to support the proposed fee amounts.

**Response:** The Office is meeting Congressional direction to establish "reasonable" fees by recovering only the marginal costs associated with providing public access to the automated search systems. Costs and projected usage rates were determined from the best available records, for example, financial statements for the Office and the results of the public evaluations of the APS-Text and T-Search systems. A summary of the costs used in the fee calculations is included above under "Cost Calculations." Full details of these cost calculations are available for public inspection at the Patent and Trademark Office in Suite 904 of Building 2, Crystal Park, at 2121 Crystal Drive, Arlington, Virginia.

**Comment:** Two respondents questioned the proposed fees for search assistance. If the search assistance is similar to that which is provided free now, there should be no fee. If the search assistance entails doing searches, the Office should not be getting into that business.

**Response:** The PTO is withdrawing the proposed fee for staff search assistance to conduct a search using T-Search capabilities. The fee for staff search assistance to conduct a search using APS-Text capabilities is being adopted, because an untrained user cannot conduct a search without significant help from Office staff. Users of course, have the option of obtaining free training on the system.

**Comment:** One respondent commented that user fees cannot be justified under the theory that electronic search provides a new service or offers an enhancement to the public's ability to search the patent data base, and that the public has an option of paying the fee or using the paper files. Another respondent commented that APS-Text and T-Search represent enhancements to services already provided.

**Response:** The fees are specifically authorized under § 104 (c) of Pub. L. 100-703 and are calculated to allow recovery of only the marginal cost for providing the system to the public.

**Comment:** Two respondents claimed that the Office should ask Congress for funding to offer free access here and at the PDLs.

**Response:** It continues to be PTO policy, consistent with OMB Circular A-130, that costs for access to the automated search systems be borne by those who actually use the automated search systems.

**Comment:** One respondent claimed that the accuracy of the trademark data base is suspect.

**Response:** All of the backfile data base elements (registrations issued prior to September 9, 1980) have been corrected except owner information. As originally planned, the owner field will be cleaned up the active registrations issued prior to September 9, 1980. It is projected that this owner field will be cleaned up by the third quarter of fiscal year 1991.

**Comment:** Three respondents claimed that the public requires access to the dead data base.

**Response:** The Office will consider this proposal further. The dead data base is now available in electronic format for all applications and registrations that were active on January 1, 1983 and are now inactive. However, many of these records are of poor quality. Costs for cleaning up these records would be significant, and those costs would likely be reflected in the T-Search user fee.

**Comment:** Four respondents addressed the fee waiver policy. The proposal to waive fee appears inconsistent with PTO's position that the free paper search files provide an equal and viable resource to anyone not wanting to pay for the automated files. If paper records are inferior, then anyone seeking access to T-Search should be able to qualify for the fee waiver. If the paper records are adequate, then there should be no need to waive the access fee for anyone.

**Response:** The waiver policy authorized by Pub. L. 100-703 is designed for those individuals who, for some reason in the public interest, such as an educational purpose, need the capabilities of the automated system, for example, to manipulate the data.

**Comment:** One respondent commented that the procedure to enroll people in training classes by the use of a lottery was unfair and that everyone who wants to be trained should be enrolled.

**Response:** The lottery was a method for establishing the initial schedules to provide training. Everyone who requests



training will be trained. As of August 31, 1989, 449 out of 623 people requesting training on APS-Text, and 247 out of 376 people requesting training on T-Search have been trained.

*Comment:* One respondent commented that advance registration is an unrealistic approach for many searchers.

*Response:* At least one terminal in the Patent Search Room and one in the Trademark Search Library will be available for walk-up users. The other terminals will be available first for users with a reservation and then, if needed, for walk-up users. The system is designed to ensure equity of public access to the automated systems.

*Comment:* Two respondents asked for information justifying that this is not a "Major Rule" as defined by Executive Order 12291, and that the rule will not have a significant adverse impact on small entities.

*Response:* The no "major rule" determination and no significant adverse impact on small entities was based on the fact that the automated systems are being offered only at the Patent and Trademark Office's public search facilities located in Arlington, Virginia. The total number of users of these facilities averages less than 400 a day, and many of these users are members of law firms or commercial search services. The annual effect on the economy is expected to be about \$1 million, far less than the \$100 million annual threshold specified in the Executive Order. The fees for accessing the automated search systems are reasonable and should not burden small entities and, at the same time, the Office is continuing to maintain the paper search files which are available to the public free of charge. Finally, there should be no significant adverse effects on competition, because the systems are being offered only at one location, the Patent and Trademark Office in Arlington, Virginia, and the public may continue to use paper files without payment of any fee.

*Comment:* Five respondents commented that user fees burden small entities and run counter to a fundamental objective of the patent system which is to advance technology through dissemination of the technical information contained in patents.

*Response:* The Office does not believe that the fee amounts adopted will burden small entities or negatively impact the dissemination of technical information. The Office also will continue to maintain the paper search files using taxpayer funds, and provide access to the public free of charge. Further, the Office has adopted a fee waiver policy whereby the fee amount can be waived where access to the data base is needed for a personal, educational purpose by an individual or member of an educational or non-profit organization, or where payment of the fee would pose a genuine financial hardship to the user. Full details are included above under "Background".

*Comment:* One respondent commented that the Office needs a policy to ensure that no user of the patent and trademark information is disenfranchised due to an inability to pay for the services necessary to its access.

*Response:* The Commissioner will consider a fee waiver for users with a genuine financial hardship.

#### Other Considerations:

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501, et seq. There are no information collection requirements relating to patent and trademark fee rules.

The Office has determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The rules make the Office's on-line, automated patent full-text search and trademark search systems available to the public at rates significantly less than commercial systems.

The Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers, individual

industries, Federal, State or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

#### List of Subjects in 37 CFR Parts 1 and 2

##### 37 CFR Part 1

Administrative practice and procedure, Courts, Inventions and patents, Lawyers, Reporting and record keeping requirements, Small businesses.

##### 37 CFR Part 2

Administrative practice and procedure, Courts, Lawyers, Trademarks.

For the reasons set forth in the preamble, the Office is proposing to amend Title 37 of the code of Federal Regulations, Chapter 1, as set forth below.

#### PART 1-RULES OF PRACTICE IN PATENT CASES.

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.21 is amended by adding new paragraphs (o)-(q).

##### § 1.21 Miscellaneous fees and charges.

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(o) Marginal cost, paid in advance, for each hour of terminal session time, including print time, using Automated Patent System full-text search capabilities, prorated for the actual time used. The Commissioner may waive the payment by an individual for access to the Automated Patent System full-text search capability (APS-Text) upon a showing of need or hardship, and if such waiver is in the public interest.....\$40.00

(p) Marginal cost, paid advance, for each hour of Office staff search assistance to conduct a search using Automated Patent System full-text search capabilities (APS-Text), prorated for the actual time used..... \$25.00

(q) Marginal cost, for each printed page generated from the Automated Patent System text terminal..... \$0.10

#### PART 2-RULES OF PRACTICE IN TRADEMARK CASES

1. The authority citation for Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

2. Section 2.6 is amended by adding new paragraphs (w)-(x).

##### § 2.6 Trademark fees

\*\*\*\*\*

(w) Marginal cost, paid in advance, for each hour of terminal session time, including print time, using T-Search capabilities, prorated for the actual time used. The Commissioner may waive the payment by an individual for access to T-Search upon a showing of need or hardship, and if such waiver is in the public interest..... \$40.00

(x) Marginal cost, for each printed page generated from the T-Search terminal..... \$0.10

Dec. 4, 1989

JEFFREY M. SAMUELS  
Acting Commissioner of Patents  
and Trademarks

[1110 TMOG 601]

#### (177) DEPARTMENT OF COMMERCE Patent and Trademark Office 37 CFR Part 2

##### Patent and Trademark Automated Search System Fees

Agency: Patent and Trademark Office, Commerce  
Action: Listing of suspension of final rule

*Summary:* The Patent and Trademark Office (Office), on December 11, 1989, amended the rules of practice in patent and trademark cases, Parts 1 and 2 of Title 37, Code of Federal Regulations, setting forth the fees for public access to the Office's text data bases: the Automated Patent System (APS) and the automated trademark search system (T-Search). 54 FR 50942. That final rule became effective on February 12, 1990. On that date, 37 CFR 2.6(w), dealing with T-Search fees, took effect, but was immediately suspended by the Commissioner.

The collection of the fee was initially suspended to permit users to become familiar with the T-Search system. The T-Search system has been available to the public since April 1989, a sufficient time for users to become familiar with the system. Therefore, as provided in the final rule, the Office now gives notice that the suspension is lifted. The Office will begin to collect the fees set forth in 37 CFR 2.6(w) sixty (60) days from the date of this notice. Cost estimates based on usage and actual costs are available for inspection in the Office of Long-Range Planning and Evaluation, Room 507, Crystal Park 1, Crystal Drive, Arlington, Virginia.

*Dates:* The suspension of 37 CFR 2.6(w) is lifted as of Nov. 13, 1990. The collection of fees under 37 CFR 2.6(w) will begin on November 13, 1990.

*For Further Information Contact:* Frances Michalkewicz by telephone at (703) 557-1610 or by mail to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

September 4, 1990

HARRY F. MANBECK, Jr.  
Assistant Secretary and Commissioner  
of Patents and Trademarks

[1119 TMOG 6]

#### (178) Automated Trademark System (X-Search) Training for Public Users

X-Search, an enhanced automated trademark searching system, is scheduled to become available in July 1993.

Several free training classes will be offered to the public. A four-hour class, consisting of a lecture session and hands-on instruction, will be conducted once a month from 4:00 to 8:00 p.m. This class is for users who have no experience with automated trademark searching. A two-hour class will be conducted three times a week for users who have experience with automated trademark searching techniques. These classes will be held from 5:30 to 7:30 p.m. on Tuesdays and Thursdays and from 9:00 to 11:00 a.m. on Saturdays.

Space in all sessions will be limited. A lottery-type drawing will be held to determine specific class assignments. To enter the lottery drawing, a completed application form including all information shown below may be deposited in the Trademark Search Library or submitted via mail or telefax. Applications received on or before June 25, 1993, will be included in the lottery for classes beginning in July.

Trainees who fail to appear at their scheduled class will not be reassigned until all persons scheduled on the original lottery have been accommodated. Subsequent lotteries will be offered periodically if demand requires.

Training for the new system is recommended, but not required. In addition to the formal training described above, informal demonstrations will take place during business hours in the Trademark Search Library, 2900 Crystal Drive, room 2B30. These sessions will be available for the first ten days following introduction of the X-Search system and will not require a reservation. Specific dates will be posted in the Trademark Search Library.

Patent and Trademark Office

#### Automated Trademark System (X-Search) Application Form for Training

Name \_\_\_\_\_  
First Last MI

Mailing Address \_\_\_\_\_

Phone Number: \_\_\_\_\_  
(Area Code)

Employer: \_\_\_\_\_

Prefer: Two-Hour Saturday Class Two-Hour Tuesday Class

Two-Hour Thursday Class Four-Hour Class

Applications should be deposited in the Trademark Search Library of forwarded via mail or telefax to:

Commissioner of Patents and Trademarks  
Box PUTB  
Washington, D.C. 20231  
FAX: 703/305-7786

May 17, 1993

THERESA A. BRELSFORD  
Assistant Commissioner for  
Public Services and  
Administration

[1151 TMOG 52]

#### (179) DEPARTMENT OF COMMERCE Patent and Trademark Office 37 CFR Parts 1, 2, and 10 [Docket No. 921061-2261] [RIN 0651-AA50]

##### Electronic Filing of Patent and Trademark Applications

Agency: Patent and Trademark Office Commerce  
Action: Advance Notice of Proposed Rulemaking

*Summary:* This advance notice of proposed rulemaking is to inform the public that the Patent and Trademark office (PTO) is considering amending its rules of practice: (1) to allow for electronic filing of patent applications and trademark applications; and (2) to require applications filed in paper form to follow a prescribed order and format.

The PTO anticipates that permitting electronic filing of applications will improve the accuracy of the information relied upon in the examination of patent and trademark applications, eliminate delays caused by mailing and data entry, and, as a first step toward a fully-automated processing system, ultimately provide considerable cost savings. The cost savings realized could be used to help reduce the need for future fee adjustments and/or fund improvements in the delivery of services. Requiring applications filed on paper to follow a prescribed order and format will enable the PTO to convert these applications to electronic format.

The purposes of this notice are to: (1) invite interested parties to participate in pilot programs involving electronic filing of patent and trademark applications; and (2) encourage comments on this topic, in the form of responses to the questions posed in this notice, from industry, the patent and trademark bars, and members of the public.

*Dates:* Comments should be received on or before Feb. 28, 1993.

*Addresses:* Written comments should be addressed, if sent by mail, to the attention of Edward R. Kazenske, Executive Assistant to the Commissioner and Director of Interdisciplinary Programs, c/o Commissioner of Patents and Trademarks, Washington, D.C. 20231. If delivered by hand, comments should be brought to the Office of the Executive Assistant to the Commissioner and Director of Interdisciplinary Programs, Room 906, Crystal Park 2, 2121 Crystal Drive, Arlington, Va.



For Further Information Contact: Edward R. Kazenske, Executive Assistant to the Commissioner and Director of Interdisciplinary Programs, (703) 305-8600.

# SUPPLEMENTARY INFORMATION:

## 1. Pilot Programs

Currently, the PTO accepts patent and trademark applications delivered by mail or in person. These applications are in paper form or, in the case of patent applications for nucleotide sequences, a combination of computer-readable (see 37 CFR 1.821-1.825) and paper form.

The PTO is initiating a pilot program that would permit electronic filing of patent and trademark applications, using software now under consideration by the PTO. Initially, it is anticipated that participants in the pilot program would be required to use the PTO software to create a diskette, which would then be mailed to the PTO along with the paper application generated by the diskette. The diskette would serve the limited function of eliminating the initial data entry of applications into the PTO databases.

As part of a second pilot program, a separate group of participants is being solicited to file paper applications following a prescribed order and format. The paper applications would then be scanned and converted to electronic format. Data collected from the pilot programs will be evaluated to determine whether requiring submission of a paper application in a certain order and format facilitates data entry; whether any modifications to the electronic filing software are required; and more fundamentally, whether electronic filing is a feasible, cost-effective alternative to filing in paper form.

## 2. Paper Applications

The PTO contemplates that paper applications will be required to follow the order and format of the data elements (e.g., inventor, foreign priority information, in the case of a patent application; applicant, mark, in the case of a trademark application) entered in the electronic filing system. This would enable the PTO to scan and convert paper applications to electronic applications upon receipt at the PTO. Once the paper application is converted into electronic form, processing of the application will be done in a purely electronic format. The electronic form of the application would become the official file.

## 3. Electronic Filing

The PTO contemplates that applicants filing by electronic means would be required to use an "Authoring Program" developed by the PTO, which will be available to facilitate the preparation of an electronic submission and record the submission on electronic media. This "Authoring Program" will include a validation feature so that applicants, themselves, can test whether an electronic submission complies with all requirements.

The "Authoring Program" software under consideration by the PTO will be designed to be compatible with computers capable of creating files of standard ASCII (American Standard Code for Information Interchange) text within one or more of the major operating systems environments (e.g., DOS, Windows, Unix®, and Apple Macintosh®).

The format for text in patent applications will specify a set of mandatory data elements, similar to those required under the Patent Cooperation Treaty. The format for text in trademark applications will specify a set of mandatory data elements, similar to those required of a "written application" under 15 U.S.C. 1051. In both the patent and trademark software, specific formats will be required for non-textual elements, such as drawings, formulas, tables and specimens. These non-textual elements would be submitted in separate computer files called "Presentations," similar to the presentation of nucleotide sequence information in accordance with 37 CFR 1.821-1.825.

The PTO also contemplates that certain individuals be designated by the agency as qualified "electronic application transmitters." Upon application to the PTO, unlimited parties meeting specified requirements may be issued Personal Identifi-

cation Numbers to enable them to transmit applications in electronic form on behalf of themselves or other individuals.

In an effort to facilitate public comment to the questions set forth below, the following background information is provided:

## 4. Background Specific to Electronic Patent Applications

### Signature

Under 35 U.S.C. 111, a patent application must include an oath by the applicant. 35 U.S.C. 25 permits a declaration in lieu of oath. The applicant's signed oath or declaration is not required for receipt of a filing date, but may be submitted, upon payment of a surcharge, within a prescribed period.

### Certified Copy of Foreign Patent Application

Under 35 U.S.C. 119, a U.S. patent application may be based on a foreign patent application, thus, potentially, conferring the benefit of the earlier foreign patent application's filing date. A certified copy of the foreign patent application is required to be filed in the PTO before the patent is granted.

## 5. Background Specific to Electronic Trademark Applications

### Signature

Under 15 U.S.C. 1051, a trademark application must be verified by the applicant. Prior to implementation of the Trademark Law Revision Act of 1988 (TLRA) on Nov. 16, 1989, the PTO permitted verification of the application to be provided at any time during the examination process. With implementation of the TLRA, the PTO amended its regulations with respect to the verification of an application. 37 CFR 2.21, which sets forth the minimum requirements for an application to receive a filing date, was amended to require that the application be signed by the applicant at the time of filing.

### Specimen

Under 15 U.S.C. 1051, a trademark application based on "use in commerce" must include specimens or facsimiles of the mark as used. 37 CFR 2.21(a)(5) requires at least one specimen or facsimile to be included with the "use" application in order to receive a filing date. Applications filed based upon a "bona fide" intention to use the mark in commerce, under 15 U.S.C. 1051(b), must be supplemented with specimens or facsimiles before the registration issues. In order to meet the minimum requirements for filing an amendment to allege use or statement of use, one specimen or facsimile must be submitted. 37 CFR 2.76(e)(2) and 2.88(e)(2).

### Certification or Certified Copy of Foreign Registration

Under 15 U.S.C. 1126(e), "an application [based on a foreign registration] shall be accompanied by a certification or a certified copy of the registration of the country of origin of the applicant." 37 CFR 2.21(a)(5) requires the certification or certified copy to be included with the application in order to receive a filing date.

## 6. Comments on the following Questions and Any Other Related Matters Are Solicited

### Questions Common to Patent and Trademark Applications

- What benefits do you foresee for the applicant if electronic filing is adopted? What disadvantages do you foresee?
- Should the PTO require paper applications to be filed in a specific order and format to facilitate conversion to electronic format? What advantages and disadvantages do you foresee?
- Should the electronic file become the official agency file?
- Should electronic filing be expanded to encompass amendments and other submissions to the PTO?
- Should paper or electronic application filings receive a filing date only if they meet order and format requirements, or should compliance be subject to a surcharge?

- Should the PTO accept electronic filing by diskette, on-line, or both?
- Should applications filed in paper form be converted to electronic form by the PTO? Should the PTO charge a fee for this service?
- If paper applications are converted to electronic form by the PTO, should the PTO destroy or retain the paper applications?
- Should fees be processed electronically?
- Should the PTO create a registry of "electronic application transmitters" capable of transmitting patent and trademark applications for others? If so, what, if any, criteria should be established before one could be "registered" as an "electronic application transmitter?"

### Questions Related Solely to Patent Issues

- Should the PTO require the oath or declaration to an electronically filed patent application be filed on paper to authenticate that applicants believe themselves to be original and first inventors of the subject matter of the electronically filed application? If not, how should the filing of the oath or declaration be accomplished?
- How should the filing of certified copies of foreign patent applications be accomplished for an electronically filed patent application?

### Questions Related Solely to Trademark Issues

- Should the PTO require electronically filed applications to include a scanned, signed declaration in order to receive a filing date? Should the PTO accept declarations in electronic form with some type of electronic signature? If not, should 37 CFR 2.21 be amended to permit unverified applications to be accorded a filing date? If so, within what time period must an unverified application be ratified by the submission of a signed declaration? How long should the PTO retain the signed declaration after it has been scanned and merged into the electronic file?
- Should "use" applications submitted without a specimen be given a filing date? If so, within what time period after filing must the specimens be submitted? Should the number of required specimens be reduced? How long should the PTO keep the specimens after they are scanned and merged into the electronic file?
- Should Section 44(e) of the Trademark Act (15 U.S.C. 1126(e)) be amended to permit applicants to submit a facsimile of the certification or certified copy of the foreign registration? Alternatively, should the statute be amended to permit Section 44(e) applicants to obtain a filing date absent a certification or certified copy of the foreign registration? If so, within what time period must a Section 44(e) application be supplemented with a certificate or certified copy of the foreign registration? How long should the PTO retain the certification or certified copy after it has been scanned and merged into the electronic application?

## 7. Candidates for the Pilot Programs

Any person interested in participating in one of the pilot programs identified above is requested to contact Edward R. Kazenske, Executive Assistant to the Commissioner and Director of Interdisciplinary Programs, c/o Commissioner of Patents and Trademarks, Washington, D.C. 20231. If delivered by hand, written statements of interest should be brought to Suite 906, Crystal Park 2, 2121 Crystal Drive, Arlington, Va. 22202. Telephone: (703) 305-8600. Please indicate which pilot program you wish to participate in and please be certain to include a telephone number where you may be reached.

Nov. 23, 1992

DOUGLAS B. COMER  
Acting Assistant Secretary  
and Acting Commissioner  
of Patents and Trademarks

[1145 TMOG 9]

## (180) United States Postal Service Interruption and Emergency in the State of California

A service interruption in United States Postal Service (USPS) in the State of California occurred on June 29, 1995, due to the action of the UNABOM bomber. The USPS will maintain heightened security procedures for mail originating in the State of California. These procedures will be in effect until further notice and are as follows:

Mail destined for California is not affected by these procedures.

For Express Mail, Priority Mail, First-Class Mail, international air mail and military mail items weighing less than 12 ounces, normal collection, distribution, and transportation will remain in effect.

Mail weighing 12 ounces or more which has been placed into California collection boxes will be returned to the sender. Postal Service window clerks will not accept Express Mail, Priority Mail, First-Class Mail, international air mail or military mail weighing 12 ounces or more.

Postal Service marketing and sales managers will work with known shippers to accept mail pieces weighing 12 ounces or more, but this mail will not be transported on scheduled passenger airlines.

Parcel post and international surface mail originating in California are not affected by these procedures.

The Patent and Trademark Office (PTO) is designating the interruption in the service of the USPS in the State of California caused by the UNABOM bomber as a postal service interruption and an emergency within the meaning of 35 U.S.C. 21(a). Any request to accept a paper or fee delayed by this emergency should be directed to Jeffrey V. Nase, Patent Legal Administrator, (703) 305-9285, PK1-520, for patent-related matters, and to Lynne G. Beresford, Trademark Legal Administrator, (703) 308-8900, 10B10 ST, for trademark-related matters.

June 30, 1995

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

[1176 TMOG 74]

## TRADEMARK PUBLICATIONS

## (181) Separation of the Patent and Trademark Sections of the Official Gazette

Effective February 2, 1971, the *Official Gazette* will be separated into two parts to be known as the *Patent Official Gazette* and the *Trademark Official Gazette*.

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Orders for subscriptions should be addressed to Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Also effective February 2, 1971, the *Official Gazette* will no longer contain "Decisions in Patent and Trademark Cases." Decisions of the type heretofore found in the "Decisions in Patent and Trademark Cases" are published by non-Federal organizations such as, for example, the Bureau of National Affairs, Inc., 1231 25th St. NW., Washington, D.C. 20037, and West Publishing Co., 50 Kellogg Blvd., St. Paul, Minn. 55102.

Finally, the "Decisions Leaflet" of the *Official Gazette* will no longer be supplied as a separate subscription item after January 26, 1971. According to present plans, however, both the *Patent Official Gazette* and the *Trademark Official Gazette* will have identical "Patent Office Notices" sections containing



notices of the various types heretofore published in the Gazette decision leaflet and Trademark Section. Those notices of particular interest to Patent Office employees will be accumulated and published approximately every fourth week, and distributed separately to employees.

Dec. 29, 1970

WILLIAM E. SCHUYLER, JR.  
Commissioner of Patents

[882 O.G. TM 33]

(182) **Changes in Format for Publishing Trademarks for Opposition**

Because of the adoption of the International classification of goods and services by the United States as of September 1, 1973 (see *Official Gazette* of June 26, 1973, 911 O.G. TM 210), it is necessary to change the arrangement in the *Official Gazette* of the marks published for opposition.

Beginning with the issue of May 7, 1974, the section of the *Official Gazette* entitled "Marks Published for Opposition" will be divided into four sections instead of the present two sections. (For the preceding change from one to two sections, see *Official Gazette* of October 13, 1964, 807 O.G. TM 51.) Sections 1 and 2 will be according to international classification and will contain marks in applications filed on or after September 1, 1973, and Sections 3 and 4 will be according to prior United States classification and will contain marks in applications filed on or before August 31, 1973.

In Section 1, all marks presented in combined applications filed on or after September 1, 1973 for registration in more than one international class will be published with only one reproduction of each mark. The reproduction of the mark will be followed by the international class numbers, and under each class will appear the goods or services in connection with which the mark is used. If the date of first use applies to all classes, it will appear following the last class; otherwise, the dates of use will appear after each class.

In Section 2, all marks presented in applications filed on or after September 1, 1973 for registration in a single class will be published in international class order.

In Section 3, all marks presented in combined applications filed on or before August 31, 1973 for registration in more than one prior United States class will be published with only one reproduction of each mark. The reproduction of the mark will be followed by the prior United States class numbers and titles, and under each class will appear the goods or services in connection with which the mark is used. If the date of first use applies to all classes, it will appear following the last class; otherwise, the dates of use will appear after each class.

In section 4, all marks presented in applications filed on or before August 31, 1973 for registration in a single class will be published in the prior United States class order.

The following explanation will appear under the heading "Marks Published for Opposition":

The following marks are published in compliance with section 12(a) of the Trademark Act of 1946. Applications for the registration of marks in more than one class have been filed as provided in section 30 of said act as amended by Public Law 772, 87th Congress, approved Oct. 9, 1962, 76 Stat. 769. Opposition under Section 13 may be filed within thirty days of the date of this publication. See Rules 2.101 to 2.105.

A separate fee of twenty-five dollars for opposing each mark in each class must accompany the opposition.

Sections 1 through 4 will appear immediately after the above explanation, the sections being designated as follows:

- Section 1. International classification-Application in more than one class
- Section 2. International classification-Application in one class
- Section 3. Prior United States classification-Application in more than one class
- Section 4. Prior United States classification-Application in one class

The same procedure of dividing into four sections will be followed in the notice of the issuance of registrations on the Supplemental Register.

Mar. 22, 1974

RENE D. TEGTMEYER  
Assistant Commissioner  
for Trademarks

[921 O.G. TM 122]

(183) **Change in Official Gazette Entry to Show Cancellation of Fewer Than All Classes in a Multiple Class Registration**

Effective with the *Official Gazette* issue of December 16, 1980, there will be a change in the *Official Gazette* listing entitled "Trademark Registrations Cancelled." Beginning with that issue, "Trademark Registrations Cancelled" will list:

- (1) single class registrations cancelled;
- (2) multiple class registrations cancelled in all classes;
- (3) multiple class registrations cancelled in fewer than all classes.

For every entry in the listing, the specific classes cancelled will be included in parentheses, next to the registration number and mark.

For a single class registration and for a multiple class registration in which every class has been cancelled, the class number(s) shown in parentheses will represent every class to which the registration applied.

For a multiple class registration in which fewer than all classes have been cancelled, the *Official Gazette* entry will include the word "only" following the notation of classes in parentheses, for example: (Int. Cls. 12 and 20, only). In this example, the addition of the word "only" would indicate that there are classes in the registration in addition to Classes 12 and 20, but only Classes 12 and 20 have been cancelled.

Oct. 29, 1980.

MARGARET M. LAURENCE  
Assistant Commissioner  
for Trademarks

[1000 TM 21]

(184) **Single Copies of the Trademark Official Gazette**

Members of the public ordering single copies of the Trademark Official Gazette from the Superintendent of Documents are reminded they must specify the date of the issue being ordered.

The date of the issue in which a mark will be published for opposition is shown on The Notice of Publication form mailed to applicants approximately two weeks before the publication date. This date must be included on each single copy order.

Orders received without an issue date may be filled from current weekly stock. The Superintendent of Documents cannot check on whether a particular mark is published in the issue then in stock. If the stock is exhausted at the time the order is received, the order will be returned unfilled.

Mar. 3, 1981

MARGARET M. LAURENCE  
Assistant Commissioner  
for Trademarks

[1004 TMOG 36]

(185) **Inadvertently Issued Registration Numbers**

Effective Jan. 3, 1984, a new sub-section identified as "Inadvertently Issued Registration Numbers" will exist as the last category of cancellations listed under the "Trademark Registrations Cancelled" section of the *Official Gazette*.

This new sub-section will provide public notice of the cancellation of registration numbers which have been inadvertently issued by the Patent and Trademark Office.

Nov. 15, 1983

MARGARET M. LAURENCE  
Assistant Commissioner  
for Trademarks

[1037 TMOG 16]

(186) **Ordering the TMEP (2nd Edition)**

The U.S. Government Printing Office (GPO) is accepting orders for the *Trademark Manual of Examining Procedure* (TMEP), 2nd edition. The second edition replaces the first edition (revision 7) and incorporates all changes in policy and procedure through March 1993.

New orders should be sent to:

Superintendent of Documents  
United States Government Printing Office  
P.O. Box 371954  
Pittsburgh, Pa. 15250-7954

Stock Number - 903-010-00000-2  
Price - \$19.00

Orders may also be placed by phone using MASTER-CARD® or VISA® by calling (202) 783-3238.

If there are any problems with an order, please call the Customer Adjustment Department of the GPO at (202) 512-2457.

July 9, 1993

ROBERT M. ANDERSON  
Acting Assistant Commissioner  
for Trademarks

[1153 TMOG 13]

(187) **Notice to Subscribers**

The Patent and Trademark Office announces a change in the point of contact for subscribers who have not been receiving all of their copies of the *Official Gazette*, *Manual of Patent Examining Procedures*, *Revisions*, *Annual Indices*, or other patent and trademark publications. All correspondence and inquiries concerning subscription services including requests for reinstatement or renewal of subscriptions should be directed to:

Mr. Michael F. DiMario  
Assistant Public Printer  
Superintendent of Documents (SD)  
U.S. Government Printing Office  
Washington, D.C. 20401

Furthermore, the Superintendent of Documents advises that expiration notices are sent out approximately three months before the expiration date. However, subscribers should not rely on this schedule. If a notice is not received within two months of the expiration date, the subscriber should renew the subscription with the Superintendent of Documents. Attach a label from the envelope in which the publication is received, together with a check covering the amount of the subscription. If a deposit account with the Superintendent of Documents is to be used, include the deposit account number with the renewal.

This notice is effective with the publication date and supersedes the notice published on this subject in 969 O.G. 2, dated Mar. 14, 1978.

Aug. 3, 1984

THERESA A. BRELSFORD  
Assistant Commissioner  
for Administration

[1045 TMOG 24]

(188) **Printing of Use in Another Form Claims**

Effective immediately, all claims of prior use of the subject mark in another form contained in applications for Trademark registrations will be printed in the *Official Gazette* and on the registration certificates according to the following formats:

- First used in another form on
- First used in commerce in another form on

July 15, 1986

MARGARET M. LAURENCE  
Assistant Commissioner  
for Trademarks

[1069 TMOG 4]

**TRADEMARK MISCELLANEOUS**(189) **Recording of Documents Affecting Title**

The Patent Office is liberalizing its policy concerning the recording of documents, other than assignments, which affect title to trademark registrations and applications. Under Rule 2.185 of the Trademark Rules of Practice, instruments affecting title to a trademark registration or application, and licenses of trademarks which are the subject of trademark registrations or applications, will be recorded even though the recording thereof may not serve as constructive notice under Section 10 of the Trademark Act of 1946, as amended (15 U.S.C. 1060).

June 16, 1971

WILLIAM E. SCHUYLER, JR.  
Commissioner of Patents

Published in 36 F.R. 13231; July 16, 1971

[889 O.G. TM 2]

(190) **International Protection of Government Emblems and Seals****Change of Intent**

The Patent and Trademark Office, Department of Commerce, intends to forward only the 50 State seals plus one department seal for each department listed in the publication "Seals and Other Devices in Use at the Government Printing Office" ("Seals") instead of the entire publication, as indicated on page 59366 of the Federal Register of Dec. 23, 1975.

Since the publication had been printed in 1975, it was assumed that few deletions and additions would be necessary. However, the response to the above notice, along with some necessary deletions, resulted in a large number of seals in the publication requiring deletion. This rendered the publication unacceptable for submission to the World Intellectual Property Organization (WIPO).

Therefore, the Patent and Trademark Office now intends to forward only the 50 State seals along with the departmental seal denoted "No. 1" for each department listed in the "Seals" publication. If this is not the preferred departmental or State seal, the department or State involved is requested to notify the Patent and Trademark Office by Sept. 21, 1976. This notification should either specify the number of the preferred seal, as it appears in the "Seals" publication, or provide a clear, black and white photograph, suitable for reproduction, of the



preferred seal. The seal must be no larger than 1 1/2 inches in diameter.

These seals will then be forwarded to WIPO for protection under Article 6 of the Paris Convention for the Protection of Industrial Property.

Address all correspondence to: Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Aug. 18, 1976

C. MARSHALL DANN  
Commissioner of Patents  
and Trademarks

Published in 41 F.R. 35741

[950 O.G. TM 114]

(191) **Recording of "Territorial Assignments"  
in the Assignment Division of the Patent  
and Trademark Office**

It has been the practice of the Assignment Division for many years to refuse to record "territorial assignments," that is, assignments purporting to transfer rights in a trademark registration (not a concurrent use registration) for less than the entire United States. Hereinafter, such documents will be recorded as long as the requirements of the Rules of Practice are met by the documents submitted.

The Office is not addressing the validity or effect of such documents by recording same, but is merely recognizing that such transfers may affect title to a registered mark and therefore ought to be recorded. At the time a Section 8 affidavit or declaration or an application for renewal is filed, the Examiner of Trademarks will consider the effect of such a document.

Oct. 7, 1977

BERNARD A. MEANY  
Assistant Commissioner  
for Trademarks

[964 TMOG 8]

(192) **Helpful Hints**

**Assignment Cover Sheets**

The Office developed PTO Form 1594, Recordation Form Cover Sheet (Trademarks), and PTO Form 1595, Recordation Form Cover Sheet (Patents), to facilitate submitting data required to record an assignment. The first versions of these forms have been available since Sept. 1992, and most assignments are now received with them. Both forms and their instructions will be updated later this year to remove ambiguities and incorporate suggestions received from customers. Until the revisions are completed, the Office will continue to work with practitioners to improve the utility of the current forms.

A practitioner recently noted that the current cover sheets for both patent and trademark assignments are not clear as to the proper entry of different execution dates (Item 3) when there are multiple assignors shown (Item 1). Pending redesign of the forms, the Office suggests when there are multiple assignors named in Item 1, number each assignor, and in Item 3, preface each execution date with the corresponding number. If all assignor information cannot be entered in the space provided for Item 1, enter "See Attached List" and proceed in the same manner. This will enable Assignment Branch staff to associate the correct date with the appropriate assignor.

Another practitioner called to our attention the fact that although the forms indicate "Total number of pages comprising cover sheet" (Item 9), Assignment Branch staff frequently cross out that entry and replace it with the total number of pages submitted, both in cover sheets and the assignment instrument itself. Soon after the forms were printed, Assignment Branch staff found they were better able to verify document integrity by using the total number of pages per submission. This number is then used as a cross-check as the assignment moves through

the recordation process, receives reel and frame numbers, is microfilmed, and returned to the customer. Pending revisions to the forms, the preferred procedure is to indicate the total number of pages submitted, both in cover sheets and the attached assignment.

Additional comments or suggestions for improving either or both assignment cover sheets should be directed to Audrey Britt, Chief, Assignment Branch, at (703) 308-9706.

Mar. 8, 1993

THERESA A. BRELSFORD  
Assistant Commissioner for  
Public Services and  
Administration

[1148 TMOG 304]

(193) **Indexing Against a Recorded Assignment**

It has been the practice of the Patent and Trademark Office (PTO) to process requests for indexing against a recorded document by adding the newly requested property to the data base record for the previously recorded document, except if the previously recorded document was an assignment. The PTO only required a transmittal letter with the recording fee and not a copy of the previously recorded document to process the indexing request. While indexing the additional properties resulted in the assignment data base being updated, the indexing request itself was never microfilmed to become part of the official record.

Effective immediately, the PTO will no longer process such indexing requests. Such indexing requests do not comply with 37 CFR 3.11, 3.28, and 3.31 which require that each request for recordation include the document to be recorded and a cover sheet. Instead of filing an indexing request, a party should submit a cover sheet in conformance with 37 CFR 3.31, a true copy of the document, and the recording fee. PTO will assign a new recording date to that submission, update the assignment data base, and microfilm the cover sheet and document to become part of the official record.

Nov. 3, 1993

THERESA A. BRELSFORD  
Assistant Commissioner for  
Public Services and  
Administration

[1157 TMOG 12]

(194) **Flexible Working Hours**

On Jan. 4, 1979 the Patent and Trademark Office is beginning a 15 month experiment with flexible working hours for its employees. Under the "flexitime" experiment many of the Office's employees will have flexibility to begin their workdays as early as 6:30 a.m. or as late as 9:30 a.m., and end their workdays between 3:00 p.m. and 6:30 p.m. Employees in every case shall of course work eight hours each day. All or most patent and trademark examiners will have flexible hours.

The public hours of the Patent and Trademark Office will continue to be 8:30 a.m. to 5:00 p.m. All units of the Office which deal directly with the public will be staffed to answer telephone calls and receive visitors during those hours. All employees will be on duty from 9:30 a.m. to 3:00 p.m. The patent public search room will continue to operate from 8:00 a.m. until 8:00 p.m. and the trademark search room from 8:00 a.m. until 5:30 p.m.

With the advent of flexible hours, it will be advisable for members of the public to make appointments in advance when they wish to interview examiners.

Dec. 13, 1978

DONALD W. BANNER  
Commissioner of Patents  
and Trademarks

[978 TMOG 141]

As with most government agencies, the Patent and Trademark Office disposes of old files, papers and records pursuant to a specific schedule. In an effort to clarify any questions concerning the procedures for disposing of Trademark records and in response to public inquiries, the present Retention Schedule for Trademark Records and other records including trademark matters which may be of interest to the public is set forth as follows:

**International Intellectual Property Activities Case Files.** Project case files showing Patent and Trademark Office activity relating to problems concerning the protection of intellectual property throughout the world. Includes correspondence with private individuals, the Department of State and other countries; reports, records of international meetings concerning patents; trademarks and other matters pertaining to the protection of intellectual property throughout the world; and other materials relating to international affairs.

**Proposed Intellectual Property Legislation Files.** Documents accumulated in the preparation and processing of legislation proposed by or in the interests of the Patent and Trademark Office. Includes drafts of legislation, reports to committees on introduced legislation, and comments on legislative proposals.

**Trademark Adversary Proceedings Files.** Consists of Trademark Opposition, Cancellation, Interference, and Concurrent-Use proceedings files.

**Canceled Trademark Registration Files.** Consists of original application and all related correspondence.

**Expired Trademark Registration Files.** Consists of original application and all related correspondence.

**Abandoned Trademark Application Files.** Consists of original application and all related correspondence.

**Trademark Renewal Index.** Index to trademark registration that are renewed.

**Indexes to Trademark Applications.** Index shows applicant's name, serial number of application, filing date, name of mark description of goods, attorney's name, and final disposition of the application.

A. Applicant's Index.

B. Serial Index.

**Proceedings Index to Trademark Adversary Proceedings.** Index arranged by type of proceeding. Shows status of proceeding prior to and immediately after a decision by the Board.

**Trademark Adversary Proceeding Records.** Card file showing records of Trademark Adversary Proceedings.

**Trademarks Published in Official Gazette.** Clippings of marks from Official Gazette.

a. Those which have been opposed.

b. All others.

**Trademark Registrant's Index.** Index to Trademark registrant's name, includes serial and registration numbers, date of registration, line of goods and other related information.

**Class of Goods Index.** Card index used to indicate into what class any conceivable goods may fall.

**Index to Trademark Trial and Appeal Board Cases.** Record of trademark trial and appeal board cases.

**Public Advisory Committee for Trademark Affairs Files.**

a. Agenda, minutes, correspondence, reports and related supporting files.

b. Paper and reference materials.

PERMANENT. Transfer to FRC 5 years after close of case. Offer to National Archives when 25 years old.

PERMANENT. Transfer to FRC after 5 years. Offer to National Archives when 25 years old.

The past schedule to destroy after 10 years is in the process of being changed. At this time, these records are not being disposed of pending the new amendment to this section.

Destroy 2 years after the date of cancellation.

Destroy 2 years after expiration of registration.

Destroy 2 years after date of abandonment.

PERMANENT. Offer to National Archives when no longer needed for reference.

PERMANENT. Offer to National Archives when no longer needed for reference.

PERMANENT. Offer to National Archives when no longer needed for reference.

Destroy 3 years after termination of the proceeding.

PERMANENT. Offer to National Archives when no longer needed for reference.

Retain in agency until no longer needed for reference.

Destroy when mark is registered.

PERMANENT. Offer to National Archives when no longer needed for reference.

Destroy after information transferred to magnetic media.

PERMANENT. Offer to National Archives when no longer needed for reference.

PERMANENT. Transfer to Federal Records when 10 years old. Offer to National Archives when 25 years old.

Destroy when 10 years old or no longer needed for reference, whichever is sooner.



**Seminar in Trademark Practice and Procedure Files.** Record set of training materials used in training trademark examiners.

**Trademark Petitions Files.** Petitions to the Commissioner relating to trademarks with related materials.

- a. Original Petitions in trademark case file.
- b. Other copies.

**Trademark Protest Letters.** Letters of protest to the Commissioner related to trademarks.

**International Patent and Trademark Activities Case Files.** Project case files showing Patent and Trademark Office activity relating to international patent and trademark programs.

- a. Records that supplement the International Property Activities Case Files (Item 103).
- b. Other materials.

**International Intellectual Property Activities Case Files.** Project case files showing Patent and Trademark Office activity relating to problems concerning the protection of intellectual property throughout the world. Includes correspondence with private individuals, the Department of State and other countries; reports; records of international meetings concerning patents, trademarks and other matters pertaining to the protection of intellectual property throughout the world; and other materials relating to international affairs.

**Proposed Intellectual Property Legislation Files.** Documents accumulated in the preparation and processing of legislation proposed by or in the interest of the Patent and Trademark Office. Includes drafts or legislation, reports to committees on introduced legislation, and comments on legislative proposals.

**Bulky Trademark Specimens.** Trademark applications specimens which do not strictly meet the basic requirements for physical form of specimens which state:

1. That they be made of material suitable for being placed inside a manila file wrapper.
2. That they be capable of being arranged flat, such as being folded.
3. That they be of a size not to exceed 8 1/2 inches wide by 13 inches long. (Rule 2.56).

These requirements provide for specimens which will fit inside the application file wrapper, which is 9 x 14 inches in size and which will conveniently expand to about one inch thickness.

Specimens which do not meet the above requirements are referred to as "bulky" specimens and the Examiner must require that they be replaced by specimens of acceptable size and shape.

February 28, 1979

[980 TMOG 16]

#### (196) Proposed Records Control Schedule

As with most government agencies, the Patent and Trademark Office periodically updates the schedule it uses to dispose of old files, papers and records. Set forth below is a recent update of the Patent and Trademark Office's Records Control Schedule. The schedule is currently being reviewed by the National Archives and Records Administration and, following its approval, will constitute the basis for disposing of Patent and Trademark Office records.

Any comments or questions related to the proposed schedule should be directed to John Hassett, (703) 557-0183. Written comments should be mailed to:

John Hassett, Director

Patent and Trademark Office  
Crystal Plz. 1, Lobby  
Washington, D.C. 20231

June 17, 1986

SAUL LEFKOWITZ  
Acting Assistant Commissioner  
for Trademarks

THERESA A. BRELSFORD  
Assistant Commissioner  
for Administration

#### Commissioner's and Deputy Commissioner's Records

1. **Commissioner's Correspondence and Subject Files.** Correspondence to and from other public officials, members of the public, and the Patent and Trademark Office staff; reports; special investigations and survey reports; and related materials. (See index under Item 3).

PERMANENT. Transfer to Federal Records Center when 10 years old. Offer to National Archives when 25 years old.

Dispose of with related case file.

Destroy when 2 years old.

Destroy when no longer needed or when three years old, whichever is earlier.

PERMANENT. Transfer to office responsible for international affairs after case is closed.

Destroy 5 years after close of case or sooner if no longer needed.

PERMANENT. Transfer to FRC 5 years after close of case. Offer to National Archives when 25 years old.

PERMANENT. Transfer to FRC after 5 years. Offer to National Archives when 25 years old.

Destroy 30 days after applicant is notified that the specimens are unacceptable, unless picked up sooner by the applicant.

PERMANENT. Transfer to Federal Records Center when 5 years old. Offer to National Archives when 25 years old.

2. **Reports to the Commissioner.** Reports received by the Commissioner from the Patent and Trademark Office staff and maintained as separate series.

PERMANENT. Transfer to Federal Records Center when 5 years old. Offer to National Archives when 25 years old.

3. **Index to Commissioner's Correspondence and Subject Files.** Card index to records described under Item 1.

PERMANENT. Transfer to Federal Records Center with related files. Offer to National Archives with related files.

4. **Deputy Commissioner's Correspondence and Subject Files.** Correspondence to and from other public officials, members of the public, and the Patent and Trademark Office staff, with related materials (exclusive of records retained in Item 1).

PERMANENT. Transfer to Federal Records Center when 5 years old. Offer to National Archives when 25 years old.

5. **Policy Documentation Files.** Formal policy and procedural issuances, current and obsolete, such as organizational charts, regulations, orders, circulars, manuals, and other types of directives, with related forms, recommendations, endorsements, clearances and comments.

PERMANENT. Transfer to FRC when obsolete. Offer to National Archives when 25 years old.

6. **Work-Flow Control and/or Statistical Reports Files.** Various periodic statistical reports used to show the flow of work through the Patent and Trademark Office and the printers, such as PALM, TRAM, PMS Statistical Reports on Patents to printers, and similar reports.

Destroy when 5 years old or sooner if no longer needed.

7. **Production and Pendency Reports Files.** Quarterly, monthly, and biweekly statistical reports prepared to show the production and quality output of examiners and clerks and the status of the assigned projects. Reports are mainly used to evaluate the efficiency of personnel for promotion purposes.

- a. Office of Assistant Commissioners or equivalent. Transfer to FRC when 5 years old. Destroy when 10 years.
- b. Other Offices.

8. **Special Studies Files.** Report on special studies surveys, and inspections of operations, management and systems with related papers showing their inception, scope, procedure and results.

PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 25 years old.

9. **Narrative and Statistical Reports Files.** Annual or other periodic narrative and statistical reports.

- a. Reports to the Office of the Commissioner and the Offices of the Assistant Commissioners.

PERMANENT. Transfer to FRC when 10 years old. Offer to the National Archives when 25 years old.

- b. Other Offices.

10. **Internal Administrative Files.** Administrative operations files of organizational offices, consisting of:

- a. Correspondence concerning routine or temporary internal administrative matters.

Destroy when 2 years old.

- b. Office personnel files.

Destroy after separation of employee.

- c. Completed requisitions for services, supplies and equipment, and travel documents.

Destroy 1 year after action is completed.

- d. Records pertaining to charity drives, bond campaigns, blood donations, and other voluntary activities.

Destroy on completion of program.

- e. Hand receipt files.

Destroy when property is accounted for.

- f. Suspense files.

Destroy when purpose is served.

- g. Chronological files.

Destroy when 2 years old.

11. **Program Planning and Evaluation Files.** Files showing the overall development of Patent and Trademark Office plans

and the evaluation of their effectiveness. Included are one copy of each staff study, evaluation report, system study, and related correspondence and background materials.

PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 30 years old.

12. **Surplus Property Case Files.** Case files on disposal of surplus real and related personal property.

Transfer to FRC 3 years after close of file. Destroy 10 years after close of file.

13. **Excess Real Property Reports.** Reports of real property with related papers.

Destroy when 10 years old.

14. **Budget Policy and Procedure Correspondence Files.** Correspondence files showing Patent and Trademark Office policy and procedure governing budget administration, and reflecting expenditures for Patent and Trademark Office programs.

PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 25 years old.

15. **Budget Estimates Files.** File copies of budget estimated comprising appropriation language sheets, narrative statements, and related schedules and data.

PERMANENT. Transfer to FRC after 10 years. Offer to National Archives when 25 years old.

16. **Records Disposition Files.** Descriptive inventories, disposal authorizations, schedules for retirement of records and correspondence or memoranda relating to revisions.

PERMANENT. Offer to National Archives when 25 years old or when no longer needed, whichever is longer.

17. **Forms Files.** One copy of each form with data showing the inception and scope of the form, the program or administrative purpose of the form, and the related procedure instituted, revised, superseded, or canceled.

PERMANENT. Offer to National Archives when 25 years old or when no longer needed, whichever is longer.

18. **Systems Development Program Files.** Program documents, schedules, and correspondence pertaining to the execution, review, and analysis of Patent Office research and development programs, and relating to the general planning and supervision of the programs.

PERMANENT. Transfer to FRC 5 years after completion to program. Offer to National Archives 20 years later or when 25 years old, whichever is sooner.

19. **Systems Development Task Force, Committee, and Board Files.** Agendas, directives, minutes of meetings, and related papers, of Task Forces, Committees, Board, etc. of which the Patent Office serves as Secretary, or Chairman thereof.

PERMANENT. Transfer to FRC 5 years after close of file. Offer to National Archives 20 years later or after 25 years old, whichever is sooner.

20. **Technical Report Files.** One copy of each technical report of unpublished manuscript or report prepared in connection with a project, terminal narratives, statistical and graphic complications, summarizations, analyses, and related papers.

PERMANENT. Transfer to FRC when 5 years old. Offer to National Archives when 25 years old.

21. **Systems Development Project Case Files.** Project case files reflecting a complete history of each project from initiation through research, development, design, and testing to completion.

PERMANENT. Transfer to FRC 5 years after completion or termination of project. Offer to National Archives when 25 years old.

#### ADP Records (also in GRS 20)

22. **ADP Planning Documents Files.** Planning documents consisting of master plan, feasibility studies with associated charts and diagrams, and supporting data that reflect on characteristics of the data automation activity.

PERMANENT. When no longer needed or used offer to National Archives with related materials.

23. **ADP Program Management Files.** Program management documents consisting of the development of plans, policy, and procedures governing the conversion of electrical machine operations and the supervision, control, coordination, and operation of the mechanization program.



- PERMANENT.** Offer to National Archives with related materials.
24. **ADP Standardizations Files.** Standardization files consisting of data elements and codes, standardization requests, and justification for all data systems developed by or for the Patent Office.
- PERMANENT.** Offer to National Archives with related materials.
25. **ADP Data Systems Planning Files.** Documents containing definition of the system.
- PERMANENT.** Offer to National Archives with related materials.
26. **ADP Information Retrieval System Master Reference File.** Magnetic media containing an index to patents and trademarks and publications.
- PERMANENT.** Offer to National Archives on termination of Patent and Trademark Office.
27. **Publication Tape File.** Magnetic media which are reproduced and disseminated as publication or used for reproducing a printed publication.
- PERMANENT.** Offer to National Archives when publication needs cease.

#### Patent Records

28. **Advertising Files.** Copies of proposed advertising matter, circulars, letters, cards, and related correspondence intended to solicit patent business and submitted by registrants as required by regulations.
- Destroy when 25 years old.
29. **Complaint Files.** Case files relating to complaints made against attorneys registered to practice before the Patent Office.
- Destroy on death of attorney.
30. **Board of Appeals Decisions Files.** Copies of Board of Appeals decisions with related background materials.
- a. Cases patented.
- Destroy 10 years after patent issued.
- b. All others.
- Destroy 10 years after appeal is decided.
31. **Indexes to Appeal Cases.** Indexes, arranged in various ways, to the appeal cases.
- Destroy 30 years after date of appeal.
32. **Declaration of Assistance Received Files.** Form received from applicants showing assistance received, if any, in the preparation of application for patent (PTOL-284).
33. **Academy Lecture Files.** Lectures prepared by the Staff for presentation at the Academy. (These lectures are updated periodically to reflect the changing views of the Patent and Trademark Office)
- a. Historical Sample
- PERMANENT.** Retain 1 copy of each basic lecture and of any major changes made to it. Offer to NARS when 25 years old.
- b. All other copies.
- Destroy when obsolete.
34. **Academy Training Sessions Files.** Background materials relating to each session of the Patent Office Academy, including names of attendees and instructors, schedule of classes, evaluation sheets, and related materials.
- PERMANENT.** Offer to National Archives when 25 years old.
35. **Academy Examinations Files.** Completed examinations of persons attending the Academy.
- Destroy when 1 year old.
36. **Academy Application Files.** Applications for training in the Academy, including memoranda of agreement and personal history statements.
- Destroy when 2 years old.
37. **Academy Correspondence File.** Correspondence relating to the courses offered by the Patent Office Academy.
- Destroy when 5 years old.
38. **Disclosure Document File.** Documents submitted by inventors as evidence of the date of conception of an invention.
- a. Disclosure Documents referred to in a separate letter in a related patent application filed within two years.
- Dispose of with related patent application.
- b. Disclosure Documents not referred to.
- Destroy when 2 years old.
39. **Disclosure Documents Index.** Cross-reference index to Disclosure Documents maintained by inventor's name and includes DD number and date of receipt.
- Destroy with related DD's.
40. **Index to Patents Available for License or Sale.** Index created when a patent is made available for license or sale, issued to the U.S. Government or dedicated to the Public.
- Destroy when no longer needed for reference.
41. **General Correspondence File.** Consists mainly of inquiries and requests for information and publications. Also includes correspondence regarding the "Register of Patents Available for License or Sale."
- Destroy when 3 years old.
42. **Foreign Filing Licensing Documents.** Petitions to the Commissioner of Patents and Trademarks for license to file applications for patents in foreign countries.
- Destroy 25 years after date of issue.
43. **Indexes to Foreign Filing Licensing Documents.** Indexes to licensing documents described in Item 43.
- Destroy 25 years after issue.
44. **Transmittals to Other Agencies Files.** Copies of transmittal letters to other agencies enclosing correspondence and related enclosures sent to the Patent and Trademark Office for services rendered by other agencies, such as copyright information and requests for publications from the Government Printing Office.
- Destroy when 1 year old.
45. **D-I Files.** Files relating to patent applications which may have a bearing on national security. Files usually consist of form listing serial number of application filing date, examining unit, title of invention, attorney assignee, and the concurrences listing the recommendation, signature, agency, and date; a memorandum summary indicating whether a secrecy order is required; the defense agency's request for a secrecy order; the secrecy order issued; and related materials.
- Destroy 35 years after date of receipt for review.
46. **Drawing Correction Slips.** Index arranged by serial number of application and used to locate orders for correction of drawings.
- Destroy when 2 years old.
47. **Inventor's Index to Patent Applications.** Index arranged alphabetically by name of the inventor. Each slip shows the inventor's name and residence, title of the invention, name and address of the attorney, application serial number and the filing date of the application.
- PERMANENT.** Offer to National Archives when no longer needed for reference.
48. **Numerical (serial) Index to Patent Applications.** Index arranged by the serial number assigned to the application.
- PERMANENT.** Offer to National Archives when no longer needed for reference.
49. **Assignment Document Files and Index.** Copies of documents assigning and transferring from one party to another the rights, title, and interest to trademarks and inventions and the letters patent obtained therefrom with related indexes.
- PERMANENT.** Offer to the National Archives when no longer needed for current business.
50. **Indexes to Government Interests.** Indexes to patents in which the Federal government has an interest by virtue of either of ownership of the application or resulting patent, thru assignment, or receipt of a license.
- a. Government Agency Index.
- PERMANENT.** Offer to National Archives when no longer needed for reference.
- b. Patent Number Index.
- Destroy when no longer needed for reference.
- c. Assignor Index.
- Destroy when no longer needed for reference.
51. **Petitions to the Commissioner.** Petitions to the Commissioner concerning patent applications.
- a. Original petitions in patent case file.
- Dispose of with related case file.
- b. Other copies.
- Destroy when 2 years old.
52. **Patent Protest Letters.** Protest to the grant of a patent (Rule 291).
- a. Letters filed in patent case file.
- Dispose of with related case file.

- b. Others.
- Destroy when 5 years old.
53. **Patent Docket Cards.** Cards used to control patent applications.
- Destroy when 6 months old.
54. **Classifications Definitions Files.** One copy of each issuance of Classifications Definitions, with related background papers.
- PERMANENT.** Transfer to FRC when 10 years old.
- Offer to National Archives when 30 years old.
55. **Canceled Drawings.** Drawings that were canceled because they did not meet Patent and Trademark Office specifications. Copy of drawing is filed with application.
- Destroy 5 years after filing date.
56. **Abandoned Patent Application Files.** Patent applications that did not result in a patent.
- a. Those that are retained because they are referred to in another application that may have become patented.
- Dispose of with patent file in which cited.
- b. All others.
- Destroy when 20 years old.
57. **Patent Files.** Case files showing the prosecution of application for, and the granting of, a patent. Includes the original application, copy of drawing, and all material relating to the prosecution of the application and subsequent actions by the Patent and Trademark Office.
- a. Files selected by the Commissioner of Patents and Trademarks or the Archivist of the U.S.
- PERMANENT.** Transfer to Federal Records Center when 10 years old. Offer to National Archives when 40 years old.
- b. All others.
- Destroy when 35 years old.
58. **Patent File Charge-out Records.** Record showing name of person charging out a patent file.
- Destroy after file is returned and all papers are determined to be in file.
59. **Statistical Reports on Patents to Printers Files.** Weekly statistical report to management concerning the number of patents sent to the printers and the amount of backlog.
- a. Original Report.
- Destroy when 5 years old.
- b. Operating Unit Copy.
- Destroy when 2 years old.
60. **Quality Review of Sample of Allowed Applications.** Records relating to the examination of allowed applications sampled for quality review, includes query to the examining group and their reply.
- Destroy 1 year after ultimate disposition of related case.
61. **Sample Pull-Rate Files.** Form showing which of the allowed applications are to be selected for the quality review sample, includes the pull rate and list of applications by serial number.
- Destroy when 1 year old.
62. **Printer-Waiting Register Files.** Register showing status of Query Disposition Records return to a group for reply.
- Destroy when 1 year old.
63. **Query Disposition Record Files.** Form used to return printer-waiting cases to a group for answer to a specific query.
- Destroy 6 months after query is returned.
64. **Batch Control Sheet for Allowed Cases Files.** Form uses as input to PALM System showing routing control and batch contents, such as PTO Form 1238-1.
- Destroy when 1 year old.
65. **Checklist for Applications Allowed by Examiner File.** Form used in completing a final review of allowed applications before sending to the printer, such as PTO Form 1167.
- Destroy when 1 year old.
66. **Patent Interference Files.** Case files produced in the process of resolving of adjudicating conflicts arising between parties in this matter of priority of invention.
- a. Cases that reach the hearing stage.
- PERMANENT.** Transfer to Federal Records Center when 10 years old. Offer to National Archives when 40 years old.
- b. Cases that are abandoned before reaching a hearing.
- Destroy when 40 years old.
67. **Board of Interference Decisions.** Copies of Board of Interference Decisions.

**PERMANENT.** Offer to the National Archives when 40 years old.

68. **Index to Patent Interferences.** Arranged numerically by interference number. Shows names of parties involved, application serial number and/or patent numbers involved, subject of interference, sections, date of hearings, decisions rendered, and other remarks.

**PERMANENT.** Offer to National Archives when 40 years old.

69. **Index to Interference Exhibits.** Describes exhibits in each interference.

Destroy when 40 years old.

70. **Proceedings Under AEC and NASA Acts.** Separate series of interference files relating to the SEC and NASA Acts.

Dispose of with related patent files.

71. **Settlement Agreements.** Files relating to the settlement agreed to by parties in the interference.

Dispose of with related interference case file.

72. **Court Cases.** Proceedings in cases where the Commissioner is a party of a civil suit.

a. Cases selected by the Solicitor as being precedent setting or of historical or political significance.

**PERMANENT.** Offer to the National Archives when 30 years old.

b. All other cases.

Destroy when 30 years old.

73. **Index to Court Cases.** Card index to cases described under Item 72.

Retain in agency until no longer needed for reference.

74. **Roster of Registered Patent Attorneys and Agents.** Printout listing registered patent attorneys and agents.

Destroy after undated listing is received.

75. **Case Folders of Registered Attorneys and Agents.** Application folders of the attorneys, agents, or firms registered to practice before the Patent and Trademark Office.

Destroy on death of attorney or agent.

76. **Unsuccessful Application for Registration to Practice before the Patent and Trademark Office.** Application folders of those applicants who failed to be registered.

Destroy 5 years after date of examination.

77. **Examination Papers of Applicants for Registration.** Examination answer papers to applications for registration to practice before the Patent and Trademark Office.

Destroy after grades are recorded.

#### Trademark Records

78. **Trademark Examiners Work Reports.** Records showing amount of work processed by examiners in a given time.

Used to evaluate examiners work and progress.

Destroy when 5 years old.

79. **Trademark Adversary Proceedings Files.** Consists of Trademark Opposition, Cancellation, Interference, and Concurrent-Use proceedings files.

Destroy when 25 years old. Check with the Chairman of the Trademark Trial and Appeal Board before destruction. General Services should generate a list of files to be destroyed and send to the Search Room to destroy matching cards in Adversary Proceeding file.

80. **Canceled Trademark Registration Files.** Consists of original application and all related correspondence.

Destroy 2 years after the date of cancellation.

81. **Expired Trademark Registration Files.** Consists of original application and all related correspondence.

Destroy 2 years after expiration of registration.

82. **Abandoned Trademark Application Files.** Consists of original application and all related correspondence.

Destroy 2 years after date of abandonment.

83. **Trademark Renewal Index.** Index to trademark registrations that are renewed.

**PERMANENT.** Offer to National Archives when no longer needed for reference.

84. **Indexes to Trademark Applications.** Index shows applicant's name, serial number of application, filing date, name of mark description of goods, attorney's name, and final disposition of the application.

a. Applicant's Index.

**PERMANENT.** Offer to National Archives when no longer needed for reference.



- b. Serial Index.  
**PERMANENT.** Offer to National Archives when no longer needed for reference.
85. *Proceedings Index to Trademark Adversary Proceedings.* Index in the Trademark Public Search Library arranged by type of proceeding.  
Destroy card from list sent by the Warehouse after matching Adversary Proceeding file is destroyed.
86. *Trademark Adversary Proceedings Records.* Card file maintained at the Trademark Trial and Appeal Board, showing records of Trademark Adversary Proceedings, with information on mark, parties, disposition, termination date, etc.  
**PERMANENT.** Offer to National Archives when no longer needed for reference.
87. *Trademark Registrant's Index.* Index to Trademark registrant's name, includes serial and registration numbers, date of registration, line of goods and other related information.  
**PERMANENT.** Offer to National Archives when no longer needed for reference.
88. *Index to Trademark Trial and Appeal Board Ex Parte Cases.* Record of Trademark Trial and Appeal Board cases in ex parte appeals.  
**PERMANENT.** Offer to National Archives when no longer needed for references.
89. *Public Advisory Committee for Trademark Affairs Files.* Agenda, minutes, correspondence, reports, working papers, reference materials, and related supporting files.  
Destroy when 10 years old or no longer needed for reference.
90. *Trademark Petitions Files.* Petitions and decisions to the Commissioner relating to trademarks, with related materials.  
a. Original Petitions in trademark case file.  
Dispose of with related case file.  
b. Copies of petition decisions in petition number order and in subject order in the Assistant Commissioner's Office.  
**PERMANENT.** Offer to the National Archives when no longer needed for references.  
c. Other copies.  
Destroy when 2 years old.
91. *Trademark Protest Letters.* Letters of protest to the Commissioner related to trademarks.  
Destroy when no longer needed or when three years old, whichever is earlier.

#### Public Information and Service Records

92. *International Intellectual Property Activities Case Files.* Project case files showing Patent and Trademark Office activity relating to problems concerning the protection of intellectual property throughout the world. Includes correspondence with private individuals, the Department of State and other countries; reports; records of international meetings concerning patents; trademarks and other matters pertaining to the protection of intellectual property throughout the world; and other materials relating to international affairs.  
**PERMANENT.** Transfer to FRC 5 years after close of case. Offer to National Archives when 25 years old.
93. *Proposed Intellectual Property Legislation Files.* Documents accumulated in the preparation and processing of legislation proposed by or in the interest of the Patent and Trademark Office. Includes drafts of legislation, reports to committees on introduced legislation, and comments on legislative proposals.  
**PERMANENT.** Transfer to FRC after 5 years. Offer to National Archives when 25 years old.
94. *Printed Articles Files.* Articles submitted for clearance and printed in magazines, journals, and other information media, including related background materials.  
Destroy when 10 years old.
95. *Public Affairs Report.* Weekly, monthly, and quarterly reports relating to public affairs activities prepared for the Department of Commerce.  
Destroy when 6 months old.
96. *Speakers Files.* Correspondence, schedules, travel material and related records concerning the scheduling of Patent and Trademark Office speakers.  
Destroy when 3 years old.
97. *Exhibit Files.* Correspondence, photographs, reports and related materials concerning major exhibits developed by the Patent and Trademark Office, such as the 175th anniversary exhibit.  
**PERMANENT.** Transfer to FRC when 10 years old. Offer to the National Archives when 30 years old.
98. *Photograph Files.* Photographs of key Patent and Trademark Office officials, major exhibits and other subjects that related to the functioning of the Patent and Trademark Office. Includes the negative and one positive print.  
**PERMANENT.** Offer for transfer to the National Archives when 20 years old.
99. *Publications Files.* Official record copy of each publication that contributes to an understanding of the organization and functioning of the Patent and Trademark Office.  
**PERMANENT.** Transfer to FRC when 10 years old. Offer to National Archives when 30 years old.
100. *Speech Files.* Official records copy of each speech given by the Commissioner and other Patent and Trademark Office executives.  
**PERMANENT.** Transfer to FRC when 10 years old. Offer to the National Archives when 30 years old.
101. *News Release Files.* Official records copy of each new release.  
**PERMANENT.** Transfer to Federal Records Center when 10 years old. Offer to National Archives when 30 years old.
102. *Patents Received and Files Register.* Register showing date and number of patent cases received in search room and date filed.  
Destroy 2 years after date of last entry in volume.
103. *Reports on Search Room Activities Files.* Weekly, monthly and other periodic reports showing production and general activities of the public search room, with related background papers.  
a. Original Report.  
Destroy when 1 year old.  
b. Operating Office Copy.  
Destroy when 2 years old.
104. *Patent and Trademark Reproduction Copy Files.* The master copy of patents and trademarks used for the photoreproduction of sales copies; includes original drawings and specifications.  
Transfer to FRC when 10 years old. Destroy when 20 years old.
105. *Reprint Requisition File.* Requisitions, such as PTO Form 228, used for ordering the reprint or printed patents or trademarks after current stock is depleted.  
Destroy when 1 year old.
106. *Sales Journal.* Shows statistical information on sales of copies of patents and trademarks.  
Destroy when 5 years old.
107. *Correspondence and Sale Control Records.* Records used to control the flow of correspondence and sale of printed materials.  
Destroy when 1 year old.
108. *Requests for Publications.* Correspondence requesting copies of certain publications and other printed materials.  
Return requests with ordered materials.
109. *Microform Files.* Microform copies of applications as filed, printed patent files and printed trademark files.  
a. Master microfilm files. (Certified as processed under 41 CFR 101-11.504)  
**PERMANENT.** Transfer to classified site. Offer to National Archives when 25 years old.  
b. All other microform copies  
Non-Records
110. *Charged-Out Slips File.* Slips recording the charge-out of records to Patent and Trademark Office employees and the public, such as PTO Forms 124, 125, and 271.  
Destroy when records are returned.
111. *Binding Instructions.* Cards showing instructions on how the various publications received by the library are to be bound.  
Destroy when no longer needed.
112. *Charge-out Files of Library Materials.* Sets of 3"x 5" cards showing records of library materials on temporary or indefinite loan to researchers or Patent and Trademark Office staff.  
Destroy when obsolete or on return of book.

113. *Interlibrary Loans Files.* Records of books borrowed from other libraries.  
Destroy 2 years after return of book.
114. *Library Serial Order Cards.* 3"x 5" cards used to record purchase of journals, magazines, etc.  
Destroy when no longer needed for reference.
115. *Library Book Order Cards.* 3"x 5" cards showing book purchases.  
Destroy when no longer needed for reference.
116. *Foreign Patent Accession Register.* Bound volumes arranged by country. Each shows the patent number and the date that copy was received in the Patent and Trademark Office.  
Destroy when no longer needed for reference.
117. *Inventor's Index.* Arranged alphabetically by name of inventor. Shows name and address of inventor, title of invention, serial number of application, patent number, date of issuance, attorney, and assignee.  
**PERMANENT.** Offer to National Archives when no longer needed for reference.
118. *PTO Procurement Files.* Contract, requisition, purchase order, lease, and bond and surety records, including correspondence and related papers pertaining to award, administration, receipt, inspection and payment (other than those covered in Items 1, 2, 13, and 15).  
a. Procurement or purchase organization copy, and related papers.  
1. Transactions of more than \$10,000 and all construction contracts exceeding \$2,000.  
Destroy 6 years and 3 months after final payment.  
2. Transactions of \$10,000 or less and construction contracts under \$2,000.  
Destroy 3 years after final payment. (Close file at the end of the fiscal year, retain 3 years and destroy, except that files on which actions are pending shall be brought forward to the next fiscal year's files for destruction therewith.)  
b. Obligation copy.  
Destroy when funds are obligated.  
c. Other copies of record described above used by component elements of a procurement office for administrative purposes.  
Destroy upon termination or completion.
119. *Solicited and Unsolicited Bids and Proposals Files.*  
a. Successful bids and proposals.  
Destroy with related contract case files (see item 118 of this schedule.)  
b. Solicited and unsolicited unsuccessful bids and proposals.  
1. When filed separately from contract case files.  
Destroy when related contract is completed.  
2. When filed with contract case files.  
Destroy with related contract case files (see item 118 of this schedule.)  
c. Cancelled Solicitations Files.  
1. Formal solicitations of offers to provide products or services (e.g., Invitations for Bids, Requests for Proposals, Requests for Quotations) which were cancelled prior to award of a contract. The files include presolicitation documentation on the requirement, any offers which were opened prior to the cancellation, documentation on any government action up to the time of cancellation, and evidence of the cancellation.

- Destroy 5 years after date of cancellation.  
2. Unopened Bids.  
Return to bidder.  
d. Lists or Card Files of Acceptable Bidders.  
Destroy when superseded or obsolete.
120. *Public Printer Files.* Records relating to requisitions on the Printer, and all supporting papers.  
a. Printing procurement unit copy of requisition, invoice, specifications, and related papers.  
Destroy 3 years after completion or cancellation of requisition.  
b. Accounting copy of requisition.  
Destroy 3 years after period covered by related account.

#### Non Record Materials

- The Records Disposal Act of 1943, as amended, states that "library and museum material made or acquired and preserved solely for reference or exhibition purposes, extra copies of documents preserved only for convenience of reference, and stocks of publications and of processed documents are not included within the definition of the word 'records' as used in this Act." Non-record material is disposed of as soon as its purpose is served. The following list consists of those non-record materials that are unique to the Patent and Trademark Office.
121. *Foreign Patents.* Copies of patents issued by foreign countries.
122. *Translation of Foreign Patents and Publications and Related Indexes.* Typewritten copies of translations and related indexes.
123. *Card Catalogs.* 3"x 5" cards used as finding aids to the library.
124. *Patent Examiner's Search Files.* Reference file used by examiners in processing applications. Arranged by class and subclass and consist of U.S. patents, foreign patents, extracts from publications, and other materials relating to a certain class or subclass.
125. *Printed Trademark Registrations Reference Files.* Digest of Registered marks consisting of a set of registered work marks arranged alphabetically and secondarily by trademark registration number; a set of registrations comprising symbols, arranged according to the classification of the goods or services with which they are used; of registration arranged by registration number.
126. *Numerical Index to Patent Classification.* Arranged numerically by patent number and shows the class and subclass assignment of each patent.
127. *Shelf List of Classified Patents.* Listing of all U.S. Patent numbers comprising, respectively, the "original" and "cross reference" classification of patents according to the official classification of the Patent and Trademark Office.
128. *Public Search Files of U.S. Patents.* Printed or microfilm copies of U.S. Patents arranged in two series: 1) numerically by class and subclass assignment, and secondarily by patent number and 2) numerically by patent number.
129. *Legislative History Files.* Consist mainly of copies of published materials relating to legislation that is of interest to the Patent and Trademark Office. Includes copies of bills, public laws, Federal Register, Congressional Record, and similar materials.

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[1068 TMOG 5]

## (197) U.S. DEPARTMENT OF COMMERCE

Office of the Assistant Secretary and Commissioner  
of Patents and TrademarksPUBLIC ADVISORY COMMITTEE  
FOR TRADEMARK AFFAIRSAgency: Patent and Trademark Office, Commerce  
Action: Notice of Committee Charter Amendment

Summary: In accordance with the provisions of the Federal Advisory Committee Act, 5 U.S.C. App. (1976), and after consultation with GSA, it has been determined that an amendment of the charter of the Public Advisory Committee for Trademark Affairs is in the public interest in connection with the performance of duties imposed on the Department by law. The charter amendment was signed on December 3, 1990.

The charter has been amended as follows to: (1) broaden the topics that the Committee may address to include international trademark law, (2) allow the membership of the Committee to be drawn from a wider range of the trademark community rather than solely from the regular, associate and supplementary membership of the United States Trademark Association (USTA), (3) increase the number of members on the Committee from 15 to 18, (4) provide for the direct selection of the members and appointment of the chairman of the Committee by the Assistant Secretary and Commissioner of Patents and Trademarks rather than by the president of the USTA, and (5) set the term of membership at two years.

For Further Information Contact: Lynne Beresford, Committee Control Officer, Office of the Assistant Commissioner for Trademarks, U.S. Patent and Trademark Office, Washington, D.C. 20231, telephone: (703) 557-7464, or Jan Jivatodi, Committee Management Analyst, U.S. Department of Commerce, Washington, D.C. 20230, telephone: (202) 377-4217.

Supplementary Information: The Committee was first estab-

lished in September 1970, and the latest charter renewal was signed on April 4, 1990. The charter amendment was approved on December 3, 1990, and provides for the following:

(1) The amendment broadens the objectives and duties of the Committee to specifically embrace international trademark law. The previous charter permitted the Committee to advise the Patent and Trademark Office only on the steps which could be taken to increase the efficiency and effectiveness of the administration of the Trademark Act and to provide a continuing source of knowledge from the private sector to the Government. Given the increased interest within the trademark community and the Patent and Trademark Office in international trademark law, especially in the Madrid Protocol and harmonization, it is desirable that the charter refer explicitly to international trademark law.

(2) Section 5(b)(2) of the Federal Advisory Committee Act requires that the membership of advisory committees be "fairly balanced in terms of the points of view represented..." The amendment furthers that goal by permitting the membership to be drawn from a wide range of the trademark community including users of the public search room, academia, members of the public at large, and the business community.

(3) The amendment increases the number of members on the Committee from 15 to 18. The increase was needed to permit additional members, from different sectors of the trademark community, to be added to the Committee without having to displace any of the current Committee members.

(4) Section 5(b)(2) of the Federal Advisory Committee Act requires that "the membership be fairly balanced in terms of the points of view represented..." The amendment furthers that goal by permitting the chairman to be appointed, and the members of the Committee to be selected by the Assistant Secretary and Commissioner of Patents and Trademarks.

(5) The charter of the Public Advisory Committee for Trademark Affairs did not set terms for members. In order to promote more orderly administration of the Committee, the amendment sets the terms of the members at two years. Members will serve at the discretion of the Assistant Secretary and Commissioner



of Patents and Trademarks. Appointments, when vacancies occur, shall be for the remainder of the unexpired term.

Jan. 16, 1991

HARRY F. MANBECK, Jr.  
Assistant Secretary and Commissioner  
of Patents and Trademarks

[1123 TMOG 20]

(198) U.S. Department of Commerce  
Office of the Assistant Secretary and Commissioner  
of Patents and Trademarks

## Public Advisory Committee for Trademark Affairs

Agency: Patent and Trademark Office, Commerce  
Action: Notice of Renewal

Summary: In accordance with the provisions of the Federal Advisory Committee Act, 5 U.S.C. App. (1976), and after consultation with GSA, it has been determined that the renewal of the charter of the Public Advisory Committee for Trademark Affairs is in the public interest in connection with the performance of duties imposed on the Department by law. Supplementary Information: The Committee was first established in September 1970, and its latest renewal was signed on April 3, 1992. The Committee's purpose is to advise the Patent and Trademark Office concerning steps which can be taken to increase the efficiency and effectiveness of administration of the Trademark Act and to provide a continuing source of knowledge from the private sector to the Government in the area of international and domestic trademark law.

Committee members are drawn from the trademark bar, business and industry, academia, the public at large, and users of the public search room, and are selected by the Assistant Secretary of Commerce and the Commissioner of Patents and Trademarks to assure a balanced representation among members of the trademark community. The Committee will function solely as an advisory body, and in compliance with the provisions of the Federal Advisory Committee Act.

For Further Information Contact: Lynne Beresford, Committee Control Officer, Office of the Assistant Commissioner for Trademarks, U.S. Patent and Trademark Office, Washington, D.C. 20231, telephone: (703) 305-9464, or Jan Jivatodi, Committee Management Analyst, U.S. Department of Commerce, Washington, D.C. 20230, telephone: (202) 377-4299.

April 24, 1992

HARRY F. MANBECK, Jr.  
Assistant Secretary and Commissioner  
for Patents and Trademarks

[1138 TMOG 58]

(199) Advisory Committee for Patents and  
Trademarks; Establishment

In accordance with the provisions of the Federal Advisory Committee Act (5 U.S.C. App. 2.) and General Services Administration Interim Rule on Federal Advisory Committee Management, 41 CFR Part 101-6, as amended, and after consultation with GSA, the Secretary of Commerce has determined that the establishment of the Advisory Committee for Patents and Trademarks is in the public interest in connection with the performance of duties imposed on the Department by law.

1. The Committee will advise the Patent and Trademark Office on broad policy issues involving both patents and trademarks, and the overall operation of the Office including matters concerning office-wide Automation programs.

2. The Committee will consist of at least 10 but no more than 18 members to be appointed by the Assistant Secretary and Commissioner of Patents and Trademarks to assure a balanced representation among patent and trademark attorneys, corporate executives, technical research directors, inventors, the judiciary, professional patent and trademark searchers, information specialists and publishers, automation experts, consumer

groups, entrepreneurs, and educators. The Committee will function solely as an advisory body and in compliance with the provisions of the Federal Advisory Committee Act. Its charter will be filed under the Act, 15 days from the date of the publication of this notice.

Interested persons are invited to submit comments regarding the establishment of the Advisory Committee for Patents and Trademarks. Such comments, as well as any inquiries, may be addressed to the Executive Assistant to the Assistant Secretary and Commissioner of Patents and Trademarks, U.S. Department of Commerce, Washington, D.C. 20231, phone: 703-557-3071, or the Department's Committee Management Analyst, phone: 202-377-4217.

Nov. 14, 1986

DONALD J. QUIGG  
Assistant Secretary and  
Commissioner of Patents and Trademarks

[FR Doc. 86-26451 Filed 11-21-86; 8:45 am]  
BILLING CODE 3510-16-M

[1073 TMOG 5]

(200) Patent and Trademark Office  
Performance Review Board Membership

Agency: Patent and Trademark Office, Commerce

Action: Announcement of Membership of the Patent and Trademark Office Performance Review Board

Summary: In conformance with the Civil Service Reform Act of 1978, 5 U.S.C. 4314 (c) (4), the Patent and Trademark Office is modifying the composition of its Performance Review Board to achieve the maximum possible degree of fairness and equity in the process of appraising, rating and rewarding the performance of senior executives and employees in the Senior-Level and Administratively-Determined pay categories.

This notice (1) announces the appointments of three new members of the Performance Review Board; and (2) establishes rotational term limits for each member to assure consistency, stability and objectivity in the performance appraisal process. Address: Comments should be addressed to Director, Office of Human Resources, Patent and Trademark Office, One Crystal Park, Suite 700, Washington, D.C. 20231.

For Further Information Contact: Colleen Woodard at the above address or telephone (703) 305-8062.

Supplementary Information: The Patent and Trademark Office Performance Review Board is comprised of the following individuals:

Bradford R. Huther, Chairperson  
Associate Commissioner  
and Chief Financial Officer  
Patent and Trademark Office  
Washington, D.C. 20231

Term - expires September 30, 1996

Theodore Morris (New Member)  
Director, Patent Examining Group 1500  
Patent and Trademark Office  
Washington, D.C. 20231

Term - expires September 30, 1996

Carol C. Darr  
Associate Administrator,  
Office of International Affairs  
National Telecommunications  
and Information Administration  
Department of Commerce  
Washington, D.C. 20230

Term - expires September 30, 1995

Nicholas P. Godici (New Member)  
Director, Patent Examining Group 3200  
Patent and Trademark Office  
Washington, D.C. 20231

Term - expires September 30, 1996

Paula J. Schneider (New Member)  
Principal Associate Director for Programs  
Office of the Director  
Bureau of the Census  
Washington, D.C. 20233  
Term - expires September 30, 1996

J. O. Thomas  
Deputy Assistant Commissioner  
for Patent Process Services  
Patent and Trademark Office  
Washington, D.C. 20231  
Term - expires September 30, 1995

Karl E. Bell  
Deputy Director of Administration  
National Institute of Standards  
and Technology  
Gaithersburg, Md. 20899  
Term - expires September 30, 1995

Belkis Leong-Hong  
Director, Center for Information Management  
Defense Information Systems Agency  
Falls Church, Va. 22041  
Term - expires September 30, 1996

Gerald R. Lucas  
Director, Eastern Administrative  
Support Center  
Department of Commerce  
Norfolk, Va. 23510  
Term - expires September 30, 1996

BRADFORD R. HUTHER  
Acting Assistant Secretary of Commerce and  
Acting Commissioner of Patents and Trademarks

[1167 TMOG 97]

(201) Certified Copies of Trademark  
Applications/Registrations

The Trademark Operation is in the process of microfilming its records and, as this proceeds, requests for certified copies of applications and, eventually, registrations, will be furnished from the microfilmed records. Such certified copies will not contain copies of the file jacket.

Jan. 17, 1984

MARGARET M. LAURENCE  
Assistant Commissioner  
for Trademarks

[1039 TMOG 140]

(202) Notice of a Change in Procedure Regarding  
Requests for Certification Services

The purpose of this notice is to inform the trademark community of a change of address for all requests for certification services and to amend in part a previous notice entitled "Expedited Services for Certified Copies of Trademark Registration" published at 1070 TMOG 4 (Sept. 16, 1986).

All requests for certified and uncertified copies of trademark documents pertaining to applications and registrations (i.e., application files, file wrappers, trademark title and status reports, registrations, etc.) must now go to the Certification Division, Office of Public Records, at the following mailing address:

Commissioner of Patents and Trademarks  
Box 10, Certification Division  
Washington, D.C. 20231

Requests can also be hand-carried to any of the following three locations:

Attorney's Window  
Crystal Plaza 4, First Floor  
Arlington, Virginia 22202

Attorney's Window  
South Tower, Second Floor  
2900 Crystal Drive  
Arlington, Virginia 22202

Office of Public Records  
North Tower, Tenth Floor  
2800 Crystal Drive  
Arlington, Virginia 22202

In addition, requests with deposit account orders can be transmitted by facsimile transmission to (703) 308-7048.

There will no longer be a limit on the number of requests for certified trademark documents.

Turnaround times for all requests, except requests for regular service for certified copies of trademark registrations, will remain unchanged and will be based upon the date of receipt by the Certification Division. Requests for certified copies of trademark registrations will be processed and mailed back to the requester within ten calendar days from the date of receipt by the Certification Division from the Patent and Trademark Office mail room. Requests for expedited services for certified copies of trademark registrations will continue to be processed and mailed back to the requester within three working days after they are received by the Certification Division from the Patent and Trademark Office mail room.

Requests for negative certificates will continue to be handled by the Post Registration Section of the Office of Trademark Services.

Requests mailed to the prior address will be forwarded to the Certification Division. General inquiries should be made to the above mailing address or to the Special Handling Section, Certification Division, at (703) 308-9726.

July 1, 1994

PHILIP G. HAMPTON, II  
Assistant Commissioner  
for Trademarks

[1165 TMOG 13]

(203) Temporary Suspension of "At Cost" Services  
for Orders for Certified Copies

Effective immediately, and until further notice, the Certification Division, Office of Public Records, will temporarily suspend accepting requests for "at cost" service for orders of certified copies of PTO documents except where the requester provides documentation that the copy is required for pending litigation.

The Certification Division's ability to provide "at cost" services is based upon the ready availability of source documents either on microform or via access to electronic images. Increased filings of both patent and trademark applications have resulted in more instances where requested documents are not yet available on film or electronic media to fill customer orders on an "at cost" basis efficiently and for a reasonable fee.

Orders for expedited service for certified copies of both patent and trademark applications-as-filed and trademark registrations will continue to be accepted. Customers will be advised within three working days if microform or electronic images are not available to fill their orders on an expedited basis, and the order will be filled as a request for regular service with an appropriate adjustment and/or credit for fees paid.

Customers are reminded that expedited service is provided on a "local basis" for those orders: (1) placed through the PTO's Public Service Windows located in the Patent Search Room and the Trademark Search Library; (2) hand-delivered to the Office of Public Records' (OPR) Service Counter in the North Tower building; (3) transmitted via fax directly to the Certification Division; or (4) received from an overnight delivery service at the OPR Service Counter. Requests for



expedited service received through the US mail will be processed as regular orders.

In those cases where Certification Division cannot fill a customer order within 30 days of receipt due to unavailability of media or the source document itself, customers will be provided with a certified letter documenting their request and the Office's inability to fill the order as requested. These letters will be provided at no charge. The order itself will be closed and a full refund or credit made to the customer.

Customers placing orders for certified copies may use the following as guidelines for expected turnaround times from initial receipt of an order in PTO to mailing date from the Office:

Certified Product	Days to Mail
Patent Application-As-Filed, Expedited (microfiche available)	7
Patent Applications-As-Filed, Regular	17
Patent Related File Wrapper	25
Patent Copy	10
Trademark Application-As-Filed, Expedited (microfiche available)	7
Trademark Application-As-Filed, Regular	17
Trademark Related File Wrapper	25
Trademark Registration	10
Trademark Registration, Expedited	3

Delivery of any specific copy will vary based on the availability of microfilm products and/or file accessibility. Customers are encouraged to fax orders for copies directly to Certification Division at (703) 308-9759 and to pay by PTO Deposit Account, MasterCard, or Visa to minimize processing time. Information on the status of pending orders may be obtained by calling (703) 308-9726 or 1 (800) 972-6382 (outside the Washington, D.C. Metro area).

November 2, 1995

WESLEY H. GEWEHR  
Administrator for  
Information Dissemination

[1180 TMOG 121]

## (204) Change in Legal Holidays

The Commissioner's Notice of Sept. 25, 1979, "Change in Legal Holidays," is hereby rescinded in view of Public Law 98-144, enacted Nov. 2, 1983, which amended the listing of legal public holidays in 5 USC § 6103. That amendment took effect in 1986 and added a new legal holiday relating to the birthday of Martin Luther King, Jr. This new holiday is designated for the third Mon. in Jan.

Section 6103, as amended, reads as follows:

New Year's Day, Jan. 1  
Birthday of Martin Luther King, Jr., the third Mon. in Jan.  
Washington's Birthday, the third Mon. in Feb.  
Memorial Day, the last Mon. in May  
Independence Day, July 4  
Labor Day, the first Mon. in Sept.  
Columbus Day, the second Mon. in Oct.  
Veterans Day, Nov. 11  
Thanksgiving Day, the fourth Thurs. in Nov.  
Christmas Day, Dec. 25.

Each of the holidays enumerated will constitute a "Federal holiday within the District of Columbia," as referred to in Section 21, Title 35, United States Code. In accordance with 37 CFR 1.6(a) and 1.10(a), the Patent and Trademark Office will not receive papers on these holidays. Actions required to be taken on such days may be taken on the next succeeding

day that the Office is open for business in accordance with 37 CFR 1.7.

July 15, 1986

DONALD J. QUIGG  
Assistant Secretary and  
Commissioner of Patents  
and Trademarks

[1069 TMOG 5]

## (205) Filing of Papers During Unscheduled Closings of the Patent and Trademark Office

When the Patent and Trademark Office is officially closed by Executive Order of the President or by the Office of Personnel Management for an entire day because of some unscheduled event, such as adverse weather conditions, the Patent and Trademark Office will consider that day as a "federal holiday within the District of Columbia" under 35 U.S.C. § 21. Any action or fee due that day will be considered as timely for the purposes of, e.g., 35 U.S.C. §§ 119, 133 and 151, if the action is taken, or fee paid, on the next succeeding business day on which the Patent and Trademark Office is open. When the Patent and Trademark Office is open for business during any part of a business day between 8:30 a.m. and 5:00 p.m., papers are due on that day even though the Office may be officially closed for some period of time during the business day because of an unscheduled event. The procedures of 37 CFR 1.8 or 1.10 may be used, as appropriate, for the filing of papers. On any day the Office is open for at least part of the day, papers may also be deposited up to midnight in any boxes which are provided by the Patent and Trademark Office under 37 CFR 1.6(c).

Feb. 11, 1987

DONALD W. PETERSON  
Acting Assistant Secretary  
and Commissioner of Patents  
and Trademarks

[1076 TMOG 6]

## (206) Regulations Relating to the Use of Patent and Trademark Office Records or Search Facilities and Enforcement Procedures

Agency: Patent and Trademark Office, Department of Commerce

Action: Notice

Summary: The Patent and Trademark Office is revising its regulations relating to use of Patent and Trademark Office records or search facilities and procedures for enforcing these regulations. These regulations and their enforcement are necessary to promote an atmosphere conducive to research and to maintain the integrity of the files and records in the Patent and Trademark Office.

Effective Date: July 1, 1987

For Further Information Contact: Theresa A. Brelsford, Assistant Commissioner for Administration, Patent and Trademark Office, Washington, D.C. 20231, (703) 557-2290.

Supplementary Information: The procedures will apply to all visitors to the Patent and Trademark Office.

Visitors are reminded that unauthorized removal of government material or property may be prosecuted as a criminal felony under the provisions of 18 U.S.C. 2071, in addition to the imposition of administrative sanctions contained in these procedures.

## Regulations Relating to the Use of Patent and Trademark Office Records or Search Facilities

These regulations are established for all persons using the facilities of the Patent and Trademark Office (PTO), and will be appropriately enforced as specified herein.

Smoking within PTO is prohibited except in designated areas (41 CFR 101-20.109-10).

All persons using the facilities of the PTO are subject to regulations governing conduct on property under the charge of the General Services Administration which appear in 41 CFR Subpart 101-20.3 (41 CFR §§ 101-20.300 through 101-20.315).

Packages, briefcases and other personal effects brought into the PTO, as well as storage lockers provided for general use, are subject to search by authorized personnel for reasonable cause under the provisions of 41 CFR 101-20.301.

Unauthorized removal of PTO files, documents, reference materials, or any government property is prohibited. In addition to the administrative sanctions specified in these regulations, violators may also be subject to arrest and prosecution under the provisions of 18 U.S.C. 2071 which carries a possible "fine of \$2,000 or imprisonment for not more than three years, or both", and/or the violator may be subject to discipline under the PTO Code of Professional Responsibility if he or she is a practitioner as defined in 37 CFR 10.1(r).

All persons must comply with posted Official Notices and with verbal requests made by PTO personnel for compliance with these regulations.

## 1. User Passes

- Individuals visiting any area of the PTO must obtain a valid, non-transferable user pass and wear it visibly displayed at all times while on the premises.
- Permanent User Passes may be obtained from the Manager of the Patent Public Search Room. The first Permanent User Pass is issued at no charge. Permanent User Passes subsequently issued as replacements will be provided at a charge of \$5.00 per Pass. The holder of a Permanent User Pass may be issued one (1) Temporary User Pass, within a ninety (90) day period at no charge. A request for a second Temporary User Pass during the same ninety day period will require the purchase of a Permanent User Pass at the required replacement fee.
- Temporary User Passes may be obtained by visitors at no charge from the managers of the Patent or Trademark Public Search Rooms and are valid through the expiration date stamped thereon.
- Permanent and Temporary User Passes must be surrendered to the PTO upon request for cause.

## 2. Use of Search Areas

- The Patent and Trademark Office facilities may be used by visitors only during the hours specified, Monday through Friday, and are closed to the public on Saturdays, Sundays and Legal Holidays:
 

Patent Public Search Rm.,	
Mezzanine and Microfilm	
Center.....	8:00 a.m.-8:00 p.m.*
Trademark Public Search Rm.,	8:00 a.m.-5:30 p.m.*
Assignment Search Rm.,	
Public Service Center, and Scientific	
Library.....	8:30 a.m.-5:00 p.m.*
Patent Examining Organizations	
Trademark Examining	
Law Offices and all other public access areas of the	
PTO.....	8:30 a.m.-5:00 p.m.*

\* Clearing of these areas would begin prior to this time to ensure all visitors are out of the building by the time designated.

- Materials available for search purposes in the Patent and Assignment Search Rooms and patent application file histories shall not be removed from those areas.
- Trademark registrations in the Trademark Search Library shall not be removed from the secured bundles in the registered file. Photocopying from bound volumes of trademarks is prohibited.
- Trademark files shall not be removed from PTO space in Crystal Plz. Bldg. 2.
- Use of Patent Examining Group search areas is strictly limited to searching materials unavailable in the Patent Public Search Room or the Scientific Library. Examining Group search areas may be used only when such use does not conflict with the regular business of the organization.
- Visitors to a Patent Examining Group Search Area

must register with the designated Group Search Area representative indicating the times entering and leaving the area, User Pass number, and the class(es) and subclass(es) to be searched.

- Documents removed from the files of Patent Examining Group search areas must be immediately returned to their proper location after use. Documents shall not be removed from the area in which they were obtained without specific written authorization from a Group Director or Supervisory Patent Examiner in the Examining Group where the material(s) reside. Such authorization will not be given for U.S. Patents and other material readily available through the Scientific Library.

## 3. PROHIBITIONS

The following are prohibited:

- Conduct which is rude or abusive to PTO employees or others.
- Smoking and consumption of food or beverages in other than designated areas.
- Loud talking or any conduct which may be disruptive to others.
- Use of radios, televisions, typewriters, photographic equipment, dictation equipment and other mechanical, electrical or electronic items without specific authorization from an Assistant Commissioner of the PTO.
- Improper use, mutilation, destruction or unauthorized removal of PTO records, documents or government property.
- Reserving seats or work areas.
- Affixing messages to walls, telephone booths or other government property, except designated message boards.
- Use of the PTO as a mailing address, use of PTO stationery, and use of PTO emblem or seal.
- Use of PTO telephones and other office equipment, such as copiers, etc., except where specifically provided for public use. This includes the use of PTO telephones to receive incoming calls.
- Use of any computer terminal other than the TRAM terminals provided for public use in the Trademark Search Library, and the CASPIR and FOUR-PHASE terminals (or CASSIS terminal if the FOUR-PHASE terminals are not operating) provided in the Patent Public Search Room for public use.
- Placing PTO files or documents, government property or government owned reference materials in rental storage lockers.
- Use of rental storage lockers without depositing the required fee or holding the key to a storage locker beyond the specified maximum period of use.

[1079 TMOG 7]

## (207) Procedures for Enforcement of the Regulations Relating to the Use of Patent and Trademark Office Records or Search Facilities

Under applicable statutes and regulations, including 40 U.S.C. 486(c), 41 CFR 101-20.3, and appropriate sections of Department Organization Orders 10-14 and 30-3 of the Department of Commerce, the procedures appearing below are established.

- Violations involving unauthorized removal of PTO files, documents, records or government property.
  - Each observed or reported violation will be investigated.
  - Persons found in possession of PTO material or government property, other than in areas or under circumstances where possession is specifically authorized, shall be required to immediately surrender the material or property and if appropriate, their User Pass. An oral explanation for the possession of such material or property will be requested by the PTO.
  - Each incident involving unauthorized possession of PTO material or government property shall be immediately



- reported by telephone or in person to the Office or Group Director of the area from which the material or property was taken.
- d. If it appears to the Office or Group Director that possession of the materials was inadvertent or otherwise unintentional, no further action will be taken. The materials will be replaced appropriately and the person's User Pass will be returned.
  - e. If it appears to the Office or Group Director that possession of the materials was intentional, all persons involved shall be required to submit written statements detailing the circumstances and, in the case of a PTO User/visitor, show cause why the User Pass and visitor privileges should not be suspended or revoked. Statements will also be obtained from other witnesses where appropriate. The material or property shall be secured for possible use as evidence by the Office or Group Director, if appropriate.
  - f. If the involved person possesses a Permanent User Pass, it shall be retained and forwarded with the written statements to the Assistant Commissioner for Administration. A Temporary User Pass may be issued as replacement by the Assistant Commissioner for Administration, pending action on an alleged violation.
  - g. If the involved person possesses only a Temporary User Pass it shall be retained and forwarded with the written statements to the Assistant Commissioner for Administration within two weeks of the incident. No replacement will be provided pending action by the Assistant Commissioner for Administration.
2. Other violations of public use regulations.
    - a. Each observed or reported violation will be investigated. The persons involved shall be informed of the nature of the violation and requested to comply with regulations.
    - b. If it appears that the violation was inadvertent or otherwise unintentional and the involved person immediately conforms to the regulations, no further action will be taken.
    - c. If the violation appears to be intentional or if the person involved refuses to comply with a verbal request from a PTO employee or continues to violate the regulations after being requested to comply, the person shall be required to surrender his or her User Pass to the PTO. A written report of each violation and the User Pass will be submitted to the Assistant Commissioner for Administration for a final decision. User Pass replacement procedures shall be as specified in paragraphs 1.f. or 1.g.
    - d. If the Assistant Commissioner for Administration determines that a reported violation was inadvertent or otherwise not intentional, the User Pass will be returned and no further action will be taken. In all other cases, the Assistant Commissioner for Administration will request the person involved to show cause in writing why his or her User Pass and visitor privileges should not be suspended or revoked.
    - e. A written decision will be rendered by the Assistant Commissioner for Administration after consideration of any timely submitted response.
    - f. In the case of a written decision by the Assistant Commissioner for Administration adverse to a practitioner as defined by 37 CFR 10.1(r), a copy of the written decision will be forwarded to the Director of the Office of Enrollment and Discipline for whatever further action, including sanctions, as may be appropriate under the PTO Code of Professional Responsibility.
  3. Factors to be Considered in Assessing Penalties.
    - a. Penalties will be determined on a case by case basis.
    - b. Prior violations of regulations will be considered when assessing whether any violation is willful, deliberate or intentional, and when determining the penalty to be imposed.
    - c. Penalties may be assessed as follows, depending on circumstances:
      - (1) For a first offense: from a written warning to a 30 day suspension of the User Pass and visitor privileges.

- (2) For a second offense: a suspension of the User Pass and visitor privileges from 5 days to one year.
- (3) For a third or subsequent offense: from a suspension of 30 days to permanent revocation of the User Pass and visitor privileges.
- (4) For any single serious or aggravated violation: suspension of the User Pass and visitor privileges for up to one year or permanent revocation of the User Pass and visitor privileges. A serious or aggravated violation is defined as any instance involving multiple violations of regulations during a single event or acts which also constitute a violation of Federal or local criminal law.

## 4. Record of Penalties Imposed.

A record of penalties imposed for given violations will be maintained by the Assistant Commissioner for Administration. These records will be made available to the public upon request.

## 5. Use of Public Facilities During Suspension or After Revocation of User Pass.

No individual will be permitted to use the facilities specified in these regulations while his or her User Pass is suspended or revoked.

## 6. Absence of Assistant Commissioner for Administration.

In the absence of the Assistant Commissioner for Administration, the Deputy Assistant Commissioner for Administration will carry out the responsibilities assigned by these regulations.

## 7. Absence of Designated PTO Officials.

In the absence of any Designated PTO Official, a Deputy or Acting Official will carry out the responsibilities assigned by these regulations.

## 8. Assistance.

PTO employees may, when necessary, request the Security Officer of the Patent and Trademark Office or the Federal Protective Service or their contractors to provide assistance in carrying out their assigned responsibilities in paragraphs 1 and 2.

## 9. Appeals.

Decisions rendered by the Assistant Commissioner for Administration may be reviewed on petition to the Commissioner.

May 11, 1987

THERESA A. BRELSFORD  
Assistant Commissioner  
for Administration

[1079 TMOG 8]

## (208) Rules Concerning Conduct on Patent and Trademark Premises

## 1. Applicability

These rules apply to all premises under the charge and control of the U.S. Patent and Trademark Office (PTO) through the General Services Administration and to all persons entering such premises.

## 2. Admission to Property

Patent and Trademark Office facilities are closed to the public outside of normal working hours. During normal working hours, a valid User Pass is required to enter PTO premises.

The individual's User Pass must be displayed at all times while on PTO premises.

## 3. Preservation of Property/Conduct on PTO Premises

The following activities are prohibited on PTO premises:

a. Improperly disposing of rubbish; willfully destroying or damaging property; theft of property; creating a hazard to persons or things; and placing Government documents or materials in storage lockers.

b. The willful and unlawful concealment, removal, mutilation, obliteration or destruction, or attempts to do so, or, with intent to do so, or taking and carrying away of any record, book, paper, document, or other things from the facilities shall result in a fine of not more than \$2,000 or imprisonment of not more than 3 years, or both. See 18 U.S.C. § 2071.

c. Removal of papers, materials, or other Government property from designated areas. Within a designated area, papers or other Government property must be returned to its proper location after use, unless otherwise posted.

d. Using PTO premises and facilities as a place of business. It is prohibited to reserve work areas, use PTO as a mailing address, use PTO stationery, or a PTO telephone number as a personal telephone number.

## 4. Inspection

Packages, briefcases, storage lockers and other containers in the possession of visitors, employees, or other persons arriving at, working at, visiting, or departing from the PTO are subject to inspection. See 41 CFR § 101-20.301.

## 5. Disturbances

Disorderly conduct or other conduct which creates a loud or unusual noise or a nuisance which impedes or disrupts the performance of official duties by Government employees or which prevents the public from obtaining the administrative services provided on the property in a timely manner is prohibited. See 41 CFR § 101-20.305.

## 6. Conformity with signs and directions

Persons on the PTO premises shall at all times comply with the official signs of a prohibitory, regulatory or directory nature and with the lawful direction of PTO employees.

No rude or abusive conduct to PTO employees and fellow users.

No food or beverages are permitted.

No smoking except in designated areas.

No mechanical or electronic equipment such as radios, televisions, typewriters, computers, or photographic equipment may be used without prior permission from the Assistant Commissioner for Administration.

No use of PTO telephone and office equipment, except as specifically designated for public use.

## 7. Penalties and other laws.

Nothing in these rules shall be construed to abrogate any other Federal laws or regulations or any State and local laws and regulations applicable to any area in which property under the charge and control of the PTO through the U.S. General Services Administration is situated. See 40 U.S.C. §§ 318(c) and 486(c).

41 CFR § 101-20.315 provides that whoever is found guilty of violating the rules of conduct on Federal property contained in 41 CFR § 101-20.3 while on any property under the charge and control of the U.S. General Services Administration is subject to a fine of not more than \$50, imprisonment of not more than 30 days, or both. See 40 U.S.C. § 318c.

Failure to follow these rules may result in immediate removal from the premises, suspension of user privileges,

and/or enforcement of any criminal sanctions that may apply.

Aug. 30, 1991

THERSA A. BRELSFORD  
Assistant Commissioner for  
Administration

[1131 TMOG 7]

(209)

Department of Commerce  
Patent and Trademark Office

## Changes in Practice Concerning Letters of Protest

After April 1, 1995, Letters of Protest filed prior to the publication of a mark for opposition will be granted only if there is sufficient evidence in the Letter of Protest to establish a *prima facie* case which supports a refusal of registration. In such a case, publication of the mark for opposition, without consideration of the issue and evidence presented in the Letter of Protest, might result in a clear error by the Office. Further, after April 1, 1995, FOIA requests for copies of letters of protest should be directed to the Office of the Assistant Commissioner for Trademarks, rather than to the Solicitor's Office.

Letter of Protest practice will change as follows: Under current practice, when a Letter of Protest is filed prior to the publication of a mark, the evidence in the letter is forwarded to the Examining Attorney whenever such evidence can properly be considered by an examining attorney during *ex parte* examination and the evidence supports any reasonable ground for refusal.

Under the revised practice, when a Letter of Protest is filed prior to the publication of a mark, the evidence in the letter will be forwarded to the Examining Attorney only if there is sufficient evidence in the Letter of Protest to establish a *prima facie* case which supports a refusal of registration such that publication of the mark for opposition, without consideration of the issue and evidence presented in the Letter of Protest, might result in a clear error by the Office.

The standard for the granting of a Letter of Protest filed or considered after publication of the mark in the *Official Gazette* is not changing. The standard is whether publication of the mark constituted clear error and whether the Letter of Protest was filed within thirty days of the publication of the mark. *In re Pohn*, 3 USPQ2d 1700 (Comm'r Pats. 1987), and *In re BPJ Enterprises Ltd.*, 7 USPQ2d 1375 (Comm'r Pats. 1988).

Because the Letter of Protest procedure, which permits a third party to introduce evidence during the *ex parte* examination of an application, is not mandated by statute or rule, the Office wants to clearly define the standards used for granting Letters of Protest and harmonize the standards used for granting these letters before and after publication of the mark. The new standard for prepublication Letters of Protest will discourage the filing of Letters of Protest which do not present sufficient evidence to support a *prima facie* case for refusal to register. As a result, fewer applications will be taken out of the normal order of processing for consideration of evidence in a Letter of Protest.

## Requests for Copies of Letters of Protest

At the present time, copies of documents relating to Letters of Protest are requested pursuant to the Freedom of Information Act (FOIA) from the Solicitor's Office of the Patent and Trademark Office. After April 1, 1995, any party making a FOIA request for a complete copy of the Letter of Protest should file that request directly with the Office of the Assistant Commissioner for Trademarks by mailing it to 2900 Crystal Drive, Arlington, Va. 22202-3513 or by faxing it to (703) 308-7220. Such a request should be directed to the attention of the Administrator for Classification and Practice. Upon review of the Letter of Protest material, the Administrator will usually forward a copy of the Letter of Protest and its attachment to the requester. Only in cases where the Letter of Protest or its attachments contain material that would potentially be expected from disclosure under the Freedom of Information Act will the Administrator not forward the requested material. If, in the opinion of the Administrator, any part of the Letter of Protest materials



should be excepted from disclosure under FOIA, the matter will be forwarded to the Office of the Solicitor for further review.

February 21, 1995

PHILIP G. HAMPTON, II  
Assistant Commissioner  
for Trademarks

[1172 TMOG 93]

(210) **Notice of Change in the Method of  
Assigning Registration Numbers to  
Trademark Registrations**

As of October 10, 1995, in the *Trademark Official Gazette* sections titled TRADEMARK REGISTRATIONS ISSUED, TRADEMARK REGISTRATIONS ISSUED UNDER SECTION 1(D), and SUPPLEMENTAL REGISTER, registration numbers will be assigned in ascending serial number order. Currently registration numbers are assigned in ascending class order by ascending serial number inside each class, e.g., in Class 1, Ser. No. 100,000 might be assigned Reg. No. 1,900,001; and in Class 42, Ser. No. 000,001 might be assigned Reg. No. 1,903,456. Under the new system, registration numbers will be assigned in ascending serial number order regardless of class, e.g., Ser. No. 000,001 would be assigned Reg. No. 1,900,001; and Ser. No. 100,000 would be assigned Reg. No. 1,903,456.

August 30, 1995

ROBERT M. ANDERSON  
Deputy Assistant Commissioner  
for Trademarks

[1179 TMOG 12]

(211) **DEPARTMENT OF COMMERCE**

**Patent and Trademark Office**

**Effect of December 1, 1993 Amendments  
to the Federal Rules of Civil Procedure on  
Trademark Trial and Appeal Board  
Inter Partes Proceedings**

Trademark Rule 2.116(a) provides that, except as otherwise provided, and wherever applicable and appropriate, procedure and practice in Trademark Trial and Appeal Board (Board) inter partes proceedings shall be governed by the Federal Rules of Civil Procedure. Trademark Rule 2.120(a) provides, in part, that the provisions of the Federal Rules of Civil Procedure relating to discovery shall apply in opposition, cancellation, interference, and concurrent use registration proceedings except as otherwise provided in Trademark Rule 2.120; and that the opening of discovery is governed by the Federal Rules of Civil Procedure. Thus, where the Board has its own rule concerning a particular matter of practice or procedure, that rule governs; if there is no Board rule concerning the matter, the Federal Rules of Civil Procedure apply, where applicable and appropriate.

On December 1, 1993, certain of the rules in the Federal Rules of Civil Procedure were amended, and one new rule was added. Specifically, Rules 1, 4, 5, 11, 12, 15, 16, 26, 28, 29, 30, 31, 32, 33, 34, 36, 37, 38, 50, 52, 53, 54, 58, 71A, 72, 73, 74, 75, and 76 were amended, and new Rule 4.1 was added. Included in the amendments are changes in the discovery rules to require that the parties to a civil action: (1) make a series of automatic disclosures, during the pretrial stages of the proceedings, of certain evidence; (2) file the disclosures with the court; (3) meet, early in the proceeding, to discuss, inter alia, the automatic disclosure and to develop a plan for discovery; and, (4) transmit to the court a written report outlining the discovery plan. The timing of some of these matters is tied to the timing of a scheduling conference to be held, or a scheduling order to be issued, by the court. The timing and sequence of other of the matters depends upon the direction of the court. Further, parties are prohibited from seeking any of the tradi-

tional forms of discovery until after they have met and developed their discovery plan.

The Patent and Trademark Office (Office) believes that the application of the cited provisions in inter partes proceedings before the Board would increase the complexity and cost of the proceedings and would be unduly burdensome both to the Board and the parties. For these reasons, the Office is now of the opinion that these provisions would have a detrimental effect on, and are not appropriate for, Board proceedings. Moreover, the Office's Public Advisory Committee for Trademark Affairs has recommended that incorporation of the amendments in Board practice be deferred until the Office can evaluate the effects of the amendments on civil actions. On the other hand, some of the provisions added by the amendments are not objectionable, and others so clearly do not apply in, and/or are not appropriate for, Board proceedings that they need not be mentioned.

Accordingly, application of Rule 2.120(a) is hereby waived, in pertinent part, to the extent that the following provisions of the Federal Rules of Civil Procedure, as amended, which otherwise arguably would apply in Board proceedings, and which would, in the opinion of the Office, have a detrimental effect on those proceedings, shall not be applied therein unless and until further notice is given:

1. Rule 16(b) [requirement that court issue a scheduling order, after consulting with parties by scheduling conference, telephone, mail, or other suitable means]
2. Rules 26(a)(1)-26(a)(4) [requirements for series of automatic disclosures of evidence]
3. Rule 26(b)(4) [requirements for taking discovery from a person identified, in automatic disclosure, as an expert whose opinions may be presented at trial]
4. Rule 26(d), first sentence [prohibition against the taking of discovery before the parties have met to discuss, inter alia, the automatic disclosures and to develop a plan for discovery]
5. Rule 26(e)(1) [requirement for supplementation of automatic disclosures]
6. Rule 26(f) [requirement that the parties meet, early in the proceeding, to discuss, inter alia, the automatic disclosure and to develop a plan for discovery]
7. Rule 26(g)(1) [signature requirements for automatic disclosures]
8. Rule 30(a)(2)(C) [requirement that a party obtain leave of court or written stipulation to take a deposition prior to the Rule 26(f) meeting of the parties]
9. Rule 33(a), last sentence [requirement that a party obtain leave of court or written stipulation to serve interrogatories prior to the Rule 26(f) meeting of the parties]
10. Rule 34(b), last sentence of first paragraph [requirement that a party obtain leave of court or written stipulation to serve request for production of documents and things prior to the Rule 26(f) meeting of the parties]
11. Rule 36(a), last sentence of first paragraph [requirement that a party obtain leave of court or written stipulation to serve request for admission prior to the Rule 26(f) meeting of the parties]
12. Rule 37(a)(2)(A) [provision of motion to compel disclosure and for sanctions for failure to make automatic disclosure]
13. Rule 37(c)(1) [description of sanctions which may be imposed for failure to make, or supplement, automatic disclosure]
14. Rule 37(g) [provision of sanctions for failure to participate in good faith in the framing of a discovery plan]

Discovery in Board inter partes proceedings will continue to open as it did prior to December 1, 1993 amendments to the Federal Rules of Civil Procedure, that is, as provided in those rules as they existed on November 30, 1993. Thus, interrogatories, requests for production of documents and things, and requests for admission may be served upon the plaintiff after the proceeding commences (i.e., after the notice of opposition or petition for cancellation is filed, and after the mailing by the Board of the notice of institution in an interference or concurrent use proceeding), and upon the defendant with or after service of the complaint by the Board. Discovery depositions generally may be taken by any party after commencement of the proceeding. Board's permission to take a discovery deposition must be obtained in certain situations, including a situation in which the plaintiff seeks to take a deposition prior to the expiration of 30 days after service of the complaint by the Board upon any defendant, except where a defendant has served a notice of taking deposition or otherwise sought discovery or where the notice of deposition: (1) states that the proposed deponent is about to go out of the United States and will be unavailable for examination unless the person's deposition is taken before expiration of the 30-day period, and, (2) sets forth facts to support the statement.

Similarly, the practice embodied in Rules 33(a), 34(b), and 36(a) of the Federal Rules of Civil Procedure, as they read on November 30, 1993, that a defendant may serve responses to interrogatories, requests for production of documents and things, and requests for admission either within 30 days after service of a discovery request (35 days if service of the request for discovery is made by first-class mail, "Express Mail," or overnight courier—Trademark Rule 2.119(c)), or within 45 days after service of the complaint upon it by the Board, whichever is later, will continue to be followed in Board proceedings.

The Patent and Trademark Office will, in due course, publish a notice of proposed rule making to amend, as may be necessary, the trademark rules governing practice and procedure in inter partes proceedings before the Board.

Jan. 15, 1994

ROBERT M. ANDERSON  
Acting Assistant Commissioner  
for Trademarks

[1159 TMOG 14]

(212) **Interlocutory Decisions by the  
Trademark Trial and Appeal Board.**

Only final decisions of the Trademark Trial and Appeal Board are subject to judicial review. Some confusion may exist in *inter partes* trademark proceedings as to whether certain decisions of the Board are "final" for purpose of judicial review.

An example where confusion may arise is a case in which (1) an opposition is filed, (2) applicant counterclaims for cancellation of a registration relied upon by an opposer, and (3) the Board renders a decision (generally on summary judgment) on the opposition, but sets the counterclaim for trial. Under these circumstances, there is no final order of the Board, because a decision has not been entered on the counterclaim.

The party losing the opposition may feel compelled to seek judicial review within two months of the Board's decision to "preserve" its rights. But such an appeal appears to be premature under *Copeland's Enterprises, Inc. v. CNV, Inc.* 887 F.2d 1065, 12 USPQ2d 1563 (Fed. Cir. 1989) (in banc). *Copeland's* is not the only appeal which has been dismissed because it was taken from an interlocutory decision of the Board. See *Cortex Corporation v. W.L. Gore & Associates, Inc.*, No. 91-1016 (Fed. Cir. January 14, 1991) (unpublished), and *Kellogg Co. v. Pack'em Enterprises, Inc.*, No. 90-1336 (Fed. Cir. Sept. 27, 1990) (unpublished).

In an effort to (1) minimize disruption in proceeding pending before the Board, (2) eliminate unnecessary appeals and filing of civil actions, only to have the appeal or civil action dismissed as premature, and (3) provide some certainty to parties and their attorneys as to when an appeal is timely, the Board will, when resolving a merits issue prior to final judgement, generally

indicate that it has entered an "interlocutory" order in the proceeding and further set the time for seeking judicial review of the "interlocutory" order to expire two months from the date a final order is entered in the proceeding.

Jan. 22, 1991

HARRY F. MANBECK, Jr.  
Assistant Secretary and Commissioner  
of Patents and Trademarks

[1123 TMOG 36]

(213) **Patent and Trademark Office  
Trademark Trial and Appeal Board**

**New Title for Members of  
Trademark Trial and Appeal Board**

The Chairman and Members of the Trademark Trial and Appeal Board have been authorized to use the respective titles Chief Administrative Trademark Judge and Administrative Trademark Judge for signing all correspondence and decisions, and for other business-related activities.

The respective titles of Chairman and Member will continue to be the official titles for personnel, budget and fiscal purposes.

Oct. 15, 1993

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

[1156 TMOG 32]

(214) **Department of Commerce  
Patent and Trademark Office**

37 CFR Part 10  
[Docket No. 930366-4319]  
RIN 0651-AA65

**Cross-Appeals in Patent and Trademark  
Office Disciplinary Proceedings**

Agency: Patent and Trademark Office, Commerce.

Action: Proposed Rulemaking.

**Summary:** On July 21, 1993, the Patent and Trademark Office (PTO) proposed amending a rule of practice in practitioner disciplinary proceedings. 58 FR 38994. The proposed rule change provides for a time period for a party to a disciplinary proceeding to file a cross-appeal, after the other party (the respondent or the Director of the Office of Enrollment and Discipline) to the proceeding has appealed from the initial decision of the administrative law judge (ALJ) to the Commissioner. Currently, PTO rules do not provide for such a time period. A party in a disciplinary proceeding may be interested in appealing only if the other party has appealed. Allowing a time period for filing a cross-appeal will give parties to disciplinary cases more flexibility after an initial decision by the administrative law judge and will avoid the necessity of filing a contingent appeal simply to preserve rights in the event the other party files an appeal.

One comment to the rule change proposed on July 21, 1993, was received suggesting substantive changes. This second notice adopts that suggested change.

**Dates:** Written comments must be received on or before [March 16, 1995] to ensure consideration. An oral hearing will not be conducted.

**Addresses:** Address written comments to Commissioner of Patents and Trademarks, Box OED, Washington, D.C. 20231, marked to the attention of Harry I. Mostak. Written comments will be available for public inspection in Suite 518, on the 5th floor of Crystal Park I, located at 2011 Crystal Drive, Arlington, Virginia.



**For Further Information Contact:** Harry I. Moatz by telephone at (703) 308-5273 or by mail marked to his attention and addressed to Commissioner of Patents and Trademarks, Box OED, Washington, D.C. 20231.

**Supplementary Information:** A Notice of Proposed Rulemaking was published in the Federal Register (58 FR 38994) on July 21, 1993, and in the *Official Gazette* of the PTO (1153 Off. Gaz. 32) on August 10, 1993. Comments were due August 20, 1993. One comment was received. The comment suggested a substantive change to the original proposed rulemaking. The PTO has adopted the change and is now publishing a second notice requesting comments on the amended notice.

Pursuant to 37 CFR § 10.132 *et seq.*, the Director of the Office of Enrollment and Discipline within the PTO may initiate a disciplinary proceeding against a practitioner. If the proceeding is contested by the practitioner and the Director continues to prosecute, an ALJ for the Department of Commerce enters an initial decision which includes findings of fact, conclusions of law and an order. 37 CFR § 10.154.

Either party to the proceeding may appeal from the initial decision of the ALJ to the Commissioner within thirty (30) days of the date of the decision. 37 CFR § 10.155(a). However, prior to this proposed rule change, § 10.155(a) did not provide for the filing of a cross-appeal.

With regard to interference proceedings, 37 CFR § 1.304(a) addresses the filing of cross-appeals by stating in pertinent part that:

the time for filing a cross-appeal [to the Court of Appeals for the Federal Circuit] or cross-action [in a district court] expires (1) 14 days after service of the notice of appeal or the summons and complaint or (2) two months after the date of decision of the Board of Patent Appeals and Interferences, whichever is later.

The proposed rule change is similar to the cross-appeal authorized in interference proceedings.

**Response to and Analysis of Comment:** The single comment suggested that the second sentence of the proposed § 10.155(a) be modified by adding "pursuant to § 10.142" after "(1) 14 days after service of the appeal" to make clear that the period for filing a cross-appeal or reply brief runs from service pursuant to § 10.142. The suggestion is being adopted. The comment further suggested that the fifth sentence in the rule proposed on July 21, 1993, be separated into three new sentences. The first and second new sentences make clear that "the other party to an appeal or cross-appeal may file a reply brief," and that a "reply brief by the respondent" is to be "served in duplicate with the Director." The third new sentence provides a date certain for filing any reply brief by avoiding uncertainty as to when "receipt" of an appeal, cross-appeal or copy thereof occurs, and by relying on the date of "service pursuant to § 10.142" of an appeal, cross-appeal, or a copy thereof. The suggestions have been adopted in the proposed rules.

**Other Considerations:** This rule change conforms with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Orders 12612 and 12866, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule change will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of the rule change is to provide a time period to file a cross-appeal in a PTO disciplinary proceeding. See the original notice of proposed rulemaking published in the *Federal Register*, 58 FR at 38996.

The PTO has determined that the rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612. The Office of Management and Budget has determined that the rule change is not significant for the purposes of Executive Order 12866.

The rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, since no record keeping or reporting requirements within the coverage

of the Act are placed upon the public.

#### List of Subjects in 37 CFR Part 10

Administrative practice and procedure, Inventions and patents, Lawyers, Reporting and recordkeeping requirements.

For the reasons set out in the preamble, and pursuant to the authority contained in 35 U.S.C. 6, the PTO proposes to amend 37 CFR part 10 as follows, wherein deletions are indicated by brackets ( ) and additions by arrows (▶◀):

#### Part 10-Representation of Others Before The Patent and Trademark Office

1. The authority citation for 37 CFR part 10 would continue to read as follows:

**Authority:** 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

2. Section 10.155 is amended by revising paragraph (a) to read as follows:

#### § 10.155 Appeal to the Commissioner.

(a) Within thirty (30) days from the date of the initial decision of the administrative law judge under § 10.154, either party may appeal to the Commissioner. ▶If an appeal is taken, the time for filing a cross-appeal expires (1) 14 days after the date of service of the appeal pursuant to § 10.142 or (2) 30 days after the date of the initial decision of the administrative law judge, whichever is later.◀ An appeal ▶or cross appeal◀ by the respondent will be filed and served with the Director in duplicate and will include exceptions to the decisions of the administrative law judge and supporting reasons for those exceptions. If the Director files the appeal ▶or cross-appeal◀, the Director shall serve ▶on the other party◀ a copy of the appeal ▶or cross-appeal◀. ▶The other party to an appeal or cross-appeal may file a reply brief. A respondent's reply brief shall be filed and served in duplicate with the Director. The time for filing any reply brief expires◀ [Within] thirty (30) days after ▶the date of◀ [receipt] ▶service pursuant to § 10.142◀ of an appeal ▶, cross-appeal◀ or copy thereof[, the other party may file a reply brief, in duplicate with the Director]. If the Director files [the] ▶a◀ reply brief, the Director shall serve ▶on the other party◀ a copy of the reply brief. Upon the filing of an appeal ▶, cross appeal, if any,◀ and [a] reply brief▶◀, if any, the Director shall transmit the entire record to the Commissioner.

January 13, 1995

MICHAEL K. KIRK  
Deputy Assistant Secretary  
of Commerce and Deputy  
Commissioner of Patents  
and Trademarks

[1171 TMOG 33]

#### (215) Request for Information to Aid in the Implementation of the Recordation Requirements of Section 8 of the Fastener Quality Act

**Agency:** Patent and Trademark Office, Commerce  
**Action:** Notice; Request for Information

**Summary:** The Patent and Trademark Office (PTO) is seeking information concerning alphanumeric designations currently in use by manufacturers or distributors of industrial fasteners. These alphanumeric designations may be used to signify the physical characteristics, strength, chemical content, size or other information about the fastener upon which they appear or they may be used as common law trademarks to identify and distinguish the manufacturer or distributor of such fasteners. The PTO needs information concerning these alphanumeric designations in order to administer the proposed fastener recordal system published on Aug. 17, 1992, at 57 F.R. 37060, 37061 to implement the requirements of Section 8 of the Fas-

tener Quality Act, Public Law 101-592. Therefore, the PTO is requesting from fastener industry associations, standards bodies, or individual manufacturers or distributors, any general or specific information available concerning alphanumeric designations currently in use within the industry, whether as unregistered trademarks, as marks required by a standard, or for any other purpose.

**Date:** Comments should be submitted on or before Sept. 27, 1993. Comments received after this date will be considered if possible.

**Addresses:** All comments concerning alphanumeric designations should be addressed to Lynne G. Beresford, Trademark Legal Administrator, Commissioner of Patents and Trademarks, Washington, D.C. 20231, telephone number (703) 305-9464.

**For Further Information Contact:** Lynne G. Beresford, Trademark Legal Administrator, (703) 305-9464.

**Supplementary Information:** In 1990, Congress enacted the Fastener Quality Act, Public Law 101-592 (the Act) to protect public safety, deter introduction of non-conforming fasteners into commerce, improve the tracing of fasteners used in critical applications, and provide customers with greater assurance that fasteners meet stated specifications. The Act requires that certain fasteners sold in commerce conform to the specifications to which they are represented to be manufactured; provides for accreditation of laboratories engaged in fastener testing; and requires the inspection, testing and certification (in accordance with standardized methods) of fasteners covered by the Act.

Section 8 of the Act prohibits offering fasteners for sale that are required by an applicable standard or specification to bear a raised or depressed insignia identifying the manufacturer or private label distributor unless such manufacturer or distributor has complied with the requirements of a program of the Secretary of Commerce for the recordation of such insignia in order to ensure that the fasteners can be traced to the manufacturer or distributor.

The program for recordation of fastener insignias, established by the Secretary of Commerce and administered by the Patent and Trademark Office, will allow the owner of a mark, which is the subject of a duly filed trademark application or registration, to apply for recordal of that mark as its fastener insignia. However, if the manufacturer or private label distributor does not wish to use a trademark as its fastener insignia, it will be permitted to apply for a unique alphanumeric designation for that purpose.

The PTO wants to ensure that it does not inadvertently issue an alphanumeric designation that is either already in use by a manufacturer or distributor as its identifying insignia, or a designation already in use by the industry to signify the physical characteristics, strength, chemical content, size or other information about the fastener. For that reason, the PTO is requesting from fastener industry associations, standards bodies, or individual manufacturers or distributors, any general or specific information available concerning alphanumeric designations currently in use within the industry, whether as unregistered trademarks, as marks required by a standard, or for any other purpose. The PTO does not need information concerning specific registered alphanumeric trademarks, as that information is readily available from the PTO's database.

(Authority: 15 USC 5407)

July 15, 1993

MICHAEL K. KIRK  
Acting Assistant Secretary  
and Acting Commissioner  
of Patents and Trademarks

[1154 TMOG 9]

#### (216) FEDERAL REGISTER NOTICE DEPARTMENT OF COMMERCE Patent and Trademark Office

**Notice of Hearings and Request for Comments on Preliminary Draft of the Report of the Working Group on Intellectual Property Rights**

**Agency:** Patent and Trademark Office, Commerce

**Action:** Notice of hearings and request for public comments  
**Summary:** The Working Group on Intellectual Property Rights of the White House Information Infrastructure Task Force has issued a preliminary draft of its report, "Intellectual Property and the National Information Infrastructure," and is soliciting public comment. Copies of the preliminary report may be obtained by calling the U.S. Patent and Trademark Office at (703) 305-9300 or by sending a written request to the Commissioner of Patents and Trademarks, U.S. Patent and Trademark Office, Box 4, Washington, D.C. 20231, marked to the attention of Terri A. Southwick, Office of Legislative and International Affairs. The Working Group will hold public hearings on the preliminary report in Washington, D.C., Chicago and Los Angeles.

**Dates:** The public hearing in Chicago will be held on September 14, 1994, from 9 a.m. to 5 p.m. The public hearing in Los Angeles will be held on September 16, 1994, from 9 a.m. to 5 p.m. The public hearing in Washington, D.C., will be held on September 22 and 23, 1994 from 9 a.m. to 5 p.m. Requests to present oral testimony at the Chicago or Los Angeles hearings must be received on or before September 7, 1994. Requests to present oral testimony at the Washington, D.C., hearings must be received on or before September 15, 1994. As announced in the previous notice regarding the submission of written comments on the preliminary report, published at 59 Fed. Reg. 35912 (July 14, 1994), all written comments must be submitted on or before September 7, 1994. Comments in reply to initial written comments may be submitted no later than September 28, 1994.

**Addresses:** The hearing in Chicago will be held at the University of Chicago, Ida Noyes Hall, 1212 East 59th Street, Chicago, Illinois. The hearing in Los Angeles will be held at the University of California at Los Angeles, 1100 Schoenberg Hall, 405 Hilgard Avenue (Southeast side of UCLA Campus), Los Angeles, California. The hearings in Washington, D.C. will be held at the Andrew W. Mellon Auditorium, Constitution Avenue between 12th and 14th Streets, N.W., Washington, D.C. Requests to present oral testimony should be submitted to the Commissioner of Patents and Trademarks, U.S. Patent and Trademark Office, Box 4, Washington, D.C. 20231, marked to the attention of Terri A. Southwick, Attorney-Advisor, Office of Legislative and International Affairs. Requests should specify the date and location of the hearing at which the requester wishes to present oral testimony, and should include the name, address, telephone number, fax number and professional affiliation, if any, of the requester.

The transcripts of the hearings will be made available for public inspection 10 days after the hearings at the Scientific and Technical Information Center of the Patent and Trademark Office, Room 2C01, Crystal Plaza 3/4, 2021 Jefferson Davis Highway, Arlington, Virginia, between the hours of 9 a.m. and 4 p.m., Monday through Friday, except holidays. Information about obtaining copies of transcripts of the hearings may be obtained by calling (703) 305-9300 no sooner than 10 days after the hearings.

**For Further Information Contact:** Terri A. Southwick or Michael O'Neil, Office of Legislative and International Affairs, U.S. Patent and Trademark Office, Box 4, Washington, D.C. 20231. Telephone: (703) 305-9300; Fax: (703) 305-8885.

**Supplementary Information:** The Working Group on Intellectual Property Rights, chaired by Assistant Secretary of Commerce and Commissioner of Patents and Trademarks Bruce A. Lehman, was established as part of the White House Information Infrastructure Task Force. The Task Force, chaired by Secretary of Commerce Ronald H. Brown, was created to work with Congress and the private sector to develop comprehensive telecommunications and information policies aimed at articulating and implementing the Administration's vision for the National Information Infrastructure (NII).

"Intellectual Property and the National Information Infrastructure: A Preliminary Draft of the Report of the Working Group on Intellectual Property Rights" represents the Working Group's examination and analysis to date of the intellectual property implications of the NII, and includes the Group's draft findings and recommendations. While it addresses each of the major areas of intellectual property law, including patent, trademark and trade secret, the preliminary report focuses primarily on copyright law and its application and effectiveness in the context of the NII.



The Working Group solicited written comments from the public on the preliminary report in a notice published at 59 Fed. Reg. 35912 on July 14, 1994.

Dated: Aug. 12, 1994

Bruce A. Lehman  
*Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks*

[1166 TMOG 17]

#### (217) Iraqi Sanctions Regulations

On Jan. 18, 1991, the Department of the Treasury, Office of Foreign Assets Control (OFAC), published the Iraqi Sanctions Regulations (Regulations) (31 CFR Part 575). 56 Fed. Reg. 2112. The regulations implement Executive Orders 12722 (Aug. 2, 1990) and 12724 (Aug. 9, 1990) relating to certain property and transactions in which the Government of Iraq and persons in Iraq may have an interest.

It appears that the provisions of the Executive Orders and Regulations prohibit transactions relating to the filing or prosecution of applications for patents or for registration of trademarks, where an Iraqi interest is involved. The prohibited transactions, however, may be authorized by a specific license issued pursuant to the procedures described in Section 575.801 of Subpart H of the Regulations.

This notice is intended to alert practitioners and applicants to the prohibitions which may apply to matters before the Patent and Trademark Office, (PTO) if Iraqi interests are involved. This notice is further intended to advise that where such interests or potential interests come to the attention of the PTO, an appropriate specific license from OFAC may be required.

Jan. 29, 1991

HARRY F. MANBECK, Jr.  
*Commissioner of Patents  
and Trademarks*

[1123 TMOG 36]

#### (218) Notice Regarding Patent and Trademark Rights in the Russian Federation

Representatives of the Russian Federation met with representatives of the U.S. Government on Monday, February 24, 1992, at the U.S. Patent and Trademark Office. The Russian delegation sought information about the operation of the U.S. patent and trademark systems and provided information about the treatment of inventions, industrial designs, utility models, trademarks, service marks, and appellations of origin in the Russian Federation.

Following is the text of a statement from the Chairman of the Committee for Patents and Trademarks (ROSPATENT), outlining the status of industrial property protection in the Russian Federation and the plans for the future.

#### INFORMATION

by the Committee for Patents and Trademarks

Due to the fact that the draft laws on patents and on trademarks were approved in the first hearing by the Supreme Soviet of the Russian Federation and taking into account numerous questions of domestic inventors, foreign patent offices and patent attorneys, the Committee for Patents and Trademarks (Rospatent) of the Ministry of Science, Higher School and Technical Policy of the Russian Federation hereby informs that:

1. Until the Patent Law and Trademark Law become effective, the provisions of the USSR Laws on Inventions, Industrial Designs and Trademarks, that are adopted as the normative base by the States party to the Provisional Agreement on the Industrial Property Protection, as signed in Minsk on Dec. 27, 1991, are applied in the territory of the Russian Federation.

According to the Provisional Agreement, the Russian Federation, as well as the other States party to it, recognizes the validity of titles of protection issued earlier pursuant to the USSR Laws in the territory of the Russian Federation.

Rospatent has submitted to the Government of the Russian Federation its proposals on issuing a normative act which is to certify the adoption by the Russian Federation of the said obligations arising out of the Provisional Agreement.

2. The applicants, who have filed applications for inventions, industrial designs and trademarks with the former USSR Gospatent, may, without losing the priority dates, wait until the Provisional Agreement on the Industrial Property Protection becomes effective, the Interstate Patent Office is established and its working procedures for issuing interstate titles of protection are elaborated.

3. In accordance with the abovesaid proposals by Rospatent, as submitted to the Government of the Russian Federation, any applicant wishing to obtain a patent (a trademark certificate) of the Russian Federation will be given the right to seek, on the basis of an application filed, for provisional protection in the territory of the Russian Federation.

Such provisional protection will be granted to inventions, industrial designs and trademarks claimed in the applications in respect of which the examiners have taken decisions on the possibility of issuing patents (certificates), and will last from the date when the data on an application are published in a special gazette to the date of issuance of a patent (certificate) of the Russian Federation.

The provisional protection in the territory of the Russian Federation will not impose legal barriers to obtaining, by the applicant, an interstate patent (certificate) after the Provisional Agreement on the Industrial Property Protection becomes effective. The priority date will still be considered as the date of filing the application either with the former USSR Gospatent or with Rospatent, with due regard to the conventional priority.

4. According to the Provisional Agreement on the Industrial Property Protection signed on Dec. 27, 1991, an inventor's certificate issued in the former USSR may not be exchanged for patents of the individual States party to the Provisional Agreement. The question of exchanging inventor's certificates for interstate patents will be finally resolved in the course of developing and concluding an Interstate Convention.

In this connection, Rospatent does not exchange inventors' certificates for patents if a petition to this extent was filed after Dec. 27, 1991.

V. Rassokhin  
*Chairman of Rospatent*

Copies of unofficial translations of the draft laws referred to in the statement are available from Box 4, U.S. Patent and Trademark Office, Washington, DC 20231. The charge is \$4.00 to cover the cost of duplication. Checks should be made payable to the Commissioner of Patents and Trademarks.

March 2, 1992

HARRY F. MANBECK, Jr.  
*Assistant Secretary and Commissioner  
of Patents and Trademarks*

[1136 TMOG 216]

#### (219) Regarding Industrial Property Protection in Ukraine

The following announcement of Ukraine was furnished by the World Intellectual Property Organization of Geneva, Switzerland.

#### ANNOUNCEMENT ON THE PROVISIONAL REGULATION CONCERNING THE LEGAL PROTECTION OF INDUSTRIAL PROPERTY IN UKRAINE

The President of Ukraine, by his Decree of Sept. 18, 1992, approved the Provisional Regulation on Legal Protection of Objects of Industrial Property and Rationalization Proposals in

Ukraine ("Regulation"). The Regulation entered into force on Sept. 18, 1992.

The situation of industrial property protection in Ukraine, as resulting in particular from the transitional provisions of the Regulation, is summarized below.

#### I. The Transitional Provisions Concerning Priority and, in Respect of Applications for Patents of Inventions, the Carrying Out of Examination

(1) Any priority claimed within six months from the entry into force of the Regulation, i.e. until Mar. 18, 1993, on the basis of the first filing in a State party to the Paris Convention for the Protection of Industrial Property, will be recognized even if it is claimed after twelve months from the first filing in the case of patents for inventions, or six months from the first filing in the case of industrial designs or trademarks, provided that it is claimed not later than twenty-seven months from the first filing in the case of patents for inventions, or not later than twenty-one months from the first filing in the case of industrial designs and trademarks.

(2) The applicant or any other person may submit to the State Patent Office of Ukraine within five years from the filing date a request for the substantive examination of an application for a patent for invention. The request must be accompanied by a search report established by an International Searching Authority under the Patent Cooperation Treaty (PCT) or an organization registered with the State Patent Office of Ukraine as a Searching Authority, or by evidence that an action to grant a patent has been taken by a Patent Office which has a substantive examination system for granting patents.

#### II. Applications for Industrial Property Rights Filed with the Patent Office of the Soviet Union

(3) An applicant of an application for a patent for invention, for an inventor's certificate, for an industrial design patent or certificate or for a trademark certificate filed with the Patent Office of the Soviet Union may request the State Patent Office of Ukraine within six months from the date of entry into force of the Regulation, i.e., until Mar. 18, 1993, that the said application be further processed according to the Regulation. The request must be accompanied by a copy of said application, including a copy of the request showing the filing date as sent back by the Patent office of the Soviet Union to the applicant, and by any available evidence showing that the said application still had effect on Dec. 24, 1991. The filing date and any priority date of the said application will be maintained.

#### III. Industrial Property Rights Granted by the Patent Office of the Soviet Union

(4) Patents for inventions, industrial design patents and trademark certificates granted by the Patent Office of the Soviet Union prior to Dec. 25, 1991, will, after their registration by the State Patent Office of Ukraine at the request of the owner and upon furnishing of a document for payment of the prescribed fee (see paragraph (11), below), be considered as having the same effects for the remaining period of their validity as a patent for invention, industrial design patent or trademark certificate granted in accordance with the Regulation by the State Patent Office of Ukraine. The duration of the said validity is 20 years from the filing date of the application in the case of a patent for invention, 15 years from the filing date of the application in the case of an industrial design patent and, in the case of a trademark certificate, 10 years from the filing date of the application (if the period of validity of the certificate had not yet been extended by Dec. 24, 1991) or from the date of the request for extension of the period of validity (if the period of validity of the certificate had already been extended by Dec. 24, 1991). The request must be filed within six months from the date of entry into force of the Regulation, i.e., until Mar. 18, 1993, and must be accompanied by a copy of the patent or certificate granted by the Patent Office of the Soviet Union.

(5) As regards inventors' certificates and industrial design certificates granted by the Patent Office of the Soviet Union in relation to which a 20-year term in the case of inventions, or a 15-year term in the case of industrial designs, both counted from the filing date of the application, has not expired before

the entry into force of the Regulation, i.e., prior to Sept. 18, 1992, the State Patent Office of Ukraine will grant, at the request of the inventor (inventors) and with the consent of the applicant, a Ukrainian patent to the inventor himself, or to any other physical or legal person, with their consent, indicated in the request, or to the Ukrainian Inventions Foundation. In the case of inventions, if the said request is not made within the period of one year after the entry into force of the Regulation, i.e., until Sept. 18, 1993, inventors' certificates granted by the Patent Office of the Soviet Union shall be exchanged for Ukrainian patents granted to the Ukrainian Inventions Foundation. Any Ukrainian patent to which this paragraph applies will be valid until the expiration of 20 years from the filing date of the application in the case of inventions, and 10 years from the filing date of the application, with an opportunity of subsequent extension, upon request of the owner, but not longer than for another 5-year period in the case of industrial designs.

#### IV. Effects in Ukraine of International Applications under the Patent Cooperation Treaty (PCT)

(6)(a) On Sept. 21, 1992, Ukraine deposited a declaration of continuation the effect of which is that the Patent Cooperation Treaty (PCT) is applied by Ukraine. Nationals and residents of Ukraine can therefore file international applications, and Ukraine can be designated and elected in international applications filed, from that date.

(b) On Sept. 29, 1992, the Assembly of the PCT Union adopted, with effect on Oct. 1, 1992, new Rules 32.1 and 32.2 in the Regulations under the PCT, concerning the extension of international applications to certain successor States.

(c) For the purpose of determining the status of international applications with respect to Ukraine, one has to distinguish between

(i) international applications designating the Soviet Union which were filed prior to Dec. 25, 1991 (see (d), below);

(ii) international applications—irrespective of the designations, they contain—which were filed between Dec. 25, 1991, and Nov. 23, 1992 (see (e) to (g), below);

(iii) international applications designating Ukraine filed on or after Sept. 21, 1992 (see (h), below).

(d) As regards any international application whose international filing date is prior to Dec. 25, 1991, and in which the Soviet Union has been designated, the "national filing effect" of any such application under Article 11(4) of the PCT will, pursuant to the deposit by Ukraine of its declaration of continuation, be recognized in Ukraine (provided that the international application has not lost its effect in the Soviet Union by Dec. 24, 1991). The conditions under which any such international application, or any patent or inventor's certificate resulting therefrom and granted by the Patent Office of the Soviet Union, may continue to have effect in Ukraine are the following:

(i) if a patent for invention or an inventor's certificate has been granted by the Patent Office of the Soviet Union on the basis of the international application, the conditions described in paragraphs (4) and (5), above, are applicable;

(ii) if the applicant has entered the national phase before the Patent Office of the Soviet Union but a patent for invention or an inventor's certificate had not been granted by the Patent Office of the Soviet Union without the application having been rejected by that Office, the applicant must, until Mar. 18, 1993,

—furnish to the State Patent Office of Ukraine a copy of the Russian translation submitted to the Patent Office of the Soviet Union and any available evidence showing that the application still had effect on Dec. 24, 1991,

—file the request referred to in paragraph (3), above, with the State Patent Office of Ukraine, and

—furnish to the State Patent Office of Ukraine a document for payment of the prescribed fee (see paragraph 11, below);

(iii) if the applicant has not entered the national phase before the Patent Office of the Soviet Union and the time limit for entering the national phase



before that Office had not expired on Dec. 24, 1991, the applicant must, until Mar. 18, 1993, furnish to the State Patent Office of Ukraine a translation of the international application into Ukrainian or Russian and a document for payment of the prescribed fee (see paragraph 11, below).

(e) As regards any international application whose filing date is later than Dec. 24, 1991, and earlier than Nov. 24, 1992<sup>1</sup>, its effects may be extended to Ukraine (irrespective of the designations it contains) through the performance by the applicant of the following acts:

- (i) filing with the International Bureau of the World Intellectual Property Organization (WIPO) a request for extension;
- (ii) paying to the International Bureau of WIPO an extension fee of 185 Swiss francs, payable in Swiss francs.

(f) The applicant in respect of each and every international application referred to in (e), above, or his agent or common representative if there is one, will receive a written notification from the International Bureau of WIPO calling his attention to the fact that he can, by filing a written request for extension, extend the effects of the international application to Ukraine. The notification will, in particular, specify the modes of payment of the extension fee of 185 Swiss francs. The request for extension must contain the identification of the international application by its international application number. A form which may be used for the purpose of requesting the extension to Ukraine will be attached to the notification. The request for extension must be in English or French, and may be sent by telefax or telex. The request for extension and the corresponding payment must reach the International Bureau of WIPO before the expiration of three months from the date of the notification sent by the International Bureau of WIPO; if either the request or the fee is received later, the request will be refused. It is recommended that applicants await the notification from the International Bureau of WIPO and use the form attached to it, but requests and payments may be made without waiting for the notification from the International Bureau of WIPO.

(g) If the conditions described in (e) and (f), above, are fulfilled, Ukraine will be considered as having been designated in the international application on its international filing date. For entering the national phase before the State Patent Office of Ukraine, the applicant must furnish to that Office a translation of the international application into Ukrainian or Russian and a document for payment of the prescribed fee (see paragraph 11, below) until Dec. 31, 1993, or within the following time limit if that time limit expires after Dec. 31, 1993:

- (i) before the expiration of 21 months from the priority date if Ukraine is not elected under Chapter II of the PCT within 19 months from the priority date;
- (ii) before the expiration of 31 months from the priority date if Ukraine is elected under Chapter II of the PCT within 19 months from the priority date.

(h) As regards any international application whose international filing date is later than Sept. 20, 1992, and in which Ukraine has been designated, the applicant, in order to enter the national phase before the State Patent Office of Ukraine, must furnish to that Office a translation of the international application into Ukrainian or Russian and a document for payment of the prescribed fee (see paragraph 11, below) to that Office within the following time limit:

- (i) before the expiration of 21 months from the priority date if Ukraine is not elected under Chapter II of the PCT within 19 months from the priority date;
- (ii) before the expiration of 31 months from the priority date if Ukraine is not elected under Chapter II of the PCT within 19 months from the priority date.

<sup>1</sup>With the exception of any such international application whose international filing date is later than Sept. 21, 1992, and in which Ukraine has been designated under Rule 4.9(a) of the Regulations under the PCT: in such a case, the procedure described in (e) to (g) is not applicable, and the procedure described in (h) is applicable. It should be noted that only those international applications filed on or after Sept. 21, 1992, can specifically designate Ukraine.

#### V. Effects in Ukraine of International Registrations under the Madrid Agreement Concerning the International Registration of Marks

(7)(a) On Sept. 21, 1992, Ukraine deposited a declaration of continuation the effect of which is that the Madrid Agreement Concerning the International Registration of Marks is applied by Ukraine.

(b) On Sept. 29, 1992, the Assembly of Madrid Union adopted, with effect on Oct. 1, 1992, a new Rule 38 in the Regulations under the Madrid agreement, concerning the effect of international registrations in certain successor States.

(c) Pursuant to the deposit of the declaration of continuation and to the decision of the Assembly, certain international registrations may have effect in Ukraine subject to the conditions described below. Those international registrations are those which have territorial extension to the Soviet Union effective from a date prior to Dec. 25, 1991.

(d) The conditions referred to above are the following:

- (i) the filing with the International Bureau of the World Intellectual Property Organization (WIPO) of a request;
- (ii) the payment to the International Bureau of WIPO of a fee, the amount of which is 62 Swiss francs per international registration.

(e) The owner of each and every international registration concerned, or his representative (if the owner has a representative whose name appears in the International Register), will receive a written notice from the International Bureau of WIPO calling his attention to the fact that he can, by filing a written request, continue the effect of the international registration to Ukraine. The notice will, in particular, specify the modes of payment of the fee. The request must contain the identification of the international registration concerned by its international registration number. A form (in French) will be attached to the notice and may be used. The request must be in English or French, and may be sent by telefax or must reach the International Bureau of WIPO before the expiration of six months from the date of the notice sent by the International Bureau of WIPO; if either the request or the fee is received later, the request will be refused. Requests and payments may be made without waiting for the notice of the International Bureau of WIPO.

(f) If the conditions described above are fulfilled, the international registration concerned will, with respect to Ukraine, have effect as from the effective date of the territorial extension to the Soviet Union and benefit from any priority validly claimed in regard to such extension.

(g) For each international registration which has no territorial extension to the Soviet Union or whose international registration date is later than Dec. 24, 1991, protection in Ukraine can only be obtained by filing, through the intermediary of the national Office of the country of the owner, a request for territorial extension under Rule 20 of the Regulations under the Madrid Agreement. It is to be noted that requests for territorial extension to Ukraine are possible at present.

#### VI. Prior User Right

(8) Enterprises, organizations and institutions which have already started to use inventions or industrial designs for which protection can be obtained according to paragraph (5), above, prior to the entry into force of the Regulation, i.e., prior to Sept. 18, 1992, will have the right to a continued use of such inventions and industrial designs, but without increasing the volume of their utilization.

#### VII. New Applications

(9) From the date of entry into force of the Regulation, i.e. from Sept. 18, 1992, onward, applications for patents for inventions, for industrial design patents and for trademark certificates can be filed with the State Patent Office of Ukraine. The request as a part of the application must be filed in Ukrainian and be accompanied on the filing date by the prescribed fees. Other parts of the application may be presented in Ukrainian or Russian. They may also be presented in English, French or German, provided that a translation into Ukrainian is presented upon request of the state Patent Office of Ukraine.

#### VIII. Procedural Provisions

(10) If an applicant does not have his ordinary residence or principal place of business in Ukraine, he must authorize a representative in Ukraine, and all applications and requests referred to in the present announcement must be filed through the intermediary of such a representative. The list of the persons who can act as representatives is available at the State Patent Office of Ukraine.

(11) The amounts of the fees which are referred to as "prescribed fees" in the present announcement as well as the kind of document which constitutes a "document for payment of the prescribed fee" will be published in a separate announcement.

#### IX. Address of the Patent Office

State Patent Office of Ukraine  
4, Karl Leibknecht Street  
252008 Kiev  
Ukraine  
Tel.: (7044) 293-2188  
Fax.: (7044) 268-2588

Dec. 11, 1992

DOUGLAS B. COMER  
Acting Assistant Secretary and  
Acting Commissioner of  
Patents and Trademarks

[1146 TMOG 680]

#### (220) Regarding Industrial Property Protection in the Czech Republic and the Slovak Republic

The following announcements concerning industrial property protection in the Czech Republic and the Slovak Republic were furnished by the World Intellectual Property Organization (WIPO).

#### Announcement on the Protection of Industrial Property in the Czech Republic

In view of the fact that Czechoslovakia ceased to exist on Dec. 31, 1992, and that the Czech Republic and the Slovak Republic became independent States on Jan. 1, 1993, the situation of industrial property protection in the Czech Republic is summarized below.

#### I. Legal Basis

(1) The respective legal acts on the protection of industrial property of Czechoslovakia remain applicable in the Czech Republic.

#### II. Applications for Industrial Property Rights Filed with the Federal Office for Inventions of Czechoslovakia and Industrial Property Rights Granted by that Office,

(2) Applications for industrial property rights filed with the Federal Office for Inventions of Czechoslovakia and industrial property rights granted by that Office maintain their legal effect in both the Czech Republic and the Slovak Republic, it being understood that the next fees which are to be paid must be paid, for protection in both the Czech Republic and the Slovak Republic, to both the Industrial Property Office of the Czech Republic and the Industrial Property Office of the Slovak Republic.

#### III. International Treaties

(3) The Czech Republic has deposited, with effect on Jan. 1, 1993, a declaration the effect of which is that all those treaties administered by WIPO to which Czechoslovakia was party continue to be applicable as far as the Czech Republic is concerned. Those treaties are: the Convention Establishing the World Intellectual Property Organization, the Paris Convention for the Protection of Industrial Property, the Madrid Agreement for the Repression of False or Deceptive Indications of Source on Goods, the Madrid Agreement Concerning the International

Registration of Marks, the Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks, the Lisbon Agreement for the Protection of Appellations of Origin and their International Registration, the Locarno Agreement Establishing an International Classification for Industrial Designs, the Patent Cooperation Treaty (PCT), the Strasbourg Agreement Concerning the International Patent Classification, the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, the Berne Convention for the Protection of Literary and Artistic Works, and the Treaty on the International Registration of Audiovisual Works.

#### IV. Effects in the Czech Republic of International Applications under the Patent Cooperation Treaty (PCT)

(4)(a) Pursuant to the deposit of the declaration of continuation referred to in paragraph (3), above, nationals and residents of the Czech Republic can file international applications, and the Czech Republic can be designated and elected in international applications filed, on or after Jan. 1, 1993.

(b) Rules 32.1 and 32.2 of the Regulations under the PCT permit the extension of international applications to the Czech Republic.

(c) For the purpose of determining the status of international applications with respect to the Czech Republic, one has to distinguish between

(i) international applications specifically<sup>1</sup> designating Czechoslovakia which were filed prior to Jan. 1, 1993 (see (d), below);

(ii) international applications not specifically<sup>1</sup> designating the Czech Republic—irrespective of the other designations they contain—filed between Jan. 1, 1993, and Feb. 21, 1993 (see (e) to (g) below);

(iii) international applications specifically<sup>1</sup> designating the Czech Republic filed on or after Jan. 1, 1993 (see (h) below).

(d) As regards any international application whose international filing date is prior to Jan. 1, 1993, and in which Czechoslovakia is specifically designated, the "national filing effect" of any such application under Article 11(4) of the PCT will, pursuant to the deposit by the Czech Republic of its declaration of continuation, be recognized in the Czech Republic (provided that the international application had not lost its effect in Czechoslovakia by Dec. 31, 1992). The conditions under which any such international application, or any patent resulting therefrom and granted by the Federal Office for Inventions of Czechoslovakia, may continue to have effect in the Czech Republic are the following:

(i) if a patent has been granted by the Federal Office for Inventions of Czechoslovakia on the basis of the international applications, paragraph (2), above, is applicable;

(ii) if the applicant has entered the national phase before the Federal Office for Inventions of Czechoslovakia but a patent for invention has not been granted by the Office without the application having been rejected by it, paragraph (2), above, is applicable;

(iii) if the applicant has not entered the national phase before the Federal Office for Inventions of Czechoslovakia and the time limit for entering the national phase had not expired on Dec. 31, 1992, the applicant must, before the expiration of the applicable time limit under PCT Article 22 or 39(1), furnish to the Industrial Property Office of the Czech Republic a translation of the international application into the Czech language and pay the prescribed fee.

(e) As regards any international application whose international filing date is later than Dec. 31, 1992, and earlier than Feb. 22, 1993,<sup>2</sup> and in which the Czech Republic is not specifically designated, its effects may be extended to the Czech

<sup>1</sup>In this announcement, an international application is regarded as "specifically" designating a State either if that State has been designated under Rule 4.9(a) of the Regulations under the PCT or if the designation of that State has been confirmed under Rule 4.9(c) of those Regulations.

<sup>2</sup>With the exception of any international application whose international filing date is later than Dec. 31, 1992, and in which the Czech Republic is specifically designated: in such a case, the procedure described in (e) to (g) is not applicable, and the procedure described in (h) is applicable.



Republic (irrespective of the other designations it contains) through the performance by the applicant of the following acts:

(i) filing with the International Bureau of the World Intellectual Property Organization (WIPO) a request for extension;

(ii) paying to the International Bureau of WIPO an extension fee of 185 Swiss francs, payable in Swiss francs.

(f) The applicant in respect of each and every international application referred to in (e), above, or his agent or common representative if there is one, will receive a written notification from the International Bureau of WIPO calling his attention to the fact that he can, by filing a written request for extension, extend the effects of the international application to the Czech Republic. The notification will, in particular, specify the modes of payment of the extension fee of 185 Swiss francs. The request for extension must contain the identification of the international application by its international application number. A form which may be used for the purpose of requesting the extension to the Czech Republic will be attached to the notification. The request for extension must be in English or French, and may be sent by telefax or telex. The request for extension and the corresponding payment must reach the International Bureau of WIPO before the expiration of three months from the date of the notification sent by the International Bureau of WIPO; if either the request or the fee is received later, the request will be refused. It is recommended that applicants await the notification from the International Bureau of WIPO and use the form attached to it, but requests and payments may be made without waiting for the notification from the International Bureau of WIPO.

(g) If the condition described in (e) and (f), above, are fulfilled, the Czech Republic will be considered as having been designated in the international application on its international filing date. For entering the national phase before the Industrial Property Office of the Czech Republic, the applicant must furnish to that Office a translation of the international application into the Czech language and pay the prescribed fee within three months from the date of the request for extension or, if it expires later, within the following time limit:

(i) before the expiration of 21 months from the priority date if the Czech Republic is not elected under Chapter II of the PCT within 19 months from the priority date;

(ii) before the expiration of 30 months from the priority date if the Czech Republic is elected under Chapter II of the PCT within 19 months from the priority date.

(h) As regards any international application whose *international filing date is later than Dec. 31, 1992*, and in which the Czech Republic is specifically designated, the applicant, in order to enter the national phase before the Industrial Property Office of the Czech Republic, must furnish to that Office a translation of the international application into the Czech language and pay the prescribed fee to that Office within the following time limit:

(i) before the expiration of 21 months from the priority date if the Czech Republic is not elected under Chapter II of the PCT within 19 months from the priority date;

(ii) before the expiration of 30 months from the priority date if the Czech Republic is elected under Chapter II of the PCT within 19 months from the priority date.

#### V. Effects in the Czech Republic of International Registrations under the Madrid Agreement Concerning the International Registration of Marks.

(5)(a) Pursuant to the deposit of the declaration of continuation referred to in paragraph (3), above, and pursuant to Rule 38 of the Regulations under the Madrid Agreement, any international registration with a territorial extension to Czechoslovakia effective from a date prior to Jan. 1, 1993, may have effect in the Czech Republic subject to the following conditions:

(i) the filing with the International Bureau of the World Intellectual Property Organization (WIPO) of a request;

(ii) the payment to the International Bureau of WIPO of a fee, the amount of which is 62 Swiss francs per international registration.

(b) The owner of each and every international registration concerned, or his representative (if the owner has a representative whose name appears in the International Register), will receive a written notice from the International Bureau of WIPO

calling his attention to the fact that he can, by filing a written request, obtain a continuation of the effect of the international registration in the Czech Republic. The notice will contain a request form (in French) and specify the modes of payment of the fee. The request must contain the identification of the international registration concerned by its international registration number. The request must be made in English or French, and may be sent by telefax or telex. The request and the corresponding payment must reach the International Bureau of WIPO before the expiration of six months from the date of the notice sent by the International Bureau of WIPO; if either the request or the fee is received later, the request will be refused. Requests and payments may be made without waiting for the notice of the International Bureau of WIPO.

(c) If the conditions described above are fulfilled, the international registration concerned will, with respect to the Czech Republic, have effect as from the effective date of territorial extension to Czechoslovakia and benefit from any priority validly claimed in regard to such extension.

(d) For each international registration which has no territorial extension to Czechoslovakia or whose international registration date is later than Dec. 31, 1992, protection in the Czech Republic can only be obtained by filing, through the intermediary of the national Office of the country of the owner, a request for territorial extension under Rule 20 of the Regulations under the Madrid Agreement. It is to be noted that requests for territorial extension to the Czech Republic are possible at present.

#### VI. New Applications for Industrial Property Rights

(6) Applications for industrial property rights filed from Jan. 1, 1993, with the Industrial Property Office of the Czech Republic have no effect in the Slovak Republic. However, unless it is clear that the applicant does not seek protection in the Slovak Republic, the Industrial Property Office of the Czech Republic will, during a transitory period of a few months, invite the applicant to specify, within a time limit which will be fixed in the invitation, whether he wants to obtain protection in the Czech Republic only or both in the Czech Republic and in the Slovak Republic. In the latter case, the Industrial Property Office of the Czech Republic will transmit a copy of the application to the Industrial Property Office of the Slovak Republic and the filing date of the application with the Industrial Property Office of the Czech Republic will be recognized by the Industrial Property Office of the Slovak Republic.

(7) Applications requesting protection in the Czech Republic must be filed in the Czech language.

#### VII. General Provisions

(8) The fees to be paid to the Industrial Property Office of the Czech Republic are of the same amount as the fees which were payable to the Office of Czechoslovakia before Jan. 1, 1993.

(9) If an applicant does not have his ordinary residence or principle place of business in the Czech Republic, he must authorize a representative in the Czech Republic, and all applications to be filed with the Industrial Property Office of the Czech Republic must be filed through the intermediary of such a representative. The list of persons who can act as representatives is available at the Industrial Property Office of the Czech Republic.

#### VIII. Address of the Industrial Property Office of the Czech Republic

Industrial Property Office of the Czech Republic  
Revolucni ulice 7  
11346 Prague 1  
Czech Republic  
Tel.: (2) 28 96 (operator service)  
Fax.: (2) 231 92 30  
Teleprinter: 123 109 FUV

#### Announcement on the Protection of Industrial Property in the Slovak Republic

In view of the fact that Czechoslovakia ceased to exist on Dec. 31, 1992, and that the Czech Republic and the Slovak Republic became independent States on Jan. 1, 1993, the situation of industrial property protection in the Slovak Republic is summarized below.

#### I. Legal Basis

(1) Pending the enactment of new legislation, the respective legal acts on the protection of industrial property of Czechoslovakia remain applicable in the Slovak Republic.

#### II. Applications for Industrial Property Rights Filed with the Federal Office for Inventions of Czechoslovakia and Industrial Property Rights Granted by that Office

(2) Applications for industrial property rights filed with the Federal Office for Inventions of Czechoslovakia and industrial property rights granted by that Office maintain their legal effect in both the Czech Republic and the Slovak Republic, it being understood that the next fees which are to be paid must be paid, for protection in both the Czech Republic and the Slovak Republic, to both the Industrial Property Office of the Czech Republic and the Slovak Republic.

#### III. International Treaties

(3) The Slovak Republic has deposited, with effect on Jan. 1, 1993, a declaration the effect of which is that all those treaties administered by WIPO to which Czechoslovakia was party continue to be applicable as far as the Slovak Republic is concerned. Those treaties are: the Convention Establishing the World Intellectual Property Organization, the Paris Convention for the Protection of Industrial Property, the Madrid Agreement for the Repression of False or Deceptive Indications of Source on Goods, the Madrid Agreement Concerning the International Registrations of Marks, the Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks, the Lisbon Agreement for the Protection of Appellations of Origin and their International Registration, the Locarno Agreement Establishing an International Classification for Industrial Designs, the Patent Cooperation Treaty (PCT), the Strasbourg Agreement Concerning the International Patent Classification, the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, the Berne Convention for the Protection of Literary and Artistic Works, and the Treaty on the International Registration of Audiovisual Works.

#### IV. Effects in the Slovak Republic of International Applications under the Patent Cooperation Treaty (PCT)

(4)(a) Pursuant to the deposit of the declaration of continuation referred to in paragraph (3), above, national and residents of the Slovak Republic can file international applications, and the Slovak Republic can be designated and elected in international applications filed, on or after Jan. 1, 1993.

(b) Rules 32.1 and 32.2 of the Regulations under the PCT permit the extension of international applications to the Slovak Republic.

(c) For the purpose of determining the status of international applications with respect to the Slovak Republic, one has to distinguish between

(i) international applications specifically<sup>1</sup> designating Czechoslovakia which were filed prior to Jan. 1, 1993 (see (d), below);

(ii) international applications not specifically designating the Slovak Republic—irrespective of the other designations they contain—filed between Jan. 1, 1993 and Mar. 6, 1993 (see (e) to (g), below);

(iii) international applications specifically<sup>1</sup> designating the Slovak Republic filed on or after Jan. 1, 1993 (see (b), below).

(d) As regards any international application whose *international filing date is prior to Jan. 1, 1993*, and in which Czechoslovakia is specifically designated, the "national filing effect" of any such application under Article 11(4) of the PCT will, pursuant to the deposit by the Slovak Republic of its declaration

of continuation, be recognized in the Slovak Republic (provided that the international application had not lost its effect in Czechoslovakia by Dec. 31, 1992). The conditions under which any such international application, or any patent resulting therefrom and granted by the Federal Office for Inventions of Czechoslovakia, may continue to have effect in the Slovak Republic are the following:

(i) if a patent has been granted by the Federal Office for Inventions of Czechoslovakia on the basis of the international application, paragraph (2), above, is applicable;

(ii) if the applicant has entered the national phase before the Federal Office for Inventions of Czechoslovakia but a patent for invention has not been granted by the Office without the application having been rejected by it, paragraph (2), above, is applicable;

(iii) if the applicant has not entered the national phase before the Federal Office for Inventions of Czechoslovakia and the time limit for entering the national phase had not expired on Dec. 31, 1992, the applicant must, before the expiration of the applicable time limit under PCT Article 22 or 39(1), furnish to the Industrial Property Office of the Slovak Republic a translation of the international application into the Slovak language and pay the proscribed fee.

(e) As regards any international application whose *international filing date is later than Dec. 31, 1992, and earlier than Mar. 7, 1993*,<sup>2</sup> and in which the Slovak Republic is not specifically designated, its effects may be extended to the Slovak Republic (irrespective of the other designations it contains) through the performance of the following acts:

(i) filing with the International Bureau of the World Intellectual Property Organization (WIPO) a request for extension;

(ii) paying to the International Bureau of WIPO an extension fee of 185 Swiss francs, payable in Swiss francs.

(f) The applicant in respect of each and every international application referred to in (e), above, or his agent or common representative if there is one, will receive a written notification from the International Bureau of WIPO calling his attention to the fact that he can, by filing a written request for extension, extend the effects of the international application to the Slovak Republic. The notification will, in particular, specify the modes of payment for the extension fee of 185 Swiss francs. The request for extension must contain the identification of the international application by its international application number. A form which may be used for the purpose of requesting the extension to the Slovak Republic will be attached to the notification. The request for the extension must be in English or French, and may be sent by telefax or telex. The request for extension and the corresponding payment must reach the International Bureau of WIPO before the expiration of three months from the date of the notification sent by the International Bureau of WIPO; if either the request or the fee is received later, the request will be refused. It is recommended that applicants await the notification from the International Bureau of WIPO and use the form attached to it, but requests and payments may be made without waiting for the notification from the International Bureau of WIPO.

(g) If the condition described in (e) and (f), above, are fulfilled, the Slovak Republic will be considered as having been designated in the international application on its international filing date. For entering the national phase before the Industrial Property Office of the Slovak Republic, the applicant must furnish to that Office a translation of the international application into the Slovak language and pay the proscribed fee within three months from the date of the request for the extension or, if it expires later, within the following time limit:

(i) before the expiration of 21 months from the priority date if the Slovak Republic is not elected under Chapter II of the PCT within 19 months from the priority date;

(ii) before the expiration of 30 months from the priority date if the Slovak Republic is elected under Chapter II of the PCT within 19 months from the priority date.

(h) As regards any international application whose *international filing date is later than Dec. 31, 1992*, and in which the Slovak Republic is specifically designated, the applicant, in order to enter the national phase before the Industrial Property Office of the Slovak Republic, must furnish to that Office a translation of the international application into the Slovak



language and pay the prescribed fee to that Office within the following time limit:

- (i) before the expiration of 21 months from the priority date if the Slovak Republic is not elected under Chapter II of the PCT within 19 months from the priority date;
- (ii) before the expiration of 30 months from the priority date if the Slovak Republic is elected under Chapter II of the PCT within 19 months from the priority date.

#### V. Effects in the Slovak Republic of International Registrations under the Madrid Agreement Concerning the International Registration of Marks

(5)(a) Pursuant to the deposit of the declaration of continuation referred to in paragraph (3), above, and pursuant to Rule 38 of the Regulations under the Madrid Agreement, any international registration with a territorial extension to Czechoslovakia effective from a date prior to Jan. 1, 1993, may have effect in the Slovak Republic subject to the following conditions:

- (i) the filing with the International Bureau of the World Intellectual Property Organization (WIPO) of a request;
- (ii) the payment to the International Bureau of WIPO of a fee, the amount of which is 62 Swiss francs per international registration.

(b) The owner of each and every international registration concerned, or his representative (if the owner has a representative whose name appears in the International Register), will receive a written notice from the International Bureau of WIPO calling his attention to the fact that he can, by filing a written request, obtain a continuation of the effect of the international registration in the Slovak Republic. The notice will contain a request form (in French) and specify the modes of payment of the fee. The request must contain the identification of the international registration concerned by its international registration number. The request must be made in English or French, and may be sent by telefax or telex. The request and the corresponding payment must reach the International Bureau of WIPO before the expiration of six months from the date of the notice sent by the International Bureau of WIPO; if either the request or the fee is received later, the request will be refused. Requests and payments may be made without waiting for the notice of the International Bureau of WIPO.

(c) If the conditions described above are fulfilled, the international registration concerned will, with respect to the Slovak Republic, have effect as from the effective date of the territorial extension to Czechoslovakia and benefit from any priority validly claimed in regard to such extension.

(d) For each international registration which has no territorial extension to Czechoslovakia or whose international registration date is later than Dec. 31, 1992, protection in the Slovak Republic can only be obtained by filing, through the intermediary of the national Office of the country of the owner, a request for territorial extension under Rule 20 of the Regulations under the Madrid Agreement. It is to be noted that requests for territorial extension to the Slovak Republic are possible at present.

#### VI. New Applications for Industrial Property Rights

(6) From Jan. 1, 1993, it is possible to file applications for industrial property rights with the Industrial Property Office of the Slovak Republic. Applications filed with the Industrial Property Office of the Czech Republic have no effect in the Slovak Republic. However, the following procedure will apply, during a transitory period of a few months, to applications filed with the Industrial Property Office of the Czech Republic: unless it is clear that the applicant does not seek protection in the Slovak Republic, the Industrial Property Office of the Czech office will invite the applicant to specify, within a time limit which will be fixed in the invitation, whether he wants to obtain protection in the Czech Republic only or both in the Czech Republic and the Slovak Republic. In the latter case, the Industrial Property Office of the Czech Republic will transmit a copy of the application to the Industrial Property Office of the Slovak Republic and the filing date of the application with the Industrial Property Office of the Czech Republic will be recognized by the Industrial Property Office of the Slovak Republic.

(7) Applications requesting protection in the Slovak Republic must be filed in the Slovak language.

#### VII. General Provisions

(8) The fees to be paid to the Industrial Property Office of the Slovak Republic are of the same amount as the fees which were payable to the Office of Czechoslovakia before Jan. 1, 1993.

(9) If an applicant does not have his ordinary residence or principal place of business in the Slovak Republic, he must authorize a representative in the Slovak Republic, and all applications to be filed with the Industrial Property Office of the Slovak Republic must be filed through the intermediary of such a representative. The list of persons who can act as representatives is available at the Industrial Property Office of the Slovak Republic.

#### VIII. Address of the Industrial Property Office of the Slovak Republic

Industrial Property Office of the Slovak Republic  
Nam. Slobody 29  
81312 Bratislava  
Slovakia  
Tel: (7) 33 00 57  
Fax: (7) 31 44 61

Jan. 28, 1993

DOUGLAS B. COMER  
Acting Assistant Secretary  
and Acting Commissioner of  
Patents and Trademarks

[1147 TMOG 72]

#### (221) Regarding Industrial Property Protection in Kazakhstan

The following announcement was furnished by the World Intellectual Property Organization of Geneva, Switzerland.

#### ANNOUNCEMENT OF THE PROTECTION OF INDUSTRIAL PROPERTY IN KAZAKHSTAN

The situation of industrial property protection in Kazakhstan is summarized below.

#### I. Legislation

(1) On Aug. 5, 1992, the Patent Law of Kazakhstan entered into force. This Law deals with preliminary patents and patents for inventions, preliminary patents and patents for industrial designs and patents for utility models.

(2) The Law on Trade Marks, Service Marks and Appellations of Origin of Kazakhstan was adopted on Jan. 18, 1993. This said Law entered into force on Feb. 23, 1993.

(3) The National Patent Office of Kazakhstan was established on June 23, 1992. It is under the supervision of the Cabinet of Ministers.

#### II. Membership in Treaties

(4) The Government of Kazakhstan deposited on Feb. 16, 1993, a declaration to the effect that the Convention Establishing the World Intellectual Property Organization, the Paris Convention for the Protection of Industrial Property, the Madrid Agreement Concerning the International Registration of Marks and the Patent Cooperation Treaty continue to be applicable to Kazakhstan.

#### III. Applications for Industrial Property Rights Filed with the National Patent Office of Kazakhstan

(5) Applications for the grant of patents for inventions, patents for industrial designs and patents for utility models and applications for the registration of marks and appellations of origin have been able to be filed with the National Patent Office of Kazakhstan since Aug. 27, 1992.

#### IV. Industrial Property Rights Granted by the Patent Office of the Soviet Union

(6) A patent for invention or inventor's certificate, an industrial design patent or industrial design certificate, or a trademark certificate, which was issued by the Patent Office of the Soviet Union may be registered by the National Patent Office of Kazakhstan at the request of the owner. Upon registration, such industrial property rights will be considered as having the same effects as a patent for invention, industrial design patent or trademark certificate issued by the National Patent Office of Kazakhstan. The duration is 20 years from the filing date of the application in the case of a patent for invention, 10 years from the filing date of the application in the case of an industrial design patent with the right to extend registration in the case of a trademark certificate. The filing date and any Dec. 1, 1993, in the case of inventions and industrial designs, and before Nov. 1, 1993, in the case of trademarks. It must be accompanied by the original or a copy, certified by a notary or any other competent authority, of the patent or certificate issued by the Patent Office of the Soviet Union and evidence that the prescribed fees have been paid to the National Patent Office of Kazakhstan.

#### V. Applications for Industrial Property Rights Filed with the Patent Office of the Soviet Union or with the Patent Office of the Russian Federation Before Oct. 14, 1992

(7) The applicant of an application for a patent for invention or an inventor's certificate, for an industrial design patent or an industrial design certificate or for a trademark certificate which had been filed with the Patent Office of the Soviet Union or with the Patent Office of the Russian Federation before Oct. 14, 1992, may request the National Patent Office of Kazakhstan before Dec. 1, 1993, in the case of an application for a patent for invention or an inventor's certificate, or for an industrial design patent or certificate, and before Nov. 1, 1993, in the case of an application for a trademark certificate, that the said application be further processed according to the Kazakh legislation. The request for further processing by the National Patent Office of Kazakhstan must be accompanied by a copy of the said application, including a copy of the request part of the said application showing the filing date as sent back to the applicant by the Patent Office of the Soviet Union or by the Patent Office of the Russian Federation, by a declaration that the said application is, to the best knowledge of the applicant, still pending before the Patent Office of the Russian Federation, and by an application filed according to the Kazakh legislation.

(8) If the applicant has received from the Patent Office of the Soviet Union or from the Patent Office of the Russian Federation in respect of an application filed before Oct. 14, 1992, a decision on grant of protection, the request needs only to be accompanied by a copy, certified by a notary or any other competent authority, of the said decision, as well as, in the case of inventions, by the description, any drawings and the claims on which the decision is based and an abstract of the invention or, in the case of industrial designs, by five photographs, one of which must be certified by a notary or any other competent authority, and any drawings. The filing date and any priority date of the application filed with the Patent Office of the Soviet Union or the Patent Office of the Russian Federation will be maintained.

#### VI. Effects in Kazakhstan of International Applications under the Patent Cooperation Treaty (PCT)

(9)(a) On Feb. 16, 1993, Kazakhstan deposited a declaration of continuation the effect of which is that the Patent Cooperation Treaty (PCT) is applied by Kazakhstan. Nationals and residents of Kazakhstan can therefore file international applications, and Kazakhstan can be designated and elected in international applications filed, from the date.

(b) On Sept. 29, 1992, the Assembly of the PCT Union adopted, with effect on Oct. 1, 1992, new Rules 32.1 and 32.2 of the Regulations under the PCT, concerning the extension of international applications to certain successor States.

(c) For the purpose of determining the status of international applications with respect to Kazakhstan, one has to distinguish between:

- (i) international applications designating the Soviet Union which were filed before Dec. 25, 1991 (see (d), below);
- (ii) international applications—irrespective of the designations they contain—which were filed between Dec. 25, 1991, and Apr. 16, 1993 (see (e) to (g), below);
- (iii) international applications specifically\* designating Kazakhstan filed on or after Feb. 16, 1993 (see (h), below).

(d) As regards any international application whose international filing date is before Dec. 25, 1991, and in which the Soviet Union has been designated, the "national filing effect" of any such application under Article 11(4) of the PCT will, pursuant to the deposit by Kazakhstan of its declaration of continuation, be recognized in Kazakhstan. The conditions under which any such international application, or any patent or inventor's certificate resulting therefrom and granted by the Patent Office of the Soviet Union or by the Patent Office of the Russian Federation, may continue to have effect in Kazakhstan are the following:

- (i) if a patent for invention or an inventor's certificate has been granted by the Patent Office of the Soviet Union or by the Patent Office of the Russian Federation on the basis of international application, the conditions referred to in paragraph (6) above, are applicable;
- (ii) if the applicant has entered the national phase before the Patent Office of the Soviet Union or the Patent Office of the Russian Federation but a patent for invention or an inventor's certificate has not been granted by any of those Offices, the conditions referred to in paragraph (7), above, are applicable, provided that the applicant must, before Dec. 1, 1993, file with the National Patent Office of Kazakhstan a request that the international application be further processed according to the Kazakh legislation; the request must be accompanied by a copy of the Russian translation of the international application submitted to the Patent Office of the Soviet Union or the Patent Office of the Russian Federation and a declaration that the application is still pending before the Patent Office of the Russian Federation; however where a decision to grant a patent has issued, only the requirements referred to in paragraph (8), above, apply;
- (iii) if the applicant has not entered the national phase before the Patent Office of the Soviet Union or the Patent Office of the Russian Federation and the time limit for entering the national phase had not expired on Dec. 24, 1991, the applicant must, before Dec. 1, 1993, or, if Kazakhstan is elected under Chapter II of the PCT within 19 months from the priority date, before Dec. 1, 1993, or the expiration of 31 months from the priority date whichever is later, furnish to the National Patent Office of Kazakhstan a translation of the international application into Kazakh or Russian and evidence that the prescribed fee (see paragraph (12), below) has been paid to the latter Office.

(e) As regards any international application whose international filing date is later than Dec. 24, 1991, and earlier than Apr. 17, 1993,\*\* its effect may be extended to Kazakhstan (irrespective of the designations it contains) through the performance by the applicant of the following acts:

- (i) filing with the International Bureau of the World Intellectual Property Organization (WIPO) a request for extension;
- (ii) paying to the International Bureau of WIPO an extension fee of 185 Swiss francs, payable in Swiss francs.
- (f) The applicant irrespective of each and every international application to in (e), above, or his agent or common representative if there is one, will receive a written notification from the International Bureau of WIPO calling his attention to the fact that he can, by filing a written request for extension, extend the effects of the international application to Kazakhstan. The notification will, in particular, specify the modes of payment

\*in this announcement, an international application is regarded as "specifically" designating Kazakhstan either if Kazakhstan has been designated under Rule 4.9(a) of the Regulations under the PCT or if the designation of Kazakhstan has been confirmed under Rule 4.9(c) of those Regulations.

\*\*With the exception of any such international application international filing date is on or after Feb. 16, 1993, and in which Kazakhstan is specifically designated in such a case, the procedure described in (e) to (g) is not applicable, and the procedure described in (h) applies. It should be noted that Kazakhstan can be specifically designated only in those international applications filed on or after Feb. 16, 1993.



of the extension fee of 185 Swiss francs. The request for extension must contain the identification of the international application by its international application number. A form which may be issued for the purpose of requesting the extension to Kazakhstan will be attached to the notification. The request for extension must be English or French, and may be sent by telefax or telex. The request for extension and the corresponding payment must reach the International Bureau of WIPO before the expiration of three months from the date of the notification sent by the International Bureau of WIPO; if either the request or the fee is received later, the request will be refused. It is recommended that applicants await the notification from the International Bureau of WIPO and use the form attached to it, but requests and payments may be made without waiting for the notification from the International Bureau of WIPO.

(g) If the conditions described in (e) and (f), above, are fulfilled, Kazakhstan will be considered as having been designated in the international application on its international filing date. For entering the national phase before the National Patent Office of Kazakhstan, the applicant must furnish, within the following time limit, to that Office both a translation of the international application into Kazakh or Russian and evidence that the prescribed fee (see paragraph (12), below) was paid:

(i) before Dec. 1, 1993, or the expiration of 21 months from the priority date, whichever is later, if Kazakhstan is not elected under Chapter II of the PCT before the expiration of 19 months from the priority date and item (iii) does not apply;

(ii) before Dec. 1, 1993, or the expiration of 31 months from the priority date, whichever is later, if Kazakhstan is elected under Chapter II of the PCT before the expiration of 19 months from the priority date;

(iii) before Dec. 1, 1993, or the expiration of 31 months from the priority date, whichever is later, if a request for extension to Kazakhstan is made after, but the demand was made before, the expiration of 19 months from the priority date, and a later election of Kazakhstan is made together with the request for extension or within three months from the date of the request for extension.

(h) As regards any international application whose international filing date is on or after Feb. 16, 1993, and in which Kazakhstan is specifically designated, the applicant, in order to enter the national phase before the National Patent Office of Kazakhstan, must furnish, within the following time limit, to that Office both a translation of the international application into Kazakh or Russian and evidence that the prescribed fee (see paragraph (12), below) has been paid to the said Office:

(i) before the expiration of 21 months from the priority date if Kazakhstan is not elected under Chapter II of the PCT with 19 months from the priority date;

(ii) before the expiration of 31 months from the priority date if Kazakhstan is elected under Chapter II of the PCT within 19 months from the Priority date.

#### VII. Effects in Kazakhstan of International Registrations under the Madrid Agreement Concerning the International Registration of Marks

(10) (a) On Feb. 16, 1993, Kazakhstan deposited a declaration of continuation the effect of which is that the Madrid Agreement Concerning the International Registration of Marks is applied by Kazakhstan.

(b) on Sept. 29, 1992, the Assembly of the Madrid Union adopted, with effect on Oct. 1, 1992, a new Rule 38 in Regulations under the Madrid Agreement, concerning the effect of international registrations in certain successor States.

(c) Pursuant to the deposit of the declaration of continuation and to the decision of the Assembly, certain international registrations may have effect in Kazakhstan subject to the conditions described below. Those international registrations are those which have territorial extensions to the Soviet Union effective from a date prior to Dec. 25, 1991.

(d) The conditions referred to above are the following:

(i) the filing with the International Bureau of the World Intellectual Property Organization (WIPO) of a request;

(ii) the payment to the International Bureau of WIPO of a fee, the amount of which is 62 Swiss francs per international registration.

(e) The owner of each and every international registration concerned, or his representative (if the owner has a representative whose name appears in the International Register), will receive a written notice from the International Bureau of WIPO calling his attention to the fact that he can, by filing a written request, obtain the continuation of the effect of the international registration in Kazakhstan. The notice will, in particular, specify the modes of payment of the fee. The request must contain the identification of the international registration concerned by its international registration number. A form (in French) will be attached to the notice and may be used. The request must be in English or French, and may be sent by telefax or telex. The request and the corresponding payment must reach the International Bureau of WIPO before the expiration of six months from the date of the notice sent by the International Bureau of WIPO; if either the request or the fee is received later, the request will be refused. Requests and payments may be made without waiting for the notice of the International Bureau of WIPO.

(f) If the conditions described above are fulfilled, the international registration concerned will, with respect to Kazakhstan, have effect as from the effective date of the territorial extension to the Soviet Union and benefit from any priority validly claimed in regard such extension.

(g) For each international registration which has territorial extension to the Russian Federation effective from a date prior to Apr. 17, 1993, the owner may request the National Patent Office of Kazakhstan before Nov. 1, 1993, that the said registration be processed as an application under the Kazakh legislation. The request must be accompanied by an extract from the International Register established by the International Bureau of WIPO, by a declaration that, to the best knowledge of the owner, the international registration still has effect in the Russian Federation, and by an application filed according to the Kazakh legislation.

(h) For each international registration not covered by (c) or (g), above, namely, for each international registration which has no territorial extension to the Soviet Union or to the Russian Federation or whose international registration date is later than Apr. 16, 1993, protection in Kazakhstan can only be obtained by filing, through the intermediary of the national Office of the country of the owner, a request for territorial extension under Rule 20 of the Regulations under the Madrid Agreement. It is noted that requests for territorial extension to Kazakhstan are possible at present.

#### VIII. Procedural Provisions

(11) If an applicant does not have his ordinary residence or principal place in business in Kazakhstan, he must authorize a representative in Kazakhstan, and all requests, applications and other documents must be filed through the intermediary of such a representative.

(12) The list of the persons who can act as representatives and the official fees applicable to the procedures referred to under paragraphs (5), (6), (7), (8), (9) and (10)(g) are available from the National Patent Office of Kazakhstan.

(13) The request part of any application referred to under paragraph (5), above, any request referred to under paragraphs (6), (7), (9)(d)(ii) and (10)(g), above, and any declaration referred to under paragraphs (7), (9)(d)(ii) and (10)(g), above, must be filed in Kazakh or Russian. Other parts of any application referred to under paragraph (5), above, may be presented in other languages, provided that a translation into Kazakh or Russian is presented within two months from the filing date.

(14) If an applicant, due to circumstances beyond his control, was unable to observe a time limit applicable under paragraph (6), (7), (9)(d), 10(g) or (13), above, the time limit may, upon request, be extended by two months by the National Patent Office of Kazakhstan.

#### IX. Address of the National patent Office of Kazakhstan

National Patent Office  
Ablai-khan avenue 93/95  
480091 Alma-Ata

Kazakhstan  
Telex: (064) 251244 orlan su

June 11, 1993

MICHAEL K. KIRK  
Acting Assistant Secretary  
and Acting Commissioner of  
Patents and Trademarks

[1153 TMOG 23]

#### (222) Regarding Industrial Property Protection in Belarus

The following announcement was furnished by the World Intellectual Property Organization of Geneva, Switzerland.

#### ANNOUNCEMENT OF THE PROTECTION OF INDUSTRIAL PROPERTY IN BELARUS

The situation of industrial property protection in Belarus is summarized below.

#### I. Legislation

(1) On Feb. 5, 1993, the Law on Patents for Inventions, the Law on Patents for Industrial Designs and the Law on Trademarks and Service Marks of Belarus and the respective Parliamentary Decrees putting the said laws into effect were adopted and entered into force.

#### II. Membership in Treaties

(2) The Government of Belarus deposited on Apr. 14, 1993, a declaration to the effect that the Paris Convention for the Protection of Industrial Property, the Madrid Agreement Concerning the International Registration of Marks and the Patent Cooperation Treaty continue to be applicable to Belarus. Belarus was already party to the Convention Establishing the World Intellectual Property Organization.

#### III. Industrial Property Rights Granted by the Patent Office of the Soviet Union

(3) A patent for invention, an industrial design patent or trademark certificate, which was issued by the Patent Office of the Soviet Union may be registered by the State Patent Office of Belarus at the request of the owner. Upon registration, such industrial property rights will be considered as having the same effects as a patent for invention, industrial design patent or trademark certificate issued by the State Patent Office of Belarus. The duration is 20 years from the filing date of the application with the patent Office of the Soviet Union in the case of a patent for invention, 15 years from the filing date of the application with the Patent Office of the Soviet Union in the case of an industrial design patent, and 10 years from the filing date of the request for registration by the State Patent Office of Belarus in the case of a trademark certificate, the latter request to be filed before the expiry of the 10-year term from the filing date of the application with the Patent Office of the Soviet Union. The filing date and any priority date of the application with the Patent Office of the Soviet Union will be maintained.

(4) As regards inventors' certificates and industrial design certificates granted by the Patent Office of the Soviet Union in relation to which a 20-year term in the case of inventions, or a 15-year term in the case of industrial designs, both counted from the filing date of the application, has not expired, the State Patent Office of Belarus will grant for the remaining term a Belarusian patent for invention or industrial design patent upon the joint request of the applicant and the inventor (inventors). Failing the agreement between the applicant and the inventor (inventors), no patent will be granted.

(5) The request for registration by the State Patent Office of Belarus must be filed before Feb. 5, 1994, in the case of inventions and industrial designs, and before Oct. 5, 1993, in the case of trademarks. It must be accompanied by the original or a copy, certified by a the patent owner, or the applicant, or

the patent attorney, of the patent or certificate issued by the Patent Office of the Soviet Union, and also by a copy of the document attesting that the fee for the preceding term has been paid.

(6) Any inventor's certificate which is not exchanged for a patent for invention will enjoy the legal status which had been applicable to the invention in question in the Soviet Union before July 1, 1991.

#### IV. Applications for Industrial Property Rights Filed with the Patent Office of the Soviet Union or with the Patent Office of the Russian Federation Before Feb. 5, 1993

(7) The applicant of an application for a patent for invention or an inventor's certificate, or of an application for an industrial design patent or an industrial design certificate which had been filed with the Patent Office of the Soviet Union or with the Patent Office of the Russian Federation before Feb. 5, 1993, and in respect of which a decision to grant has been taken, may request the State Patent Office of Belarus to issue a Belarusian patent for invention or industrial design patent. The request must be filed before Aug. 5, 1993.

(8) The applicant of an application for a patent for invention or an inventor's certificate, of an application for an industrial design patent or an industrial design certificate, or of an application for a trademark certificate, which had been filed with the Patent Office of the Soviet Union or with the Patent Office of the Russian Federation before Feb. 5, 1993, and the processing of which has not been completed and in respect of which patents or certificates have not been granted, may request the State Patent Office of Belarus before Aug. 5, 1993, that the said application be further processed according to the Belarusian legislation and that the priority date of the said application be maintained, provided that the request is filed before the expiry of 27 months from the filing date of the first application in the case of inventions, and before the expiry of 21 months from the filing date of the first application in the case of industrial designs and trademarks.

#### V. Applications for Industrial Property Rights Filed, Before Apr. 14, 1993, with the Industrial Property Offices of States Party to the Paris Convention for the Protection of Industrial Property

(9) The State Patent Office of Belarus will recognize the priority date of the first application filed in a State party to the Paris Convention, provided that, in the case of inventions, the request for the grant of a Belarusian patent based on the said application is filed with the State Patent Office of Belarus before the expiry of 27 months from the filing date of the first application or, in the case of industrial designs and trademarks, the request for the grant of a Belarusian industrial design patent, or for the grant of a Belarusian trademark certificate, based on said application, is filed with the State Patent Office of Belarus before the expiry of 21 months from the filing date of the first application.

#### VI. Effects in Belarus of International Applications under the Patent Cooperation Treaty (PCT)

(10) (a) As mentioned in paragraph (2), above, on Apr. 14, 1993, Belarus deposited a declaration of continuation, the effect of which is that the Patent Cooperation Treaty (PCT) is applied by Belarus. Nationals and residents of Belarus can therefore file international applications, and Belarus can be designated and elected in international applications filed, from that date.

(b) Rules 32.1 and 32.2 of the Regulations under the PCT, allow the extension of international applications to certain successor States.

(c) For the purpose of determining the status of international applications with respect to Belarus, one has to distinguish between:

(i) international applications designated the Soviet Union which were filed before Dec. 25, 1991 (see (d), below);

(ii) international applications-irrespective of the designations they contain-which were filed between Dec. 25, 1991, and June 22, 1993 (see (e) to (g), below);



(iii) international applications specifically\* designated Belarus filed on or after Apr. 14, 1993 (see (h), below).

(d) As regards any international application whose international filing date is before Dec. 25, 1991, and in which the Soviet Union has been designated, the "national filing effect" of any such application under Article 11(4) of the PCT will, pursuant to the deposit by Belarus of its declaration of continuation, be recognized in Belarus. The conditions under which any such international application, or any patent or inventor's certificate resulting therefrom and granted by the Patent Office of the Soviet Union or by the Patent Office of the Russian Federation, may continue to have effect in Belarus are the following:

(i) if a patent for invention or an inventor's certificate has been granted by the Patent Office of the Soviet Union or by the Patent Office of the Russian Federation on the basis of international application, the conditions referred to in paragraph (3) to (6) above, are applicable;

(ii) if the applicant has entered the national phase before the Patent Office of the Soviet Union or the Patent Office of the Russian Federation but a patent for invention or an inventor's certificate has not been granted by either of those Offices, the conditions referred to in paragraphs (7) and (8), above, are applicable, provided that the applicant, before Aug. 5, 1993, files with the State Patent Office of Belarus a request that the international application be further processed according to the Belarusian legislation; the request must be accompanied by a copy of the Russian translation of the international application submitted to the Patent Office of the Soviet Union or the Patent Office of the Russian Federation and a declaration that the application is still pending before the Patent Office of the Russian Federation, except where a decision to grant a patent has been made, in which case only the requirements referred to in paragraph (7), above, apply;

(iii) if the applicant has not entered the national phase before the Patent Office of the Soviet Union or the Patent Office of the Russian Federation and the time limit for entering the national phase had not expired on Dec. 24, 1991, the applicant must furnish to the State Patent Office of Belarus, within the following time limit, a translation of the international application into Belarusian or Russian and evidence that the prescribed fee (see paragraph (13), below) has been paid to the latter Office.

—before Aug. 5, 1993, or before the expiration of 21 months from the priority date, whichever is later, if Belarus is not elected under Chapter II of the PCT within 19 months from the priority date;

—before Aug. 5, 1993, or before the expiration of 31 months from the priority date, whichever is later, if Belarus is elected under Chapter II of the PCT within 19 months from the priority date.

(e) As regards any international application whose international filing date is later than Dec. 24, 1991, and not later than June 22, 1993,\*\* its effect may be extended to Belarus (irrespective of the designations it contains) through the performance by the applicant of the following acts:

(i) filing with the International Bureau of the World Intellectual Property Organization (WIPO) a request for extension;

(ii) paying to the International Bureau of WIPO an extension fee of 185 Swiss francs, payable only in Swiss francs.

(f) The applicant in respect of each and every international application referred to in (e), above, or his agent or common representative if there is one, will receive a written notification from the International Bureau of WIPO drawing his attention to the fact that he can, by filing a written request for extension, extend the effects of the international application to Belarus. The notification will, in particular, specify the modes of pay-

ment of the extension fee of 185 Swiss francs. The request for extension must contain the identification of the applicant's international application by its international application number. A form which may be issued for the purpose of requesting the extension to Belarus will be attached to the notification. The request for extension must be in English or French, and may be sent by telefax or telex. The request for extension and the corresponding payment must reach the International Bureau of WIPO before the expiration of three months from the date of the notification sent by the International Bureau of WIPO; if either the request or the fee is received later, the request will be refused. It is recommended that applicants await the notification from the International Bureau of WIPO and use the form attached to it, but requests and payments may be made prior to receipt of the notification from the International Bureau of WIPO.

(g) If the conditions described in (e) and (f), above, are fulfilled, Belarus will be considered as having been designated in the international application on its international filing date. In order to enter the national phase before the State Patent Office of Belarus, the applicant must furnish to that Office, within the following time limit, both a translation of the international application into Belarusian or Russian and evidence that the prescribed fee (see paragraph (13), below) has been paid:

(i) before Aug. 5, 1993, or before the expiration of 21 months from the priority date, whichever is later, if Belarus is not elected under Chapter II of the PCT within 19 months from the priority date and item (iii) does not apply;

(ii) before Aug. 5, 1993, or the expiration of 31 months from the priority date, whichever is later, if Belarus is elected under Chapter II of the PCT within 19 months from the priority date;

(iii) before Aug. 5, 1993, or the expiration of 31 months from the priority date, whichever is later, if a request for extension to Belarus is made after, but the demand for international preliminary examination was made before, the expiration of 19 months from the priority date, and a later election of Belarus is made together with the request for extension or within three months from the date of the request for extension.

(h) As regards any international application whose international filing date is on or after Apr. 14, 1993, and in which Belarus is specifically designated, the applicant, in order to enter the national phase before the State Patent Office of Belarus, must furnish to that Office, within the following time limit, both a translation of the international application into Belarusian or Russian and evidence that the prescribed fee (see paragraph (13), below) has been paid to the said Office:

(i) before the expiration of 21 months from the priority date if Belarus is not elected under Chapter II of the PCT within 19 months from the priority date;

(ii) before the expiration of 31 months from the priority date if Belarus is elected under Chapter II of the PCT within 19 months from the Priority date.

#### VII. Effects in Belarus of International Registrations under the Madrid Agreement Concerning the International Registration of Marks

(11) (a) As mentioned in paragraph (2), above, On Apr. 14, 1993, Belarus deposited a declaration of continuation, the effect of which was that the Madrid Agreement Concerning the International Registration of Marks is applied by Belarus.

(b) Pursuant to the deposit of the declaration of continuation and to Rule 38 of the Regulations under the Madrid Agreement, certain international registrations may have effect in Belarus subject to the conditions described below. The international registrations are those which have a territorial extension to the Soviet Union effective from a date prior to Dec. 25, 1991.

(c) The conditions referred to above are the following:

(i) the filing with the International Bureau of the World Intellectual Property Organization (WIPO) of a request;

(ii) the payment to the International Bureau of WIPO of a fee, the amount of which is 62 Swiss francs per international registration.

(d) The owner of each and every international registration concerned, or his representative (if the owner has a representative whose name appears in the International Register), will receive a written notice from the International Bureau of WIPO

drawing his attention to the fact that he can, by filing a written request, obtain the continuation of the effect of the international registration in Belarus. The notice will, in particular, specify the modes of payment of the fee. The request must contain the identification of the international registration concerned by its international registration number. A form (in French) will be attached to the notice and may be used. The request must be in English or French, and may be sent by telefax or telex. The request and the corresponding payment must reach the International Bureau of WIPO before the expiration of six months from the date of the notice sent by the International Bureau of WIPO; if either the request or the fee is received later, the request will be refused. Requests and payments may be made upon receipt of the notice of the International Bureau of WIPO.

(e) If the conditions described above are fulfilled, the international registration concerned will, with respect to Belarus, have effect as of the effective date of the territorial extension to the Soviet Union and benefit from any priority validly claimed with regard to such extension.

(f) For each international registration which has a territorial extension to the Russian Federation effective as of a date between Dec. 25, 1991 and Apr. 14, 1993, the owner may request the State Patent Office of Belarus, before Aug. 5, 1993, that the said registration be processed as an application under the Belarusian legislation. The request must be accompanied by an extract from the International Register established by the International Bureau of WIPO, by a declaration that, to the best knowledge of the owner, the international registration still has effect in the Russian Federation, and by an application filed according to the Belarusian legislation.

(g) For each international registration not covered by (b) or (f), above, namely, for each international registration which has no territorial extension to the Soviet Union or to the Russian Federation or whose international registration date is later than Apr. 14, 1993, protection in Belarus can only be obtained by filing, through the intermediary of the national Office of the country of the owner, a request for territorial extension under Rule 20 of the Regulations under the Madrid Agreement. It is noted that requests for territorial extension to Belarus are possible at present.

#### VIII. Procedural Provisions

(12) If an applicant does not have his ordinary residence or principal place in business in Belarus, he must authorize a representative in Belarus, and all requests, applications and other documents must be filed through the intermediary of such a representative.

(13) The official fees applicable to the procedures referred to under paragraphs (3), (4), (5), (7), (8) (10) and (11)(f) are available from the State Patent Office of Belarus.

(14) Any request referred to under paragraphs (3), (4), (5), (7), (8), (10)(d)(ii) and (11)(f), above, and any declaration referred to under paragraphs (10)(d)(ii) and (11)(f), above, must be filed in Belarusian or Russian.

#### IX. Address of the National Patent Office of Belarus

State Patent Office of Belarus  
66, pr. Skoriny  
Minsk 220072  
Belarus  
Tel.: (70172) 395 840  
Fax.: (70172) 394 130

June 11, 1993

MICHAEL K. KIRK  
Acting Assistant Secretary  
and Acting Commissioner of  
Patents and Trademarks

[1152 TMOG 23]

#### (223) Regarding Patent and Trademark Rights in the Republic of Lithuania

The State Patent Bureau of the Republic of Lithuania has provided the U.S. Patent and Trademark Office with informa-

tion regarding the protection of inventions, industrial designs, and trademarks in the Republic of Lithuania.

Following is the unedited text of the SUMMARY OF INDUSTRIAL PROPERTY PROTECTION IN LITHUANIA, provided in English translation by the Government of Lithuania, outlining the status of industrial property protection in Lithuania pending enactment of new legislation.

"The system of industrial property protection in Lithuania functioned reasonably well until 1940 ('Law on Protection of Trademarks' of Jan. 27, 1925, 'Law on the Protection of Inventions and Improvements' of May 14, 1928, 'Law on the Protection of Industrial Models and Designs').

• Since 1940 industrial property protection in Lithuania had been based on legal acts of the Soviet Union.

• After Lithuania has declared its independence it started establishing an independent national industrial property legislation. On Apr. 12, 1991, the Government of the Republic of Lithuania established the Lithuanian Patent Office, which is functioning under the name of the State Patent Bureau. On Dec. 1, 1991, the State Patent Bureau has proceeded the registration of Company Names of the Republic of Lithuania under the Regulations of Company Names.

Since Apr. 30, 1992 the Republic of Lithuania is a member of the World Intellectual Property Organization (WIPO).

• In order to ensure legal protection of industrial property (inventions, industrial designs and trademarks), rights of inventors, patent owners and investors on May 20, 1992 the Government of the Republic of Lithuania adopted a Decree No 362 on provisional measures until the laws of the Republic of Lithuania on inventions, industrial designs and trademarks are adopted. The contents of the provisional measures and their main consequences are summarized below.

#### INDUSTRIAL PROPERTY RIGHTS GRANTED BY THE PATENT OFFICE OF THE FORMER SOVIET UNION

1. Valid patents for inventions, as well as valid inventor's certificates, granted by the Patent Office of the former Soviet Union on the basis of applications filed beginning with Jan. 1, 1978, shall be registered as patents of the Republic of Lithuania for a period not longer than 15 years from the date of filing an application, provided that the inventor together with the applicant or the patent owner files a request to that effect with the State Patent Bureau no later than Sept. 30, 1993 and pays the prescribed State fee. Failing such a request, the patent or inventor's certificate will not have any effect in the Republic of Lithuania.

2. Industrial design for which valid industrial design patent or industrial design certificates granted by the Patent Office of the former Soviet Union on the basis of applications filed beginning with Jan. 1, 1983 shall be registered as industrial designs in the Republic of Lithuania for a period of 5 years with a possibility of renewing the registration for 5 consecutive years but not longer than for a period of 10 years from the date of filing an application provided that the creator of the industrial design together with the applicant or the patent owner files a request to that effect with the State Patent Bureau not later than Sept. 30, 1993 and pays the prescribed State fee. Failing such a request, the industrial design patent or certificate shall not have any effect in Lithuania.

3. A patent or industrial design, which has been registered under paragraph 1 or 2 above, will have no effect against any person who in the Republic of Lithuania, prior to the date of the request for registration was using the invention or industrial design protected by inventor's certificate or certificate or was making effective and serious preparation for such use.

4. Trademarks for which valid trademark certificates were granted by the Patent Office of the former Soviet Union shall be registered as trademarks in the Republic of Lithuania for a period of 10 years, provided that the owner of the trademark certificate files a request to that effect with the State Patent Bureau not later than Sept. 30, 1993 and pays the prescribed State fee. The same applies to international trademark registration effected under Madrid Agreement concerning the International Registration of Marks, for which valid trademark certificates had the territorial extension to the Former Soviet Union. Failing such a request, the trademark certificate will not have any effect in the Republic of Lithuania.

5. Priority rights may be claimed from May 20, 1992 onwards,

\*In this announcement, an international application is regarded as "specifically" designating Belarus either if Belarus has been designated under Rule 4.9(a) of the Regulations under the PCT or if the designation of Belarus has been confirmed under Rule 4.9(c) of those Regulations.

\*\*With the exception of any such international application whose international filing date is on or after Apr. 14, 1993, and in which Belarus is specifically designated: in such a case, the procedure described in (e) to (g) is not applicable, and the procedure described in (h) applies. It should be noted that Belarus can be specifically designated only in those international applications filed on or after Apr. 14, 1993.



but not later than Apr. 30, 1993, on the basis of previous patents, industrial design and trademark applications filed with the Patent Office of the former Soviet Union after Jan. 1, 1990, and which were pending on Jan. 31, 1992. Such priority rights are governed by the provisions of Article 4 of the Paris Convention for the Protection of Industrial Property.

6. Information regarding patents for inventions and industrial designs and trademark certificates shall be published in the OFFICIAL GAZETTE of the State Patent Bureau of the Republic of Lithuania.

#### NEW APPLICATIONS FOR INDUSTRIAL PROPERTY RIGHTS FILED WITH THE STATE PATENT BUREAU OF THE REPUBLIC OF LITHUANIA

7. Pending the enactment of industrial property legislation in Lithuania, it is possible to file patent applications and applications for the registration of industrial designs and of trademarks with the State Patent Bureau on the basis of legal acts of the Republic of Lithuania.

Foreign natural and legal persons, having their ordinary residence or principle place of business outside Lithuania, shall file requests and applications only through a patent attorney, registered in the Register of patent attorneys of the Republic of Lithuania.

Copies of the list of fees of the State Patent Bureau of the Republic of Lithuania and of the list of registered patent attorneys are available from Box 4, U.S. Patent and Trademark Office, Washington, D.C. 20231

July 7, 1993

MICHAEL K. KIRK  
*Acting Assistant Secretary  
and Acting Commissioner of  
Patents and Trademarks*

[1153 TMOG 4]

#### (224) Regarding Industrial Property Rights in the Republic of Slovenia

The Industrial Property Protection Office of the Republic of Slovenia has provided the U.S. Patent and Trademark Office (USPTO) with a consolidated text, in English, of the Law on Industrial Property of the Republic of Slovenia which regulates the grant and protection of patents, model rights and design rights, trademarks and service marks, and appellations of origin. In addition, the Industrial Property Protection Office has notified the USPTO that it has entered into an "extension agreement" with the European Patent Organisation that will enter into force in January 1994. After entry into force of the agreement, it will be possible to obtain patent protection in Slovenia through obtaining a European patent. The Republic of Slovenia also plans to ratify the Patent Cooperation Treaty administered by the World Intellectual Property Organization.

A copy of the consolidated text of the Slovenian industrial property law can be obtained by writing to the U.S. Patent and Trademark Office, Box 4, Washington, D.C. 20231.

BRUCE A. LEHMAN  
*Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks*

[1154 TMOG 39]

#### (225) Regarding Industrial Property Rights in The Republic Of Croatia

The State Patent Office of the Republic of Croatia has provided the U.S. Patent and Trademark Office with information regarding the protection of inventions, industrial designs, and trademarks and appellations of origin in the Republic of Croatia.

Following is the unedited text of the document provided in English translation by the Government of Croatia, outlining the status of industrial property protection.

#### "I. INTELLECTUAL PROPERTY IN THE REPUBLIC OF CROATIA

##### MEMBERSHIP IN INTERNATIONAL ORGANIZATIONS, CONVENTIONS AND TREATIES

The Republic of Croatia is a party to the following conventions:

- the Convention Establishing the World Intellectual Property Organization;
- the Paris Convention for the Protection of Industrial Property;
- the Madrid Agreement Concerning the International Registration of Marks;
- the Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks;
- the Locarno Agreement Establishing an International Classification for Industrial Designs;
- the BERNE Convention for the Protection of Literary and Artistic Works based on the notifications confirmed by the Director General of the World Intellectual Property Organization, in his letter of 29, July, 1992, considered to be effective from 8, October, 1991, the date of independence declaration of the Republic of Croatia.

This fact grants the continuity of membership of the Republic of Croatia in the aforementioned conventions, starting from the found state of former Socialist Federal Republic of Yugoslavia.

#### II. INDUSTRIAL PROPERTY IN THE REPUBLIC OF CROATIA

##### 1. MAIN FEATURES OF INDUSTRIAL PROPERTY LAW IN THE REPUBLIC OF CROATIA

Industrial Property Law comprises:

- patents;
- designs;
- trademarks and service marks;
- appellations of origin.

According to this Law, which is basically in accordance with the aforementioned conventions and arrangements, the validity of patent is 20 years, and the validity of designs and marks 10 years upon the submission of the patent application. The validity of marks can be renewed without limitations. Foreign legal and physical persons are obliged to protect their industrial property rights in the Republic of Croatia by means of an authorized representative, either a Croatian citizen or a local legal entity.

##### 3. INDUSTRIAL PROPERTY IN THE REPUBLIC OF CROATIA-PROSPECTS

A new law on industrial property is expected to be passed during 1994, conceding the use of the institution of complete examination of conditions for the grant of patents. Within general activities aimed at harmonization and unification of the legal provisions governing industrial property rights, the State Patent Office will take up the activities concerning the admission to PCT and the European Patent Convention.

##### 4. INDUSTRIAL PROPERTY RIGHTS GRANTED OR APPLIED FOR BY SUBMITTING AN APPLICATION, TO THE FORMER FEDERAL PATENT OFFICE FOR THE TERRITORY OF FORMER YUGOSLAVIA (SFRY)

4.1. The Industrial property rights granted through the former Federal Patent Office up to 8 October, 1991 are regulated in Article 10, paragraph 1 and 2 of the Law on Changes and Amendments of the Law on Protection of Inventions, Technical Improvements and Distinctive Signs ("Official Gazette of the Republic of Croatia", 2 April, 1992): "All rights of industrial property which are granted by the decisions of the former Federal Patent Office up to 8 October 1991 are valid on the territory of the Republic of Croatia up to their expiration. Upon the request of the rightful claimants from the aforementioned paragraph, the State Patent Office will enter this particular right into the corresponding register."

4.2. Rights acquired in former Yugoslavia by the international registration of marks (International Bureau of WIPO, Geneva)

The Assembly of the Madrid Union on 29 September, 1992 adopted the new Rule No. 38, which apart from the Republic of Croatia applies to Slovenia and Ukraine, of the Regulations under the Madrid Arrangement, according to which the internationally registered marks with the territorial sign YU with the dates earlier 1 December, 1992 can be effective in the Republic of Croatia, provided that:

- a request is submitted to the International Bureau of WIPO, Geneva (on the basis of the written notification of the International Bureau of WIPO);
- a fee in the amount of 62 Swiss francs for each internationally registered mark is paid to the International Bureau.

The International Bureau will by the end of 1992 notify in written form each of the owners of the internationally registered mark with the sign YU, with the appeal to utilize the possibility provided by the Rule No. 38 prior to March 1, 1994.

4.3. The Industrial property rights applied for by submitting the application at the former Federal Patent Office before 8 October, 1991, which were not granted or declined, can be effected in the Republic of Croatia by submitting the same applications to the State Patent Office until 4 November, 1993 (this period was prolonged by the Regulation of the Government of the Republic of Croatia of 14 April, 1993)."

The address of the State Patent Office is:

State Patent Office  
of the Republic of Croatia  
Avenija Vukovar 78 41000 Zagreb  
CROATIA

The State Patent Office of the Republic of Croatia has also provided a copy of the fees charged and a list of patent attorneys authorized to practice. Copies of these can be provided on request. Please send request to U.S. Patent and Trademark Office, Office of Legislation and International Affairs, Box 4, Washington, D.C. 20231.

Nov. 4, 1993

BRUCE A. LEHMAN  
*Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks*

[1156 TMOG 112]

#### (226) Regarding Patent And Trademark Rights In The Former Yugoslav Republic Of Macedonia

The Ministry of Development of the former Yugoslav Republic of Macedonia has provided the U.S. Patent and Trademark Office with information regarding the status of industrial property protection within the former Yugoslav Republic of Macedonia.

Following is the unedited text of the ANNOUNCEMENT ON THE PROTECTION OF INDUSTRIAL PROPERTY IN THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA, provided in English translation by the Ministry of Development.

"The present situation of industrial property protection in the former Yugoslav Republic of Macedonia is summarized below.

##### I. Legislation

(1) On July 14, 1993, the Industrial Property Act entered into force. An Office for the Protection of Industrial Property of the former Yugoslav Republic of Macedonia will be set up within a few months.

(2) Pending the setting-up of the said Office, applications for patents for inventions, utility models, industrial designs, trademarks, service marks and appellations of origin may be filed with the Ministry of Development in order to establish a filing

or priority date. Applications so filed will not, however, be processed to grant or refusal until the said Office has been established.

##### II. Application of International Treaties

(3) On July 23, 1993, the former Yugoslav Republic of Macedonia deposited a declaration the effect of which is that all those treaties administered by WIPO to which Yugoslavia was party continue to be applicable as far as the former Yugoslav Republic of Macedonia is concerned. Those treaties are: the Convention Establishing the World Intellectual Property Organization, the Paris Convention for the Protection of Industrial Property, the Madrid Agreement Concerning the International Registration of Marks, the Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks, the Locarno Agreement Establishing an International Classification for Industrial Designs and the Berne Convention for the Protection of Literary and Artistic Works.

(4) A further announcement will be made on the procedure to be followed to confirm the effect of international registrations to Rule 38 of the Regulations under the Madrid Agreement.

##### III. Applications for Industrial Property Rights Previously Filed with the Former Federal Patent Office in Belgrade and Industrial Property Rights Granted by the Former Federal Patent Office in Belgrade

(5) The applicant of any application for an industrial property right filed with the former Federal Patent Office in Belgrade prior to April 26, 1992, may file with the Office for the Protection of Industrial Property of the former Yugoslav Republic of Macedonia, after its establishment and prior to July 7, 1994, a request that the application be further processed.

(6) The owner of any industrial property right granted by the former Federal Patent Office in Belgrade and valid on July 7, 1993, may file with the Office for the Protection of Industrial Property of the former Yugoslav Republic of Macedonia, after its establishment and prior to July 7, 1995, a request to the effect that the granted industrial property right be considered for the remaining period of its validity as an industrial property right granted by the Office for the Protection of Industrial Property of the former Yugoslav Republic of Macedonia.

##### IV. Address of the Ministry of Development

Ministry of Development  
Bote Bocevski 9  
91000 Skopje  
The former Yugoslav Republic of Macedonia

Telephone (3891) 220 678  
Telefax (3891) 223 027

Nov. 4, 1993

BRUCE A. LEHMAN  
*Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks*

[1156 TMOG 113]

#### (227) Regarding Industrial Property In The Kyrgyz Republic

The following notice is reprinted from the December 1993 edition of "Industrial Property" published by the World Intellectual Property Organization, giving the status of industrial property protection in the Kyrgyz Republic:

The present situation of industrial property protection in the Kyrgyz Republic is summarized below.

##### I. Legislation

(1) Pending the enactment of the industrial property laws, the Government of the Kyrgyz Republic adopted, on August



2, 1993, the Provisional Regulations on Industrial Property, which cover inventions, utility models, industrial designs and trademarks. It is possible, as of August 2, 1993, to file applications for the grant of patents for inventions and for the registration of utility models, industrial designs and trademarks with the Patent Department of the State Committee on Science and New Technologies of the Kyrgyz Republic.

## II. Application of International Treaties

(2) The Kyrgyz Republic intends to become party to the Convention Establishing the World Intellectual Property Organization (WIPO), to the Paris Convention for the Protection of Industrial Property, to the Madrid Agreement Concerning the International Registration of Marks, to the Patent Cooperation Treaty (PCT) and to the Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks.

(3) Announcements will be made as soon as the Kyrgyz Republic becomes party to the treaties mentioned in paragraph (2), above, or to any other treaties administered by WIPO. Details will be given at that stage of the procedures to be followed to confirm the application to the Kyrgyz Republic of certain international applications under the PCT and certain international registrations under the Madrid Agreement.

### III. Reregistration of Industrial Property Titles Granted by the Patent Office of the Soviet Union and Further Processing of Pending Applications

(4) The owner of a patent for invention, an inventor's certificate, an industrial design patent or certificate granted by the Patent Office of the Soviet Union and still in force may file directly with the Patent Department of the State Committee on Science and New Technologies of the Kyrgyz Republic before May 1, 1994, a request for the grant of a Kyrgyz patent for invention, design patent or trademark certificate.

(5) An applicant of an application for a patent for invention, for an industrial design patent or for a trademark certificate filed before August 2, 1993, with the express or implied intention of obtaining protection also in the Kyrgyz Republic and pending with the Patent Office of the Russian Federation may file with Patent Department of the State Committee on Science and New Technologies of the Kyrgyz Republic before May 1, 1994, a

request that the application be further processed under Kyrgyz legislation.

#### IV. Procedural Provisions

(6) The procedures referred to in paragraphs (1), (4) and (5) are subject to payment of the prescribed fees.

#### V. Address of the Patent Office

Patent Department of the State Committee on Science and New  
Technology  
87, Isanov St.  
720001 Bishkek  
Kyrgyz Republic  
Telephone: (3312) 21 54 86  
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**BRUCE A. LEHMAN**  
*Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks*  
[1160 TMOG 14]

(228) **Extension of Time for Filing Notices of Opposition to Marks Published in the Official Gazette Dated November 14, 1995**

Since copies of the Trademark Official Gazette dated November 14, 1995, were not mailed until November 20, 1995, the thirty-day opposition period for marks published in the Trademark Official Gazette dated November 14, 1995, is extended from December 14, 1995, until December 20, 1995.

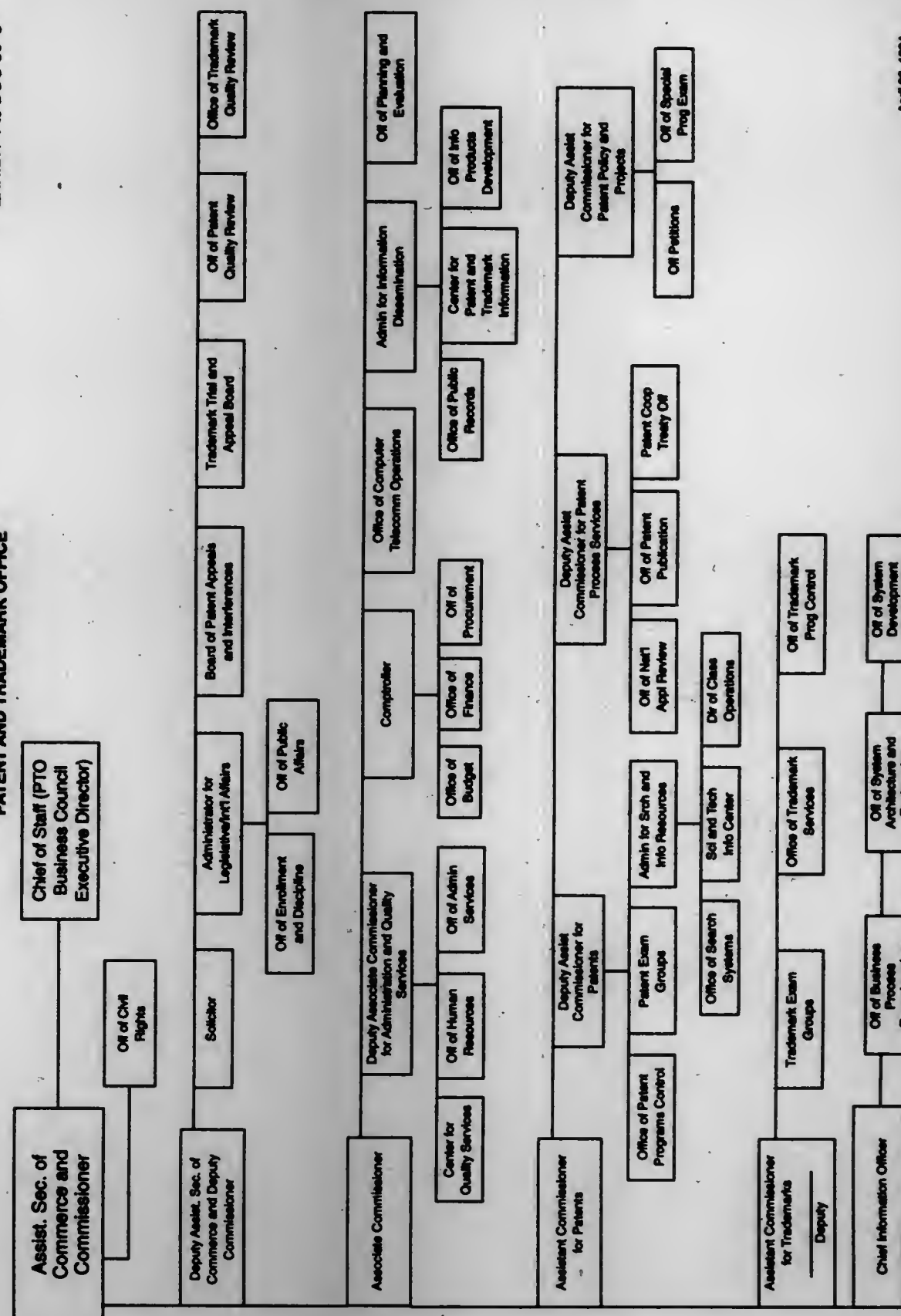
December 1, 1995

**PHILIP G. HAMPTON, II**  
*Assistant Commissioner  
for Trademarks*

[1181 TMOG 39]

EXHIBIT 1 to DDO 30-3

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## PATENT AND TRADEMARK OFFICE NOTICES

## Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1181 O.G. 50, on December 19, 1995.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective June 20, 1995, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

International fees were changed, effective on January 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1995, and were announced in the *Official Gazette* at 1177 O.G. 171, on August 29, 1995.

The schedule of PCT fees (in U.S. dollars), effective January 1, 1996, is as follows:

## International Application (PCT Chapter I) fees:

Transmittal fee .....	220.00
Search Fee .....	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA) .....	
—No corresponding prior U.S. national application filed .....	660.00
—Corresponding prior U.S. national application filed .....	430.00
—Supplemental search fee, per additional invention (payable only upon invitation) .....	190.00
European Patent Office as ISA .....	1700.00

## International fees

Basic fee .....	677.00
Basic Supplemental fee (for each page over 30) .....	13.00
Designation fee per country or region —For the first 11 national or regional offices designated .....	164.00
—For each designation in excess of 11 offices .....	No Charge

Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5) .....	
—Designation fee .....	164.00
—Confirmation fee .....	82.00

International Application (PCT Chapter II) fees associated  
with filing a Demand for Preliminary Examination:

Handling fee .....	207.00
Preliminary examination fee .....	

USPTO as International Preliminary  
Examining Authority (IPEA)

—USPTO was ISA in PCT Chapter I .....	470.00
—Additional examination fee, per additional invention (payable only upon invitation) .....	140.00
—USPTO was not ISA in PCT Chapter I .....	710.00
—Additional examination fee, per additional invention (payable only upon invitation) .....	250.00

U.S. National Stage Fees	Small Entity	Regular
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## Basic National fee

USPTO was IPEA .....		
—All claims presented satisfied provisions of PCT Article 33(2) to (4) .....	47.00	94.00
—All claims presented did not satisfy provisions of PCT Article 33(2) to (4) .....	340.00	680.00
USPTO was ISA but not IPEA .....	375.00	750.00
USPTO was neither ISA nor IPEA .....		
—Search report has not been prepared by the European Patent Office or the Japanese Patent Office .....	505.00	1010.00
—Search report has been prepared by the European Patent Office or the Japanese Patent Office .....	440.00	880.00

## Other National fees

—For each independent claim in excess of 3 .....	39.00	78.00
—For each claim in excess of 20 .....	11.00	22.00
—For each application containing a multiple dependent claim .....	125.00	250.00
—Surcharge for filing oath or decla- ration after the time limit appli- cable under PCT Article 22 or 39(1) .....	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1) .....	130.00	130.00

Nov. 27, 1995  
BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

## Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on December 29, 1992 for which maintenance fees due at 3 years



and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,173,963 through 5,175,885  
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on December 27, 1988 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,793,001 through 4,794,651  
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on December 25, 1984 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,489,443 through 4,490,854  
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1994, which are reproduced below:

#### 37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) .....\$495.00  
By other than a small entity .....\$990.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) .....\$995.00  
By other than a small entity .....\$1,990.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) .....\$1,495.00  
By other than a small entity .....\$2,990.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) .....\$65.00  
By other than a small entity .....\$130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable .....\$660.00  
(2) unintentional .....\$1,550.00

#### Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

#### PATENTS WHICH EXPIRED October 25, 1995 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,464 (4,411,963)	06/854,657 (06/280,844)	07/28/87 (10/25/83)
Re. 34,236 (4,701,952)	07/424,699 (06/923,668)	04/21/93 (10/20/87)
4,411,030	06/311,476	10/25/83
4,411,031	06/326,066	10/25/83
4,411,036	06/321,511	10/25/83
4,411,049	06/217,030	10/25/83
4,411,062	06/227,016	10/25/83
4,411,064	06/275,085	10/25/83
4,411,078	06/291,078	10/25/83
4,411,082	06/309,761	10/25/83
4,411,083	06/312,533	10/25/83
4,411,084	06/271,001	10/25/83
4,411,085	06/337,720	10/25/83
4,411,094	06/350,117	10/25/83
4,411,099	06/348,220	10/25/83
4,411,115	06/272,276	10/25/83
4,411,116	06/370,031	10/25/83
4,411,129	06/415,503	10/25/83
4,411,132	06/297,837	10/25/83
4,411,134	06/314,573	10/25/83
4,411,139	06/252,668	10/25/83
4,411,152	06/287,630	10/25/83
4,411,167	06/310,566	10/25/83
4,411,177	06/242,763	10/25/83
4,411,182	06/258,230	10/25/83
4,411,188	06/217,598	10/25/83
4,411,201	06/271,184	10/25/83
4,411,206	06/284,813	10/25/83
4,411,208	06/289,994	10/25/83
4,411,220	06/243,961	10/25/83
4,411,230	06/274,392	10/25/83
4,411,232	06/259,163	10/25/83
4,411,238	06/286,324	10/25/83
4,411,239	06/349,270	10/25/83
4,411,250	06/256,585	10/25/83
4,411,254	06/257,497	10/25/83
4,411,257	06/327,130	10/25/83
4,411,258	06/365,459	10/25/83
4,411,267	06/237,520	10/25/83
4,411,271	06/347,522	10/25/83
4,411,272	06/300,610	10/25/83
4,411,279	06/324,753	10/25/83
4,411,290	06/273,309	10/25/83
4,411,295	06/287,284	10/25/83
4,411,306	06/268,530	10/25/83
4,411,308	06/284,796	10/25/83
4,411,315	06/278,915	10/25/83
4,411,316	06/232,473	10/25/83
4,411,318	06/285,750	10/25/83
4,411,323	06/282,509	10/25/83
4,411,330	06/294,541	10/25/83
4,411,333	06/321,201	10/25/83
4,411,336	06/319,441	10/25/83

Patent Number	Serial Number	Issue Date	4,411,694	06/324,221	10/25/83
4,411,356	06/298,287	10/25/83	4,411,698	06/404,258	10/25/83
4,411,361	06/374,897	10/25/83	4,411,703	06/341,128	10/25/83
4,411,364	06/340,802	10/25/83	4,411,705	06/318,274	10/25/83
4,411,365	06/340,457	10/25/83	4,411,711	06/402,273	10/25/83
4,411,377	06/291,765	10/25/83	4,411,713	06/392,098	10/25/83
4,411,380	06/280,155	10/25/83	4,411,714	06/295,590	10/25/83
4,411,382	06/390,257	10/25/83	4,411,717	06/463,190	10/25/83
4,411,391	06/263,979	10/25/83	4,411,722	06/279,839	10/25/83
4,411,392	06/243,351	10/25/83	4,411,723	06/329,456	10/25/83
4,411,396	06/276,289	10/25/83	4,411,728	06/248,961	10/25/83
4,411,401	06/236,726	10/25/83	4,411,733	06/389,780	10/25/83
4,411,403	06/323,965	10/25/83	4,411,743	06/370,817	10/25/83
4,111,405	06/279,142	10/25/83	4,411,749	06/294,786	10/25/83
4,111,406	06/264,386	10/25/83	4,411,760	06/263,207	10/25/83
4,411,407	06/340,491	10/25/83	4,411,761	06/276,985	10/25/83
4,411,412	06/323,907	10/25/83	4,411,764	06/321,297	10/25/83
4,411,416	06/322,111	10/25/83	4,411,769	06/360,927	10/25/83
4,411,418	06/348,128	10/25/83	4,411,770	06/369,330	10/25/83
4,411,420	06/236,975	10/25/83	4,411,773	06/403,685	10/25/83
4,411,423	06/363,036	10/25/83	4,411,776	06/418,953	10/25/83
4,411,429	06/332,247	10/25/83	4,411,777	06/345,516	10/25/83
4,411,433	06/307,584	10/25/83	4,411,790	06/265,660	10/25/83
4,411,440	06/369,657	10/25/83	4,411,792	06/291,175	10/25/83
4,411,442	06/293,497	10/25/83	4,411,793	06/333,696	10/25/83
4,411,448	06/274,533	10/25/83	4,411,797	06/308,129	10/25/83
4,411,449	06/272,358	10/25/83	4,411,799	06/340,595	10/25/83
4,411,457	06/250,789	10/25/83	4,411,801	06/303,154	10/25/83
4,411,464	06/289,627	10/25/83	4,411,802	06/299,708	10/25/83
4,411,468	06/240,772	10/25/83	4,411,803	06/360,642	10/25/83
4,411,473	06/227,084	10/25/83	4,411,807	06/387,654	10/25/83
4,411,479	06/309,456	10/25/83	4,411,808	06/405,297	10/25/83
4,411,483	06/253,873	10/25/83	4,411,811	06/421,593	10/25/83
4,411,491	06/301,113	10/25/83	4,411,812	06/320,281	10/25/83
4,411,492	06/233,417	10/25/83	4,411,815	06/276,734	10/25/83
4,411,526	06/487,997	10/25/83	4,411,818	06/348,198	10/25/83
4,411,528	06/226,305	10/25/83	4,411,820	06/255,695	10/25/83
4,411,532	06/336,607	10/25/83	4,411,824	06/407,207	10/25/83
4,411,537	06/354,527	10/25/83	4,411,825	06/308,258	10/25/83
4,411,539	06/331,677	10/25/83	4,411,830	06/396,258	10/25/83
4,411,541	06/343,117	10/25/83	4,411,842	06/321,857	10/25/83
4,411,550	06/297,367	10/25/83	4,411,849	06/289,388	10/25/83
4,411,554	06/313,455	10/25/83	4,411,851	06/312,966	10/25/83
4,411,560	06/243,390	10/25/83	4,411,853	06/377,212	10/25/83
4,411,561	06/266,566	10/25/83	4,411,855	06/296,580	10/25/83
4,411,565	06/261,694	10/25/83	4,411,860	06/242,919	10/25/83
4,411,566	06/222,786	10/25/83	4,411,869	06/470,428	10/25/83
4,411,568	06/265,466	10/25/83	4,411,875	06/362,173	10/25/83
4,411,571	06/252,792	10/25/83	4,411,879	06/292,646	10/25/83
4,411,574	06/282,754	10/25/83	4,411,880	06/378,980	10/25/83
4,411,575	06/259,723	10/25/83	4,411,882	06/274,603	10/25/83
4,411,591	06/273,748	10/25/83	4,411,888	06/403,751	10/25/83
4,411,607	06/254,385	10/25/83	4,411,889	06/381,530	10/25/83
4,411,609	06/255,102	10/25/83	4,411,893	06/422,891	10/25/83
4,411,611	06/252,604	10/25/83	4,411,903	06/313,853	10/25/83
4,411,613	06/272,575	10/25/83	4,411,921	06/355,327	10/25/83
4,411,614	06/349,988	10/25/83	4,411,927	06/393,566	10/25/83
4,411,620	06/306,666	10/25/83	4,411,933	06/252,457	10/25/83
4,411,623	06/313,489	10/25/83	4,411,934	06/423,484	10/25/83
4,411,624	06/309,513	10/25/83	4,411,940	06/367,277	10/25/83
4,411,630	06/234,125	10/25/83	4,411,944	06/268,794	10/25/83
4,411,633	06/434,977	10/25/83	4,411,956	06/347,810	10/25/83
4,411,637	06/331,502	10/25/83	4,411,957	06/412,164	10/25/83
4,411,652	06/295,024	10/25/83	4,411,959	06/293,537	10/25/83
4,411,656	06/343,886	10/25/83	4,411,960	06/332,429	10/25/83
4,411,658	06/234,841	10/25/83	4,411,967	06/368,517	10/25/83
4,411,660	06/368,187	10/25/83	4,411,968	06/307,338	10/25/83
4,411,663	06/285,681	10/25/83	4,411,973	06/293,080	10/25/83
4,411,664	06/373,591	10/25/83	4,411,974	06/367,193	10/25/83
4,411,668	06/340,685	10/25/83	4,411,975	06/367,194	10/25/83
4,411,671	06/385,743	10/25/83	4,411,979	06/337,334	10/25/83
4,411,672	06/285,619	10/25/83	4,411,983	06/357,114	10/25/83
4,411,675	06/289,797	10/25/83	4,411,987	06/440,044	10/25/83
4,411,676	06/368,385	10/25/83	4,411,990	06/254,346	10/25/83
4,411,681	06/458,169	10/25/83	4,411,992	06/249,906	10/25/83
4,411,682	06/304,991	10/25/83	4,411,998	06/359,773	10/25/83
4,411,692	06/247,679	10/25/83	4,411,999	06/306,870	10/25/83
4,411,693	06/247,680	10/25/83	4,412,000	06/320,215	10/25/83
			4,412,003	06/288,270	10/25/83



Patent Number	Serial Number	Issue Date	4,700,404	06/932,664	10/20/87
4,412,007	06/340,946	10/25/83	4,700,406	06/828,944	10/20/87
4,412,014	06/278,139	10/25/83	4,700,407	06/897,020	10/20/87
4,412,019	06/397,319	10/25/83	4,700,408	07/046,001	10/20/87
4,412,023	06/316,815	10/25/83	4,700,415	06/764,941	10/20/87
4,412,028	06/335,450	10/25/83	4,700,416	06/869,367	10/20/87
4,412,031	06/467,764	10/25/83	4,700,423	06/761,634	10/20/87
4,412,037	06/302,040	10/25/83	4,700,424	06/847,262	10/20/87
4,412,039	06/284,295	10/25/83	4,700,425	06/820,360	10/20/87
4,412,041	06/467,765	10/25/83	4,700,430	06/763,820	10/20/87
4,412,042	06/356,004	10/25/83	4,700,431	06/763,345	10/20/87
4,412,048	06/301,169	10/25/83	4,700,433	06/893,595	10/20/87
4,412,050	06/222,361	10/25/83	4,700,436	06/836,537	10/20/87
4,412,052	06/377,274	10/25/83	4,700,437	06/947,818	10/20/87
4,412,054	06/408,936	10/25/83	4,700,439	06/631,579	10/20/87
4,412,055	06/423,905	10/25/83	4,700,442	06/867,796	10/20/87
4,412,062	06/392,040	10/25/83	4,700,445	06/397,571	10/20/87
4,412,063	06/364,986	10/25/83	4,700,452	06/743,607	10/20/87
4,412,066	06/389,118	10/25/83	4,700,456	06/790,607	10/20/87
4,412,071	06/378,702	10/25/83	4,700,459	06/905,225	10/20/87
4,412,075	06/339,725	10/25/83	4,700,463	06/903,453	10/20/87
4,412,076	06/339,723	10/25/83	4,700,467	06/742,520	10/20/87
4,412,079	06/419,883	10/25/83	4,700,468	06/879,023	10/20/87
4,412,080	06/408,103	10/25/83	4,700,471	06/797,962	10/20/87
4,412,081	06/412,062	10/25/83	4,700,474	06/935,255	10/20/87
4,412,083	06/357,158	10/25/83	4,700,477	06/769,087	10/20/87
4,412,088	06/300,786	10/25/83	4,700,481	06/866,534	10/20/87
4,412,097	06/227,035	10/25/83	4,700,482	06/821,408	10/20/87
4,412,099	06/264,175	10/25/83	4,700,487	06/880,411	10/20/87
4,412,107	06/281,642	10/25/83	4,700,488	06/828,778	10/20/87
4,412,112	06/368,065	10/25/83	4,700,496	06/872,330	10/20/87
4,412,116	06/382,251	10/25/83	4,700,498	06/797,168	10/20/87
4,412,117	06/301,055	10/25/83	4,700,505	06/873,601	10/20/87
4,412,118	06/272,190	10/25/83	4,700,510	06/865,857	10/20/87
4,412,121	06/297,514	10/25/83	4,700,512	06/887,444	10/20/87
4,412,124	06/269,180	10/25/83	4,700,514	06/762,424	10/20/87
4,412,125	06/424,092	10/25/83	4,700,517	06/931,673	10/20/87
4,412,128	06/229,418	10/25/83	4,700,527	06/771,499	10/20/87
4,412,136	06/330,995	10/25/83	4,700,528	06/785,073	10/20/87
4,412,141	06/217,098	10/25/83	4,700,530	06/834,268	10/20/87
4,412,145	06/343,111	10/25/83	4,700,534	06/894,179	10/20/87
4,412,149	06/303,751	10/25/83	4,700,537	06/906,349	10/20/87
4,412,162	06/348,306	10/25/83	4,700,539	06/880,689	10/20/87
4,412,169	06/324,938	10/25/83	4,700,540	06/691,873	10/20/87
4,412,174	06/267,656	10/25/83	4,700,545	06/860,034	10/20/87
4,412,178	06/255,975	10/25/83	4,700,551	06/884,229	10/20/87
4,412,179	06/255,977	10/25/83	4,700,552	06/900,312	10/20/87
4,412,185	06/274,214	10/25/83	4,700,553	07/006,850	10/20/87
4,412,189	06/262,814	10/25/83	4,700,555	06/865,304	10/20/87
4,412,195	06/368,662	10/25/83	4,700,557	06/931,900	10/20/87
4,412,200	06/364,291	10/25/83	4,700,559	06/914,186	10/20/87
4,412,202	06/303,504	10/25/83	4,700,562	06/816,939	10/20/87
4,412,205	06/295,841	10/25/83	4,700,563	06/878,663	10/20/87
4,412,208	06/299,120	10/25/83	4,700,566	06/888,178	10/20/87
4,412,216	06/250,564	10/25/83	4,700,567	06/801,121	10/20/87
4,412,220	06/251,675	10/25/83	4,700,574	06/863,683	10/20/87
4,412,227	06/386,823	10/25/83	4,700,576	06/785,397	10/20/87
4,412,234	06/244,321	10/25/83	4,700,577	06/917,282	10/20/87
4,412,248	06/338,730	10/25/83	4,700,580	06/831,871	10/20/87
4,412,249	06/338,731	10/25/83	4,700,583	06/490,206	10/20/87
4,412,254	06/276,897	10/25/83	4,700,587	06/876,521	10/20/87
4,412,257	06/387,628	10/25/83	4,700,588	06/810,903	10/20/87
4,412,259	06/234,791	10/25/83	4,700,593	06/891,830	10/20/87
4,412,262	06/316,262	10/25/83	4,700,612	06/839,980	10/20/87
4,412,265	06/325,500	10/25/83	4,700,615	06/816,144	10/20/87
4,412,269	06/233,763	10/25/83	4,700,620	06/827,581	10/20/87
4,412,282	06/220,934	10/25/83	4,700,622	06/898,123	10/20/87
4,412,295	06/362,667	10/25/83	4,700,630	06/902,297	10/20/87
4,412,315	06/286,921	10/25/83	4,700,634	06/864,033	10/20/87
4,412,324	06/264,813	10/25/83	4,700,638	06/895,138	10/20/87
4,412,325	06/282,644	10/25/83	4,700,639	06/804,431	10/20/87
4,412,329	06/311,782	10/25/83	4,700,640	06/915,916	10/20/87
4,412,332	06/244,375	10/25/83	4,700,644	06/865,549	10/20/87
4,412,335	06/305,564	10/25/83	4,700,648	06/882,460	10/20/87
4,412,342	06/332,137	10/25/83	4,700,653	06/846,434	10/20/87
4,412,346	06/399,868	10/25/83	4,700,655	06/900,519	10/20/87
4,412,349	06/313,238	10/25/83	4,700,660	06/829,651	10/20/87
4,700,403	06/939,258	10/20/87	4,700,686	06/943,039	10/20/87
			4,700,688	06/918,601	10/20/87

Patent Number	Serial Number	Issue Date	4,700,949	07/006,797	10/20/87
4,700,691	06/716,573	10/20/87	4,700,950	06/813,483	10/20/87
4,700,695	06/895,362	10/20/87	4,700,952	06/910,475	10/20/87
4,700,697	06/732,281	10/20/87	4,700,954	06/436,242	10/20/87
4,700,700	06/907,862	10/20/87	4,700,955	06/895,479	10/20/87
4,700,703	06/844,949	10/20/87	4,700,956	06/808,894	10/20/87
4,700,706	06/825,336	10/20/87	4,700,957	06/893,665	10/20/87
4,700,709	06/824,349	10/20/87	4,700,958	06/863,516	10/20/87
4,700,712	06/896,835	10/20/87	4,700,959	06/736,276	10/20/87
4,700,713	06/947,827	10/20/87	4,700,960	06/854,412	10/20/87
4,700,718	06/866,987	10/20/87	4,700,962	06/871,283	10/20/87
4,700,724	06/671,221	10/20/87	4,700,967	06/836,871	10/20/87
4,700,725	06/853,142	10/20/87	4,700,971	06/735,972	10/20/87
4,700,726	06/858,790	10/20/87	4,700,972	06/873,987	10/20/87
4,700,732	06/903,699	10/20/87	4,700,974	06/866,383	10/20/87
4,700,735	06/897,915	10/20/87	4,700,975	06/865,653	10/20/87
4,700,737	06/902,171	10/20/87	4,700,978	06/911,516	10/20/87
4,700,741	06/905,242	10/20/87	4,700,980	06/931,233	10/20/87
4,700,747	06/755,280	10/20/87	4,700,981	06/915,728	10/20/87
4,700,750	06/793,380	10/20/87	4,700,987	06/948,117	10/20/87
4,700,755	06/814,856	10/20/87	4,700,990	06/832,386	10/20/87
4,700,758	06/862,679	10/20/87	4,701,008	06/639,634	10/20/87
4,700,762	06/848,347	10/20/87	4,701,010	06/646,004	10/20/87
4,700,769	06/746,101	10/20/87	4,701,012	06/722,572	10/20/87
4,700,771	07/002,909	10/20/87	4,701,013	06/797,548	10/20/87
4,700,775	06/832,444	10/20/87	4,701,017	06/835,507	10/20/87
4,700,777	06/850,473	10/20/87	4,701,018	06/914,642	10/20/87
4,700,780	07/031,493	10/20/87	4,701,023	06/786,660	10/20/87
4,700,781	06/806,445	10/20/87	4,701,024	06/936,180	10/20/87
4,700,782	06/928,445	10/20/87	4,701,029	06/753,444	10/20/87
4,700,787	06/793,698	10/20/87	4,701,037	06/829,010	10/20/87
4,700,788	06/731,204	10/20/87	4,701,038	06/682,698	10/20/87
4,700,790	06/706,060	10/20/87	4,701,041	06/925,602	10/20/87
4,700,794	06/885,342	10/20/87	4,701,047	06/745,405	10/20/87
4,700,800	07/012,735	10/20/87	4,701,054	06/735,874	10/20/87
4,700,801	06/689,295	10/20/87	4,701,058	06/898,469	10/20/87
4,700,804	06/814,739	10/20/87	4,701,061	06/909,935	10/20/87
4,700,807	06/900,288	10/20/87	4,701,062	06/781,177	10/20/87
4,700,809	06/853,795	10/20/87	4,701,064	06/924,931	10/20/87
4,700,812	06/864,452	10/20/87	4,701,067	06/927,479	10/20/87
4,700,813	06/826,487	10/20/87	4,701,076	06/893,067	10/20/87
4,700,814	06/675,418	10/20/87	4,701,077	06/866,957	10/20/87
4,700,816	06/862,657	10/20/87	4,701,080	06/707,770	10/20/87
4,700,817	06/874,486	10/20/87	4,701,094	06/824,036	10/20/87
4,700,820	06/853,560	10/20/87	4,701,095	06/894,440	10/20/87
4,700,828	06/886,602	10/20/87	4,701,098	06/911,920	10/20/87
4,700,829	07/034,909	10/20/87	4,701,100	06/764,676	10/20/87
4,700,832	06/912,981	10/20/87	4,701,104	06/875,460	10/20/87
4,700,833	06/827,358	10/20/87	4,701,106	06/873,850	10/20/87
4,700,843	06/878,584	10/20/87	4,701,107	06/848,243	10/20/87
4,700,851	06/724,563	10/20/87	4,701,111	06/849,504	10/20/87
4,700,854	06/753,953	10/20/87	4,701,128	06/810,583	10/20/87
4,700,857	06/893,859	10/20/87	4,701,130	06/914,797	10/20/87
4,700,864	06/873,688	10/20/87	4,701,132	06/825,353	10/20/87
4,700,867	06/832,804	10/20/87	4,701,133	07/005,705	10/20/87
4,700,870	06/830,195	10/20/87	4,701,136	06/820,056	10/20/87
4,700,871	06/789,876	10/20/87	4,701,138	06/943,087	10/20/87
4,700,874	06/844,424	10/20/87	4,701,148	06/881,323	10/20/87
4,700,877	06/842,317	10/20/87	4,701,153	06/860,742	10/20/87
4,700,884	06/691,681	10/20/87	4,701,155	06/884,475	10/20/87
4,700,885	06/870,804	10/20/87	4,701,181	06/881,084	10/20/67
4,700,888	06/875,577	10/20/87	4,701,186	06/509,637	10/20/87
4,700,891	06/912,469	10/20/87	4,701,194	06/828,894	10/20/87
4,700,895	06/803,229	10/20/87	4,701,207	06/897,551	10/20/87
4,700,899	06/788,765	10/20/87	4,701,210	06/875,079	10/20/87
4,700,901	06/891,281	10/20/87	4,701,211	06/746,142	10/20/87
4,700,902	06/807,973	10/20/87	4,701,213	06/813,405	10/20/87
4,700,905	07/006,349	10/20/87	4,701,216	06/876,818	10/20/87
4,700,906	07/028,191	10/20/87	4,701,223	06/856,715	10/20/87
4,700,910	06/689,950	10/20/87	4,701,224	06/854,462	10/20/87
4,700,912	06/855,303	10/20/87	4,701,225	06/908,004	10/20/87
4,700,915	06/928,792	10/20/87	4,701,232	06/860,678	10/20/87
4,700,917	06/907,399	10/20/87	4,701,242	06/722,810	10/20/87
4,700,924	06/915,565	10/20/87	4,701,243	06/832,527	10/20/87
4,700,930	06/851,204	10/20/87	4,701,248	06/880,080	10/20/87
4,700,932	06/827,353	10/20/87	4,701,249	06/895,634	10/20/87
4,700,940	06/880,715	10/20/87	4,701,252	06/906,633	10/20/87
4,700,946	06/786,473	10/20/87	4,701,255	06/933,380	10/20/87
			4,701,256	06/809,112	10/20/87



Patent Number	Serial Number	Issue Date	4,701,545	06/828,611	10/20/87
4,701,257	06/826,658	10/20/87	4,701,550	06/745,238	10/20/87
4,701,263	06/812,518	10/20/87	4,701,551	06/887,570	10/20/87
4,701,264	06/730,957	10/20/87	4,701,552	06/842,348	10/20/87
4,701,266	06/854,168	10/20/87	4,701,557	06/407,198	10/20/87
4,701,271	06/415,089	10/20/87	4,701,562	06/878,201	10/20/87
4,701,274	06/727,894	10/20/87	4,701,569	06/865,276	10/20/87
4,701,276	06/925,248	10/20/87	4,701,570	06/885,572	10/20/87
4,701,281	06/844,408	10/20/87	4,701,577	06/865,768	10/20/87
4,701,283	06/793,738	10/20/87	4,701,581	06/907,337	10/20/87
4,701,284	06/843,305	10/20/87	4,701,586	06/869,213	10/20/87
4,701,285	06/793,722	10/20/87	4,701,605	06/828,708	10/20/87
4,701,286	06/744,693	10/20/87	4,701,610	06/823,599	10/20/87
4,701,288	06/741,382	10/20/87	4,701,619	06/842,590	10/20/87
4,701,292	06/650,041	10/20/87	4,701,623	06/768,581	10/20/87
4,701,298	06/866,921	10/20/87	4,701,634	06/750,302	10/20/87
4,701,305	06/878,536	10/20/87	4,701,640	06/710,225	10/20/87
4,701,306	06/617,575	10/20/87	4,701,641	06/665,871	10/20/87
4,701,308	06/806,815	10/20/87	4,701,649	06/892,951	10/20/87
4,701,310	06/737,523	10/20/87	4,701,650	06/892,956	10/20/87
4,701,318	06/855,993	10/20/87	4,701,652	06/572,598	10/20/87
4,701,328	06/824,470	10/20/87	4,701,657	06/894,664	10/20/87
4,701,330	06/862,065	10/20/87	4,701,660	06/838,831	10/20/87
4,701,339	06/832,125	10/20/87	4,701,672	06/737,797	10/20/87
4,701,340	06/806,701	10/20/87	4,701,678	06/921,168	10/20/87
4,701,344	06/800,638	10/20/87	4,701,685	06/387,254	10/20/87
4,701,347	06/853,676	10/20/87	4,701,697	06/572,927	10/20/87
4,701,352	06/679,835	10/20/87	4,701,698	06/914,519	10/20/87
4,701,354	06/800,135	10/20/87	4,701,700	06/803,161	10/20/87
4,701,363	06/822,580	10/20/87	4,701,708	06/891,823	10/20/87
4,701,366	06/750,140	10/20/87	4,701,734	06/844,880	10/20/87
4,701,367	06/833,684	10/20/87	4,701,735	06/940,608	10/20/87
4,701,371	06/878,782	10/20/87	4,701,742	06/835,380	10/20/87
4,701,379	06/900,859	10/20/87	4,701,749	06/806,731	10/20/87
4,701,385	06/680,891	10/20/87	4,701,750	06/638,112	10/20/87
4,701,391	06/824,294	10/20/87	4,701,751	06/894,899	10/20/87
4,701,398	06/839,581	10/20/87	4,701,754	06/724,382	10/20/87
4,701,401	06/802,679	10/20/87	4,701,757	06/835,258	10/20/87
4,701,417	06/800,460	10/20/87	4,701,764	06/821,787	10/20/87
4,701,422	06/848,514	10/20/87	4,701,768	06/928,033	10/20/87
4,701,427	06/789,066	10/20/87	4,701,772	06/935,653	10/20/87
4,701,430	06/895,139	10/20/87	4,701,783	07/005,296	10/20/87
4,701,431	06/850,274	10/20/87	4,701,789	06/838,371	10/20/87
4,701,435	06/848,682	10/20/87	4,701,795	06/794,676	10/20/87
4,701,436	06/841,062	10/20/87	4,701,796	06/673,956	10/20/87
4,701,438	06/896,041	10/20/87	4,701,814	06/820,542	10/20/87
4,701,441	06/700,870	10/20/87	4,701,821	06/769,813	10/20/87
4,701,442	06/744,341	10/20/87	4,701,823	06/788,427	10/20/87
4,701,445	06/630,285	10/20/87	4,701,834	06/893,565	10/20/87
4,701,454	06/831,392	10/20/87	4,701,838	06/692,886	10/20/87
4,701,455	06/747,671	10/20/87	4,701,853	06/739,615	10/20/87
4,701,459	06/883,258	10/20/87	4,701,854	06/701,349	10/20/87
4,701,463	06/897,483	10/20/87	4,701,858	06/688,035	10/20/87
4,701,470	06/447,035	10/20/87	4,701,863	06/681,537	10/20/87
4,701,472	07/017,970	10/20/87	4,701,869	06/715,829	10/20/87
4,701,484	07/017,519	10/20/87	4,701,872	06/676,840	10/20/87
4,701,492	06/787,067	10/20/87	4,701,876	06/651,312	10/20/87
4,701,498	06/878,037	10/20/87	4,701,880	06/731,360	10/20/87
4,701,499	06/799,339	10/20/87	4,701,882	06/809,982	10/20/87
4,701,501	06/800,943	10/20/87	4,701,883	06/875,909	10/20/87
4,701,502	06/808,763	10/20/87	4,701,888	06/926,852	10/20/87
4,701,503	06/757,218	10/20/87	4,701,893	06/802,809	10/20/87
4,701,506	06/892,154	10/20/87	4,701,910	06/907,439	10/20/87
4,701,513	06/941,864	10/20/87	4,701,911	06/737,467	10/20/87
4,701,514	06/814,747	10/20/87	4,701,918	06/796,598	10/20/87
4,701,515	06/858,667	10/20/87	4,701,941	06/666,083	10/20/87
4,701,519	06/941,901	10/20/87	4,701,945	06/658,886	10/20/87
4,701,520	06/853,101	10/20/87	4,701,946	06/663,800	10/20/87
4,701,522	06/815,444	10/20/87	4,701,950	06/599,715	10/20/87
4,701,523	06/862,681	10/20/87	4,701,958	06/730,488	10/20/87
4,701,526	06/807,724	10/20/87	4,701,961	06/727,889	10/20/87
4,701,527	06/673,308	10/20/87	5,058,207	07/613,047	10/22/91
4,701,528	06/812,166	10/20/87	5,058,210	07/475,452	10/22/91
4,701,529	06/916,772	10/20/87	5,058,211	07/600,694	10/22/91
4,701,530	06/914,203	10/20/87	5,058,216	07/434,529	10/22/91
4,701,534	06/859,663	10/20/87	5,058,217	07/342,031	10/22/91
4,701,536	06/882,592	10/20/87	5,058,219	07/575,228	10/22/91
4,701,543	06/886,845	10/20/87	5,058,221	07/643,240	10/22/91
			5,058,223	07/368,101	10/22/91

Patent Number	Serial Number	Issue Date	5,058,506	07/527,508	10/22/91
5,058,224	07/392,860	10/22/91	5,058,510	07/522,165	10/22/91
5,058,225	07/540,903	10/22/91	5,058,519	07/502,832	10/22/91
5,058,227	07/625,433	10/22/91	5,058,523	07/504,632	10/22/91
5,058,232	07/150,656	10/22/91	5,058,528	07/450,239	10/22/91
5,058,234	07/468,925	10/22/91	5,058,530	07/365,896	10/22/91
5,058,237	07/589,105	10/22/91	5,058,531	07/527,209	10/22/91
5,058,241	07/531,357	10/22/91	5,058,561	07/512,170	10/22/91
5,058,248	07/519,049	10/22/91	5,058,562	07/554,862	10/22/91
5,058,250	07/530,128	10/22/91	5,058,564	07/469,412	10/22/91
5,058,256	07/663,364	10/22/91	5,058,572	07/143,362	10/22/91
5,058,264	07/515,773	10/22/91	5,058,578	07/259,209	10/22/91
5,058,268	07/472,084	10/22/91	5,058,595	07/472,767	10/22/91
5,058,270	07/598,475	10/22/91	5,058,602	07/418,751	10/22/91
5,058,271	07/599,629	10/22/91	5,058,607	07/485,006	10/22/91
5,058,273	07/693,152	10/22/91	5,058,613	07/596,204	10/22/91
5,058,274	07/591,434	10/22/91	5,058,614	07/525,712	10/22/91
5,058,276	07/509,134	10/22/91	5,058,621	07/536,506	10/22/91
5,058,278	07/557,368	10/22/91	5,058,622	07/464,459	10/22/91
5,058,279	07/510,127	10/22/91	5,058,627	07/509,294	10/22/91
5,058,281	07/571,344	10/22/91	5,058,629	07/530,262	10/22/91
5,058,285	07/553,662	10/22/91	5,058,631	07/394,594	10/22/91
5,059,289	07/500,042	10/22/91	5,058,638	07/618,471	10/22/91
5,058,294	07/522,467	10/22/91	5,058,640	07/649,023	10/22/91
5,058,296	07/441,164	10/22/91	5,058,644	07/417,530	10/22/91
5,058,297	07/541,834	10/22/91	5,058,655	06/841,167	10/22/91
5,058,305	07/544,974	10/22/91	5,058,658	07/616,347	10/22/91
5,058,308	07/657,419	10/22/91	5,058,662	07/588,393	10/22/91
5,058,309	07/526,281	10/22/91	5,058,668	07/561,334	10/22/91
5,058,310	07/415,883	10/22/91	5,058,675	07/604,219	10/22/91
5,058,314	07/495,844	10/22/91	5,058,676	07/429,748	10/22/91
5,058,317	07/517,573	10/22/91	5,058,681	07/582,449	10/22/91
5,058,319	07/582,743	10/22/91	5,058,682	07/574,982	10/22/91
5,058,323	07/580,855	10/22/91	5,058,683	07/607,561	10/22/91
5,058,327	07/557,465	10/22/91	5,058,686	07/186,035	10/22/91
5,058,328	07/463,244	10/22/91	5,058,691	07/502,747	10/22/91
5,058,330	07/348,203	10/22/91	5,058,695	07/482,276	10/22/91
5,058,334	07/354,452	10/22/91	5,058,696	07/608,922	10/22/91
5,058,337	07/631,168	10/22/91	5,058,698	07/559,377	10/22/91
5,058,340	07/494,623	10/22/91	5,058,706	07/461,615	10/22/91
5,058,341	07/509,816	10/22/91	5,058,707	07/612,450	10/22/91
5,058,348	07/435,453	10/22/91	5,058,709	07/535,151	10/22/91
5,058,349	07/495,403	10/22/91	5,058,722	07/663,263	10/22/91
5,058,352	07/591,212	10/22/91	5,058,726	07/451,221	10/22/91
5,058,359	07/522,655	10/22/91	5,058,729	07/426,883	10/22/91
5,058,365	07/404,848	10/22/91	5,058,730	07/562,583	10/22/91
5,058,367	07/297,411	10/22/91	5,058,733	07/514,548	10/22/91
5,058,373	07/590,820	10/22/91	5,058,734	07/644,208	10/22/91
5,058,376	07/274,511	10/22/91	5,058,735	07/643,700	10/22/91
5,058,381	07/469,613	10/22/91	5,058,742	07/185,988	10/22/91
5,058,384	07/632,944	10/22/91	5,058,760	07/463,363	10/22/91
5,058,390	07/528,613	10/22/91	5,058,763	07/612,211	10/22/91
5,058,394	07/475,811	10/22/91	5,058,774	07/518,995	10/22/91
5,058,397	07/574,065	10/22/91	5,058,777	07/356,847	10/22/91
5,058,399	07/411,858	10/22/91	5,058,787	07/604,079	10/22/91
5,058,400	07/481,984	10/22/91	5,058,789	07/557,576	10/22/91
5,058,403	07/554,562	10/22/91	5,058,790	07/547,855	10/22/91
5,058,405	07/562,638	10/22/91	5,058,794	07/523,324	10/22/91
5,058,412	07/513,754	10/22/91	5,058,796	07/446,413	10/22/91
5,058,418	07/578,245	10/22/91	5,058,801	07/509,579	10/22/91
5,058,432	07/324,173	10/22/91	5,058,808	07/573,094	10/22/91
5,058,433	07/382,627	10/22/91	5,058,810	07/629,062	10/22/91
5,058,434	07/485,586	10/22/91	5,058,815	07/330,261	10/22/91
5,058,437	07/411,139	10/22/91	5,058,816	07/407,745	10/22/91
5,058,438	07/482,582	10/22/91	5,058,825	07/520,993	10/22/91
5,058,439	07/534,104	10/22/91	5,058,826	07/471,332	10/22/91
5,058,441	07/451,689	10/22/91	5,058,831	07/460,493	10/22/91
5,058,445	07/301,924	10/22/91	5,058,833	07/489,349	10/22/91
5,058,457	07/533,492	10/22/91	5,058,836	07/457,877	10/22/91
5,058,464	07/414,100	10/22/91	5,058,837	07/335,204	10/22/91
5,058,469	07/609,831	10/22/91	5,058,841	07/448,279	10/22/91
5,058,471	07/564,648	10/22/91	5,058,844	07/547,471	10/22/91
5,058,474	07/655,762	10/22/91	5,058,848	07/627,977	10/22/91
5,058,476	07/471,015	10/22/91	5,058,849	07/542,913	10/22/91
5,058,479	07/568,075	10/22/91	5,058,853	07/358,293	10/22/91
5,058,488	07/423,117	10/22/91	5,058,854	07/481,497	10/22/91
5,058,492	07/488,735	10/22/91	5,058,858	07/637,241	10/22/91
5,058,498	07/615,855	10/22/91	5,058,859	07/518,474	10/22/91
			5,058,862	07/593,317	10/22/91



Patent Number	Serial Number	Issue Date	5,059,250	06/842,905	10/22/91
5,058,869	07/605,924	10/22/91	5,059,251	07/449,960	10/22/91
5,058,877	07/525,750	10/22/91	5,059,252	07/448,937	10/22/91
5,058,878	07/450,476	10/22/91	5,059,256	07/477,916	10/22/91
5,058,883	07/496,588	10/22/91	5,059,259	07/554,855	10/22/91
5,058,889	07/674,979	10/22/91	5,059,267	07/574,478	10/22/91
5,058,890	07/560,793	10/22/91	5,059,270	07/324,552	10/22/91
5,058,897	07/581,912	10/22/91	5,059,289	07/502,412	10/22/91
5,058,898	07/632,453	10/22/91	5,059,292	07/573,891	10/22/91
5,058,899	07/490,749	10/22/91	5,059,301	07/672,504	10/22/91
5,058,903	07/367,056	10/22/91	5,059,303	07/367,144	10/22/91
5,058,904	07/482,486	10/22/91	5,059,305	07/649,280	10/22/91
5,058,905	07/417,471	10/22/91	5,059,306	07/541,555	10/22/91
5,058,906	07/299,724	10/22/91	5,059,308	07/213,799	10/22/91
5,058,911	07/501,010	10/22/91	5,059,309	07/541,689	10/22/91
5,058,913	07/568,931	10/22/91	5,059,311	07/224,447	10/22/91
5,058,923	07/659,828	10/22/91	5,059,314	07/588,726	10/22/91
5,058,931	07/542,257	10/22/91	5,059,315	07/420,886	10/22/91
5,058,940	07/560,423	10/22/91	5,059,317	07/416,247	10/22/91
5,058,942	07/574,395	10/22/91	5,059,320	07/446,082	10/22/91
5,058,943	07/477,779	10/22/91	5,059,322	07/514,293	10/22/91
5,058,944	07/568,227	10/22/91	5,059,330	07/503,528	10/22/91
5,058,945	07/535,090	10/22/91	5,059,338	07/618,962	10/22/91
5,058,949	07/568,973	10/22/91	5,059,341	07/503,488	10/22/91
5,058,950	07/607,986	10/22/91	5,059,361	07/252,072	10/22/91
5,058,951	07/645,598	10/22/91	5,059,363	07/650,427	10/22/91
5,058,954	07/425,758	10/22/91	5,059,367	07/302,982	10/22/91
5,058,958	07/418,489	10/22/91	5,059,372	07/039,469	10/22/91
5,058,962	07/401,109	10/22/91	5,059,383	07/336,725	10/22/91
5,058,971	07/482,142	10/22/91	5,059,391	07/239,480	10/22/91
5,058,980	07/482,778	10/22/91	5,059,397	07/310,631	10/22/91
5,059,002	07/454,755	10/22/91	5,059,399	07/455,266	10/22/91
5,059,003	07/392,866	10/22/91	5,059,402	07/231,526	10/22/91
5,059,008	07/498,525	10/22/91	5,059,405	07/282,309	10/22/91
5,059,017	07/531,271	10/22/91	5,059,409	07/443,289	10/22/91
5,059,020	07/625,312	10/22/91	5,059,413	07/182,673	10/22/91
5,059,031	07/468,532	10/22/91	5,059,416	07/372,394	10/22/91
5,059,034	07/308,344	10/22/91	5,059,418	07/410,164	10/22/91
5,059,039	07/540,148	10/22/91	5,059,434	07/596,498	10/22/91
5,059,048	07/422,590	10/22/91	5,059,456	07/519,624	10/22/91
5,059,052	07/408,565	10/22/91	5,059,457	07/604,963	10/22/91
5,059,053	07/372,888	10/22/91	5,059,458	07/565,198	10/22/91
5,059,054	07/366,833	10/22/91	5,059,467	07/395,699	10/22/91
5,059,057	07/593,098	10/22/91	5,059,479	07/458,866	10/22/91
5,059,062	07/537,690	10/22/91	5,059,486	07/370,817	10/22/91
5,059,067	07/435,021	10/22/91	5,059,494	07/521,480	10/22/91
5,059,071	07/510,864	10/22/91	5,059,495	07/498,468	10/22/91
5,059,076	07/544,959	10/22/91	5,059,499	07/202,579	10/22/91
5,059,085	07/407,438	10/22/91	5,059,519	07/206,054	10/22/91
5,059,086	07/490,435	10/22/91	5,059,520	07/900,820	10/22/91
5,059,087	07/523,664	10/22/91	5,059,525	07/530,469	10/22/91
5,059,089	07/258,594	10/22/91	5,059,533	07/219,738	10/22/91
5,059,101	07/424,912	10/22/91	5,059,534	07/403,907	10/22/91
5,059,116	07/401,795	10/22/91	5,059,536	07/631,211	10/22/91
5,059,117	07/593,512	10/22/91	5,059,560	07/496,946	10/22/91
5,059,134	07/597,536	10/22/91	5,059,569	07/299,168	10/22/91
5,059,139	07/424,889	10/22/91	5,059,575	07/539,481	10/22/91
5,059,141	07/447,861	10/22/91	5,059,581	07/545,016	10/22/91
5,059,151	07/613,418	10/22/91	5,059,583	07/386,329	10/22/91
5,059,168	07/591,958	10/22/91	5,059,589	07/488,572	10/22/91
5,059,173	07/557,388	10/22/91	5,059,590	07/316,969	10/22/91
5,059,180	07/439,417	10/22/91	5,059,592	07/221,518	10/22/91
5,059,184	07/518,603	10/22/91	5,059,598	07/409,192	10/22/91
5,059,187	07/518,244	10/22/91	5,059,599	07/534,180	10/22/91
5,059,200	07/506,446	10/22/91	5,059,603	07/364,289	10/22/91
5,059,202	07/541,505	10/22/91	5,059,607	07/535,969	10/22/91
5,059,203	07/352,870	10/22/91	5,059,613	07/495,551	10/22/91
5,059,215	07/476,561	10/22/91	5,059,617	07/423,162	10/22/91
5,059,217	07/594,990	10/22/91	5,059,620	07/178,964	10/22/91
5,059,220	07/438,330	10/22/91	5,059,624	07/315,107	10/22/91
5,059,221	07/548,448	10/22/91	5,059,625	07/591,997	10/22/91
5,059,223	07/460,483	10/22/91	5,059,642	07/407,294	10/22/91
5,059,225	07/295,032	10/22/91	5,059,643	07/061,430	10/22/91
5,059,226	07/427,374	10/22/91	5,059,645	07/525,201	10/22/91
5,059,231	07/406,402	10/22/91	5,059,652	07/375,470	10/22/91
5,059,236	07/594,797	10/22/91	5,059,656	07/458,030	10/22/91
5,059,242	07/516,080	10/22/91	5,059,669	07/123,029	10/22/91
5,059,247	07/569,896	10/22/91	5,059,672	07/543,452	10/22/91
			5,059,682	07/346,689	10/22/91

Patent Number	Serial Number	Issue Date	5,060,177	07/491,163	10/22/91
5,059,683	07/348,340	10/22/91	5,060,184	07/587,558	10/22/91
5,059,685	07/652,217	10/22/91	5,060,188	07/316,068	10/22/91
5,059,692	07/574,730	10/22/91	5,060,212	07/232,321	10/22/91
5,059,696	07/493,595	10/22/91	5,060,215	07/327,841	10/22/91
5,059,697	07/537,717	10/22/91	5,060,232	07/570,325	10/22/91
5,059,702	07/414,994	10/22/91	5,060,234	07/636,017	10/22/91
5,059,703	07/334,637	10/22/91	5,060,241	07/431,061	10/22/91
5,059,707	07/499,875	10/22/91	5,060,242	07/314,749	10/22/91
5,059,711	07/172,732	10/22/91	5,060,245	07/546,472	10/22/91
5,059,715	07/668,328	10/22/91	5,060,246	07/354,005	10/22/91
5,059,717	07/552,342	10/22/91	5,060,254	07/373,885	10/22/91
5,059,729	07/680,620	10/22/91	5,060,262	07/519,856	10/22/91
5,059,731	07/475,520	10/22/91	5,060,279	07/265,859	10/22/91
5,059,733	07/542,298	10/22/91	5,060,289	07/519,030	10/22/91
5,059,734	07/542,297	10/22/91	5,060,290	07/402,932	10/22/91
5,059,735	07/643,706	10/22/91	5,060,291	07/350,192	10/22/91
5,059,738	07/489,991	10/22/91	5,060,296	07/316,738	10/22/91
5,059,750	07/460,950	10/22/91	5,060,297	07/176,844	10/22/91
5,059,751	07/573,613	10/22/91	5,060,301	07/561,949	10/22/91
5,059,768	07/579,805	10/22/91	5,060,311	07/510,859	10/22/91
5,059,774	07/258,693	10/22/91			
5,059,782	07/551,498	10/22/91			
5,059,802	07/522,713	10/22/91			
5,059,817	07/553,456	10/22/91			
5,059,850	07/479,250	10/22/91			
5,059,854	07/461,892	10/22/91			
5,059,864	07/455,527	10/22/91			
5,059,866	07/103,631	10/22/91			
5,059,871	07/550,176	10/22/91			
5,059,873	07/621,672	10/22/91			
5,059,874	07/634,673	10/22/91			
5,059,875	07/448,347	10/22/91			
5,059,886	07/532,730	10/22/91			
5,059,905	07/399,324	10/22/91			
5,059,912	07/474,353	10/22/91			
5,059,913	07/628,852	10/22/91			
5,059,914	07/551,181	10/22/91			
5,059,928	07/536,643	10/22/91			
5,059,930	07/497,615	10/22/91			
5,059,941	07/584,602	10/22/91			
5,059,943	07/493,782	10/22/91			
5,059,945	07/517,432	10/22/91			
5,059,946	07/350,149	10/22/91			
5,059,948	07/557,979	10/22/91			
5,059,961	07/397,059	10/22/91			
5,059,967	07/499,848	10/22/91			
5,059,969	07/578,919	10/22/91			
5,059,970	07/493,330	10/22/91			
5,059,972	07/451,443	10/22/91			
5,059,988	07/547,139	10/22/91			
5,060,008	07/595,850	10/22/91			
5,060,009	07/499,508	10/22/91			
5,060,011	07/335,492	10/22/91			
5,060,015	07/625,215	10/22/91			
5,060,024	07/365,733	10/22/91			
5,060,027	07/469,454	10/22/91			
5,060,068	07/265,401	10/22/91			
5,060,079	07/503,311	10/22/91			
5,060,085	07/493,586	10/22/91			
5,060,103	07/469,062	10/22/91			
5,060,113	07/561,228	10/22/91			
5,060,117	07/454,627	10/22/91			
5,060,118	07/334,072	10/22/91			
5,060,119	07/501,660	10/22/91			
5,060,122	07/654,189	10/22/91			
5,060,126	07/556,752	10/22/91			
5,060,127	07/669,741	10/22/91			
5,060,130	07/571,382	10/22/91			
5,060,131	07/530,632	10/22/91			
5,060,133	07/475,743	10/22/91			
5,060,147	07/397,632	10/22/91			
5,060,154	07/531,198	10/22/91			
5,060,155	07/472,831	10/22/91			
5,060,160	07/446,929	10/22/91			
5,060,163	07/609,102	10/22/91			



**4,399,407**, Reexam. No. 90/004,031, Nov. 13, 1995, Cl. 324/379, ENGINE ANALYSER WITH CONSTANT WIDTH DIGITAL WAVEFORM DISPLAY, Michael J. Kling, et. al., Owner of Record: SPX Corp., Muskegon, Mich., Attorney or Agent: David R. Fairbairn, Kinney & Lange, Minneapolis, Minn., Ex. Gp.: 2213, Requester: Snap-On Inc., Kenosha, Wis., c/o H. V. Stotland & J. Terry Stratman, Emrich & Dithman, Chicago, Ill.

**5,037,437**, Reexam. No. 90/004,032, Nov. 14, 1995, Cl. 623/016, METHOD OF BONE PREPARATION FOR PROSTHETIC FIXATION, Frederick A. Matsen, III, Owner of Record: University of Washington, Seattle, Wash., Attorney or Agent: Kinney & Lange, Minneapolis, Minn., Ex. Gp.: 3308, Requester: Richard J. Anderson, Fish & Richardson, Minneapolis, Minn.

**5,375,853**, Reexam. No. 90/004,030, Nov. 1, 1995, Cl. 277/059, GAS LUBRICATED BARRIER SEAL, James R. Wasser, et. al., Owner of Record: John Crane, Inc., Morton Grove, Ill., Attorney or Agent: Vangelis Economou, Dorn, McEachran, Jambor & Keating, Chicago, Ill., Ex. Gp.: 3108, Requester: Owner

#### Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

#### TRADEMARK REGISTRATIONS WHICH EXPIRED OCTOBER 03, 1995 DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
101,569	71/080,398	12/29/1914
101,573	71/081,185	12/29/1914
101,599	71/079,042	12/29/1914
101,610	71/078,757	12/29/1914
320,292	71/351,932	12/25/1934
320,296	71/349,400	12/25/1934
320,301	71/352,292	12/25/1934
320,322	71/354,062	12/25/1934
320,339	71/339,804	12/25/1934
320,340	71/339,803	12/25/1934
320,351	71/355,230	12/25/1934
320,388	71/356,210	12/25/1934
320,391	71/356,610	12/25/1934
320,396	71/356,099	12/25/1934
573,102	71/594,375	04/14/1953
586,344	71/647,719	03/02/1954
596,178	71/659,201	10/05/1954
599,801	71/652,260	12/28/1954
599,810	71/659,168	12/28/1954
599,811	71/659,169	12/28/1954
599,817	71/659,332	12/28/1954
599,827	71/652,571	12/28/1954
599,832	71/661,572	12/28/1954
599,833	71/661,574	12/28/1954
599,836	71/666,272	12/28/1954
599,837	71/666,522	12/28/1954
599,838	71/666,888	12/28/1954
599,840	71/667,070	12/28/1954
599,856	71/640,479	12/28/1954
599,857	71/643,739	12/28/1954

599,859	71/651,658	12/28/1954
599,863	71/658,419	12/28/1954
599,870	71/664,490	12/28/1954
599,873	71/640,558	12/28/1954
599,874	71/640,560	12/28/1954
599,875	71/653,188	12/28/1954
599,877	71/658,916	12/28/1954
599,880	71/657,835	12/28/1954
599,887	71/647,404	12/28/1954
599,890	71/656,655	12/28/1954
599,891	71/662,692	12/28/1954
599,897	71/663,316	12/28/1954
599,902	71/638,076	12/28/1954
599,927	71/649,864	12/28/1954
599,931	71/658,661	12/28/1954
599,936	71/661,123	12/28/1954
599,943	71/606,874	12/28/1954
599,945	71/659,455	12/28/1954
599,960	71/655,439	12/28/1954
599,962	71/660,735	12/28/1954
599,964	71/664,433	12/28/1954
599,983	71/650,748	12/28/1954
599,987	71/644,296	12/28/1954
599,992	71/653,101	12/28/1954
599,993	71/667,309	12/28/1954
600,000	71/596,851	12/28/1954
600,002	71/624,902	12/28/1954
600,003	71/634,697	12/28/1954
600,004	71/651,980	12/28/1954
600,007	71/659,834	12/28/1954
600,029	71/665,058	12/28/1954
600,039	71/666,656	12/28/1954
600,043	71/639,388	12/28/1954
600,045	71/663,274	12/28/1954
600,052	71/665,189	12/28/1954
600,054	71/665,692	12/28/1954
600,062	71/655,552	12/28/1954
600,065	71/661,262	12/28/1954
600,069	71/606,893	12/28/1954
600,083	71/615,417	12/28/1954
600,088	71/651,934	12/28/1954
600,099	71/656,313	12/28/1954
600,102	71/657,482	12/28/1954
600,103	71/629,483	12/28/1954
600,119	71/639,900	12/28/1954
600,123	71/659,012	12/28/1954
600,127	71/664,893	12/28/1954
600,136	71/632,266	12/28/1954
600,139	71/663,171	12/28/1954
600,145	71/656,987	12/28/1954
600,149	71/664,918	12/28/1954
600,164	71/651,868	12/28/1954
600,165	71/644,702	12/28/1954
600,174	71/648,505	12/28/1954
600,175	71/653,559	12/28/1954
600,176	71/666,276	12/28/1954
600,177	71/645,922	12/28/1954
600,181	73/011,193	12/24/1974
1,000,069	73/012,357	12/24/1974
1,000,070	73/019,961	12/24/1974
1,000,073	73/003,393	12/24/1974
1,000,075	73/007,158	12/24/1974
1,000,077	73/008,984	12/24/1974
1,000,078	73/001,748	12/24/1974
1,000,079	73/001,749	12/24/1974
1,000,080	73/016,940	12/24/1974
1,000,081	73/004,930	12/24/1974
1,000,085	73/015,231	12/24/1974
1,000,087	73/014,919	12/24/1974
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1,000,089	73/000,722	12/24/1974
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1,000,097	73/017,426	12/24/1974
1,000,100	73/003,847	12/24/1974
1,000,101	73/002,632	12/24/1974
1,000,108	73/025,995	12/24/1974
1,000,111	73/026,001	12/24/1974
1,000,113	73/013,192	12/24/1974
1,000,121		

1,000,122	73/013,668	12/24/1974	1,000,324	72/417,418	12/24/1974
1,000,123	73/018,745	12/24/1974	1,000,326	72/413,515	12/24/1974
1,000,127	73/011,762	12/24/1974	1,000,329	72/430,094	12/24/1974
1,000,129	73/003,415	12/24/1974	1,000,335	72/448,238	12/24/1974
1,000,135	73/002,133	12/24/1974	1,000,337	72/456,403	12/24/1974
1,000,136	73/001,495	12/24/1974	1,000,339	72/458,355	12/24/1974
1,000,137	73/010,774	12/24/1974	1,000,341	72/459,775	12/24/1974
1,000,138	73/012,178	12/24/1974	1,000,345	72/427,166	12/24/1974
1,000,139	73/012,540	12/24/1974	1,000,347	72/438,416	12/24/1974
1,000,142	73/006,528	12/24/1974	1,000,348	72/445,720	12/24/1974
1,000,144	73/025,258	12/24/1974	1,000,349	72/452,350	12/24/1974
1,000,146	73/004,359	12/24/1974	1,000,351	72/456,883	12/24/1974
1,000,147	73/014,706	12/24/1974	1,000,356	72/463,804	12/24/1974
1,000,148	73/015,814	12/24/1974	1,000,357	72/440,289	12/24/1974
1,000,150	73/009,882	12/24/1974	1,000,358	72/453,077	12/24/1974
1,000,154	72/453,418	12/24/1974	1,000,361	72/466,050	12/24/1974
1,000,155	72/436,529	12/24/1974	1,000,362	72/428,640	12/24/1974
1,000,157	72/368,139	12/24/1974	1,000,363	72/429,717	12/24/1974
1,000,162	72/384,571	12/24/1974	1,000,364	72/438,133	12/24/1974
1,000,163	72/399,169	12/24/1974	1,000,367	72/457,674	12/24/1974
1,000,164	72/432,724	12/24/1974	1,000,372	72/459,815	12/24/1974
1,000,165	72/434,042	12/24/1974	1,000,374	72/443,761	12/24/1974
1,000,167	72/451,926	12/24/1974	1,000,379	72/460,723	12/24/1974
1,000,171	72/461,172	12/24/1974	1,000,381	72/461,740	12/24/1974
1,000,172	72/461,886	12/24/1974	1,000,386	72/465,409	12/24/1974
1,000,174	72/462,973	12/24/1974	1,000,391	73/029,760	12/24/1974
1,000,176	72/463,749	12/24/1974	1,000,394	73/002,611	12/24/1974
1,000,177	72/465,228	12/24/1974	1,000,396	72/462,487	12/24/1974
1,000,178	72/466,276	12/24/1974	1,000,399	72/464,479	12/24/1974
1,000,181	72/443,291	12/24/1974	1,000,401	72/458,332	12/24/1974
1,000,182	72/450,692	12/24/1974	1,000,402	72/463,127	12/24/1974
1,000,184	72/457,451	12/24/1974	1,000,403	72/427,436	12/24/1974
1,000,185	72/461,978	12/24/1974	1,000,409	72/464,450	12/24/1974
1,000,189	72/460,770	12/24/1974	1,000,414	72/457,566	12/24/1974
1,000,193	72/452,240	12/24/1974	1,000,415	72/466,223	12/24/1974
1,000,195	72/457,101	12/24/1974	1,000,418	72/465,781	12/24/1974
1,000,196	72/465,459	12/24/1974	1,000,423	72/466,843	12/24/1974
1,000,199	72/409,341	12/24/1974	1,000,427	72/459,322	12/24/1974
1,000,200	72/410,744	12/24/1974	1,000,428	72/464,698	12/24/1974
1,000,201	72/438,925	12/24/1974	1,000,435	72/465,452	12/24/1974
1,000,205	72/447,203	12/24/1974			
1,000,208	72/452,217	12/24/1974			
1,000,213	72/446,660	12/24/1974			
1,000,218	72/462,727	12/24/1974			
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1,000,222	72/458,848	12/24/1974			
1,000,235	72/436,347	12/24/1974			
1,000,236	72/441,630	12/24/1974			
1,000,244	72/459,271	12/24/1974			
1,000,246	72/459,574	12/24/1974			
1,000,247	72/460,510	12/24/1974			
1,000,248	72/460,969	12/24/1974			
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1,000,255	72/433,870	12/24/1974			
1,000,256	72/435,929	12/24/1974			
1,000,257	72/436,162	12/24/1974			
1,000,258	72/442,514	12/24/1974			
1,000,260	72/445,139	12/24/1974			
1,000,261	72/446,227	12/24/1974			
1,000,263	72/450,120	12/24/1974			
1,000,264	72/452,109	12/24/1974			
1,000,265	72/457,489	12/24/1974			
1,000,269	72/465,054	12/24/1974			
1,000,271	72/438,740	12/24/1974			
1,000,275	72/422,696	12/24/1974			
1,000,277	72/454,031	12/24/1974			
1,000,281	72/463,763	12/24/1974			
1,000,282	72/424,186	12/24/1974			
1,000,283	72/437,901	12/24/1974			
1,000,284	72/439,406	12/24/1974			
1,000,288	72/465,072	12/24/1974			
1,000,296	72/466,606	12/24/1974			
1,000,297	72/467,167	12/24/1974			
1,000,299	72/435,596	12/24/1974			
1,000,302	72/454,256	12/24/1974			
1,000,303	72/454,257	12/24/1974			
1,000,306	72/446,762	12/24/1974			
1,000,314	72/465,305	12/24/1974			
1,000,322	72/417,417	12/24/1974			

### Adverse Decisions in Interference

In the designated interferences involving the following patents, final decisions have been rendered that the respective patentees are not entitled to patents containing the claims listed.

Patent No. 4,671,470, Paul J. Jonas, METHOD FOR FASTENING AIRCRAFT FRAME ELEMENTS TO SANDWICH SKIN PANELS COVERING SAME USING WOVEN FIBER CONNECTORS, Interference No. 102,086 final judgment adverse to the patentees rendered February 27, 1990, as to claims 7 and 10/7.

Patent No. 4,817,042, Leon A. Pintsov, INSERTION MACHINE WITH PRIORITIZED SELECTION OF INSERTS, Interference No. 102,718 final judgment adverse to the patentees rendered October 23, 1995, as to claims 6 and 7.

Patent No. 4,843,063, Saad Seyedin, Thomas Thomas, Hanne Bentz, Larry Ellingsworth, Rosa Armstrong, POLYPEPTIDE CARTILAGE-INDUCING FACTORS FOUND IN BONE, Interference No. 103,519 final judgment adverse to the patentees rendered September 25, 1995, as to claims 1 and 2.

Patent No. 4,931,048, George A. Lopez, MEDICAL DEVICE, Interference No. 102,844 final judgment adverse to the patentees rendered November 13, 1995, as to claims 1, 2, 5-9 and 17.

Patent No. 4,980,375, Abraham Sunshine, Eugene M. Laska, ONSET-HASTENED/ENHANCED ANTIPYRETIC RESPONSE, Interference No. 103,089 final judgment adverse to the patentees rendered October 26, 1995, as to claims 1-24.

Patent No. 5,015,487, Mark W. Collison, Terry F. Farver, Chris



tine A. McDonald, Paula J. Herald, Daniel J. Monticello, USE OF LANTHIONINES FOR CONTROL OF POST-PROCESSING CONTAMINATION IN PROCESSED MEAT, Interference No. 103,554 final judgment adverse to the patentees rendered October 26, 1995, as to claims 1-10.

Patent No. 5,036,535, Jerry Gechter, Jeffrey A. Fried, Robert L. Pokress, SWITCHLESS AUTOMATIC CALL DISTRIBUTION SYSTEM, Interference No. 103,051 final judgment adverse to the patentees rendered October 26, 1995, as to claims 1-63.

Patent No. 5,066,240, Gary J. Verdun, HIGH DENSITY ELECTRICAL CONNECTOR WITH ELECTROSTATIC DISCHARGE PROTECTION, Interference No. 103,524 final judgment adverse to the patentees rendered November 15, 1995, as to claims 1-9.

Patent No. 5,127,858, Paul A. Pelligrino, Gary L. Potter, Robert N. Schenk, CONTROL MEANS FOR MARINE ENGINES AND TRANSMISSIONS, Interference No. 103,569 final judgment adverse to the patentees rendered November 28, 1995, as to claims 1 and 4/1.

Patent No. 5,153,082, Takao Ogino, Tadaaki Miyazaki, Masao Ogawa, Yuko Maeda, Shigeru Kijima, Koji Takagi, Takahiro Kawagoe, NONAQUEOUS ELECTROLYTE SECONDARY BATTERY, Interference No. 103,575 final judgment adverse to the patentees rendered November 6, 1995, as to claims 1-6.

Patent No. 5,169,673, Gary L. Demeny, Robert G. Smead, METHOD AND APPARATUS FOR ELECTROSTATICALLY SPRAY PAINTING OBJECTS IN A SPRAY PAINT BOOTH, Interference No. 103,508 final judgment adverse to the patentees rendered November 15, 1995, as to claims 1-13.

Patent No. 5,206,345, Boris Masinovsky, William M. Gallatin, Paul J. Simons, IL-4 AND TNF INDUCE MAB 6G10-RECOGNIZED EXPRESSION ON BONE MARROW STROMAL CELLS, Interference No. 103,371 final judgment adverse to the patentees rendered October 6, 1995, as to claims 1 and 2.

Patent No. 5,310,747, Masayuki Enomoto, Junya Takahashi, Tomoyuki Kusaba, Masayo Sugano, Rei Matsunaga, Masahiro Tamaki, ENZIMIDAZOLE DERIVATIVES, AGRICULTURAL AND HORTICULTURAL FUNGICIDES CONTAINING THE SAME AS AN ACTIVE INGREDIENT AND INTERMEDIATE COMPOUNDS THEREOF, Interference No. 103,542, final judgment adverse to the patentees rendered September 29, 1995, as to claims 1-10.

OLIVIA M. DUVALL, *Sup'v Legal  
Instruments Examiner  
Board of Patent Appeals &  
Interferences*

### 37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an national stage application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the nonsigning inventor. The inventor whose signature is missing (Pierre Alain Froidevaux) may join in the application by promptly filing an appropriate oath or Declaration complying with CFR 1.63. The international application number is PCT/CH94/00101 and was filed on 31 May 1994 in the names of Pierre Alain Froidevaux, Willi Wetzels and Stefan Rutishauser for the invention entitled SCREW EXTRUDER. The national stage application number is 08/379,479 and has a 35 U.S.C. 371 date of 24 March 1995.

### Registration To Practice

The following person successfully passed the registration examination that was held May 3, 1995, and has been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until applicant's registration certificate is mailed to applicant. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of the following applicant on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before February 16, 1996.

Yang, Lucy X., 7795 Kenmore Dr., #11, Portage, Mich. 49002

December 4, 1995 KAREN L. BOVARD, *Director  
Office of Enrollment and Discipline*

### Errata

"All reference to Patent No. 5,464,015 to Albert F. Koch, III, et al. of Massachusetts for REAL-TIME ULTRASONIC ENDOCARDIAL DISPLACEMENT DISPLAY appearing in the Official Gazette of November 07, 1995 should be deleted since no patent was granted."

"All reference to Patent No. 5,466,866 to James F. White of Ohio for PROCESS FOR THE PURIFICATION OF AROMATIC POLYCARBOXYLIC ACIDS appearing in the Official Gazette of November 14, 1995 should be deleted since no patent was granted."

### Service by Publication

A petition to cancel the registrations identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

The Lakeland Group, Fairfax, Calif., Reg. No. 1,639,294 for the mark "THE LAKE LAND GROUP", Canc. No. 23,831.

Twin Tires Systems, Inc., Dallas, Tex., Reg. No. 1,727,415, for the mark "TWIN TIRES", Canc. No. 24,363.

Trojan Distributing Co., Inc., Los Angeles, Calif., Reg. No. 696,549 for the mark "Field & Stream", Canc. No. 24,109.

Pier 25, Inc., Philadelphia, Pa., Reg. No. 1,702,343 for the mark "Amazon", Canc. No. 23,904.

Aditi Nutra-Sentials Inc., New York, N.Y., Reg. No. 1,587,340 for the mark "Primal Cream Therapy", Canc. No. 23,903.

Made Rite Processing Corp., New York, N.Y., Reg. No. 640,337 for the mark "Mandarin and design", Canc. No. 23,610.

JEAN BROWN  
*Technical Support Manager,  
Trademark Trial  
and Appeal Board, for  
ROBERT M. ANDERSON  
Deputy Assistant Commissioner  
for Trademarks*

### Certificate of Correction For Week of January 2, 1996

P. 09,203	5,252,342	5,336,558	5,380,877	5,413,885	5,432,885	5,444,521	5,450,990
Re. 34,712	5,260,407	5,342,884	5,381,138	5,413,960	5,434,135	5,444,546	5,451,608
Re. 35,039	5,260,439	5,346,915	5,387,628	5,414,071	5,434,235	5,444,700	5,452,128
D. 351,407	5,264,174	5,347,010	5,389,549	5,414,110	5,434,792	5,444,756	5,452,444
D. 360,292	5,269,018	5,348,620	5,390,585	5,417,162	5,434,869	5,444,970	5,452,457
D. 360,512	5,281,580	5,353,157	5,390,720	5,418,522	5,436,176	5,445,282	5,452,506
D. 361,737	5,284,529	5,355,096	5,390,846	5,420,330	5,436,254	5,445,367	5,452,947
D. 362,369	5,285,184	5,356,147	5,394,381	5,420,628	5,436,324	5,445,573	5,453,265
D. 362,827	5,285,971	5,359,117	5,395,941	5,420,800	5,436,956	5,445,638	5,453,837
D. 363,075	5,288,841	5,361,242	5,395,985	5,422,084	5,437,444	5,445,918	5,453,925
4,676,637	5,289,579	5,361,628	5,396,116	5,422,911	5,437,660	5,446,046	5,454,094
4,679,266	5,295,618	5,364,547	5,396,490	5,423,290	5,438,146	5,446,224	5,454,201
4,746,745	5,298,383	5,364,850	5,398,373	5,423,498	5,438,349	5,446,720	5,454,806
4,879,225	5,305,387	5,365,125	5,398,903	5,423,928	5,438,826	5,446,744	5,455,186
4,984,522	5,309,519	5,370,401	5,399,712	5,424,276	5,438,872	5,446,957	5,455,318
5,053,412	5,310,255	5,371,241	5,403,514	5,425,040	5,439,996	5,447,254	5,455,930
5,055,032	5,311,543	5,371,630	5,407,682	5,425,808	5,441,250	5,447,310	5,456,571
5,134,287	5,312,478	5,372,741	5,407,769	5,426,922	5,441,409	5,447,432	5,456,789
5,139,101	5,313,418	5,373,780	5,408,148	5,427,095	5,441,452	5,447,713	5,457,385
5,172,051	5,315,204	5,373,895	5,408,441	5,427,912	5,441,499	5,448,087	5,457,800
5,177,604	5,323,110	5,374,254	5,409,933	5,427,922	5,442,297	5,448,654	5,458,163
5,184,688	5,328,870	5,375,926	5,410,970	5,428,263	5,442,357	5,448,764	5,458,459
5,194,072	5,329,782	5,377,564	5,411,670	5,428,274	5,442,670	5,449,291	5,459,123
5,210,032	5,330,291	5,377,816	5,412,007	5,428,306	5,442,759	5,449,419	5,459,388
5,219,578	5,332,527	5,378,507	5,412,095	5,428,537	5,442,872	5,449,875	5,459,695
5,223,493	5,335,665	5,379,437	5,412,686	5,428,838	5,443,158	5,449,886	5,460,765
5,250,148	5,336,112	5,380,564	5,413,113	5,429,474	5,443,648	5,450,701	5,461,583
				5,429,821	5,443,735	5,450,756	
				5,432,371	5,444,433	5,450,775	
				5,432,777	5,444,470	5,450,852	



Summary of Final Decisions  
Issued by the  
Trademark Trial and Appeal Board  
September 11-15, 1995

Date Issued	Type of Case <sup>(1)</sup>	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's Mark and Goods/Services	Applicant's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
9-12	EX	74/439,481	Emerson Musical Instruments, Inc.	2(d)	Refusal Affirmed	"LEGACY" (flutes and piccolos)	"LEGACY" (flutes and piccolos)	"LEGACY" (drumheads)	No
9-13	EX	74/340,080	Bentlin Management GmbH	2(e)(4)	Refusal Reversed	"BENTLIN" (and design) [business consultation and market analysis]	"BENTLIN" (and design) [business consultation and market analysis]		Yes
9-13	EX	74/391,889	ZEHO Hornung & Zeeb GmbH	2(d)	Refusal Affirmed	"EINHORN" (and design) [shirts and blouses for men and women]	"EINHORN" (and design) [shirts and blouses for men and women]	"PATRICK EINHORN" [men's ladies' and children's shirts, etc.]	No
9-13	EX	74/174,185	Orogenta Ltd.	2(d)	Refusal Affirmed	"OG" (in stylized design) [gold jewelry]	"OG" (in stylized design) [gold jewelry]	"OG" [jewelry containing opals with or without other genuine stones in 14kt. or 18kt. gold]	No

(1) EX=EX PARTE APPEAL; OPP=OPPOSITION; CANG=CANCELLATION; CU=CONCURRENT USE; (R)=REQ. FOR RECONSIDERATION

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Special box designations should be used to allow forwarding of particular types of trademark mail to the appropriate areas as quickly as possible. In addition to these box designations, filers are encouraged to indicate whether the contents of the envelope contain a fee. Envelopes containing a fee should be marked "FEE;" envelopes not containing a fee should be marked "NO FEE." Box designations and "FEE/NO FEE" indicators should appear on the envelope as well as on the cover sheet or first page of any document.

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California	Los Angeles Public Library .....	(213) 228-7220
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Colorado	Denver Public Library .....	(303) 640-6249
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	Akron: Summit County Public Library.....	Not Yet Operational
	Cincinnati and Hamilton County, Public Library of.....	(513) 369-6936
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	Nashville: Stevenson Science Library, Vanderbilt University.....	(615) 322-2775
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## PATENT EXAMINING GROUPS

## CHEMICAL EXAMINING GROUPS

	Phone number Area Code 703	New Case Date*
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100— JOHN E. KITTLE, Director.....	308-0661	06/16/94
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director.....	308-1235	06/28/94
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—BARRY S. RICHMAN, Director.....	308-0651	08/26/94
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director.....	308-2351	09/15/94
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director.....	308-0196	03/22/94

## ELECTRICAL EXAMINING GROUPS

INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director.....	308-1782	01/17/94
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director.....	308-0511	05/31/94
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—BOBBY R. GRAY, Director.....	305-9600	06/23/93
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director.....	305-3800	03/30/94
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director.....	308-0956	05/24/94
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600—NICHOLAS P. GODICI, Director.....	305-4700	04/19/94
DESIGN, GROUP 2900—JOHN E. KITTLE, Director.....	308-0661	05/30/94

## MECHANICAL EXAMINING GROUPS

HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—F.R. SCHMIDT, Director.....	308-1113	05/12/94
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—CARLTON R. CROYLE, Director.....	308-1148	07/12/94
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director.....	308-0858	09/26/94
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director.....	308-0861	08/25/94
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director.....	308-1021	06/20/94

\*A communication from the examiner should have been received in most applications filed prior to this date.

## Patents will Expire as Follows:

- (1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
- (2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
- (3) All design patents are granted for a term of 14 years from the date of the grant. However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.



## TRADEMARK OPERATION

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 Philip G. Hampton, II, Assistant Commissioner  
 Robert M. Anderson, Deputy Assistant Commissioner  
 David E. Bucher, Director, Trademark Examining Office  
 Condition of Trademark Applications as of October 1, 1995

Law Office	Oldest Date	
	New*	Amendment Filed
Law Office 101—Ron Sussman, Acting Managing Attorney, (703) 308-9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	03/23/95	05/25/95
Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308-9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	05/23/95	07/03/95
Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308-9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	04/26/95	08/21/95
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308-9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	04/06/95	08/14/95
Law Office 105—Thomas Howell, Managing Attorney, (703) 308-9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	05/23/95	05/01/95
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308-9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	02/14/95	07/03/95
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308-9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	06/02/95	07/24/95
Law Office 108—David Shallant, Managing Attorney, (703) 308-9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	05/15/95	06/17/95
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308-9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	06/30/95	05/30/95
**Collective Marks—Class 200 **Certification Marks—Classes A & B		
Office of Trademark Services—John Walker, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126 Affidavits Under Sections 8 & 15 (All Classes)..... Renewals (All Classes)..... Section 12(c) Publications (All Classes).....	02/14/95 07/25/95 04/11/95	—0— —0— —0—

1. \*\* Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch tone phone should call (703) 305-8747 through (703) 305-9752 from 6:30 a.m. to Midnight EST, Monday thru Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. \* These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

## REEXAMINATIONS

JANUARY 2, 1996

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,250,570 (2761th)

## REDUNDANT MEMORY CIRCUIT

Frederick Tsang, Saratoga; Gregory A. Kannal, Mountain View, and Marcian E. Hoff, Jr., Sunnyvale, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Reexamination Request No. 90/003,594, Oct. 10, 1994.

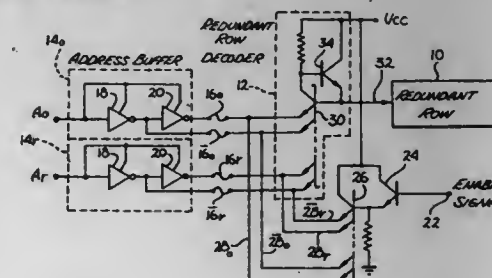
Reexamination Certificate for Patent 4,250,570, issued Feb.

10, 1981, Ser. No. 867,779, Jan. 9, 1978.

Continuation of Ser. No. 705,597, Jul. 15, 1976, abandoned.

Int. Cl.<sup>6</sup> G11C 13/00; 11/40

U.S. Cl. 365—200



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1-7 & 9-12 are cancelled.

Claim 8 is determined to be patentable as amended.

New claims 13-15 are added and determined to be patentable.

8. [The circuit defined by claim 4] A redundant memory circuit for a memory array comprising:

a memory having a preselected number of rows and columns having addresses associated therewith, each of said rows and columns having an individual decoder coupled thereto; and one or more redundant rows or columns having initially unspecified addresses associated therewith, each of said redundant rows or columns having an individual redundant decoder coupled thereto;

programming means for causing the redundant decoders coupled to said redundant rows or columns having initially unspecified addresses to respond only to the addresses of defective rows or columns having addresses associated therewith; means for disabling said defective rows or columns having addresses associated therewith;

programming means for causing the redundant decoders coupled to said redundant rows or columns having initially unspecified addresses to respond only to the addresses of defective rows or columns having addresses associated therewith wherein programming said means includes:

a plurality of fuses coupled to each of said redundant decoders and operable to be selectively blown;

address means for applying to one or more of said redundant rows or columns the addresses of one or more of said defective rows or columns, coupled to said fuses;

current means coupled to said fuses and coacting with said address means for allowing sufficient current to flow through selected ones of said fuses to blow said selected ones of said fuses; and

wherein said fuses comprise silicon fusible links.

B1 4,313,135 (2762th)

## METHOD AND APPARATUS FOR PRESERVING OR RESTORING AUDIO TO VIDEO

J. Carl Cooper, 1373 Sydney, Sunnyvale, Calif. 94087

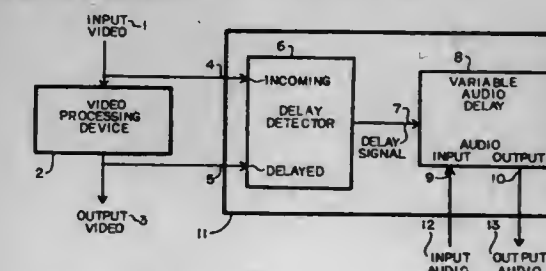
Reexamination Request No. 90/001,391, Dec. 7, 1987.

Reexamination Certificate for Patent 4,313,135, issued Jan.

26, 1982, Ser. No. 172,043, Jul. 28, 1980.

Int. Cl.<sup>6</sup> H04N 5/073; 5/60

U.S. Cl. 348—512



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim 10 is confirmed.

Claims 7 and 8 were previously disclaimed.

Claims 1-5, 9, 11, 12 and 13 are cancelled.

Claim 6 is determined to be patentable as amended.

New claims 14-18 are added and determined to be patentable.

6. Apparatus [as claimed in claim 2] for maintaining correct audio to video timing relationship in a television system, comprising a delay detection circuit to measure the delay through at least one external video device, and a variable audio delay circuit controlled by said delay detection circuit to provide an audio delay equal to the delay through said video device, said delay detection circuit has as one input the video which is input to said external video device and has as a second input the video which is output from said external video wherein said delay detection circuit utilizes a phase lock loop and a correlation circuit as part of said circuit to measure the delay through said external video device.

B1 4,322,902 (2763th)

## INDICATORS FOR GARMENT HANGERS

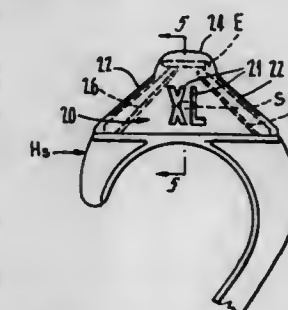
Frank C. Lenthall, Frankston, Australia, assignor to Spotless Plastics Pty. Ltd., North Melbourne, Australia

Reexamination Request No. 90/003,580, Sep. 26, 1994.

Reexamination Certificate for Patent 4,322,902, issued Apr. 6, 1982, Ser. No. 30,527, Apr. 16, 1979.

Int. Cl.<sup>6</sup> G09F 3/00

U.S. Cl. 40—322



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 8-16 is confirmed.

Claim 5 is cancelled.

Claims 1-4 and 6 are determined to be patentable as amended.



Claim 7 dependent on an amended claim, is determined to be patentable.

New claims 17-20 are added and determined to be patentable.

17. In combination, a molded plastic hanger for garments and other articles and a molded plastic indicating device, said combination comprising:

a hook having a top contour adapted to engage a rail or other supporting means, said hook having an integrally molded plastic flange which forms an enlarged display portion extending from the hook such that it projects above the top contour of the hook which engages said rail or other supporting means; and

said molded plastic indicating device which receives said molded plastic flange to attach said indicating device to said enlarged display portion, said indicating device being readily visible when the hanger is in use by virtue of its position on said hook.

B1 4,428,583

Patent Not Issued For This Number

B1 4,509,148 (2765th)

#### SEMICONDUCTOR MEMORY DEVICE

Masamichi Asano, Tokyo, and Hiroshi Iwahashi, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Reexamination Request No. 90/003,525, Aug. 9, 1994.

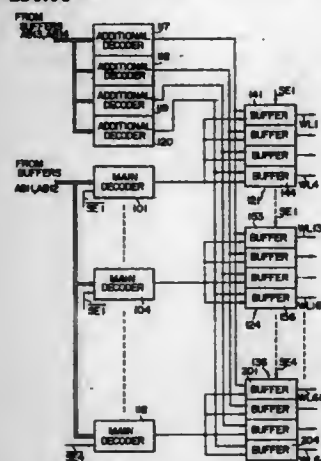
Reexamination Certificate for Patent 4,509,148, issued Apr. 2, 1985, Ser. No. 493,605, May 11, 1983.

Continuation of Ser. No. 192,203, Sep. 30, 1980, Pat. No. 4,447,895.

Claims priority, application Japan, Jan. 4, 1979, 54-128392

Int. Cl.<sup>6</sup> G11C 8/00; 11/40

U.S. Cl. 365-230.06



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 1 is cancelled.

New claims 2 to 42 are added and determined to be patentable.

34. An address designation circuit responsive to externally generated address signals and comprising:

a plurality of first decoding circuits coupled to said address signals;

a plurality of second decoding circuits coupled to said address signals; and

a plurality of buffer circuits each including a plurality of buffers having first and second input terminals, said first input terminals of the buffers in each of said buffer circuits being commonly connected to an output of a different one of said plurality of said first decoding circuits, and said second input terminals of each buffer in each buffer circuit being connected

to an output of a different one of said plurality of said second decoding circuits; and

a selection circuit for selectively activating said first decoding circuits.

B1 5,008,804 (2766th)

#### ROBOTIC TELEVISION-CAMERA DOLLY SYSTEM

Gary B. Gordon, Saratoga, Calif., and Robert R. Gonnelli, Valley Cottage, N.Y., assignors to Total Spectrum Manufacturing Inc., Valley Cottage, N.Y.

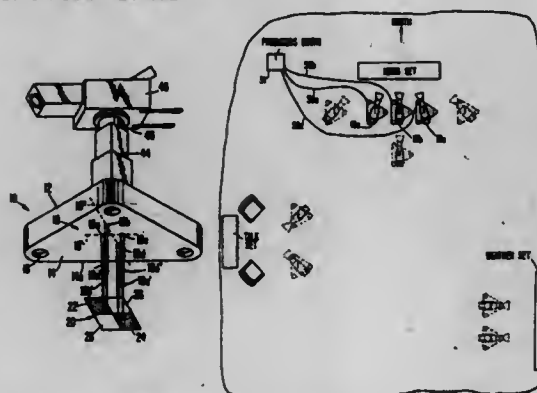
Reexamination Request No. 90/002,976, Mar. 2, 1993.

Reexamination Certificate for Patent 5,008,804, issued Apr. 16, 1991, Ser. No. 574,852, Aug. 30, 1990.

Continuation of Ser. No. 228,933, Jun. 23, 1988, Pat. No. 4,959,798.

Int. Cl.<sup>6</sup> F16M 3/00

U.S. Cl. 364-167.01



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1-17 are cancelled.

[1. A positioning system for moving a dolly member along a substantially planar surface, said dolly member having a rotation axis normal to said planar surface and a translation axis parallel to said planar surface, said system comprising:

a target means for defining a reference point and a reference direction on said planar surface;

driving means for moving said dolly member on said planar surface;

detection means affixed to said dolly member for detecting said target means; and

processor means coupling said detection means to said driving means, said processor means

controlling said driving means to move said dolly member on said planar surface by dead reckoning to a vicinity of said target means; and

in response to an output of said detecting means, controlling said driving means to move said dolly member to bring the translation axis thereof parallel to the reference direction defined by said target means, and to bring the rotation axis of said dolly member into coincidence with the reference point defined by said target means.]

B1 5,147,322 (2767th)

#### MEDICAL APPLIANCE SECURING DEVICE

Michael L. Bowen, Arlington, and Roger A. Liebelt, Mansfield, both of Tex., assignors to TCNL Technologies, Inc., Wilmington, Del.

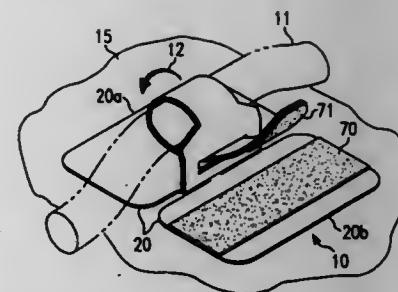
Reexamination Request No. 90/003,578, Sep. 19, 1994.

Reexamination Certificate for Patent 5,147,322, issued Sep. 15, 1992, Ser. No. 799,122, Nov. 26, 1991.

Int. Cl.<sup>6</sup> A61M 25/02

U.S. Cl. 604-180

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:



The patentability of claims 6-7 is confirmed.

Claim 1 is determined to be patentable as amended.

Claims 2-5, dependent on an amended claim, are determined to be patentable.

1. A holder for securing a generally tubular member of a medical device to a support surface comprising:

an anchoring patch having a top surface and a bottom surface, said bottom surface coated with an adhesive for attaching said anchoring patch to the support surface;

a retaining tab having a first portion and a second portion, said first portion non-removably connected to said anchoring patch and having an aperture therein, said second portion having a width less than the width of said first portion and dimensioned to allow said second portion to be inserted through said aperture, said retaining tab being of sufficient length to wrap around the circumference of the generally tubular member, extend through said aperture and contact said top surface of said anchoring patch; and

first fastening means secured to said top surface of said anchoring patch and complementary second fastening means secured to said second portion of said retaining tab such that when said retaining tab is wrapped around the circumference of the generally tubular member and said second portion of said retaining tab is inserted through said aperture, said first fastening means may be firmly and removably secured to said complementary fastening means.



# STATUTORY INVENTION REGISTRATIONS

PUBLISHED JANUARY 2, 1996

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H1512

## VISCOUS COUPLING PLATE HARDENING AND FLATTENING METHOD

Thomas W. Cowan, Liverpool; Sankar K. Mohan, and Carl F. Stephens, both of Syracuse, all of N.Y., assignors to New Venture Gear, Inc., Troy, Mich.

Filed Feb. 28, 1994, Ser. No. 203,016

Int. Cl.<sup>6</sup> C23C 8/30

U.S. Cl. 148—219

1 Claim

1. A method for hardening and flattening viscous coupling plates used in drivetrains of motor vehicles and subjected to frictional contact with one another for torque transmission to provide wear resistance and improved resistance to plastic deformation during use, said method comprising the steps of:

- (a) placing a plurality of viscous coupling plates spaced apart from one another in a fixture and while in said fixture sequentially:
  - (1) ferritic nitrocarburizing said viscous coupling plates from step (a) above at a temperature of about 1050° F. to about 1200° F. in a nitriding media for a time period of about three to about three and one-half hours and producing an epsilon iron nitride surface layer on said viscous coupling plates that is about 0.0010 inches to about 0.0015 inches thick and has a hardness of about Rockwell C62;
  - (2) oil quenching said viscous coupling plates from step (a)(1) to room temperature;
  - (3) tempering said viscous coupling plates from step (a)(2) for at least about two hours at a temperature of at least about 350° F.;
  - (4) air cooling said viscous coupling plates from step (a)(3) to room temperature;
- (b) removing said viscous coupling plates from step (a)(4) from said fixture; and
- (c) passing said viscous coupling plates from step (b) through a series of leveling rolls at least once to bring said plates to within about 0.002 inches to about 0.013 inches flatness and to more uniformly redistribute any residual stresses that remain in said plates and to render said plates less susceptible to deformation during use in the drivetrain of a motor vehicle.

H1513

## OLEOYL SARCOSINATE WITH POLYHYDROXY FATTY ACID AMIDES IN CLEANING PRODUCTS

Bruce P. Murch, Cincinnati; Rajan K. Panandiker, West Chester; James M. Vander Meer, Fairfield; Jing-Feng You, West Chester, all of Ohio, and Jean-Pol Boutique, Gembloux, Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 1, 1994, Ser. No. 252,510

Int. Cl.<sup>6</sup> C11D 1/12

U.S. Cl. 252—546

15 Claims

1. A cleaning composition comprising:
  - (a) at least about 0.5%, by weight, of oleoyl sarcosinate; and
  - (b) at least about 1%, by weight, of a polyhydroxy fatty acid amide surfactant.

H1514

## DETERGENT COMPOSITIONS WITH OLEOYL SARCOSINATE AND POLYMERIC DISPERSING AGENT

Kenneth W. Willman, and James M. Vander Meer, both of Fairfield, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 1, 1994, Ser. No. 252,126

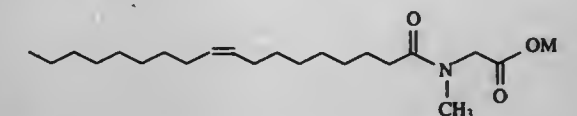
Int. Cl.<sup>6</sup> C11D 1/18

U.S. Cl. 252—547

11 Claims

1. A detergent composition comprising

(a) at least 0.1% of oleoyl sarcosinate of the formula:



wherein M is hydrogen or a cationic moiety; and  
(b) from about 0.05% to about 15% of a polymeric dispersing agent selected from the group consisting of polycarboxylates, polyethylene glycol polymers, polyaspartates and mixtures thereof.

H1515

## SILVER HALIDE PHOTOGRAPHIC MATERIAL

Yasushi Hattori, and Yoshiharu Yabuki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 31, 1993, Ser. No. 113,755

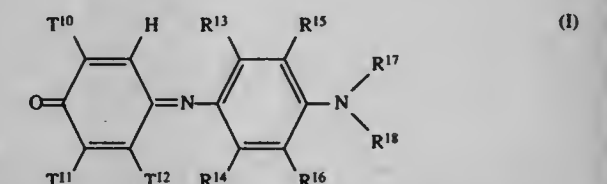
Claims priority, application Japan, Sep. 3, 1992, 4-258835

Int. Cl.<sup>6</sup> G03C 1/06

U.S. Cl. 430—522

8 Claims

1. A silver halide photographic material comprising a transparent support having thereon a dye layer comprising a hydrophilic colloid, a hydrophobic polymer layer and at least one light-sensitive silver halide emulsion layer, wherein the dye layer contains at least one dye represented by formulae (I) to (VIII) dispersed in the form of fine solid particles, the dye layer is disposed between the at least one light-sensitive silver halide emulsion layer and the support, the hydrophilic colloid coating weight of the dye layer is 0.5 g/m<sup>2</sup> or less, and the hydrophobic polymer layer is disposed between the dye layer and the support:



wherein T<sup>10</sup>, T<sup>11</sup> and T<sup>12</sup> independently represent a hydrogen atom, a halogen atom, a cyano group, a nitro group, a carboxyl group, an alkyl group, an aryl group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, an alkylsulfonyl group, an arylsulfonyl group, a sulfamoyl group, a carbamoyl group, an amino group, a sulfonamido group, a carbonamido group, a ureido group, a sulfamido group, a hydroxyl group, a vinyl group or an acyl group; R<sup>13</sup> and R<sup>14</sup> independently represent a hydrogen atom, a halogen atom, an alkoxy group, an alkyl group, an alkenyl group, an aryloxy group or an aryl group; R<sup>15</sup> and R<sup>16</sup> independently represent a member selected from the group consisting of a hydrogen atom, an alkyl group, an alkoxy group, and a halogen atom;







# REISSUES

JANUARY 2, 1996

Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,136

## ACTUATOR OF DIAPHRAGM TYPE

Jiro Hasegawa; Ikuo Nakamura, and Tadashi Hishinuma, all of Yokohama, Japan, assignors to Jidosha Denki Kogyo Kabushiki Kaisha, Yokohama, Japan

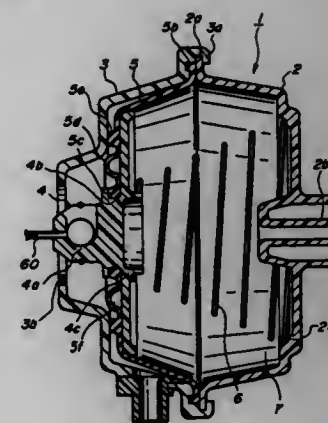
Original No. 5,249,508, dated Oct. 5, 1993, Ser. No. 841,330, Feb. 25, 1992. Application for reissue Oct. 25, 1994, Ser. No. 330,248

Claims priority, application Japan, Mar. 22, 1991, 3-017519; Mar. 22, 1991, 3-017527

Int. Cl.<sup>6</sup> F16J 3/02

U.S. Cl. 92—99

2 Claims



1. An actuator of a diaphragm type for controlling a device mounted on an automotive vehicle, comprising:

- an actuator casing having first and second cup-shaped casing halves engaged with each other, the second casing half having an opening through a center part thereof;
- a diaphragm disposed between said first and second casing halves of said actuator casing and forming a negative pressure chamber together with said first casing half of said actuator casing, said diaphragm having a plate fitting portion in a center part thereof, said plate fitting portion having a center aperture therethrough [and an annular rib surrounding the center aperture];
- a diaphragm plate disposed in the actuator casing and secured to said plate fitting portion of said diaphragm, said diaphragm plate having a projecting portion with a cable connecting member projecting through the opening in said second casing half of said actuator casing;
- a conical spring disposed between said diaphragm plate and said first casing half of said actuator casing, said conical spring urging said diaphragm plate and said plate fitting portion toward said second casing half of said actuator casing; and
- said diaphragm further having an annular expansive portion having a semicircularly curved section extending toward said second casing half and located adjacent to the plate fitting portion and spaced from said diaphragm plate to form an air space with said diaphragm plate.

Re. 35,137

## HIGH SPEED SERIAL DATA LINK

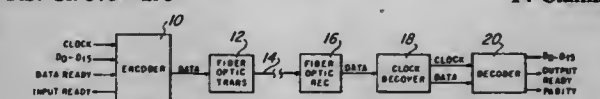
Mark A. Bryans, Dallas; James H. Cline, Allen; Francis B. Frazee, Plano, all of Tex., and Lark E. Lehman, Colorado Springs, Colo., assignors to Texas Instruments Incorporated, Dallas, Tex.

Original No. 4,979,185, dated Dec. 18, 1990, Ser. No. 256,954, Oct. 30, 1989. Application for reissue Dec. 16, 1992, Ser. No. 991,682

Int. Cl.<sup>6</sup> H04L 25/49

U.S. Cl. 375—293

14 Claims



7. A method for transmitting data comprising a plurality of data words, each data word composed of a plurality of 1's and 0's, comprising the steps of:

- (a) prepending a unique signal to each data word for indicating the start of a transmitted data word, thereby forming a prepended data word;
- (b) converting each prepended data word into an encoded data word having no more than a first preselected number of consecutive 1's and no more than a second preselected number of consecutive 0's by inserting 1's and 0's into said prepended data word to convert strings of 1's and 0's therein longer than the first and second preselected numbers, respectively into at least two shorter strings; and
- (c) serially transmitting said encoded data word one bit at a time.

Re. 35,138

## ACHROMATIC OVERCLAD FIBER OPTIC COUPLER

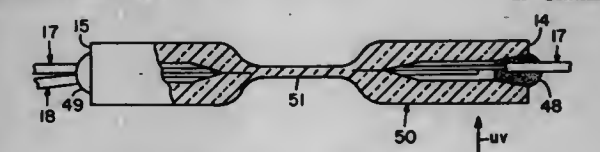
David L. Weidman, Corning, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Original No. 5,268,979, dated Dec. 7, 1993, Ser. No. 913,390, Jul. 15, 1992. Application for reissue Mar. 25, 1994, Ser. No. 217,956

Int. Cl.<sup>6</sup> G02B 6/26

U.S. Cl. 385—42

19 Claims



- 1. [A] An achromatic coupler comprising a body of matrix glass, and a plurality of optical waveguide paths extending through said body, each of said paths comprising a core region surrounded by a cladding region of refractive index less than that of said core region, the lowest refractive index of the cladding regions of said paths being  $n_2$ , at least a portion of one of said optical waveguide paths being disposed in close proximity to another of said paths to form a coupling region, the refractive index of at least that region of said body adjacent said paths being  $n_3$ , where  $n_3$  is lower than  $n_2$  by such an amount that the value of  $\Delta_{2,3}$  is less than  $[0.125\%] 0.07$ , wherein  $\Delta_{2,3}$  equals  $(n_2^2 - n_3^2)/2n_2^2$ .



Re. 35,139

**RING TRAVELLER FOR A BEVELLED FLANGED RING**  
 Franz Oberholzer, Fehraltorf, Switzerland, assignor to Bracker  
 AG, Pfaffikon, Switzerland

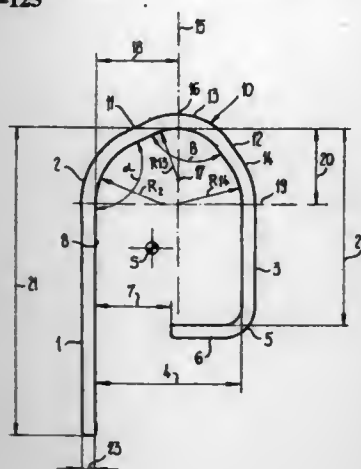
Original No. 5,297,380, dated Mar. 29, 1994, Ser. No. 917,388,  
 Jul. 23, 1992. Application for reissue Nov. 15, 1994, Ser. No.  
 341,909

Claims priority, application Switzerland, Aug. 13, 1991,  
 02388/91

U.S. Cl. 57—125

Int. Cl.<sup>6</sup> D01H 7/60

7 Claims



1. In a ring traveller for use with a bevelled flanged ring of a ring spinning machine or a ring doubling and twisting machine, said ring having a running surface, wherein said ring traveller comprises:

(a) first and second traveller arms arranged in approximately the same direction, said first traveller arm being longer than said second traveller arm and having a counterface intended for bearing on said running surface of the ring, and said second traveller arm has an inwardly angled engagement part intended for engagement with an annular shoulder, and

(b) a connecting part extending between the traveller arms and comprising first and second straight portions extending towards each other at an obtuse angle, whereof said first straight portion adjoins said first longer traveller arm via an arcuate portion and a circular arcuate portion interconnects said first and second straight portions and forms an apex whose distance from said first traveller arm is greater than its distance from said second traveller arm;

the improvement wherein:

(c) the traveller has a longitudinal extent which between the said first [140%] 210-215% traveller arms, and

(d) the part distance from said first traveller arm to an axis passing through the apex and disposed approximately parallel to said first and second traveller arms amounts to approximately 54% of said first distance.

## PLANT PATENTS

GRANTED JANUARY 2, 1996

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,413

**MINIATURE ROSE PLANT NAMED 'MACCRICKE'**  
 Samuel D. McGredy, 130 B Beach Road, Castor Bay, Auckland  
 9, New Zealand

Filed Sep. 30, 1994, Ser. No. 315,900

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—7.1

1 Claim

1. A new and distinct variety of miniature rose plant substantially as described and illustrated, which is particularly characterized by being easy to propagate; vigorous, hardy, bushy and upright habit; having blooms borne singly or in sprays from 4 to 7 which open slowly to a flat form with cup shaped petals of deep pink coloring with a slight white margin at the outer edges; and, the flowers being produced in abundance covering much of the healthy green foliage.

long-lasting medium red double flowers having consistent petals which detach cleanly, and  
 (b) from the biological point of view from very vigorous vegetation, produces flowers in abundance, exhibits the ability readily to be forced, and is very resistant to diseases when grown under greenhouse conditions;  
 substantially as herein shown and described.

9,416

**CHRYSANTHEMUM PLANT NAMED 'ICEY ISLE'**  
 Peter S. Hesse, Nipomo, Calif., assignor to Clearwater Nursery,  
 Inc., Nipomo, Calif.

Filed Mar. 31, 1995, Ser. No. 414,745

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—82.1

1 Claim

1. A new and distinct Chrysanthemum plant named Icey Isle substantially as herein described and shown, characterized by its white floret coloration and excellent upright spreading habit.

9,414

**MINIATURE ROSE PLANT NAMED 'MEIGLOYEL'**  
 Alain A. Meiland, Antibes, France, assignor to The Conard-  
 Pyle Company, West Grove, Pa.

Filed Feb. 7, 1995, Ser. No. 384,731

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—8.2

1 Claim

1. A new and distinct variety of miniature rose plant characterized by the following combination of characteristics:

(a) forms in abundance attractive double blossoms which stably exhibit Chinese Yellow coloration under greenhouse growing conditions,

(b) exhibits a bushy growth habit with considerable branching, and  
 (c) possesses a good ability to undergo pot forcing under greenhouse growing conditions;

substantially as herein shown and described.

**CHRYSANTHEMUM PLANT NAMED 'CANARY ISLE'**  
 Peter S. Hesse, Nipomo, Calif., assignor to Clearwater Nursery,  
 Inc., Nipomo, Calif.

Filed Mar. 31, 1995, Ser. No. 422,444

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—82.2

1 Claim

1. A new and distinct Chrysanthemum plant named Canary Isle substantially as herein described and shown, characterized by its yellow floret coloration and excellent upright spreading habit.

9,415

**HYBRID TEA ROSE PLANT NAMED 'DELROUMO'**  
 Georges Delbard, Commentry, France, assignor to Société  
 Civile Agricole, Pépinières et Roseraies Georges Delbard,  
 Commentry, France

Filed Nov. 4, 1994, Ser. No. 334,115

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—20

1 Claim

1. A new and distinct variety of Hybrid Tea rose plant characterized by the following combination of characteristics:

(a) from a physical point of view it forms green mature wood, assumes an upright to bushy growth habit, and forms attractive

**CHRYSANTHEMUM PLANT NAMED 'CARIBBEAN ISLE'**  
 Peter S. Hesse, Nipomo, Calif., assignor to Clearwater Nursery,  
 Inc., Nipomo, Calif.

Filed Mar. 31, 1995, Ser. No. 414,939

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—82.4

1 Claim

1. A new and distinct Chrysanthemum plant named Caribbean Isle substantially as herein described and shown, characterized by its pink/lavender floret coloration and excellent upright spreading habit.



**PATENTS**  
**GRANTED JAN. 2, 1996**

**ERRATA**

<b>For</b>	<b>See</b>
<b>CLASS</b>	<b>PATENT NO.</b>
034-516 .....	5,479,727
074-502 .....	5,479,776
063-002 .....	5,479,131
063-002 .....	5,479,796
063-003 .....	5,479,797
063-019 .....	5,479,798
108-144 .....	5,479,852
119-715 .....	5,479,891
119-771 .....	5,479,892
137-493 .....	5,479,978
279-050 .....	5,480,164
273-176 .....	5,480,167
607-017 .....	5,480,441
029-623 .....	5,480,462
162-301 .....	5,480,520
430-127 .....	5,480,627
430-493 .....	5,480,628
424-450 .....	5,480,817
435-240 .....	5,480,825
423-228 .....	5,480,860
430-264 .....	5,480,886
435-007 .....	5,480,895
435-069 .....	5,480,956
546-289 .....	5,480,997
554-142 .....	5,481,025
318-135 .....	5,481,155
342-028 .....	5,481,266
369-044 .....	5,481,386
358-311 .....	5,481,411



# PATENTS

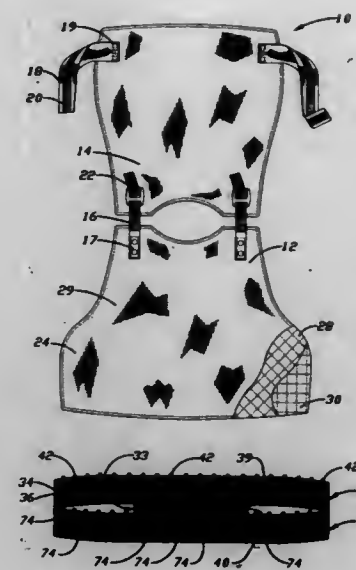
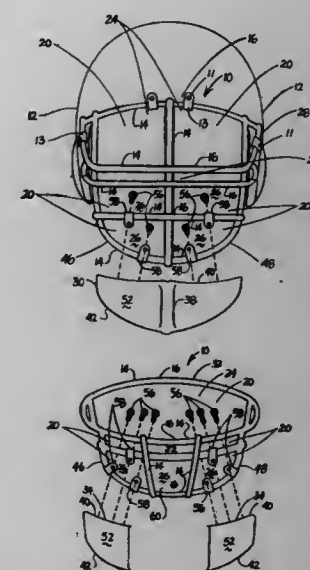
GRANTED JANUARY 2, 1996

## GENERAL AND MECHANICAL

5,479,658  
FACE MASK AND FACE MASK COVER  
Daniel S. Harris, 1030 W. Elm St., Greenwood, Ind. 46142  
Filed Aug. 4, 1994, Ser. No. 285,894  
Int. Cl.<sup>6</sup> A42B 3/18

U.S. Cl. 2—9

21 Claims



directions of said second panel in which said plurality and another plurality of stitches are positioned away from the periphery of said first and second panels.

1. A football helmet face mask and cover comprising a sheet of rigid material formed to overlie spaced bars of the face mask, said sheet having upper and lower boundaries, said upper and lower boundaries being rolled to conform to and to extend over the spaced bars of said face mask, said sheet covering the area between said bars, said cover having an inside surface and an outside surface, said rolled boundaries being rolled toward said inside surface, said exterior surface accommodating design indicia complementary with the helmet design whereby said helmet and face mask have a coordinated design presentation.

5,479,659  
LIGHTWEIGHT BALLISTIC RESISTANT GARMENTS  
AND METHOD TO PRODUCE THE SAME  
Thomas E. Bachner, Jr., Unionville, Pa., assignor to Second Chance Body Armor, Inc., Central Lake, Mich.  
Filed Oct. 15, 1993, Ser. No. 137,596  
Int. Cl.<sup>6</sup> A41H 1/02

U.S. Cl. 2—2.5

84 Claims

1. A ballistic resistant garment, for covering and protecting vital portions of a human body, comprising:  
at least two panels which are adjacent and overlie one another in which each panel comprises at least two layers of ballistic resistant material in which said ballistic material is woven; and  
a plurality of stitches which are disposed into a first panel of said at least two panels connecting said at least two layers of ballistic resistant material within said first panel in which said plurality of stitches are positioned in a row in a first direction and another plurality of stitches which are disposed into a second panel of said at least two panels connecting said at least two layers of ballistic resistant material within said second panel, in which said another plurality of stitches are positioned in at least two rows, in which said at least two rows are in a second and third direction respectively in which said second and third directions are transverse to one another and in which said row in said first direction of said first panel is transverse to said two rows in said second and third

5,479,660  
EXERCISE GLOVE  
Gregory Najac, 229 Rte. 202, Pomona, N.Y. 10970  
Filed Apr. 14, 1994, Ser. No. 227,396  
Int. Cl.<sup>6</sup> A41D 13/08

U.S. Cl. 2—20

4 Claims



1. An exercise glove for the hand of a user in exercises involving the gripping of a pole-like exercise device comprising a generally planar palm structure in approximately a rectangular form, the palm structure at one end defining a curved edge for conforming to the upper area of the palm of said hand, the palm structure at the other end defining a substantially straight edge for conforming to the underside of the fingers of said hand at the middle joints thereof, said curved edge constituting a first terminal end of said palm structure and said substantially straight edge constituting a second terminal end of said palm structure first and second straps extending outwardly from the sides, respectively, of the palm structure between said first and second terminal ends and proximate said curved edge, and said palm structure defining on its face, outwardly of said hand, a stippled surface.



5,479,661

**GARMENT HAVING PRINTED INSTRUCTIONS FOR SELF-EXAMINATION OF THE BREASTS**

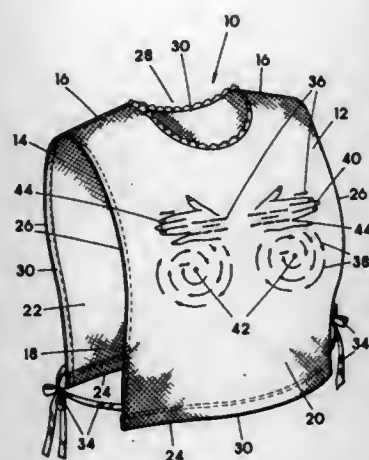
Linda J. Fingleson, and Lisa A. Richman, both of 26540 Agoura Rd., #218, Calabasas, Calif. 91302

Filed Jan. 3, 1995, Ser. No. 368,014

Int. Cl.<sup>6</sup> G09B 23/28; A41D 1/00

U.S. Cl. 2—69

3 Claims



1. An upper body garment having visible instructions thereon to be worn by a woman for and during breast self-examination and which affords a degree of privacy to the woman by generally covering her breasts while wearing the garment and examining her breasts by directly touching her breasts with her hands underneath said garment.

said garment having a front panel and a back panel connected to one another by shoulder seams, one shoulder seam on each side of a central neck opening defined between the front and back panels for passage of a woman's head, said front panel having a left terminal side edge and an oppositely disposed right terminal side edge, said back panel having a left terminal side edge and an oppositely disposed right terminal side edge, first attachment means for releasably connecting the left terminal side edges together for a partial length of the left side edges during wearing of the garment, said first attachment means arranged for connecting the left terminal side edges so as to leave a first side opening between the connected left side edges and above said first attachment means sufficiently large and properly placed to allow insertion of a hand through the first side opening to access a breast while wearing the garment,

second attachment means for releasably connecting the right terminal side edges together for a partial length of the right side edges during wearing of the garment, said second attachment means arranged for connecting the right terminal side edges so as to leave a second side opening between the connected right side edges and above said second attachment means sufficiently large and properly placed to allow insertion of a hand through the second side opening to access a breast while wearing the garment,

visible instructions imprinted on said front panel, said instructions visible and readable by a woman while wearing the garment so that a woman wearing the garment is capable of reading and following the instructions and accessing her breasts for examination thereof with her hands inserted through said first and second side openings of the garment to directly touch and examine her breasts,

said visible instructions including upside-down printed words, and directional arrows indicating proper hand motions in a breast examination.

5,479,662

**PRIVACY COVERING FOR NURSING MOTHERS**

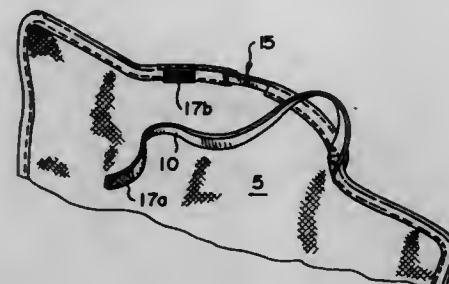
Teri Runco, 12 Stafford Ct., Sterling, Va. 20165

Filed Nov. 7, 1994, Ser. No. 336,220

Int. Cl.<sup>6</sup> A41D 1/00; 1/20; 1/22

U.S. Cl. 2—104

6 Claims



1. A privacy covering for nursing mothers comprising a panel of fabric of a height and width sufficient to cover at least a chest region between a mother's shoulders and lap and a neck strap for detachably securing the panel so as to hang from the mother's neck; wherein a resiliently flexible strip is fastened running along a central portion of an upper edge of the covering, said strip being resiliently flexible for bending about a line running along said panel in a direction normal to the upper edge thereof but being resistant to bending within a plane containing said line; wherein said strip has an arcuately curved, unstressed configuration acting to bow the central portion of the upper edge of said panel away from the mother's chest when hanging loosely therefrom; and wherein said neck strap, when secured about the neck of the mother, runs from a position adjacent a first end of said strip to a position adjacent a second end of said strip, said positions being located laterally inwardly from opposite ends of said upper edge of the covering.

5,479,663

**SAFETY LINER AND COVER ASSEMBLY FOR A WATER MATTRESS**

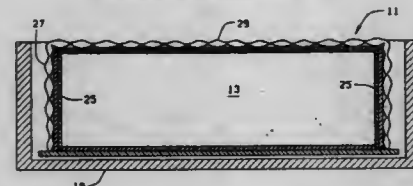
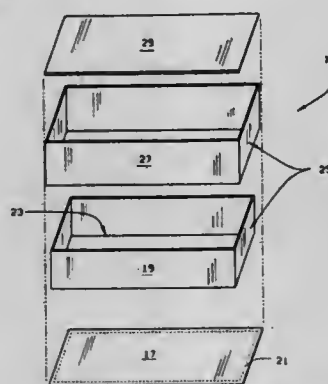
Dennis Boyd, 14457 Rouge River, Chesterfield, Mo. 63017

Filed Mar. 7, 1994, Ser. No. 207,358

Int. Cl.<sup>6</sup> A47C 27/08

U.S. Cl. 5—470

11 Claims



1. A safety liner and cover assembly for a water mattress adapted to be disposed inside an external frame comprising: a base composed of a sheet of flat vinyl material;

5,479,665

**AUTOMATED TRI-FOLD BED**

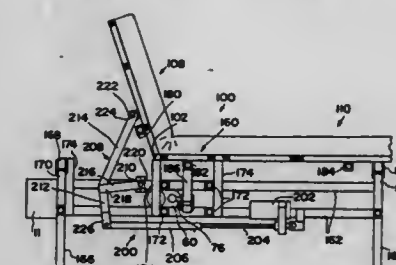
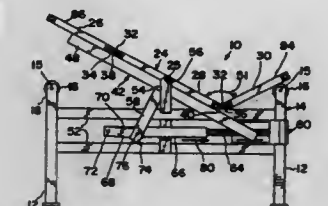
Joseph P. Cassidy, 612 Central Ave., Lafayette, Ind. 47905-1864; James L. Meyer, and David J. Meyer, both of 1889 180th Ave., Lost Nation, Iowa 52254

Filed Sep. 9, 1983, Ser. No. 118,883

Int. Cl.<sup>6</sup> A61G 7/05

U.S. Cl. 5—613

21 Claims



1. An automated tri-fold bed comprising

a bed frame;

means for supporting a mattress, the supporting means being pivotable between a horizontal planar configuration and a mattress folding configuration,

means for pivoting the supporting means about transversely centered longitudinal pivot axis, the pivoting means including an actuating arm rigidly attached to the supporting means and oriented orthogonally thereto, and actuating means for moving the actuating arm to pivot the supporting means, the actuating means being horizontally disposed and transversely mounted on the bed frame and having a first end rigidly attached to the bed frame and a second end coupled to a link, the link being coupled to the actuating arm, and

means for folding at least one end of the supporting means about a transverse axis to permit raising of one end of the mattress, said means to fold being normally detached from the supporting means and movable to abut and rise the supporting means to raise the end of the mattress.

5,479,666

**FOOT EGRESS CHAIR BED**

L. Dale Foster, Brookville, and John W. Ruehl, Shelbyville, both of Ind., assignors to Hill-Rom Company, Inc., Batesville, Ind.

Filed Jan. 25, 1994, Ser. No. 186,657

Int. Cl.<sup>6</sup> A61G 7/06

U.S. Cl. 5—624

48 Claims

1. A bed having a generally planar bed position and convertible to a chair position and permitting patient egress from the foot end thereof comprising:

a base;

a frame mounted on said base;

a patient support platform mounted on said frame and including at least head and foot panels;

said head panel being mounted for pivotal movement relative to said frame to a raised position when converting said bed to the chair position,

said foot panel including a pivoting portion and a collapsing portion, said collapsing portion extending from and retracting toward said pivoting portion as said pivoting portion pivots upwardly and downwardly, respectively; and

a side wall extending circumferentially around the base to define a recess for receiving a water mattress, said side wall including a layer of vinyl material sealed to the base such that the base and side wall form a watertight safety liner, said side wall further including a layer of fabric secured to said layer of vinyl and disposed exteriorly thereof such that the fabric layer forms the external layer of the side wall;

a top fabric panel disposed above the recess and having a length and width comparable to the length and width of the base; means for removably securing the top fabric panel to the side wall around the perimeter of the side wall to enclose said recess defined by the side wall and the base.

5,479,664

**MATTRESS COVER**

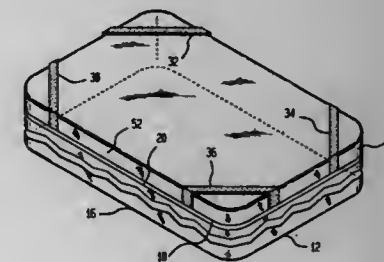
Jeffrey M. Hollander, 4700 Leitner Dr. N., Coral Springs, Fla. 33067

Filed May 26, 1994, Ser. No. 249,756

Int. Cl.<sup>6</sup> A47G 9/02

U.S. Cl. 5—499

23 Claims



16. An extra-thick mattress-mattress cover combination comprising:

an extra-thick mattress having at least top, bottom end and side surfaces;

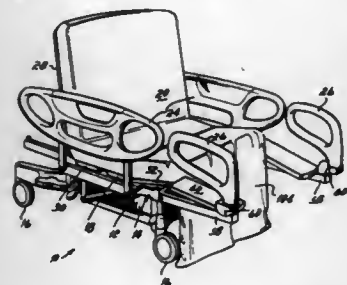
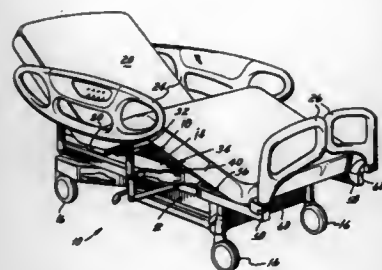
a mattress cover consisting of top panel means for covering at least a substantial portion of said top surface of the mattress, skirt means extending outwardly from said top panel means and forming an enclosure for at least portions of said side and end surfaces of said mattress, said skirt means having at least a distal edge remote from said top panel means, said continuous enclosure having an opening situated at said distal edge, said opening having at least a central area, the depth of said side and end surfaces of the mattress exceeds the depth of said skirt means, so that in a working condition of said mattress cover a space is formed between said distal edge of said skirt means and the bottom surface of the mattress,

edge elastic means for forming a resilient boundary of said opening, and

peripheral elastic means for urging said edge elastic means and an adjacent portion of said skirt means towards said bottom surface of the mattress, so as to pull said skirt means away from said top panel and to provide a close fit between said mattress cover and said mattress, said peripheral elastic means comprises a plurality of elastic straps spaced apart along said resilient periphery of said opening,

whereby in said working condition each said elastic strap extends along said space and said bottom surface of the mattress.





linkage connected between said frame and said platform for moving said platform longitudinally relative to said frame, pivoting said pivoting portion and collapsing said collapsing portion to convert said platform to and between the generally planar bed position and the chair position.

5,479,667

**ERGONOMIC PILLOW ASSEMBLY**

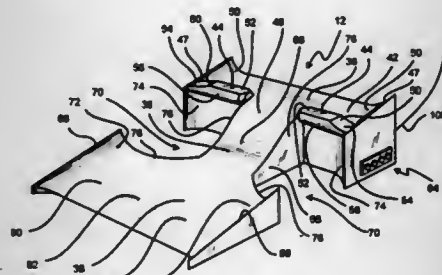
Frank O. Nelson, and Kathy L. Nelson, both of 91 Harvest Pl., Woodland Park, Colo. 80863

Filed Feb. 16, 1994, Ser. No. 197,266

Int. Cl.<sup>6</sup> A47C 20/02

U.S. Cl. 5—636

22 Claims



1. An ergonomic pillow assembly operable to receive and support a person's head having a skull section connected to a neck portion, spinal assembly, lumbar, and waist area thereon, comprising:

- a head support assembly to receive and support a person's skull section and neck portion connected to a thoracic support assembly which, in turn, is connected to a waist and lumbar support assembly;
- said head support assembly and said waist and lumbar support assembly extended laterally of said thoracic support assembly; and

c) said thoracic support assembly includes a shoulder cut-out retainer area between said head support assembly and said waist and lumbar support assembly operable to receive the person's shoulder therein when resting on the person's side.

5,479,668

**REVOLVING SUNTAN BED**

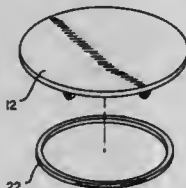
Tracey A. Cooper, and Richard W. Cooper, Jr., both of 3129 A Liberty, Hill AFB, Utah 84056

Filed Feb. 23, 1995, Ser. No. 393,193

Int. Cl.<sup>6</sup> A47C 20/00; A61G 7/00

U.S. Cl. 5—656

2 Claims



1. A revolving suntan bed for continuously revolving a user lying thereupon and allowing such user to attain an even tan when the suntan bed is placed under a tanning light source comprising, in combination:

- a circular horizontal planar rigid pedestal having an upper surface, a lower surface, and a periphery interconnecting the surfaces, and a diameter of about 6 feet;
- a rigid tubular coupling component axially secured to the lower surface of the pedestal and extended downwards therefrom;
- an annular rigid driving gear axially aligned with the pedestal and coupled to the lower surface thereof;
- six rotatable rollers coupled to and extended downwards from the lower surface of the pedestal in a generally circular configuration between the periphery of the pedestal and the driving gear;
- a rigid base coextensive with the pedestal and having a central cylindrical hub disposed within the coupling component for allowing revolution of the pedestal with respect thereto, an annular rigid horizontal planar bottom wall axially aligned about the hub, inboard and outboard concentrically positioned side walls coupled to and extending upwards from the bottom wall to define an annular track for receiving the rollers therein and directing their direction of travel, and four spokes coupled between the hub and inboard side wall and with each spoke positioned perpendicularly with respect to the adjacently located spokes; and

an electric motor disposed between a pair of spokes and positionable upon a recipient horizontal supporting surface, the motor having a fixed stator and a geared rotatable rotor in mesh with the driving gear and with the motor electrically energizable for imparting rotation to the rotor, the driving gear and rotor in combination designed to allow the pedestal to complete one revolution every 20 minutes.

5,479,669

**MULTI-PURPOSE TOOL FOR IC**

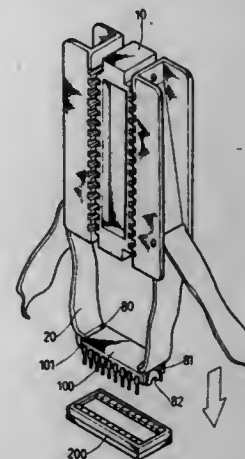
Wen S. Chen, P.O. Box 82-144, Taipei, Taiwan, Prov. of China

Filed Aug. 12, 1994, Ser. No. 289,784

Int. Cl.<sup>6</sup> B25F 1/00; B23P 19/00

U.S. Cl. 7—107

1 Claim



1. A multi-purpose tool for IC comprising: a body including a left portion, a right portion, and an intermediate portion fitted between the left portion and the right portion, said left portion being formed with a plurality of transverse teeth at an inner side, said right portion being formed with a plurality of transverse teeth at an inner side, said intermediate portion being formed at both inner sides with a plurality of transverse teeth adapted to engage the teeth of said left portion and said right portion; a pair of inner arms each pivotally connected with an upper end of said left portion and said right portion, each of said inner arms being formed at an inner end with a flange and a leg under the flange, said leg having a notch at a lower edge; and a pair of outer arms each pivotally connected with an upper end of said left portion and said right portion, each of said outer arms being formed at a lower end with a hook engageable with the notch of the leg of said inner arms.

5,479,670

**DOUBLE-ENDED SOCKET WRENCH FOR SPRINKLER NOZZLES**

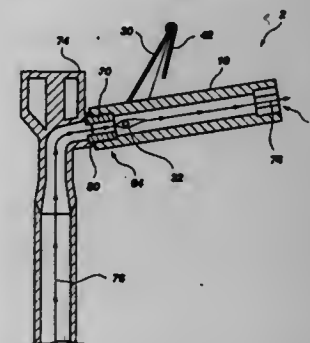
William G. Coffey, 1347 N. 1350 East, Richfield, Id. 83349

Filed Mar. 30, 1994, Ser. No. 219,948

Int. Cl.<sup>6</sup> B25B 13/00

U.S. Cl. 7—138

8 Claims



1. A wrench for removing nozzles from sprinkler heads and the like, the wrench comprising: a housing comprising an exterior wall disposed so as to define an elongate void extending from a first open end of the housing to a second open end thereof,

the first end including a plurality of surfaces formed in the wall and extending from the opening to a point within the housing so as to define a socket in the first end, the socket being nestable with an angled outer surface of a sprinkler nozzle,

leverage means connected to the housing to facilitate rotation of the housing about the longitudinal axis thereof, and probe means connected to the housing, the probe means being of sufficient length and width to enter a nozzle and dislodge debris in a sprinkler head.

5,479,671

**METHODS AND DEVICES FOR INSTALLING DISCONTINUOUS SHEATHS ON CABLES AND TO CABLES THUS SHEATHED**

Jérôme Stubler, Paris; Patrick Ladret, Vaulx-en-Velin, and Joël Dupuis, Les Essarts le Roi, all of, France, assignors to Freyssinet International et Cie, Villacoublay, France

Filed Nov. 21, 1994, Ser. No. 345,436

Claims priority, application France, Nov. 22, 1993, 93 13941

Int. Cl.<sup>6</sup> E01D 19/10; F16L 3/00

U.S. Cl. 14—22

6 Claims



1. A sheathed cable assembly comprising: a cable; a discontinuous sheath surrounding said cable composed of identical successive tubular sections having ends which fit together; and an inextensible cablelet pulled taut along the cable inside the successive sheath sections, said cablelet being fastened to a plurality of equidistant fasteners, the number of fasteners being equal to that of said sheath sections, each respective said fastener being fixed to a respective one of said sheath sections at a point on said one of said sheath sections and a distance between any two successive said fasteners fastened to the cablelet also being equal to the distance between two identical points on two successive said sheath sections, said distance being slightly less than a minimum length envisageable for each said section.

5,479,672

**FLOOR CLEANING AND POLISHING EQUIPMENT**

Dennis J. Brown, High Wycombe, and Roger J. M. Simpson, Slough, both of, United Kingdom, assignors to Lever Industrial Company, Division of Indopco, Inc., Bridgewater, N.J.

Filed Jul. 26, 1994, Ser. No. 280,698

Claims priority, application United Kingdom, Jul. 26, 1993, 9315447

Int. Cl.<sup>6</sup> A47L 11/14

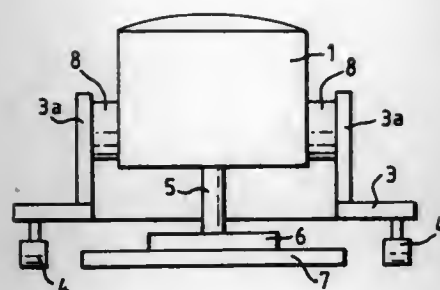
U.S. Cl. 15—98

4 Claims

1. A combined floor cleaning and floor polishing machine comprising:

- (i) a motor housing;
- (ii) a base having two opposed upwardly extending members means attaching the base to the motor housing;





- (iii) floor engaging castors attached to said base;
- (iv) a rearwardly and upwardly extending control handle attached to the motor housing; and
- (v) motor means mounted in said motor housing, said motor means comprising a substantially vertical downwardly extending rotary shaft means for driving a rotary disc attached to the shaft by a coupling the rotary disc having a selectively changeable pad, and the operative floor weight of said motor means being split between the operative pad on the rotary disc and the castors, wherein the means attaching the motor housing to said base comprises two elastomeric blocks aligned one to either side of the motor means, said elements being fastened between the members of the base and the motor housing to provide for relative movement therebetween.

5,479,673

## REVERSIBLE SCRUB BRUSH AND SCRAPER

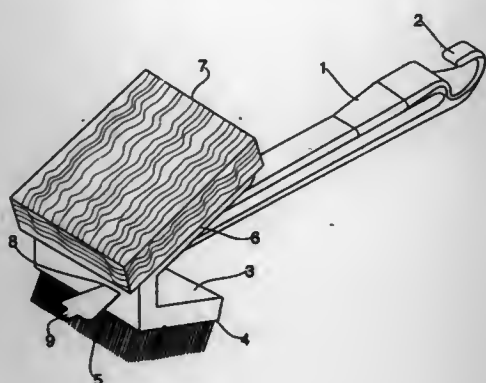
Bruce M. Carton, c/o Trim Brush Company Inc., 22 Littell Rd., East Hanover, N.J. 07936

Filed Dec. 21, 1994, Ser. No. 360,365

Int. Cl.<sup>6</sup> A47L 13/12; A46B 17/08

U.S. Cl. 15—111

13 Claims



1. A tool comprising:
- an elongated handle having first and second opposite ends, hook means at the first end,
  - a workpiece holder at the second opposite end of the handle, containing:
  - first means for fastening a scouring pad,
  - a scouring pad fastened to the workpiece holder by the first means,
  - second means for fastening bristles,
  - bristles fastened to the workpiece holder by the second means,
  - third means for fastening a scraper and
  - a scraper fastened to the workpiece holder by the third means,
  - wherein the workpiece holder has a modified "V" shape with a short side, a long side and a flat base intermediate said short and long sides.

5,479,674  
GOLF-SHOE CLEANING APPARATUS FOR ATTACHING TO A GOLF BAG

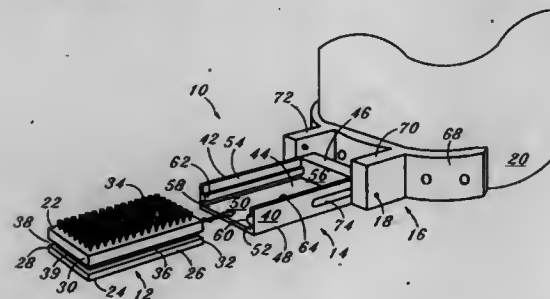
Richard J. Gilcrest, 1730 Halford Ave., #147, Santa Clara, Calif. 95051

Filed Jun. 29, 1994, Ser. No. 267,659

Int. Cl.<sup>6</sup> A47L 23/00; A63B 55/08

U.S. Cl. 15—161

18 Claims



1. A cleaning device for golf shoes for attachment to a golf bag having a base and a side, comprising:
- a retaining member having two opposing side surfaces and a top surface;
  - a cleaning element retained by said retaining member;
  - a bracket secured by attachment means to the base of said golf bag;
  - hinge means, hingedly connecting said retaining member to said bracket, such that said retaining member pivots between a store position, roughly parallel to the side of said golf bag, and a use position, wherein said cleaning element faces upward; and
  - releasable locking means for securing said retaining member in the store position.

5,479,675

## HAND TROWEL ASSEMBLY

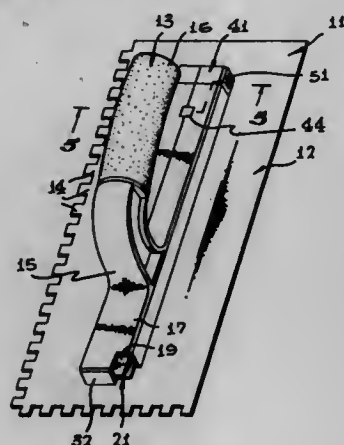
Walter W. Pytlewski, East 5255 Seltice Way, Post Falls, Id. 83854

Filed Mar. 1, 1995, Ser. No. 396,702

Int. Cl.<sup>6</sup> B05C 17/10

U.S. Cl. 15—235.4

10 Claims



1. A hand trowel assembly, comprising:
- a blade, said blade having a mount longitudinally disposed thereon;
  - a handle, said handle having a fitting in sliding, interlocking engagement with the mount and a first stop limiting the travel of the fitting in one direction with respect to the mount, the mount being longer than the fitting;
  - a keeper, said keeper being in sliding, interlocking engagement with the mount and including a second stop limiting the travel of the keeper with respect to the mount in the opposite

direction and a latch releasably engaging said handle and thereby immovably securing the handle to said blade.

5,479,676

## VACUUM CLEANER

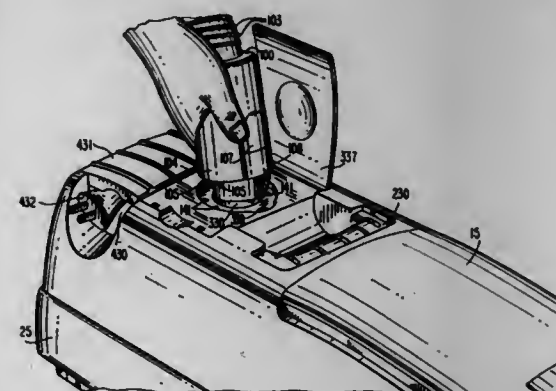
Michael F. Martin, Bristol, Tenn.; William D. Starr, Bristol, Va., and Peter Hockstra, Bristol, Va., assignors to Electrolux Corporation, Atlanta, Ga.

Filed May 12, 1994, Ser. No. 241,579

Int. Cl.<sup>6</sup> A47L 9/28

U.S. Cl. 15—323

13 Claims



1. A vacuum cleaner having:
- a blower for creating suction,
  - an electric motor for driving said blower,
  - an electric motor actuation circuit electrically connected to said electric motor,
  - a dirt collection container,
  - a body, housing said electric motor, said electric motor actuation circuit, said dirt collection container, and said blower, and having defined therein a suction port, an exhaust port, and a suction passage extending therethrough from said suction port to said exhaust port; and
  - a hose connected at a first end of said body, said hose having a handle at a second end thereof, said handle having a control for actuating said motor, said hose further having hose conductors connected to said control and extending to said first end, and first electrical contact members connected to said hose conductors at said first end; wherein:
  - each one of said suction port and said exhaust port comprises respective second electrical contact members for mating with said first electrical contact members when said hose is connected to a respective one of said suction port and said exhaust port, said respective second electrical contact members being connected to said electric motor actuation circuit for actuating said motor in response to user actuation of said control.

5,479,677

## CASTER DEVICE

Ping-Feng Chong, No.22, Kuang-Fu Rd., Chi-Chin Dist., Kaohsiung City, Taiwan, Prov. of China

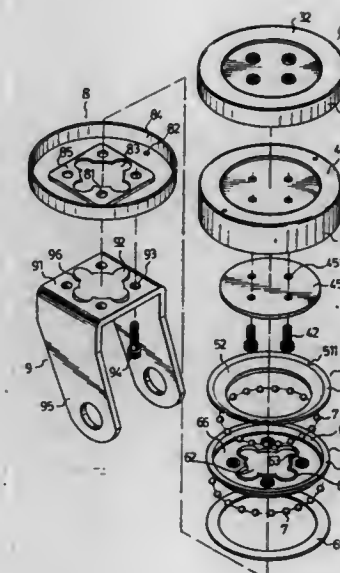
Filed Sep. 7, 1994, Ser. No. 301,678

Int. Cl.<sup>6</sup> B60B 33/00

U.S. Cl. 16—21

7 Claims

1. A caster device for supporting a push cart, comprising:
- a cap member having a flat top adapted to be fixed to the push cart and a circular side wall depending downwardly from said flat top, said flat top having two pins fixed to a bottom face of said flat top, said circular side wall of said cap member having an inwardly curled lower edge;
  - an inverted and truncated conical ring member having a curved side wall and a flange extending horizontally and outwardly



- from an upper edge of said curved side wall, said flange having two notches respectively engaging said pins of said cap member so as to position said ring member within said cap member such that said flange of said ring member abuts said bottom face of said flat top of said cap member;
- a bowl-shaped rotary member having a circular bottom wall and a side wall extending upwardly from said bottom, said side wall having a top edge and a horizontal flange extending outwardly from said top edge of said side wall, said bottom of said rotary member having at least two equally spaced threaded holes formed therein, said rotary member being disposed below said ring member such that said horizontal flange abuts said flange of said ring member and such that said side wall of said rotary member is supported by said inwardly curled lower edge of said cap member, said side wall of said rotary member and said curved side wall of said ring member cooperatively defining a first annular ball-receiving space, said horizontal flange and said side wall of said rotary member, and said inwardly curled lower edge of said cap member cooperatively defining a second annular ball-receiving space;
- a plurality of steel balls rotatably confined within said first annular ball-receiving space and said second annular ball-receiving space to permit rotation of said rotary member with respect to said cap member;
- an inverted U-shaped bracket having a base and two support legs suspended downwardly from said base;
- at least two fastening bolts passing through said base of said inverted U-shaped bracket to engage said threaded holes of said circular bottom wall of said rotary member to permit rotation of said inverted U-shaped bracket with said rotary member; and
- a wheel mounted rotatably between said support legs of said inverted U-shaped bracket.

5,479,678

## LOCKING HINGE

David G. Reed, Langborne, and Phillip Olikara, Newtown, both of Pa., assignors to Martin Marietta Corp.

Filed Feb. 21, 1995, Ser. No. 393,585

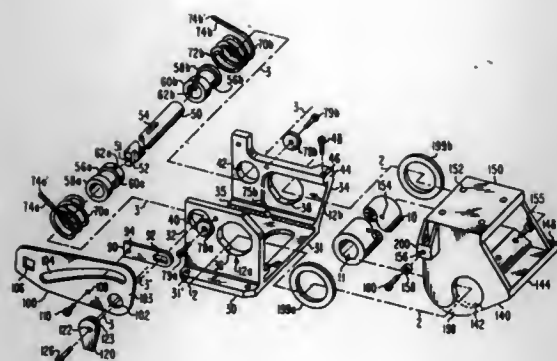
Int. Cl.<sup>6</sup> E05F 1/08

U.S. Cl. 16—325

4 Claims

1. A hinge for hinging between a first, stowed state, and a second, deployed state, said hinge comprising:
- a first clevis, said first clevis defining a vee-block support and a first bottoming portion;
  - a cylindrical shaft supported by said vee-block, and defining a length, an axis, and also defining a diameter which results in





two-line support along said shaft, whereby said axis represents an axis of rotation of said cylindrical shaft in said vee-block;

a second clevis nonrotatably affixed to said cylindrical shaft, whereby said second clevis may rotate freely in said vee-block in response to torques about said axis of rotation, but said cylindrical shaft may tend to be displaced from proper seating in said vee-block in response to torques about second and third axes, which second and third axes are mutually orthogonal to each other and to said axis of rotation, said second clevis also including a second bottoming portion at a predetermined distance from said axis of rotation and at a first predetermined plane transverse to said axis of rotation along said length of said cylindrical shaft, selected to coincide with the distance from said axis of rotation and the transverse plane of said first bottoming portion, to limit the rotation of said cylindrical shaft toward said deployed state so long as said cylindrical shaft is supported by said vee block, said second clevis further including cam engagement means at a second predetermined distance from said axis of rotation and at a second predetermined plane transverse to said axis of rotation; cam affixed to said first clevis for rotation relative thereto about a cam axis, said cam engaging said cam engaging means of said second clevis at engagement points, which are at distances from said cam axis which are (a) substantially equal to said second predetermined distance when said hinge is in deployed state, and (b) which are greater than said second predetermined distance when said hinge is in the stowed state; and

rotational drive means coupled to said cam and to said first clevis, for urging said cam to rotate relative to said first clevis about said cam axis in a direction which tends to move said second clevis from said stowed state toward said deployed state, whereby, when said cam begins to rotate, said distance between said cam axis and said engagement point is greater than when said cam nears the end of its rotation, and rotates said second clevis at a rate which is greater than the rotation rate when said cam is near said end of its rotation, and in which said distance from said cam axis and said engagement point becomes substantially equal to said second predetermined distance when said cam nears the end of its rotation, and rotates said second clevis at a rate which is less than the rotation rate when said cam begins to rotate, and whereby, when said cam is near said end of its rotation, said bottoming portions of said first and second clevises interact, with a resultant force which tends to maintain said cylindrical shaft in said vee block at said first plane, and said cam tends to generate a force which tends to maintain said cylindrical shaft in said vee block at said second plane.

5,479,679

# FIBER BATT FEEDING APPARATUS FOR A FIBER PROCESSING MACHINE

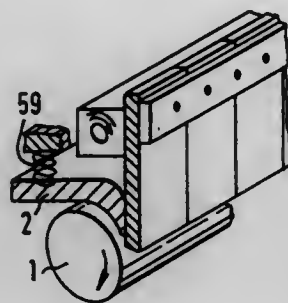
Ferdinand Leifeld, Kempen, Germany, assignor to Trützschler GmbH & Co. KG, Mönchengladbach, Germany  
Filed Dec. 23, 1993, Ser. No. 172,158

Claims priority, application Germany, Dec. 23, 1992, 42 43 833.0; Jan. 6, 1993, 43 34 035.0

Int. Cl.<sup>6</sup> D01G 15/40

U.S. Cl. 19—105

11 Claims



1. An apparatus for feeding a fiber batt to a fiber processing machine, comprising

- (a) a rotatably supported feed roll;
- (b) a feed table having a face portion cooperating with said feed roll and defining therewith a nip through which the fiber batt passes in an advancing direction;
- (c) an elongated holding element extending spaced from, and generally parallel to said feed roll;
- (d) support means for displaceably supporting said holding element;
- (e) a plurality of sensor elements disposed along said feed roll; each said sensor element having a first location and a second location spaced from said first location; each said sensor element being affixed at said first location to said holding element; each said sensor element having a sensing end portion adjacent said second location; said sensing end portion of each said sensor element cooperating with said feed roll and directly engaging the fiber batt; each said sensor element being movable away from said feed roll as a function of thickness variations of the fiber batt between the feed roll and a respective said sensor element; each said sensor element imparting a displacement force to said holding element as function of displacements of the sensor element in response to the thickness variations; said holding element being displaceable to an extent representing a sum of the displacement forces simultaneously applied by the sensor elements to said holding element; said sensor elements being leaf springs; and
- (f) signal generating means connected to said holding element for generating a signal as a function of displacements of said holding element.

5,479,680

# SLIVER DRAFTING APPARATUS

Herbert Stalder, vord.Bantalstrasse 9., CH-8483 Kollbrun, and Peter Toggweiler, Hulfteggstr. 4, CH-8400 Winterthur, both of, Switzerland

Continuation-in-part of Ser. No. 681,047, Apr. 5, 1991, abandoned. This application Jan. 28, 1993, Ser. No. 10,265

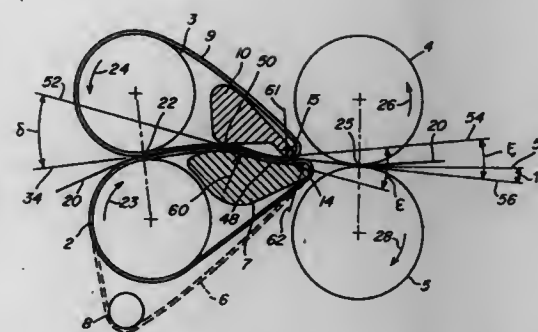
Claims priority, application Switzerland, Apr. 6, 1990, 01175/90

Int. Cl.<sup>6</sup> D01H 5/86

U.S. Cl. 19—248

51 Claims

1. A drafting apparatus having an apron zone for drafting a sliver in a yarn spinning machine comprising:



cover substantially perpendicularly to the winding direction thereof and a handle disposed to said sheet cover in the vicinity of said shape-keeping member, and wherein the outside end portion of said sheet cover overlapped on the inside end portion thereof has a slender externally extracting slit cut out and opened therethrough so that the handle of said pull means attached to the inside end portion can be extracted to the outside therethrough.

5,479,682

# CLAMP FOR PAPER SHEETS

Remigius V. Hendriks, Mensinge 12, NL-5655 HA Eindhoven, and Johanna M. A. T. Cavé-Jansen, Beekersberg 5, NL-5066 CT Moegestel (NBR), both of, Netherlands

PCT No. PCT/NL93/00005, § 371 Date Sep. 7, 1994, § 102(e) Date Sep. 7, 1994, PCT Pub. No. WO93/13948, PCT Pub. Date Jul. 22, 1993

PCT Filed Jan. 8, 1993, Ser. No. 256,517

Claims priority, application Netherlands, Jan. 8, 1992, 9200023

Int. Cl.<sup>6</sup> B42F 3/00

U.S. Cl. 24—67.11

7 Claims

at least one apron drafting mechanism comprising a pair of upper and lower inlet rollers forming a rearward apron nipping area, an upper apron and a lower apron, a spring loaded upper apron cradle mechanism having a forward nose for engaging the upper apron, a guide having an upper surface and a forward nose for engaging the lower apron and a pair of upper and lower sliver delivery rollers;

the upper apron traveling around the upper inlet roller and around said forward nose of said cradle mechanism, and the lower apron traveling around the lower inlet roller and around said forward nose of said guide;

said guide having at least one step-like recess in its upper surface upwardly facing the lower apron, said step-like recess having a rearward edge and said spring loaded cradle mechanism urging the upper apron downwardly into pressing engagement with said lower apron;

the pressingly engaged aprons forming a sliver path therebetween which is substantially S-shaped along a substantial length of the path between the inlet rollers and the delivery rollers.

5,479,681

# CARGO COLLAPSE PREVENTING DEVICE

Takaharu Muraoka, Chiba, Japan, assignor to Muraoka Co., Ltd., Japan

Filed Jan. 21, 1994, Ser. No. 181,745

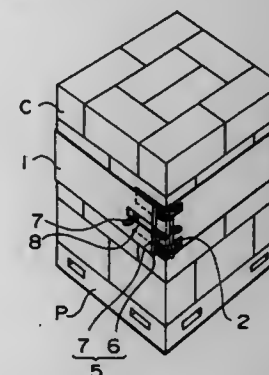
Claims priority, application Japan, Jan. 22, 1993, 5-004867

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Int. Cl.<sup>6</sup> B65D 71/02

U.S. Cl. 24—16 R

4 Claims



1. A cargo collapse preventing device including a sheet cover having opposite ends and having a length sufficient to be horizontally wound around cargoes palletized on a predetermined loading platform or to be vertically wound around the cargoes together with the loading platform and a fastening means for connecting and fastening the opposite ends of the sheet cover in the state that the opposite ends are overlapped each other defining inside and outside end portions, comprising a pull means provided with each of the opposite ends of said sheet cover for causing the opposite ends to be overlapped each other and positioned, wherein said pull means includes a rigid shape-keeping member fixed to said sheet

1. Clamp comprising a U-shaped body having two legs joined at one end by a web, said legs spaced apart a distance for inserting objects therebetween, one of the legs being provided with a resilient lockable lip for clamping the objects between said lip and the other leg of the U-shaped body, said lockable lip having a hinge axis which extends essentially at right angle to a longitudinal center line of the web of the U-shaped body, wherein the leg in which the lip is provided and at least the adjacent part of the web are provided with a groove such that the U-shaped body is elastically deformable to increase the distance between a free locking end of the lip and a part of the one leg to be engaged by the lip, and the free end of the lip engages said one leg in a locked position.

5,479,683

# THREE-DIMENSIONAL EYEWINDER APPARATUS

Rory L. C. Flemmer, Independence, W. Va., and David L. Byron, Honeoye Falls, N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Dec. 29, 1993, Ser. No. 175,086

Int. Cl.<sup>6</sup> B21D 7/08; 7/14

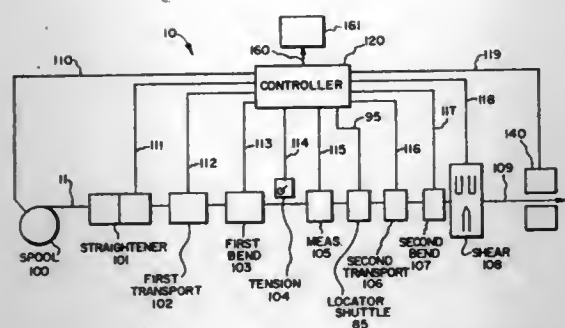
U.S. Cl. 29—20

18 Claims

1. An eyewinder comprising:

- a first transport station for transporting a wire;
- a first bending station for bending a wire in a first direction;
- a second bending station spaced from said first bending station for bending the wire in a second direction;
- a monitoring station disposed between the first and second bending stations for monitoring physical characteristics of the wire and generating monitor signals representative of said physical characteristics;





a shearing station for shearing a portion of the wire having first and second bends from the rest of the wire;  
a controller coupled to the stations for receiving the monitoring signals from the monitor station and for operating the stations in accordance with the predetermined program and with the monitor signals.

5,479,684

# METHOD OF MANUFACTURING INK JET PRINTHEADS BY INDUCTION HEATING OF LOW MELTING POINT METAL ALLOYS

Richard D. Murphy, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

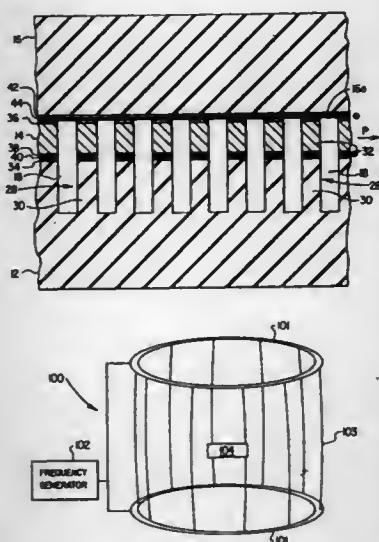
Continuation of Ser. No. 176,793, Dec. 30, 1993, abandoned.

This application Mar. 20, 1995, Ser. No. 407,260

Int. Cl.<sup>6</sup> H01L 41/22

U.S. Cl. 29—25.35

18 Claims



1. A method of manufacturing a piezoelectric assembly, comprising the steps of:

- providing an intermediate body portion having a substantially flat lower surface, said intermediate body portion being constructed of a piezoelectric material;
- providing a main body portion having a substantially flat upper surface;
- depositing a first conductive metal over said lower surface, said first conductive metal having a first melting point less than each of the respective Curie points of said intermediate and main body portions;
- joining said first conductive metal with said upper surface by placing said intermediate body portion over said main body portion;
- inducing a first current in said first conductive metal with a first electromagnetic field to thereby melt said first conductive metal without unduly heating said intermediate and main body portions; and

cooling said first conductive metal, said first conductive metal electrically and mechanically joining said intermediate body portion to said main body portion, thereby forming the piezo-electric assembly.

5,479,685

# METHOD OF PRODUCING INK JET PRINT HEAD

Akihiro Shimokata; Yasuhisa Fujii, and Hisayoshi Fujimoto, all of Kyoto, Japan, assignors to Rohm Co., Ltd., Japan

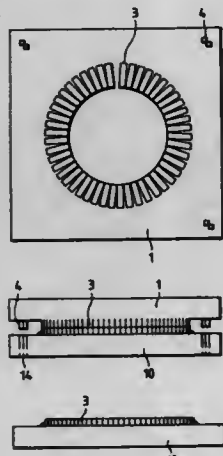
Filed Mar. 7, 1994, Ser. No. 206,759

Claims priority, application Japan, Mar. 16, 1993, 5-055261

Int. Cl.<sup>6</sup> H01L 41/22; B41J 2/045

U.S. Cl. 29—25.35

4 Claims



1. A method of producing an ink jet print head, comprising the steps of:
  - forming separate ink paths with a predetermined pattern on a head base;
  - fixing a vibration plate to a side of said head base having separate ink paths formed thereon;
  - temporarily fixing a piezoelectric element to a side of a dummy substrate;
  - patterning said piezoelectric element in accordance with said pattern of said separate ink paths of said head base to form separate piezoelectric elements;
  - sticking said piezoelectric elements temporarily fixed to the side of said dummy substrate to said vibration plate so that said separate piezoelectric elements respectively correspond to said separate ink paths of said head base; and
  - removing said dummy substrate from said vibration plate, whereby said separate piezoelectric elements remain on said vibration plate and are positioned relative to the ink paths to form an ink jet head without the need to stick the separate piezoelectric elements one by one on the vibration plate.

5,479,686

# PROCESS FOR PRODUCING A CASE FOR RECEIVING A WATCHWORK

Robert Wohlfahrt, Luzern, Switzerland, assignor to Crash Holding AG, Zug, Switzerland

Continuation-in-part of Ser. No. 946,363, Dec. 18, 1992, abandoned. This application Jan. 6, 1994, Ser. No. 177,929

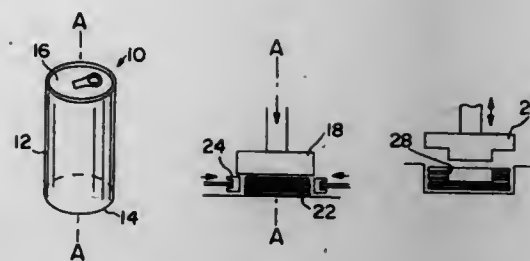
Claims priority, application Switzerland, Apr. 12, 1991, CH 1090/91-2

Int. Cl.<sup>6</sup> G04D 3/00

U.S. Cl. 29—179

16 Claims

1. A process for producing a casing for receiving a watch movement comprising:
  - providing a disposable empty metal container having a side wall about a longitudinal axis, a bottom and a cover;



compressing said container in at least one direction to produce a compressed multi-layer metal piece of predetermined dimension; and  
forming a cavity in said compressed multi-layer metal piece for receiving a watch movement.

5,479,687

# APPARATUS FOR JOINING SHEETS OF MATERIAL

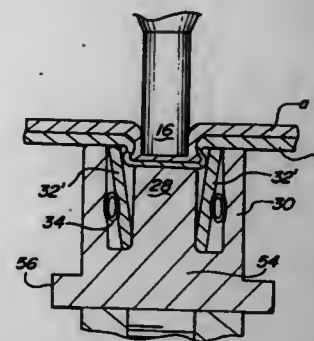
Edwin G. Sawdon, St. Clair, Mich., assignor to BTM Corporation, Marysville, Mich.

Filed Jan. 31, 1994, Ser. No. 189,580

Int. Cl.<sup>6</sup> B23P 11/00

U.S. Cl. 29—243.5

59 Claims



56. A die assembly employed within an apparatus for joining sheets of material, said die assembly comprising:

- means for abutting at least one of said sheets of material, said abutting means having a working surface and a peripheral surface;
- means for supporting at least one of said sheets of material, said supporting means having a shoulder surface, an inside surface and an outside surface, said inside surfaces being disposed against said peripheral surface of said abutting means prior to forming a joint;
- means for urging said supporting means toward said abutting means, said supporting means being expandably movable in a transverse direction away from said abutting means during forming of said joint; and
- means for protecting said supporting means and said urging means substantially surrounding said outside surfaces of said supporting means and said urging means, said urging means disposed within a single channel of said protecting means.

5,479,688

# PULLING TOOL

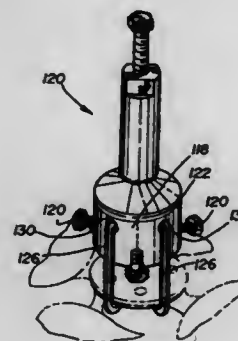
Michael Rubino, Chicago, and Michael Berg, Elgin, both of Ill., assignors to Sensible Products, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 61,362, May 12, 1993, Pat. No. 5,390,404, which is a continuation-in-part of Ser. No. 900,348, Jun. 18, 1992, Pat. No. 5,211,211, which is a continuation-in-part of Ser. No. 737,046, Jul. 29, 1991, Pat. No. 5,163,211. This application Mar. 29, 1994, Ser. No. 219,444

Int. Cl.<sup>6</sup> B23P 19/04

U.S. Cl. 29—259

4 Claims



1. In a pulling tool for pulling off a rotor of a motor or a fan from a shaft, said pulling tool comprising an elongated screw having a first end and a second end, a housing with which said screw is threadingly received, said housing comprising a first open end through which threadingly passes said screw, and a second open end through which protrudes said second end of said screw, said housing comprising a first securing means for releasably holding a rotor of a motor, and second securing means for releasably holding a fan, said first securing means comprising a plurality of rotatable bolts and a first plurality of holes formed in said housing for threadingly receiving said plurality of bolts, and said second securing means comprising a plurality of hooked securing means, each said hooked securing means having a first end and a second hooked end, and a second plurality of holes for removably mounting said hooked securing means, said second end of each said hooked securing means being capable of being hung so as to protrude beyond said second open end of said housing, wherein the improvement comprises:

said housing comprising at least a first section having a circular cross section; said second plurality of holes being formed in said circular cross-section section; said second plurality of holes being equally spaced about said section;  
said first plurality of holes and said second plurality of holes lying on the same plane so that the first and second plurality of holes are substantially coplanar and substantially the same distance from said second open end of said housing;  
each said hole of said first plurality of holes being sandwiched between at least two said holes of said second plurality of holes.

5,479,689

# WINDSHIELD EXPANSION TOOL AND METHOD FOR REMOVING VEHICLE WINDSHIELDS

David E. Schmit, Eden Prairie; Bobby W. Sanders, Jr., Rosemount, and James H. Lundquist, Bloomington, all of Minn., assignors to Harmon Glass Company, Minneapolis, Minn.

Filed May 24, 1994, Ser. No. 248,873

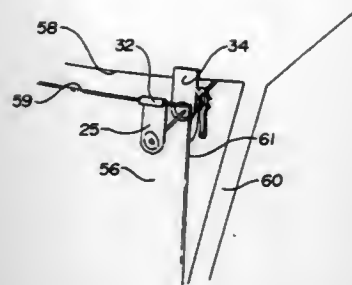
Int. Cl.<sup>6</sup> B23P 19/02

U.S. Cl. 29—426.4

19 Claims

16. A method of removing a vehicle windshield from a vehicle, said windshield having top, bottom and side edges, said vehicle having corresponding top, bottom and side vehicle frame members, and said windshield further having seals along said top, bottom and





side edges for connecting the windshield to the top, bottom and side vehicle frame members, respectively, said method comprising the steps of:

- providing a windshield expansion tool having a pair of selectively expandable jaws;
- cutting the seals along said top edge and said side edges;
- separating the top and side edges from the top and side frame members in a direction substantially perpendicular to the windshield to be replaced and inserting said pair of jaws between one of said top and side edges and its corresponding frame member;
- expanding said jaws; and
- cutting the seal along said bottom edge while said jaws are expanded.

5,479,690

#### TUBE MAKING MECHANISM HAVING A FILL TUBE FOR DEPOSITING A CERAMIC POWDER INTO THE TUBE AS IT IS BEING MADE

Bertie F. Hall, Jr., Ann Arbor, Mich., assignor to Hoskins Manufacturing Company, Detroit, Mich.

Filed Dec. 1, 1993, Ser. No. 160,951

Int. Cl.<sup>6</sup> H01B 13/26

U.S. Cl. 29—33 R

21 Claims

1. A tube making mechanism comprising:
  - a substantially vertical frame;
  - a plurality of forming rolls attached to said frame for forming a flat metal strip into a semi-cylindrical form in which the longitudinal edges of said metal are separated from each other;
  - a set of seam closing rolls attached to said frame downstream of said forming rolls to close said longitudinal edges of said metal strip to each other;
  - a seam welder attached to said frame adjacent to said closing rolls for welding said adjacent longitudinal edges of said metal strip to each other to make a seam welded tube;
  - a fill tube attached to said frame for depositing a ceramic powder received from an external source into said seam welded tube, said fill tube having a mounting bracket attached to said frame upstream of said seam welder, a guide tube attached to said mounting bracket, said guide tube extending into said seam welded tube downstream of said seam welder a distance selected to prevent contamination of a weld made by said seam welder by airborne ceramic powder deposited in seam-welded tube by said fill tube, said mounting bracket having a powder fill channel directing said ceramic powder received from said external source into said guide tube; and
  - a seam guide attached to said frame for aligning said longitudinal edges of said metal strip with said seam welder upstream of said closing rolls, said seam guide extending into said metal strip in said cylindrical form a distance sufficient to displace said fill tube in the vicinity of said seam welder away from said seam welder to inhibit damage to said fill tube by the welding of said longitudinal edges of said metal strip to each other.

#### 5,479,691 METHOD AND APPARATUS FOR MANUFACTURING PHOTOGRAPHIC FILM AND PHOTOGRAPHIC FILM CASSETTE

Makoto Shimizu; Toshiro Esaki; Tadayoshi Shibata, and Koichi Takahashi, all of Kanagawa, Japan, assignors to Fujifilm Photo Film Co., Ltd., Kanagawa, Japan

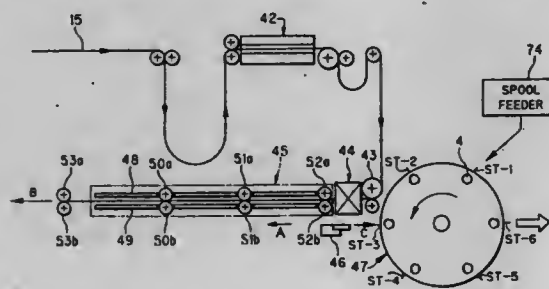
Filed Aug. 3, 1993, Ser. No. 100,966

Claims priority, application Japan, Aug. 3, 1992, 4-206653; Jan. 12, 1992, 4-272987; Dec. 7, 1992, 4-326982

Int. Cl.<sup>6</sup> B65B 25/14

U.S. Cl. 29—430

3 Claims



1. A method of manufacturing a photographic film cassette having a cassette shell, a spool rotatably mounted in said cassette shell, and a photographic filmstrip wound about said spool, a trailing end of said photographic filmstrip being secured to said spool, said method comprising the steps of:
  - transporting a long strip of photographic film longitudinally in a first direction along a film transport path;
  - cutting said long strip of photographic film into an individual photographic filmstrip having a first length while stopping said transporting for a period of time when said long strip of photographic film has been transported by a predetermined length in said first direction;
  - holding a portion of said strip of photographic film which corresponds to said trailing end of said individual photographic filmstrip one of immediately before and after said cutting step;
  - moving said photographic filmstrip, during said holding step, by a given distance in a second direction, which is reverse to said first direction, through a distance which is less than said first length, and then securing said trailing end to said spool; and
  - rotating said spool thereby winding said photographic filmstrip around said spool.

5,479,692

#### METHODS FOR MOUNTING AN AUTOMOBILE WHEEL ON A HUB ASSEMBLY AND LIFTING AN AUTOMOBILE WHEEL INTO AN AUTOMOBILE BODY

Phillip Barkus, 407 Cartwright Blvd., Massapequa Park, N.Y. 11762

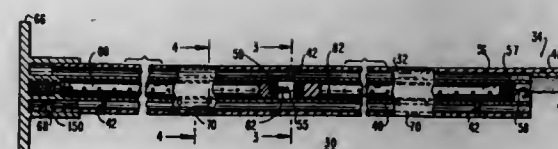
Filed Oct. 28, 1993, Ser. No. 144,656

Int. Cl.<sup>6</sup> B23P 19/04

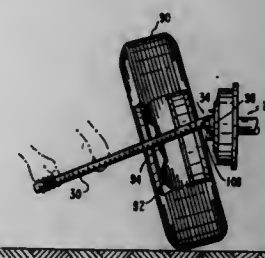
U.S. Cl. 29—468

15 Claims

1. A method for lifting an automobile wheel into a body of an automobile, comprising the steps of:
  - providing an elongated member having first and second longitudinal extremities, a handle member slidable received in the elongated member and a pivot means for pivotally engaging the body of the automobile;
  - releasably engaging the elongated member with the automobile wheel;
  - engaging the pivot means with the body of the automobile;
  - slidably extending the handle member outwardly from the elongated member beyond the second longitudinal extremity thereof; and
  - lifting the elongated member by applying a lifting force to the extended handle member while pivotally supporting the first extremity of the elongated member with the pivot means on



securely attaching said lower portion of said upper frame to said upper portion of said lower frame.



the body of the automobile such that the automobile wheel releasably engaged with the elongated member is lifted into the body of the automobile.

5,479,693

#### AUTOMOTIVE INSTRUMENT PANEL INSTALLATION ARRANGEMENT AND METHOD FOR MOUNTING

Hiroshi Oyama, Chigasaki, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

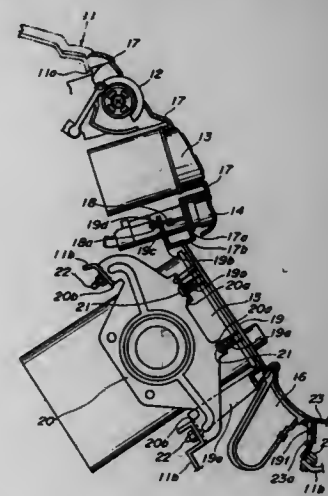
Filed Dec. 3, 1993, Ser. No. 160,755

Claims priority, application Japan, Dec. 21, 1992, 4-340577

Int. Cl.<sup>6</sup> B23P 19/04; G12B 9/10

U.S. Cl. 29—469

14 Claims



9. A method of mounting a plurality of vertically stacked instruments in an instrument panel of a vehicle, comprising the steps of:
  - mounting a first group of instruments via an upper frame to form an upper instrument assembly wherein control portions of said first group of instruments are accessible from a front face of said upper instrument assembly;
  - mounting a second group of instruments via a bracket and a lower frame to form a lower instrument assembly wherein control portions of said second group of instruments are accessible from a front face of said lower instrument assembly;
  - inserting said lower instrument assembly into a lower side of an installation opening provided in said instrument panel;
  - attaching installation portions of said bracket and said lower frame to mounting portions on an inner side of said instrument panel;
  - inserting said upper instrument assembly into an upper side of said installation opening such that a lower portion of said upper frame overlaps an upper portion of said lower frame; and

5,479,694

#### METHOD FOR MOUNTING INTEGRATED CIRCUITS ONTO PRINTED CIRCUIT BOARDS AND TESTING

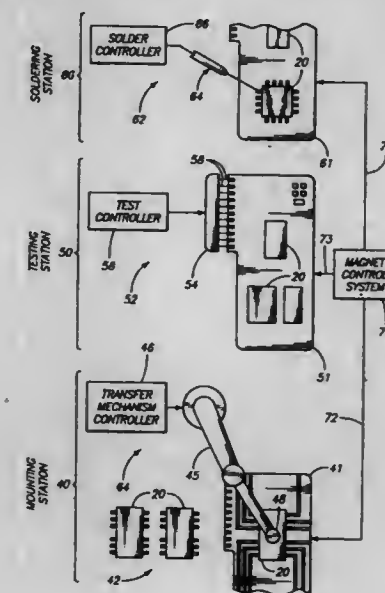
Donald D. Baldwin, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Apr. 13, 1993, Ser. No. 48,129

Int. Cl.<sup>6</sup> H05K 3/34; B23K 31/02; B23P 19/00; G01R 31/00

U.S. Cl. 29—593

9 Claims



1. A method for mounting an integrated circuit (IC) device onto a printed circuit board (PCB), the PCB having a plurality of bonding sites provided thereon, the IC device having a plurality of conductive bonding portions for electrically contacting corresponding bonding sites when the IC device is mounted to the PCB, the method comprising the following steps:
  - providing a PCB having an upper surface;
  - providing magnetic material within the IC device;
  - inducing a magnetic field of a selected strength at the surface of the PCB to hold the IC device onto the PCB in such a manner that the conductive portions of the IC device are in alignment with the corresponding bonding sites;
  - testing the PCB and IC device while the IC device is being held onto the PCB by the magnetic field; and
  - after said testing, soldering the conductive bonding portions to the corresponding bonding sites of the PCB while the IC device is held onto the PCB by the magnetic field.

5,479,695

#### METHOD OF MAKING A MULTILAYER MONOLITHIC MAGNETIC COMPONENT

Gideon S. Grader, Haifa, Israel; David W. Johnson, Jr., Pluckemin, N.J.; Apurba Roy, Rockwall, Tex., and John Thomson, Jr., Spring Lake, N.J., assignors to AT&T Corp., Murray Hill, N.J.

Division of Ser. No. 695,653, May 2, 1991, Pat. No. 5,349,743.

This application Jul. 1, 1994, Ser. No. 270,197

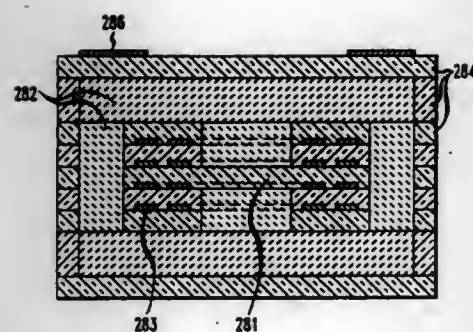
Int. Cl.<sup>6</sup> H01F 41/02

U.S. Cl. 29—602.1

33 Claims

1. A method for constructing a solid composite magnetic component comprising the steps of:
  - preparing a magnetic material in a ceramic material format having a first sintering rate and a first sintering temperature;





preparing an insulating non-magnetic material in a ceramic material format, with a sintering rate and sintering temperature substantially identical to the first sintering rate and first sintering temperature;  
preparing apertures in the insulating non-magnetic material for accepting the magnetic material;  
depositing conductors within the insulating non-magnetic material which are connected to form at least a winding to provide electromagnetic excitation of the magnetic material;  
forming a composite structure of the magnetic material and the insulating non-magnetic material by adding the magnetic material to the apertures to form a structure with well defined magnetic and insulating non-magnetic regions; and  
co-firing the structure to form a solid composite structure.

5,479,696

# METHOD OF MAKING COMBINATION READ/WRITE MAGNETIC HEAD

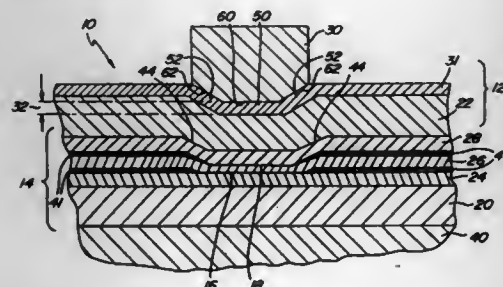
Michael McNeil, Santa Ynez, Calif., assignor to Applied Magnetics Corporation, Goleta, Calif.

Division of Ser. No. 736,449, Jul. 25, 1991, Pat. No. 5,315,469. This application Feb. 15, 1994, Ser. No. 196,646

Int. Cl.<sup>6</sup> G11B 5/42

U.S. Cl. 29—603

16 Claims



1. A method of making a combination read/write magnetic head for writing data in a desired orientation, comprising the steps of:  
forming a first MR shield layer;  
forming a first insulating layer over said MR shield layer;  
forming a first stripe of magnetoresistive material over said first insulating layer;  
forming a first set of conductor leads over said MR stripe layer wherein at the completion of said steps of forming of said first set of conductor leads and forming of said first stripe, said first stripe is electrically coupled between said first set of conductor leads, said first set of conductor leads and said first stripe of magnetoresistive material cooperating to form a section perpendicular to said desired orientation between a pair of sections non-parallel to said section perpendicular to said desired orientation;  
covering said first stripe and said first set of conductor leads with a second insulating layer, said second insulating layer defining a portion perpendicular to said desired orientation

between a pair of portions non-parallel to said portion of said second insulating layer perpendicular to said desired orientation;

forming a second MR shield layer over said first layer of insulation, said second MR shield layer forming a leading write pole, said second MR shield layer cooperating with said second insulating layer to form a portion perpendicular to said desired orientation between a pair of portions non-parallel to said portion of said second MR shield layer perpendicular to said desired orientation;

forming a recording gap layer over said second MR shield layer; and

forming a trailing write pole over said gap layer, so that said trailing write pole defines a portion perpendicular to said desired orientation and extension portions non-parallel to said portion perpendicular to said desired orientation, wherein said first set of leads are formed so as to have a thickness greater than that of said first stripe.

5,479,697

# METHOD FOR MANUFACTURING MAGNETIC PICKUP SENSOR

Ichiro Togo, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

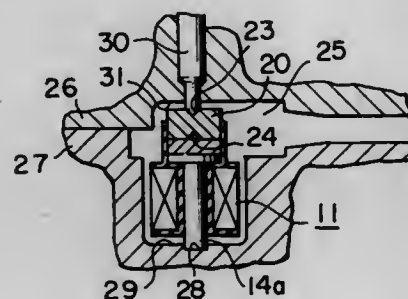
Division of Ser. No. 700, Jan. 5, 1993, Pat. No. 5,418,454. This application Apr. 12, 1994, Ser. No. 229,438

Claims priority, application Japan, Jan. 8, 1992, 4-001493

Int. Cl.<sup>6</sup> H01F 41/02

U.S. Cl. 29—606

5 Claims



1. A method for manufacturing a magnetic pickup sensor, comprising the steps of:

a) preparing a support unit (16) having a positioning recess (23) adapted to be engaged for positioning the support unit within a mold;

b) assembling a magnet (13) for generating a magnetic flux, an iron core (14) and a pickup coil (15) into association with said support unit to provide a sensor assembly (11) for detecting a change in magnetic flux generated from said magnet and passing through said iron core;

c) placing said sensor assembly within a mold cavity (25) defined by a mold die (26, 27), with one, outwardly projecting end (14a) of said iron core of said sensor assembly fitted within a recess (28) formed in a wall (29) of said mold cavity, and with said positioning recess of said support unit being engaged by the mold die for accurately positioning and holding said sensor assembly in place during molding of mold resin; and

d) filling said mold cavity around said sensor assembly with a mold resin to form a mold resin housing therefor.

5,479,698

# GEOMETRY STATION

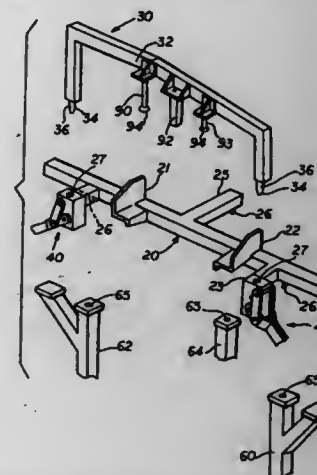
Jeffrey R. Angel, Oxford, Mich., assignor to Progressive Tool & Industries Co., Southfield, Mich.

Continuation of Ser. No. 149,988, Nov. 10, 1993, abandoned, which is a division of Ser. No. 811,180, Dec. 19, 1991, Pat. No. 5,265,317. This application Nov. 29, 1994, Ser. No. 346,364

Int. Cl.<sup>6</sup> B25B 1/20; B23P 11/00

U.S. Cl. 29—701

6 Claims



1. An apparatus for accurately establishing a net location between at least two objects mounted in a unitary frame structure for thereafter performing work on said at least two objects, said apparatus comprising:

a base having support means integral therewith;

a first frame structure releasably mounted to said support means; means for accurately locating said at least two objects on said first frame structure wherein a net location is established between said at least two objects by said locating means;

a second frame structure positioned with respect to said first frame structure, said second frame structure comprising means for retaining said at least two objects at said established net location;

means for positioning said second frame structure with respect to said first frame structure; and

means for interengaging said second frame structure to said first frame structure to establish said unitary frame structure, said interengaging means being mounted to said first and second frame structures whereby said unitary frame structure is removed from said support means of said base and transported by said positioning means to at least one work performing station located within a defined region surrounding said positioning means.

5,479,699

# APPARATUS FOR EXPANDING TUBULAR MEMBERS

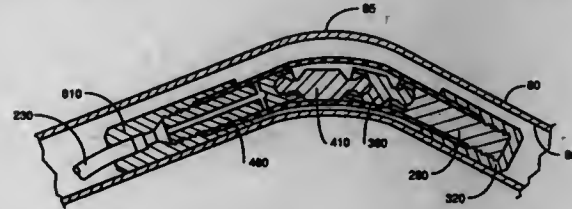
David A. Snyder, North Huntingdon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 7, 1994, Ser. No. 192,536

Int. Cl.<sup>6</sup> B23P 15/00

U.S. Cl. 29—727

10 Claims



1. In a nuclear heat exchanger having a tubular member disposed therein, the tubular member having an inner diameter and

having a curved U-bend portion, an apparatus for radially expanding the tubular member, comprising:

(a) an elongate segmented mandrel insertable into the tubular member, said mandrel having an exterior surface thereon and a flow channel therethrough terminating in a port on the exterior surface, said mandrel including a plurality of adjacent segments capable of traversing the curved U-bend portion of the tubular member, adjacent ones of said segments interconnected by a ball-and-socket joint therebetween, so that the adjacent ones of said segments swivel about respective ones of the ball-and-socket joints in order that said mandrel flexes as said segments traverse the curved U-bend portion of the tubular member;

(b) a resilient bladder surrounding the exterior surface of said mandrel and covering the port, said bladder capable of radially expanding into intimate engagement with the inner diameter of the tubular member for radially expanding the tubular member, said bladder including a plurality of spaced-apart ribs extending circumferentially therearound in order that said bladder flexes as said bladder traverses the curved U-bend portion of the tubular member;

(c) a pressurizer in fluid communication with the channel for supplying a pressurized fluid to the channel, through the port and to said bladder to pressurize said bladder for radially expanding said bladder into intimate engagement with the inner diameter of the tubular member, so that the tubular member is radially expanded thereby; and

(d) a controller connected to said pressurizer for controlling said pressurizer, so that said pressurizer controllably pressurizes the fluid to controllably expand said bladder.

5,479,700

# DESIGN AND MANUFACTURING METHOD FOR A SOLID ELECTROLYTE ION CONDUCTING DEVICE

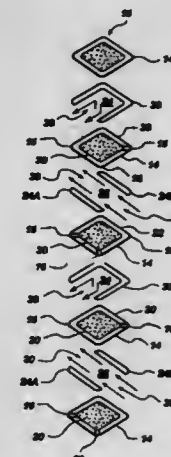
Jesse A. Nachlas, Eden; Kelly B. Povers, North Salt Lake, both of Utah, and James R. McKinnin, Afton, Wyo., assignors to Ceramtec, Inc., Salt Lake City, Utah

Division of Ser. No. 843,004, Feb. 28, 1992, Pat. No. 5,298,138. This application Mar. 29, 1994, Ser. No. 219,205

Int. Cl.<sup>6</sup> H01R 43/00

U.S. Cl. 29—825

6 Claims



1. A method of assembling and electrically connecting a plurality of solid oxide electrolyte plates into a monolithic electrochemical ion conducting device comprising the steps:

applying a layer of electrode material to a substantial portion of at least one surface of said electrolyte plates;

heating said electrode layered electrolyte plates to a temperature sufficient to bond said electrode material to said electrolyte plates;

applying an electrical interconnect material to said electrolyte plates to form an electrical pathway between said electrode materials and the exterior of said device;



applying a layer of sealing material to at least a portion of said electrolyte plates;  
stacking a plurality of said electrolyte plates in a pattern whereby each plate is separated from successive plates by a solid oxide spacer;  
thermally treating a stack of said electrolyte plates and said spacers at a temperature sufficient to activate said sealing material to seal said spacers and said electrolyte plates into a monolithic unit;  
electrically connecting in series every other said electrolyte plate in said stack by connecting said electrical interconnects of every other plate from one end of said stack to the other in a first electrical path, extending the electrical pathway around the end of said stack, and connecting said electrical interconnects of every other said plate not connected in a second electrical pathway, said first and second electrical pathways and electrodes connected thereto forming a complete electrical circuit.

5,479,701

#### COVER STRIP-OFF METHOD IN A COVERED WIRE CUTTING AND STRIPPING APPARATUS

Yoshiaki Yamano; Masayoshi Hashimoto, both of Yokkaichi, and Hiroji Kadera, Gifu, all of Japan, assignors to Sumitomo Wiring Systems, Ltd., Mie, Japan

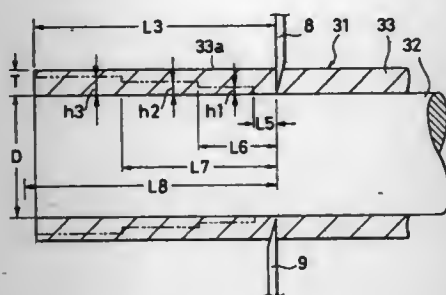
Filed May 20, 1994, Ser. No. 246,629

Claims priority, application Japan, May 25, 1993, 5-122891

Int. Cl.<sup>6</sup> H02G 1/12

U.S. Cl. 29—825

11 Claims



1. A cover strip-off method for a covered wire cutting and stripping apparatus in which a cover at an end portion of a covered wire is stripped and the covered wire is cut to a predetermined length, the method comprising the steps of:

- incising the cover at the end portion of said covered wire by means of a plurality of cutting blades disposed opposite to each other by an incision amount;
- moving said covered wire and said cutting blades relative to each other in a longitudinal direction of said covered wire during said incising, thereby stripping off the cover at the end portion of said covered wire from said core; and
- reducing the amount of incision in said covered wire of said cutting blades while maintaining portions of said cutting blades in contact with said cover during said moving step.

5,479,702

Patent Not Issued For This Number

#### 5,479,703 METHOD OF MAKING A PRINTED CIRCUIT BOARD OR CARD

Kishor V. Desai, Vestal; Harold Kohn, Endwell; Richard C. Senger, and Donald P. Seraphim, both of Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

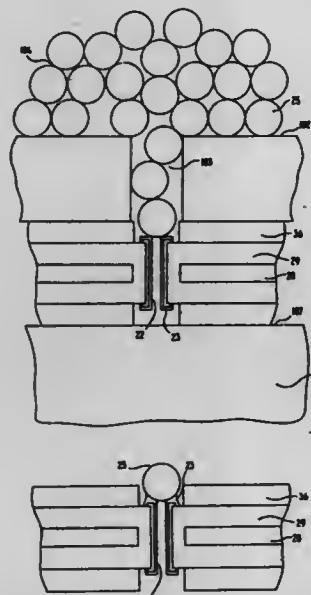
Division of Ser. No. 995,714, Dec. 23, 1992. This application

Sep. 21, 1994, Ser. No. 309,777

Int. Cl.<sup>6</sup> H05K 3/42; 3/34; 3/46

U.S. Cl. 29—852

1 Claim



1. A method of making a printed circuit board or card, comprising the steps of:

- forming a circuitized power core by depositing an electrically insulating material on a top side and a bottom side of a planar electrically conductive layer material;
- forming a plurality of holes through said circuitized power core from said top to said bottom;
- plating electrically conductive material on the surface of the through holes and on the top and bottom surfaces of the electrically insulating layer of the circuitized power core adjacent each through hole, said material on the inside of said holes being continuous with the material on the top and bottom of the circuitized power core;
- placing within a ball dispenser assembly a plurality of substantially spherical balls having a diameter slightly larger than the diameter of said plated through holes in said circuitized power core and being made of electrically conductive material, said balls being arranged in a pattern matching the pattern of through holes formed in said circuitized power core;
- placing said circuitized power core over said planar surface on said ball dispenser assembly, aligning said plated through holes with holes in an exterior surface of said ball dispenser assembly, wherein said holes in said ball dispenser are slightly larger than said balls, and aligning location pins provided in said dispenser with location holes in said power core;
- placing a fixture base plate over said power core and securing said base plate to said ball dispenser;
- introducing pressurized gas into said ball dispenser causing said exterior surface to press against said power core and said power core to press against said base plate;
- inverting said ball dispenser, power core and base plate;
- vibrating the ball dispenser, power core and base plate, causing said balls to pass through said passages in said exterior surface and become wedged at the opening of said plated through holes;
- turning off said source of pressurized gas;

- heating the ball dispenser, power core and base plate to a temperature which melts only the material plated on the through holes;
- reverting the ball dispenser, power core, and base plate; and
- removing said base plate and said power core from said ball dispenser.

5,479,704

#### PROCESS FOR REPAIRING DAMAGED BLADES OF TURBOENGINES

Karl-Hermann Richter, Indersdorf; Reinhold Meler, Dorfens-Stadt; Thilo Schmitt, Munich, and Bernd Stimpfer, Dachau, all of Germany, assignors to MTU Motoren-und Turbinen Union München GmbH, Munich, Germany

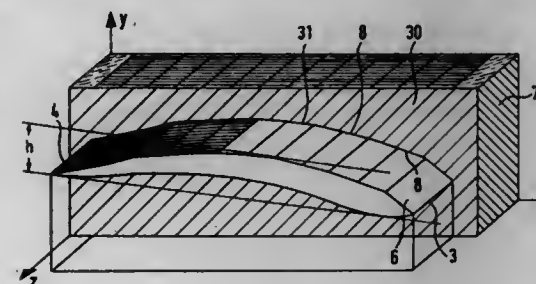
Filed Aug. 5, 1994, Ser. No. 286,695

Claims priority, application Germany, Aug. 13, 1993, 43 27 189.8

Int. Cl.<sup>6</sup> B23P 15/00

U.S. Cl. 29—889.1

20 Claims



1. A process for repairing a damaged blade of a turboengine comprising:

- separating a damaged portion of a blade of a turboengine from the remainder of the blade to leave a stump of sound material having an exposed surface at which the damaged portion has been removed,
- abutting against said exposed surface of the blade stump, a repair plate of substantially constant thickness which exceeds by at least 50% a maximum profile height of the blade at said exposed surface, said repair plate being formed with a surface which abuts against said exposed surface of the blade stump along the length of the exposed surface
- butt welding said repair plate and said blade stump at the abutting surfaces thereof to join said repair plate of said blade stump by a welded joint, and
- machining the repair plate and the welded joint to form an outer surface which is smoothly continuous with an outer surface of the blade stump.

5,479,705

METHOD OF MANUFACTURING AN ARTICLE BY SUPERPLASTIC FORMING AND DIFFUSION BONDING  
John O. Fowler, and Brian Richardson, both of Lancashire, England, assignors to Rolls-Royce plc, London, England  
Continuation-in-part of Ser. No. 45,097, Apr. 12, 1993, Pat. No. 5,363,555. This application Jun. 7, 1994, Ser. No. 255,764  
Claims priority, application United Kingdom, May 1, 1992, 9209464

The portion of the term of this patent subsequent to Jun. 28, 2011, has been disclaimed.

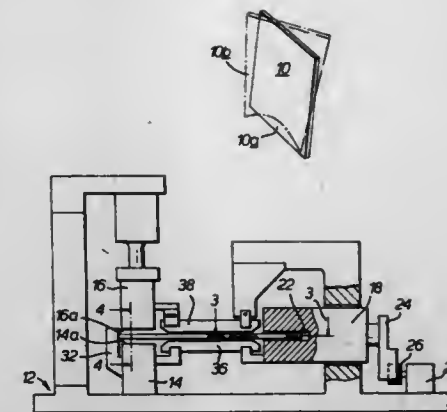
Int. Cl.<sup>6</sup> B23P 15/04

U.S. Cl. 29—889.72

28 Claims

1. A method of manufacturing an article by superplastic forming and diffusion bonding at least two metal workpieces comprising the steps of

- applying a stop off material to prevent diffusion bonding to preselected areas of at least one of the surfaces of at least one of the at least two metal workpieces,



- assembling the at least two workpieces into a stack relative to each other so that the surfaces are in mating abutment,
- applying heat and pressure across the thickness of the at least two workpieces to diffusion bond the at least two workpieces together in areas other than the preselected areas to form an integral structure,
- heating the integral structure and applying loads to opposite ends of the integral structure to twist one end relative to the other end to contour the integral structure to a predetermined shape,
- heating the twisted integral structure to a temperature at which the metal is plastic and internally pressurising the twisted integral structure to break the adhesive bond between the stop off material and the at least one workpiece in the preselected areas,
- heating the twisted integral structure and internally pressurising it to cause the preselected areas of at least one of the workpieces to be superplastically formed to produce an article of predetermined shape.

5,479,706

#### METHOD FOR MANUFACTURING SILENCER AND APPARATUS FOR MANUFACTURING SAME

Akihiko Tamano, Ageo, and Tsukasa Ikeda, Ohmiya, both of Japan, assignors to Sanki Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

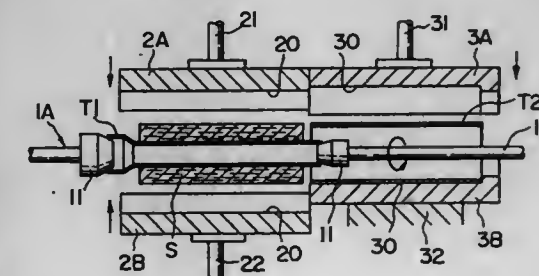
Division of Ser. No. 228,035, Apr. 15, 1994. This application Nov. 23, 1994, Ser. No. 344,468

Claims priority, application Japan, Apr. 19, 1993, 5-115446

Int. Cl.<sup>6</sup> B23P 15/00

U.S. Cl. 29—890.08

2 Claims



1. A method for manufacturing a silencer with sound-absorbing material being filled in a space between a multi-perforated inner tube and an outer tube, which comprises steps of:

- winding on and around outer peripheral surface of said multi-perforated inner tube a long web of mat-shaped sound-absorbing material in multiple layers and to a predetermined thickness;
- then, gradually bringing a pair of levelling members, each having a semi-arcuate concavity which is substantially equal to the inner diameter of the outer tube, into contact with the



outer peripheral surface of the sound-absorbing material, while rotating the inner tube with the sound-absorbing material, in the winding direction, to thereby substantially level the outer diameter of the sound-absorbing material to the inner diameter of the outer tube; and

c) inserting the inner tube into the outer tube, while continuously rotating the inner tube.

5,479,707

# METHOD OF MAKING AN INTEGRALLY FORMED, MODULAR ICE CUBER HAVING A STAINLESS STEEL EVAPORATOR AND A MICROCONTROLLER

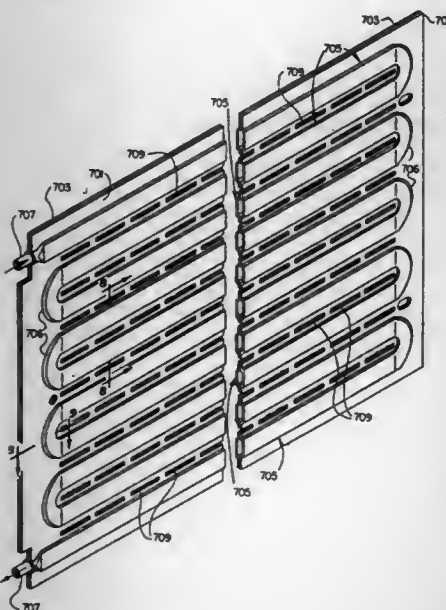
Robert J. Alvarez, Denver; Scott E. Bredesen, Englewood; James J. Wilson, Westminster; Duane D. Flim, Aurora, all of Colo.; Todd E. Kniffen, Williamsburg, Iowa, and Clinton O. Schahrer, Longmont, Colo., assignors to Mile High Equipment Company, Denver, Colo.

Division of Ser. No. 993,386, Dec. 18, 1992, Pat. No. 5,291,752, which is a division of Ser. No. 701,440, May 13, 1991, Pat. No. 5,182,925. This application Mar. 7, 1994, Ser. No. 207,310

Int. Cl.<sup>6</sup> B23P 15/00

U.S. Cl. 29—890.039

20 Claims



1. A method for manufacturing an evaporator on which to freeze water into ice comprising the steps of:

forming a depression in a first plate, the depression having a serpentine pattern with parallel sections traversing the first plate and bend sections connecting the parallel sections to form a continuous depression;

mating the first metal plate to a second plate, the depression extending outwardly away from the second plate, thereby forming a continuous serpentine refrigerant channel between the first and the second plate;

forming an array of freezing sites on outside surfaces of the parallel sections on which to freeze water flowing across sites including the step of placing dividing means on the outside surface of the first plate in a direction perpendicular to the parallel sections of the depression for separating adjacent freezing sites.

5,479,708

# UTENSIL HOLDER FOR INFANTS

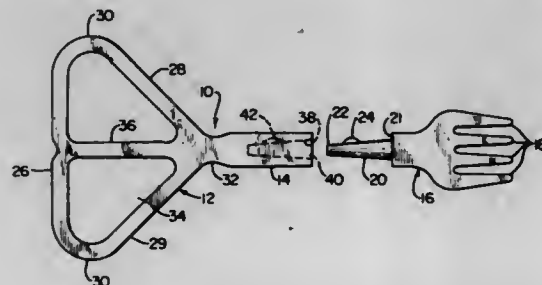
Martha M. Thomas, 8316 E. Jamison Cir., Englewood, Colo. 80112

Continuation-in-part of Ser. No. 421,984, Oct. 16, 1989, abandoned, and a continuation of Ser. No. 690,547, Apr. 23, 1991, Pat. No. 5,138,737, and a continuation-in-part of Ser. No. 931,838, Aug. 18, 1992, Pat. No. 5,251,843. This application Mar. 24, 1994, Ser. No. 217,237

Int. Cl.<sup>6</sup> A47J 43/28

U.S. Cl. 30—122

16 Claims



1. A utensil holder for use by infants and toddlers comprising: an elongated, generally triangular handle having a plurality of sides, said handle including a hollow gripping area for insertion of the fingers of the infant's hand, a utensil-supporting portion disposed at one side of said handle intermediately between opposite ends of said handle, and said handle having converging portions extending from said opposite ends into said utensil-supporting portion, wherein said gripping area is of generally triangular shape, said handle having a bar member substantially bisecting said gripping area defining intermediate gripping means to alleviate pressure on small muscle groups of the hand while effecting a secure grip with said handle; and

a utensil attached to said utensil-supporting portion, said handle being longer in a direction transverse to a direction of entry of said utensil-supporting portion into the infant's mouth than in a direction parallel to said direction of entry and being longer in said transverse direction than the longest dimension across the infant's mouth to prevent lodging of said handle in the infant's mouth.

5,479,709

# DUST REMOVING DEVICE FOR PORTABLE POWER SAW

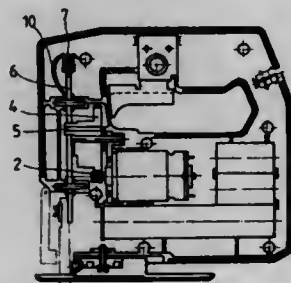
Motor Lai, P.O. Box 82-144, Taipei, Taiwan, Prov. of China

Filed Oct. 25, 1994, Ser. No. 329,096

Int. Cl.<sup>6</sup> B23D 49/16

U.S. Cl. 30—123.3

2 Claims



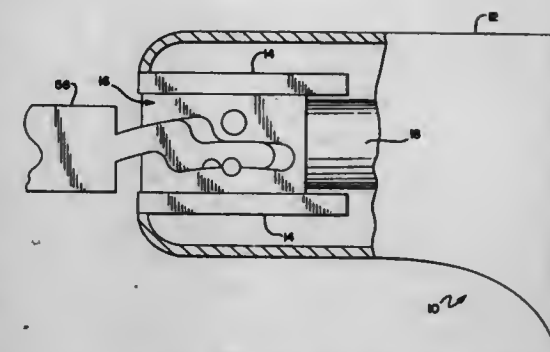
1. A dust removing device for a power saw comprising: a motor having a spindle; a pinion mounted on said spindle of said motor; a gear meshed with said pinion and provided with an eccentric rod thereon;

a yoke connected with said eccentric rod of said gear so that said yoke will reciprocate backwards and forwards when said gear rotates, said yoke having a lower end connected with a saw blade;

said yoke being an elongated member with a slot for receiving said eccentric rod of said gear so that when said eccentric rod rotates about said axle of said gear, said yoke will reciprocate backwards and forwards, said elongated member having a lower end and an upper end, each said end of said elongated member having a guide slot for receiving respective pins rigidly fixed in a housing of said power saw for guiding the reciprocating direction of said yoke, said upper end of said elongated member bearing against a first end of said air chamber;

a compressible air chamber connected at one end with an upper end of said yoke;

a pipe having a first end connected with an outlet of said air chamber and a second end disposed behind said saw blade; whereby when said motor is turned on, said spindle will drive said pinion which in turn will drive said gear thereby causing said eccentric rod to rotate about an axle of said gear and therefore, pulling said yoke to move backwards and forwards to compress said air chamber to exhaust air to remove saw dust accumulated in front of said saw blade.



(d) a blade clamp for mounting a saw blade in a cutting plane, said blade clamp having an arcuate cam follower in engagement with said arcuate cam surface, the blade clamp being mounted by the drive member for limited relative movement with respect thereto;

(e) the arcuate cam surface and the arcuate cam follower being defined by respective radii contained in a plane parallel with the cutting plane;

(f) whereby upon reciprocation of said drive member and upon engagement with a work piece by a blade mounted by said blade clamp an orbital movement will be imparted to the blade.

5,479,710

# NUT SPLITTERS

Peter R. Aston, Walsall, England, assignor to Hydra-Tight Limited, England

PCT No. PCT/GB92/01066, § 371 Date Nov. 30, 1993, § 102(c) Date Nov. 30, 1993, PCT Pub. No. WO93/00193, PCT Pub. Date Jan. 7, 1993

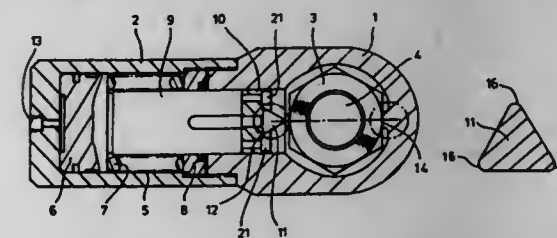
PCT Filed Jun. 15, 1992, Ser. No. 157,016

Claims priority, application United Kingdom, Jun. 28, 1991, 9113991

Int. Cl.<sup>6</sup> B26B 17/00

U.S. Cl. 30—182

8 Claims



1. A nut splitter comprising a nut-encircling frame, a blade supported by, and displaceable relative to, said frame together with means for effecting said relative movement in a direction to split a nut within said frame, wherein the cutting edge of said blade is formed with a blunt convexly, rounded cross-section at said edge.

5,479,711

# ORBITAL AND ADJUSTABLE CANT MECHANISM FOR RECIPROCATING SAWS

Mary H. Hathcock, New Bern, N.C., assignor to S-B Power Tool Company, Chicago, Ill.

Filed Apr. 6, 1995, Ser. No. 417,931

Int. Cl.<sup>6</sup> B23D 49/16

U.S. Cl. 30—393

8 Claims

1. A reciprocating saw mechanism comprising:

(a) a housing having guide means defining a rectilinear guideway;

(b) a drive member mounted by said guideway for reciprocating movement, said drive member having an arcuate cam surface;

(c) powered means mounted in the housing and connected to said drive member for reciprocating the same;

5,479,712

# TRIANGULATION RANGEFINDER FOR ARCHERS

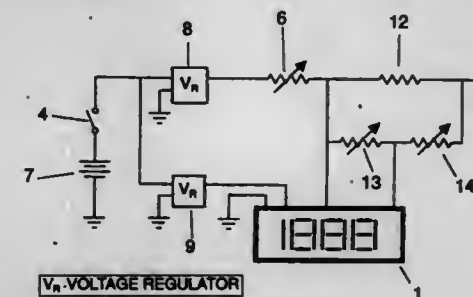
Jeffrey B. Hargrove, 3001 E. Miller Rd., Bancroft, Mich. 48414; William G. Wickham, 4880 W. Britton Rd., Perry, Mich. 48872, and John E. Briggs, 202 Howard St., Morrice, Mich. 48857

Filed Jun. 17, 1994, Ser. No. 261,936

Int. Cl.<sup>6</sup> F41B 5/14

U.S. Cl. 33—265

5 Claims



1. A bow mountable rangefinding apparatus for use from an elevated position, said apparatus comprising:

an analog sensor to attenuate a voltage signal in proportion to the tangent of the angle made by tilting the bow about a horizontal axis,

said angle being formed between a vertical axis and the line of sight made between the bow and a target when said bow is tilted about said horizontal axis;

a means for pivotably mounting said sensor on said horizontal axis;

a means for adjusting said voltage signal to a level proportional to elevation; a means for supplying said voltage signal to said sensor; a means for attenuating the said voltage signal by the tangent of said angle to emulate the principle of triangulation for range determination;

a means to measure and numerically display the attenuated voltage signal as a number representing target range;

a means for attaching said measurement and display device to the output voltage signal of said sensor;

a means of powering all circuits of the device by a battery;

a switching means for selectively energizing said circuits;



a means wherein said sensor, voltage signal adjustment circuitry, measurement and display device, battery and switch are secured in a housing; and  
a means for securing said housing to the bow.

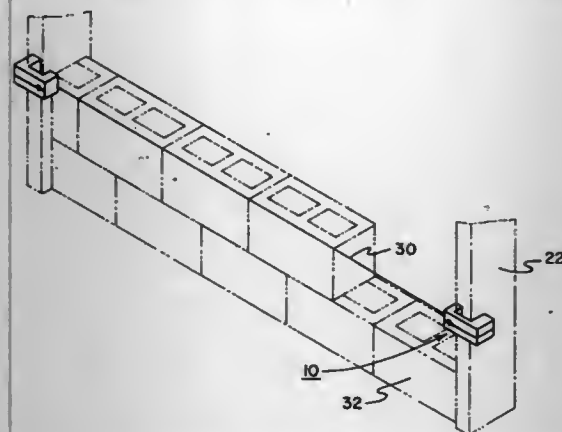
5,479,713

# LINE BLOCK MASONRY ALIGNMENT SYSTEM FOR USE IN CONJUNCTION WITH DOOR BUCKS AND A PLUMB LINE

Robert W. Wood, P.O. Box 48, Main St., Fayette, N.Y. 13065  
Filed Nov. 28, 1994, Ser. No. 345,604  
Int. Cl.<sup>6</sup> G01C 15/10

U.S. Cl. 33—407

5 Claims



1. A line block masonry alignment system comprising, in combination:

at least two rigid plastic and generally U-shaped line blocks having squared-off corners, each line block formed of a short leg, a long leg, and a cross-leg therebetween and with the line block defining a holding space for receiving a door buck, each leg having a central axis and a generally rectangular cross-section, the long leg having a length of at least 60% greater than that of the short leg, the cross leg having a length equal to that of the long leg, the cross leg further having a longitudinal groove formed along its peripheral central extent at a location remote from the holding space and with the groove projected through both the long leg and short leg, the short leg having an axial circular bore formed therethrough with the bore in communication with the groove and with the diameter of the bore being equal to the depth of the groove, the groove and bore of each line block adapted to hold and retain an end of a line therein; and

a line having a knot formed at each end and with the line disposed within the groove of each line block and each knot thereof positionable within the bore of each line block, the line extendable in a taut configuration and thereby defining a plumb line for facilitating the level construction of a course of masonry when the line blocks are secured between a pair of spaced door bucks.

5,479,714

# HEADLAMP LEVELING APPARATUS

Evan L. Hopkins, Emporia, Kans., assignor to Hopkins Manufacturing Corporation, Emporia, Kans.

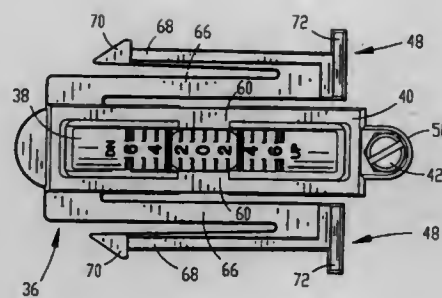
Filed Feb. 6, 1995, Ser. No. 393,567  
Int. Cl.<sup>6</sup> G01B 5/24; B60Q 1/04

U.S. Cl. 33—335

12 Claims

1. A leveling apparatus for use on the reflector of an automotive headlamp assembly, comprising:

a level defining a longitudinal axis and including a means for indicating when the longitudinal axis is level;



a support means for supporting the level on the reflector, the support means including a holder for the level, a securing means for securing the apparatus to the headlamp assembly, and an adjustment means for adjusting the angular orientation of the level relative to the reflector so that a level indication is provided by the level when the reflector is properly oriented for use, the holder including a front end to which the securing means is connected and a rear end to which the adjustment means is connected;

the securing means including a pair of arms connected to opposite sides of the front end of the holder, the arms including a pair of pawls for engaging the headlamp assembly to secure the holder in place, a holder biasing means for biasing the rear end of the holder downward, and a pawl biasing means for biasing the pawls outward away from one another in a direction generally transverse to the longitudinal axis of the level.

5,479,715

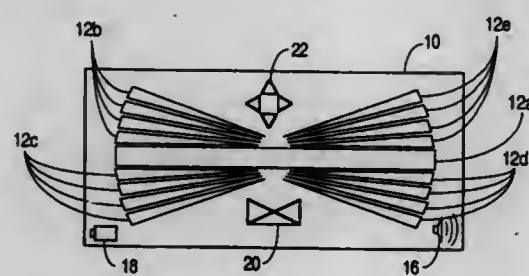
# ELECTRONIC LEVEL DISPLAYING INCLINATION USING A MULTI-SEGMENT FAN-LIKE DISPLAY

Gary R. Schultheis, Los Gatos, and Charles E. Heger, Saratoga, both of Calif., assignors to Zircon Corporation, Campbell, Calif.

Filed Jul. 19, 1994, Ser. No. 277,058  
Int. Cl.<sup>6</sup> G01C 9/06

U.S. Cl. 33—366

14 Claims



1. An inclination device comprising:

a sensor determining an inclination of the device relative to a null inclination;

a housing in which the sensor is mounted, the housing defining a longitudinal axis; and

a visual display on the housing and operatively connected to the sensor and displaying the determined inclination, the visual display including a plurality of illuminated non-parallel and adjacent segments, each segment representing a predetermined sequential increment of inclination and each segment being arranged at a different angle relative to the longitudinal axis of the housing, a particular number of the segments being illuminated for each determined inclination.

5,479,716

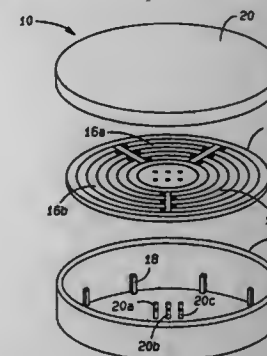
# CAPACITIVE BASED GRAVITY SENSOR

Michael E. Murphy, Ann Arbor, Mich., assignor to Design & Test Technology, Inc., Ann Arbor, Mich.

Filed Jul. 12, 1994, Ser. No. 273,793  
Int. Cl.<sup>6</sup> G01C 9/06

U.S. Cl. 33—366

21 Claims



1. An inclinometer for measuring tilt about a predetermined axis located in substantially in a horizontal plane:

a plate oriented in a plane substantially normal to the predetermined axis and having discreet, isolated sector sections arranged about the axis, the sections each having electrically conductive regions between which a capacitance may be established;

a sealed chamber in which the plate is placed;

a fluid having electrical properties occupying a first portion of the sealed chamber, the fluid contacting the electrically conductive regions of at least one of the isolated sections of the plate when the inclinometer is oriented in a first tilted position about the predetermined axis, and contacting differing portions of at least one section of the plate when the inclinometer is oriented in a second tilted position about the predetermined axis wherein the capacitance of at least one section varies in accordance with the orientation of the plate about the predetermined axis.

5,479,717

# LEVEL INDICATOR

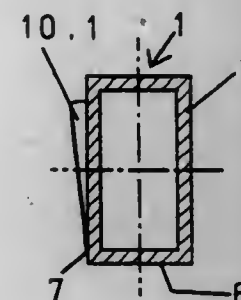
Peter von Wedemeyer, Annweiler am Trifels, Germany, assignor to Stabila-Massgerate Gustav Ullrich GmbH, Germany

Filed Jan. 10, 1994, Ser. No. 179,098  
Claims priority, application Germany, Jan. 10, 1993, 93 00 224.6 U

U.S. Cl. 33—379

Int. Cl.<sup>6</sup> G01C 9/02

22 Claims



1. A level indicator comprising:

an elongate body defined by a plurality of surfaces including a measuring surface along which a measurement is made and a contact surface which intersects the measuring surface and which is adapted for facing toward a support;

the contact surface of the body having body zones thereon with a high coefficient of friction;  
spirit level capsules supported on the body;  
the body zones comprising a material with a high coefficient of friction, and means securing the material to the body; and  
wherein the material at the body zones is inclined with respect to the contact surface by about two degrees with respect to the contact surface.

5,479,718

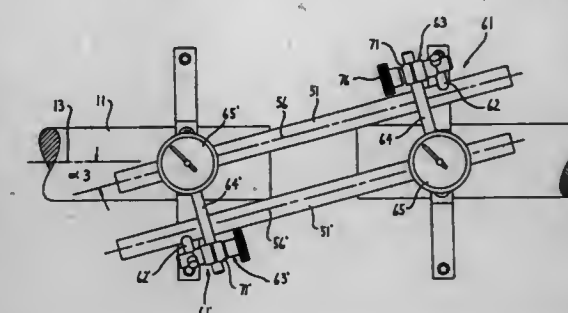
# SHAFT ALIGNMENT DEVICE

Thomas E. Cook, Kalamazoo, Mich., assignor to Durametallic Corporation, Kalamazoo, Mich.

Filed Jul. 19, 1994, Ser. No. 277,329  
Int. Cl.<sup>6</sup> G01B 5/24

U.S. Cl. 33—412

5 Claims



1. A shaft alignment device for aligning first and second shafts which are disposed in generally adjacent but opposed in-line relation, comprising:

first and second substantially identical gauging assemblies adapted for mounting on the respective first and second shafts in generally axially opposed relation for measuring misalignment, each gauging assembly including:

(a) a clamping bracket adapted to be releasably fixed to one of said shafts in generally surrounding relationship thereto, said clamping bracket having a body part which projects radially outwardly of the respective shaft and which defines thereon a radially outwardly facing peripheral surface which functions as a reading surface,

(b) an elongate support rod mounted on said clamping bracket in radially outwardly spaced relation from the shafts and projecting generally axially away from the clamping bracket generally toward the clamping bracket of the other gauging assembly, said support rod at its point of engagement with said clamping bracket being disposed in close proximity to the respective reading surface, and said support rod being disposed with the axis thereof in skewed relation relative to an axial plane which intersects the rod axis and passes through the axis of the respective shaft,

(c) a dial indicator gauge positioned adjacent and spaced laterally from a free end of said support rod, said dial indicator gauge having a feeler adapted to be positioned for contact with the reading surface of the other clamping bracket associated with the other gauging assembly as positioned on the other shaft, and

(d) a gauge mounting arrangement mounted on said support rod adjacent the free end thereof and projecting radially thereof for supporting said dial indicator gauge in spaced relation from the respective support rod, said gauge holding arrangement including means for permitting the position of the dial indicator gauge to be adjusted relative to the respective support rod;

said first and second gauging assemblies when mounted respectively on said first and second shafts being disposed with the respective clamping brackets in generally axially opposed relation so that the reading surfaces are disposed generally on the same diametral side of the shafts and the dial indicator gauge on one assembly contacts the reading surface of the



other assembly and vice versa, the support rods of the assemblies projecting axially generally toward the opposed clamping bracket so that the support rods of said two assemblies are disposed in generally sidewardly spaced but parallel relationship with said support rods both projecting in skewed relation relative to an axial plane, whereby readings are taken by the dial indicator gauges at the reading surfaces in different angular orientations of the alignment device as mounted on the shafts to determine the amount of misalignment.

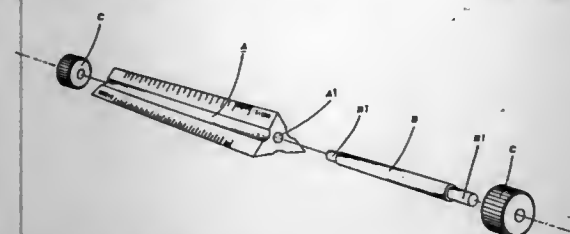
5,479,719

## ROLLING RULER

Bao-Shen Liu, 3rd Fl., No. 20, Alley 6, Lane 190, Te Hsing E. Rd., Shin Lin District, Taipei, Taiwan, Prov. of China  
Filed Nov. 15, 1994, Ser. No. 339,545  
Int. Cl.<sup>6</sup> B43L 13/02

U.S. Cl. 33—449

16 Claims



1. A rolling ruler comprising:  
a ruler body integrally having a centrally located through hole; a plurality of surfaces on said ruler body defining an angular cross-section, the intersection of said surfaces forming a plurality of edges; a plurality of scales located on said edges; at least one scale of said scales being hidden from view when at least another scale of said scales is positioned for use;  
a shaft positioned in said centrally located through hole, said shaft having two ends; and  
two rollers respectively mounted on said two ends, said two rollers being sized to permit translation of said ruler body when each of said at least one scale and said at least another scale is positioned for use.

5,479,720

## METHODS AND APPARATUS FOR MEASURING WEB THICKNESS AND OTHER CHARACTERISTICS OF A MOVING WEB

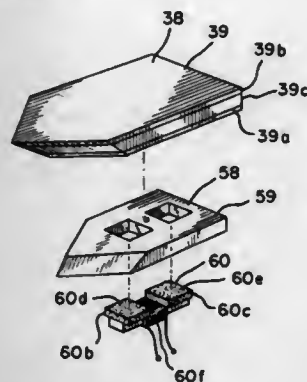
Ake A. Hellstrom, Columbus; Karsten G. Koester, Plain City; Thomas A. Frisco, Columbus, and James E. Throm, Jr., Galloway, all of Ohio, assignors to ABB Industrial Systems, Inc., Columbus, Ohio

Filed Jan. 21, 1994, Ser. No. 186,047

Int. Cl.<sup>6</sup> G01B 7/06

U.S. Cl. 33—501.02

27 Claims



1. A sheet sensing shoe comprising:

a main body having first and second opposing, generally planar surfaces, first and second opposing ends and first and second opposing sides, said first planar surface being adapted to engage a moving sheet, and said first end including first and second faces which extend between said first and second planar surfaces and converge toward one another to share a common side extending between said first and second planar surfaces.

5,479,721

## METHOD AND APPARATUS FOR MEASURING THE LENGTH (MIU) OF THE INTERNAL TAPER OF AN INTERNALLY UPSET DRILL PIPE TUBE

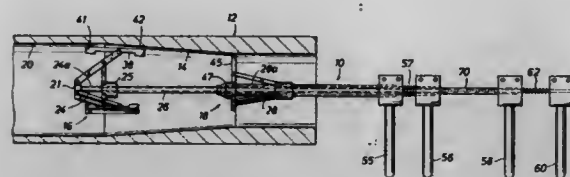
Nels Wickander, Spring, Tex., assignor to Prideco, Inc., Houston, Tex.

Filed Mar. 30, 1994, Ser. No. 220,281

Int. Cl.<sup>6</sup> G01B 3/56; 21/22

U.S. Cl. 33—531

6 Claims



1. In an internally upset drill pipe tube having an internal taper (MIU), a method of measuring the length of the internal taper, comprising the steps of  
positioning a first link machine having a plurality of link mechanisms in the tube beyond the inner end of the taper,  
expanding the first link machine to move a plurality of locating arms carried by the link mechanisms outwardly to a position adjacent the inner wall of the tube with their longitudinal axes parallel to the longitudinal axis of the tube,  
moving the first link machine towards the outer end of the tube until a contact point on each locating arm engages the taper and another contact point on each locating arm engages the inner wall of the tube beyond the taper,  
positioning a second link machine having a plurality of link arms in the tube within the taper,  
expanding the second link machine to move the plurality of link arms outwardly to a position whereby the ends of the link arms radially approximate the internal diameter of the taper adjacent the outer end of the taper,  
moving the second link machine toward the outer end of the tube until the ends of the link arms engage the outer end of the taper, and  
measuring the distance between the engaged positions of the first and second link machines to determine the length of the internal taper.

5,479,722

## MOVABLE REGISTRATION PIN MECHANISM

W. Vernon Smith, Tustin, and Hendley W. Hall, San Pedro, both of Calif., assignors to Excellon Automation Co., Torrance, Calif.

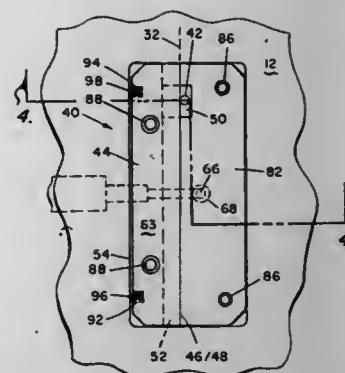
Filed Aug. 24, 1994, Ser. No. 294,967

Int. Cl.<sup>6</sup> B23Q 3/00; B25B 11/00

U.S. Cl. 33—617

25 Claims

1. Registration apparatus comprising:  
a member having a reference surface;  
a channel formed in said reference surface of said member;  
a registration pin;  
said registration pin movably mounted in said channel relative to said reference surface; and



locking means for selectively causing said registration pin to bear against said member thereby locking said pin in a registration position relative to said member and said reference surface.

5,479,723

## IMAGE REGISTRATION BOARD

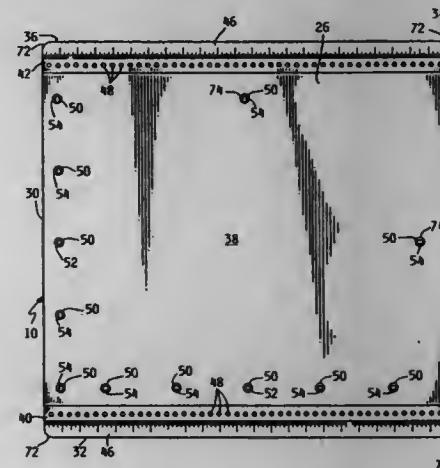
Gretchen Ternes, Shoreview, Minn., assignor to Ternes-Burton Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 780,739, Oct. 18, 1991, abandoned. This application Jul. 15, 1992, Ser. No. 913,856

Int. Cl.<sup>6</sup> G01D 21/00

U.S. Cl. 33—623

19 Claims



1. In an image board for use with at least one registration pin and at least one spacer to register a first image, said at least one spacer having a bottom pin, said image board having a top bed layer defining an image layout area, said image layout area having a plurality of peripheral edges, said image board having a plurality of sides edges disposed along and proximate to said peripheral edges of said layout area, the improvement comprising:  
a first border region including a first plurality of index holes disposed generally in alignment with one another and spaced apart generally equidistantly along said first border region to receive the bottom pin of the spacer therein, the at least one spacer being selectively movable between different positions along said first plurality of index holes, said first border region being positioned generally proximate to a first one of the plurality of peripheral edges of the image layout area, the image layout area having a second one and a third one of the plurality of peripheral edges, each of said second one and said third one of the plurality of peripheral edges being oriented generally perpendicular to said first one of the plurality of peripheral edges, each of said second one and said third one of the plurality of peripheral edges not having a distinct plurality of index holes disposed generally therealong; and

at least one aperture extending through the image board and disposed in a predetermined position relative to said first plurality of index holes, each one of said at least one aperture being at least partially bounded by the image layout area, each one of the at least one aperture receiving one of the at least one registration pin therein such that at least a portion of the at least one registration pin extends above the image layout area, wherein the registration of the first image in a first linear direction generally perpendicular with said first plurality of index holes and a second linear direction generally parallel with said first plurality of index holes is determined only by the at least one registration pin and is not selectively adjustable by the at least one spacer.

5,479,724

## METHOD AND APPARATUS FOR SCOUR DEPTH MEASUREMENT

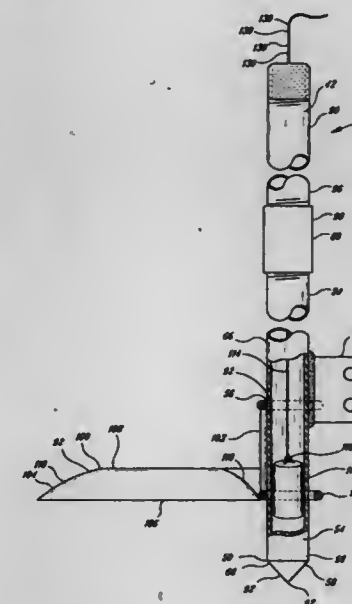
Anthony P. Nahajski, and Stuart E. Nahajski, both of 20411 12th Ave. NW, Seattle, Wash. 98177

Filed Mar. 9, 1994, Ser. No. 208,534

Int. Cl.<sup>6</sup> G01B 5/18; E21B 47/04

U.S. Cl. 33—719

16 Claims



1. An apparatus for measuring scour depth of an immersed waterway bed adjacent a structure, comprising:  
an elongated guide of a nonferromagnetic material, the guide having a lower end and an upper end, the guide further having a portion of the upper end defining an opening and the guide having an internal portion defining a substantially vertical passageway within the guide extending from the opening toward the lower end;  
a bed detector member having a slidable connection for connecting the bed detector member to the guide for movement under the influence of gravity toward the waterway bed, the bed detector member being external to the passageway, at least a portion of the bed detector member being ferromagnetic, and the bed detector having a contact surface for engaging the waterway bed;  
a magnetic probe positionable within the passageway for unobstructed axial travel within the passageway, with the magnetic attraction of the probe to the ferromagnetic portion of the bed detector inhibiting descent of the probe when the probe is positioned in juxtaposition to the bed detector member; and  
a support line connected to the probe and extendible through the opening in the upper end of the guide, so that the elevation of the bed detector may be determined by manipulation of the support line.



5,479,725

# METHOD OF AND ARRANGEMENT FOR REHABILITATING A BALLAST BED OF A TRACK

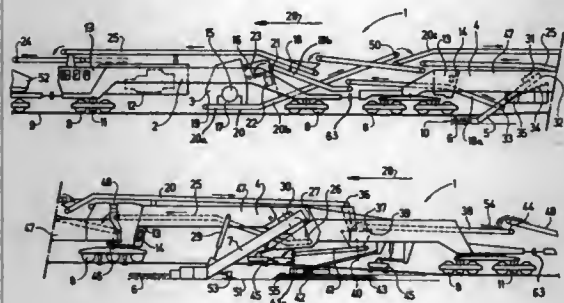
Josef Theurer, Vienna, and Manfred Brunninger, Altenberg, both of, Austria, assignors to Franz Plasser Bahnbaumaschinen-Industrieges. m.b.H., Vienna, Austria

Filed Jun. 13, 1994, Ser. No. 258,666

Claims priority, application Austria, Jun. 16, 1993, 1178/93 Int. Cl.<sup>6</sup> E02F 5/22

U.S. Cl. 37—104

22 Claims



1. A method of rehabilitating a ballast bed by installing a protective layer between a subgrade and a layer of ballast, comprising the steps of:

- exposing the subgrade by continuously removing old ballast from the ballast bed;
- withdrawing and comminuting at least a portion of old ballast;
- discharging comminuted old ballast over the exposed subgrade to form at least part of the protective layer; and
- mixing sand with comminuted old ballast to form a ballast-sand mixture and discharging the mixture upon the exposed subgrade for formation of the protective layer after removal of remaining old ballast.

5,479,726

# COMPACT PADDING MACHINE

William B. Bishop, Albuquerque, N.M., assignor to Ozzie's Pipeline Padder, Inc., Scottsdale, Ariz.

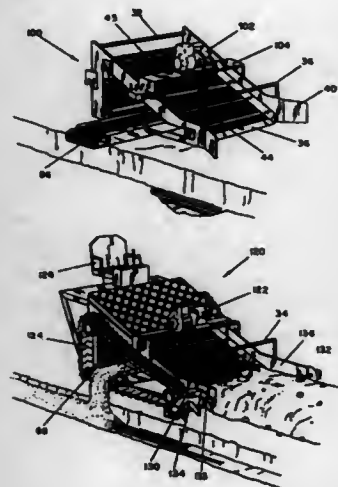
Continuation of Ser. No. 855,907, Mar. 23, 1992, Pat. No. 5,261,171, which is a continuation of Ser. No. 499,619, Mar. 26, 1990, Pat. No. 5,097,610. This application May 19, 1993, Ser. No. 64,941

The portion of the term of this patent subsequent to Mar. 24, 2009, has been disclaimed.

Int. Cl.<sup>6</sup> E02F 5/22

U.S. Cl. 37—142.5

8 Claims



1. A self-contained padding apparatus for moving along one side of a pipeline ditch, picking up excavated material from said one

side of the ditch, and processing the excavated material into padding material for placement in the ditch, said apparatus comprising, in combination:

- a prime mover; and
- a padding attachment comprising means removably connecting said padding attachment to one end of said prime mover whereby said attachment moves along the path of travel of said prime mover; means for collecting and separating excavated material from the side of the ditch as said prime mover moves along the side of the ditch into padding material and residual material; means from transporting the padding material to the ditch; and
- side members supported by said padding attachment and positioned on opposite sides of said means for collecting and separating to retain the excavated material on said means for collecting and separating, wherein at least one of said side members has an opening through which the means for transporting the padding material extends from said padding attachment whereby padding material may be transported through said side members to the pipeline ditch.

5,479,727

# MOISTURE REMOVAL AND PASSIVATION OF SURFACES

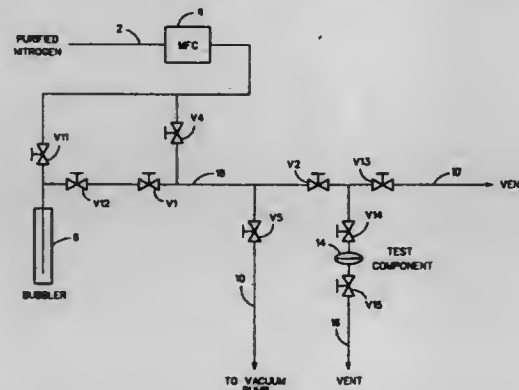
Stephen M. Fine, Emmaus; Andrew D. Johnson, Doylestown, and John G. Langan, Wescosville, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 25, 1994, Ser. No. 329,029

Int. Cl.<sup>6</sup> F26B 3/00

U.S. Cl. 34—516

15 Claims



1. A process for moisture removal and moisture passivation of a surface on which moisture is absorbed comprising contacting said surface with a flow of a carrier gas at a pressure of at least approximately 14.7 psia containing a drying reagent to remove absorbed moisture from said surface and passivate said surface to retard the readsorption of moisture, wherein said drying reagent is a composition of the formula:  $R_aSiX_bY_cZ_d$  where  $a=1-3$ ;  $b, c$ , and  $d$  are individually 0-3 and  $a+b+c+d=4$ ;  $R$  is one or more organic groups; and  $X, Y$  and  $Z$  are individually hydrogen, halogen, alkoxy, amine or  $-N(H)Si(R_3)$ , but at least one of  $X, Y$  or  $Z$  have a bond to silicon that is readily hydrolyzable.

15. A process for moisture removal and moisture passivation of an interior surface of a high purity gas piping on which moisture is absorbed, comprising: (a) purging said piping with an inert gas which has a moisture content below 0.1% by volume; and (b) contacting said surface at a pressure of at least approximately 14.7 psia and a temperature of less than approximately 65° C. with a flow of a carrier gas containing a drying reagent to remove absorbed moisture from said surface and passivate said surface to retard the readsorption of moisture, wherein said drying reagent is a composition of the formula:  $R_aSiX_bY_cZ_d$  where  $a=1-3$ ;  $b, c$ , and  $d$  are individually 0-3 and  $a+b+c+d=4$ ;  $R$  is one or more organic groups; and  $X, Y$  and  $Z$  are individually hydrogen, halogen, alkoxy, amine or  $-N(H)Si(R_3)$ , but at least one of  $X, Y$  or  $Z$  have a bond to silicon that is readily hydrolyzable.

5,479,728

# APPARATUS FOR BACKFILLING AND TAMPING A TRENCH

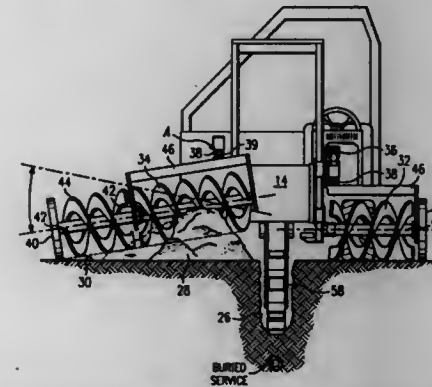
Arthur D. Deken; James E. Franklin, and Cody L. Sewell, all of Perry, Okla., assignors to The Charles Machine Works, Inc., Perry, Okla.

Filed Mar. 8, 1994, Ser. No. 207,174

Int. Cl.<sup>6</sup> E02F 5/22

U.S. Cl. 37—142.5

17 Claims



1. An apparatus for backfilling and compacting soil into a trench, comprising:

- a tractor;
- a left and right auger mounted on the tractor to move soil from the right of way into the trench, the augers being mounted on a vertically moveable element, the augers being mounted on the vertically moveable element by a pivoting connection to pivot about the vertically moveable element to allow the augers to float to facilitate the movement of a controlled amount of soil and to accommodate uneven terrain;
- a tamper assembly mounted on the tractor to tamp the soil into the trench to restore the trench.

5,479,729

# METHOD AND APPARATUS FOR CONTROLLING EXCAVATION EQUIPMENT

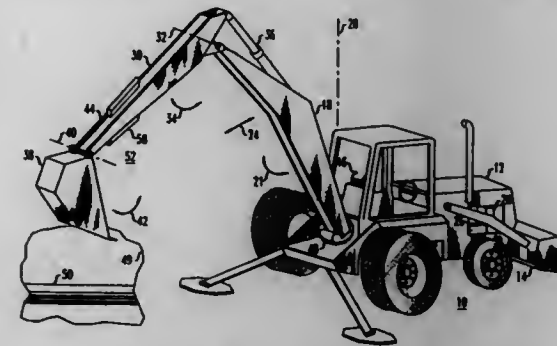
Hossein Eslambolchi, Bedminster, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Apr. 4, 1994, Ser. No. 223,248

Int. Cl.<sup>6</sup> F02F 1/00

U.S. Cl. 37—195

6 Claims



1. A method for controlling a piece of excavation equipment that is excavating near a buried cable and/or pipe, that carries a locating signal independent of the control of the excavation equipment, to prevent the excavation equipment from severing the cable and/or pipe, comprising the steps of:

- continuously determining the strength of the locating signal, carried by the cable and/or pipe independent of the control of the excavation equipment, to sense if the buried cable and/or pipe is sufficiently close to the excavation equipment to be potentially damaged thereby;

alerting the excavation equipment when the buried cable and/or pipe is sufficiently close to the excavation equipment to be potentially damaged thereby; and temporarily disabling the excavation equipment, upon being alerted if the buried cable and/or pipe is sufficiently close to the excavation equipment to prevent the equipment from further excavating.

5,479,730

# SNOWBLOWER ATTACHMENT FOR A PICKUP TRUCK

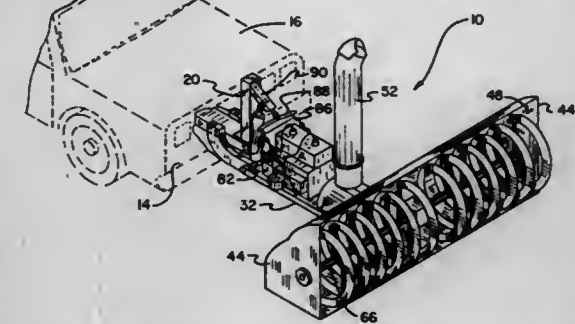
James R. Gogan, 9-11th Ave., Madawaska, Me. 04756

Filed Jun. 6, 1994, Ser. No. 254,556

Int. Cl.<sup>6</sup> E01H 5/04

U.S. Cl. 37—231

1 Claim



1. A new and improved snowblower attachment for a pickup truck comprising, in combination:

- a rearward support couplable with respect to a front end of a pickup truck, the rearward support including a central horizontal post, removably attachable to the front end of the pickup truck and extending forwardly thereof, a pair of vertically extending posts spaced parallel with each other secured at a central extent to a forward end of the horizontal post with lateral supports with an arcuate shape secured at rearward ends thereof to an intermediate extent of the horizontal post and at forward ends thereof to the lower ends of the vertical posts;
- a forward support including a base plate having a rearward end with a hinge pin coupling the rearward end of the forward support with the forward end of the rearward support, the forward support having a downwardly curved forward end providing a curved cross-sectional configuration, parallel side plates at external sides of the forward end and an upper curved end forming, in association with a lower curved portion and side panels thereof, a housing, the forward support also having a chimney extending in a vertical orientation with an upper free end formed with a curved end and a pivotable baffle, the chimney also having a lower end in operative association with a rearward end of the housing;
- an auger positioned in the housing for rotation about a horizontal axis, the auger also including a support shaft secured rotating the auger within the side plates;
- a motor positioned on the rearward end of the forward support, the motor having a drive shaft with a first end secured to the motor and a second end with a gearing assembly adapted to rotate the auger, a central portion of the drive shaft including fan blades located at an interface location between the housing and the chimney;
- a pair of chain assemblies having their lower ends coupled to the forward support and having their upper ends secured to a yoke at an upper extent of the vertical posts;
- a piston having its lower end secured to an intermediate position between the vertical posts and its upper end secured with respect to the yolk to vary the angular orientation of the forward support; and
- controls for the motor and piston located within a cab of a vehicle supporting the attachment.



5,479,731

## TREE HARVESTING APPARATUS

Lars Widegren, Arentgræpetan 31, S-981 32 Kiruna, Sweden  
PCT No. PCT/SE92/00604, § 371 Date Jun. 14, 1994, § 102(e)  
Date Jun. 14, 1994, PCT Pub. No. WO93/04575, PCT Pub.  
Date Mar. 18, 1993

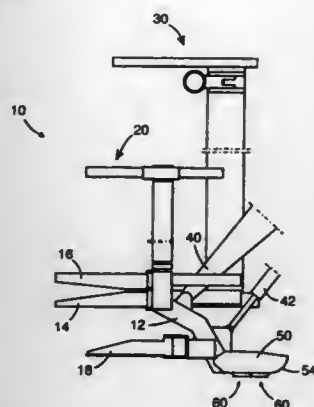
PCT Filed Sep. 2, 1992, Ser. No. 204,257

Claims priority, application Sweden, Sep. 9, 1991, 9102616

Int. Cl.<sup>6</sup> A01G 23/06

U.S. Cl. 37—302

11 Claims



1. A tree harvester which is adapted to be fitted to a crane arm for the purpose of uprooting trees, said tree harvester comprising: a frame mountable on the crane arm; first means which is supported by said frame and which is selectively engageable with a tree for uprooting the tree from the ground; and second means which is supported by said frame and which is selectively engageable with and movable along the ground so as to scrape or cultivate the ground for forest regeneration, and wherein said second means includes a ground support unit which is adapted to engage the ground and facilitate uprooting of the tree by supporting said tree harvester against the ground.

5,479,732

## ERECTABLE PERISCOPING DISPLAY DEVICE

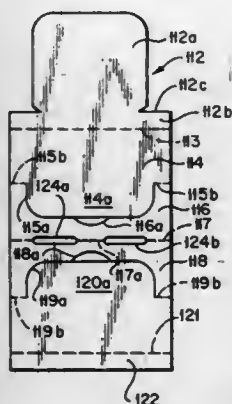
Ronald P. Burtch, Stouffville, and Irving M. Koltz, Toronto, both of, Canada, assignors to Ronald P. Burtch & Associates Limited, Canada

Filed Jun. 21, 1994, Ser. No. 263,337

Int. Cl.<sup>6</sup> G09F 1/06

U.S. Cl. 40—124.1

20 Claims



10. A blank for a display device, said blank comprising a display panel comprising a tongue portion and a base portion extending outwardly on both sides of said tongue portion to form shoulders, and first, second, third, fourth and fifth further panels formed integrally with said display panel and arranged in serial relation,

said further panels being defined by respective fold lines between adjacent panels, said first panel being disposed adjacent said display panel and being separated therefrom by a further fold line, said second and third panels including a common opening therein formed along a fold line between said second and third panels and disposed centrally of said fold line between said second and third panels, at least one of said first and fourth panels including a precut wing portion formed between spaced portions of a discontinuous fold line between said one panel and an adjacent panel, said wing portion projecting beyond said discontinuous fold line towards said common opening.

5,479,733

## DISPLAY APPARATUS

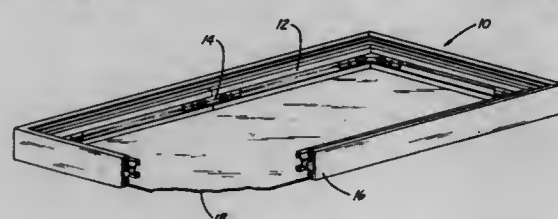
Yuri Kusina, Glendale, Calif., assignor to Color Arts, Inc., Racine, Wis.

Filed Nov. 1, 1993, Ser. No. 143,629

Int. Cl.<sup>6</sup> G09F 1/12

U.S. Cl. 40—155

23 Claims



11. In an apparatus for mounting a display panel and including a frame member and a frame connector, the frame member having a plurality of arm structures extending outwardly from a frame axis, and wherein each arm structure has a strip, the improvement wherein: the connector comprises a center portion and a pair of wing-like compression members extending from the center portion at an angle greater than 90° and less than 180°; and each of the pair of compression members bears against a strip of each of two arm structures.

5,479,734

## DEVICE FOR INDIVIDUALIZING VERTICALLY STORED DOCUMENTS, FOR THE PURPOSES OF LOCATING AND IDENTIFYING THEM

Pierre Rouget, and Gabrielle Rouget, both of 6, rue Martin de Brignaudy, 13007 - Marseille, France

PCT No. PCT/FR92/00637, § 371 Date Dec. 23, 1993, § 102(e)  
Date Dec. 23, 1993, PCT Pub. No. WO93/01061, PCT Pub.  
Date Jan. 21, 1993

PCT Filed Jul. 3, 1992, Ser. No. 167,977

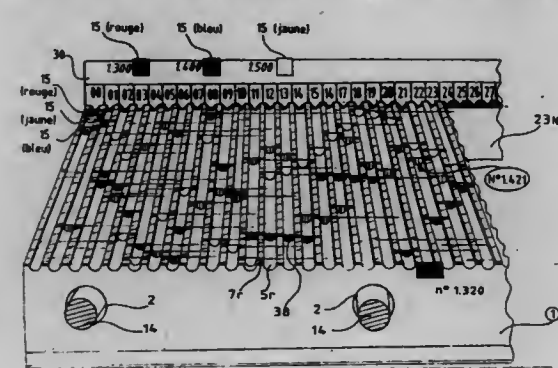
Claims priority, application France, Jul. 5, 1991, 91 08776

Int. Cl.<sup>6</sup> G09F 1/10

U.S. Cl. 40—373

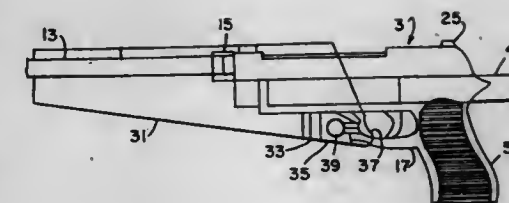
20 Claims

18. A system for filing and identifying documents in a filing



cabinet, said system comprising:

- a suspension strip fixed to a top edge of each of said documents, said suspension strip including an orifice for receiving a suspension rod of the filing cabinet, said suspension strip including a series of marks, said series of marks being identical from one suspension strip to one another;
- a scale positioned behind said suspension strip of said documents, said scale comprising a plurality of information areas having a first part of an identification means displayed thereon, said information areas being aligned with a corresponding row of marks formed by alignment of said series of marks of adjacent suspension strips; and
- a tab fixed to a top edge of each suspension strip, said tab constituting a guide mark of a drawing suspended to said suspension strip to which said tab is fixed, wherein said tabs display a second part of said identification means which is also displayed on a top portion of said scale.



trigger guard and locking a barrel extension housing on the trigger guard.

5,479,737

## FIREARM BARREL ASSEMBLY

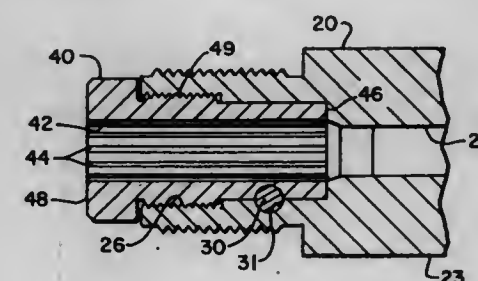
William E. Osborne, and Timothy V. Blazek, both of Guilford, Conn., assignors to The Marlin Firearms Company, North Haven, Conn.

Filed Feb. 3, 1994, Ser. No. 190,889

Int. Cl.<sup>6</sup> F41A 21/12

U.S. Cl. 42—76.01

15 Claims



1. A barrel assembly for a firearm comprising:
- a cartridge chamber insert defining an axial bore, said insert bore having a plurality of first longitudinally extending angularly spaced grooves, said insert further having front and rear ends and an outer surface, said first grooves extending longitudinally from said rear end to said front end and said outer surface having a second transverse groove;
  - a barrel defining a first axial bore and a breech portion, said breech portion defining a second bore coaxial to said first axial bore, said second bore axially receiving said insert, said breech portion having a transverse bore, said transverse bore being aligned with said insert second groove; and
  - pin means disposed within said insert second groove and said transverse bore.

5,479,738

## WILDLIFE HUNTING AND OBSERVATION BLIND CONSTRUCTED FROM A SALVAGED LIQUID STORAGE TANK

Michael L. Danna, 12766 Conway Lake Ct., Creve Coeur, Mo. 63141

Filed Dec. 9, 1993, Ser. No. 164,217

Int. Cl.<sup>6</sup> A01M 31/02

U.S. Cl. 43—1

20 Claims

7. A blind for observing wildlife, the blind comprising:
- a tubular wall extending around a horizontal center axis of the tubular wall, the tubular wall having an upper half, a bottom half, opposite edges, and at least one opening in the upper half; and
  - a pair of axially spaced sidewalls connected to the opposite edges of the tubular wall, the tubular wall and the pair of sidewalls together defining an interior volume of the blind, the interior volume being sufficiently large enabling an individual to stand upright within the interior volume, the opening in the upper half of the tubular wall providing access to the interior

5,479,736

## AUGMENTED SERVICE PISTOL AND AMMUNITION WEAPONS SYSTEM

David J. Forrester, Jacksonville, Ala., assignor to Cerberus Institute for Research and Development, Inc., Jacksonville, Ala.

Filed Jan. 6, 1994, Ser. No. 177,985

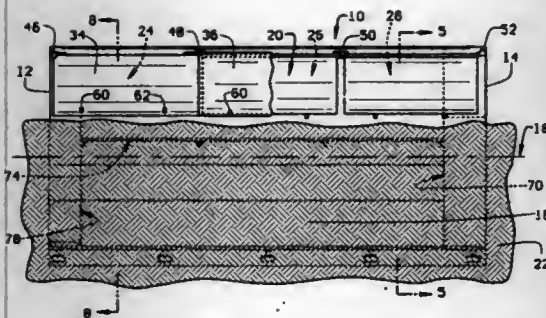
Int. Cl.<sup>6</sup> F41A 21/32; F41C 23/04

U.S. Cl. 42—72

21 Claims

1. An augmented service pistol weapons system, comprising a barrel adapter for connection to a pistol barrel, a barrel extension connected to an adapter sleeve, sides enclosing a portion of a pistol, and hinged flaps connected to the sides for engaging a pistol





volume from outside the blind, the bottom half of the tubular wall being buried underground, the opening in the upper half of the tubular wall having a lower edge, the lower edge of the opening being sufficiently proximate to a ground surface enabling an individual to step from the ground surface through the opening and into the interior volume of the blind, and at least a portion of the upper half of the tubular wall projecting aboveground.

5,479,739

# SPRING ACTUATED MARINE ANIMAL CAPTURING DEVICE

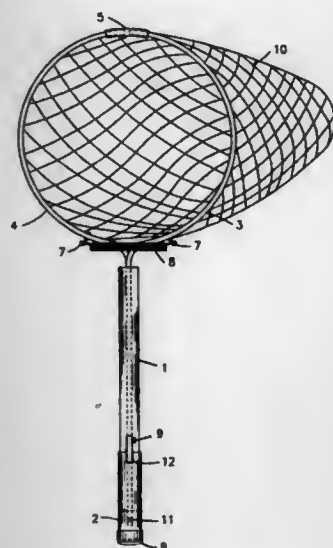
J. Mark Livingston, 1931 NW. 18th St., Crystal River, Fla. 34428

Filed Aug. 31, 1994, Ser. No. 298,569

Int. Cl.<sup>6</sup> A01K 77/00

U.S. Cl. 43-12

3 Claims



1. A capturing device comprising:
  - a hollow tubular handle having a proximal end and a distal end;
  - a control shaft coaxial with and extending internally through said hollow tubular handle and free to rotate with respect to said handle;
  - a frame defining an aperture when in the open position, said frame comprising a first frame member and a second frame member, said first frame member connected to said distal end of said tubular handle, said second frame member connected to said control shaft, said first and second frame members being capable of being folded with respect to each other between an open and a closed position about an axis defined by said handle by the rotation of said control shaft within said tubular handle;
  - a container suspended from said frame members, said container being sufficiently flexible to permit said frame members to travel between open and closed positions; and

means connected to said shaft which can be grasped by hand for rotating said shaft with respect to said handle; and further comprising elastic means connected to at least one of said frame members for urging said frame members from an open to a closed position with respect to each other.

5,479,740

# FISHING ROD WITH FISHLINE LAID THROUGH IT

Masaru Akiba, and Tomoyoshi Tsurufuzi, both of Tokyo, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan

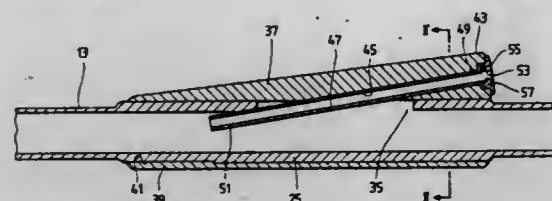
Continuation of Ser. No. 978,073, Nov. 18, 1992, abandoned, which is a continuation of Ser. No. 831,372, Feb. 4, 1992, abandoned. This application Feb. 7, 1994, Ser. No. 193,647

Claims priority, application Japan, Feb. 4, 1991, 3-3581 U; Feb. 4, 1991, 3-13230

Int. Cl.<sup>6</sup> A01K 87/04

U.S. Cl. 43-24

15 Claims



1. A fishing rod through which a fishline is laid, comprising:
  - a jointless tubular member comprising substantially constant inner and outer radial dimensions and an elongated mortise extending along a longitudinal axis of said tubular member, said constant inner radial dimension defining an open interior of the rod through which said fishline is adapted to pass;
  - an outer member provided on said tubular member to cover said mortise;
  - guide means provided in said outer member for guiding the fishline from the outside of said tubular member to inside thereof without coming into contact with inner and outer circumferential surfaces of said tubular member, said guide means comprising a first end located radially outside said constant outer radial dimension and a second end located radially inside said constant inner radial dimension, and a single, straight longitudinal section extending between said first and second ends, wherein said single longitudinal section defines a single axis of said guide means which is slightly oblique with respect to said longitudinal axis of said tubular member, said guide means further comprises a continuous guide tube through which the fishline is introduced into said tubular member, said guide tube extending substantially straight from said first end to said second end, and said tubular member is radially interposed between said guide tube and said outer member, and said guide tube extends beyond said elongated mortise along said longitudinal axis.

5,479,741

# VEGETATION MAINTENANCE SYSTEM

John P. Underwood, 42 West Vogel, Phoenix, Ariz. 85021

Continuation-in-part of Ser. No. 112,573, Aug. 25, 1993, abandoned, which is a division of Ser. No. 729,185, Jul. 12, 1991, Pat. No. 5,245,878. This application Mar. 18, 1994, Ser. No. 210,681

Int. Cl.<sup>6</sup> A01G 13/00

U.S. Cl. 47-30

6 Claims

1. A guard for protecting a plant, comprising:
  - a) a sheet of semi-rigid material having
    - i) a top edge,
    - ii) a bottom edge,
    - iii) a first end extending between said top and bottom edges, and
    - iv) a second end spaced from said first end; and



- b) fastening means formed on said sheet for fastening said first end in overlapping relationship with said second end at selectively variable locations relative to said second end, to form a tubular sheath having an adjustable diameter for surrounding said plant, said fastening means including
  - i) a plurality of spaced apart female elements located at regularly spaced intervals across the entire length of said sheet; and
  - ii) a plurality of male elements spaced at intervals corresponding to the spacing of said female elements, located in alternating relationship with said female elements across the entire length of said sheet, said male elements receivable by said female elements of said overlapping first end and said second end.

5,479,742

# PLANTER BOX

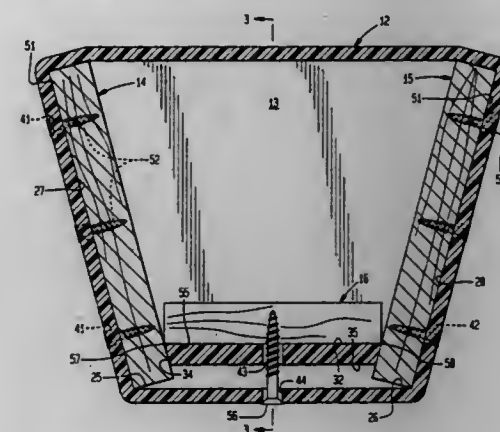
Joseph J. Monahan, P.O. Box 284 3 Heritage Ln., S. Lancaster, Mass. 01561

Filed Aug. 9, 1994, Ser. No. 288,091

Int. Cl.<sup>6</sup> A01G 9/02

U.S. Cl. 47-66

18 Claims



1. A planter box comprising:
  - a first side wall member;
  - a second side wall member;
  - a bottom wall member; and
  - a pair of end caps, each said end cap defining a first support surface sloping downwardly and inwardly and engaging a marginal face portion at one end of said first side wall member; a second support surface sloping downwardly and inwardly, horizontally spaced from and facing said first support surface, and engaging a marginal face portion at one end of said second side wall member; and wherein said bottom wall member has a first longitudinal edge extending between said end caps and supported by said first side wall member and a second longitudinal edge extending between said end caps and supported by said second side wall member.

5,479,743

# INFLATABLE EMERGENCY SHELTER

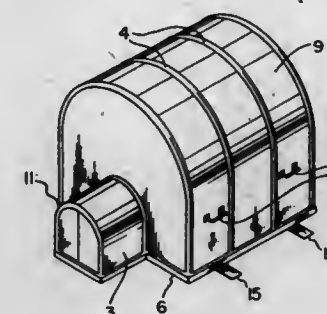
Lorne Queen, and Kevin Queen, both of RR#1 Keewatin, Ontario, Canada

Filed Jul. 28, 1994, Ser. No. 281,545

Int. Cl.<sup>6</sup> E04G 11/04

U.S. Cl. 52-2.22

25 Claims



1. An erectable portable emergency shelter for use in cold conditions, which comprises:
  - a substantially air impermeable, fabric enclosure having an inflatable floor as a base and inflatable ribs for supporting an upper section mountable on the base;
  - a hinge between a part of a lowermost perimeter edge of the upper section and an adjacent part of a perimeter edge of the base, such that the upper section is openable substantially entirely to uncover the floor;
  - means to provide a seal between a non-hinged part of the lowermost edge of the upper section and an adjacent non-hinged part of the perimeter edge of the base; and
  - the enclosure including a vestibule having means for providing heat-loss limiting entry or exit of a person from the enclosure.

5,479,744

# MOVABLE UTILITY GREENHOUSE

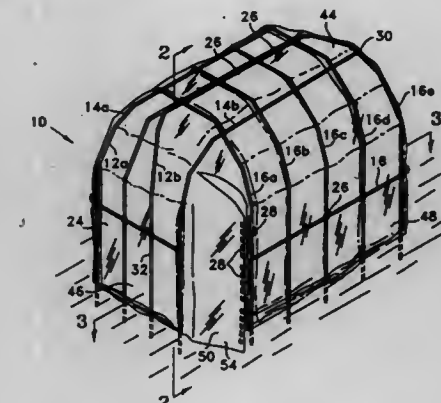
Scott A. Meyer, 6205 S. 12th St., Phoenix, Ariz. 85040

Filed Jun. 1, 1994, Ser. No. 251,895

Int. Cl.<sup>6</sup> A01G 9/16

U.S. Cl. 52-63

17 Claims



12. A durable, movable utility greenhouse comprising:
  - a flexible, substantially continuous sheet plastic skin forming two opposing short walls, two opposing long walls, and four corner walls wherein each of said corner walls is interspersed between one of said short walls and one of said long walls, and a roof above said walls;
  - a plurality of electrical metal tubing (EMT) frame members embedded into the ground and extending in a generally upright direction inside said skin from the ground along each of said four walls for at least a predetermined wall height distance, then curving inward and upward so that said roof has a rounded appearance above each of said four walls, said



frame members including first and second main frame members each of which extend vertically upward adjacent both of said short walls and generally horizontal adjacent said roof, said first and second main frame members residing proximate one another adjacent said roof and spaced apart along said short walls;

an outer cover brace extending circumferentially and generally horizontally along and outside said skin and said frame members around at least a portion of said greenhouse;

an inner cover brace extending circumferentially and generally horizontally along and inside said frame members and said skin around at least a portion of said greenhouse, said inner cover brace being spaced vertically below said outer cover brace; and

a plurality of tie means for attaching various ones of said frame members and braces to one another.

5,479,745

# FLOOR PANEL SUPPORT LEG AND DOUBLE FLOOR

Yoshinari Kawai, Hyogo; Fumihiro Oyama, Osaka, and Mikio Yamagishi, Tokyo, all of, Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan

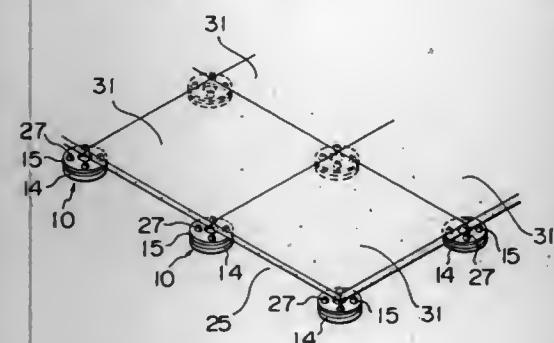
Filed Apr. 19, 1994, Ser. No. 229,795

Claims priority, application Japan, Apr. 21, 1993, 5-117748

Int. Cl.<sup>6</sup> E04B 9/00

U.S. Cl. 52—126.6

9 Claims



1. A floor panel support leg for supporting butted portions of a plurality of floor panels atop a floor slab, comprising:

an approximately cylindrical first pedestal member having a bottom portion and an opened end portion respectively formed at one end side and the other end side in an axial direction of the first pedestal member, and further having a first thread portion formed in an outer circumferential surface thereof;

an approximately cylindrical second pedestal member having an opened end portion and a bottom portion respectively formed at one end side and the other end side in an axial direction of the second pedestal member, and further having a second thread portion formed in an inner circumferential surface thereof, said first pedestal member being inserted from its opened end side into said second pedestal member from its opened end side so that said first thread portion is thread-engaged with said second thread portion; and

a fixing member situated between the first and second pedestal members, said fixing member fixing said first and second pedestal members in a condition where said first and second pedestal members are in thread engagement with each other to thereby prevent said first and second pedestal members from moving relatively to each other.

5,479,746

# COMPONENT FOR THE CONSTRUCTION OF GROUND-BEARING STAIRWAYS AND RAMPS AND COMPONENTS FOR EMBODYING SAME

Matti P. Mannonen, Helsinki, Finland, assignor to Trioplan Oy, Helsinki, Finland

PCT No. PCT/FI89/00068, § 371 Date Dec. 5, 1990, § 102(e) Date Dec. 5, 1990, PCT Pub. No. WO89/09856, PCT Pub. Date Oct. 19, 1989

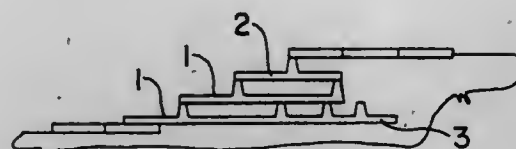
PCT Filed Apr. 11, 1989, Ser. No. 585,054

Claims priority, application Finland, Apr. 12, 1988, 881691

Int. Cl.<sup>6</sup> E04F 11/14

U.S. Cl. 52—182

5 Claims



1. A component system for the building of ground-bearing stairways of one or more layers, comprising at least three different concrete slab components, each component comprising a slab part having an upper surface and one or more upright supports extending from the upper surface of the slab part, said components being arranged close to each other in adjacent upper and underlying layers and the components in each upper layer being in overlapping relationship and connected to the components in the underlying layer, characterized in that each support of each slab component has the same height and an upper surface which is made parallel with the slab, the slab of one slab component in one upper layer covers at least two adjacent supports in the adjacent underlying layer, the slab components of each upper layer are invisibly connected to the supports of the underlying layer, all surfaces of the slab component which diverge from the horizontal plane are upright and that at least one of all mutually opposite upright surfaces is inclined inwards and towards the other to enable releasing from a casting mold, and the upright supports of two adjacent slab components in one layer of the stairway form three support and fastening surfaces.

5,479,747

# CONDUIT CONNECTING MECHANISM FOR A SCREEN PANEL

Ming-Hsin Wu, 20, Lane 92, Shing Ell Street, Tao Yuan City, Tao Yuan County, Taiwan, Prov. of China

Filed May 12, 1994, Ser. No. 241,706

Int. Cl.<sup>6</sup> E04F 17/08; H02G 3/10

U.S. Cl. 52—220.7

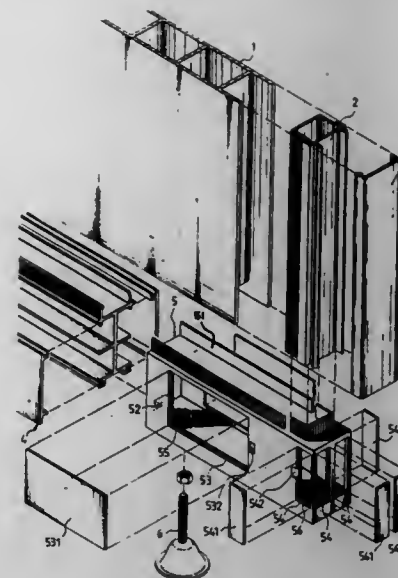
7 Claims

1. A conduit connecting mechanism comprising:

a) a screen panel including an end edge provided with a trim body and a bottom edge provided with a chamber;

b) a conduit assembly secured to the bottom edge of the screen panel for routing a plurality of electric cords therethrough; and

c) a substantially rectangular connecting box secured to the bottom edge of the screen panel adjacent the end edge, the connecting box including a rear end in communication with the conduit assembly, a top surface, an insert on the top surface, the insert being interconnected with the chamber of the screen panel and the trim body, a pair of side walls, a frontal wall and at least one rectangular horizontal opening



provided in the side walls and at least one elongated vertical opening provided in the frontal wall.

5,479,748

# FRICTION CONNECTOR FOR ANCHORING REINFORCEMENT TENDONS IN REINFORCED OR PRE-STRESSED CONCRETE GIRDERS

Jose L. Siller, Miguel Angel 78, Mexico, D.F. C.P., Mexico

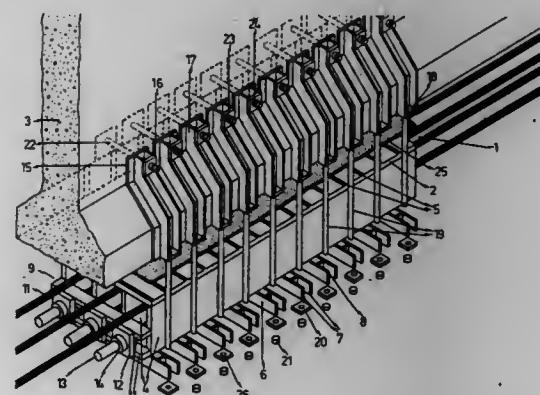
Filed Dec. 30, 1992, Ser. No. 998,480

Claims priority, application Mexico, Jan. 7, 1992, 9200051

Int. Cl.<sup>6</sup> E04C 3/20

U.S. Cl. 52—231

14 Claims



1. A friction connector for reinforcing or repairing reinforced or pre-stressed concrete girders comprising a web, an upper or compression section and a lower or tension section having a lower face with a predetermined width, said friction connector comprising:

a base plate having an upper face, a lower face, a width equal to the width of the lower face of the tension section of the girder and a length sufficient to provide a suitable friction force against the lower face of the tension section of the girder; means to press said upper face of said base plate against the lower face of the tension section of the girder; means for increasing the friction between said upper face of said base plate and the lower face of the tension section of the girder;

a plurality of elongated plates and reinforcing tendons, the elongated plates being integrally attached to said lower face of said base plate and extending longitudinally thereof in order to form longitudinal channels for permitting the passage of the reinforcing tendons therethrough;

at least one tendon-supporting beam attached to one of the end of each one of said elongated plates and extending perpendicularly thereto;

means for anchoring a layer of reinforcing tendons to said tendon-supporting beam; and

means for tightening said tendons against said tendon-supporting beam in order to increase the tensile strength of the tension section of the girder.

5,479,749

# STRUCTURAL SYSTEMS FOR SUPPORTING A BUILDING UTILIZING LIGHT WEIGHT STEEL FRAMING FOR WALLS AND HOLLOW CORE CONCRETE SLABS FOR FLOORS

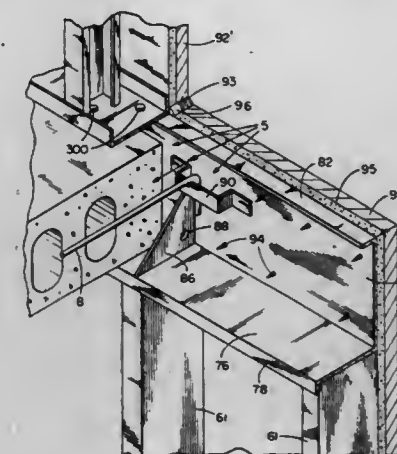
Thomas Colasanto, Commack, N.Y., and Thomas Nastasi, Jr., 331 Wheatley Rd., Old Westbury, N.Y. 11568, assignors to Marco Consulting Services, Inc., Commack, and Thomas Nastasi, Jr., Old Westbury, both of N.Y.

Continuation-in-part of Ser. No. 999,431, Dec. 31, 1992, which is a division of Ser. No. 493,794, Mar. 15, 1990, Pat. No. 5,113,631. This application Jul. 22, 1993, Ser. No. 94,697

Int. Cl.<sup>6</sup> E04B 1/38

U.S. Cl. 52—236.9

9 Claims



1. An improved structural system for supporting a building comprising:

a) first and second horizontal floor members and a plurality of light weight steel framed bearing wall panels, each panel comprising a horizontal bottom track attached to said first horizontal floor member and a plurality of vertical wall studs arranged at predetermined intervals along said bottom track; and

b) an exterior finish supporting member for attaching an exterior finish to at least one of said bearing wall panels, said supporting member comprising an elongated, generally L-shaped deck stud channel having an upper vertical leg having a vertical dimension at least as great as the height of said horizontal floor member, and a lower horizontal leg having a horizontal dimension at least as great as the width of said vertical wall studs and being supported on said vertical studs, said upper leg having a free end and an inwardly-extending horizontal flange secured to said free end thereof supporting a horizontal bottom track thereabove, said lower leg having a free end and a downwardly-extending vertical flange secured to said free end thereof which serves to properly position said channel on said vertical wall studs; and

c) a first inward extending attachment means attached to said supporting member to said second horizontal floor member.



5,479,750

## JOIST CAP

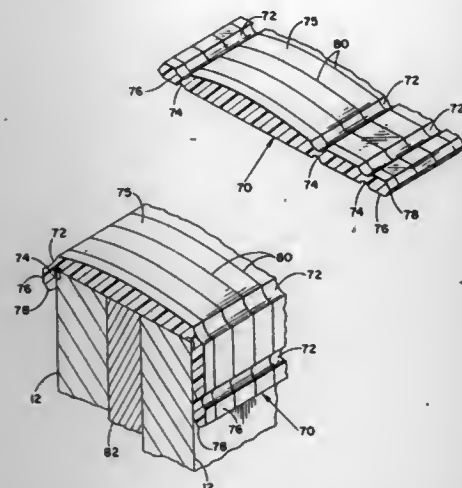
Stanley B. Carlberg, 6628 Manchester La., Eden Prairie, Minn. 55434

Filed Mar. 11, 1993, Ser. No. 29,518

Int. Cl.<sup>6</sup> E04H 12/00

U.S. Cl. 52—300

10 Claims



1. A joist cap adaptable to an end of a joist, comprising:
- an elongated water impermeable plate-like member having an upper surface and a lower surface and a length terminating in a pair of ends; and
  - a plurality of web means integrally formed into the plate-like member and extending the length thereof for facilitating bending of said plate-like member at said web means to conform said plate-like member to the end of the joist, said web means defined by a first groove in said upper surface and a second groove in said lower surface immediately opposite said first groove.

5,479,751

## METHOD AND APPARATUS FOR FABRICATION OF WOOD SUBSTITUTE CONTAINING CEMENT AND SYNTHETIC RESIN

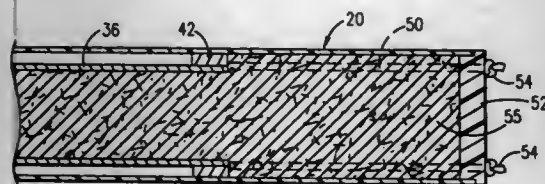
James E. White, 4904 Cottonwood Dr., Hutchinson, Kans. 67502

Filed Aug. 30, 1994, Ser. No. 298,031

Int. Cl.<sup>6</sup> E04C 3/34

U.S. Cl. 52—309.12

9 Claims



1. A wood substitute product comprising an elongated, tubular, preformed casing filled with a cured material comprising respective amounts of cement and synthetic resin foam material, said synthetic resin foam material being dispersed throughout the cured material, the synthetic resin foam material being present in a volumetric amount greater than the volumetric amount of said cement.

5,479,752

## PLANAR ROOFING MADE OF FOLDED METAL SHEETS

Fabio Menegoli, San Pietro, Italy, assignor to ISCOM S.r.l., Pescantina, Italy

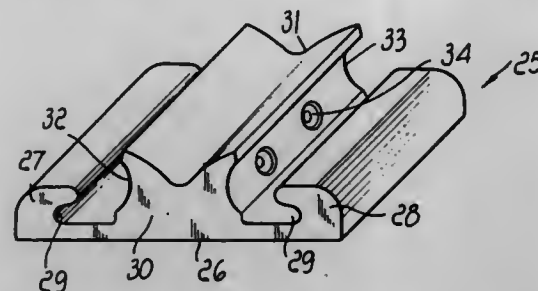
Filed Jul. 5, 1994, Ser. No. 267,765

Claims priority, application Italy, Jul. 8, 1993, VR93U0031; Apr. 14, 1994, VR94U0025

Int. Cl.<sup>6</sup> E04D 1/34

U.S. Cl. 52—549

12 Claims



1. A planar roofing made of folded metal sheets, which comprises a plurality of metal sheets in which two non-adjacent edges are complementarily folded so as to allow the coupling of two adjacent sheets by partial overlap, and a plurality of supporting retainer blocks, which can be anchored to a purlin for the roofing, wherein each supporting retainer block comprises a base portion for resting on the purlin, two lateral parallel portions that rise from the external part of the base portion, each lateral parallel portion having a cantilevered part so as to delimit a recess which is meant to accommodate a relatively deep fold or bend which is provided proximate to, and along, a folded edge of a respective metal sheet, each recess being inclined towards the respective raised portion by a preset angle, said supporting retainer blocks comprising furthermore an intermediate elevated portion which has a lateral recess that is directed towards each one of said recesses, runs parallel to them and delimits, in an upper region, a cradle which is meant to act as a support for a drainage channel delimited between two adjacent plates.

5,479,753

## PROCESS FOR SEALING A SLOPED METAL ROOF

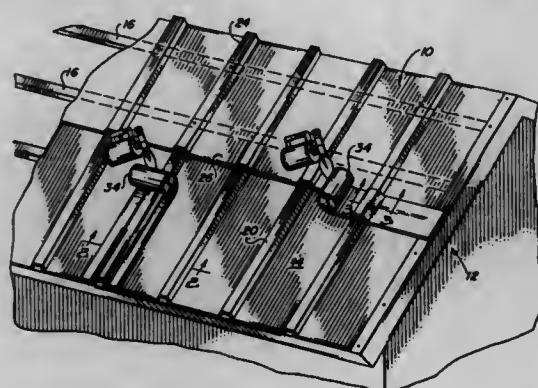
Charles T. Williams, 19153 Fruitport Rd., Spring Lake, Mich. 49456

Filed Aug. 31, 1994, Ser. No. 298,190

Int. Cl.<sup>6</sup> E04B 1/00

U.S. Cl. 52—741.4

13 Claims



1. A process for sealing a sloped metal roof wherein separate sheets of corrugated metal roof sheeting overlap to form roof seams and wherein such seams loosen and become leaky over a period of time, the process comprising:
- applying elongated strips of a flexible hot melt thermoplastic bituminous composite material over the seams and the edges of the roof surface immediately adjacent thereto but not over

the whole roof surface, the bituminous composite material having an elevated operating temperature that requires heating for the material to achieve a state where bonding on the metal roof will occur during application, the bituminous composite material, being heated to the operating temperature so as to become soft and semi-molten, the heated bituminous composite material conforming with the surface of the roof and the convolutions of the corrugations and bonding to the roof surface.

5,479,754

## METHOD AND APPARATUS FOR INSTALLING AND ELEVATOR SHAFT DOOR

Jean C. Pelvilain, Ponthierry, France, and Klaus Betzin, Berlin, Germany, assignors to Inventio AG, Hergiswil, Switzerland

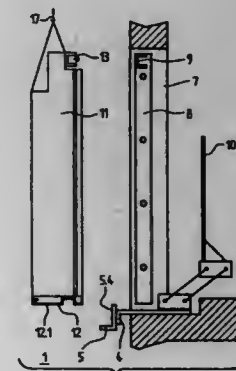
Filed Jan. 14, 1994, Ser. No. 181,347

Claims priority, application European Pat. Off., Jan. 14, 1993, 93100430

Int. Cl.<sup>6</sup> E04B 1/00

U.S. Cl. 52—745.16

16 Claims



1. A method for installing a pre-assembled elevator shaft door in an elevator shaft door opening comprising the steps of:
- orienting a bracket assembly having a predetermined length door carrier cut-out formed therein at a predetermined position in a threshold recess of an elevator shaft door opening of an elevator shaft and fixing said bracket assembly to the threshold recess;
  - orienting said door carrier cut-out to a desired height with respect to the threshold recess and fixing said door carrier cut-out at said desired height;
  - mounting generally vertically extending fastening plates on both sides of the shaft door opening at a first predetermined distance from said door carrier cut-out;
  - lifting a pre-assembled shaft door assembly up an elevator shaft to the shaft door opening and setting a lower end of the shaft door assembly down on said bracket assembly, the lower end of the shaft door assembly having a threshold carrier plate attached thereto, said threshold carrier plate having a pair of recesses formed therein spaced apart a second predetermined distance, said second predetermined distance being less than said first predetermined distance and said recesses detenting in said door carrier cut-out;
  - pivoting the shaft door assembly on said bracket assembly into a generally vertical position in the shaft door opening;
  - extending laterally locking bars mounted on the shaft door assembly into locking bar pockets mounted on said fastening plates and fixing said locking bars; and
  - bending outwardly tongues formed in said fastening plates, drawing laterally covering brackets mounted on the shaft door assembly into abutment with said fastening plates, bending said tongues over said covering brackets and fixing said covering brackets to the shaft door assembly.

5,479,755

## METHOD OF INSTALLING LOOPED BACKED CARPET

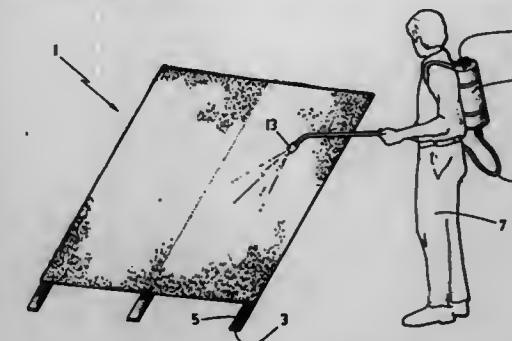
Joseph R. Pacione, Thronhill, Canada, assignor to Tac-Fast Systems SA, Switzerland

Continuation of Ser. No. 251,955, Jun. 1, 1994. This application May 18, 1995, Ser. No. 444,259

Int. Cl.<sup>6</sup> A47G 27/04

U.S. Cl. 52—746.1

18 Claims



1. A method of installing a looped backed carpet comprising the following steps:
- installing tape having upwardly facing hooks, onto a floor, the hooks removably covered to prevent premature attachment of the hooks to a carpet;
  - loose laying a carpet having a loop backing over top of the tape;
  - applying water to the carpet to allow the carpet fibres to absorb water;
  - waiting for a period to allow the carpet to achieve substantially maximum expansion;
  - removing the tape covering to attach the carpet to the floor in its substantially expanded state.

5,479,756

## APPARATUS INTEGRATING SYSTEM

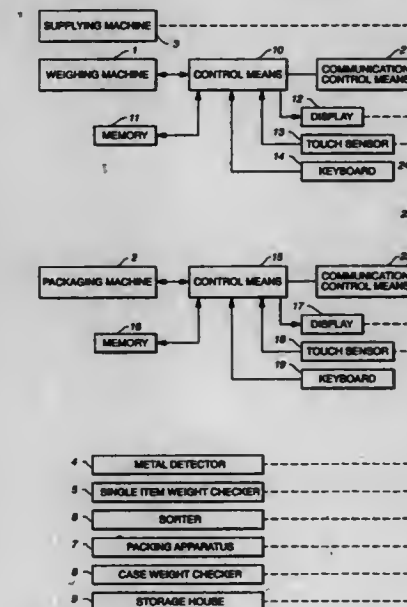
Setsuo Haze, Ryoji Nishimura, Masao Fukuda, and Satoshi Konishi, all of Shiga, Japan, assignors to Ishida Co., Ltd., Japan

Filed Jun. 3, 1994, Ser. No. 253,528

Int. Cl.<sup>6</sup> B65B 57/00; 57/18; 59/02; 1/32

U.S. Cl. 53—77

8 Claims



1. An apparatus integrating system comprising a group of apparatus including a weighing machine for weighing articles to be



supplied and a packaging machine for packaging weighed articles, said group of apparatus operating in a mutually coordinated manner; said system comprising:

- a master input means for allowing a user to enter and thereby setting conditions of system operation related to operations of all of said group of apparatus;
  - individual input means each separately associated with one of said group of apparatus for allowing a user to enter and thereby setting conditions of individual operation of said one apparatus and those of said apparatus operating in a mutually coordinated manner therewith;
  - a master memory means for storing said conditions of system operation and said conditions of individual operations;
  - a master display means for displaying said conditions of system operation and modes of operations of all of said group of apparatus;
  - individual display means each provided to one of said group of apparatus for displaying at least said conditions of individual operation and mode of operation of said group of apparatus;
  - individual control means each provided to one of said group of apparatus for controlling said one apparatus, said individual display means and said master display means according to inputs received through said master input means and said individual input means; and
  - a master control means for controlling said master memory means and said display means according to inputs received through said master input means and signals from said apparatus control means;
- said system further comprising communication means for transferring data among said apparatus control means and between said master control means and said apparatus control means.

5,479,757

## LABEL SUPPLYING APPARATUS

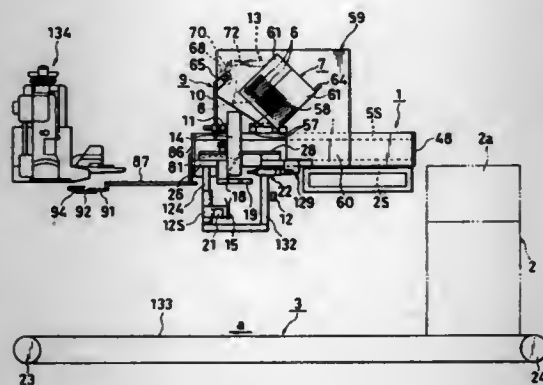
Koji Ogawa, Tokyo, Japan, assignor to Newlong Machine Works, Ltd., Tokyo, Japan

Filed Jun. 23, 1994, Ser. No. 264,808

Claims priority, application Japan, Jan. 12, 1994, 6-013087  
Int. Cl.<sup>6</sup> B65B 61/14

U.S. Cl. 53—135.1

7 Claims



1. A label supplying apparatus for supplying a label to the mouth of a bag, comprising:

- a bag conveying means for conveying a bag in an upstanding posture along a conveying path;
- a table disposed upwardly of said bag conveying means;
- a first guide-and-feed means disposed between said bag conveying means and said table, for guiding and feeding the mouth of the bag along the conveying path of said conveying means while gripping the mouth of the bag;
- a label magazine for storing a plurality of labels, said label magazine being disposed upwardly of said table and having an access opening;
- a label takeout mechanism disposed near said access opening of said label magazine and having a swing arm and a suction cup

mounted on a distal end of said swing arm for attracting and releasing one, at a time, of the labels stored in said label magazine;

- a bag detecting means disposed downwardly of said table, for detecting the bag conveyed by said bag conveying means;
- a first actuator means responsive to a detection signal from said bag detecting means, for angularly moving said swing arm of the label takeout mechanism;
- a label guide for downwardly guiding the label released from said suction cup of the label takeout mechanism;
- a label receiving means disposed downwardly of said label guide, for receiving the label guided downwardly by said label guide;
- a label detecting means for detecting the label received by said label receiving means;
- a first and a second label delivery means disposed between said label guide and said label receiving means and movable toward and away from each other, for gripping and transferring a label in a direction substantially perpendicular to said conveying path;
- a second actuator means responsive to a detection signal from said label detecting means, for relatively moving said first and second label delivery means toward and away from each other;
- a second guide-and-feed means disposed upwardly of said bag conveying means in series with said first guide-and-feed means, for guiding and feeding the mouth of the bag guided and fed by said first guide-and-feed means while gripping the mouth of the bag and a label together; and
- a label drawing means disposed near said first and second label delivery means, for drawing the label delivered by said first and second label delivery means toward the mouth of the bag guided and fed by said first guide-and-feed means, in cooperation with said second guide-and-feed means.

5,479,758

## COVERING FOR FLOWER POT AND FLORAL GROUPING

Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.

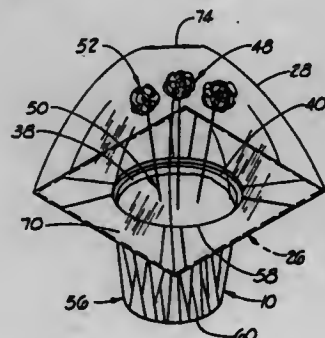
Continuation of Ser. No. 1,001, Jan. 6, 1993, Pat. No. 5,307,606, which is a continuation-in-part of Ser. No. 865,563, May 21, 1992, Pat. No. 5,245,814, which is a continuation of Ser. No. 649,379, Jan. 31, 1991, Pat. No. 5,111,638, which is a continuation of Ser. No. 249,761, Sep. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 219,083, Jul. 13, 1988, Pat. No. 4,897,031, which is a continuation of Ser. No. 4,275, Jan. 5, 1987, Pat. No. 4,773,182, which is a continuation of Ser. No. 613,080, May 22, 1984, abandoned. This application Jan. 14, 1994, Ser. No. 183,010

The portion of the term of this patent subsequent to May 3, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B65B 25/02; 43/08; 5/02; 47/00

U.S. Cl. 53—410

21 Claims



1. A method for providing a covering for use with a pot having a floral grouping disposed therein, the pot having a top and a bottom and an outer peripheral surface, and the floral grouping

having a stem end and a bloom end with the floral grouping extending a distance upwardly from the top of the pot terminating with the bloom end, the method comprising:

- providing a sheet of material having an upper surface, a lower surface and an outer peripheral surface, a sheet extension being connected to the sheet of material and the sheet extension extending a distance from the outer peripheral surface of the sheet of material;
- forming the sheet of material into a pot cover having a top, a bottom and a cover opening extending through the top a distance toward the bottom of the pot cover providing a pot receiving space shaped and adapted to receive the pot, the sheet extension extending a distance from the pot cover;
- placing the pot in the pot cover with the top of the pot being disposed in the top of the pot cover and the floral grouping extending a distance upwardly from the top of the pot cover; and
- forming the sheet extension about the floral grouping.

5,479,759

## METHOD AND APPARATUS FOR PACKAGING FOOD

Michael P. Gorlich, and Robert F. McPherson, Jr., both of Hilton Head Island, S.C., assignors to World Class Packaging Systems, Inc., Hilton Head Island, S.C.

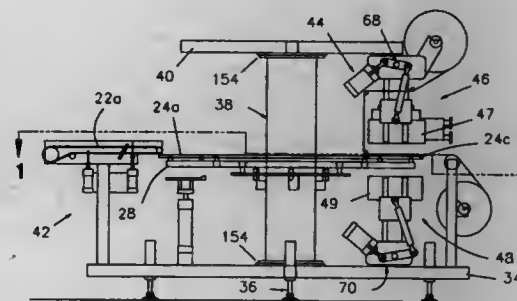
Continuation of Ser. No. 154,756, Nov. 18, 1993, Pat. No. 5,419,097. This application Dec. 21, 1994, Ser. No. 360,567

The portion of the term of this patent subsequent to May 30, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> B65B 31/04

U.S. Cl. 53—432

44 Claims



1. An apparatus for making modified atmosphere packages comprising:

- a plurality of packaging stations, including at least one station for loading a food product into trays;
- a rotary conveyor for moving said trays from one station to the next, said rotary conveyor including a platform for carrying a plurality of trays;
- one of said packaging stations adapted to load said trays on said platform, and another of said stations adapted to unload said trays from said platform;
- an apparatus for replacing the ambient atmosphere in said trays with an atmosphere reduced in oxygen content;
- a mechanism for displacing said platform from a first position on one of said stations upwardly to a second position still aligned with said station; and
- one of said stations including means for severing a film from a continuous web and means for heat sealing the film to a tray.

5,479,760

## CLAMSHELL PACKAGING MACHINE AND METHOD

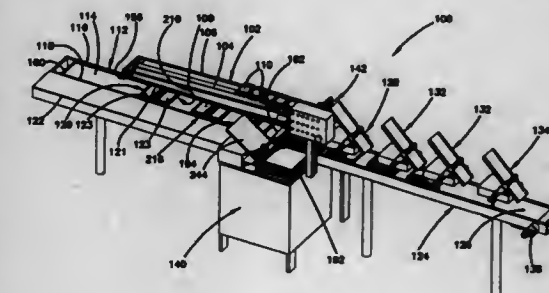
Howard C. Petrell, 23025 Mobile St., West Hills, Calif. 91307

Filed Dec. 6, 1993, Ser. No. 163,050

Int. Cl.<sup>6</sup> B65B 35/30; 61/20

U.S. Cl. 53—445

8 Claims



1. A method for inserting a wrap into an envelope formed by a rigid body of a clamshell and a flexible cover of the clamshell comprising the steps of:

- positioning the clamshell in a predetermined orientation;
- positioning the wrap in a predetermined location substantially coplanar with and adjacent to the opening of the envelope;
- suspending the wrap in air;
- directing air flow across the wrap and toward the envelope opening;
- propelling the wrap while suspended in air into the envelope opening;
- opening the clamshell by increasing the distance between the clamshell body and the clamshell cover; and
- inserting a video cassette into the clamshell.

5,479,761

## METHOD OF WRAPPING A FOOD ITEM

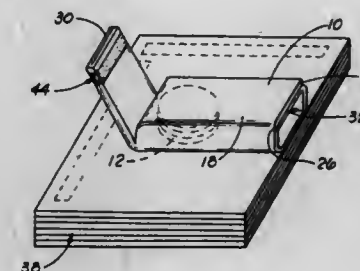
Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.

Continuation of Ser. No. 922,972, Jul. 30, 1992, abandoned, which is a continuation-in-part of Ser. No. 803,318, Dec. 4, 1991, Pat. No. 5,344,016, which is a continuation-in-part of Ser. No. 707,417, May 28, 1991, abandoned, which is a continuation of Ser. No. 502,358, Mar. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 391,463, Aug. 9, 1989, abandoned, which is a continuation-in-part of Ser. No. 249,761, Sep. 26, 1988, abandoned. This application Apr. 15, 1994, Ser. No. 228,338

Int. Cl.<sup>6</sup> B65B 11/48; 67/08

U.S. Cl. 53—461

4 Claims



1. A method of preparing a wrapped food item at a food preparation center, comprising the steps of:

- preparing a food item;
- providing a plurality of flexible sheets of material, each flexible sheet of material having a first side, a second side opposite the first side, a third side, a fourth side opposite the third side, an upper side, and a lower side, the plurality of flexible sheets of material together comprising a pad of flexible sheets of material, each flexible sheet of material having a bonding material



disposed on the lower surface thereof and extending a distance along at least the first side and the third side thereof; disposing the food item on the upper surface of the top sheet of the pad of flexible sheets of material; folding the first side of the flexible sheet of material over the food item; folding the second side of the flexible sheet of material over the food item and the first side of the flexible sheet of material, so as to cause the second side to overlap the first side, the second side being bondingly connected to the first side by the bonding material disposed on the lower surface of the flexible sheet of material along the first side thereof; folding the third side of the flexible sheet of material over the food item, the first side, the second side, the third side being bondingly connected to the second side by a portion of the bonding material on the third side of the flexible sheet of material; and folding the fourth side of the flexible sheet of material over the third side and the food item, the first side, the second side, and the third side of the flexible sheet of material, the fourth side being bondingly connected to the third side by another portion of the bonding material disposed on the lower surface of the flexible sheet of material near the third side whereby the food item is completely enclosed within the flexible sheet of material thereby providing a wrapped food item for delivery to a customer at the food preparation center.

5,479,762

## CARRIER PUCK

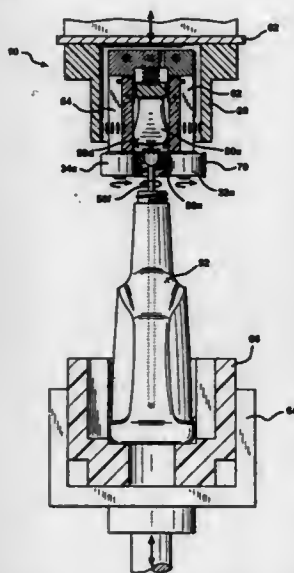
Gary S. Bliss, Beavercreek, Ohio, assignor to Dowbrands L.P., Indianapolis, Ind.

Filed May 6, 1994, Ser. No. 239,018

Int. Cl.<sup>6</sup> B65B 7/28

U.S. Cl. 53—490

17 Claims



1. A puck for releasably gripping a closure element to be moved along a predetermined path and mated to a container in combination with drive apparatus, said puck comprising:

- a main body adapted to be moved by a transport device along said predetermined path; and
- a gripper assembly associated with said main body for releasably gripping said closure element prior to and during mating with said container, said gripper assembly including at least one support arm having at least one gripper member rotatably mounted thereon for engaging said closure element and being rotatable independently of said support arm and driven by the drive apparatus relative to said support arm so as to effect rotation of said closure element to permit said closure element to mate with said container.

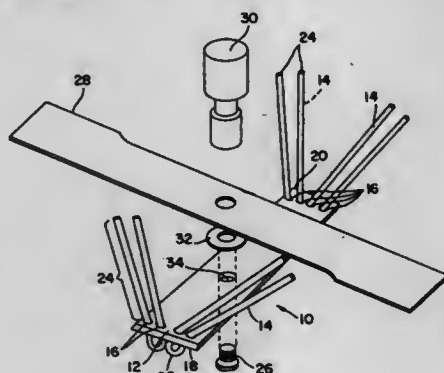
5,479,763  
ROTARY FILAMENT ASSEMBLY AND METHOD  
John E. Coble, Marietta, Ga., assignor to Environmental Blades, Inc., Marietta, Ga.

Filed Jan. 21, 1994, Ser. No. 184,956

Int. Cl.<sup>6</sup> A01D 34/73

U.S. Cl. 56—12.7

27 Claims



14. A method of using a horizontally disposed rotary member to produce lawn mulch, comprising the steps of: providing said horizontally disposed rotary member with a mount; bringing a resilient monofilament into communication with said mount so that said resilient monofilament is removably attached to said horizontally disposed rotary member and a free portion of said resilient monofilament protrudes from said horizontally disposed rotary member and points substantially upwardly out of said horizontally disposed rotary member; and attaching said horizontally disposed rotary member to a drive shaft of a power lawn mower; whereby operation of said power lawn mower causes said resilient monofilament to reduce fragments of cut vegetation into fine particles suitable for lawn mulch.

5,479,764

NONPOWERED DISC SCALPING APPARATUS FOR SUGAR BEETS AND LIKE PLANTS

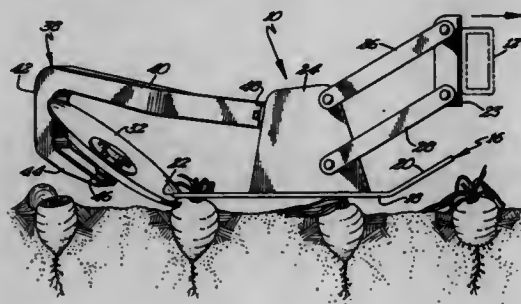
Paul R. Crummy, Rte. 1, Box 108A, and Kevin M. Crummy, P.O. Box 15, both of Argyle, Minn. 56713

Filed Nov. 30, 1993, Ser. No. 159,377

Int. Cl.<sup>6</sup> A01D 23/02

U.S. Cl. 56—121.4

20 Claims



1. Nonpowered scalping apparatus movable along a ground surface in a horizontal movement direction parallel to a row of plants having at least portions embedded in the ground surface comprising, in combination: a disc having a circular periphery; and means for rotatably mounting the disc about an axis which is tilted at an acute angle to the ground surface in a plane which is generally perpendicular to the ground surface and which is substantially nonparallel to the horizontal movement direction and the row, with the disc being held at the acute angle when the scalping

apparatus is moved in the horizontal movement direction with the plants engaging the circular periphery of the disc while the disc moves in the horizontal movement direction causing the disc to rotate without being powered.

5,479,765

TWO ELEMENT, EXTENDIBLE, LAWN EDGER BLADE COMBINATION

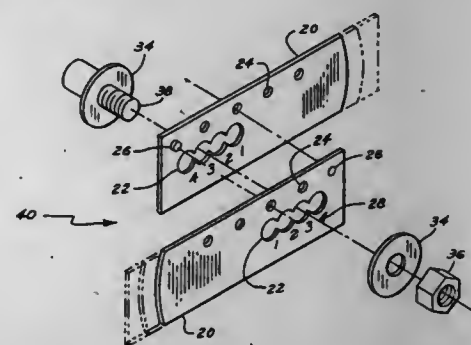
Albert Wall, 515 S. Crescent Ave., Lodi, Calif. 95240, and G. Warren Holly, 5815 Morgan Pl. #35, Stockton, Calif. 95219

Filed Mar. 16, 1995, Ser. No. 405,099

Int. Cl.<sup>6</sup> A01D 34/84

U.S. Cl. 56—256

6 Claims



1. A cutter blade assembly for a lawn edging device comprising: first and second blade members connectable to a powered drive shaft, said blade members having a cutting edge end and a mounting end, wherein the mounting ends are positioned side-by-side for connection therebetween, said mounting ends including stepped mounting holes spaced at regular intervals so that extending the cutting blades from one mounting position to the next will result in an equal and balanced outward extension of the combined length of the two blades, thereby compensating for wear on the cutting edge ends of said two blades, connecting means for insertion through said stepped mounting holes for connecting the first and second blade members and means for preventing relative rotation between the first and second blade members when connected.

5,479,766

BALING APPARATUS AND METHOD

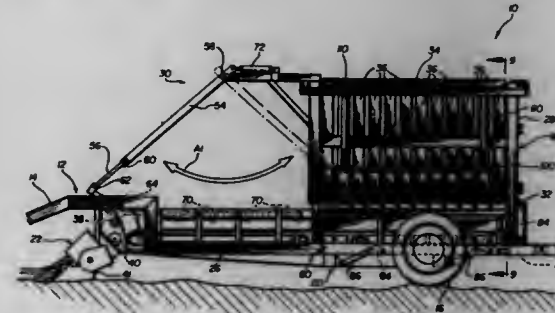
Woodbury S. Ransom, 14 Elm Rd., Bolinas, Calif. 94924

Filed Jul. 6, 1994, Ser. No. 271,327

Int. Cl.<sup>6</sup> A01D 87/02; A01F 15/02; 15/04

U.S. Cl. 56—341

27 Claims



1. An apparatus for baling material comprising: a bale chamber having a material receiving opening for receiving balable material from beneath said bale chamber, said material receiving opening located at a lower portion of said chamber and said bale chamber having a bale discharge

opening located at an upper portion of said chamber for discharge of a bale formed in said bale chamber; delivery means for delivering balable material beneath the bale chamber and adjacent the material receiving opening of said bale chamber; periodic compression means for periodically compressing balable material adjacent said material receiving opening into the bale chamber to thereby compress material within the bale chamber to form a bale of material and for periodically retracting to a position spaced apart from the material receiving opening to permit material to be conveyed adjacent the material receiving opening of the bale chamber by said delivery means; and selectively actuable supporting means for supporting the material contained in said bale chamber and located at or above said material receiving opening of said bale chamber during retraction of the compression means, said supporting means being retractable to a non-support position during compression by the compression means.

24. A method for forming bales of material comprising the steps of:

- forming and transporting a mat of baling material from an area containing the material;
- periodically separating and delivering a segment of the mat of baling material to an area beneath a bale chamber and adjacent a material receiving opening of said bale chamber and thereafter;
- upwardly compressing each said segment of baling material into the bale chamber through the material receiving opening of the bale chamber, the compression forming a substantially horizontal compressed layer of fibrous material that becomes part of the bale; and
- supporting from below any compressed layers in the bale chamber after completion of each compressing step.

5,479,767

TRASH BAFFLE FOR ROUND BALER

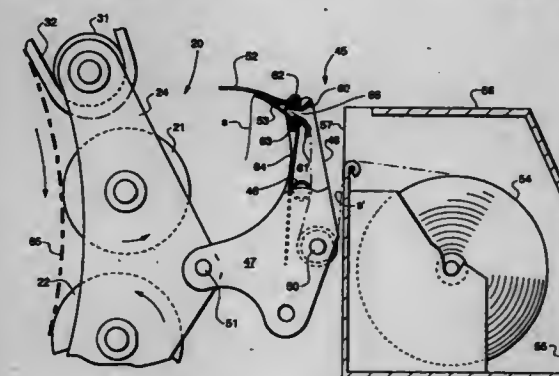
John R. McClure, New Holland, and Steven C. Schlotterbeck, Leola, both of Pa., assignors to New Holland North America, Inc., New Holland, Pa.

Filed Sep. 23, 1994, Ser. No. 311,656

Int. Cl.<sup>6</sup> A65B 11/04; A01D 39/00

U.S. Cl. 56—343

10 Claims



1. A round baler for forming crop material into cylindrical bales, said baler having a main frame, a tailgate pivotally connected to said main frame, a sledge assembly mounted on said main frame for movement between a bale starting position and a full bale position, said sledge assembly including conveying means having a crop engaging surface extending transversely of said main frame, an apron movably supported along a continuous path on said main frame and on said tailgate, said apron path having an inner course that cooperates with said conveying means on said sledge assembly to define a bale forming chamber, a pickup for feeding crop material into said chamber, and



dispensing means carried on said sledge assembly for dispensing sheet material into said bale forming chamber so that said sheet material is wrapped circumferentially around a cylindrical package of crop material contained in said bale forming chamber to form a bale,

said dispensing means pivotally mounted on said sledge assembly for movement between an extended position at which said sheet material is dispensed into said bale forming chamber and a retracted position,

the improvement comprising

baffle means mounted on said dispensing means,

said baffle means disposed between said sheet material and said conveying means, under conditions where said dispensing means is in said retracted position, to shield said sheet material from stray crop material and other debris.

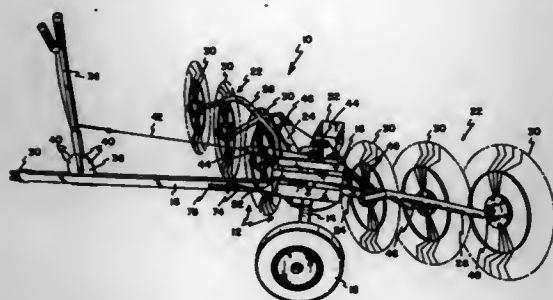
5,479,768

## TURF CARE IMPLEMENT

Allen J. Hettich, 6200 S. Shore Dr., Aberdeen, S. Dak. 57401  
Continuation of Ser. No. 87,195, Jul. 2, 1993, abandoned. This application Jun. 16, 1995, Ser. No. 442,135  
Int. Cl.<sup>6</sup> A01D 78/14

U.S. Cl. 56—365

14 Claims



14. A turf care implement device configured for being towed, comprising:

a frame;

rolling means supporting the frame;

a rake assembly including a plurality of wheel-type rakes mounted on a pair of support arms, wherein each of the support arms rotatably mounts on a pivoting lift arm;

arm-lifting means for raising and lowering the lift arms between a use position and storage position;

a cable and spring assembly including tension springs connecting to each lift arm and a cable attaching to and extending between the springs.

5,479,769

## METHOD AND APPARATUS FOR CONNECTING THE ENDS OF TWO ASSEMBLAGES OF THREADS

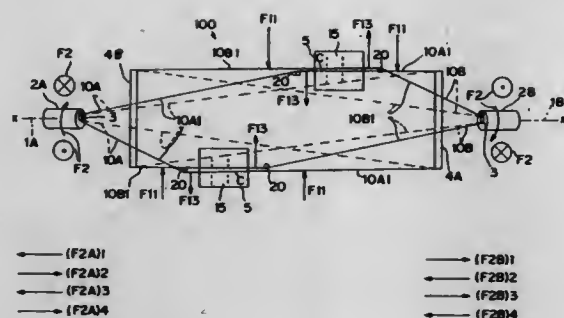
Jean Belloy, Riom; Pierre Jonville, Clermont-Ferrand, both of France, and Guido Valente, Salo, Italy, assignors to Compagnie Generale Des Etablissements Michelin - Michelin & Cie, Clermont Ferrand Cedex, France  
Continuation of Ser. No. 94,099, Aug. 3, 1993, abandoned.  
This application May 19, 1995, Ser. No. 445,162  
Claims priority, application France, Feb. 6, 1991, 91 01417  
Int. Cl.<sup>6</sup> D01H 15/00

U.S. Cl. 57—22

16 Claims

1. A method of connecting the ends of two assemblages of threads, each of the assemblages being formed by at least two threads twisted together in the same direction, each thread being a multifilament thread, the assemblages having the same number of threads, the method comprising:

(a) untwisting the ends of the assemblages in order to separate the threads of these ends from each other so as, in this way, to obtain free ends of threads;



(b) forming as many junction pairs as there are threads in each of the assemblages, each pair comprising a free end of one thread of each assemblage;

(c) untwisting the filaments being in at least a part of each of the threads, in junction pairs, by untwisting means which employ air;

(d) placing the untwisted parts side by side in each junction pair as so to obtain a junction region, the junction regions being shifted axially from each other;

(e) assembling the filaments of the two threads together by air splicing in each of these junction regions;

(f) assembling together all of the threads thus combined by twisting in the direction of twist of the assemblages; and

(g) performing the untwisting step (a) above to separate the threads of the ends of the assemblages and the assembling step (f) above by using spaced apart rotating means which act separately and in the same manner on an intermediate part of each of the assemblages in such a manner that, for each assemblage, the untwisting and the twisting operations occur with rotations in opposite directions, the spaced apart rotating means moving apart from each other during the untwisting step (a) and approaching each other during the twisting of the assembling step (f).

5,479,770

## CLEANING RESERVE SURFACES OF RING-SPINNING OR -TWISTING SPINDLES

Jakob Bothner, Göppingen, and Friedrich Dinkelmann, Alfdorf, both of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Germany

Filed Nov. 30, 1994, Ser. No. 346,676

Claims priority, application Germany, Dec. 15, 1993, 43 42 773.1

Int. Cl.<sup>6</sup> D01H 1/38; 4/36

U.S. Cl. 57—303

17 Claims

1. In combination with a longitudinally extending row of spindles rotatable about respective parallel axes lying in a common longitudinal plane and each having an upper package-forming region, a lower reserve surface, and a contact surface all having centers of curvature on the axis,

an apparatus for cleaning yarn windings from the lower reserve surfaces, the apparatus comprising:

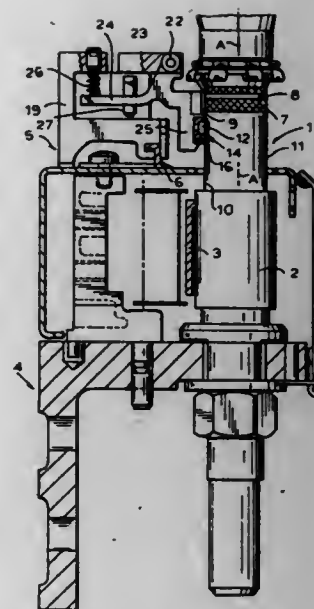
a carriage displaceable longitudinally along the row parallel to the plane past the spindles;

a blade mounted on the carriage and having an edge juxtaposable with each of the reserve surfaces as the carriage moves along the row;

a spacer mounted on the carriage, fixed thereon relative to the blade, and engageable with the contact surfaces of the spindles as the carriage moves along the row;

spring means urging the spacer and blade transversely of the plane toward the spindles, whereby a transverse spacing between the blade and the reserve surfaces decreases as the spacer wears;

sensor means for detecting the transverse spacing between the blade and the reserve surfaces; and



control means for emitting an output when the detected transverse spacing falls below a predetermined threshold.

5,479,771

## METHOD AND DEVICE FOR MANUFACTURING A TWISTED YARN

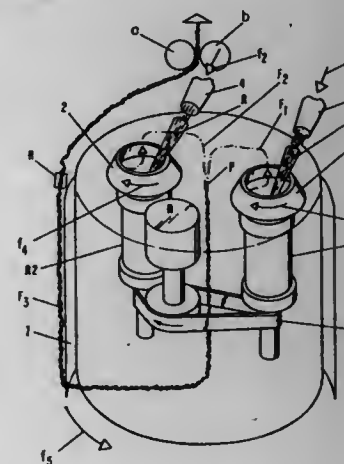
Ulrich Ballhausen, Aachen; Gustav Franzen, Willich; Rainer Lorenz, Nettetal; Ulrich Lossa, Krefeld, and Guido Spix, Kaarst, all of Germany, assignors to Palitex Project-Company GmbH, Krefeld, Germany

Filed Sep. 16, 1994, Ser. No. 310,695

Int. Cl.<sup>6</sup> D01H 4/08; 4/38

U.S. Cl. 57—406

18 Claims



1. A method for manufacturing a yarn from fiber material, said method comprising the steps of:

providing at least two spinning devices arranged adjacent to one another;

dissolving fiber material and feeding the dissolved fiber material to said at least two spinning devices;

generating with each said spinning device an individual spun fiber;

combining said individual spun fibers at an inlet opening of a hollow spindle axle to a yarn;

twisting said yarn in a two-for-one twisting operation by first passing said yarn in a first yarn feeding direction through said hollow spindle axle to an outlet opening of said hollow spindle axle, guiding said yarn substantially radially from said

outlet opening of said hollow spindle axle, and then guiding said yarn in a second yarn feeding direction counter to said first yarn feeding direction, wherein said yarn forms a yarn balloon rotating in a direction of rotation about said at least two spinning devices;

arranging a centering element on an axis extending along said hollow spindle axle so as to be spaced from said inlet opening of said hollow spindle axle; and

feeding said yarn from said yarn balloon via said centering element to a winding device.

5,479,772

## FILM COOLING STARTER GEOMETRY FOR COMBUSTOR LINERS

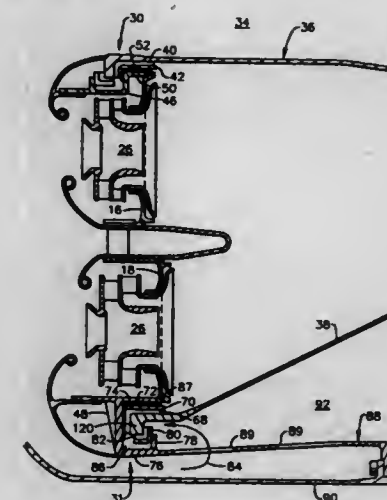
Ely E. Halila, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 897,699, Jun. 12, 1992, abandoned. This application Dec. 16, 1993, Ser. No. 167,102

Int. Cl.<sup>6</sup> F02C 7/32; F23R 3/08

U.S. Cl. 60—39.32

9 Claims



1. An improved film starter structure for a combustor of a gas turbine engine, the combustor having an outer annular liner and an inner annular liner, an axially forward section of each of the inner and outer liners being coupled to a combustor dome, high pressure compressor air being directed onto the combustor dome and the liners for mixing with fuel for combustion and for cooling the surfaces of the liners by establishing a uniform insulative film of cooling air on the internal liner surfaces, the structure comprising:

a plurality of circumferentially spaced, axially extending ribs formed on a radially outer surface of the forward section of the inner liner generally adjacent the combustor dome, said ribs defining a plurality of spaced slots;

an annular inner ring overlying said ribs and slots of the inner liner for defining a plurality of air passages;

a support extending from the combustor dome for supporting the inner liner to the dome;

means for defining an air chamber for introducing compressor discharge air into said air passages, the compressor discharge air exiting said air passages along the radially outer surface of the inner liner for establishing a cooling film barrier on the combustor liner surface; and

a spring seal disposed between the combustor dome and said annular ring for urging said annular ring against said ribs.



5,479,773

## TANGENTIAL AIR ENTRY FUEL NOZZLE

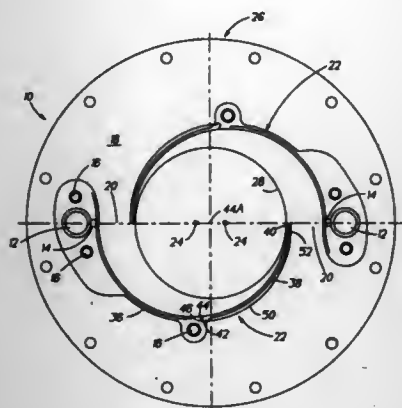
Edward J. McCoomb, Springfield, Mass.; Thomas J. Rosfjord, South Windsor, Conn.; Michael P. Ross, Ellington, Conn.; Timothy S. Snyder, Glastonbury, Conn., and Steven A. Lozyniak, South Windsor, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 13, 1994, Ser. No. 322,629

Int. Cl.<sup>6</sup> F02C 7/32

U.S. Cl. 60—39.32

6 Claims



1. A tangential air entry fuel nozzle having a longitudinal axis, comprising:

- two cylindrical-arc scrolls having the center line of each offset from the other, overlapping ends of said scrolls forming an inlet slot therebetween;
- a combustor end endplate having a central opening for air and fuel egress;
- a remote end endplate;
- said scrolls each secured between said endplates;
- each scroll having a fixed vane and a floating vane, said fixed vane containing a fuel supply conduit and fixedly secured to said endplates; and
- each floating vane secured to a corresponding fixed vane, longitudinally slidable throughout at least the vast majority of its length, whereby unrestricted longitudinal differential expansion between said fixed vane and said floating vane is permitted.

5,479,774

## COMBUSTION CHAMBER ASSEMBLY IN A GAS TURBINE ENGINE

Anthony D. Burnell, Bristol, England, and Peter D. Price, Newport, Wales, assignors to Rolls-Royce plc, London, England

PCT No. PCT/GB92/00745, § 371 Date Jan. 24, 1994, § 102(e) Date Jan. 24, 1994, PCT Pub. No. WO92/19915, PCT Pub. Date Nov. 12, 1992

PCT Filed Apr. 23, 1992, Ser. No. 137,129

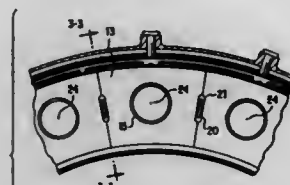
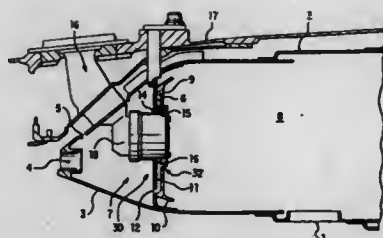
Claims priority, application United Kingdom, Apr. 30, 1991, 9109278

Int. Cl.<sup>6</sup> F02C 3/14

U.S. Cl. 60—39.36

9 Claims

1. A combustion chamber for a gas turbine engine comprising: a combustion chamber having an annular end wall, the end wall defining an upstream end of the chamber and having first entry and exit apertures and second entry and exit apertures; a plurality of fuel injector means, associated with the first entry and exit apertures, for introducing plumes of a fuel and air mixture into the combustion chamber, the plumes being capable of overlapping; and a source of high pressure air on the upstream side of the end wall communicating with the first and second entry and exit



apertures, the second entry and exit apertures directing the high pressure air into and dispersing overlapped plumes; wherein the end wall comprises an internal bulkhead and a heat shield spaced from the bulkhead, the second entry apertures are located in the bulkhead and the second exit apertures are located in the heat shield co-axially aligned with the second entry apertures in the bulkhead.

5,479,775

## AIR-COMPRESSING FUEL-INJECTION INTERNAL-COMBUSTION ENGINE WITH AN EXHAUST TREATMENT DEVICE FOR REDUCTION OF NITROGEN OXIDES

Michael Kraemer, Notzingen; Friedrich Wirbeleit, Ruedern; Christian Enderle, Baltmannsweiler; Walter Friess, Stuttgart; Bernd Krutzsch, Denkendorf; Gert Withalm, Ebersbach; Christof Schoen, Weinstadt; Leopold Mikulic, Aichwald; Gernot Hertweck, Fellbach, and Frank Thoma, Stuttgart, all of, Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

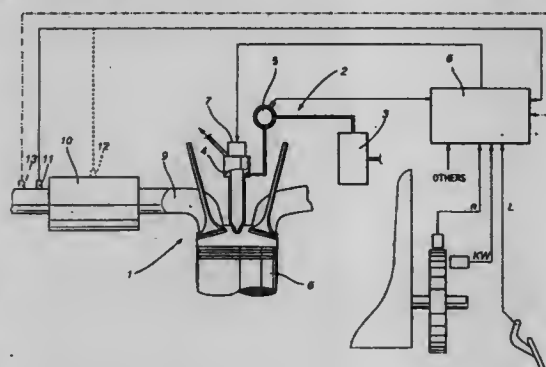
Filed Apr. 25, 1994, Ser. No. 232,807

Claims priority, application Germany, Apr. 23, 1993, 43 13 348.7

Int. Cl.<sup>6</sup> F01N 3/20

U.S. Cl. 60—274

18 Claims



1. An air compressing fuel-injection type internal combustion engine arrangement comprising: a variable volume combustion chamber which provides for engine operating cycles with compression, ignition, expansion and exhaust of a fuel and air mixture supplied to the combustion chamber,

an exhaust treatment device for supplying reducing agents to reduce nitrogen oxides in the exhaust from the combustion chamber,

a temperature sensor for sensing the temperature in the region of the exhaust treatment device, to thereby control operation of the exhaust treatment device, and

a fuel injection system including a high pressure pump and a fuel injection nozzle opening to the combustion chamber, said fuel injection system providing for primary fuel injection through the fuel injection nozzle to the combustion chamber during a first stage of the engine operating cycle to facilitate primary combustion in said combustion chamber and providing for secondary fuel injection to the combustion chamber during a second stage of the engine operating cycle to affect the effectiveness of the exhaust treatment device,

wherein said secondary fuel injection is provided as a supplementary fuel injection by way of the same fuel injection nozzle as the primary fuel injection and spaced by a time interval from the primary fuel injection with the supplementary fuel injection occurring at the earliest toward the end of the combustion phase after ignition top dead center in the combustion chamber, and

wherein the supplementary injection which follows the primary injection with a time interval within an operating cycle, is merely a nitrogen oxide reducing late supplementary injection, which takes place between 80° after ignition top dead center and the bottom dead center operation of the combustion chamber.

5,479,777

## TORQUE AND SPEED CONTROL METHODS AND APPARATUS FOR PNEUMATIC MOTORS

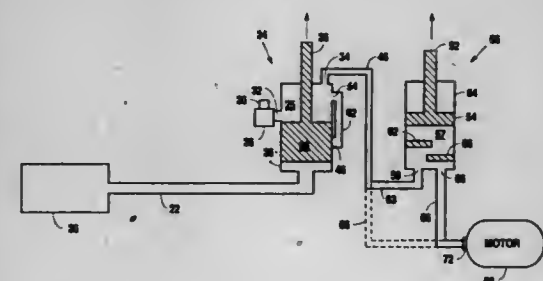
Thomas J. Mickel, Jupiter, and Stewart W. Willason, Palm Beach Gardens, both of Fla., assignors to Mednext Inc., Riviera Beach, Fla.

Filed Apr. 15, 1994, Ser. No. 227,856

Int. Cl.<sup>6</sup> F16D 31/00; 31/02

U.S. Cl. 60—327

4 Claims



1. A method of iteratively adjusting the compressible gas volume in a pneumatic accumulator connected to a pneumatic motor, the method comprising

- providing proportionally controlled pressurized gas to the pneumatic accumulator;
- measuring transient relative motor torque for the motor;
- choosing a desired change in transient relative motor torque;
- adjusting the pneumatic accumulator compressible gas volume to achieve said desired change in transient relative motor torque;
- comparing compensated and uncompensated motor speed rise times to obtain a rise time change;
- returning to said choosing step to establish a new desired change in transient relative motor torque if said rise time change is not acceptable;
- measuring motor run-on time; and
- adjusting said motor run-on time and returning to said choosing step to establish a new desired change in transient relative motor torque if said motor run-on time is not acceptable.

2. A torque and speed control for insertion between a pressurized gas supply and a pneumatic motor, comprising

- a proportional gas control valve comprising a piston which fits sealingly and slidingly within a valve body and having a pressurized gas inlet for communication with the pressurized gas supply and a proportionally controlled gas outlet;
- a pneumatic accumulator having a compressible gas volume, an accumulator gas inlet communicating with said proportionally controlled gas outlet, and an accumulator gas outlet for communicating with the pneumatic motor;

5,479,776

## CONTROL DEVICE OF A BICYCLE GEAR CHANGE

Antonio Romano, Padova, Italy, assignor to Campagnolo S.r.l., Vicenza, Italy

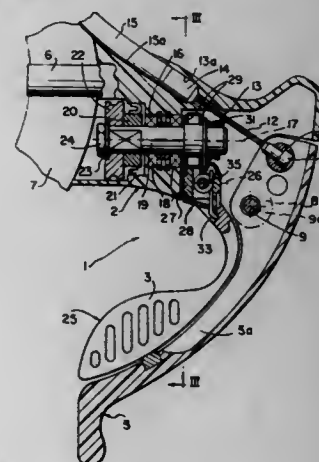
Filed Mar. 18, 1994, Ser. No. 214,488

Claims priority, application Italy, Apr. 20, 1993, TO93A0263

Int. Cl.<sup>6</sup> F16C 1/10; G05G 11/00

U.S. Cl. 74—502.2

3 Claims



1. A control device for a gear change mechanism, for a bicycle having a handle bar, said control device comprising:

- a gear change flexible control cable,
- a support body fixable onto the handle bar of the bicycle,
- a gear change operating rotor having an axis and rotatably mounted in the support body for rotation in opposite directions around said axis, said operating rotor carrying winding up means for said gear change flexible control cable,
- indexing means carried by the operating rotor and by the support body, respectively, and adapted to cooperate therebetween so as to define a plurality of steady positions of said operating rotor corresponding to engagement of the various speed ratios which can be selected with the gear change mechanism,
- an intermediate support member rotatably mounted on said axis of the operating rotor,



means for adjusting said accumulator compressible gas volume to obtain effective reduction of motor torque transients due to gas pressure transients, and a dump valve exhaust port within said valve body which, when not closed by said gas control valve piston, communicates with said proportionally controlled gas outlet and which is coupled to said proportional gas control valve through said gas control valve piston, said exhaust port being substantially open when said proportional gas control valve pressurized gas inlet is closed by said gas control valve piston, and said exhaust port being substantially closed when said proportional gas control valve pressurized gas inlet is at least partially open.

5,479,778

### HYDRAULIC CONTROL SYSTEM FOR CONSTRUCTION MACHINES

Tsukasa Toyooka, Ibaraki; Toichi Hirata, Ushiku; Genroku Sugiyama, Ibaraki, and Akira Tatsumi, Tokyo, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

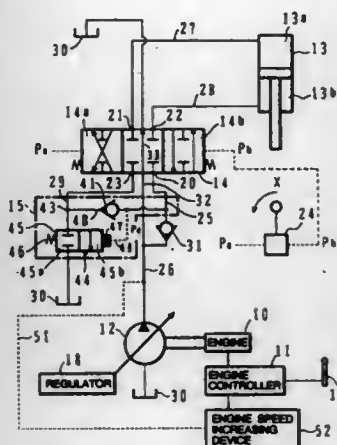
Filed Dec. 1, 1994, Ser. No. 352,807

Claims priority, application Japan, Dec. 2, 1993, 5-303019

Int. Cl.<sup>6</sup> F16D 31/02; F04B 49/00

U.S. Cl. 60—431

14 Claims



1. A hydraulic control system for construction machines, comprising an engine, engine control means for controlling a rotational speed of said engine, a hydraulic pump driven by said engine, a hydraulic actuator driven by a hydraulic fluid delivered from said hydraulic pump, a directional control valve for controlling a flow of the hydraulic fluid supplied from said hydraulic pump to said hydraulic actuator, and recovery means for recovering a return fluid from the hydraulic actuator to the supply side of said hydraulic actuator when the pressure of the hydraulic fluid supplied to said hydraulic actuator is smaller than a first predetermined value, wherein said hydraulic control system further comprises:

- detecting means for detecting the pressure of the hydraulic fluid supplied to said hydraulic actuator, and
- engine speed increasing means for controlling said engine control means to approximately simultaneously increase the rotational speed of said engine when the detected pressure is higher than said first predetermined pressure and a cessation of the recovering action of the recovery means is detected.

### 5,479,779 DEVICE FOR THE PREVENTION OF THE ABUSE OF DRY-PLATE CLUTCHES

Hans P. Havdal, Kongsberg, Norway, assignor to Kongsberg Automotive A/S, Norway

PCT No. PCT/N092/00202, § 371 Date Sep. 12, 1994, § 102(e) Date Sep. 12, 1994, PCT Pub. No. WO93/13328, PCT Pub. Date Jul. 8, 1993

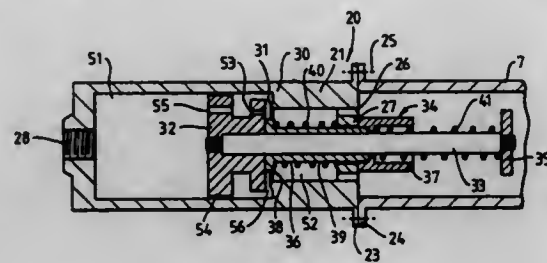
PCT Filed Dec. 18, 1992, Ser. No. 244,723

Claims priority, application Norway, Dec. 20, 1991, 915047

Int. Cl.<sup>6</sup> F15B 7/00; 7/10

U.S. Cl. 60—591

7 Claims



1. In a device for the prevention of the abuse of a dry-plate clutch for a motor vehicle with a manual gearbox due to too rapid an engagement of the clutch, wherein the device acts jointly with a hydraulic master cylinder and a related slave cylinder for operation of the clutch, and the device includes a valve unit that is installed hydraulically in series with and between the master cylinder and the slave cylinder, the valve unit having a valve body and a valve housing having a valve seat for the valve body and a first and a second valve housing chamber located on each side of the valve seat and arranged to face the slave cylinder and the master cylinder, respectively, the valve unit opening when there is movement of the valve body from the valve seat and into the first valve housing chamber of the valve unit, the improvement comprising a first passage directly connecting the first and second valve chambers of the valve unit with each other to permit restricted fluid flow between the chambers when the valve body sits on the valve seat and the valve unit is closed, means for forcibly opening the valve unit when the clutch is located in a position between a position of maximum disengagement and a second position located close to the position in which the clutch begins to engage, and a spring arranged to exercise a force on the valve body to bias the valve body away from the valve seat, wherein the force exercised by the spring is greater than the force exercised on the valve body by the hydraulic fluid when the fluid flows towards the master cylinder during a predetermined normal rate of engagement of the clutch, but wherein the force exercised by the spring is less than the force exercised by the hydraulic fluid on the valve body when the clutch is engaged more rapidly than at said predetermined rate.

5,479,780

### CIRCULAR INTERNAL COMBUSTION ENGINE

Thomas J. McCabe, 4312 Le Bourget Ave., Culver City, Calif. 90232

Filed Aug. 29, 1994, Ser. No. 297,614

Int. Cl.<sup>6</sup> F02B 75/22; F02G 3/02

U.S. Cl. 60—624

10 Claims

1. A circular internal combustion engine, comprising:
  - a. a torque shaft;
  - b. a central cam connected to said torque shaft;
  - c. a stationary middle ring located about said central cam;
  - d. an exhaust ring assembly located about said middle ring and connected to said torque shaft and said central cam, said middle ring providing stationary support for a plurality of power chambers located between said central cam and said exhaust ring; and

5,479,782

### GAS TURBINE COMBUSTOR

David M. Parker, Oviedo; David T. Foss, Perry E. Lowe, both of Winter Park, and David J. Amos, Orlando, all of Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

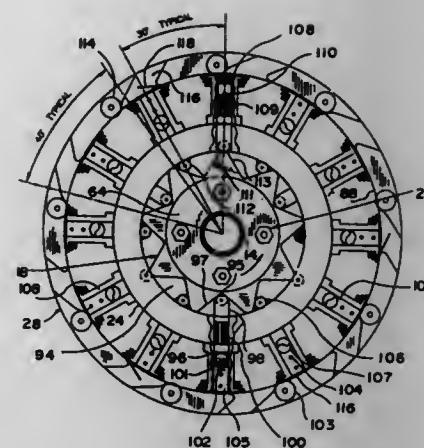
Division of Ser. No. 141,757, Oct. 27, 1993, Pat. No. 5,394,688.

This application Oct. 7, 1994, Ser. No. 319,686

Int. Cl.<sup>6</sup> F02C 9/20

U.S. Cl. 60—747

14 Claims



e. means for utilizing thermal energy from said power chambers to apply leverage on surfaces of said central cam and exhaust ring to provide rotational force.

5,479,781

### LOW EMISSION COMBUSTOR HAVING TANGENTIAL LEAN DIRECT INJECTION

Thomas F. Fric, Schenectady, and Anil Gulati, Albany, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

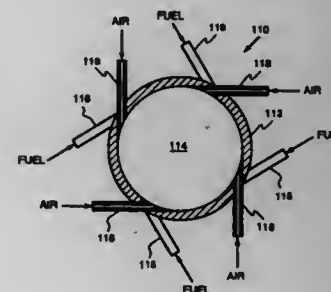
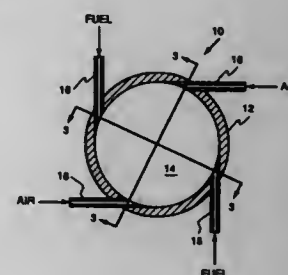
Continuation of Ser. No. 115,081, Sep. 2, 1993, abandoned.

This application Mar. 7, 1995, Ser. No. 400,640

Int. Cl.<sup>6</sup> F02C 1/00

U.S. Cl. 60—740

3 Claims



1. In a gas turbine having a compressor for producing compressed air, a combustor for heating said compressed air comprising:

- a) a first substantially cylindrical liner forming a chamber therein for containing a combustion zone, a second substantially cylindrical liner forming an outer annular passage encircling said first liner;
- b) a flow guide forming a first inlet passage having first and second portions, said first portion extending axially and being concentric with said liner, said second portion extending radially and encircling said first portion;
- c) a plurality of fuel discharge means extending radially into said outer annular passage, each of said fuel discharge means having a plurality of fuel discharge ports formed therein;
- d) a second inlet passage for said chamber, said second inlet passage having first and second portions, said first portion of said second inlet passage formed between said fuel nozzle and said flow guide and extending axially and being concentric with said first portion of said first inlet passage, said second portion of said second inlet passage extending radially and encircling said first portion of said second inlet passage;
- e) a plurality of first swirl vanes disposed in said second portion of said first inlet passage; and
- f) a plurality of second swirl vanes disposed in said second portion of said second inlet passage.

5,479,783

### ABSORPTION CHILLER

Shulchiro Uchida, Ibaraki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 6, 1994, Ser. No. 223,748

Claims priority, application Japan, Apr. 7, 1993, 5-080361

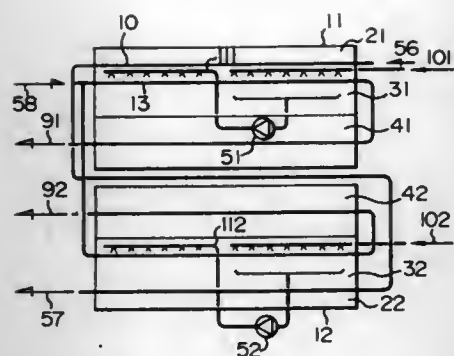
Int. Cl.<sup>6</sup> F25B 15/00

U.S. Cl. 62—101

8 Claims

1. An absorption chiller comprising at least two chiller modules in which an evaporator, an absorber, a condenser, a low-temperature generator, a high-temperature generator, a heat exchanger, an absorption solution pump and a refrigerant pump are functionally connected to one another, and gas, oil, vapor or exhaust gas discharged from a gas turbine, a diesel engine or another process is used as a heat source for the low-temperature generator or the high-temperature generator.





wherein said at least two chiller modules are connected to each other such that chilled water flows through said respective chiller modules in series, cooling water flows through said respective chiller modules in parallel and directions of flow of the chilled water and the cooling water are reverse to each other longitudinally in at least one chiller module which includes a final outlet for the chilled water; and that, in the absorber of each chiller module, absorption solution is sprayed in at least two stages so that a concentration of the absorption solution becomes weaker toward the inlet side of the cooling water.

5,479,784

## REFRIGERANT DISTRIBUTION DEVICE

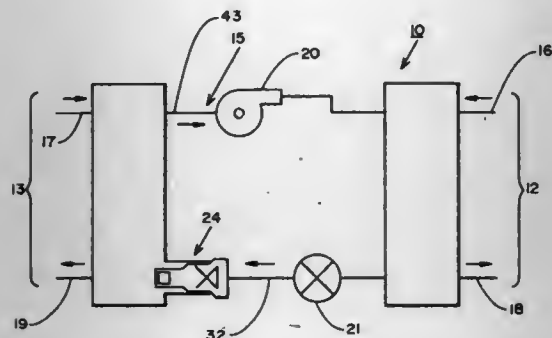
Thomas J. Dobmeyer, Baldwinsville, N.Y.; Thierry Jomard, Villeurbanne, France, and Dennis Penge, Cicero, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed May 9, 1994, Ser. No. 239,710

Int. Cl.<sup>6</sup> F25B 41/06

U.S. Cl. 62—117

12 Claims



1. A method of connecting a refrigerant expansion device to the entrance port of an evaporator unit that includes the steps of providing a housing having a tubular body, an expanded bell section at one end of the body section and a necked down section at the other end of the body section; mounting a bushing having an orifice means in the necked down section of the housing; mounting a mixing means in the body section of the housing; slidably mounting the body section of the housing within the entrance port of the evaporator unit; and connecting the bell end section of the housing to a refrigerant expansion device.

5,479,785  
ELECTRONIC DEFROST CONTROLLER WITH FAN  
DELAY AND DRIP TIME MODES

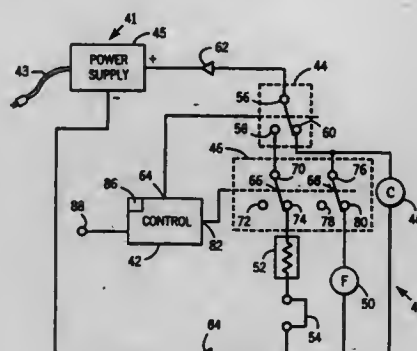
Robert M. Novak, Manitowoc, Wis., assignor to Paragon Electric Company, Inc., Two Rivers, Wis.

Filed Feb. 8, 1994, Ser. No. 194,107

Int. Cl.<sup>6</sup> F25D 21/08

U.S. Cl. 62—155

31 Claims



1. An apparatus for controlling an appliance, said appliance including a compressor, a fan, and a heater; the apparatus comprising:

first switch means for selectively coupling a first terminal with one of a second terminal and a third terminal in response to a first control signal, said first terminal being coupled with an energy source, said third terminal being coupled with said compressor;

second switch means for selectively coupling said second terminal with said heater and said third terminal with said fan in response to a second control signal; and

control means coupled with said first switch means and said second switch means for generating said first control signal and said second control signal.

5,479,786

FLOW REGULATING VALVE APPARATUS FOR AIR  
CONDITIONING SYSTEMS

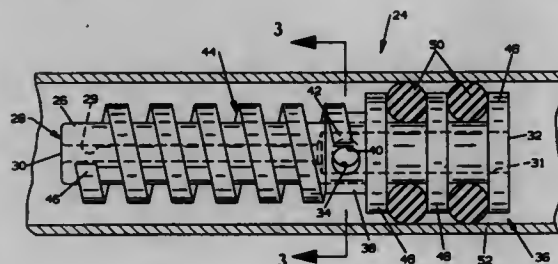
Eric J. Glasson, Somerset, Mass.; Joseph M. Gondusky, Warwick, R.I., and Kevin J. Laboe, Birmingham, Mich., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 29, 1994, Ser. No. 219,070

Int. Cl.<sup>6</sup> G05D 23/08

U.S. Cl. 62—222

15 Claims



1. A regulating valve for use in an air conditioning system comprising a body member having a longitudinal axis, an outer periphery and a selected length receivable in a conduit of the air conditioning system, seal means comprising an annular seal seat formed about the outer periphery of the body member and an elastomeric member received on the seat to provide a seal between the body member and the conduit, the seal means having an inlet side and an outlet side, a passageway in the body member having an inlet port on the inlet side of the seal means and an outlet port

on the outlet side of the seal means, an auxiliary passageway in said body having an inlet port on the inlet side of the seal means and an outlet port on the outlet side of the seal means, and a temperature responsive multilayer thermostatic metal element fixedly mounted to the body member and the other end of the thermostatic metal element movable to variably change the restriction to flow of fluid through the auxiliary passageway in dependence upon the temperature of the thermostatic metal element.

5,479,787

## AIR-CONDITIONED BOOTH WITH VENDING UNIT

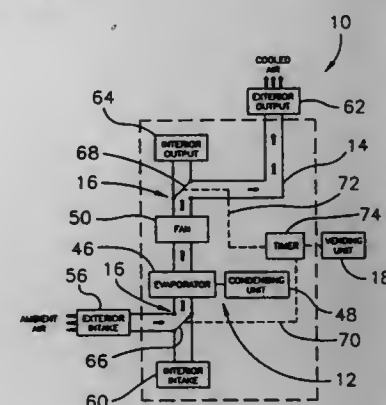
Steven B. Carter, 3217 Quiet Mill Rd., Apt. B-6, Raleigh, N.C. 27612, and Thomas A. Mefferd, Murrells Inlet, N.C., assignors to Steven B. Carter, Raleigh, N.C.

Filed Jul. 1, 1994, Ser. No. 269,751

Int. Cl.<sup>6</sup> F25D 17/08

U.S. Cl. 62—231

20 Claims



8. An air-conditioned booth used in an entertainment club for providing a cooled environment in the club, comprising:

- a base unit;
- a platform connected to the base unit for a person to stand thereon;
- a wall structure extending upwardly from the platform and enclosing an interior space;
- a top unit attached to the wall structure such that the wall structure extends between the base unit and the top unit;
- an interior output coupled to the interior space of the booth and connectable to an air conditioner;
- a damper operatively connected to the interior output vent and moveable between a first position where the damper blocks cooled air from passing into the interior space of the booth through the interior output so as to place the booth in a non-cooling mode and a second position where the cooled air is directed into the interior space through the interior output so as to place the booth in a cooling mode;
- a vending unit operatively connected to the damper, wherein the damper is moved from the first position to the second position for a selected time period in response to a predetermined amount of currency being inputted into the vending unit.

5,479,788

## REFRIGERANT RECOVERY SYSTEM

Jerry J. Roegner, 14710 Cloverdale Rd., Woodbridge, Va. 22193

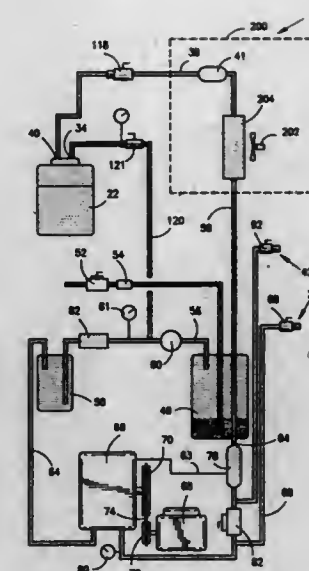
Filed Sep. 13, 1993, Ser. No. 120,206

Int. Cl.<sup>6</sup> F25B 45/00

U.S. Cl. 62—292

14 Claims

1. A refrigerant recovery system for recovering used refrigerant from an existing refrigerant system, comprising:



- a refrigerant system connector for connecting the refrigerant recovery system into the existing refrigerant system;
- a check valve fluidly connected to said refrigerant system connector;
- a main compressor unit for compressing refrigerant withdrawn from the existing refrigerant system, said main compressor unit is fluidly connected to said check valve;
- a cooler unit fluidly connected to said main compressor unit for receiving and cooling compressed refrigerant from said main compressor unit;
- a recovery tank having a liquid port fluidly connected to said cooler unit for receiving cooled compressed liquid/gas from said cooler unit, said recovery tank having a vapor port fluidly connected to said main compressor unit;
- a fluid connection extending from said vapor port of said recovery tank to a position in said fluid connection between said check valve and said main compressor, said fluid connection is a continuously open connection for continuously recirculating refrigerant vapor from said recovery tank again through said main compressor unit and said cooler unit throughout operation of the system while simultaneously withdrawing refrigerant from the existing refrigerant system to increase the rate and degree of recovery of refrigerant into said recovery tank.

5,479,789

## HEAT EXCHANGER FOR A HEAT PUMP

William H. Borten, Potomac, Md., and L. Jeremy Crews, Key Largo, Fla., assignors to Aire Solutions, Inc., Carrollton, Tex.

Filed Dec. 29, 1994, Ser. No. 366,604

Int. Cl.<sup>6</sup> F25B 13/00

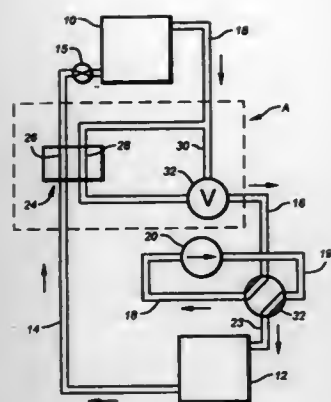
U.S. Cl. 62—324.1

21 Claims

1. A heat exchange system for use in a reversible cycle heat pump comprising a suction line and a liquid line, said system comprising:

- a heat exchanger suction line in fluid communication with the suction line of the reversible cycle heat pump;
- a heat exchanger liquid line in fluid communication with the liquid line of the reversible cycle heat pump, and wherein said heat exchanger liquid line is in thermal communication with said heat exchanger suction line;
- a heat exchanger bypass line in controllable fluid communication with said heat exchanger suction line; and





d) a flow control device capable of controlling flow through said heat exchanger bypass line.

5,479,790

## SUCTION ACCUMULATOR STRUCTURE

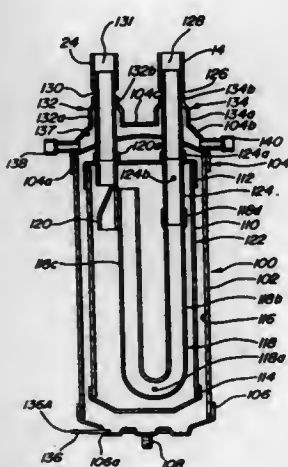
Edward W. Bottum, Jr., and Edward W. Bottum, Sr., both of c/o Refrigeration Research, Inc., 525 N. Fifth St., Brighton, Mich. 48116

Filed Jul. 6, 1993, Ser. No. 86,307

Int. Cl.<sup>6</sup> F25B 43/00

U.S. Cl. 62—503

10 Claims



1. A suction accumulator assembly comprising:
  - a pair of casings one of which is positioned within the other and providing a first space therebetween sealed from an atmosphere surrounding the outer of said casings; a first inlet and outlet means extending through a wall of the inner of said casings causing said inner casing to serve as a suction accumulator;
  - a second inlet and outlet means supported by and extending through a wall of said outer casing and connected to said first inlet and outlet means, a portion of said second inlet and outlet means extending beyond an exterior of said outer casing; and
  - means on the exterior of said outer casing defining a second space surrounding said portion of said second inlet and outlet means and sealed from the atmosphere, said first space preventing sweating of said outer casing and said second space preventing sweating of said portion of said second inlet and outlet means.

5,479,791

## BRASSIERE BLANK, BRASSIERE AND METHODS OF MAKING SAME

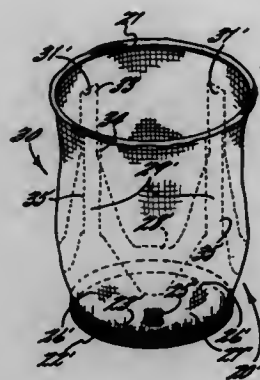
Harold G. Osborne, Boomer, N.C., assignor to Alba-Waldensian, Inc., Valdese, N.C.

Filed May 3, 1994, Ser. No. 237,114

Int. Cl.<sup>6</sup> A41C 3/00; A41D 27/00

U.S. Cl. 66—171

8 Claims



1. A method of making a circular knit blank for the manufacture of a brassiere comprising:
  - knitting a series of courses defining the lower part of a cylindrical tubular fabric torso encircling portion in the form of a turned welt; and then
  - knitting to said turned welt portion a series of courses defining a cylindrical tubular fabric upper portion having a front torso portion and a rear torso portion of said front torso portion having a pair of differentially shaped breast cups with respect to the remainder of the upper torso portion defined by areas in which the courses are simple knit courses; and then
  - knitting to said upper torso portion a series of courses defining a shoulder portion having a cylindrical tubular front and back fabric straps each having an elongated area in which the courses are simple knit with the areas being divided by an elongated panel area, and then completing said blank by knitting several courses forming a non-welted non-raveling edge.

5,479,792

## HEATING ARRANGEMENT

Bertil Berg, Sundsvall, and Ralph Johansson, Alnö, both of, Sweden, assignors to Sunds Defibrator Industries Aktiebolag, Sweden

PCT No. PCT/SE92/00694, § 371 Date May 6, 1994, § 102(e) Date May 6, 1994, PCT Pub. No. WO93/09391, PCT Pub. Date May 13, 1993

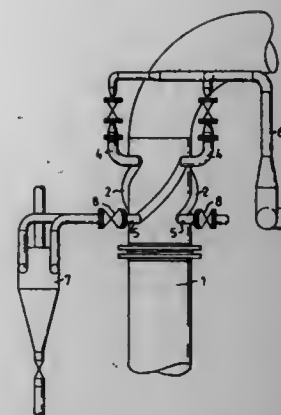
PCT Filed Oct. 5, 1992, Ser. No. 232,292

Claims priority, application Sweden, Nov. 6, 1991, 9103263 Int. Cl.<sup>6</sup> D21C 1/02

U.S. Cl. 68—5 D

12 Claims

1. Apparatus for heating fibrous material being conveyed through a pipe comprising a plurality of fitting members mounted on the outer surface of said pipe, each of said plurality of fitting members being disposed in the form of a helical curve on said outer surface of said pipe, and a corresponding plurality of steam pipes, each of said plurality of steam pipes being connected to a corresponding fitting member whereby steam is supplied to each of said plurality of fitting members; said pipe including a plurality of



apertures at locations corresponding to each of said plurality of fitting members whereby steam can pass into said pipe there-through.

5,479,793

## MINIMUM DWELL TIME REED RATCHET FOR WASHING MACHINE AUGERS

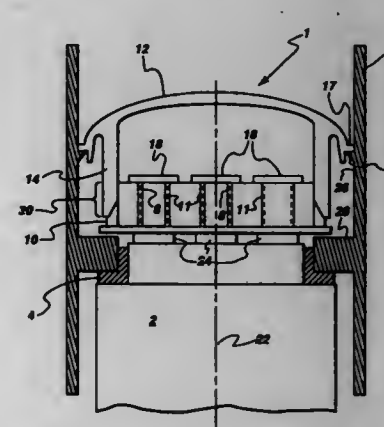
Sudhir D. Savkar, Niskayuna, and Harold J. Jenkins, Amsterdam, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 1, 1994, Ser. No. 283,430

Int. Cl.<sup>6</sup> D06F 17/08

U.S. Cl. 68—133

18 Claims



1. A ratchet mechanism for rotating about an axis of rotation, said mechanism comprising:
  - a cam disc provided with a plurality of cam teeth extending substantially radially from its outer diameter;
  - a cap provided with a plurality of reeds extending integrally therefrom and meshing with the cam teeth;
  - the reeds being flexible for deflecting around the cam teeth when the cam disc is rotated in a first direction about the axis of rotation, thereby allowing the cam disc to rotate relative to the cap; and
  - each reed having a trailing edge for engaging a trailing edge of an adjacent one of the cam teeth when the cam disc is rotated in a second direction which is opposite to said first direction.
17. A machine for washing articles, comprising:
  - a housing having a front panel, rear panel and side panel,
  - a mounting platform within said housing,
  - a tub having a vertical axis and being mounted on said platform within said housing at a position spaced from each of said housing panels;
  - a basket in said tub having a size sufficient for holding articles to be washed,
  - an agitator within said basket wherein the agitator rotates in an oscillating motion which facilitates washing of said articles,

an auger mounted at the top of said agitator wherein the auger rotates in a single direction to facilitate moving articles from the top of the basket to the bottom of the basket to accomplish an evenly washed load,

a ratchet mechanism mounted between the agitator and the auger to transform the continuously oscillating rotation of the agitator into a periodic rotation in a single direction for the auger, means for imparting oscillating motion to said agitator during a wash cycle,

wherein said ratchet mechanism comprises

a cam disc attached to the agitator, the cam disc comprising a plurality of cam teeth;

a cap attached to the auger in a manner sealing the top of the auger against intrusion of matter, the cap comprising a plurality of reeds meshed with the plurality of cam teeth wherein the plurality of cam teeth is disparate from an inner wall of the auger,

each of the plurality of reeds being adapted to deflect when the cam disc rotates in a first direction whereby the plurality of reeds becomes unmeshed from the plurality of cam teeth to allow the cam disc to rotate with respect to the cap,

each of the plurality of reeds further being adapted to remain meshed with the plurality of cam teeth when the cam disc rotates in a second direction which is opposite to the first direction, and

each of the plurality of reeds comprising a chamfer on lower end thereof to promote placement of the cap over the cam disc during assembly of the ratchet mechanism.

5,479,794

## WHEEL LOCK DEVICE

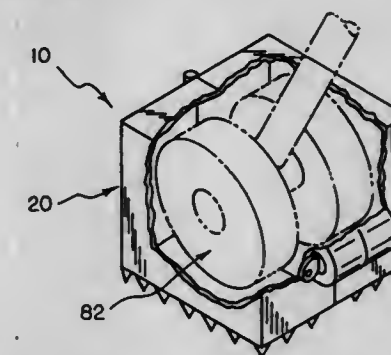
Terry R. Rains, 498 Se Hankel St., Dallas, Tex. 75238

Filed Jan. 25, 1994, Ser. No. 186,376

Int. Cl.<sup>6</sup> B62H 5/16

U.S. Cl. 70—226

6 Claims



1. A new and improved wheel lock device for preventing unauthorized use of vehicles having strut-mounted wheels, the wheel lock device comprising:
  - a shoe having sides, a top, and a bottom wherein a strut-mounted wheel assembly of a vehicle may be enclosed, the top having a central aperture therethrough where through a wheel strut may extend, the shoe being separated vertically into two equal parts;
  - hinge means pivotally connecting the two parts of the shoe whereby the two parts may be aligned in spread apart open relationship for receiving the wheel assembly, the hinge means also allowing the two parts of the shoe to be aligned in facing touching closed relationship for encasing the wheel assembly whereby precluding free rotation along a supporting surface;
  - locking means whereby the two parts of the shoe may be releasably secured in the closed position for preventing removal of the shoe from the wheel assembly;
  - a key removably operationally connected to the locking means whereby rotation of the key by a user releases the locking means so the shoe may be removed from the wheel assembly; and



anti-slide means for precluding the wheel lock device from sliding along the supporting surface thereby preventing unauthorized use of the vehicle.

5,479,795

## FISH-HOOK CLASP

Danilo Neri, 285, Via La Fontina, I-52033 Caprese Michelangelo (AR), Italy

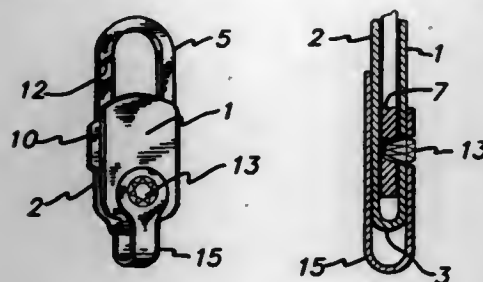
Filed Mar. 11, 1994, Ser. No. 208,682

Claims priority, application Italy, Apr. 29, 1993, AR93A0010

Int. Cl.<sup>6</sup> A44C 25/00

U.S. Cl. 63—2

6 Claims



1. A fish-hook clasp used as an openable fastening to connect the ends of necklaces and bracelets intended for use in jewelry fields in general, comprising:

- a casing having facing wings (1, 2) and a connecting loop (3);
- a rotating pawl (7) with an indentation (9);
- a housing (4) formed in one of the wings (1, 2) and aligned coaxially with the indentation (9) for operative cooperation with the rotating pawl (7);
- a decorative element (13) with a back which acts as a journal for the rotating pawl (7) and which is held in place at the back by the housing (4) and the indentation (9); and
- a U-shaped band (15) provided with at least one hole (16) through which the decorative element (13) is displayed.

5,479,796

## ORNAMENT WITH A COMPACT-DISC

Seiichi Shimano, Osaka, Japan, assignor to Nikkodo Co., Ltd., Osaka, Japan

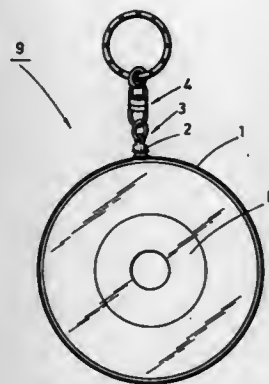
Filed Jun. 22, 1994, Ser. No. 264,208

Claims priority, application Japan, Jun. 22, 1993, 5-033578

Int. Cl.<sup>6</sup> A44C 25/00

U.S. Cl. 63—2

2 Claims



1. An ornament including a compact-disc consisting of:  
a supporting body having a closed back-side which has a size larger than the compact-disc;  
means in a center of said closed back-side for retaining the compact disc on said supporting body;

an aperture in said closed back-side by which said compact disc can be forced from said ornament; and  
means for attaching a chain or a strand to said supporting body to suspend said supporting body.

5,479,797

## UNIDIRECTIONALLY SIZEABLE BRACELET ASSEMBLY AND CLOSURE MEANS THEREFOR

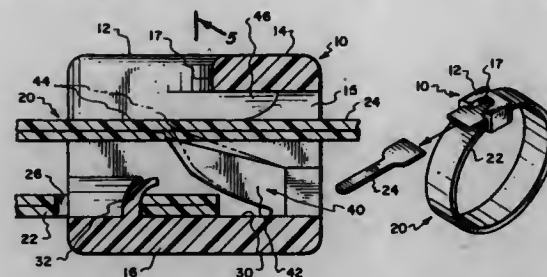
Dean D. Peterson, Canoga Park, Calif., assignor to Precision Dynamics Corporation, San Fernando, Calif.

Filed Jul. 15, 1993, Ser. No. 91,260

Int. Cl.<sup>6</sup> A61B 5/103; A44C 5/00

U.S. Cl. 63—3

25 Claims



1. In an identification bracelet, the combination of: band means for encircling a portion of a person or an object to be identified, said band means having a first end and a second end adapted to lie adjacent each other in said encircling relationship; said second end having at least a portion thereof being a smooth surface; closure means having a body portion operably attached to said first end of said band means and adapted to receive and maintain said second end of said band means in said adjacent relationship; said closure means including unidirectional gripping means for gripping said second end of said band means to permit the movement of said second end in a first direction while preventing the movement of said second end in a second and opposite direction; in which said gripping means is formed integrally as a unitary structure with said body portion, said gripping means constituting infinitely adjustable gripping means capable of gripping said second end at any position along its length within a given range by biting into said smooth surface.

5,479,798

## PROCESS FOR MANUFACTURING LOCKET-HALVES

Manfred Müller, Steinenlandstrasse 14, de7530 Pforzheim-Eutingen, Germany

PCT No. PCT/EP91/01990, § 371 Date Apr. 27, 1993, § 102(e) Date Apr. 27, 1993, PCT Pub. No. WO92/07484, PCT Pub. Date May 14, 1992

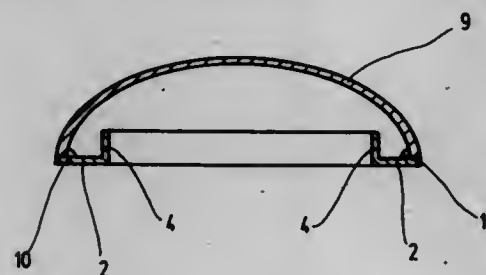
PCT Filed Oct. 19, 1991, Ser. No. 50,218

Claims priority, application Germany, Jan. 27, 1990, 40 34 288.3

Int. Cl.<sup>6</sup> A44C 15/00

U.S. Cl. 63—19

15 Claims



1. A process for the manufacture of locket-halves comprising the steps of:

forming a locket half-shell from a first sheet having a rim and a first exterior diameter;  
stamping into a second sheet an annular groove with a second exterior diameter substantially the same as the first exterior diameter of the locket half-shell, the annular groove having an inner wall at an inner edge which inner wall forms an inner portion, and an outer wall at an outer edge;  
separating the inner portion of the second sheet encircled by the inner edge of the annular groove to form a perforated sheet;  
inserting the rim of the locket half-shell into said annular groove of the perforated sheet;  
soldering the rim of the locket half-shell to the perforated sheet; and  
separating an extending portion of the second sheet extending beyond the outer edge of the groove after the stamping of the annular groove.

5,479,799

## KEY AND BOLT LOCK DEVICE

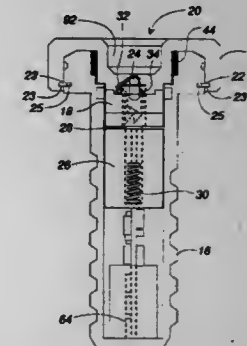
John Kilman, deceased, late of Atlanta, Ga.; Kent C. Falkenstein, Orangevale, Calif.; Donal O. Beckstead, Folsom, Calif., and Phillip L. Myers, Lithonia, Ga., assignors to Kilman Electric Company, Stone Mtn, Ga.

Filed Oct. 27, 1994, Ser. No. 329,976

Int. Cl.<sup>6</sup> F16B 41/00

U.S. Cl. 70—231

5 Claims



1. A key and bolt lock device, comprising: a key to be received by a bolt, device, said key including:

- a housing such that said key can be received by said bolt;
- a power source;
- a transmit coil such that said transmit coil can transfer energy and data to a receiving coil located in said bolt by magnetic coupling; and
- a memory device capable of storing at least one security code; means for transmitting a security code from said memory device to said bolt; and

said bolt, including:

- a head capable of receiving said key;
- a body which is operatively associated with said head such that said head rotates on said body when said key and bolt lock device is in a locked position;
- latching means which, when activated, attach said head to said body so that said head and body rotate together;
- a receiving coil capable of magnetically coupling with said transmit coil in said key, receiving energy for operation of bolt functions, and receiving data from said transmit coil;
- a second memory device capable of storing a security code; energy storage means for storing energy received from said key in order to operate said bolt; and
- a microcontroller which receives the security code transmitted from said key by said transmit coil, and retrieves said security code stored in said second memory device, compares said key security code to said second security code, and if the two codes are the same, activates said latching means.

5,479,800

## PLASTIC LOCK

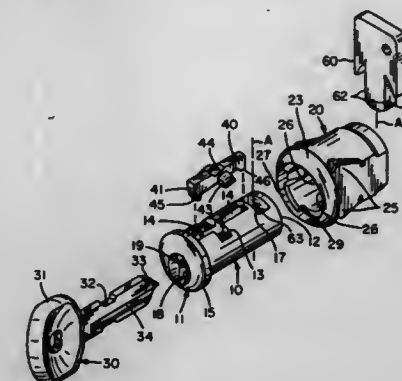
Gary L. Myers, River Grove, Ill., assignor to Fort Lock Corporation, River Grove, Ill.

Continuation-in-part of Ser. No. 962,855, Oct. 19, 1992, abandoned. This application Aug. 5, 1993, Ser. No. 102,642

Int. Cl.<sup>6</sup> E05B 29/00

U.S. Cl. 70—365

14 Claims



1. A key lock mechanism, comprising:

- a lock shell, wherein said shell comprises a predominantly cylindrical casing having a front end, a rear end, a central throughbore having at least one interior longitudinal channel;
- a lock plug, having a front end and a rear end, longitudinally disposed and rotatable about a longitudinal axis within the central throughbore of the lock shell, the lock plug including a longitudinal recess and pivot pad recesses disposed perpendicularly to and on opposing sides of the longitudinal recess, the lock plug further comprising:
- a double-acting, key-actuated tumbler means comprising a bar tumbler having a center rocker body receivable within the longitudinal recess and having a top and a bottom wherein said bottom comprises a front peg and rear peg, said bar tumbler including an integral axle perpendicular to and extending laterally beyond said center rocker body, said axle connecting said center rocker body to a left and a right pivot pad, said pivot pads each including a flat, angled bottom surface, and being receivable in one of the pivot pad recesses, the angled bottom surfaces of the pivot pads engaging the respective pivot pad recesses for gravitationally biasing said tumbler means to a locking position where said top engages said interior longitudinal channel; and
- a keyway in the front end of the lock plug allowing insertion of a key into the key-actuated tumbler means such that both front and rear pegs of the tumbler means are actuated thereby disengaging the tumbler means top from the interior longitudinal channel and enabling the lock plug to be rotated within the throughbore.

5,479,801

## WEB FOR A BUILT-IN DOUBLE LOCK CYLINDER

Ernst Keller, Untere Schwandenstrasse 22, CH-8805 Richterswil, Switzerland

Filed Dec. 7, 1993, Ser. No. 162,296

Claims priority, application Switzerland, Jan. 27, 1993, 231/93

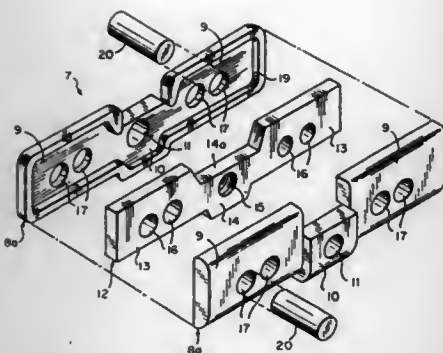
Int. Cl.<sup>6</sup> E05B 9/04

U.S. Cl. 70—373

6 Claims

1. A double lock cylinder having two cylinder housing parts, each part including a cylindrical case having at a bottom thereof, an extension which is provided with a cutout (4), the two cylinder housing parts being connected with a separately produced web, said web comprising two legs and a center part, each leg being inserted into the cutout, the web having a plurality of plate-like parts extending over the length of the web and in shiftable contact against each other,





said web being made of three parts (8a, 8a, 12), two outer parts (8a, 8a) of the three parts abutting to form a shell (8), into which an interior part (12) has been inserted, wherein the shell (8) has two half shells (8a), each of the two half shells (8a) having a recess on an inner side receiving the interior part, and the interior part (12) of the plurality of plate-like parts has a threaded bore (15) for a cuff nut.

5,479,802

# METHOD OF INSTALLING A COMBINATION LOCK DEADBOLT ASSEMBLY AND A KIT THEREFOR

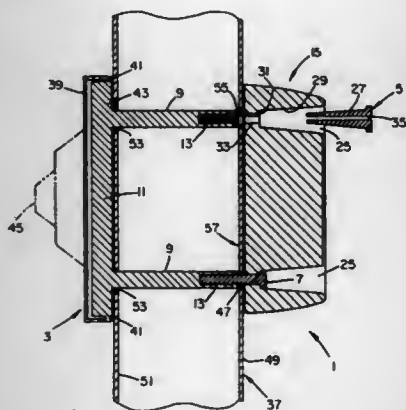
J. Clayton Miller, 5085 Danville Rd., Nicholasville, Ky. 40356

Filed Apr. 21, 1994, Ser. No. 230,948

Int. Cl.<sup>6</sup> E05B 9/06

U.S. Cl. 70-443

12 Claims



1. A method of installing a combination lock deadbolt assembly on a door comprising the steps of:

- providing a housing for a combination lock, said housing formed by at least a pair of sidewalls connected by a base member, each sidewall including at least one elongated tapered bore therethrough, a taper of each said at least one elongated tapered bore extending from an opening to a step in said at least one elongated tapered bore;
- applying said housing to one surface of said door;
- inserting a drill guide having a cylindrical drill bit bore into said elongated tapered bore, said drill guide having an outer surface taper extending between one end of said drill guide and a drill guide lip positioned at an end opposite said one end, said outer surface taper corresponding to the taper of each of said tapered bores;
- inserting a drill bit into said drill guide to drill a hole through said door; and
- repeating steps (c) and (d) for each tapered bore in said housing to facilitate mounting said housing to said door.

## 5,479,803 CONTROL APPARATUS FOR A CONTINUOUS HOT ROLLING MILL

Hiroyuki Imanari, Chofu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

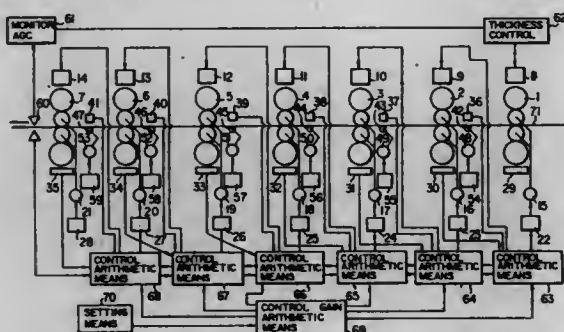
Filed Jun. 18, 1993, Ser. No. 77,928

Claims priority, application Japan, Jun. 19, 1992, 4-161346

Int. Cl.<sup>6</sup> B21B 37/12

U.S. Cl. 72-8

6 Claims



1. A control apparatus for a continuous hot rolling mill, comprising:

main-motor speed control units for controlling speeds of rolling mill driving main motors, corresponding to a plurality of stands;

roll gap control units for controlling roll gaps, whereby speed command values for said main-motor speed control units and roll gap values for said roll gap control units are respectively calculated by use of a process model in which an interference system between a delivery thickness and a backward interstand tension of a rolled material is modeled;

said process model including means for calculating said delivery thickness and said interstand tension in response to a roll gap command value and a main-motor speed command value, said delivery thickness and said interstand tension being calculated in consideration of interference between said delivery thickness and said interstand tension;

a setting means for setting variables for expressing said process model, a target thickness value of said rolled material, a target interstand tension value of said rolled material, variables for responses of said thickness and said interstand tension and variables for adjusting responses of a control system for controlling said thickness and said interstand tension;

a control gain arithmetic means for obtaining control gains as numeric values for respective stands by substituting said set variables into predetermined control gain operation expressions; and

a plurality of control arithmetic means for calculating said speed command values and said roll gap command values for causing said thickness to follow said target thickness value and said interstand tension to follow said target interstand tension value while reducing an interaction between said thickness and interstand tension by use of said control gains calculated by said control gain arithmetic means, each of said control arithmetic means being provided for each of said stands.

5,479,804

## TOOLS FOR PAINTLESS DENT REPAIR

Clay L. Cook, 3013 N. Taylor, Little Rock, Ark. 72207, assignor to Clay L. Cook, Little Rock, Ark.

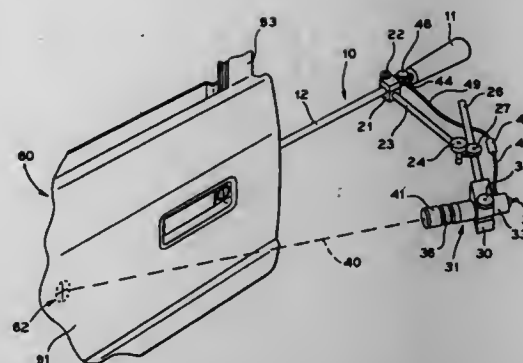
Filed Sep. 28, 1994, Ser. No. 313,867

Int. Cl.<sup>6</sup> B21J 13/02

U.S. Cl. 72-35

11 Claims

7. In combination, a steel bar of elongated longitudinal length and cylindrical in configuration and being of a selected diameter, a handle affixed to said steel bar at one end thereof, by means of which the steel bar may be manipulated as a component of a working tool,



bearing members of each guide disk being arranged in one of the vertically adjustable chocks so as to be swivelable about a horizontal axis that extends transversely to the rolling direction; fitted guides arranged and guided in the rockers so as to be independently displaceable parallel to the rolling direction; and bearing slides that are adjustable in horizontal planes in the direction of the horizontal axis, one bearing slide being arranged in each one of the fitted guides and each chock being clamped in one of the bearing slides, whereby the fitted guides can be moved in opposite directions so as to tilt the rotational axes of the guide disks.

5,479,806

## LEVELLING MACHINE, PARTICULARLY FOR LEVELLING SHEETS AND STRIPS

Willi Benz, Neuss, Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

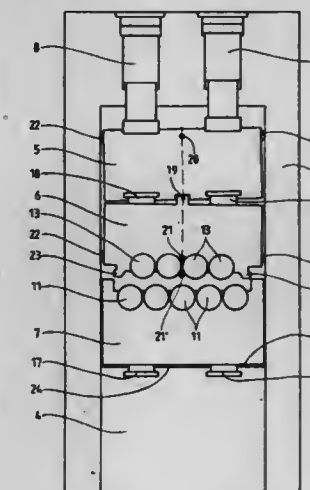
Filed Mar. 21, 1994, Ser. No. 210,910

Claims priority, application Germany, Mar. 19, 1993, 43 08 744.2

Int. Cl.<sup>6</sup> B21D 1/02

U.S. Cl. 72-165

4 Claims



## 5,479,805 TWO-HIGH CROSS ROLLING MILL WITH GUIDE DISKS

Paul Koenen, Krefeld, and Manfred Hien, Mönchengladbach, both of, Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

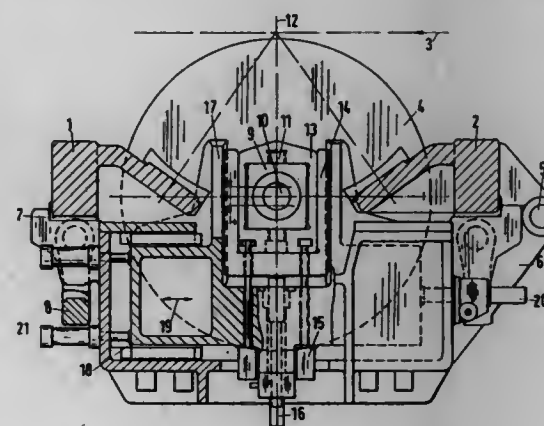
Filed Mar. 15, 1994, Ser. No. 213,625

Claims priority, application Germany, Mar. 15, 1993, 43 08 721.3

Int. Cl.<sup>6</sup> B21B 19/04

U.S. Cl. 72-97

9 Claims



1. A levelling machine for levelling sheets and strips, the levelling machine comprising a housing having a plurality of upper leveller rolls and a plurality of lower leveller rolls arranged offset relative to the upper leveller rolls, the leveller rolls having a length, further comprising an upper roll stand and a lower roll stand adjustably positioned within the housing of the levelling machine, back-up rolls and the leveller rolls arranged in each roll stand, an upper and lower crossbeam positioned within the housing for supporting the back-up rolls and leveller rolls, respectively, the back-up rolls supporting the leveller rolls over the length thereof, adjusting cylinders for adjusting at least the upper crossbeam relative to the housing for positioning the leveller rolls, compensating cylinders arranged between the roll stands and the crossbeams, the upper roll stand and the upper crossbeam being mounted so as to be tiltable relative to one another by the compensating cylinders and in a travel direction of the material being levelled, the upper roll stand and the upper crossbeam being tiltable about tilting points arranged in three planes located one above the other, wherein the upper crossbeam is tiltable relative to the upper roll stand and the upper roll stand is tiltable relative to the lower roll stand.

1. A two-high cross rolling mill, comprising: a roll stand; driven rolls having a rolling direction and being situated in the roll stand one above the other; a pair of rotatably driven guide disks each rotatable about an axis; rockers that are swivelable around vertical axes on one side of the roll stand; a bearing member on each side of each guide disk, the bearing members being arranged in the rockers; a plurality of vertically adjustable chocks, each of the two



5,479,807

## COILER FURNACE FOR A HOT STRIP

Friedrich Moser, St. Florian, Austria, assignor to Voest-Alpine Industrieanlagenbau GmbH, Linz, Austria

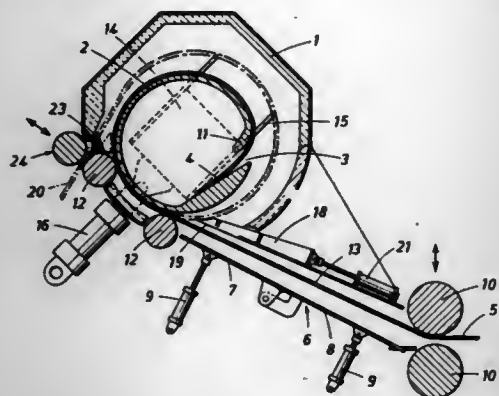
Filed Feb. 28, 1994, Ser. No. 202,955

Claims priority, application Austria, Mar. 5, 1993, A 426/93

Int. Cl.<sup>6</sup> B21C 47/00; B21B 41/06

U.S. Cl. 72—202

11 Claims



1. A coiler furnace comprising

(a) a furnace hood,

(b) a rotatable coiler drum mounted in said furnace hood and operable to coil a strip delivered to the drum in a predetermined direction and to pay off the coiled strip from the furnace hood, the strip having a leading end and a trailing end, an incoming strip portion being adjacent the leading end and an outgoing strip portion being adjacent the trailing end, the coiler drum having

(1) a peripheral surface defining a receiving opening for receiving the leading strip end, and the coiler drum being rotatable in a first sense in said direction to coil the strip on the drum in a strip-receiving position and in a second sense opposite thereto to pay off the strip, the incoming and outgoing strip portions defining a triangular space with the coiled strip,

(c) a strip-receiving guide having a delivery end disposed adjacent said receiving opening in the strip-receiving position of the coiler drum to guide the leading strip end into the receiving opening,

(d) a strip-delivering guide adapted to catch the trailing strip end of the coiled strip upon rotation of the coiler drum in the second sense and to guide the trailing strip end out of the coiler furnace,

(e) a coiler drum guide extending transversely to the longitudinal and transverse directions of the incoming strip portion, and

(f) drum-adjusting means for displacing said coiler drum along said coiler drum guide in a first direction to an extent which increases with the diameter of said coiled strip during rotation of said coiler drum in the first sense so as to maintain said triangular space in a predetermined position.

5,479,808

## HIGH INTENSITY REHEATING APPARATUS AND METHOD

Francis H. Bricmont, Pittsburgh, Pa., assignor to Bricmanage, Inc., McMurray, Pa.

Continuation of Ser. No. 58,274, May 4, 1993, abandoned,

which is a continuation of Ser. No. 713,523, Jun. 12, 1991,

abandoned, which is a continuation-in-part of Ser. No.

621,638, Dec. 3, 1990, Pat. No. 5,082,047, which is a division

of Ser. No. 387,141, Jul. 31, 1989, Pat. No. 4,991,276. This

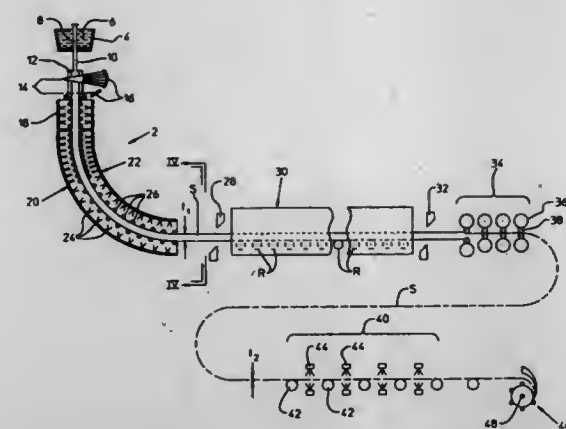
application Apr. 12, 1994, Ser. No. 226,505

Int. Cl.<sup>6</sup> B21B 1/46; B22D 11/12; F27B 9/02

U.S. Cl. 72—202

15 Claims

1. A method for treating a hot, thin metallic strip workpiece having a first thickness, said method comprising:



(a) continuously casting liquid metal in a fluid cooled mold to form a flexible yet solid strip workpiece having a first thickness within the range of 1.5 and 2.5 inches and having a temperature gradient between a solid skin region and a relatively hotter core region;

(b) heating said workpiece having said relatively hotter core region while continuously conveying and guiding said workpiece at a controlled rate of speed in a first furnace portion commencing at a charging end operating at a first temperature above the melting temperature of said workpiece to rapidly initially raise the temperature of said solid skin region of said workpiece to thereby reverse the flow of heat from the core region to the skin region and cause heating of the core region by conducting heat transfer from the skin region;

(c) heating said workpiece while continuously conveying and guiding said workpiece at a controlled rate of speed in a second furnace portion operating at a second temperature less than said first temperature to heat-soak said workpiece in order to cause said workpiece to attain a desired rolling temperature therethrough; and

(d) rolling said workpiece after heat-soaking thereof in said second furnace portion without further heating of the workpiece to reduce said workpiece from said first thickness to a lesser second thickness.

5,479,809

## APPARATUS FOR ADJUSTING THE UPPER EDGE OF A WORK ROLL TO THE ROLLING LINE

Manfred Stachuletz, and Helmut Strohmeier, both of Düsseldorf, Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

Continuation of Ser. No. 881,026, May 11, 1992, abandoned.

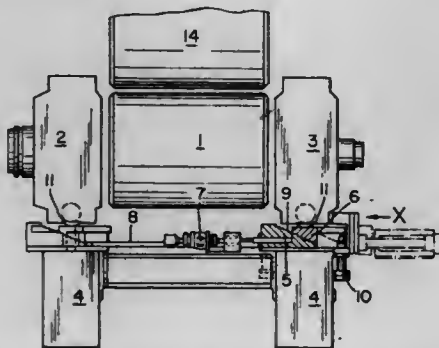
This application Apr. 19, 1994, Ser. No. 231,436

Claims priority, application Germany, May 13, 1991, 41 15 958.6

Int. Cl.<sup>6</sup> B21B 31/30

U.S. Cl. 72—244

9 Claims



1. An apparatus for vertically adjusting a lower roll in a roll stand having a plurality of chocks, said apparatus comprising:

a wedge element disposed supportingly beneath each said chock and adjustable for vertically adjusting the lower roll, each said wedge element comprising an upper wedge and a lower wedge, and each of said upper and lower wedges having a sloped surface for load-bearing engagement with the sloped surface of the other of said upper and lower wedges when said upper wedge is vertically supported atop said lower wedge; and

lifting means connected to said upper wedge and operable for vertically moving the upper wedge independently of the lower wedge, each said sloped surface being defined by a plurality of steps extending along said sloped surface, and each said step of each of the upper and lower wedges comprising a substantially horizontally-oriented surface engageable in load bearing relation with a substantially horizontally-oriented surface of a step of the other of said upper and lower wedges when said upper wedge is disposed in vertically supported relation atop said lower wedge, said lower wedge being disposed for substantially horizontal movement relative to said upper wedge to provide adjustability of the lower roll to a new vertical position by operation of said lifting means to vertically move the upper wedge combined with relative horizontal movement of said lower wedge so as to place said substantially horizontal surfaces of a plurality of said steps of said upper and lower wedges in load-bearing contact to support said upper wedge atop said lower wedge in the new vertical position of the lower roll.

5,479,810

## METHOD FOR PRODUCING FORM WOUND STATOR COILS

Robert H. Hartmann, and James A. Guerrein, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Division of Ser. No. 202,847, Feb. 24, 1994, Pat. No.

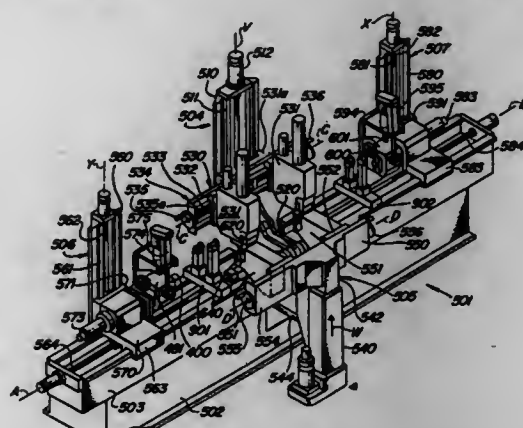
5,394,720, which is a continuation of Ser. No. 891,871, Jun. 1, 1992, abandoned. This application Dec. 9, 1994, Ser. No.

352,937

Int. Cl.<sup>6</sup> B21D 7/12

U.S. Cl. 72—302

4 Claims



1. A method for forming a form wound stator coil from a bobbin having a lower leg including a straight length arm and two nose end arms, and an upper leg including an upper leg straight length portion and two nose end arms, a lead end nose defining a lead end inner nose radius, an opposite lead end nose defining an opposite lead end inner nose radius, and leads comprising

- clamping the lower and upper legs of the bobbin proximate to the opposite ends of their straight length portions to maintain the straight length portions to predetermined dimensions,
- clamping the lead end nose, the leads, and the opposite lead end nose;
- rotating the lower and upper legs outward to a predetermined angular relationship from one another about an axis equivalent to the center axis of the stator core into which the finished coil will be inserted and at the same time

forming a radius of predetermined dimensions between the straight length portion and the lower leg nose end arms; forming radii between the lead end and opposite lead end noses and the upper and lower nose end arms proximate to said noses;

- rotating said noses to a predetermined angle; and
- raising said noses to bend them outward from the center of the stator core to form clearance for a rotor to be inserted after the coils are placed in the slots of the core.

5,479,811

## PROCEDURE FOR CALIBRATING THE WHEEL SPEEDS FOR A MOTOR VEHICLE

Matthias Baumann, Böblingen, and Gerhard Fischle, Esslingen, both of, Germany, assignors to Mercedes-Benz AG, Germany

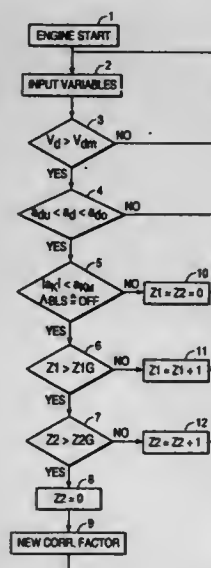
Filed May 24, 1995, Ser. No. 449,660

Claims priority, application Germany, May 24, 1994, 44 18 070.5

Int. Cl.<sup>6</sup> G01P 21/00

U.S. Cl. 73—2

5 Claims



1. Process for calibrating wheel speeds for a motor vehicle having a plurality of wheels, of the type wherein wheel speed correction factors for forming mutually matched corrected wheel speeds are determined only when vehicle speed exceeds a predetermined minimum speed, vehicle brakes are not actuated, and vehicle turning is sufficiently small, said process comprising the steps of:

- detecting an instantaneous speed of each vehicle wheel;
- determining a vehicle turning rate based on magnitude of a time derivative of a difference between respective speeds of left and right wheels of said vehicle;
- detecting a signal indicative of actuation of said vehicle brakes;
- determining when the following conditions are satisfied
  - vehicle speed is greater than a predetermined minimum value;
  - vehicle acceleration is between predetermined upper and lower limits;
  - vehicle turning rate is below a predetermined limit; and
  - vehicle brakes are not actuated; and
- calculating a new wheel speed correction factor only when all of the conditions in said determining step are satisfied concurrently for a predetermined time period.



5. Process for calibrating wheel speeds for a motor vehicle having a plurality of wheels, of the type wherein wheel speed correction factors for forming mutually matched corrected wheel speeds are determined only when vehicle speed exceeds a predetermined minimum speed, vehicle brakes are not actuated, and vehicle turning is sufficiently small, said process comprising the steps of:

- detecting an instantaneous speed of each vehicle wheel;
- determining a vehicle turning rate based on magnitude of a time derivative of a difference between respective speeds of left and right wheels of said vehicle;
- detecting a signal indicative of actuation of said vehicle brakes;
- determining when the following conditions are satisfied
  - (i) vehicle speed is greater than a predetermined minimum value;
  - (ii) driving torque of said vehicle is within a predetermined range;
  - (iii) vehicle turning rate is below a predetermined limit; and
  - (iv) vehicle brakes are not actuated; and
- calculating a new wheel speed correction factor only when all of the conditions in said determining step are satisfied concurrently for a predetermined time period.

5,479,812

#### ON-SITE CALIBRATION DEVICE AND METHOD FOR NONLINEARITY CORRECTION FOR FLOW SENSOR/TRANSMITTER

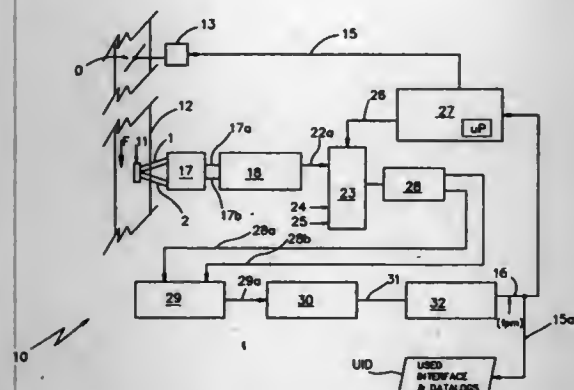
Robert D. Juntunen, and Roger R. Roth, both of Minnetonka, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 15, 1994, Ser. No. 275,868

Int. Cl.<sup>6</sup> G01F 25/00

U.S. Cl. 73—3

5 Claims



1. The method for providing calibrated flow sensor units for connection to variable air volume measurement and control apparatus, comprising:

- a. connecting a sensor unit to produce measurements of air flow or pressure as a differential voltage output signal,
- b. measuring three pressure values with the sensor unit and applying corrections to these measurements,
- c. entering a pickup relationship between flow and pressure drop for the sensor unit into storage,
- d. using the pickup relationship expressed as a series of point values, and the three pressure values, calculating points on a linearization curve as a series of point values,
- e. using the unit with gain and offset preset, measure the sensor unit's signal output responsive to air flow at the unit's intended installation site at at least three additional conditions; no flow, minimal flow, and full flow or maximum flow,

f. adjusting these air flow responsive values by employing duct area values of a duct in which the sensor unit is deployed, and adjust the linearization curve to these adjusted air flow responsive values.

5,479,813

#### SENSOR MATCHING THROUGH REAL-TIME OUTPUT COMPENSATION

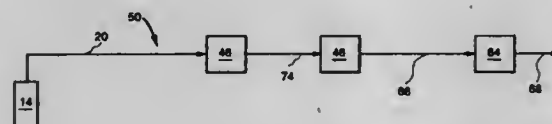
Frederic G. Pla, Schenectady, and Robert A. Hedeon, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 243,343, May 16, 1994. This application May 11, 1995, Ser. No. 438,717

Int. Cl.<sup>6</sup> G01D 27/00; G01D 18/00

U.S. Cl. 73—4 R

2 Claims



1. A sensor assembly comprising:

- a) a sensor having an analog output;
- b) an analog-to-digital converter having an analog input side operatively connected to said analog output, having a sampling interval, and having a digital output side yielding a digital output for each said sampling interval; and
- c) a filter having an input side operatively connected to the digital output side of said analog-to-digital converter and having an output equal to the sum of the products of said digital outputs and associated fixed filtering coefficients, said sum taken over a predetermined number of said sampling intervals, and said fixed filtering coefficients being set equal to filtering coefficients adaptively-determined such that said output of said filter generally matches a reference digital output from a reference sensor.

5,479,814

#### METHOD AND APPARATUS FOR DETECTING MERCURY VAPOR CONTENT OF UNCONSOLIDATED POROUS MATERIALS

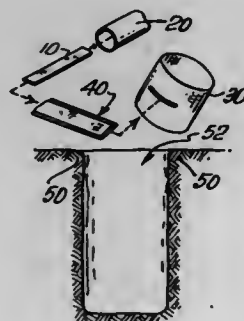
Patty Rehn, 19005 Pinehurst Rd., Bend, Oreg. 97701

Filed Apr. 6, 1994, Ser. No. 223,556

Int. Cl.<sup>6</sup> G01N 1/00; G01V 9/00

U.S. Cl. 73—19.01

2 Claims



1. Apparatus for determining mercury vapor content of earth comprising a sleeve formed of needlepoint canvas; a silver strip

within said sleeve; means to elevate said sleeve with said silver above a base upon which the means to elevate rests and a permeable covering over said sleeve and silver and means to elevate.

5,479,816

#### METHOD OF PHYSICAL-CHEMICAL ANALYSIS BASED ON THE CONTROL OF INTERFACE TENSIONS, AND CORRESPONDING APPARATUS

Jacques Richou; Michel Grimaldi, both of Toulon; Robert Verger, Marseille; Claude Riviere, Marseille; André Bois, Marseille, and Sylvie Nury, Fourqueux, all of, France, assignors to Université de Toulon et du Var, Laboratoire D'Optoelectronique, Lar Garde, France

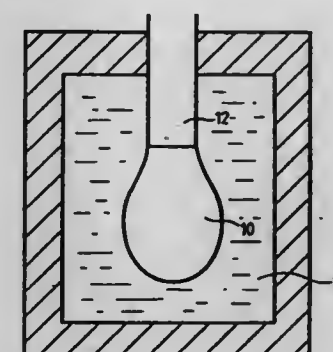
PCT No. PCT/FR92/00227, § 371 Date Apr. 22, 1994, § 102(e) Date Apr. 22, 1994, PCT Pub. No. WO92/16824, PCT Pub. Date Oct. 1, 1992

PCT Filed Mar. 12, 1992, Ser. No. 117,177

Claims priority, application France, Mar. 14, 1991, 91 03105 Int. Cl.<sup>6</sup> G01N 13/02

U.S. Cl. 73—64.48

15 Claims



1. Method for the analysis of the behavior of an interface between a liquid and an immiscible fluid ambient medium comprising

- the controlled introduction of liquid into the ambient medium,
- a calculation and control of the interface tension between this liquid and this ambient medium, characterized in that it comprises
- an action of servocontrol on a mechanism for the introduction of the liquid in a direction tending to bring the interface tension to a desired value,
- and a measurement of characteristics of the physical reaction between this liquid and this ambient medium resulting from the liquid introduction from a measurement of the flow rate of introduction.

5,479,817

#### SPARK PLUG WITH BUILT-IN PRESSURE SENSOR

Takahiro Suzuki, and Kouji Okazaki, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Continuation of Ser. No. 79,752, Jun. 22, 1993, abandoned.

This application May 1, 1995, Ser. No. 431,465

Claims priority, application Japan, Jul. 28, 1992, 4-219604

Int. Cl.<sup>6</sup> H01T 13/40

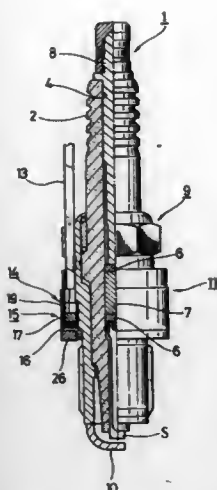
U.S. Cl. 73—115

7 Claims

1. A method for collecting, analyzing, and measuring a plurality of volatile and relatively non-volatile components that are released upon oral processing of solid matter, semi-solid matter, liquid matter or combinations thereof transportable in a breath of a subject comprising:

- providing a predetermined amount of solid matter, semi-solid matter, liquid matter or combinations thereof to the subject for orally processing;
- oral processing of the matter by the subject in a way so that the matter is physically altered by oral processing for a predetermined period of time sufficient to release volatile and relatively non-volatile components from the matter into an oral cavity;
- obtaining from the subject at least one sample of breath containing volatile and relatively non-volatile components released from the orally processed matter, each breath sample flowing into one of a plurality of collection chambers maintained at a constant temperature and volume;
- directing each breath sample from each one of a plurality of the collection chambers through at least one separation interface, the interface disposed to capture thereon the released volatile and relatively non-volatile components from the breath sample; and
- transferring simultaneously both the released volatile and the released relatively non-volatile components from the separation interface into an apparatus for analyzing and measuring the released components.





opposite to said lower edge relative to said pressure sensor, wherein said pressure sensor comprises a plate packing, a piezo-electric element, an electrode plate with the lead wire connected thereto, and an insulating plate, all stacked one over the other.

5,479,818

# PROCESS FOR DETECTING FOULING OF AN AXIAL COMPRESSOR

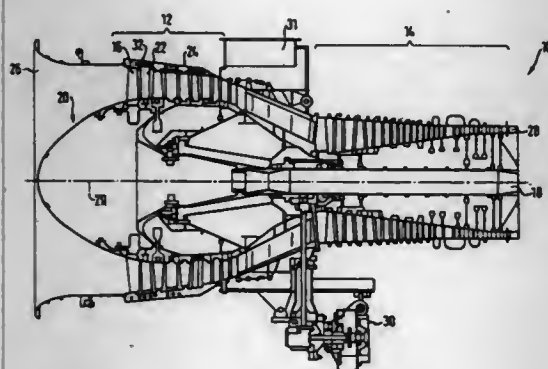
Hilger A. Walter, Stade; Herwart Hönen, Uebach-Palenberg, and Heinz E. Gallus, Aachen, all of, Germany, assignors to Dow Deutschland Inc., Germany

Filed May 20, 1994, Ser. No. 246,908

Int. Cl.<sup>6</sup> G01L 3/26

U.S. Cl. 73-116

44 Claims



1. Process for detecting fouling of an axial compressor, said compressor comprising  
a rotor,  
a housing,  
an inlet where, in operation, gas enters at a first pressure, and  
an outlet where, in operation, gas exits at a second pressure higher than said first pressure,  
said rotor being rotatably mounted within said housing for rotation about a rotational axis,  
said axial compressor further comprising at least one axial compressor stage, each said axial compressor stage comprising  
a row of rotor blades mounted on said rotor and being arranged one following the other in a circumferential direction with respect to said rotational axis, and  
a row of stator blades mounted on said housing and being arranged one following the other in a circumferential direction with respect to said rotational axis,  
each said axial compressor stage having, in operation, a dynamic pressure field surrounding each said rotor in the region of said housing,

each said axial compressor stage further having, in operation, a characteristic frequency defined as the product of the number of rotor blades mounted in said row of rotor blades and the rotational speed of said rotor,  
each said axial compressor stage further having a defined reference pattern associated with said characteristic frequency,  
said process comprising the following steps:  
measuring the pressure fluctuations of at least one said dynamic pressure field with a pressure sensing means responsive at said characteristic frequency and generating at least one sensor signal;  
deriving a plurality of frequency components from each sensor signal, wherein one said frequency component is derived at a frequency essentially equivalent to said characteristic frequency;  
smoothing said plurality of frequency components into a smoothed frequency signal; and  
comparing said smoothed frequency signal and said defined reference pattern, thereby determining a fouling parameter indicative of the fouling of said axial compressor.

5,479,819

Patent Not Issued For This Number

5,479,820

# CRYOGENIC GAUGE

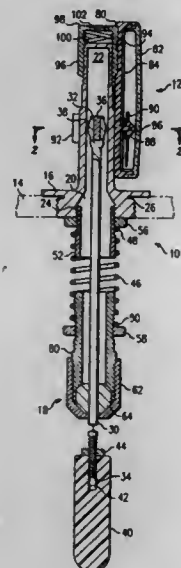
Nicholas M. G. Fekete, Richardson, Tex., assignor to Rochester Gauges, Inc., Dallas, Tex.

Filed Oct. 12, 1993, Ser. No. 134,050

Int. Cl.<sup>6</sup> G01F 23/38

U.S. Cl. 73-319

12 Claims



8. A gauge assembly comprising:  
(a) a float assembly, which moves in response to changes in fluid level in a vessel having:  
(1) a head defining a passageway, said passageway having first and second ends, said first end of said passageway being closed and said second end being open and said head having an exterior threaded surface;  
(2) a spring having first and second ends, said first end being attached to said head adjacent to said second end of said passageway;  
(3) a lift rod, said lift rod having first and second ends;  
(4) first magnet attached to said first end of said lift rod, said lift rod being movable within said passageway of said head;

(5) a float adjustably attached to said second end of said lift rod;  
(6) said lift rod being adjustably attached to said second end of said spring, thereby allowing for adjustment of said float attached to said lift rod to a desired position in said vessel;  
(7) an adjustment nut threadedly engaging said threaded surface with a spring interposed between a top of said adjustment nut and said head;  
(b) a dial assembly slidably mounted adjacent to said passageway of said head having:  
(1) a base having a pivot pin, said base also having a clamping member for slidably engaging said head of said float assembly; and  
(2) a pointer assembly comprising a second magnet attached to an indicating arm which is pivotally attached to said pivot pin;  
(3) a dial face located between said base and said pointer assembly; said dial face having volume indicia;  
(4) said second magnet movable in response to changes in position of said first magnet in said passageway;  
(5) said dial assembly having an adjustment nut engaging means on the outside of said base for rotatably engaging said adjustment nut to permit positioning of the dial assembly along the head.

5,479,821

# METHOD AND APPARATUS FOR MEASURING UNBALANCE OF A MOTOR VEHICLE WHEEL ON A MOTOR VEHICLE

Eickhart Goebel, Pfungstadt, Germany, assignor to Hofmann Werkstatt-Technik GmbH, Pfungstadt, Germany

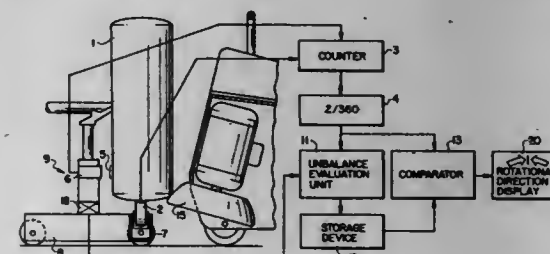
Filed Aug. 25, 1993, Ser. No. 111,820

Claims priority, application Germany, Aug. 25, 1992, 42 28 145.8

Int. Cl.<sup>6</sup> G01M 1/28

U.S. Cl. 73-457

28 Claims



1. An apparatus for measuring unbalance of a vehicle wheel freely rotatably mounted on a motor vehicle, comprising:  
a lifting means for raising the vehicle wheel to be measured;  
a drive means for driving the vehicle wheel in rotation;  
a sensing means for sensing at least one of a speed of rotation of the vehicle wheel and a rotational angle of the vehicle wheel, said sensing means including means for sensing a marking on the vehicle wheel;  
a force measuring means for ascertaining centrifugal forces resulting from unbalance of the vehicle wheel;  
an evaluation means for determining at least one correcting weight size and at least one angular position at which at least one weight having said at least one correcting weight size is to be fixed to the vehicle wheel;  
an incremental generator in rolling engagement with said vehicle wheel and rotated by said vehicle wheel for generating increment signals corresponding to rotation of the vehicle wheel; and  
a rotational angle generator connected to the means for sensing a marking on the vehicle wheel and to the incremental generator, for determining the rotational angle of the vehicle wheel based on a counting rate between each two successive sensings of the markings on the vehicle wheel by said means for

sensing a marking on the vehicle wheel compared with a full rotation of the vehicle wheel.

5,479,822

# CASING FOR A VIBRATORY GYROSCOPE

Shozo Motohashi; Katsumi Fujimoto; Hiroshi Nishiyama; Yoshiaki Heinouchi; Kazuhiro Yoshitani, and Yukio Sakashita, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

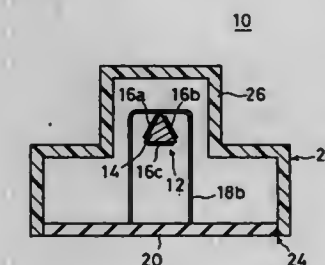
Filed Oct. 13, 1993, Ser. No. 135,332

Claims priority, application Japan, Jan. 16, 1992, 4-304842

Int. Cl.<sup>6</sup> G01P 15/08; 1/02

U.S. Cl. 73-504.14

2 Claims



1. A vibratory gyroscope comprising:  
a cylinder-shaped vibrating body; and  
a case to cover said vibrating body, said case having upper and lower portions, said upper portion being narrower in width than said lower portion,  
wherein in a direction a) which is orthogonal to a vertical direction of said vibrating body and b) which is orthogonal to an axis direction of said vibrating body, at least a length of said upper portion of said case, opposed to said vibrating body, is different from a length of an integer multiple of a half-wave length of a sound wave of a vibrating frequency of said vibrating body.

5,479,823

# METHOD AND APPARATUS FOR INDUCING AUDIO VIBRATIONS

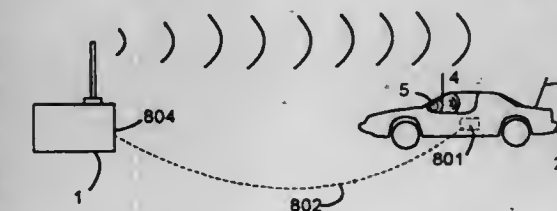
James E. Van Hout, Auburn Hills; Alexander J. Owski, Redford; Anthony J. Mangiapane, Sterling Heights, and Charles T. Briggs, III, Southfield, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Nov. 3, 1994, Ser. No. 333,657

Int. Cl.<sup>6</sup> G01H 1/00

U.S. Cl. 73-579

30 Claims



1. A method for testing for vibrations in the interior of a vehicle comprising the steps of:  
selecting a frequency from within a predetermined range of frequencies;  
generating a signal at the selected frequency;  
frequency modulating the signal with a carrier signal to shift the frequency to a range of frequencies receivable by an FM receiver;  
transmitting the frequency modulated signal;  
receiving the transmitted signal with the FM receiver;



demodulating the received signal;  
reproducing the demodulated signal through speakers located in the interior of the vehicle so as to induce sympathetic vibrations in components of the vehicle sensitive to said demodulated signal at the selected frequency; and  
identifying sources of the vibrations.

5,479,824

## ON-LINE SHAFT CRACK DETECTOR

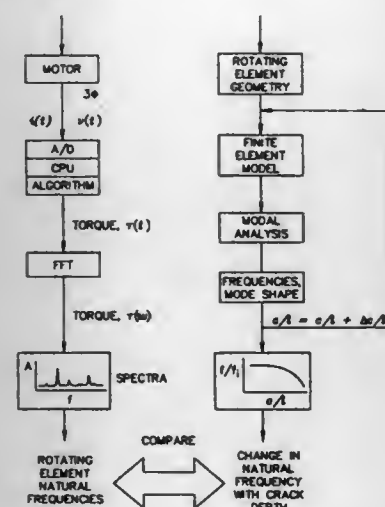
Martin R. Torres, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Dec. 21, 1993, Ser. No. 170,966

Int. Cl.<sup>6</sup> G01N 29/04

U.S. Cl. 73-602

14 Claims



1. A method for monitoring the depth of a crack in a rotating element driven by a motor, comprising the steps of:  
generating a table of data showing the change in simulated torsional natural frequency of a geometric model of said rotating element as a function of simulated crack depth;  
measuring a torsional natural frequency of said rotating element; and  
identifying a simulated crack depth corresponding to said measured torsional natural frequency in said table of data,  
wherein said step of measuring a torsional natural frequency comprises the steps of determining the time-varying torque of said rotating element by measuring fluctuations in the current and voltage being drawn by said motor and transforming said time-varying torque to the frequency domain.

5,479,825

## TRANSDUCERS FOR TRANSMITTING AND/OR RECEIVING ULTRASONIC ENERGY

Paul Williams, and Bradley M. Pankonin, both of Columbus, Ohio, assignors to ABB Industrial Systems Inc., Columbus, Ohio

Division of Ser. No. 10,652, Jan. 28, 1993, Pat. No. 5,348,538.

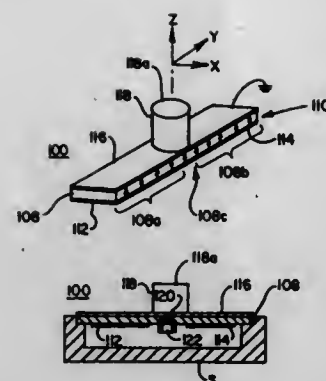
This application Dec. 23, 1994, Ser. No. 362,909

Int. Cl.<sup>6</sup> G01N 29/24; 29/28

U.S. Cl. 73-644

14 Claims

1. An ultrasonic energy transducer for contact with sheet material, said transducer comprising:  
a piezoelectric element having at least first and second portions which interface with one another at an interface region;  
a material contact for coupling said piezoelectric element to said sheet material, said material contact being secured to said interface region of said piezoelectric element; and



electrical contacts for making an electrical connection to said at least first and second portions of said piezoelectric element.

5,479,826

## MICROWAVE SYSTEM FOR MONITORING TURBINE BLADE VIBRATION

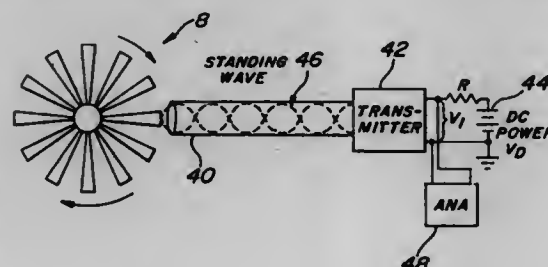
Michael Twerdochlib; Robert J. Beeson, both of Oviedo; David E. Bateman, Geneva; Paul F. Rozelle, Fern Park, and John F. DeMartini, Lake Mary, all of Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jun. 17, 1994, Ser. No. 262,108

Int. Cl.<sup>6</sup> G01N 29/00; 17/00

U.S. Cl. 73-660

10 Claims



1. A method for monitoring turbine blade vibrations, comprising the steps of:

- transmitting a continuous wave of microwave energy towards a rotating row of blades, wherein a reflected wave is produced upon passage of an individual blade tip through the path of said continuous wave such that a standing is produced by an interaction of the transmitted wave with the reflected wave and wherein a disturbance in said standing wave resulting from the passage of said blade tip produces a signal indicative of the time at which each said passage occurs;
- monitoring said signal; and
- analyzing said signal to determine an elapsed time between passages of individual blades through the path of said continuous wave to detect vibrations of said blades.

5,479,827

## CAPACITIVE PRESSURE SENSOR ISOLATING ELECTRODES FROM EXTERNAL ENVIRONMENT

Shigeo Kimura; Yoshiyuki Ishikura; Takashi Kihara, and Takashi Masuda, all of Kanagawa, Japan, assignors to Yamatake-Honeywell Co., Ltd., Tokyo, Japan

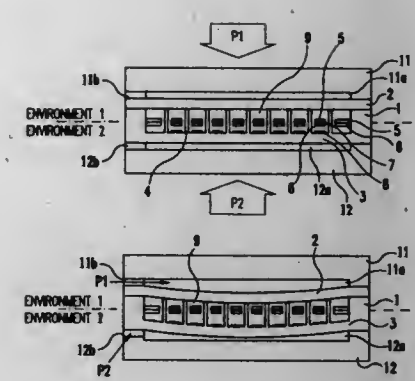
Filed Oct. 7, 1994, Ser. No. 319,532

Int. Cl.<sup>6</sup> G01L 13/06

U.S. Cl. 73-718

7 Claims

1. A capacitive pressure sensor comprising:  
a first diaphragm;



a second diaphragm bonded to said first diaphragm so as to form a cavity between said first diaphragm and said second diaphragm with said cavity isolated from outside said cavity;  
a plurality of pillars for securely supporting said first and second diaphragms;  
a movable electrode formed on the bottom of said cavity on said second diaphragm; and  
a fixed electrode formed over the entire area of said cavity without contacting with said plurality of pillars, said fixed electrode securely supported by the inner wall of said cavity substantially in parallel with said movable electrode, said fixed electrode constituting a capacitor structure together with said movable electrode.

5,479,828

## STRUCTURE WITH INTRINSIC DAMAGE CONTROL, MANUFACTURING PROCESSES AND METHOD OF USE

Philippe Bonniau, Houilles; Bernard Estang, Chevreuse; Bernard Perrier, Viry Chatillon; Jean Chazelas, Paris, and Jérôme Lecuillet, Chateaufort, all of France, assignors to Thomson-CSF, Puteaux, France

Division of Ser. No. 989,568, Dec. 11, 1992, Pat. No. 5,309,533.

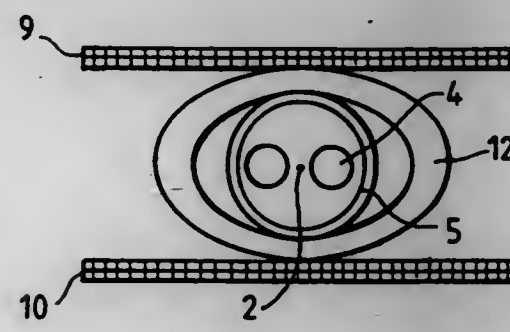
This application Jan. 18, 1994, Ser. No. 183,349

Claims priority, application France, Dec. 11, 1991, 91 15347

Int. Cl.<sup>6</sup> G01L 1/24; G01B 11/16

U.S. Cl. 73-800

7 Claims



1. A method for determining a value and localization of a stress comprising the steps of:

- providing a structure comprising a composite material including a plurality of sheets forming piles, a casing formed between two of the plurality of sheets forming the composite material, the casing having an internal diameter, and an optical fiber located within the casing and having an external diameter which is less than the internal diameter of the casing so as to form a non-solid void area between the external diameter of the optical fiber and the internal diameter of the casing, the optical fiber having a slow axis and a fast axis of propagation; introducing an input signal constituted by a continuous light wave with low temporal coherence and high spatial coherence into the optical fiber;

measuring a phase-shift between a wave train of the fast axis known as a reference signal and each of the successive wave trains coming from the slow axis at an output of the optical fiber.

6. A process for the manufacture of a structure comprising the steps of:

- providing an optical fiber having a fast axis of propagation and a slow axis of propagation;
- disposing the optical fiber within a casing; the optical fiber having an external diameter which is less than an internal diameter of the casing so as to form a non-solid void area between the external diameter of the optical fiber and the internal diameter of the casing;
- disposing the casing with the optical fiber in a composite material including a plurality of sheets forming piles, the casing with the optical fiber being disposed between two of the sheets of the composite material to generate a resulting structure; and
- polymerizing and stabilizing the resulting structure by a temperature and pressure cycle, wherein a maximum temperature of the cycle remains below a temperature for which the optical fiber risks being damaged.

5,479,829

## METHOD FOR QUANTITATIVE INSPECTION OF COLD-EXPANDED FASTENER HOLES

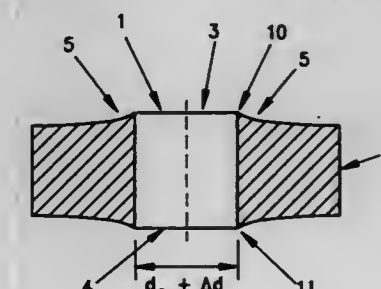
Alan Levy, Stony Brook; James R. Kennedy, Huntington, and John M. Papazian, Great Neck, all of N.Y., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Dec. 16, 1994, Ser. No. 357,741

Int. Cl.<sup>6</sup> G01M 5/00

U.S. Cl. 73-823

10 Claims



1. A method for measuring a degree of cold expansion of a cold expanded hole in a structural part, said hole having an opening located in at least one plane of the structural part and out-of-plane deformation in a material surrounding the opening formed as a result of cold expansion, said method comprising:

- measuring the out-of-plane deformation in the material surrounding the opening relative to an edge defining the opening;
- comparing the deformation measurement to a three-dimensional model constructed from an array of out-of-plane displacement profiles obtained for a hole which has substantially the same dimensions and which has been subjected to varying degrees of cold expansion; and
- determining the degree of cold expansion of the hole based on the results of this comparison.

5,479,830

## ANCHORAGE HARDWARE TESTING DEVICE

Richard J. Gemra, Millington, N.J., assignor to Bell Communications Research Inc., Livingston, N.J.

Filed Nov. 18, 1994, Ser. No. 341,724

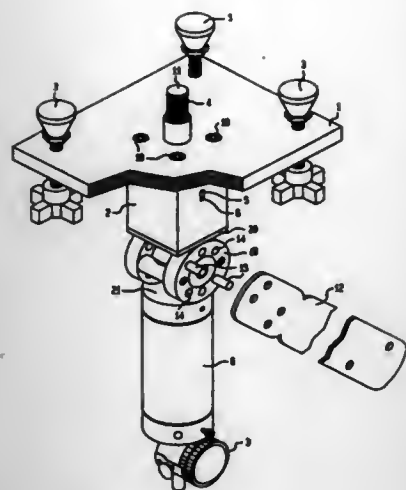
Int. Cl.<sup>6</sup> G01N 3/08

U.S. Cl. 73-826

20 Claims

1. A device for applying a force to hardware on a surface and comprising





a mounting frame,  
an enclosure secured to said mounting frame away from the surface and including a coupler member slidably positioned therein,  
means extending through said frame, secured to said coupler member and attachable to the hardware,  
a housing member spaced from said enclosure  
spring means within said housing member and means connecting said spring means to said coupler member, and  
means for increasing the spacing between said enclosure and said housing member to cause said spring means to generate a force to apply through said connecting means and said coupler member to the hardware to be tested.

5,479,831

## FISHLINE TENSION MEASURING DEVICE FOR FISHING REEL

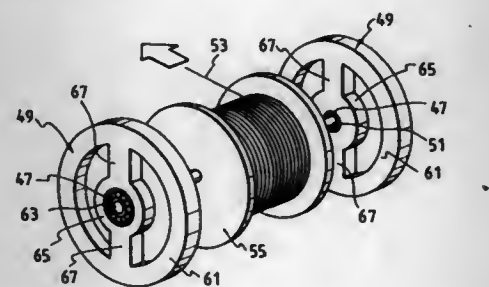
Haruomi Hirose, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Filed Mar. 28, 1994, Ser. No. 218,807

Claims priority, application Japan, Mar. 29, 1993, 5-070173  
Int. Cl.<sup>6</sup> G01L 5/00

U.S. Cl. 73-862.44

7 Claims



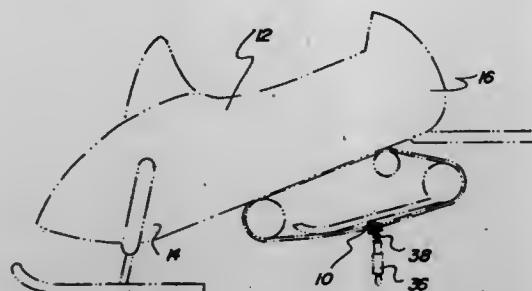
1. A fishline tension measuring device for use in a fishing reel having a main body, said device comprising:

- a bearing support member having a first portion and second portion located radially inward relative to said first portion with respect to a spool shaft, said first portion being fixed to said main body and said second portion supporting a bearing which in turn supports said spool shaft; and
- a strain gauge mounted on a third portion of said bearing support member located radially between said first portion and said second portion with respect to said spool shaft, wherein said third portion extends from said first portion to said second portion radially with respect to said spool shaft and perpendicularly with respect to a direction of a tension caused on a fishline.

5,479,832  
SNOWMOBILE TRACK ADJUSTER  
Furie C. Poerio, R.D. 8, Box 80, Punxsutawney, Pa. 15767  
Filed Sep. 29, 1994, Ser. No. 314,794  
Int. Cl.<sup>6</sup> G01L 1/04

U.S. Cl. 73-862.453

1 Claim



1. A snowmobile track adjustment device for aiding in the adjustment of the tension in a track on a snowmobile comprising, in combination:

- a snowmobile having a front portion and a back portion, the back portion having a plurality of adjustable tracks thereon, the adjustable tracks serving to drive the snowmobile along a snow surface;
- a planar rectangular top plate having an upper surface and a lower surface, the upper surface and the lower surface covered by a rubber material, the rectangular top plate having apertures formed through two end portions thereof, the rectangular top plate removably placed on a top portion of the adjustable tracks of the snowmobile;
- a planar rectangular bottom plate having an upper surface and a lower surface, the upper surface and the lower surface covered by a rubber material, the rectangular bottom plate having apertures formed through two end portions thereof, the lower surface having a securement loop secured to a central portion thereof;
- two bolts, each of the two bolts received through the apertures formed through the rectangular bottom plate and extending upwardly through the apertures formed through the rectangular top plate and coupled therewith by two wing nuts; and
- a spring gauge having a hooked upper end, the hooked upper end coupled with the securement loop of the rectangular bottom plate for accurately adjusting the track on the snowmobile.

5,479,833

Patent Not Issued For This Number

5,479,834

## APPARATUS HAVING A PIVOTED EDDY CURRENT PROBE FOR DETECTING FLAWS IN THE INNER SURFACE OF A HOLE

Toshio Sanagawa, and Naoya Shimizu, both of Kobe, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 841,097, Feb. 25, 1992, abandoned.

This application Jun. 27, 1994, Ser. No. 266,156

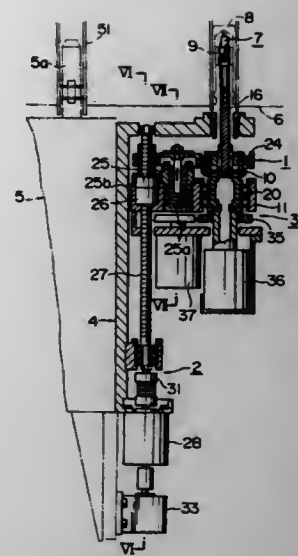
Claims priority, application Japan, Mar. 6, 1991, 3-040027

Int. Cl.<sup>6</sup> G01D 21/00

U.S. Cl. 73-866.5

4 Claims

1. An apparatus for inspecting an inner cylindrical surface of a hole having an access inlet aperture of smaller diameter than said inner cylindrical surface, comprising:  
a casing;



- a rotating mechanism mounted on said casing;
- a sensor assembly comprising
  - a sensor holder having a central axis,
  - sensor means comprising at least one eddy-current probe slidably mounted in said sensor holder for reciprocal movement in the direction of said central axis of said sensor holder, and
  - spring means between said sensor holder and said sensor means for resiliently urging said sensor means outwardly with respect to said sensor holder;
- a tilting mechanism mounted on said rotating mechanism for rotation around a longitudinal axis and comprising
  - a guide cylinder having an outer end insertable into said hole to be inspected and an inner end,
  - a tilting shaft member reciprocally movable within said guide cylinder in the direction of said longitudinal axis,
  - an inner end on said tilting shaft member adjacent said inner end of said guide cylinder,
  - an outer end on said tilting shaft member,
  - a push rod slidably mounted in said tilting shaft member for sliding movement with respect thereto in the direction of said longitudinal axis,
  - a spring member in said guide cylinder between said shaft member and push rod for resiliently urging said push rod towards said outer end of said guide cylinder,
  - means for pivotally mounting said sensor holder on said outer end of said guide cylinder for tilting said sensor holder between an inserting position wherein said central axis coincides with said longitudinal axis and said sensor holder is partly within said outer end of said guide cylinder, and an inspecting position wherein said central axis extends at an angle with respect to said longitudinal axis,
  - a link member having an inner end pivotally connected to said push rod and an outer end pivotally connected to said sensor holder so that movement of said shaft member in the direction of said longitudinal axis moves said push rod and moves said sensor holder between said inserting position and said inspecting position,
  - a longitudinal slot in said inner end of said link member,
  - a pin member extending from said push rod and slidably engaged in said slot for pivotally connecting said inner end of said link member to said push rod and providing limited substantially longitudinal displacement of said link member relative to said push rod,
  - a slot in said push rod extending in the direction of said longitudinal axis, and
  - a pin member in said tilting shaft member slidably engaged in said slot in said push rod for providing limited longitudinal displacement between said push rod and said tilting shaft member;
- said rotating mechanism comprising a hollow rotatable block member rotatably mounted on said casing and having a pair of

diametrically oppositely disposed parallel slots therein extending in the direction of said longitudinal axis;  
connecting bolt means extending through said pair of said slots in said block member and through said inner end of said tilting shaft member to facilitate limited displacement of said tilting shaft member relative to said block member in the direction of said longitudinal axis; and  
a lifting mechanism connected to said inner end of said guide cylinder and mounted on said casing for reciprocating said rotating mechanism and said tilting mechanism in the direction of said longitudinal axis to insert and retract said sensor assembly through said access inlet aperture into and from said hole.

5,479,835

## REVERSE GEAR SYNCHRONIZER

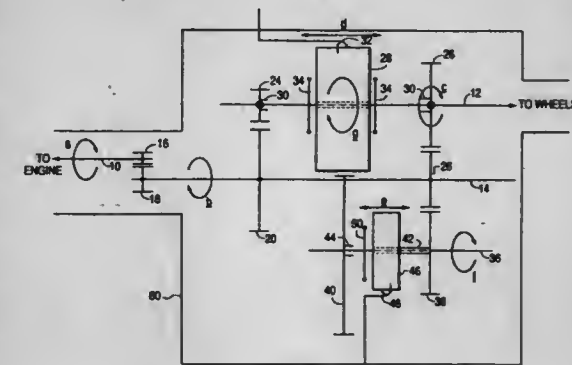
Rodolfo Esparsa, and William Leonard, both of Queretaro, Mexico, assignors to Transmisiones y Equipos Mecanicos, S.A. de C.V., Queretaro, Mexico

Filed Aug. 9, 1994, Ser. No. 288,250

Int. Cl.<sup>6</sup> F16H 3/091; F16D 23/08

U.S. Cl. 74-331

6 Claims



- 1. A manual transmission for a motor vehicle, comprising:
  - (a) an axially rotatable input shaft;
  - (b) an axially rotatable counter shaft constantly torque-transmittingly coupled to said input shaft;
  - (c) a plurality of driver gears constantly torque-transmittingly mounted on said counter shaft;
  - (d) an axially rotatable main shaft;
  - (e) a plurality of forward driven gears mounted on said main shaft for free rotation relative to said main shaft; said driven gears being in a constant meshing relationship with respective said driver gears and defining determined transmission ratios therewith;
  - (f) forward gear selecting means for torque-transmittingly coupling a selected said forward driven gear to said main shaft for rotating said main shaft from said counter shaft at a selected transmission ratio;
  - (g) a reverse shaft;
  - (h) a reverse idler gear axially fixedly mounted on said reverse shaft;
  - (i) first torque transmitting means for constantly torque-transmittingly coupling said reverse idler gear to said counter shaft;
  - (j) a reverse driven gear axially fixedly mounted on said reverse shaft at an axial distance from said reverse idler gear;
  - (k) second torque transmitting means for constantly torque-transmittingly coupling said reverse driven gear to said main shaft;
  - (l) reverse gear selecting means for torque-transmittingly coupling said counter shaft to said main shaft by means of said reverse idler gear and said reverse driven gear; said reverse gear selecting means including a sleeve axially slidably mounted on said reverse shaft between said reverse idler gear and said reverse driven gear.



and said reverse driven gear; said sleeve having first and second axially spaced positions;

(m) cooperating locking means provided on said sleeve, said reverse idler gear and said reverse driven gear for torque-transmittingly coupling said reverse idler gear to said reverse driven gear in said first position of said sleeve and for disengaging said reverse idler gear from said reverse driven gear in said second position of said sleeve; and

(n) synchronizing means mounted on said reverse shaft between said reverse idler gear and said reverse driven gear for synchronizing rotational speeds of said reverse idler gear and said reverse driven gear prior to allowing said sleeve to assume said first position.

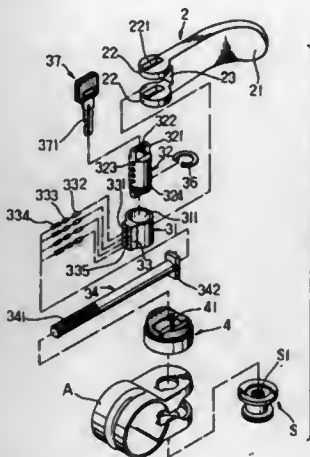
5,479,836

**QUICK RELEASE HAVING AN ANTI-THEFT DEVICE**  
Chin-Shu Chang, 58, Ma Yuan West St., Taichung, Taiwan, Prov. of China

Continuation-in-part of Ser. No. 156,163, Nov. 23, 1993, abandoned. This application Jun. 20, 1994, Ser. No. 276,661  
Int. Cl.<sup>6</sup> B62K 21/12; A45C 13/10; E05B 65/52

U.S. Cl. 74-551.1

1 Claim



1. A quick release mechanism comprising a post including a first end having an outer thread formed thereon and a second end having a lock housing provided thereon, a pad slidably engaged on said post, a nut threadably engaged with said outer thread of said post, a core rotatably engaged in said lock housing and including two sides each having a rib formed thereon, a handle including two cams formed thereon, each of said cams including a groove formed therein for engaging with said ribs of said core such that said core and said handle rotate in concert, and means for locking said core to said lock housing so as to prevent said handle from rotating relative to said lock housing.

5,479,837

**GUARD FOR CHANNEL BED PRESSES**

Kenneth E. Kyle, Madison, Conn., assignor to Geo Olcott company, Inc., Scottsboro, Ala.

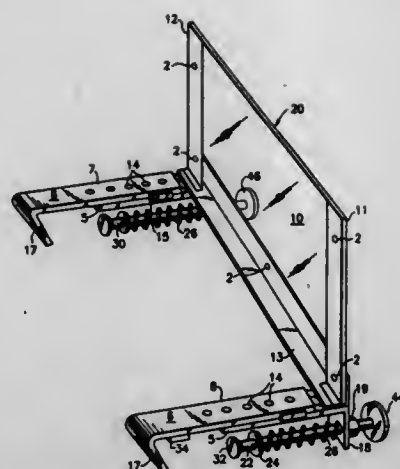
Filed Nov. 15, 1993, Ser. No. 151,868

Int. Cl.<sup>6</sup> F16P 1/00

U.S. Cl. 74-608

2 Claims

1. An easily installable and removable guard for use with an "H" frame channel bed press having a channel bed, wherein the guard comprises a high impact transparent shield, said shield being affixed to two vertical support members; said two vertical support members being affixed to a horizontal support member, said horizontal support member having two lineally adjustable members affixed in perpendicular relationship to said horizontal support member, and said horizontal support member having two spring-



loaded plungers affixed in perpendicular relationship to said horizontal support member, wherein said two lineally adjustable members each have a top piece and a bottom piece, each of said top pieces having a first end and a second end, the first end of each of said top pieces being flat, each of said top pieces having a first side and a second side, the first side of each of said top pieces having affixed thereon a first slide member, the second side of each of said top pieces having thereon a second slide member, said first and said second slide members of each of said top pieces extending below said top pieces and engaging their respective bottom pieces, the second end of each of said top pieces being formed into a hook to engage the channel bed of the "H" frame channel bed press; each of said top pieces having six holes therethrough; each of said bottom pieces having a first end and a second end, the first end of each of said bottom pieces being flat and having a hole therethrough; said hole in each of said bottom pieces aligning with one of said holes in each of said top pieces, said aligned holes in said top pieces and said bottom pieces each having a bolt passing therethrough, each of said bolts being threadably engaged with a nut forming a fastening assembly, each of said fastening assemblies acting to prevent lateral movement of each of said top pieces, said second end of each of said bottom pieces being affixed to the horizontal support member, wherein a bushing is inserted between each of said two spring-loaded plungers and the horizontal support member, said two spring-loaded plungers and said hooks being adapted to extend over the channel bed of said "H" frame channel bed press to engage said channel bed and removably support said guard on said "H" frame channel bed press.

5,479,838

**TWO-STAGE DRIVE TYPE LEVER UNIT AND MACHINE APPARATUS USING THE SAME**

Yasuo Yoshizawa, Yonezawa, Japan, assignor to Yoshiki Industrial Co., Ltd., Yamagata, Japan

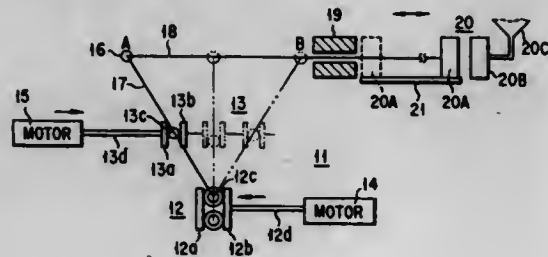
PCT No. PCT/JP92/01720, § 371 Date Jul. 21, 1994, § 102(e) Date Jul. 21, 1994, PCT Pub. No. WO94/15118, PCT Pub. Date Jul. 7, 1994

PCT Filed Dec. 28, 1992, Ser. No. 256,715

Int. Cl.<sup>6</sup> B30B 1/06; F16H 21/44

U.S. Cl. 74-834

3 Claims



1. A machine apparatus comprising:

a lever unit having a lever member pivotally supported by a stationary fulcrum and having a force point and an action point, a force point regulator connected to said force point of said lever member, and an action point regulator connected to said action point, said force point and said action point being movable in the corresponding regulators as said lever member is rotated;

a first driving source for driving said force point regulator, thereby rotating said lever member; and

a second driving source for driving said stationary fulcrum, thereby applying a pressure to said action point through said force point as a fulcrum.

5,479,839

**METHOD FOR CUTTING TUBES, WHERE TUBES ARE MOVED INTO THE CUTTING POSITION BY A ROTATABLE CLAMPING PLATE**

Jan Johansson, Byske, Sweden, assignor to Renholmens Mekaniska Verkstad AB, Byske, Sweden

PCT No. PCT/SE91/00875, § 371 Date Oct. 18, 1993, § 102(e) Date Oct. 18, 1993, PCT Pub. No. WO92/11111, PCT Pub. Date Jul. 9, 1992

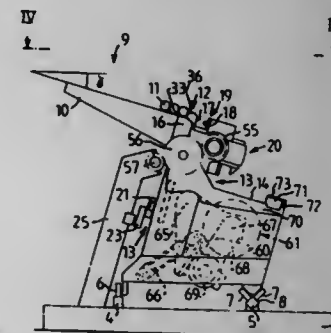
PCT Filed Dec. 18, 1991, Ser. No. 78,308

Claims priority, application Sweden, Dec. 18, 1990, 9004040

Int. Cl.<sup>6</sup> B23D 21/04; 47/04

U.S. Cl. 83-23

3 Claims



1. A method for continuously cutting pipes used in connection with welding, comprising the steps of:

feeding a first pipe to a pipe collecting position;

advancing said first pipe longitudinally into abutment with a reference surface and therefrom to a pipe cutting position;

adjusting a cutting device to cut said first pipe in the pipe cutting position to a length determined by said reference surface;

cutting said first pipe;

simultaneously with the cutting of said first pipe, feeding a second pipe to said pipe collecting position;

removing said cutting device from said pipe cutting position upon completion of the cutting, and simultaneously removing the cut pipe, advancing said second pipe longitudinally into abutment with said reference surface and therefrom to said pipe cutting position;

adjusting said cutting device to cut said second pipe in said pipe cutting position to a length determined by said reference surface; and

cutting said second pipe; repeating the steps of the method with each following pipe thereafter; wherein

said advancing of said pipes from said pipe collecting position to said pipe cutting position including rotating jaw chucks, each jaw chuck having a pair of gripping jaws.

5,479,840

**BRAKING SYSTEM FOR PORTABLE MACHINE TOOL**

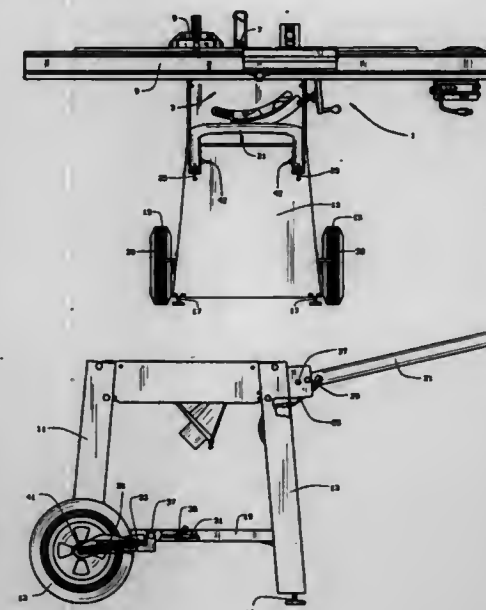
James E. Hilliard, Markham; William A. Lane, Brooklin; John W. Bartlett, Pickering; John W. LaBallister, Markham, all of, Canada, and Frederick B. Jedlicka, Jerseyville, Ill., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 6, 1994, Ser. No. 254,505

Int. Cl.<sup>6</sup> B23D 47/02; B60B 33/00; B25H 1/00

U.S. Cl. 83-477.2

7 Claims



2. A portable machine tool comprising:

a supporting base for the machine tool;

base leg supports depending from opposite ends of the supporting base each terminating in a lower end;

one pair of spaced wheels mounted adjacent the lower end to the base leg supports at one end of the supporting base;

leveling feet mounted adjacent the lower end to the base leg supports at the opposite end of the supporting base;

spring urged brake bars operating to engage one of each of the spaced wheels in braking engagement;

a release cable connected to each spring urged brake bar operating to disengage the spring urged brake bar engaging each wheel; and

a movable handle mounted to the supporting base and connected to each release cable; said movable handle being movable to a first predetermined position for non-operative engagement with each release cable to enable an associated spring urged brake bar to jointly operatively engage one of the spaced wheels in braking engagement; said movable handle also being movable to a second predetermined position for joint operative engagement with each release cable for disengaging the spring urged brake bar associated with each one of said wheels;

whereby the portable machine tool can be tilted onto the spaced wheels when the spring urged brake bars are moved out of braking engagement with each wheel by locating the movable handle in its first predetermined position and moved to a desired location where the spring urged brake bars can operatively re-engage each wheel when the movable handle is moved to its second predetermined position.



5,479,841

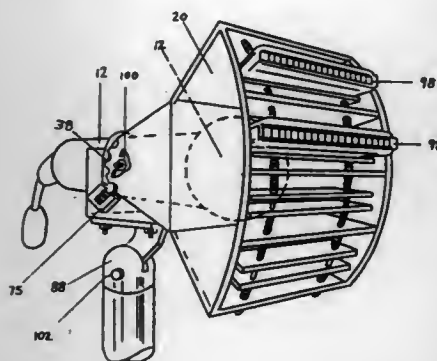
## FREE STANDING MULTI-HARP HOLDER

Robert H. Garrett, 902 Green Valley Dr., St. Albans, W. Va. 25177

Filed Sep. 24, 1993, Ser. No. 125,800  
Int. Cl.<sup>6</sup> G10D 7/12

U.S. Cl. 84—379

4 Claims



1. Apparatus for simultaneously holding a plurality of harmonicas comprising a walled base defining an enclosure, a microphone extending through a rear portion of said base into said enclosure, a flared sound chamber disposed around portions of said base and said microphone, a plurality of transverse sound chamber plates disposed at the periphery of said sound chamber and forming a plurality of small sound chambers, a pair of transverse, spring biased holding plates disposed in each of the small sound chambers and adapted to hold a harmonica therebetween, pivot means to pivot said flared chamber about an axis perpendicular to the axis of said microphone so that a harmonica to be played in any of said small sound chambers may be pivoted to desired position adjacent the end of said microphone, locking means to lock said flared sound chamber in desired position comprising a plurality of notches provided in a wall portion of said flared sound chamber, and a spring loaded locking member disposed on said base and engaging within one of said notches.

5,479,842

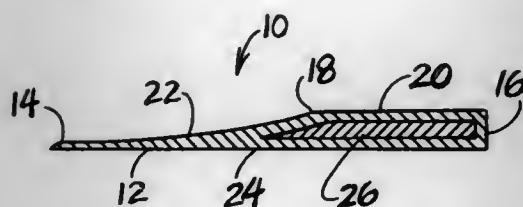
## FLAVORED MUSICAL INSTRUMENT REEDS

Walter H. Ostermeyer, 2415 Forest Park Blvd., Fort Wayne, Ind. 46805

Filed Dec. 30, 1993, Ser. No. 176,096  
Int. Cl.<sup>6</sup> G10D 9/02; B05D 3/02

U.S. Cl. 84—383 A

18 Claims



1. A reed for a musical instrument comprising a reed body having opposite ends, one of said ends being adapted to be mounted in a mouthpiece of a musical instrument, the other of said ends being tapered from a position remote of said one end toward said other of said ends, said reed body being impregnated with a water solution of a water soluble based flavorant, said flavorant being concentrated at said other of said ends.

5,479,843

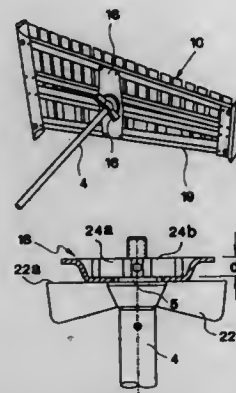
## SPIN-LOCK MUSICAL INSTRUMENT STAND

Misuo Yanagisawa, Yachio, Japan, assignor to Pearl Musical Instrument Co., Chiba, Japan

Filed Jul. 19, 1994, Ser. No. 279,245  
Int. Cl.<sup>6</sup> G10D 13/08

U.S. Cl. 84—403

15 Claims



1. A support for a musical instrument comprising:

- a base member for placement on a support surface, said base member comprising a support rod defining a longitudinal axis and a key member disposed proximate one end of said support rod;
- an attachment plate adapted to be affixed to an instrument, said attachment plate comprising an aperture adapted to receive said key member; and
- locking means for securing said attachment plate to said base member at a locked position, wherein said base member is rotated relative to said attachment plate a predetermined angle from an unlocked position to said locked position.

5,479,844

## PNEUMATIC BOOSTER WITH ELECTROMAGNETIC SERVO CONTROL, ESPECIALLY FOR MOTOR VEHICLE BRAKE SYSTEMS

Helmut Heibel, Moschheim, and Josef Pickenhahn, Plaidt, both of, Germany, assignors to Lucas Industries Public Limited Company, West Midlands, United Kingdom

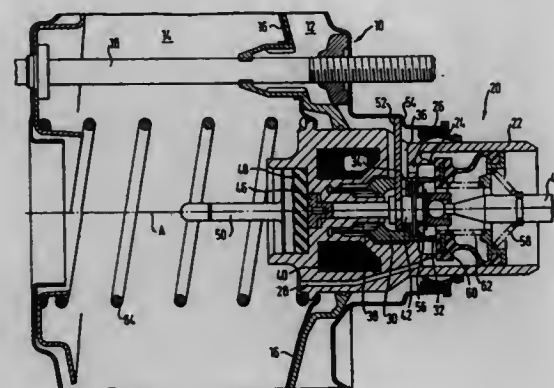
PCT No. PCT/EP93/00855, § 371 Date Aug. 19, 1994, § 102(e) Date Aug. 19, 1994, PCT Pub. No. WO93/21048, PCT Pub. Date Oct. 28, 1993

PCT Filed Apr. 6, 1993, Ser. No. 284,663

Claims priority, application Germany, Apr. 8, 1992, 4211849 Int. Cl.<sup>6</sup> F15B 9/10

U.S. Cl. 91—369.2

8 Claims



1. A pneumatic booster with electromagnetic servo control, for motor vehicle brake systems, comprising

a booster casing (10) inside which a first chamber (12) and a second chamber (14) are separated from each other by a movable wall (16),

a valve housing (22) which is connected to the movable wall (16) for joint axial relative movement with respect to the booster casing (10) and which includes a first valve seat (24), a sealing member (60) which is arranged to be axially movable inside the valve housing (22) and is biased in a direction towards the first valve seat (24),

a piston (42) which is guided in the valve housing (22) so as to be axially displaceable and designed to transmit actuating forces from an actuator member (44) to an output member (50),

a valve closing member (30) which is guided in the valve housing (22) so as to be axially displaceable with respect to the piston (42) and has a second valve seat (32) for cooperation with the sealing member (60),

an abutment member (52) which projects to the outside substantially radially through a recess (36) formed in the valve housing (22) and defines an inoperative position of the piston (42) with respect to the booster casing (10) by abutting against a stop (54) formed at the booster casing (10), when the actuator member (44) is not actuated,

a valve spring (38) which biases the valve closing member (30) in the direction of the sealing member (60), and

an electromagnet (40) which, when energized, moves the valve closing member (30) away from the sealing member (60) against the resistance of the valve spring (38), characterized in that the abutment member (52) is connected firmly to the piston (42) and received in the recess (36) of the valve housing (22) and in a corresponding radial recess (34) of the valve closing member (30) with an axial clearance of such dimensions that the valve spring (38) holds the valve closing member (30) against the abutment member (52) when the electromagnet (40) is not energized, simultaneously holding the second valve seat (32) against the sealing member (60) when the piston (42) is in said inoperative position.

5,479,846

## PISTON MACHINE ABLE TO BE USED AS A COMPRESSOR OR MOTOR

Claude Trapp, Rueil Malmaison, France, assignor to Seref, France

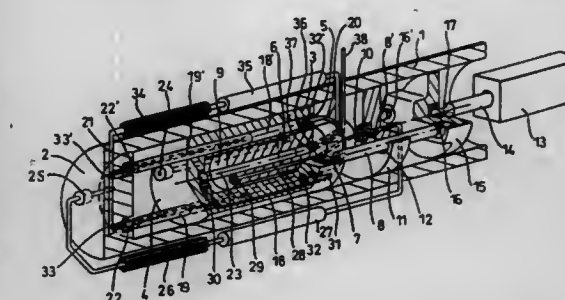
PCT No. PCT/FR92/01077, § 371 Date May 20, 1994, § 102(e) Date May 20, 1994, PCT Pub. No. WO93/10353, PCT Pub. Date May 27, 1993

PCT Filed Nov. 20, 1992, Ser. No. 244,258

Claims priority, application France, Nov. 22, 1991, 91 14385 Int. Cl.<sup>6</sup> F01B 15/00

U.S. Cl. 92—66

8 Claims



1. Machine for exchanging energy between a mechanical member comprising a mobile part having an alternate rectilinear movement and a first piston cooperating with a cylinder for transferring a fluid under pressure, wherein said first piston is connected to said mobile part by means of a first joint and said cylinder is connected to a fixed part by means of a second joint, said first and second joints having two degrees of angular freedom, said first piston being mobile in said fixed cylinder and comprising a bore which cooperates with a fixed second piston, said first mobile piston being driven by two connecting rods which are connected to it by two ball joints and said second fixed piston being connected by a ball joint to a wall fixed to said cylinder.

6. Machine for exchanging energy between a mechanical member comprising a mobile part having an alternate rectilinear movement and a first piston cooperating with a first cylinder for transferring a fluid under pressure, wherein said first cylinder is connected to said mobile part by means of a first joint and said first piston is connected to a fixed part by means of a second joint, said first and second joints having two degrees of angular freedom, a second piston being mobile in a fixed second cylinder and comprising a bore which cooperates with said fixed first piston, the mobile second piston being driven by two connecting rods which

5,479,845

## FLUID SUPPLY ASSEMBLY FOR WORKING VEHICLES

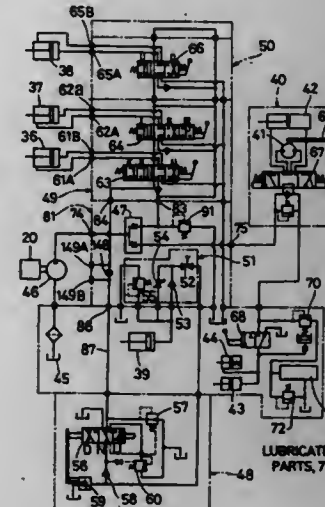
Masahisa Kawamura, Amagasaki, and Ryota Obashi, Kobe, both of, Japan, assignors to Kanzaki Kokyukoki Mfg. Co., Ltd., Amagasaki, Japan

Filed Jan. 18, 1994, Ser. No. 183,504

Claims priority, application Japan, Feb. 17, 1993, 5-051407 Int. Cl.<sup>6</sup> F15B 13/06

U.S. Cl. 91—514

11 Claims



1. In a working vehicle comprising: a hydraulic lift mechanism for lifting and lowering an auxiliary implement to be connected liftably to the vehicle, said lift mechanism including a hydraulic



are connected to it by two ball joints and the fixed first piston being connected by a ball joint to a wall fixed to said fixed second cylinder.

5,479,847

**DUAL-PISTON PUMP APPARATUS**

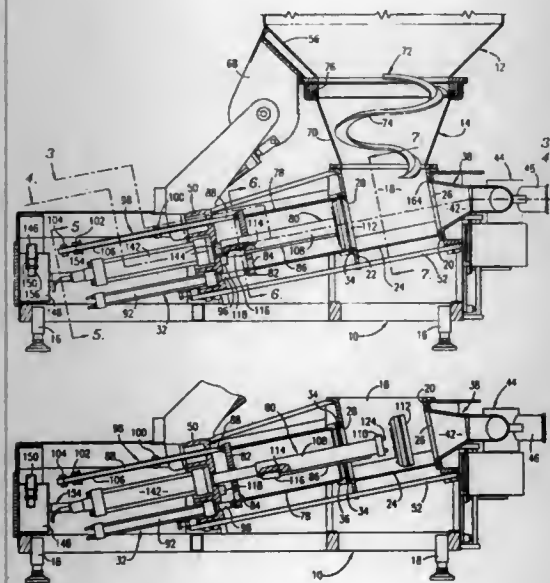
Richard G. Powers, and William R. Wright, both of Overland Park, Kans., assignors to Marlen Research Corporation, Overland Park, Kans.

Filed Nov. 7, 1994, Ser. No. 335,139

Int. Cl.<sup>6</sup> F01B 31/00

U.S. Cl. 92—87

20 Claims

**1. A dual-piston pump apparatus comprising:**

- a frame defining a pump chamber having a common zone for receiving therein material to be pumped by both of said dual pistons, said chamber including structure defining an inlet and an outlet;
- a pair of side-by-side pistons each supported on the frame for reciprocating movement within the pump chamber along a line that is angled relative to the horizontal by an angle of less than about 45° between a retracted position withdrawn from the outlet and an extended position adjacent the outlet, each piston being movable, through said common material-receiving zone between the retracted and extended positions thereof and presenting a piston face; and
- a piston moving means for reciprocating the pistons between the retracted and extended positions thereof and through said common material-receiving zone.

**17. A method of cleaning a dual-piston pump apparatus comprising the steps of:**

- moving a catch from a first position in which the catch prevents the end of a reciprocative sleeve of the apparatus from being withdrawn from a pump chamber of the apparatus and a reciprocative piston of the apparatus from being extended into the chamber beyond the sleeve, to a second position in which the end of the sleeve is free to be withdrawn from the pump chamber and the piston is free to be extended beyond the sleeve;
- retracting the sleeve to a position withdrawn from the pump chamber to expose the hole in the chamber from which the sleeve is removed;
- extending the piston into the chamber beyond the sleeve to expose a face and head of the piston within the chamber; and
- cleaning all exposed surfaces of the apparatus.

5,479,848

**DEVICE FOR THE INSTANT, AUTOMATIC, PRESSURIZED PERCOLATION OF FOOD LIQUIDS**  
 Rolland Versini, 1 square des Bleuets, Calas 13480, France  
 PCT No. PCT/FR93/00340, § 371 Date Nov. 17, 1994, § 102(e)  
 Date Nov. 17, 1994, PCT Pub. No. WO93/19655, PCT Pub. Date Oct. 14, 1993

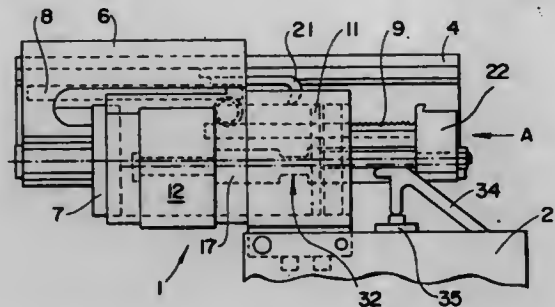
PCT Filed Apr. 5, 1993, Ser. No. 313,042

Claims priority, application France, Apr. 6, 1992, 92 04469

Int. Cl.<sup>6</sup> A47J 31/00; 31/24; 31/34; 31/36

U.S. Cl. 99—287

20 Claims

**1. Device for instant, automatic, pressurized percolation of food liquids including hot beverages, comprising:**

- a mechanical group formed from functional sections, said mechanical group being removable without tools, and comprising:
  - an infusion chamber comprising an upper opening enabling receipt of a food powder and a longitudinal axis;
  - a compression piston horizontally displaceable in said infusion chamber, said piston including a mobile base;
  - a filling chamber extending said infusion chamber, said filling chamber being horizontally movable with said mobile base;
  - a horizontal pivot borne by said infusion chamber;
  - a scraper for removing food powder, said scraper being pivotal in a vertical plane perpendicular to said longitudinal axis of said infusion chamber around said horizontal pivot;
  - a main rack, a secondary rack and a pinion gear;
  - a mobile element bearing said compression piston and driving said main rack which is affixed to said mobile element;
  - at least one fixed rail, said infusion chamber, said mobile element, said filling chamber and said mobile base being slidable along said at least one fixed rail, and said pinion being affixed to said at least one fixed rail so that said main rack activates said secondary rack in an opposite direction to movement of said main rack through said pinion;
  - a rod affixing said filling chamber and said mobile base, said rod being constructed and arranged so as to check movement of said scraper;
  - a heater for production of hot water capable of being attached to said mechanical group through said infusion chamber by quick connectors; and
  - a drive unit for activating movable elements and through reversal of motion causing displacement of said main rack and said secondary rack in opposite directions.

5,479,849

**LOWER CHAMBER VENT FOR THE LOWER CHAMBER OF A BREWING MACHINE**

Brian King, Belmont, Mass.; Paul King, Montreal, and Stan McLean, Dorval, both of, Canada, assignors to VKI Technologies, Inc., Quebec, Canada

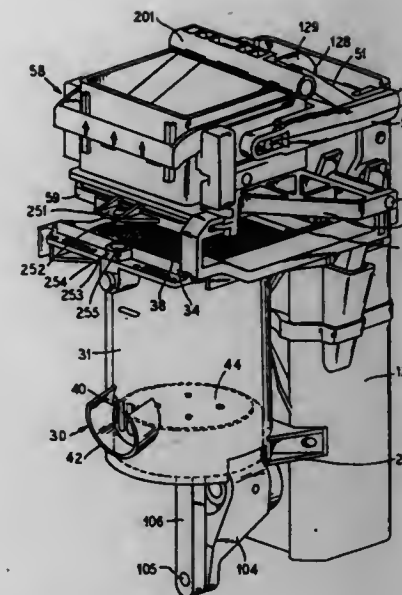
Filed Mar. 31, 1995, Ser. No. 414,802

Int. Cl.<sup>6</sup> A47J 31/32

U.S. Cl. 99—287

6 Claims

- 1. Apparatus for brewing a beverage comprising, in combination:
  - an upper chamber for receiving and containing hot water in a brewing material and having an open lower end,



- means for inputting a plurality of bread recipes to said process control unit;
- means for selecting one of said plurality of recipes:
- a plurality of whole grain storage bins;
- a grinder;
- means for feeding one or more grains from said plurality of grain storage bins to said grinder according to said selected recipe as determined by said process control unit;
- mixing means for forming a dough;
- means for delivering ground grain from said grinder to said mixing means;
- a plurality of dry ingredient storage bins;
- means for delivering a dry ingredient from at least one of said plurality of dry ingredient storage bins to said mixing means as determined by said process control unit according to said selected recipe;
- liquid delivering means for delivering a liquid ingredient as determined by said process control unit according to said selected recipe to said mixing means; and
- means for delivering bread loaf portions of dough from said mixing means.

5,479,851

**FRUIT AND VEGETABLE JUICER**

Stephen J. McClean, Beverly Hills, and Richard W. Yallop, Hurstville, both of, Australia, assignors to Breville Pty Ltd., Pyrmont, Australia

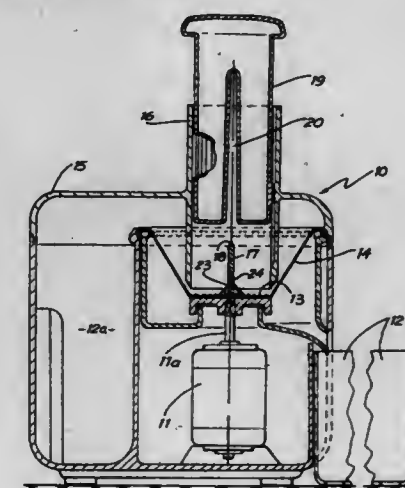
Filed May 3, 1995, Ser. No. 433,606

Claims priority, application Australia, May 25, 1994, PM5869; Feb. 13, 1995, PN1087

Int. Cl.<sup>6</sup> A23N 1/02

U.S. Cl. 99—512

8 Claims



- 1. A fruit and vegetable juicer, comprising a horizontal grating disc rotatable about a substantially vertical axis; a substantially frusto-conical filter sieve surrounding said grating disc and being integral with said grating disc, said filter sieve having sides which project upwardly and outwardly from said grating disc; a feed tube arranged above said grating disc; a food pusher insertable into said feed tube and pressing fruit and vegetable down onto said grating disc for grating so that pulp and juice thereby produced fly upwardly and outwardly and the juice pass through said filter sieve while the pulp pass over said filter sieve for subsequent collection, said feed tube having an internal diameter which is substantially equal to a diameter of said grating disc; at least one knife provided in said feed tube and having an upwardly directed cutting edge, said at least one knife being attached to and supported by said feed tube, said food pusher being formed so as to pass downwardly past said at least one knife so that a downward movement of said food pusher causes fruit and vegetables to be cut by said cutting edge of said at least one knife and pressed onto said grating disc, while said fruit and vegetable is held against rotation by said at least one knife.

**5,479,850**  
**APPARATUS AND METHOD FOR A BREAKMAKING MACHINE**

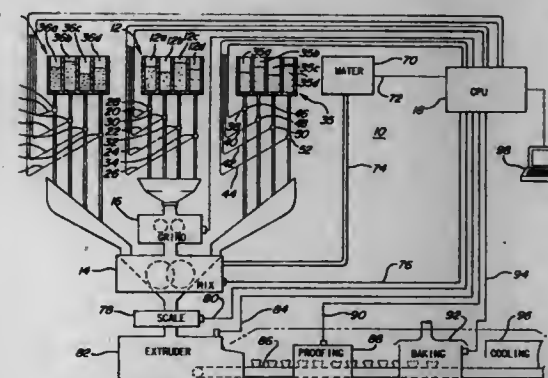
Richard M. Anderson, Waterville, Ohio, assignor to The Andersons, Maumee, Ohio

Filed Oct. 22, 1993, Ser. No. 140,323

Int. Cl.<sup>6</sup> A47J 27/14

U.S. Cl. 99—357

9 Claims



- 1. A machine for producing a wide range of mixtures of dough for the making of a variety of breads, comprising in combination:
  - a process control unit;



5,479,852

## TABLE HEIGHT ADJUSTABLE DEVICE

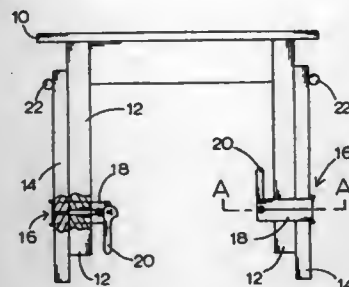
John T. Lloyd, 80926 Turkey Run Rd., Creswell, Oreg. 97426

Filed Jun. 2, 1993, Ser. No. 71,296

Int. Cl.<sup>6</sup> A47B 9/00

U.S. Cl. 100—144

15 Claims



## 1. A table comprising:

a table top;

a plurality of leg assemblies, each leg assembly including a leg member connected to the table top and extending vertically downward;

each leg assembly further including an extension member parallel to the leg member in the assembly and variably juxtaposed to the leg member, the leg assembly further including a tapered tongue extending along one of the members in the assembly and an elongate groove extending along the other member in the assembly and the tongue fitting within the groove;

each leg assembly further including a yoke, the leg member in the assembly being bound to the extension member by the yoke; and

each assembly further including a cam lever, each lever being pivotally connected to the yoke in the leg assembly and rotatable between a locked position and an unlocked position, each leg assembly including a series of holes extending along one of the members in the assembly and at least one pin projecting from the other member in the assembly, the pin being registrable with selected ones of said holes when the cam lever is rotated to the locked position.

5,479,853

## MULTIPLE STAMPING DIES WITH CUMULATIVE STAMPING MARKERS AND METHOD OF STAMPING PARTS

James E. Carroll, St. Clair Shores, and Ronald L. Lambert, Hale, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

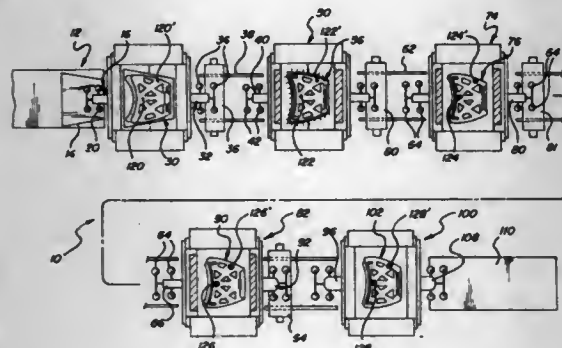
Division of Ser. No. 358,508, Dec. 19, 1994. This application

Apr. 19, 1995, Ser. No. 426,747

Int. Cl.<sup>6</sup> B31F 1/07

U.S. Cl. 101—32

3 Claims



1. In a press line for serially stamping a part from blanks supplied from a supply station into a predetermined form at an end

station having a plurality of discrete stamping dies at different stations between said supply and delivery stations, wherein the improvement comprises a set of stamping dies at each of said discrete stations, a marker die for each of said die sets, each of said marker dies having a marker for producing a shape on said part being stamped by said press line of die sets different from the shape of the other of said marker dies, said marker dies being located in corresponding positions in said die sets so that said shapes relate to a common point on said part as it is being serially stamped in the press line.

5,479,854

## AUTOMATIC SQUEEGEE ANGLE AND PRESSURE ADJUSTING MEANS

Naiochi Chikahisa, Kofu; Ken Takahashi, Yamanashi; Takao Naito, Yamanashi, and Takashi Sasaki, Yamanashi, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

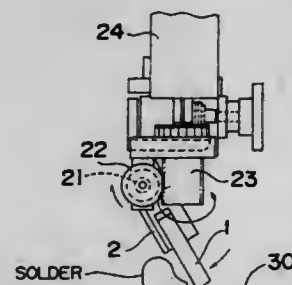
Filed Dec. 16, 1994, Ser. No. 356,969

Claims priority, application Japan, Dec. 16, 1993, 5-315685

Int. Cl.<sup>6</sup> B41F 15/46

U.S. Cl. 101—123

2 Claims



1. A screen printing machine for driving a squeegee to form a film of solder on a board through a screen, the screen printing machine comprising:

an automatic squeegeeing angle setting means which includes a squeegeeing angle of the squeegee and a squeegeeing angle detecting means for detecting the angle thereof to set the squeegeeing angle of the squeegee by the squeegeeing angle adjusting means based on a detection of the squeegeeing angle detecting means;

an automatic pressing amount setting means which includes a squeegee pressing amount adjusting means for adjusting a squeegee pressing amount caused by the squeegee and a squeegee pressing force detecting means for detecting a squeegee pressing force to set the pressing amount in consideration of a change in height resulting from a change of the angle of the squeegee by the squeegee pressing amount adjusting means based on a detecting of the squeegee pressing force detecting means; and

an automatic balancing amount setting means which includes a pressing amount balance adjusting means for adjusting balance of the pressing amount of the squeegee to set the balance of the pressing amount of the squeegee by the pressing amount balance adjusting means based on a detecting of the pressing force detecting means.

5,479,855

## BELT-TYPE PRINTING MACHINE FOR MULTI-COLOR PURPOSES

Michael Christoph, Clausthal-Zellerfeld; Udo Welschlaue, and Wolfgang Becker, both of Northeim, all of, Germany, assignors to Thimm Verpackung GmbH &amp; Co., Northeim, Germany

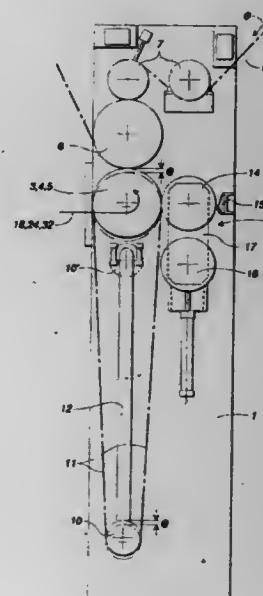
Filed Mar. 21, 1995, Ser. No. 408,684

Claims priority, application Germany, Mar. 24, 1994, 44 10 132.5

Int. Cl.<sup>6</sup> B41F 5/16

U.S. Cl. 101—174

9 Claims



1. A belt-type printing machine, especially for a plurality of colors, comprising at least one printing station (2) containing a frame (1), idler rolls (7) arranged in bearings therein, an impression cylinder (6) for guiding a continuous web (8) to be printed arranged in bearings on the frame (1), a plate cylinder (3), two sprocket wheels (4, 5) coaxially mounted to but not commonly driven with the plate cylinder (3) and at least one tensioning cylinder (10), around which an endless belt (11) extends having at least one flexible printing plate and being provided with perforations for the sprocket wheels (4, 5), wherein an inking assembly (13) allocated to the flexible printing plate of the belt (11), a drive acting upon the sprocket wheels (4, 5) to the belt (11) and an additional single drive (32) acting upon the plate cylinder (3) to the belt (11) for the purpose of avoiding the jump movement between the perforations of the belt and the pins of the sprocket wheels are provided, whereby the two sprocket wheels (4, 5) are idler rollers against each other, the drive of the sprocket wheels (4, 5) is divided into two separately controllable partial drives (18, 24), measuring devices (21, 27, 22, 28) for determining the instantaneous angular positions of the two sprocket wheels (5, 4) against each other and the instantaneous driving torques of the two partial drives (18, 24) are provided, and controlling means (37) for the controlling of driving torques equal to each other via the two partial drives (18, 24) to the sprocket wheels (5, 4) each and, in case of overriding a limit of these equal driving torques, of an additional torque adapted to the amount of overriding and to be transmitted by the additional single drive (32) of the plate cylinder (3) to the endless belt (11).

5,479,856

## ROTARY PRINTING PRESS FOR TWO-SIDED PRINTING OF SHEETS

Arno Wirz, Bammental, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

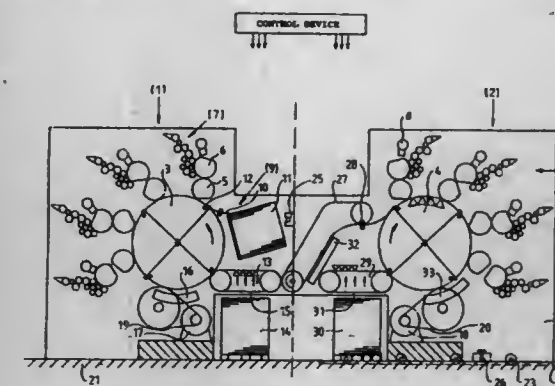
Filed Feb. 10, 1994, Ser. No. 195,362

Claims priority, application Germany, Feb. 10, 1993, 43 03 797.6

Int. Cl.<sup>6</sup> B41F 5/06; 7/06

U.S. Cl. 101—177

21 Claims



1. A rotary printing press for two-sided printing of sheets, comprising:

a first printing unit with a first impression cylinder and a plurality of printing devices arranged around said first impression cylinder;

a first sheet feeder with means for separating sheets singly from a feeder pile and for feeding the singly separated sheets to said first printing unit for printing one of the sides of the respective sheets;

a second printing unit with a second impression cylinder and a plurality of printing devices arranged around said second impression cylinder;

said first and second printing units being satellite printing units disposed mirror-symmetrically and horizontally in tandem, said first printing unit being a stationary printing unit and said second printing unit being movable relative to and being couplable to said first printing unit;

a first delivery disposed between said first and second printing units, said first delivery being disposed so as to receive the respective sheet printed in said first printing unit and depositing the sheet on a first delivery pile, said first delivery being disconnectable from said first printing unit and being adapted to selectively deliver the sheet to the first delivery pile and to said second printing unit;

a second sheet feeder disposed between said first and second printing units, said second sheet feeder, when said second printing unit is coupled to said first printing unit, receiving the sheet from said first delivery and feeding the sheet to said second printing unit for printing the other of the sides of the respective sheet; and

a control device connected to said first and second printing units for controlling operational sequences performed in the rotary printing press.

5,479,857

## CLEANING DEVICE FOR CYLINDERS OF A PRINTING PRESS

Michael Braun, Speyer, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed Apr. 18, 1994, Ser. No. 228,683

Claims priority, application Germany, Apr. 16, 1993, 43 12 420.8

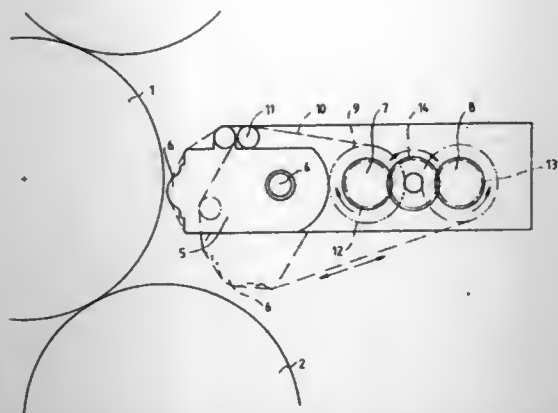
Int. Cl.<sup>6</sup> B41F 35/06

U.S. Cl. 101—423

8 Claims

1. Cleaning device for cylinders of a printing press having a cleaning cloth which is unwound from a replaceable supply roll on





a clean-cloth spindle, guided over a pressure pad movable towards the circumference of a cylinder, and wound onto a soiled-cloth spindle, and reversible drive means for feeding the cleaning cloth in sections and partially re-transporting the cleaning cloth, as well as rewinding the cleaning cloth from the soiled-cloth spindle onto the supply roll of the clean-cloth spindle, comprising a single electric motor electronically controllable so as to be reversible in direction of rotation, a gear wheel drivingly connected to said single electronically controllable electric motor so as to be reversible in direction of rotation with said electric motor, a gear wheel drivingly connected to the clean-cloth spindle, a gear wheel drivingly connected to the soiled cloth spindle, and coupling means automatically activatable for selectively bringing said gear wheel reversible in direction of rotation alternatively into meshing engagement with said gear wheel drivingly connected to the clean-cloth spindle and with said gear wheel drivingly connected to the soiled-cloth spindle when the direction of rotation of the single electric motor is reversed, said coupling means comprising an axial-cam guide by means of which said gear wheel is drivingly connected so as to be reversible in direction of rotation and alternatively engageable with said gear wheels drivingly connected to the clean-cloth and soiled-cloth spindles, respectively.

5,479,858

#### DEVICE FOR FEEDING A PRINTING PLATE TO A PLATE CYLINDER OF A PRINTING PRESS

Hermann Beisel, Walldorf, and Christian Compera, Dossenheim, both of, Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany  
Division of Ser. No. 54,964, Apr. 29, 1993, Pat. No. 5,460,092.  
This application Mar. 31, 1995, Ser. No. 414,371  
Claims priority, application Germany, Apr. 29, 1992, 42 14 049.8

Int. Cl.<sup>6</sup> B41F 1/32

U.S. Cl. 101-477

8 Claims

1. Device for feeding a printing plate to a plate cylinder of a printing unit of a printing press, the plate cylinder having a clamping device formed with clamping surfaces for clamping a leading edge of the printing plate the rein., the feeding device defining a plate-changing position in which the printing plate is transferred to the plate cylinder, the feeding device comprising at least one element for holding and guiding the printing plate, said at least one element being a readily rotatable roller having an outer cylindrical surface, whereby, in the plate-changing position, said outer cylindrical surface is disposed substantially tangentially to a straight line extending parallel to and between the clamping surfaces of the clamping device and leaving the printing unit in an upwardly inclined direction, at least another element for holding and guiding the printing plate disposed above said roller, said other element being a holding device for gripping the printing plate by suction, yet being slidable on the printing plate, said holding device, in the plate-changing position, being disposed substantially on said straight line leaving the printing unit in the upwardly inclined direction, wherein the printing plate is formed with a hole, and wherein said holding device comprises a suction cup having a



sealing, elastic suction lip for sealing off a space within said suction cup when the printing plate is pressed against said suction lip, said suction lip being formed of material having good sliding properties, said suction cup and the hole formed in the printing plate being disposed relative to one another so that, upon a sliding displacement of the printing plate, the hole formed in the printing plate passes said suction and into said space within said suction cup, in a printing plate-releasing condition of said holding device.

5,479,859

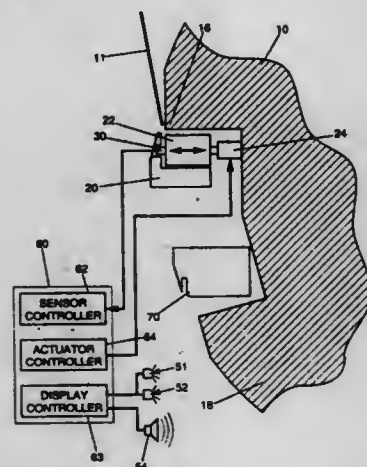
#### METHOD AND APPARATUS FOR CONTROLLING THE AUTOMATED CHANGING OF PRINTING PLATES IN PRINTING MACHINES

Bernd Lindner; Nikola Pupic, both of Heusenstamm; Helmut Schild, Steinbach/Ts.; Berthold Seib, Rodgau, and Thomas Möller, Neuhof-Rommertz, all of, Germany, assignors to MAN Roland Druckmaschinen AG, Germany  
Filed Nov. 14, 1994, Ser. No. 338,908  
Claims priority, application Germany, Nov. 12, 1993, 43 38 664.4

Int. Cl.<sup>6</sup> B41L 3/02

U.S. Cl. 101-485

9 Claims



1. A method for controlling the changing of a printing plate in a printing machine having a plate cylinder, the printing plate having a front edge to be held in position by a gripping portion of a leading edge clamping rail mounted on the plate cylinder, whereby a used printing plate is removed from the opened gripping portion of the leading edge clamping rail and a new printing plate is

subsequently inserted into the opened gripping portion, said method comprising of the steps of:

providing position sensors responsive to the position of the front edge of a printing plate, said sensors being interrogatable for determining whether a front edge of a printing plate is in an in-register position in the gripping portion of the leading edge clamping rail;

opening the gripping portion of the leading edge clamping rail; drawing the used printing plate away from the gripping portion; interrogating the position sensors to determine whether the front edge of the used printing plate is in an in-register position, such interrogation continuing and subsequent steps of the plate change method being suspended until it is determined that the used printing plate is no longer in register; feeding the front edge of a new printing plate into the opened gripping portion of the leading edge clamping rail; interrogating the position sensors to determine whether the front edge of the new printing plate is in an in-register position, such interrogation continuing and subsequent steps of the plate change method being suspended until it is determined that the new printing plate is in register; and closing the gripping portion of the leading edge clamping rail.

5,479,860

#### SHAPED-CHARGE WITH SIMULTANEOUS MULTI-POINT INITIATION OF EXPLOSIVES

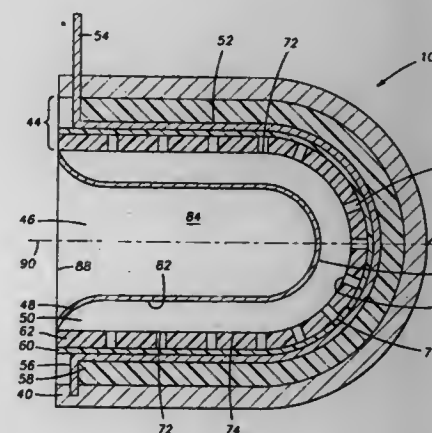
James Ellis, Houston, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 268,791; Jun. 30, 1994, abandoned. This application Nov. 16, 1994, Ser. No. 340,750

Int. Cl.<sup>6</sup> F42B 3/00; F42C 15/00

U.S. Cl. 102-313

5 Claims



1. An apparatus for perforating an earth formation from a borehole, said apparatus connected to an energy source and comprising:

- (a) a housing adapted to be deployed within said borehole;
- (b) a liner located within said housing;
- (c) a detonator assembly located between said liner and said housing and comprising a plurality of detonators for producing approximately simultaneous detonation waves when activated by said energy source, where in said plurality of detonators is arranged in a predetermined pattern; and
- (d) explosive material located between said liner and said detonator assembly, said explosive material cooperating with such detonator assembly to activate, approximately simultaneously in response to said detonation waves, at a plurality of initiation points determined by the pattern of said plurality of detonators.

5,479,861

#### PROJECTILE WITH SABOT

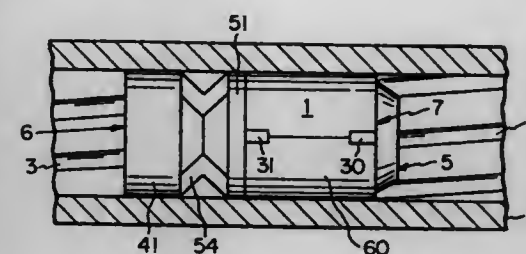
Anthony E. Kinchin, No. 12 Slaney Rd., Walsall, West Midlands, United Kingdom

Filed Jan. 3, 1994, Ser. No. 176,936

Int. Cl.<sup>6</sup> F42B 14/06

U.S. Cl. 102-439

22 Claims



1. A projectile comprising a substantially cylindrical metal slug having an exterior surface, a front end portion and a rear end portion and a sabot having a pair of independent arcuate segments, said sabot having an inner surface surrounding said exterior surface of said slug and an outer surface, a pair of radial outwardly extending lugs on said front end portion of said slug and a pair of radial outwardly extending lugs on said rear end portion of said slug, said radial outwardly extending lugs in each pair of lugs being radially spaced 180° from each other and all of said radial outwardly extending lugs located in the same longitudinal axial plane through said slug, each of said sabot segments having a pair of spaced longitudinal edges having opposed ends and a notch formed in each of said segments at each of said opposed ends of each of said longitudinal edges, wherein each of said radial outwardly extending lugs on said front end portion of said slug and said rear end portion of said slug extends into one of said notches whereby said radial outwardly extending lugs cooperate with said notches in said segments to provide a nonrotatable connection between said sabot and said slug when said projectile is propelled along a rifled gun barrel to impart a rotary motion to said sabot by contact between said outer surface of said sabot and rifling in a gun barrel and rotary motion is transferred from said sabot to said slug due to said nonrotatable connection between said sabot and said slug.

5,479,862

#### OVERHEAD CONVEYOR WITH SUPPLEMENTAL WHEEL AND RAIL FOR INCREASING DRIVING TRACTION

Holger Waterkamp, Wetter, Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

Filed Dec. 22, 1993; Ser. No. 172,610

Claims priority, application Germany, Dec. 23, 1992, 42 44 445.4

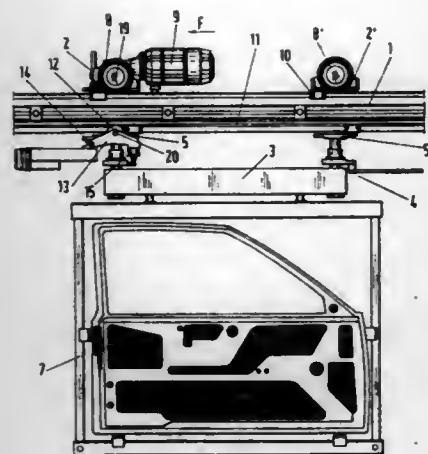
Int. Cl.<sup>6</sup> B61B 3/02

U.S. Cl. 104-93

6 Claims

1. A rail conveyor, comprising: an I-shaped main rail having an upwardly facing running surface; a trolley guided at the I-shaped rail and having lateral guide rollers; a running wheel adapted to roll on the running surface of the main rail; a counter wheel; and an extra rail for the counter-wheel, the extra rail having a downwardly facing running surface, the counter wheel being arranged to engage the downwardly facing running surface of the extra rail so as to force the running wheel against the main rail to increase frictional engagement between the running wheel and the main rail, the extra rail extending parallel to the main rail and being arranged horizontally and laterally adjacent to the main rail and offset from a vertical plane of the main rail, the running wheel and





the counter-wheel each having an axle that lies in a plane aligned perpendicular to the longitudinal extension of the main rail.

5,479,863

## RAILROAD FREIGHT CAR

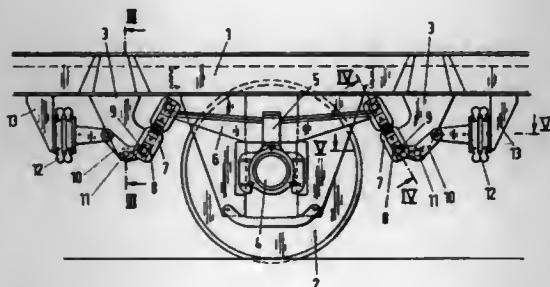
Günter Ahlborn, Siegen, and Herbert Büdenbender, Netphen, both of, Germany, assignors to ABB Henschel Waggon Union GmbH, Berlin, Germany

Filed May 16, 1994, Ser. No. 243,156

Claims priority, application Germany, May 8, 1993, 43 16 535.4

Int. Cl.<sup>6</sup> B61F 5/30; 5/32

U.S. Cl. 105—199.5



1. A railroad freight car, comprising:
  - a loading platform;
  - at least one wheelset;
  - spring brackets;
  - leaf suspension springs;
  - link suspension mountings suspending said leaf suspension springs from said spring brackets;
  - said loading platform being cushioned against said at least one wheelset by said leaf suspension springs;
  - guidance of said at least one wheelset allowing a vertical displacement and limitedly horizontal out-turn of said at least one wheelset relative to said loading platform; and
  - lifting elements each being interposed between a respective one of said link suspension mountings and a respective one of said spring brackets for raising said loading platform relative to said at least one wheelset.

5,479,864

## TRADER DESK NOSING ASSEMBLY

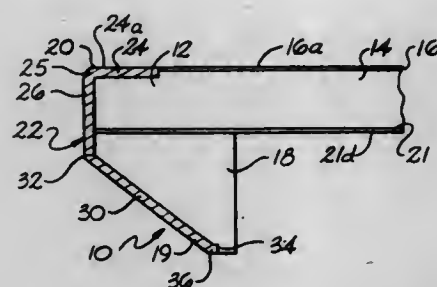
John Kemp, Columbia, S.C., assignor to Specialized Banking Furniture International, Newberry, S.C.

Filed Apr. 22, 1994, Ser. No. 231,236

Int. Cl.<sup>6</sup> A47B 17/00

U.S. Cl. 108—27

12 Claims



1. In combination, a nosing assembly and a trader desk work surface having an underside and a front end portion with a first exterior surface, comprising:
  - a lower block having a second exterior surface, said lower block directly attached to said underside of said trader desk work surface; and
  - a nosing attached only to said first and second exterior surfaces, said nosing substantially surrounding and conforming to said first and second exterior surfaces;
 whereby said trader desk work surface is provided with a nosing to protect said trader desk work surface and users thereof.

5,479,865

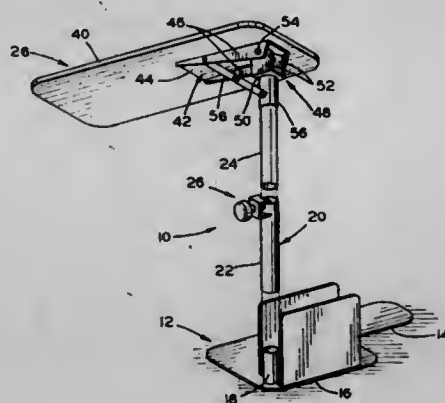
## TABLE WITH ELONGATE SUPPORT AND BASE PLATE FOR USE WITH SEATING APPARATUS

Ford B. Cauffel, 4126 Nantucket Dr., Toledo, Ohio 43623  
Continuation-in-part of Ser. No. 950,142, Sep. 24, 1992, Pat. No. 5,293,825. This application Aug. 6, 1993, Ser. No. 102,916

Int. Cl.<sup>6</sup> A47B 23/00

U.S. Cl. 108—42

11 Claims



1. An assembly for use under either side of seating apparatus having two sides for supporting a table and a post, said assembly comprising a base plate of sufficient size to be received under supporting structure on either side of said seating apparatus for supporting the table and post, said base plate having two sides, a sleeve to receive the post, a mounting base to receive said sleeve, said mounting base and said base plate having fastener means for mounting said base plate and said sleeve on an outer edge portion on either side of said base plate.

5,479,866

## PORTABLE TABLE APPARATUS

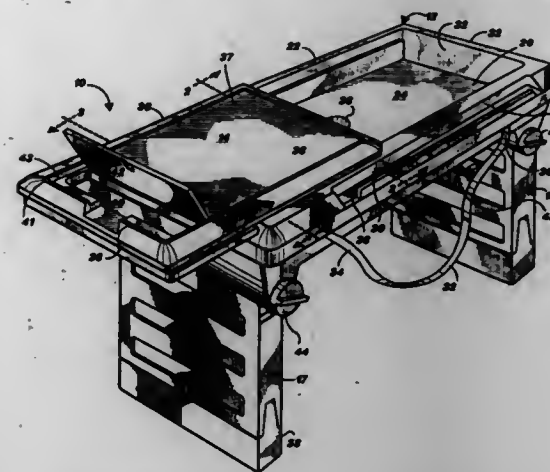
Steven P. Rae, 4359 Hwy. 138, Oregon, Wis. 53575

Filed Mar. 21, 1994, Ser. No. 215,230

Int. Cl.<sup>6</sup> A47B 37/00

U.S. Cl. 108—44

23 Claims



1. A portable table comprising:
  - (a) a tray member having an internal bottom surface, an external bottom surface, opposing first and second exterior end walls and opposing exterior side walls, internal bottom surface defining an interior chamber comprising opposing first and second interior end walls, opposing first and second interior side walls and an interior bottom surface;
  - (b) a planar cover member releasably engaged to the tray member such that it substantially covers the internal bottom surface and the interior chamber of the tray member, the planar cover member including a top surface and an internal storage compartment adjacent the top surface, the storage compartment having a lid which aligns with the top surface;
  - (c) means for slidably engaging the planar cover member onto the tray member; and
  - (d) at least two leg members wherein each of said leg members is attached to opposing ends of external bottom surface of the tray member, respectively.

5,479,867

## ROTARY TABLE

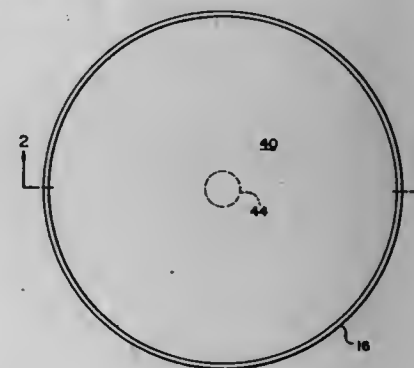
Bruce D. Blevins, 1259 E. Windsor Ave., Bristol, Tenn. 37620, and Richard A. Souder, P.O. Box 695, Bluff City, Tenn. 37618

Filed Oct. 12, 1993, Ser. No. 134,655

Int. Cl.<sup>6</sup> A47B 57/00

U.S. Cl. 108—94

8 Claims



1. A rotary table comprising a base having a planar top surface, a central through hole, and a radially extending circumferential flange;

- a bearing retainer having a central through hole and an array of recesses defined therein, arranged on plural concentric circles, wherein said recesses are arranged in at least three concentric circles, each circle having more recesses than its inwardly neighboring circle;
- each of said recesses loosely containing a captive ball which is pressed into the recess and partly protrudes from both top and bottom ends of the recess, each said ball bearing against the top surface of the base;
- a top plate having a flat bottom surface supported by said balls, and a central post extending downwardly through the central holes in both the retainer and the base; and
- means for retaining said post in said central holes.

5,479,868

## WHEELS HUB MOUNT

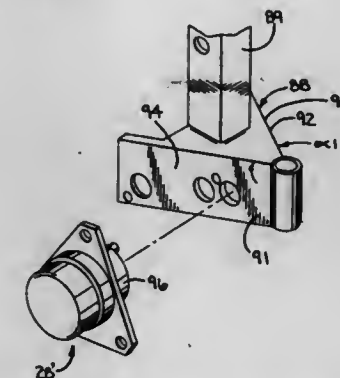
James H. Bassett, Sycamore, Ill., assignor to Dawn Equipment Co., Sycamore, Ill.

Filed Jun. 8, 1993, Ser. No. 73,574

Int. Cl.<sup>6</sup> A01C 5/06

U.S. Cl. 111—139

20 Claims



1. A hub assembly for mounting a member for rotation relative to a frame, said hub assembly comprising:
  - a support for the member;
  - a fixed hub part;
  - first means for connecting the member support to the fixed hub part for rotation relative thereto about a first axis; and
  - second means for connecting the fixed hub part fixedly to the frame relative to which the member is to be rotated,
 said second means comprising a first surface on the fixed hub part to abut a surface on the frame and a pin on one of the frame and the fixed hub part to project into a first bore on the other of the frame and the fixed hub part to prevent rotation of the fixed hub part around the first axis relative to the frame with the first surface abutted to the frame surface, said pin being movable into the first bore by translatable movement of the pin in a direction parallel to the first axis, said pin and bore being offset from the first axis, said second means further including third means for drawing the first surface on the fixed hub part against the frame surface.

5,479,869

## OIL SPILL RECOVERY SHUTTLE BARGE SYSTEM

Thomas W. L. Coudon, Port Deposit, Md., and George W. Dowell, III, Alexandria, Va., assignors to Marine Spill Response Corporation, Washington, D.C.

Filed Aug. 12, 1994, Ser. No. 289,560

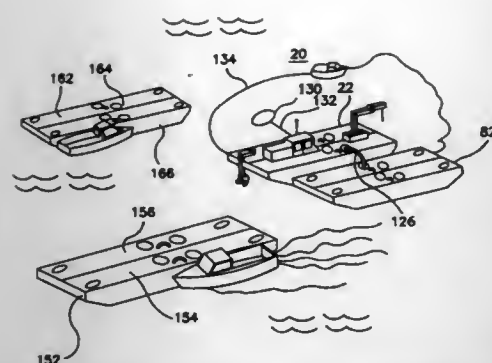
Int. Cl.<sup>6</sup> B63B 3/08

U.S. Cl. 114—26

20 Claims

1. An oil spill recovery shuttle barge system comprising:
  - a first barge comprising at least first and second substantially identical non-self propelled pontoons detachably joined-in side by side relationship, each of the first and second pon-





toons including a storage tank, a means for joining the respective pontoon to another pontoon, a means for mounting a thrust unit on the respective pontoon, and a means for mounting a crane on the respective pontoon;

a second barge comprising at least third and fourth substantially identical non-self propelled pontoons detachably joined in side by side relationship, each of the third and fourth pontoons including a storage tank, a means for joining the respective pontoon to another pontoon, a means for mounting a thrust unit on the respective pontoon, and a means for mounting a crane on the respective pontoon, the third and fourth pontoons being substantially identical to the first and second pontoons, respectively, and the thrust unit mounting means and crane mounting means on the third and fourth pontoons being substantially identical to the thrust unit mounting means and crane mounting means on the first and second pontoons, respectively;

a detachable thrust unit mountable to one of the respective thrust unit mounting means on one of the first and second barges, said thrust unit including a propulsion means for propelling the respective barge;

a detachable crane mountable to one of the respective crane mounting means on the first and second barges; and

at least one detachable hose for connecting a storage tank on one barge to a storage tank on the other barge.

5,479,870

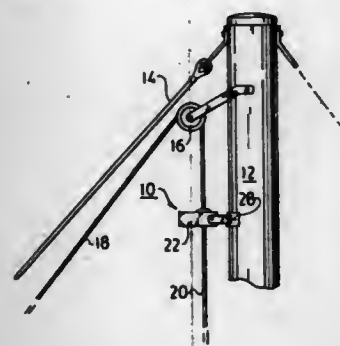
## RUNAWAY HALYARD STOP

John E. Corzine, 72 Cranberry Rd., Rochester, N.Y. 14612  
Filed Mar. 21, 1995, Ser. No. 408,059

Int. Cl.<sup>6</sup> B63B 21/08

U.S. Cl. 114—102

13 Claims



1. A runaway halyard stop for tackle used for raising an object to a predetermined location positioned above a boat deck, said tackle having:

a pulley fastened to a mast at a position above said predetermined location;

a halyard having a lifting end for attachment to said object and a working end for securing said raised object in a location above said deck, said halyard having a bight running through said pulley, said bight having a lifting length positioned

between said pulley and said lifting end and having a working length positioned between said pulley and said deck; said halyard being placed under tension whenever said object is raised to and secured in said predetermined location, and said working length being aligned in a predetermined halyard-under-tension direction whenever said halyard is under tension;

said runaway halyard stop comprising:

a stop body adapted to be pivotally attached to said mast at a preselected location below said pulley, said stop body including a passageway with walls through which the working length of said halyard bight is passed, said pivoted stop body being movable between:

a first position in which said passageway is substantially aligned with said halyard-under-tension direction so that its walls create little, if any, frictional resistance to movement of said working length, and

a second position in which said passageway is out of alignment with said halyard-under-tension direction so that its walls create frictional resistance to movement of said working length; and

said stop body is biased toward said second position by a force selected so that said frictional resistance created by said passageway walls is sufficient to prevent movement of said working length whenever said halyard is not under tension but is insufficient to prevent movement of said working length whenever said halyard is under tension.

5,479,871

## EMERGENCY POWER SYSTEM FOR SUBMARINES

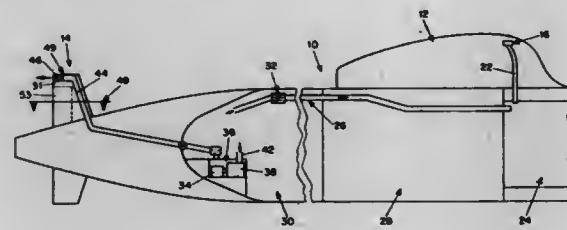
Robert F. Fox, Westerly, R.I., and Craig R. Dawson, Norwich, Conn., assignors to General Dynamics Corporation, Falls Church, Va.

Filed Dec. 3, 1993, Ser. No. 161,793

Int. Cl.<sup>6</sup> B63G 8/36

U.S. Cl. 114—334

4 Claims



1. An emergency power system for a submarine having an aft portion and a rudder structure comprising a gas turbine mounted in the aft portion of the submarine and exhaust gas duct means extending from the gas turbine to the rudder structure for ejecting gas turbine exhaust gases from the submarine, the rudder structure comprising an upper rudder structure and lower rudder structure, the upper rudder structure having a fixed portion and a movable flapped portion, the fixed portion including an exhaust gas plenum at the top thereof to receive exhaust gases from the exhaust gas duct means, and wherein the gas turbine is mounted in a section in an aft trim tank.

5,479,872

## SUPPORT FOR BOATCOVER

Randall V. Hulett, N 13584 McCune Rd., Fairchild, Wis. 54741  
Continuation of Ser. No. 199,003, Feb. 18, 1994, abandoned.

This application Jan. 23, 1995, Ser. No. 378,864

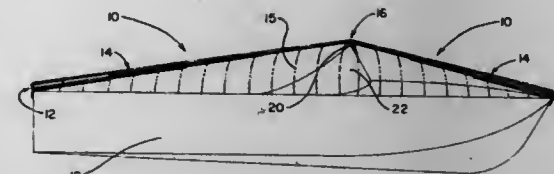
Int. Cl.<sup>6</sup> B63B 17/00

U.S. Cl. 114—361

3 Claims

1. A new and improved support apparatus for a flexible sheet boat cover for a boat, comprising:

a first resilient support assembly,



a telescopic extensible and retractable pole assembly connected at a first end to said first resilient support assembly, and a second resilient support assembly connected to a second end of said pole assembly,

wherein said first resilient support assembly is adapted to be supported by a portion of a boat body and includes a resilient portion which presses up against a side surface of the boat toward said second end of said telescopic extensible and retractable pole assembly when said pole assembly is in an extended condition,

wherein said second resilient support assembly is adapted to be supported by a top portion of a boat windshield when said pole assembly is in an extended condition and a portion of said second resilient support assembly presses up against the top portion of the boat windshield toward said first end of said telescopic extensible and retractable pole assembly,

wherein said pole assembly is adapted to support a flexible sheet boat cover when said pole assembly is in an extended condition and supported by said first resilient support assembly and said second resilient support assembly, and

wherein at least said first or said second resilient support assembly comprises a plate member having opposed ends, a hinge connected between one of said opposed ends and a corresponding telescopic extensible and retractable pole assembly, said hinge adapted to permit said plate member to assume a first folded position proximal to said corresponding telescopic extensible and retractable pole assembly and a second unfolded position distal with respect to said corresponding telescopic extensible and retractable pole assembly, and resilient means for normally biasing said plate member into said first folded position.

5,479,873

## METHOD OF MANUFACTURING ALUMINUM BORATE WHISKERS HAVING A REFORMED SURFACE BASED UPON GAMMA ALUMINA

Yoshitomo Shintani, Susono; Tetsuya Suganuma, Nagoya; Shuitsu Matsuo, Atsugi; Hajime Saito, Nissin; Hidenori Yamaoka, Odawara; Nobuhisa Kuroono, Aichi, and Hiroaki Kotaka, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, and Toshiba Ceramics Co., Ltd., Hadano, both of Japan

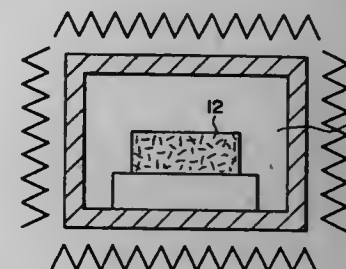
Filed Feb. 14, 1995, Ser. No. 388,451

Claims priority, application Japan, Feb. 14, 1994, 6-039107

Int. Cl.<sup>6</sup> C30B 29/62

U.S. Cl. 117—75

3 Claims



1. A method of manufacturing aluminium borate whiskers having a reformed surface, comprising the step of heating aluminium borate whiskers having a surface layer of  $\gamma$ -alumina in an atmosphere of ammonia gas such that a nitro-oxide and oxide layer of aluminium is formed along the surface of the whiskers.

5,479,874

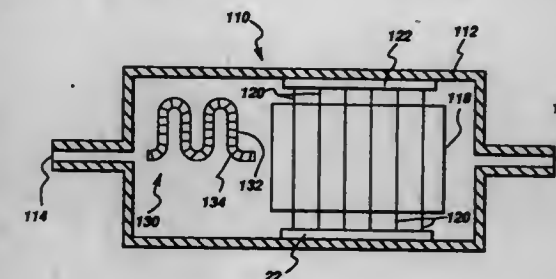
## CVD DIAMOND PRODUCTION USING PREHEATING

Sanjay M. Correa, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.  
Division of Ser. No. 128,330, Sep. 29, 1993, abandoned. This application Sep. 14, 1994, Ser. No. 306,077

Int. Cl.<sup>6</sup> C30B 25/08

U.S. Cl. 117—84

2 Claims



1. A method of producing diamond by chemical vapor deposition comprising the steps of:

providing a reaction chamber having at least one substrate therein;

introducing a hydrogen/hydrocarbon gas mixture into said reactor chamber;

heating said substrate to a temperature within a temperature range for effecting diamond deposition thereon from said gas mixture;

preheating said gas mixture as it enters said reaction chamber to about said substrate temperature to minimize initial temperature difference between said gas mixture and said substrate for maintaining a substantially uniform temperature across said substrate; and

passing said preheated gas mixture over said substrate while concurrently heating said gas mixture to its dissociation temperature.

5,479,875

## FORMATION OF HIGHLY ORIENTED DIAMOND FILM

Takeshi Tachibana; Kimitsugu Saito; Kazushi Hayashi; Kozi Nishimura, and Rie Nakamura, all of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

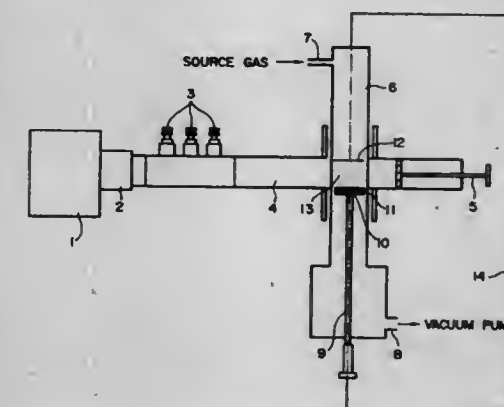
Filed Jul. 21, 1994, Ser. No. 278,315

Claims priority, application Japan, Sep. 17, 1993, 5-231595

Int. Cl.<sup>6</sup> C30B 23/08

U.S. Cl. 117—103

16 Claims



1. A method of forming a highly oriented diamond film comprising the steps of:

cleaning the surface of a single crystal substrate, and leaving it in a high vacuum of  $10^{-6}$  Torr or less at a temperature between room temperature and  $800^{\circ}\text{C}$ . for 15 min for releasing gas molecules absorbed on the surface of said substrate



processing the surface of said single crystal substrate using carbon-containing plasma  
 applying an electric field between said substrate and the plasma for allowing a current to flow thereacross for a specified time, thereby forming nuclei of diamond for synthesizing a diamond film  
 synthesizing highly oriented diamond particles or films in which crystal orientations are epitaxial to the said substrate.

5,479,876

## AUTOMATIC MILKING

Michael J. Street, Bedford; Toby T. F. Mottram, Chard; Arthur L. Wilkin, Hitchin, and Robert C. Hall, St. Albans, all of, England, assignors to British Technology Group Ltd., London, England

PCT No. PCT/GB92/01110, § 371 Date May 6, 1994, § 102(e) Date May 6, 1994, PCT Pub. No. WO93/00001, PCT Pub. Date Jul. 1, 1993

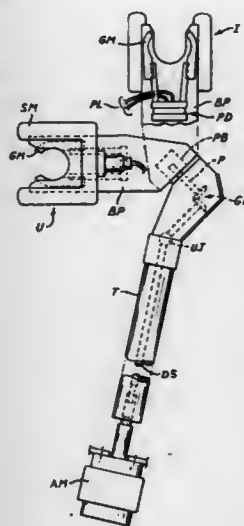
PCT Filed May 31, 1994, Ser. No. 167,996

Claims priority, application United Kingdom, Jun. 20, 1991, 9113405

Int. Cl.<sup>6</sup> A01J 5/017

U.S. Cl. 119—14.08

12 Claims



1. An arrangement for the automatic application of milking apparatus to an animal comprising:  
 a milking apparatus store,  
 a milking apparatus handling device including a milking apparatus carrier movable on the device, and  
 said handling device further including a guided elongate support member having pivoted at an outward end said Carrier in the form of a teat-cup gripper, the axis of the pivot for the gripper being inclined at an angle to the elongate member but generally in the horizontal plane of the member, and  
 a teat sensor on the handling device together with at least one animal position sensor and a control unit responsive to the animal and teat sensor to operate the handling device,  
 the arrangement being such that when an animal is sensed to be in milking position the control unit operates the handling device to take milking apparatus for a teat of the animal from the store in the carrier to a specific teat with the carrier moved to a sideways offset at a selected angle to the device and the teat sensor in range of the teat.

5,479,877  
 BIRDHOUSE ASSEMBLY KIT AND METHOD OF  
 ERECTING A BIRDHOUSE

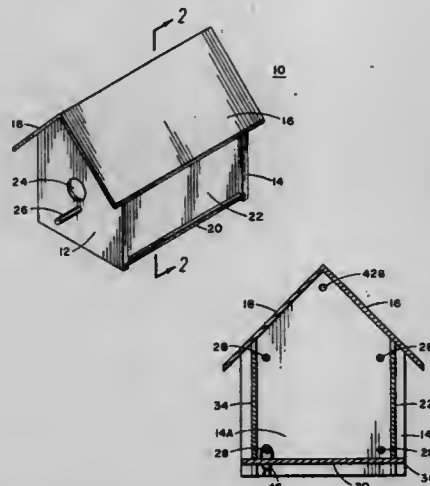
Edmund J. Demboske, 7000 Rue deMarquis, Naples, Fla. 33963

Filed Dec. 5, 1994, Ser. No. 349,511

Int. Cl.<sup>6</sup> A01K 31/00

U.S. Cl. 119—23

12 Claims



1. A birdhouse comprising:  
 a front wall and a rear wall of substantially identical configuration, each of said front and rear walls having a rectangular lower portion and a triangular upper portion, said triangular upper portion defining a peak roof line, said lower portion of each of said front and rear walls having slots extending parallel to edges of a face thereof and a plurality of blind holes formed in each face within the area defined by the slots, said front wall including an opening for admitting birds;  
 a plurality of dowels extending between said front and rear walls and fixed in the blind holes for assembling said front wall to said rear wall;  
 a pair of sheet material roof members extending from a peak of said triangular portion along the peak roof line to form a peaked roof;  
 first and second side walls adapted for sliding into said slots along opposite side edges of said front and rear walls;  
 a floor of sheet material adapted for sliding into said slots along a bottom edge of said front and rear walls, said floor extending outward of said slots along said opposite side edges for supporting said side walls in said slots and  
 a pair of holes formed in said floor approximately underlying one of said dowels and a tie means extending through one of said holes, over said one of said dowels and through another of said hole for tying said floor to said dowel.

5,479,878

## BIRD FEEDER

Don Coulter, 123 Shipley Street, Thunder Bay, Ontario, Canada

Filed Oct. 28, 1994, Ser. No. 330,566

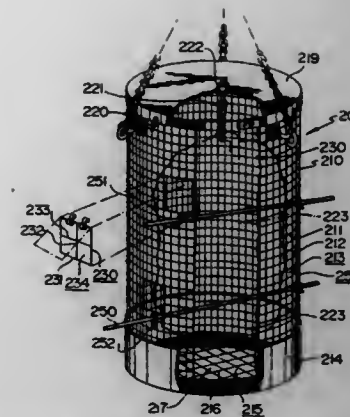
Claims priority, application Canada, Jul. 22, 1994, 2128661

Int. Cl.<sup>6</sup> A01K 39/00

U.S. Cl. 119—51.03

4 Claims

1. A bird feeder comprising:  
 (i) a generally cylindrical enclosure including an upper ring, a lower ring, a plurality of spaced-apart longitudinally-extending wires extending between said upper ring and said lower ring, and a plurality of spaced-apart encircling wires traversing said longitudinally-extending wires, said encircling wires and said longitudinally-extending wires thereby providing a plurality of bird entry portals therebetween of a first



selected size to permit entry and exit of selected desirable birds of a desired size;  
 (ii) an open bottom floor provided by a plurality of mutually-transverse wires to provide a plurality of openings of said first selected size therebetween;  
 (iii) a selectively-removable, solid cylindrical cover resting atop said upper ring, for removable securement atop said generally-cylindrical enclosure;  
 (iv) a plurality of cooperative latches removably securing said cover to said generally-cylindrical enclosure;  
 (v) an eyelet/hook combination securely suspended from an interior face of said solid cylindrical cover for suspending a mass of bird food within said generally-cylindrical enclosure;  
 (vi) additional portals provided by a hinged-removable door defined by a rectangular wire frame and mutually-transverse wires connected thereto, to provide a plurality of additional portals therebetween, said additional portals being of a second selected size which is larger than said first selected size; and  
 (vii) means attached to said enclosure for hanging said bird feeder from a support.

5,479,879

## BIRD FEEDER

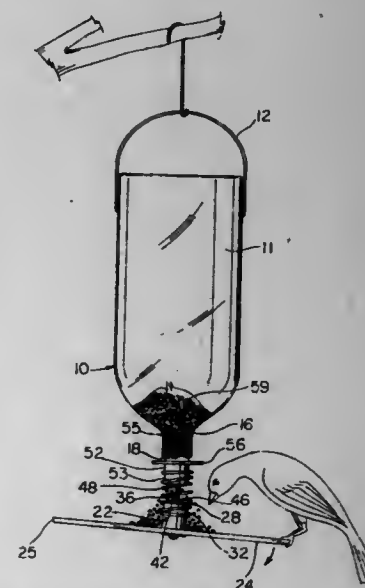
Jack J. Blek, 25340 Peavine St., Cassopolis, Mich. 49031

Filed Sep. 20, 1994, Ser. No. 309,536

Int. Cl.<sup>6</sup> A01K 39/012

U.S. Cl. 119—52.2

7 Claims



1. An animal feeding device comprising a container for storing animal feed, a platform for supporting an animal to be fed, and

dispensing means mounted between the platform and said container for dispensing feed from the container and for securing the platform to the container but permitting relative movement between the container and the platform, said dispensing means including conveying means for conveying feed from said container to an opening in said dispensing means and further including regulating means responsive to said relative movement between the container and the platform for regulating the flow of feed from the container to the opening, said conveying means including a flow housing defining a passage for conveying feed from the container to the opening, one end of said flow housing being attached to the container and the other end of said flow housing being attached to said regulating means, said regulating means including a coil spring, said coil spring being attached to said other end of said flow housing and to the platform, said regulating means further including an agitator rod for stimulating the flow of feed.

5,479,880

## WATER FILTERING OPEN TRAY BIRD FEEDER

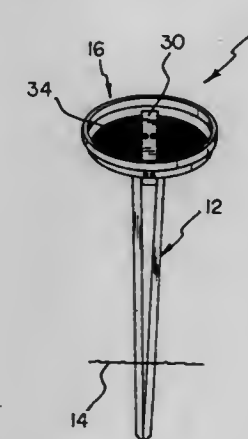
Darlene K. Stuhr, and Donald E. Stuhr, both of Box 57, 411. Southwright, Orfordville, Wis. 53576

Filed Sep. 15, 1994, Ser. No. 306,628

Int. Cl.<sup>6</sup> A01K 39/01

U.S. Cl. 119—57.8

2 Claims



2. A bird feeder comprising: a support means for piercing and engaging a ground surface;  
 a filtering means mounted to an upper distal end of said support means for receiving and supporting a mass of birdseed for consumption by an animal, said filtering means being further operable to permit a filtering of rain water through said birdseed to maintain said birdseed in a dry condition, said filtering means including a frame coupled to the upper distal end of the support means, said frame comprises a circular frame, and further wherein said filtering means further comprises a transverse support extending across a center of said circular frame; a circumferential perch extending along an upper perimeter of said circular frame so as to project upwardly and outwardly therefrom; and a substantially planar mesh support screen secured across a lower perimeter of said frame such that said birdseed can be positioned within said filtering means, with said mesh support screen permitting a draining of rain water from said birdseed, thereby maintaining said birdseed in a dry condition.



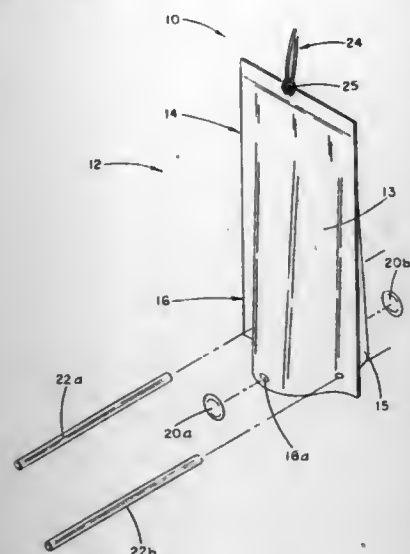
5,479,881

**SEMI-RIGID WILD GAME FEEDER APPARATUS**

Twila Lush, 410 E. Main, Bloomfield, Nebr. 68718, and Mark Chobon, H.C. 65, Box 46, O'Neill, Nebr. 68263  
Filed Sep. 27, 1994, Ser. No. 312,828  
Int. Cl.<sup>6</sup> A01K 39/00

U.S. Cl. 119—57.8

7 Claims



1. A disposable bird feeder for containing and making available bird seed for the feeding of birds comprising:

an upright flexible, semi-rigid bag, having top and bottom ends, front and rear walls including top, bottom and intermediate side portions and a bottom wall joined to said front and rear walls at said bottom portions thereof and closing the bottom end of said bag, said bottom portions of said front and rear walls extending downwardly from said bottom wall and defining a bag support lip, means for closing said top end upon insertion of said bird seed into said bag, said bag being self-standing on said bag support lip when placed on said bottom end;

dispensing means for dispensing seed from said bag;  
means for releasably closing said dispensing means so as to retain said bird seed in said bag during storage;  
a pair of holes positioned in the bottom portion of at least one of said front and rear walls adjacent said dispensing means; and  
a support member positioned in at least one of said holes.

5,479,882

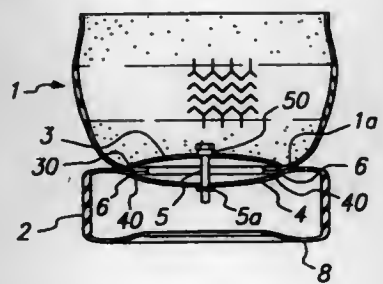
**TIRE FEEDER, AND METHODS OF CONSTRUCTING AND UTILIZING SAME**

Bradley D. Kerner, 120 S. Pleasant View Ave., P.O. Box 71, Corsica, S. Dak. 57328

Filed Jan. 31, 1995, Ser. No. 381,348  
Int. Cl.<sup>6</sup> A01K 5/00; 7/00

U.S. Cl. 119—61

20 Claims



1. A container, comprising:

a first tire being substantially inverted having an aperture there-through defined by at least one tire bead portion;  
a second tire having an aperture therethrough defined by at least one tire bead portion, said second tire being positioned relative to said first tire so that said bead portion defining said aperture of said first tire is substantially adjacent said bead portion defining said aperture of said second tire;  
a first disk positioned substantially within said first tire and sized so as to substantially cover said aperture defined by said tire bead of said first tire, and having an outer edge which substantially contacts said tire bead of said first tire;  
a second disk positioned substantially within said second tire and sized so as to substantially cover said aperture defined by said tire bead of said second tire and adjacent said first tire aperture, and having an outer edge which substantially contacts said tire bead of said second tire; and  
means for forcing said first and second disks together so as to substantially secure said first tire to said second tire.

5,479,883

Patent Not Issued For This Number

5,479,884

**MESH COVER ATTACHED TO A TERRARIUM BY HOOK-AND-LOOP FASTENERS**

Bert Grosman, Fremont, Calif., assignor to Novalek, Inc., Hayward, Calif.

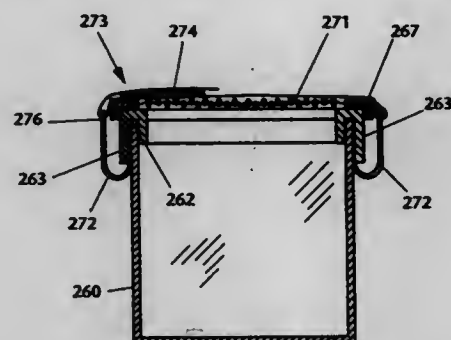
Continuation-in-part of Ser. No. 209,144, Mar. 9, 1994. This application Oct. 31, 1994, Ser. No. 332,131

The portion of the term of this patent subsequent to Aug. 29, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> A01K 63/00

U.S. Cl. 119—265

18 Claims



1. A cover arrangement in combination with an opening formed in a tank, said cover arrangement including:  
a mesh portion having a continuous perimeter;  
a first member extending continuously about said perimeter of said mesh portion;  
a second member extending continuously about said opening, said first and second members being configured for mutual continuous engagement; and  
hook-and-loop fastener means for joining said first and second members.

5,479,885

**ADMISSION MANIFOLD OF MODULATABLE IMPEDANCE AND LOW HEAD LOSS**

Francesco Ausiello, Bologna, Italy, and Michael Pontoppidan, Rueil Malmaison, France, assignors to Magneti Marelli France, Nanterre, France

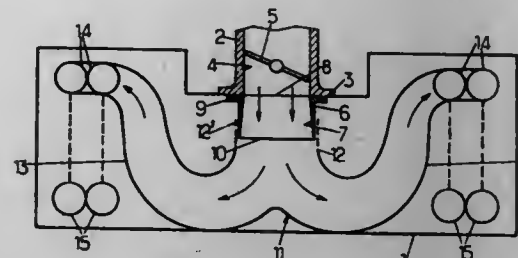
Filed Mar. 6, 1995, Ser. No. 399,147

Claims priority, application Italy, Mar. 7, 1994, 94 02596

Int. Cl.<sup>6</sup> F02B 27/02; F02M 35/10

U.S. Cl. 123—184.55

10 Claims



1. An admission manifold for an internal combustion engine having fuel injection, the manifold comprising:

a plenum chamber positioned downstream from a butterfly valve that controls the flow of air fed to the engine, said plenum chamber defining a resonance volume; and  
at least as many suction ducts as there are cylinders in the engine, each suction duct feeding a corresponding cylinder with admission air that it receives from the plenum chamber;

wherein the manifold further comprises:  
an air inlet diffuser whose inlet is connected to the outlet of the butterfly valve; and  
an air flow guide for sharing admission air leaving the diffuser between the suction ducts, and mounted downstream from the inlet diffuser in such a manner that the outlet from the diffuser opens out towards the tubular inlet of the guide which has an upstream edge spaced transversely from the downstream edge of the diffuser relative to the air flow direction so as to define an adjustable permanent diaphragm effect between the inlet diffuser and the flow guide, the inlet diffuser, the flow guide, and at least part of the suction ducts being housed in the plenum chamber.

5,479,887

**ROTARY INTERNAL COMBUSTION ENGINE AND COMPRESSOR**

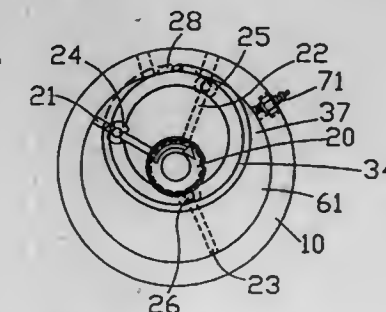
Chen-Long Chen, No. 216, Chung-Chen S. Rd., Taiwan, Taiwan, Prov. of China

Continuation-in-part of Ser. No. 35,202, Mar. 22, 1993, abandoned. This application Dec. 9, 1993, Ser. No. 164,875

Int. Cl.<sup>6</sup> F02B 53/08

U.S. Cl. 123—203

4 Claims



1. A rotary internal combustion engine having a fuel/air mixture supply and a fresh air supply and comprising:

a) a housing having a fuel/air mixture compression chamber, a power chamber and a fresh air compression chamber, each chamber having a substantially circular cross-sectional configuration and being coaxially arranged with each other; a first passage connecting the fuel/air mixture compression chamber and the power chamber; and a second passage connecting the fresh air compression chamber and the power chamber;

b) a shaft rotatably mounted in the housing and extending through all three chambers so as to be substantially concentric with all three chambers;

c) a fuel/air mixture vane fixed on the shaft so as to rotate with the shaft in the fuel/air mixture compression chamber;

d) a power vane fixed on the shaft so as to rotate with the shaft in the power chamber;

e) a fresh air compression vane fixed on the shaft so as to rotate with the shaft in the fresh air compression chamber;

f) a fuel/air compression rotor located eccentrically with respect to the shaft and connected to the fuel/air mixture vane so as to rotate therewith in the fuel/air mixture compression chamber;

g) a power rotor located eccentrically with respect to the shaft and connected to the power vane so as to rotate therewith in the power chamber;

h) a fresh air compression rotor located eccentrically with respect to the shaft and connected to the fresh air compression vane so as to rotate therewith in the fresh air compression chamber;

i) a first cut-off member extending from the fuel/air compression rotor and passing across the first passage, the first cut-off member is positioned such that the oil must accumulate to a first level before the oil can flow through the primary oil drainback hole; and at least one secondary oil drainback hole is formed in the engine compartment and operative to channel oil flowing there-through into the oil pan, wherein the secondary oil drainback hole is positioned such that the oil must be at a second level before the oil can flow through the secondary oil drainback hole; wherein the first level is higher than the second level such that a quantity of oil is stored in the engine compartment when the oil is at the first level; and wherein a first flow capacity of the primary oil drainback hole is greater than a second flow capacity of the secondary oil drainback hole; and wherein the oil is supplied to the engine compartment at a flow rate which is less than the first flow capacity and greater than the second flow capacity.

5,479,886

**ENGINE OIL CAPACITOR**

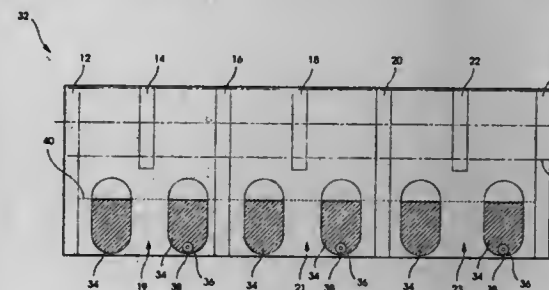
Jay F. Leonard; Richard J. Gustafson, both of Columbus, Ind., and Mark B. Hinderleider, Jamestown, N.Y., assignors to Cummins Engine, Columbus, Ind.

Filed May 12, 1995, Ser. No. 440,060

Int. Cl.<sup>6</sup> F01M 1/00

U.S. Cl. 123—196 R

22 Claims



1. An engine compartment having an oil capacitor function, the engine compartment comprising:

at least one primary oil drainback hole formed in the engine compartment and operative to channel oil flowing there-through to an oil pan, wherein the primary oil drainback hole is positioned such that the oil must accumulate to a first level before the oil can flow through the primary oil drainback hole; and at least one secondary oil drainback hole is formed in the engine compartment and operative to channel oil flowing there-through into the oil pan, wherein the secondary oil drainback hole is positioned such that the oil must be at a second level before the oil can flow through the secondary oil drainback hole; wherein the first level is higher than the second level such that a quantity of oil is stored in the engine compartment when the oil is at the first level; and wherein a first flow capacity of the primary oil drainback hole is greater than a second flow capacity of the secondary oil drainback hole; and wherein the oil is supplied to the engine compartment at a flow rate which is less than the first flow capacity and greater than the second flow capacity.



member having at least one first recess portion such that the first passage is closed by the first cut-off member and opened when the at least one first recess portion passes across the first passage thereby allowing compressed fuel/air mixture to pass into the power chamber;

- j) ignition means to ignite the fuel/air mixture in the power chamber; and,
- k) a second cut-off member extending from the fresh air compression rotor and passing across the second passage, the second cut-off member having at least one second recess portion such that the second passage is closed by the second cut-off member and opened when the at least one second recess portion passes across the second passage thereby allowing compressed fresh air to enter the power chamber, the at least one second recess portion being located such that compressed fresh air passes into the power chamber during burning of the fuel air mixture in the power chamber.

5,479,888

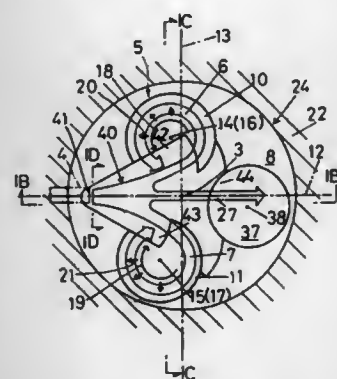
## DIVIDED CHAMBER TYPE DIESEL ENGINE

Yousuke Morimoto, Kiyoshi Hataura, and Yasukazu Kamata, all of Sakai, Japan, assignors to Kubota Corporation, Osaka, Japan

Filed Jul. 13, 1993, Ser. No. 90,954  
Int. Cl.<sup>6</sup> F02B 19/12

U.S. Cl. 123—262

8 Claims



1. A divided chamber type diesel engine having a cylinder head (23) provided with a divided chamber (1), a cylinder (22) provided with a main combustion chamber (5), an injection hole (4) being formed in said cylinder head (23) at an eccentric position relative to a cylinder tenor axis (3), said injection hole (4) being oriented to a center portion of said cylinder (22) so that a combustion expanding gas injected from the injection hole (4) forms a straight advancing gas flow (27) along an injection axis (12) of the injection hole (4) and a pair of swirling gas flows (6), (7), on opposite sides of the injection axis (12) when viewed in parallel to said cylinder center axis (3), developed by a natural flow produced within the main combustion chamber (5) based on gas explosion; at least a pair of valve recesses (10), (11) being formed concavely in at least one of a cylinder head surface (9) and a piston top surface (8) facing said main combustion chamber (5), said pair of valve recesses (10), (11) being arranged separately on the opposite sides of the injection axis (12) of said injection hole (4) when viewed in parallel to the cylinder center axis (3);
- respective swirl centers (14), (15) of said pair of swirling gas flows (6), (7) being located within said pair of valve recesses (10), (11) when viewed in parallel to the cylinder center axis (3);
- an intake passage (28) is formed in said cylinder head (23) while an intermediate intake valve opening (30) and an end intake valve opening (31) are formed in an intermediate portion and an end portion of said intake passage (28) respectively; when a phantom transverse line (56) is defined imaginarily in a diametral direction of said cylinder (22) so as to intersect the

cylinder center axis (3) perpendicularly when viewed in parallel to the cylinder center axis (3), said intake passage (28) is located in one region (57) of two regions (54), (57) which are on the opposite sides of said phantom transverse line (56); a suction air induction port portion, (58) of said intake passage (28) on its entrance side is formed substantially in parallel to said phantom transverse line (56);

by locating a center (60) of said end intake valve opening (31) nearer to said phantom transverse line (56) than a center (59) of said intermediate intake valve opening (30), a center passing line (61) passing through both said centers (59), (60) is inclined relative to an axis (62) of said suction air induction port portion (58); and

by forming an inter-valve-opening port portion (63) located between both said centers (59), (60), substantially in parallel to said center passing line (61), an orientation of said inter-valve-opening port portion (63), is inclined relative to an orientation of said suction air induction port portion (58).

5,479,889

## MULTI-INTAKE VALVE ENGINE

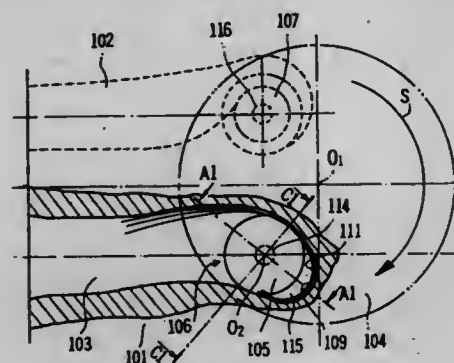
Hiromi Sato, Toyokazu Iwasa, Akihiro Ohya, and Hiroshi Nathume, all of Fujisawa, Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Mar. 31, 1994, Ser. No. 221,341  
Claims priority, application Japan, Apr. 5, 1993, 5-078275; Apr. 5, 1993, 5-078276; Apr. 16, 1993, 5-090170

Int. Cl.<sup>6</sup> F02B 31/00

U.S. Cl. 123—308

16 Claims



1. An engine having at least one cylinder and first and second intake ports for each cylinder, the first and second intake ports being formed in a cylinder head, a combustion chamber being defined in the cylinder, the first and second intake ports substantially extending parallel to each other and perpendicular to the longitudinal direction of a crankshaft of the engine, downstream ends of the first and second intake ports opening to the combustion chamber respectively, air being sucked into the first and second intake ports during an intake stroke respectively, first and second swirls being generated in the first and second intake ports respectively, and the downstream end of the first intake port opening in the combustion chamber downstream of the downstream end of the second intake port in the flow direction of the first swirl, characterized in that the first intake port is a helical port to generate the first swirl, and a recess is formed in a wall of the second intake port near the downstream end of the second intake port to reverse the flow direction of the air in the second intake port such that the second swirl flows in the same direction as the first swirl in the combustion chamber, the recess being generally defined by a relatively long oblique side and a relatively short bottom side so that the recess forms a substantially right-angled triangle in section, and the short bottom side extends substantially parallel to a bottom face of the cylinder head, the short bottom including a flat portion, the ratio of a length (C) of the flat portion to a length (E) of the short bottom is equal to or greater than 0.1.

5,479,890

## COMPRESSION RELEASE ENGINE BRAKES WITH ELECTRONICALLY CONTROLLED, MULTI-COIL HYDRAULIC VALVES

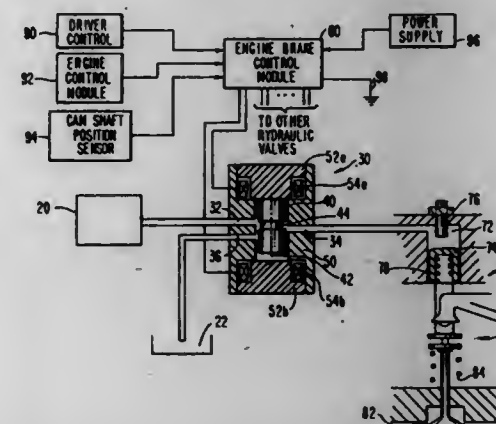
Haoran Hu, Farmington, Conn., and John A. Konopka, Feeding Hills, Mass., assignors to Diesel Engine Retarders, Inc., Wilmington, Del.

Filed Oct. 7, 1994, Ser. No. 319,734

Int. Cl.<sup>6</sup> F01L 13/06; F02D 13/04

U.S. Cl. 123—322

15 Claims





belt passages of said base portion, said pet seating portion is installed to said base portion, the pet is secured to the safety seat by said restraining strap secured to said restraining strap passage of said upper portion of at least one of said walls and attached to the pet harness, and the pet is securely and safely restrained in the vehicle for travel.

5,479,893

# COMBINED REACTOR FOR CYCLIC CHAR BURNING ENGINES

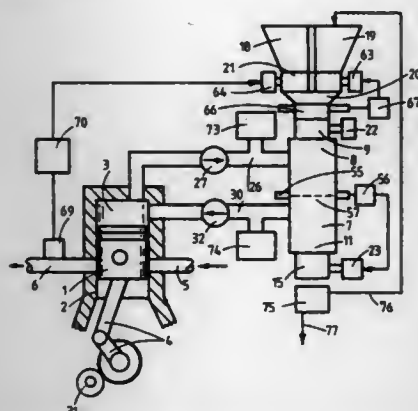
Joseph C. Firey, P.O. Box 15514, Seattle, Wash. 98115-0514

Filed Jan. 30, 1995, Ser. No. 379,914

Int. Cl.<sup>6</sup> F02B 45/00

U.S. Cl. 123—23

9 Claims



1. In a cyclic char burning engine comprising: at least one combined means for compressing and expanding gases, each said combined means comprising: an internal combustion engine mechanism comprising a variable volume chamber for compressing and expanding gases, and drive means for driving said internal combustion engine mechanism and for varying the volume of said chamber through repeated cycles, each cycle comprising a compression time interval followed by an expansion time interval, each said combined means for compressing and expanding further comprising, intake means for admitting reactant gases into said variable volume chamber prior to each said compression time interval, exhaust means for removing reacted gases from said variable volume chamber after each said expansion time interval; each said combined means for compressing and expanding having at least two separate gas flow connections to a separate primary reaction chamber within enclosing walls and a pressure vessel container; said char burning engine further comprising a source of supply of reactant gas containing appreciable oxygen gas to each said intake means for admitting reactant gases into said variable volume chamber; said char burning engine further comprising means of cranking said internal combustion engine mechanism when said char burning engine is being started; each said separate primary reaction chamber comprising: a refuel end with a refuel mechanism means for inserting fresh char fuel particles into said refuel end, an ash removal end, a char fuel direction of motion from said refuel end toward said ash removal end, each said primary reaction chamber further comprising, a char fuel preheat zone positioned toward said refuel end of said primary reaction chamber, an ash collection zone positioned toward said ash removal end of said primary reaction chamber, and rapid reaction zones positioned between said char fuel preheat zone and said ash collection zone; each said primary reaction chamber further comprising at least one ash removal means for removing unburned materials from said ash removal end; each said primary reaction chamber further comprising means for preheating the contents within said primary reaction chamber when said char burning engine is being started;

an improvement to each said primary reaction chamber, comprising:  
a source of char fuel chunks;  
a source of porous ceramic chips;

premixing means for premixing said char fuel chunks and said porous ceramic chips together;  
wherein said premixing means for premixing said char fuel chunks and said porous ceramic chips together further comprises means for setting the volumetric ratio of porous ceramic chips to char fuel to exceed the ratio of char fuel ash volume content to ceramic chip pore volume content, and to be finite;

wherein said refuel mechanism means for inserting fresh char fuel particles into said refuel end of said primary reaction chamber comprises means for inserting premixed char fuel chunks and porous ceramic chips together from said premixing means into said primary reaction chamber; and said refuel mechanism means for inserting further comprises refuel drive means for driving said means for inserting and comprising apparatus adapted to carry out said insertion over a refuel time interval, and to apply a compression force to the contents of said primary reaction chamber at all times when said char burning engine is running except during said refuel time intervals;

wherein said ash removal means for removing unburned materials from said ash removal end of said primary reaction chamber further comprises means for removing ceramic particles and ashes together from said primary reaction chamber, and comprising ash removal drive means for driving said means for removing and comprising apparatus adapted to carry out said removal over an ash removal time interval;

wherein said primary reaction chamber is tapered in the direction of char fuel motion with reaction chamber cross section area at right angles to the direction of char fuel motion increasing in the direction of char fuel motion;

wherein said primary reaction chamber further comprises several air delivery ports through the enclosing walls of said primary reaction chamber, and these air delivery ports positioned along the length of said primary reaction chamber in the direction of char fuel motion, and also positioned around the periphery of said primary reaction chamber at right angles to the char fuel motion direction, each said air delivery port comprising an outlet end into said primary reaction chamber and an inlet end;

air inlet means for connecting said variable volume chamber to said air delivery port inlets so that said air delivery port inlets are connected to said variable volume chamber only during said compression time intervals;

wherein said primary reaction chamber further comprises at least one hot gas delivery port through the enclosing walls of said primary reaction chamber, and these hot gas delivery ports positioned at the ash removal end of said primary reaction chamber, and these hot gas delivery ports preferably positioned around the periphery of said primary reaction chamber at right angles to the char fuel motion direction, each said hot gas delivery port comprising an inlet end into said primary reaction chamber and an outlet end;

hot gas outlet means for connecting said variable volume chamber to said hot gas delivery port outlets so that said hot gas delivery port outlets are connected to said variable volume chamber only during said expansion time intervals.

5,479,894

# TWO-STROKE INTERNAL COMBUSTION ENGINE

Friedrich Noltemeyer, Waiblingen; Alfred Hoppe, Stuttgart; Jürgen Müzenmaier, Remshalden; Friedrich-Rusch, Stuttgart, and Günter Karl, Esslingen, all of, Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Jul. 11, 1994, Ser. No. 272,828

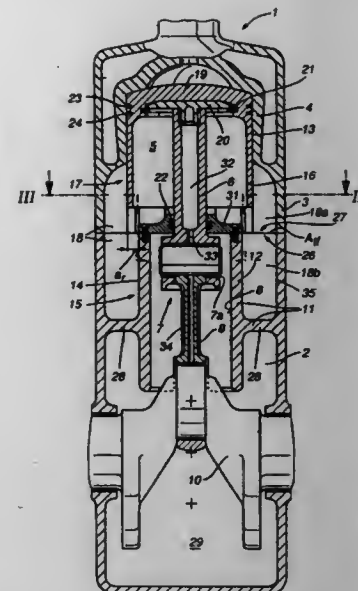
Claims priority, application Germany, Jul. 10, 1993, 43 23 159.4

Int. Cl.<sup>6</sup> F02F 7/00; F02B 25/14

U.S. Cl. 123—74 AC

3 Claims

1. A two-stroke internal combustion engine comprising an engine block having a crankcase with a crankshaft and a cylinder housing including at least one cylinder having a cylinder axis and



in each cylinder a piston with piston rings and a downwardly extending cylindrical skirt, a crosshead and a crosshead rod connected to said piston for movement therewith, a crosshead guide structure for supporting said crosshead for linear movement along the axis of said cylinder, and a connecting rod extending between said crosshead and said crankshaft for transferring motion from said piston to said crankshaft, said piston having, in said cylinder, top and bottom dead-center positions and said cylinders having walls with inlet and outlet slits arranged above the bottom dead-center position of the piston and being in communication with gas inlet and outlet channels for conducting gas to and from said cylinder, said engine block consisting of a cylinder housing and a crankcase joined along a dividing plane extending across said engine block below the lowest piston ring of said piston when it is in the bottom dead-center position but above the bottom end of said cylindrical skirt, said cylinder housing including channel structures which are open toward said dividing plane and have walls projecting inwardly toward said piston so as to define, together with the skirt of said piston, said gas inlet and outlet channels said inwardly projecting walls extending downwardly only to said dividing plane so as to define, in the bottom dead center position of said piston, an open annular space around said piston skirt extending from said dividing plane downwardly into said crankcase.

5,479,895

# DUAL VALVE ENGINE PROTECTIVE DEVICE

David M. Rusconi, Redwood City, Calif., assignor to Triangle Engineered Products Co., Bensenville, Ill.

Filed Feb. 17, 1995, Ser. No. 390,083

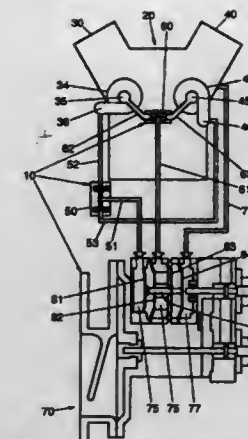
Int. Cl.<sup>6</sup> F01P 5/14

U.S. Cl. 123—41.15

10 Claims

1. A protective device for terminating the operation of an internal combustion engine having two banks of cylinders and an associated cooling circuit for each bank, each cooling circuit including a separate coolant pump having an inlet and an outlet to circulate liquid coolant through each bank of the engine by increasing the coolant fluid pressure in the pump outlet relative to the pump inlet, the protective device comprising, in combination:

a pressure detector;  
a first valve connected to the outlet of each coolant pump and having a biasing means for communicating the lower of the two pump outlet coolant pressures to the pressure detector;  
a second valve connected to the inlet of each coolant pump and having a biasing means for communicating the higher of the two pump inlet coolant pressures to the pressure detector; and



5,479,896

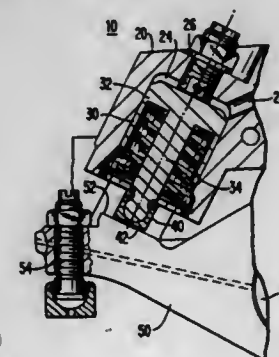
# COMPRESSION RELEASE ENGINE BRAKE SLAVE PISTON DRIVE TRAIN

Kurt E. Freiburg, West Hartford, Conn., and James D. Liebel, Springfield, Mass., assignors to Diesel Engine Retarders, Inc., Wilmington, Del.

Continuation of Ser. No. 81,978, Jun. 23, 1993, Pat. No. 5,365,916. This application Aug. 26, 1994, Ser. No. 296,516. The portion of the term of this patent subsequent to Nov. 22, 2011, has been disclaimed.  
Int. Cl.<sup>6</sup> F01L 1/14; 13/06

U.S. Cl. 123—90.16

6 Claims



1. In a compression release engine braking system, apparatus for transmitting force and motion to open a valve in an internal combustion engine associated with the engine brake comprising:

a hydraulic cylinder;  
a hydraulic piston disposed in said hydraulic cylinder for reciprocation along a first axis of said hydraulic cylinder in response to hydraulic fluid pressure in said hydraulic cylinder acting on said hydraulic piston, said hydraulic piston having a main body and an extension rigidly attached to said main body and extending from said main body parallel to said first axis in a direction away from the hydraulic fluid in said hydraulic cylinder, the end of said extension which faces away from said main body being substantially spherically convex;  
a bearing pad rotatably secured to said spherically convex end of said extension, said bearing pad having a spherically concave inner surface which is substantially concentric with said spherically convex end received in said inner surface, and a substantially flat outer surface opposite said inner surface; and







5,479,902

**FUEL INJECTION SYSTEM FOR A DIESEL ENGINE**  
Friedrich Wirbel; Wolfgang Lehner, both of Esslingen, and  
Alois Raab, Aalen, all of, Germany, assignors to Daimler-  
Benz AG, Stuttgart, Germany

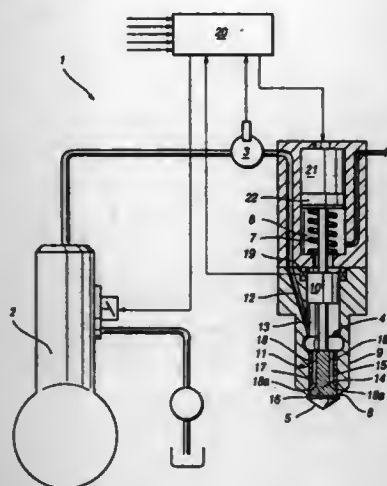
Filed Aug. 2, 1994, Ser. No. 283,954

Claims priority, application Germany, Aug. 2, 1993, 43 25 904.9

Int. Cl.<sup>6</sup> F02M 37/04

U.S. Cl. 123—498

6 Claims



1. A fuel injection system for a Diesel engine comprising a common high pressure fuel supply conduit (Common Rail), a high pressure fuel pump supplying fuel under pressure to said fuel supply conduit, a number of valve-controlled injectors in communication with said fuel supply conduit so as to receive fuel under pressure therefrom, each injector including a body with a control needle movably disposed therein and having a valve seat and a spring engaging the control needle so as to be normally seated on said valve seat and a needle actuator for lifting said needle of its seated position under the control of an electronic control unit, said needle including a piston-like tip with slot-shaped orifices formed in the outer surface thereof which orifices are fully covered when said control needle is seated but are exposed as said control needle is unseated by said needle actuator, said control needle including a pressure compensation piston disposed in a cylinder formed in said injector body and defining in said injector body with said piston-like needle tip a pressure chamber in communication with said fuel supply conduit for compensating the fuel pressure effective on said control needle so that the effective cross-section of the orifice opening of said injector is controlled solely by said needle actuator.

5,479,903

**V-SHAPED INTERNAL COMBUSTION ENGINE**

Johannes Werner, Waiblingen; Klaus-Jürgen Thiele, Nürtingen; Emil Bäuerle, Esslingen; Walter Kerschbaum, Fellbach, and Peter Bauknecht, Steinheim, all of, Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Aug. 3, 1994, Ser. No. 285,046

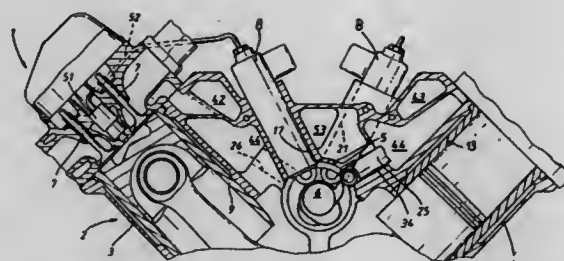
Claims priority, application Germany, Aug. 4, 1993, 43 26 159.0

Int. Cl.<sup>6</sup> F02B 75/22; F01L 1/04; F02M 39/02

U.S. Cl. 123—509

7 Claims

1. A multicylinder internal combustion engine comprising cylinder banks arranged in the shape of a V to define a V space between the cylinder banks and having a cam shaft supported centrally within the V space between the cylinder banks and with push rods disposed in push rod guides alongside said cylinder banks so as to be operable by said cam shaft and inlet and outlet valves operable by said push rods via rocker arms disposed on said cylinder banks and a fuel injection system including fuel pumps supported in a pump housing structure having mounting openings arranged along-



side said cylinder banks so as to be operable by said cam shaft and fuel injectors for injecting fuel into said cylinders, said push rods and said fuel pumps also being arranged in V-shaped rows along said cylinder banks, each of said cylinder banks having a coolant return channel extending alongside thereof between said cylinders and said fuel pumps, said coolant return channel projecting from said cylinder banks and having said pump housing structure connected thereto, and a coolant supply channel extending centrally between said pump housing structures such that said coolant partially surrounds the walls defining said pump mounting openings, said fuel pump mounting opening, said coolant, channels, said push rod guides and associated cylinders being disposed in a fan-like arrangement in a cross-sectional plane extending through a particular cylinder.

5,479,904

**FUEL VAPOR COLLECTING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE**

Yoshitomo Fujimori, and Hiroaki Mihara, both of Saltama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

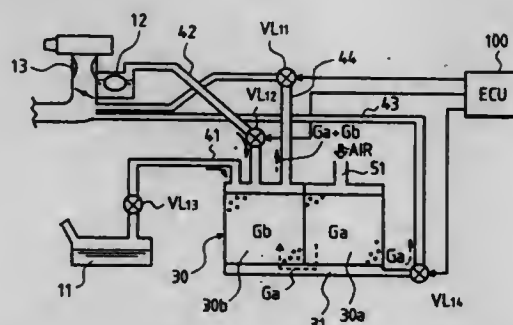
Filed Nov. 30, 1994, Ser. No. 350,178

Claims priority, application Japan, Dec. 16, 1993, 5-342717

Int. Cl.<sup>6</sup> F02M 37/04

U.S. Cl. 123—520

11 Claims



1. A fuel vapor collecting system in which a fuel vapor adsorbed during a stopping of the engine is purged after a starting of the engine, comprising:

- a plurality of canisters connected in series with communication passages to form a canister train and each adsorbing the fuel vapor generating at least in a fuel tank,
- a port open to an atmosphere which is formed in one end of said canister train,
- a first purging passage for connecting at least one of the communication passages to an intake system of the engine,
- a port for introducing the fuel vapor which is formed in the other end of said canister train,
- a second purging passage for connecting said other end to the intake system of the engine,
- a first purging means for selectively purging only the fuel vapor adsorbed in at least one canister between the communication passage to which said first purging passage is connected and the port open to the atmosphere, with the air inspired in

through the port open to the atmosphere by the negative pressure generated in said first purging passage, a second purging means for purging the fuel vapor adsorbed in all canisters connected in series, with the air inspired in through the port open to the atmosphere by the negative pressure generated in said second purging passage, and a purging switching means for switching the purge by the first purging means to the purge by the second purging means after the elapse of a predetermined time since the start of the purging by the first purging means.

5,479,905

**FUEL VAPOR CONTROL SYSTEM AND THE METHOD THEREOF**

Takenori Ito, Kawasaki, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

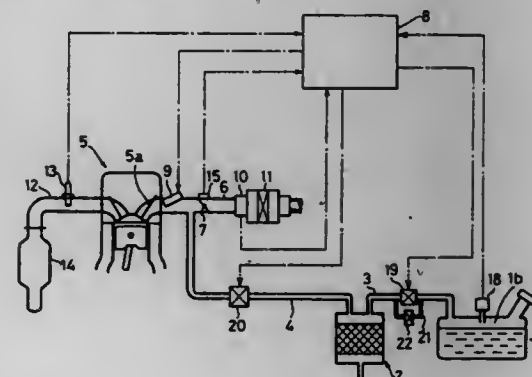
Filed Jan. 11, 1995, Ser. No. 371,368

Claims priority, application Japan, Jan. 31, 1994, 6-009518

Int. Cl.<sup>6</sup> F02M 37/04

U.S. Cl. 123—520

5 Claims



1. A fuel vapor control system for a fuel tank of a vehicle having an engine, said fuel tank for storing a fuel, canister for storing a fuel vapor, a fuel vapor passage communicating said fuel tank with said canister, a pressure control valve provided in said fuel vapor passage, a pressure sensor for detecting a pressure in an upper space of said fuel tank, an electronic control unit, said pressure control valve for opening said fuel vapor passage by said electronic control unit when said pressure is above a specified value and for closing said fuel vapor passage by said electronic control unit when an engine is stopped, and a vehicle speed sensor for detecting a vehicle speed of said vehicle, comprising:

- fueling judgement means for judging whether or not said vehicle is fueled based on said detected pressure and said detected vehicle speed when said engine is operated;
- closing signal generating means for generating a closing signal for a predetermined time when it is judged that said vehicle is fueled; and
- pressure control valve closing means responsive to said closing signal for closing said pressure control valve so as to prevent said fuel from flowing out of said canister through said fuel vapor passage during fueling.

5,479,906

**MULTIPLE PHASE FUEL SUPPLY SYSTEM FOR INTERNAL COMBUSTION ENGINE**

Curtis B. Collie, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

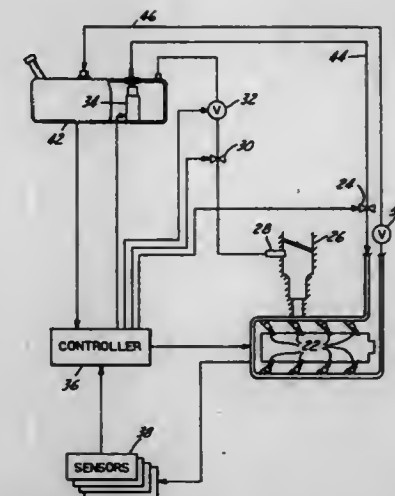
Filed Mar. 16, 1995, Ser. No. 405,313

Int. Cl.<sup>6</sup> F02M 21/02

U.S. Cl. 123—525

14 Claims

1. A multiple phase fuel supply system for an internal combustion engine, comprising:



- a pressurized supply tank for holding liquid hydrocarbon fuel, with said fuel having the characteristic that it is normally a vapor at room temperature and atmospheric pressure;
- at least one liquid injector for receiving liquid fuel from the tank and for injecting the liquid into the intake system of the engine;
- at least one vapor injector for receiving fuel vapor from the tank and for injecting the vapor into the intake system of the engine; and
- a controller for operating the liquid injector and the vapor injector such that at least one operating parameter of the supply tank will be maintained between predetermined limits.

5,479,907

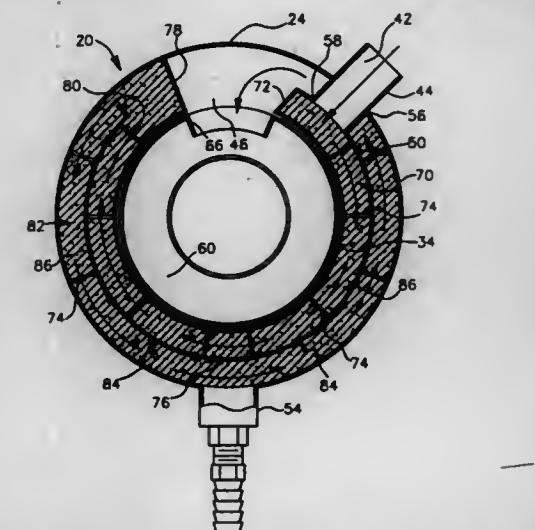
**COMBINATION IN-LINE AIR-FILTER/AIR-OIL SEPARATOR/AIR-SILENCER WITH PRESEPARATOR**  
Robert A. Walker, Jr., 8326 Jamieson St., Northridge, Calif. 91325

Filed Jul. 12, 1994, Ser. No. 273,880

Int. Cl.<sup>6</sup> F02B 77/00

U.S. Cl. 123—573

60 Claims



- 1. A combination apparatus for silencing and filtering air flow and separating air-contaminate mixtures, the apparatus comprising: a housing having an outer wall and a channel having a channel wall disposed axially therein between a primary inlet and primary outlet;
- an air filter joined to the primary inlet;
- a secondary inlet port through the outer wall;
- a secondary outlet port through the channel wall;



- a first baffle extending axially in the housing between the outer wall and the channel wall; a first air flow passageway formed between the channel wall and an adjacent surface of the first baffle;
- a second air flow passageway formed between the housing wall and an adjacent surface of the first baffle, wherein the first and second air flow passageways are constructed in series so that an air contaminate mixture entering through the secondary inlet port is routed through the housing from the first air flow passageway to the second air flow passageway and through the secondary outlet port; and
- a plurality of second baffles extending radially between the first baffle and the channel wall and the first baffle and the housing.

5,479,908

## ENGINE SPEED CONTROL DEVICE

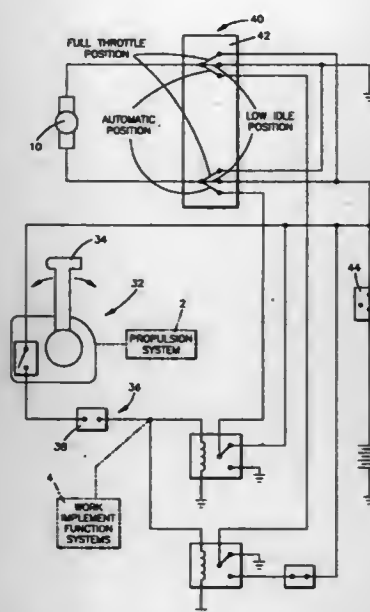
Engene Y. Grinberg, Shippensburg, and Rodney Cisney, Orrstown, both of Pa., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed May 26, 1994, Ser. No. 249,415

Int. Cl.<sup>6</sup> F02D 7/00; 31/00

U.S. Cl. 123—386

4 Claims



1. In a construction vehicle having an internal combustion engine and work implements mounted thereon, the engine driving a hydraulic system that provides a vehicle propulsion system and a work implement control system, an engine speed control system for controlling the engine's revolutions between a low idle condition, a full speed condition and an economy speed condition comprising:

- first electrical circuit means, including a propel lever, for an operator to selectively set said propel lever to signal the propulsion system to move the vehicle between a forward moving direction, a reverse direction and a neutral, non-moving position;
- second electrical circuit means, including a start/stop switch, said second electrical circuit means interconnected with said first electrical circuit means, for an operator to selectively set said start/stop switch to activate and deactivate the implement control system;
- third electrical circuit means, including a throttle switch, said third electrical circuit means interconnected with said first and second electrical circuit means, for an operator to set said throttle switch in a low idle speed position, a full speed position and an automatic speed adjustment position;

- actuator means responsive to said throttle switch for moving a fuel feeding device on the vehicle between a low idle condition, a full speed condition and an economy speed condition; and
- wherein said actuator means moves said engine into a low idle condition upon the occurrence of any of the following conditions:
  - said throttle switch is in said low idle speed position, regardless of said start/stop switch position and regardless of said propel lever position;
  - said throttle switch is in said automatic speed adjusting position, regardless of said start/stop switch position, and with said propel lever stroked in reverse;
  - said throttle switch is in said automatic speed adjusting position, with said start/stop switch on, and said propel lever in neutral;
  - said throttle switch is in said automatic speed adjusting position, with said start/stop switch off, and said propel lever stroked forward; and
  - said throttle switch is in said automatic speed position, with said start/stop switch off, and said propel lever neutral.

5,479,909

## SNOWMOBILE WITH CONTROL SYSTEM FOR ACTIVATING ELECTRONIC FUEL INJECTION

Wes Blakeslee, Badger, and Ian Hart, Greenbush, both of Minn., assignors to Polaris Industries L.P., Minneapolis, Minn.

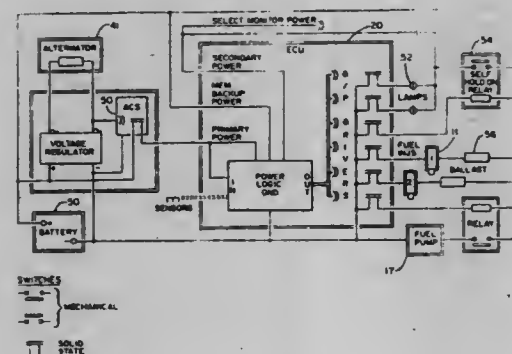
Continuation of Ser. No. 61,716, May 12, 1993, abandoned.

This application Mar. 22, 1995, Ser. No. 408,335

Int. Cl.<sup>6</sup> F02D 41/06

U.S. Cl. 123—491

12 Claims



3. In a snowmobile engine having a battery, an electronically controlled fuel system, comprising:

- fuel injection means for conveying fuel to the engine;
- electronic control unit means electrically connected to the battery for controlling the operation of the fuel injection means;
- an alternator for producing an electrical current in response to the rotation of the engine, the alternator having an electrical output; and
- control switch means electrically connected to the electrical output of the alternator, to the battery and to the electronic control unit means, for supplying electrical energy from the battery to the electronic control unit means upon detecting electrical current provided by the alternator in response to the rotation of the engine so that power is supplied to the electronic control unit means whenever an operator attempts to start the engine, whether by manually pulling a starter rope or by activating an electric starter.

5,479,910

## METHOD AND DEVICE FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE

Hans-Peter Bauer, Ditzingen; Herbert Schneider, and Thomas Kuettner, both of Stuttgart, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

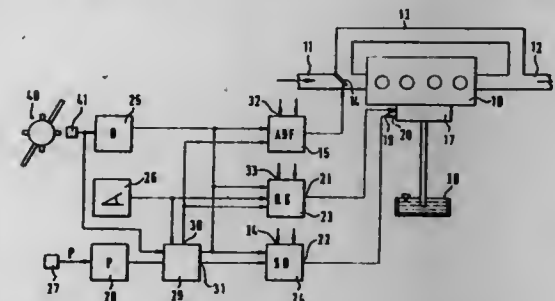
Filed Mar. 24, 1995, Ser. No. 410,628

Claims priority, application Germany, May 4, 1994, 44 15 640.5

Int. Cl.<sup>6</sup> F02M 17/00; 37/04

U.S. Cl. 123—179.17

14 Claims



1. A method for controlling a delivery of fuel to an internal combustion engine, comprising the steps of:

determining at least one of a fuel quantity to be delivered to the engine and a start time for the delivery of fuel to the engine;

determining a duration of the delivery of fuel to the engine as a function of at least one of the fuel delivery start time and an end time for the delivery of fuel to the engine, the fuel delivery duration being indicative of the fuel quantity;

determining whether the fuel delivery duration is greater than a predetermined threshold value; and

determining whether at least one of the fuel delivery start time and fuel delivery end time is valid as a function of whether the fuel delivery duration is greater than the predetermined threshold value.

5,479,911

## DIAMOND IMPREGNATED RESINOID CUTTING BLADE

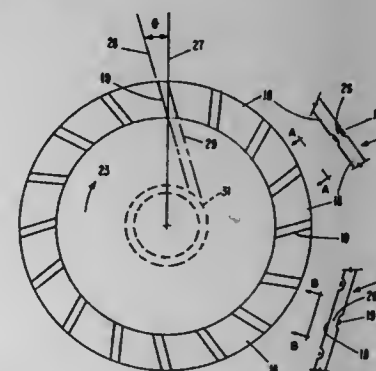
Gideon Levinson, Mitzpe, and Eran Goldberg, Nesher, both of, Israel, assignors to Kulicke and Soffa Investments Inc., Wilmington, Del.

Filed May 13, 1994, Ser. No. 242,721

Int. Cl.<sup>6</sup> B28D 1/04

U.S. Cl. 125—15

13 Claims



1. A diamond impregnated resinoid dicing saw blade having side cutting surfaces, comprising:

- a continuous annular ring shape for cutting hard objects comprising a homogeneous cured mass of resin and filler impregnated with substantially uniform sized diamond particles, said annular ring shape having a continuous cutting edge at its outside diameter and discontinuous cutting edges extended completely across the side cutting surfaces,

said side cutting surface comprising a plurality of non-symmetrical cutting teeth raised across said sides of said continuous annular ring shape and a discontinuous flat plane surface for mounting in a cooling flange hub, and recessed cooling grooves formed between adjacent cutting teeth in said annular ring shape, whereby

said recessed cooling grooves providing means for conducting a cooling fluid radially outward from said cooling flange hub in said recessed cooling grooves for simultaneously cooling the cutting edges of said saw blade and the hard object being cut.

5,479,912

## SPACE HEATING APPLIANCES

Simon Dunne, Birmingham, United Kingdom, assignor to Ambi-Rad Limited, Halesowen, United Kingdom

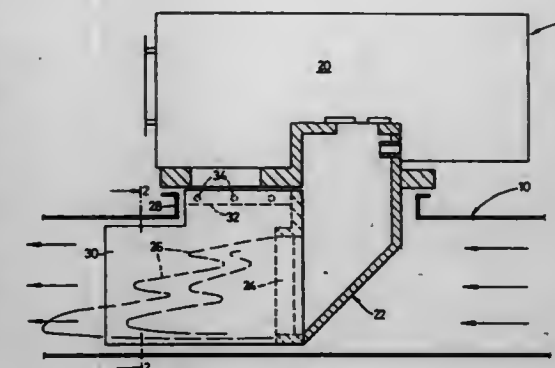
Filed Jul. 20, 1994, Ser. No. 277,957

Claims priority, application United Kingdom, Jul. 20, 1993, 9315042

Int. Cl.<sup>6</sup> F24C 3/00

U.S. Cl. 126—91 A

5 Claims



1. Radiant tube space heating apparatus comprising:

a radiant tube providing a flow path for gases;

means for inducing a flow of gases through said tube along said path;

a combustion burner device having a tubular burner head that projects laterally into said radiant tube and terminates at a mouth facing downstream of the flow of said gases, said burner mouth having a pair of flat sides spaced laterally from said radiant tube to allow said gases to flow therebetween along said path, said combustion burner device including means for introducing a combustible fuel mix into said burner head and means for heating said fuel mix sufficiently for combustion within a combustion zone located downstream of said burner mouth;

and shield means extending downstream from said combustion mouth substantially coextensive with said combustion zone for substantially shielding said fuel mix from exposure to said flow of gases during passage through said combustion zone, said shield means comprising a pair of flat plates supported within said tube in spaced parallel relation to said flat plates and said tube.

5,479,913

## DIRECT CONTACT WATER HEATER

Charles L. Adams, Fort Worth, Tex., assignor to PVI Industries, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 143,937, Oct. 27, 1993, Pat. No. 5,437,249. This application Jan. 31, 1995, Ser. No. 381,129

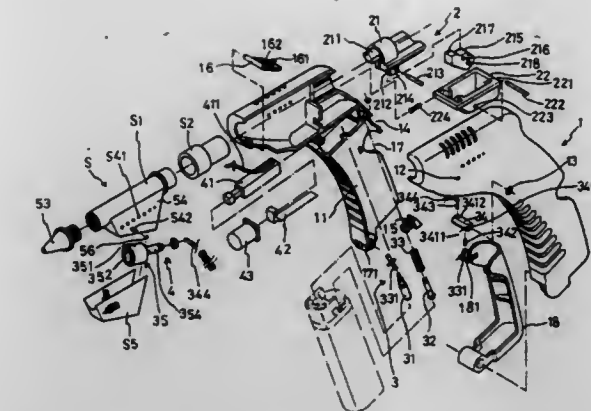
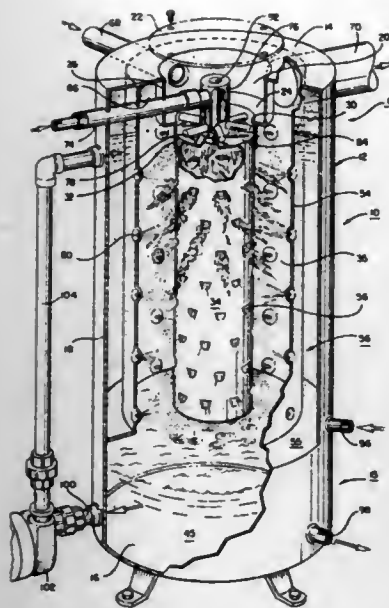
Int. Cl.<sup>6</sup> F24H 1/20

U.S. Cl. 126—360 R

16 Claims

1. A water heater comprising:





said switch retainer plate to release gas, and a back opening through which said gas lighter holder can be moved in and out of said bottom chamber.

5,479,915

## HEATING DEVICE FOR GASEOUS FUELS

Karl Rieper, Müllerviertel 20, A-4563 Micheldorf, Austria

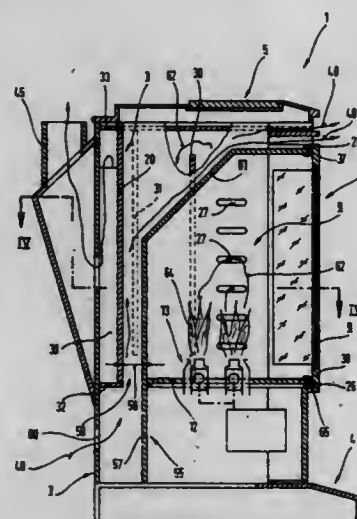
Filed Mar. 4, 1994, Ser. No. 206,744

Claims priority, application Austria, Mar. 8, 1993, 434/93

Int. Cl.<sup>6</sup> F24C 3/00

U.S. Cl. 126—512

19 Claims



1. A heating device for burning gaseous fuels, which comprises
  - (a) a floor plate having a supporting surface,
  - (b) an outer shell resting on the supporting surface of the floor plate and having a longitudinal axis extending perpendicularly to the supporting surface, the outer shell consisting of
    - (1) a base and
    - (2) two shanks projecting from the base, the shanks having end edges,
  - (c) an inner-shell consisting of
    - (1) a base and
    - (2) two shanks projecting from the base, the shanks having end edges defining therebetween an open space opposite the base,
  - (3) the end edges of the outer and inner shell shanks being fixedly connected to each other, and
  - (4) the base and shanks of the inner shell defining a combustion chamber,

5,479,914

## INTERNAL COMBUSTION GLUE GUN

Chin-Lin Tsai, 3F, No. 94, Sec. 4, Chung Hsin Rd., San Chung City, Taipei Hsien, Taiwan, Prov. of China

Filed Dec. 6, 1994, Ser. No. 349,820

Int. Cl.<sup>6</sup> B65D 5/66; B67D 5/52

U.S. Cl. 126—401

7 Claims

1. An internal combustion glue gun comprising a glue stick propelling mechanism, a gas release control mechanism, an igniter unit, and a melting unit, and a housing comprised of two symmetrical halves connected together to hold said glue stick propelling mechanism, said gas release control mechanism, said igniter unit, and said melting unit, wherein said housing comprises a bottom chamber having two pivot pins aligned at a bottom side, a working temperature indicator hole, which receives a temperature detecting chip, which detects the temperature of said melting unit, a gas pressure regulator mounting hole, which receives a gas pressure regulator, a substantially L-shaped switch hole, a switch retainer plate mounted on said switch hole, a collapsible support turned about the pivot pins on said bottom chamber to hold a disposable gas lighter, permitting the disposable gas lighter to be controlled by

- (d) the inner shell base being spaced from the outer shell base and the inner shell shanks being spaced from the outer shell shanks in a direction extending perpendicularly from the outer shell base and shanks, respectively, to define an intermediate space therebetween,

- (1) the inner shell shanks having openings through which the combustion chamber is in communication with the intermediate space,
- (e) a plate opposite the floor plate and covering the outer and inner shells,
- (f) a door arrangement for closing the open space,
- (g) a burner base plate mounted on the inner shell and carrying a gaseous fuel burner assembly,
- (h) a covering sheet metal element over the combustion chamber,
- (i) a smoke pipe connection piece in communication with the intermediate space through a flue gas outlet in the region of the covering sheet metal element whereby the intermediate space defines a flue gas passage between the shank openings and the flue gas outlet, and
- (j) sheet elements arranged around the shanks of the outer shell and defining a convection channel therebetween.

5,479,917

## STRUCTURE OF DIVING MASK

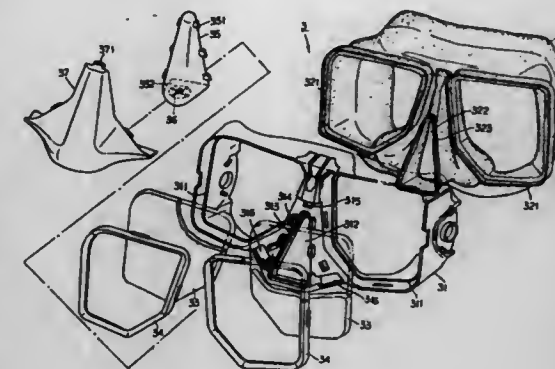
Hsing-Chi Hsieh, 1 Fl., No. 22, Lane 125, Jen Ai Street, San-chung City, Taipei Hsien, Taiwan, Prov. of China

Filed Feb. 28, 1995, Ser. No. 395,725

Int. Cl.<sup>6</sup> A61F 9/02

U.S. Cl. 128—200.29

2 Claims



1. A diving mask comprising:
  - a mask frame with an inner flange,
  - a pliable skirt with a frame edge that is received in said inner flange of said mask frame,
  - at least one lens, said lens having an edge received in said inner flange of said mask frame and an edge received on said frame edge of said pliable skirt,
  - at least one fixing clamp that affixes said lens in position in said inner flange of said mask frame and contacting said frame edge of said pliable skirt, and
  - an independent rigid nose cover, wherein
    - a nose notch is formed in a central portion of said pliable skirt, said nose notch corresponding in position to that of a user's nose when said user wears said diving mask, said nose notch includes a frame edge formed around the periphery of said nose notch,
    - a nose slot is formed in a central portion of said mask frame, said nose slot corresponding in position to that of said nose notch of said pliable mask, said nose slot includes an inner flange formed around an inner periphery of said nose slot, said inner flange receives said frame edge of said nose notch, and
    - said rigid nose cover includes projections that are received in fixing slots in said mask frame, a bottom of said rigid nose cover includes a one-way drain valve at a location corresponding to that of the user's nostrils, such that said one-way drain valve is actuated by the user's exhalations.

5,479,916

## LOW PROFILE GAS BURNER FIREPLACE TABLE

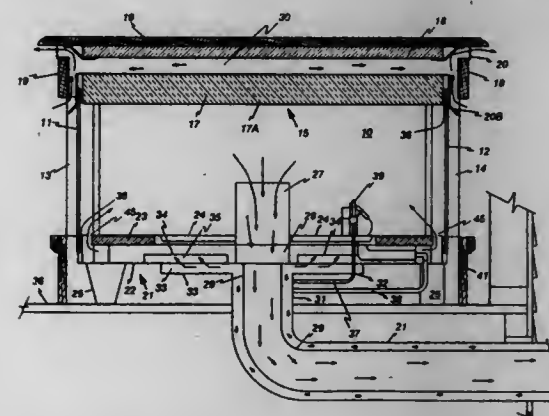
Ronald J. Shimek, and Daniel C. Shimek, both of 6665 W. Hwy. 13, Savage, Minn. 55378

Filed Jan. 6, 1995, Ser. No. 369,741

Int. Cl.<sup>6</sup> F24C 3/00

U.S. Cl. 126—512

17 Claims



1. A low profile gas burner fireplace for mounting under a table top, comprising:
  - a box shaped fireplace structure having a plurality of walls comprising four substantially vertical walls, a top wall and a bottom wall,
  - at least two of said side walls comprising glass panels, said top wall further comprising table top insulation, said bottom wall comprising a plurality of panels including an upper panel,
  - a gas burner system in a combustion chamber inside said walls, an exhaust gas passageway extending through said upper panel of said bottom wall for conveying exhaust gasses downwards through said upper panel of said bottom wall,
  - fresh air venting means for conducting combustion air through at least one of said walls other than top wall,
  - an induced draft fan system comprising an exhaust stack connected to said exhaust gas passageway for conducting exhaust gasses from said gas burner system to a point below said fireplace.

5,479,918

## BREATH CONTROLLER

James F. Petit, 1009 W. Weiland Ave., Appleton, Wis. 54914

Filed Jun. 30, 1994, Ser. No. 269,135

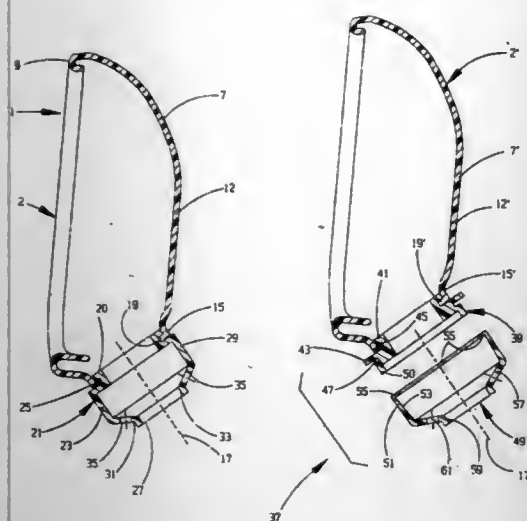
Int. Cl.<sup>6</sup> A62B 18/08

U.S. Cl. 128—201.15

2 Claims

1. A breath controller adapted for use with a helmet comprising:
  - a shell made of a flexible material and having a free edge adapted to fit in a substantially air tight fashion over a person's nose, cheeks, and chin while leaving the eyes uncovered, the shell having a chin section and a tube in said chin section of the shell, said shell having only one opening, said tube forming said one opening;
  - strap means secured to the shell for holding the breath controller to a person's face; and
  - means for directing exhalation outside of said shell and for preventing exhalation from forming condensation inside said shell said directing means comprising:
    - a sleeve having first and second ends;





groove means at the sleeve first end for holding the sleeve to the shell tube; and

wall means joined to the groove means for defining an opening in the sleeve second end and at least one transverse hole intermediate the sleeve first and second ends that is in communication inside the sleeve with the opening in the sleeve second end, the sleeve allowing unrestricted inhaling and exhaling of air through both the opening in the sleeve second end and through the sleeve transverse hole directly between the atmosphere and the person's nose and mouth, the opening in the sleeve second end and the transverse hole being located downwardly and forwardly of the chin section of said shell and adapted to extend substantially below the lowermost edge of a helmet worn by a person.

5,479,919

**DEVICE FOR PUTTING INTO OPERATION AN OXYGEN-RELEASING CARTRIDGE IN A RESPIRATOR**  
Ralf Buchtal, Lübeck, Germany, assignor to Drägerwerk AG, Lübeck, Germany

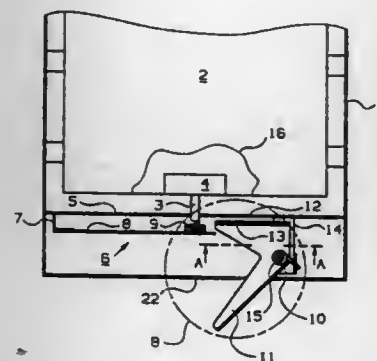
Filed Jun. 1, 1994, Ser. No. 252,445

Claims priority, application Germany, Jul. 1, 1993, 43 21 926.8

Int. Cl.<sup>6</sup> A62B 7/00

U.S. Cl. 128—202.27

4 Claims



1. A device for actuating a starting device of an oxygen-releasing cartridge, the cartridge supplying oxygen for respiration, the device comprising: respirator receiving housing, said respirator receiving housing accommodating said oxygen-releasing cartridge; a mounting support fastened to said respirator receiving housing; a striker spring fastened to said mounting support and extending in a cantilevered manner; a striking hammer disposed at a free end of said striker spring, said striking spring being deflectable to a pretensioned position allowing said striker spring to move, for moving

said striker hammer, for actuating the starting device; a fixed axis member mounted to said respirator receiving housing; a release lever mounted on said fixed axis member for pivoting from a starting position toward a striker spring pretensioned position, said release lever including a tensioning tongue movable with said release lever and a leaf spring connected to said tensioning tongue, said leaf spring being deflectable in a direction away from said striker spring pretensioned position, said tensioning tongue and said leaf spring mounted on said tensioning tongue extending at least partially behind said free end of said striker spring for deflecting said striker spring toward said pretensioned position; a return member connected to said release lever for automatically restoring said release lever to said starting position.

5,479,920

**BREATH ACTUATED MEDICINAL AEROSOL DELIVERY APPARATUS**

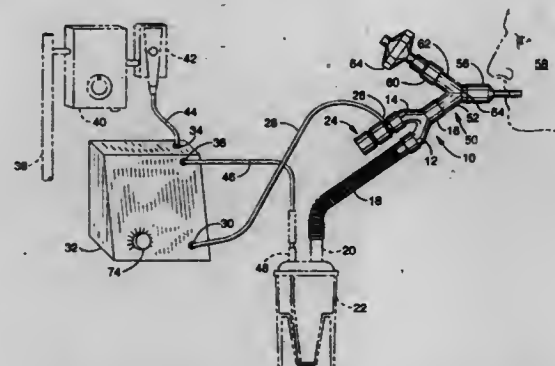
Samuel D. Piper; James I. C. Lee, and Gordon A. Wong, all of Sacramento, Calif., assignors to Vortran Medical Technology, Inc., Sacramento, Calif.

Filed Mar. 1, 1994, Ser. No. 205,598

Int. Cl.<sup>6</sup> A61M 16/00

U.S. Cl. 128—204.23

12 Claims



1. A breath actuated apparatus for on-demand delivery of medicinal aerosol produced by a nebulizer containing medicament aerosolized by a flow of breathable gas, comprising:

- (a) a first wye, said first wye including first aerosol outlet means for delivering medicinal aerosol to a patient, said first wye including aerosol inlet means for receiving medicinal aerosol from a nebulizer, said first wye including air inlet means for receiving ambient air;
- (b) a uni-directional inhalation valve coupled to said air inlet means;
- (c) signalling means for providing an inhalation pressure signal representing inhalation of said patient and an exhalation pressure signal representing exhalation of said patient, said inhalation signal generated by said patient's inhalation airflow, said exhalation signal generated by said patient's exhalation airflow; and
- (d) control means for sensing the magnitude of said inhalation and exhalation signals, said control means being responsive to a threshold inhalation pressure followed by a threshold exhalation pressure to permit delivery of said breathable gas to a nebulizer only when said threshold inhalation pressure is followed by said threshold exhalation pressure.

5,479,921

**ENDOTRACHEAL TUBE STABILIZER**

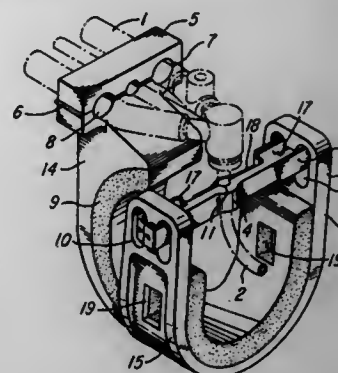
Jeanne B. Reif, 1499 A NW. Amberst Dr., Port St. Lucie, Fla. 34986

Continuation of Ser. No. 900,690, Jun. 17, 1992, Pat. No. Des. 347,686. This application Feb. 4, 1994, Ser. No. 191,465

Int. Cl.<sup>6</sup> A61M 16/00

U.S. Cl. 128—207.17

19 Claims



1. An endotracheal tube stabilizer, comprising: a head frame including at least three projections arranged structurally in a configuration as a three-pronged head frame composed of a hardened, yet flexible material; padded means provided in predetermined locations on the three-pronged frame which is capable of being sprung aside to allow for insertion of a patient's head secured in a firm yet cradling manner to receive an endotracheal tube; and a separate endotracheal tube clamping-securing device including an endotracheal tube support bar arranged structurally to be fastened to and located around the endotracheal tube, said three-pronged head frame including a superior-central projection thereof positioned over a top medial aspect of the patient's head as well as a left projection and a right projection respectively arising from a posterior aspect of said central projection.

5,479,922

**BIDIRECTIONAL FILTER**

Philip Reichl, Irvine, Calif., assignor to Del Mar Avionics, Irvine, Calif.

Division of Ser. No. 960,959, Oct. 14, 1992, Pat. No. 5,297,557.

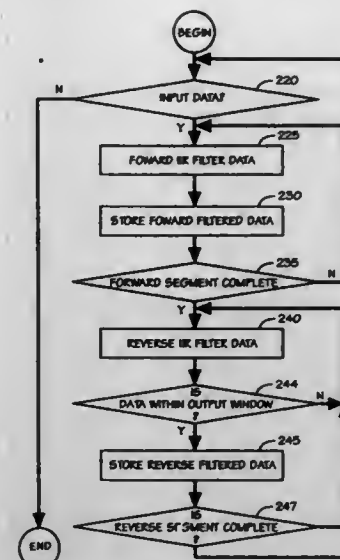
This application Oct. 29, 1993, Ser. No. 144,696

Int. Cl.<sup>6</sup> A61B 19/00

U.S. Cl. 128—630

20 Claims

1. A filter for eliminating noise in electrical signals comprising: acquisition means capable of acquiring a digital representation of an analog electrical signal, said acquisition means including at least one analog sensor capable of generating said analog electrical signal in response to a bioelectric stimulus, and an analog to digital converter coupled to said analog sensor; computational means including, window gating means and signal storage means for gating a series of time domain, full window (WF) data elements of said digital representation and for storing said windowed data elements for subsequent fluent and analysis of said digital representation in a series of individual windows; filter means contained within said computational means for implementing a zero phase, bidirectional Infinite Impulse Response filtering algorithm upon each of said series of full windows in a first forward direction for the length of said data element and in a second reverse direction opposite said first forward direction for said data element length; truncating means responsive to said filtering means for separating a first part leading data element segment, as a retained, filtered, output window (W1) of said full window (WF), and



discarding a second part trailing data element segment, is a truncated window (W2) of said full window; and combining said truncated trailing data element with new data input for another pass through said bidirectional filter.

5,479,923

**METHOD AND APPARATUS FOR ANALYZING A SAMPLE**

Börje T. Rantala, Helsinki, Finland, assignor to Instrumentarium Corporation, Finland

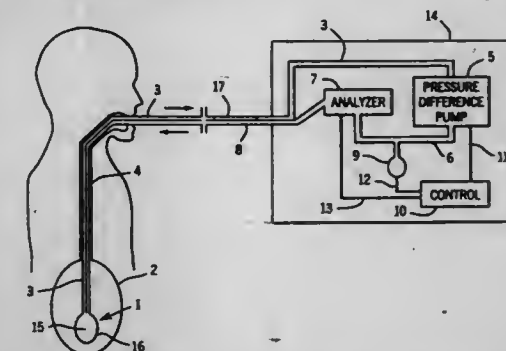
Filed Oct. 15, 1993, Ser. No. 137,670

Claims priority, application Finland, Jan. 16, 1992, 924716

Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 128—632

37 Claims



1. Apparatus for analyzing a fluid substance found in a patient's organ (2), said apparatus comprising: a sampling element (1) having a generally enclosed sampling chamber (15) with a wall (16) across which the substance to be analyzed may pass between the organ and said sampling chamber; a pressure-difference producing element (5) coupled to said sampling chamber by a conduit means (3), said pressure-difference producing element creating a pressure difference for withdrawing a sample of the contents of said sampling chamber from said sampling chamber along said conduit means; an analyzer (7) coupled to said pressure-difference producing element for receiving the sample withdrawn from said sampling chamber to obtain a sample analysis result; and pressure measuring means coupled to said analyzer for measuring the pressure on the sample and for providing a pressure measurement result, said analyzer altering the analysis result in accordance with the pressure measurement result.



5,479,924

METHOD OF MEASURING THE  $^{17}\text{O}$  CONTENT AND DISTRIBUTION IN A BODY

Gil Navon, Ramat Gan, and Itamar Ronen, Tel Aviv, both of Israel, assignors to British Technology Group Ltd., London, England

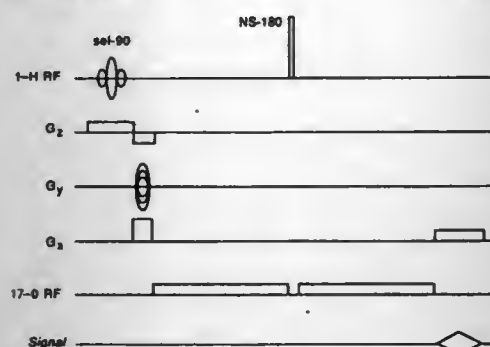
Filed Jun. 15, 1994, Ser. No. 259,865

Claims priority, application Ireland, Jun. 18, 1993, 106066

Int. Cl.<sup>6</sup> A61B 5/055

U.S. Cl. 128—653.2

9 Claims



1. A method of measuring a content and a distribution of  $^{17}\text{O}$  isotopes in a body, comprising steps of:
  - applying a first magnetic resonance imaging sequence to the body when the body is not irradiated with radio waves at a  $^{17}\text{O}$  resonance frequency;
  - collecting a first nuclear magnetic resonance signal from the body;
  - irradiating the body with radio waves at the  $^{17}\text{O}$  resonance frequency;
  - applying a second magnetic resonance imaging sequence to the body;
  - collecting a second nuclear magnetic resonance signal from the body; and
  - measuring a difference between the first nuclear magnetic resonance signal and the second nuclear magnetic resonance signal, the difference providing a nuclear magnetic resonance image of the distribution of the  $^{17}\text{O}$  isotopes in the body.

5,479,925

## MAGNETIC RESONANCE (MR) ANGIOGRAPHY IN A LOW-FIELD IMAGING MAGNET

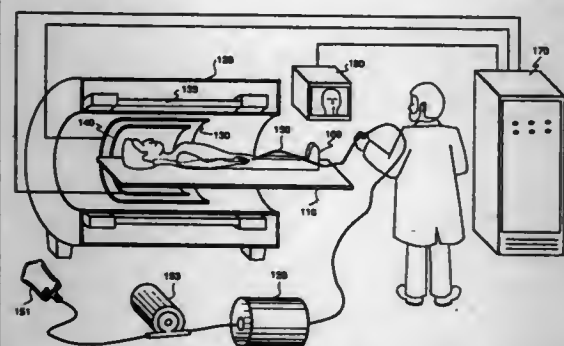
Charles L. Dumoulin, Ballston Lake, and Robert D. Darrow, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 23, 1994, Ser. No. 264,283

Int. Cl.<sup>6</sup> A61B 5/055

U.S. Cl. 128—653.3

4 Claims



1. A nuclear magnetic resonance (NMR) imaging system for obtaining vessel-selective NMR angiographic images from a subject comprising:
  - a) a nuclear magnetic resonance (NMR) active fluid having nuclei capable of producing an NMR signal;

- a low-field imaging magnet for applying a substantially uniform magnetic field over said subject;
- a high-field polarizing magnet for polarizing the nuclei of the NMR active fluid;
- a catheter for routing the polarized NMR active fluid from the high-field polarizing magnet into a selected vessel of said subject within the low-field imaging magnet;
- an RF transmitter means for transmitting RF energy into said subject of a selected duration, amplitude and frequency to directly cause nutation of the polarized NMR active fluid within said subject;
- a gradient means for varying the amplitude of the magnetic field in at least one spatial dimension over time;
- an RF receive coil for detecting a set of NMR response signals from the NMR active fluid within said subject;
- a receiver means coupled to the RF receive coil for receiving the detected NMR response signals from the NMR active fluid in the selected vessel;
- an image processor means for creating an angiographic image from the detected NMR response signals;
- a controller means connected to the RF transmitter means, the receiver means, the image processor means and the gradient means, for activating the RF transmitter means, the receiver means, the image processor means and the gradient means each according to a predetermined NMR pulse sequence; and
- a display means connected to the image processor means for displaying the angiographic image of the selected vessel to an operator.

5,479,926

## IMAGING SYSTEM DISPLAY PROCESSOR

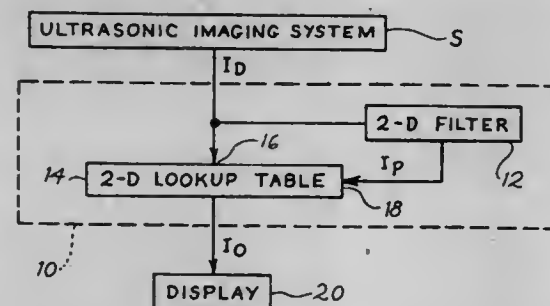
Kutay Ustuner, Mt. View; Matthew I. Haller, San Francisco; Ting-Lan Ji, Mt. View; Pai-Chi Li, Sunnyvale, all of Calif., and Can Cinbis, Shoreview, Minn., assignors to Acuson Corporation, Mountain View, Calif.

Filed Mar. 10, 1995, Ser. No. 401,715

Int. Cl.<sup>6</sup> A61B 8/00

U.S. Cl. 128—660.04

19 Claims



1. An imaging system display processor that is responsive to first and second image signals depicting a common entity, said first image signal having a greater detail resolution than said second image signal, and said second image signal having greater contrast resolution than said first image signal, said display processor comprising:
  - a first input for receiving the first image signal;
  - a second input for receiving the second image signal;
  - means, coupled to the first and second inputs, for forming an output signal as a function of at least the first and second image signals, said output signal characterized by a brightness and a color, said brightness displaying the detail resolution of the first image signal, said color displaying the contrast resolution of the second image signal.

5,479,927

## METHODS AND APPARATUS FOR PERFORMING SONOMAMMOGRAPHY AND ENHANCED X-RAY IMAGING

Ascher Shmulewitz, Seattle, Wash., assignor to NeoVision Corporation, Seattle, Wash.

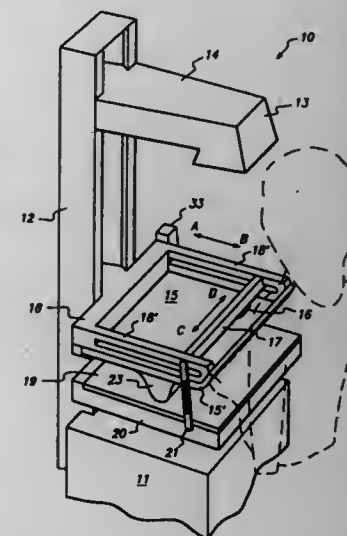
Continuation-in-part of Ser. No. 145,958, Oct. 29, 1993. This application Jul. 20, 1994, Ser. No. 277,894

The portion of the term of this patent subsequent to Dec. 12, 2012, has been disclaimed.

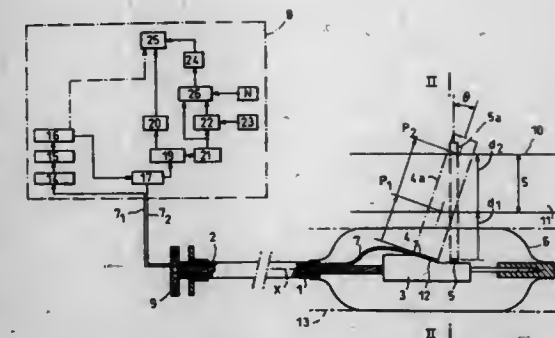
Int. Cl.<sup>6</sup> A61B 8/00; 6/14

U.S. Cl. 128—660.09

66 Claims



1. In apparatus for obtaining images of biological tissue by passing X-ray radiation through a biological tissue to form an image in a receptor, the apparatus comprising an X-ray source for emitting X-ray radiation, first and second compression surfaces adapted for immobilizing the biological tissue therebetween, and a receptor disposed adjacent the second compression surface, the X-ray source disposed adjacent the first compression surface so that X-ray radiation emitted from the source passes through the biological tissue and is received by the receptor, the improvement comprising:
  - a compression plate that is radiolucent and sonolucent, the compression plate having first and second surfaces, the second surface forming the first compression surface;
  - an ultrasonic transducer disposed adjacent to the first surface of the compression plate; and
  - drive means for moving the ultrasonic transducer across the first surface of the compression plate while the biological tissue remains immobilized between the first and second compression surfaces.



- at least one narrow-beam ultrasound transducer fixed on a support block provided with rotation means to rotate said at least one narrow-beam transducer in a direction of said duct and to position said at least one narrow-beam transducer with its narrow-beam cutting said duct according to a cutting plane substantially perpendicular to the longitudinal axis of said duct;
- at least one wide-beam ultrasound transducer mounted in said probe to have its wide beam in a known relative position with respect to that of said at least one narrow-beam ultrasound transducer, rotation means being also provided to rotate said at least one wide-beam ultrasound transducer in the direction of said duct to measure, by the Doppler effect, the speed of said fluid flowing in said duct;
- a control and processing unit comprising processing means for processing the characteristics of the signal(s) from said at least one narrow-beam transducer, the control and processing unit also comprising speed and/or energy measuring means for measuring the speed and/or the backscattered energy ( $E_b$ ) by the particles in suspension in the fluid flowing within said duct, controlled by:
  - means for determining given instants where the speed and/or the backscattered energy are measured, one of said instants corresponding to a maximum backscattered energy resulting from a maximum of particles detected in movement within the measuring volume of said at least one wide-beam transducer at that instant and other instants corresponding to instantaneous backscattered energy measures; and
  - correcting means for correcting the speed or the flow rate by a factor that depends on the instantaneous backscattered energy at each instant and on the maximum backscattered energy during the instant where all the particles in suspension contained in a transverse cross-section are in movement.

5,479,929

## DRIVE SYSTEM WITH A MULTITURN ROTARY STOP

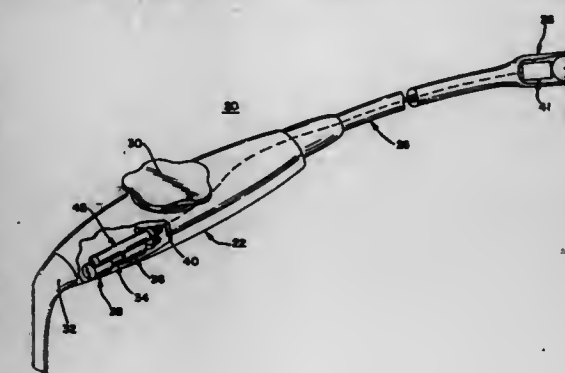
Thomas G. Cooper, Menlo Park; David V. Adams, San Carlos, and John W. Eaton, Palo Alto, all of Calif., assignors to Acuson Corporation, Mountain View, Calif.

Filed Jun. 27, 1994, Ser. No. 267,594

Int. Cl.<sup>6</sup> A61B 8/00

U.S. Cl. 128—662.03

22 Claims



5,479,928

## ULTRASONIC METHOD AND APPARATUS FOR FLOW MEASUREMENT

Dominique Cathignol, Genas; Bernard Lavandier, Amblerie, and Raoul Muchada, Lyons, all of France, assignors to Institut National de la Sante et de la Recherche Medicale, Paris, France

Continuation of Ser. No. 64,900, May 24, 1993, abandoned.

This application Feb. 13, 1995, Ser. No. 387,385

Claims priority, application France, Sep. 21, 1992, 92 11425

Int. Cl.<sup>6</sup> A61B 8/12; 8/06

U.S. Cl. 128—662.06

33 Claims

1. A probe for accurately measuring the speed or the flow rate of a fluid containing particles suspended in said fluid flowing in a given duct having a longitudinal axis, said probe having a longitudinal axis, and comprising:
  - a narrow-beam ultrasound transducer fixed on a support block provided with rotation means to rotate said at least one narrow-beam transducer in a direction of said duct and to position said at least one narrow-beam transducer with its narrow-beam cutting said duct according to a cutting plane substantially perpendicular to the longitudinal axis of said duct;



1. A drive system for an ultrasonic probe, comprising:
  - a motor;
  - a position encoder attached to the motor;
  - a multiturn rotary stop having a threaded portion; and
  - a spring stop assembly coupling the motor to the multiturn rotary stop, wherein the spring stop assembly comprises a motor-driven gear coupled to a hub by a torsional spring, and wherein the hub is fixed to the multiturn rotary stop.

5,479,930

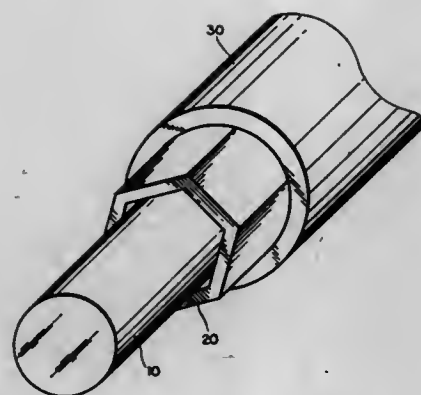
# ULTRASONIC TRANSESOPHAGEAL PROBE WITH ARTICULATION CONTROL FOR THE IMAGING AND DIAGNOSIS OF MULTIPLE SCAN PLANES

George P. Gruner, Mukilteo, and John A. Doldge, Jr., Mill Creek, both of Wash., assignors to Advanced Technology Laboratories, Inc., Bothell, Wash.

Division of Ser. No. 155,416, Nov. 19, 1993, Pat. No. 5,402,793. This application Jan. 19, 1995, Ser. No. 375,023  
Int. Cl.<sup>6</sup> A61B 8/12;1/00

U.S. Cl. 128—662.06

11 Claims



between the spacer and the protective sheath, or between the spacer and the wave guide and between the spacer and the protective sheath.

5,479,932

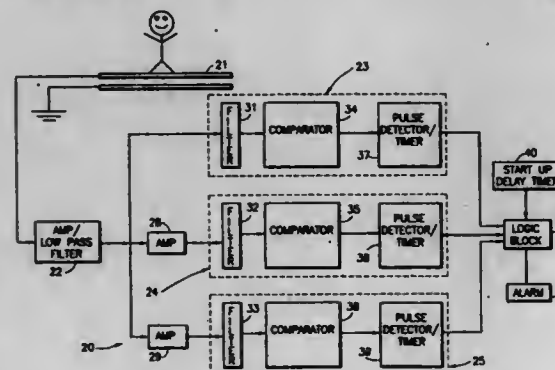
# INFANT HEALTH MONITORING SYSTEM

Joseph Higgins, 243 Branford Rd., N. Branford, Conn. 06471; E. Carr Everbach, 2103 Mt. Vernon St., Philadelphia, Pa. 19130, and Kevin J. Parker, 340 Howland Ave., Rochester, N.Y. 14620

Filed Aug. 16, 1993, Ser. No. 106,553  
Int. Cl.<sup>6</sup> A61B 5/0205

U.S. Cl. 128—671

5 Claims



1. An ultrasonic transducer probe having a piezoelectric transducer located at a distal end thereof for ultrasonic scanning from within a cavity of the body, said distal end being movable in two directions while located within the body, comprising:

a bendable articulation section connected to said distal end; a gastroscope section connected to said articulation section; and control means coupled to said gastroscope section and connected to said articulation section for controlling the movement of said articulation section in said two directions, including limit stops, located with said control means, for limiting the range of movement of said articulation section in each of said two directions;

wherein said control means comprises a handle section including a control knob coupled to said articulation section and having a range of control which is limited by said limit stops; and wherein said limit stops are connected to said handle section, whereby the continued application of force when said control knob is turned in opposition to one of said limit stops is applied through said limit stops to said handle section.

5,479,931

# IR THERMOMETER

Mark Mooradian, San Diego, Calif., assignor to Thermoscan, Inc., San Diego, Calif.

Filed Nov. 18, 1993, Ser. No. 154,276

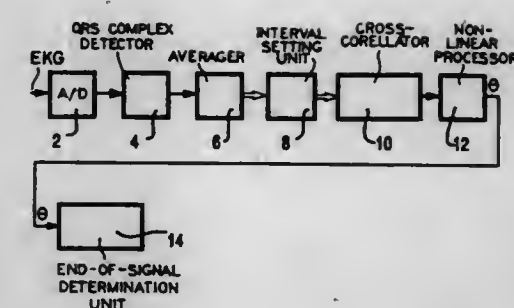
Int. Cl.<sup>6</sup> A61B 5/05;6/00

U.S. Cl. 128—664

4 Claims

1. In combination in an IR thermometer for measuring radiation emanating from a tympanic membrane of a patient, the improvement comprising an IR wave guide partially encased in a concentric spacer which is further partially encased by a protective sheath wherein said spacer has a first cross-sectional shape that departs from a second cross-sectional shape of said protective sheath or said IR wave guide, thereby creating a series of axially distributed spaces positioned between the spacer and the wave guide or

- a. means for receiving the output signal from the passive sensor;
  - b. band pass filter means connected to said output signal receiving means and constructed for receiving the signal from the passive sensor as an input signal thereto and transmitting an output signal corresponding to a range of frequencies representative of a normal breathing rate for infants as detected in the input signal thereto;
  - c. a comparator connected to the band pass filter means for receiving the output signal therefrom and constructed for comparing the signal from the band pass filter means to a reference signal representing a normal breathing rate for an infant and transmitting a breathing rate detected output whenever the signal received by the comparator exceeds the reference signal; and
  - d. a pulse detector/timer
    1. connected to the comparator for receiving the breathing rate detected output from the comparator,
    2. timing a period of time between the receipt of the output from said comparator, and
    3. generating an anomaly detected signal whenever the period of time exceeds 30 seconds;
- D. a third signal processing circuit for monitoring heart rates of an infant and comprising
- a. means for receiving the output signal from the passive sensor,
  - b. band pass filter means connected to said output signal receiving means and constructed for receiving the signal from the passive sensor as an input signal thereto and transmitting an output signal corresponding to a range of frequencies representative of a normal heart rate for infants as detected in the input signal thereto;
  - c. a comparator connected to the band pass filter means for receiving the output signal therefrom and constructed for comparing the signal from the band pass filter means to a reference signal representing a normal heart rate for an infant and transmitting a heart rate detected output whenever the signal received by the comparator exceeds the reference level; and
  - d. a pulse detector/timer
    1. connected to the comparator for receiving the heart rate detected output from the comparator,
    2. timing a period of time between the receipt of the output from said comparator, and
    3. generating an anomaly detected signal whenever the period of time exceeds 30 seconds; and
- E. control means for receiving the anomaly detected signals from each of the signal processing circuits, determining when an alarm condition exists and transmitting an alarm initiation signal when required.



estimating a level of said noise in said ECG signals from each heart cycle; compensating for said level of noise in the cross-correlation of said time-synchronized signals; and generating a signal indicative of said low-amplitude signal structures from said cross-correlation quantity.

5,479,934

# EEG HEADPIECE WITH DISPOSABLE ELECTRODES AND APPARATUS AND SYSTEM AND METHOD FOR USE THEREWITH

Mir A. Imran, Palo Alto, Calif., assignor to Physiometrix, Inc., No. Billerica, Md.

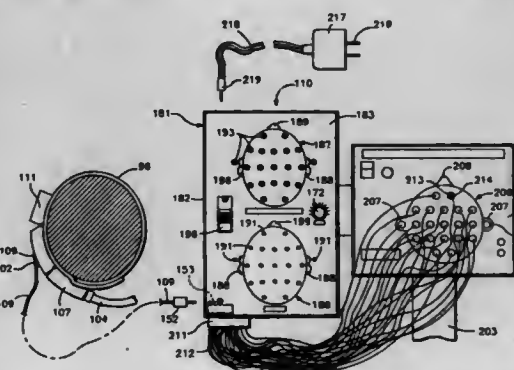
Continuation of Ser. No. 790,412, Nov. 8, 1991, abandoned.

This application Sep. 23, 1993, Ser. No. 126,113

Int. Cl.<sup>6</sup> A61B 5/0478

U.S. Cl. 128—731

27 Claims



1. A headpiece for making EEG measurements on the head of a patient in the form of a human being utilizing an electrode positioning system requiring the use of a plurality of electrodes in predetermined anatomical positions on the head of the patient, the head having a front, a back and first and second sides, the front having a chin with a frontal portion comprising, a plurality of longitudinally extending and transversely extending elastic strips of an elastic material forming a pattern having openings therein, a plurality of electrode assemblies mounted on said strips of material in spaced-apart positions, means secured to said strips for securing said strips and the electrode assemblies mounted thereon to the head of the patient after stretching of the strips so that the electrode assemblies are positioned in the desired anatomical positions on the head of the patient regardless of the size of the head of the patient and hold-down means secured to the strips for securing the strips to the head of the patient after the strips have been stretched so that they extend over the front, rear and first and second sides of the head of the patient, said hold-down means including first and second straps depending from the first and second sides of the head of the patient and strap means secured to the first and second straps extending forwardly from the first and second straps and including a frontal portion adapted to extend over and engage the frontal portion of the chin of the patient, said frontal portion of the strap means lying in a plane which is substantially perpendicular to the neck of the patient when engaging the frontal portion of the chin of the patient.

5,479,933

# METHOD AND APPARATUS FOR PROCESSING ECG SIGNALS

Roosbeh Atarius, Lund; Thomas Ohlsson, Haesselby, and Lef Soernmo, Lund, all of, Sweden, assignors to Siemens Elema AB, Solna, Sweden

Filed Jun. 23, 1994, Ser. No. 264,719

Claims priority, application Sweden, Jul. 16, 1993, 9302435

Int. Cl.<sup>6</sup> A61B 5/0472

U.S. Cl. 128—696

19 Claims

1. A method for processing an ECG signal containing noise and low-amplitude signal structures, comprising the steps of:
  - detecting respective ECG signals from a plurality of cardiac cycles;
  - converting said ECG signals into digital signals;
  - detecting QRS complexes in said digital signals;
  - time-synchronizing digital signals from at least two cardiac cycles;
  - cross-correlating the time-synchronized digital signals over a time interval encompassing at least two cardiac cycles to obtain a cross-correlation quantity having a magnitude;



5,479,935

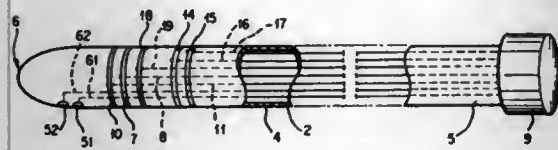
**AMBULATORY REFLUX MONITORING SYSTEM**  
Anders Essen-Moller, Stockholm, Sweden, assignor to Synetics Medical, Inc., Irving, Tex.

Filed Oct. 21, 1993, Ser. No. 139,117

Int. Cl.<sup>6</sup> A61B 5/05

U.S. Cl. 128—734

10 Claims



1. A system for monitoring gastroesophageal reflux comprising:
  - (a) an electrical connector;
  - (b) a gastroesophageal catheter with a distal end and a proximal end, with an impedance sensor attached to the catheter near the distal end and electrically communicating with said electrical connector at the proximal end;
  - (c) an ambulatory recorder connected to said electrical connector adapted to record impedance data generated by said impedance sensor and communicated to the recorder through said connector; and
  - (d) executable software, resident in the recorder, adapted to determine a presence of gastroesophageal reflux from said impedance data and graphically project said impedance data generated by said impedance sensor and communicated to said recorder through said connector.

5,479,936

**BIOPSY WOUND CLOSURE DEVICE AND METHOD**  
Hossein Nabai, 14555 Levan Rd., Suite 410, Livonia, Mich. 48154, and Homayoon Rahbari, 1314 N. Macomb St., P.O. Box 360, Monroe, Mich. 48161

Division of Ser. No. 56,399, May 4, 1993, Pat. No. 5,388,588.

This application Dec. 19, 1994, Ser. No. 358,819

Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 128—754

9 Claims



1. A closure device for the repair of skin tissue, controlling bleeding, and reducing the likelihood of inducing excess scar tissue, during a routine skin biopsy procedure, comprising: a syringe for administering an anesthetic to a biopsy site of a patient, said syringe having a detachable needle at one end of said body; a biopsy punch attached to a lower end portion of said body of said syringe, said biopsy punch being exposed for excising a biopsy specimen when said needle is detached from said body; and a pre-formed cylindrical sponge in the interior of said syringe having a diameter which is about the same diameter as the diameter of a circular blade of a punch used for excising a specimen of skin for

a skin biopsy, said sponge being accessible when said detachable needle is removed from said syringe for implanting said sponge into a bleeding site after the excising of said specimen by said punch during a routine biopsy procedure.

5,479,937

**ORAL COLLECTION DEVICE**

Thomas R. Thieme, Independence; Andrew S. Goldstein; Stephen C. Piacentini, both of Portland, and Nanette M. Klimkow, Beaverton, all of Oreg., assignors to Epitope, Inc., Beaverton, Oreg.

Continuation-in-part of Ser. No. 935,845, Aug. 25, 1992, Pat. No. 5,339,829, which is a continuation-in-part of Ser. No. 865,054, Apr. 8, 1992, abandoned, which is a continuation-in-part of Ser. No. 641,739, Jan. 15, 1991, Pat. No. 5,103,836, which is a continuation-in-part of Ser. No. 486,415, Feb. 28, 1990, abandoned, which is a continuation-in-part of Ser. No. 410,401, Sep. 21, 1989, Pat. No. 5,022,409. This application Aug. 3, 1993, Ser. No. 99,926

Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 128—760

6 Claims



1. A device for obtaining oral fluid that contains substances for testing comprising:
  - (a) an absorbent pad for recovering a test substance from oral fluid; means for extracting from the pad oral fluid that has been absorbed into the pad, wherein said means includes a syringe composed of a barrel, a plunger having an inner end to which the absorbent pad is attached, a fluid passageway at the outlet end of the barrel, and a detection reagent means contained in said passageway, effective to be released into the oral fluid when oral fluid is expelled from the barrel.

5,479,938

**LUMEN DIAMETER REFERENCE GUIDEWIRE**

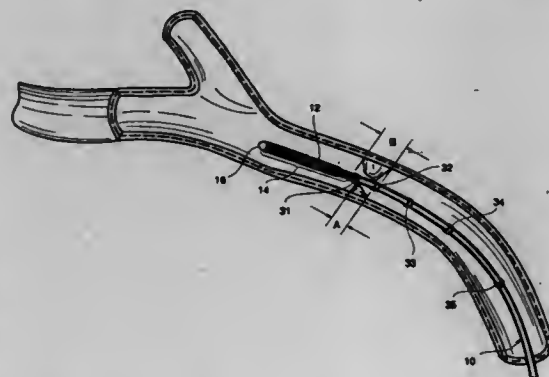
Steven D. Weler, Miramar, Fla., assignor to Cordis Corporation, Miami Lakes, Fla.

Filed Feb. 7, 1994, Ser. No. 192,506

Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 128—772

10 Claims



1. A lumen diameter reference guidewire comprising:
  - (a) a central core wire;
  - (b) a coiled spring wire surrounding a distal portion of said core wire;

a tip member;

said coiled spring wire being fixed at its distal end to said tip member;

said guidewire having in a non-tapered distal area thereof immediately proximal of the coiled spring wire, a plurality of markers which are highly radiopaque, each marker having the same precise width which is a precise fraction of a millimeter and which is designated "x" and having predetermined millimeter distances between adjacent markers, the predetermined distances varying in precise increments from marker to marker with the distance between the closest edges of the first two adjacent markers in a direction proximally from a distal end of said guidewire being 4x and the distance between the furthest edges of the two adjacent markers being 6x, so that the markers provide a scale to a physician whereby the physician can accurately determine distances inside a blood vessel using the markers independently or in conjunction with each other.

5,479,939

**SLEEP DETECTING APPARATUS**

Hiroyuki Ogino, Nara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 784,438, Dec. 20, 1991, abandoned.

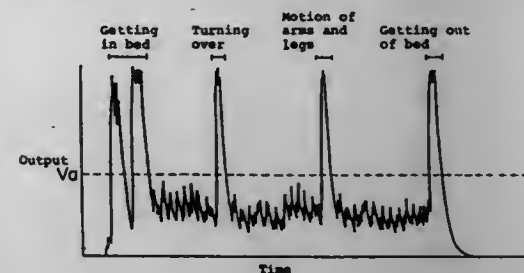
This application Apr. 6, 1994, Ser. No. 224,104

Claims priority, application Japan, Mar. 9, 1990, 2-058270; Mar. 12, 1990, 2-60218; May 25, 1990, 2-135893; Jun. 20, 1990, 2-161822

Int. Cl.<sup>6</sup> A61B 5/103

U.S. Cl. 128—782

4 Claims



1. An apparatus which operates to sense a condition indicative of sleep, comprising:

an infrared ray emitter and sensor assembly for radiating infrared rays over a bed on which a human body is located, and for detecting a characteristic of infrared rays and for outputting a detection signal which is generated by said characteristic and indicative of moving of said human body, said detection signal being proportional to an amount of movement of said human body;

a comparator for comparing said detection signal to a predetermined value indicative of rough body movement;

a timer for measuring a time interval during which said human body is in a substantially motionless condition on the basis of said detection signal, said time interval being interrupted when a level of said detection signal exceeds said predetermined value, said substantially motionless condition indicating that said human body is asleep, and

sleep judging means for outputting an electrical signal indicating that said human body is asleep when said time interval exceeds a predetermined time period.

5,479,940

**SECURING AND PROTECTIVE RIGID DISC FOR CONDOM; CONDOM PROVIDED WITH SUCH A DISC**  
Raymond G. Babled, 72, avenue d'Orgeval, 95210 Saint-Gratien, France

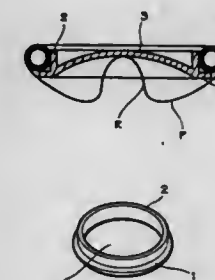
PCT No. PCT/FR93/00737, § 371 Date Apr. 21, 1994, § 102(e) Date Apr. 21, 1994, PCT Pub. No. WO94/05237, PCT Pub. Date Mar. 17, 1994

PCT Filed Jul. 20, 1993, Ser. No. 232,106

Claims priority, application France, Aug. 28, 1992, 92 10353 Int. Cl.<sup>6</sup> A61F 6/04

U.S. Cl. 128—844

19 Claims



1. In combination with a rolled condom in rolled form defining inner and outer annular side walls, and open and closed ends thereof, a securing and protective rigid insert for being removably positioned within the open end of the rolled condom to ensure proper unrolling and application of the condom by a user, said insert comprising:

(a) a cylindrical ring for engaging the inner side wall of the rolled condom;

(b) a radially and outwardly extending flat flange formed to a bottom peripheral edge of said ring, and residing under the inner side wall of the rolled condom between the open end thereof and the closed end thereof;

(c) a solid wall hood formed to said ring and enclosing an open area defined by said ring;

(d) said ring, flange, and hood defining a unitary structure, whereby:

(1) upon proper application of the rolled condom by the user, the insert automatically separates from the condom as the condom is unrolled; and

(2) upon attempting improper application of the rolled condom, the insert prevents unrolling of the condom by the user (e) wherein the solid wall hood is convex having a hollow side which is on the same side of the insert as said flange.

5,479,941

**DEVICE FOR INDUCING ALTERED STATES OF CONSCIOUSNESS**

Michael Harner, Norwalk, Conn., assignor to Foundation of Shamanic Studies, Norwalk, Conn.

Filed Oct. 18, 1993, Ser. No. 138,343

Int. Cl.<sup>6</sup> A61G 15/00; 7/04

U.S. Cl. 128—845

19 Claims

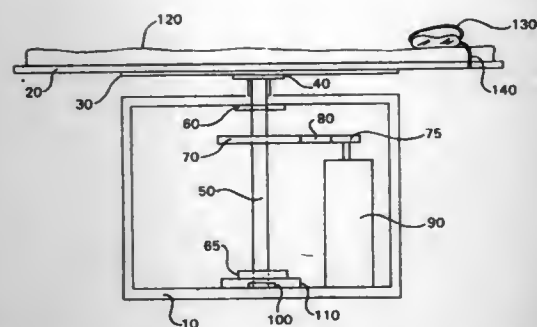
1. A system for inducing a trance state in an adult subject comprising:

(a) horizontal rigid, non-bending body support means adapted to support said subject in a supine position during rotation of the device;

(b) rotating means operably connected to said body support means to horizontally rotate said body support means;

(c) speed control means operably connected to said rotating means to control the speed of said rotation to be between about 10 and about 60 revolutions per minute.





(d) a light shield means worn by the subject during rotation of said body support means for blocking light from the subject's eyes.

5,479,942

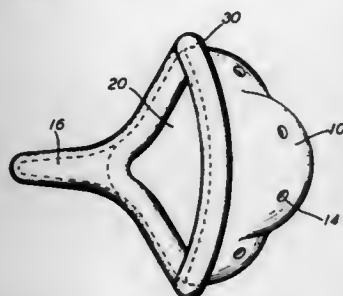
## ATHLETIC PROTECTIVE SYSTEM

Frank DiMatteo, 501 Sunnyfield Dr., Monroeville, Pa. 15146  
Filed Nov. 9, 1994, Ser. No. 308,602

Int. Cl.<sup>6</sup> A61F 5/37; 13/00

U.S. Cl. 128—846

20 Claims



1. A device for protecting a male genital region from injury comprising: a cup portion having a generally convex outer surface, a generally concave inner surface, an edge encircling said concave inner surface, and having sufficient volume to enclose a wearer's male genitals; a resilient edge padding mounted over said edge encircling said concave inner surface adequate to contact such wearer's body at the lower portion thereof and absorb at least a major portion of any impact experienced by said device; and a support rod extending from a lower portion of said edge generally away from said concave inner surface, and adapted to extend between such wearer's upper thighs and engage the body proximate to the superior ramii, the inferior ramii, and/or the Ischial ramii of the pelvis with minimal contact with the upper thighs; said cup portion further having:

- a. a generally curved upper edge adapted to arcuately contact the wearer's abdomen above the pubic area without having any corner intersections between side edges and a top edge of said cup, and
- b. a generally circular side edge periphery at a mid-section below said generally curved upper edge adapted to contact the wearer's abdomen on each side of the pubic area and enclose the wearer's genitals without crowding such genitals.

5,479,943

## HANDCUFF SHIELD

John S. Kuhnelt, III, 3204 Singletary, Apartment 159, Baker, La. 70714-2358

Filed Apr. 28, 1995, Ser. No. 430,577

Int. Cl.<sup>6</sup> A51F 5/37; E05B 75/00

U.S. Cl. 128—846

20 Claims

1. A handcuff shield for covering a pair of handcuffs to prevent the handcuffs from touching the skin of the user and transmitting



viruses and bacteria from the handcuff to the user, each of said pair of handcuffs being covered by said handcuff shield having an arcuate casing and an arcuate blade pivotally connected thereto for encircling a wrist of a person to whom the handcuffs are attached, said arcuate blade being receivable and lockable in said casing, said handcuff shield comprising:

- a. first body section means having a bottom and two sidewalls extending upwardly therefrom for covering said arcuate casing,
- b. a second body section means having a bottom and two sidewalls extending upwardly therefrom for covering said arcuate blade, and
- c. a flexible joint means for connecting said first body section means to said second body section means.

5,479,944

## NASAL DEVICES

Bjorn Petruson, Goteborg, Sweden, assignor to Patent Development & Investment S.A., Luxembourg

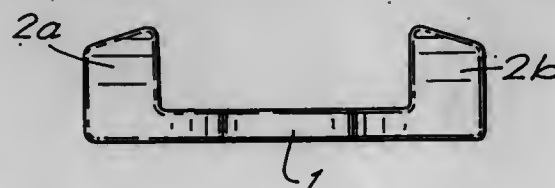
Continuation of Ser. No. 391,010, May 17, 1989, abandoned.

This application May 14, 1991, Ser. No. 701,621

Int. Cl.<sup>6</sup> A61F 5/37

U.S. Cl. 128—858

28 Claims



1. A one-piece device for positioning in the nose comprising:
  - (i) a pair of tabs for positioning in respective nostrils; and
  - (ii) an elongate connecting member resiliently interconnecting the tabs;

wherein:

- (a) each tab is resilient and has a surface for engaging the outer side wall of the respective nostril, is relatively thin so as to project a relatively small distance from the outer side wall into the passage of the respective nostril and is formed from a resilient, relatively soft material whereby said surface may conform to the contours of said respective side wall;
- (b) the connecting member is of a length sufficient to follow a path from one tab to the other over the septum of the nose;
- (c) said connecting member is resiliently bendable from an inoperative configuration into an operative configuration in which the tabs are positioned within the nostrils, the connecting member follows said path over the septum, and there is a restoring force tending to return said connecting member to the inoperative configuration; and
- (d) the restoring force is sufficient to maintain the device in the nose of a user by means of engagement of the tabs with their respective nostril by means of the tabs urging the respective side walls outwardly.

# 5,479,945 METHOD AND A REMOVABLE DEVICE WHICH CAN BE USED FOR THE SELF-ADMINISTERED TREATMENT OF URINARY TRACT INFECTIONS OR OTHER DISORDERS

John G. Simon, Boston, Mass., assignor to UroMed Corporation, Watertown, Mass.

Continuation-in-part of Ser. No. 746,364, Aug. 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 636,285, Dec. 31, 1990, Pat. No. 5,090,424. This application Dec. 20, 1991, Ser. No. 811,571

Int. Cl.<sup>6</sup> A61F 5/48

U.S. Cl. 128—885

6 Claims



1. A method for delivering antibiotics or other therapeutic compound to an infected or diseased urinary tract comprising the following steps:

providing a remove-to-void delivery device having an exterior surface having antibiotics or other therapeutic compound resident thereon, wherein said antibiotics or other therapeutic compound are resident on the delivery device through means of coating the exterior surface or portions of the exterior surface with a solution of, antibiotics or other compound and urine-soluble binder, prior to insertion, or by attaching a urine-soluble pellet containing antibiotics or other compound or both, prior to insertion, said remove-to-void delivery device further including an expandable proximal portion which can be inserted into the urethra, bladder or bladder neck,

inserting the delivery device with the antibiotics or other therapeutic compound into the urethra,

expanding the expandable portion of the device, allowing the antibiotics or other therapeutic compound to dissolve into the urine and/or onto the inner walls of the urinary tract,

reversing the expansion of the expandable portion of the device, removing the device from the urethra.

5,479,946

## MUSCLE ENERGY CONVERTER

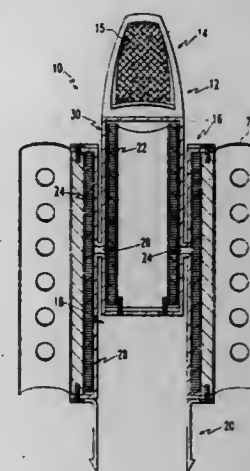
Dennis R. Trumble, Pittsburgh, Pa., assignor to Allegheny-Singer Research Institute, Pittsburgh, Pa.

Filed Apr. 15, 1994, Ser. No. 228,586

Int. Cl.<sup>6</sup> A61M 1/12

U.S. Cl. 128—899

17 Claims



1. A muscle energy converter comprising:
  - a piston having an attachment head for connection to a muscle,
  - said piston having material which is magnetically reactive; and

a cylinder having a chamber in which the piston is disposed, said cylinder having a port connected to the chamber for transport of fluid in the chamber as the muscle moves the piston, said piston comprising a first magnetic section having at least one magnet and said cylinder comprising a second magnetic section having at least one magnet, said first magnetic section and said second magnetic section providing opposing fields to maintain the piston in co-axial alignment within the cylinder.

5,479,947

## CIGARETTE MAKING MACHINE

Derek H. Dyett, High Wycombe, England, assignor to Molins PLC, Milton Keynes, England

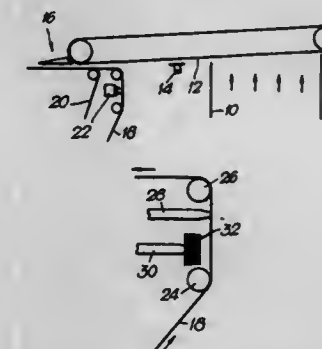
Filed Jun. 14, 1994, Ser. No. 260,475

Claims priority, application United Kingdom, Jun. 19, 1993, 9312704

Int. Cl.<sup>6</sup> A24C 5/24

U.S. Cl. 131—37

5 Claims



1. A device for applying adhesive to the wrapper web in a cigarette making machine comprising a pair of movable nozzles, means for controlling the position of each nozzle so that one nozzle at a time is in position to apply adhesive to the wrapper web while the other nozzle is in a retracted position, and cleaning means for removing the accumulated adhesive string from each nozzle while in the retracted position.

5,479,948

## ELECTRICAL SMOKING ARTICLE HAVING CONTINUOUS TOBACCO FLAVOR WEB AND FLAVOR CASSETTE THEREFOR

Mary E. Counts; Willie G. Houck, Jr., both of Richmond; Kenneth S. Houghton, Midlothian; A. Clifton Lilly, Jr., Chesterfield; Peter J. Lipowicz; James L. Myracle, both of Midlothian; F. Murphy Sprinkel, Glen Allen; James M. Washington, Richmond, and Susan E. Wrenn, Chesterfield, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 10, 1993, Ser. No. 105,346

Int. Cl.<sup>6</sup> A24F 47/00

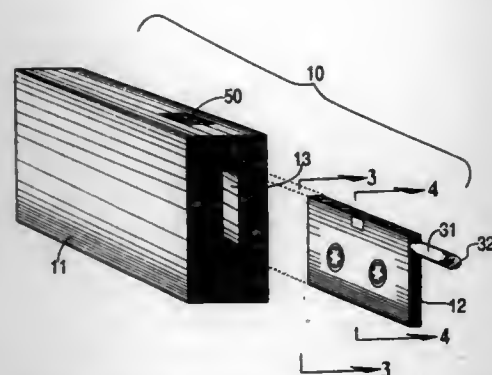
U.S. Cl. 131—194

145 Claims

1. An electrical smoking article for generating a tobacco flavor substance from a web having tobacco flavor medium therealong comprising:

a source of electrical energy;  
electrical heating means;  
means for supporting a section of the web in thermal proximity to said electrical heating means;  
means for advancing the web to present a successive section of the web having the tobacco flavor medium therealong to said electrical heating means; and  
control means for applying electrical energy from said source of electrical energy to said electrical heating means for a predetermined period of time to generate a tobacco flavor substance





from the section having tobacco flavor medium therealong for delivery to a smoker; and means for actuating said advancing means independently of applying electrical energy to said electrical heating means to present the successive section of the web to the electrical heating means.

5,479,949

# SHEET MATERIAL FOR A SMOKING PRODUCT INCORPORATING AN AROMATIC SUBSTANCE

Jean C. Battard, Saran; Jean M. E. Mane, Grasse, and Daniel Esnault, Saint Jean De La Ruelle, all of, France, assignors to Societe Nationale D'Exploitation Industrielle Des Tabacs Et Allumette et Etablissements V., France

PCT No. PCT/FR92/00331, § 371 Date Oct. 12, 1993, § 102(e) Date Oct. 12, 1993, PCT Pub. No. WO92/18020, PCT Pub. Date Oct. 29, 1992

PCT Filed Apr. 14, 1992, Ser. No. 133,048

Claims priority, application France, Apr. 17, 1991, 91 04721 Int. Cl.<sup>6</sup> A24D 1/02

U.S. Cl. 131—365

5 Claims

1. A process for preparation of a sheet material for use in the manufacture of smoking products, wherein aromatic substances are introduced in a paste used in the manufacture of the sheet material, on a paper-making machine, in the form of molecular encapsulation of the aromatic substances in cyclodextrins; the improvement comprising maintaining an encapsulation complex of the aromatic substances in cyclodextrins in powder form in a suspension solution, at a temperature below 15° C., and wherein the process of preparation of the sheet material on the paper making machine comprises drying in a final drying section and wherein said suspension solution is introduced into said drying section, whereby aromatic substances not completely encapsulated in the cyclodextrins are eliminated by evaporation during said drying.

5,479,950

# FINGER TIP MUSTACHE SHAVING DEVICE WITH COVER

Edward A. Andrews, 6835 Beach Rd., Troy, Mich. 48098

Continuation of Ser. No. 20,586, Feb. 22, 1993, abandoned.

This application Oct. 6, 1994, Ser. No. 319,149

Int. Cl.<sup>6</sup> B26B 21/00; A45D 2/50

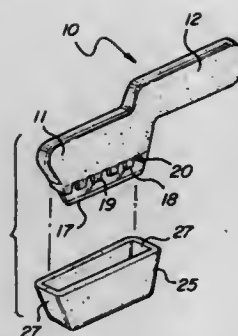
U.S. Cl. 132—215

20 Claims

1. A small-size lightweight mustache shaving device, grippable between a user's forefinger and thumb for edging and shaping his own mustache hair, comprising:

an elongated, narrow, substantially flat body no more than about two inches long which is divided into a forward head portion and an integral rear fingertip-grip portion, said fingertip-grip portion being of a length approximating the free ends of a typical user's forefinger and thumb;

said forward head portion having an elongated longitudinally extending edge and a centerline parallel to said extending edge;



a flat blade integrally supported in said body, said blade having a straight elongated, razor-sharp edge no more than about three-fourths of an inch long, mounted upon said forward head portion with the sharp edge of the blade extending a short distance laterally outwardly of said elongated edge of said head portion and side edges on each side of said sharp edge angling at an obtuse angle relative to said sharp edge for providing blunting which enables a user to apply greater pressure on said sharp edge to enhance cutting action; said integral rear fingertip-grip portion having a centerline parallel to the centerline of said forward head portion and offset away from the sharp edge of the blade; whereby the grip portion may be manually gripped between a user's fingertips and the blade and its supporting head portion may be moved over his mustache hair to be cut and his skin adjacent thereto in order to cut and shape his mustache hair with the sharp edge of the blade.

5,479,951

# BENDABLE, EXTENDABLE HAIRBRUSH WITH REMOVABLE BRUSH HEAD

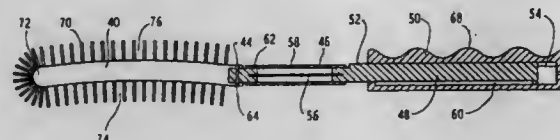
Sabrina S. Denebeim, 260 Avila St., San Francisco, Calif. 94123

Filed Apr. 4, 1994, Ser. No. 222,696

Int. Cl.<sup>6</sup> A45D 2/00; 1/20; A46B 5/02

U.S. Cl. 132—265

21 Claims



1. A hair styling device comprising:

a handle section having an internal bore,

an extension member slidably received within said internal bore of said handle section, and a brush head attached to said extension member,

wherein said extension member comprises a bendable section having a bendable element therein, said bendable element being flexible enough to allow said bendable section to be easily bent to a desired position and said bendable element being rigid enough to hold said bendable section in said desired position,

whereby the length of said hairbrush can be contracted by sliding said extension member into said internal bore of said handle section, and the length of said hairbrush can be extended by withdrawing said extension member from said internal bore of said handle section.

5,479,952

# DENTAL FLOSS OF ULTRA-HIGH MODULUS LINE MATERIAL WITH ENHANCED MECHANICAL PROPERTIES

Anagnostis E. Zachariades, Hillsborough, and Premal Shukla, Foster City, both of Calif., assignors to Polteco, Inc., Hayward, Calif.

Division of Ser. No. 177,905, Jan. 6, 1994, Pat. No. 5,407,623.

This application Feb. 23, 1995, Ser. No. 393,548

Int. Cl.<sup>6</sup> A61C 15/00

U.S. Cl. 132—321

5 Claims

1. A dental floss comprised of a unitary filament of high molecular weight polyethylene material having a molecular weight of at least 300,000, a Young's modulus in the range of 0.5 GPa to 10 GPa and a tensile strength of 0.1 GPa to 1.2 GPa.

5,479,953

# PORTABLE INTRAVENOUS EQUIPMENT CONSOLE AND WALKER APPARATUS FOR AN AMBULATORY PATIENT

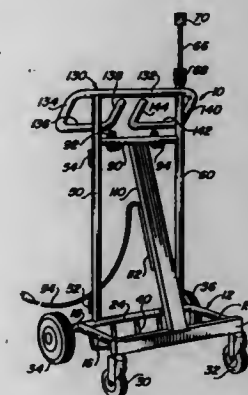
Patrick S. Pasulka, 6808 N. 18th St., Paradise Valley, Ariz. 85253

Filed Dec. 20, 1993, Ser. No. 168,423

Int. Cl.<sup>6</sup> A45B 3/00

U.S. Cl. 135—66

22 Claims



1. Portable intravenous equipment console and walker apparatus comprising in combination:

base means for providing support and stability;

wheel means secured to the base means for moving the base means;

frame means secured to and extending upwardly from the base means for supporting intravenous equipment;

handle means secured to the frame means to which a user holds onto for walking including

a first element extending generally horizontal,

a second element extending diagonally downwardly from the first element,

a third element extending inwardly from the second element remote from the first element,

a fourth element extending diagonally upwardly from the third element remote from the first element,

a fifth element extending downwardly from the first element generally parallel to and spaced apart from the second element,

a sixth element secured to and extending inwardly from the fifth element and generally aligned with the third element, and

a seventh element secured to and extending diagonally upwardly from the sixth element and generally parallel to and spaced apart from the fourth element.

5,479,954

# FOLDABLE TENT

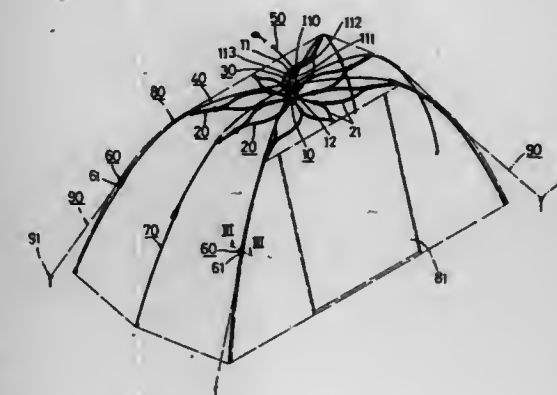
Tu Lin, No. 138-2, Ta-Chieh Rd., Ching-Shui Chen, Taichung Hsien, Taiwan, Prov. of China

Filed Dec. 13, 1994, Ser. No. 357,180

Int. Cl.<sup>6</sup> E04H 15/28

U.S. Cl. 135—98

8 Claims



5. A foldable tent including a canopy and a collapsible frame assembly for stretching said canopy, wherein said frame assembly comprises:

a crown having a vertically extending passageway formed there-through;

a plurality of curved rib units having upper ends pivoted to and around said crown, and lower ends fastened to a periphery of said canopy;

a slider having a base member and a retainer extending upwardly from said base member, said retainer being extensible to pass through said passageway when said frame assembly is collapsed, and being engageable with said crown when said frame assembly is stretched;

a plurality of stretcher members having first ends pivoted to and around said base member of said slider, and second ends pivoted respectively to said rib units for supporting said rib units to stretch said canopy, said stretcher members being connected to one another to form a reinforcement network for supporting said rib units;

said retainer being an elongated hollow stem having a distal portion, a proximal portion relative to said base member, and an annular shoulder that is formed between said distal portion and said proximal portion, said distal portion diverging toward said shoulder, said proximal portion diverging toward said shoulder, said hollow stem having a slot which is formed diametrically therethrough and extending a predetermined distance from said proximal portion to said distal portion for permitting compression of said hollow stem, said shoulder forming an anchor which engages said crown when said hollow stem expands for positioning said hollow stem on said crown, and extending through said passageway of said crown when said stem is compressed for allowing downward movement of said hollow stem away from said crown so as to collapse said frame assembly; and

a pull cord having one end thereof connected securely to said distal portion of said hollow stem, said pull cord extending through said passageway of said crown so as to facilitate pulling of said hollow stem toward said crown.



5,479,955

**METHOD AND APPARATUS FOR ASEPTICALLY FILLING CONTAINERS**

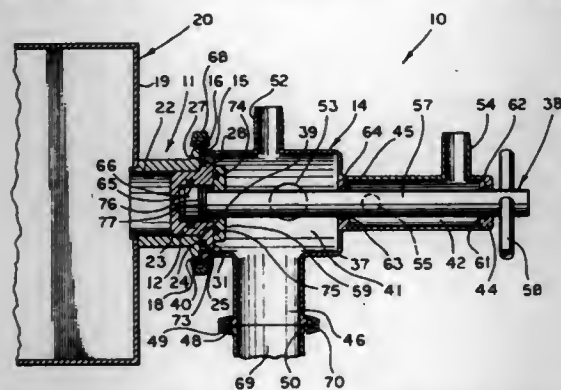
Mark R. Roodvoets, Inman; Jeffrey L. Gorman, Simpsonville, both of S.C.; Philip E. Nelson, West Lafayette, and Richard S. Smith, Lafayette, both of Ind., assignors to Spartanburg Steel Products, Inc., Spartanburg, S.C.

Filed May 31, 1994, Ser. No. 251,265

Int. Cl.<sup>6</sup> B08B 3/04; 9/06

U.S. Cl. 137—15

14 Claims



14. A method of sterilizing, filling and discharging a container having a fitting member adapted to removably receive a plug comprising the steps of: positioning the plug on an end of a plunger in a sterilization housing; detachably coupling the sterilization housing with the fitting member; introducing a sterilizing reagent into the sterilization housing, to sterilize the housing, the plug, the plunger, the fitting member and the container; aseptically filling the container with a product by introducing the product into the sterilization housing through a filling port; engaging the plug with the fitting member by manipulating the plunger; and disengaging the sterilization housing from the fitting member so that the sterilization housing may be used to sterilize, and aseptically fill and discharge other containers.

5,479,956

**RELEASE APPARATUS FOR PNEUMATIC VALVE OPERATOR AND METHOD**

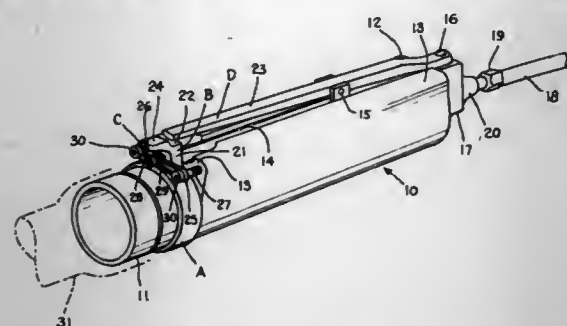
Lawrence F. Yuda, Seneca, S.C., assignor to Compact Air Products, Inc., Westminster, S.C.

Filed Sep. 26, 1994, Ser. No. 311,265

Int. Cl.<sup>6</sup> F16K 35/00

U.S. Cl. 137—15

7 Claims



6. The method of actuating a pneumatic valve for operating a pneumatic device carried by a cylindrical hand held housing utilizing a manually movable depressible pneumatic valve operator comprising the steps of:

- mounting a ring upon said cylindrical housing rotatable in response to manipulation by a hand of a user of the apparatus; carrying a protuberance on said ring extending radially outwardly of a periphery of the ring;
- attaching a resilient member to said ring on one end and to the housing on the other end;

retaining said protuberance in a blocking position preventing unintended movement of said pneumatic valve operator by the action of said resilient member; and rotating said blocking member and said ring about an exterior of the housing for moving the blocking member into and out of blocking position;

whereby the protuberance is rotatable by the user by rotation of the ring against the force of said resilient member out of blocking position preparatory to manually moving said pneumatic valve operator, and said protuberance is automatically returnable to blocking position upon release of the ring by the action of said resilient member.

5,479,957

**SLUDGE PIPELINE LUBRICATION SYSTEM**

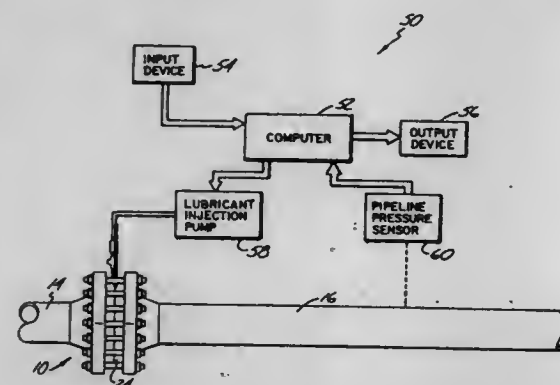
Harry Crow, Richfield, Conn.; Thomas M. Anderson, Hugo, Minn.; Scott Kelly, Pleasanton, Calif.; Terry Atherton, Excelsior, and Larry Schmidt, Lino Lakes, both of Minn., assignors to Schwing America, Inc., White Bear, Minn.

Continuation of Ser. No. 70,516, Jun. 1, 1993, Pat. No. 5,361,797. This application Jul. 11, 1994, Ser. No. 273,191

Int. Cl.<sup>6</sup> F17D 1/16

U.S. Cl. 137—101.19

19 Claims



10. In a pipeline for conveying high viscosity material, a system for lubricating a plug flow of high viscosity material in the pipeline, the system comprising:

- a first pipe through which the plug flow of high viscosity material is pumped;
- a second pipe through which the plug flow of high viscosity material is pumped, the second pipe being located downstream from the first pipe and at least partially separated from the first pipe;
- a lubrication spool for lubricating the plug flow of high viscosity material with lubricant from a lubricant source, the lubrication spool located in a first position between the first pipe and the second pipe during lubrication, the lubrication spool comprising:
  - a first spool section, the first spool section being located immediately adjacent the first pipe when the lubrication spool is in the first position;
  - a second spool section, the second spool section being located immediately adjacent the second pipe when the lubrication spool is in the first position;
  - an aperture, in the first and second spool sections, providing a passage for the plug flow of high viscosity material being pumped between the first and second pipes; and
  - a lubrication passage located between the first and second spool sections for applying lubricant to the plug flow of high viscosity material being pumped between the first and second pipes; and
  - an adjusting means for adjusting the amount of lubricant applied to the plug flow of high viscosity material, the adjusting means comprising:

means for sensing pressure of the plug flow of high viscosity material in the pipeline downstream from the lubrication spool; and means for controlling the amount of lubricant applied based upon the sensed pressure.

5,479,958

**SUPPLY UNIT FOR MEDICAL TREATMENT INSTRUMENTS**

Ryszard Kummerfeld, Travemünde, Germany, assignor to Drägerwerk AG, Lubeck, Germany

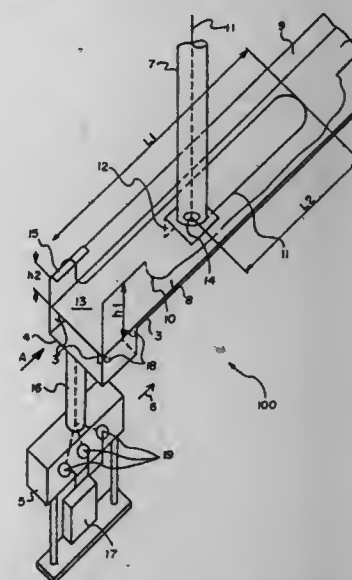
Filed Mar. 20, 1995, Ser. No. 406,503

Claims priority, application Germany, May 11, 1994, 44 16 618.4

Int. Cl.<sup>6</sup> A01G 25/09

U.S. Cl. 137—357

10 Claims



1. A supply unit for medical treatment instruments, comprising: a structural tube-type supply beam, said supply beam being fastened to a ceiling; electrical and medical gas-carrying supply lines extending through said tube-type supply beam; tracks extending longitudinally on said supply beam; a carriage positioned on said tracks for movement along said tracks; support means arranged on said carriage, said supply lines being freely displaceable within said supply beam and said supply lines being accommodated within said supply beam in the form of a loop including a first partial length  $L_1$  and a second partial length  $L_2$ , a sum of said first partial length  $L_1$  and said second partial length  $L_2$  of said freely displaceable supply lines within said supply beam corresponding at least to a predetermined movement of said carriage along said tracks; and tube guide means for deflecting said supply lines from said supply beam to said support device.

5,479,959

**INTEGRATED STORAGE AND TRANSFER SYSTEM AND METHOD FOR SPACECRAFT PROPULSION SYSTEMS**

L. Scott Stotelmyer, Manhattan Beach, and Don K. Fulkerson, Valencia, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

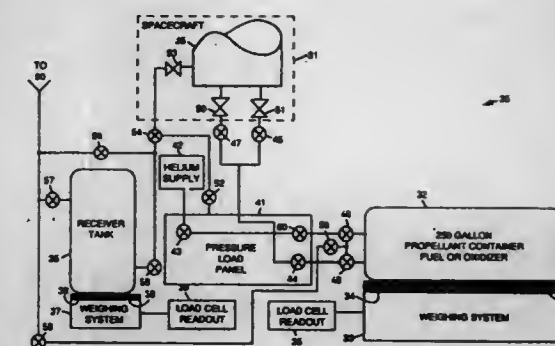
Division of Ser. No. 173,736, Dec. 23, 1993. This application May 27, 1994, Ser. No. 250,084

Int. Cl.<sup>6</sup> F16K 37/00

U.S. Cl. 137—559

15 Claims

1. In a bipropellant loading system for use with a spacecraft comprising propellant storage tanks that each have a propellant input and a vent output, a portable weighing system for providing



output signals indicative of the weight of the respective propellant loading tanks, a weight leadout device coupled to the portable weighing system for providing an output indicative of the weight of the respective propellant loading tanks, an inert gas supply, and a pressure load panel coupleable to the inert gas supply for providing pressure to transfer the fuel and oxidizer propellants to the respective propellant storage tanks in the spacecraft, wherein the improvement comprises:

two portable propellant loading tanks for respectively storing and transferring fuel and oxidizer propellant that are respectively coupleable between the propellant input of the propellant storage tanks in the spacecraft and the pressure load panel.

5,479,960

**FLUID COUPLINGS AND SEALS**

Douglas F. Kirkman, 1 Boniface Rd., Ickenham, Middlesex, England

PCT No. PCT/GB91/0166, § 371 Date Apr. 12, 1993, § 102(e) Date Apr. 12, 1993, PCT Pub. No. WO92/06272, PCT Pub. Date Apr. 16, 1992

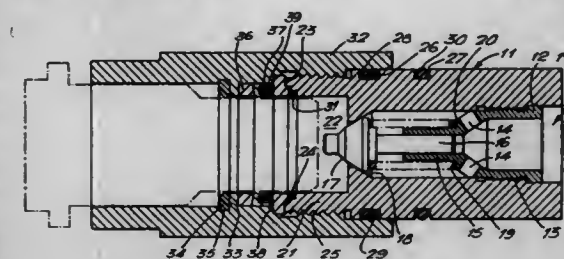
PCT Filed Sep. 26, 1991, Ser. No. 969,164

Claims priority, application United Kingdom, Sep. 29, 1990, 9021249

Int. Cl.<sup>6</sup> F16L 37/28

U.S. Cl. 137—614.04

9 Claims



1. A coupling comprising a female coupler and a male coupler insertable therein, said female coupler having at one end a receiving socket for said male coupler, a first internal bore extending to said receiving socket, a valve seal in said first internal bore and a spring loaded poppet valve in said first internal bore and extending into said receiving socket, and said male coupler having a second internal bore including a valve seal at a forward end of said male coupler and a spring loaded poppet valve disposed in said second internal bore, said poppet valves being mutually engageable to allow fluid flow between the couplers on the mating of the couplers and each providing closure of said female coupler and said male coupler respectively when said couplers are mutually withdrawn from mating, and an annular, J-section, metallic sealing member, having a dynamic sealing portion which is convex towards said male coupler and is disposed to seal against the male coupler, and a static sealing portion disposed to sealingly engage the female coupler, said static sealing portion extending radially outwardly from the dynamic sealing portion; and said female coupler further including an annular shoulder at said one end and engaged by the static sealing portion, an annular sleeve, a retainer which is disposed between said annular sleeve and said static sealing portion



for urging said static sealing portion against said annular shoulder at said one end and an annular recess accommodating a U-section sealing member providing a radial seal between said female coupler and said male coupler.

5,479,961

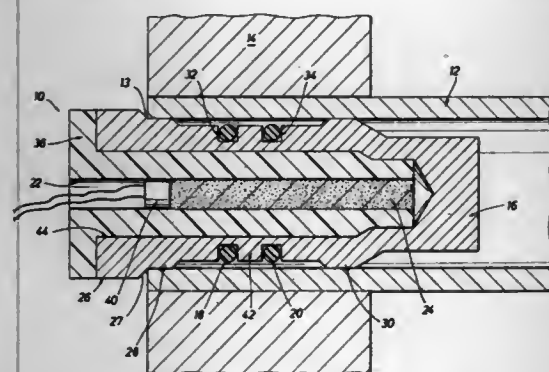
# METHOD OF PLUGGING A HEAT EXCHANGER TUBE AND PLUG THEREFOR

Peter L. DeMarsh, Picayune, Miss., and William W. Crawford, Slidell, La., assignors to Senior Engineering Company, Commerce, Calif.

Filed Dec. 9, 1994, Ser. No. 352,895  
Int. Cl.<sup>6</sup> F16L 55/10

U.S. Cl. 138—97

4 Claims



1. A plug for sealing the open end of a tube located in an opening in a tube sheet of a heat exchanger comprising a generally cylindrical metallic body of ductile material for positioning in the open end of the tube, first and second circumferential grooves in the outside surface of the metallic body, said grooves having walls generally perpendicular to the longitudinal axis of the body and first and second resilient seal rings positioned in the grooves, the seal rings having a diameter less than the depth of the grooves so that the seal rings are protected as the body is positioned in the tube, a longitudinal opening in the body, and an explosive charge in the opening that when detonated will expand the body such that the walls of the grooves flare out and away from the seal rings into metal-to-metal sealing engagement with the tube and to force the resilient seal rings into sealing engagement with the tube between the metal-to-metal seals, thereby plugging the end of the tube.

5,479,962

Patent Not Issued For This Number

5,479,963

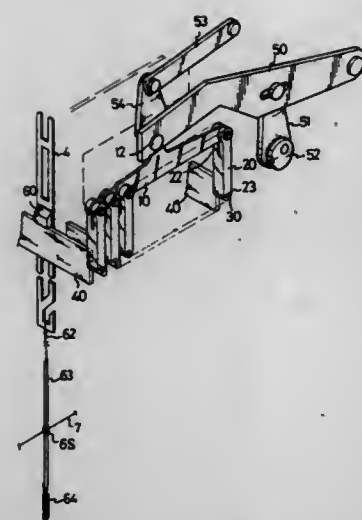
# LOOM HEALD HOOK LIFTER

Chuan-tien Cheng, 7 Fl., No. 11, Alley 8, Lane 1, Sec. 3, Pao An St., Shulin Chen, Taipei Hsien, Taiwan, Prov. of China  
Filed Nov. 30, 1994, Ser. No. 351,157  
Int. Cl.<sup>6</sup> D03C 1/18; 3/32

U.S. Cl. 139—55.1

1 Claim

1. A weaving machine heald hook lifter comprising:  
a bracket;  
a plurality of links each including an upper tip linked to the bracket and a lower tip through which a hole is defined;  
a corresponding number of blades each including a hole defined in an edge thereof; and  
means for pivotally interconnecting said links and said blades, respectively;



said means comprising a corresponding number of pintles each loosely extending through the hole defined in each of the links and frictionally engaging the hole defined in each of the blades.

5,479,964

# ROTARY DOBBY HAVING CONNECTING ROD AUTOMATICALLY DISENGAGABLE FROM DRIVE SHAFT

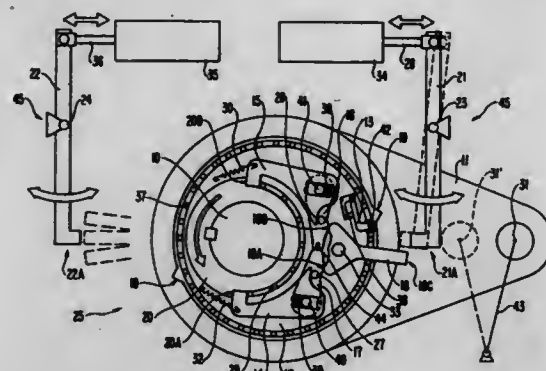
Lucio Burigana, Via Tornielli, 15 - 33080 Roveredo in Piano (Pordenone), Italy

Filed Dec. 20, 1993, Ser. No. 169,646

Claims priority, application Italy, Dec. 18, 1992, UD92A0183  
Int. Cl.<sup>6</sup> D03C 1/00

U.S. Cl. 139—76

9 Claims



1. A rotary dobby comprising:  
a connecting rod;  
a cam disk in camming engagement with said connecting rod, said cam disk having an outer periphery defining two respective mating surfaces;  
a drive shaft;  
a drive disk integral with said drive shaft so as to rotate therewith;  
two mutually opposing ratchet levers pivotally mounted to said cam disk at respective fulcrums, each of said ratchet levers having a first end engageable with a respective one of said mating surfaces defined by the outer periphery of said cam disk, and a second end remote from the first end;  
a rocking lever pivotally mounted to said cam disk at a pivot, said pivot lying in a plane coincident with the axis of said drive shaft, said plane passing between the respective fulcrums at which the ratchet levers are pivotally mounted to

said cam disk, respectively, while extending from said pivot to the axis of said drive shaft,  
said rocking lever having a first end disposed to one side of said pivot as viewed in a direction parallel to said plane, and a second end disposed to the other side of said pivot as viewed in said direction, said first end of the rocking lever comprising first and second terminal contact appendages disposed symmetrically with respect to said plane and respectively operatively connected to the second ends of said ratchet levers so as to cause said ratchet levers to pivot about said fulcrums, and said second end of said rocking lever constituting a control arm; and  
control means for cooperating with the control arm of said rocking lever to control the rocking of said rocking lever about said pivot.

5,479,965

# REED ASSOCIATED LIGHT SENSITIVE APPARATUS FOR MONITORING WEFT THREAD IN A LOOM

Sten Åke O. Rydborn, Klöxhultsvägen 21, 343 00 Ålmlhult (SE), Sweden

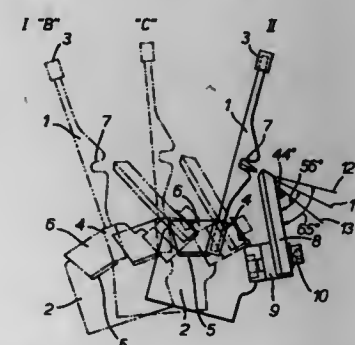
PCT No. PCT/SE92/00652, § 371 Date Apr. 5, 1994, § 102(c)  
Date Apr. 5, 1994, PCT Pub. No. WO93/06280, PCT Pub. Date Apr. 1, 1993

PCT Filed Sep. 21, 1992, Ser. No. 211,184

Claims priority, application Sweden, Sep. 23, 1991, 9102751  
Int. Cl.<sup>6</sup> D03D 51/34

U.S. Cl. 139—370.2

17 Claims



1. An apparatus for monitoring of the weft in a loom of the type in which the weft is driven through the shed of the loom with the aid of a jet and which has a reed pivotally disposed for pivoting between a first position and a second position, the reed having a longitudinal channel for the weft, said apparatus comprising an arm having a free end adapted to be located in the proximity of the longitudinal channel in the reed; and means at the arm free end for holding a light source and two light-sensitive elements, with the light source directed towards the channel for illuminating a rear portion of the channel, and with one light-sensitive element directed towards an upper corner of the channel, and the other light-sensitive element directed towards a lower corner of the channel.

5,479,966

# QUICK FILL FUEL CHARGE PROCESS

Raymond R. Tison, Mentor, and Paul F. Swenson, Shaker Heights, both of Ohio, assignors to Consolidated Natural Gas Service Company, Inc., Pittsburgh, Pa.

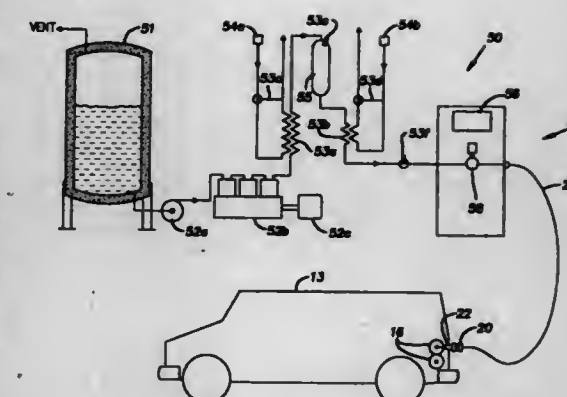
Filed Jul. 26, 1993, Ser. No. 97,754

Int. Cl.<sup>6</sup> B65B 31/00; B67C 3/00

U.S. Cl. 141—4

3 Claims

1. A method of fast filling a vehicle fuel tank with high pressure natural gas comprising the steps of coupling a fill line to the vehicle tank, introducing high pressure natural gas into the line and the tank, measuring the pressure in the line in a manner that yields



a measurement of the initial pressure of the gas in the tank, assigning an initial temperature for the gas in the tank, predetermining the final desired pressure and temperature of the gas in the tank at the end of the fill, calculating the temperature of the gas to be added to the tank so that the adiabatic compression and rise in temperature of gas in the tank is automatically compensated for and the tank is substantially filled with a mass that results in a condition, when the tank and the gas contained therein are substantially at ambient temperature, wherein the pressure in the tank is substantially equal to the nominal rated pressure of the tank and, thereafter filling the tank with gas at the calculated gas temperature, the gas being added to the tank being supplied from a store of LNG at the site at which vehicles are being fast filled, and the gas being added to the tank being supplied at a temperature below ambient temperature in such a manner that at the end of the filling process the temperature of the gas in the tank is not substantially above ambient temperature.

5,479,967

# METHOD OF FILLING A BOURDON TUBE WITH A GEL SUBSTANCE

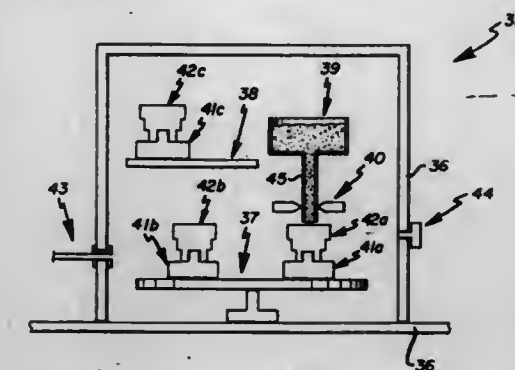
Duane J. Zytkevich, Onamia, and Thomas J. McEvoy, Minnetonka, both of Minn., assignors to B. Braun Medical, Inc., Plymouth, Minn.

Filed Jan. 24, 1994, Ser. No. 185,529

Int. Cl.<sup>6</sup> B65B 3/04

U.S. Cl. 141—7

10 Claims



1. A method of completely filling an enclosed space of a structure, of the type having an exterior orifice connected to the enclosed space, with a gelatinous substance, comprising the steps of: (a) preconditioning the structure by:  
(i) orienting the structure with its exterior orifice disposed vertically upright;  
(ii) attaching a funnel to the exterior orifice;  
(iii) evacuating for a first time the enclosed space to a predetermined vacuum level; and  
(iv) venting the enclosed space to remove the vacuum level; and  
(b) filling the structure by:



- (i) evacuating for a second time the enclosed space to a predetermined vacuum level;
- (ii) depositing a gelatinous substance in the enclosed space; and
- (iii) venting the enclosed space to remove the vacuum level.

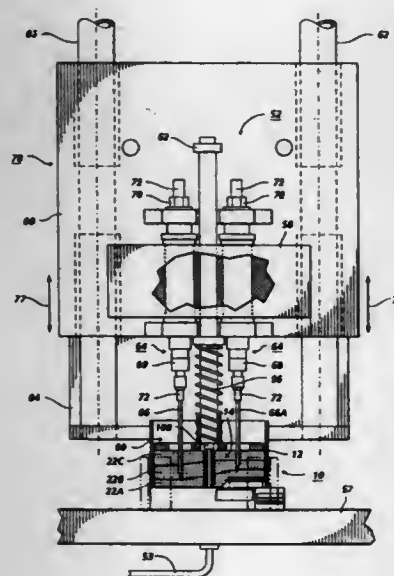
5,479,968

# INK FILLING APPARATUS AND METHOD FOR FILLING INK CARTRIDGES

Ismael R. Sanchez, and Alexander A. Antonelli, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.  
Filed Aug. 16, 1993, Ser. No. 106,727  
Int. Cl.<sup>6</sup> B41J 2/175

U.S. Cl. 141—110

21 Claims



1. An ink filling apparatus for filling ink cartridges with a quantity of ink, the cartridge having a housing defining a chamber for the storage of ink and an ink saturation medium in the chamber for holding the ink, said ink filling apparatus comprising: an ink injecting member to penetrate the ink saturation medium; a compression member to compress the ink saturation medium, said compression member defining an opening having a size larger than said ink ejecting member to permit said ink ejecting member to pass through said compression member; and an actuating member to move said ink injecting member through the opening and to penetrate the ink saturation medium to supply ink thereto.

5,479,969

# APPARATUS FOR DISPENSING SUBSTANCES WHICH ARE BIOLOGICALLY HAZARDOUS

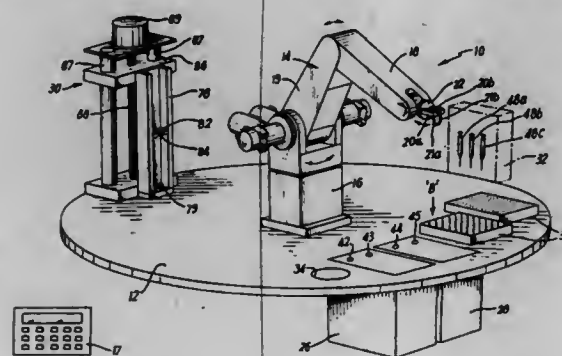
Robert Hardie, Warrington, and Kevin Shaw, Great Sutton, both of, United Kingdom, assignors to British Nuclear Fuels plc, Warrington, United Kingdom  
PCT No. PCT/GB93/01718, § 371 Date Jul. 7, 1994, § 102(e) Date Jul. 7, 1994, PCT Pub. No. WO94/04415, PCT Pub. Date Mar. 3, 1994  
Continuation-in-part of Ser. No. 933,373, Aug. 24, 1992, Pat. No. 5,309,959. This PCT application Aug. 13, 1993, Ser. No. 211,811

Claims priority, application United Kingdom, Aug. 19, 1992, 9217616; Mar. 22, 1993, 9305882  
The portion of the term of this patent subsequent to May 10, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B65B 43/42

U.S. Cl. 141—130

20 Claims



1. A dispensing apparatus comprising a robot device having gripping means presentable to a plurality of stations, each station being adapted to provide an operation in a sequence of operations such as to produce a measured quantity or dose from a supply of a hazardous substance, and one of the stations comprising a multi-syringe receiving and filling station comprising syringe receiving means capable of receiving and holding syringes of different sizes each adapted to contain a said substance, the said station having means for operating each syringe when located at that station.

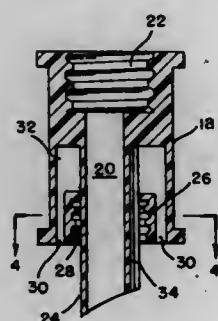
5,479,970  
FUNNEL

Christopher R. Trani, 1906 Radcliff Ave., Bronx, N.Y. 10462  
Filed Nov. 10, 1994, Ser. No. 339,163

Int. Cl.<sup>6</sup> B65B 39/00; B67C 11/00

U.S. Cl. 141—297

4 Claims



1. An air removal adaptor for funnels to remove air from a container being filled with a liquid poured into one of the funnels, comprising: a cylindrical housing having a center bore extending through said cylindrical housing from a first end to a second end thereof;

5,479,972

# EXTENSION TABLE FOR A TABLE SAW

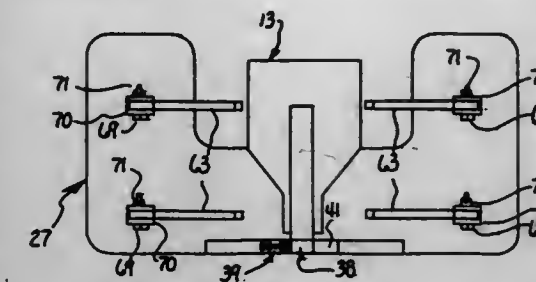
Kent G. Keating, Amherst, and Joseph A. Drago, Williamsville, both of N.Y., assignors to Photo Sculptures, Inc., Amherst, N.Y.

Filed Dec. 9, 1994, Ser. No. 352,635

Int. Cl.<sup>6</sup> B25H 1/00; B27B 3/28

U.S. Cl. 144—287

10 Claims



1. In a table saw system having a table surface, and having a cutting blade having a circular cutting surface moving generally perpendicular to said table surface, and having a support frame, an extension table comprising: an extension work surface having a top and a bottom surface, and having a base portion, and having first and second arms; said base portion having an external edge and an internal edge; said first and second arms each having a first end adjacent an end of said base portion, and a second end extending away therefrom; said extension work surface attached to said table surface at said base portion internal edge; said first and second arms having longitudinal guide channels, and having an exterior edge and an interior edge; each said interior edge being a distance from said table surface forming a first work gap and a second work gap; legs attached to said bottom surface; a guide fence apparatus having a guide fence, and having first and second members and locking means; said guide fence having a top edge and a bottom edge, and having a plurality of openings between said top and bottom edges; said first and second members having first and second ends, said first end adapted to engage said guide channel, said second end adapted to fit through said opening; and said locking means adapted to engage said second end of a member to secure said guide fence to said extension work surface.

5,479,971

# DUAL ACTION TREE CUTTING APPARATUS

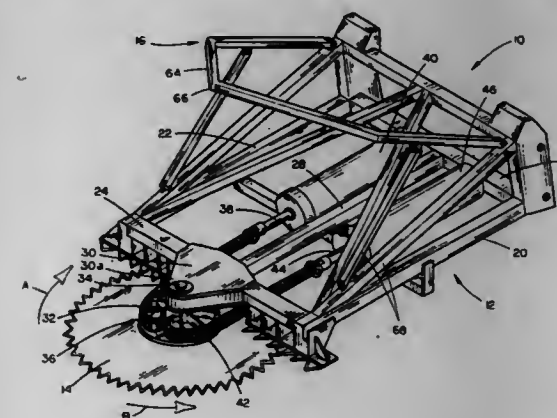
Lorry L. Marshall, P.O. Box 51, Sargent, Nebr. 68874

Filed Aug. 1, 1994, Ser. No. 283,583

Int. Cl.<sup>6</sup> A01G 23/08

U.S. Cl. 144—34 R

3 Claims



1. A dual action tree cutting apparatus, comprising: a support frame having a forward end, rearward end, and longitudinal sides; a single, generally planar blade rotatably mounted on a generally vertical shaft on the forward end of said frame, for rotation about the longitudinal axis of said shaft; said blade having an arcuate cutting edge extending around the entire perimeter thereof, and a centerline mark passing through said shaft dividing the blade into first and second halves, said centerline having forward and rearward ends intersecting the blade perimeter; said blade cutting edge formed on the perimeter at a length from the shaft which increases from the centerline rearward end to the centerline forward end along each blade half; and drive means on said frame operably connected to said blade for selectively rotating said blade clockwise and counterclockwise on said shaft.

5,479,973

# PNEUMATIC TIRES

Hiromichi Ikeda, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 767,355, Sep. 30, 1991, abandoned, which is a continuation of Ser. No. 451,979, Dec. 18, 1989, abandoned. This application Jun. 9, 1992, Ser. No. 896,788  
Claims priority, application Japan, Dec. 29, 1988, 63-331324

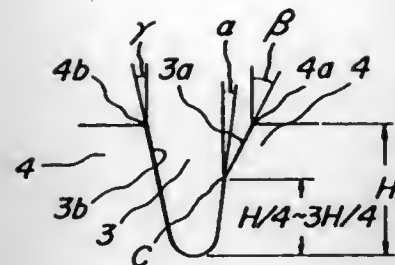
Int. Cl.<sup>6</sup> B60C 11/13

U.S. Cl. 152—209 B

2 Claims

1. A pneumatic radial tire comprising: a tread provided with lugs inclined with respect to an equator of the tire and in opposition to direction of cords constituting an outermost belt layer and having a point-symmetrical tread pattern; a side of a lug edge forming an obtuse intersection angle with respect to each side edge of a tread portion among lug edges of each lug in the circumferential direction of the tire, an intersection angle  $\theta$ , being defined by a standard line segment defined by connecting an intersect point between said lug edge and said tread side edge to an intersect point between said lug edge and a line segment located at a position corresponding to  $1/4$  of a tread width and in parallel with said tread side edge and a meridional line passing said standard line segment, wherein,





$0^\circ < \theta < 35^\circ$ , and a wall of a lug groove located at a side of said standard line segment in a section viewed in a direction perpendicular to an extending direction of said lug groove defining said lug is tapered outward from a middle portion of a depth of said lug groove in the radial direction of the tire so as to enlarge said lug groove and each of said lug grooves is opened at said tread edge; wherein said lug groove wall located at the side of the standard line segment satisfies  $3^\circ < \beta - \alpha < 30^\circ$  when an intersection angle of a portion of the lug groove wall located inward from a point where said tapered lug groove wall begins in the radial direction of the tire with respect to a radial line segment from a center of the tire is  $\beta$  and an intersection angle of a portion of the lug groove wall located outward from the point in the radial direction of the tire with respect to the radial line segment from the center of the tire is  $\alpha$ , and wherein said intersection angles  $\alpha$  and  $\beta$  are within  $0^\circ < \alpha < 20^\circ$  and  $5^\circ < \beta < 45^\circ$ , respectively.

5,479,974

## NOISE-REDUCTION SYSTEM FOR VEHICLE TIRES

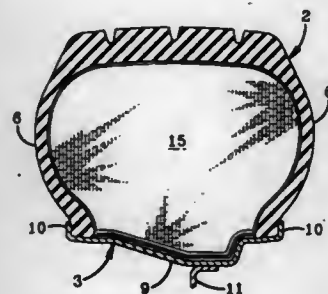
Gary C. Noggle, Doylestown, and Donald E. Andrews, Jr., Mogadore, both of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Continuation-in-part of Ser. No. 323,284, Oct. 14, 1994, abandoned. This application Apr. 10, 1995, Ser. No. 419,684

Int. Cl.<sup>6</sup> B60C 5/00

U.S. Cl. 152-333.1

11 Claims



1. A noise-reduction system for a vehicle wheel assembly comprising:

- an annular rim;
- a tubeless pneumatic tire mounted on the rim and forming an annular inner chamber therebetween; and
- a plurality of baffles, each being formed of a flexible non-self-supporting sheet of material attached at a fixed end within the inner chamber, whereby each of said baffles assumes a collapsed state and rests upon the rim when the wheel assembly is stationary, and assumes an extended position with a free end of the baffle extending into the inner chamber by the influence of centrifugal force when said wheel assembly is rotating to reduce the amount of acoustic resonance within said chamber by changing the characteristics of sound waves created within the inner chamber by the rotating wheel assembly.

5,479,975

## TIRE VALVE STEM

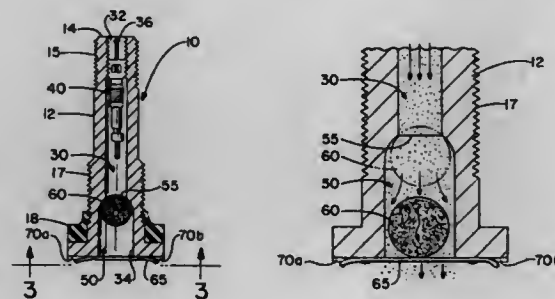
Robert Fogal, Sr., Chambersburg, Pa., and John Hall, Salem, Ohio, assignors to International Marketing, Inc., Chambersburg, Pa.

Filed Nov. 23, 1994, Ser. No. 344,557

Int. Cl.<sup>6</sup> B60C 29/04; F16K 51/00

U.S. Cl. 152-429

16 Claims



1. A tire valve stem comprising:

- an elongated valve body having a first end, a second end, and including a passageway formed therein, said passageway extending from said first end of said valve body to said second end of said valve body and said passageway defining an inlet port at said first end of said valve body for communication with a source of compressed air, and said passageway defining an outlet port at said second end of said valve body for communication with the interior of a tire;
- valve means disposed within said passageway for selectively blocking the flow of air through said passageway;
- a filter chamber, formed in fluid communication with said passageway between said first end and said second end of said passageway, said filter chamber having an upper region and a lower region wherein said upper region defines a filter seat;
- a filter element smaller in cross-sectional size relative to said filter chamber and disposed in an unbiased state within said filter chamber, said filter element capable of forming a selective seal with said filter seat when said filter element is forced adjacent to said filter seat; and
- occlusion means for preventing said filter element from exiting said lower region of said filter chamber.

5,479,976

## THREE-CHAMBER TIRE

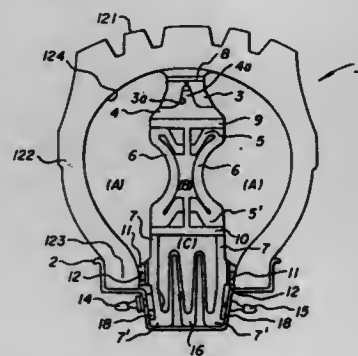
Woon-Je Cho, 821-10 Glen Everest Rd., Scarborough, Ontario, Canada

Filed Dec. 20, 1994, Ser. No. 359,429

Int. Cl.<sup>6</sup> B60C 17/01; 5/22; 17/04

U.S. Cl. 152-518

4 Claims



1. A three-chamber tire, comprising:

- a tire body including a bead mountable to a rim of a wheel and an interior hollow space therewithin to form a service chamber;



5,479,979

## SCREEN DEVICE

Seizo Hayashiguchi, Tsu, Japan, assignor to Hayashiguchi Mfg. Co., Ltd., Mie, Japan

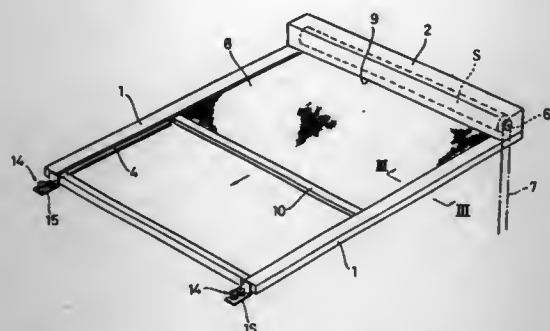
Filed Mar. 14, 1994, Ser. No. 209,629

Claims priority, application Japan, Aug. 5, 1993, 5-194639; Dec. 10, 1993, 5-310428

Int. Cl.<sup>6</sup> A47G 5/02

U.S. Cl. 160-265

1 Claim



1. A screen device comprising: a pair of parallel side frames, said side frames defining guide grooves in sides thereof that oppose each other; a take-up shaft mounted between first ends of said side frames; a screen wound around said take-up shaft; a bar secured to a free end of said screen, said bar having both ends thereof received in said guide grooves, respectively; engaging pieces attached to opposite side edges of said screen, respectively; a pair of rails disposed in the side frames, each of said rails engaging a respective one of said engaging pieces to thereby maintain the side edges of said screen within said side frames, respectively; elastic members interposed between said rails and said side frames and supporting said rails on said side frames so as to tension said screen in the widthwise direction thereof; wires having leading ends attached to said bar; wire take-up drums around which said wires are wrapped, respectively, and constant force springs urging said wire take-up drums to rotate in directions in which said wires tend to be wound around said wire take-up drums, respectively, thereby tensioning said screen in the longitudinal direction thereof.

5,479,980

## METHOD DEVICE FOR FORMING DRILLED NEEDLE BLANKS

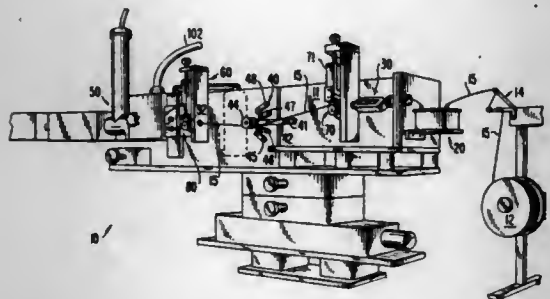
Rolf A. Spingler, Jestetten, Germany, assignor to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 51,456, Apr. 21, 1993, Pat. No. 5,384,945. This application Oct. 18, 1994, Ser. No. 324,548

Int. Cl.<sup>6</sup> B21G 1/00; B23P 23/06

U.S. Cl. 163-5

18 Claims



1. An apparatus for producing a drilled needle blank of predetermined length from a supply of stock wire which comprises: a wire transporter to advance the stock wire and the leading end surface thereof in a distal direction to a drill station;

a drill positioned at the drill station to form a suture attachment portion in said leading end surface of the stock wire; and a wire cutter positioned proximal to the drill station to cut the stock wire at the predetermined length to produce the drilled needle blank.

5,479,981

## METHOD FOR CASTING A HOLLOW CAMSHAFT FOR INTERNAL COMBUSTION ENGINE

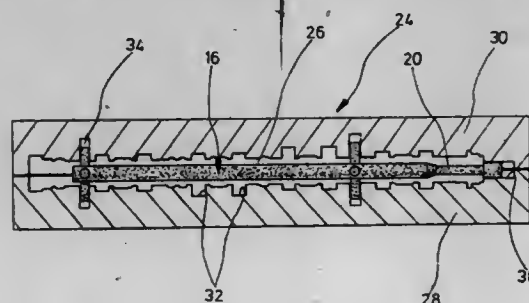
Taeyoung Kim, Kyungsangnam-do, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

Filed Dec. 29, 1993, Ser. No. 175,296

Int. Cl.<sup>6</sup> B22C 9/10; 9/24; B22D 25/00

U.S. Cl. 164-16

8 Claims



1. A method for casting a hollow camshaft for an internal combustion engine comprising the steps of:

providing a core forming mold having first, second and third molding cavities, the second molding cavity located between the first and third cavities and having a diameter less than the first and third cavities;

supplying a molding sand into the cavities of the core forming mold;

hardening the molding sand by an amine gas to obtain a molding core having a first region corresponding to the first cavity, a second region corresponding to the second cavity and a third region corresponding to the third cavity;

providing an iron casting mold having a first cavity of a configuration of the camshaft and a second cavity corresponding to the third region of the molding core;

positioning the molding core within the iron casting mold such that the first and second regions of the molding core are located within the first cavity of the iron casting mold and the third region of the molding core is fitted into the second cavity of the iron casting mold to support the molding core; casting a molten iron within the iron casting mold to entirely enclose the first and second regions of the molding core so as to form a cast product; and

separating the cast product from the iron casting mold after the molten iron has solidified and removing the molding core from the cast product, thereby obtaining the hollow camshaft having a relatively large inner diameter portion formed by the first region of the molding core and a relatively small inner diameter portion formed by the second region of the molding core.

5,479,982

## METHOD FOR THE PRODUCTION OF A STEEL STRIP BY THE CASTING OF A STRAND FOLLOWED BY ROLLING

Erich Höffken; Dieter Krüger, both of Dinslaken; Gisbert Mehring, Hattingen, and Günter Pietzko, Essen, all of Germany, assignors to Thyssen Stahl Aktiengesellschaft, Duisburg, Germany

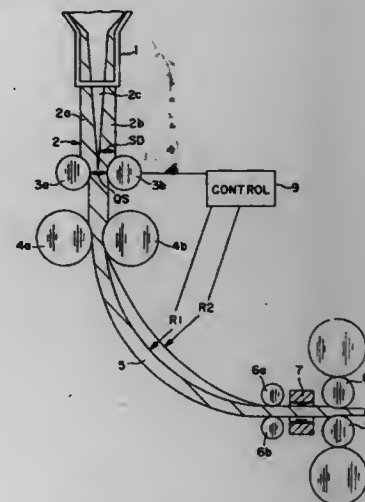
Filed Dec. 8, 1993, Ser. No. 164,008

Claims priority, application Germany, Dec. 23, 1992, 42 43 857.8

Int. Cl.<sup>6</sup> B22D 11/12; 11/16

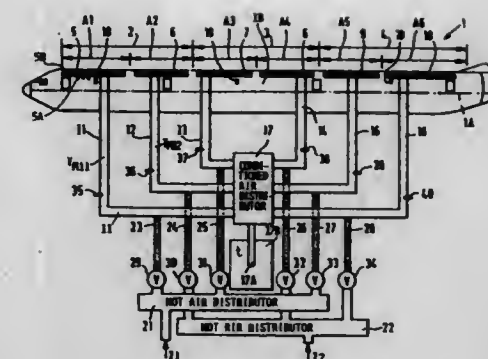
U.S. Cl. 164-454

7 Claims



1. A method for producing a steel strip which has been cast as a strand in a cooled oscillating continuous chill mould, said strand having solidified strand shells and a liquid core as it leaves said continuous chill mould, comprising

squeezing said strand emerging from said continuous chill mould until said strand shells are welded together and said strand has a first cross-sectional thickness, hot rolling said strand to a second cross-sectional thickness, detecting whether there are any deviations in the normal path of travel of the strand following said hot rolling, and correcting said deviations by changing said first cross-sectional thickness during said squeezing step.

CLIMATE CONTROL ZONE CONFIGURATION  
CABIN ZONE LENGTH:

CFB	FWD	MID	AFT
A	AREA 1	AREA 2-3	AREA 4-5-6
B	AREA 1-2	AREA 3-4	AREA 5-6
C	AREA 1	AREA 2-3-4	AREA 5-6
D	AREA 1-2	AREA 3-4-5	AREA 6

control unit (41) connected to receive zone signals from said zone temperature regulating arrangements and connected to receive signals from and provide control signals to said distribution system temperature control arrangements, wherein said second plurality of said air distribution systems is greater than said first plurality of said air conditioning zones, and wherein said control signals to said distribution system temperature control arrangements are determined by said control unit based on said zone signals to achieve a selected alterable configuration of respective ones of said air distribution systems allocated to respective ones of said air conditioning zones.

5,479,984

## REMOVABLE POSITIVE SHUT-OFF PANEL

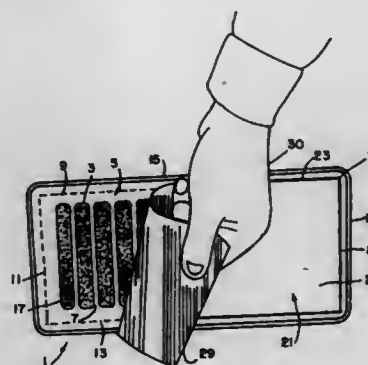
David Easterbrook, and Michael Butorac, both of Toronto, Canada, assignors to Eastorac Corporation, Toronto, Canada

Filed Jun. 7, 1994, Ser. No. 255,714

Int. Cl.<sup>6</sup> F24F 13/08

U.S. Cl. 165-96

7 Claims



1. A heating and cooling register apparatus, comprising a flexible plastic panel made of magnetic material and having a rectangular shape for adhering the panel to the surface of a register and to prevent air from escaping from the register.

5,479,983

## MULTIPLE ZONE AIR CONDITIONING SYSTEM WITH ZONE SIZE ALTERING FEATURE FOR A PASSENGER AIRCRAFT

Heinz Fischer, Henstedt Ulzburg; Wolfgang Mueller, Beckdorf, and Ruediger Schmidt, Fredenbeck, all of Germany, assignors to Deutsche Aerospace Airbus GmbH, Hamburg, Germany

Filed Mar. 16, 1994, Ser. No. 210,059

Claims priority, application Germany, Mar. 17, 1993, 43 08 466.4

Int. Cl.<sup>6</sup> F24F 11/02; B64D 13/06

U.S. Cl. 165-22

17 Claims

1. An air conditioning system for a passenger aircraft having a passenger cabin (1B) that is to be divided into a first plurality of air conditioning zones (2 to 4) and having an air conditioning plant (17B) providing conditioned air and an air tap system (21, 22) providing heated air, said air conditioning system comprising a second plurality of air distribution systems (5 to 10) that are each connected to said air conditioning plant and that each define an associated air introduction section (A1 to A6) of said passenger cabin, a respective zone temperature regulating arrangement associated with each of said air conditioning zones in said passenger cabin, a respective distribution system temperature control arrangement in each of said air distribution systems (5 to 10), and a zone



5,479,985

## HEAT EXCHANGER

Ken Yamamoto, Obu; Michiyasu Yamamoto, Chiryu; Norimasa Baba, Nagoya; Mikio Fukuoka, Bisai; Isao Kuroyanagi, Anjo; Ryouichi Sanada, Kariya, and Eichi Torigoe, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 23, 1993, Ser. No. 35,925

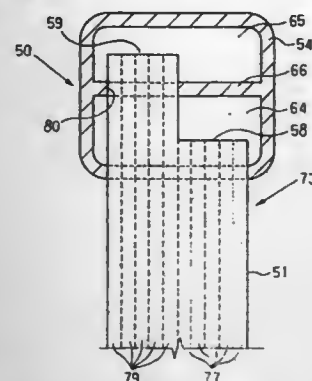
Claims priority, application Japan, Mar. 24, 1992, 4-066351;

Apr. 7, 1992, 4-085735; May 27, 1992, 4-134981

Int. Cl.<sup>6</sup> F28F 9/02

U.S. Cl. 165—176

5 Claims



1. A heat exchanger, comprising:

a plurality of tubes in which a heating medium flows in a longitudinal direction; and

one header having an inlet chamber for flowing the heating medium into said tubes, an outlet chamber for flowing the heating medium from inside of said plurality of tubes, and a partitioning means, fixed to and extending from a first wall of said header to a second wall opposite said first wall, for separating said inlet chamber and said outlet chamber in two stages in the longitudinal direction of said plurality of tubes, with an end of said plurality of tubes inserted through said partitioning means.

5,479,986

## TEMPORARY PLUG SYSTEM

John C. Gano, Carrollton; Jim Longbottom, Whitesboro, both of Tex.; Bill W. Loughridge, Duncan, and Lance E. Brothers, Ninnekah, both of Okla., assignors to Halliburton Company, Houston, Tex.

Filed May 2, 1994, Ser. No. 236,436

Int. Cl.<sup>6</sup> E21B 33/13

U.S. Cl. 166—292

26 Claims

1. An apparatus for temporarily closing a subterranean fluid conducting conduit, comprising:

a tubular housing disposed within the fluid of a subterranean well;

a temporary plug positioned within said housing for blocking fluid passage through said housing;

a mechanical fracturing means for breaking said temporary plug so that fluid flow through said housing is permitted; and

said temporary plug being constructed at least partially from material dissolvable in the well fluid.

5,479,987

## DRILLING AND CEMENTING WITH GLYCOSIDE-BLAST FURNACE SLAG-DRILLING FLUID

Arthur H. Hale, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

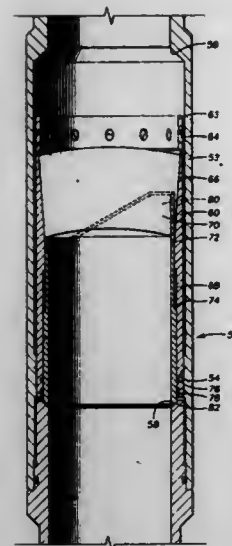
Filed Jul. 27, 1994, Ser. No. 281,385

Int. Cl.<sup>6</sup> E21B 33/14

U.S. Cl. 166—293

10 Claims

1. A method for drilling a well, comprising:



combining constituents comprising water, glycoside, and blast furnace slag to produce a drilling fluid; and thereafter utilizing said drilling fluid in a well drilling operation to form a borehole, thus producing a used drilling fluid.

5,479,988

## MUD CHECK VALVES IN DRILLING APPARATUS (WELLS)

Robert P. Appleton, Glenburn House, Tornaveen, Torphins, Aberdeenshire, AB31 4NY, Scotland, United Kingdom, assignor to Robert Patrick Appleton, Aberdeenshire, United Kingdom

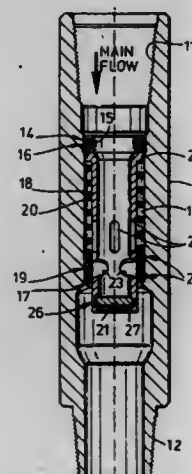
Filed Jul. 18, 1994, Ser. No. 244,481

Claims priority, application United Kingdom, Nov. 30, 1991, 9125551

Int. Cl.<sup>6</sup> E21B 34/06; 21/10; 3/02; F16K 17/196

U.S. Cl. 166—325

9 Claims



1. A check valve for connection with the top end of a drillstring as a mud saver, comprising a tubular valve member (18) axially shiftable within a tubular body (10, 10A) through a sleeve seal (19, 19A) mounted in the body (10, 10A) and which cooperates with ports (23) in the wall of the tubular valve member (18) which ports (23) are disposed adjacent a downstream end of the tubular valve member (18), spring means (20) urging the tubular valve member (18) in the upstream direction and into abutment with a first stop means, and a closure (21, 2A) closing the downstream end of the tubular valve member (18); characterized in that the sleeve seal

(19,19A) is axially shiftable in the body (10, 10A) in an upstream direction away from a second stop means (17), and in that the said spring means (20) urges the sleeve seal (19A) in the downstream direction.

said predetermined tension force being greater than said predetermined compression force.

5,479,990

## RISING CENTRALIZING SPIDER

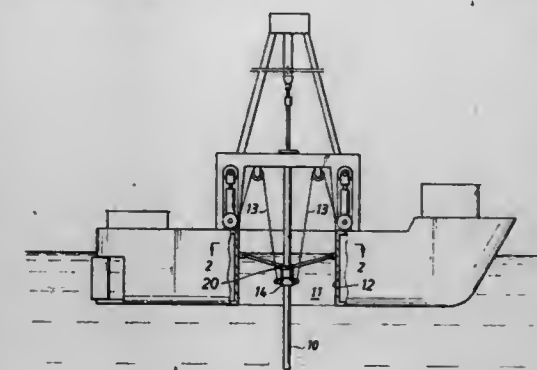
George W. Peppel, Argyle, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 252,143, Jun. 1, 1994, abandoned, which is a continuation of Ser. No. 952,232, Sep. 28, 1992, abandoned. This application May 15, 1995, Ser. No. 440,813

Int. Cl.<sup>6</sup> E21B 19/09

U.S. Cl. 166—350

7 Claims



1. An apparatus for centralizing a riser in an opening in a floating drilling vessel as said riser raises and falls in response to wave and wind forces on the drilling vessel, said apparatus comprising:

a rotary bearing collar adaptable for positioning around the riser and disposed to rotatively follow the vertical movement of the riser; and

a plurality of spider arms, one end of each arm being pivotally mounted on said collar and the other end of each arm being pivotally mounted at a fixed position on the portion of the drilling vessel surrounding the opening.

5,479,991

## REELED TUBING DEPLOYED PACKER WITH CONTROL LINE BYPASS

Clark E. Robison, Plano, and Dennis D. Rood, Carrollton, both of Tex., assignors to Halliburton, Dallas, Tex.

Filed Jan. 10, 1994, Ser. No. 178,703

Int. Cl.<sup>6</sup> E21B 33/12

U.S. Cl. 166—387

31 Claims

1. A packer which serves to seal-off a flow passageway of a first fluid, comprising a bypass passage for allowing a control signal to bypass said packer.

5,479,992

AGRICULTURAL IMPLEMENT CONTROLLER TO COMPENSATE FOR SOIL HARDNESS VARIATION

James H. Bassett, Sycamore, Ill., assignor to Dawn Equipment Company, Sycamore, Ill.

Filed Jul. 27, 1993, Ser. No. 97,978

Int. Cl.<sup>6</sup> A01C 5/00

U.S. Cl. 172—4

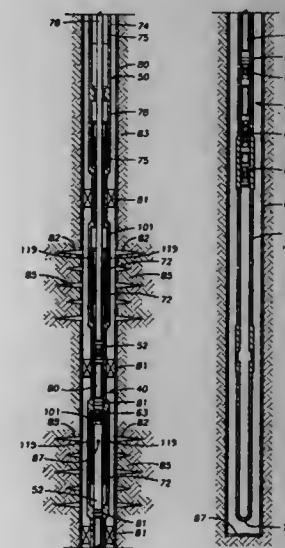
19 Claims

1. An agricultural system comprising:

a frame to be moved relative to subjacent soil;

an implement;

means for mounting the implement to the frame in an operative position so that the implement is vertically movable relative to the frame and engageable with subjacent soil;



1. An apparatus in a borehole comprising:

a housing suspended within the borehole;

a slidable member disposed within said housing;

an expandable member disposed between said housing and said slidable member and having a contracted position at a first location and an expanded position at a second location;

an actuator member suspended within the borehole;

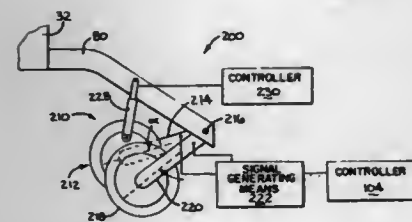
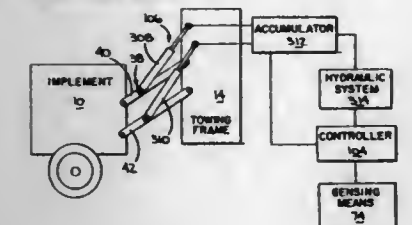
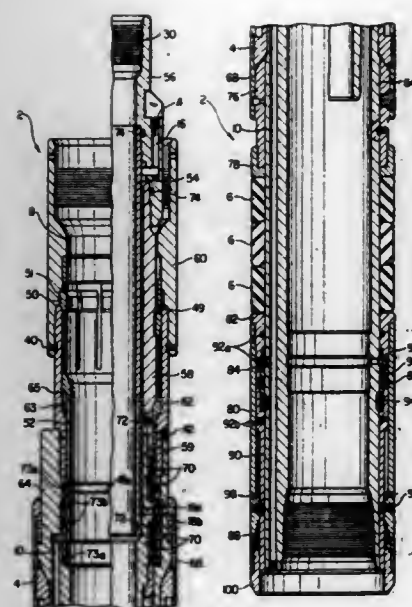
said actuator member engaging said slidable member and adapted to apply a tension force on said slidable member causing said slidable member to engage said expandable member in said contracted position at said first location;

said slidable member adapted to move past said expandable member upon said actuator member applying a predetermined tension force;

said actuator member adapted to engage said slidable member and apply a compression force to move said expandable member to said expanded position at said second location;

said slidable member adapted to move past said expandable member upon said actuator member applying a predetermined compression force; and





first means acting between the frame and implement for exerting a variable vertical force on the implement;  
a sensing element;  
means mounting the sensing element to the frame so that the sensing element engages soil relative to which the frame is moved; and

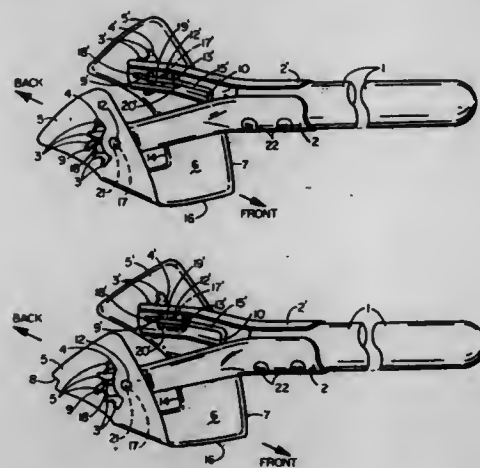
first means associated with the sensing element for generating a) a first signal as the sensing element encounters soil of a first hardness and b) a second signal as the sensing element encounters soil of a second hardness, wherein the sensing element comprises a rotatable element that rolls along soil relative to which the frame is moved, said mounting means for the rotatable element comprising means for mounting the rotatable element to the frame for vertical movement relative to the frame, whereby upon encountering soil of different hardness the relative vertical position of the rotatable element and frame changes, said first means generating said first signal with the rotatable element in a first vertical position relative to the frame and generating said second signal with the rotatable element in a second vertical position relative to the frame, and means responsive to a) said first signal for sending a command to said first means acting between the frame and the implement for producing a first vertical force on said implement and b) said second signal for sending a command to said first means acting between the frame and the implement for producing a second vertical force on said implement that is different from the first vertical force.

**5,479,993**  
**ADJUSTABLE PITCH GARDEN HOE TOOL**  
James A. Bojar, 2524 Pasadena Blvd., Wauwatosa, Wis. 53226  
Continuation-in-part of Ser. No. 192,613, Feb. 7, 1994, which is a continuation-in-part of Ser. No. 16,252, Feb. 11, 1993, Pat. No. 5,285,855. This application Jul. 21, 1994, Ser. No. 278,599

The portion of the term of this patent subsequent to Feb. 11, 2013, has been disclaimed.  
Int. Cl.<sup>6</sup> A01B 1/06; 1/22

U.S. Cl. 172—372

7 Claims



1. As an article of manufacture, an adjustable pitch garden hoe tool comprising:

- a—a handle;
- b—ferrule leg mount segments attached to said handle;
- c—a base blade being mounted on said ferrule leg mount segments by means of fastening pivot pins so that the base blade may pivot on said ferrule leg mount segments;
- d—a compression spring mounted between said ferrule leg mount segments;
- e—said compression spring having three sides including a straight apex segment and two attached legs;
- f—arms attached to the legs of said compression spring which extend into pitch set slots and pitch set stops in vertical sides of said base blade; and
- g—said arms of said compression spring are movable back and forth from and into said pitch set stops to adjust the angle of said base blade with respect to the ferrule leg mount segments;

**5,479,994**  
**METHOD OF ELECTROTHERMOMECHANICAL DRILLING AND DEVICE FOR ITS IMPLEMENTATION**  
Georgy N. Soloviev; Boris B. Kudryashov, and Vladimir S. Litvinenko, all of St. Petersburg, Russian Federation, assignors to Sankt-Peter Burgsky Gorny Institut Imeni G.V. Plekhanova, St. Petersburg, Russian Federation  
PCT No. PCT/RU92/00120, § 371 Date Feb. 1, 1994, § 102(e) Date Feb. 1, 1994, PCT Pub. No. WO93/20323, PCT Pub. Date Oct. 14, 1993

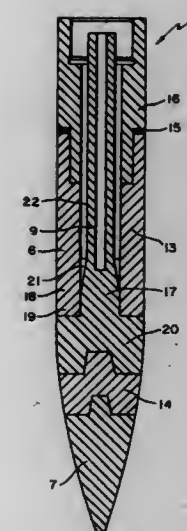
PCT Filed Jun. 17, 1992, Ser. No. 185,910  
Claims priority, application Russian Federation, Apr. 3, 1992, 5036112

Int. Cl.<sup>6</sup> E21B 7/14

U.S. Cl. 175—11

4 Claims

1. A method of high speed drilling a hole in a rocky surface/layer with an electrothermomechanical device employing a drill core having a pair of coaxial drill pipes with a waveguide therebetween, and a magnetron with a simultaneous strengthening of the walls of the hole by means of a thermomechanical penetrator comprising:



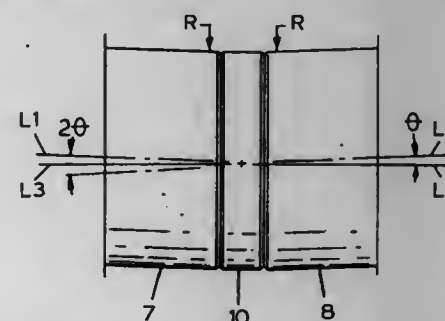
the steps of loosening and softening the rocky layer by drying same at a temperature from about 400 K. to 450 K. after insertion of said drill core into the rocky layer, followed by dehydration of any water in the hole at temperatures of from about 700 K. to about 750 K., and melting and/or burning out of organic matter and impurities and disassociation with a separation into a gaseous phase at a temperature from about 750 K. to about 950 K., with final baking and sintering of weakened walls of the hole at a temperature of from about 1800 K. to about 2300 K.; whereby the weakened walls of the hole are strengthened by thermal transformation of the layer with the magnetron's UHF energy channelled thereto by the waveguide formed by said plurality of drill pipes of said drill core, and wherein crystalline rock interlayers are precluded from forming an obstacle to the further movement and penetration of the drill's penetrator into the rocky surface/layer due to the working temperatures of said penetrator being low as compared to that of the rock melting temperatures.

**5,479,995**  
**ADJUSTABLE ORIENTING SUB**  
Thomas E. Falgout, Sr., 110 Charles Read St., Lafayette, La. 70503

Filed Jul. 5, 1994, Ser. No. 270,760  
Int. Cl.<sup>6</sup> E21B 7/08

U.S. Cl. 175—74

19 Claims



1. An improved adjustable orienting sub for use as a length element in a drill string to adjustably change the relative orientation between drill string portions axially separated by the sub, the sub comprising:

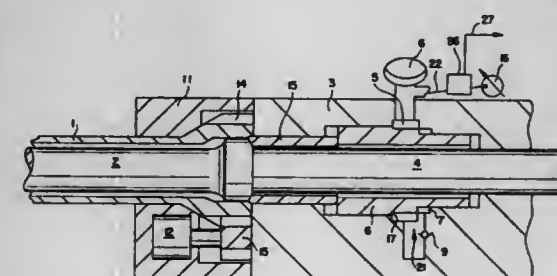
- a) a first member having a first axis, means at a first end for fluid tight attachment to a drill string, a fluid channel extending generally along said first axis and a second end with a generally transverse first annular abutment and a generally coaxial bore, relative to said first axis with straight threads;

- b) a second generally tubular member having a second axis, generally coaxial threads, relative to said second axis on a first end to mate with threads in said first member, and generally coaxial threads, relative to said second axis, on a second end having a pitch different than said threads on said first end;
- c) a third member having a third axis, means at a first end for fluid tight attachment to a drill string, a fluid channel extending generally along said third axis and a second end with a generally transverse annular abutment and a generally coaxial bore, relative to said third axis, with straight threads to mate with said threads on said second end of said second member; the improvement comprising,
- d) an annular ring with a length defined by generally parallel annular abutments, to separate and mate with said abutments on said first two members, with means for mounting on said second member between said threads thereon, secured for sympathetic rotation therewith for axial movement relative thereto, arranged to serve as a rotational position indicator for said second member relative to said first and third members; whereby a change in the rotational relationship between said ring and either said first or said third member produces a change in the rotational relationship between said first and third members.

**5,479,996**  
**ROCK DRILLING DEVICE WITH RECOIL DAMPER**  
Christer Jönsson, and Jörgen Jonasson, both of Saltsjö-Boo, Sweden, assignors to Atlas Copco Rocktech AB, Nacka, Sweden

Filed Oct. 6, 1994, Ser. No. 319,419  
Claims priority, application Sweden, Jan. 15, 1993, 9303398  
Int. Cl.<sup>6</sup> B25D 17/24; E21B 6/00  
U.S. Cl. 175—135

3 Claims



1. Rock drilling device comprising a machine housing (3), a hammer piston (4) movable to-and-fro in the machine housing, a drill string comprising a set of tubes (1) for transferring rotation to a drill bit and a set of rods (2) arranged centrally in the set of tubes for transferring impact energy from said hammer piston to said drill bit, and a recoil damper (21) arranged in the machine housing for damping recoils from said set of rods, characterized by means (22) for sensing a liquid pressure in said recoil damper (21) and actuating means (23, 24) for stopping the supply of pressure liquid to a hammer device in the rock drilling device when the pressure in the recoil damper (21) falls below a predetermined value.



5,479,997

**EARTH-BORING BIT WITH IMPROVED CUTTING STRUCTURE**

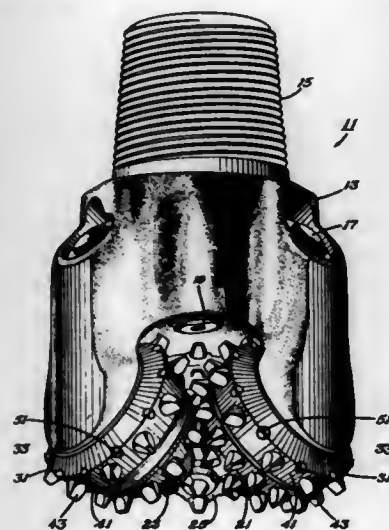
Danny E. Scott, Houston; Robert E. Grimes, Cypress; Matthew R. Isbell, and Rudolf C. O. Pessier, both of Houston, all of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Continuation of Ser. No. 89,318, Jul. 8, 1993, Pat. No. 5,351,768. This application Aug. 19, 1994, Ser. No. 293,228. The portion of the term of this patent subsequent to Oct. 4, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> E21B 10/00

U.S. Cl. 175—374

18 Claims

**1. An earth-boring bit comprising:**

- a bit body;
- at least one cutter rotatably secured to the bit body and having a cutter shell surface including at least a gage surface intersecting a heel surface;
- a plurality of cutting teeth arranged in generally circumferential rows on the cutter, including a heel row of heel teeth on the heel surface of the cutter; and
- a secondary cutting structure including at least one scraper insert secured to the cutter shell surface generally at the intersection of the gage and heel surfaces and between a pair of heel teeth having a pitch therebetween and a projection from the heel surface, the scraper insert including a gage insert surface and a heel insert surface, the gage and heel insert surfaces converging to define a cutting edge for engagement with the sidewall of the borehole and projecting from the heel surface a distance not greater than the lesser of one-half the projection of the heel teeth and 30% of the pitch between the pair of heel teeth.

5,479,998

**ELECTRONIC POWERED MOTOR VEHICLE**

Hiroto Ito, Yokohama, Japan, assignor to Namco Ltd., Tokyo, Japan

Filed Feb. 24, 1994, Ser. No. 201,396

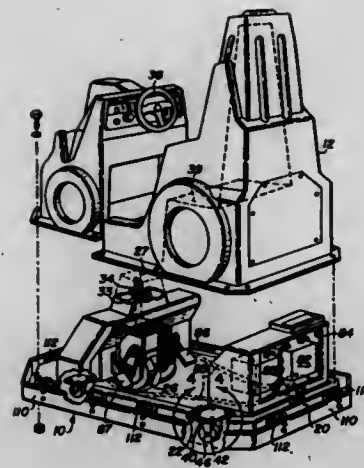
Int. Cl.<sup>6</sup> B62D 61/08; B62M 7/10; B60K 17/30

U.S. Cl. 180—23

8 Claims

**1. A motor vehicle (10) with an on-board propelling power source (30) and operator control (38), comprising:**

- a chassis (20) including an operator seat (39) for receiving a human operator, said chassis (20) having a lower surface (22) establishing a horizontal plane (24);
- a front wheel (26) projecting from said lower surface (22) of said chassis about a front end of said chassis (20), for steering said chassis, said front wheel (26) being rotatable about a first axis of rotation (28) parallel to said horizontal plane (24), and turnable about a first vertical axis of rotation (27) extending



- from said chassis (20) and intersecting said horizontal plane (24) and said first axis of rotation (28);
- a pair of rear wheels (42, 44) mounted on said lower surface (22) of said chassis (20) and spaced laterally relative to each other along a second axis of rotation (46) extending parallel to said horizontal plane (24), each of said rear wheels (42, 44) being rotatable about said second axis of rotation (46) and positioned about a rear end of said chassis (20);
- a steering means (38, 37) extending from said front wheel (26) to a position adjacent to said operator seat (39) to allow a human operator to control the direction of said front wheel (26) from said operator seat (39), the steering means including a control (38) for contact with said human operator and attached to a steering shaft (37);
- a power source means (30) for propelling said front wheel (26), the power source means including an electric motor (80) with means (85) to connect with an electronic battery (82);
- a drive-gear train assembly (30) connecting said electronic motor (80) to said front wheel for translating rotation of said electric motor (80) to rotation of said front wheel (26), the drive-gear train assembly being rotatable about said first vertical axis (27) in response to motion of the steering means;
- an interface gear means interconnecting the drive-gear assembly (30) to said steering shaft (37) including a U-joint (36) attached at one terminal end of said steering shaft (37), said U-joint (36) being connected to a rotatable shaft (33) engaged to the drive-gear train assembly (30), said rotatable shaft (33) being coaxial with said first vertical axis (27); and
- a first and second rear caster (40, 43) mounted on said lower surface (22) of said chassis (20) with each of said first and second rear caster (40, 43) joined to one of the rear wheels (42, 44) for supporting said rear wheels (42, 44) to said chassis (20), said first rear caster (40) being rotatable around a first rear caster axis (50) of rotation extending in a direction intersecting said horizontal plane (24) and said second axis of rotation, and said second rear caster (43) being rotatable around a second rear caster axis of rotation extending parallel to said first rear caster axis of rotation (50), whereby said rear wheels (42, 44) provide support for said chassis (20) and directional guidance.

5,479,999

**POWERED, AUTOMATIC, SELF-TRACKING SYSTEM FOR THE REAR AXLES OF TRUCKS, TRAILERS AND BUSES**

Cataldo Proia, 127 W. Embargo St., Rome, N.Y. 13440

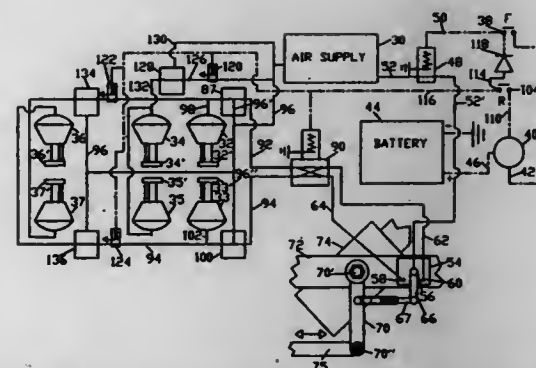
Filed Sep. 19, 1994, Ser. No. 308,434

Int. Cl.<sup>6</sup> B62D 5/26

U.S. Cl. 180—24.01

32 Claims

- 1. Apparatus for making the rear axles of a motor-driven vehicle self-tracking, the motor vehicle having a frame, a steering system, a rear axle suspension system for each of at least one rear axle on



the vehicle, and a drive shaft defining a longitudinal center-line of the vehicle, said apparatus comprising:

- a) motion sensor means for automatically sensing and distinguishing between a right and left hand turn of the vehicle's steering system;
- b) a plurality of axle-pivoting mechanisms positioned adjacent preselected components of said rear axle suspension system; and
- c) means for operably connecting said motion sensor means to said plurality of axle-pivoting mechanisms, said motion sensor means being operable through said connecting means to activate a first group of said axle-pivoting mechanisms to move their respective rear axle suspension system and respective rear axle in a first pivotal direction with respect to said center-line in response to said motion sensor means sensing a right-hand turn of the vehicle, and said motion sensor means being operable through said connecting means to activate a second group of said axle-pivoting mechanisms to move their respective rear axle suspension system and respective rear axle in a second pivotal direction opposite to said first pivotal direction in response to said motion sensor means sensing a left-hand turn of the vehicle.

5,480,000

**ELECTRIC POWER STEERING APPARATUS**

Toshihiko Daido, Nara; Mitsuhiro Nishimoto, Kashihara, and Hirofumi Matsuoka, Kyoto, all of Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

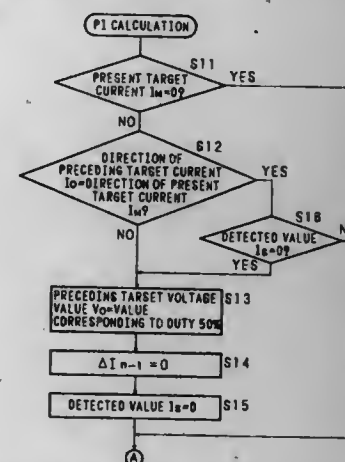
Filed Jul. 25, 1994, Ser. No. 280,015

Claims priority, application Japan, Jul. 30, 1993, 5-190496

Int. Cl.<sup>6</sup> B62D 5/04

U.S. Cl. 180—79.1

7 Claims



- 1. An electric power steering apparatus, in which an electric motor for assisting steering torque of the apparatus is adapted to be driven by a PWM wave, and the duty cycle of the PWM wave is adapted to be under feedback control in time series by detecting the driving current of the electric motor, comprising:

- first means for judging whether predetermined conditions are fulfilled or not, and
- second means for setting a target voltage of the electric motor for the feedback control to a voltage value decided in reference to the minimum duty cycle of the PWM wave for driving the electric motor when the predetermined conditions are fulfilled by said first means.

5,480,001

**FRAME STRUCTURE FOR A MOTORCYCLE**

Ikuo Hara, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

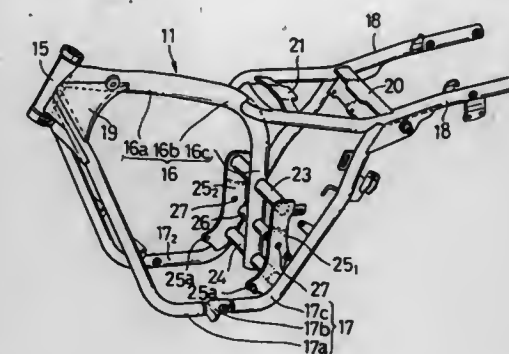
Filed Oct. 19, 1994, Ser. No. 325,588

Claims priority, application Japan, Jan. 19, 1993, 5-261326

Int. Cl.<sup>6</sup> B62K 11/02; 25/20

U.S. Cl. 180—227

20 Claims

**1. A frame structure for a motorcycle having an engine mounted thereon comprising:**

- a body frame having a front end provided with a head pipe for supporting a front suspension;
- a swing arm for supporting a rear wheel being pivotably supported at a front end of the swing arm to a rear portion of said body frame at a position behind said engine;
- said body frame includes a single main pipe having a rearwardly extending portion located over said engine and extending rearwardly from said head pipe, a bent portion extending from a rear end of said rearwardly extending portion, and a downwardly extending portion located behind said engine and extending downwardly from said bent portion;
- a pair of laterally extending cross pipes being vertically spaced from each other are connected at an intermediate portion of each cross pipe to said downwardly extending portion of said main pipe;
- a pair of supporting plates positioned to be disposed adjacent to said downwardly extending portion of said main pipe and each said supporting plate being connected to at least one of a first end and a second end of each of said cross pipes; and
- said front end of said swing arm being pivotably supported to a pivot shaft located between said cross pipes and extending between said supporting plates.



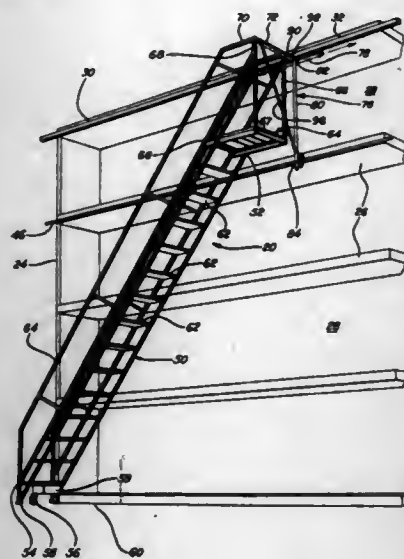
5,480,002

## DUAL TRACK MOUNTED LADDER SYSTEM

James F. Kerr, 2705 E. Hall Rd., Crosswell, Mich. 48422, assignor to James F. Kerr, Crosswell, Mich.  
Continuation-in-part of Ser. No. 298,531, Aug. 29, 1994, Pat. No. 5,413,191, which is a continuation of Ser. No. 204,105, Mar. 1, 1994, abandoned, which is a continuation of Ser. No. 63,409, May 18, 1993, abandoned. This application Dec. 13, 1994, Ser. No. 354,603  
Int. Cl.<sup>6</sup> E06C 7/00

U.S. Cl. 182—38

20 Claims



1. A ladder system for positioning a ladder relative to a storage rack having a front face and located at one side of an aisle, a longitudinal direction being defined as extending parallel to the front face of the storage rack and a lateral direction being defined as extending perpendicular to the front face of the storage rack, the ladder system comprising:

- a ladder having upper and lower ends, with the lower end being engageable with a horizontal support track;
- an upper track located near the front face of the storage rack;
- a lower track vertically spaced from said upper track and located near the front face of the storage rack;
- a cantilever mounted carriage assembly having a horizontal arm extending parallel to said upper track, a vertical arm connected to and depending from said horizontal arm and a horizontal ladder support track connected to said horizontal and vertical arms and extending in a lateral direction;
- said horizontal arm being provided with longitudinally spaced upper rollers engageable with said upper track and said vertical arm being provided with lower rollers engageable with said lower track, said upper and lower rollers movable along said tracks as said carriage assembly and said ladder are moved in the longitudinal direction parallel to the front face of the storage rack; and
- the upper end of said ladder being provided with laterally spaced rollers engageable with said horizontal ladder support track to permit said ladder to move along said support track in a lateral direction perpendicular to the front face of the storage rack.

5,480,003

## PASSIVE LUBRICATION DELIVERY SYSTEM AND INTEGRAL BEARING HOUSING

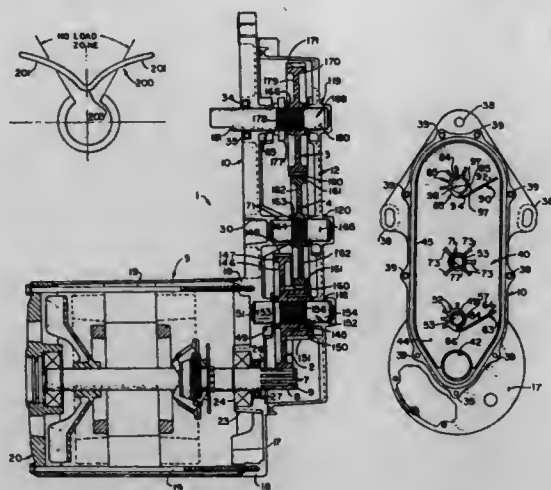
Jason J. Hill, Manchester, and Joseph L. Tevaarwerk, Clayton, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Sep. 9, 1994, Ser. No. 303,365

Int. Cl.<sup>6</sup> F01M 9/00

U.S. Cl. 184—6.12

24 Claims



1. In a bearing lubrication system in which a shaft is journaled for rotation in a bearing, and a gear is mounted on said shaft, said bearing being loaded primarily through less than its full circumference, leaving an unloaded reach of said bearing, the improvement comprising said bearing being interrupted through a substantial arc in at least a portion of said unloaded reach to define a gap in said bearing through which lubricant travels, and structural means, adjacent a radial side of said gear and fixed against movement with respect to said bearing, for channeling lubricant into said gap.

9. In a bearing lubrication system in which shafts are journaled for rotation in bearings, each of said bearings being loaded primarily through less than its full circumference, leaving an unloaded reach of said bearing, the improvement comprising said bearing being interrupted through a substantial arc in at least a portion of said unloaded reach to define a gap in said bearing through which lubricant travels, and fixed structural means for channeling lubricant into said gap, said bearing lubrication system comprising a gear box with a plurality of gears, mounted on said shafts and said shafts being parallel to but spaced vertically from one another, and said structural means comprising scoop means adjacent at least one radial side of every gear.

5,480,004

## CROSSPORT AND SINGLING MANIFOLD FOR A SERIES PROGRESSIVE DIVIDER VALVE

John P. Snow, Sagamore Hills, Ohio, assignor to Lubriquip, Inc., Cleveland, Ohio

Filed Nov. 9, 1994, Ser. No. 337,539

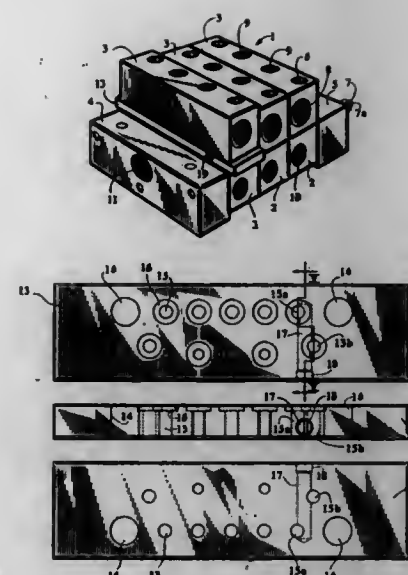
Int. Cl.<sup>6</sup> F16N 27/00

U.S. Cl. 184—7.4

23 Claims

1. In a series progressive divider valve assembly having a fluid input, a plurality of fluid outputs, and a plurality of adjacent valve units, each valve unit having a plurality of non-communicating passages therein extending between a lower region of the valve unit and an upper region of the valve unit, at least some of said passages establishing a first complete fluid flow path between said fluid input and a fluid output, the improvement comprising:

- a manifold disposed between said lower region and said upper region of at least one valve unit, said manifold having a plurality of bores therein respectively disposed in registry with said passages in said at least one valve unit, and having at least one further bore therein extending between at least



two of said bores and placing said at least two bores and the passages respectively in registry therewith in fluid communication and establishing a second complete flow path between said fluid input and a different fluid output.

17. A method for producing a selected flow pattern in a series progressive divider valve assembly comprising the steps of:

- assembling a plurality of valve units in succession adjacent each other, each valve unit having a fluid inlet port and at least one fluid outlet port and a plurality of non-communicating passages therein extending between a lower region of the valve unit and an upper region of the valve unit establishing a first, complete fluid flow path between said inlet port and an outlet port;
- providing a manifold having a plurality of bores therein;
- disposing said manifold between said lower region and said upper region of at least one valve unit so that said bores in said manifold are respectively disposed in registry with said passages in said at least one valve unit; and
- providing at least one further bore in said manifold extending between at least two of said bores in said manifold for placing said at least two bores and the passages in said at least one valve unit respectively in registry therewith in fluid communication and establishing a second complete fluid flow path between said inlet port and a different outlet port.

5,480,005

## ELEVATOR SWING CAR ASSIGNMENT TO PLURAL GROUPS

Joseph Bittar, Avon, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Continuation-in-part of Ser. No. 887,946, May 26, 1992, Pat. No. 5,300,739. This application Jan. 10, 1994, Ser. No. 179,459

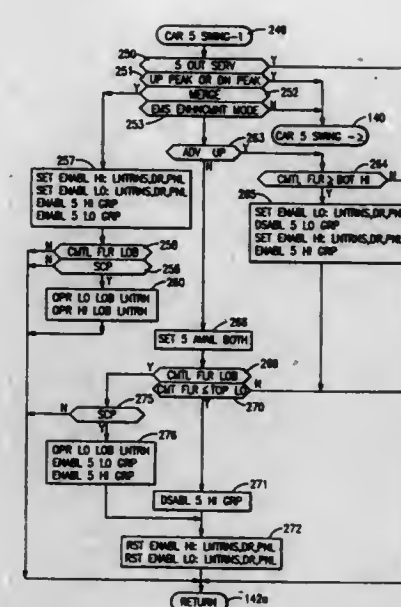
Int. Cl.<sup>6</sup> B66B 1/20; 1/18

U.S. Cl. 187—383

62 Claims

1. A multi-elevator system, comprising:

- a plurality of elevators arranged to service at least a low rise group of floors and a high rise group of floors, responding to up hall calls and down hall calls assigned thereto, respectively, by a low group control and a high group control, all of said elevators having service corridors on the same lobby floor for access to the relevant floors;
- at least one of said elevators comprising a swing car disposed within a hoistway having access to both of said groups of floors, having first doors, hall lanterns and car call buttons for servicing said low rise group of floors and having second doors, hall lanterns and car call buttons for servicing said high rise group of floors; and



a controller for providing a swing car assignment signal indicative of the selected group of floors to which the next swing car assignment should be made and in response thereto operating the lobby hall lantern and enabling the remaining hall lanterns, doors and car call buttons of the selected group of floors, enabling response of said swing car to hall calls in said selected group of floors assigned thereto by the corresponding group control identified by said swing car assignment signal, and disabling response of said car to hall calls in the other of said groups of floors, and dispatching said swing car for service to said selected group of floors;

characterized by the improvement comprising: said controller providing a traffic signal indicative of at least one characteristic of the traffic in said multi-elevator system, said controller, in response to said traffic signal indicating a particular characteristic of the level of traffic in said system, when said swing car is traveling in said system within said selected group of floors and enabled for response to hall calls in said selected group of floors assigned thereto by said corresponding group control, enabling said swing car for response to hall calls in the other one of said groups of floors assigned thereto by the other one of said group controls; said controller, in response to said next car assignment signal, disabling the hall call lanterns, doors, and car call buttons of said swing car for the other of said group of floors; and said controller determining if the committable floor of said swing car is a floor in said other group of floors contiguous to said selected group of floors and in response to said committable floor being said contiguous floor in said other group, enabling the hall lanterns, doors and car call buttons of said swing car for said other group of floors.

5,480,006

## ELEVATOR DOWNPEAK SECTORING

Nader Kameli, Cromwell, and James M. Collins, Farmington, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Continuation of Ser. No. 92,676, Jul. 16, 1993, abandoned. This application Aug. 8, 1994, Ser. No. 291,529

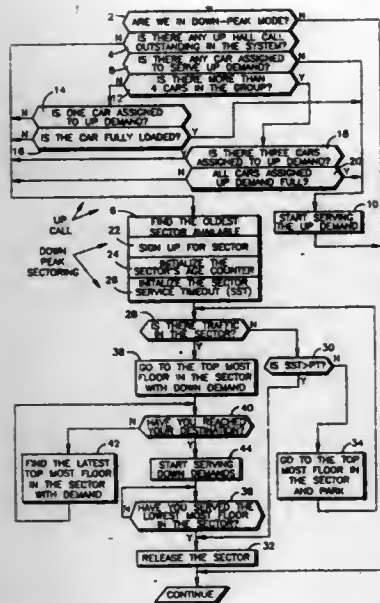
Int. Cl.<sup>6</sup> B66B 1/20

U.S. Cl. 187—383

5 Claims

- 1. A method of dispatching a plurality of elevator cars operating as a group in a building during a down peak mode of operation, comprising: assigning floors of said building to sectors of contiguous floors; and





assigning one of said cars to one of said sectors for responding to down hall calls in said sector; characterized by the improvement comprising: upon assigning said car to said one sector, initiating an age counter for said one sector; and said assigning step comprises assigning said car to the one of said sectors, that does not have a car assigned to it, for which the time since it last had a car assigned to it is the longest, as indicated by said age counter.

5,480,007

## DISC BRAKE ROTOR

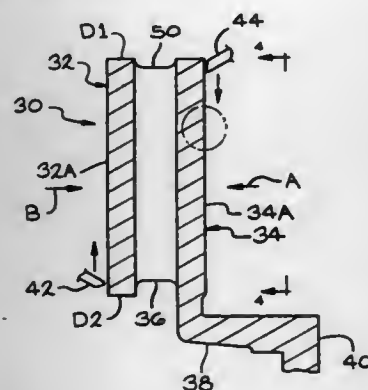
Dean J. Hartford, Wayne, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Continuation of Ser. No. 91,843, Jul. 7, 1993, abandoned. This application Mar. 27, 1995, Ser. No. 411,057

Int. Cl.<sup>6</sup> B60T 1/06

U.S. Cl. 188—18 A

4 Claims



1. A method for machining a disc brake rotor adapted for use in a disc brake assembly comprising the steps of:

- providing a disc brake rotor having a friction disc portion defining first and second generally parallel friction faces adapted to be frictionally engaged by a pair of brake pads of the disc brake assembly, each of said friction faces extending from an inner diameter to an outer diameter;
- mounting the disc brake rotor on a cutting machine having a cutting tool; and
- operating the cutting machine to machine a groove in said first friction face by moving the cutting tool from the inner

diameter of said first friction face to the outer diameter of said first friction face; and  
(d) operating the cutting machine to machine a groove in said second friction face by moving the cutting tool from the outer diameter of said second friction face to the inner diameter of said second friction face.

5,480,008

## BRAKE FRICTION PAD ASSEMBLY

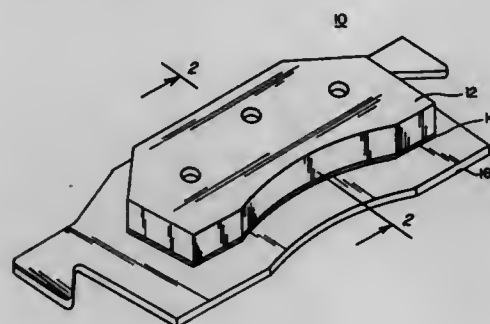
Alan R. Hummel, Winchester, and John P. Kwolek, Cross Junction, both of Va., assignors to Wagner Electric Corporation, Houston, Tex.

Filed Mar. 23, 1994, Ser. No. 216,356

Int. Cl.<sup>6</sup> F16D 65/097; 69/04

U.S. Cl. 188—73.37

3 Claims



1. A brake friction pad assembly comprised of:  
a metallic backing plate element;  
a molded friction pad element having a mating surface;  
a uniformly thin elastomeric adhesive film thermally cured and adhered to said molded friction pad element but not to said backing plate element; and  
mechanical fastener means joining said molded friction pad element to said metallic backing plate element with said thin elastomeric film in an intermediate position and contacting said mechanical backing plate.

5,480,009

## BRAKE SYSTEM WITH TWO INDEPENDENT MECHANICAL BRAKES

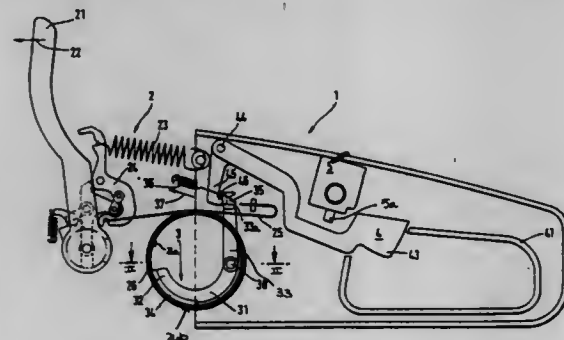
Dieter Wieland; Herbert Armbruster, both of Remseck, and Gerhard Meyer, Ludwigsburg, all of, Germany, assignors to Andreas Stihl, Waiblingen, Germany

Filed Sep. 9, 1994, Ser. No. 303,375

Int. Cl.<sup>6</sup> F16D 51/00; B23D 57/02

U.S. Cl. 188—77 W

11 Claims



1. A device for braking an electric drive motor of a hand-held working tool, said device comprising:  
a safety brake for an immediate stopping of the working tool;

an independent mechanical coasting brake for coasting the working tool to a stop after switching off the drive motor; said mechanical coasting brake acting on a rotational part connected to the drive motor;  
said mechanical coasting brake being activated when a switch element for activating the drive motor is released;  
wherein said rotational part is a component of said safety brake and is a brake drum; and  
wherein said safety brake acts on one side of said brake drum and said mechanical coasting brake acts on the other side of said brake drum.

5,480,010

## DRUM BRAKE ADJUSTER

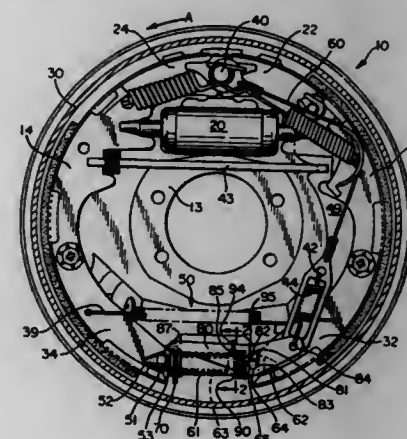
Donald D. Johannesen, South Bend, Ind., assignor to AlliedSignal Inc., Morristown, N.J.

Filed Oct. 27, 1994, Ser. No. 330,298

Int. Cl.<sup>6</sup> F16D 65/56

U.S. Cl. 188—79.54

5 Claims



1. A drum brake with an adjuster mechanism, the drum brake comprising a pair of brake shoes having between one pair of opposed ends said adjuster mechanism, the adjuster mechanism comprising a threaded shaft member engaging non-rotatably one of said ends of the drum brake shoes, a socket member engaging non-rotatably the other end of the other brake shoe, a starwheel received threadedly on said shaft and the threaded shaft extending into the socket member such that the starwheel engages an end of said socket member, the socket member having a projection extending from one side thereof and said projection comprising a button having an enlarged head and a reduced diameter area, a lever member mounted rotatably on said button and including an end part engaging said starwheel and an opposite end extending away from the end part, resilient means comprising a torsion spring mounted around said socket member and having one end extending into engagement with said lever member and another end fixedly engaging said button, and connection means comprising a cable attached at a first end to an anchor pin of the drum brake and a second end which includes a resilient member connected with the opposite end of the lever member, such that braking movement of said brake shoes can cause the connection means to pivot said lever about the button so said end part of the lever member causes rotation of said starwheel, which extends longitudinally said threaded shaft relative to the socket member and effects adjustment of the brake shoes relative to a drum of the drum brake.

5,480,011

## HYDRAULIC DAMPER

Osamu Nagai; Kunihide Okamoto, both of Shizuoka, and Kaoru Yamamoto, Kanagawa, all of, Japan, assignors to Showa Corp., and Honda Giken Kogyo Kabushiki Kaisha, both of, Japan

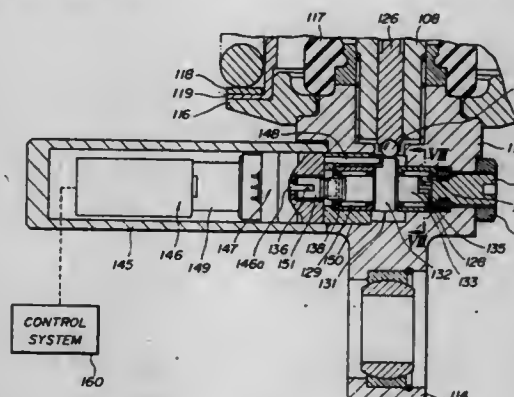
Filed Sep. 29, 1993, Ser. No. 128,987

Claims priority, application Japan, Sep. 29, 1992, 4-073582 U; Sep. 29, 1992, 4-073583 U

Int. Cl.<sup>6</sup> F16F 9/46

U.S. Cl. 188—299

10 Claims



1. A hydraulic damper comprising:  
a first oil chamber;  
a second oil chamber;  
a communication mechanism defining a communication oil passage, said first and second oil chambers communicating with each other through said communication oil passage; and  
a damping force adjusting mechanism for varying a cross-sectional area of said communication oil passage to adjust damping force;  
said damping force adjusting mechanism comprising:  
an adjusting rod having an end disposed in a portion of said communication oil passage, said adjusting rod being movable toward and away from said communication oil passage to vary said cross-sectional area of said communication oil passage;  
an eccentric cam rotatably disposed in engagement with an opposite end of said adjusting rod, said eccentric cam being a constant-velocity cam with a change in its eccentricity per unit angle of rotation thereof being constant;  
a rotary actuator for rotating said eccentric cam to move said adjusting rod toward and away from said communication oil passage to adjust the damping force.

5,480,012

## NOIS AND VIBRATION REDUCTION IN A TORQUE CONVERTER CLUTCH ASSEMBLY

Ann T. Polubinski, Canton, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 3, 1994, Ser. No. 334,174

Int. Cl.<sup>6</sup> F16H 45/02; F16D 3/70

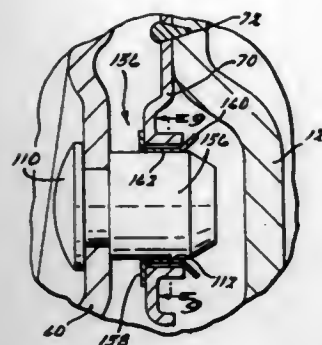
U.S. Cl. 192—3.29

12 Claims

1. In a torque converter for an automatic transmission, the torque converter having a longitudinal axis of rotation, an assembly for drivably connecting an impeller cover, and bypass clutch, comprising:

- a drive plate fixed to the impeller cover having a first hole therein directed along the axis;
- the bypass clutch having a piston plate located near the drive plate, supported for axial and rotational displacement relative to the drive plate, having a second hole substantially aligned with the first hole;
- a pin fixed to the piston plate having a shank extending into the second hole, a body extending from the piston plate into the first hole; and





a spring clip located in an annular space between the pin body and drive plate at the first hole, contacting the pin body and drive plate and resiliently drivably connecting the pin body and drive plate.

5,480,013

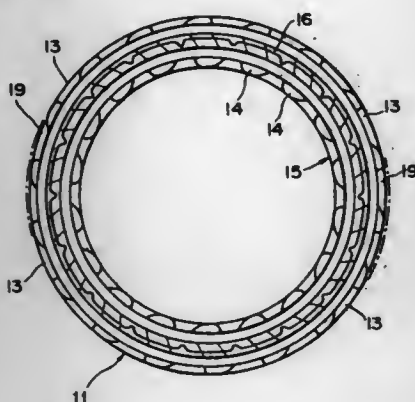
# ONE-WAY CLUTCH INCORPORATING A RETAINER HAVING PAIRED SYMMETRIC ENGAGEMENT PORTIONS

Satoshi Fujiwara, Kashiwara, and Takaaki Ikeda, Nara, both of Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan  
Filed Jul. 13, 1994, Ser. No. 274,445

Claims priority, application Japan, Aug. 31, 1993, 5-216385  
Int. Cl.<sup>6</sup> F16D 41/07

U.S. Cl. 192-45.1

3 Claims



1. A one-way clutch for use between an inner ring and an outer ring disposed about said inner ring, said one-way clutch comprising:

- an annular retainer adapted to be mounted between the inner ring and the outer ring, said annular retainer including a cylindrical part and a generally annular flange extending radially outwardly from one axial end of said cylindrical part;
- a plurality of engagement members disposed between the inner ring and the outer ring and spaced apart at equal intervals in a circumferential direction of said annular retainer, said cylindrical part having pockets formed therein, and said engagement members being respectively received in said pockets of said cylindrical part of said annular retainer;
- an annular spring operably engaged with said engagement members and urging said engaging members to rotate in a given direction which will cause said engagement members to engage with the inner and outer rings when said annular retainer is mounted between the inner ring and the outer ring; wherein said annular retainer further includes at least one pair of outer ring-engagement portions adapted to engage with an inner surface of the outer ring to fix said annular retainer to the outer ring, said outer ring-engagement portions being disposed at symmetrical positions of said annular retainer with respect to a central axis of said annular retainer;

wherein each of said outer ring-engagement portions constitutes a portion of said cylindrical part and a portion of said flange between a pair of said pockets and between a pair of press-cut slits formed in said annular retainer so as to extend radially outwardly from said pair of pockets, respectively, and through said flange to a radial outside of said annular retainer; and wherein each of said outer ring-engagement portions has an outer radius larger than that of a portion of said flange other than said engagement portions.

5,480,014

# DOUBLE CLUTCH ARRANGEMENT

John R. Barton, Coventry, and Christian J. Brace, Westbury, both of England, assignors to Massey Ferguson Manufacturing Limited, England

PCT No. PCT/GB93/00427, § 371 Date Nov. 8, 1993, § 102(e) Date Nov. 8, 1993, PCT Pub. No. WO93/18314, PCT Pub. Date Sep. 16, 1993

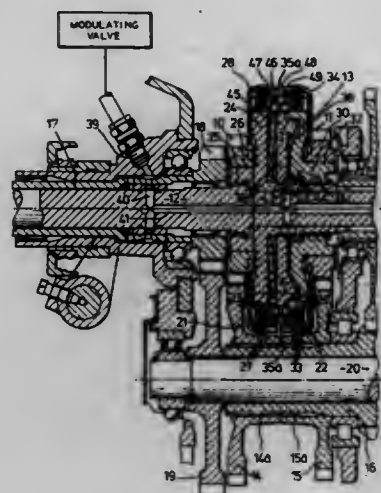
PCT Filed Mar. 2, 1993, Ser. No. 146,149

Claims priority, application United Kingdom, Mar. 10, 1992, 9205163

U.S. Cl. 192-48.3

Int. Cl.<sup>6</sup> F16D 21/00

20 Claims



1. A double clutch structure for connecting an input shaft to an output shaft while always maintaining a predetermined driving torque therebetween, said double clutch structure comprising:

- a first clutch adapted to selectively connect the input shaft to the output shaft;
- a second clutch adapted to selectively connect the input shaft to the output shaft;
- an engaging means movable in a first direction to engage said first clutch and disengage said second clutch and in a second direction to disengage said first clutch and engage said second clutch;
- a first resilient means reacting between said engagement means and said first clutch for applying a clutch engaging pressure to said first clutch when said engagement means is moved in said first direction; and
- a second resilient means reacting between said engagement means and said second clutch for applying a clutch engaging pressure to said second clutch when said engagement means is moved in said second direction;
- said first and second resilient means always applying a predetermined minimum clutch engaging pressure to at least one of said first and second clutches such that a predetermined driving torque is always maintained between the input shaft and the output shaft.

5,480,015

# DELAY RESTORING TYPE LIMIT-TORQUE COUPLING MECHANISM

Tai-Her Yang, 5-1 Taipin St. Si-Hn Town, Dzan-Hwa, Taiwan, Prov. of China

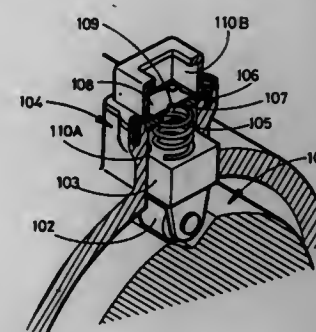
Division of Ser. No. 67,965, May 27, 1993. This application

Oct. 3, 1994, Ser. No. 317,589

Int. Cl.<sup>6</sup> F16D 7/06

U.S. Cl. 192-56.1

7 Claims



1. A limit torque mechanism comprising:

- a) a first relative motion body defining an indentation in a surface thereof;
- b) a second relative motion body located adjacent to the first relative motion body, the second relative motion body defining: an air chamber having a first end opening towards the first relative motion body and a second end defining an air hole;
- c) a forced reversing mechanism comprising: an element configured to engage the indentation on the first relative motion body; and a piston attached to the element and slidably located in the air chamber;
- d) first biasing means acting on the piston to exert a static pressure on the piston so as to urge the element into the indentation in the first relative motion body; and
- e) damping means located on the second relative motion body so as to act on the piston to dampen return movement of the piston when the element has been disengaged from the indentation.

5,480,016

# ARRANGEMENT FOR FASTENING A CLUTCH TO A CRANKSHAFT

Walter Kurz, Durach; Wolfgang Baier, Obbach, and Uwe Melnig, Weinheim-Steinklingen, all of Germany, assignors to Fichtel & Sachs AG, Germany

Filed Mar. 21, 1994, Ser. No. 215,322

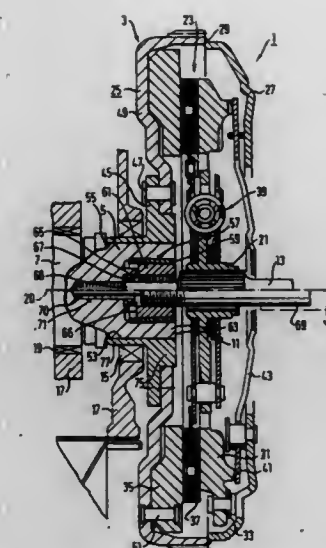
Claims priority, application Germany, Mar. 26, 1993, 43 09 871.1

Int. Cl.<sup>6</sup> B60K 17/02; F16D 13/60

U.S. Cl. 192-70.16

45 Claims

1. An arrangement comprising a crankshaft of an internal combustion engine of a motor vehicle, and a friction clutch having an input component fastened to an output end of the crankshaft and including as an output component a clutch disc having a hub axially aligned with the crankshaft and the output component being combined into an assembled unit with the input component before the input component is fastened to the output end of the crankshaft, wherein for fastening the input component of the clutch to the output end of the crankshaft a force-fit coupling is provided having on the input component and the output end associated joining faces extending substantially axially, and wherein tool-application surfaces are provided on the force-fit coupling, by which the joining faces, upon assembly, can be tightened against one another in a radial-force fit, the force-fit coupling being arranged so that it radially tightens the joining faces upon application of forces acting axially on the tool-application surfaces, the tool-application surfaces being accessible axially through the hub of the clutch disc



and/or the hub of the clutch disc being capable of engaging the tool-application surfaces.

5,480,017

# ANNULAR HYDRAULIC CLUTCH RELEASE CYLINDER DEVICE

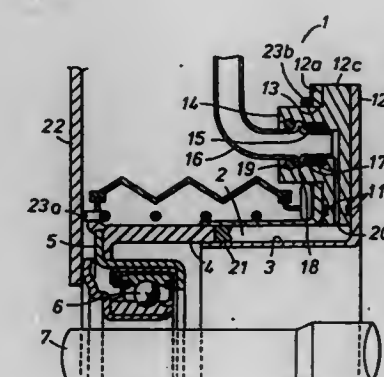
Norihisa Uenohara, and Hiroshi Uehara, both of Osaka, Japan, assignors to Exedy Corporation, Osaka, Japan  
Filed Apr. 15, 1994, Ser. No. 227,924

Claims priority, application Japan, Sep. 14, 1993, 5-252529; Sep. 14, 1993, 5-252530; Sep. 14, 1993, 5-252531

Int. Cl.<sup>6</sup> F16D 23/14; 25/06

U.S. Cl. 192-98

13 Claims



1. A clutch release cylinder device for use with a clutch, comprising:

- an annular cylinder adapted to be aligned coaxially with an axial center line of a clutch device, said release cylinder device defining an annular recess having an open end facing the clutch device and a closed bottom end facing away from the clutch device;
- an annular piston slidably received in said annular recess; and
- an annular clutch release bearing assembly including a release bearing a bearing seat fixedly secured to an external axial end of said annular piston and supporting said release bearing, and a pressure flange supported by said release bearing and adapted to engage a central part of a diaphragm spring means of the clutch device;
- said annular cylinder comprising a pair of cylinder members each formed of formed sheet metal, and provided with a flange and a tubular portion, said tubular portion of one of said cylinder members being larger than that of the tubular portion of the other cylinder member, said annular recess



being defined between said tubular portions which are coaxially nested with each other; and wherein said annular cylinder further comprises an annular spacer member interposed between said flanges of said cylinder members, a passage leading to said bottom end of said annular recess being passed through said space member.

5,480,018

# HOPPERS FOR MACHINES WITH HOPPERS AND PROCESSING METHOD THEREOF

Beji Sasaki, Tokyo, Japan, assignor to Friends of freesia Co., Ltd., Tokyo, Japan

PCT No. PCT/JP93/01172, § 371 Date Apr. 29, 1994, § 102(e) Date Apr. 29, 1994, PCT Pub. No. WO94/05477, PCT Pub. Date Mar. 17, 1994

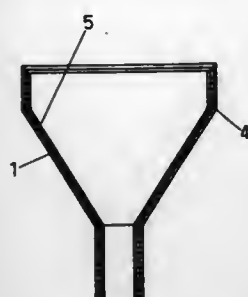
PCT Filed Aug. 23, 1993, Ser. No. 232,208

Claims priority, application Japan, Sep. 7, 1992, 4-279106

Int. Cl.<sup>6</sup> B65G 11/00

U.S. Cl. 193—2 R

11 Claims



1. A main hopper comprising a plurality of thin and rigid membrane hoppers, said membrane hoppers being of a frusto-conical shape and having an upper opening of large diameter and a lower opening of small diameter, said membrane hoppers being laminated to one another detachably, the innermost membrane hopper being removable for cleaning said main hopper.

5,480,019

# COIN-DISTINGUISHING METHOD AND APPARATUS THEREFOR

Yonezo Furuya, Hiki, Japan, assignor to Nippon Conlux Co., Ltd., Tokyo, Japan

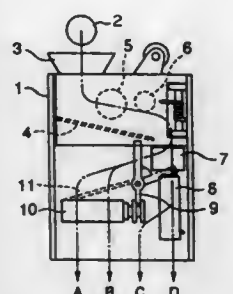
Filed Nov. 3, 1993, Ser. No. 147,054

Claims priority, application Japan, Nov. 11, 1992, 4-300928

Int. Cl.<sup>6</sup> G07D 5/08

U.S. Cl. 194—318

14 Claims



3. An apparatus for identifying coins, comprising: a coin path along which a coin passes; a first sensor means provided along said coin path, for detecting a first characteristic of said coin passing along said coin path; a second sensor means provided along said coin path, for detecting a second characteristic of said coin passing along said coin path;

a first setting means that sets a first region defining a comparison reference for identifying said coin based on a first measured value from said first sensor means and a second measured value from said second sensor means; a second setting means that sets a second region included within the first region; a preliminary determination means that performs a preliminary determination as to whether or not the measured values detected by said first and second sensor means lie within the second region; and a determination means that, if said preliminary determination means determines that the measured values lie within said second region, determines said coin is a counterfeit as a result of the preliminary determination, and if the preliminary determination means determines that if either of the measured values do not lie within the second region, performs a determination as to whether or not the measured values lie within the first region.

5,480,020

# HANGING DEVICE FOR A HANGING CONVEYOR

Ralf Schneuing, and Paul Janzen, both of Blefeld, Germany, assignors to Dürkopp Adler Aktiengesellschaft, Blefeld, Germany

Filed Jul. 20, 1994, Ser. No. 277,958

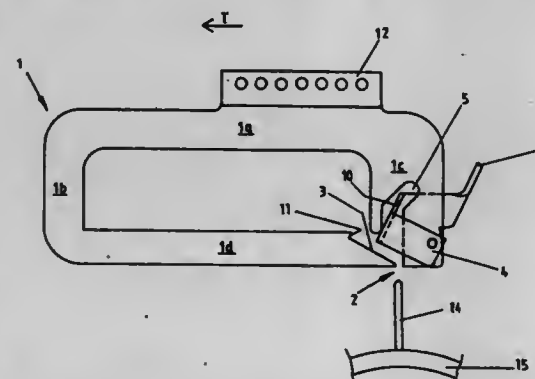
Claims priority, application Germany, Jul. 21, 1993, 43 24 426.2

426.2

Int. Cl.<sup>6</sup> B65G 37/00

U.S. Cl. 198—465.4

12 Claims



1. A hanging device for a hanging conveyor for receiving a hook of a clothes hanger, the device being openable in order to release or eject the clothes hanger, the hanging device comprising: a body having a length and a width formed as a frame open on both sides for receiving the clothes hanger from either side, the length of the body being greater than the width of the body by a factor of at least 10; a bevel formed on the body; a slot in the body, the slot permitting ejection of the hook and being provided in a rear region of the body with respect to a direction of transport; and a flap fastened to the body for pivoting around an axis extending transverse to the direction of transport, the hook of the clothes hanger during transport lying on the bevel formed on the body and resting against the flap which during transport remains closed.

5,480,021

# PITCH CHANGE FOR AN ORDERLY SUCCESSION OF ELEMENTS

Bruno Belvederi, S. Martino di Monte S. Pietro, and Salvatore Rizzoli, Bologna, both of, Italy, assignors to G. D. Societa' per Azioni, Bologna, Italy

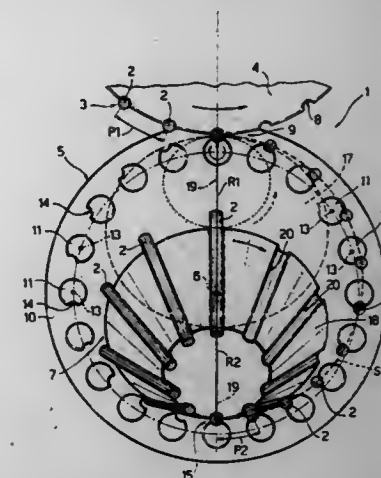
Filed May 2, 1994, Ser. No. 236,961

Claims priority, application Italy, May 7, 1993, BO93A0204

Int. Cl.<sup>6</sup> B65G 17/46

U.S. Cl. 198—471.1

12 Claims



1. A pitch change device (1) for changing the pitch of elements (2) traveling in an orderly succession (3), said pitch change device (1) comprising:

a conveyor (10) for successively feeding elements (2) along a path (S) extending about a first axis (6) between a loading station (9) and an unloading station (15), said conveyor (10) having transfer means (11) for supporting said elements (2) along said path (S) and for changing the distance between said elements (2) and said first axis (6) between said loading station (9) and said unloading station (15), said transfer means (11) being rotated 360° between said loading station (9) and said unloading station (15), said loading station (9) and said unloading station (15) being located on diametrically opposed sides of said conveyor (10).

5,480,022

# ROLLER OF VARIABLE OUTER DIAMETER TYPE, AND CARRYING APPARATUS AND METHOD USING THE SAME

Yutaka Matsuda, Kuala Lumpur, Malaysia, and Kaoru Shimizu, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 151,211, Nov. 12, 1993, Pat. No. 5,407,054. This application Oct. 31, 1994, Ser. No. 331,734

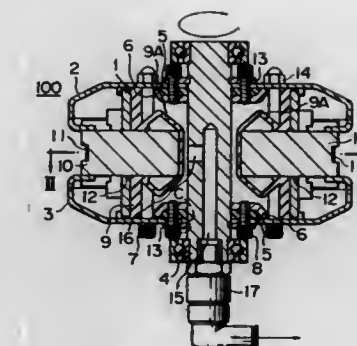
Claims priority, application Japan, Apr. 21, 1993, 5-094423; Jul. 28, 1993, 5-186037

Int. Cl.<sup>6</sup> B65G 13/12

U.S. Cl. 198—782

11 Claims

1. An apparatus for transferring articles, comprising: (a) a plurality of rotary shaft means having rollers of variable outer diameter type mounted on a shaft portion of said rotary shaft means; (b) individual ones of said rollers comprising: a holding member having a plurality of through holes radially arranged in a side surface thereof and a hollow portion communicating with said through holes; a sealing member mounted in said hollow portion and provided with diaphragms corresponding to each of said through holes; sliders fitted to slide in each of said through holes and providing a roller peripheral surface; and



said diaphragms of said sealing member urging, responsive to fluid supplied into the hollow portion thereof, said sliders to displace in a direction such that an outer diameter size of the roller is enlarged;

(c) a pair of transporting conveyers arranged at both ends of said rotary shaft means so as to hold it therebetween; and (d) a third conveyer means provided so as to intersect with said transporting conveyers at a predetermined angle thereto.

5,480,023

# BASEBALL CAP CARRYING BAG

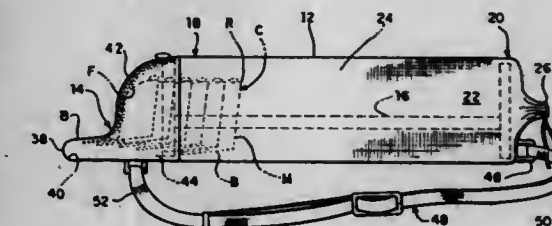
Alonzo L. Puller, P.O. Box 891, Charles Town, W. Va. 25414

Filed Nov. 9, 1994, Ser. No. 338,121

Int. Cl.<sup>6</sup> A45C 11/02; 13/04; B65D 85/18

U.S. Cl. 206—8

7 Claims



1. A cap storage container for receiving a plurality of caps, each of the plurality of caps including a main body portion and a bill, the plurality of caps being arranged in a front-to-rear shingled array, said cap storage container comprising:

an elongated container body having a front end, rear end, and a wall extending from said front end to said rear end, said wall constructed from a supple material and defining an elongated chamber dimensioned to receive the plurality of caps, said elongated container body including an opening for insertion of the plurality of caps; a frame disposed within said elongated chamber, said frame supporting said wall of said elongated container body and preventing the crushing of the plurality of caps stored within said elongated chamber, said frame having a front frame member adjacent said front end of said elongated container body, a rear frame member located adjacent said rear end of said elongated container body, and a lateral frame member extending from said front frame member to said rear frame member; and a bill container body extending from said front end of said elongated container body, said bill container body having a bill container front surface constructed of cloth and a bill container back surface defining a bill-receiving chamber, a portion of said bill container front surface having a convex shape, whereby said bill container front surface resembles a convex front surface of a visored cap.

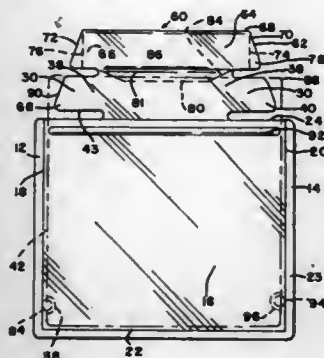


5,480,024

**COMPUTER DISKETTE RETAINER FOR FILE FOLDERS**  
Daryl Hertema, 199 W. Pine River Rd., Midland, Mich. 48640  
Continuation-in-part of Ser. No. 43,355, Apr. 6, 1993, abandoned. This application Jul. 18, 1994, Ser. No. 276,245  
Int. Cl.<sup>6</sup> B65D 85/57

U.S. Cl. 206—232

14 Claims



1. A computer diskette retainer for accommodating and storing at least one computer diskette and being attachable to an upper edge of a file folder to be adjacent to the upper edge as the folder is disposed in a file drawer, said retainer comprising:

a pocket portion having a rear wall, a front wall, a pair of side walls and a bottom wall, said side walls and said bottom wall securing said front wall to said rear wall and maintaining said front wall in spaced relationship from said rear wall to define a pocket having an upper open end;

an attachment portion formed by an extension of said rear wall and having at least one laterally extending tongue for engaging the file folder;

each said tongue having a base integral with said attachment portion, a free end disposed proximate to a corresponding one of said side walls;

said attachment portion providing sufficient support to said pocket portion so that upon engagement of said at least one tongue with the file folder, said pocket portion is suspended from the upper edge of the file folder and accommodates the at least one diskette therein; and

label retaining means for retaining a label therein, said label retaining means including a front panel and a rear panel joined along a common edge and defining a label retention area therebetween, a lower edge of one of said front and rear panels being integral with said attachment portion.

10. A computer diskette retainer for accommodating and storing at least one computer diskette and being attachable to an upper edge of a file folder to be adjacent to the upper edge as the folder is disposed in a file drawer, the folder having at least one generally vertically oriented slot, said retainer comprising:

a pocket portion having a rear wall, a front wall, a pair of side walls and a bottom wall, said rear, front and side walls are self-supporting, said side walls and said bottom wall securing said front wall to said rear wall and maintaining said front wall in spaced relationship from said rear wall to define a pocket having an open upper end;

an attachment portion formed by a vertical extension of said rear wall and having a pair of laterally extending tongues for matingly engaging corresponding slots on the folder;

each said tongue having a base integral with said attachment portion, a free end disposed proximate to a corresponding one of said side walls, each said tongue including a lower edge in generally spaced, parallel relationship to an upper edge of said rear wall;

said attachment portion providing sufficient support to said pocket portion so that upon insertion of said at least one tongue into a corresponding slot, said pocket portion is suspended from the upper edge of the file folder and accommodates a diskette therein;

label retaining means for retaining a label therein, said label retaining means including a front panel and a rear panel joined along a common edge and defining a label retention

area therebetween, said lower edge of said front panel is integral with said attachment portion, and front panel exerts a compressive force against said rear panel when said retainer is attached to the file folder.

13. A combination file folder and computer diskette retainer for accommodating and storing at least one computer diskette with file contents, comprising:

a file folder having a pair of elongate upper edges;

a computer diskette retainer including a pocket portion having a rear wall, a front wall, a pair of side walls and a bottom wall, said side walls and said bottom wall securing said front wall to said rear wall and maintaining said front wall in spaced relationship from said rear wall to define a pocket having an open upper end;

an attachment portion formed by an extension of said rear wall and having at least one laterally extending tongue for engaging said file folder;

each said tongue having a base integral with said attachment portion, a free end disposed proximate to a corresponding one of said side walls;

said attachment portion providing sufficient support to said pocket portion so that upon engagement of said at least one tongue with the file folder, said pocket portion is suspended from the upper edge of the file folder and accommodates at least one diskette therein; and

wherein said file folder has at least one generally vertically oriented slot disposed along at least one of said upper edges, and said tongues are constructed and arranged to engage a corresponding one of said slots for suspending said diskette retainer adjacent said upper edge of said folder.

14. A computer diskette retainer for accommodating and storing at least one computer diskette, said diskette having at least one recess, said retainer being attachable to an upper edge of a file folder to be adjacent to the upper edge as the folder is disposed in a file drawer, said retainer comprising:

a pocket portion having a rear wall, a front wall, a pair of side walls and a bottom wall, said side walls and said bottom wall securing said front wall to said rear wall and maintaining said front wall in spaced relationship from said rear wall to define a pocket having an upper open end;

an attachment portion formed by an extension of said rear wall and having at least one laterally extending tongue for engaging the file folder;

each said tongue having a base integral with said attachment portion, a free end disposed proximate to a corresponding one of said side walls;

said attachment portion providing sufficient support to said pocket portion so that upon engagement of said at least one tongue with the file folder, said pocket portion is suspended from the upper edge of the file folder and accommodates the at least one diskette therein; and

locking means for releasably locking the at least one diskette in said pocket portion, said locking means includes at least one detent projecting normally into said pocket from at least one of said front and rear walls for engaging a corresponding one of the at least one recess on the diskette.

5,480,025

**STEP-SHAPED INNERFRAME FOR USE WITH SHORT CIGARETTES AND HINGED LID BOX**

James B. Draucker, Chesterfield; Charles D. Hansen, Jr., Richmond; Reginald W. Newsome, Richmond, and Xuan M. Pham, Richmond, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Dec. 6, 1993, Ser. No. 161,495

Int. Cl.<sup>6</sup> B65D 85/10; A24F 15/00

U.S. Cl. 206—246

27 Claims

1. A hinged lid box for packaging a cigarette bundle comprising:

a front exterior wall;

a back exterior wall;

two side exterior walls;



a bottom exterior wall, wherein said front, back, bottom and side exterior walls are interconnected to form an interior receptacle, wherein the cigarette bundle has a shorter height than the front, back and side exterior walls;

a top lid hingably connected to said back exterior wall to close the defined interior receptacle; and

an innerframe located within the interior receptacle comprising: a front panel contacting an upper portion of the inner side of said front exterior wall;

a bottom step panel substantially perpendicularly connected to a lower edge of said front panel;

a back panel substantially perpendicularly connected to said bottom step panel such that said back panel and said front panel extend in opposite directions in a substantially parallel manner, said back panel contacting a lower portion of the inner side of said back exterior wall and located opposite to said front exterior wall in a substantially parallel relationship; wherein said bottom step panel divides the interior receptacle into an upper receptacle defined by said bottom step panel and inner sides of said front panel of the innerframe and said side and back exterior walls, the upper receptacle sized to receive the cigarette bundle, and into a lower receptacle defined by said bottom step panel, said back panel, and said front, side and bottom exterior walls.

5,480,026

**BOCCI BALL CADDY**

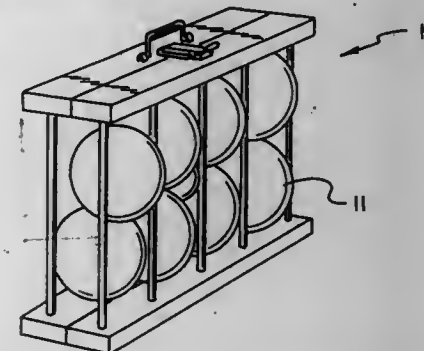
David W. Darling, and Judy S. Darling, both of 195 Sharon Dr., Rochester, N.Y. 14626

Filed Jan. 17, 1995, Ser. No. 373,610

Int. Cl.<sup>6</sup> B65D 61/00; A63B 71/00

U.S. Cl. 206—315.9

7 Claims



1. A bocci ball caddy for allowing a user to transport standard-sized bocci balls from one location to another comprising, in combination:

a pair of similarly shaped halves, each half having a top rail, an opposed aligned bottom rail, and five coplanar and parallel rigid cylindrical spaced linear bars extended therebetween

with each bar having a diameter of about 3/4 inches and with the spacing between adjacent bars being about 4 1/4 inches;

a pair of hinges secured between the bottom rails of the halves for allowing the halves to be folded into an orientation with the top rails placed in contact, the bottom rails placed in contact, and each bar of one half positioned in a spaced and symmetrically aligned offset relation to a corresponding bar of the other half to define a coupling bar pair with the spacing between the bars of each coupling bar pair being about 1 1/4 inches and with adjacently positioned coupling bar pairs defining a holding space therebetween for holding two bocci balls in a linear stacked sequence, the hinges further allowing the halves to be unfolded with the bars positioned in a common plane;

a latch formed of a hook portion coupled to one of the top rails of one of the halves and a loop portion coupled to the other top rail of the other half and with the loop portion securable to the hook portion for locking the folded halves together; and a generally rigid U-shaped carrying handle coupled to one of the top rails at the midpoint thereof near the latch.

5,480,027

**STACKABLE AND DISPOSABLE TOOTHBRUSH HOLDER**

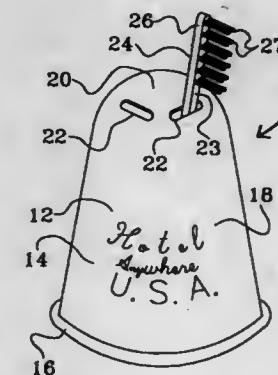
Marilyn K. Leonard, 1811 S. Quebec Way, Apt. 246, Denver, Colo. 80231

Filed Mar. 1, 1994, Ser. No. 203,309

Int. Cl.<sup>6</sup> B65D 85/20

U.S. Cl. 206—362.1

12 Claims



1. A disposable and stackable toothbrush holder in combination with a toothbrush for holding the toothbrush in an upright position, the holder comprising:

a toothbrush handle having a length "H" and a toothbrush head with bristles mounted at one end of said toothbrush handle; an upside down cup having a lower portion, a middle portion, and an upper portion, said cup having a height "h" adapted for receiving a portion of the length "H" of said toothbrush handle therein; and

annular lines of weakness in the upper portion of said cup for breaking through and forming an annular hole in a portion of the upper portion, said hole dimensioned and adapted for receiving said toothbrush handle therethrough;

whereby said upside down cup holds said toothbrush handle in an upright position and the height "h" of said cup is less than the length "H" of said toothbrush handle so that the bristles of said toothbrush head are held above said upside down cup to air dry after the use of the toothbrush.



5,480,028

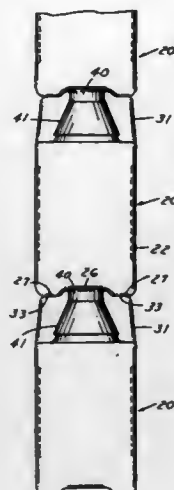
## STACKABLE PLASTIC CONTAINER PACKAGE

Gerald R. Roblason, Perrysburg, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Filed Dec. 8, 1993, Ser. No. 163,458

Int. Cl.<sup>6</sup> B65D 21/032

U.S. Cl. 206—511



1. A stackable plastic container package including
  - a container including a body having a generally rectangular cross section including a base wall, sidewalls and end walls, and a top wall, the width of the sidewalls being greater than the width of the end walls,
  - said container having a vertical axis,
  - said container having a longitudinal direction in the direction of the width of each side wall,
  - said top wall having an integral neck extending vertically above the top wall defining a dispensing opening adjacent one of said end walls,
  - a closure on said neck,
  - said bottom wall having spaced longitudinally extending integral portions defining a longitudinal recess extending lengthwise of the bottom wall and generally parallel to the sidewalls,
  - said longitudinally extending integral portions and said longitudinal recess on said bottom wall extending for substantially the full width of said sidewalls,
  - said top wall of said body including a first integral projection extending vertically upwardly from lower portions of the top wall and said first projection is adjacent the other end wall,
  - a second centrally located projection extending vertically upwardly from the first projection and said first and second projections define spaced generally horizontal surfaces parallel to each other, said surfaces being positioned above the level of the lower portions of the top wall, the lower portions of the top wall are intermediate the dispensing opening and the first projection,
  - the vertical height of said second centrally located projection and the top of said closure being substantially the same, such that when one container is stacked on another, the horizontal surfaces of the first and second projections of the top wall are engaged by the longitudinally extending spaced portions on the bottom wall of a container stacked thereon.

5,480,029

## AIR INFLATABLE/DEFLATABLE PACKAGING COMPONENT SHAPED TO FIT A CORNER OF AN ARTICLE

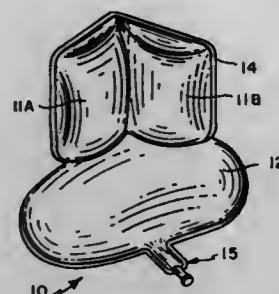
Charles A. Batsford, Stow, Mass., assignor to Air-Ride Packaging of America, Inc., Stow, Mass.

Continuation of Ser. No. 153,485, Nov. 16, 1993, Pat. No. 5,351,829, which is a continuation of Ser. No. 2,066, Jan. 8, 1993, abandoned. This application Apr. 14, 1994, Ser. No. 227,798

Int. Cl.<sup>6</sup> B65D 81/10

U.S. Cl. 206—522

9 Claims



1. A packaging component for protecting a product when placed in a shipping container, said component comprising:
  - a first single generally rectangular inflatable and deflatable plastic element having a non-inflatable region for providing two inflatable and deflatable compartments in said first element;
  - a second single generally oval inflatable and deflatable plastic element positioned remotely from said first element;
  - an intermediate inflatable and deflatable plastic coupling element substantially centrally positioned between said first and second elements for coupling said first and second elements;
  - a valve for permitting air under pressure to be supplied to, or to be released from, said first element, said second element, and said coupling element whereby said elements are inflated, or deflated, respectively; and
  - the shapes of said first and second elements and said coupling element being such that when said first, second, and coupling elements are inflated and positioned so that said first element is folded substantially along said non-inflatable region and positioned substantially perpendicularly with respect to said second element, and said coupling element is centrally positioned therebetween, they form a corner-shaped configuration for enclosing a corner of a product so as to provide a firm and snug fit thereon when a product is placed in a container.
9. A packaging component for protecting a product when placed in a shipping container, said component comprising:
  - a first single selectably shaped inflatable and deflatable plastic element having a non-inflatable region for providing two inflatable and deflatable compartments in said first element;
  - a second single selectably shaped inflatable and deflatable plastic element positioned remotely from said first element;
  - an inflatable and deflatable plastic coupling element substantially centrally positioned between said first and second elements for coupling said first and second elements;
  - a valve for permitting air under pressure to be applied to, or to be released from, said first element, said second element and said coupling element whereby said elements are inflated, or deflated, respectively; and
  - the shapes and relative positions of said first and second elements and said coupling element being such that when said first, second, and coupling elements are inflated and folded so that said first element is folded substantially along said non-inflatable region and positioned substantially perpendicularly with respect to said second element, and said coupling element is centrally positioned therebetween, they form a corner-shaped configuration for enclosing a corner of a product so as to provide a firm and snug fit thereon when a product is placed in a container.

5,480,030

## REUSABLE, EVACUABLE ENCLOSURE FOR STORAGE OF CLOTHING AND THE LIKE

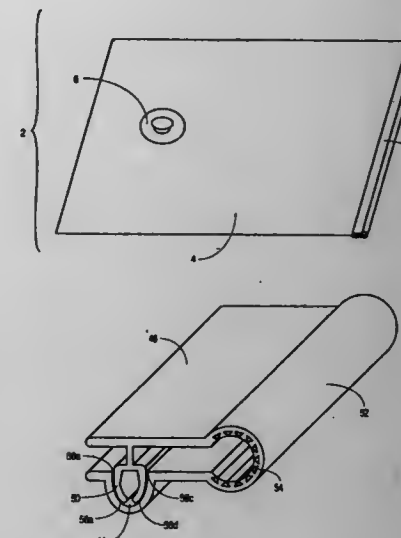
Gerald W. Sweeney, Atherton; James W. Pfeiffer, Los Gatos; David M. Hadden, Los Altos; Kenneth L. Blanchard, Milpitas, and Howard R. Mullin, Atherton, all of Calif., assignors to New West Products, Inc., Atherton, Calif.

Filed Dec. 15, 1993, Ser. No. 168,963

Int. Cl.<sup>6</sup> B65D 81/20

U.S. Cl. 206—524.8

20 Claims



12. A reusable closure for forming a seal between a plurality of flexible layers, said closure comprising:
  - a) a first strip having a slot running along a surface of said first strip; and
  - b) a second strip having a bifurcated flange running along a surface of said second strip, said bifurcated flange comprising a first ridge and a second ridge, each of said first and second ridges having a generally convex outside surface which extends substantially the entire distance from a base of said ridge to a tip of said ridge, the tips of said first and second ridges being separated by an opening;
 wherein said slot and said bifurcated flange are sized such that said bifurcated flange fits within said slot, the generally convex outside surface of each of said ridges pressing against a concave interior surface of said slot when said slot and said bifurcated flange are fitted together.

5,480,031

## COMBINED PIZZA BOX LID SUPPORT AND CUTTER

Jonathan Maultasch, 10 Dunster Rd., Great Neck, N.Y. 11021, and Bruce Maultasch, 252 Forest Dr., Jericho, N.Y. 11753

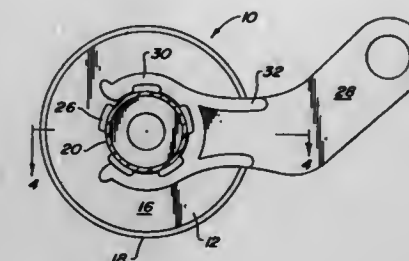
Filed Mar. 31, 1995, Ser. No. 414,809

Int. Cl.<sup>6</sup> B65D 85/00; A45C 11/20

U.S. Cl. 206—525

20 Claims

1. A device for use with a pizza product in a pizza box, comprising:
  - a disc for engaging a top panel of the pizza box above the pizza product contained in the pizza box, said disc having an outer peripheral edge forming a cutting surface;
  - a shaft member extending transversely from said disc, said shaft member having an end remote from said disc for engaging the pizza product while said disc engages the top panel of the pizza box; and
  - a handle connected to said shaft member;
 whereby the device can be used both as a lid support and as a rotary cutting tool to slice the pizza product.



5,480,032

## PRODUCT SORTING APPARATUS FOR VARIABLE AND IRREGULARLY SHAPED PRODUCTS

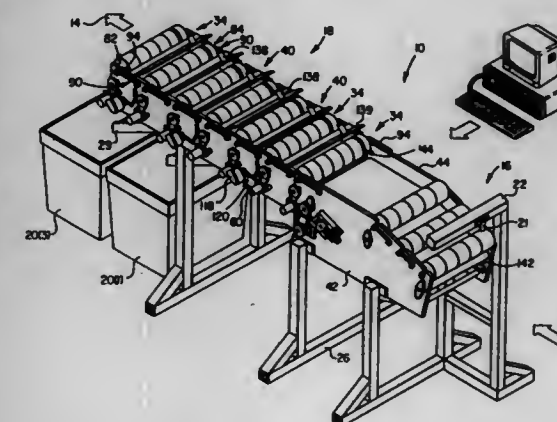
James M. Pippin, Keller; Kenneth C. Flagg, Jr., Arlington, and Gary S. Robertson, Euless, all of Tex., assignors to Electro-Com Automation, Inc., Arlington, Tex.

Continuation of Ser. No. 982,718, Nov. 27, 1992, abandoned, which is a continuation of Ser. No. 643,853, Jan. 22, 1991, Pat. No. 5,186,336. This application Feb. 9, 1994, Ser. No. 194,098

Int. Cl.<sup>6</sup> B07C 5/36; B65G 47/00

U.S. Cl. 209—583

7 Claims



1. Apparatus for sorting a stream of objects having varying thicknesses comprising:
  - transport means defining a transport path for transporting a singulated stream of objects, said transport means including a plurality of diverter gates;
  - a plurality of drive rollers spaced apart along the transport means and between each one of the plurality of diverter gates;
  - a plurality of pinch rollers, each one of the plurality of the pinch rollers mounted adjacent to one of the plurality of drive rollers for pinching an object against that drive roller;
  - an object detector positioned upstream of each of said plurality of drive rollers for detecting objects at the next downstream drive roller for generating an available signal for a downstream roller available to receive an object;
  - means for selectively actuating each drive roller independent of other of the plurality of rollers in response to the available



signal to move an object along the transport path toward the next adjacent roller; and  
a controller responsive to the available signal for tracking the position of objects in the singulated stream and selectively actuating a drive roller independent of other of the plurality of drive rollers to propel an object downstream to the next adjacent downstream drive roller only when the downstream roller is available to receive the object.

5,480,033

## FORMS SEPARATING CONVEYANCE

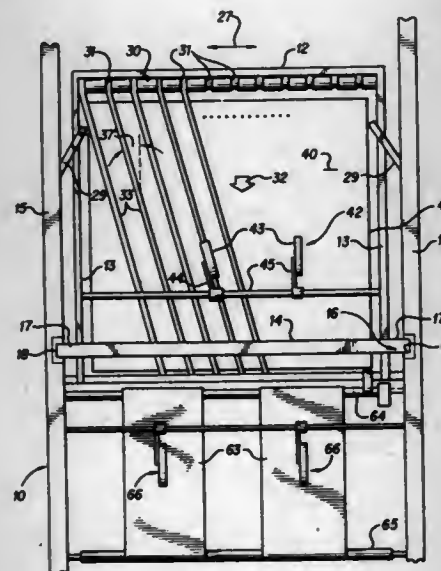
Michael S. Kalisiak, North Tonawanda, N.Y., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Nov. 15, 1993, Ser. No. 151,853

Int. Cl.<sup>6</sup> B07C 5/00

U.S. Cl. 209—584

21 Claims



1. Apparatus for conveying and separating into discrete groups substantially planar elements, comprising:  
a carriage having first and second ends;  
a frame;  
means for mounting said carriage so that it extends generally horizontally, and so that it is mounted at said second end thereof to said frame for limited oscillatory movement in a generally horizontal plane;  
means for effecting significant oscillatory movement of said first end of said carriage in said generally horizontal plane;  
conveyor means mounted by said carriage for conveying planar elements from said first to said second end thereof in a first direction;  
sensor means mounted on said frame, distinct from said carriage, for sensing planar elements on or adjacent said carriage; and  
control means responsive to said sensor means for controlling said means for effecting significant oscillatory movement of said carriage first end.

5,480,034

## SCREENING MACHINE

Yoshikazu Kobayashi, Ashina, Japan, assignor to Kabushiki Kaisha Miike Tekkoshu, Hiroshima, Japan

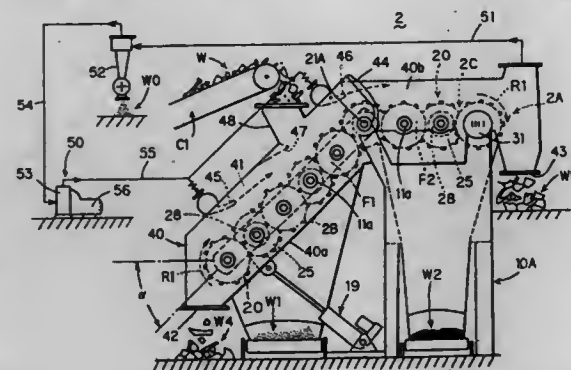
Filed Jun. 14, 1994, Ser. No. 259,468

Claims priority, application Japan, Jun. 22, 1993, 5-176001; Dec. 1, 1993, 5-338816; Dec. 27, 1993, 5-353235; Feb. 7, 1994, 6-035368; Mar. 18, 1994, 6-073987; Mar. 18, 1994, 6-073988; May 12, 1994, 6-124600

Int. Cl.<sup>6</sup> B07B 13/05

U.S. Cl. 209—667

13 Claims



1. A screening machine comprising a plurality of rotors (20) adapted such that in a frame (10) axes of said rotors are arranged parallel to one another from a supply side where objects to be screened (W) including mixed substances different at least size are supplied from above by a conveying means (C1) to a discharge side where the remainders after screening are discharged, a series of said rotors (20) being arranged in an inclined plane with a series of said rotors (20) on the discharge side being placed higher than those on the supply side, and such that said rotors (20) are rotated in the same direction by a rotating drive means (30) to feed the objects to be screened on said rotors from the supply side to the discharge side, and each rotor (20) further comprises a plurality of large diameter sections (25) and a plurality of small diameter sections (28) alternately disposed in the axial direction of each rotor (20) and arranged in a staggered relation in the feeding direction to define screening gaps (G) having desired dimensions between said large and small diameter sections (25-28), and each of said large diameter sections (25) of said rotor (20) has a plurality of projections (26a) at least on one side, which do not interfere with said large diameter sections (25) and said small diameter sections (28) of adjacent rotors (20).

5,480,035

## DISHWASHER RACK WITH ADJUSTABLE SHELF

John M. Smith, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

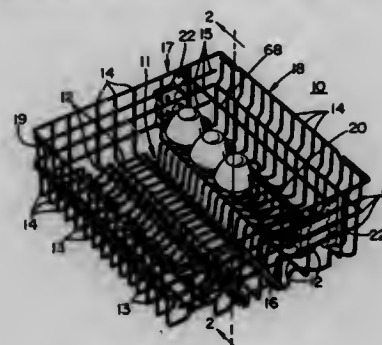
Filed Feb. 7, 1994, Ser. No. 192,367

Int. Cl.<sup>6</sup> A47F 7/00

U.S. Cl. 211—41

6 Claims

1. An apparatus for supporting articles in a dishwasher,



including:

an open dishrack having opposite sides comprising spaced apart elongated members;  
an article supporting open shelf extending between said opposite sides and including oppositely projecting fingers;  
a pair of shelf supporting plates including snap attachment means mounting said plates in facing relationship on selected members of said opposite dishrack sides;  
each of said plates including an upper and a lower hub positioned in facing relationship with said upper and lower hubs respectively of said other plate to rotatably receive said shelf fingers for mounting said shelf in a selected one of an upper and a lower position; and  
support means, including said plates, for selectively supporting said shelf in a generally horizontal configuration and in a generally vertical configuration when said shelf is in its upper position and when said shelf is in its lower position.

5,480,036

## GREETING CARD DISPLAY APPARATUS OR THE LIKE

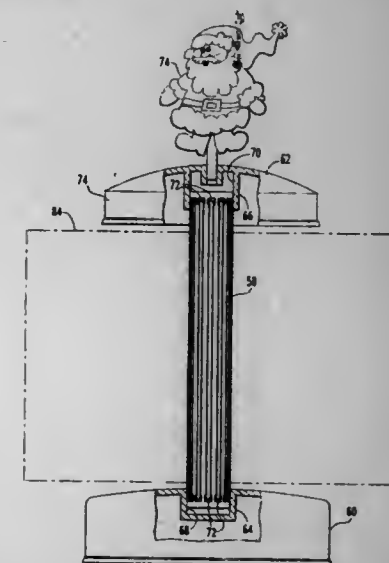
Mark A. Opar, 1100 Lakeview Dr., Bridgeville, Pa. 15017

Filed Jun. 8, 1994, Ser. No. 257,003

Int. Cl.<sup>6</sup> A47F 7/00

U.S. Cl. 211—45

18 Claims



1. A greeting card display apparatus or the like comprising:  
an elongated, upstanding member having a pair of opposed axial ends and an axially elongated exterior periphery extending intermediate said opposed axial ends;  
a plurality of opening means formed in each of said opposed axial ends with ones of said opening means adjacent one of said axial ends being disposed essentially in axial alignment with respective ones of said opening means adjacent the other of said axial ends;  
card retention means retained by at least some of said opening means and adapted to retain greeting cards with respect to said display apparatus;  
a pair of end cap means retained with respect to said upstanding member adjacent said opposed axial ends, respectively; and  
each of said end cap means including pocket means for receiving and retaining said opposed axial ends, respectively, in a manner that said end cap means axially overlap and conceal said pluralities of opening means, respectively.

5,480,037

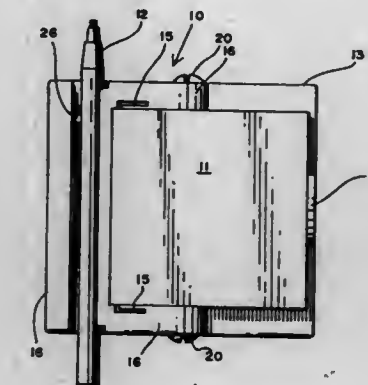
## NOTE PAPER HOLDER AND METHOD

Kip R. Pope, 1804 Bridgestone Dr., Champaign, Ill. 61821  
Continuation-in-part of Ser. No. 897,777, Jun. 12, 1992, abandoned. This application Mar. 25, 1994, Ser. No. 218,272

Int. Cl.<sup>6</sup> B42F 17/08

U.S. Cl. 211—50

5 Claims



1. A holder assembly for a pad of individual sheets of paper comprising, in combination,  
a magazine for holding the pad, said magazine portion having a forward portion and a rearward portion,  
said magazine comprising  
a bottom,  
a pair of opposed sides at the forward portion of the magazine,  
a head essentially perpendicular to the ends of the opposed sides and located at the forward portion of the magazine,  
a pair of yieldable means extending from the opposed sides for yieldably engaging the pad near the head of the magazine,  
a mounting base for securing the magazine to an intended location for use by a user,  
said mounting base having lateral sides and a bottom portion,  
each of said lateral sides having an upstanding slotted portion that extends away from the bottom portion of said base,  
said magazine having two trunion assemblies, each assembly including a rotatable member having a shaft for inserting into the upstanding slotted portions of the mounting base,  
said rotatable member engaging a fixed member for pivotally securing the magazine to the upstanding slotted portions of the mounting base, whereby the shafts of the trunion assemblies allow the magazine to be pivotally adjusted about the upstanding slotted portions of the mounting base and whereby once the pad is placed within the magazine, the top sheet of the paper of the pad can be easily engaged by the user and can thereafter be removed.

5,480,038

## TOOTHBRUSH HOLDER

Susan J. Collier, 2675 Arbor Springs Way, Marietta, Ga. 30066  
Continuation of Ser. No. 202,335, Feb. 25, 1994, abandoned.

This application Jan. 3, 1995, Ser. No. 368,240

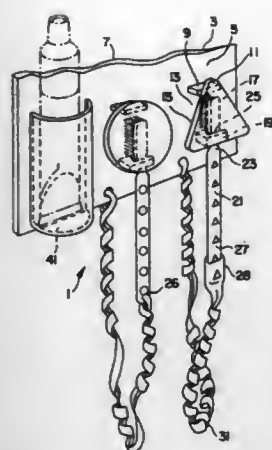
Int. Cl.<sup>6</sup> A47F 7/00

U.S. Cl. 211—65

13 Claims

1. A toothbrush holder comprising:  
a platform, said platform further comprising a mount for supporting said platform in an upright configuration;  
at least one plate carried by said platform, said plate and said platform defining a gap therebetween;  
a strap having a first end and a second end, said first strap end attached to said platform and said second end attached to a handle of a toothbrush;  
a retainer for securing said toothbrush to said holder, said retainer positioned within said gap;





wherein when said toothbrush is connected to said strap said toothbrush can be used in vicinity of said holder, said retaining means permitting said toothbrush to be stored within said gap between uses.

5,480,039

# **TWO BIN INVENTORY/FACING CONSTRUCTION FOR SIMILAR PRODUCTS WITH DIFFERENT PACKAGING OR DIFFERENT VERSIONS OF THE SAME SIZED AND SHAPED PRODUCT**

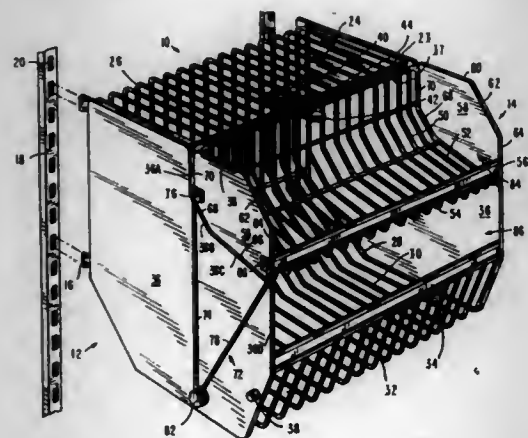
Milton J. Merl, 50 Wilcox Rd., Stonington, Conn. 06830

Filed Apr. 14, 1994, Ser. No. 227,540

Int. Cl.<sup>6</sup> A47F 5/08

U.S. Cl. 211—88

3 Claims



1. A two bin inventory/facing construction for similar products with different packaging or different versions of the same sized and shaped product for increasing the efficiency of a gondola merchandising system having a base, vertical uprights secured to the base, and space shelving along the vertical upright and spaced from the base, said two bin inventory/facing construction comprising

- a back bin adapted to be horizontally supported by the vertical uprights;
- the back bin having a bottom wall, diagonally sloping rear and front walls, and sidewalls, forming a cradle-type compartment;
- a front bin having a bottom wall, rear and front sloping walls and sidewalls, forming a smaller cradle, said front bin being received proximate to an upper forward portion of the back bin and being positioned in an opening in the back bin; and
- means pivotally connecting the front bin to said back bin, allowing movement of said front bin from an upper position resting proximate the back bin to a lower position spaced away from the back bin allowing access to said back bin.

5,480,040

# **CURTAIN ROD**

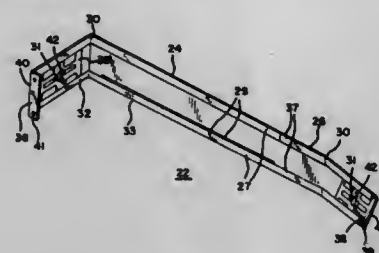
Richard B. Ryan, 1309 Appletree, Libertyville, Ill. 60048, assignor to Richard B. Ryan, Libertyville, Ill.

Filed May 27, 1993, Ser. No. 68,232

Int. Cl.<sup>6</sup> A47F 5/00

U.S. Cl. 211—105.1

39 Claims



1. A curtain rod assembly comprising:

- first and second rod members, each of said rod members having a first and a second end, said first and second rod members being slidably engageable via said second ends to form a telescoping curtain rod, each of said rod members having a means facilitating bending adjacent said first end and perpendicular to the major axis of said rod member, said means facilitating bending allowing each of said rod members to be bent into an L-shaped member with a facial section and a lateral section, wherein said first and second rod members are engageable prior to bending and are engageable after bending.

5,480,041

# **TRAILER-MOUNTED CRANE**

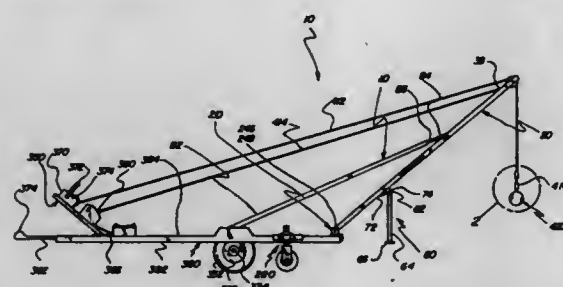
Eugene M. Turner, 20508 Mitchell Ave., Dinwiddie, Va. 23841

Filed Jun. 27, 1994, Ser. No. 270,905

Int. Cl.<sup>6</sup> B66C 23/00

U.S. Cl. 212—273

11 Claims



1. A new trailer-mounted crane for providing a vehicle-trailable general purpose lightweight crane having manual load hoist and motorized boom pitch winches, the trailer-mounted crane comprising:

- a flatbed trailer defining a transportable crane base, the trailer comprising: a generally rectangular unitary trailer frame constructed of square metal tubing, the frame having a trailer hitch connecting member projecting from a front end thereof, the connecting member lying essentially coaxial the major axis of the frame and having a vehicular trailer hitch socket fixedly connected to a front end thereof for operably connect-

ing the trailer with a towing vehicle; an axle transversely fixedly mounted to an underside of the frame and having a wheel on bearings rotatably mounted to each end thereof, each wheel having a wheel rim with an inflated rubber tire removably connected thereto; a rigid essentially planar trailer deck fixedly coplanarly connected to a top of the trailer frame for providing a working surface thereon and also for providing a crane mounting surface thereon;

a crane boom pivotally connected at a proximal end thereof central a top rear edge of the trailer deck such that a distal end of the boom is elevationally adjustable for hoisting, moving, and lowering loads within a zone located behind the rear end of the trailer, the boom comprising an elongated metal channel having a vertically longitudinally oriented sheave rotationally mounted at the distal end thereof;

boom travel limit means for preventing the boom from being raised to a dangerous vertical orientation whereupon the boom and any load suspended therefrom may fall towards operating personnel located near the front end of the trailer, the boom travel limit means comprising an elongated metal tubular member having a metal rod slidably telescoped therein, a proximal free end of the tubular member pivotally connected central the top of the trailer deck, a distal free end of the rod pivotally connected to the boom intermediate the ends of the boom, the tubular member having a length sufficient to prevent the boom from rising to a vertical position when the distal end of the tubular member abuts the boom;

boom support means for optionally supporting the boom and any load suspended therefrom at a point along the boom intermediate the distal and proximal ends thereof whereby relieving a portion of the downward force applied to the rear end of the trailer, the boom support means comprising an elongated metal leg pivotally connected at a first end thereof to the boom intermediate the distal and proximal ends of the boom, the leg having a generally planar foot pad fixedly connected to a second end thereof, the leg also having an active position wherein the leg depends generally vertically from the boom such that the foot engages a supporting surface, the leg further having an inactive position wherein the leg is pivoted to lie collateral the boom;

boom sway damping means for controlling swinging load induced boom yaw whereby improving overall stability of the crane, the boom sway damping means comprising left and right opposing complimentary shock absorbing elongated brace members, each brace member comprising an elongated metal tubular member having a metal rod slidably telescoped therein, the tubular member having an angled proximal end portion pivotally connected near a side of the top rear edge of the trailer deck and a first abutment defined by a distal end thereof, the rod having a complementarily angled distal end portion pivotally connected to a side of the boom intermediate the ends of the boom such that the brace members lie on a common plane with each other and with the boom, the rod additionally having a circumferential shoulder formed thereon intermediate the distal end and a proximal end thereof defining a second abutment, the first and second abutments being in spaced facing relationship, the rod further having a compression coil spring disposed thereon between the first and second abutments such that the rod is extensively biased relative the tubular member such that the left and right opposing complimentary shock absorbing elongated brace members in combination permit the boom to yaw slightly relative the trailer when laterally stressed by a swinging load whereby preventing a potentially damaging oscillatory condition from occurring throughout the crane;

winch mounting means whereby winches may be positioned for ease of operator access and also for aligning the winches relative the boom, the winch mounting means comprising a flat post projecting upwardly from the trailer deck such that the lateral axis of the post lies parallel the lateral axis of the trailer and an upper end of the post extends at an angle toward the front end of the trailer, the post having an integral flange base fixedly connected central the deck near the front end of the trailer;

a load hoist winch secured to the winch mounting means, the load hoist winch having a manual crank handle operably connected to a hoist cable takeup spool, the load hoist winch also having a hoist cable fixedly connected at a proximal end thereof to the hoist cable takeup spool, the hoist cable extending through the circumferential groove of the sheave and being terminated at a distal end thereof with a releasable load connecting link whereby operation of the crank handle raises and lowers the load connecting link;

a boom pitch winch secured to the winch mounting means, the boom pitch winch having an electrically powered motor operably connected to a boom pitch cable takeup spool, the boom pitch winch also having a boom pitch cable fixedly connected at a proximal end thereof to the boom pitch takeup spool and fixedly connected at a distal end thereof to the boom proximal the distal end of the boom whereby operation of the motor raises and lowers the distal end of the boom, the boom pitch winch further having a source of electrical power operably connected thereto and motor control means whereby the motor may be started, stopped, and reversed; and

trailer support means for preventing the trailer from pitching rearwardly about the axle when a heavy load is suspended from the boom, the trailer support means comprising left and right essentially identical vertically adjustable leg assemblies depending from opposing sides of the trailer deck proximal the rear end thereof, each leg assembly having a downwardly projecting fork with a wheel rotationally mounted therein for engaging a supporting surface, each leg assembly also having vertical adjustment securement means for securing the leg at a selected vertical position.

5,480,042

# **LOCK AND COUPLER FOR A RAILWAY RAMP CAR HAVING FLUID AND ELECTRICAL COUPLINGS**

Thomas H. Engle, Cape Vincent, N.Y., assignor to Knorr Brake Holding Corporation, Westminster, Md.

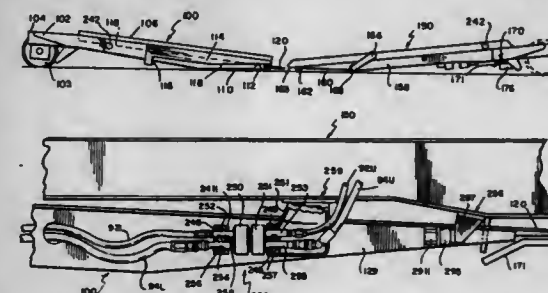
Continuation of Ser. No. 177,150, Jan. 4, 1994, Pat. No.

5,445,083. This application Mar. 29, 1995, Ser. No. 412,581

Int. Cl.<sup>6</sup> B61G 5/08; 5/10; B61D 47/00

U.S. Cl. 213—1.3

14 Claims



1. A train including a plurality of rail cars and a ramp car, a main reservoir pipe and a brake pipe running through each car, said ramp car including first and second car portions coupled in a travel condition and separated in a loading condition, said ramp car including fluid coupling means for coupling first portions of said main reservoir and brake pipes on said first car portion to second portions of said main reservoir and brake pipes on said second car portion when said car is in said travel condition, said fluid coupling means comprising:

- first and second housings connected to said first and second car portions respectively;
- a main reservoir pipe port and brake pipe port in each housing each connected to a respective main reservoir pipe and brake pipe portion;
- a main reservoir coupling port and brake coupling port in each housing each connected by a passage to a respective main reservoir pipe port and brake pipe port;
- valve means in each of said main reservoir passages for automatically closing said main reservoir passages when said first



and second housings are separated and automatically opening said main reservoir passages when said first and second housings are joined.

5,480,043

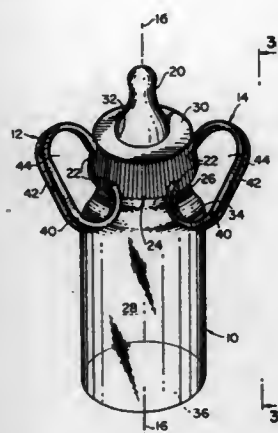
# **TWO-HANDLE COLLAR FOR A BABY BOTTLE FOR HELPING THE BABY HOLD AND SUPPORT A BOTTLE WHILE DRINKING THROUGH A NIPPLE**

Janice P. Wingo, 576 Stratford Ave., St. Louis, Mo. 63130  
Continuation of Ser. No. 71,186, Jun. 2, 1993, abandoned.  
This application Jun. 16, 1994, Ser. No. 260,776

Int. Cl.<sup>6</sup> A61J 9/00; 9/06

U.S. Cl. 215—11.1

20 Claims



13. A pair of handles removably mountable on a baby bottle for helping a young baby hold and support a bottle with the baby's elbows bent and hands positioned normally near left and right sides of the baby's jaw and cheeks while drinking through a nipple on the bottle comprising:

- a collar mountable on a neck of the bottle above a shoulder of the bottle;
- a first loop-shaped handle attached to said collar and projecting outwardly from said collar for providing a first grasping region spaced away from the bottle;
- a second loop-shaped handle attached to said collar and projecting outwardly from said collar for providing a second grasping region spaced away from the bottle;
- said first and second loop-shaped handles each having an opening sufficiently large for insertion of four fingers of a respective hand of a baby when the fingers are curled around the grasping region in grasping relationship with the thumb inserted through the opening in an opposite direction from the fingers;
- each of said grasping regions being inclined at angle A relative to a central axis of the collar and being inclined at angle A relative to a central longitudinal axis of the bottle when said collar is mounted on the neck of the bottle;
- said angle A being in a range from about 15° to about 90°;
- said collar comprising nipple mounting means for mounting a nipple on a mouth of the neck of the bottle;
- said collar including a generally cylindrical side wall with significant axial length L of at least about three-eighths of an inch;
- said first and second loop-shaped handles each including a first lobe adapted to be nearer to a baby's nose and a second lobe adapted to be farther from a baby's nose when a nipple mounted on the bottle is in the baby's mouth;
- said second lobe of each loop-shaped handle being below a central longitudinal axis of the bottle when said collar is mounted on the neck of the bottle for pushing upwardly by a baby's hand in supporting relationship for tilting the central longitudinal axis of the bottle upwardly above horizontal in a convenient position for drinking from the nipple when the baby is reclining with the nipple in the baby's mouth;

- said second lobe of each loop-shaped handle being at a position farther from said nipple mounting means than said first lobe;
- said collar serving as the sole connecting means for connecting the first and second handles to the bottle; and
- at least the first lobe of each handle being above the shoulder of the bottle.

5,480,044

# **SAFETY CAP**

Steven E. Nasser, 3400 Armstrong Dr., Wichita Falls, Tex. 76304

Filed Jul. 27, 1994, Ser. No. 281,085

Int. Cl.<sup>6</sup> B65D 41/04

U.S. Cl. 215—228

7 Claims



1. A safety cap shaped to prevent choking for a dispenser including an upper surface region surrounding a central column, said upper surface extending away from said central column at a first obtuse angle, comprising:

- a lid portion generally cylindrical in shape and having an upper portion and lower portion wherein said lower portion engages the central column of the dispenser;
- attachment means located within said lid portion for securing the cap to the central column of the dispenser;
- a frusto-conical flange portion located at said lower portion of said lid portion, said frusto-conical flange portion extending at a second obtuse angle with respect to said lid portion, wherein said first obtuse angle is substantially equal to said second obtuse angle of said flange portion; and
- a rotational assistance means attachable to said lid portion for frictionally engaging said flange portion of said cap, said rotational assistance means comprising a resilient material capable of causing friction between said rotational assistance means and said flange portion wherein said rotational assistance means includes a base ring portion which matingly receives said lid portion, said base ring portion including a lower face which engages said flange portion and extends away from said lid portion at an angle substantially equal to said second obtuse angle of said flange portion.

5,480,045

# **NECK FINISH FOR A CONTAINER AND A MATCHING REGISTERING MULTIPLE THREADPATTERN IN A FLEXIBLE CAP FOR ENGAGEMENT ON SAID NECK FINISH**

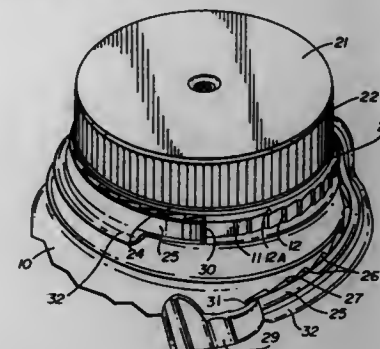
Luca Molinaro; Robert E. Crisci, and Harry E. Crisci, all of New Castle, Pa., assignors to Portola Packaging, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 36,277, Mar. 24, 1993, abandoned. This application Aug. 30, 1993, Ser. No. 113,064

Int. Cl.<sup>6</sup> B65D 39/00

U.S. Cl. 215—256

20 Claims



1. In combination, a container neck and a closure therefor, said neck having an opening, a lip surrounding said opening, an upper neck stretch depending from said lip, at least one first spiral thread configuration on said upper neck stretch, a lower neck stretch below said upper neck stretch, said lower neck stretch having a plurality of exterior fastening configurations projecting therefrom,

said closure having a top covering said opening, an upper skirt portion depending from said top, at least one second spiral thread configuration on said upper skirt portion mating with said at least one first spiral thread configuration on said upper neck stretch, a removable lower skirt portion below said upper skirt portion, said lower skirt portion having a plurality of interior fastening configurations projecting therefrom, selected ones of said exterior fastening configurations and said interior fastening configurations interengaging to substantially resist relative rotation of said closure and said neck, each of said selected ones of said interior fastening configurations being positioned radially outwardly of a first one of said exterior fastening configurations and in engagement with a second one of said exterior fastening configurations to resist said relative rotation of said closure and said neck.

5,480,046

# **FIBER PROBE FABRICATION HAVING A TIP WITH CONCAVE SIDEWALLS**

Robert W. Filas, Bridgewater, and Herschel M. Marchman, New Providence, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Continuation-in-part of Ser. No. 173,384, Dec. 22, 1993, abandoned. This application May 20, 1994, Ser. No. 247,164

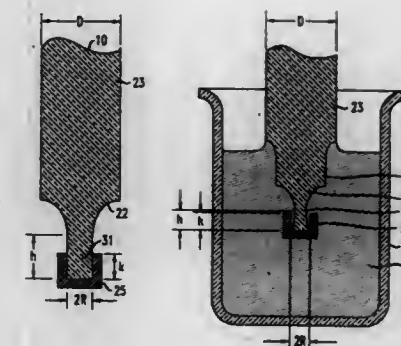
Int. Cl.<sup>6</sup> B44C 1/22; C03C 15/00

U.S. Cl. 216—7

24 Claims

1. A method of making a fiber probe device including the steps of:

- providing a cylindrical fiber segment;
- etching, prior to step (c), only a cylindrical bottom region of the fiber segment, the bottom region having an initial height, whereby its maximum width is reduced;
- cleaving the bottom region whereby its initial height is reduced to a reduced height and a cleaved bottom endface thereof is produced;
- coating both the cleaved endface and a first height of the sidewalls that is equal to or less than its reduced height with a protective masking layer;



- etching the bottom region whereby the sidewalls thereof become concave;
- removing, prior to step (g), the masking layer; and
- etching the bottom region whereby the maximum width of the cleaved endface is reduced to a desired value.

5,480,047

# **METHOD FOR FORMING A FINE RESIST PATTERN**

Makoto Tanigawa, Kitakatsuragi; Hiroki Tabuchi, Nara, and Takayuki Taniguchi, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan

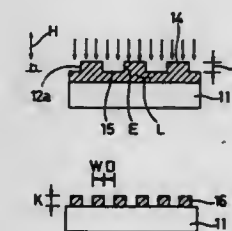
Filed May 12, 1994, Ser. No. 242,082

Claims priority, application Japan, Jun. 4, 1993, 5-134348

Int. Cl.<sup>6</sup> B44C 1/22

U.S. Cl. 216—12

4 Claims



1. A method for forming a fine resist pattern by exposing comprising the steps of:

- forming a resist layer on a semiconductor substrate;
- forming a phase shifting pattern in an upper portion of the resist layer, the phase-shifting pattern having a tapered edge corresponding to a portion to which formation of an objective fine resist pattern is not desired;
- exposing the entire surface of the semiconductor substrate including the phase-shifting pattern; and
- forming a fine resist pattern below an outline except for the tapered edge of the phase-shifting pattern.



**5,480,048**  
**MULTILAYER WIRING BOARD FABRICATING METHOD**

Naoya Kitamura, Yokohama; Hisashi Sugiyama, Yokosuka; Yoshihide Yamaguchi, Fujisawa; Masayuki Kyoui, Yokohama; Hideyasu Murooka, Yokohama; Ryoji Iwamura, Yokohama, and Makio Watanabe, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

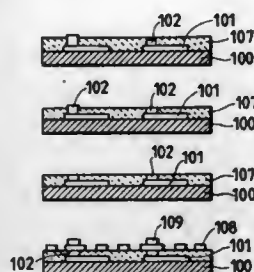
Filed Aug. 30, 1993, Ser. No. 113,983

Claims priority, application Japan, Sep. 4, 1992, 4-236612

Int. Cl.<sup>6</sup> B44C 1/22; B29C 37/00

U.S. Cl. 216—13

55 Claims



1. A method of fabricating a multilayer wiring board, comprising the steps of:

- 1) forming a base substrate having at least one of a horizontal wiring conductor and a vertical via conductor as wiring layers on at least one of surfaces thereof;
- 2) putting a mold having a planar surface on a wiring layer side of said base substrate and supplying a solvent-free fluid polymer precursor into between said base substrate and said mold;
- 3) exhausting between said mold and said base substrate;
- 4) moving said mold toward said base substrate before filling gaps between at least adjacent ones of the conductors on said base substrate with said solvent-free fluid polymer precursor;
- 5) applying a hydrostatic pressure to said solvent-free fluid polymer precursor;
- 6) hardening said solvent-free fluid polymer precursor at said hydrostatic pressure;
- 7) exposing an upper surface of said horizontal wiring conductor or said vertical via conductor; and
- 8) forming a wiring layer comprising at least one of another horizontal wiring conductor and another vertical via conductor connected with said horizontal wiring conductor and said vertical via conductor;

wherein the steps 2) to 8) are of at least one set.

**5,480,049**  
**METHOD FOR MAKING A FIBER PROBE DEVICE HAVING MULTIPLE DIAMETERS**  
Herschel Maclyn Marchman, New Providence, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Division of Ser. No. 173,285, Dec. 22, 1993, Pat. No. 5,394,500. This application Aug. 26, 1994, Ser. No. 296,573

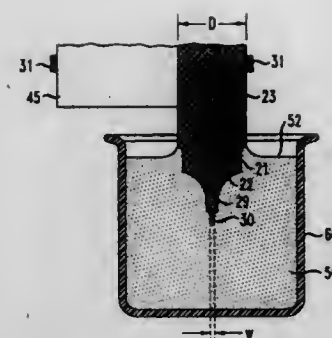
Int. Cl.<sup>6</sup> B29D 11/00; B44C 1/22; C03C 15/00

U.S. Cl. 216—24

8 Claims

1. A method of making a fiber probe device comprising the steps of:

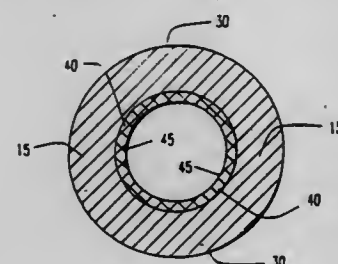
- (a) providing an initial cylindrical fiber segment;
- (b) etching, prior to step (d), a lower cylindrical region of the fiber segment for a first time duration, whereby the maximum width of the lower cylindrical is reduced but the maximum width of the upper cylindrical region remains essentially unchanged;
- (c) etching a lowest portion of the lower region for a second time duration, whereby the maximum width of the lowest portion of the lower region becomes less than that of a remaining portion of the lower region;



- (d) cleaving the tip of the lowest region of the fiber, whereby a cleaved lowest region of the fiber is formed; and
- (e) etching, subsequent to step (c), the cleaved lowest region and the remaining portion of the lower region of the fiber for a second time duration, whereby the maximum width of the cleaved lowest region is reduced to a desired value.

**5,480,050**  
**MONOLITHIC HOLLOW WAVEGUIDE METHOD**  
Clifford E. Morrow, N. Kingston; Otto Gregory, Wakefield; Poonam Bhardwaj, Kingstown, and Gong-En Gu, Cranston, all of R.I., assignors to Surgilase, Inc., Warwick, R.I.  
Division of Ser. No. 968,020, Oct. 29, 1992, Pat. No. 5,395,480, which is a division of Ser. No. 832,708, Feb. 7, 1992, Pat. No. 5,325,458. This application Dec. 14, 1994, Ser. No. 355,741  
Int. Cl.<sup>6</sup> B29D 11/00; B44C 1/22; C23F 1/00  
U.S. Cl. 216—24

10 Claims



1. A method of manufacturing a low cost and highly efficient monolithic hollow metal waveguide for transmitting electromagnetic radiations, comprising the steps of:

- (a) polishing and cleaning the interior surface of a monolithic hollow metal tube, and
- (b) forming dielectric thin films up to about 20 microns in thickness directly over the polished and cleaned interior surface of monolithic hollow metal tube by a native chemical liquid phase reaction or by a combination of chemical gas, vapor and liquid phase reactions.

**5,480,051**  
**METHOD FOR THE ANISOTROPIC ETCHING OF AN ALUMINIFEROUS LAYER**  
Manfred Hain, Zorneding, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany  
Filed May 2, 1994, Ser. No. 235,987

Claims priority, application Germany, May 27, 1993, 43 17 722.0

Int. Cl.<sup>6</sup> C23F 1/00

U.S. Cl. 216—67

17 Claims

1. A method for anisotropic etching an aluminiferous layer in a vacuum chamber comprising the steps of:

generating a high-frequency field to produce a plasma environment;  
adding a volatile, non-halogen-containing hydrocarbon to a chlorine-containing etching gas; and  
exposing the aluminiferous layer partially covered with a lacquer mask to the chlorine-containing etching gas, in the plasma environment, to form an aluminiferous structure having a sidewall angle greater than or equal to zero, the sidewall angle being set by the ratio of the volatile hydrocarbon to the chlorine-containing etching gas.

**5,480,052**  
**DOMED EXTENSION FOR PROCESS CHAMBER ELECTRODE**

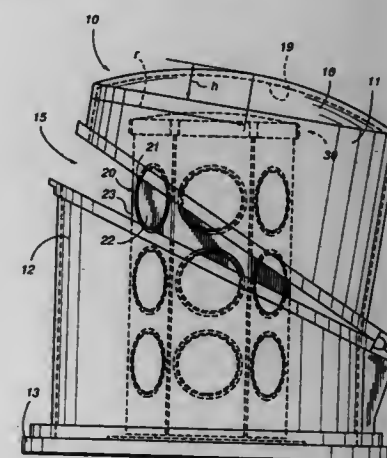
Michael G. Furr; Joseph Kava; Greg Blackburn, and Richard McGovern, all of San Jose, Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Oct. 22, 1993, Ser. No. 141,456

Int. Cl.<sup>6</sup> H05H 1/00

U.S. Cl. 216—71

18 Claims



1. A process for preventing polymer deposition on an inner surface of a wafer plasma processing chamber within which is located an electrode adapted to retain one or more wafers to be processed, comprising the steps of:

- placing a dielectric in the region between a portion of said electrode and a proximate process chamber inner surface so that such dielectric does not lie between a wafer and a facing surface of said chamber, wherein said region is between said chamber inner surface and a portion of said electrode which is not adapted to retain wafers, wherein said dielectric is an extension of said electrode, wherein said dielectric is provided with a curved upper surface, and in which at least a portion of said process chamber inner surface is curved, wherein said curved upper surface conforms to the curve of said proximate process chamber inner surface.

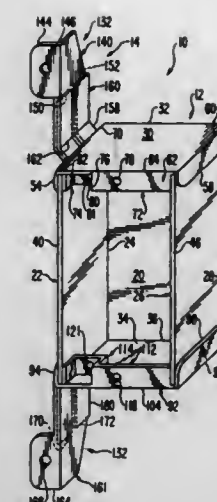
**5,480,053**  
**FOLDABLE ELECTRICAL BOX**  
Robert W. Jorgensen, Niles, Mich., assignor to Hubbell Incorporated, Orange, Conn.  
Continuation of Ser. No. 151,929, Nov. 15, 1993, abandoned.  
This application Mar. 31, 1995, Ser. No. 415,579

Int. Cl.<sup>6</sup> H02G 3/00

U.S. Cl. 220—62

16 Claims

1. An electrical box assembly formed by folding a thin, unitary blank of sheet material, comprising:  
an electrical box including  
a first substantially planar panel,



- a second substantially planar panel coupled to said first panel by a first fold line and extending substantially perpendicular to said first panel,
- a third substantially planar panel coupled to said first panel by a second fold line and extending substantially perpendicular to said first panel,
- a fourth substantially planar panel coupled to said first panel by a third fold line and extending substantially perpendicular to said first panel, and
- a fifth substantially planar panel coupled to said first panel by a fourth fold line and extending substantially perpendicular to said first panel, and
- a mounting bracket including  
a first bracket portion folded to form a first section extending outwardly from a first end of said second panel at an obtuse angle and a second section extending from said first section for offset mounting of said electrical box to a support member,
- a first reinforcing panel coupled to said first bracket portion by a fifth fold line to overlie a part of said first and second sections of said first bracket portion for reinforcing and supporting said first bracket,
- a second bracket portion folded to form a first section extending outwardly from a second end of said second panel at an obtuse angle and a second section extending from said first section of said second bracket portion for offset mounting of said electrical box to the support member, and
- a second reinforcing panel coupled to said second bracket portion by a sixth fold line to overlie a part of said first and second sections of said second bracket portion for reinforcing and supporting said second bracket.

**5,480,054**  
**BREW-THROUGH CAP FOR THERMAL CONTAINER**  
William E. Midden, Springfield, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.

Filed Oct. 28, 1993, Ser. No. 144,307

Int. Cl.<sup>6</sup> B65D 51/16

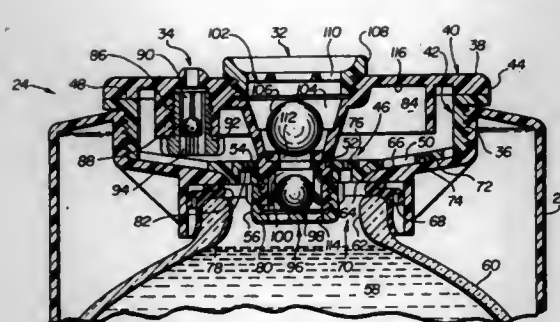
U.S. Cl. 220—202

10 Claims

1. A beverage container for retaining beverages, said container comprising:

- a body having a reservoir chamber therein;
- a portion of said body having a mouth formed therethrough communicating with said reservoir chamber;
- a lid assembly attached to said body of said container for covering said mouth;
- an exterior segment and an interior segment of said lid assembly, said exterior and interior segments being spaced apart and defining a lid chamber therebetween;
- a first vent attached to said exterior segment communicating with ambient atmosphere and said lid chamber, said first vent





having a first inlet port communicating with ambient atmosphere, a first outlet port communicating with said lid chamber, and a wall extending therebetween defining a first vent cavity;

vent anti-spill means including said first vent chamber of said first vent for preventing leakage of liquid therethrough when said container is tipped; and

a second vent in said interior segment communicating with said lid chamber and said reservoir chamber for passing atmosphere between said reservoir chamber and said lid chamber, said first vent being offset from said second vent.

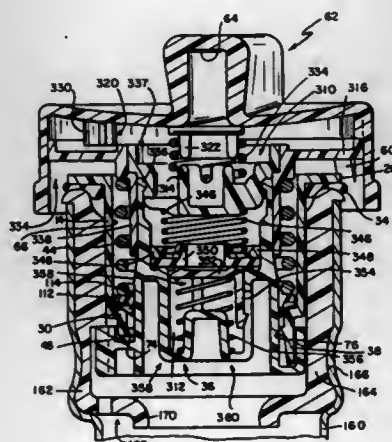
5,480,055

**QUICK-ON CAP WITH REMOVAL DELAY MECHANISM**  
Robert S. Harris, and Jeffery Griffin, both of Connersville, Ind., assignors to Stant Manufacturing Inc., Connersville, Ind.

Filed May 6, 1994, Ser. No. 239,217  
Int. Cl.<sup>6</sup> B65D 51/16

U.S. Cl. 220—203.26

24 Claims



3. A cap engageable with a filler neck having a mouth, the cap comprising

closure means for closing the filler neck, the closure means having an axis of rotation,

handle means for rotating the closure means about the axis of rotation and relative to the filler neck in one of a cap-installation direction toward the filler neck and a cap-removal direction away from the filler neck, and

control means for providing a lost-motion driving connection between the handle means and the closure means during rotation of the handle means about the axis of rotation relative to the filler neck in a cap-removal direction and providing a direct-drive driving connection between the handle means and the closure means during rotation of the handle means about the axis of rotation in a cap-advancing direction, the control means including a torsion spring coupled to the closure means and the handle means.

5,480,056

**PLUNGER FOR DRUM LINER REMOVAL**

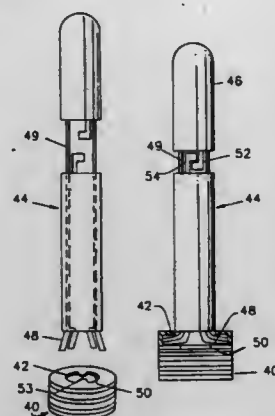
William Lima, Monmouth Beach; Earl V. Lind, Brick, and Philip D. Bartlett, Holmdel, both of N.J., assignors to Russell-Stanley Corporation, Red Bank, N.J.

Division of Ser. No. 54,694, Apr. 29, 1993, Pat. No. 5,284,998, which is a continuation of Ser. No. 655,755, Feb. 14, 1991, abandoned. This application Sep. 15, 1993, Ser. No. 121,795

Int. Cl.<sup>6</sup> B65D 17/52

U.S. Cl. 220—284

2 Claims



1. A plunger for attaching to a drum reseal cap having opposed ends comprising a handle at one end, resiliently mounted fingers at the end opposite the handle, a sliding cylinder for forcing the resiliently mounted fingers outwardly to engage the reseal cap for activating said reseal cap and catch means comprising a depending lip on the handle which engages an upwardly extending lip for retaining the resiliently mounted fingers in an outward position.

5,480,057

**BULK CONTAINER HAVING FLEXIBLE INNER CONTAINER AND RIGID OUTER CONTAINER**

Vincent Papaluca, Dandenong, Australia, assignor to Entapack Pty. Ltd, Dandenong, Australia

PCT No. PCT/AU92/00273, § 371 Date Dec. 27, 1993, § 102(e) Date Dec. 27, 1993, PCT Pub. No. WO93/00268, PCT Pub. Date Jan. 7, 1993

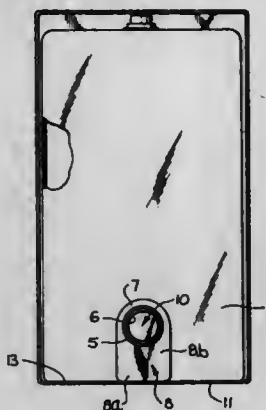
PCT Filed Jun. 11, 1992, Ser. No. 175,418

Claims priority, application Australia, Jun. 27, 1991, PK6925

Int. Cl.<sup>6</sup> B65D 90/04

U.S. Cl. 220—403

8 Claims



1. A bulk container including an inner collapsible container and an outer rigid container in which the inner collapsible container is housed, the rigid container including a bottom wall for supporting the collapsible container, a plurality of side walls to support the collapsible container when filled, and an outlet opening through one of the side walls,

said collapsible container being provided with an outlet spout adapted to extend through the outlet opening of the rigid container, an outlet flange joining said spout to said collapsible container, and a substantially rigid flange extension being an extension of said outlet flange and extending from a position adjacent said outlet opening to a position adjacent the junction of the side wall and the bottom wall of the rigid container to hold a portion of the flexible container into the corner of the rigid container beneath said outlet while the collapsible container is being filled, wherein the lower edge of the flange extension contacts the bottom wall of the rigid container.

5,480,058

**MULTI-PURPOSE FOLD-DOWN UTILITY TRAY**

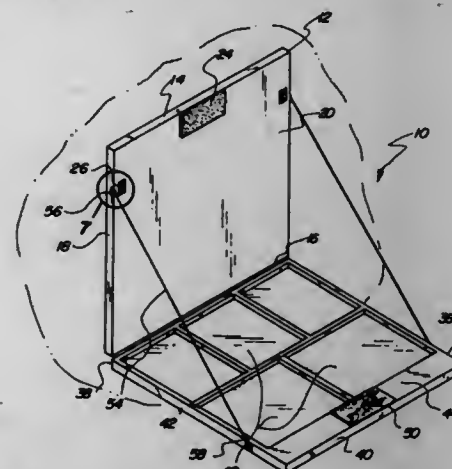
Robert D. Hutchins, R.D. #1, Box 1056, Vergennes, Vt. 05491

Filed Dec. 20, 1994, Ser. No. 360,165

Int. Cl.<sup>6</sup> A47B 5/04

U.S. Cl. 220—478

5 Claims



1. A new and improved multi-purpose fold-down utility tray for folding down to allow for a variety of purposes comprising, in combination:

a rectangular upper panel having an upper edge, a lower edge, two side edges, an interior surface, and an exterior surface, the interior surface having a hook and loop type fastener patch secured inwardly of the upper edge, the interior surface having a recess formed therein inwardly of each of the two side edges;

a plurality of adhesive strips secured to the exterior surface of the rectangular upper panel, the adhesive strips having removable protective covers thereon, the adhesive strips serving to secure the upper panel to a wall or flat surface;

a rectangular lower panel having an upper edge, a lower edge, two side edges, an interior surface, and an exterior surface, the upper edge hingedly secured to the lower edge of the upper panel, the interior surface having a plurality of recessed compartments formed therein, the interior surface having a hook and loop type fastener secured inwardly of the lower edge, the hook and loop type fastener cooperating with the hook and loop type fastener of the upper panel when the lower edge is folded upwardly to abut the upper edge of the upper panel in a closed configuration;

two cords, each of the two cords having a first end and a second end, each first end having a strap theresecured, each strap secured to the two side edges of the upper panel adjacent the recess formed inwardly thereof by a rivet, each second end having a strap theresecured, each strap secured to the two side edges of the lower panel by a rivet, the two cords serving to support the lower panel in a position perpendicular to the upper panel in an open configuration.

2. A new and improved multi-purpose fold-down utility tray for folding down to allow for a variety of purposes comprising, in combination:

an upper panel having a hook and loop type fastener patch secured thereon;

a plurality of adhesive strips secured to the upper panel, the adhesive strips serving to secure the upper panel to a wall or flat surface;

a lower panel hingedly secured to the upper panel, the lower panel having a plurality of recessed compartments formed therein, the lower panel having a hook and loop type fastener secured thereon, the hook and loop type fastener cooperating with the hook and loop type fastener of the upper panel in a closed configuration;

two cords, each of the two cords secured to the upper panel and secured to the lower panel, the two cords serving to support the lower panel in a position perpendicular to the upper panel in an open configuration.

5,480,059

Patent Not Issued For This Number

5,480,060

**SPACE SAVING SYSTEM FOR CORELESS ROLLED WIPERS**

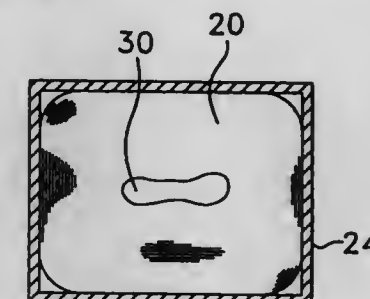
David A. Blythe, Philadelphia, Pa., assignor to Scott Paper Company, Delaware County, Pa.

Filed Aug. 8, 1994, Ser. No. 287,553

Int. Cl.<sup>6</sup> B65H 1/00

U.S. Cl. 221—63

7 Claims



1. A centerflow rolled wiper system comprising:

(a) a coreless rolled web having a centerflow hole, said coreless rolled web including a plurality of wipers defined by lines of perforation across the width of said web, each of said wipers having a length L;

(b) an initial center hole through said coreless rolled web having a cross-sectional perimetric dimension which is less than two times L, said coreless rolled web having been bi-directionally compressed to a generally rectangular cross section;

(c) a dispenser carton in which said bi-directionally compressed rolled web resides, said dispenser carton sized to maintain said generally rectangular cross section of said bi-directionally compressed rolled web;

(d) a dispensing port through at least one end of said dispenser carton through which a user can withdraw said wipers from the centerflow hole of said coreless rolled web.

5,480,061

**PORTABLE TABLETOP COOKIE DISPENSER**

Victor H. Ellinger, Mesa, Ariz., assignor to E & S Dispenser Company, Tempe, Ariz.

Filed Sep. 1, 1994, Ser. No. 299,272

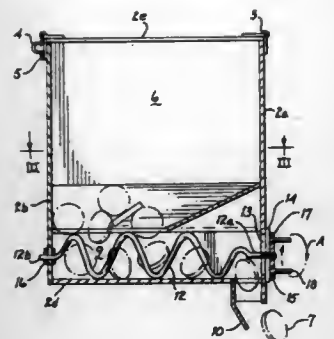
Int. Cl.<sup>6</sup> G07F 1/36

U.S. Cl. 221—75

15 Claims

1. A dispenser for discrete commodities comprising in combination a container having an outlet and defining a storage chamber





for the commodities; a screw conveyor in said chamber arranged to advance the commodities towards said outlet; means for driving said screw conveyor; and partitioning means in said chamber defining a trough which opens to said outlet, said screw conveyor being located in said trough, said trough having a section remote from said outlet, and said guide means being arranged to direct the commodities into said section.

5,480,062

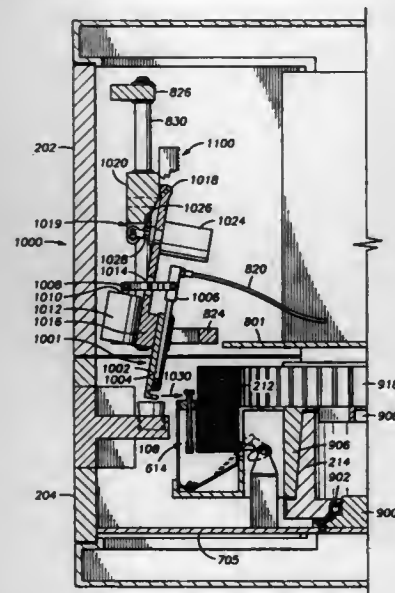
## VACUUM OPERATED MEDICINE DISPENSER

Lisa W. Rogers; Thomas L. Kraft; John F. Berry; Scott A. Kelley; John A. Thompson, III, all of Houston; Clifford D. Ober, Missouri City; Michael C. Kuchar, Houston; Robert R. Mayer, Jr., Sugar Land; Van W. Hoskins, Friendswood; Vincent C. Weido, Houston, and Mark G. Henckel, Katy, all of Tex., assignors to KVM Technologies, Inc., Houston, Tex. Division of Ser. No. 162,810, Dec. 6, 1993, Pat. No. 5,405,048, which is a continuation-in-part of Ser. No. 80,807, Jun. 22, 1993, abandoned. This application Jan. 30, 1995, Ser. No. 380,124

Int. Cl.<sup>6</sup> B65G 59/04; B65H 3/08; G07F 11/16

U.S. Cl. 221-174

5 Claims



1. An oral solids medicine storage apparatus for use in an automatic medicine dispensing machine, comprising:
  - a storage container including a floor configured to channel oral solids to a retrieval location within the storage container from which the solids can be retrieved;
  - a container probe having a probe tip, wherein the container probe is selectively advanceable into the storage container to permit the probe tip to contact an item of oral solids; and

a refill cartridge engageable with the storage container to permit one or more items of oral solids contained in the refill cartridge to be selectively advanced into the storage container for retrieval by the container probe.

5,480,063

## VOLUMETRIC FLUID DISPENSING APPARATUS

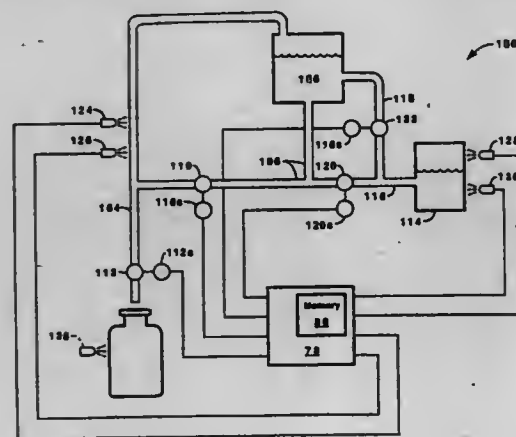
Denis E. Keyes, P.O. Box 507, Rocky Hill, N.J. 08553-0507; John R. Randall, Jr., 72 Stratford Dr., Freehold, N.J. 07728, and James V. Curcio, 113 New York Ave., South Plainfield, N.J. 07080

Continuation-in-part of Ser. No. 26,878, Mar. 5, 1993, abandoned. This application Apr. 11, 1994, Ser. No. 225,803

Int. Cl.<sup>6</sup> B67D 5/08

U.S. Cl. 222-64

8 Claims



1. An apparatus for dispensing a predetermined volume of fluid comprising:
  - (a) a closed-fluid chamber containing the fluid to be dispensed;
  - (b) a fill tube communicatively connected to the fluid chamber and forming a closed loop with the fluid chamber;
  - (c) a fill valve disposed in the closed circuit formed by the fill tube for controlling the flow of fluid from the fluid chamber into the fill tube;
  - (d) sensing means for detecting the level of the fluid in the fill tube; and
  - (e) a discharge valve for dispensing the contents of the fill tube; and
  - (f) an electronic controller responsive to said sensing means for selectively opening and closing the fill valve and the discharge valve to first transfer fluid from the fluid chamber to the fill tube and then to dispense a predetermined volume of fluid from the fill tube.

5,480,064

## DISPENSING SYRINGE FOR A FLUID GLUE

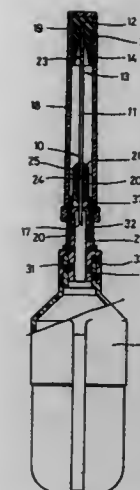
Yi-Tsung Yan, P.O. Box 96-405, Taipei, Taiwan, Prov. of China Filed Jan. 4, 1995, Ser. No. 368,325

Int. Cl.<sup>6</sup> B67D 5/00

U.S. Cl. 222-83

4 Claims

1. An improved dispensing syringe for a fluid glue comprising:
  - a syringe seat having a conic cylinder opening in one end thereof, and a contact surface and a guide hole in other end thereof; said contact surface and said guide hole being used for mounting a syringe stem to be glued in place with a glue;
  - said syringe stem, of which one end having a flat opening, and other end thereof having a bevel opening; said flat opening located on outer end of said syringe seat; having a given length between said flat opening and said syringe seat; a front end of said syringe stem having a curved surface for providing a cohesion after each dispensing of a glue made of



cyanoacrylate; said bevel opening located in center of said conic cylinder opening;

a syringe cap which being an elongate cylinder cap, having a sealing pad mounted in the inner bottom thereof; opening end of said syringe cap being mounted on outer end of said syringe seat;

said sealing pad made of a material not becoming polymerized with said glue of cyanoacrylate, and being fastened in inner bottom of said syringe cap; having a blind hole facing opening end of said syringe cap for closing said flat opening of said front end;

a guide sleeve having a cylindrical surface and a plurality of ribs, and a conic through-hole in center thereof; said conic through-hole having an end surface between outer end and said cylindrical surface; said ribs facilitating said guide sleeve fastened next to said sealing pad in said syringe cap.

5,480,065

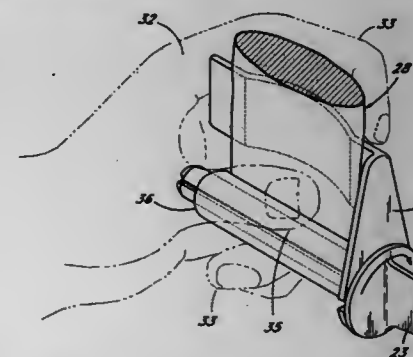
## DEVICE FOR DISPENSING THE CONTENTS OF COLLAPSIBLE TUBE

Ronald J. Powers, 550 E. Third St. #B, Oxnard, Calif. 93030 Filed Mar. 6, 1995, Ser. No. 398,788

Int. Cl.<sup>6</sup> B65D 35/32

U.S. Cl. 222-99

6 Claims



1. A device for dispensing the contents of a collapsible tube comprising:
  - a turn key and tube support member having a bearing support plate with a bearing supported thereby, said bearing having a horizontal central axis, said bearing support plate having a turn key face and a handle face, said bearing support plate extending upwardly from said bearing to a tube support plate which extends generally parallel to said central axis of said bearing outwardly from said turn key face of said bearing support plate, said tube support plate having a tube contact face, an upper edge, a lower edge and a back face and wherein the lower edge of said tube contact face is above said slotted

arm when said tube contact face is vertical and the upper edge of said tube support plate is above the slotted arm and wherein said tube contact face is curved to partially surround a tube placed in the device; and

an exposed turn key rotatably held by said bearing support plate in the bearing therein about the central axis of the bearing, said turn key having a hollow, slotted arm extending outwardly from said turn key face of said bearing support plate, said turn key having a handle extending outwardly from said turn key in a direction away from the handle face of said bearing support plate, said slotted arm including a tube base supporting slot and said slotted arm being exposed to a user's touch when the slotted arm is supported in the bearing and when a tube is wrapped around the slotted arm, an exterior of a portion of the tube, which is wrapped around the hollow slotted arm, is exposed to a user's touch, whereby when a tube base is inserted into said tube base supporting slot and the handle turned and the back face of the tube support plate is held to resist the turning of the handle, the tube is rolled around the turn key and the tube rests against the tube contact face and any contents of the tube are forced out of the top thereof.

5,480,066

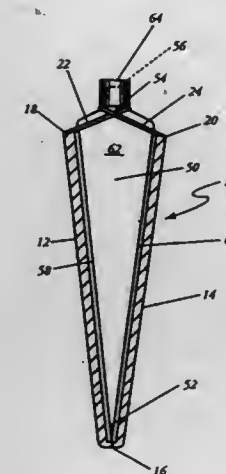
## DEVICE FOR DISPENSING MATERIAL FROM A TUBE

Kurt E. Blum, 907 E. Burton St., Murfreesboro, Tenn. 37129 Filed Jul. 20, 1994, Ser. No. 278,050

Int. Cl.<sup>6</sup> B65D 35/28

U.S. Cl. 222-103

9 Claims



1. A device for dispensing material from a squeeze tube, said squeeze tube having an opened end, a closed end, a spout proximate said closed end, a first side, a second side, and a cap, said device comprising:
  - a first plate;
  - a second plate;
  - a live hinge joining said first plate to said second plate, said first plate, said second plate, and said live hinge integrally molded from a resilient material, said first plate and said second plate approximately equal in length to said first side and said second side;
  - a first elastomeric band attached to said first plate for receiving said spout between said cap and said opened end; and
  - a second elastomeric band attached to said second plate for receiving said spout between said cap and said opened end.



5,480,067

## COMPOSITE FOIL HOSE-SHAPED BAG

Andreas Sedlmeler, Ummendorf, Germany, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

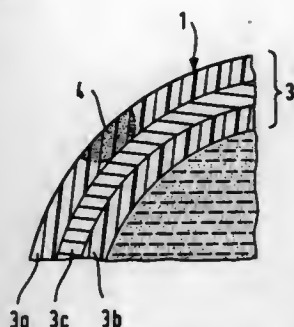
Filed Apr. 14, 1994, Ser. No. 227,416

Claims priority, application Germany, Apr. 14, 1993, 43 12 192.6

Int. Cl.<sup>6</sup> B65D 35/08

U.S. Cl. 222—107

5 Claims



1. A hose-shaped bag (1) is formed of a composite foil (3) including a metal foil (3c) and at least one outer plastic foil (3a) located on an outer surface of the metal foil (3c), wherein the improvement comprises a weakened location (4) of reduced mechanical strength produced by a thermal effect and forming a rated failure location for said bag, the weakened location being formed only in said outer plastic foil (3a) and terminating at the outer surface of the metal foil (3c).

5,480,068

## SECURED DISPOSABLE LIQUID SOAP DISPENSER

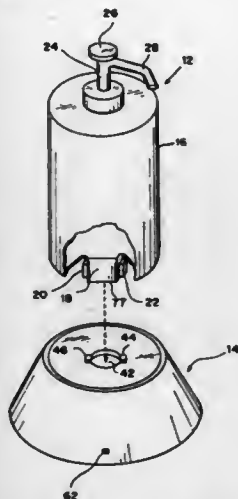
Alan D. Frazier, West Chester, and Richard P. Lewis, Oaks Meeting, both of Pa., assignors to Scott Paper Company, Delaware County, Pa.

Division of Ser. No. 31,116, Mar. 12, 1993, Pat. No. 5,350,087, which is a division of Ser. No. 661,273, Feb. 26, 1991, Pat. No. 5,240,147. This application Jun. 27, 1994, Ser. No. 265,830

Int. Cl.<sup>6</sup> B67D 5/64

U.S. Cl. 222—153.03

7 Claims



1. A countertop mounted fluid dispensing system comprising: a base unit adapted to be affixed to a countertop, said base unit including a locking means and at least one lug orifice; said base unit further comprising an upper base section having a top wall with said lug orifice therethrough; slide members affixed within said upper base section; a lower base section including a top plate; and track means mounted to said top plate of said lower base section for slidably engaging slide members so that said upper

base section is moveable from an aligned position with said lower base section to an unaligned position with said lower base section; and

a fluid dispenser including a bottle and a lug extending from said bottle, said lug adapted to be received in said lug orifice and engaged by said locking means.

5,480,069

## AEROSOL DISPENSING DEVICE

Michael Barney, Leeds; Terry J. Holmes, South Wirral; David Moore, Leicester, and Anthony C. Wass, Stamford, all of, United Kingdom, assignors to Chesebrough-Pond's USA Co., Greenwich, Conn.

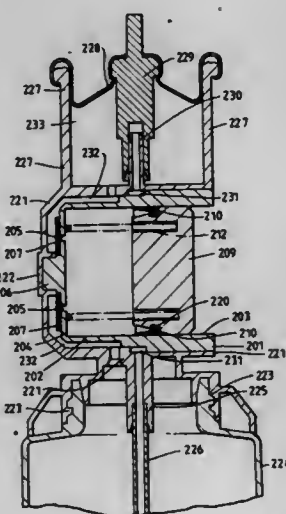
Filed Jul. 14, 1994, Ser. No. 275,209

Claims priority, application United Kingdom, Jul. 23, 1993, 9315299; Jul. 23, 1993, 9315307

Int. Cl.<sup>6</sup> B67D 5/54

U.S. Cl. 222—401

7 Claims



7. An aerosol device for dispensing of a pressured liquid as an aerosol without use of a pre-dosed propellant, comprising:

- (i) a container for storing the pressured liquid to be dispensed;
- (ii) a valve assembly arranged along a central axis of said device including a spray button head through which the pressured liquid may be dispensed, the valve assembly communicating with and being downstream from the container;
- (iii) a casing interposed between the valve assembly and the container;
- (iv) a fluid feed projection for conducting the pressured liquid from the container downstream to the valve assembly, the fluid feed projection being fitted on an upper open end of the container; and

- (v) a pump assembly arranged along a longitudinal axis down a length thereof, the longitudinal axis not being coaxial with the central axis of the valve assembly, the pump assembly at least partially being surrounded by the casing and capable of introducing atmospheric air into the container to generate a positive pressure therein, the pump assembly comprising: a pressure chamber defined by a generally open end, a generally closed end, an inner surface and an outer surface; means for attaching the pump assembly to the container; a piston located in the pressure chamber; and at least one one-way valve located at the generally closed end of the pressure chamber and having at least one hole releasably sealed by at least one elastically deformable member located on the outer surface of the pressure chamber, the at least one one-way valve arranged above the container storing the pressured liquid.

5,480,070

## CONVEYING ARRANGEMENT FOR THE DOSED CONVEYANCE OF BULK MATERIAL

Felix Wallner, Linz; Leopold W. Keppinger, Leonding, and Christian Bohm, Wels, all of, Austria, assignors to Deutsche Voest-Alpine Industrieanlagenbau GmbH, Dusseldorf, Germany

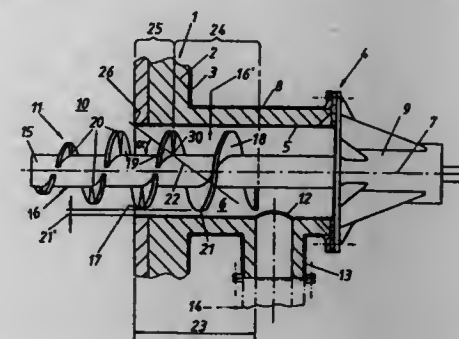
Filed Jul. 7, 1993, Ser. No. 88,313

Claims priority, application Austria, Jul. 7, 1992, 1388/92

Int. Cl.<sup>6</sup> G01F 11/20

U.S. Cl. 222—413

20 Claims



1. A conveying arrangement for dosed conveyance of bulk material from a vessel, the conveying arrangement comprising:

- a conveying channel having an entry opening and a discharge opening; and
- a conveyor worm, rotatably disposed and extending within said conveying channel from at least said entry opening to said discharge opening, said conveyor worm including: a first flight means formed by a plurality of paddles and being arranged for extending into an interior of the vessel for conveying the bulk material from the lesser into said conveying channel; and a second flight means downstream of said first flight means for preventing the bulk material from flowing through said discharge opening when said conveyor worm is not rotating, and said second flight means being formed by a continuous helix extending along said conveyor worm by at least one half of a convolution and at most two convolutions wherein said first flight means formed by said plurality of paddles has a first external diameter and said second flight means formed by said continuous helix has a second external diameter, said second external diameter being larger than said first external diameter.

5,480,071

## MEASURING DEVICE FOR POWDER PRODUCTS

Evans Santagiuliana, Vicenza, Italy, assignor to Taplast Srl, Povolara Dueville (VI), Italy

Filed Jul. 25, 1994, Ser. No. 244,776

Claims priority, application Italy, Feb. 14, 1992, VI92A0021

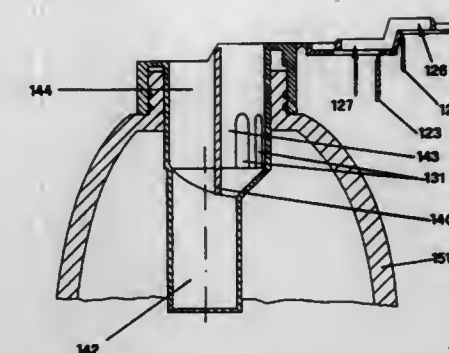
Int. Cl.<sup>6</sup> G01F 11/26

U.S. Cl. 222—455

10 Claims

1. A measuring/dispensing device for granular or powder products comprising:

- a tubular body having a first part, adapted to be inserted in the neck of a product container, and a second part, external and coaxial with the first part, provided with elements for connecting it rigidly with the neck of said container;
- a cap, connected with the tubular body through a first hinge which closes with a snap on the rim of the tubular body, a lid connected with said cap through a second hinge and adapted to be opened by rotation about said second hinge, and said tubular body having in its interior at least one diaphragm dividing the inner volume and defining a measuring chamber, communicating with the interior of said container close to an end of said diaphragm, and a collecting chamber being connected with a dispensing duct arranged in a top section in



correspondence with the cap and communicating with the outside environment; wherein said lid includes a first lid portion communicating through a first opening with the dispensing duct and a second lid portion communicating through a second opening with the measuring chamber.

5,480,072

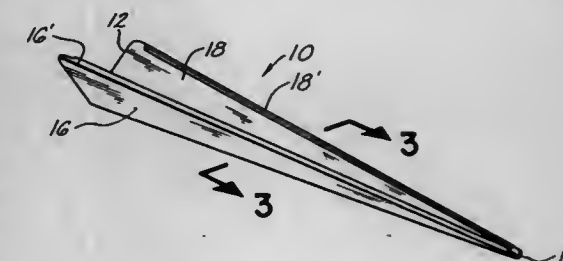
## FLUID POURING GUIDE

Robert L. Ripley, P.O. Box 219, Glenco, Okla. 74058  
Continuation-in-part of Ser. No. 122,282, Oct. 18, 1993, abandoned. This application May 11, 1994, Ser. No. 241,435

Int. Cl.<sup>6</sup> B65D 5/74

U.S. Cl. 222—460

6 Claims



1. As a new article of manufacture, a length of sheet material having opposite marginal side edges converging toward one end edge and having its opposite side portions folded toward each other along its longitudinal axis in upwardly divergent cooperating wall relation in defining an open end trough-like pouring guide, each marginal side edge being provided with a substantially coextensive stiffening member projecting laterally of the respective wall and facing the stiffening member on the opposite wall.

5,480,073

## CAP HOLDER APPARATUS

Frank A. LaManna, 21 Rockmeadow Rd., Norwalk, Conn. 06850

Filed Jul. 5, 1994, Ser. No. 270,595

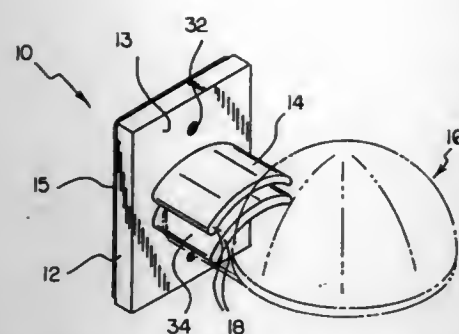
Int. Cl.<sup>6</sup> A41H 43/00; D06C 15/00; A47F 7/06; B65D 85/02

U.S. Cl. 223—1

6 Claims

1. A cap holder apparatus, comprising: a base assembly adapted to be attached to a support surface, said base assembly including a top surface and a bottom surface, a plurality of concentric clamp members in the form of portions of walls of a cylinder projecting from said top surface of said base assembly, each of said clamp members including an accurate contour for clamping therebetween a complementary accurate contour on a head covering or cap, said clamp members arrayed on said base assembly such that free ends of said clamp members are concentric to each other, wherein said clamp members are resilient and project from said base assembly such that said free ends of said clamp members converge toward each other, and





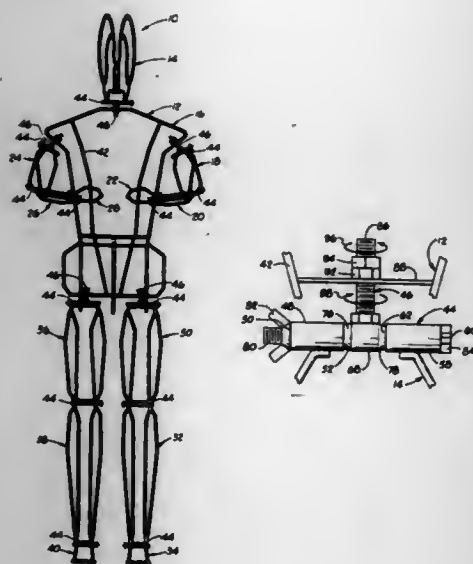
attaching means for attaching said base assembly to a support surface.

# 5,480,074 MANNEQUIN

Daron D. Duncan, and Patricia R. Duncan, both of 1812 Birch, Duncan, Okla. 73533

Filed Feb. 12, 1993, Ser. No. 17,066

Int. Cl.<sup>6</sup> D06C 15/00; A41H 5/00; E05C 17/64; F16C 11/00  
U.S. Cl. 223-66 12 Claims



12. A mannequin comprising:

- a head section;
- a torso section;
- a hinge assembly connected to the torso section and having a rotational assembly connected to the head section, the hinge assembly permitting hinged movements of the head section relative to the torso section and the rotational assembly portion of the hinge assembly permitting rotational movement of the head section relative to the torso section;
- a left upper arm section;
- a hinge assembly including a rotational assembly with the hinge assembly being connected to the left upper arm section and the rotational assembly being connected to the torso section, the hinge assembly permitting hinged movement of the left upper arm section relative to the torso section and the rotational assembly permitting rotational movement of the left upper arm section relative to the torso section;
- a left lower arm section;
- a hinge assembly connected to the left lower arm section and connected to the left upper arm section for permitting hinged movement of the left lower arm section relative to the left upper arm section;
- a left hand section;

- a hinge assembly including a rotational assembly with the hinge assembly being connected to the left lower arm section and the rotational assembly being connected to the hand section, the hinge assembly permitting rotational movement of the left hand section relative to the left lower arm section and the rotational assembly permitting rotational movement of the left hand section relative to the left lower arm section;
- a right upper arm section;
- a hinge assembly including a rotational assembly with the hinge assembly being connected to the right upper arm section and the rotational assembly being connected to the torso section, the hinge assembly permitting hinged movement of the right upper arm section relative to the torso section and the rotational assembly permitting rotational movement of the right upper arm section relative to the torso section;
- a right lower arm section;
- a hinge assembly connected to the right lower arm section and connected to the right upper arm section for permitting hinged movement of the right lower arm section relative to the right upper arm section;
- a right hand section;
- a hinge assembly including a rotational assembly with the hinge assembly being connected to the right lower arm section and the rotational assembly being connected to the hand section, the hinge assembly permitting rotational movement of the right hand section relative to the right lower arm section and the rotational assembly permitting rotational movement of the right hand section relative to the right lower arm section;
- a left upper leg section;
- a hinge assembly including a rotational assembly with the hinge assembly being connected to the left lower leg section and the rotational assembly being connected to the torso section, the hinge assembly permitting hinged movement of the left upper leg relative to the torso and the rotational assembly permitting rotational movement of the left upper leg section relative to the torso section;
- a left lower leg section;
- a hinge assembly connected to the left lower leg section and connected to the left upper leg section for permitting hinged movement of the left lower leg section relative to the left upper leg section;
- a left foot section;
- a hinged assembly connected to the left foot section and connected to the left lower leg section for permitting hinged movement of the left foot section relative to the left lower leg section;
- a right upper leg section;
- a hinge assembly including a rotational assembly with the hinge assembly being connected to the right lower leg section and the rotational assembly being connected to the torso section, the hinge assembly permitting hinged movement of the right upper leg relative to the torso and the rotational assembly permitting rotational movement of the right upper leg section relative to the torso section;
- a right lower leg section;
- a hinge assembly connected to the right lower leg section and connected to the right upper leg section for permitting hinged movement of the right lower leg section relative to the right upper leg section;
- a right foot section;
- a hinged assembly connected to the right foot section and connected to the right lower leg section for permitting hinged movement of the right foot section relative to the right lower leg section; and
- wherein the hinge assembly connected to the torso section and the head section further comprises a rotational assembly with the rotational assembly being connected to the head section for permitting rotational movement of the head section relative to the torso section; and wherein the hinge assembly connected between the left upper arm section and the torso section further comprises a rotational assembly connected to the torso section for permitting rotational movement of the left upper arm section relative to the torso section; and wherein the hinge assembly connected to the left lower arm section and the hand section further comprises a rotational

assembly connected to the left hand section for permitting rotational movement of the left hand section relative to the left lower arm section; and wherein the hinge assembly connecting the right upper arm section to the torso section further comprises a rotational assembly connected to the torso section for permitting rotational movement of the left upper arm section relative to the torso section; and wherein the hinge assembly connected to the right lower arm section and the hand section further comprises a rotational assembly connected to the right hand section for permitting rotational movement of the right hand section relative to the right lower arm section; and wherein the hinge assembly connected to the left upper leg section and the torso section further comprises a rotational assembly connected to the torso section for permitting rotational movement of the left upper leg section relative to the torso section; and wherein the hinge assembly connected between the torso section and the right upper leg section further comprises a rotational assembly connected to the torso section for permitting rotational movement of the right upper leg section relative to the torso section, and

wherein each hinge assembly:

hinge member means having a hinge opening through a portion thereof; and

a hinge pin extending through the hinge opening in the hinge member means with a head means disposed on one end of the hinge pin engaging an end of the hinge member means and a nut means disposed on the opposite end of the hinge pin, one of the body sections being connected to one portion of the hinge member means and one other body section being connected to another portion of the hinge member means whereby at least a portion of the hinge member means and the body section connected thereto are hingedly rotatable about the hinge pin, the nut means being tightenable for increasing the friction between the hinge member means for substantially preventing rotation of the hinge member means.

# 5,480,075

## HANGER FOR WESTSUITS AND DIVING ACCESSORIES

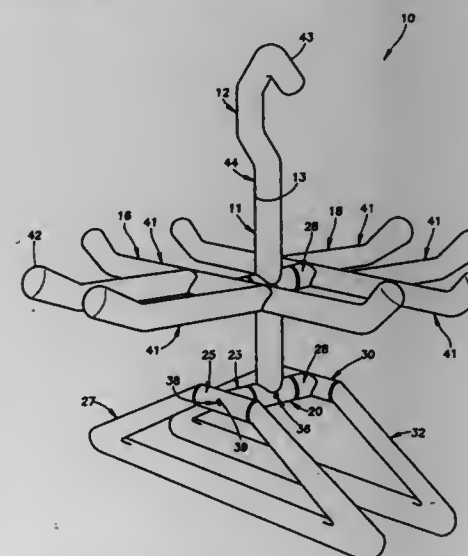
Clegg G. Robinson, 1423 El Capitan, Napa, Calif. 94558

Filed Dec. 5, 1994, Ser. No. 349,330

Int. Cl.<sup>6</sup> A41D 27/22; A47F 5/08

U.S. Cl. 223-88

7 Claims



1. A wet gear hanger comprising:

- (a) a vertical support member;
- (b) a hook support member connected to an end of the vertical support member;
- (c) an upper swivel member housing connected to the vertical support member;

# 5,480,076

## CLOTHES HANGER WITH RETRACTABLE ARMS

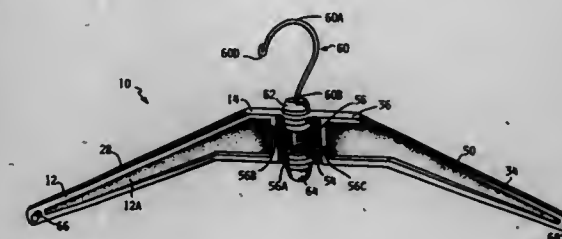
Kenneth D. Siegel, 2017 Curtis Ave., #B, Redondo Beach, Calif. 90278, and Scott O. Ganaja, 1213 W. Newport St., San Luis Obispo, Calif. 93405

Filed Mar. 27, 1995, Ser. No. 411,087

Int. Cl.<sup>6</sup> A41D 27/22; F16C 11/00; E05F 1/08

U.S. Cl. 223-94

24 Claims



24. A clothes hanger having retractable arms comprising:

- a) a first garment support arm having a first engagement end further having a pair of hook bores therethrough,
- b) a second garment support arm having a second engagement end further having a pair of hook bores therethrough, where when said first and second engagement ends swivelly intermesh, the hook bores are in alignment and a spring slot is formed,
- c) a hinge spring having a coil that is inserted into the spring slot, where said spring normally biases the first and second garment support arms in an extended garment holding position,
- d) a hanger support hook secured by push nuts that when inserted through the hook bores and the spring slot on said first and second engagement ends, rotatably secures and allows the first and second support arms to remain in their extended position or to be placed in a retracted position and,
- e) means for securing and positioning said hanger support hook on said first and second engagement ends.



5,480,077

**DOUBLE THUMB STRAP FOR PISTOL HOLSTER**

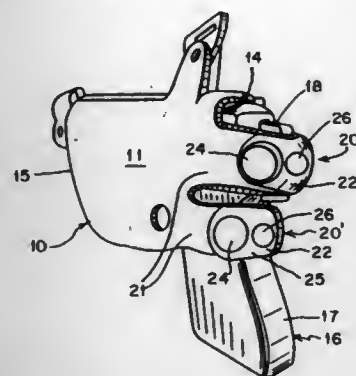
Christian Eng, 402 Daub Ave., Hewlett, N.Y. 11557

Filed Jul. 18, 1994, Ser. No. 276,454

Int. Cl.<sup>6</sup> F41C 33/02

U.S. Cl. 224-243

3 Claims



1. An automatic pistol holster comprising a hollow holster body having an inner wall and an outer wall defining a front muzzle end and a rear access opening into which, and from which, an automatic pistol having a muzzle end and a butt end, the latter of which has a hammer and a neck adjacent said hammer is adapted to be inserted and removed, respectively, with the muzzle end of the pistol disposed adjacent to said front muzzle end and the butt end of the pistol disposed adjacent to said rear access opening when said pistol is fully inserted in said holster body; and means for releasably securing the pistol in said holster body, said means including at least two pair of thumb straps, each pair comprising a first strap secured at a first end to said inner wall and a second strap secured at a first end to said outer wall, said first and second straps each having second ends having cooperating fastening means for releasably securing said second ends together, one of said pairs of said straps being positioned to be receivable over the butt end of the pistol adjacent to the hammer and the other of said pairs of said straps being positioned to be receivable over the neck thereof when said pistol is fully inserted into said holster body.

5,480,078

**GOLF BAG CART DETACHABLE ACCESSORY CARRIER**

Steven M. Verrette, and Christopher C. Bean, both of Los Alamitos, Calif., assignors to C &amp; S Industries, Los Alamitos, Calif.

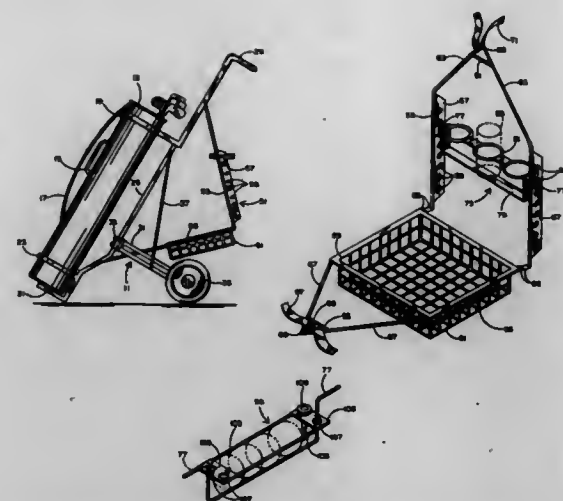
Filed Aug. 30, 1993, Ser. No. 115,477

Int. Cl.<sup>6</sup> B62B 1/16; B60R 9/08

U.S. Cl. 224-274

2 Claims

1. A utility carrier for a golf bag cart comprising: a generally vertical portion having an upper end and a lower end; a generally horizontal portion having a first end connected to said lower end of said generally vertical portion and a second end; attachment means for suspendably attaching said upper end of said generally vertical portion and said second end of said generally horizontal portion to a golf bag cart; article support means, supported by said generally horizontal portion, for supporting articles to be carried; suspension means supported by said generally vertical portion for carrying accessories and wherein said suspension means further comprises a pair of spaced apart flanges each having a plurality of apertures, the apertures on one of said pair of flanges equal in height to the apertures on the other of said pair of flanges;



- at least one accessory to be supported by a pair of equal height apertures of said spaced apart flanges, said accessory further comprising: a support structure further comprising: a pair of rods horizontally extending from said support structure and having ends engageable with said pair of equal height apertures of said flanges; a pair of spaced apart side arms having ends extending between positions adjacent said ends of said rods; a pair of plates, connecting the ends of said pair of side arms, each said plate spanning the space between said apart side arms adjacent the ends of said side arms, said rods being continuous with respect to each other and extending below the ends of said side arms; and wherein said pair of spaced apart side arms are spaced apart sufficiently from each other and from said continuous extent of said rods to support a plurality of golf balls.

5,480,079

**ATTACHABLE CONTAINER PARTICULARLY SUITED FOR AMBULATORY AIDS**

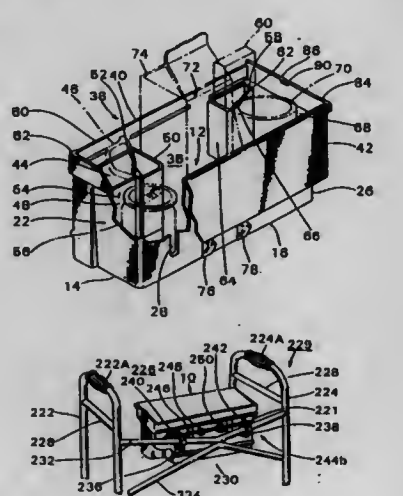
Karl J. Douglass, 3730 Dogwood La., Doylestown, Pa. 18901

Filed Sep. 23, 1993, Ser. No. 125,630

Int. Cl.<sup>6</sup> B60R 11/00

U.S. Cl. 224-551

29 Claims



1. An article carrying container adapted for mounting upon a support apparatus, comprising: a bottom wall having a first edge, a second edge, a third edge and a fourth edge;

- a first wall extending generally perpendicularly from said first edge of said bottom wall;  
a second wall extending generally perpendicularly from said second edge of said bottom wall;  
a third wall extending generally perpendicularly from said third edge of said bottom wall, said third wall including a first retainer member positioned on an interior surface of said third wall;  
a fourth wall extending generally perpendicularly from said fourth edge of said bottom wall, said bottom wall, said first wall, said second wall, said third wall and said fourth wall defining an interior portion of said container for receiving at least one article therein, said fourth wall including a mounting member for mounting said container upon said support apparatus; and  
a first compartment located in said interior portion of said container for receiving a first article therein, said first compartment comprising a fifth wall and a sixth wall, said fifth wall extending generally parallel to said third wall and including a first protrusion spaced from said first wall and positioned generally opposite said first retainer member of said third wall of said container, said sixth wall extending between said fifth wall and said fourth wall, a portion of said fifth wall, a portion of said first wall, a first portion of said third wall and a first portion of said bottom wall of said container defining a second compartment therebetween for receiving a second article therein, said first retainer member of said third wall of said container and said first protrusion of said fifth wall cooperating to secure said second article in said second compartment.

5,480,080

**METHOD AND APPARATUS FOR CUTTING DECORATIVE GIFT-WRAP PAPER**

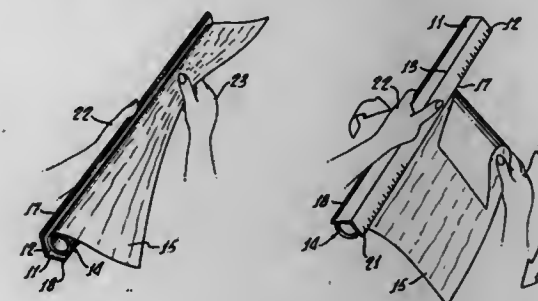
Lee T. Ferguson, 7148 Lantana Ter., Carlsbad, Calif. 92009

Filed Jul. 8, 1994, Ser. No. 272,676

Int. Cl.<sup>6</sup> B26F 3/02

U.S. Cl. 225-1

6 Claims



1. A method of cutting a straight-sided piece of gift-wrap paper from a conventional roll thereof, said conventional roll of paper being generally about 30 inches long and about 2 inches in diameter, said roll having a cylindrical tubular core, said method comprising providing an elongate open-topped upwardly-concave cradle element the length of which is at least about equal to the length of said roll, said element having opposed edges that are spaced from each other a substantial distance, one of said opposed edges being a cutting edge, employing the left hand of a normal-size adult person to hold said cylindrical cutting element with the concave upper side thereof facing generally upwardly, disposing in said cradle element said conventional roll of gift-wrap paper, causing the orientation of said roll relative to that of said element to be such that the free end of the gift-wrap paper in said roll is on the side of said element that is adjacent said cutting edge, employing the right hand of said person to pull generally upwardly on said free end to thereby cause gift-wrap paper to be fed from said roll and to cause said roll to rotate freely in said element, employing said left hand to simultaneously grasp said roll and said element to clamp said roll against said element and prevent further rotation of

said roll, employing said left hand to turn said element upside down so that said roll faces downwardly from said element, and said roll and said element are held in said left hand, and employing said right hand to pull upwardly on said free end in such manner that said paper is pulled against said cutting edge and is cut thereby in a straight line.

5,480,081

**SCORING AND BREAKING DEVICE WITH A CARRYING CASE THEREFOR**

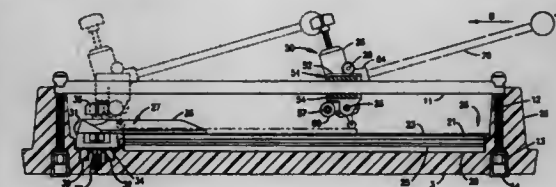
Kevin R. Wilson, Blue Springs, Mo., and Mitchell H. Babkes, Wichita, Kans., assignors to Diamant Boart, Inc., Kansas City, Mo.

Filed Sep. 24, 1993, Ser. No. 126,355

Int. Cl.<sup>6</sup> B28D 1/24

U.S. Cl. 225-96.5

33 Claims



31. An apparatus for scoring a tile along a scoring path, said apparatus comprising: a base for holding said tile during a scoring operation; a scoring assembly; and support means for slidably mounting said scoring assembly to said base, said scoring assembly including: a center head, pivotally mounted to said support means to rotate to and from a scoring position, for scoring said tile along said scoring path, and abutment means, rigidly mounted to said support means, for abutting against said center head to maintain said center head at a constant scoring distance from said base throughout said scoring operation.

5,480,082

**TILE CUTTER**

Masaki Yasuga, Osaka, Japan, assignor to Sankeibutusan Co., Ltd., Osaka, Japan

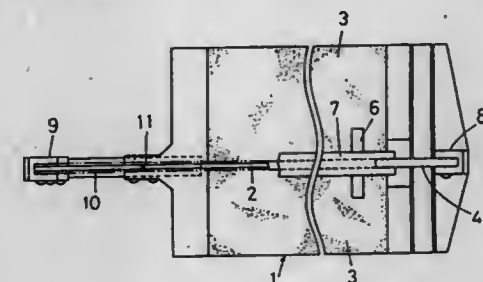
Filed Jul. 26, 1994, Ser. No. 280,439

Claims priority, application Japan, Aug. 5, 1993, 5-194521

Int. Cl.<sup>6</sup> B28D 1/24

U.S. Cl. 225-96.5

7 Claims



6. A tile cutter comprising: a base body extending in a longitudinal direction; a replaceable ridge attached to said base body and extending at a generally center position of said base body in the longitudinal direction; a guide rail erected over said ridge and extending in the longitudinal direction from a first end to a second end; and a stationary post erected integrally with said base body and fixing the first end of said guide rail;



a detachable post separated from said base body, fixing the second end of said guide rail and attached to said ridge; and a tile cutting lever supported slidably on said guide rail and having a cutter.

5,480,083

# DEVICE FOR SEPARATING PERFORATED SECTIONS OF A TUBULAR WEB

Fritz Achelpohl, Llenen, Germany, assignor to Windmüller & Höscher, Lengerich, Germany

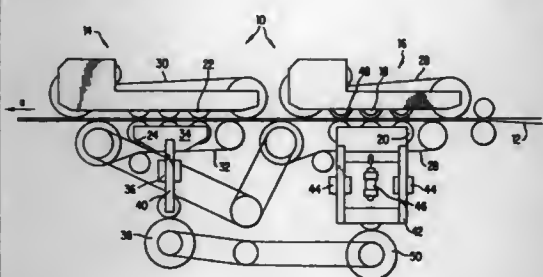
Filed Dec. 13, 1993, Ser. No. 165,806

Claims priority, application Germany, Dec. 18, 1992, 42 43 105.0

Int. Cl.<sup>6</sup> B26F 3/02

U.S. Cl. 225—100

4 Claims



1. A device for separating sections of a perforated tubular web, comprising a pulling mechanism and a tearing mechanism, each said mechanism comprising horizontal rollers on each of opposite sides of a perforated tubular section to be separated from the web and continuous conveyor belts running over the rollers on each of the opposite sides of each said mechanism, the rollers of one of the sides of the tearing mechanism being movable toward the tubular web using a control element, the pulling mechanism further comprising a control element for moving the rollers of one of the sides of the pulling mechanism in a direction perpendicular to the tubular web for increasing pressure on the tubular web in said direction perpendicular to the tubular web, the control element of the pulling mechanism being synchronized with the control element of the tearing mechanism, wherein rotational axes of opposing rollers of at least one of at least one of the pulling mechanism and the tearing mechanism are disposed vertically above one another and wherein rubber rings are provided around a circumference of at least some of the rollers of the at least one mechanism.

5,480,084

# DISPENSING RACK

Mark E. Daniels, Redondo Beach, Calif., assignor to The Advantage Group, Inc., Redondo Beach, Calif.

Filed Nov. 23, 1993, Ser. No. 156,017

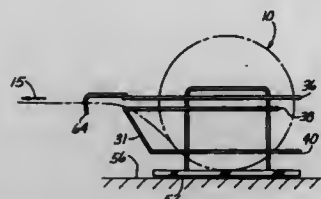
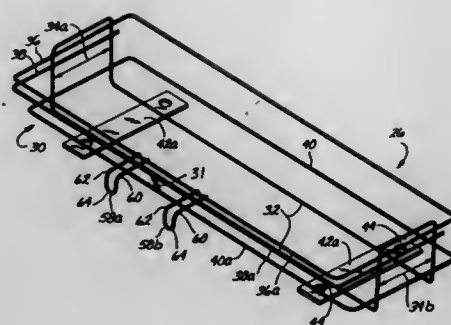
Int. Cl.<sup>6</sup> B26F 3/02

U.S. Cl. 225—106

16 Claims

16. A rack for separately dispensing rectangular bags from a roll of such bags, each bag being attached to adjacent bags along a rupturable transverse line by which each bag is separated from its ensuing bag on the roll upon the application of a predetermined quantum of force applied in a first direction to the first of the bags being unrolled when its next ensuing bag is restrained from movement in said first direction; said first direction being radially, away from said roll; said rack comprising:

a rectangular cradle of such length and width dimensions as to accommodate the roll of bags and to permit the roll to be rotated in said cradle about an axis parallel to the sides of the cradle, said cradle having bottom support means lying in a first plane on which the roll of bags is placed and supported, and a rectangular perimeter support to retain the roll on the bottom support means, said perimeter support having a pair of ends connected together by a forward side element and a rear side element, said perimeter support being disposed at least partially in a second plane above and parallel to the first plane



to encompass at least a portion of the roll of bags; means to secure the rectangular cradle to a supporting planar surface; said cradle further including a rectilinear member disposed in a third plane above and spaced from the second plane, said rectilinear element being supported parallel to the forward side element of said perimeter support;

a pair of parallel snagging elements spaced apart from each other and attached to and disposed to extend laterally outwardly from the forward side of the rectilinear element, each of said snagging elements including a first section disposed to extend outwardly from and normal to said rectilinear element, and a second section disposed to extend from said first section in a direction angled transversely to the first section to extend at least partially across the spacing between the second and third planes for a predetermined distance, said second section terminating in a rounded end,

whereby, when the first bag of the roll is passed between the forward sides of the rectangular perimeter support and the rectilinear element spaced therefrom, and is pulled therebetween in the first direction, the first bag and its next ensuing bag will unroll and pass over the rounded ends of the second section of the snagging elements until the rupturable transverse line separating the first bag from the ensuing bag reaches said rounded ends of the second sections of the snagging elements, whereupon said rounded ends will puncture said rupturable line and restrain continued movement of the ensuing bag, so that further pulling of the first bag in the first direction results in detachment of the first bag from the ensuing bag along said rupturable transverse line; and further withdrawal of the ensuing bag is accomplished by grasping its edge between the snagging elements, pulling it initially over said rounded ends of the snagging elements, and thereafter further pulling it in the first direction.

5,480,085

# METHOD AND APPARATUS FOR CONTROLLING TENSION BETWEEN VARIABLE SPEED DRIVER ROLLERS

Elliot S. Smithe, Hollidaysburg; Michael P. Lambert, and Jason H. Wilkinson, both of Altoona, all of Pa., assignors to F. L. Smithe Machine Company, Inc., Duncansville, Pa.

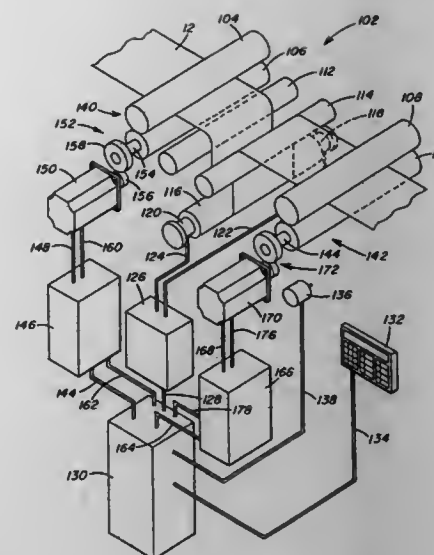
Continuation-in-part of Ser. No. 775,336, Oct. 11, 1991, Pat. No. 5,241,884. This application Sep. 3, 1993, Ser. No. 116,359

Int. Cl.<sup>6</sup> B23Q 15/00

U.S. Cl. 226—44

10 Claims

1. Apparatus for controlling the tension in a web advancing in a feed path comprising, a machine frame supporting the web for movement in the feed path, a first pair of pull rolls rotatably supported in said machine frame for engaging the web,



a first drive means for rotating said first pair of pull rolls to advance the web in the feed path, a second pair of pull rolls rotatably supported in spaced relation to said first pair of pull rolls in said machine frame for engaging the web in a tension zone of the web extending between said first and second pair of pull rolls,

second drive means for rotating said second pair of pull rolls to apply tension on the web between said first and second drive means,

a motion controller electrically connected to transmit and receive signals to and from said first and second drive means for adjusting the relative rotation of said first and second pairs of pull rolls upstream and downstream of the tension zone to generate a preselected feed rate of the web and a preselected tension in the web,

means for sensing the tension applied to the web in the tension zone between said first and second drive means and generating to said motor controller an input signal representative of the tension,

operator means electrically connected to said motion controller for transmitting an input signal to said motion controller corresponding to an operator selected tension to be applied to the web in the tension zone between said first and second drive means, and

said motion controller being responsive to the input signal received from said operator means to compare the input signals received from said sensing means with the input signal received from said operator means to generate an output signal to a selected one of said first and second drive means to rotate a selected one of said first and second pull rolls at a preselected rate so that the tension applied to the web corresponds to the operator selected tension.

5,480,086

# NON-CONTACT WEB CONVEYING APPARATUS

Hiroshi Nakashima, and Sanhiro Fukuhara, both of Kana-gawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kana-gawa, Japan

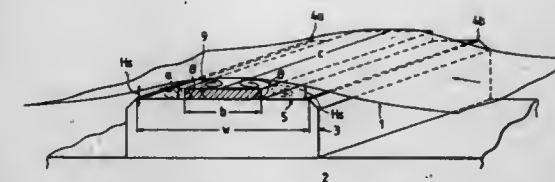
Continuation of Ser. No. 229,103, Apr. 18, 1994, abandoned, which is a continuation of Ser. No. 814,068, Dec. 24, 1991, abandoned, which is a continuation of Ser. No. 633,206, Dec. 31, 1990, abandoned, which is a continuation of Ser. No. 408,349, Sep. 18, 1989, abandoned. This application May 18, 1995, Ser. No. 443,677

Claims priority, application Japan, Sep. 19, 1988, 63-232592 Int. Cl.<sup>6</sup> B65H 20/00

U.S. Cl. 226—97

7 Claims

1. In a non-contact web conveying apparatus comprising: at least two static pressure support type air blowing boxes arranged in staggered positions on both sides of a web so that



said web is conveyed while being suspended and said web waves continuously in a direction of movement, each of said air blowing boxes having air jetting outlets formed at opposite edges thereof, said air jetting outlets providing an air flow over an air jetting surface, on at least one of said air blowing boxes, said air jetting outlets being formed integrally and flush with said air jetting surface, the improvement comprising:

at least one protrusion centrally located on said air jetting surface in a middle section equi-distant from said air jetting outlets, said at least one protrusion having a length, width, and height that is sufficient in comparison with an area of said air jetting surface, to provide an increased air pressure without increasing said air flow to stably convey said web, wherein said web would contact said air jetting surface in the absence of said air flow and said protrusion;

wherein said width is measured in said direction of movement and is 30% to 70% of a distance between said air jetting outlets, said height is measured from an air jetting surface and is in a range from 5 mm to 25 mm, an angle  $\theta$  is formed by rise walls of said protrusion and said air jetting surface, said angle  $\theta$  being in a range from 45° to 135°, and said length is measured in the direction of width of said web and is larger than the width of said web.

5,480,087

# FASTENER FEEDING APPARATUS

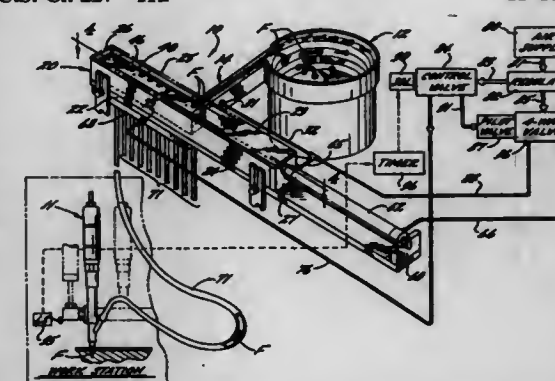
Alfred Young, and Fred E. Church, both of Hickory, N.C., assignors to Design Tool, Inc., Conover, N.C.

Filed Sep. 2, 1994, Ser. No. 300,791

Int. Cl.<sup>6</sup> B65H 5/00

U.S. Cl. 227—112

11 Claims



1. A fastener feeding apparatus adapted for concurrently feeding a plurality of fasteners to respective driving machines, and comprising

a housing having a pair of parallel, longitudinally extending side wall members, opposite end wall members, and a bottom plate, and so as to define a longitudinal channel extending between said end wall members,

a plurality of discharge openings in said bottom plate of said housing and which are disposed in a longitudinally spaced apart arrangement,

a fastener delivery chute extending laterally through one of said side wall members of said housing at a medial location along its length,

a slide assembly, mounted for longitudinal reciprocation in said channel and between a dump position and a ready position, said slide assembly comprising means



- (a) for receiving and retaining fasteners from said delivery chute in a longitudinally spaced apart arrangement on said slide assembly during movement of said slide from said dump position to said ready position, with the longitudinally spaced apart arrangement matching that of said discharge openings in said bottom plate,
- (b) for retaining the fasteners in said arrangement during movement from said ready position to said dump position, and
- (c) for concurrently releasing the fasteners upon said slide assembly reaching said dump position so that the fasteners fall through respective ones of said discharge openings.

5,480,088

### OVERDRIVE SIGNALLING STRUCTURE FOR FASTENER DRIVING TOOL

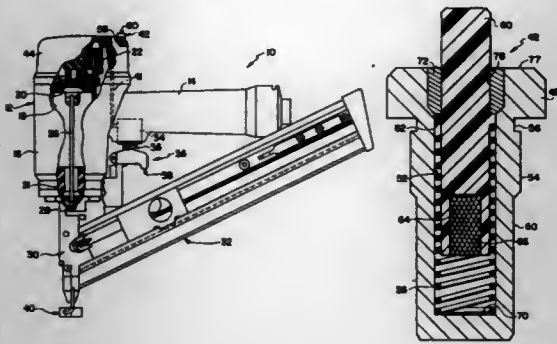
Phillip M. Braun, Exeter, R.I.; John J. Harrison, Pawcatuck, Conn.; Arthur E. Perra, Hope Valley, R.I.; Patrick J. Scanlon, East Greenwich, R.I., and David J. Simonelli, Coventry, R.I., assignors to Stanley-Bostitch, Inc., East Greenwich, R.I.

Filed Aug. 16, 1994, Ser. No. 291,706

Int. Cl.<sup>6</sup> B25C 1/04

U.S. Cl. 227—130

7 Claims



1. A fastener driving tool comprising:
- a portable housing defining a fastener drive track,
  - a fastener driving element carried by the housing for movement within the drive track through successive cycles of operation, each of which includes a fastener driving stroke and a return stroke,
  - a drive piston operatively connected with the fastener driving element for movement therewith,
  - a magazine assembly carried by the housing for receiving a supply of fasteners and feeding successive fasteners into the drive track in a position to be driven into a work piece during successive fastener driving strokes of the fastener driving element,
  - actuating structure carried by the housing and being constructed and arranged to move from a normal, inoperative position into an operative position to initiate the movement of the drive piston and the fastener driving element through a fastener driving stroke,
  - overdrive signaling structure carried by the housing and including an impulse responsive member mounted with respect to the housing so as (1) to remain in a first position when the fastener driving tool is being operated at an acceptable power required to drive a fastener into the work piece and (2) to move from said first position thereof to a second position extending outwardly from the housing in response to an excessive impulse force resulting from a fastener driving stroke of the tool, thereby signaling the tool operator that the tool is being operated at a power in excess of the power requirements to drive a fastener into the work piece.

5,480,089

### SURGICAL STAPLER APPARATUS WITH IMPROVED STAPLE POCKETS

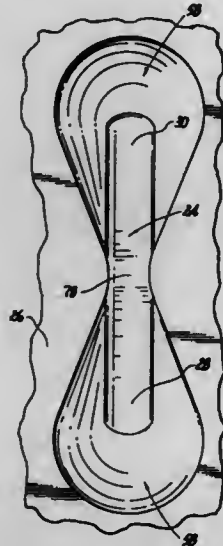
Jeffrey J. Blewett, Plantsville, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Aug. 19, 1994, Ser. No. 293,235

Int. Cl.<sup>6</sup> A61B 17/068

U.S. Cl. 227—175.1

15 Claims



1. In a staple forming anvil of a surgical stapler, the anvil including a multiplicity of staple forming pockets having proximal end distal ends and defining first and second staple leg forming cups, the improvement comprising a channeling surface formed along a proximal and a distal perimeter portion of each of the staple forming pockets, the channeling surface forming a substantially lemniscate shape.

5,480,090

### WRAPPING AS PACKAGING

Renzo Taddei, Viganello, and Franco Roda, Pregassona, both of, Switzerland, assignors to Fratelli Roda S.A., Taverne, Switzerland

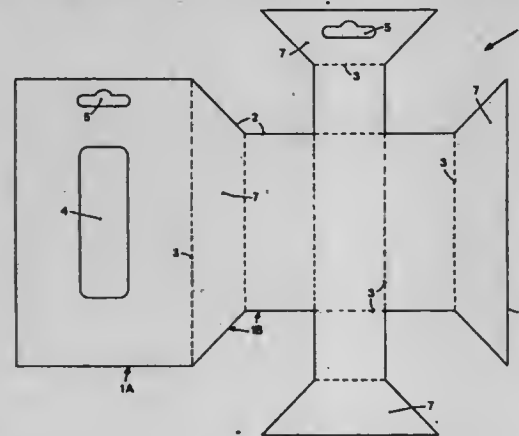
Filed Aug. 8, 1994, Ser. No. 286,909

Claims priority, application Switzerland, Aug. 10, 1993, 2385/93

Int. Cl.<sup>6</sup> B65D 5/42

U.S. Cl. 229—162

4 Claims



1. A wrapping made, as packaging (6) for a product, from one piece by punching out and folding a flat sheet (1) of packaging material, comprising:

- a first flat backing part (1A) having a first buttonhole (5) and a window (4) which can allow the product contained in the packaging (6) to be seen, said first buttonhole (5) and said window (4) being formed in a same obverse face (6A) of the packaging (6); and
- a second flat shaped part (1B) having a second buttonhole (5) that directly faces the first buttonhole (5) after folding of the second part (1B) along a plurality of premade fold lines (3), said second part (1B) being joined to the first part (1A) by a single one of the plurality of fold lines (3) so as to contain the product.

5,480,091

### STRESS-RELIEVING ARRANGEMENT FOR CARTON HANDLES

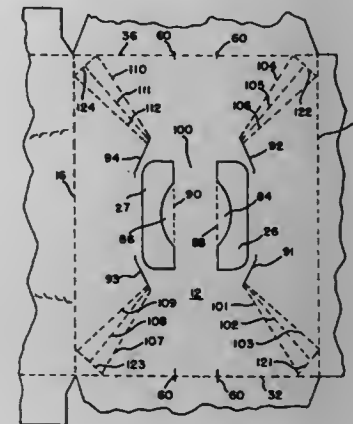
James T. Stout, Ellijay, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed May 11, 1995, Ser. No. 439,046

Int. Cl.<sup>6</sup> B65D 5/468

U.S. Cl. 229—117.14

20 Claims



1. A carton for packaging articles, comprising a plurality of carton walls foldably interconnected to form said carton, one of said carton walls having a pair of opposed side edges, a pair of opposed end edges and a first hand aperture for use in lifting said carton, each of said side edges and either one of said end edges defining therebetween a corner of said one carton wall, said one carton wall being formed with a first severance line disposed transversely of an imaginary line extending between said first hand aperture and one of said corners so as to prevent stress concentration at a region of said first hand aperture upon lifting of said carton, said severance line extending from and terminating in said one carton wall such that opposite ends of said severance line are disposed at positions spaced from said side and end edges.

5,480,092

Patent Not Issued For This Number

5,480,093

### COMBUSTION HEATER SYSTEM FOR MOTOR VEHICLES

Toru Tochizawa, and Toshikatsu Takanohashi, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

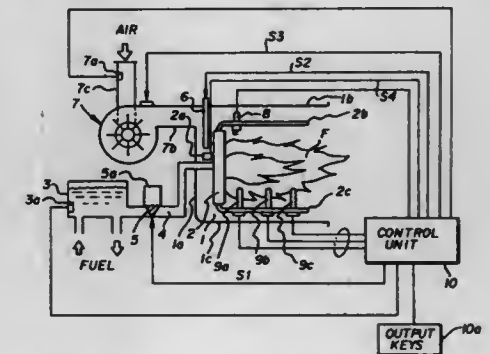
Filed Mar. 24, 1994, Ser. No. 216,888

Claims priority, application Japan, Mar. 24, 1993, 5-065535

Int. Cl.<sup>6</sup> B60H 1/22

U.S. Cl. 237—12.3 C

13 Claims



1. A combustion heater system for use in a motor vehicle, comprising:
- a combustion chamber;
  - a combustion pad disposed in said combustion chamber;
  - a fuel supply passage connected to said combustion pad for supplying a fuel to the combustion pad;
  - valve means for selectively opening and closing said fuel supply passage;
  - air supply means for supplying air to said combustion chamber;
  - heating means for heating said combustion pad;
  - spark means for producing sparks in said combustion chamber to ignite a fuel vapor emitted from said combustion pad; and
  - control means for energizing said heating means to heat the combustion pad, actuating said valve means to open said fuel supply passage, actuating said air supply means to supply air to said combustion chamber, and subsequently energizing said spark means to produce sparks in said combustion chamber upon elapse of a preset period of time which begins with the energization of said heating means and is determined depending on conditions for vaporization of the fuel.

5,480,094

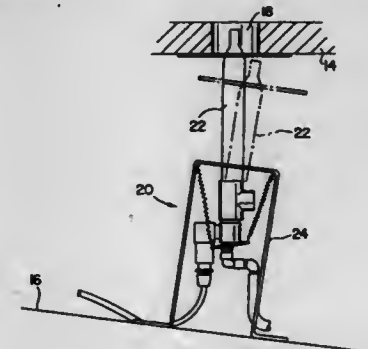
AIR POWERED WATER DISPLAY NOZZLE UNIT  
Mark Fuller, 10711 Bluffs Dr., #101, Studio City, Calif. 91604, and Alan Robinson, 5344 C N. Peck Rd., El Monte, Calif. 91732

Filed Jan. 10, 1994, Ser. No. 179,981

Int. Cl.<sup>6</sup> B05B 17/08

U.S. Cl. 239—17

14 Claims



1. An air powered water display nozzle system that is located within a reservoir of fluid, comprising:



a housing that is located within the reservoir;  
a source of pressurized air;  
a nozzle that is coupled to said source of pressurized air;  
a valve that controls the introduction of pressurized air into said inner chamber of said nozzle;  
a positioning plate attached to said nozzle.

5,480,095

# ACTUATOR AND CONTAINER FOR DISPENSING FLUIDS

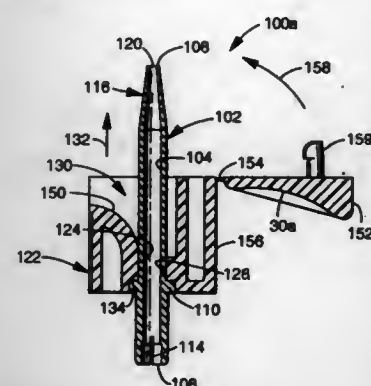
William W. Stevenson, Lake Elmo; John C. Ruta, White Bear Lake; W. Bruce Sandison, St. Louis Park, and Russell E. Blette, Hastings, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 121,270, Sep. 14, 1993, abandoned. This application Jun. 16, 1994, Ser. No. 260,527

Int. Cl.<sup>6</sup> B65D 83/14; 83/16; B05B 1/34; 1/100

U.S. Cl. 239—104

31 Claims



1. An actuator for use with a dispenser for a fluid, comprising:  
(a) an actuator body;

(b) a passageway smoothly extending in a smooth curvilinear manner through said actuator body from an inlet end to an outlet end, for conveying the fluid from said inlet end to said outlet end thereof while attenuating accumulation of solidified material from the fluid within said passageway and on said actuator body;

(c) a dispensing tube having an inlet end and an outlet end and defining said passageway extending between said inlet end and said outlet end of said dispensing tube;

(d) means for mounting said dispensing tube on said actuator body; and

(e) means for deflecting a portion of said dispensing tube while received mounted on said actuator body, wherein said passageway extends smoothly in a curvilinear manner between said inlet end and said outlet end to attenuate the accumulation of solidified material from the fluid during dispensing of the fluid.

5,480,096

# MOBILE WATERING DEVICE

Mitchell E. Wilson, Belton, Mo., assignor to Innovation Corporation, Belton, Mo.

Continuation-in-part of Ser. No. 162,228, Dec. 6, 1993, abandoned. This application Sep. 7, 1994, Ser. No. 302,359

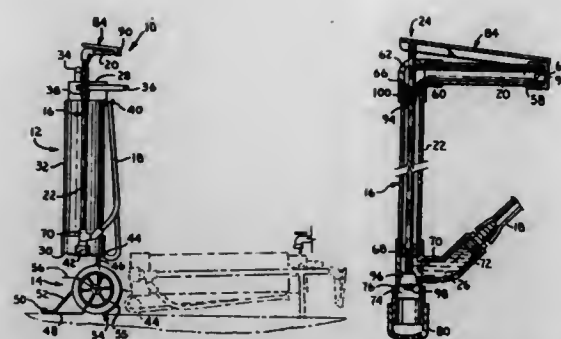
Int. Cl.<sup>6</sup> B05B 9/03

U.S. Cl. 239—148

19 Claims

2. A mobile watering device comprising:

(a) a reservoir having a top portion and a bottom portion, said top portion including an inlet and said bottom portion including an outlet wherein said reservoir further includes a handle for pushing and pulling said reservoir, said handle extending laterally from said reservoir for supporting said reservoir on a support surface in a horizontal loading position;



(b) a pair of rotatable support wheels coupled with said bottom portion for rotatable support thereof for permitting rollable movement of said reservoir;

(c) a portable delivery wand having a handle portion and a delivery portion, said delivery portion including a channel having an inlet and an outlet for permitting passage of a liquid therethrough;

(d) a conduit intercoupling said reservoir outlet with said wand channel inlet;

(e) shiftable closure means coupled with said channel for selective shifting between an open position wherein liquid is permitted to flow by gravity from said channel inlet and through said channel outlet and a closed position wherein passage of liquid through said channel outlet is prevented; and

(f) operating means for selectively shifting said closure means between said open position and said closed position.

5,480,097

# GAS ATOMIZER WITH REDUCED BACKFLOW

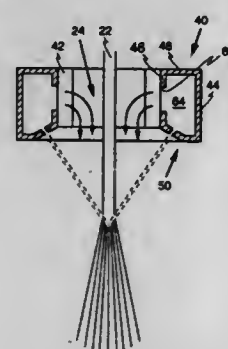
William T. Carter, Jr., Ballston Lake; Thomas F. Sawyer, Stillwater; Mark G. Benz, Burnt Hills, and Mark E. Braaten, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 25, 1994, Ser. No. 217,834

Int. Cl.<sup>6</sup> B05B 1/26

U.S. Cl. 239—296

10 Claims



1. A spray forming converter for atomizing a molten metal comprising:

a manifold for receiving a gas therein and for passing a stream of molten metal therethrough;

at least one primary gas directing structure, including at least three jets about the periphery of the manifold, operatively positioned in the manifold, for directing the gas through the at least one primary gas directing structure such that the gas engages the molten metal stream after passing through the manifold for converting the metal stream into a spray pattern of molten metal droplets; and

at least one secondary gas directing structure, operatively positioned in the manifold, for providing a gas pressure magnitude sufficient to prevent backflow but not of sufficient magnitude that the gas from the secondary gas directing structure interferes with the flow of the stream of molten metal as the stream passes inside the manifold.

5,480,098

# MOBILE MATERIAL PROCESSING MACHINE WITH TANDEM AXLE

Werner Doppstadt, Vossnacker Strasse 67, 42555 Velbert, Germany

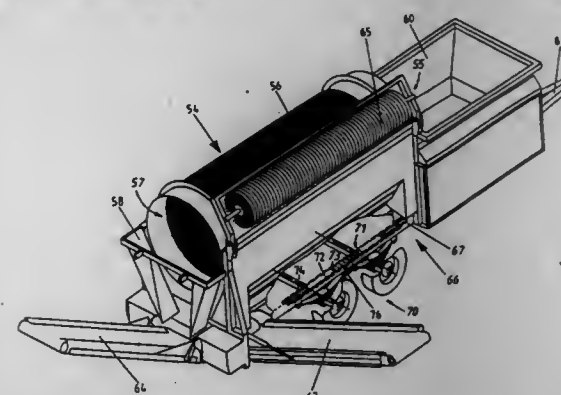
Filed Mar. 21, 1994, Ser. No. 215,326

Claims priority, application Germany, Apr. 10, 1993, 9305445 U

Int. Cl.<sup>6</sup> B02C 9/04; B62D 53/00

U.S. Cl. 241—101.76

17 Claims



1. A mobile material processing machine comprising:

a support frame;

said support frame including lateral, longitudinally extending support frame members;

a wheel-supported undercarriage including lateral, longitudinally extending undercarriage beams;

said wheel-supported undercarriage carrying a tandem axle;

each one of said lateral, longitudinally extending support frame members being disposed on top of respective co-extending undercarriage beams;

each one of said support frame members and each one of said co-extending undercarriage beams being provided with a plurality of holes which are aligned to each other in a direction substantially perpendicular to said support frame and said undercarriage;

bolt means extending through a preselected number of said holes in said perpendicular direction and directly interconnecting said support frame members and said undercarriage beams co-extending therewith; and

said bolt means being temporarily releasable for temporarily disconnecting said support frame member and said undercarriage beam co-extending therewith in order to permit relative displacement between said support frame and said undercarriage.

5,480,099

# MILL SWEEP FOR PULVERIZERS

Joe H. Bunton, Fort Collins, Colo., assignor to March-Southwestern Corp., Ft. Collins, Colo.

Filed Jun. 27, 1994, Ser. No. 266,004

Int. Cl.<sup>6</sup> B02C 15/00

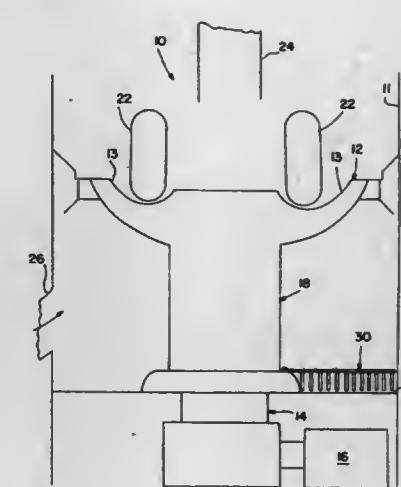
U.S. Cl. 241—119

10 Claims

1. In a pulverizer mill of the type including a rotatable vertical spindle, a floor member, and an opening in the floor member, wherein the improvement comprises a mill sweep member carried by said vertical spindle, wherein said mill sweep member comprises:

(a) a horizontal, elongated mounting bar including a plurality of spaced openings;

(b) a plurality of cable members each having a first end detachably secured to said mounting bar and a free end; wherein said first end is secured in a sleeve member which is received in one of said openings in said mounting bar; wherein each said sleeve member is vertically adjustable relative to said mounting bar; and wherein each said free end extends below said mounting bar.



5,480,100

# APPARATUS FOR CRUSHING CONCRETE STRUCTURES

Itsuo Tagawa, and Takaharu Kozaki, both of Tokyo, Japan, assignors to Tagawakougyou Co., Ltd., Tokyo, Japan

PCT No. PCT/JP92/00100, § 371 Date Dec. 2, 1993, § 102(e)

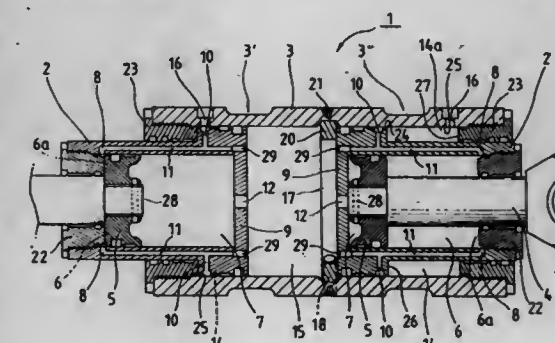
Date Dec. 2, 1993, PCT Pub. No. WO93/15291, PCT Pub. Date Aug. 5, 1993

PCT Filed Feb. 3, 1992, Ser. No. 129,053

Int. Cl.<sup>6</sup> B02C 1/08

U.S. Cl. 241—266

4 Claims



1. An apparatus for crushing concrete structures, comprising a pair of arms having extremities, a pair of crushing blades fixedly secured to the respective extremities of said arms so as to confront each other, and a hydraulic cylinder unit for opening and closing the arms to crush the concrete structures by means of said crushing blades, wherein

said hydraulic cylinder unit comprises:

a first cylinder having a bottom, which receives therein a piston having a piston rod protruding in one direction, said first cylinder including a piston-rod-side oil chamber and a piston-side oil chamber in front of and behind said piston, respectively; and

a second cylinder which receives therein said first cylinder whose cylinder bottom serves as a piston of said second cylinder, said second cylinder including a piston-rod-side oil chamber and a piston-side oil chamber in front of and behind said cylinder bottom, respectively, of said first cylinder;

said first cylinder having a first oil port opening in said piston-rod-side oil chamber, a second oil port opening in the outer periphery of said cylinder bottom and communicating with said first oil port by way of an oil passage extending through the interior of said first cylinder, and a third oil port provided in said cylinder bottom;

said second cylinder having a fourth oil port opening in said piston rod-side oil chamber, and a fifth oil port opening in said second cylinder bottom;



a passage formed between said second oil port and said piston-rod-side oil chamber of said second cylinder for producing a predetermined flow resistance;

said fourth oil port communicating with said second oil port when said first cylinder reaches its stroke end on piston rod side.

5,480,101

## THIN STRIP CORE FOR MAGNETIC AMPLIFIERS

Katunori Nomura; Hiroaki Anise, and Yoshiyuki Yamauchi, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 62,040, May 17, 1993, abandoned, which is a continuation of Ser. No. 925,427, Aug. 10, 1992, abandoned, which is a continuation of Ser. No. 712,054, Jun.

7, 1991, abandoned, which is a continuation of Ser. No.

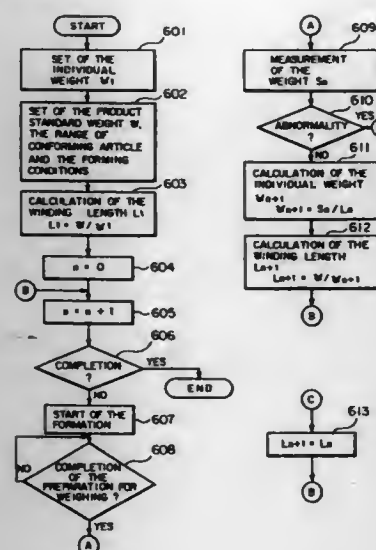
412,824, Sep. 26, 1989, Pat. No. 5,042,736. This application

Sep. 1, 1994, Ser. No. 298,298

Int. Cl.<sup>6</sup> B65H 43/00

U.S. Cl. 242—160.4

6 Claims



1. A combination of thin strip cores for magnetic amplifiers comprising:

first and second thin strip cores, being the n'th and the (n+1) 'th cores, respectively, produced in a winding operation, said first thin strip core comprising a first winding thin strip core, said first thin strip core having a length  $L_n$  of said thin strip and a weight per unit length  $S_n/L_n (=W_n)$ , wherein  $S_n$  equals the weight of the n'th thin strip core,

said second thin strip core comprising a second winding thin strip core, said second thin strip core having a length  $L_{n+1}$  having a predetermined functional relationship with the weight per unit length  $S_n/L_n (=W_n)$  of said first thin strip core, said  $L_{n+1}$  being different than said  $L_n$ ,

wherein said first thin strip core has a trailing edge that is an only counterpart to a leading edge of said second thin strip core,

wherein said functional relationship is

$L_{n+1} = W/W_n$ , where "W" is the standard weight of a product.

5,480,102

## BAITCASTING REEL

Jun Sato, Sakai, Japan, assignor to Shimano Inc., Osaka, Japan

Continuation of Ser. No. 739,491, Aug. 2, 1991, abandoned.

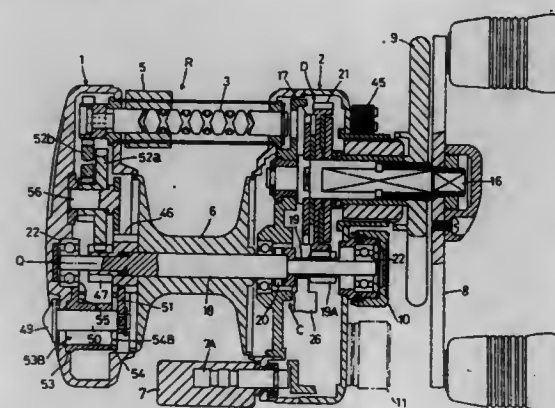
This application Mar. 21, 1994, Ser. No. 215,017

Claims priority, application Japan, Aug. 6, 1990, 2-83343 U; Aug. 6, 1990, 2-83344 U; Aug. 6, 1990, 2-83345 U; Aug. 6, 1990, 2-208810; Aug. 7, 1990, 2-83881 U

Int. Cl.<sup>6</sup> A01K 89/00

U.S. Cl. 242—310

8 Claims



1. A baitcasting reel comprising: a reel body having right and left cases, a thumb rest, and at least one lower frame member; and a level wind mechanism and a spool disposed between said first and second cases;

wherein said spool includes side walls for forming a line accommodating section, said side walls having outer peripheral portions;

wherein said reel body includes a connector portion, a center frame, and annular flanges disposed adjacent said outer peripheral portions of said spool;

wherein said center frame includes said thumb rest; and wherein said first case, said connector portion and said center frame are integrally formed together, and wherein said annular flanges are formed integral with said at least one lower frame member,

said first case having a bearing support for said spool, and said connector portion having an opening for receiving said annular flanges and said at least one lower frame member, said first case and said connector portion including mounting seats for positioning said annular flanges.

5,480,103

## MECHANICALLY INCOMPATIBLE MAGNETIC RECORDING TAPE CARTRIDGES HAVING THE SAME FORM FACTOR

Sten R. Gerfast, Mendota Heights, and Daniel C. Egan, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 73,592, Jun. 8, 1993, abandoned.

This application Oct. 24, 1994, Ser. No. 328,749

Int. Cl.<sup>6</sup> G11B 23/087

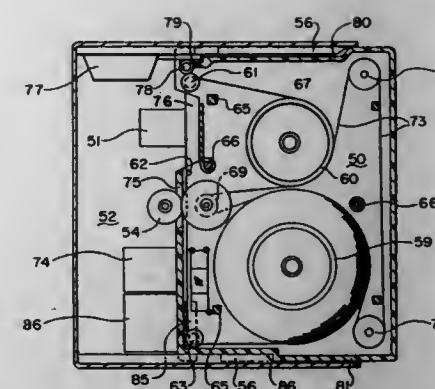
U.S. Cl. 242—347

5 Claims

1. A housing for a first belt-driven tape cartridge that has a form factor, the housing being substantially similar to but incompatible with a second belt-driven tape cartridge having substantially the same form factor, the housing comprising:

a top plate having a top surface and periphery outline substantially the same as the periphery outline of the form factor; a front wall perpendicularly attached to the top plate along a front edge margin of the top plate and having a front surface including:

structure defining a belt-driven tape transport aperture, and



structure defining a separate read/write access aperture; a back wall perpendicularly attached to the top plate along a back edge margin of the top plate; and a pair of side walls perpendicularly attached to the top plate along respective side edge margins of the top plate, each side wall having a side surface, at least one of the side walls including a countersunk lip having transverse edges defined along a portion of the side edge margin of the top plate and indented from the top surface and the side surface, and at least one of the side walls including an indented rail-mating channel defining a rib along the top of the portion of the side wall and extending backward along a portion of the side wall from the margin of the front surface that is less than a distance of a corresponding indented channel in the second tape cartridge, whereby the housing for the first tape cartridge has substantially the same form factor as a second tape cartridge, but the first tape cartridge can not be inserted into a tape drive for reading the second tape cartridge due to the distance of the indented rail-mating channel of the one of the side walls being less than the distance of the corresponding indented rail-mating channel in the second tape cartridge, and the second tape cartridge cannot be inserted into a tape drive for reading the first tape cartridge due to a lack of the countersunk lip on the one of the side walls.

5,480,104

## DEACTIVATING DEVICE FOR LOCKING MECHANISM OF PRETENSIONER

Kelichi Kato; Keisuke Imai; Masanori Oyabu; Yasuhiko Kouda; Makoto Isomura; Takuya Nezaki, and Koh Watanabe, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

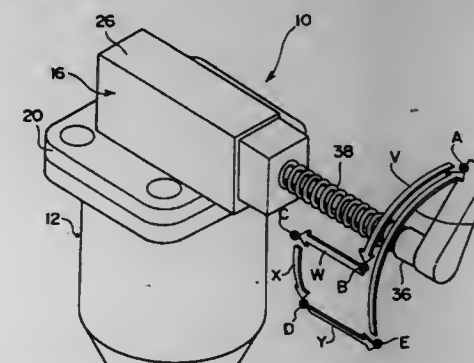
Filed Dec. 13, 1994, Ser. No. 357,186

Claims priority, application Japan, Dec. 29, 1993, 5-352334; Mar. 16, 1994, 6-045805

Int. Cl.<sup>6</sup> B60R 22/46

U.S. Cl. 242—374

23 Claims



1. A deactivating device for a locking mechanism of a pretensioner, for use in a pretensioner which is provided in such a

manner as to be capable of forcibly retracting an occupant-restraining webbing of a webbing retractor and has a locking mechanism capable of setting the pretensioner in an operative state and in an inoperative state, said deactivating device comprising:

an operation lever provided movably about a central axis of rotation and in a direction of the central axis of rotation, and adapted to set said locking mechanism in one of an activated state and a deactivated state; and

an urging member for imparting an urging force to said operation lever,

wherein said operation lever has a deactivation operation mode for setting said locking mechanism in the deactivated state and an activation operation mode for setting said locking mechanism in the activated state, and in said deactivation operation mode, said operation lever moves continuously in stages about the central axis of rotation against the urging force of said urging member and in the direction of the central axis of rotation against the urging force of said urging member, while in said activation operation mode, said operation lever is automatically made to undergo returning movement by the urging force of said urging member from the deactivation operation mode.

5,480,105

## SEAT BELT RETRACTOR

Yoshiichi Fujimura, Shiga; Hideaki Yano, Ohtsu, and Shizutaka Matsuura, Shiga, all of Japan, assignors to Takata Corporation, Tokyo, Japan

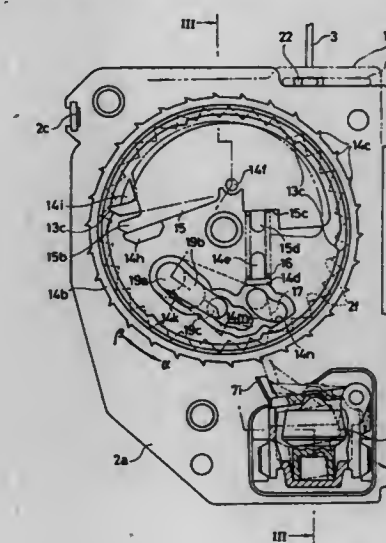
Filed Aug. 4, 1994, Ser. No. 285,427

Claims priority, application Japan, Nov. 24, 1993, 5-293483

Int. Cl.<sup>6</sup> B60R 22/405

U.S. Cl. 242—383.2

7 Claims



1. A seat belt retractor comprising: a reel shaft for a webbing winding; a frame for rotatably supporting both ends of said reel shaft; locking means for preventing said reel shaft from rotating in a webbing unwinding direction at a time when it is necessary to prevent said reel shaft from rotating; and an activating device for activating said locking means:

said locking means having reel shaft-rotating preventing teeth which are provided on said frame, and a pawl engaging with said reel shaft-rotating preventing teeth at said time so as to prevent said reel shaft from rotating in the webbing unwinding direction;

said activating device having a lock gear for engaging said pawl with said reel shaft-rotating preventing teeth, a predetermined number of lock gear-rotating preventing teeth, and



an inertia member having a pawl for engaging with said lock gear-rotating preventing teeth; the number of said lock gear-rotating preventing teeth being set to be less than the number of said reel shaft-rotating preventing teeth.

5,480,106

### CORE PLUG FOR STEEL COILS WITH VARIABLE LENGTH BRIDGE

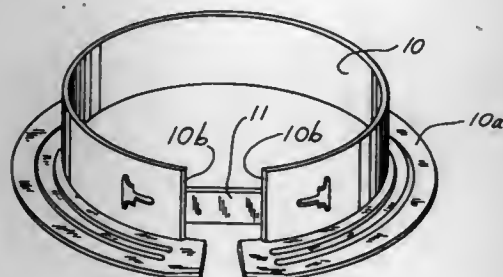
Ted J. Voissem, Appleton, Wis., assignor to Badger Plug Company, Appleton, Wis.

Filed Jul. 8, 1994, Ser. No. 272,186

Int. Cl.<sup>6</sup> B65H 75/24

U.S. Cl. 242—571

5 Claims



1. A core plug for placement within a steel coil, the core plug comprising:
  - a cylindrical main body and a radial flange at one end of a cylindrical portion of the cylindrical main body;
  - said main body having a radial gap extending axially all the way through the main body and through the radial flange;
  - a bridge adapted to span the gap having ends engageable with the main body;
  - at least one aperture at each side of the gap adapted to receive each said end of said bridge;
  - each said bridge end engaged within one of said apertures.

5,480,107

### 3X MULTI-ENGINE JET CONFIGURATION

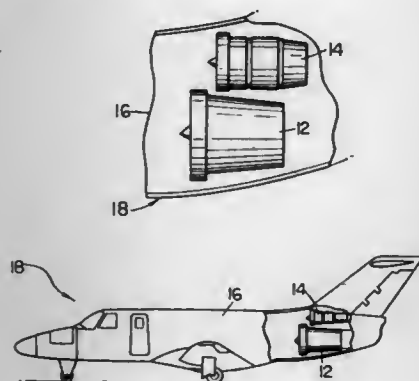
Richard J. Bacon, 1268 Northridge Ct., Golden, Colo. 80401

Filed Apr. 11, 1994, Ser. No. 225,585

Int. Cl.<sup>6</sup> B64D 27/20

U.S. Cl. 244—55

4 Claims



1. A twin-engine jet aircraft configuration, comprising:
  - (a) an airframe having a centerline along its longitudinal axis;
  - (b) a first jet engine mounted within a plane vertical to the centerline;
  - (c) a second jet engine mounted within said plane vertical to the centerline;

- (d) each of said first and second jet engines having a thrust adequate to takeoff, climb, cruise and land the aircraft at full gross weight without use of the other engine;
- (e) one of said first and second jet engines having a maximum thrust greater than the maximum thrust of the other of said first and second engines.

5,480,108

### HARPOON HEADS AND HARPOONS PROVIDED WITH SUCH HEADS FOR THE ANCHORING OF HELICOPTERS TO PLATFORMS

Vincent J. Amiant, Angouleme; Francis D. Le Blanc, and Paul R. Borghetti, both of Ruelle, all of, France, assignors to Etat Français as represented by the Delege General pour l'Armement, Paris, France

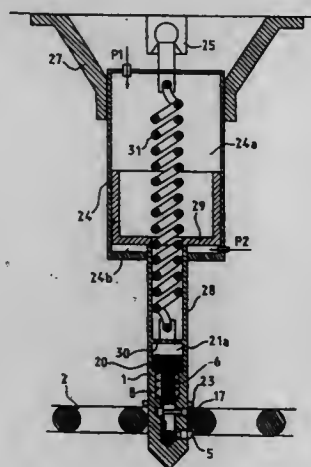
Filed Feb. 8, 1994, Ser. No. 194,093

Claims priority, application France, Feb. 19, 1993, 93 01899

Int. Cl.<sup>6</sup> B64B 1/66; B64F 1/12

U.S. Cl. 244—115

8 Claims



1. A harpoon cooperating with a grid for a vertical takeoff and landing aircraft comprising:
  - a connecting arm having a head with a convex end; fingers oriented and movable radially between a retracted position inside radial holes of said head and an extended position;
  - a rod slidable in an axial bore of the head, said rod urging said fingers to the extended position while descending into the bore and releasing said fingers while rising in the bore, wherein rod descent is effected in response to penetration of the head into a cell of the grid after said fingers pass beyond a level of a smallest diameter of the cell;
  - a spring urging said rod one of downward and upward; pneumatic means for urging said rod the other of downward and upward; and
  - means for rearming said rod, wherein said connecting arm comprises a jack having a first piston, said head being attached to said first piston, wherein said rod is attached to a second piston communicating with said first piston and said rod and movable in an area contiguous with said bore.

5,480,109

### SYSTEM FOR PREVENTING THE AUTOMATIC OPENING OF AN IMPROPERLY CLOSED AND LOCKED AIRCRAFT DOOR

Bernd Klein, Hamburg, and Wolfgang Mueller, Beckdorf, both of, Germany, assignors to Deutsche Aerospace Airbus GmbH, Hamburg, Germany

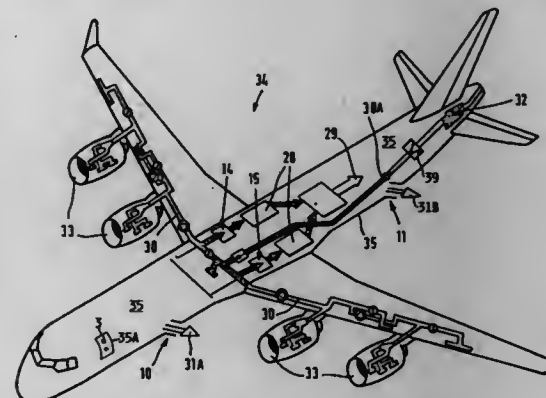
Filed Mar. 18, 1994, Ser. No. 210,629

Claims priority, application Germany, Mar. 20, 1993, 43 09 058.3

Int. Cl.<sup>6</sup> B64C 1/14; E05B 45/06

U.S. Cl. 244—129.5

16 Claims



1. A system for preventing the automatic opening of an improperly closed and locked aircraft door for use in an aircraft (34) having a fuselage (35), at least one door (35A) through the fuselage, an air supply and exhaust system and at least one device providing data indicative of the operating status of the aircraft, the system comprising a door monitoring unit (1) that comprises a door monitor control arrangement (2) having at least one data evaluation channel and a plurality of sensors (3) grouped together to form a smaller plurality of sensor units (3n), wherein at least one sensor (3) is installed in the at least one door of the aircraft to detect a closing and locking status of the door, respective conductors connecting each of said sensors (3) to respective inputs of said door monitor control arrangement (2) to provide a signal representing said closing and locking status from each said sensor (3) to said at least one data evaluation channel, at least one air system control arrangement (4, 5, 36) arranged to control the air supply and exhaust system, respective conductors connecting respective outputs of said door monitor control arrangement (2) to inputs of said air system control arrangement (4, 5, 36), and respective conductors connecting the device providing data indicative of the operating status of the aircraft to at least one respective extra input of said at least one air system control arrangement (4, 5, 36).

5,480,110

### TRANSPORT PLANE WITH STUB TAIL

Gerhard Löbert, Baldham, Germany, assignor to Daimler-Benz Aerospace AG, Munich, Germany

Filed Mar. 25, 1994, Ser. No. 218,057

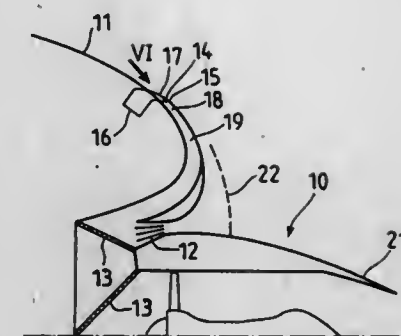
Claims priority, application Germany, Mar. 27, 1993, 43 10 017.1

Int. Cl.<sup>6</sup> B64D 27/02; B64C 21/02; 21/06

U.S. Cl. 244—130

10 Claims

1. Transport plane with stub tail, comprising:
  - jet engines directly integrated in a fuselage tail of the plane;
  - an air intake formed along the fuselage tail;
  - a short diffuser connected between said air intake and said jet engines; and
  - boundary layer suction slot means, said boundary layer suction slot means including a combination of ejectors and diffusers in the fuselage tail, said suction slot means obtains boundary layer air from the boundary layer which is associated with said suction slot means, and said suction slot boundary layer



air feeding into intake air which is derived from said air intake to form combination air feeding into said jet engines.

5,480,111

### MISSILE WITH DEPLOYABLE CONTROL FINS

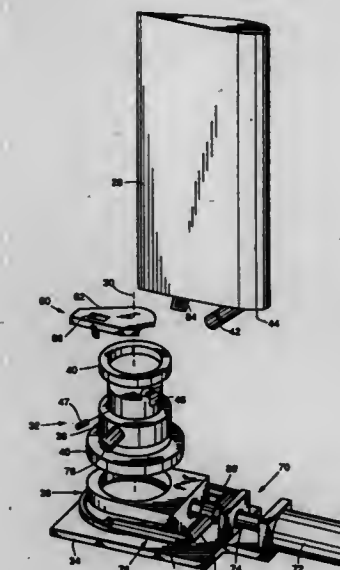
John D. Smith, and Ryan D. Lamberton, both of Tucson, Ariz., assignors to Hughes Missile Systems Company, Los Angeles, Calif.

Filed May 13, 1994, Ser. No. 242,393

Int. Cl.<sup>6</sup> F42B 10/14

U.S. Cl. 244—3.27

9 Claims



1. A missile, comprising:
  - a missile body having a missile body axis;
  - a control fin;
  - an actuator shaft rotatable about an axis perpendicular to the missile body axis;
  - a deployment shaft extending from the control fin in a direction that is not parallel to the actuator shaft;
  - a deployment shaft bore in the actuator shaft, the deployment shaft being rotatably received with the deployment shaft bore; and
  - a stop fixedly supported on the actuator shaft and positioned to contact the control fin when the control fin is in an extended position;
  - a locking latch on the control fin; and
  - a locking latch receiver fixedly supported on the stop and positioned to receive the locking latch therein when the control fin is in the extended position.



5,480,112

**RAILROAD SWITCH STAND HAVING IMPROVED HANDLE MEANS**

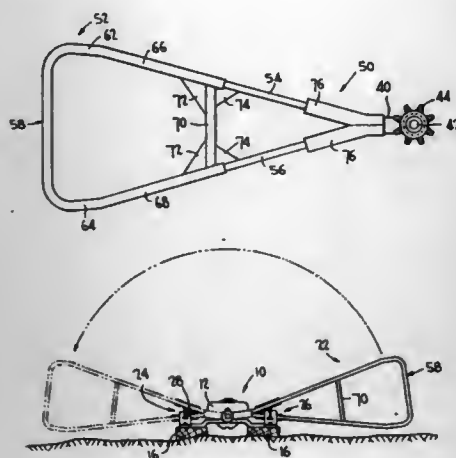
Thomas P. Painter, Jr., Lawrenceville, Ga.; Gary A. Obenchain, Moneta, Va.; Morris L. Myers, Roanoke, Va.; Charles S. Christy, Roanoke, Va., and James D. Rhodes, Roanoke, Va., assignors to Norfolk Southern Corporation, Norfolk, Va.

Filed Oct. 20, 1994, Ser. No. 326,231

Int. Cl.<sup>6</sup> B61L 5/00

U.S. Cl. 246—410

9 Claims



1. A railroad switch stand for operating a railroad switch between two positions, said switch stand including a connecting rod, operating means for causing reciprocation of said connecting rod and handle means connected with said operating means for pivotal movement about a pivot axis between two operative positions, said handle means having an inner end adjacent said pivot axis and an outer end remote from said pivot axis, and said handle means including a pair of inner steel portions and an outer bent tubular portion having legs forming extensions of said steel portions, said inner end having a first dimension extending along an arc having said pivot axis as its center, said outer end having a second dimension extending along an arc having said pivot axis as its center, said second dimension being many times greater than said first dimension to facilitate grasping of the handle in either of its operative positions.

5,480,113

**WASTE BAG HOLDER**

Bernhard Hachenberg, 59 Cassia St., Dee Why, New South Wales, 2099, Australia

PCT No. PCT/AU93/00028, § 371 Date Jul. 21, 1994, § 102(e) Date Jul. 21, 1994, PCT Pub. No. WO93/14980, PCT Pub. Date Aug. 5, 1993

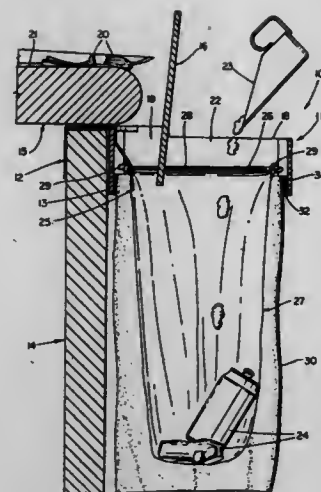
PCT Filed Jan. 21, 1993, Ser. No. 256,744

Claims priority, application Australia, Jan. 22, 1992, PL0518 Int. Cl.<sup>6</sup> B65B 67/04

U.S. Cl. 248—100

6 Claims

1. A waste bag holder for holding shopping bags, including a frame having a rear wall, a pair of forwardly directed side arms, and a front wall interconnecting said arms; means for mounting the frame on a support; means for suspending a flexible container from the frame; and a skirt depending from the frame so that the flexible container is substantially surrounded by the skirt and the support; wherein the frame is square, rectangular, circular, elliptical or D-shaped in top plan view; and further comprising a downwardly, inwardly directed lip on the rear wall of the frame for entering the mouth of a bag or container suspended from the frame.



5,480,114

**BIAXIAL BALANCE ADJUSTING STRUCTURE FOR MEDICAL STAND APPARATUS**

Katsushige Nakamura, Hachioji, Japan, assignor to Mitaka Kohki Co., Ltd., Tokyo, Japan

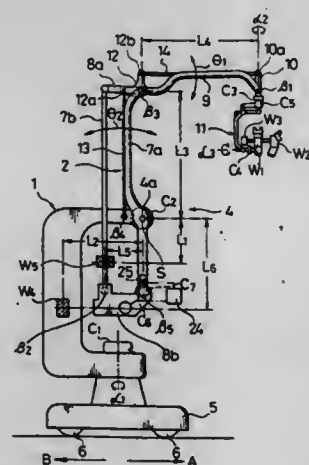
Filed Mar. 2, 1994, Ser. No. 204,456

Claims priority, application Japan, Mar. 18, 1993, 5-082392

Int. Cl.<sup>6</sup> F16L 3/00

U.S. Cl. 248—123.2

10 Claims



1. A biaxial balance adjusting structure for a medical stand apparatus, comprising:

a retaining link mechanism, utilizing a parallel link, supported at the middle on a pivot assumed on a frame;

a medical optical device and/or its auxiliary devices, disposed to one end portion of said retaining link mechanism; and

a counterweight disposed on the other end portion of said retaining link mechanism relative to the pivot;

wherein said counterweight consists of a first counterweight which can be moved in the horizontal direction and a second counterweight which can be moved in the vertical direction, and said first and second counterweights are interlocked with each other so that they can simultaneously be moved closer to or farther from the pivot in the respective directions.

5,480,115

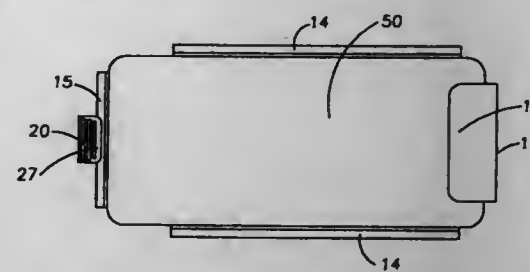
**HAND RELEASE BRACKET**

Garry P. Haltorf, 1470 East Ave., Rochester, N.Y. 14610  
Continuation-in-part of Ser. No. 262,623, Jun. 20, 1994. This application Mar. 29, 1995, Ser. No. 412,468

Int. Cl.<sup>6</sup> A47B 96/06

U.S. Cl. 248—221.11

17 Claims U.S. Cl. 248—231.9



1. A hand release latch and bracket for releasably retaining a hand holdable instrument, the hand release latch and bracket comprising:

a. a pivotal mount for the latch on the bracket so that the latch releasably engages and retains the instrument on the bracket;

b. a finger release element for moving the latch to an unlatched position for releasing the instrument from the bracket; and

c. the finger release element being arranged in proximity with the inter-engagement of the latch and the instrument so that a thumb and finger can engage opposite sides of the instrument while another finger operates the finger release element to release the latch, whereupon the instrument moves into the grip of the thumb and finger so that moving of the finger release element can be stopped and the instrument can be withdrawn from the bracket by the thumb and finger gripping the instrument.

5,480,116

**SIGN HOLDER**

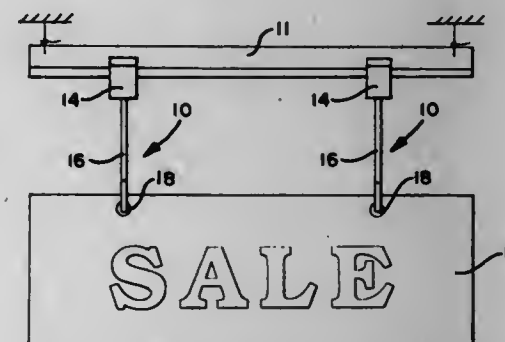
Mike T. Callas, 120 Gideons Point Rd., Tonka Bay, Minn. 55331

Continuation-in-part of Ser. No. 23,008, May 17, 1994. This application Aug. 25, 1994, Ser. No. 295,433

Int. Cl.<sup>6</sup> A47B 96/06

U.S. Cl. 248—228.4

19 Claims



1. A device for hanging a sign from a ceiling comprising: at least one member releasably attached to the ceiling, the member having a first wall, a second wall laterally spaced from the first wall, each wall having a top end and a bottom end, the top ends moveable in outward directions to release the member from the ceiling, a transverse wall connected to middle portions of the first and second walls, the top ends pivoting outwardly relative to the transverse wall and separating to release the member from the ceiling, and hanger means mounted on the member and attached to the sign to hang the sign from the ceiling.

5,480,117

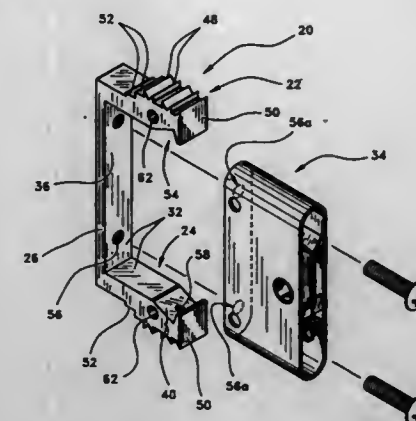
**MOUNTING BRACKET FOR WALL PANEL LOCKS**

Joseph C. Fleming, III, 17301 Edwards Rd., Cerritos, Calif. 90701

Filed Apr. 28, 1994, Ser. No. 234,047

Int. Cl.<sup>6</sup> A47F 5/08

18 Claims



1. In combination, a panel locking mechanism, comprising:

a generally U-shaped mounting bracket for anchoring a locking member to the peripheral frame of a panel, said mounting bracket comprising a base, first and second spaced legs extending from opposing end portions of said base, and frictional engagement means for securing the bracket to the frame extending outwardly from at least one of the legs;

a lock component slidably mounted in the mounting bracket; and

fastening means for attaching the lock component to the bracket.

5,480,118

**FOLDABLE EASEL DISPLAY MOUNT**

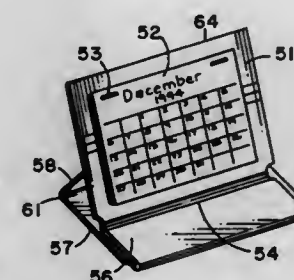
Carroll N. Cross, 3202 Holiday Ave., Apopka, Fla. 32703

Filed Nov. 9, 1993, Ser. No. 149,115

Int. Cl.<sup>6</sup> A47B 97/04

U.S. Cl. 248—459

9 Claims



1. An easel-type display mount comprising:

a first display panel having front and rear faces and having a plurality of edges;

a second display panel having front and rear faces and having a plurality of edges;

said first display panel and second display panel being attached together with said first display panel having a hinge line along one edge thereon for rotation thereof relative to said second display panel;

a base panel having a plurality of edges, said base panel having said second display panel attached thereto in a face to face relationship and covering a portion of said base panel; and

a support panel having a plurality of edges and being hingedly attached to one edge of said base panel with a ductile hinge for moving said support panel relative to said base panel and



relative to said first display panel for supporting said first display panel with said support panel to thereby form a supporting easel for said first display panel in different angular positions by the angle said support panel is held with said ductile hinge whereby an easel display mount provides a plurality of display positions.

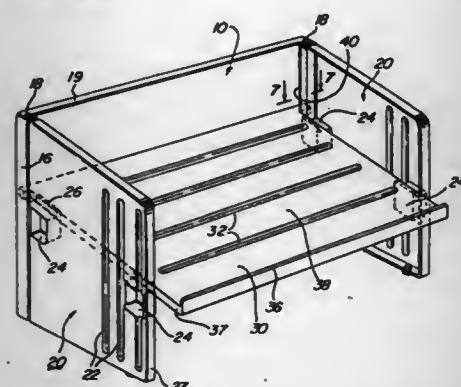
# 5,480,119 PORTABLE PODIUM

James S. Fish, Plymouth, and Dennis Deutsch, Hastings, both of Minn., assignors to Pierce Companies, Inc., Santa Ana, Calif.

Filed May 11, 1994, Ser. No. 241,609  
Int. Cl.<sup>6</sup> A47B 97/04

U.S. Cl. 248—460

14 Claims



1. A portable podium for supporting books and papers during activities of public speaking which can be readily assembled and disassembled, the podium comprising:

- a main panel substantially rectangular in shape forming a front when the podium is assembled and having two side edges, a bottom edge, and a top edge;
- two side panels, each side panel having two side edges, a bottom edge, and a top edge, each side panel about half as wide as the main panel, and sized to lie substantially co-planar on the main panel forming a flat package when the podium is disassembled;
- a hinge attaching a side edge of a first side panel to a first side edge of the main panel;
- a hinge attaching a side edge of a second side panel to a second side edge of the main panel;
- a flat shelf sized to lie on the main panel when the podium is disassembled;
- retention means for slidably and pivotally retaining an edge of the shelf in proximity with the main panel; and
- support means attached to the side panels for supporting and engaging with the shelf when the podium is assembled, so that the disassembled podium can be assembled by swinging the side panels so that they are substantially perpendicular to the main panel, placing the bottom edges of the main panel and the side panels in contact with a horizontal support surface, sliding the shelf so that a retained edge of the shelf is above the support means and pivoting the shelf so that it engages the support means.

# 5,480,120 ADJUSTABLE HANGER APPARATUS

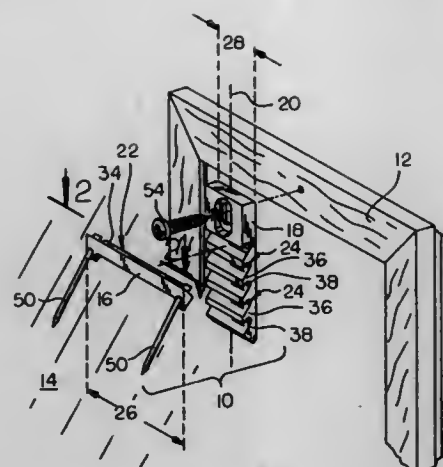
Bobby R. Bruner, 6330 Laurel La., Placerville, Calif. 92667  
Filed Apr. 15, 1994, Ser. No. 228,365

Int. Cl.<sup>6</sup> A47G 1/24

U.S. Cl. 248—477

12 Claims

- 1. An adjustable hanger apparatus for hanging an object on a vertical surface, comprising:
  - a first hanger assembly for mounting on the vertical surface, said first hanger assembly including a first connector portion, and



a second hanger assembly for mounting on the object, wherein said second hanger assembly includes a longitudinal axis, wherein said second hanger assembly includes a plurality of second connection portions arrayed along said longitudinal axis, and wherein said second connection portions are adapted to connect to said first connector portion of said first hanger assembly, such that, when a selected second connection portion is connected to said first connector portion, the object hangs by said second hanger assembly and said first hanger assembly next to the vertical surface, wherein said first hanger assembly includes: a pair of fastener-receiving portions located at opposite ends of said first hanger assembly, and said first connector portion being located between said fastener-receiving portions, wherein each of said fastener-receiving portions includes a rear wall and a channel for receiving a fastener, wherein said rear wall and said channel are oriented with respect to each other at a first predetermined acute angle.

# 5,480,121

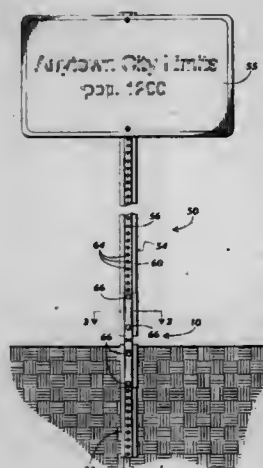
## BREAK-AWAY CONNECTOR FOR SIGN POST

Gerald Rice, and Walter A. Alexander, Sr., both of Marietta, Ga., assignors to VSAR Systems of Atlanta, Inc., Marietta, Ga.

Filed Nov. 3, 1993, Ser. No. 147,119  
Int. Cl.<sup>6</sup> F16M 13/00

U.S. Cl. 248—548

20 Claims



- 1. A break-away connector for connecting to an in-ground post and an above-ground post of a highway sign, comprising: two elongated channels of generally U-shaped construction in cross-sectional view; and

a stud having a tubular wall of a selected thickness with an outside surface sized to abut the inside surfaces of the channels with a central portion of the stud having a tubular wall thickness less than the selected thickness to provide an area of structural weakness for allowing the stud to fracture omnidirectionally, the stud welded at an upper portion to one channel and at a lower portion to the other channel to form an integral connector for wedging attachment to an in-ground post and an above-ground post of a highway sign with bolts extending through spaced-apart bores in each of the channels with the central portion between the two channels, whereby the connector, being bolted to the in-ground post and the above-ground post of the highway sign, severs at the central portion upon impact of the highway sign by a motor vehicle regardless of the direction from which the impact is applied.

# 5,480,122

## SHUT-OFF VALVE FOR INSTALLATION IMMEDIATELY DOWNSTREAM FROM A DEFECTIVE VALVE MOUNTED INTO THE COMPRESSION-CONNECTION TYPE OF OUTLET OF THE DEFECTIVE VALVE

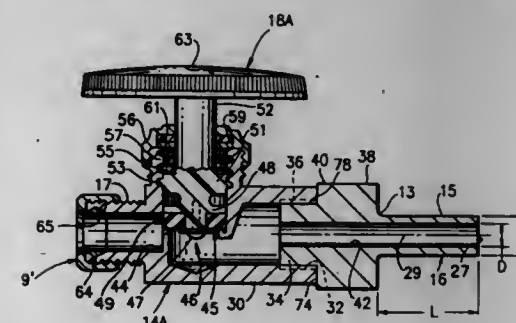
Paul J. Barker, 15 Ferris Rd., Old Greenwich, Conn. 06870  
Continuation-in-part of Ser. No. 941,227, Sep. 2, 1992, Pat. No. 5,246,200. This application Aug. 23, 1993, Ser. No. 110,568

The portion of the term of this patent subsequent to Sep. 21, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> F16K 3/22

U.S. Cl. 251—148

16 Claims



1. A trouble-shooting shut-off valve mountable onto an outlet end of a defective water shut-off valve, said defective water shut-off valve being of a type having an outlet end with external threads on said outlet end and with a compression-connection outlet socket in said outlet end, said trouble-shooting shut-off valve including a valve housing having a valve chamber therein with an inlet passage leading to said valve chamber and an outlet passage leading from said valve chamber with valve means in said valve chamber movable to a closed position for blocking communication between the inlet and outlet passages and movable to an open position for opening communication between the inlet and outlet passages and with a handle coupled to said valve means for selectively moving said valve means to the closed position and to the open position, said trouble-shooting shut-off valve being characterized by:

- a boss projecting downstream from the valve housing and having external threads thereon,
- said boss encircling said outlet passage,
- said boss having a downstream termination with a truncated conical surface within said boss contiguous with a downstream end of said outlet passage,
- said truncated conical surface flaring outwardly in a downstream direction adapted for engaging a compression sleeve for making a compression-connection between said boss and a flex tube inserted into said outlet passage with a compression nut and a compression sleeve encircling the flex tube and the compression nut engaging said external threads on the boss

for wedging the compression sleeve in contact with said truncated conical surface and also wedging the compression sleeve in compression gripping relationship around the flex tube,

said valve housing having an upstream end with an internally-threaded socket within said upstream end,

said socket encircling said inlet passage,

an inlet-tail-tube fitting,

said inlet-tail-tube fitting having a main body portion,

said main body portion having a downstream protruding end portion with external threads thereon,

said main body portion having a shoulder surface encircling said downstream protruding end portion,

said downstream protruding end portion having its external threads screwed into said internally-threaded socket with said shoulder surface abutting against said upstream end of the valve housing,

said main body portion having an inlet-tail-tube projecting in an upstream direction therefrom,

said inlet-tail-tube fitting having an axial bore therein extending through said downstream protruding end portion and through said main body portion and through said inlet-tail-tube,

said axial bore in said inlet-tail-tube fitting communicating with said inlet passage in said valve housing for forming an upstream extension of said inlet passage,

said inlet-tail-tube having an outside diameter E for fitting into the compression-connection outlet socket of the defective water shut-off valve,

said inlet-tail-tube being formed of material suitable for making a compression connection thereto by a compression sleeve encircling said inlet-tail-tube,

said inlet-tail-tube projecting upstream a distance L from said main body portion of the fitting to an inlet end thereof, and said length L being less than about 1/4 of an inch and being sufficient for having on said inlet-tail-tube a loose compression sleeve and a loose compression nut with the inlet-tail-tube inserted fully into said compression-connection outlet socket of the defective water shut-off valve for making a compression connection between said inlet-tail-tube and the outlet end of the defective water shut-off valve by screwing the compression nut onto said external threads on said outlet end for squeezing the compression sleeve into said outlet socket and onto the inlet-tail-tube.

# 5,480,123

## BUTTERFLY TYPE CONTROL VALVE

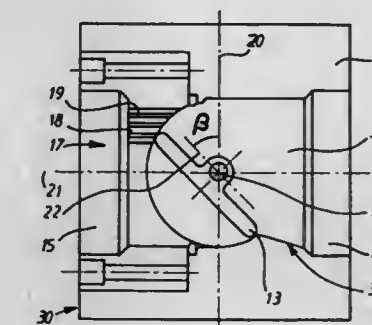
Roger Bey, Illzach, France, assignor to Rotatrol AG, Cham, Switzerland

Filed Nov. 23, 1994, Ser. No. 346,286

Claims priority, application France, Nov. 24, 1993, 93 14219  
Int. Cl.<sup>6</sup> F16K 1/22

U.S. Cl. 251—305

15 Claims



- 1. A butterfly valve comprising: a housing having an inlet and outlet, and a flow passage extending from said inlet to said outlet, and wherein a flow passage axis extends in a direction from said inlet to said outlet at a center of said flow passage;



a butterfly plug disposed in said housing between said inlet and said outlet, said butterfly plug movable about a pivot axis between a closed position and varying angular positions with respect to said closed position to thereby control flow through said flow passage, and wherein with respect to a plane passing through said pivot axis and parallel to said flow passage axis said plane separates said valve into first and second regions, and wherein said butterfly plug includes first and second peripheral portions with said first peripheral portion disposed in said first region when said butterfly plug is in said closed position and said second peripheral portion disposed in said second region when said butterfly plug is in said closed position;

an element generating a pressure drop, said element disposed at an inlet side of said housing with respect to said butterfly plug, said element also disposed in said first region; said housing further including a closing zone disposed in said second region and at an outlet side of said housing with respect to said butterfly plug when said butterfly plug is in said closed position, said closing zone maintaining a closed relationship between said second peripheral portion of said butterfly plug and said housing during initial movement of said butterfly plug from said closed position such that during initial movement of said butterfly plug from said closed position flow only passes over said first peripheral portion of said butterfly plug in said first region and flow does not pass over said butterfly plug in said second region, and during initial opening flow passes through said element prior to passing over said first peripheral portion of said butterfly plug.

5,480,124

## VACUUM TUBING VALVE

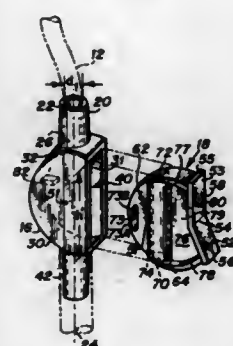
Bruce K. Bartlett, Santa Cruz, and Fritz Haas, Novato, both of Calif., assignors to Vision Medical and Dental, Ben Lomond, Calif.

Filed Nov. 30, 1994, Ser. No. 347,816

Int. Cl.<sup>6</sup> F16K 5/04

U.S. Cl. 251-309

20 Claims



1. A vacuum tubing valve comprising: a first receiver tube shoulder (20) extending along a longitudinal axis (24) for receiving a first tubular hose (12); a stator unit (16) including a first half-disc shaped wall (30), a second half-disc shaped wall (31) connected parallel to and in alignment with said first half-disc shaped wall (30) by a first C-shaped wall (32) intermediate and perpendicular to said first and second half-disc shaped walls (30, 31) thereby forming a C-shaped cavity (40) with an opening about the side opposite said C-shaped wall (32), a first aperture (33) within said C-shaped wall (32), a second aperture (44) within said first C-shaped wall (32) and in axial alignment with said first aperture (33), the first receiver tube shoulder (20) being joined with said first C-shaped wall (32) about said first aperture (33); a second receiver tube shoulder (42) extending along said longitudinal axis (22) and joined to the stator (16) about said second aperture (44); and

a C-shaped rotor (18) positioned within said cavity (40) and rotatable within said cavity (40), having an elongated channel (72) extending end-to-end, said channel (72) being in alignment along said longitudinal axis (24) and with said first and second apertures (33, 44) when said rotor (18) is in a first position, and said channel (72) is off-set from said longitudinal axis (24) and with said first and second apertures (33, 44) when the rotor (18) is in a second position, a frontal wall (52, 53) protruding from said cavity (40) opening such that the rotational position of the rotor (18) within said cavity (40) is controllable by pressure applied to said frontal wall (52, 53).

5,480,125

## HOIST WITH A LIFTING DEVICE

Harald Bitsch, Witten; Heinz Hasselmann, Hagen; Johannes Kluge; Wolfgang Krebs, both of Wetter; Uwe Lichtenvort, Essen; Anton Münzebrock, Dortmund, and Günter Sornborn, Hagen, all of, Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

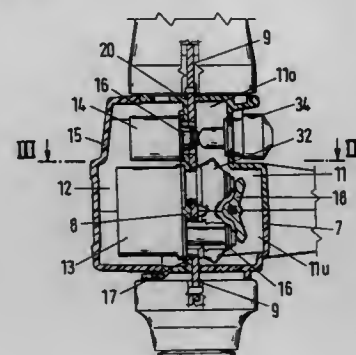
Filed Sep. 3, 1993, Ser. No. 116,325

Claims priority, application Germany, Sep. 3, 1992, 42 29 673.0

Int. Cl.<sup>6</sup> B66D 1/00; 1/12; H01H 19/04

U.S. Cl. 254-264

12 Claims



1. A hoist, comprising: load suspension means; lifting means for raising and lowering the load suspension means; a traction mechanism connecting the suspension means with the lifting means; and control means for the lifting means and the load suspension means, the control means being arranged between the load suspension means and the traction mechanism and including a housing with a handle for manipulating the load suspension means, switching members arranged in the housing for controlling the lifting means, actuating means being arranged in the handle for actuating the switching members, and a high-strength connecting member fastened in the housing, the traction mechanism and the load suspension means being fastened to the connecting member, the housing being divided into a first, mechanical part which is provided with the handle and into a second, electrical part that receives the switching members, the connecting member being arranged between the mechanical part and the electrical part, a dividing wall being a structural component part of the housing and extending parallel to and adjacent with the connecting member; and

inwardly projecting webs being a structural component part of the housing that enclose the connecting member on a side remote from the dividing wall and fasten the connecting member to the housing.

5,480,126

## FENCING CONSTRUCTION

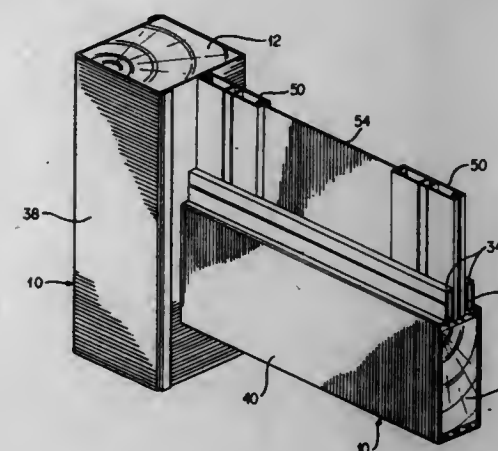
André Teasdale, Montreal, Canada, assignor to Soniplastics Inc., Quebec, Canada

Filed Mar. 23, 1994, Ser. No. 216,408

Int. Cl.<sup>6</sup> E04H 17/14

U.S. Cl. 256-19

12 Claims



6. A fencing construction comprising: at least two substantially vertical elongated beams; two first sleeves for covering the vertical beams, each sleeve comprising a pair of substantially symmetric L-shaped parts provided with opposite male and female interlocking members longitudinally extending along free edges thereof for meshing in a locking engagement and holding the two parts together around a corresponding vertical beam; least two substantially horizontal beams having ends connected to the vertical beams; two second sleeves for covering the horizontal beams, each sleeve comprising a pair of substantially symmetric L-shaped parts provided with opposite male and female interlocking members longitudinally extending along free edges thereof for meshing in a locking engagement and holding the two parts together around a corresponding horizontal beam.

5,480,127

## APPARATUS FOR THE MELTING AND TREATMENT OF METAL

Alok Choudhury, Püttlingen; Jochen Schumann, Maintal; Harald Scholz, Rodenbach, and Jan-Erwin Schindler, Sasbachwalden, all of, Germany, assignors to Leybold Durrferit GmbH, Cologne, Germany

Filed Dec. 1, 1994, Ser. No. 347,958

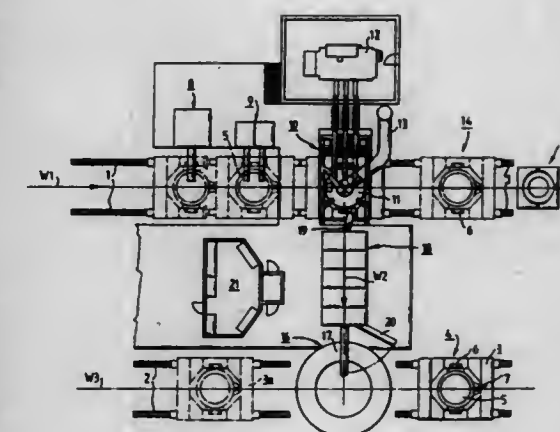
Claims priority, application Germany, Feb. 11, 1994, 44 04 313.9

Int. Cl.<sup>6</sup> C21B 13/14

U.S. Cl. 266-143

9 Claims

1. Apparatus for melting and treating metal comprising a ladle for holding metal,



first linear track means on which said ladle can be transported, a preheating station, a first treatment station, and a slag removal station arranged serially on said first linear track means, means for melting said metal in said ladle at said first treatment station to form a melt, second linear track means which meets said first linear track means perpendicularly at said first treatment station, and a second treatment station on said second linear track means remote from said first treatment station, said ladle being transportable on said second linear track means from said first treatment station to said second treatment station.

5,480,128

## GAS SPRING WITH THREADED MOUNT AND METHOD OF PRODUCING THE SAME

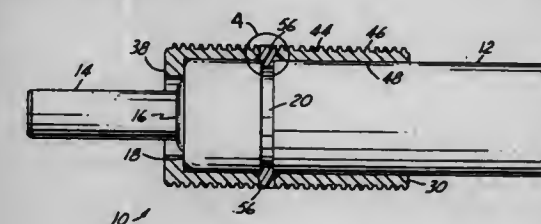
Patrick J. Cotter, Plymouth, Mich., assignor to Diebolt International, Inc., Detroit, Mich.

Filed Jan. 6, 1995, Ser. No. 369,689

Int. Cl.<sup>6</sup> F16F 9/34

U.S. Cl. 267-64.11

13 Claims



1. A gas spring comprising, an elongate tubular casing having a chamber therein for containing gas under pressure and an annular side wall having an annular groove around the outer circumference of said casing, a rod received in said casing and projecting from one end of said casing, a piston within said chamber connected to said rod for axial movement therewith, a sleeve telescoped over said casing and having a wall with external threads thereon and an internal annular groove around the inner circumference of said sleeve and constructed and arranged to align with said annular groove in said casing to form a passage defined by said annular grooves, and a lock ring of resinous material received in said passage for retaining said sleeve on said casing.



5,480,129

# SHOCK ABSORBER WITH AIR SHOCK MODULE, AIR SHOCK MODULE FOR A SHOCK ABSORBER AND PROCESS FOR INSTALLATION OF THE AIR SHOCK MODULE AND SHOCK ABSORBER

Heinz-Joachim Gilsdorf, Ebenhausen; Heinz Sydekum, Dittellbrunn, and Holger Gubitz, Schweinfurt, all of, Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Feb. 17, 1994, Ser. No. 197,692

Claims priority, application Germany, Feb. 18, 1993, 43 04 961.3

Int. Cl.<sup>6</sup> B60G 15/08; 11/27; F16F 9/05

U.S. Cl. 267—64.24

20 Claims



1. Shock absorber assembly comprising:
  - a shock absorber, said shock absorber comprising:
    - a sealed cylinder defining a chamber therein, said cylinder containing a damping fluid;
    - a piston rod sealingly projecting into said cylinder and being axially displaceable with respect to said cylinder;
    - a piston being attached to said piston rod, said piston being slidably disposed within said cylinder to sealingly divide said chamber into first and second chambers;
    - means for permitting flow of damping fluid between said first and second chambers;
    - a central longitudinal axis defined through said sealed cylinder, the central longitudinal axis defining a longitudinal direction of said shock absorber
  - an outer tube, said outer tube having an end surface portion, said end surface portion being perpendicular to the longitudinal axis of said shock absorber;
  - a pneumatic spring for applying a substantially longitudinally directed force to said end surface portion of said outer tube, to longitudinally displace said outer tube;
  - said pneumatic spring comprising:
    - a receptacle accommodating a portion of said outer tube of said shock absorber;
    - means for applying the substantially longitudinally directed force to said end surface portion of said shock absorber, to longitudinally displace said outer tube;
    - said means for applying the substantially longitudinally directed force comprising membrane means for providing the substantially longitudinally directed force;
    - means for transferring the substantially longitudinally directed force provided by said membrane means to said end portion of said shock absorber;
    - means for connecting said membrane means to said force transferring means;
    - said force transferring means comprising a component separate from said shock absorber; and
    - said force transferring means being disposed directly adjacent said end surface portion of said outer tube to apply the substantially longitudinally directed force directly to said end surface portion.

5,480,130

# DEVICE FOR FURTHER PROCESSING AFTER COPYING

Kaoru Suzuki, Yamatokoriyama; Tadahiro Ando; Hiroshi Naka, both of Naka; Mitsutoshi Sawada, Yamatokoriyama; Tomonori Ohata, Osaka; Hiroshi Miura, Yamatokoriyama; Masayoshi Nakabayashi, Wakayama, and Eliti Ando, Higashiosaka, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 247,750, May 23, 1994, Pat. No.

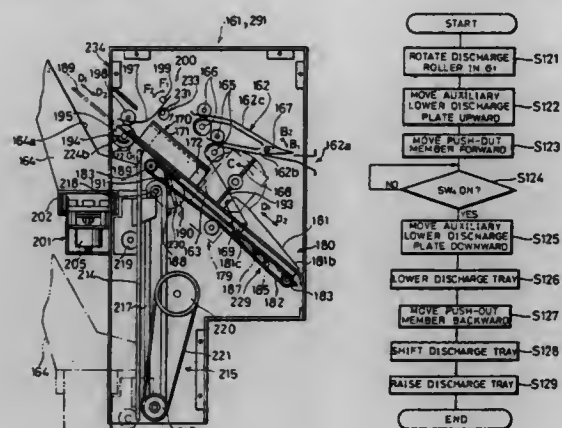
5,435,535, which is a division of Ser. No. 982,320, Nov. 25, 1992, Pat. No. 5,344,130. This application Apr. 27, 1995, Ser. No. 429,819

Claims priority, application Japan, Nov. 25, 1991, 3-309009; Nov. 25, 1991, 3-309012; Nov. 29, 1991, 3-316299; Nov. 29, 1991, 3-316306; Dec. 9, 1991, 3-324712; Dec. 9, 1991, 3-324715; Feb. 26, 1992, 4-039793; Feb. 27, 1992, 4-041135; Mar. 16, 1992, 4-058250; Mar. 26, 1992, 4-068534

Int. Cl.<sup>6</sup> B42B 2/00; B65G 57/00; B65H 31/30

U.S. Cl. 270—53

12 Claims



1. A device for further processing after copying, comprising:
  - sheet holding means for placing thereon a plurality of sheets;
  - means for processing after copying which carries out a predetermined process on a plurality of copied sheets stacked on said sheet holding means;
  - sheet push-out means for pushing out the sheets processed by said means for processing after copying, to be discharged out of the device through the discharge opening;
  - a discharge tray, fitted to the device at a lower level than a sheet discharge opening, for placing thereon the sheets pushed out by said sheet push-out means;
  - drive means for driving said discharge tray up and down;
  - auxiliary lower discharge means capable of moving upward and downward between a forward position and a retreat position, the forward position being a position where a level difference between the discharge opening and said discharge tray is covered; and
  - control means for controlling the movement of said auxiliary lower discharge means so as to start moving upward before the sheets have been completely pushed out by said sheet push-out means onto said discharge tray.
2. A method for controlling a discharge of sheets by a sheet discharge means and an adjustment of a discharge tray position using a device for further processing after copying, comprising the steps of:
  - rotating a discharge roller in a sheet discharge direction and moving a push-out member upward in the sheet discharge direction; and
  - raising the discharge tray back to an upper limit position at which the sheets are to be placed thereon after temporarily being lowered.

5,480,131

# PAPER FEEDING DEVICE

Hideaki Furukawa, and Tadashi Yamakawa, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

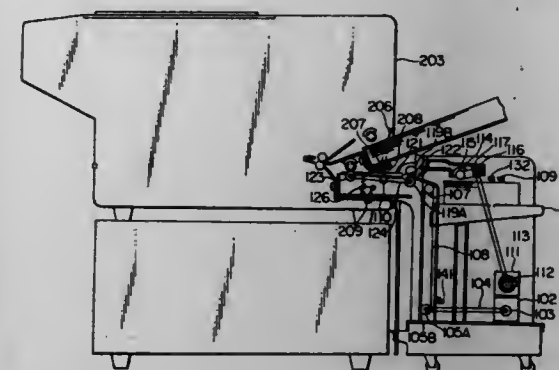
Continuation of Ser. No. 642,562, Jan. 18, 1991, abandoned, which is a continuation of Ser. No. 198,588, May 23, 1988, abandoned, which is a continuation of Ser. No. 894,744, Aug. 11, 1986, abandoned, which is a continuation of Ser. No. 544,410, Oct. 21, 1983, abandoned. This application Sep. 8, 1993, Ser. No. 117,655

Claims priority, application Japan, Jan. 25, 1982, 57-187181; Jan. 25, 1982, 57-186072; Jan. 25, 1982, 57-186073; Jan. 25, 1982, 57-186074; Jan. 25, 1982, 57-187178; Jan. 25, 1982, 57-187179; Jan. 25, 1982, 57-187180; Jan. 25, 1982, 57-187183; Jan. 25, 1982, 57-187184; Jan. 25, 1992, 54-187182

Int. Cl.<sup>6</sup> B65H 3/44

U.S. Cl. 271—9.06

10 Claims



1. A sheet feeding device comprising:
    - storage means for storing sheets;
    - feeding means for feeding a sheet from said storage means;
    - transfer means for transferring the sheet fed by said feeding means along a transfer path to a predetermined position; and
    - control means for controlling said transfer means in such a manner as to stop the transferred sheet at said predetermined position,
- wherein said control means releases activation of said transfer means in different timings in accordance with different sheet sizes so that the sheet stops at said predetermined position.

5,480,132

# SHEET TRANSPORT APPARATUS WITH DISENGAGEMENT MEANS TO ALLOW REVERSE SHEET MOVEMENT

Takehiko Kiyohara, Zama, and Tetsuhiro Nitta, Yokohama, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 70,808, Jun. 3, 1994, abandoned.

This application May 1, 1995, Ser. No. 432,596

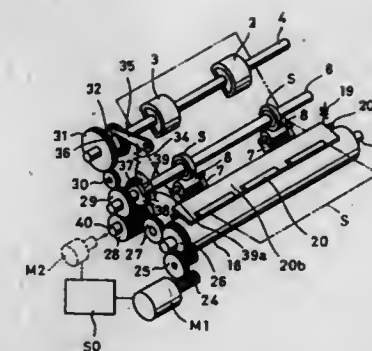
Claims priority, application Japan, Jun. 29, 1992, 4-171086; Jul. 6, 1992, 4-201945

Int. Cl.<sup>6</sup> B65H 5/00

U.S. Cl. 271—10.01

37 Claims

1. A sheet transport apparatus comprising:
  - transport means for transporting a sheet in a predetermined direction and a direction reverse to the predetermined direction;
  - a rotating member contactable with the sheet upstream of said transport means;
  - a drive source; and
  - drive transmission means for transmitting a driving force from said drive source to said rotating member to transport the sheet in the predetermined direction when said transport means is transporting the sheet in the predetermined direction, and transmitting no driving force from the drive source when said transport means is transporting the sheet in the reverse



direction, wherein said rotating member to which no driving force is transmitted is rotatable by a force from the sheet being transported in the reverse direction.

5,480,133

# ADJUSTABLE SHEET TAKE-OFF MECHANISM FOR A SCREEN PRINTING PRESS

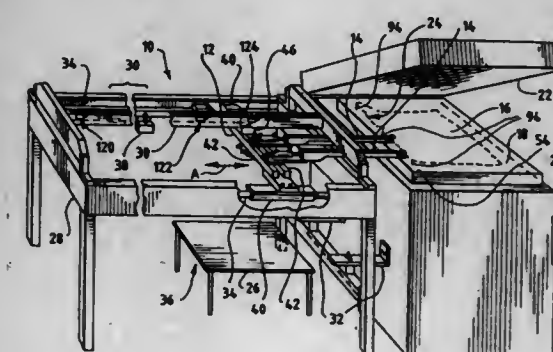
Phil Motev, Deerfield, and Simon Kitaygorodskiy, Chicago, both of Ill., assignors to A.W.T. World Trade, Inc., Chicago, Ill.

Filed May 5, 1994, Ser. No. 238,373

Int. Cl.<sup>6</sup> B65H 29/10

U.S. Cl. 271—85

24 Claims



1. A take-off apparatus for removing sheets of stock from a bed of a screen printing press comprising:
  - a take-off frame adapted to be operated adjacent said press;
  - a carriage member slidably mounted to said take-off frame and reciprocal through a pick-up stroke and a drop-off stroke for transferring said stock from said press; and
  - at least one gripper assembly mounted to said carriage member for gripping a forward edge of said stock at a pick-up point as said carriage member travels through said pick-up stroke and for releasing said stock near a drop-off point as said carriage member travels through said drop-off stroke, said at least one gripper assembly including lateral adjustment means for selective positioning of said gripper assembly along said forward edge and longitudinal adjustment means for selective positioning of said gripper assembly at said forward edge of said stock to accommodate variable arrangements of said forward edge.



5,480,134

**MECHANISM FOR OPENING AND CLOSING A RESEALABLE CARTRIDGE**

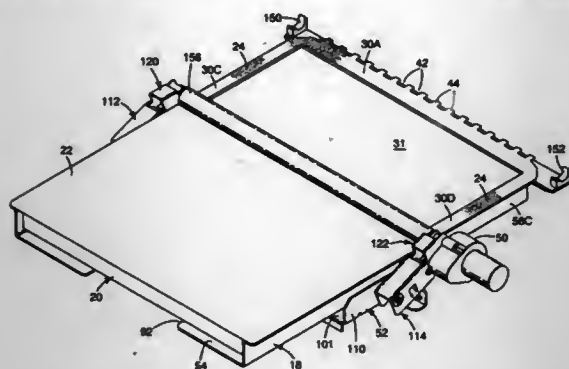
Anthony M. Weber, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 9, 1994, Ser. No. 239,509

Int. Cl.<sup>6</sup> B65H 1/00

U.S. Cl. 271—145

40 Claims



1. A mechanism for opening and closing a resealable cartridge having a tray and a flexible cover resealably engaged with said tray, said mechanism comprising:

- a base for receiving said tray of said cartridge;
- a roller shaft including means for engaging said cover of said cartridge; and
- a motor, having a rotor shaft coupled to said roller shaft such that a central longitudinal axis of said rotor shaft is in substantial coaxial alignment with a central longitudinal axis of said roller shaft, for rotating said roller shaft in a first direction to wind said cover about said roller shaft, thereby removing at least part of said cover from said tray, and for rotating said roller shaft in a second direction to unwind said cover from said roller shaft, thereby resealably engaging said cover with said tray.

5,480,135

**SHEET COLLATING OR STORAGE DEVICE**

Hiromichi Nagane; Alexandre Dodge, both of Rennes; Marie-Helene Froger, Fougères; Christophe Truffaut, and Stéphane Michel, both of Rennes, all of France, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

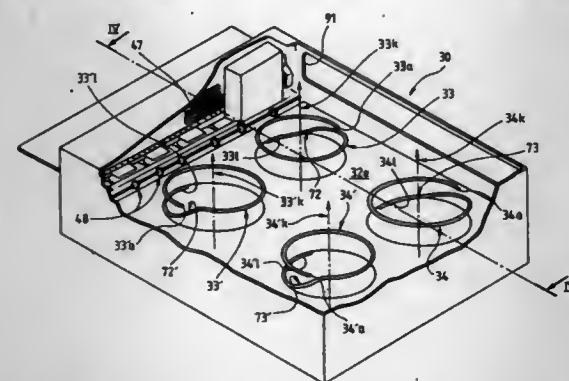
Filed Nov. 30, 1993, Ser. No. 159,490

Claims priority, application France, Dec. 1, 1992, 92 14461

Int. Cl.<sup>6</sup> B65H 43/00; 29/42

U.S. Cl. 271—176

30 Claims



1. A device for collating sheets having at least two edges which are offered to an input of the device, comprising:

- conveyor means adapted to convey the sheets in a circuit arranged between the input and an output of the device, the conveyor means comprising at least a first pair of helical ramps having inner and upper areas and a predetermined

winding direction and each comprising a free end, the ramps being arranged on rotating means adapted to rotate them about their helix axis in the opposite direction to the winding direction; and

sheet guide and placement means, the rotation of the ramps conveying the sheet placed by said sheet guide and placement means, on a predetermined portion of each of the two ramps, along at least part of said circuit and toward the free end of said ramps, a first of the two ramps of said pair having, in relation to the second, a reverse winding, wherein the sheet guide and placement means comprise the inner and upper areas of each of the ramps, said helical ramps being arranged in order that said inner and upper areas come into contact with the sheet edges approximately transversely to the movement of arrival of the sheet to guide it laterally.

5,480,136

**DEVICE FOR DEPOSITING SHEETS**

Gerhard Meyer, Neusäss-Steppach, Germany, assignor to Franz Gremser KG, Neusäss

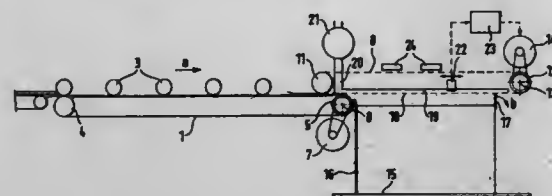
Filed May 9, 1994, Ser. No. 239,985

Claims priority, application Germany, May 14, 1993, 43 16 220.7

Int. Cl.<sup>6</sup> B65H 43/00

U.S. Cl. 271—176

14 Claims



1. A device for depositing sheets on a stack table having stack abutments, comprising

- a conveying system which includes a plurality of endless conveyor belts arranged in parallelism and means to drive the conveyor belts at the same speed to convey the sheets separately in spaced relation to each other on an upper surface thereof;
- a perforated belt system which overlaps the one end of the conveyor belts and comprises a plurality of parallel endless perforated belts driven by a motor at an adjustable speed, such perforated belt system extending over a stack table;
- a plurality of suction air ducts, which are respectively arranged behind each lower run of said perforated belts and are solely open toward the perforated belts;
- a source of vacuum which is connected with the ends of vacuum ducts nearest to the conveyor belts and is adapted to supply vacuum reducing the air pressure in the suction air ducts; and
- a motor control sensor adapted to respond to the leading edge of a sheet and to the fall of a sheet from the perforated belt duct system and able to be adjusted in the direction of movement of the sheet to a distance from the start of the suction air ducts, which is less than the sheet length, such sensor being adapted to accelerate the motor with the perforated belt system in alternation after the fall of a sheet to a high conveying speed and after engagement of the sheet to slow down again the perforated belt system.

5,480,137

**SUCTION-AIR CONTROL DEVICE FOR A SHEET-TRANSFER DRUM**

Rudi Hauptenthal, Epfenbach, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

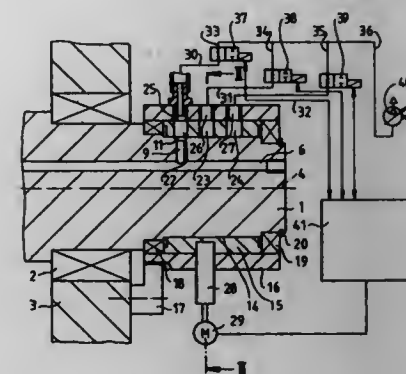
Filed May 10, 1994, Ser. No. 240,921

Claims priority, application Germany, May 10, 1993, 43 15 549.9

Int. Cl.<sup>6</sup> B65H 5/14

U.S. Cl. 271—276

8 Claims



1. Suction-air control device for a rotatable sheet-transfer drum having suction-type grippers disposed thereon and having a journal with a rotationally symmetrical surface, comprising a rotary valve disposed on the journal of the sheet-transfer drum for connecting the suction-type grippers to a stationary suction-air source, a stationary housing of said rotary valve, and means for controlling a supply of suction air from the suction-air source to the suction-type grippers with a time lead or a time lag as a function of the rotational speed of the sheet-transfer drum, means defining at least one suction-air bore extending from the interior of the journal to the surface thereof, said one suction-air bore being connectable to the suction-type grippers, the rotationally symmetrical surface of the journal forming a sealing surface of the rotary valve, and said rotary valve comprising at least one closing member formed with at least one air-passage opening disposed over a defined rotational-angle range for connecting the one suction-air bore formed in the journal with at least one connection hole formed in said housing of said rotary valve, said closing member being rotatably disposed relative to said housing and relative to the journal; and wherein said controlling means include actuating means connected to said one closing member for rotating said one closing member.

5,480,138

**DEVICE FOR SHEET-FORMAT ADJUSTMENT OF A SHEET-TRANSFER DRUM**

Rudi Hauptenthal, Epfenbach, and Maurice Lämmerzahl, Heidelberg, both of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed May 10, 1994, Ser. No. 240,926

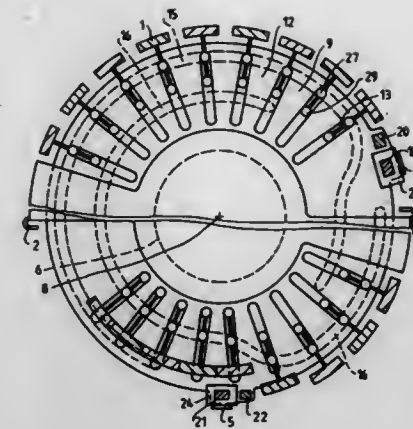
Claims priority, application Germany, May 10, 1993, 43 15 513.8

Int. Cl.<sup>6</sup> B65H 5/02

U.S. Cl. 271—276

5 Claims

1. Device for sheet-format adjustment of a sheet-transfer drum having a shaft, the device comprising sheet-holding segments displaceable in guides radially and in a rotational direction of the sheet-transfer drum, guide discs disposed on both sides of the sheet-transfer drum and fixedly connected to the shaft of the sheet-transfer drum, said guides including mutually parallel guide slots formed in said guide discs, and at least one guide element connected to one of said sheet-holding segments and being seated in each of said guide slots, and a respective control disc disposed on each side of the sheet-transfer drum and rotatable on the shaft of the sheet-transfer drum, said control disc being associated with the respective guide disc and being connected to at least one cross-



member, said at least one guide element being seated in a control slot formed in said control disc, said control slot having a radial guiding component, and gripper devices for holding leading and trailing edges of sheets, said gripper devices for holding the sheet trailing edge being disposed on said at least one cross-member, at least one of said control discs being connected to a driving element for rotating said control discs relative to said guide discs on said shaft of the sheet-transfer drum.

5,480,139

**BASKETBALL PRACTICE ASSEMBLY**

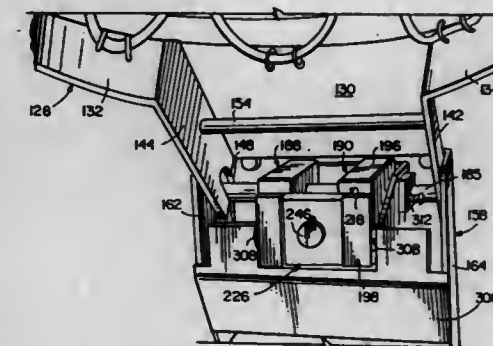
Aubrey J. Owen, Jr., 273 Argilla Rd., Ipswich, Mass. 01938, and Henry E. St. Louis, Jr., Center Ossipee, N.H., assignors to Aubrey J. Owen, Jr., Ipswich, Mass.

Continuation-in-part of Ser. No. 590, Jan. 5, 1993, Pat. No. 5,308,059, which is a continuation of Ser. No. 720,006, Jun. 24, 1991, abandoned. This application Jan. 24, 1994, Ser. No. 185,077

Int. Cl.<sup>6</sup> A63B 63/08

U.S. Cl. 273—1.5 R

19 Claims



1. A basketball hoop and hoop support assembly comprising: a first outer frame support adapted for attachment to a backboard and having a first upper transverse axle secured therein; a hoop assembly including a hoop and a mounting bracket, said mounting bracket having a pair of sides, each with a slot adapted to engage said first axle, said mounting bracket also having a mounting rod extending between said sides and parallel to said first axle; and



a hoop support and breakaway mechanism located within said first outer frame support and pivotally secured to said first axle for permitting said hoop assembly to pivot downwardly under a predetermined load, said breakaway mechanism including spring loaded quick release means for releasably capturing said mounting rod.

5,480,140

## BATH TUB BASKETBALL GAME

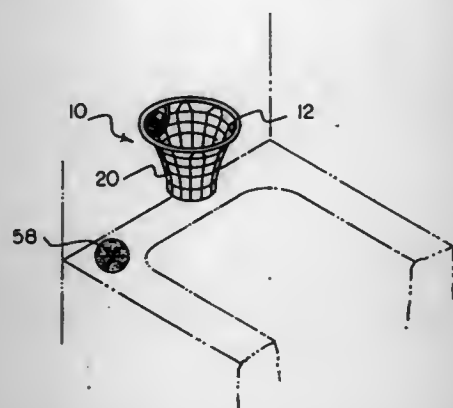
Joseph L. Darnell, Rte. 1 Box 34J Doolittle Rd., Priest River, Id. 83856

Filed Sep. 14, 1994, Ser. No. 305,844

Int. Cl.<sup>6</sup> A63B 63/08

U.S. Cl. 273-15 R

2 Claims



1. A new and improved scrub-a-dub-hoop for providing enjoyment for a user in the bathtub with a simulated basketball game comprising, in combination:

a basketball hoop having an upper surface and a lower surface, the lower surface having a plurality of securement eyes thereon, the basketball hoop having a circular shape with an eight inch diameter;

a net having an upper end and a lower end, the upper end having a plurality of U-shaped securement strings thereattached, the U-shaped securement strings adapted for coupling with the plurality of securement eyes of the lower surface of the basketball hoop;

a suction cup having an outer surface and an inner surface, the outer surface adapted for securement to a bathroom wall, a circular molded plastic piece having a first edge, a second edge, and an intermediate groove therebetween, the first edge secured to the inner surface of the suction cup;

a molded plastic rim base having an upper end and a lower end, the upper end integral with the lower surface of the basketball hoop, a securement aperture formed downward of the upper end, the lower end having a first extent and a second extent parallel to each other, the first extent having a slot key end integral with an outer surface thereof, the second extent having a slot key end integral with an outer surface thereof, the first extent and the second extent capable of separating to allow the securement aperture to secure to the intermediate groove of the circular molded plastic piece of the suction cup;

a generally U-shaped clasp removably secured to the slot key end of the first extent and the second extent of the molded plastic rim base, the clasp serving to provide a tight fit around the circular molded plastic piece; and

a sponge ball serving as a ball to shoot through the basketball hoop and as a means of washing.

5,480,141

## HITTING PRACTICE APPARATUS

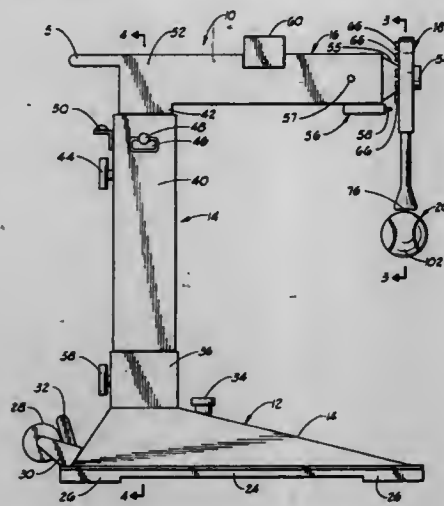
David G. Wood, 7913 N. McKee Blvd., Oklahoma City, Okla. 73132

Filed Aug. 31, 1994, Ser. No. 299,158

Int. Cl.<sup>6</sup> A63D 15/10

U.S. Cl. 273-26 E

12 Claims



1. A hitting practice apparatus comprising:

a horizontal support arm;

a rotation element, pivotally supported on the support arm and rotatable in a plane substantially orthogonal to the support arm;

a unitary ball suspension cable having an upper end, secured to the rotation element, and a lower end;

a ball element comprising a ball having an axial internal passage, the passage characterized by opposed first and second surface outlets and an internal channel through which the ball suspension cable is clearlying extended, the internal channel having an enlarged section comprising an internal chamber adjacent the second surface outlet, and a constricted section intermediate the internal chamber and the first surface outlet;

a lower cable stop element, secured to the lower end of the ball suspension cable and positioned within the internal chamber, the lower cable stop element having a cross-sectional dimension exceeding that of the constricted section of the internal channel, while permitting rotation of the ball element with respect to the lower cable stop element and ball suspension cable; and

a lower spring, positioned within the internal chamber of the ball element intermediate the lower cable stop element and the constricted section of the internal channel.

5,480,142

## REVERSIBLY ELEVATABLE GOLF CUP

Vojtech Ackerman, 4958 Dumfries Dr., Houston, Tex. 77096

Filed Mar. 27, 1995, Ser. No. 411,108

Int. Cl.<sup>6</sup> A63B 57/00

U.S. Cl. 273-34 A

7 Claims

1. A golf cup, comprising:

a golf cup adapted to be placed in a hole in a golf green; and

5,480,144

## FOOTBALL WITH BLADDER PROTECTIVE PANEL

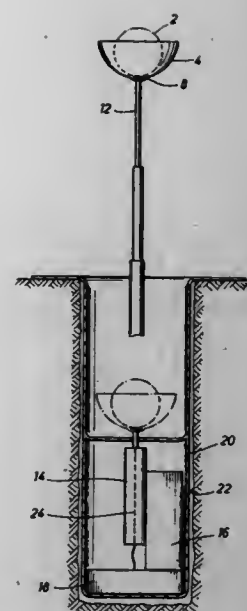
William J. Downing, Lot 51, Northland Trailer Ct., Ada, Ohio 45810

Filed Apr. 18, 1995, Ser. No. 423,937

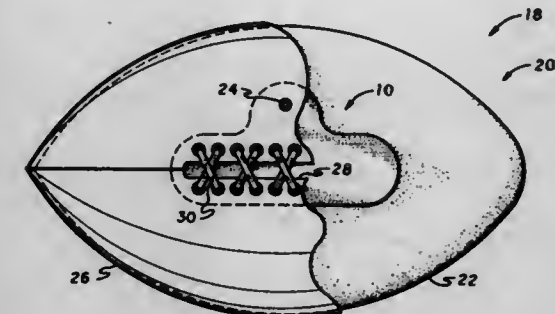
Int. Cl.<sup>6</sup> A63B 41/04; 41/08

U.S. Cl. 273-65 A

5 Claims



means for reversibly elevating said cup a predetermined distance above said green in response to a golf ball entering said cup.



1. A football comprising:

a bladder having a flexible, inflatable bag and a valve projecting outwardly therefrom;

a cover surrounding said bladder, said cover having means defining a longitudinally oriented gap therein exposing said bladder, said cover having laces crossing said gap; and

a flexible protective panel disposed between said bladder and said cover, and covering said gap and terminating below said cover, and having means defining an opening engaging said valve.

5,480,145

## CORRELATED SET OF GOLF CLUB IRONS

Brad L. Sherwood, N. 4921 Division, Spokane, Wash. 99207

Continuation of Ser. No. 196,387, Feb. 14, 1994, Pat. No.

5,388,826. This application Feb. 13, 1995, Ser. No. 388,462

Int. Cl.<sup>6</sup> A63B 53/00

U.S. Cl. 273-77 A

59 Claims

5,480,143

## WINGED PRACTICE BALL

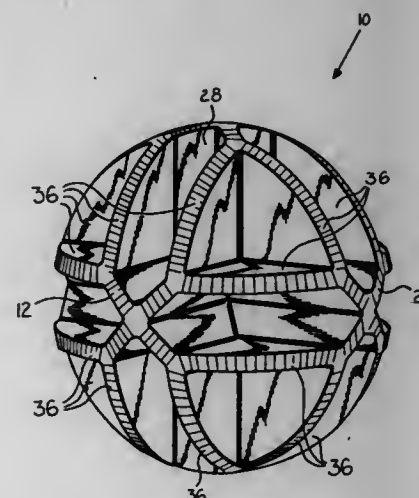
Gary D. McMurtry, 427 Shearer Blvd., Cocoa, Fla. 32922

Filed Mar. 28, 1994, Ser. No. 219,546

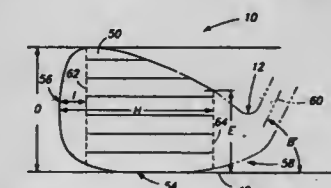
Int. Cl.<sup>6</sup> A63B 43/00

U.S. Cl. 273-58 R

10 Claims



1. A practice ball comprising an X-member, a Y-member and a Z-member rigidly attached at their midpoints, and a plurality of wings interconnecting said X-member, Y-member and Z-member, said wings being shaped like fiat webs, said X-member, Y-member and Z-member having a constant cross-section over their lengths through a point at which said X-member, Y-member and Z-member are mutually attached.



1. A correlated set of individually numbered golf club irons progressing from a high numbered club to a low numbered club; individual clubs having a front striking face, a rear face, a sole, a toe and a heel; the front striking faces of clubs within the set individually having a total planar area defining a progressively decreasing loft angle in going from the high numbered club to the low numbered club; the front striking faces of clubs within the set individually having a maximum planar length; for at least two chosen pairs of clubs within the set, the striking face total planar area of individual clubs within each chosen pair increasing in size in going from the higher numbered club to the lower numbered club.



club in the pair, for the at least two chosen pairs of clubs within the set, the maximum planar length of individual clubs within each chosen pair increasing in size in going from the higher numbered club to the lower numbered club.

5,480,146

# GOLF GRIP WITH RECESSES TO INSURE PROPER HAND POSITIONING OF A USER

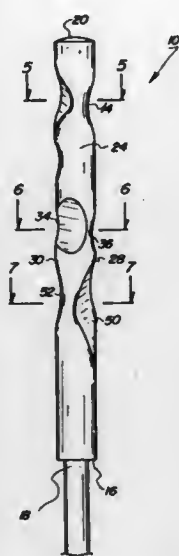
Larry D. Comer, 217 Liberty Dr., Thomasville, N.C. 27360

Filed Dec. 8, 1994, Ser. No. 352,396

Int. Cl.<sup>6</sup> A63B 53/14

U.S. Cl. 273—81.4

1 Claim



1. A golf grip with recesses to insure proper hand positioning of a user comprising, in combination:

- a cylindrical body portion fabricated of an elastomeric material with limited resilience, the body portion having an open lower end for positioning over the upper end of a golf shaft, the cylindrical body portion having a cap over the upper end for the closure thereof, the body portion having a front surface positionable over the head of the golf club when the grip is positioned on a golf club and the golf club is held for use and a rear surface on the side opposite from the front surface, the cylindrical body portion having a leading surface facing in the direction of the club face and a trailing surface facing in the direction opposite from the leading surface;
- three separate and circumferentially spaced central recesses formed in the central extent of the grip, the central recesses including a major recess between the front surface and trailing surface and major recesses on the leading surface and a minor recess between the rear surface and trailing surface;
- three separate and circumferentially spaced upper recesses formed in the upper extent of the grip, the upper recesses including a major recess on the rear surface and leading surface and a major recess on the front surface and trailing surface and a minor recess on the rear surface and trailing surface; and
- two separate and circumferentially spaced lower recesses formed in the lower extent of the grip, the lower recesses including a major recess in the leading surface and front surface and a major recess in the trailing surface.

5,480,147

# BASKETBALL GAME ADJUSTMENT APPARATUS

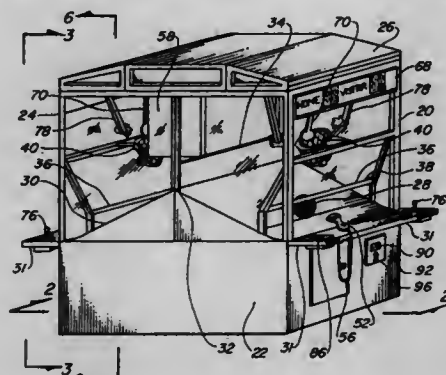
Albert J. Ethier, 10616 Horley St., and Eric Schulz, 10421 Lesterford Ave., both of Downey, Calif. 90241

Filed Feb. 6, 1995, Ser. No. 386,805

Int. Cl.<sup>6</sup> A63F 7/20

U.S. Cl. 273—85 R

20 Claims



1. A basketball game amusement apparatus comprising:
  - a) a transparent enclosure permitting viewing therewithin,
  - b) a miniature air inflated basketball captivated inside the enclosure,
  - c) a pair of inclined playing surfaces within the enclosure each angled upwardly on a facing end forming a centrally located apex providing downward positioning of the basketball at rest,
  - d) a pair of opposed striker bars each positioned less than the basketballs height directly above one of the playing surfaces such that the basketball is contained within the enclosure and yet accessible between the bar and the playing surface from outside,
  - e) a pair of opposed basketball hoops above the playing surfaces in full view from outside the enclosure, and
  - f) a striker having an angular impact surface, accessible from outside of the enclosure, permitting a player to hit the resting basketball with the striker toward the opponents hoop and when passing through scoring a goal.

5,480,148

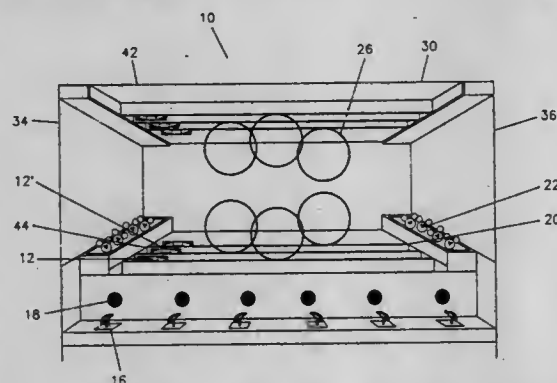
# WATER DRIVEN ROLLER COASTER GAME

Dennis Bartosik, 5705 Jason Lee Pl., Sarasota, Fla. 34233  
Continuation-in-part of Ser. No. 15,126, Nov. 9, 1993. This application Nov. 15, 1994, Ser. No. 339,836

Int. Cl.<sup>6</sup> A63F 9/14

U.S. Cl. 273—86 B

15 Claims



1. A water activated roller coaster game system for use by people for fun and amusement and prizes comprising in combination:
  - a game housing having an enclosed rear face and an enclosed side face and an enclosed top roof and an enclosed bottom

floor and an open front face for the people to participate in the game and observe the progress of the game;

- a plurality of roller coasters and a plurality of race tracks disposed within the game housing in a parallel orientation, each roller coaster being dedicated to traverse one of the race tracks from a start line to a finish line;
- a plurality of game consoles disposed adjacent to the game housing and outside the front face, each game console for activating and controlling the traverse of one of the roller coasters over one of the race tracks;
- a plurality of motor means disposed in the game housing and adjacent to the race tracks, each motor means being electrically coupled to one roller coaster for moving the roller coaster over one of the race tracks;
- a plurality of switch means, each switch means being disposed in one of the game consoles and further being therebetween one of the consoles and one of the roller coasters for moving the roller coaster over the race track when in a closed status and halting the roller coaster when in an open status;
- a second plurality of switch means, each second switch means being disposed in the game housing at the finish line of one of the race tracks and further being therebetween the finish line of one race track and a pop-up winner indicator disposed rearwardly on one of the game consoles, the second switch means for raising the pop-up winner indicator when a winning roller coaster reaches the finish line.

5,480,149

# FLIPPER FEEDER RAMP

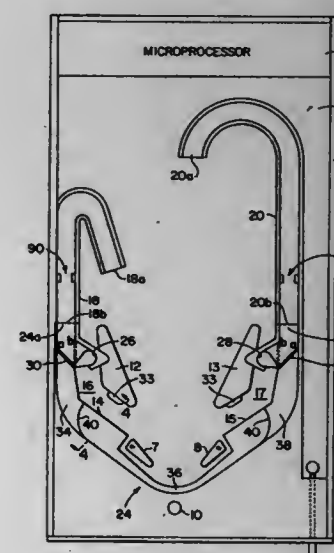
John Trudeau, Bolingbrook, Ill., assignor to Williams Electronics Games, Inc., Chicago, Ill.

Filed Sep. 1, 1994, Ser. No. 299,731

Int. Cl.<sup>6</sup> A63F 7/30

U.S. Cl. 273—118 R

17 Claims



1. A play feature for a pinball game having an inclined playfield supporting a rolling ball, comprising:
  - a) a first flipper;
  - b) a second flipper;
  - c) a ramp for delivering a ball between the first and second flippers;
  - d) first means for delivering the ball to a first end of the ramp;
  - e) second means for delivering the ball to a second end of the ramp; and
  - f) means for controlling access to said ramp from said first and second means for delivering.

5,480,150

# SYSTEM FOR GENERATING RANDOM OUTCOMES USING DISCS

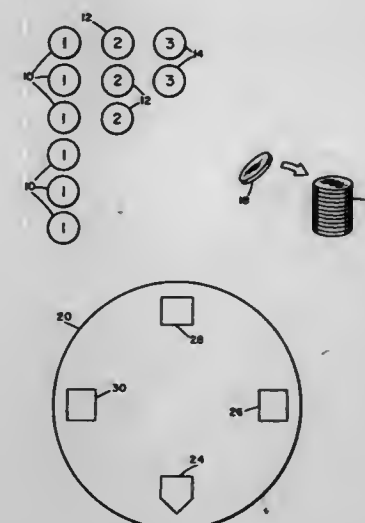
Rudi Weyand, 16776 Bernardo Center Dr., Suite 110B, San Diego, Calif. 92128

Filed Dec. 5, 1994, Ser. No. 349,549

Int. Cl.<sup>6</sup> A63F 3/00; 9/02

U.S. Cl. 273—138 R

6 Claims



5. A system for randomly selecting an outcome from a predetermined set of outcomes, comprising:

- a plurality of sets of discs, each set consisting of at least one disc, each disc in said set having an indicia side and a non-indicia side, said indicia side of each said disc in a set having the same indicia as said indicia side of every other said disc in said set and different from said indicia of said indicia side of said discs in every other said set.
- a disc having a cross-sectional thickness greater than that of each disc in said plurality of sets of discs;
- a game board having a plurality of positions; and
- at least one playing piece, said playing piece disposable at said positions, said predetermined set of outcomes includes changing said position at which a playing piece is disposed.

5,480,151

# GOLF CLUB SHAFT WITH ALIGNMENT SYSTEM

Byron H. Adams, 5915 Bent Creek Trail, Dallas, Tex. 75252

Filed Nov. 4, 1994, Ser. No. 336,664

Int. Cl.<sup>6</sup> A63B 53/00

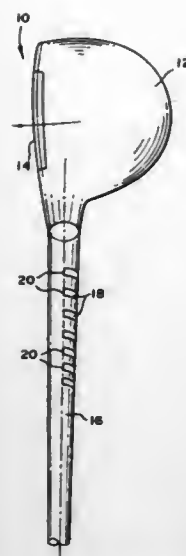
U.S. Cl. 273—163 A

1 Claim

1. A golf club including a club head, grip, shaft and alignment system to aid a golfer in aligning the club toward an intended target line comprising:

- alignment indicia in the form of a series of identical, in-line, alignment marks on the shaft, adjacent the head, forming a sighting image along a length of the shaft;
- said alignment indicia being equally spaced from each other in the form of C-shaped marks extending approximately 180° around the periphery of the shaft and including ends which are in registration with said club head and located at a precise top center position of said shaft when said club head is precisely aligned perpendicular to an intended target line;





whereby positioning the sighting image at the top center position of said shaft locates the club head to the intended target line.

5,480,152

# HOLLOW, METALLIC GOLF CLUB HEAD WITH RELIEVED SOLE AND DENDRITIC STRUCTURES

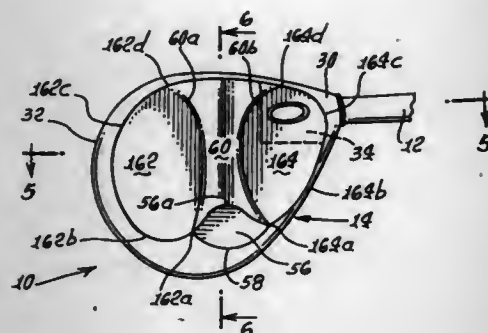
Glenn H. Schmidt, Malibu, and Richard C. Helmstetter, Carlsbad, both of Calif., assignors to Callaway Golf Company, Carlsbad, Calif.

Continuation-in-part of Ser. No. 29,553, Mar. 11, 1993, Pat. No. 5,301,945, which is a continuation of Ser. No. 819,379, Jan. 15, 1992, Pat. No. 5,240,252, which is a continuation-in-part of Ser. No. 791,322, Nov. 14, 1991, Pat. No. 5,180,166, which is a continuation of Ser. No. 595,963, Oct. 16, 1990, Pat. No. 5,067,715. This application Jan. 6, 1994, Ser. No. 173,389

Int. Cl.<sup>6</sup> A63B 53/04

U.S. Cl. 273—167 A

45 Claims



1. A set of golf club heads, each head comprising a shell having toe and heel portions, and a front wall defining a ball striking face, and top and bottom walls, the ball striking faces of the heads having varying angularities with respect to vertical, the bottom wall of each head having a medial ridge, and forming two dish, similar shallow recesses, one recess between the ridge and heel portion and the other recess between the ridge and toe portion, said recesses located rearwardly of said front wall, one recess having an arcuate peripheral edge portion generally convex toward said heel portion and the other recess having an arcuate peripheral edge portion generally convex toward said toe portion, said ridge being forwardly elongated and having a forwardmost extent with forwardly diverging opposed surfaces diverging toward and in proximity to said front wall, rearwardmost extent with rearwardly diverging opposed surfaces diverging away from and distal from

said head front wall, and a curved rearward edge convex toward and distal from said front wall.

5,480,153

# GOLF WOOD CLUB WITH SMOOTH GROOVE-FREE FACE

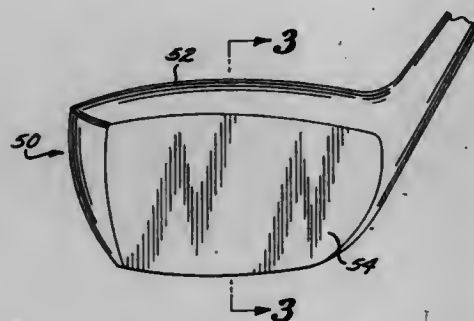
Lawrence Y. Igarashi, 30231 Tomas Rd., Rancho Santa Margarita, Calif. 92688

Continuation-in-part of Ser. No. 250,798, May 27, 1994. This application Dec. 21, 1994, Ser. No. 360,884

Int. Cl.<sup>6</sup> A63B 53/04

U.S. Cl. 273—167 H

11 Claims



5. A golf driver club, comprising a hollow club head body and a rigid metal, non-resilient ball-impacting faceplate attached to said club head body, said faceplate having a ball-impacting surface defined by said rigid metal which is smooth, highly polished and free of grooves and indentations, thereby minimizing any impartation of spin to a golf ball upon impact with said ball-impacting face.

5,480,154

# GOLF BALL INCLUDING SOUND-EMITTING MEANS

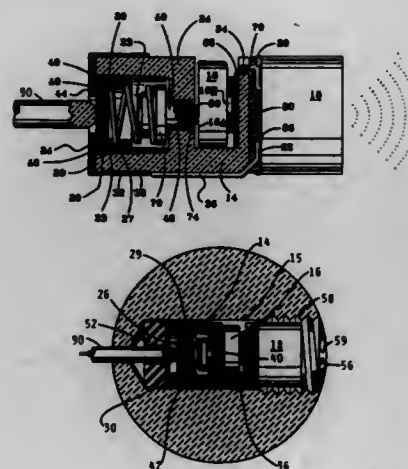
William R. Barnhill, 1750 Orchard Rd., Mooresville, Ind. 46158; Jerry D. Weddell, 10 Kentucky Ave., Clayton, Ind. 46118, and Dave Smitson, 1660 Cottonwood Ct., Plainfield, Ind. 46168

Filed Nov. 7, 1994, Ser. No. 334,950

Int. Cl.<sup>6</sup> A63B 43/00

U.S. Cl. 273—213

24 Claims



1. A golf ball including a sound-emitting device, comprising, in combination:  
a carrier member carried by the golf ball interiorly thereof;  
a battery;

a sound-emitting means, electrically activatable, and having a first electric circuitry means and a second electric circuitry means which activate the sound-emitting means when impressed with different voltage;

electric circuitry operatively connecting in series the respective ones of the first electric circuitry means and the second electric circuitry means of the sound-emitting means and the battery;

switch means in said circuitry in operative series with the battery and the sound-emitting means' first electric circuitry means and second electric circuitry means;

a movable actuator member movably carried by the carrier member in a chamber provided therein;

an inner cap member connected into an assembly with the carrier member, and having electrically conductive means connected to one of the first electric circuitry means and second electric circuitry means of the sound-emitting means; the movable actuator member and the carrier member/cap member assembly being relatively movable into and between a sound-silent condition in which the switch means is in an open-circuit condition, and a sound-emitting condition in which the switch means is in a closed-circuit condition;

the switch means comprising a relative movability of the inner cap member's electrically conductive means and the movable actuator member, that relation being such that in a first relative position they are in a closed-circuit operatively touching condition, and providing electrical contact therebetween, and in a second relative position they are operatively in an open-circuit condition not operatively touching, and not providing electrical contact therebetween;

a conductive body member;

a spring means operatively interconnecting the conductive body member and the movable actuator member, and biasing them apart, and biasing the movable actuator member toward a relative position having sound-emitting closed-circuit condition of the switch means, and maintaining that sound-emitting condition until circuit-opening opposing force is applied as specified below;

releasable holding means operative to hold the carrier member/cap member assembly and the movable actuator member in a relative holding position of operative electrical open-circuit non-engagement which releasably maintains the sound-silent condition of the switch means;

the releasable holding means being releasably operative, by impact force by a golf club upon the ball, to release its said holding operativity, the spring means then being operative, due to the said release by the releasable holding means, to cause the movable actuator member and the carrier member/cap member assembly to move relatively to one another, to operatively electrically engage one another to achieve sound-emitting closed-circuit condition of the switch means;

there being provided a conductor means between the movable actuator member and the conductive body member, serving as a conductor of electrical energy between the movable actuator member and the conductive body member;

the conductive body member operatively electrically engaging the battery;

and the inner cap member is provided with an inner cap aperture which provides operative access through the inner cap member to the movable actuator member for manual force to be operatively applied to the movable actuator member, opposing the bias force of the spring means thereupon, to achieve open-circuit silencing of the sound-emitting means, and also to establish said releasably held holding condition of the releasable holding means to hold and maintain the silence of the sound-emitting means, and also to cock the device for the subsequent impacting of the ball by a golf club to re-start the sound-emitting operativity of the sound-emitting means, by a single manual force impact by the user;

the golf ball being provided with a primary receiving chamber, into which the carrier member is disposed;

in a combination in which the movable actuator member comprises a generally cylindrical body having, as a part of the switch means in said electric circuitry, electrical conductivity means on a first face of the movable actuator member, that

being the face thereof which, when the carrier member is disposed in the golf ball, is the movable actuator member's face facing the direction which the movable actuator member is being biased by the said spring means;

the movable actuator member also having electrical conductivity means on a second face thereof, which electrical conductivity means is in electrical conductivity contact with the said conductor means;

and the movable actuator body provides electrical conductivity operatively between the electrical conductivity means on its first and second faces;

the electric circuitry including portions which provide components of the said switch means which are operatively in electrically conductive engagement with the said electrical conductivity means on the said first face of the movable actuator member when the movable actuator member is released from the sound-silent condition of the switch means.

5,480,155

# GOLF BALL

Robert P. Mollitor, Niles, Mich., and Terence Melvin, Somers, Conn., assignors to Lisco, Inc., Tampa, Fla.

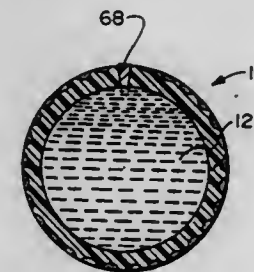
Continuation-in-part of Ser. No. 887,727, May 22, 1992, abandoned, which is a division of Ser. No. 321,689, Mar. 10, 1989, Pat. No. 5,150,906. This application Dec. 2, 1993, Ser. No. 162,215

The portion of the term of this patent subsequent to Sep. 29, 2009, has been disclaimed.

Int. Cl.<sup>6</sup> A63B 37/08; B23P 25/00

U.S. Cl. 273—220

17 Claims



3. An improved golf ball that has a high coefficient of restitution, that conforms to the initial velocity requirements of the U.S.G.A., and that may, in regulation play, be driven long distances, in terms of both carry and roll, as a result of being struck by a golf club, the improved golf ball comprising: a substantially spherical shell of polymeric material and a core material that substantially fills the spherical shell without stressing the spherical shell, where the spherical shell is substantially solely responsible for the initial velocity of the golf ball when the golf ball is struck by the golf club and which allows the golf ball to be driven long distances both in the air and on the ground when it lands.

5,480,156

# SQUEEZABLE TALKING TRADING CARDS

Dieter D. Doederlein, Mississauga; G. Dale Newman, Unionville; Brian J. Burgess, Newmarket, and Anthony C. Sharp, Agincourt, all of, Canada, assignors to The M2000 Group Inc., Richmond Hill

Filed Oct. 13, 1994, Ser. No. 322,135

Int. Cl.<sup>6</sup> G09F 1/00

U.S. Cl. 273—237

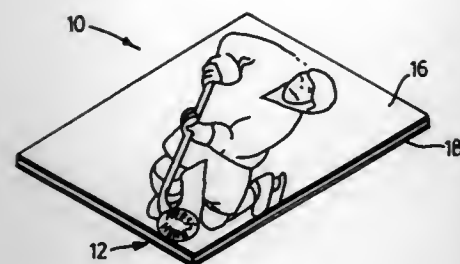
7 Claims

1. A trading card capable of generating sounds, comprising:

(a) a thin housing having front and back surfaces;

(b) flexible sheets affixed to the front surface and to the back surface of the housing;





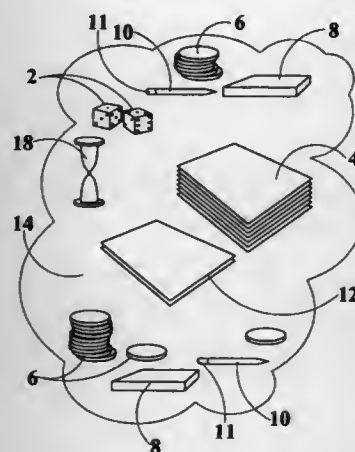
- (c) sound generating means located in the housing for generating preselected patterns of sounds;
- (d) power means located in the housing for supplying electrical power to the sound generating means;
- (e) activation means located in the housing for activating the sound generating means; and
- (f) wherein the front surface of the housing comprises a flat planar front panel and the back surface comprises a thin narrow planar frame extending around the back of the periphery of the front panel, and wherein the front panel of the housing has apertures therein for receiving components of the sound generating means, the power means and the activation means, and wherein the panel apertures include a battery aperture which extends to an edge of the front panel.

5,480,157

**FACT GAME AND METHOD OF PLAYING THE SAME**  
Donna M. Plummer, #151 Rte. 125, Barrington, N.H. 03825  
Filed Nov. 10, 1994, Ser. No. 337,069  
Int. Cl.<sup>6</sup> A63F 9/18

U.S. Cl. 273-432

3 Claims



1. A method of playing a game comprising a plurality of betting chips to be equally distributed to each contestant and wagered by each contestant during the course of playing the game; a mechanism for determining which contestant will match answers to the other contestant; a deck of cards containing a plurality of different cards with each card of said deck of cards asking a question requesting a factual response concerning the lives of the contestants playing the game; a plurality of answer tablets for facilitating the contestants responding to each factual inquiry concerning a card selected from said deck of cards, said method comprising the steps of:

- a) providing each contestant and a dealer with a writing instrument and an answer tablet and a equal number of betting chips;
- b) determining the playing order of the contestants playing the game;

- c) said dealer selecting a card from a deck of cards and reading a question posed in said selected card aloud to each said contestant;
- d) each said contestant placing a wager, by selecting a desired number of said betting chips to wager, on said read question;
- e) each said contestant secretly responding to said read question by indicating an answer on the answer tablet using the writing instrument;
- f) once each said contestant has responded to said read question, placing the answer tablet face down;
- g) shuffling said answer tablets;
- h) having one contestant read each said answer;
- i) having said dealer match each said read answer to the contestant believed to have provided such answer;
- j) awarding said dealer said wagered betting chips for each said answer correctly matched to the contestant believed to have provided such answer; and
- k) said dealer awarding said wagered betting chips for each said answer incorrectly matched to the contestant believed to have provided such answer.

5,480,158

**ENTERTAINMENT INSTALLATION**

Ullrich Schulze, Wiesbaden; Juergen Schattauer, Hueffelsheim; Horst Heinen, Stromberg, and Konrad Rieck, Bingen, all of, Germany, assignors to NSM Aktiengesellschaft, Bingen, Germany

PCT No. PCT/DE93/00045, § 371 Date Jul. 21, 1994, § 102(e) Date Jul. 21, 1994, PCT Pub. No. WO93/14843, PCT Pub. Date Aug. 5, 1993

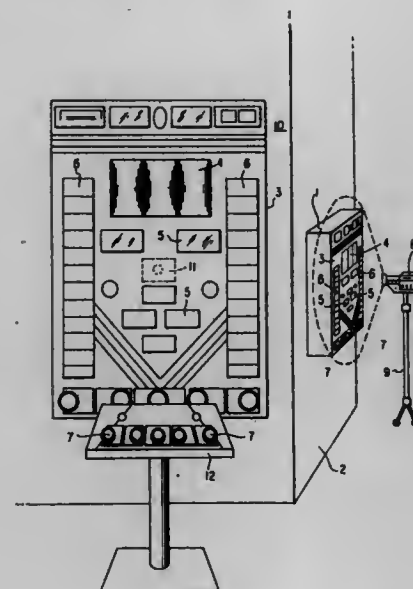
PCT Filed Jan. 18, 1993, Ser. No. 256,743

Claims priority, application Germany, Jan. 22, 1992, 42 01 555.3

Int. Cl.<sup>6</sup> A63F 9/22

U.S. Cl. 273-434

9 Claims



1. An entertainment installation comprising:
- at least one entertainment device defining a game area;
  - first actuation members operatively connected to the entertainment device for operating the entertainment device;
  - a video recording device associated with the entertainment device for monitoring the game area thereof;
  - a projector operatively connected to the video recording device for projecting an image of the game area;
  - a projection screen for displaying the image of the game area projected by the projector; and
  - at least one control console operatively connected to the entertainment device and associated with the projection screen, the

control console having second actuation members thereon functionally identical to the first actuation members of the entertainment device, the second actuation members thereby being adapted to operate the entertainment device.

5,480,159

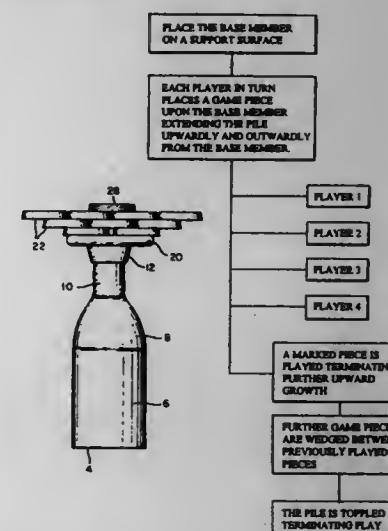
**GAME OF SKILL**

Bruce F. Alsip, P.O. Box 10237, Bainbridge Island, Wash. 98110  
Division of Ser. No. 979,161, Nov. 19, 1992, abandoned, which is a continuation-in-part of Ser. No. 820,090, Jan. 13, 1992, abandoned. This application Ser. 28, 1994, Ser. No. 314,530

Int. Cl.<sup>6</sup> A63F 9/00

U.S. Cl. 273-450

6 Claims



1. A method of game play comprising assembling a base member on a supporting surface, said base member having an upper surface and being assembled on said supporting surface such that said upper surface is in a substantially horizontal disposition, assembling a plurality of playing pieces on said base member to form a game structure, said playing pieces including closely spaced substantially parallel opposite surfaces and being assembled such that the opposite surfaces thereof are substantially parallel to said base member upper surface, said playing pieces being assembled in said game structure such that at least some of said playing pieces are captured in cantilevered relation between at least two other playing pieces, said playing pieces being assembled so as to extend said game structure both upwardly and laterally outwardly from said base member, one of said playing pieces being designated as an uppermost playing piece and being assembled to define an uppermost point in said game structure, said method further comprising assembling a plurality of additional playing pieces in said game structure after assembling said uppermost playing piece therein, said additional playing pieces being assembled in said game structure at locations which are disposed laterally outwardly from and below said uppermost playing piece.

5,480,160

**SHAFT SEAL WITH IN-LINE SEALING RINGS**

Axel Harms, Dachau, Germany, assignor to MTU Motoren- und Turbinen-Union Muenchen GmbH, Munich, Germany  
Filed May 2, 1994, Ser. No. 236,376

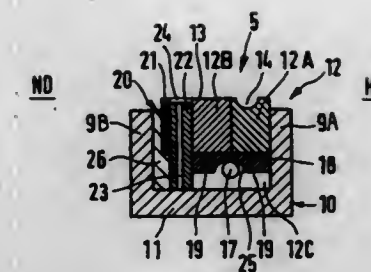
Claims priority, application Germany, May 6, 1993, 43 15 004.7

Int. Cl.<sup>6</sup> F16J 15/16; 15/40

U.S. Cl. 277-3

14 Claims

1. A shaft seal with in-line sealing rings for sealing chambers (HD, ND) in a machine casing from each other, one chamber (HD)



holding a high pressure, the other chamber (ND) holding a lower pressure, said shaft seal comprising a plurality of seal rings arranged along a shaft (1) passing from one chamber into the other, said seal rings contacting each other in the axial direction, said seal rings comprising at least one slide seal ring (12) positioned next to said high pressure chamber (HD) and including a plurality of circumferentially arranged sealing segments (16), at least one brush seal ring (20) positioned next to said lower pressure chamber (ND), and at least one compressed air gap seal ring (22) positioned between said slide seal ring (12) and said brush seal ring (20), said compressed air gap seal ring (22) forming an air gap (24) around said shaft, said compressed air gap seal ring (22) having at least one bore (23) for admitting air under a sealing pressure into said air gap (24), said sealing pressure in said air gap (24) being lower than said high pressure in said high pressure chamber (HD) and higher than said lower pressure in said lower pressure chamber (ND) in operation.

5,480,161

**SHAFT SEAL WITH CONTROLLED POROSITY ELEMENTS**

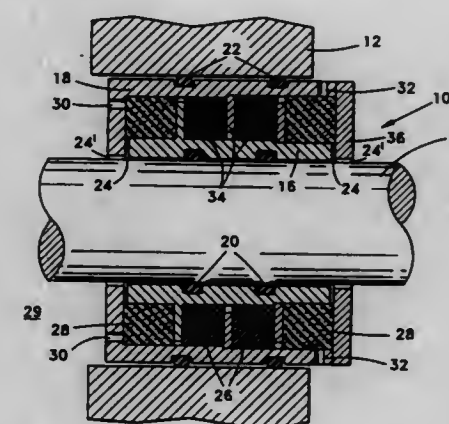
Richard Borowski, Rochester, N.Y., assignor to Garlock Inc., New York, N.Y.

Filed Jan. 15, 1993, Ser. No. 77,177

Int. Cl.<sup>6</sup> F02F 11/00

U.S. Cl. 277-53

9 Claims



1. A labyrinth type seal assembly comprising radially inner and outer relatively rotatable seal elements and at least two bodies of controlled porosity microcellular foam material retained in and substantially filling at least an axially outer portion of a pathway between said seal elements, at least one of said bodies being of lesser density than at least one other of said bodies, and positioned such that fluids and materials entering said pathway first encounter a body of said lesser density foam material and said radially outer seal element having at least one drain port located radially outwardly of an entrance to said pathway so that fluids and particulate materials entering said pathway through said entrance may escape from said pathway through said at least one drain port after passing through a body of said controlled porosity microcellular foam material.



5,480,162

## AXIAL LOAD CARRYING BRUSH SEAL

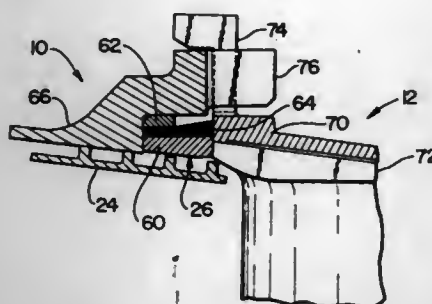
Bruce I. Beeman, Jr., Lake Worth, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 8, 1993, Ser. No. 118,159

Int. Cl.<sup>6</sup> F16J 15/447

U.S. Cl. 277-53

4 Claims



1. A brush seal for sealing and transmitting axial loads comprising an annular shaped backing plate, a co-axially disposed and parallelly spaced side plate, and a bundle of axially extending flexible and resilient bristles extending beyond the back plate and flush at the remote end of said bristles with the edge faces of said side plate and said back plate, said bundle of axially extending flexible and resilient bristles being disposed between said side plate and said back plate, said back plate axially extending beyond said side plate for transmitting axial loads from one location adjacent the remote end of said bristles to another location, and said back plate bears against said one location and said another location to transmit axial loads.

5,480,163

## LIP SEAL WITH REINFORCED BACKUP

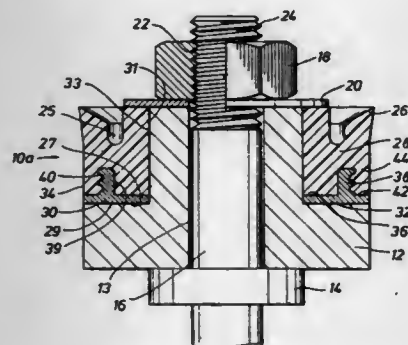
Hank T. Miser, Missouri City; Frederick B. Pippert, Sugar Land, and John T. Rogers, Plano, all of Tex., assignors to Utex Industries, Inc., Houston, Tex.

Filed Aug. 5, 1993, Ser. No. 102,565

Int. Cl.<sup>6</sup> F16J 15/32

U.S. Cl. 277-188 A

14 Claims



1. A replaceable sealing member for use with a metallic annular support having an annular wall and an annularly extending shoulder portion generally transverse to said annular wall, comprising:  
a reinforcement section having a radially extending annular flange portion and an annular skirt portion axially projecting from a first side of said radially extending annular flange portion, said reinforcement section having a lip support surface disposed radially to one side of said annular skirt portion on said first side of said radially extending annular flange portion;  
a body bonded to said first side of said radially extending annular flange portion of said reinforcement section, said body being formed of material more resilient than that of said reinforcement section;

a flexible lip seal portion on said body, said lip seal portion being generally axially displaced from said lip support surface, said flexible lip seal portion being formed of material more resilient than that of said reinforcement section;

a first annular body wall on said body for engagement with said annular wall of said metallic annular support whereby said first annular body wall limits radial movement of said replaceable sealing member with respect to said metallic annular support;

a second annular body wall concentrically disposed with respect to said first annular body wall, said lip support surface extending to said second annular body wall and having an axial extent at said second annular body wall less than the axial extent of said skin, said skirt being disposed in said body between said first and second body walls, said skirt being radially positioned more proximal to said second annular body wall than to said first annular body wall; and

an abutment surface on a second side of said radially extending annular flange portion for abutment with said annularly extending shoulder portion of said metallic annular support such that said abutment surface limits axial movement of said replaceable sealing member with respect to said metallic annular support.

5,480,164

## DEAD LENGTH COLLET CHUCK HOLDER

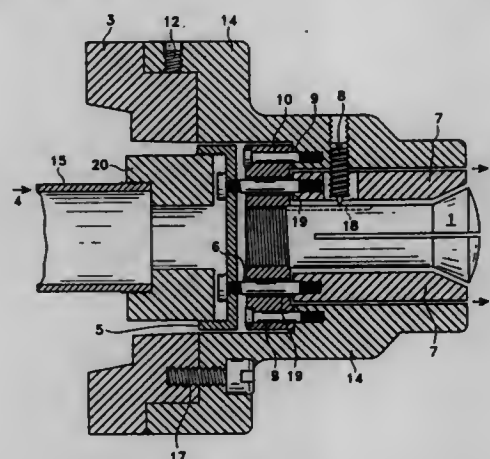
William G. Murphy, P.O. Box 2799, Corona, Calif. 91718

Filed Nov. 23, 1994, Ser. No. 344,142

Int. Cl.<sup>6</sup> B23B 31/20

U.S. Cl. 279-50

3 Claims



1. An improved dead length collet chuck holder for preventing edgewise movement of collet jaws while closing containing a collet threaded at one end, a collet retaining ring, a closing sleeve surrounding the collet, a push tube for applying closing pressure to the collet jaws without axial movement of the jaws and an actuator for coupling said push tube to the closing sleeve, the improvement comprising, in part, a series of bolts arranged around a drilled bolt circle in said collet retaining ring with a corresponding series of tapped holes in the interior of the chuck holder whereby the collet is firmly anchored at its threaded end to the collet retaining ring which is then bolted to the chuck body so that the possibility of axial movement of the collet jaws and any workpiece therein is minimized.

5,480,165

## BRUSH SEAL ASSEMBLY

Ralph F. J. Flower, Devizes, England, assignor to Cross Manufacturing Company Limited, England

PCT No. PCT/GB92/00289, § 371 Date Aug. 19, 1993, § 102(e)

Date Aug. 19, 1993, PCT Pub. No. WO92/14951, PCT Pub.

Date Sep. 3, 1992

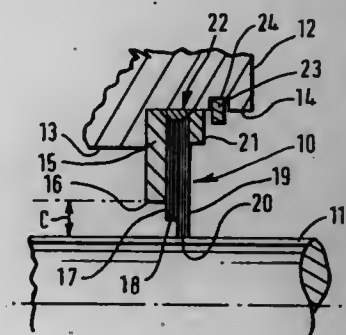
PCT Filed Feb. 19, 1992, Ser. No. 107,747

Claims priority, application United Kingdom, Feb. 19, 1991, 9103459

Int. Cl.<sup>6</sup> F16J 15/447

U.S. Cl. 277-53

11 Claims



1. A brush seal assembly for withstanding a large pressure difference thereacross whilst effecting a seal between a first component and a surface of a second component which may perform excursions in a direction towards and away from the first component and which second component is also relatively movable in a direction normal to the excursion direction, which seal assembly comprises a backing plate adapted for mounting on the first component to extend towards said surface of the other component, the backing plate having a free edge spaced from said surface by a distance greater than the largest expected excursion of the second component, a first row of bristles projecting beyond the backing plate towards said surface of the other component, a second row of bristles projecting beyond the tips of the bristles of the first row and adapted to contact and effect a seal against said surface of the other component, one of the first and second rows of bristles bearing against and being supported by the backing plate, a majority of the bristles of the second row each having a lesser stiffness than the stiffness of each of a majority of the bristles of the first row, the first row of bristles lying against the bristles of the second row, and at least a majority of the bristles of the first row each having a larger cross-sectional area than the cross-sectional area of each of a majority of the bristles of the second row, said larger cross-sectional area bristles providing support for said bristles of said second row.

5,480,166

## MULTI-PURPOSE TOOL HOLDER

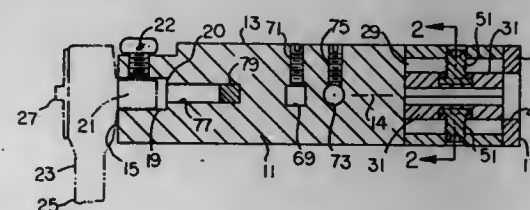
Edward Millsop, 93 Land of Nod Rd., Windham, Me. 04062

Filed Sep. 19, 1994, Ser. No. 308,289

Int. Cl.<sup>6</sup> B25F 1/02

U.S. Cl. 279-143

6 Claims



1. A multi-purpose tool holder, comprising:  
an elongated barrel having a longitudinal axis;

a linear side surface paralleling said longitudinal axis;  
a first end surface extending transverse to said longitudinal axis;  
a second end surface extending transverse to said longitudinal axis;

a first non-circular cross-sectioned socket in said first end surface adapted to receive therein the drive plug of a turning implement, whereby said barrel is turnable around said longitudinal axis;

a linear slideway formed in said barrel proximate to said second end surface;

said slideway comprising parallel guide surfaces extending transverse to said longitudinal axis;

two jaws slidably mounted in said slideway for linear movement toward and away from said longitudinal axis;

said jaws having facing V cross-sectioned grooves therein adapted to grip the corners of a square cross-sectioned tool shank positionable in the space between the jaws;

an adjustment screw associated with each jaw for holding each jaw in selected positions of adjustment in said slideway, whereby the jaws are enabled to grip tool shanks having different cross-sectional dimensions;

a second socket formed in the side surface of said barrel at an intermediate point along the barrel longitudinal dimension;

said second socket having a square cross-section for receiving therein a square cross-sectioned tool shank, whereby said barrel is usable as a handle for turning a tool whose shank is seated in said second socket;

a third socket formed in the side surface of said barrel in near proximity to said second socket; said third socket having a circular cross-section for receiving therein a circular cross-sectioned tool shank; and

said barrel being usable as a handle for turning a tool whose shank is seated in said third socket.

5,480,167

## TABLE-TOP MINIATURE GOLF GAME

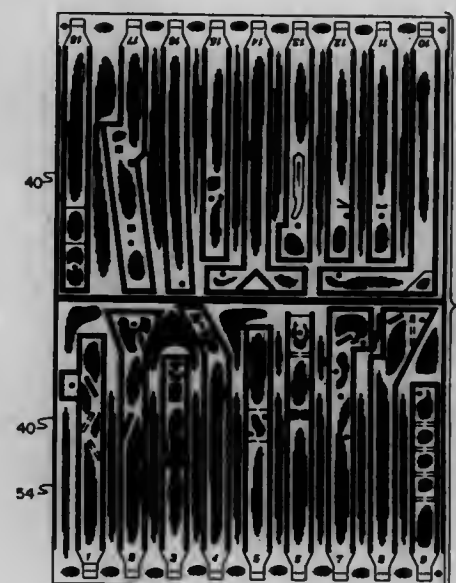
Tony I. Johnson, Rte. 4 Box 310-J, Rocky Mount, N.C. 27801

Filed Jan. 5, 1995, Ser. No. 369,107

Int. Cl.<sup>6</sup> A63B 67/02

U.S. Cl. 273-176 R

13 Claims



1. A table-top miniature golf game for allowing users to play a round of golf comprising, in combination:

a plurality of rigid magnetically attractive metal spheres with each sphere constituting a golf ball and with each golf ball having a diameter of about 1/4 inch;

a plurality of golf clubs, each club having a rigid elongated shaft with an upper end and a lower end, a toe having a curved neck



portion integral with the lower end of the shaft and a face portion extended angularly outwards from the neck portion for striking a golf ball, a handle coupled around the upper end of the shaft for allowing a user a firm grip, and a magnet coupled to and extended axially outwards from the upper end of the shaft for retrieving one of the golf balls during play, each club further having a length of about 3 1/2 inches; and two similarly shaped transportable playing surfaces constituting a golf course positionable upon a table top for use, each playing surface having a rectangular plate with an upper surface and a lower surface and a periphery interconnecting the surfaces formed of a front edge, a rear edge, and a pair of opposed side edges, each plate further having a width of about 11 1/2 inches and a length of about 25 1/2 inches, each plate additionally having a layer of felt fabric coupled to the upper surface thereof, each playing surface further having a peripheral elevated boundary formed thereon at a location adjacent to the rear edge and side edges thereof and with each boundary formed of a plurality of dowels positioned in an end-to-end configuration and with each dowel having a diameter of about 1/4 inch, the golf course having eighteen holes with nine holes formed on one playing surface constituting a front nine and with the holes of the front nine numbered "1" through "9", respectively, and with another nine holes formed on the other playing surface constituting a back nine and with the holes of the back nine numbered "10" through "18", respectively, each hole further having a generally elongated shape with a starting end constituting a tee, a concluding end constituting a green, and a lane therebetween constituting a fairway, each hole additionally having its fairway and green demarcated by a plurality of dowels positioned in an end-to-end configuration to thereby create an elevated border constituting a rough and with each dowel having a diameter of about 1/4 inch, each green of each hole including a bore disposed thereon constituting a cup and with the cup sized for receiving a golf ball therein, each tee of each hole including three spaced aligned concave indentations formed thereon and with each indentation used for removably holding one of the golf balls therein for striking with one of the clubs, and wherein at least one of the holes additionally has a hazard formed on its fairway and at least one of the holes additionally has an elevated area of play formed thereon.

5,480,168

# **QUICK ADJUSTABLE FASTENING MEANS TO ADJUST THE POSITION OF A GAITER ON A ROLLER SKATE**

Ting-Hsing Chen, Tainan, Taiwan, Prov. of China, assignor to Far Great Plastics Industrial Co., Ltd., Tainan, Taiwan, Prov. of China

Filed Jan. 20, 1995, Ser. No. 375,665

Claims priority, application China, Jan. 9, 1995, 95200919.6 Int. Cl.<sup>6</sup> A63C 17/06

U.S. Cl. 280—11.22

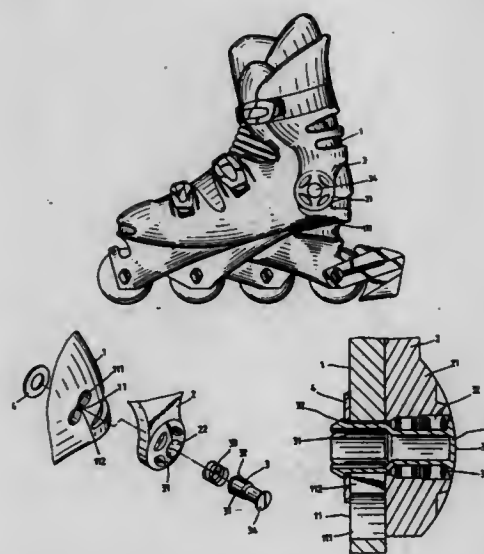
1 Claim

1. A quick adjustable fastening system to adjust the position of a gaiter with respect to a roller skate, comprising:

a roller skate having a pair of troughs formed through respective opposing sides thereof adjacent a rear end portion of said roller skate, each of said troughs being formed by at least two apertures and a slotted through opening therebetween, said slotted through opening having a width dimension smaller than a diameter dimension of said apertures;

a gaiter having a pair of bulge portions disposed on respective sides thereof, each of said bulge portions including a through bore formed in a center portion thereof and coinciding in position with a selected one of said apertures of said trough, said through bore having a first diameter at an inner end portion and a second diameter at an outer end portion thereof, said first diameter being smaller than said second diameter;

a pair of rod members, each of said pair of rod members extending through a respective through bore of said gaiter and a selected aperture of a respective trough, each rod member having longitudinal slots formed through a front section



thereof and an enlarged portion formed on an end of said rod member adjacent said front section, said enlarged portion having a diameter larger than that of said aperture of said trough of said roller skate, said rod member having a head formed at an end thereof opposing said enlarged portion, said rod member having a rear section disposed between said front section and said head, said rear section having a diameter substantially equal to said width dimension of said slotted through opening of said trough, said front section having a diameter slightly smaller than that of said aperture of said trough of said roller skate;

a pair of springs, each of said pair of springs being concentrically disposed on said rear section of a respective rod member for applying a bias force to said head thereof; and

a pair of washers, each of said pair of washers being disposed within said shoe for capturing an enlarged portion of a respective rod member, said gaiter being displaceable responsive to displacement of each of said rod members from one of said apertures of said trough to another, said rod member being displaceable from one aperture of said trough to another responsive to depression of said rod member within said through bore to displace said rear section of said rod member into said trough aperture and sliding said rear section through said slotted through opening to said other trough aperture.

5,480,169

# **WHEEL AND LEG ASSEMBLY FOR A TRAVEL BAG**

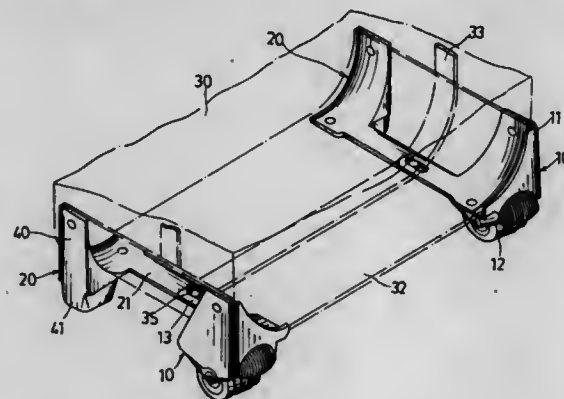
King-Sheng Wang, No. 569, Ching-Kuo Rd., Ta-Chia Chen, Taichung Hsien, Taiwan, Prov. of China

Filed Aug. 9, 1994, Ser. No. 287,888

Int. Cl.<sup>6</sup> B62B 1/26

U.S. Cl. 280—37

1 Claim



1. A wheel and leg assembly for a travel bag having a rectangular bottom, the assembly comprising:

a) a wheel assembly including a wheel holder configured to fit over a first bottom corner of a travel bag, a wheel, a horizontal extension at an inner side of the wheel holder, the horizontal extension terminating in a mounting lug, and an oblong hole formed in the mounting lug;

b) a leg assembly including a leg holder configured to fit over a second bottom corner of the travel bag, a leg, a horizontal extension at an inner side of the leg holder, the horizontal extension terminating in a mounting lug, and an oblong hole formed in the mounting lug; and

c) wherein when the wheel assembly and the leg assembly are engaged against opposite bottom corners along a short side of the bag bottom, the mounting lugs and oblong holes of the wheel and leg assemblies overlap for permitting adjustment of the wheel and leg assembly to the length of the short side and receiving a rivet through the oblong holes to secure the wheel and leg assembly to the bottom of the bag.

5,480,170

# **COOLER CADDY, AND METHODS OF CONSTRUCTING AND UTILIZING SAME**

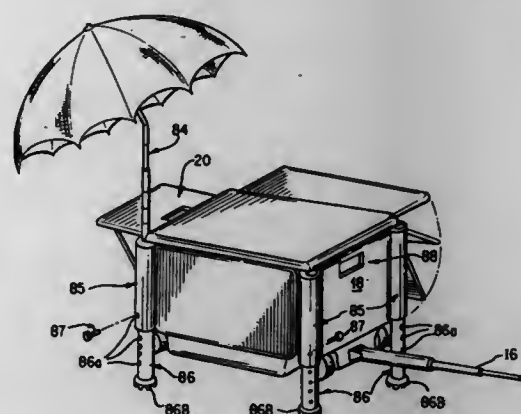
Ronald R. Kaiser, II, 12060 Cavell, Livonia, Mich. 48150

Continuation-in-part of Ser. No. 709,208, Jun. 3, 1991, Pat. No. 5,306,029. This application Apr. 1, 1994, Ser. No. 222,395

Int. Cl.<sup>6</sup> B62B 3/02

U.S. Cl. 280—30

20 Claims



1. A device for conveying food and food related objects, comprising:

an insulated container portion having four side walls, a bottom member, and a top member with a substantially horizontal surface;

at least one tray means hingedly secured to one of said side walls adapted to pivot between a substantially vertical position and a substantially horizontal position;

means for supporting said tray means in said substantially horizontal position;

means for holding said tray means in said substantially vertical position;

at least three wheels mounted to said container;

means, connected to said container, for adjustably elevating and stably supporting said container on a ground surface independently of said wheels;

said tray means being substantially planar with said horizontal surface of said top member when in said substantially horizontal position, said top member having corner extensions located proximate inner corners of said tray means, each corner extension having a recess for receiving and locking a respective inner corner of said tray means when the tray means is in the horizontal position;

said elevating means comprising a plurality of elongated tubing members attached to said container, a plurality of elongated

leg members slidably disposed within lower ends of said tubing members, respectively, and means connectable to said tubing members and said leg members for selectively locking said leg members in a fixed position relative to said tubing members; and

means, connected to said container, for selectively supporting a pole member in plural elevated positions thereof above said container and for storing the pole member in a contracted position thereof.

5,480,171

# **SLIDER LOCKING MECHANISM**

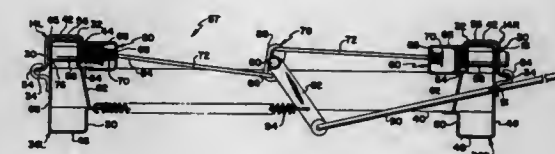
Dean C. Cheffey, Springfield, Mo., assignor to Hutchens Industries, Inc., Springfield, Mo.

Filed Nov. 10, 1994, Ser. No. 339,155

Int. Cl.<sup>6</sup> B62D 53/06

U.S. Cl. 280—149.2

13 Claims



1. A wheeled vehicle comprising

a trailer body including a pair of longitudinally extending members having a series of longitudinally spaced openings formed therein,

a tandem wheel assembly including a frame supporting a portion of said trailer body for relative longitudinal sliding motion with respect thereto to vary the longitudinal position of support and a pin locking system carried by said tandem wheel assembly cooperable with said openings to selectively lock said trailer body and tandem wheel assembly in a selected longitudinal position of support, said locking system comprising:

a plurality of pins mounted on said frame for movement between extended and retracted positions,

said pins being constructed and arranged to engage within selected openings of said series of openings when in the extended position thereof to thereby retain said tandem wheel assembly in a selected position of longitudinal adjustment with respect to said trailer body,

a plurality of springs, one of said plurality of springs being operatively associated with each pin for resiliently biasing said associated pin into the retracted position thereof when in an unstuck condition,

and a linkage mechanism carried by said frame constructed and arranged to be moved between an operative position and an adjusting position,

said linkage mechanism being constructed and arranged with respect to said pins (1) to move said pins from the retracted position thereof into the extended position thereof within a selected opening against the resilient bias thereof in response to the movement of said linkage mechanism from the adjusting position thereof to the operative position thereof and (2) to allow movement of said pins from the extended position thereof into the retracted position thereof to occur by virtue of the resilient bias thereon (A) when in an unstuck condition during the movement of said linkage mechanism from the operative position thereof and (B) when in a stuck condition at a time after the movement of said linkage mechanism from the operative position thereof to the adjusting position thereof when the stuck condition has been changed to an unstuck condition.



5,480,172

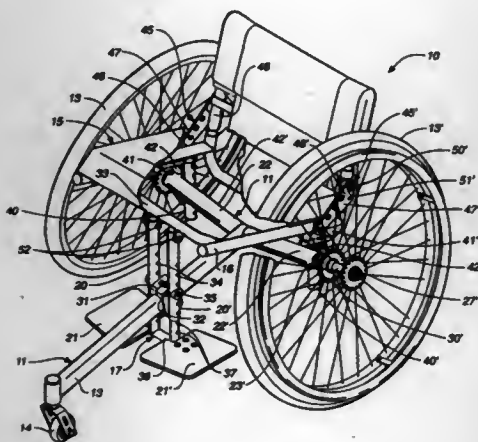
**THREE-WHEELED COMPETITION WHEELCHAIR  
HAVING AN ADJUSTABLE CENTER OF MASS**Dean W. James, Clovis, Calif., assignor to Quickie Designs Inc.,  
Fresno, Calif.

Filed Jul. 15, 1994, Ser. No. 275,446

Int. Cl.<sup>6</sup> A61G 5/00; B62M 1/14

U.S. Cl. 280—250.1

27 Claims



1. A three-wheeled wheelchair apparatus comprising:
  - a wheelchair frame having an aft portion and a fore portion, and including at least one beam extending generally from said aft portion to said fore portion;
  - a pair of rear drive wheels rotatably mounted to said wheelchair frame proximate said aft portion;
  - a front wheel rotatably mounted to said wheelchair frame proximate said fore portion;
  - a seat assembly carried by and supported on said wheelchair frame;
  - a footrest assembly including a seat support post having one end movably mounted to said seat assembly, and an opposite end carrying footrest plates, and the footrest assembly being movably mounted longitudinally along said at least one beam for positioning of said footrest plates in a selected one of a plurality of positions relative said seat assembly and said wheelchair frame such that the location of a combined center of gravity of the wheelchair apparatus and the user supported thereon can be changed.

5,480,173

**WHEEL CHAIR HAVING LONGITUDINALLY  
ADJUSTABLE ARM RESTS**

Jozef Koniecko, 3615 Techny Rd., Nirthbrook, Ill. 60062

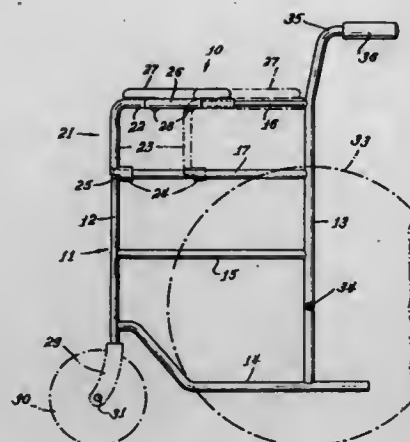
Filed Mar. 14, 1994, Ser. No. 212,729

Int. Cl.<sup>6</sup> B62M 1/14; A47C 7/54

U.S. Cl. 280—250.1

4 Claims

1. A wheel chair having a frame, comprising:
  - (a) front and rear vertical frame members,
  - (b) horizontal frame members connected at their ends to said vertical frame members,
  - (c) a seat mounted on said frame,
  - (d) upper horizontal arm rest support guide members each connected at one end to a respective rear vertical frame member, and having each of their other ends extending forwardly,
  - (e) lower horizontal arm rest support guide members, each connected at one end to one of said rear vertical frame



- members and each connected at the other end to one of said front vertical frame members,
- (f) movable L-shaped arm rest supporting members each comprising:
  - (1) a horizontal arm, and
  - (2) a vertical arm extending from one end of said horizontal arm,

said horizontal arms being in telescoping engagement with said upper horizontal arm rest support guide members, the lower ends of said vertical arms each having means slidably engaging one of said lower horizontal arm rest support guide members, arm rests being affixed to each one of the horizontal arms of said L-shaped arm rest supporting members, whereby, each of said arm rests and its L-shaped supporting member may be extended to a forward position for normal use, and whereby each of said arm rests and its L-shaped supporting member may be retracted to a rearward position to enable said wheel chair to be pushed close to a table for dining and other activities.

5,480,174

**DEFLECTOR FOR A TRAILER**

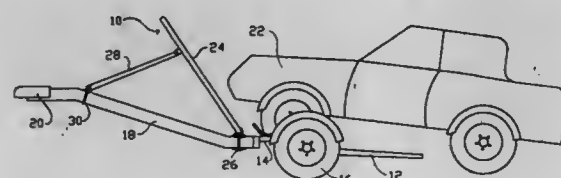
Ronald I. Grenier, 5019-99 Street, Edmonton, Alberta, Canada

Filed Feb. 3, 1995, Ser. No. 382,976

Int. Cl.<sup>6</sup> B62D 25/16

U.S. Cl. 280—414.1

6 Claims



1. A rock deflector for a trailer, comprising:
  - a deflector shield having a top, a bottom, a first face and a second face;
  - a first mounting bracket pivotally secured to the bottom of the deflector shield, whereby the deflector shield is pivotally mounted in a transverse orientation to a neck of the trailer;
  - a brace having a first end and a second end, the first end being secured to the first face of the deflector shield; and
  - a second mounting bracket secured to the second end of the brace, whereby the brace is mounted to the neck of the trailer.

5,480,175

**INTERFACE DEVICE BETWEEN A SKI AND  
ASSOCIATED BINDINGS**

Lionel Astier, Seynod; Joel Arduin, Metz-Tessy, and Alain Bejean, Alby-Sur-Cheran, all of, France, assignors to Salomon S.A., Chavanod, France

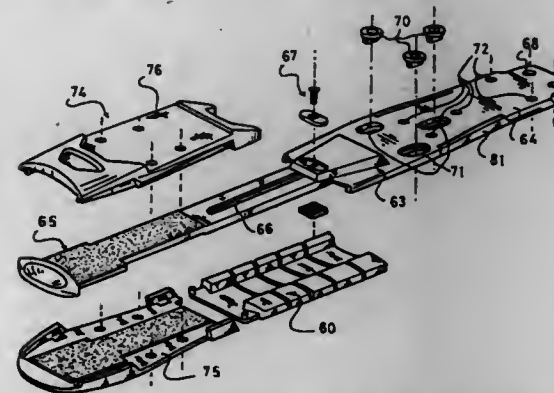
Filed Apr. 12, 1993, Ser. No. 45,119

Claims priority, application France, Apr. 10, 1992, 92 04592

Int. Cl.<sup>6</sup> A63C 9/08

U.S. Cl. 280—607

11 Claims



1. Interface device between a ski and front and rear bindings designed to hold the ends of a boot in place, said bindings being connected to a central area of said ski, said interface device comprising a spacer attached to said ski and assembled to one of said bindings, and a connection plate assembled to the other of said bindings, said connection plate having a first end fastened to said ski, a central part raised in relation to an upper surface of said ski, and a second end attached to said ski beyond said spacer, by means of a first block of damping material mounted in a sandwich configuration between an end of said connection plate and said ski.

5,480,177

**CHAIR**

Yoshifumi Yoneda, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan

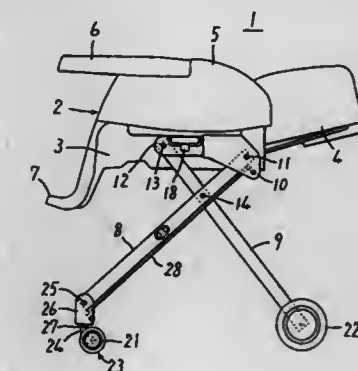
Filed Mar. 30, 1995, Ser. No. 413,484

Claims priority, application Japan, Apr. 4, 1994, 6-066100

Int. Cl.<sup>6</sup> B62B 7/06

U.S. Cl. 280—642

5 Claims



5,480,176

**EXTERNAL MOUNTED BINDING**

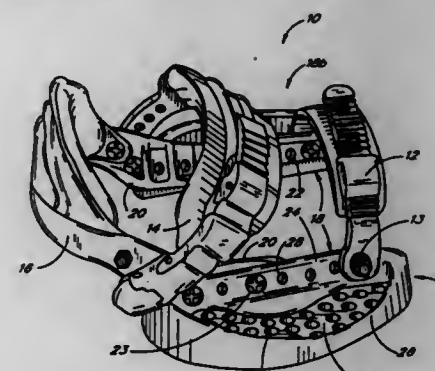
Thomas P. Sims, 340 Calle Liptizana, Goleta, Calif. 93117

Filed Jan. 18, 1994, Ser. No. 183,079

Int. Cl.<sup>6</sup> A63C 9/12

U.S. Cl. 280—618

5 Claims



1. A snowboard and binding, comprising:
  - a snowboard defining an upper surface, a lower surface, a first pattern of threaded holes extending between said upper surface and said lower surface and a second pattern of threaded holes extending between said upper surface and said lower surface;
  - a first pod defining a first base defining a first horizontal contact surface positioned against said upper surface of said snowboard and a first wall defining a first generally vertical surface, said first pod defining a first plurality of holes, at least two of said first plurality of holes being alignable with at least two of said first pattern of threaded holes when said first pod

and said snowboard have a first angular orientation relative one another and at least two of said first plurality of holes being alignable with at least two of said first pattern of threaded holes when said first pod and said snowboard have a second angular orientation relative one another;

a second pod defining a second base defining a second horizontal contact surface positioned against said upper surface of said snowboard and a second wall defining a second generally vertical surface facing said first generally vertical surface, said second pod defining a second plurality of holes, at least two of said second plurality of holes being alignable with at least two of said second pattern of threaded holes when said first pod and said snowboard have a second angular orientation relative one another and said first pod is generally parallel to said second pod, and at least two of said second plurality of holes being alignable with at least two of said second pattern of threaded holes when said second pod and said snowboard have a second angular orientation relative one another and said first pod is generally parallel to said second pod;

a toe strap secured to one of said first pod and said second pod; an ankle strap secured to one of said first pod and said second pod;

a heel loop secured to said first pod and said second pod, said first pod, said second pod, said toe strap and said heel loop cooperating to secure a boot of a rider directly against said upper surface of said snowboard, wherein each of said first and second plurality of holes form a radial pattern, each of said first and second plurality of holes comprises three rows of radially aligned holes, and each of said first and second pattern of holes define a rectangular pattern.

1. A chair comprising:
  - a seat;
  - a pair of first leg members and a pair of second leg members supporting said seat with respect to the floor face;
  - first leg mounting members rotatably mounting upper end portions of said first leg members on said seat;
  - second leg mounting members rotatably mounting upper end portions of said second leg members on said seat; and
  - wheels being rotatably mounted on lower end portions of said first and second leg members respectively for rolling on the floor face,
  - said first and second leg members being rotatably connected to each other at intermediate portions thereof respectively,



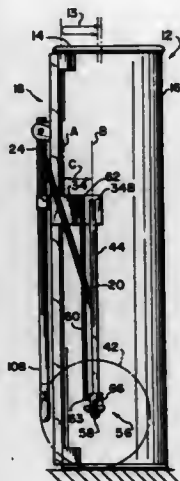
said first and second leg mounting members being held by said seat so that the distances therebetween are changeable, wherein  
said wheels mounted to either said first or second leg members are casters,  
a rotary yoke rotatably holding each said caster wheel is mounted on a caster mounting member, being mounted on said lower end portion of each related said leg member to be rotatable about a horizontally directed axis, to be rotatable about a vertically directed axis, and  
said leg mounting member mounting each said leg member provided with said caster is connected with said caster mounting member by a connecting link, thereby defining a parallel crank mechanism by said leg member, said leg mounting member, said caster mounting member and said connecting link.

**5,480,178**  
**COMPACT GOLF PULL CART WITH ATTACHED GOLF BAG**

Young J. Suk, 34 Garvies Point Rd., Glen Cove, N.Y. 11542  
Filed Dec. 16, 1993, Ser. No. 167,171  
Int. Cl.<sup>6</sup> B62B 1/12

U.S. Cl. 280—646

1 Claim



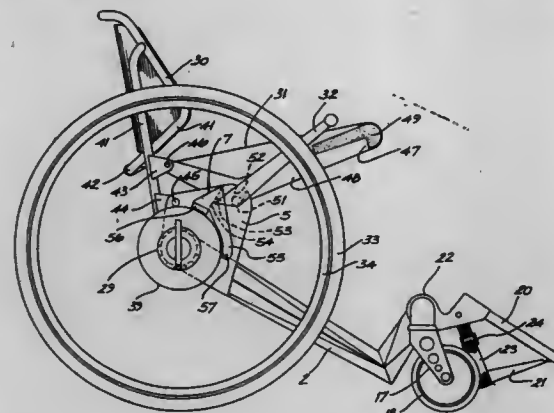
1. In combination, a golf bag of a type having a bottom and a compartment for golf clubs bounded by a circular wall with a semi-circular rear portion, and an improved golf bag pull cart of a type having pair of legs each having opposite proximal and distal ends of which said distal ends bound a bag-receiving clearance therebetween and have attached thereto wheels and of which said proximal ends are each pivotally mounted to partake of a pivotal traverse from a non-use position adjacent said golf bag into a golf bag-supporting position extending rearwardly and laterally outwardly of said golf bag, said pull cart improvements comprising a body for said cart having an operative position disposed in longitudinal alignment with said golf bag semi-circular rear wall portion, a semi-circular leg-supporting bracket with opposite ends mounted in transverse relation on said body in encircling relation about said golf bag with said bracket opposite ends positioned forwardly of said golf bag rear wall portion, pivots, for each leg each operatively disposed in a leg-supporting bracket opposite end for defining a plane of pivotal traverse of a cooperating leg perpendicularly of said bracket end and correspondingly rearwardly and laterally outwardly of said golf bag, and link means, for supporting each leg and positioned by said proximal ends thereof from a cooperating pivot so as to suspend each leg in vertical relation externally of and adjacent said golf bag in said non-use position, said golf bag bottom having an operative position protected within said bag-receiving clearance between said distal ends of said legs contributing to a compact condition of said cart of said golf bag in said non-use position thereof.

**5,480,179**  
**WHEELCHAIR CHASSIS**  
Robert T. Peacock, 54 Water Street, Foster, New South Wales, Australia

Filed Nov. 16, 1993, Ser. No. 154,015  
Claims priority, application Australia, Dec. 1, 1992, PL6136  
Int. Cl.<sup>6</sup> B62B 7/06

U.S. Cl. 280—650

5 Claims



1. A collapsible wheelchair, comprising:

a monocoque chassis of H-shaped plan view providing spaced front and back horizontal limbs each having a center and two opposite extremities, and a crossbar connecting the centers of said limbs, said chassis having an L-shaped side view, the 'L' having a longer arm and a shorter arm with said crossbar and back limb lying in the longer arm of the 'L' and the shorter arm of the 'L' being formed by the front limb;

a pair of castor wheels;

first mounting means for mounting the castor wheels at the front of said chassis at the opposite extremities respectively of the front limb;

a pair of driving wheels;

second mounting means for detachably mounting the driving wheels in coaxial relationship at the opposite extremities respectively of the back limb;

backrest;

means defining a first horizontal pivot axis at the back of said chassis and about which said backrest is turnable from an upright operating position to a stowage position at which it extends forwardly over the crossbar;

a seat having an operating position overlying said crossbar;

means on the backrest defining a second pivotal axis parallel to the first pivotal axis, said seat being turnable about said second pivotal axis from the operating position to a stowage position at which the seat lies between the stowed backrest and the chassis;

manually-releasable locking means for retaining the backrest and seat in the operating positions and releasable to permit movement the backrest and seat to the stowage positions;

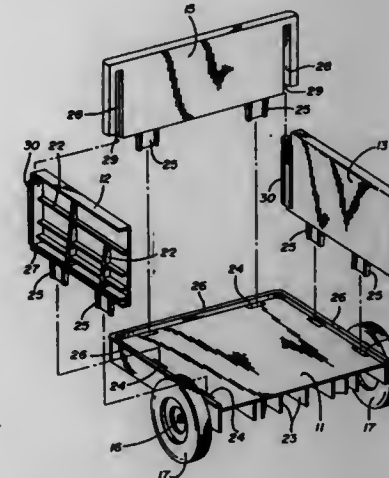
a bracket hinged to the front of the chassis to turn about a third pivotal axis parallel to the first and second pivotal axes; and a footrest mounted on the bracket and movable, by turning the bracket, from an operating position at which it extends forwardly in front of the chassis, to a stowage position at which it lies over the crossbar of the chassis.

**5,480,180**  
**UTILITY CART**  
John M. Fuller, Winchester, and Scott A. Boothby, Stephens City, both of Va., assignors to Rubbermaid Commercial Products, Inc., Winchester, Va.

Filed Jul. 22, 1994, Ser. No. 278,925  
Int. Cl.<sup>6</sup> B62D 39/00; 63/08

U.S. Cl. 280—656

15 Claims



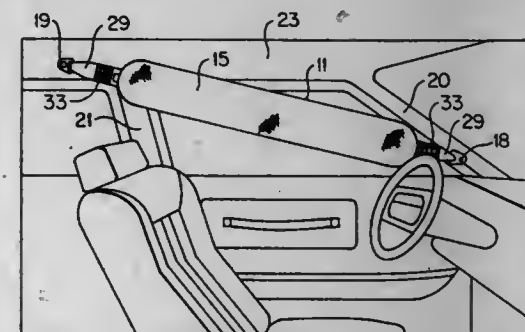
1. A utility cart comprising a base member, wheels carried by said base member, opposed end walls, opposed side walls, generally vertical and elongate slots formed near the ends in either of said end walls or said side walls, said slots being open at the bottom of either of said walls and terminating near the top of either of said walls, flanges formed at the ends of either said walls or said side walls not having said slots, said flanges being received in said slots, and connection means to removably attach said end walls and said side walls to said base member so that selected of said end walls and side walls may be attached to and extend upwardly from said base member.

**5,480,181**  
**SIDE IMPACT HEAD STRIKE PROTECTION SYSTEM**  
Lindley W. Bark, Chandler; Gershon Yaniv, Scottsdale, both of Ariz.; David J. Romeo, Alpine, Wyo.; Dirk J. Hardtmann, Mesa, and Gregory A. Mowry, Phoenix, both of Ariz., assignors to Simula Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 19,655, Feb. 19, 1993, Pat. No. 5,322,322. This application Jan. 21, 1994, Ser. No. 181,768  
Int. Cl.<sup>6</sup> B60R 21/22

U.S. Cl. 280—730.2

50 Claims



1. A safety system for protecting occupants of vehicles comprising:

(a) a braided tube enclosing an inner bladder running the length of the tube, said tube having a first end, a second end, and an inner surface;

(b) said tube mounted proximate to said first end at a first position in the vehicle;  
(c) said tube mounted proximate to said second end at a second position in the vehicle;  
(d) means for generating gas flow into said inner bladder, thereby inflating the braided tube;  
(e) crash sensor means connected to said means for generating gas, said crash sensor means being capable of initiating generation of gas flow into said inner bladder upon detection of an impact,

wherein said tube in its uninflated state is substantially longer than the straight-line distance between said first and second positions in the vehicle,

wherein upon inflation, said tube increases its diameter and decreases its length substantially such that said tube deploys under tension in a substantially straight line between the first and second positions in the vehicle.

**5,480,182**  
**CONTINUOUS CIRCUMFERENCE DIFFUSER REACTION CANISTER**

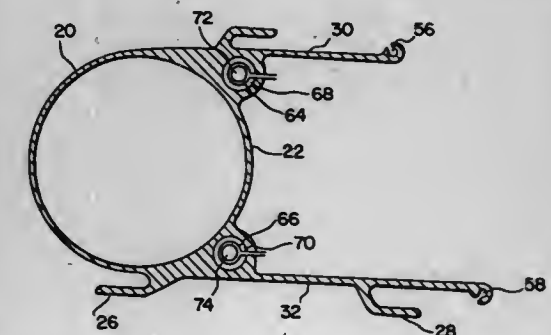
Donald R. Lauritzen, Hyrum, and Bradley W. Smith, Ogden, both of Utah, assignors to Morton International, Inc., Chicago, Ill.

Continuation of Ser. No. 123,824, Sep. 20, 1993, abandoned, which is a division of Ser. No. 840,238, Feb. 24, 1992, Pat. No. 5,332,256. This application Jul. 8, 1994, Ser. No. 272,407  
The portion of the term of this patent subsequent to Apr. 18, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> B60R 21/16

U.S. Cl. 280—728.2

14 Claims



1. For use in an inflatable restraint system for a motor vehicle, the combination comprising:

a reaction canister having a cover, a top panel and a bottom panel,

a diffuser tube having a diffuser portion and a cap portion, and an inflator having an elongated cylindrical shape and including a gas flow outlet arrangement that renders the inflator substantially thrust neutral,

said diffuser tube being arranged to permit installation therein of said inflator as a last operation of assembly,

with said diffuser and cap portions being formed in one piece with said top panel and said bottom panel of said reaction canister, and

with said top and said bottom panels extending in one piece to said cover from said diffuser and cap portions, respectively, of said diffuser tube.



5,480,183

## AIRBAG COVER RETAINER

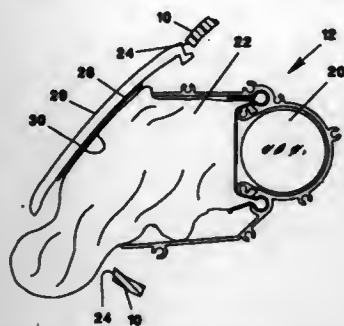
Michael J. Ward, Liberty, Utah; Steven R. Fredin, Rochester Hills, and Russell S. Gans, Westland, both of Mich., assignors to Morton International, Inc., Chicago, Ill.

Filed Oct. 21, 1994, Ser. No. 329,069

Int. Cl.<sup>6</sup> B60R 21/16

U.S. Cl. 280—728.2

3 Claims



1. In an automotive vehicle airbag assembly including a reaction canister having an open mouth, an inflator, a folded airbag within said canister positioned to be inflated by said inflator, a door normally closing the open mouth of said canister and forming a portion of the interior trim of said vehicle but openable under the influence of the expanding airbag to permit the airbag's expansion into the interior of said vehicle, and means for securing said door in a closed position prior to airbag inflation and restraining motion of said door during such inflation, the improvement wherein said securing and restraining means comprises:

a pressure-sensitive material interconnecting said airbag and door whereby the folded airbag maintains said door in its closed position prior to inflation and retains its interconnection with said door during inflation.

5,480,184

## INFLATABLE OCCUPANT RESTRAINT DEVICE

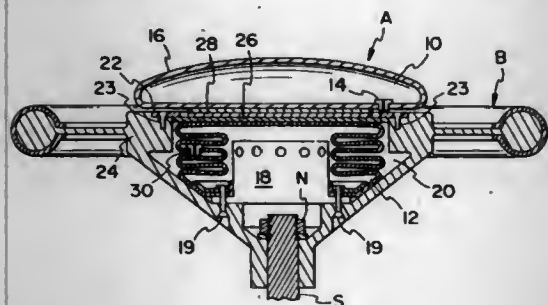
William A. Young, 4191 Bigelow Dr., Carson City, Nev. 89701

Filed Mar. 23, 1994, Ser. No. 216,565

Int. Cl.<sup>6</sup> B60R 21/16

U.S. Cl. 280—731

20 Claims



1. A steering wheel safety device for providing occupant protection from impact of a vehicle, comprising:

- a restraining device including reusable first and second inflatable members;
- said first inflatable member when inflated having a size positionable entirely within an inside periphery of a wheel handle of a steering wheel assembly and spaced therefrom;
- said first and second inflatable members each having their central axis coincident with the central axis of the steering wheel assembly;
- said first inflatable member when inflated having at least portions thereof extending laterally of its central axis beyond the lateral extension of said second inflatable member from its central axis when uninflated;

e) said second inflatable member when inflated extending laterally beyond the lateral extension of said first inflatable member when inflated and extending outside of the periphery of said wheel handle of said steering wheel assembly;

f) valve means for maintaining said first inflatable member inflated when positioned on said steering wheel assembly during normal driving operation thereby functioning as a pre-inflated head impact cushion;

g) means associated with said second inflatable member for permitting said second inflatable member to be inflated upon impact;

h) whereby when said restraining device is positioned in a vehicle, said first inflatable member provides a continuous protective interposition for a vehicle occupant and a damping device for said occupant when said second inflatable member is inflated on impact.

5,480,185

## PARTICULATE REMOVAL IN INFLATABLE RESTRAINT SYSTEM GAS GENERATORS

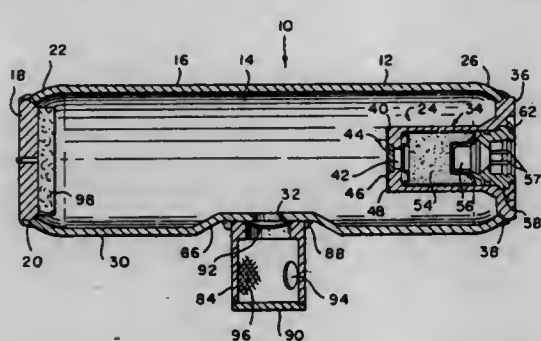
William G. Lowe, Ogden; Linda M. Rink, Liberty; Walter A. Moore, and Bradley W. Smith, both of Ogden, all of Utah, assignors to Morton International, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 989,854, Dec. 14, 1992, Pat. No. 5,290,060. This application Sep. 17, 1993, Ser. No. 123,311

Int. Cl.<sup>6</sup> B60R 21/26

U.S. Cl. 280—740

17 Claims



1. An apparatus suitable for use in inflating a vehicle occupant restraint, comprising:

- a container having a first chamber for storing a gas generating material and a second chamber useful in effecting gas redirection and for storing a supply of gas under pressure, the gas generating material when ignited producing a hot gas, the hot gas containing particulate of the gas generating material and byproducts thereof and being releasable from said first chamber into said second chamber by means of at least one gas exit nozzle, said second chamber housing a filter placed along the inner wall thereof opposite said gas exit nozzle, said filter being useful in effecting gas redirection and particulate removal from at least a portion of the hot gas released from said first chamber and impinging thereon forming an inflation gas for use in inflating the vehicle occupant restraint comprising hot gas having a significantly reduced particulate content; and

a diffuser having at least one controlling orifice for providing passage therein of at least a portion of the inflation gas from said container and at least one exit port for dispensing at least a portion of the inflation gas passing therein into the vehicle occupant restraint,

whereby there is at least an approximately 180° cumulative change in gas direction between contacting the filter and the passage of the inflation gas into the diffuser.

5,480,186

## DYNAMIC ROLL CONTROL SYSTEM FOR A MOTOR VEHICLE

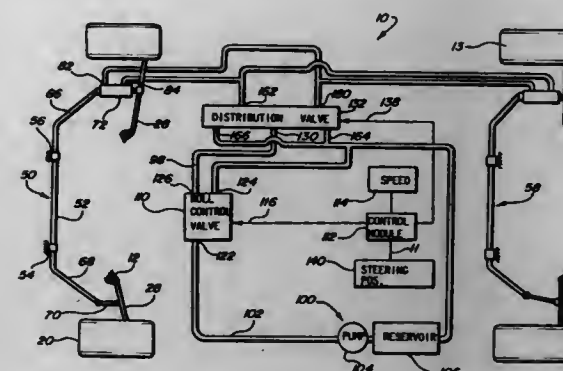
Garry R. Smith, Macomb Township, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 23, 1994, Ser. No. 363,468

Int. Cl.<sup>6</sup> B62D 9/02

U.S. Cl. 280—772

11 Claims



1. A roll control system for use in a motor vehicle, said roll control system comprising:

- a fluid supply source for providing a supply flow of a fluid;
- a roll control valve for receiving said supply flow and producing an actuation flow in response to a roll control signal generated by a control module, said roll control signal being calculated from a vehicle speed signal and a lateral weight transfer property of said vehicle;

a roll control actuator interconnecting a stabilizer bar to a suspension arm, said actuator including a cylinder having upper and lower ports and a piston slidably disposed in said cylinder between said upper and lower ports;

a distribution valve having an input port for receiving said actuation flow, a first actuation port in communication with said upper port of said roll control actuator and a second actuation port in communication with said lower port of said roll control actuator and a return port for directing said actuation flow to said return flow; and

control means for controlling said distribution valve, said control means being operative to direct said actuation flow to one of said actuation ports, thereby providing said roll control actuator with said actuation flow as required to oppose a predicted lateral weight transfer of said motor vehicle.

5,480,187

## NEWSPAPER BUNDLE CART

Ronald L. Binning, Hampton, Va., assignor to IDAB Incorporated, Hialeah, Fla.

Filed Jun. 8, 1993, Ser. No. 73,033

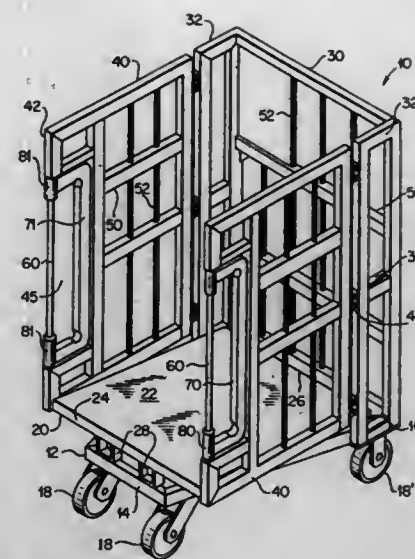
Int. Cl.<sup>6</sup> B62B 3/04

U.S. Cl. 280—79.2

32 Claims

1. A cart for supporting and containing a load, comprising:

- a support for supporting the load;
- generally vertical rear and side walls for laterally confining the rear and sides of the load;
- at least one generally vertical door for laterally confining the front of the load;
- a hinge for permitting the door to pivot about a generally vertical pivot axis proximate to one of the side walls; and
- a latch having a plurality of latch positions for holding the door in any of the latch positions and laterally confining the front of the load, the latch including a cylindrical cam with a sloped



portion for urging the door to rotate in a predetermined direction, and a plurality of progressive notches for establishing the latch positions and a follower for engaging the sloped portion and notches.

5,480,188

## VEHICLE SUSPENSION SYSTEM

Christopher B. Heyring, Dunsborough, Australia, assignor to Kinetic Limited, Australia

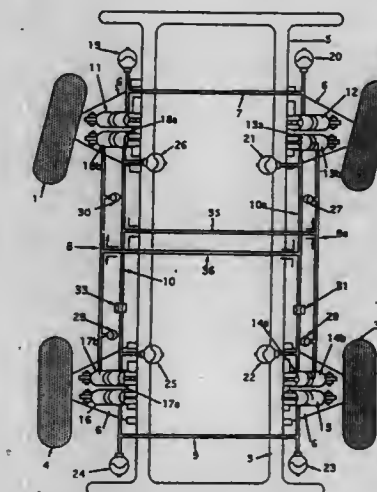
Filed Dec. 30, 1993, Ser. No. 170,296

Claims priority, application Australia, Jul. 2, 1991, PK 6974

Int. Cl.<sup>6</sup> B62D 9/02

U.S. Cl. 280—772

20 Claims



1. A vehicle having a load support body, a pair of front ground engaging wheels and a pair of rear ground engaging wheels connected to the body to support the body, each wheel being displaceable relative to the body in a generally vertical direction, a double acting fluid ram having a piston and interconnected between each wheel and the body, each ram including a first and a second fluid filled chamber on opposite sides of the piston, said first and second chambers varying in volume in response to vertical movement between the respective wheel and the body, respective first conduits providing fluid communication between said first chambers of the front and rear rams on the same side of the vehicle, respective second fluid conduits providing communication between the second chambers of the front and rear rams on the same side of the vehicle, a first further fluid communicating conduit interconnecting the first fluid conduit on each side of the vehicle to the



respective second fluid conduit on the opposite side of the vehicle, to thereby provide two fluid circuits each comprising one of said first conduits, one of said second conduits, and one of said first further conduits interconnecting the first and second conduits, each said circuit being adapted to resiliently vary the fluid capacity of the circuit to accommodate fluid displaced from rams in that circuit with a resultant pressure rise in the circuit, and at least one pair of wheels selected from the front and rear pairs of wheels of the vehicle being connected to the body by respective additional rams each defining a third fluid chamber, said third fluid chambers being interconnected by a third fluid conduit to provide a third fluid circuit, said first, second and third fluid circuits in operation being independent of external fluid and pressure sources and providing substantially consistent loading on the respective wheels irrespective of vertical position of the wheels while minimizing roll movement in the lateral direction.

5,480,189

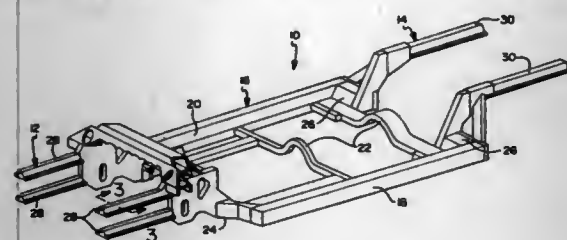
**AUTOMOTIVE VEHICLE FRAME**

Richard G. Davies, Dearborn Heights, and Peter H. Thornton, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 12, 1994, Ser. No. 289,459  
Int. Cl.<sup>6</sup> B62D 21/00

U.S. Cl. 280—797

10 Claims



1. An automotive vehicle frame comprising:
  - a forward portion;
  - a rear portion;
  - a central portion disposed between said forward portion and said rear portion; and
  - either one of said forward and rear portions including at least one rail made of metal from a family of metals including aluminum and magnesium extending longitudinally, said at least one rail having a first structural member having an open cross-section and marginal flanges and a second structural member closing the open cross-section of said first structural member, said second structural member having edge portions disposed over and in abutting relationship with said marginal flanges and welded to said marginal flanges.

5,480,190

**ENERGY CONVERTER IN A RESTRAINING SYSTEM FOR VEHICLE OCCUPANTS**

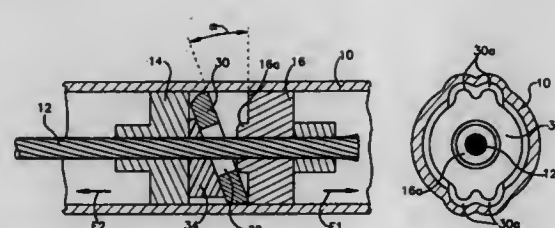
Artur Föhl, Schorndorf, Germany, assignor to TRW Repa GmbH, Alfdorf, Germany  
Continuation of Ser. No. 19,057, Feb. 18, 1993, abandoned.  
This application Apr. 4, 1994, Ser. No. 222,176  
Claims priority, application Germany, Feb. 27, 1992, 42 06 117.2

Int. Cl.<sup>6</sup> B60R 22/46

U.S. Cl. 280—806

9 Claims

1. An energy converter for use in a vehicle occupant restraint system, said energy converter comprising:
  - a tubular converter body including a yieldable wall comprising plastically deformable material, said tubular converter body having an axis;
  - a piston slidably disposed in said tubular converter body;
  - a plate including a circular portion;
  - a cable connected to said piston and said plate;



means for supporting said plate for pivotal movement between a rest position inclined to the axis of said converter body and an erected engagement position;

said plate being arranged in said rest position between said piston and another piston axially spaced apart from said piston, one of said pistons being slidably mounted on said cable, said plate having a central cutout into which a centering projection on an adjacent end face of said piston fixed on said cable can engage in fitting manner;

means disposed on said plate for plastically deforming said yieldable wall of said converter body when forces in a range from about 5,000N to about 12,000N are transmitted to said piston and said plate by said cable and said plate is moved through said converter body in a predetermined direction along the axis of said converter body, said means comprising at least one pair of radially opposite engagement projections projecting from said circular portion of said plate and engaging said wall of said converter body when said plate is in its erected engagement position; and

said plate being held by an elastically deformable guide member in said rest position in which its plane is disposed inclined to the axis of said converter body and said projections are in contact with said wall of said converter body.

5,480,191

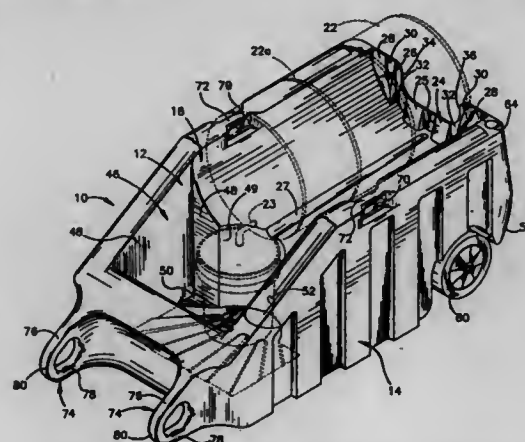
**SPILL CONTAINING STORAGE AND TRANSPORTATION DEVICE**

Michael H. Llin, Jamesville, Wis.; John O. Milliken, Gates Mills, and James P. Onders, Independence, both of Ohio, assignors to ENPAC Corporation, Chardon, Ohio  
Continuation-in-part of Ser. No. 201,019, Feb. 24, 1994. This application Sep. 9, 1994, Ser. No. 303,675

Int. Cl.<sup>6</sup> B62B 1/26

U.S. Cl. 280—831

21 Claims



1. A drum support and containment assembly comprising spaced inner and outer walls defining a substantially closed containment space, said inner wall defining a raised drum support surface and defining a receptacle at one end of said support surface, said receptacle being defined by vertical walls with at least a portion of a vertical wall which extends from said support surface to a bottom portion of said receptacle being concave and defining an arcuate intersection with said bottom portion of said receptacle so that a drum mounted on said support surface may overhang said bottom

portion and so that a pail positioned adjacent said concave portion may be positioned beneath an overhanging portion of the drum, and an aperture in said receptacle defining a passage into said containment space.

5,480,192

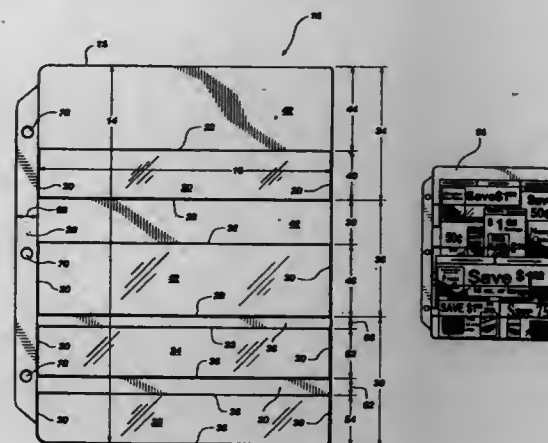
**COUPON ORGANIZER**

David G. Angerbauer, and Rose H. Angerbauer, both of 3759 S. 2035 East, Salt Lake City, Utah 84109  
Filed Dec. 29, 1993, Ser. No. 174,307

Int. Cl.<sup>6</sup> B42F 3/02

U.S. Cl. 281—31

18 Claims



1. A coupon holder for carrying rectangular coupons of various predetermined sizes and which may be carried in a cover, comprising:

- a flat, generally rectangular sheet of plastic having a front face and a back face;
- attachment means positioned along an edge of the sheet; and
- a plurality of pockets capable of holding the coupons, each pocket comprising a rectangular, transparent window attached to the front face of the sheet, each window extending across substantially the entire width of the front face of the sheet, wherein a first window is positioned within approximately the upper third of the front face of the sheet, a second window is positioned within approximately the middle third of the front face of the sheet and a third and a fourth window are positioned within approximately the lower third of the front face of the sheet such that the coupons may be located within the windows in an overlapping fashion thereby permitting certain information on the coupons to be exposed, the third and the fourth window being of approximate equal size, the windows being positioned on the sheet such that a lateral space is provided between adjacent windows thereby facilitating the insertion and removal of the coupons, and wherein each of the windows has a lower edge and two lateral edges which are attached to the sheet, and an upper side which is unattached to the sheet, thereby providing a pocket into which the coupons may be placed.

5,480,193

**CLAMP FOR PUSH-ON COUPLINGS**

Joseph A. Echols, 3070 Business Park Dr., Ste. G, Norcross, Ga. 30071; Jean D. Kimbrel, 210 Church St., Cerulian, Ky. 42215, and Sandra L. Montz, 2556 Barrett Ave., Naples, Fla. 33962

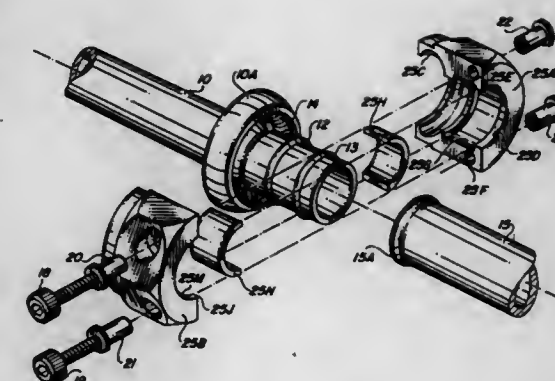
Filed May 22, 1995, Ser. No. 445,914

Int. Cl.<sup>6</sup> F16L 11/14

U.S. Cl. 285—45

4 Claims

1. A clamping assembly for securing the sealing connection between a push-on fitting having a flared end fitted into a cage and



surrounded by a garter-type coil spring housed within the cage of a pipe with a resilient O-ring sealing the connection between the push-on fitting and the pipe comprising

- a rigid clamp having a semi-annular recess aligned about the central axis of the clamp and sized to snugly fit over the cage of the pipe,
  - the clamp also having an axially aligned rigid cylindrical surface with a diameter sized to encircle but not touch the outer surface of the push-on fitting adjacent the cage of the pipe,
  - the clamp also having a pair of holes whose axes lie transverse to the axis of the clamp and lying on opposite sides of the clamp's cylindrical surface,
  - the clamp being axially split into two mirror-image halves, each clamp half having in its semi-cylindrical surface a flat edged semi-cylindrical groove, the depth of the groove being about one thirty-second of an inch,
  - a ribbon-like strip of resilient material inserted into the semi-cylindrical groove in each clamp half, the thickness of the strip being about one sixteenth of an inch to thereby accommodate oversize push-on fittings without deforming the oversize push-on fittings, and
  - a pair of screws sized to fit into the holes in both clamp halves and designed to draw the two clamp halves together around a coupled pipe and push-on fitting,
- whereby a strong, inwardly directed substantially 360° pressure is applied to the outer surface of the push-on fitting by the two strips of resilient material without deforming the push-on fitting thereby locking the pipe and push-on fitting in strict axial alignment, preventing back and forth movement of the fitting and the pipe transverse to their common axis, and preventing the rupture of the O-ring seal between the fitting and the pipe.

5,480,194

**METAL EXPANSION JOINT VIBRATION ABSORBER APPARATUS FOR PIPE SYSTEMS**

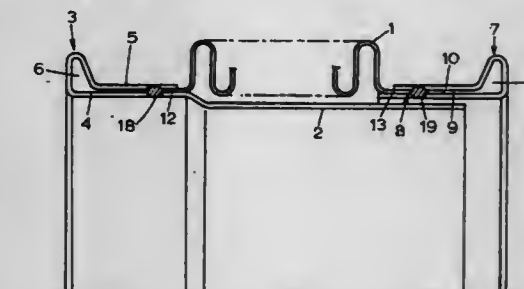
Silvano Mantoan, Au, and Werner Petermann, Emmenbrücke, both of, Switzerland, assignors to BOA AG, Rothenburg, Switzerland

Filed Nov. 21, 1994, Ser. No. 342,835

Int. Cl.<sup>6</sup> F16L 11/12

U.S. Cl. 285—49

3 Claims



1. An expansion joint and vibration absorber apparatus having at least one metal bellows element, at least one flange element



adapted to be mounted to a respective adjacent structure, and having at least one protection sleeve element in form of a pipe stub located inside of and extending coaxially to said bellows element; in which said at least one flange element and said at least one protection sleeve element are one single continuous integral sheet metal structure which includes a first portion continuous to said protection sleeve element and a second portion which is folded back onto the first portion forming a fold area between the first and the second portions, which fold area is shaped to provide the flange element;

and having a mounting unit including a further flange element located axially opposite of said one single integral sheet metal structure and a pipe stub element located inside of and extending coaxially to said bellows element, whereby an end portion of said protection sleeve element is received in said pipe stub element;

in which said further flange element and said pipe stub element are a further single continuous integral sheet metal structure which includes a further first portion forming said pipe stub element and a further second portion which is folded back onto said further first portion forming a further fold area therebetween, which further fold area is shaped to provide said further flange element;

wherein said bellows element has a first and a thereto opposite second end, which first end is welded to the first named single continuous integral sheet metal structure and which second end is welded to the further single continuous integral sheet metal structure, such that the metal expansion joint consists of three formed metal structures which are interconnected by weldings; and

in which said first and said second ends of the bellows element form its first and second necks, which first neck is inserted in a sandwich-like manner between the first portion and the second, folded back portion of said single continuous integral metal structure and is welded at one spot to both portions, and which second neck is inserted in a sandwich-like manner between the further first portion and the further second folded back portion of said further single continuous integral metal structure and is welded at one spot to both further portions.

5,480,195

## HIGH-PRESSURE PIPELINE

Ryszard Diederichs, Katowice; Helmut Sznepka, Pilchowice, and Józef Bubniak, k/Jasla, all of, Poland, assignors to Centrum Mechanizacji Górnictwa "Komag", Gliwice, Poland

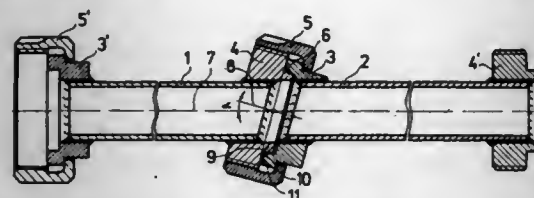
Filed Jun. 14, 1994, Ser. No. 259,501

Claims priority, application Poland, Jun. 14, 1993, 299333

Int. Cl.<sup>6</sup> F16L 27/00

U.S. Cl. 285—184

12 Claims



1. A pipeline for feeding medium under pressure from a first area to a second area, said pipeline comprising: a) a plurality of pipe segments including a first straight pipe segment of substantially circular cross-section and a second straight pipe segment of substantially circular cross-section, each of said first and second pipe segments having an oblique internal end and an external end, said first and second pipe segments being connectable with the respective oblique internal ends of said first and second pipe segments in near abutting relation wherein said respective oblique internal ends are rotatable in a rotation plane about a rotating axis which is perpendicular to the rotation plane and which intersects a longitudinal axis of at least the first pipe segment at an oblique angle  $\alpha$ , the oblique internal end of the first pipe segment being rotatable in

said rotation plane about said rotating axis and being complementary to the oblique internal end of the second pipe segment such that the first and second pipe segments can be positioned in rear abutting relation with respect to one another in any of a plurality of positions with the first and second pipe segments being thereby rotatable between a first configuration with the first and second pipe segments in substantial alignment and a second configuration with the first and second pipe segments disposed at an angle with respect to one another; and b) flange means on said first and second pipe segments for sealably connecting said first and second pipe segments with their respective internal ends in near abutting relation in any of said plurality of positions.

5,480,196

## DUCTILE IRON PIPE JOINT EMPLOYING A COUPLING AND COUPLING THEREFOR

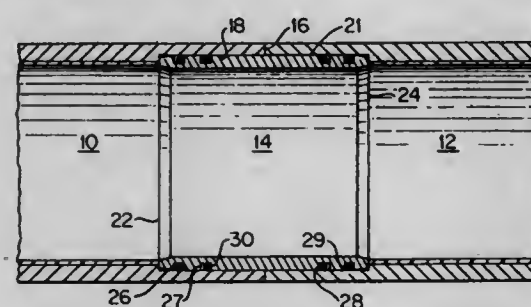
William T. Adams, Jr., Hoover, Ala., assignor to American Cast Iron Pipe Company, Birmingham, Ala.

Filed Aug. 15, 1994, Ser. No. 288,725

Int. Cl.<sup>6</sup> F16L 71/00

U.S. Cl. 285—369

22 Claims



1. A method of forming a high axial compression strength joint between two ductile iron pipes of equal diameter for trenchless installation, comprising

providing a substantially planar end face on one end of each of the two pipes to be joined, the planar end faces being perpendicular to the longitudinal axis of the respective pipes,

providing a section of reduced substantially uniform wall thickness on the end of each said pipe, said sections each extending a predetermined distance from said planar end face and having a cylindrical surface terminating in a substantially radial shoulder,

providing a high strength axial compressive load carrying coupling sleeve having a cylindrical wall in telescoping relation with and substantially complementary to said cylindrical surfaces on said pipes to be joined, said coupling sleeve having planar end faces which are perpendicular to said cylindrical wall,

providing a plurality of O-ring grooves formed in said cylindrical wall, and

providing an O-ring supported in each said O-ring groove, said O-rings forming a fluid-tight seal between said coupling sleeve and each said cylindrical surface,

the length of said coupling sleeve being equal to the sum of the lengths of said sections of reduced wall thickness whereby, when said cylindrical wall and said cylindrical surfaces are in said telescoping relation, the end faces of said pipe are in abutting relation and the end faces of said coupling sleeve are in abutting relation one with each said radial shoulder whereby all axial compressive loads applied between the two pipes are transmitted therebetween partially through said coupling sleeve and partially through said reduced wall thickness sections of each said pipe.

5,480,197

## TOGGLE CATCH FOR INTAKE AIR FILTERS OF INTERNAL-COMBUSTION ENGINES, COMPRESSORS AND OTHER MACHINES WHICH TAKE IN AIR

Volker Ernst, Sachsenheim; Rudl Hainle, and Volker Lehmann, both of Ludwigsburg, all of, Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Germany

Filed Nov. 3, 1993, Ser. No. 145,166

Claims priority, application Germany, Nov. 3, 1992, 9214938

U

Int. Cl.<sup>6</sup> E05C 19/14

U.S. Cl. 292—113

6 Claims



1. A toggle catch for the closing of first and second housing parts of intake air filters for machines which take in air, comprising: a toggle lever which pivotally engages in a bearing opening of an abutment; a hook part that is pivotally fixed on the toggle lever, said hook part reaching over a projection of the first housing part; and a spring band element, wherein the abutment is an end-face ear of the spring band element, the spring band element also having a hook-shaped end having a lug that is engageable in a form-locking manner in an undercut fastening area of the second housing part.

5,480,198

## DRIVE ARRANGEMENT FOR A SECURITY SYSTEM

Ulrich Wydler, Nürensdorf, and Lothar Pfab, Zürich, both of, Switzerland, assignors to Bauer Systemtechnik AG, Rümlang, Switzerland

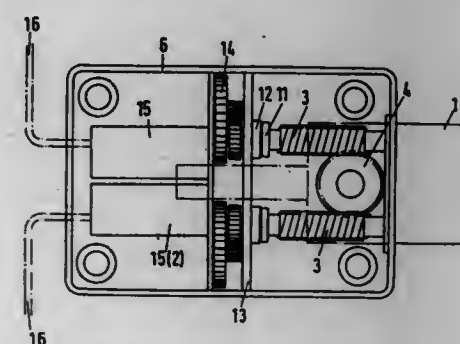
Filed Aug. 5, 1993, Ser. No. 102,463

Claims priority, application European Pat. Off., Aug. 13, 1992, 92113819

Int. Cl.<sup>6</sup> E05C 1/06

U.S. Cl. 292—144

11 Claims



1. A locking mechanism for a security system comprising: a lock case;

a lock bolt moveable along a translational axis between a locking position and an unlocking position, said locking position being occupied when a portion of said lock bolt extends out of said lock case;

transmission means for transforming rotational motion into translational motion, said transmission means coupled to said lock bolt; and

first and second motors rotatably engaging said transmission means, said first and second motors each having first and second directions of rotation,

wherein said transmission means converts rotational motion of said first and second motors into translational motion of said lock bolt, said first directions of rotation urging said lock bolt into said locking position and said second directions of rotation urging said lock bolt into said unlocking position.

5,480,199

## DOOR LATCHING AND SEAL ASSEMBLY

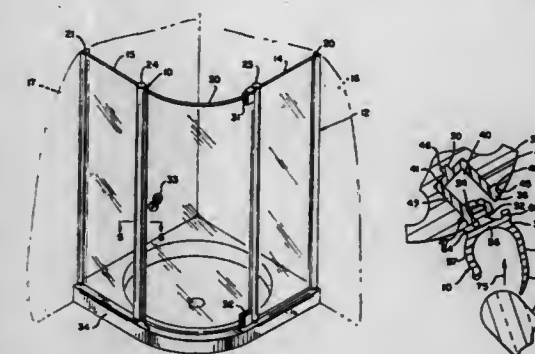
Thomas J. Husting, Port Washington, Wis., assignor to Kohler Co., Kohler, Wis.

Filed Jan. 18, 1994, Ser. No. 184,078

Int. Cl.<sup>6</sup> E05C 3/06

U.S. Cl. 292—198

10 Claims



1. A door latching and seal assembly comprising: a door panel pivotal on an essentially vertical axis; an essentially vertical support; a mounting member adapted to be secured to the essentially vertical support; a combined latching and seal member pivotally attached to the mounting member for contact with the door panel; and resilient displacement means acting between the mounting member and the latching and seal member to provide a frictional engagement between the mounting member and the latching and seal member, the frictional engagement resisting pivoting of the latching and seal member away from two distinct positions.

5,480,200

## PORTABLE AUXILIARY DOOR LOCK

David Aintablian, 16 Simcoe Street South, Oshawa, Ontario, L1H 4G2, Canada

Filed Sep. 8, 1994, Ser. No. 302,295

Claims priority, application Canada, Sep. 10, 1993, 2099034

Int. Cl.<sup>6</sup> E05C 19/18

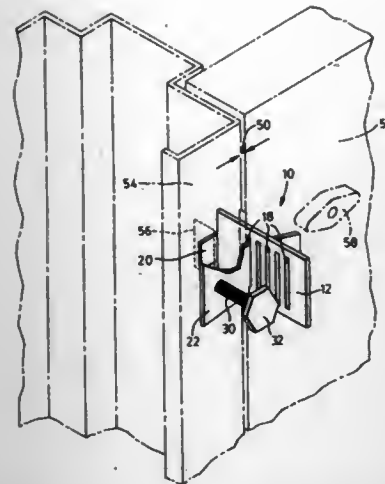
U.S. Cl. 292—288

8 Claims

1. A locking device for use with a door hung in a frame including a vertically extending doorjamb having a latch hole aligned to receive a latch bolt, there being a narrow gap between the side edge of the door and the doorjamb when the door is closed, the locking device comprising:

(a) a rigid flat plate dimensioned to fit in the gap, and to extend from the latch hole a distance inside the door clear of the door and doorjamb when the door is closed;





- (b) a tongue extending transversely from one end of the plate dimensioned to fit within the latch hole;
- (c) crossbar means releasably securable to the plate for extending across a portion of the door and a portion of the doorjamb when the door is closed;
- (d) point of contact means extending transversely from the crossbar means and spaced from the plate for providing a firm point of contact between the crossbar means and the door or doorjamb;
- (e) wherein the point of contact means comprises a threaded rod dimensioned to fit in a threaded aperture in the crossbar means; and
- (f) wherein the crossbar means comprises a flat cross plate.

5,480,201

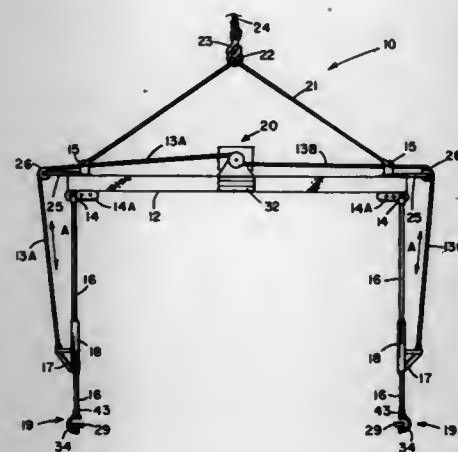
## SAFETY PIPE HANDLER

George L. Mercer, Box 11, 101 Concho Trail, Ft. Worth, Tex. 76108

Filed Feb. 13, 1995, Ser. No. 387,342  
Int. Cl.<sup>6</sup> B66C 1/28

U.S. Cl. 294—67.31

7 Claims



1. A pipe handler for suspension from a crane comprising:
- a) a horizontally disposed spreader bar having a support cable;
- b) a pair of lifting arms, a first arm thereof pivotally dependent from a first end of said spreader bar, and a second arm thereof pivotally dependent from a second end of said spreader bar;
- c) a pair of lifting shoes, a first one of said lifting shoes pivotally attached to a distal end of said first arm, and a second lifting shoe thereof pivotally attached to a distal end of said second arm; and

- d) a winch assembly having a pair of cable drums, a first cable on a first one of said drums connected to said first lifting arm and adapted to swing said first lifting arm outward, and a second cable on a second one of said drums, said second cable connected to said second lifting arm and adapted to swing said second lifting arm outward;
- e) whereby said spreader bar and said pair of lifting arms are positionable by a crane over a pipe to be handled, and said lifting arms are thereafter movable by said winch assembly to engage respective ends of said pipe with said lifting shoes for lifting and moving thereof.

5,480,202

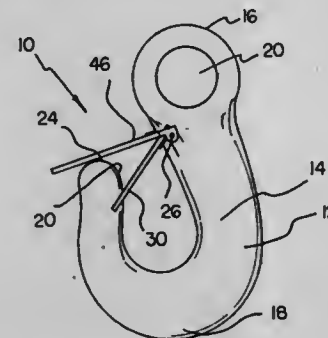
## ANTI-SNAG PLATE FOR CRANE HOOKS

Charles J. Gloden, 8451 Valley View Rd., Macedonia, Ohio 44056

Filed Nov. 14, 1994, Ser. No. 338,659  
Int. Cl.<sup>6</sup> B66C 1/36

U.S. Cl. 294—82.2

1 Claim



1. A new and improved anti-snap plate for crane hooks, comprising, in combination:
- a crane hook having a shank with an upper end and a lower end and having an opening extending through the upper end, the shank being curved and bent in a J-shaped configuration and including an upstanding projection terminating at a point at an elevation beneath the opening, the shank having an aperture adjacent to the opening;
- a safety plate formed of an elongated configuration having a lower end and an upper end with downwardly extending legs with apertures therethrough positionable in alignment with the aperture of the shank, the lower end of the safety plate being formed with a concave recess positionable in contact with the upstanding projection and movable downwardly with respect thereto;
- an anti-snap plate formed in a rectangular configuration with an upper end and a lower end and an intermediate extent therebetween, the upper end being formed with downwardly extending legs and apertures therethrough positionable in alignment with the apertures of the safety plate and aperture of the shank, the intermediate extent being positionable upon the point of the projection; and
- a pivot pin positioned through the aperture of the shank as well as the apertures of the anti-snap plate and the safety plate and a coil spring having free linear ends, the free linear ends being positioned upon the upper surface of the anti-snap plate and the lower surface of the safety plate to move such plates together toward the tip of the projection to thereby preclude the inadvertent coupling of objects to the projection for being secured to the hook through the safety plate.

5,480,203

## PULLING TOOL FOR PULLING CONNECTORIZED CABLE

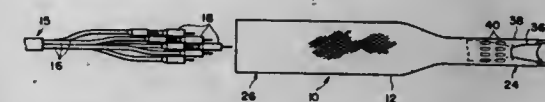
Mark L. Favalora, Niantic, and Randolph J. Minor, Stonington, both of Conn., assignors to Hubbell Incorporated, Orange, Conn.

Filed Jan. 18, 1994, Ser. No. 182,420

Int. Cl.<sup>6</sup> F16L 3/00

U.S. Cl. 294—86.42

19 Claims



1. A pulling tool for gripping a member such as a cable having a terminal end, comprising:
- a pulling member;
- a resilient mesh sleeve formed of a plurality of thin, flexible strands braided together to encapsulate the terminal end of the cable, and having a closed lead end and an open tail end, said strands being tightly interwoven to laterally expand said sleeve during longitudinal compression of said sleeve and to laterally contract said sleeve during longitudinal extension of said sleeve, said lead end having a first portion of said sleeve overlying a second portion of said sleeve to form a loop for receiving said pulling member therein, said strands being arranged in a plurality of spirally extending groups with each of said groups of said strands being positioned side by side and one of said strands in at least one of said groups of said strands having a diameter larger than at least one other of said strands in said at least one of said groups of said strands; and
- fastening means for fixedly coupling said first portion of said lead end of said sleeve to said second portion of said sleeve.

5,480,204

## CARRIER FOR CONTAINERS

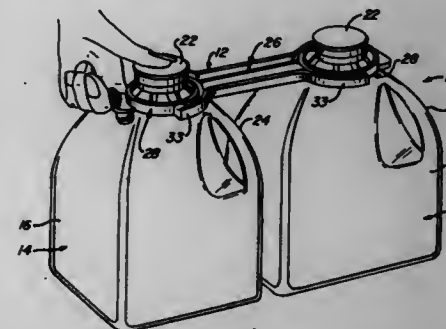
Richard W. Erickson, #6 - 675 Brea Canyon Rd., Walnut, Calif. 91789

Filed Sep. 12, 1994, Ser. No. 304,357

Int. Cl.<sup>6</sup> B65D 71/00

U.S. Cl. 294—87.2

6 Claims



1. A container carrier comprising:
- a carrier body capable of being molded from plastic and including a pair of container holders for supporting a pair of containers, respectively, and a bridge section extending between and having ends joined to said holders, and wherein said bridge section is adapted to be grasped in one hand between said ends of the bridge section to hold the carrier in a normal carrying position wherein the end portions of said bridge section tend to bend downwardly under the weight of containers supported in said holders and thereby produce a curvature in said bridge section, and
- said bridge section includes a normally lower generally planar web portion extending longitudinally and laterally of the bridge section and having normally upper and lower sides, and upstanding reinforcing rib means on said upper side only

of said web portion formed integrally with said web portion and extending longitudinally of the bridge section for reinforcing the bridge section against bending, whereby said bending of said bridge section is resisted by stressing of said reinforcing rib means in tension, and during molding of said carrier said plastic bridge section tends to warp in a manner which produces in the bridge section a curvature opposite to the bridge section curvature produced by bending of the bridge section under the weight of said containers.

5,480,205

## LOADING BOW DEVICE FOR OPEN TENDERS

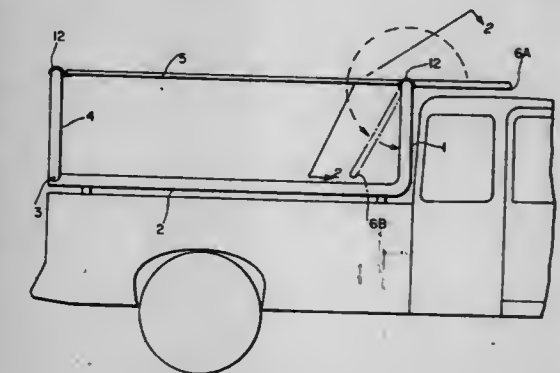
Eli Tayar, c/o Masgeriat Tal, Tel Josef 19132, Israel

Filed Oct. 12, 1994, Ser. No. 321,759

Int. Cl.<sup>6</sup> B60P 3/00

U.S. Cl. 296—3

6 Claims



1. A loading device for a truck having a driver's cabin and an open tender in back of the driver's cabin, the driver's cabin having a back wall and the open tender having side walls and a back wall, said loading device comprising:
- a front bow of inverted U shape extending parallel to and immediately in back of the driver's cabin back wall between the side walls of the open tender, said front bow comprising left and right fixed bars forming the sides of the inverted U shape and a rotatable bar forming the apex of the inverted U shape, said rotatable bar being hollow and extending horizontally substantially the width of the driver's cabin, said fixed bars each having an upper end inserted into an end of said rotatable bar and a lower end opposite said upper end;
- a plate affixed to said rotatable bar, said plate being rotatable approximately 270° with said rotatable bar between a substantially vertical position in back of the driver's cabin between said fixed bars and a substantially horizontal position over the driver's cabin;
- stopping means for stopping rotation of said rotatable bar and said plate at said substantially vertical position and said substantially horizontal position;
- a back bow of inverted U shape parallel to and positioned rearwardly of said front bow and extending between the side walls of the open tender, said back bow having left and right side portions forming the sides of the inverted U shape and an upper horizontal portion forming the apex of the inverted U shape, said side portions each having a lower end; and
- left and right lower bars extending respectively between said lower ends of said left fixed bar and said left side portion and between said lower ends of said right fixed bar and said right side portion, said left and right lower bars being connectable to the side walls of the open tender.



5,480,206

# VEHICLE MODULAR RAIL SYSTEM HAVING COVER LOCKING ATTACHMENT

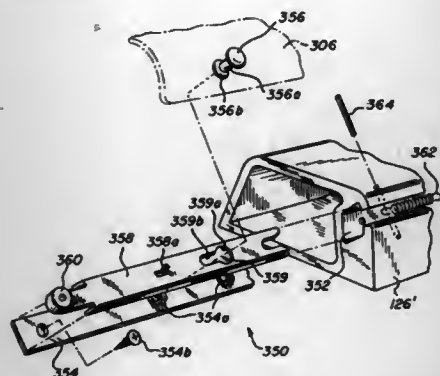
Richard C. Hathaway, Greenville; Mearl K. Bridges, New Madison, and Donald R. Klein, Greenville, all of Ohio, assignors to CR&I Inc., Greenville, Ohio

Continuation of Ser. No. 139,402, Oct. 19, 1993, abandoned, which is a division of Ser. No. 823,308, Jan. 21, 1992, Pat. No. 5,263,761. This application Aug. 24, 1994, Ser. No. 295,223

Int. Cl.<sup>6</sup> B60P 7/02

U.S. Cl. 296—36

5 Claims



1. A modular rail system for supporting a cover on a pickup truck bed which includes a front wall, an end wall, and opposing first and second side walls, the side walls each having a generally horizontal top surface, the system comprising:

a first elongated rail assembly releasably connected with said first side wall by a portion of said first elongated rail assembly having threaded openings therein, bolts being threaded upward within said threaded openings, and a lower support plate positioned intermediate said bolts and a lower surface of an extended portion of said first side wall so as to clamp said first elongated rail assembly to said extended portion of said first side wall without affixing any fasteners in the truck bed; said first elongated rail assembly including an elongated member having an outer surface with an elongated first channel located therein, defining a first elongated opening;

a second elongated rail assembly releasably connected with said second side wall by a portion of said second elongated rail assembly having threaded openings therein, bolts being threaded upward within said threaded openings of said second assembly, and a lower support plate positioned intermediate said bolts and a lower surface of an extended portion of said second side wall so as to clamp said second elongated rail assembly to said extended portion of said second side wall without affixing any fasteners in the truck bed;

said second elongated rail assembly including an elongated member having an outer surface with an elongated second channel located therein, defining a second elongated opening; and

a first support, associated with said first elongated rail assembly, and a second support, associated with said second elongated rail assembly, each support having a mating member thereon, the mating member for said first support being received in the first elongated opening of said first elongated channel and the mating member for said second support being received in the second elongated opening of said second elongated channel, wherein said first support comprises a first attachment associated with said first elongated rail assembly for lockingly attaching the cover to said first rail assembly and said second support comprises a second attachment associated with said second rail assembly for lockingly attaching the cover to said second rail assembly.

# 5,480,207 PREAMFIXED AUTO WINDSHIELD MOLDING WITH MECHANICAL INTERLOCK

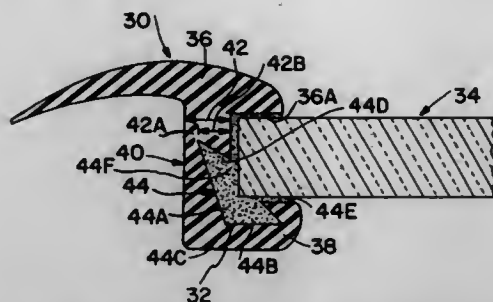
Peter Gold, 465 N. Wood Rd., Rockville Centre, N.Y.

Filed Apr. 18, 1994, Ser. No. 228,709

Int. Cl.<sup>6</sup> B60J 10/02

U.S. Cl. 296—93

3 Claims



1. In an auto windshield installation during which a glass windshield has a molding in an operative position in assembled relation about a peripheral edge of said windshield preparatory to being disposed as an assembly of said windshield and said molding into an auto windshield opening to complete said installation, the using to advantage in said installation of firstly urethane of a type that is chemically bondable to glass, and of secondly a rubber construction material for said molding that, although of a type inert to chemical bonding to said urethane, has as an effective substitute a mechanical interlock to said urethane, said molding comprising an upper crown, a bottom gripper leg in approximate parallel relation to said upper crown so as to bound a clearance therebetween sized to frictionally engage said peripheral edge of said windshield projected into said clearance, and a stem depending from said crown connected in spanning relation therefrom to said gripper leg wherein the improvement comprises said stem having a selected increased thickness, a portion of said stem thickness providing a connection of said crown to said gripper leg, and a remaining portion of said stem thickness embodying a combination urethane-molding and urethane-gripping compartment, said compartment having a shape of a ninety-degree angle and being located at a juncture of said stem and said gripper leg for being seated about a ninety-degree shape of a bottom edge of said windshield periphery, and said compartment further having at opposite ends thereof respective sides inclined at an angle in a direction effective to hold said molding in attached relation to said urethane previously deposited in said compartment incident to being molded therein while in contact with said windshield peripheral edge and curing into a solid condition, whereby holding of said molding to said solid urethane chemically bonded to said windshield corresponding mechanically interlocks said molding to said windshield to obviate inadvertent disengagement therefrom so as to contribute to facilitating said installation of said windshield in said auto windshield opening.

5,480,208

# S-PORTION FOR A FRAME-TYPE VEHICLE BODY CONSTRUCTION AND AN ASSOCIATED METHOD

John W. Cobes, Lower Burrell, and Dinesh C. Seksaria, Murrysville, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed May 6, 1994, Ser. No. 239,026

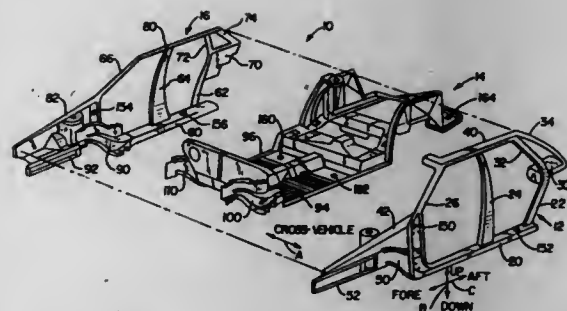
Int. Cl.<sup>6</sup> B60R 27/00; B60K 37/00

U.S. Cl. 296—203

20 Claims

1. An S-portion for a frame-type vehicle body construction, said S-portion comprising:

a first S-portion component having step means; a second S-portion component having step means; and said step means being in complementary and confronting relationship with each other so as to permit relative sliding movement therebetween, whereby desired positioning of said



first S-portion component relative to said second S-portion component can be established.

5,480,209

# MECHANISM FOR WALL-PROXIMITY RECLINING CHAIR

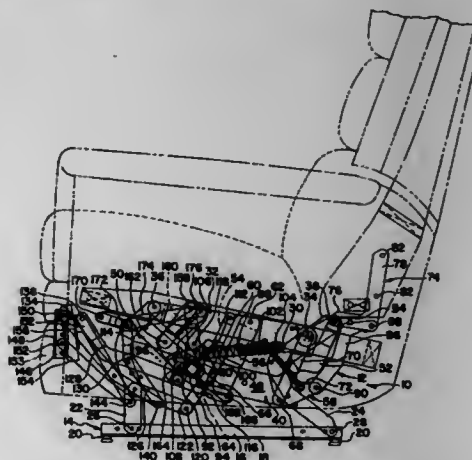
Teddy J. May, Tupelo, Miss., assignor to The Lane Company, Inc., Altavista, Va.

Filed Sep. 16, 1994, Ser. No. 306,956

Int. Cl.<sup>6</sup> A47C 1/035

U.S. Cl. 297—85

6 Claims



1. A mechanism for a wall-proximity reclining chair which has a seat and arm frame unit, a back and a primary ottoman, said mechanism comprising:

a left side linkage including a base rail adapted to support the mechanism on a floor, a right side linkage including a base rail adapted to support the mechanism on a floor, cross members interconnecting corresponding portions of the left and right side linkages and thereby integrating the side linkages into a unitary structure; the left and right side linkages being generally mirror images of one another;

each said side linkage comprising:

an upper main longitudinal link pivotally supported on the respective base rail by respective forward and rear support links having lower ends pivoted to the respective base rail and upper ends pivoted to the respective upper main longitudinal link;

a lower main longitudinal link;

a plurality of longitudinally spaced generally vertical hanging links pivotally hangingly supporting the respective lower main longitudinal link from the respective upper main longitudinal link;

a projectable-retractable pantographic linkage having a forward end and a rear end, the forward end being arranged for mounting a respective end of a transversally extending primary ottoman for projection and retraction with the pantographic linkage; upper and lower rear ends of the pantographic linkage being respectively pivoted to the for-

ward end of the lower main longitudinal link and a radially outer end of an ottoman-operating link;

a transversally extending torque tube, and means for rotating said torque tube about its own transversally extending axis for projecting and retracting said pantographic linkages;

each said side linkage further including:

a connector connecting a radially inner end of the respective ottoman-operating link to the torque tube so that the ottoman operating link rotates with the torque tube;

an L-shaped back-mounting link with upper vertical and lower forwardly projecting legs and adapted to have a chair back mounted thereto; a forward, lower end of the back-mounting link being pivoted to an upper rear portion of the respective lower main longitudinal link;

a V-shaped back-operating link having a pivotal securement to a rear portion of the respective lower main longitudinal link, a forward leg pivotally secured at an upper end thereof to a rear portion of the upper main longitudinal link, and a rear leg pivotally secured at an upper end thereof to a lower end of a driving link that is pivotally connected at an upper end thereof to the respective L-shaped back-mounting link at a juncture between said upper vertical and lower forwardly projecting legs of the respective L-shaped back-mounting link;

a back-reclining prevention lock including a transversally extending first pin provided on an articulated linkage system looping to the rear of the torque tube and pivotally connected at opposite ends thereof to:

the respective forward support link at an intermediate-height location between upper and lower ends of the respective forward support link, below and forwardly of the torque tube, and

the respective upper main longitudinal link, above the torque tube; and

further including a notch provided in an edge of a lock link; a pin-in-slot slidable connection of a rear end portion of the lock link to the upper main longitudinal link; and a lock opening link secured at a radially inner end thereof to the torque tube and pivotally connected at a radially outer end thereof to a forward end of the respective lock link, so that as the torque tube is rotated in a sense to retract the respective pantographic linkage, the respective notch and first pin are effectively engaged, and, as the torque tube is rotated in a sense to project the respective pantographic linkage, the respective notch and first pin are effectively disengaged, a respective second pin sliding from a rear end to a forward end of the respective pin-in-slot slidable connection as the torque tube is rotated in a sense to project the respective pantographic linkage, and from said forward end to said rear end of the respective pin-in-slot slidable connection as the respective L-shaped back-mounting link is rotated rearwardly corresponding to reclining of the chair back.

5,480,210

# ROTATING BABY CHAIR

Therese T. Lehenbauer, and Steven C. Lehenbauer, both of 324 Chynoweth Ave., San Jose, Calif. 95136

Continuation of Ser. No. 214,113, Mar. 17, 1994, abandoned.

This application Feb. 7, 1995, Ser. No. 385,575

Int. Cl.<sup>6</sup> A47D 1/00

U.S. Cl. 297—137

7 Claims

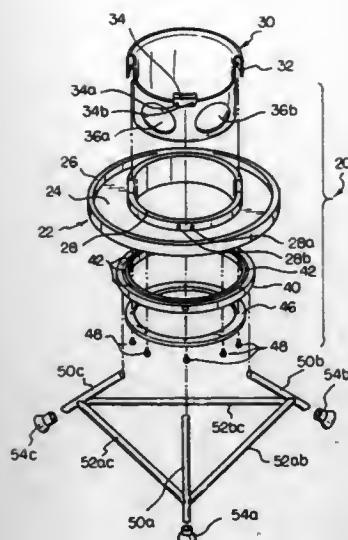
1. A rotating baby chair comprising:

a tray having a center aperture extending through a center of said tray;

a seat means associated with said tray for supporting an infant relative to said tray and within said center aperture;

support structure means rotatably coupled to said tray for supporting said tray and said seat means relative to a ground surface; and,





rotation means interposed between said tray and said support structure, said rotation means for permitting said tray and said seat means to rotate relative to said support structure means about an axis directed through said center aperture, whereby said tray and said seat means rotate together, said rotation means comprising a first annular member of first diameter affixed to said support structure means and which forms an uppermost edge of said support structure means, said first annular member being oriented in a coaxial relation with respect to said axis, said tray comprising a second annular member of second diameter equal to or greater than said first diameter of said first annular member whereby the external periphery of said second annular member extends radially with respect to the external periphery of said first annular member.

5,480,211

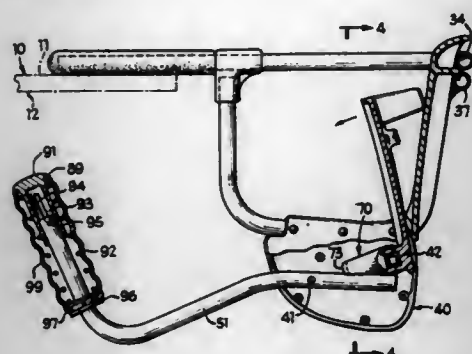
# HIGH CHAIR APPARATUS FOR ATTACHMENT TO A TABLE OR THE LIKE

Homer Douglas; Marshall L. Aberle, both of Grand Rapids; Phillip M. Parker, Kalamazoo, all of Mich.; Daniel R. Pinch, Columbus, Ind., and Robert A. Schwartzkopf, Grand Rapids, Mich., assignors to Sassy, Inc., Northbrook, Ill.  
Filed Sep. 28, 1994, Ser. No. 314,359

Int. Cl.<sup>6</sup> A47B 39/00

U.S. Cl. 297—174

20 Claims



1. A highchair apparatus for attachment to an elevated member having an upper surface, a lower surface and a thickness therebetween, said highchair apparatus comprising:  
frame means for supporting said highchair apparatus, at least a portion of said frame means engaging said upper surface of said elevated member upon said attachment of said highchair apparatus to said elevated member;

clamping means pivotally attached to said frame means at a first pivot for clamping said highchair apparatus to said elevated member, at least a portion of said clamping means engaging said lower surface of said elevated member upon attachment of said highchair apparatus to said elevated member; and  
securement means pivotally attached to a second pivot and operably associated with said clamping means for imparting movement of said clamping means about said first pivot and restrainably securing said highchair apparatus to said elevated member through clamping engagement of said at least a portion of said frame means and said clamping means with said upper and lower surfaces of said elevated member, respectively, said securement means cooperatively engaging said clamping means upon movement of said securement means from a substantially non-engaging position to a substantially engaging position to, in turn, impart movement of said clamping means from a non-clamping position to a clamping position, securely engaging said lower surface of said elevated member and, in turn, causing said at least a portion of said frame means to securely engage said upper surface of said elevated member, said securement means further serving to lock said clamping means in said secure engagement of said lower surface, and, in turn, said at least a portion of said frame means in said secure engagement of said upper surface, until force is exerted upon said securement means towards moving said securement means back from said substantially engaging position to said substantially nonengaging position.

5,480,212

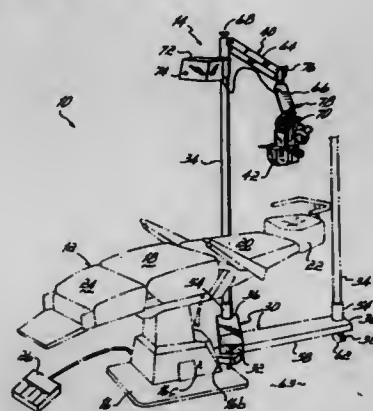
# MEDICAL INSTRUMENT POSITIONER AND PATIENT SUPPORT APPARATUS

Robert E. Marconet, Cincinnati, Ohio, assignor to Reliance Medical Products, Inc., Mason, Ohio  
Filed Nov. 18, 1993, Ser. No. 154,854

Int. Cl.<sup>6</sup> A47C 7/62

U.S. Cl. 297—188.01

17 Claims



1. A patient support in combination with a medical instrument positioner comprising:  
a support having at least one surface for supporting a patient undergoing a medical examination or medical procedure, said support including a fixed support base, and  
a medical instrument positioner comprising:  
a lever arm having first and second ends, said first end including a pivotal connection to said support base;  
a pole attached to said second end and extending upwardly therefrom, said pole including means at an upper end thereof for attaching a medical instrument mounting arm and a medical instrument thereto; and  
a lockable caster attached to said lever arm at said second end for supporting said lever arm and said pole on a support surface while allowing rolling pivotal movement thereof with respect to said base by way of said pivot connection, said caster being selectively lockable to stop said rolling pivotal movement.

5,480,213

# RECLINING SOFA

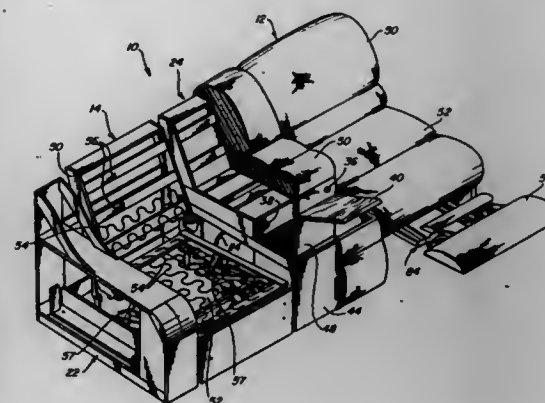
James Sproule, Grand Rapids, Mich., assignor to The Gentry Gallery, Inc., Ripley, Miss.

Continuation of Ser. No. 780,967, Oct. 23, 1991, abandoned, which is a continuation of Ser. No. 637,313, Jan. 3, 1991, Pat. No. 5,064,244. This application Dec. 29, 1993, Ser. No. 175,176

Int. Cl.<sup>6</sup> A47C 17/00

U.S. Cl. 297—232

4 Claims



3. A sectional sofa comprising:

a pair of sofa sections abutting one another end to end with one of said sections having a pair of reclining seats disposed in parallel relationship with one another in a double reclining seat sofa section, one of said reclining seats being at the end of said one sofa section abutting the end of the other sofa section and with that end of said one section being without an armrest,  
each of said reclining seats having a backrest; seat cushion and footrest and movable between upright and reclined positions, the backrests, seat cushions and footrests of the pair of reclining seats lying in respective common planes when the seats are in the same positions,  
a console disposed in the one sofa section between the pair of reclining seats and with the console and said one of the reclining seats together comprising a unitary structure, said console including an armrest portion for each of the reclining seats, said armrest portions remaining fixed when the reclining seats move from one to another of their positions, and a pair of control means, one for each reclining seat, mounted on the said one sofa section and each readily accessible to an occupant of the respective reclining seats and when actuated causing their respective reclining seats to move from the upright to the reclined position.

5,480,214

# SIDE DUMP TRAILER

Ralph R. Rogers, 733 W. 21st St., South Sioux City, Nebr. 68776

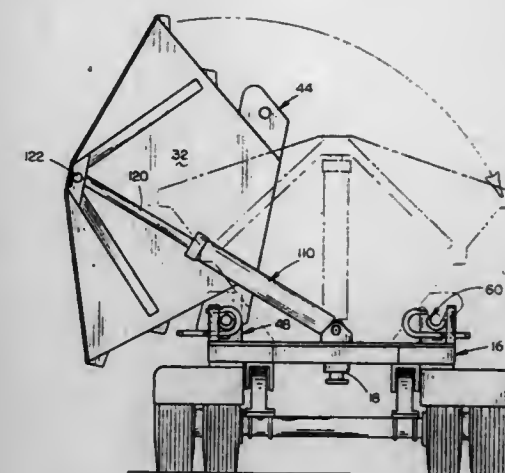
Filed Oct. 20, 1994, Ser. No. 326,468

Int. Cl.<sup>6</sup> B60P 1/16

U.S. Cl. 298—17.6

5 Claims

1. A side dump trailer, comprising:  
an elongated wheeled frame having a forward end, a rearward end, and opposite sides;  
a first support on said wheeled frame adjacent the forward end thereof at one side thereof;  
a second support on said wheeled frame adjacent the rearward end thereof at one side thereof;  
a third support on said wheeled frame adjacent the forward end thereof at the other side thereof;  
a fourth support on said wheeled frame adjacent the rearward end thereof at the other side thereof;



an elongated body movably positioned on said wheeled frame and having a forward end, a rearward end, opposite sides, and an open upper end for receiving materials to be transported; said body including a substantially flat, horizontally disposed bottom wall having a forward end, a rearward end, and first and second opposite side edges;  
said body also including an upstanding forward wall member, an upstanding rearward wall, and first and second side walls which extend upwardly and outwardly from the first and second side edges of said bottom wall;  
a first, horizontally disposed pivot pin secured to said first side wall of said body adjacent the forward end thereof adapted to be removably and pivotally received by said first support;  
a second, horizontally disposed pivot pin secured to said first side wall of said body adjacent the rearward end thereof adapted to be removably and pivotally received by said second support;  
a third, horizontally disposed pivot pin secured to said second side wall of said body adjacent the forward end thereof adapted to be removably and pivotally received by said third support;  
a fourth, horizontally disposed pivot pin secured to said second side wall of said body adjacent the rearward end thereof adapted to be removably and pivotally received by said fourth support;  
said first, second, third and fourth pivot pins being elongated and having their axes disposed parallel to the length of said body and said wheeled frame;  
said first, second, third and fourth pivot pins being positioned on the respective side walls above said bottom wall and outwardly of said side walls;  
first, second, third and fourth locking devices selectively movable between locked and unlocked positions for selectively maintaining said first, second, third and fourth pivot pins in said first, second, third and fourth supports respectively when in their locked positions;  
a first power cylinder having a base end pivotally secured to said wheeled frame intermediate the sides thereof forwardly of said body and a rod end pivotally secured to said forward wall member of said body intermediate the sides thereof;  
a second power cylinder having a base end pivotally secured to said wheeled frame intermediate the sides thereof rearwardly of said body and a rod end pivotally secured to said rearward wall of said body intermediate the sides thereof;  
and means for simultaneously selectively extending the rods of said first and second power cylinders whereby said body will dump the material therein from said one side of said body when said first and second locking devices are in their locked positions and said third and fourth locking devices are in their unlocked positions and whereby said body will dump the material therein from said other side of said body when said third and fourth locking devices are in their locked positions and said first and second locking devices are in their said unlocked positions;











an outlet valve which is provided in a discharge path for discharging working fluid from the fluid pressure apparatus and is opened so as to reduce the fluid pressure of the fluid pressure apparatus, the outlet valve including means for opening the outlet valve in response to drive current applied thereto;

wherein the inlet valve is formed by a solenoid selector valve effecting only a fully open operation and a fully closed operation;

wherein the outlet valve is formed by a flow control valve, the flow control valve being moved by the means for opening so that one-to-one correspondence continuously exists between quantity of drive current applied thereto and flow rate of the working fluid flowing therethrough; and

wherein the inlet valve and the outlet valve are not open at the same time.

5,480,224

# CONVERTIBLE COMPUTER WORKSTATION

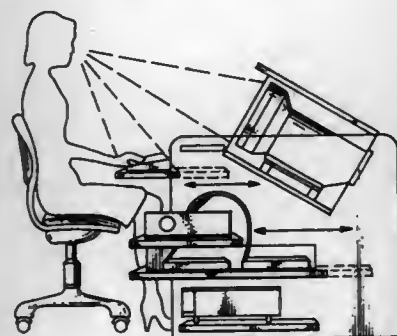
Carlos V. Ugalde, San Dimas, Calif., assignor to Continental Engineering Group, Inc., Irwindale, Calif.

Continuation of Ser. No. 704,462, May 23, 1991, Pat. No. 5,364,177. This application Oct. 11, 1994, Ser. No. 320,448. The portion of the term of this patent subsequent to Nov. 15, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> A47B 21/03

U.S. Cl. 312—194

14 Claims



1. A computer workstation with an openable and closable flat surface, the workstation comprising:

a frame assembly having a first panel for defining a flat working surface and a plurality of vertical second support panels for supporting the first panel, the first panel having a cutout formed therein;

a monitor housing having a top panel, means for supporting a monitor, and means for defining an opening through which a monitor can be viewed;

means for mounting the monitor housing inside the frame assembly for movement between a closed position where the top panel of the monitor housing is disposed in the cutout of the first panel and parallel to the flat working surface to provide a complete working surface, and an open position wherein the top panel is above the flat working surface, and the opening is viewable from above the flat working surface;

a keyboard shelf for holding a keyboard;

means for attaching the keyboard shelf to the frame assembly such that the keyboard shelf is movable between a retracted position where it is disposed underneath the first panel and an extended position where it extends out from underneath the flat working surface; and

means attached to the frame assembly for biasing the monitor housing from the closed position to the open position, wherein the keyboard shelf has first engagement means thereon, and the monitor housing has second engagement means thereon for cooperating with each other to hold the monitor housing in the closed position when the keyboard shelf is in the retracted position such that moving the keyboard shelf from the retracted position to the extended position disengages the

cooperating first engagement means from the second engagement means, allowing the means for biasing to move the monitor housing to the open position.

5,480,225

# FOLDABLE DISPLAY BOOTH

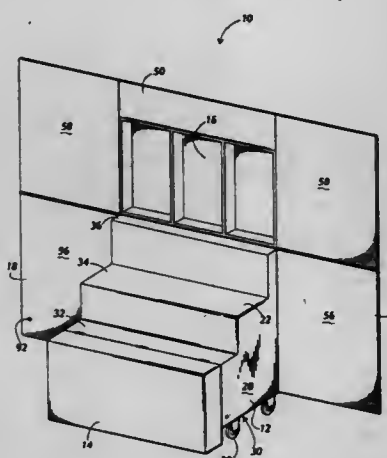
Randall J. Bailey, 176 Elizabeth St., Atlanta, Ga. 30307

Filed Dec. 14, 1993, Ser. No. 166,926

Int. Cl.<sup>6</sup> A47B 43/00

U.S. Cl. 312—258

4 Claims



1. A foldable display unit comprising:

a base having a front surface, a top surface and side surfaces, the top surface configured to nestingly receive sections hinged to the base;

the base further comprises a storage area therewithin, the storage area being accessible from an opening located on a rear surface of the base;

a front section hingedly connected to the base and dimensioned to be nestingly received by the top surface of the base; and a top section hingedly connected to the base and dimensioned to be received by the top surface of the base,

whereby the front section pivots from the front surface of the base and the top section pivots away from the top surface of the base to form an attractive display unit, and the front section pivots toward the front surface of the base and the top section pivots toward the top surface of the base to form a self-contained shipping container.

5,480,226

# ROTARY DRUM DRYER HAVING AGGREGATE COOLED SHIELDING FLIGHTS AND METHOD FOR THE UTILIZATION THEREOF

John Milstead, Chattanooga, Tenn., assignor to Astec Industries, Inc., Chattanooga, Tenn.

Filed May 9, 1994, Ser. No. 239,767

Int. Cl.<sup>6</sup> B28C 5/46; F27B 7/16; 7/38

U.S. Cl. 366—7

20 Claims

10. A method comprising:

A. directing a flame generally axially into a rotating drum to define a combustion zone therein;

B. heating and drying materials in said rotating drum using heat from said flame;

C. shielding a portion of a shell of said rotating drum which surrounds said combustion zone from heat from said flame, said shielding step comprising positioning shielding flights radially between said flame and said portion of said shell, said flights being attached to and rotating with said drum; and



D. cooling said shielding flights, said cooling step comprising lifting relatively small amounts of said materials from materials accumulated in a lower portion of said drum and continuously showering lifted materials onto outer radial surfaces of said flights through a designated angle of drum rotation such that the showering materials cascade transversely across and off from said shielding flights.

5,480,227

# SCREW EXTRUDER WITH SHEAR-CONTROLLING DIAGONALLY EXTENDING PINS

Wilfried Baumgarten, Pattensen, Germany, assignor to Krupp Maschinentechnik GmbH, Essen, Germany

PCT No. PCT/EP93/03507, § 371 Date Aug. 9, 1994, § 102(e)

Date Aug. 9, 1994, PCT Pub. No. WO94/14597, PCT Pub.

Date Jul. 7, 1994

PCT Filed Dec. 11, 1993, Ser. No. 284,554

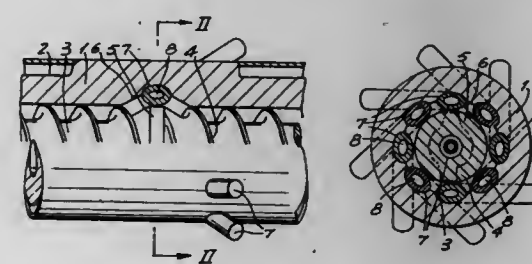
Claims priority, application Germany, Dec. 28, 1992, 42 44

312.1

Int. Cl.<sup>6</sup> B29B 7/42

U.S. Cl. 366—80

12 Claims



1. A screw extruder comprising:

an extruder cylinder having a cylinder bore;

at least one screw received in said bore and provided with a screw flight, and at least one annular core bead projecting outwardly to the diameter of said screw flight, said cylinder having an inner wall formed with an annular recess surrounding said bead; and

a plurality of pins arranged in a radial zone of said at least one core bead and extending through said recess and juxtaposed with said at least one core bead, said pins being disposed externally of a cylindrical surface enveloping said flight and extending diagonally to a radial plane of said at least one core bead and said annular recess.

5,480,228

# MIXER SYSTEMS

Jeffrey S. Gambrill, Hilton; William F. Hutchings, Fairport; Stephen L. Markle; Marlin Schutte, both of Rochester, and John M. Palmer, Groveland, all of N.Y., assignors to General Signal Corporation, Rochester, N.Y.

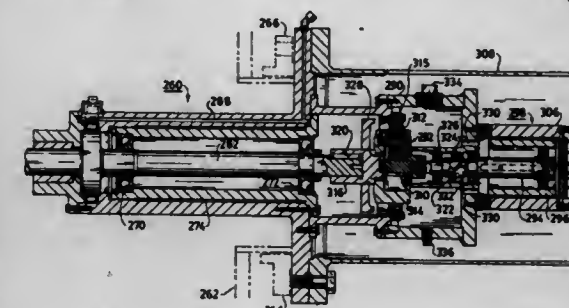
Division of Ser. No. 24,715, Mar. 1, 1993, Pat. No. 5,368,390.

This application Aug. 1, 1994, Ser. No. 283,414

Int. Cl.<sup>6</sup> B01F 13/08

U.S. Cl. 366—273

3 Claims



1. A mixer system which comprises an impeller having a shaft adapted to be driven by a motor at a lower speed and with higher torque than delivered by said motor, a magnet coupling having an inner rotor and an outer rotor, said outer rotor being connected in driving relationship with said motor, a member disposed between said inner and outer rotors for separating said inner rotor and said shaft and said impeller from said outer rotor and said motor, and a reduction gear train connected between said inner rotor and said impeller shaft for rotation at lower speed and higher torque than said motor and being separated by said separating member from said outer rotor and said motor.

5,480,229

# BAG FOR ALTERNATIVE USE

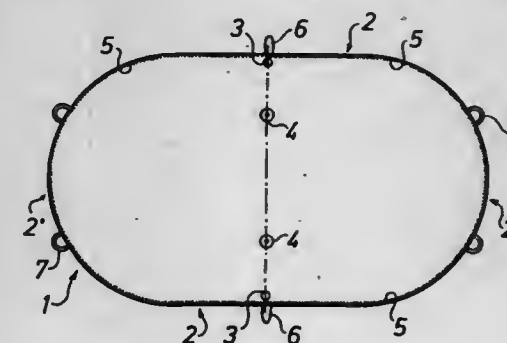
Onsri Thangsirojkul, Bangkok THX, assignor to IM International, Co., Ltd., Bangkok THX

Filed Jun. 21, 1994, Ser. No. 263,054

Int. Cl.<sup>6</sup> B65D 30/10

U.S. Cl. 383—4

7 Claims



1. A device to be used alternatively as a bag and a mat, comprising:

an integral piece of a flexible sheet material, said piece having a shape which is substantially symmetrical in relation to a substantially central symmetry line;

a first fastening element, disposed on each of two opposite sides of said piece of sheet material, being located on said symmetry line adjacent to an edge of each of said two opposite sides of said piece;

a second fastening element disposed on said each of said two opposite sides of said piece of sheet material for each said first fastening element, each second fastening element being spaced inwardly from the associated first fastening element along said symmetry line, each said first fastening element



and each said second fastening element being constructed for releasable interengagement; and  
two slide fasteners, each including two tracks and a slide, said two tracks joining each other at each said first fastening element, respectively, and the two slide fasteners extending therefrom along a circumference of said piece of sheet material, said two tracks bordering the edge of each of said two opposite sides of said piece, each said slide connecting and disconnecting each said two tracks.

5,480,230

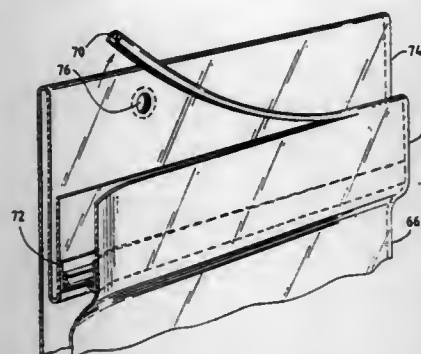
**DOUBLE HEADER PACKAGE HAVING A TEAR BEAD**  
Timothy J. May, Greenville, Wis., assignor to Reynolds Consumer Products Inc., Appleton, Wis.

Filed Apr. 11, 1994, Ser. No. 225,865

Int. Cl.<sup>6</sup> B65D 33/14;33/25

U.S. Cl. 383—9

22 Claims



1. A packaging arrangement comprising:

- a web of thermoplastic film folded to form a primary header having a first wall and a second wall and a secondary header having a first wall and a second wall, said first wall of said secondary header being disposed directly adjacent to said second wall of said primary header, said secondary header partially overlying said primary header;
- a product containment section positioned below said primary header and said secondary header with no portion of either said primary header or said secondary header overlying any of said product containment portion such that viewing of said product containment section is unobstructed by said primary header and said secondary header, said product containment section having a first wall directly adjacent to said first wall of said primary header and a second wall directly adjacent to said second wall of said secondary header;
- a tear bead engaging said secondary header to assist in opening the package arrangement; and
- a reclosable system attached to the first and second walls of the secondary header to permit the packaging arrangement to be reclosed after it has been opened.

5,480,231

**SPHERICAL SLIDING BEARING**

Takayoshi Sasaki, and Kotaro Kashiya, both of Nagoya, Japan, assignors to Daido Metal Company Ltd., Nagoya, Japan

Filed Nov. 8, 1994, Ser. No. 337,487

Claims priority, application Japan, Dec. 28, 1993, 5-336529

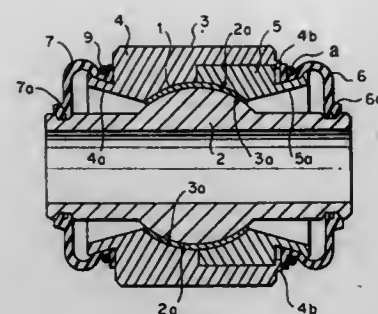
Int. Cl.<sup>6</sup> F16C 23/04;33/28

U.S. Cl. 384—206

13 Claims

1. A spherical sliding bearing comprising:

- a hollow inner rotating metallic shaft member having a spherical convex surface on its periphery;
- an outer load-carrying member having a spherical concave surface generally in conformity with said spherical convex surface, said hollow inner rotating shaft member being supported



by said outer load-carrying member so as to rotate and oscillate under the fitting relationship between the convex and concave surfaces; and

a pressure-bearing seat being interposed between the convex and concave surfaces, which comprises a fluorocarbon resin, a modifier dispersed in said fluorocarbon resin, and a reinforcement metallic member which is not exposed to the sliding-contact surface of the pressure-bearing seat;

wherein at least the convex surface of said hollow inner rotating shaft member is provided with a Ni-P electroless plating film having a thickness of from 8 to 15  $\mu$ m and a hardness of from Hv 900 to 1100.

5,480,232

**OIL SEAL FOR GAS TURBINE**

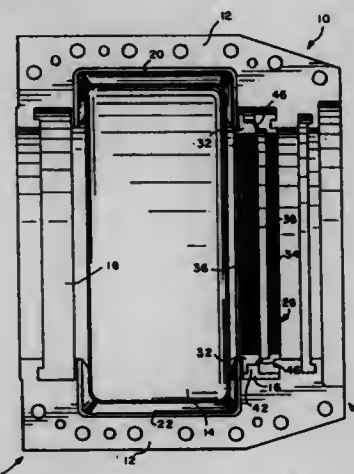
Joseph K. Lendway, Woodruff, S.C., assignor to General Electric Co., Schenectady, N.Y.

Filed May 26, 1994, Ser. No. 249,484

Int. Cl.<sup>6</sup> F16C 19/00

U.S. Cl. 384—273

6 Claims



1. In a bearing housing comprised of split half sections and adapted to be joined at mating surfaces of the half sections, and wherein each half section includes a bearing recess flanked on either side thereof by a seal recess; and a pair of annular bearing seals, each comprising a pair of half segments, each segment adapted to be received in a respective seal recess in a split half section of the housing, each segment having a pair of substantially planar interface surfaces at opposing sides thereof, the improvement comprising a groove formed in each interface surface, extending across a radial thickness dimension of the segment, such that opposing grooves in opposing interface surfaces combine to form a pair of oil channels in each bearing seal.

5,480,233

**THRUST BEARING FOR USE IN DOWNHOLE DRILLING SYSTEMS**

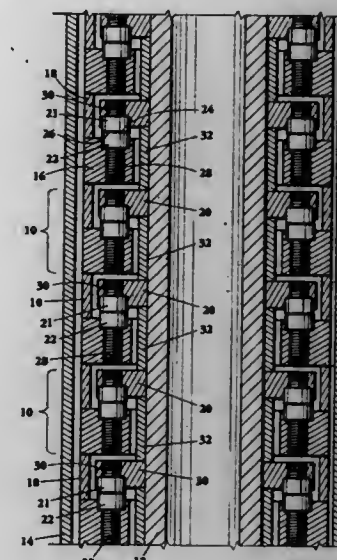
James K. Cunningham, P.O. Box 126, 504 E. Main, Big Cabin, Okla. 74332

Filed Oct. 14, 1994, Ser. No. 323,141

Int. Cl.<sup>6</sup> F16C 17/04

U.S. Cl. 384—308

8 Claims



1. A thrust bearing for use in downhole drilling systems which comprises:

- a plurality of diamond bearing inserts, each insert including (i) a stud having a bearing surface and (ii) a threaded bolt secured to said stud;
- an annular retainer having a plurality of holes therethrough, each such hole having a first portion approximately the size of the diameter of said stud and a second portion which is of a smaller diameter and is threaded to threadedly receive said threaded bolt.

5,480,234

**JOURNAL BEARING**

Wen-Jeng Chen, and Ronald L. Haugen, both of Mayfield, Ky., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

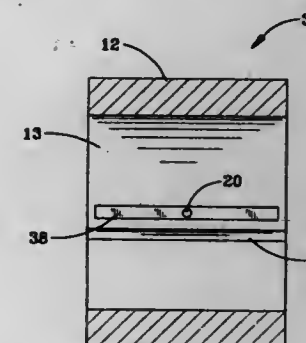
Division of Ser. No. 290,454, Aug. 15, 1994. This application

Apr. 12, 1995, Ser. No. 421,345

Int. Cl.<sup>6</sup> F16C 17/24

U.S. Cl. 384—313

1 Claim



1. In a bearing of the type for supporting a rotatable journal about an axis of rotation, the bearing having an inner surface and opposed first and second ends which define a predetermined bearing length dimension, the improvement comprising: means for leaking a predetermined volume of lubricant from an interior

portion of the bearing, the lubricant leaking means including a groove formed in the inner surface of the bearing member, the groove extending continuously, axially along the length of the bearing, from the first end to the second end; and means for mixing a volume of lubricant, the lubricant mixing means including a groove formed in the inner surface of the bearing member at a position after the lubricant leaking means in the direction of journal rotation, the groove having opposed, closed ends and extending axially along the length of the bearing, the lubricant mixing means having formed therein at least one orifice for supplying a lubricant to the interior portion of the bearing, the at least one lubricant supply orifice being disposed substantially centrally within the lubricant mixing means along the bearing length.

5,480,235

**BEARING SEALING DEVICE**

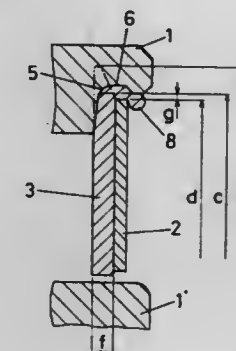
Junichi Arai, Okayama, Japan, assignor to Uchiyama Manufacturing Corp., Okayama, Japan

Filed Aug. 2, 1994, Ser. No. 284,215

Int. Cl.<sup>6</sup> F16C 33/76

U.S. Cl. 384—484

4 Claims



1. In a bearing assembly including an inner ring with an outer wall and an outer ring with an inner wall, one of said walls having therein a fitting groove, said rings being rotatable relative to each other with said walls facing each other and with an insertion opening between said rings, said insertion opening being defined by a peripheral edge of said one wall opening into said groove, and a sealing device inserted through said insertion opening and fitting in said groove to seal said assembly, the improvement comprising:

- said sealing device comprising a sealing ring and a backing ring combined together, said sealing ring being formed of an elastic sealing material and said backing ring being formed of metal or a synthetic resin material, said sealing ring having a peripheral sealing lip extending radially beyond a corresponding adjacent peripheral edge of said backing ring;
- said sealing device being fitted into said groove with said sealing ring facing inwardly and said sealing lip fitted into said groove;
- said peripheral edge of said backing ring and said peripheral edge of said one wall defining said insertion opening having respective diameters such that a gap formed therebetween with said sealing device fitted in said groove is equal to between 10% and 30% of the thickness of said sealing ring; and

said sealing lip having a volume sufficiently greater than the volume of said groove such that when said sealing device is fitted in said groove, from 10% to 40% of said volume of said sealing lip is caused to form a swelled portion extending from said sealing lip toward the exterior of said groove and embracing a peripheral edge of a surface of said backing ring that is directed away from said sealing ring, as a result of friction produced between said sealing lip and said peripheral edge of said one wall when said sealing device is inserted through said insertion opening.



5,480,236

## LINE MEMORY CONTROLLER FOR PRINTER AND METHOD THEREOF

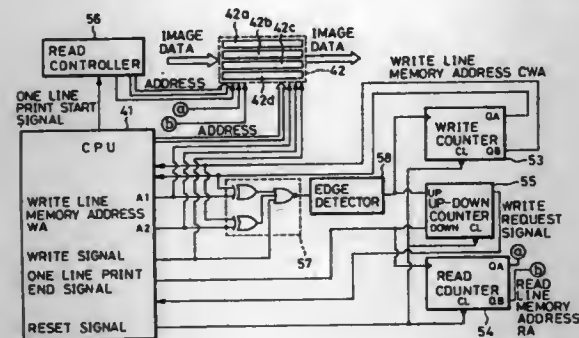
Yoshiaki Kawaoka, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 28, 1994, Ser. No. 219,298

Claims priority, application Japan, Mar. 29, 1993, 5-069788 Int. Cl.<sup>6</sup> B41J 2/32; H04N 1/00

U.S. Cl. 400—120.01

6 Claims



1. A line memory controller for controlling a read/write operation of reading from and writing into a line memory group with image data of one line, the line memory group including N line memories, wherein said N is an integer equal to 3 or larger, said line memory controller comprising:

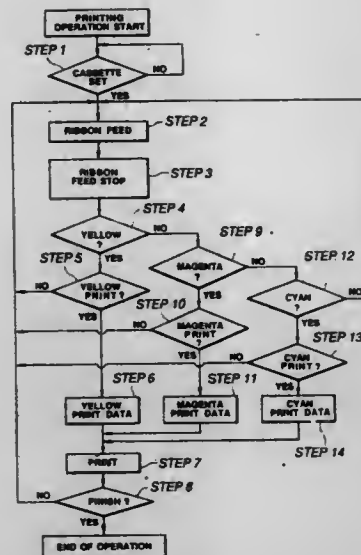
a write counter for counting a write start signal indicating a start of writing said image data of one line, and for outputting a first count value adapted to designate a write line memory into which said image data of one other line is to be written among said line memories;

a read counter for counting an one line print end signal indicating a completion of printing said image data of one line, and for outputting a second count value adapted to designate a read line memory from which said image data of said one line is to be read among said line memories;

an up-down counter, counting up in response to said write start signal and counting down in response to said one line print end signal, for outputting a third count value indicating availability of write line memories in an idle condition and for generating a write request signal when said third count value is equal to or smaller than "N-1";

a CPU for writing said image data of one line into said write line memory group after confirming generation of said write request signal, said CPU outputting a write line memory address to designate said write line memory in accordance with said first count value; and

a read controller for reading said image data of one line from said read line memory designated by said read counter, said read controller being activated by an one line print start signal from said CPU.



a printing head for printing the color segment on the recording medium;

an image data memory digitally storing a plurality of color image data corresponding to the color image;

image data memory control means for controlling said image data memory to transmit a signal for actuating said printing head;

ink ribbon control means for driving said ink ribbon to feed each of the color segments so as to be opposite said printing head;

second means for detecting and identifying the color segment presently opposite said printing head; and

third means for reading out the color image data stored in said image data memory and for judging whether or not the color segment presently detected and identified by said second means is to be subjected to printing in comparison with the color image data read out, said third means actuating the image data memory control means to transmit signals to the printing head when the third means determines that the presently detected color segment is to be printed and said third means actuating the ink ribbon control means to advance the ribbon to the next color segment when the third means determines that the presently detected color segment is not to be printed so that printing starts with the color segment detected by the second means if this color segment is to be printed.

5,480,238

## THERMAL TRANSFER PRINTER

Tetsuo Nakano, Yokohama; Yuichi Takano, Katsuta, and Masami Takada, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 22, 1994, Ser. No. 279,043

Claims priority, application Japan, Aug. 3, 1993, 5-192120; Sep. 3, 1993, 5-219663

Int. Cl.<sup>6</sup> B41J 11/46

U.S. Cl. 400—120.04

20 Claims

1. A thermal transfer printer in which a recording sheet is fed from outside through a feeding passage, the recording sheet thus fed is introduced into a transport passage and wound around a platen roller, a thermal head is pressed on the recording sheet and heated to perform recording, and the recording sheet after recording is discharged out of the printer through a discharge passage, the printer comprising:

a selector, including a switch which switches between a first discharge operation and a second discharge operation as a discharge mode of the recording sheet; and a controller which effects control in a manner that when said selector selects the first discharge operation, the recording sheet is introduced to said discharge passage while the recording is carried out, and that when said selector selects the second discharge operation,

5,480,240

## PRINT QUALITY ENHANCEMENT METHOD AND APPARATUS

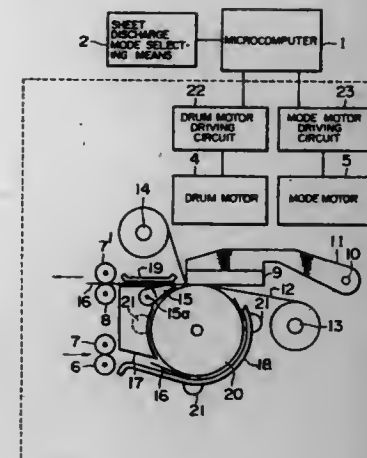
John P. Bolash, Lexington; Curt P. Breswick, Georgetown; Thomas J. Eade; David K. Lane, both of Lexington; Randall D. Mayo, Georgetown, and David S. Waldrop, Lexington, all of Ky., assignors to Lexmark International, Inc., Greenwich, Conn.

Filed Dec. 1, 1993, Ser. No. 161,006

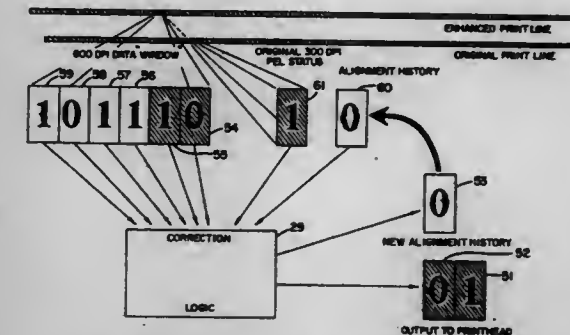
Int. Cl.<sup>6</sup> B41J 2/22

U.S. Cl. 400—124.01

8 Claims



the recording sheet is introduced to said discharge passage after the recording is completed.



1. A print quality enhancement apparatus for a dot matrix printer comprising: means for receiving, prior to printing, lower resolution data for a portion of a page to be printed for each print element of a multiple print element print head in a dot matrix printer;

means for creating, prior to and during printing, higher resolution data from the lower resolution data for a portion of a page to be printed; and

means for correcting, prior to and during printing, the higher resolution data for a portion of a page to be printed to remove unprintable dots by looking ahead at dots to be printed in the higher resolution data, the higher resolution data being positioned on a higher resolution grid and the lower resolution data being positioned on a lower-resolution grid, and including means responsive to the status of a history bit indicative of a delay status relative to the low resolution grid of a previous dot position on the higher resolution grid.

5,480,239

## POSTAGE METER SYSTEM HAVING BIT-MAPPED INDICIA IMAGE SECURITY

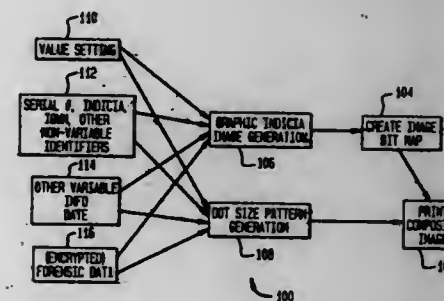
Hyung-Kun P. Kim, Wilton; Arno Muller, Westport, both of Conn., and Easwaran C. N. Nambudiri, Port Chester, N.Y., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 8, 1993, Ser. No. 133,419

Int. Cl.<sup>6</sup> B41J 2/315

U.S. Cl. 400—120.09

3 Claims



1. A printer for printing a postal indicia comprising: means to deter counterfeiting, said means including

a computer printing bit map imaging means having a dot pattern image generator for generating a unique dot pattern information; and having a graphic image generator for generating graphical information, and print composite imaging means for receiving said graphical information and dot pattern information and creating composite printing information said dot pattern image-generator causing said composite printing information symmetrically vary dot position in accordance with variation in said dot pattern information;

a matrix printer operative in conjunction with said computer printing bit-map imaging means;

said matrix printer including printing elements, a driver arranged for causing said matrix printer to print a plurality of dots in a pattern in accordance with said composite printing information from said composite imaging means.

5,480,241

## TYPE DISK

Gerhard Tietz, Berlin, Germany, assignor to Alfred Ransmayer &amp; Albert Rodrian, Berlin, Germany

Filed Oct. 20, 1994, Ser. No. 326,549

Claims priority, application Germany, Nov. 12, 1993, 43 39 239.3

Int. Cl.<sup>6</sup> B41J 1/22

U.S. Cl. 400—144.2

10 Claims



1. A type disk for a typewriter having a hub removably mounted on a drive shaft of the typewriter, the hub having a surface on which a cut out is arranged extending in the shape of a circular arc in the hub plane, a catch engageable with a recess of a collar of the drive shaft, an outrigger configured as a circular arc-shaped bow congruent to the cut out and connected integrally to the hub and collar.



having a peak region formed at the middle of the bow shape at which the catch is fixed, said peak region together with the catch being capable of spring deflection in the axial direction of the hub.

5,480,242

## TRANSFER MATERIALS SUPPLIER

Ernest M. Gunderson, Minneapolis, Minn., assignor to Fargo Electronics, Inc., Eden Prairie, Minn.

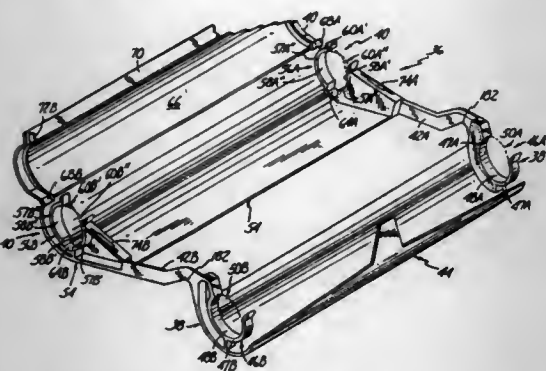
Division of Ser. No. 121,752, Sep. 14, 1993, Pat. No. 5,378,072.

This application Dec. 21, 1994, Ser. No. 360,604

Int. Cl.<sup>6</sup> B41J 35/28

U.S. Cl. 400—208

6 Claims



1. A ribbon cassette for holding a take-up ribbon core and a supply ribbon core on each of which a supply ribbon can be partially wound, said ribbon cassette comprising:

- a take-up core holder portion having a pair of spaced apart core positioners therein each formed of a resilient material band having an interior surface following substantially a circular arc path extending beyond a semicircle between either side of a gap in said band which opens to provide access to that area partially surrounded by said band;
- a supply core holder portion having a pair of spaced apart core positioners therein each formed of a pair of opposing band portions each having an interior surface following an interior path made from two substantially circular arc paths; and
- a pair of spaced apart connecting arms each joining at ends thereof a corresponding part of said take-up portion with a corresponding part of said supply portion to thereby space them apart from one another, each said connecting arm forming at least a portion of those sides defining a positioning notch located relatively near an end thereof to allow supporting those ends thereof at differing elevations during use, said positioning notch opening in a direction substantially opposed to that direction said band opens through said gap therein.

5,480,243

## INK JET RECORDING SYSTEM

Shoshi Kikkawa, Kawasaki; Manabu Kanazawa, Yokohama, and Isao Tsukada, Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 276,500, Jul. 18, 1994, abandoned, which is a continuation of Ser. No. 911,031, Jul. 9, 1992, abandoned. This application Feb. 6, 1995, Ser. No. 384,686

Claims priority, application Japan, Jul. 12, 1991, 3-198554; Jul. 23, 1991, 3-205668

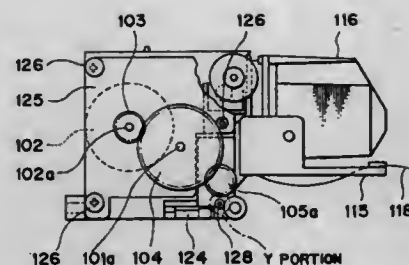
Int. Cl.<sup>6</sup> B41J 11/22

U.S. Cl. 400—354

12 Claims

7. A carriage shifting apparatus comprising:

- a body frame;
- a carriage reciprocally shiftable within said body frame; and
- a guide member having both ends supported by both side plates of said body frame and adapted to guide the shifting of said carriage;



and wherein

a support portion provided on at least one end of said guide member is non-detachably attached to at least one of said side plates by fitting said support portion into a guide member supporting portion provided in said one of the guide plates after elastically deforming said guide member supporting portion.

5,480,244

## ARTICLE INFORMATION PRINTER HAVING MEANS TO MEASURE PRINT MEDIA SIZE

Kouji Senda, Shizuoka, Japan, assignor to Kabushiki Kaisha Tec, Shizuoka, Japan

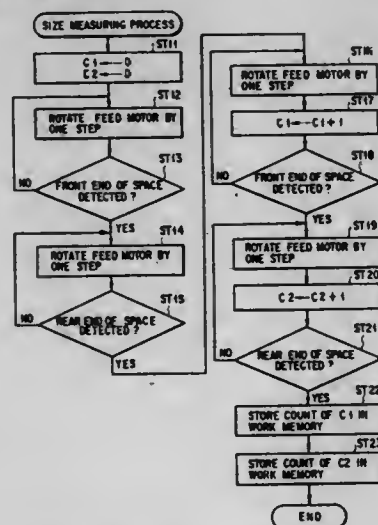
Filed Apr. 28, 1994, Ser. No. 234,669

Claims priority, application Japan, Apr. 30, 1993, 5-104770

Int. Cl.<sup>6</sup> B41J 11/46

U.S. Cl. 400—582

8 Claims



1. An article information printer comprising:
  - a feeding mechanism for feeding continuous paper in which a series of predetermined regions are provided;
  - a volatile memory for storing size data representing a length of the predetermined region, wherein said size data is supplied from an external device to the printer;
  - printing means for printing article information on the continuous paper fed by said feeding mechanism; and
  - control means for controlling said feeding mechanism on the basis of the size data stored in said volatile memory to print the article information in the predetermined region of the continuous paper;
- wherein said control means includes:
  - sensing means for sensing a distinguishable feature of the predetermined region from the continuous paper fed by the feeding mechanism; and
  - processing means, responsive to power supply which is resumed after a size data has been erased from the volatile memory due to an interruption of power supply, for driving said feeding mechanism, measuring the length of the predetermined region

on the basis of a sensing signal from the sensing means which is obtained, as a result of sensing by said sensing means, each time the continuous paper is fed by a preset distance, and setting size data indicating the measured length of the predetermined region in said volatile memory to recover the erased size data.

5,480,245

## GAMING DEVICE WITH AN IMPROVED PAPER SUPPLY SYSTEM

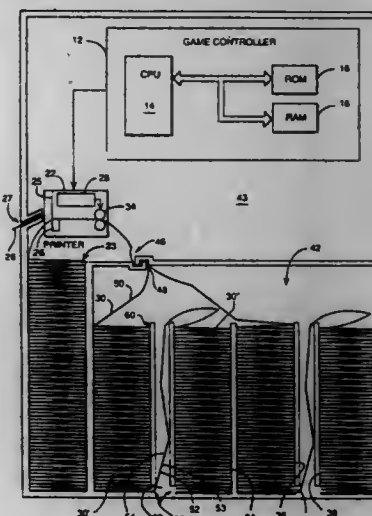
John R. Martin, Rockford, Ill., assignor to Arachnid, Inc., Rockford, Ill.

Filed Mar. 18, 1992, Ser. No. 853,106

Int. Cl.<sup>6</sup> B41J 15/18

U.S. Cl. 400—613.2

6 Claims



1. A gaming device comprising:

- a controller for controlling the operation of said gaming device;
- a printer for recording events on paper in response to said controller;
- a plurality of supplies of fan folded paper, each supply of fan folded paper having a leading end and trailing end;
- a first magazine for holding a supply of fan folded paper; and
- a second magazine for holding a supply of fan folded paper, each of said first and second magazine including a floor, a backwall extending upwardly from said floor, and an open front area opposite said backwall, said open front area extending at least substantially the same length as said backwall and parallel to said backwall, said first and second magazines being positioned relative to each other such that the open front area in said first magazine faces the open front area in said second magazine, the leading end of the fan folded paper held in said first magazine being input to said printer and the trailing end of the fan folded paper held in said first magazine being attachable to the leading end of the fan folded paper held in said second magazine so that when paper in said first magazine is depleted, the paper held in said second magazine is automatically input to said printer.

5,480,246

## TAPE PRINTING APPARATUS

Yoshinari Morimoto, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jul. 23, 1993, Ser. No. 95,216

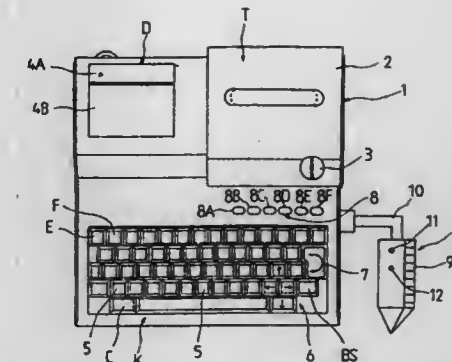
Claims priority, application Japan, Sep. 29, 1992, 4-285251

Int. Cl.<sup>6</sup> B41J 3/39

U.S. Cl. 400—615.2

17 Claims

1. A tape printing apparatus having character data input means and print means, said print means receiving from said character



data input means the character data for printing characters, numbers and symbols onto a tape, said tape printing apparatus comprising:

- image data input means for inputting image data representing graphic forms, said image data input means comprises a first image data input device for inputting hand-written image data;
- display means for displaying the data received from said character data input means and from said image data input means;
- storage means for storing independently said character data from said character data input means and said image data from said image data input means;
- editing means for selecting and combining the character data and image data retrieved from said storage means, said editing means permitting the character and image data to be positioned separately; and
- data processing means for combining the character data and image data in accordance with a layout as produced by said editing means for subsequent printing.

5,480,247

## SHEET SUPPLYING APPARATUS

Satoshi Saikawa, Inagi; Tetsuo Suzuki, Yokohama; Soichi Hiramatsu, Yokohama; Masahiro Taniguro, Yokohama; Hiroyuki Saito, Yokohama; Haruyuki Yanagi, Yokohama; Takashi Nojima, Tokyo; Hiroyuki Kinoshita, Kawasaki, and Hideaki Kawakami, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 66,378, May 25, 1993, abandoned.

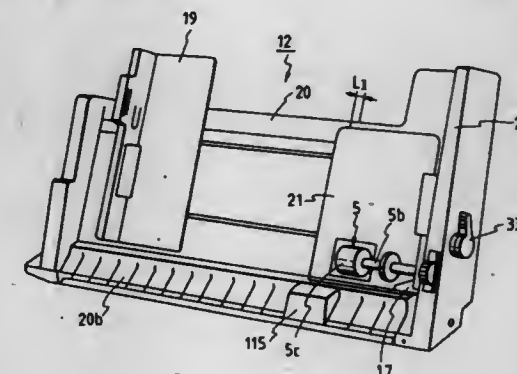
This application Mar. 13, 1995, Ser. No. 402,980

Claims priority, application Japan, May 29, 1992, 4-164292; May 29, 1992, 4-164295; Jul. 31, 1992, 4-225149

Int. Cl.<sup>6</sup> B41J 13/00

U.S. Cl. 400—629

30 Claims



25. An image forming apparatus comprising: sheet supporting means for supporting sheets; sheet supply means for feeding out the sheets supported by said sheet supporting means;



a separation claw, arranged at one front corner of the sheets supported by said sheet supporting means, for separating the sheets fed by said sheet supply means one by one, said separation claw having an abutment portion against which a leading end of a sheet fed by said sheet supply means is abutted;

regulating means for regulating leading ends of the sheets fed out by said sheet supply means; and  
image forming means for forming an image on the sheet fed by said sheet supply means,

wherein said sheet supply means is positioned between said separation claw and said regulating means in a widthwise direction of the sheet supported by said sheet supporting means, and said abutment portion is disposed downstream of said regulating means in a sheet feeding direction.

5,480,248

## CARRYING HANDLE

Naokazu Tanahashi, Nagoya, Japan; assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

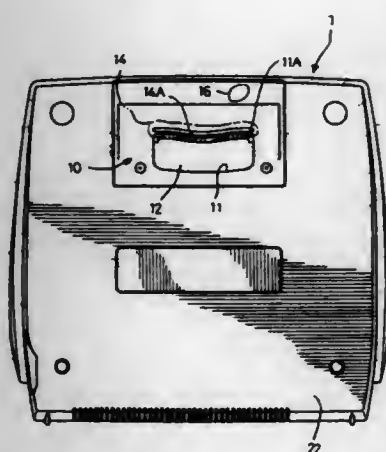
Filed Nov. 29, 1994, Ser. No. 350,038

Claims priority, application Japan, Dec. 27, 1993, 5-331529

Int. Cl.<sup>6</sup> B41J 29/02

U.S. Cl. 400—693

18 Claims



1. A handle in an electronic device having a body cover for protection of interior components of the electronic device, the body cover having a top, a bottom, and a section extending between the top and bottom to enclose an interior of the body cover, the handle comprising:

an opening section provided in the bottom of the body cover, the opening section including a substantially rectangular opening having first and second longitudinal edges and first and second connecting edges extending between said first and second longitudinal edges;

a rib wall extending from the first longitudinal edge of the opening toward the interior of the body cover and toward but separated from said second longitudinal edge to partially enclose the opening section;

a partition wall extending from the bottom toward the interior of the body cover and having a longitudinal part separated from and aligned with the second longitudinal edge of the opening and a side part at each end of the longitudinal part respectively extending parallel to the first and second edges of the opening; and

a handle section provided within the body cover along the second longitudinal edge of the opening, the second longitudinal edge having a convex curve with respect to the opening.

5,480,249

## LEAD DISPENSING STORAGE CONTAINER

Shuhei Kageyama; Shoji Anzai; Tomiji Ueki, and Yoshihide Mitsuya, all of Kawagoe, Japan, assignors to Kotobuki & Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 952,957, Sep. 29, 1992, abandoned.

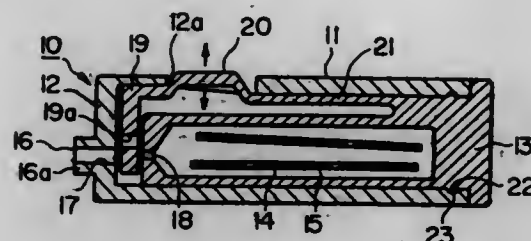
This application Jan. 4, 1994, Ser. No. 177,205

Claims priority, application Japan, Jan. 21, 1991, 3-085533 U; Jan. 14, 1992, 4-004817 U

Int. Cl.<sup>6</sup> B65D 85/20; A45C 11/34

U.S. Cl. 401—60

2 Claims



1. A lead dispensing storage container comprising:  
an outer case (12) open at one end having an outlet (16) in the opposite end and an opening (12a) in a side wall thereof;  
an inner case (13) slidably fitting into the open end of said outer case (12), said inner case having:  
four walls encompassing a storage compartment (15) for storing leads, one of said four walls having a lead path outlet (18) in alignment with said outlet in said outer case and having a tapered surface (43) adjacent to said lead path outlet (18), and,

resilient actuating gate means comprised of a resilient (21) extending along and contacting a side wall of said outer case, a pressing portion (20) projecting outward from the said opening (12a) in the side wall of said outer case (12), and a gate portion (19) positioned between the opposite end of the outer case and one of the four walls encompassing the storage compartment; said gate portion having a gate opening (19a),

said resilient arm (21) being constructed to press against side wall of said outer case (12) to prevent said inner case (13) from accidentally slipping out of the open end of said outer case,

said pressing portion (20) being biased outward into said opening (12a) in a side wall of said outer case (12) so that said gate opening (19a) in the gate portion is normally out of alignment with the lead path outlet (18) in said inner case and the outlet (16) in said outer case (12),

whereby pressing said pressing portion (20) inward moves said gate opening in the gate portion to align with the lead path outlet in said inner case and the outlet in said outer case dispensing lead from said storage case.

5,480,250

## DISPENSER WITH RIGID OPEN PORE NIB

Donald Birden, 444 N. Lamon, Chicago, Ill. 60644-2027

Filed Apr. 8, 1994, Ser. No. 225,300

Int. Cl.<sup>6</sup> B43K 8/02; 8/12

U.S. Cl. 401—199

20 Claims

1. A porous nib dispenser for a fluid coating material comprising:

a porous nib for passage and metering of said coating material onto a surface;

a support for said porous nib;

a passageway within said support for said porous nib;

said porous nib being an open pore foam having an average number of pores from 12 to 25 per linear centimeter with the average pore size being from 0.4 to 2 microns and with said

5,480,252

## COUPLING MECHANISM FOR QUICKLY AXIALLY ALIGNING ROTOR TO JOURNALS

Douglas W. Posch, East Hampton, and Douglas E. Mosher, Oxford, both of Conn., assignors to Farrel Corporation, Ansonia, Conn.

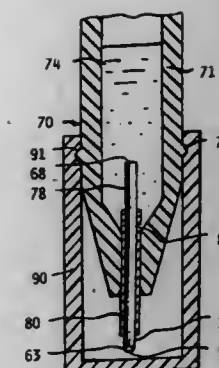
Division of Ser. No. 86,714, Jul. 2, 1993, Pat. No. 5,415,492.

This application Feb. 14, 1995, Ser. No. 388,286

Int. Cl.<sup>6</sup> F16B 1/00; F16C 3/00; B01F 7/00

U.S. Cl. 403—371

24 Claims



nib having a rigidity such that a pressure of 400 gm/cm<sup>2</sup> causes a compression of said nib of less than 20%.

5,480,251

## ASSEMBLY FOR PRODUCING FRAMEWORKS

Francois Pavageau, and Edith Pavageau, both of Nantes, France, assignors to X 2 M France S.A., St Mars La Jaille, France

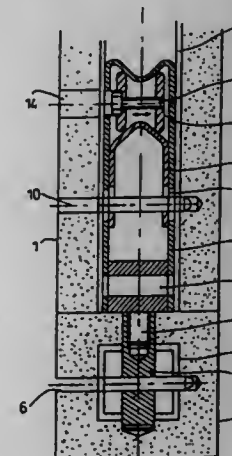
Filed Nov. 4, 1993, Ser. No. 145,506

Claims priority, application France, Dec. 21, 1992, 92 15335

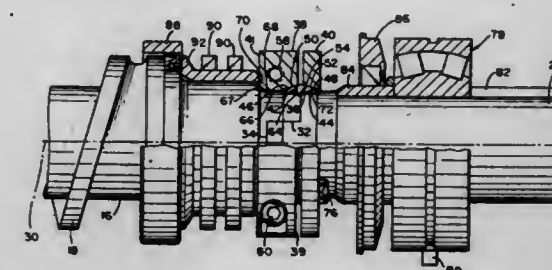
Int. Cl.<sup>6</sup> F16B 7/04

U.S. Cl. 403—256

15 Claims



1. Assembly for producing supporting or self-supporting frameworks for integrated constructions with elements having the shape of hollow beams whose hollowed out portion is filled at least partially with a stiffening core obtained from at least one hollow metallic profile extending within each element essentially along all of its length, said each element being assembled to other elements by a connection member, said connection member comprising an assembly element adapted to be inserted coaxially and then fixed within the stiffening core of a first element by a first immobilization member, a positioning member immobilized with respect to a second element by a second immobilization member which passes through at least one wall of the second element and at least one surface of the stiffening core of said second element, said positioning member being connected to the assembly element, said assembly element being an insert having the form of a strap with legs, and gripping between its legs a locking member having relative movement within said assembly element such that it provides with the bottom of said assembly element a free space within which is disposed gripping means which coacts with the locking member during displacement of one of the gripping means and locking member to exert on the assembly element a tractive force permitting by mutual reaction the application of the first and second elements closely against each other.



1. A method for coupling a rotor body to a journal to provide a common axis of rotation for said rotor body and journal, said method comprising:

providing a rotor body and a journal, one of said journal and said rotor body having a keyway element and the other of said journal and rotor body having a mating key element on facing end portions of said journal and rotor body;

providing bridge means for bridging between said facing end portions of said journal and said rotor body, wherein said bridge means comprises:

(a) a split ring assembly comprising two semicircular ring halves, each half having an outer circumferential chamfered surface comprising two faces, said chamfered faces being chamfered radially inwardly and diverging inwardly from each other in an axial direction, and having an inner circumferential surface being essentially flat in the axial direction;

(b) a split ring collar comprising two semicircular ring halves and having an inner circumferential surface, a first portion of said inner circumferential surface being chamfered to matingly receive one of the chamfered outer faces of said split ring assembly and a second portion of said inner circumferential surface being substantially axially flat; and

(c) a clamping ring having a chamfered inner surface, said chamfered inner surface chamfered to matingly receive the other chamfered outer face of said split ring assembly;

placing said clamping ring around a facing end portion of one of said journal and rotor body and bringing the facing end portions of said journal and rotor body into axial alignment inserting said key element into said keyway element;

placing the two semi-circular ring halves of said split ring assembly on said rotor body and journal to essentially completely surround the facing end portions of said journal and said rotor body;

placing the split ring collar and the clamping ring on said split ring assembly to essentially completely surround said split ring assembly; and

securing together the two semi-circular ring halves of said split ring collar and securing said clamping ring to the split ring collar whereby the chamfered inner surface of the split ring collar mates with said one of the chamfered outer faces of the split ring assembly and the chamfered inner surface of the clamping ring mates with the said other chamfered outer face of the split ring assembly producing radially-inwardly-directed force from said split ring assembly to said facing end portions of the rotor body and journal for providing and retaining co-axial alignment of said facing end portions.



5,480,253

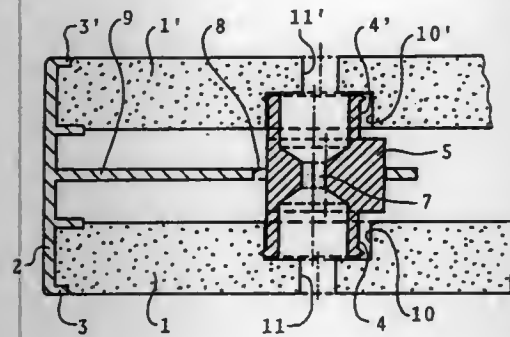
# DEVICE FOR JOINING BOARD-SHAPED ELEMENTS INTO ONE UNIT

Karl-Johan Ljungberg, Esplanaden 5, Fjugesta, Sweden  
PCT No. PCT/SE92/00318, § 371 Date Nov. 16, 1993, § 102(e)  
Date Nov. 16, 1993, PCT Pub. No. WO92/20260, PCT Pub.  
Date Nov. 26, 1992

PCT Filed May 15, 1992, Ser. No. 142,324  
Claims priority, application Sweden, May 16, 1991, 9101489  
Int. Cl.<sup>6</sup> F16B 12/20

U.S. Cl. 403—409.1

6 Claims



1. Device for joining board-shaped elements into one unit with the board-shaped elements extending in a substantially parallel relationship to each other and internally separated by means of an intermediate gap, comprising a coupling list having a side abutting adjacent parallel edge portions of the board-shaped elements, further having means extending towards and engaging with said edge portions, at least one tension member extending from said side of the coupling list between the board-shaped elements and a rotatable means engaged with the tension member for applying a tightening force to the tension member by means of a manual tool inserted through a hole in one of the board-shaped elements to press the coupling list against the edge portions of the board-shaped elements, characterized in that the tightening means include two outer stud-shaped members with an intermediately located central member, and that the stud-shaped members have an increased cross-sectional configuration in direction away from the central member, thereby forming a surrounding cutting edge portion adjacent to the outer end portions of the stud-shaped members, and that said stud-shaped members are located in bores in facing surfaces of the board-shaped elements.

5,480,254

# STORM DRAIN BOX FILTER AND METHOD OF USE

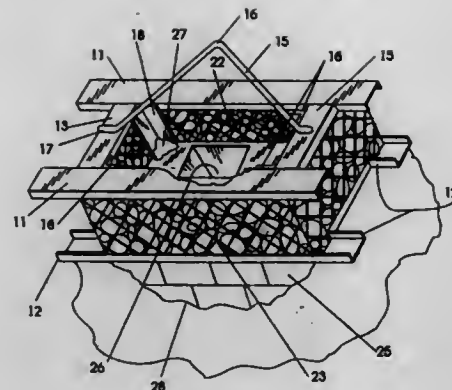
James L. Autry, Rte. 8, Box 970, Fayetteville, N.C. 28304, and  
Jimmy N. Whitley, 206 Breckenridge Dr., Knightdale, N.C. 27545

Filed Nov. 19, 1993, Ser. No. 154,527  
Int. Cl.<sup>6</sup> E01C 11/22

U.S. Cl. 404—2

9 Claims

1. A regenerable filter means in combination with a storm drain, said filter means preventing undesirable amounts of sediment and other debris from entering said storm drain prior to paving of adjacent areas comprising: a frame means having peripheral wall means, an open bottom and an open top, said frame means including a pair of rectangular, upper and lower frame portions being vertically opposed in parallel, spaced apart relation, said upper and lower frame portions being fabricated from channel members, each of said channel members within said upper frame portion facing inwardly toward each of said channel members within said lower frame portion and being arranged to receive said peripheral wall means therebetween, said frame means further including corner braces interconnecting said upper and lower frame portions at the corner junctures thereof and being disposed in perpendicular relation thereto, said peripheral wall means including permeable, interior and exterior walls being permanently retained between: said



upper and lower frame portions and being arranged in parallel spaced-apart relation within said channel members defining a space therebetween;

a crushed stone filter aggregate disposed in said space between said interior and exterior walls; and  
means for lifting said filter means for disposing the same on said storm drain whereby said filter means is positioned on top of an opening in said storm drain at the surface of an unpaved road enabling sediment and debris laden water flowing from said surface of said unpaved road to be filtered before entering said storm drain.

7. The method of filtering sediment laden water on an unpaved road adjacent a newly constructed storm drain using a regenerable, filter means having an open bottom, an open top and spaced apart permeable interior and exterior walls containing a crushed stone filter aggregate disposed in space between said interior and exterior walls and means for lifting said filter means for disposing the same on a storm drain comprising:

positioning said regenerable filter means on a storm drain at the surface of an unpaved road;  
introducing a flow of sediment laden water to the area adjacent said storm drain on the surface of said road;  
filtering said storm water through said permeable walls of said filter means;  
directing the filtered water through said open bottom of said filter means into said storm drain;  
removing said filter means from said storm drain when it has become saturated with sediment;  
flushing said filter means to remove the retained sediment;  
reclaiming the sediment collected by said filter means for further use; and  
repositioning said filter on said storm drain for continued use.

5,480,255

# IMPACT-ABSORBING BARRIERS FOR HIGHWAYS

Normand Bernaques, 238, rue Claire, St-Eustache (Québec, Canada, and Ivan Sabourin, 29, rue Armand, Côteau du lac (Québec), Canada

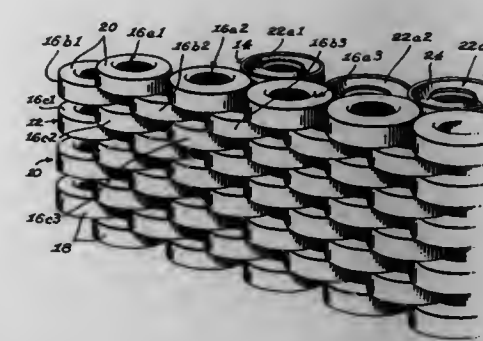
Filed Dec. 12, 1994, Ser. No. 354,501  
Int. Cl.<sup>6</sup> E01F 15/00; E02D 29/02

U.S. Cl. 404—6

13 Claims

1. An upright wall construction for absorbing transverse impact blows, comprising:

(a) a first wall of superimposed whole tires disposed horizontally in vertical rows and horizontal columns, each said whole tire defining a tread band, said first wall adapted to directly sustain the impact blows about free outer tread band sections thereof;  
(b) a second wall of superimposed half tires cut circumferentially along their tread path, also disposed horizontally in vertical rows and horizontal columns, each said half-tire defining a toroidal chamber, said toroidal chamber opening upwardly;



(c) means for interconnecting said whole tires and said half-tires, whereby said first and second walls form a single integral wall unit; and

(d) means for filling at least several of said upwardly facing half-tire toroidal chambers with a high-density material, whereby said first and second walls become firmly anchored to the ground; wherein said wall construction will remain substantially immobile over ground even after repeated impact blows.

5,480,256

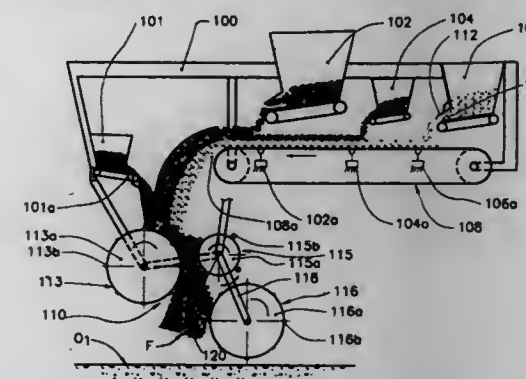
# METHOD AND APPARATUS FOR THE PREPARATION, PLACEMENT, AND COMPACTING OF COMPONENTS OF FIBROUS CONCRETE AND MIXTURES THEREOF

Boris Itsekson, 410-44th Ave., #105, San Francisco, Calif. 94121; Michael Dyuzhenko, 18 Olminkogo Street, #10, 310024 Kharkov, Ukraine; Vladimir Itsekson, 11 Stroiteley Street, #31, Moscow Region, 143952 Reutov, Russian Federation; Alexander Itsekson, 642 Alvarado St., #108, San Francisco, Calif. 94114, and Igor Tsigelman, 223 - 25th Ave., #7, San Francisco, Calif. 94121

Filed Aug. 31, 1994, Ser. No. 299,491  
Int. Cl.<sup>6</sup> E01C 19/00

U.S. Cl. 404—72

16 Claims



1. An apparatus for the preparation, placement, and compacting of components of fibrous concrete laid onto an object comprising: a rigid frame which can be installed above said object;

a plurality of capacities for receiving a plurality of fibrous concrete components, said capacities being arranged in a predetermined sequence, said capacities having means for unloading dosed quantities of said fibrous concrete components;

transportation means located under said capacities for receiving said dosed quantities, said transportation means having an unloading end and moving said plurality of fibrous concrete components in a predetermined direction;

an additional capacity for receiving an additional fibrous concrete component, said additional capacity having means for dosed unloading of said additional fibrous concrete component;

a dispensing means for laying and compacting a flow of said fibrous concrete components onto said object while said dispensing means and said object are moved with respect to each other, said dispensing means being located under said unloading end of said transportation means, said dispensing means having an upper level and a lower level and comprising:

a first body of rotation having an outer diameter;  
a second body of rotation having an outer diameter;  
a third body of rotation having an outer diameter;  
said first body of rotation and said second body of rotation being located in said upper level, said third body of rotation being located in said lower level, said outer diameter of said first body of rotation being equal to said outer diameter of said third body of rotation, said outer diameters of said first body of rotation and said third body of rotation being greater than said outer diameter of said second body of rotation, said first body of rotation having means for catching, holding, transporting, and throwing said fibrous concrete components onto said object and partially onto said second body of rotation, said second body of rotation having means for catching, holding, transporting, and throwing said fibrous concrete components onto said object, said third body of rotation having means for catching, holding, transporting, and throwing a part of said fibrous concrete components onto said object, said additional capacity having means for dosed periodic supply of said additional fibrous concrete component onto said first body of rotation.

6. A method for the preparation, placement, and compacting of fibrous concrete material components laid onto an object comprising the steps of:

providing an apparatus having a plurality of capacities arranged in a predetermined sequence, a transportation means, and a dispensing means for unloading said fibrous concrete material components onto said object, said dispensing means consisting of a first rotor, a second rotor, and a third rotor, said first rotor and said second rotor being installed in an upper level, said third rotor being installed in a lower level;

loading said capacities with predetermined loose material components;

unloading dosed quantities of said loose material components in a predetermined sequence onto said transportation means thus forming a sandwich of said loose material components moved by said transportation means;

unloading said sandwich onto said first rotor; converting said sandwich into a diverging flow directed onto said object with a predetermined direction and with a predetermined angle of scattering of said loose material components of said flow, said angle of scattering having different sectors, said loose material components having predetermined density distributions in said sectors;

controlling speed of said loose material components and said density distributions in said different sectors of said angle of scattering during said conversion step; and

reorienting said loose material components, said density distributions in said sectors, and controlling the direction of said loose material components within said angle of scattering; directing said diverging flow onto said object; and moving said apparatus and said object with respect to each other.

5,480,257

# CONCRETE RIDING TROWEL GUARD CLEARANCE SYSTEM

J. Dewayne Allen, Paragould, Ark., assignor to Allen Engineering Inc., Paragould, Ark.

Filed Dec. 21, 1993, Ser. No. 170,512  
Int. Cl.<sup>6</sup> F01C 19/00; 19/22

U.S. Cl. 404—112

13 Claims

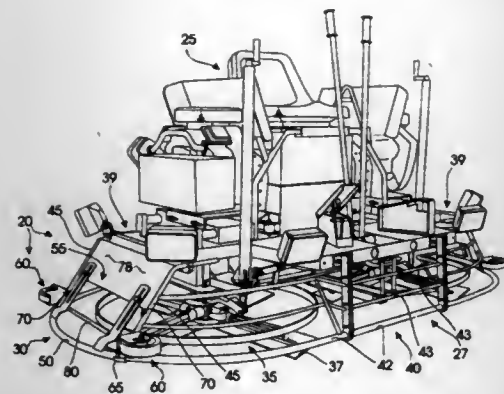
1. A motorized concrete riding trowel comprising:

a frame seating an operator;

a front, a rear, and spaced apart ends;

one or more finishing blades projecting from said frame adapted to contact and finish concrete;





a guard cage mounted to said frame and disposed about said finishing blades, said cage comprising a plurality of generally coaxial rings and a plurality of spaced apart spokes extending between said rings;

a clearance system adapted to maintain said trowel in a spaced apart relationship with a wall while allowing finishing of said concrete immediately adjacent said wall, said clearance system comprising:

arc means selectively displaceable between a deployed position mated to said cage means for guarding said blade means and a retracted position exposing at least a portion of said blade means;

coupling means for displacing said arc means between said deployed position and said retracted position, thereby establishing an unguarded cage segment allowing said finishing blades to be deployed immediately adjacent a wall; and,

buffer means secured to said cage means for contacting said wall and allowing movement of said trowel along said wall while finishing said surface immediately adjacent said wall, said buffer means comprising wheels adjustably rotatably mounted in housings secured to and projecting outwardly from said cage means;

whereby said guard clearance system maintains said trowel in a spaced apart relationship with said wall while the trowel finishes the concrete surface immediately proximate said wall.

5,480,258

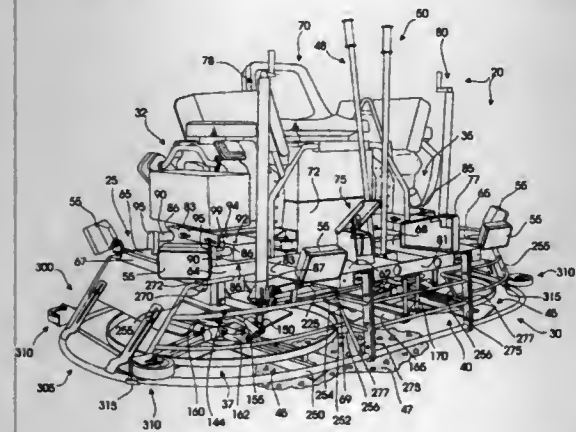
**VARIABLE WIDTH, TWIN ENGINE RIDING TROWEL**  
J. Dewayne Allen, Paragould, Ark., assignor to Allen Engineering, Inc., Paragould, Ark.

Filed Dec. 30, 1993, Ser. No. 176,118

Int. Cl.<sup>6</sup> E01C 19/00; 19/22

U.S. Cl. 404—112

22 Claims



1. A motorized riding trowel for finishing a concrete surface, said riding trowel comprising:

a frame;

motor means depending from said frame for powering said riding trowel;

two rotor means driven by said motor means and depending downwardly from said frame for frictionally contacting said concrete surface and supporting said frame thereabove, each rotor

means establishing a generally vertical axis of rotation; and, means for enabling the distance between the axis of rotation of each rotor means to be expanded or contracted.

5,480,259

**AGGREGATE FLOOR AND METHOD FOR FORMING SAME**

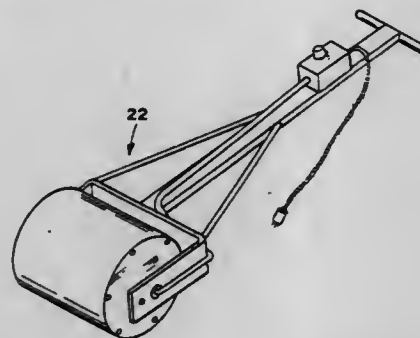
John H. Thrower, 1231 Belrose La., Charlotte, N.C. 28209

Filed Jun. 29, 1994, Ser. No. 267,406

Int. Cl.<sup>6</sup> E01C 19/23

U.S. Cl. 404—117

4 Claims



1. A manually movable roller for treating and forming an aggregate terrazzo or concrete floor having a frame, handle means including a tongue and a gripping member extending from the frame, and a single roller drum rotatably secured to the frame, the roller drum having a weight of between 20 and 30 pounds; vibrating means associated with the roller drum for vibrating the roller drum within the range of from 200 to 5000 vibrations per minute; and control means carried by the tongue for selectively establishing the variations per minute for the vibrating means to treat the floor whereby the roller may be pivotally turned to treat small and non-uniform floors.

5,480,260

**GROUND WATER COLLECTION METHOD AND APPARATUS**

Dennis R. Shattuck, Burlington, Ky., and Eric C. Volpenhein, Cincinnati, Ohio, assignors to Dames & Moore, Cincinnati, Ohio

Filed Jul. 20, 1993, Ser. No. 94,937

Int. Cl.<sup>6</sup> E02B 11/00

U.S. Cl. 405—36

4 Claims

1. A method of collecting groundwater using an existing underground pipe having an interior surface defining an interior passageway, comprising the steps of:

(a) disposing at least one generally U-shaped channel within said interior passageway, said interior surface having an invert, said channel opening toward said invert of said interior surface;

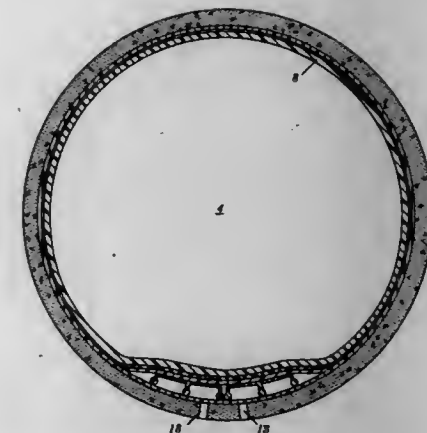
(b) inserting a flexible lining within said interior passageway;

(c) hardening said lining in situ into a rigid lining;

(d) using the inside surface of said lining to define an interior storm water passageway;

(e) defining a groundwater passageway between said lining and said interior surface of said pipe;

(f) utilizing said lining to fluidically isolate said storm water passageway from said groundwater passageway;



(g) forming at least one fluid passageway between said ground-water passageway and the environment surrounding said pipe;

(h) interposing a drainage net between said interior surface of said pipe and said lining extending therebetween from said at least one fluid passageway to said channel; and

(i) defining by means of said drainage net a plurality of flow passageways between said at least one fluid passageway and said channel.

5,480,261

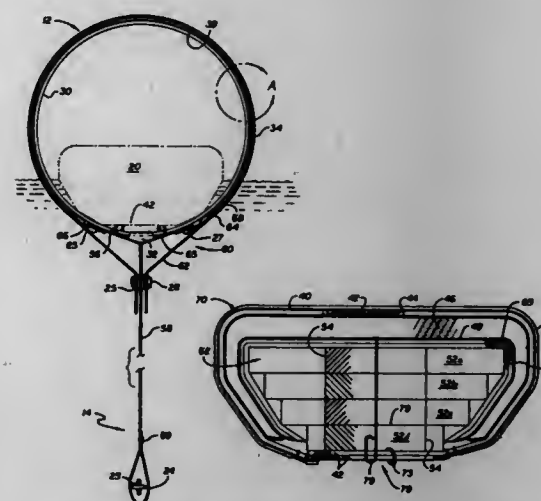
**HEAT RESISTANT CONTAMINATION CONTROL BOOM**  
Frank Meyers; John A. Brown, both of Redondo Beach, and Robert Reldel, Hawthorne, all of Calif., assignors to Kepner Plastics Fabricators, Inc., Torrance, Calif.

Filed Apr. 4, 1994, Ser. No. 223,278

Int. Cl.<sup>6</sup> E02B 15/04

U.S. Cl. 405—63

23 Claims



1. A high temperature resistant contaminant containment boom of the type adapted to contain burning contaminants floating on a liquid surface, comprising:

a flotation portion comprising

a coil support member,

an outer coil covering layer formed from a refractory material,

an inner coil cover layer formed from refractory material,

a spacing material supported air gap layer between said inner and outer coil covering layers defining a thermal insulating layer,

a flexible float assembly having refractory properties at least in part comprising means for wicking water to the float assembly and dispersing heat therefrom in the form of latent heat of vaporization of steam which leaves the flotation portion; and

a ballasted skirt portion depending from the coil support member and incorporating fasteners for attachment of the coil cover layers.

5,480,262

OIL CONTAINMENT BOOM

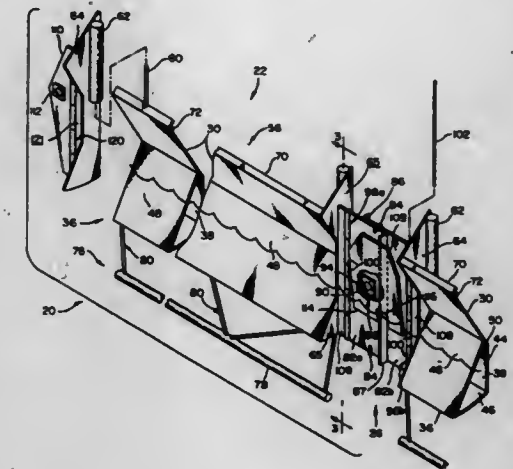
Baldassare Russo, III, 4461 - 137th SE., Bellevue, Wash. 98102

Filed Mar. 25, 1994, Ser. No. 217,624

Int. Cl.<sup>6</sup> E02B 15/04

U.S. Cl. 405—66

6 Claims



1. A floatable, continuous oil containment boom arranged to be stored and folded for quick deployment in water to control the spreading of contaminants such as oil thereover, wherein the boom is foldable to a compact configuration for storage in standard size shipping containers to facilitate transportation to a contamination site, the containment boom comprising:

a plurality of elongate, boom segments constructed of rigid material, adapted for deployment in water to contain a floating layer of contaminants such as oil, each boom segment having an elongate lower flotation member for displacement of water to create an upward flotation force, and an elongate, impermeable upper barrier extending upward from the lower flotation member, above the surface of the contaminant layer, each boom segment having a first end and a horizontally spaced apart second end, wherein the boom segments are connected end-to-end to form a continuous containment boom;

means for counterbalancing the boom segments to maintain the same in an upright position;

a plurality of pivot joints for connecting the flotation boom segments end-to-end to form a continuous containment boom, each pivot joint having at least two vertically oriented, overlapping pivot plates, adjacently disposed in parallel relation, said pivot plates being pivotally connected for relative pivotal movement about a horizontal axis disposed normal to the plane of the pivot plates;

wherein at least one pivot joint is disposed between each flotation boom segment, pivotally attaching adjacent boom segments together, end-to-end, so that said adjacent boom segments can pivot relatively about a horizontal axis;

wherein each pivot joint further comprises at least two horizontally spaced apart hinge assemblies, each hinge assembly having a vertical pivot axis to permit adjacent boom segments to pivot relatively about a vertical axis, said adjacent boom segments therein being able to pivot relatively about two independent axes; and

wherein the overlapping vertical plates are pivotally attached by a pivot hinge having a horizontal pivot axis, each pivot hinge comprising a pivot pin horizontally disposed through apertures formed in each vertical plate, and a pin flange fixedly attached to each end of the pivot pin, disposed to retain the adjacent vertical plates therebetween.



5,480,263

**SOIL DISPLACEMENT HAMMER FOR REPLACING UNDERGROUND PIPES**

Allan G. Kayes, Sittingbourne, United Kingdom, assignor to Powermole International Limited, Sittingbourne, England  
PCT No. PCT/GB92/02407, § 371 Date Sep. 14, 1994, § 102(e)  
Date Sep. 14, 1994, PCT Pub. No. WO93/13351, PCT Pub. Date Jul. 8, 1993

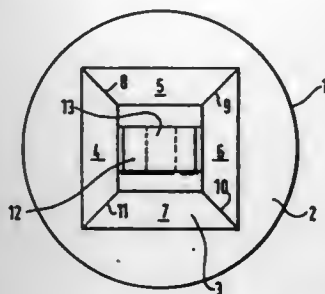
PCT Filed Dec. 30, 1992, Ser. No. 256,318

Claims priority, application United Kingdom, Dec. 31, 1991, 9127525

Int. Cl.<sup>6</sup> F16L 55/18

U.S. Cl. 405—154

6 Claims



1. A mole for use in replacing or preparing for replacement an existing underground pipe, said mole being adapted for insertion into and movement along the existing pipe, and having a front portion provided with a cutting face for engaging the internal wall of the existing pipe and arranged to cause the wall to fracture, and a rear portion provided with means for clamping to said mole a new pipe or a liner for said existing pipe, so that said mole can tow the new pipe or the liner through the fractured pipe as said mole moves therethrough, wherein a head portion of said mole is tapered towards the front and has a flat or scalloped sides defining therebetween integral cutting edges, the angle of taper being from 2° to 10° and the number of cutting edges being from 3 to 8.

5,480,264

**OFFSHORE PIPELINE SYSTEM**

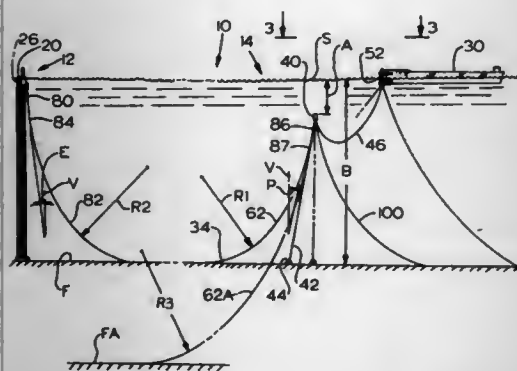
Andrew F. Hunter, Houston, Tex., assignor to Imoco, Inc., Calabasas Hills, Calif.

Filed Sep. 7, 1994, Ser. No. 302,349

Int. Cl.<sup>6</sup> F16L 1/12

U.S. Cl. 405—195.1

6 Claims



1. An offshore fluid transfer system which includes a first station and a second or buoy station, where said buoy station includes a loosely anchored seasurface structure such as a vessel, a buoy, and at least one buoy anchor line that is anchored to the seafloor and that holds said buoy to a location that is closer to said seasurface structure than to said first station, with said buoy anchor line being short enough to hold said buoy at an underwater depth to minimize

wave force on said buoy, and said system includes a conduit that extends between said first station and said seasurface structure to carry fluid between them, said conduit including a flexible hose which extends between said buoy and said seasurface structure and also including a major conduit portion that extends along most of the distance between said first station and said buoy, where said first station is further, as measured in a horizontal direction, from said buoy than the depth of said sea at either of said stations, characterized by:

said major conduit portion includes a long pipeline formed of steel pipes, which extends along said seafloor to near said buoy station, and which extends from the seafloor near said buoy station in a J-curve upwardly to said buoy, wherein said pipeline is free of fixed connection to the seafloor between said stations and said J-curve is unrestrained along more than half of the height between the seafloor and said buoy.

5,480,265

**METHOD FOR IMPROVING THE HARMONIC RESPONSE OF A COMPLIANT TOWER**

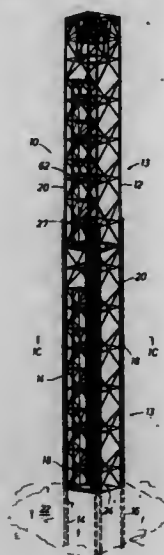
Peter W. Marshall, Stockfield, England; David A. Huete, Spring, Tex.; Denby G. Morrison, Houston, Tex., and Susan L. Smolinski, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 30, 1993, Ser. No. 175,894

Int. Cl.<sup>6</sup> E02B 17/00

U.S. Cl. 405—224

9 Claims



1. A method for reducing the natural period of the whipping mode harmonic response in a compliant tower having a vertically extending compliant framework secured to a foundation at an ocean floor and supporting a topside facility above an ocean surface and having a plurality of risers communicating between the topside facility and a plurality of wells at the ocean floor through a running span, the method comprising:

decoupling the mass of the risers from the vertically extending compliant framework by securing the risers in top tensioned relation in a plurality of riser supports which provide the principle load transfer between the risers and the compliant framework;

whereby the running spans of risers are free to respond to environmental forces along their length independent from the compliant framework.

5,480,266

**TENSIONED RISER COMPLIANT TOWER**

Peter W. Marshall, Northumberland, England; David A. Huete, Spring, Tex.; Denby G. Morrison, and Susan L. Smolinski, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

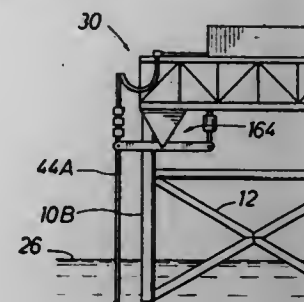
Continuation-in-part of Ser. No. 35,849, Mar. 23, 1993, Pat. No. 5,342,148, which is a continuation of Ser. No. 919,629, Jul. 24, 1992, Pat. No. 5,195,848, which is a continuation of Ser. No. 624,864, Dec. 10, 1990, abandoned. This application

Dec. 30, 1993, Ser. No. 177,088

Int. Cl.<sup>6</sup> E02R 17/02

U.S. Cl. 405—224.2

5 Claims



1. A tensioned riser deepwater tower for support of hydrocarbon wells of an offshore prospect, comprising:  
a foundation secured to an ocean floor;  
a topside facility above an ocean surface;  
a vertically extending tower jacket secured to the foundation, supporting the topside facility;  
at least one production riser suspended between the wells and the topside facility and providing fluid communication therebetween; and  
a riser support assembly supporting the riser near their upper ends to provide the principle load transfer between the riser and the tower jacket and thereby preventing riser buckling with tensioned support.

5,480,267

**SET OF STRUCTURAL ELEMENTS MADE UP OF CONCRETE BLOCKS, AND A GRAVITY RETAINING WALL ERECTED THEREFROM**

Gerhard Hagenah, Worpsswede, Germany, assignor to SF-Kooperation GmbH Beton-Konzepte, Bremen, Germany  
PCT No. PCT/EP92/02153, § 371 Date Aug. 16, 1994, § 102(e)  
Date Aug. 16, 1994, PCT Pub. No. WO93/06310, PCT Pub. Date Apr. 1, 1993

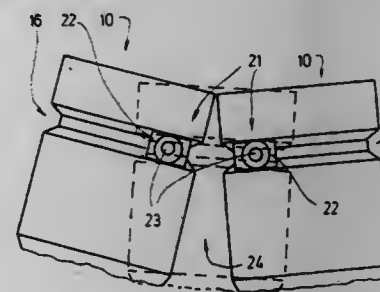
PCT Filed Sep. 18, 1992, Ser. No. 211,118

Claims priority, application Germany, Sep. 20, 1991, 41 31 423.9

Int. Cl.<sup>6</sup> F02D 29/02

U.S. Cl. 405—284

25 Claims



1. A retaining wall (25), made from a plurality of concrete blocks (10, 10a, 10b, 10c, 34) located one beside the other and, at an offset, one on top of another, wherein adjacent ones of said blocks are secured against displacements relative to one another,

i.e. transverse to an upright plane of the wall, by means of coupling pieces (21), and wherein:

- the blocks have respective depressions (16), one depression (16) each on mutually opposing upper and lower side faces (14, 15);
- between superimposed blocks there are disposed said coupling pieces (21) resting in said depressions (16);
- each of said coupling pieces (21) have two differently designed ends: an upper anchoring piece, which is rotatable in a corresponding depression, and which has a cross-section that is rounded with respect to possible rotation; and a lower elongate anchoring piece; and
- the depressions (16) have cross-sections corresponding to the upper anchoring piece and the lower elongate anchoring pieces of said coupling pieces, at least the depressions (16) which are assigned to said lower elongate anchoring pieces (22) being lower elongate first grooves extending in the plane of said wall, so that said lower elongate anchoring pieces (22) are slidable, but not rotatable, in the corresponding depressions in the plane of the wall in the direction of the length of said lower elongate first grooves.

5,480,268

**ROTARY AIRLOCK FEEDER WITH LOW PRESSURE PURGE SYSTEM**

David K. Smoot, Overland Park, Kans., assignor to Smoot Company, Kansas City, Kans.

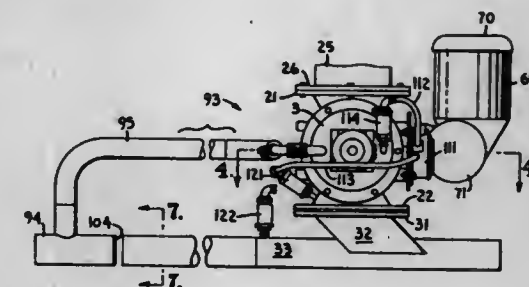
Continuation of Ser. No. 73,335, Jun. 7, 1993, abandoned.

This application May 9, 1995, Ser. No. 437,520

Int. Cl.<sup>6</sup> B65G 53/66; 53/46

U.S. Cl. 406—30

11 Claims



6. A combination rotary airlock feeder for introducing particulate material from an unpressurized source to a pressurized pneumatic convey line and a low pressure purge air system, the combination comprising:

- said pressurized pneumatic convey line including a first end and a second end, with a material intake positioned between said first and second ends, said material intake being connected to an output of said rotary airlock feeder for receiving material from said rotary airlock feeder into said pneumatic convey line, and a pressurized air source being connected to said first end of said pneumatic convey line;
- pressure reducing means positioned within the pneumatic convey line between said first end and said material intake for causing a pressure drop within said line;
- purge air supply means connected to said convey line at a point in said convey line between said first end and said pressure reducing means for feeding pressurized air from said convey line to said rotary airlock feeder;
- purging means for utilizing the air from said purge air supply means as purge air to purge said rotary airlock feeder, said purging means including a pair of purge air inputs for introducing the purge air from said purge air supply means through each of a pair of end plates in said rotary airlock feeder, respectively such that said purge air prevents said particulate material from being introduced from interior portions of said rotary airlock feeder into areas adjacent said end plates;



- (e) differential pressure sensing means for sensing a pressure differential between a high and a low pressure input;
- (f) means for connecting said high pressure input into said purging means to sense the pressure therein; and
- (g) means for connecting said low pressure input into said convey line downstream from said pressure reducing means to sense the pressure therein.

5,480,269

# METHOD OF DRILLING A HOLE FOR PRINTED WIRING BOARD

Mitsuo Ejiri, and Hidenori Kinbara, both of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jun. 6, 1994, Ser. No. 254,913

Claims priority, application Japan, Jun. 7, 1993, 5-135817

Int. Cl.<sup>6</sup> B23B 35/00

U.S. Cl. 408—1 R

4 Claims

1. A method of drilling a through-hole for inter-surface conduction in a laminate produced by attaching a metal foil on an insulating material, with a water-soluble lubricant sheet on one surface or front and reverse sides of the laminate, the method comprising drilling the through-holes in the presence of a water-soluble lubricant sheet which has a thickness of 0.02 to 3 mm and is formed from a mixture of 20 to 90% by weight of a polyether ester with 10 to 80% by weight of a water-soluble lubricant.

5,480,270

# CLUTCH FOR THREADING ATTACHMENT

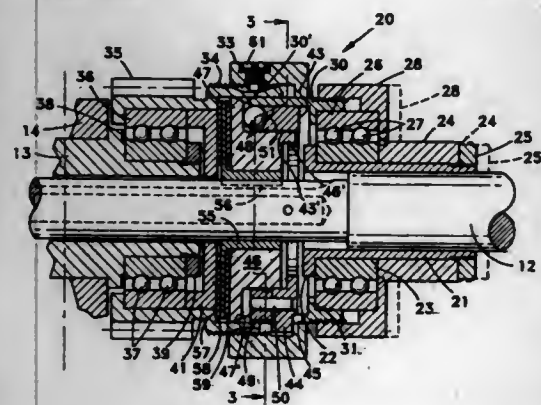
Thomas J. Read, Rochester, N.Y., assignor to Delaware Capital Formation, Inc., Wilmington, Del.

Filed May 2, 1994, Ser. No. 236,025

Int. Cl.<sup>6</sup> B23G 1/20

U.S. Cl. 408—140

10 Claims



1. In a screw machine threading attachment having a rotatable threading shaft, and at least one drive gear rotatable coaxially of the axis of said shaft, an improved clutch mechanism for releasably connecting said one drive gear to said shaft to impart rotation thereto, comprising:

- a generally disc-shaped clutch element keyed to said threading shaft for rotation therewith coaxially of said axis thereof, and for limited movement axially of said shaft,
- said clutch element having thereon opposed, generally planar surfaces disposed in parallel planes extending transversely of the axis of said shaft,
- a first annular member mounted for rotation on said shaft coaxially thereof, and connected to said one drive gear for rotation thereby,
- said first annular member being secured against movement axially of said shaft, and having thereon a generally planar surface confronting one of said planar surfaces on said clutch element,

a second annular member mounted on said shaft coaxially thereof for limited movement axially of said shaft, and having on one side thereof a generally planar surface confronting on the other of said planar surfaces on said clutch element, and camming means engaged with said second annular member and operable selectively to urge said second annular member axially toward said first annular member and said clutch element from a retracted position in which said one drive gear and said first annular element are rotatable relative to said shaft, to an advanced position in which said planar surfaces on said clutch element are gripped frictionally between said planar surfaces on said first and second annular members with a compressive force sufficient to cause said rotation of said one drive gear to be transmitted by said clutch element to said shaft.

5,480,271

# ADJUSTABLE DIE HEAD

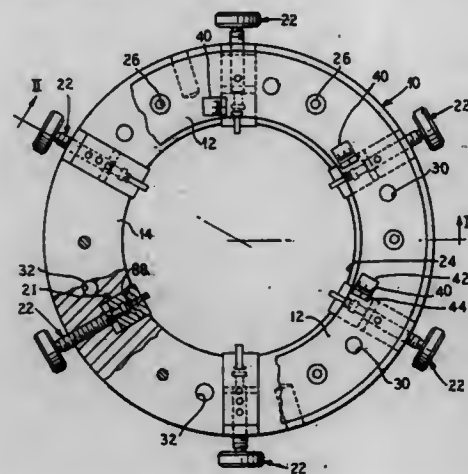
Glenn F. Jorgensen, Ridgewood, N.J., and Michael W. Kelly, Joliet, Ill., assignors to Power House Tool, Inc., Joliet, Ill., and JNT Technical Services, Inc., Little Ferry, N.J.

Filed May 13, 1994, Ser. No. 242,237

Int. Cl.<sup>6</sup> B23G 5/10

U.S. Cl. 408—184

17 Claims



1. A die assembly for cutting threads around a rod, comprising: a frame means for encircling the rod and for being rotated by an operator;

a plurality of thread-cutting chasers mounted to said frame means having a freedom of movement in a radial direction toward and away from said rod;

means allocated at each of said chasers for selectively radially positioning said chasers; and

pin means for locking said chasers at predetermined radial positions corresponding to thread diameters to be cut.

5,480,272

# CHASING TAP WITH REPLACEABLE CHASERS

Glenn F. Jorgensen, Ridgewood, N.J., and Michael W. Kelly, Joliet, Ill., assignors to Power House Tool, Inc., Joliet, Ill., and JNT Technical Services, Inc., Little Ferry, N.J.

Filed May 3, 1994, Ser. No. 237,298

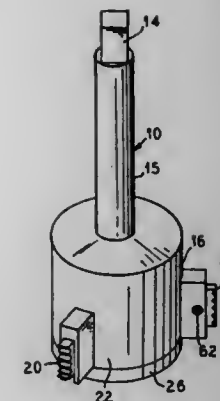
Int. Cl.<sup>6</sup> B23G 5/14

U.S. Cl. 408—222

24 Claims

1. A tool, comprising:

- a shaft portion;
- a head portion connected to said shaft portion;
- a plurality of thread chasers having thread cutting teeth, each thread chaser extending radially from said head portion and being removably and replaceably connected thereto; and



means for adjusting a radial position of said chasers relative to said head portion of said tool defining at least two cutting circumferences.

5,480,273

# BOLT ASSEMBLY

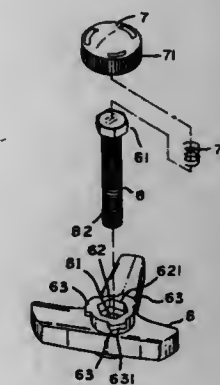
Yuch-Chiou Jou, No. 49 Linyun Street, Baan Chyau City, Taipei Hsien, Taiwan, Prov. of China

Filed Sep. 7, 1994, Ser. No. 302,054

Int. Cl.<sup>6</sup> F16B 19/00; 33/00

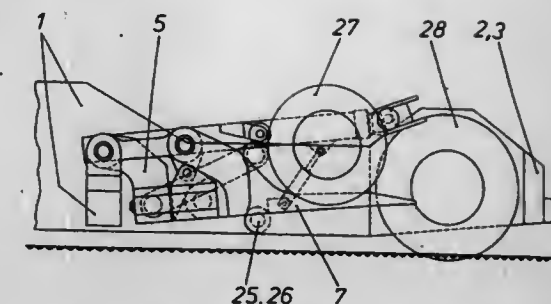
U.S. Cl. 411—373

3 Claims



1. A bolt assembly comprising:

- a knob including a hub formed thereon and including an aperture formed therein, said hub including a first engaging recess formed therein, said hub including an upper portion having ear means extended radially outward therefrom,
- a bolt engaged in said aperture of said knob and including a head for engaging with said first engaging recess of said hub,
- a cap engaged on said hub and including a bottom portion having flange means extended radially inward therefrom for engaging with said ear means so as to secure said cap to said knob, and
- means for biasing said head of said bolt to engage with said first engaging recess of said hub.



a front chassis part and a rear chassis part, the front and rear chassis parts being divided by an axle parallel buckling axle, the front chassis part having a front axle provided as a driven axle fastened to the front chassis part, the rear chassis part being provided as a fork-shape to provide a recess for picking up a nose wheel of an aircraft;

a pick up device provided connected to the front chassis part within the recess, the pick up device including a lifting platform with a support surface for the nose wheel, a pendulum tie-bar, telescopic arms with gripping arms, a push-out tie-bar, a crossbar, longitudinal swinging arms and a pendulum pin, the lifting platform, the pendulum tie-bar and the telescopic arms being mechanically connected to the crossbar via the pendulum pin, the pendulum tie-bar being able to perform a pendular movement in each of two directions of movement around the pendulum pin;

vertical drag bearings connecting said lifting platform to said pendulum tie-bar;

pivoting bearings connected to the longitudinal swinging arms for (guaranteeing) providing the longitudinal swinging arms with degrees of freedom;

first drag bearings connected to the telescopic arms whereby the telescopic arms may be pivoted;

further drag bearings connected to the crossbar whereby the crossbar may be moved;

lifting rockers connected to the rear chassis part;

a shifting device connected between said front chassis part and said push-out tie-bar;

coupling members, said lifting rockers being connected to the pick-up device by said coupling members;

bearings on each side of each of the coupling members whereby the each coupling member can be pivoted around one of the bearings, each lifting rocker being pivotable around a bearing of the buckling axle, the longitudinal swinging arms being deflected in a corresponding direction of the pendular movement during the pendular movement of the pendulum tie-bar around the pendulum pin, whereby the lifting platform performs a vertical pivoting movement via said vertical drag bearings, the telescopic arms with gripping arms and the push-out tie-bar with the shifting device are linked to the lifting platform by means of said first drag bearings on said pendulum tie-bar and via adjusting members and said crossbar is linked to the front part of the chassis via said further drag bearings.

5,480,275

# FORK LIFT TRUCK

Donald Talbert, Colorado Springs, Colo.; Robert Patterson, Bastrop, and Arnold C. Cuba, Jr., Taylor, both of Tex., assignors to Taylor Iron-Machine Works, Inc., Taylor, Tex.

Filed Oct. 18, 1993, Ser. No. 137,345

Int. Cl.<sup>6</sup> B66F 9/10

U.S. Cl. 414—635

15 Claims

1. An improved fork lift truck comprising:

- a horizontal frame having legs, the legs of the horizontal frame being substantially parallel, the legs having a transversely connected end and an open end;
- a caster wheel for supporting the fork lift truck mounted on the frame at the connected end of the legs;

5,480,274

# AIRCRAFT TUG WITHOUT TOW BAR

Wilhelm Franken, Wesel; Gerhard Weigard, Oberhausen, and Lars T. Michaelsen, Hardecke, all of Germany, assignors to Man Gutehoffnungshütte, Oberhausen, Germany

Filed Jul. 8, 1994, Ser. No. 273,029

Claims priority, application Germany, Jul. 9, 1993, 43 22 985.9

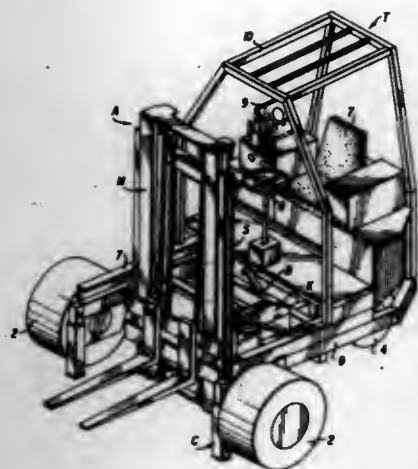
Int. Cl.<sup>6</sup> B64F 1/22

U.S. Cl. 414—429

2 Claims

1. An aircraft tug without tow bar, comprising:





- a seat for an operator secured to the frame adjacent the caster wheel mounting;
- a scissor-actuated horizontal motion carriage mounted for effecting horizontal travel on the legs; said scissor-actuated horizontal carriage having bars with front ends, a center and rear ends, said rear ends operatively connected to a hydraulic cylinder, said center slidably connected together;
- a pair of connecting bars having front ends and rear ends, each of said rear ends of said connecting bars being slidably connected to each of said front ends of said scissor-actuated horizontal carriage, said front ends of said connecting bars being slidably connected together;
- a lift assembly mounted on the frame and attached to said front ends of said connecting bars, said lift assembly being vertically moveable between a position below ground level, and a position above the level of said lift truck, whereby said lift assembly may be slidably positioned forward or rearward of said front wheels; and
- a plurality of outrigger support members.

5,480,276

**THREE FUNCTION CONTROL MECHANISM**

Robert E. Mozingo, Burlington, Iowa, assignor to Case Corporation, Racine, Wis.

Division of Ser. No. 922,171, Jul. 29, 1992, Pat. No. 5,360,312.

This application Jun. 27, 1994, Ser. No. 266,027

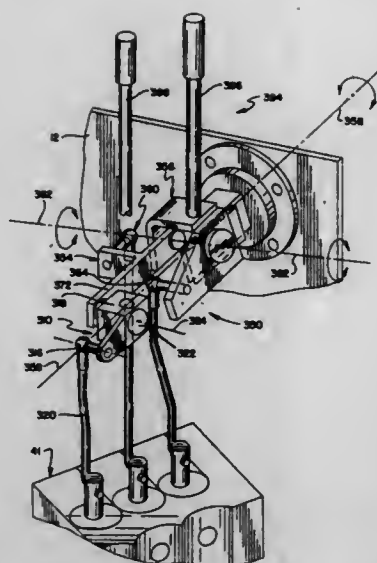
Int. Cl.<sup>6</sup> E02F 3/28

U.S. Cl. 414—685

9 Claims

6. A three function control mechanism for a loader having a wheeled frame, a loader mechanism supported from the frame for generally vertical movements relative to the frame, said loader mechanism including a pair of loader arms pivotally attached to the frame at one end thereof for movement about a generally horizontal axis, a loader bucket pivotally attached to a distal end of the loader arms, said loader bucket being articulated for movement about a transversely extending axis between an open position and a closed position, a loader actuation assembly operably associated with the loader mechanism for effecting movement thereof, said actuation assembly including a power source connected to first, second, and third linear actuators for controlling the elevation of the bucket relative to the frame, pivotal movement of the bucket relative to said loader arms, and articulated bucket movement, said control mechanism being interposed between the power source and the linear actuators for controlling various functions of the loader mechanism either independently or conjointly relative to each other, said control mechanism comprising:

- a bracket assembly mounted for movement about a first pivot axis and including a first ball joint offset from the first pivot axis and a first connecting linkage extending from the first ball joint for controlling actuation of the first linear actuator;
- a first handle assembly carried by and connected to said bracket assembly for movement through a first arc centered about said



first axis and through a second arc centered about a second pivot axis, said first handle assembly including a second ball joint offset from the second pivot axis and in axial alignment with the first pivot axis and a second connecting linkage extending from the second ball joint for controlling the second linear actuator;

- a second handle assembly carried by and connected to said bracket assembly independently of said first handle assembly for movement through an arc centered about said first pivot axis and for movement about another arc centered about a third pivot axis spaced from and extending generally parallel to said second pivot axis and generally perpendicular to said first axis, said second handle assembly including a third ball joint that is offset from the second pivot axis and in axial alignment with the first pivot axis;
- a third linkage connected between the third ball joint on the second handle assembly and the third linear actuator and whereby at least two functions of the loader mechanism are effected in response to combined arcuate movement of either handle assembly about two of the pivot axes about which each handle assembly moves.

5,480,277

**MACHINE FOR TIPPING LARGE INDUSTRIAL ARTICLES**

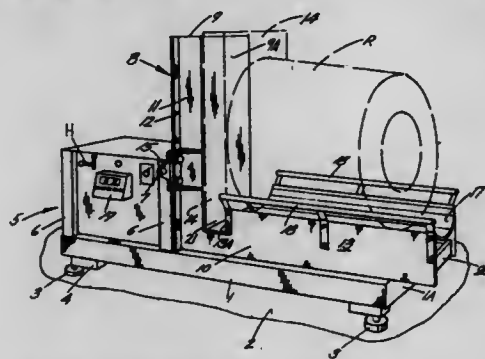
Charles A. Minz, P.O. Box 190, Hubbard, Oreg. 97032

Filed Jan. 19, 1995, Ser. No. 374,975

Int. Cl.<sup>6</sup> B25J 11/00

U.S. Cl. 414—778

6 Claims



- 1. A machine for tipping an article comprising,
  - a base including support means for spacing the base from a floor surface to provide an open area to enable the insertion of a lifting instrumentality,

a support structure on said base, shaft means carried by said support structure,

a platform and cradle, the latter perpendicularly disposed on said platform, said platform and cradle carried by said shaft means, said platform having a load receiving surface intersected by a vertical plane containing the major axis of said shaft means about which the platform and cradle are positionable,

said platform and cradle having a quadrantal range of travel about said shaft means with the load receiving surface of the platform and an article thereon being in an unbalanced condition during at least a portion of said travel, and

positioning means coupled to one end of said platform and to said base including a double acting hydraulic cylinder having its rod end and its base end coupled to said platform and said base, a fluid pressure source, first and second hydraulic lines serving said rod end and said base end of said cylinder, valve means controlling fluid flow to said cylinder, an externally piloted valve in one of said lines and responsive to fluid pressure in other of said lines to regulate said fluid flow through said one of said lines and hence fluid discharge from the cylinder when the platform is in said unbalanced condition to counterbalance article weight.

5,480,278

**AUTOMATIC STACKER APPARATUS AND METHOD**

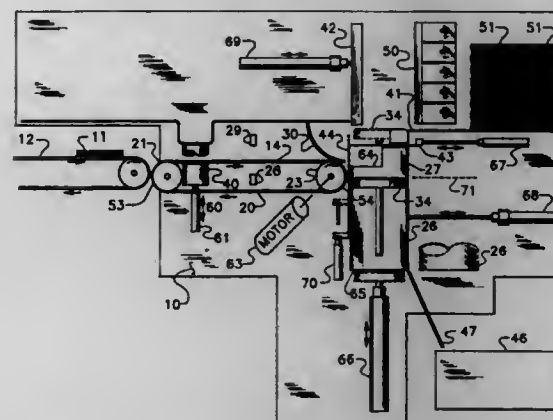
Robert K. Morgan, Boulder, Colo., assignor to MBT Corporation, Boulder, Colo.

Filed Aug. 17, 1994, Ser. No. 292,350

Int. Cl.<sup>6</sup> B65G 57/03

U.S. Cl. 414—790.3

20 Claims



1. Stacker apparatus for use in vertically stacking a plurality N of flat objects, each object having generally the same horizontal shape, and each object having generally the same vertical thickness, comprising:

- a vertically extending and elongated cylinder having a cross section generally the same as said horizontal object shape, and having an open bottom and an open top, a vertically-movable plunger within said cylinder,
- first control means for moving said plunger upward adjacent to said top of said cylinder,
- conveying means for conveying a serial stream of said objects to said top of said cylinder,
- second control means responsive to said objects serially entering said top of said cylinder, and operable to move said plunger vertically downward within said cylinder in steps generally equal to said uniform vertical thickness so as to establish a vertical stack of objects within said cylinder whose top is positioned generally coincident with said top of said cylinder,
- third control means responsive to N objects entering said cylinder and operable to interrupt said conveying means,
- fourth control means including said first control means responsive to N objects entering said cylinder and operable to cause

said plunger to move vertically upward so as to elevated said N objects above said top of said cylinder, and means responsive to said plunger in said vertically-upward position, and operable to remove said elevated stack of N objects from said plunger.

5,480,279

**GRIPPER FOR HANDLING AND STORING PRODUCTS IN ROLL FORM**

Hans-Ulrich Stauber, Grüt, Switzerland, assignor to SFT AG Spontanfördertechnik, Weinfelden, Switzerland

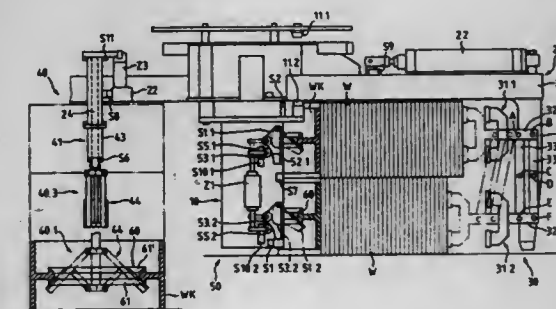
Continuation-in-part of Ser. No. 870,323, Apr. 17, 1992, abandoned. This application Nov. 10, 1994, Ser. No. 337,079

Claims priority, application Switzerland, Apr. 18, 1991, 01163/91

Int. Cl.<sup>6</sup> B65G 59/02

U.S. Cl. 414—792.9

9 Claims



1. A gripper with a roll handling configuration for handling at least one printed product roll, including a roll core or a plurality of superimposed roll cores each with printed products wound thereon, and a core handling configuration for handling a plurality of empty roll cores arranged in a rosette-shaped arrangement of juxtaposed roll cores or of juxtaposed cylinders of a plurality of vertically superimposed roll cores, the gripper comprising

- a central support;
- a plurality of radially extending arms;
- a plurality of roll clamping means carried by said radially extending arms for clamping a periphery of the printed product roll having a substantially vertical axis of rotation, said clamping means substantially forming a first circle within which said roll to be gripped is positioned, said clamping means being radially movable relative to said arms between a radially outermost position and a radially innermost position; and
- a plurality of core supporting means each for gripping the rosette-shaped arrangement comprising a plurality of the juxtaposed roll cores each having a vertical axis of rotation, said core supporting means being movable in said core handling configuration to form a second circle within said first circle formed by said clamping means in said radially outermost position, said core supporting means being movable in said roll handling configuration of the gripper away from said first circle formed by said roll clamping means in any possible position.

5,480,280

**METHOD AND APPARATUS FOR DISPENSING PALLETS**

Emil L. Bordon, Denver, Colo., assignor to Conveying Industries, Inc., Denver, Colo.

Filed Oct. 21, 1994, Ser. No. 327,435

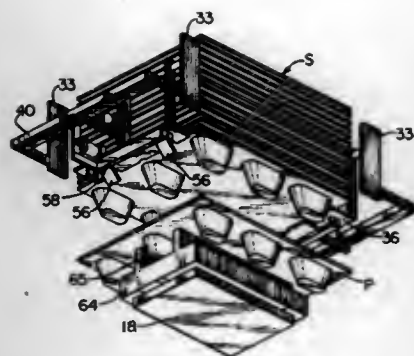
Int. Cl.<sup>6</sup> B65G 59/06

U.S. Cl. 414—798.1

18 Claims

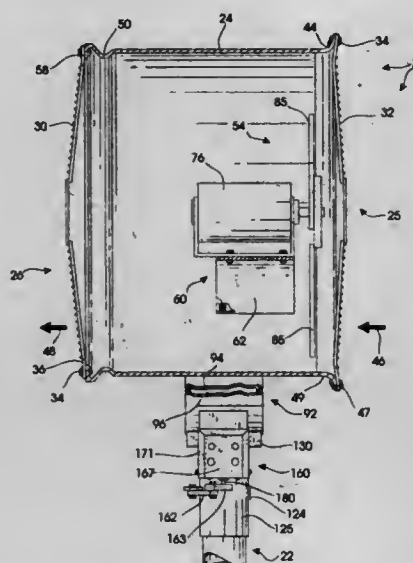
1. Apparatus for stacking and transferring flat stackable articles wherein each article has outer peripheral edges and a stack of said



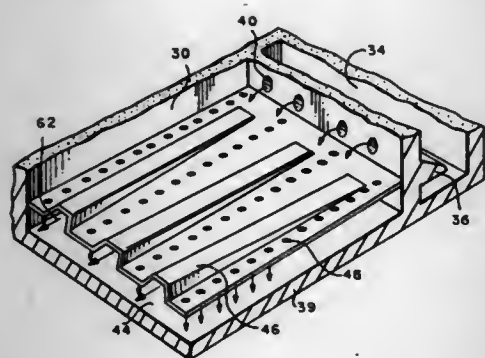


at least one duct formed in said impingement plate in communication with said second chamber to provide increased flow area for at least part of the post-impingement steam as the mass flow thereof increases in a downstream direction toward said exhaust opening.

**5,480,282**  
**HIGH VELOCITY FAN AND YOKE MOUNTING**  
 Carl G. Matson, Little Rock, Ark., assignor to Triangle Engineering, Jacksonville, Ark.  
 Filed Jun. 16, 1994, Ser. No. 260,874  
 Int. Cl.<sup>6</sup> F04D 25/10  
 U.S. Cl. 415—125 9 Claims



**5,480,281**  
**IMPINGEMENT COOLING APPARATUS FOR TURBINE SHROUDS HAVING DUCTS OF INCREASING CROSS-SECTIONAL AREA IN THE DIRECTION OF POST-IMPINGEMENT COOLING FLOW**  
 Victor H. S. Correia, Scotia, N.Y., assignor to General Electric Co., Schenectady, N.Y.  
 Filed Jun. 30, 1994, Ser. No. 269,289  
 Int. Cl.<sup>6</sup> F01D 9/02; 25/12  
 U.S. Cl. 415—115 15 Claims

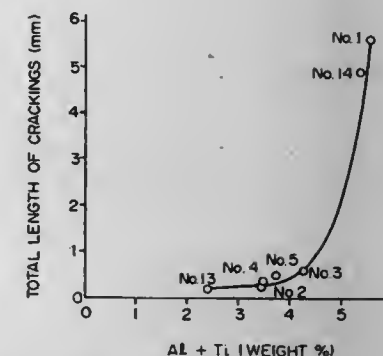


1. Impingement steam cooling apparatus for turbines comprising:  
 a turbine shroud having first and second walls spaced from one another and an impingement plate spaced between said walls to define on opposite sides of said impingement plate first and second chambers substantially sealed from one another, said impingement plate having a plurality of flow openings there-through for communicating cooling steam between said chambers through said openings;  
 a supply passage in communication with said first chamber for supplying cooling steam into said first chamber for flow through said openings into said second chamber and impingement cooling of said second wall;  
 an exhaust opening in communication with said second chamber for exhausting post-impingement cooling steam flowing from said second chamber; and

1. A portable, high volume, directional power cooling fan comprising:  
 an elongated, tubular, generally cylindrical housing adapted to be aimed at a target area to be cooled, said housing comprising an air intake end and a high velocity air output end;  
 a rotatable propeller assembly coaxially disposed within said housing adjacent said air intake end;  
 said air intake end of said housing comprising a flared portion separated from a main tubular body portion of the housing by a transition zone, whereby to form a venturi air inlet; wherein said propeller assembly is disposed at said transition zone;  
 direct drive motor means for rotating said propeller assembly; means for securing said motor means within said housing; generally U-shaped yoke means for mounting said fan; and, oscillating means for periodically rotating said yoke means.

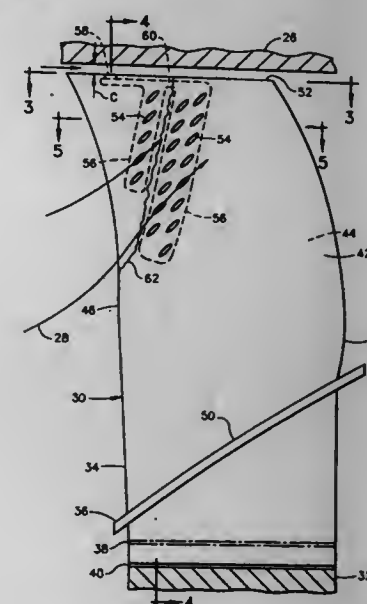
**5,480,283**  
**GAS TURBINE AND GAS TURBINE NOZZLE**  
 Hiroyuki Doi, Ibaraki; Ken Yasuda, Hitachi; Tetsuo Kashimura, Hitachi, and Yutaka Fukui, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
 Continuation-in-part of Ser. No. 965,699, Oct. 23, 1992, Pat. No. 5,370,497. This application May 20, 1994, Ser. No. 246,624  
 Claims priority, application Japan, Jan. 24, 1991, 3-277452  
 The portion of the term of this patent subsequent to Dec. 6, 2011, has been disclaimed.  
 Int. Cl.<sup>6</sup> C22C 30/00; 19/05; F01D 1/02  
 U.S. Cl. 415—199.5 29 Claims

1. A gas turbine comprising:  
 a compressor for compressing air;



a plurality of nozzles for directing combustion gas;  
 a turbine rotor; and  
 a plurality of moving blades which are connected in said turbine rotor,  
 said nozzles being provided in a ring-arrangement opposite to said moving blades, at least one nozzle having two side walls and at least one blade portion formed between said two side walls, and being formed of a nickel-base superalloy consisting essentially of, by weight: 0.05 to 0.20% carbon, 15 to 25% Co, 15 to 25% Cr, 1.0 to 3.0% Al, 1.0 to 3.0% Ti, 1.0 to 3.0% Nb, 5 to 10% W, and at least 42.5% Ni, the combination of (Al+Ti) content and the tungsten content being determined within a pentagonal shadowed area including the boundary shown in FIG. 5, five vertices of which are: A(2.5% of (Al+Ti), 10% W), L(5% of (Al+Ti), 10% W), D(5% of (Al+Ti), 5% W), E(3.5% of (Al+Ti), 5% W), and F(2.5% of (Al+Ti), 7.5% W).

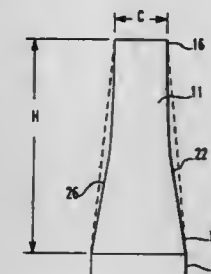
**5,480,284**  
**SELF BLEEDING ROTOR BLADE**  
 Aspi R. Wadia, Loveland, and Mark J. Mielke, Blanchester, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio  
 Filed Dec. 20, 1993, Ser. No. 169,278  
 Int. Cl.<sup>6</sup> F01D 5/18  
 U.S. Cl. 416—91 11 Claims



1. A gas turbine engine rotor blade comprising an airfoil having a root, a tip, and an outer surface for pressurizing air flowable thereover, and means for bleeding boundary layer air from said airfoil outer surface and into said airfoil disposed closer to said airfoil tip than to said airfoil root;

said airfoil further including suction and pressure outer surfaces joined together at leading and trailing edges and extending from said root to said tip; and  
 said bleeding means including a plurality of bleed apertures disposed in said airfoil suction surface and joined in flow communication with a bleed channel disposed inside said airfoil for channeling said bleed air thereto, and a bleed outlet disposed at said airfoil tip and in flow communication with said bleed channel for discharging said bleed air from said airfoil, said bleed apertures being arranged generally in a plurality of spaced apart columns extending generally longitudinally from adjacent said airfoil tip toward said airfoil root.

**5,480,285**  
**STEAM TURBINE BLADE**  
 Ashok T. Patel, Orlando; Daniel R. Cornell, Oviedo, and James F. Lydon, Winter Park, all of Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.  
 Continuation of Ser. No. 109,899, Aug. 23, 1993, abandoned.  
 This application Aug. 15, 1994, Ser. No. 290,509  
 Int. Cl.<sup>6</sup> F01D 5/14  
 U.S. Cl. 416—223 A 19 Claims

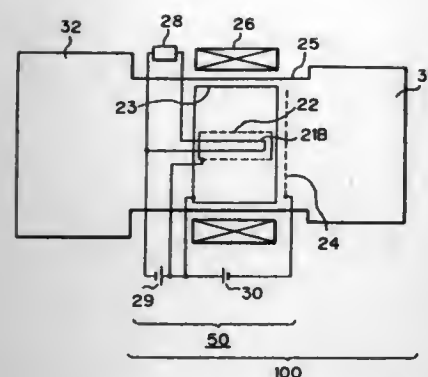


1. A turbo-machine comprising:  
 a stationary cylinder for containing a steam flow, and a rotor enclosed by said cylinder; and  
 a row of blades affixed to said rotor, each of said blades having an airfoil portion and a root portion, each of said airfoils having a leading edge and a trailing edge defining a chord therebetween, said airfoil having a base at its proximal end adjacent said root and a tip at its distal end and a mid-height region disposed mid-way between said base and said tip, said chord decreasing from said base to said mid-height region and being essentially constant from said mid-height region to said tip; wherein said chord at said mid-height region is less than one half of said chord at said base.

**5,480,286**  
**EXHAUST APPARATUS AND VACUUM PUMPING UNIT INCLUDING THE EXHAUST APPARATUS**  
 Kazutoshi Nagai, Tokyo; Tohru Satake; Hideaki Hayashi, both of Kanagawa, and Takanari Yasui, Miyagi, all of Japan, assignors to Ebara Corporation, Tokyo, Japan  
 Division of Ser. No. 11,783, Feb. 1, 1993, Pat. No. 5,326,227, which is a division of Ser. No. 833,853, Feb. 12, 1992, Pat. No. 5,240,381, which is a continuation-in-part of Ser. No. 739,361, Aug. 2, 1991, abandoned. This application Mar. 25, 1994, Ser. No. 217,699  
 Claims priority, application Japan, Aug. 3, 1990, 2-205224; Feb. 12, 1991, 3-38847; Feb. 12, 1991, 3-38848  
 Int. Cl.<sup>6</sup> F04B 37/02; F04F 11/00  
 U.S. Cl. 417—48 26 Claims

1. An exhaust apparatus comprising a thermal electron emission source, an electron accelerating grid surrounding the thermal electron emission source, an outer electrode disposed radially outward of and surrounding the electron accelerating grid, an ion accelerating grid intersecting a longitudinal axis of the outer electrode and





installed apart from the outer electrode, a vessel for containing said thermal electron emission source, said electron accelerating grid, said outer electrode, and said ion accelerating grid therein, a magnet disposed outside of the vessel to generate a magnetic field almost parallel to the longitudinal axis of said outer electrode, a power supply for heating said thermal electron emission source, a first DC power supply for applying a voltage between said electron accelerating grid, said outer electrode and said thermal electron emission source, a second DC power supply for applying a voltage between said outer electrode and said ion accelerating grid so as to get said outer electrode positive.

5,480,287

# PUMPING DEVICE, PARTICULARLY FOR SPORTS SHOES, AND METHOD FOR MANUFACTURE THEREOF

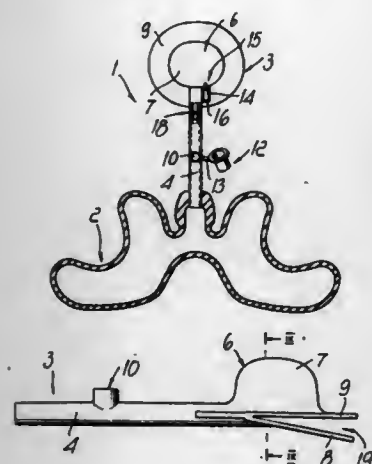
Adolfo Pozzebon, Sala d'Istrana; Alessandro Pozzebon, Paderno di Ponzano Veneto, and Alessandro Morandin, Villorba, all of, Italy, assignors to Nordica S.p.A., Treviso, Italy  
Filed Apr. 18, 1994, Ser. No. 228,634

Claims priority, application Italy, May 4, 1993, TV93A0048

Int. Cl.<sup>6</sup> F04B 43/02

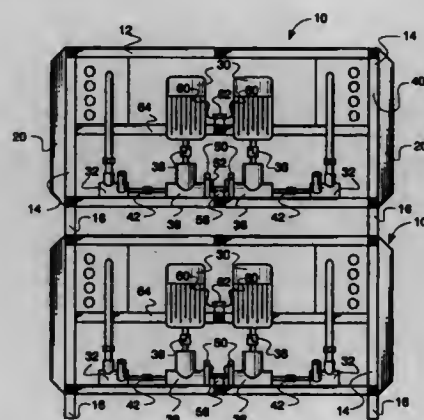
U.S. Cl. 417—53

9 Claims



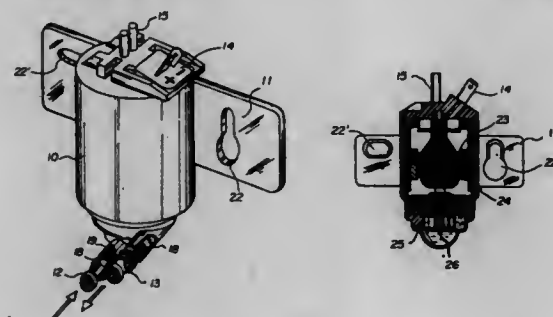
1. Method for manufacturing a pumping device, for sports shoes, comprising at least one first step of monolithic molding of a body that includes at least one tubular passage, a first seat, and a second seat for air venting and intake valves, and at least one chamber with a partially open elastically deformable wall, said method comprising at least one second step of sealing said at least one chamber, after the placement of one or more of said valves.

5,480,288  
**PUMP MODULE FOR DISPENSING APPARATUS**  
Leendert Hellenberg, Warmond, and Johannes H. Mink, Voorhout, both of, Netherlands, assignors to Fluid Management Limited Partnership, Wheeling, Ill.  
Continuation of Ser. No. 36,671, Mar. 25, 1993, abandoned.  
This application Sep. 23, 1994, Ser. No. 311,208  
Int. Cl.<sup>6</sup> F04B 53/00  
U.S. Cl. 417—313 4 Claims



1. A pump module apparatus for delivering a plurality of different materials, comprising:  
a frame defining opposed first and second openings;  
a plurality of pumps in said frame, each having a pump inlet, a pump outlet and an operating shaft;  
a plurality of inlet conduit means for receiving a flow of material extending from respective pump inlets, said inlet conduit means having a length elongated with respect to a cross section and extending along an elongate axis;  
elongated outlet conduit means for coupling the material to the respective pump outlets, extending generally parallel to said inlet conduit means;  
at least one motor within said frame, coupled to the operating shafts of said pumps through gear means; and  
electrical coupling means including at least one cable raceway extending generally parallel to said inlet and said outlet conduit means, between said first and said second openings.

5,480,289  
**CONNECTOR AND MOUNTING ARRANGEMENT FOR A WINDSHIELD WASHER PUMP**  
Albert Lee, 232 Margate Rd., Timonium, Md. 21093  
Filed Sep. 13, 1994, Ser. No. 305,346  
Int. Cl.<sup>6</sup> F04B 53/16  
U.S. Cl. 417—360 4 Claims



1. A windshield washer pump having a pump member and a terminal, said windshield washer pump comprising:  
a windshield washer pump housing having an upper portion and a lower portion,

a mounting bracket attached to said windshield washer pump housing, and  
an entrance connector for introducing washer fluid to the pump extending from the lower portion of said windshield washer pump housing and an exit connector through which washer fluid exits the pump extending from said windshield washer pump housing and disposed vertically above said entrance connector, each of said entrance and exit connectors including a channel disposed therewithin, each of said channels containing a ball and a spring for forming a check valve so as to prevent the washer fluid from flowing out the pump through the entrance connector or into the pump through the exit connector;  
wherein said entrance connector and said exit connector include a plurality of annular raised portions each having a different diameter for mating with various types of reservoir and nozzle hoses.

5,480,290

# SUBMERSIBLE MOTOR-DRIVEN PUMP

Manfred Zelder, Bonn, Germany, assignor to Wilo GmbH, Dortmund, Germany

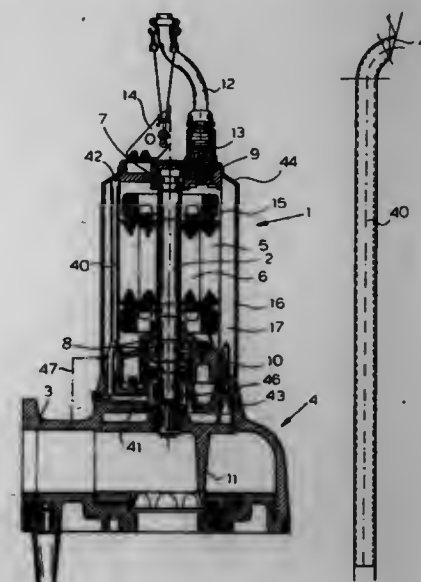
Filed Jun. 14, 1994, Ser. No. 260,175

Claims priority, application Germany, Jun. 14, 1993, 43 19 619.5

Int. Cl.<sup>6</sup> F04B 39/06

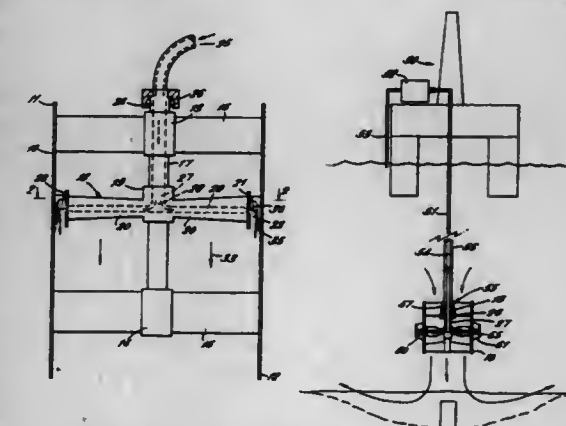
U.S. Cl. 417—366

4 Claims



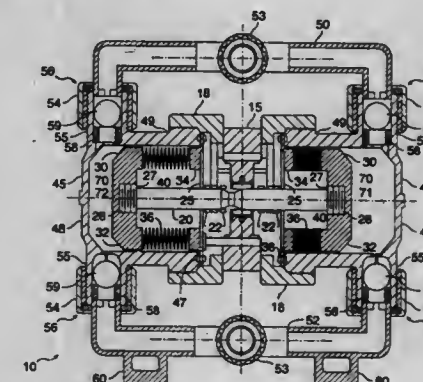
1. A submersible motor-driven pump, comprising:  
a pump drive motor having a vertical axis and formed with a motor casing surrounding said axis;  
a centrifugal pump driven by said motor and mounted on said motor casing below said motor;  
a cooling jacket coaxially surrounding said motor casing and forming an annular space traversable by a cooling medium between a partition between said motor casing and said centrifugal pump and a top of said annular space the cooling medium moving in said annular space in a circulatory direction of flow; and  
a pipe in said annular space for discharge of said cooling medium from said annular space, said pipe extending from said partition to said top of said annular space, said pipe having a bent inlet facing away from said circulatory direction of flow of the cooling medium.

5,480,291  
**UNDERWATER EXCAVATION APPARATUS**  
Nicholas V. Sills, Kincardine, United Kingdom, assignor to Underwater Excavation Limited, Aberdeen, United Kingdom  
PCT No. PCT/GB91/00611, § 371 Date Oct. 13, 1993, § 102(e)  
Date Oct. 13, 1993, PCT Pub. No. WO92/18701, PCT Pub. Date Oct. 29, 1992  
PCT Filed Apr. 18, 1991, Ser. No. 133,095  
Int. Cl.<sup>6</sup> F04B 35/02  
U.S. Cl. 417—375 17 Claims



1. Underwater excavation apparatus comprising a hollow body having an inlet to receive water, an outlet for discharge of water, a propeller mounted for rotation in the hollow body to draw water through the inlet and deliver a stream of water through the outlet, water jet means on the propeller for rotating the propeller and means to supply water under pressure to the jet means to cause the propeller to rotate and thereby draw water into the body through the inlet and deliver a flow of water through the outlet for displacing seabed material, wherein the improvement comprises providing the part of the hollow body encircling the propeller with fixed reaction vanes spaced around the body and angling the jet means on the propeller to act on the vanes to cause the propeller to rotate within the body.

5,480,292  
**DUAL CHAMBER PUMP**  
Yves Chevallier, La Garenne Colombes, France, assignor to ASTI SAE, Courbevoie, France  
Filed May 19, 1993, Ser. No. 63,626  
Int. Cl.<sup>6</sup> F04B 15/04  
U.S. Cl. 417—393 10 Claims



1. A pump comprising:  
a pump shaft having first and second ends;  
a pair of rotatable body rings;  
a pair of driven members, each driven member secured to one end of the pump shaft and being drivable between fluid inlet and fluid outlet positions;



a pair of pump body members, each pump body member having an interior and an exterior, each of the pump body members disposed over one of the driven members and secured to the pump by one of the body rings and releasable from the pump by rotation of the body ring;

a fluid inlet and a fluid outlet corresponding to each pump body member;

fluid inlet and fluid outlet valves between respective fluid inlet and fluid outlets and the interior of each pump body member; and

means operative to communicate pressure alternately to first one and then the other of the driven members; and

whereby said driven members are alternately driven between their fluid inlet and fluid outlet positions such that a fluid may be alternately drawn into the interior of each pump body member through the respective fluid inlet and fluid inlet valve, and expelled through the respective fluid outlet valve and fluid outlet.

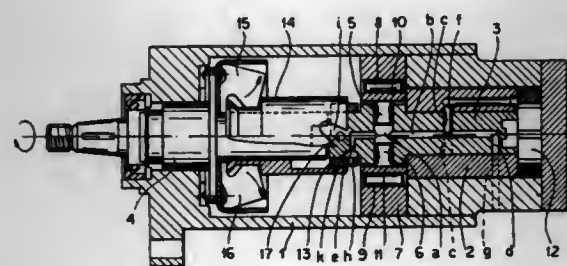
5,480,293

**ROTARY DISTRIBUTOR FUEL INJECTION APPARATUS**  
Milan Dinca, and Gheorghe V. Moisesu, both of Bucharest, Romania, assignors to Master S.A., Bucharest, Romania  
Filed Oct. 26, 1993, Ser. No. 143,569

Int. Cl.<sup>6</sup> F04B 19/02

U.S. Cl. 417—462

1 Claim



1. A rotary distributor fuel-injection apparatus, comprising:
  - a distributor body;
  - a hydraulic head mounted in said distributor body having at least one fuel inlet bore and at least one fuel outlet bore;
  - a distributor member axially fixed in and rotatable relative to said head, said distributor member having an axial bore,
  - radial bores connected to said axial bore and alignable with said fuel inlet bore and said fuel outlet bores,
  - a further radial bore communicating with said axial bore,
  - an oblique groove along a periphery of said distributor member communicating with said further radial bore,
  - a transverse bore communicating with said axial bore, and
  - a pair of opposite pumping plungers displaceable in said transverse bore;
  - a cam in said body surrounding said distributor member and controlling said pumping plungers upon rotation of said distributor member;
  - a shaft rotatable in said body and connected with said distributor member for rotating same;
  - governor weights on said shaft;
  - a thrust sleeve on said shaft directly engaged by and axially displaceable by said governor weights, said thrust sleeve being formed directly with a helical groove; and
  - a valve sleeve rotatable on said distributor member, formed with a radial port alignable with said oblique groove, and provided with a peg received in said helical groove for direct rotation of said valve sleeve by said thrust sleeve for discharge of fluid from said axial bore into said body to terminate an injection cycle.

5,480,294

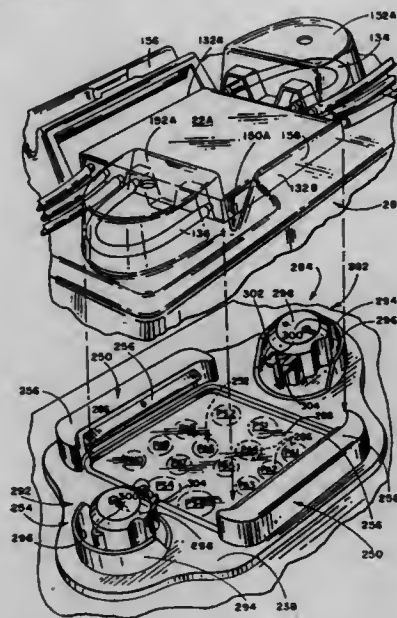
**PERISTALTIC PUMP MODULE HAVING JAWS FOR GRIPPING A PERISTALTIC PUMP TUBE CASSETTE**  
Paul M. Di Perna, Long Grove, and Richard L. West, Lake Villa, both of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Filed Dec. 22, 1993, Ser. No. 172,654

Int. Cl.<sup>6</sup> F04B 43/08

U.S. Cl. 417—477.2

18 Claims



1. A peristaltic pumping apparatus comprising
  - a peristaltic pumping element including a pump rotor rotatable about a rotational axis and a pump race circumferentially spaced about the axis,
  - a pump tube cassette including a body having a side edge and means on the side edge for supporting a flexible tubing loop in an erect, outwardly bowed position generally perpendicular to the side edge for placement within the pump race and for removal from the pump race by moving the body and the tubing loop, respectively, toward and away from the pumping element in a direction generally parallel to the rotational axis of the pump rotor, and
  - a surface spaced from the peristaltic pumping element in a plane that extends generally perpendicular to the rotational axis, including a gripping jaw assembly on the surface that opens to receive the pump tube cassette body as the body and the tubing loop are moved in the generally parallel direction toward the pumping element to place the tubing loop within the pump race and that closes against the pump tube cassette body to secure the pump tube cassette body on the surface in an orientation in which the tubing loop lies within the pump race for engagement with the peristaltic pump rotor.

5,480,295

**EASY-TO-LOAD EXTRUSION SIZING DEVICE**  
Christopher G. Greve, Covington, La., assignor to The Laitram Corporation, Harahan, La.

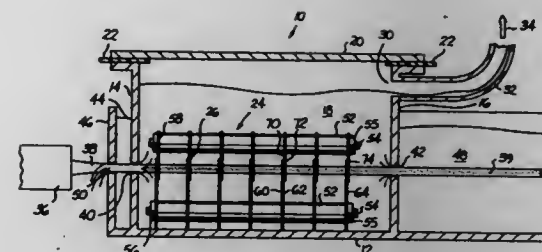
Filed Aug. 30, 1994, Ser. No. 298,040

Int. Cl.<sup>6</sup> B29C 47/90

U.S. Cl. 425—71

20 Claims

1. A sizing die assembly for an extruder, comprising:
  - a sizing die including a first die element forming a first notch therethrough and a second die element having a planar first face, the first die element having a planar second face; and
  - positioning means for moving the first and second die elements between an open position with the first notch unoccluded and a closed position with the first and second die elements abutting and offset in the direction of extrusion with the



planar first face of the second die abutting the planar second face of the first die along a plane substantially perpendicular to the direction of extrusion and with the first notch partly occluded by the second die element to form a passage through the sizing die in the closed position, the passage determining the size and shape of an extrusion pulled through the die assembly.

5,480,296

**TRANSFER MOLDING APPARATUS FOR ENCAPSULATING AN ELECTRICAL ELEMENT IN RESIN**

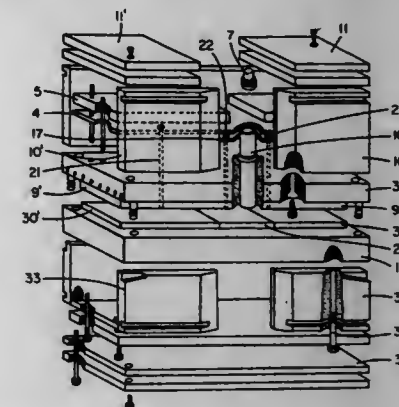
Keun Y. Jang, Kyungsangbook-Do, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Choongchungbook-Do, Rep. of Korea

Continuation-in-part of Ser. No. 983,957, Dec. 1, 1992, abandoned. This application Jun. 22, 1994, Ser. No. 264,045  
Claims priority, application Rep. of Korea, Feb. 15, 1992, 2222/1992

Int. Cl.<sup>6</sup> B29C 45/02; 45/14; 45/40

U.S. Cl. 425—116

2 Claims



1. A transfer molding apparatus, comprising:
  - a lower metal mold having a lower center block;
  - an upper center block disposed above the lower center block;
  - an upper mold base mounted above the upper center block;
  - an ejector pin plate located above the upper mold base;
  - an upper drive plate of thickness "t", comprising two cooperating portions of the same thickness and spaced apart and mounted above the ejector pin plate;
  - a cylindrical pot of a predetermined length, extending from an upper end close to an upper surface of the ejector pin plate and between said spaced apart positions of said upper drive plate, through the upper mold base, and through the upper center block to a lower surface of the upper center block, the upper end of the pot being located within a space defined between the spaced apart portions of the upper drive plate;
  - a center block ejector pin plate mounted below the ejector pin plate and extending around the pot, the ejector pin plate being formed to have a first cavity to receive an upper end of a center block runner ejector pin, the center block ejector pin plate being formed to have a second cavity to receive an upper end of a center block ejector pin, the upper mold base

and the upper center block each being formed with corresponding through apertures aligned to provide respective passages to the center block runner ejector pin and the center block ejector pin respectively; and

a plunger disposed to be reciprocable inside the pot to press a quantity of heated resin provided therein into the lower center block.

5,480,297

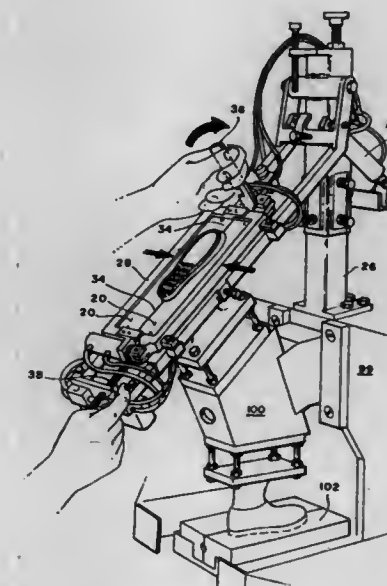
**APPARATUS FOR PRECISION MANUFACTURE**  
Anselmo Ross, Hialeah, Fla., assignor to Injection Footwear Corp., Miami, Fla.

Filed Oct. 13, 1994, Ser. No. 322,699

Int. Cl.<sup>6</sup> B23B 3/00

U.S. Cl. 425—119

6 Claims



1. An apparatus for the manufacture of goods wherein a component is injection molded in respect to a workpiece so as to effect formation of an essentially complete, permanent and uniform, blemish-free seal between said injection molded component and said, wherein the apparatus comprises:

- a. means for the precision placement of a mask in respect to a workpiece, said precision placement means comprising an armature which includes a proximal end and a distal end, said proximal end being pivotally mounted to a fixed or stationary body by an articulating coupling so as to permit arcuate movement of said distal end thereof into operative relation to said workpiece so as to effect placement of a mask in proximate relation to said workpiece, said distal end comprising a frame having said mask supported in a track of said frame;
- b. said mask comprising essentially two sections, each section thereof defining a portion of an open area of said mask and being maintained at a defined distance from each other in said frame;
- c. means for effecting relative movement of each of said sections of said mask in said track toward one another upon application of an energizing signal; and
- d. means for energizing said mask comprising a release mechanism to allow for movement of each of said sections of said mask within said frame and switching means for activation of said sections to effect relative movement of said sections and engagement of said sections with said workpiece to create a delimited area on said workpiece so as to confine said delimited area of said workpiece within said mask and thereby



permit application of an adhesive to said delimited area and to only said delimited area, said delimited area conforming with a ring mold used to injection mold a plastic component relative to said workpiece.

5,480,298

# COMBUSTION CONTROL FOR PRODUCING LOW NO<sub>x</sub> EMISSIONS THROUGH USE OF FLAME SPECTROSCOPY

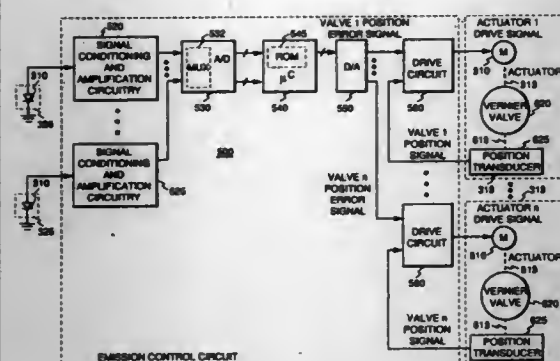
Dale M. Brown, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 226,528, Apr. 12, 1994, which is a continuation-in-part of Ser. No. 47,936, Apr. 19, 1993, Pat. No. 5,303,684, which is a division of Ser. No. 878,933, May 5, 1992, Pat. No. 5,257,496. This application Oct. 31, 1994, Ser. No. 332,190

Int. Cl.<sup>6</sup> F23N 5/08

U.S. Cl. 431—79

13 Claims



1. Apparatus for monitoring combustion flames in a high temperature environment and reducing nitrogen oxide (NO<sub>x</sub>) exhaust emissions resulting from combustion of a mixture of hydrocarbon fuel and air within a boiler burner without undue risk of flame-out comprising:

a silicon carbide photodiode for detecting and measuring intensity of a band of ultraviolet spectral lines emanating from a combustion flame in said boiler burner;

means for converting the measured intensity value of said predetermined band of ultraviolet spectral lines into a corresponding value of a burner operating parameter, said parameter being either temperature of said flame or NO<sub>x</sub> concentration in said exhaust emissions; and

means for dynamically adjusting the fuel/air mixture for said boiler burner such that the value of said burner operating parameter remains below a predetermined limit.

5,480,299

# HIGH-TEMPERATURE GAS BLOWER IMPELLER WITH VANES MADE OF DISPERSION-STRENGTHENED ALLOY, GAS BLOWER USING SUCH IMPELLER, AND GAS CIRCULATING FURNACE EQUIPPED WITH SUCH GAS BLOWER

Yoshitada Motomura, Toyota; Hiroshi Tawara, Nagoya; Kenji Tsukuta, Gifu, and Tomohito Ikubo, Nagoya, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, Japan

Division of Ser. No. 110,949, Aug. 24, 1993. This application Jul. 27, 1994, Ser. No. 281,071

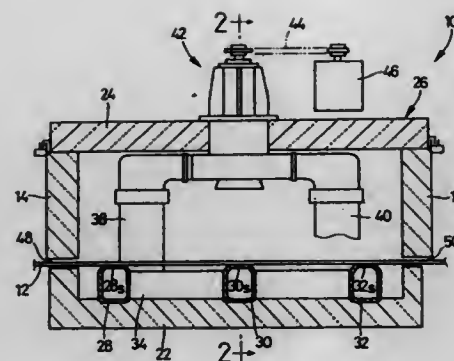
Int. Cl.<sup>6</sup> F27B 3/22

U.S. Cl. 432—176

13 Claims

1. An impeller for a high-temperature gas blower, rotated to blow a high-temperature gas, comprising a plurality of vanes

comprising an alloy and 0.1–2.0% by weight of finely divided particles of a metal oxide having a high melting point dispersed in said alloy.



5,480,300

# VERTICAL HEAT-TREATING APPARATUS AND HEAT INSULATOR

Shinichi Okoshi, Yamagata, and Hiroyuki Kimura, Fukui, both of Japan, assignors to Shin-Etsu Quartz Products Co. Ltd., Tokyo, Japan

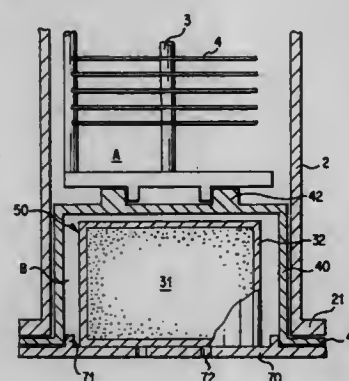
PCT No. PCT/JP92/00627, § 371 Date Dec. 23, 1993, § 102(e) Date Dec. 23, 1993, PCT Pub. No. WO93/23713, PCT Pub. Date Nov. 25, 1993

PCT Filed May 15, 1992, Ser. No. 170,164

Int. Cl.<sup>6</sup> F27D 3/12

U.S. Cl. 432—241

7 Claims



1. A vertical heat-treatment apparatus comprising a heat insulator comprising a porous body of silica glass having numerous inner microspaces, a heat insulator casing for receiving said heat insulator in a lower space, and a work holder disposed on top of said heat insulator casing, said heat insulator casing defining a heat insulator receiving space for receiving said heat insulator and a work holder accommodation space for receiving said work holder, wherein said two receiving spaces are hermetically sealed with respect to each other, and said heat insulator receiving space is in communication with the exterior.

5,480,301

# ORTHODONTIC APPLIANCES HAVING IMPROVED BONDING CHARACTERISTICS AND METHODS OF MAKING

Farrokh Farzin-Nia, Inglewood, and William R. Otsen, Glendora, both of Calif., assignors to Ormco Corporation, Glendora, Calif.

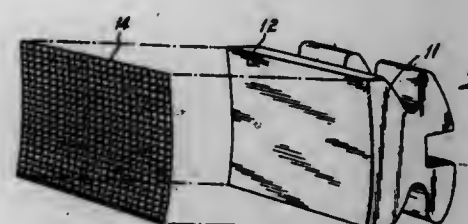
Continuation-in-part of Ser. No. 969,410, Oct. 30, 1992, Pat. No. 5,295,823. This application Mar. 22, 1994, Ser. No. 216,497

The portion of the term of this patent subsequent to Mar. 22, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> A61C 3/00

U.S. Cl. 433—9

6 Claims



1. An orthodontic appliance having improved bonding characteristics, comprising:

a metallic bonding base having a tooth contact surface;

primary mechanical interlock retention means on said tooth contact surface, said primary retention means including undercut regions which facilitate mechanical bonding of said appliance to a tooth enamel surface using a dental adhesive, said primary retention means comprising a mesh bonded to said tooth contact surface; and

secondary mechanical bond strength enhancement means applied to said primary retention means comprising particles applied to said primary retention means by a method selected from the group consisting of plasma spray coating, arc spray coating, flame spray coating and vacuum sputtering; wherein said secondary mechanical bond strength enhancement means is applied to only a portion of said primary retention means.

5,480,302

# ANTI-MICROBIAL APPARATUS AND METHOD FOR DENTAL HANDPIECES

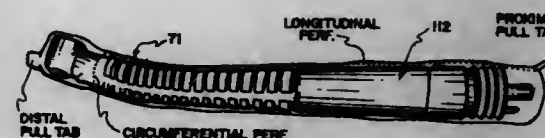
Richard K. Fife, Salt Lake City, Utah, assignor to Gulf Laboratories, Inc., Salt Lake City, Utah

Continuation of Ser. No. 162,682, Dec. 3, 1993, Pat. No. 5,407,354. This application Nov. 7, 1994, Ser. No. 335,618

Int. Cl.<sup>6</sup> A61C 1/16

U.S. Cl. 433—116

6 Claims



1. In combination, an unattached medical or dental handpiece and an anti-contamination collapsible sheath, the handpiece comprising an exterior surface, a distal work-performing end, and a proximal end;

the sheath being contiguously shrunk upon the exterior surface of the handpiece and comprising a closed distal end portion and a second portion disposed proximal of the distal end portion, the distal end portion being connected to the second portion at a circumferential tear line accommodating manual detachment along the circumferential tear line of the distal end portion and removal of the distal end portion from the handpiece thereby exposing the work-performing end of the

handpiece, leaving the second portion contiguous with the handpiece for grasping the handpiece through the second portion.

5,480,303

# GINGIVAL RETRACTION CORD TOOL

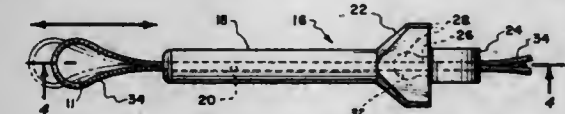
Eric Groth, Camarillo, Calif., assignor to Belpart Company, Inc., Camarillo, Calif.

Filed Aug. 15, 1994, Ser. No. 290,616

Int. Cl.<sup>6</sup> A61C 5/14

U.S. Cl. 433—136

4 Claims



1. A gingival retraction cord tool comprising:

a handle having a front end and a rear end, said handle including an elongated barrel located at said front end and an enlarged body located at said rear end, said enlarged body being fixed to said elongated barrel, said elongated barrel having a longitudinal center axis, a through hole formed through said elongated barrel and said enlarged body, said through hole at said enlarged body being spaced from said longitudinal center axis;

said enlarged body having an outer end, said outer end being connected by connection means to said enlarged body, said outer end being movable by said connection means relative to said enlarged body, movement of said outer end is between a locked position and an unlocked position; and

a cord conducted through said through hole, said cord protruding exteriorly of said through hole both from said front end and said rear end, said cord that protrudes from said front end comprising a loop, with said outer end in said locked position said cord being fixed to said elongated barrel, with said outer end in said unlocked position said cord being slidably movable within said through hole, whereby said loop is to be placed around a tooth with said cord located against the gum supporting the tooth and then said cord is tightened on the tooth by turning of said handle which twists said cord decreasing the size of said loop with said cord being then packed between the gum and the tooth.

5,480,304

# DEVICE FOR PROVIDING QUICK COUPLINGS FOR DENTAL PROSTHESES

Ezio Nardi, Casalecchio Di Reno, Italy, assignor to Rhein 83 Snc di Nardi Ezio & C., Bologna, Italy

Filed Sep. 14, 1994, Ser. No. 305,635

Claims priority, application Italy, Sep. 22, 1993, B093U0193

Int. Cl.<sup>6</sup> A61C 13/12; 13/225; 8/00

U.S. Cl. 433—172

17 Claims

12. Device for providing quick couplings for a dental prosthesis including a fixed part and a removable part, said device comprising:

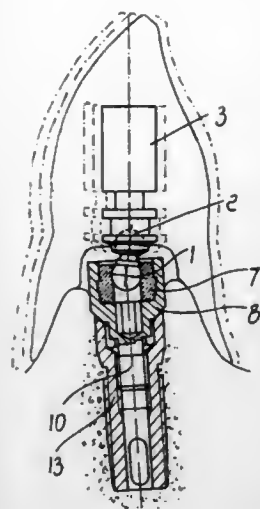
a pin element being rigidly connectable to said removable part of the prosthesis, said pin element being provided at an end thereof with a spherical seat;

a stem member having a first end and a second end, said second end being constituted by a spherical head, said spherical head being rotatably accommodated in said spherical seat for forming a spherical coupling;

a male element being rigidly connected to said first end of said stem member, whereby said stem member and said male element defining a double-male element;

a female element being accommodated in a body, said body being coupleable to said fixed part of the prosthesis so that an inlet of said female element opens at a patient's gum region,





and said male element being rotatably accommodated in said female element for forming a further spherical coupling.

5,480,305

## WEATHER SIMULATION SYSTEM

Bruce C. Montag; Dennis J. Wenzel, and Richard P. Weyrauch, all of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

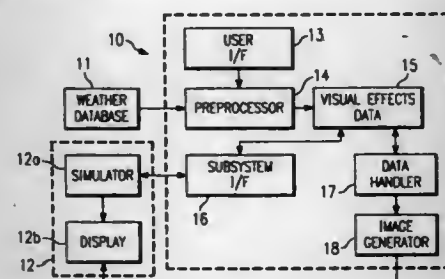
Continuation of Ser. No. 145,761, Oct. 29, 1993. This application Oct. 20, 1994, Ser. No. 326,601

The portion of the term of this patent subsequent to Apr. 25, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> G01S 13/00

U.S. Cl. 434-2

29 Claims



1. A method of using a computer to provide display data representing weather conditions based on real-world weather data, comprising the steps of:

- accessing a real-world weather database to obtain a three-dimensional set of data elements, each data element having at least a location value and a liquid water content value;
- receiving illumination angle data from which the angle of an illumination source with respect to the earth's surface can be calculated;
- calculating a transparency value for each of said data elements, using said liquid water content value and said illumination data;
- culling said data elements to determine which are within a field-of-view, to obtain a set of field-of-view data elements;
- sorting said field-of-view data elements to form a list of data elements in depth order;
- assigning a graphics primitive to each of said field-of-view data elements;
- covering an image plane with the graphic primitives associated with the frontmost of said field-of-view data elements, such that a certain percentage of said image plane is covered;
- repeating said covering step, using said field-of-view data elements in front to back order, until the image plane has been

covered a predetermined number of times or until a predetermined number of said field-of-view data elements have been used; and

assigning said field-of-view data elements to one or more depth bins on the basis of the results of said covering step, so as to generate a prioritized display list.

5,480,306

## LANGUAGE LEARNING APPARATUS AND METHOD UTILIZING OPTICAL CODE AS INPUT MEDIUM

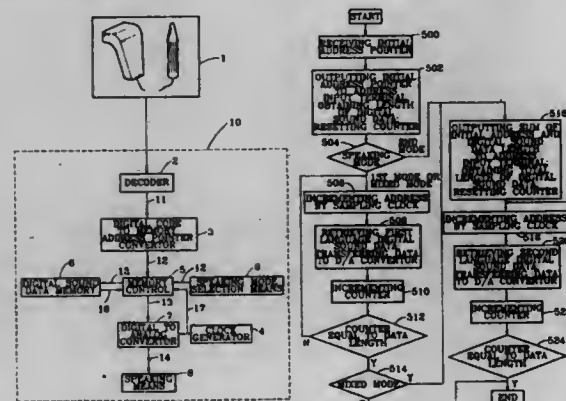
Chih-Yuan Liu, No. 529 Chungshan Road, Chi-Pei City, Hsin-chu Hsien, Taiwan, Prov. of China

Filed Mar. 16, 1994, Ser. No. 213,744

Int. Cl.<sup>6</sup> G09B 19/00

U.S. Cl. 434-156

16 Claims



1. A language learning apparatus comprising: an optical code reader for scanning and converting an optical code into an electrical signal, wherein each optical code including a digital code and a function code; decoder means for converting the electrical signal outputted from the optical code reader into digital code; digital sound data memory means for storing therein digital sound data corresponding to pronunciation of different languages and natural sounds relating to an object represented by said optical code formed separately in advance; digital code to memory address pointer converter means for converting the digital code into an initial memory address pointer associated with an area of said memory means in which associated digital sound data are stored; clock generator means for providing a sampling clock of a first frequency; speaking mode selection means for setting different language speaking modes; memory control means for retrieving the digital sound data stored in said area of the memory means in response to the initial memory address pointer, the sampling frequency of said clock generator means and the setting of said speaking mode selection means; digital to analog converter means for converting the digital data retrieve from said area of the memory means into analog signal; and speaking means for converting the analog signal obtained from said digital converter means into audio signal corresponding to different languages for said optical code at a first speed in accordance with said first frequency.

9. A language learning method comprising the following steps: (1) receiving a plurality of optical codes as input and converting each of the optical codes into electrical signal by using an optical code reader, wherein each optical code including a digital code and a function code; (2) converting the electrical signal outputted from the optical code reader into digital code; (3) converting the digital code into an initial memory address pointer pointing to an area of memory means where associated digital sound data corresponding to pronunciations of

multiple languages and natural sound relating to an object represented by said optical code are stored;

- (4) providing a sampling clock of a first frequency;
- (5) setting different language speaking modes;
- (6) retrieving the digital sound data stored in said area of the memory in response to the initial memory address pointer, the sampling frequency and the setting of the speaking mode;
- (7) converting the digital data retrieved from said area of the memory means into analog signal; and
- (8) converting the analog signal into audio signal at a first speed in accordance with said first frequency.

5,480,307

## TRAINING AND PRACTICE APPARATUS FOR SIMULATING AND PRACTISING CLINICAL DENTAL PROCESSES

Hans-Walter Lang, Leutkirch; Alfred Straka, Isney, and Frank Berlinghoff, Herlitzhofen, all of, Germany, assignors to Kalt-enbach & Voigt GmbH & Co., Biberach/Riss, Germany

PCT No. PCT/EP93/00133, § 371 Date Oct. 7, 1993, § 102(e) Date Oct. 7, 1993, PCT Pub. No. WO93/16457, PCT Pub. Date Aug. 19, 1993

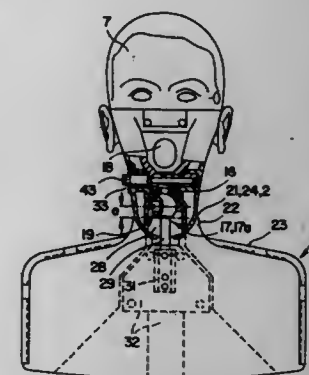
PCT Filed Jan. 21, 1993, Ser. No. 129,145

Claims priority, application Germany, Feb. 11, 1992, 42 03 957.6

Int. Cl.<sup>6</sup> G09B 23/28

U.S. Cl. 434-263

22 Claims



1. Training and practice apparatus for simulating and practicing clinical dental processes, said apparatus comprising a model head, a neck which carries the head, a carrier, a ball joint located within said neck and interconnecting said head and said carrier so that said head can thereby be swivelled into different working positions, a fixing device arranged with said ball joint within said neck, said fixing device being adjustable to fix said ball joint and thereby clamp said head in any swivel position within a given range, and to release said ball joint and thereby release said head for movement to a different swivel position, a tensioning element for adjusting said fixing device, said tensioning element extending from said fixing device within said neck out through an opening in the periphery of the neck, and a handle on the outer surface of said neck and connected to said tensioning element for moving same to adjust said fixing device.

5,480,308

## WOODEN IDENTIFICATION BLOCKS

Henriette E. Boundy, and Bruce K. Boundy, both of 6543 Thornapple River Dr., Alto, Mich. 49302

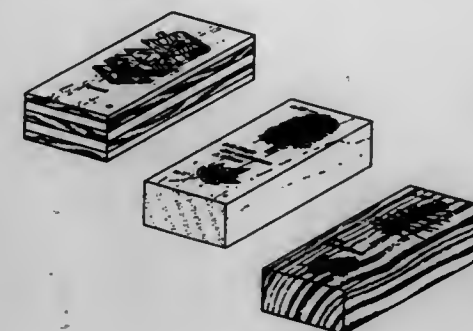
Continuation of Ser. No. 126,059, Sep. 23, 1993, abandoned.

This application Apr. 24, 1995, Ser. No. 427,690

Int. Cl.<sup>6</sup> G09B 23/38

U.S. Cl. 434-296

22 Claims



6. A set of two or more wooden blocks, each block being made of the wood of a different tree species, and having thereon indicia indicating a property of a living tree of the species from which the block is derived, said indicia comprising a picture selected from a group consisting of a picture of a full tree of the species and a picture of a leaf of a living tree of the species.

5,480,309

## UNIVERSAL MULTILAYER BASE BOARD ASSEMBLY FOR INTEGRATED CIRCUITS

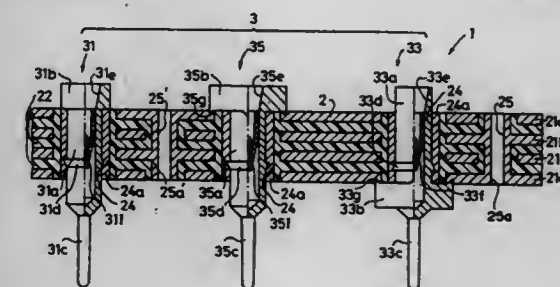
Hiroshi Arisaka, Tama, Japan, assignor to Kel Corporation, Tokyo, Japan

Filed May 23, 1994, Ser. No. 248,067

Int. Cl.<sup>6</sup> H01R 29/00

U.S. Cl. 439-43

6 Claims



1. An electrical connector assembly for connecting a selected one of a plurality of different electronic devices having lead pins in different positions to a printed circuit board comprising: a base board assembly having opposite, device connecting and circuit board connecting faces and comprising a series of conductive and insulating layers located in alternating, overlying relation, with one of the conductive layers providing a ground line and located on one of the opposite faces and another of the conductive layers providing a current source line and located on another of the opposite faces, a plurality of through-holes extending through the conductive and insulating layers and between the opposite faces and means insulating edge portions of respective through-holes from the conductive layers; a plurality of contact elements of first, second and third types each comprising a body portion for mounting in the base board assembly by receipt in a selected through-hole and formed with a pin receiving socket opening at one axial end thereof to the device connecting face for receiving an individual lead pin of a selected electronic device, at least contact



elements of the first type each having a circuit board connecting portion at an axial end of the body portion opposite the one axial end;

- a contact element of the first type remaining insulated from the conductive layers when so mounted in the base board;
- a contact element of the second type having conductive layer connecting means which protrudes from the body portion and is brought into electrically connecting engagement with the conductive layer on one of the opposite faces when the contact element is mounted in the base board by receipt of the body portion in a respective through-hole;
- a contact element of the third type having conductive layer connecting means which protrudes from the body portion and is brought into electrically connecting engagement with the conductive layer on another of the opposite faces when the contact element is mounted in the base board by receipt of the body portion in a respective through-hole; and,
- at least some of the contact elements of the second type and at least some of the contact elements of the third type each have a circuit board connecting portion at an axial end of the body portion opposite the one axial end,
- the through-holes selected for receipt of respective body portions of respective contact elements of the first, second and third types being located in positions corresponding to positions of signal, current and ground circuits, respectively, of the selected electronic device.

5,480,310

## CONNECTOR GROUND CLIP

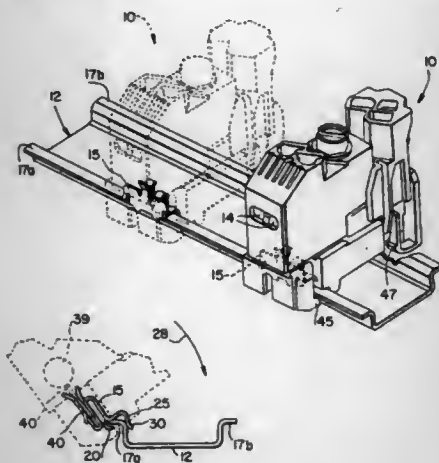
Thomas M. Baum, Fuquay-Varina, N.C., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Oct. 28, 1993, Ser. No. 144,074

Int. Cl.<sup>6</sup> H01R 4/66

U.S. Cl. 439-94

16 Claims



1. A single piece connector ground clip for tool-less establishing an electrical ground connection to a multi-rim grounding bus rail, comprising:

- a) a metallic sheet having longitudinal and transverse axes,
- b) a provision in said sheet for connecting to an electrical conductor to be grounded, and
- c) opposing fingers formed in said sheet for resiliently engaging a rim of such a grounding bus rail sufficiently to establish a low contact resistance electrical ground connection therewith, said fingers being formed in said sheet along bend axes substantially parallel to the plane defined by said longitudinal and transverse axes to provide for resilient flexing of said ground clip along the neutral line thereof for maximizing the flexibility and resiliency of said fingers when engaging such a rail, and said fingers being formed and spaced in said sheet such that they are flexibly spread when in a predetermined position on the rail to resiliently apply pressure to the rail for improved ground connection therewith.

5,480,311  
ELECTRICAL PIPE FITTING WITH INTEGRAL  
GROUNDING FIXTURE

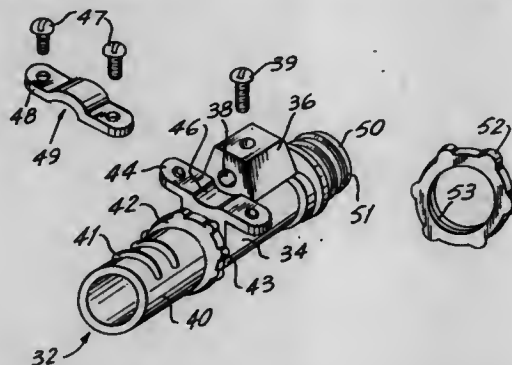
Lu V. Luu, Kowloon, Hong Kong, assignor to Pacomex Co. Ltd., Hong Kong

Filed Jul. 11, 1994, Ser. No. 270,211

Int. Cl.<sup>6</sup> H01R 13/648

U.S. Cl. 439-100

10 Claims



1. An electrical pipe fitting, comprising:
  - a hollow metal tubular member for receiving electrical wire, said tubular member having a first end and a second end, said tubular member being adapted to be coupled to a grounded electrical pipe at said first end, said tubular member also being adapted to be removably connected to an electrical receptacle box at said second end;
  - means for attaching a section of the electrical pipe to the fitting;
  - means for securing the fitting to the receptacle box;
  - a raised portion extending from said tubular member, said raised portion having an aperture for receiving and securing a grounded wire, whereby a ground path is established between the grounding wire and the electrical pipe; and
  - means for securing the grounding wire within the aperture of said raised portion, comprising a screw which extends into said aperture of said raised portion and presses an uninsulated portion of the grounding wire against said hollow tubular member.

5,480,312

PROTECTING CAP FOR PANEL-MOUNTED  
ELECTRICAL CONNECTOR

Kaoru Watanabe, and Hajime Kawase, both of Mie, Japan, assignors to Sumitomo Wiring Systems Ltd., Mie, Japan

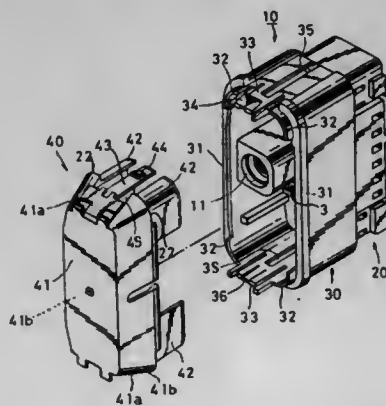
Filed Mar. 10, 1994, Ser. No. 208,278

Claims priority, application Japan, Mar. 11, 1993, 5-016910 U

Int. Cl.<sup>6</sup> H01R 13/44

U.S. Cl. 439-135

8 Claims



1. The combination of a protecting cap and an electrical connector, said electrical connector including a cylindrical portion having

an open end and a plurality of terminals disposed within said cylindrical portion, the protecting cap being attached to said cylindrical portion, and the protecting cap comprising

- a lid portion covering the open end of the cylindrical portion of the connector, the lid portion having faces inclined inwardly in a direction away from the open end of said cylindrical portion

such that the lid portion tapers in said direction away from the open end of said cylindrical portion, and a pair of engagement members engaging the cylindrical portion of the connector and attaching said protecting cap directly to said connector, whereby said protecting cap will protect said terminals during transportation of the electrical connector to a panel to which the connector is to be mounted.

5,480,313

AUTOMATIC DISCONNECT MECHANISM FOR  
ELECTRICAL TERMINAL FITTINGS

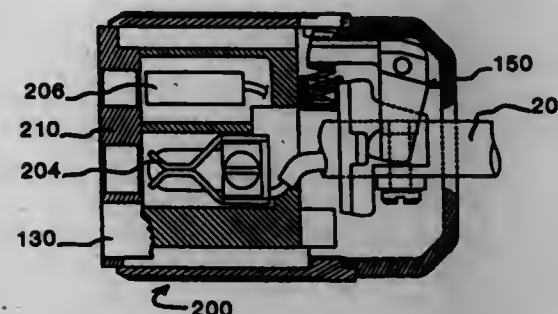
Stephane M. A. d'Alayer de Costemore d'Arc, Genappe, Belgium, assignor to Staar S.A., Brussels, Belgium

Continuation-in-part of Ser. No. 109,535, Aug. 20, 1993, abandoned. This application May 5, 1994, Ser. No. 238,668

Claims priority, application Belgium, Sep. 2, 1992, 92 00777 Int. Cl.<sup>6</sup> H01R 13/62

U.S. Cl. 439-159

17 Claims



1. An electrical fitting to be connected to an end of a cable, including an automatic disconnect mechanism which separates the electrical fitting from a mating electrical fitting responsive to a pull on the cable, the electrical fitting comprising:

- a casing which receives the end of the cable;
- electrical contact elements in the casing adapted to be connected to conductors carried by the cable;
- at least one thrust member mounted in the casing for axial movement in ejection and retraction strokes between retracted and projecting positions;
- a resilient member in the casing;
- a control member mounted in the casing for movement against force produced by the resilient member to a cocked position;
- a trigger system which holds the control member in the cocked position and is actuable to release the control member for movement therefrom;
- a cam which causes the thrust member to move axially responsive to movement of the control member in the ejection and retraction strokes, the thrust member also being movable to the retracted position upon movement of the control member to the cocked position;
- a connection between the cable and the trigger system which causes a pull on the cable of greater than a predetermined force to release the control member from the cocked position, the thrust member being moved axially in the ejection stroke to the projecting position by action of the resilient member after release of the control member to engage a fixed element associated with a mating fitting and cause the casing and the electrical contact elements therein to be moved by reaction and separated from contact elements of the mating fitting.

5,480,314

RETRACTABLE ELECTRIC PLUG

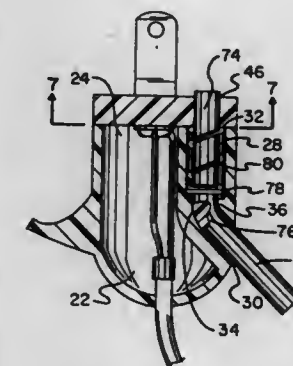
Edward I. Campbell, 107 W. 14th St., Frederick, Md. 21701

Filed Sep. 1, 1994, Ser. No. 298,314

Int. Cl.<sup>6</sup> H01R 13/62

U.S. Cl. 439-159

2 Claims



1. A retractable electric plug for allowing safe and ready removal of itself from an associated electrical receptacle without it or the receptacle being damaged in the removal process comprising, in combination:

- a rigid housing having a dome-shaped base end with a central cable hole disposed thereon adapted for receiving an electrical power cord, a peripheral integral tubular side wall connected to the base end and extended therefrom defining a hollow interior and an opening for allowing access to the interior, an arcuate protrusion extended outwards from the side wall near the base end defining a handle adapted for allowing a user a firm grip, and an elongated bore formed through the side wall at a location diametrically opposed to the handle with the bore having an open first end positioned at a location offset from the base end, a open second end positioned at a location adjacent to and flush with the opening, and a bend therebetween having an inwardly projected surface formed thereon constituting a lip;
  - a planar circular rigid prong plate secured over the opening, the prong plate having two spaced and parallel prong slots formed thereon allowing access to the interior and a plunger hole formed thereon at a location aligned with the second end of the bore;
  - a pair of elongated electrically conductive prongs with each prong having a first end coupled to the prong plate adjacent to the interior and a second end extended through a separate prong slot, the second ends of the prongs adapted to be inserted within an electrical receptacle for receiving electrical power therefrom;
  - an elongated cylindrical plunger having a first leg with a first free end, a second leg with a second free end, a bend formed therebetween, and a flange formed about the second leg at a location adjacent to the bend, the plunger slidably disposed within the bore such that its first free end extends angularly outwards from the first end thereof, its second free end extends outwards from the second end thereof, its bend is positioned within the bend thereof, and the flange is abutable against the lip thereof; and
  - a spring disposed about the second leg of the plunger between the prong plate and the lip, the spring positionable in a biased orientation with the second leg of the plunger projected from the bore, thereby placing the plunger in an extended configuration, the spring positionable in an unbiased orientation with the second leg of the plunger withdrawn into the bore, thereby placing the plunger in a retracted orientation;
- whereby when the prongs are inserted within an electrical receptacle, pushing the first free end of the plunger places the plunger in an extended configuration with its second free end forcibly abuted against the receptacle for extracting the prongs therefrom.



5,480,315  
RIGIDLY SECURABLE WATER RESISTIVE  
ELECTRICAL CONNECTOR

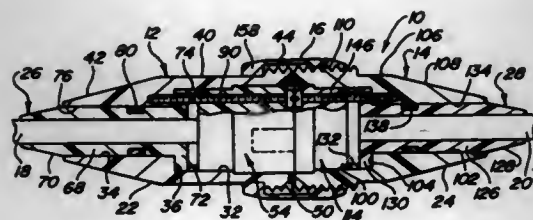
Leonard A. Martinelli, 628 Buena Vista, Lake Orion, Mich. 48362

Filed Dec. 21, 1993, Ser. No. 171,016

Int. Cl.<sup>6</sup> H01R 13/52

U.S. Cl. 439—271

16 Claims



1. An electrical connector assembly comprising:

- a first electrical connector, said first connector including a first electrical unit having a first electrical cable extending therefrom, said electrical unit including at least one extended electrical terminal electrically connected to the first electrical cable, said first connector further including a first insulative protective housing having a first end and a second end, said insulative housing including an internal bore passing therethrough, wherein the first electrical unit is seated within the bore at the first end of the housing and the first cable extends from the bore at the second end of the housing, said first housing being configured in a tapered format such that a diameter of the housing at the first end is larger than a diameter of the housing at the second end;
- a second electrical connector, said second electrical connector including a second electrical unit having a second electrical cable extending therefrom, said second electrical unit including at least one electrical connector electrically connected to the second electrical cable and being adaptable to receive the at least one extended electrical terminal in an electrical engagement, said second electrical connector further including a second insulative protective housing having a first end and a second end, said second insulative housing including an internal bore passing therethrough, wherein said second electrical unit is seated within the bore at the first end of the second housing and the second cable extends from the bore at the second end of the housing, said second housing being configured in a tapered format such that diameter of the second cylindrical housing at the first end is wider than the diameter at the second end;

the first electrical connector further includes a first tip member and the second electrical connector further includes a second tip member, said first tip member being seated within the internal bore of the first housing and said second tip member being seated within the internal bore of the second housing, said first tip member including an internal bore for accepting the first cable from the first electrical unit such that the first electrical cable extends through the tip member and out of the first connector and said second tip member including an internal bore for accepting the second cable from the second electrical unit such that the second electrical cable extends through the second tip member and out of the second connector, said first and second tip members are formed of a sealing material for sealing said cables and housing in a water-tight manner; and

- a sealing ring, said sealing ring being seated within a circumferential channel within a front face of the first insulative housing, said front face being positioned transverse to said internal bore and being adaptable to engage a front face, positioned transverse to said internal bore, of the second housing to form a water resistive seal.

5,480,316  
LOW INSERTION FORCE CARD EDGE CONNECTOR

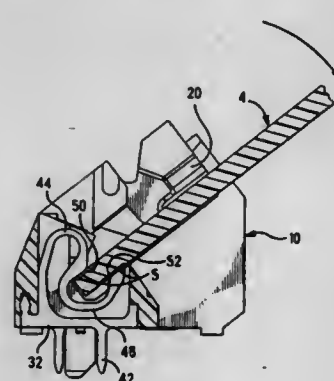
Timothy J. Kinross, Greensboro, and Roger L. Thrus, Clemmons, both of N.C., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Jun. 23, 1994, Ser. No. 264,811

Int. Cl.<sup>6</sup> H01R 13/62

U.S. Cl. 439—326

8 Claims



1. A socket for electrically connecting a circuit card to a substrate, comprising:

- a dielectric housing which defines a slot having opposite side surfaces and an opening to an exterior of the housing for receiving an edge portion of the circuit card therein, and a plurality of cavities communicating with the slot through the side surfaces thereof;

latch members on the housing at opposite ends of the slot for releasably securing the circuit card to the socket; and, a plurality of contacts disposed in respective ones of the cavities, each of the contacts comprising an electrically conductive body including a portion rigidly secured with respect to the housing, a lead extending from the rigidly secured portion outwardly of the housing for engaging a respective circuit trace on the substrate, and an elastic portion extending from the rigidly secured portion along a course which includes first a stress loop and then a contact loop, the contact loop being open toward the slot opening and having a pair of opposed contact points which extend into the slot through the opposite side surfaces for engaging respective contact pads on the circuit card, a first one of the contact points being disposed proximate a junction of the stress loop and the contact loop, the stress loop being open in a direction substantially opposite to the contact loop, the contacts being arranged such that the circuit card is insertable in the slot in a first orientation with a minimal insertion force, and the portion of the circuit card outside of said slot is pivotable in a direction away from the stress loop to a second orientation, wherein the circuit card is securable by the latch members and the contact points are elastically urged into engagement with their respective contact pads.

5,480,317  
SOCKET FOR RECEIVING A THREADED MEMBER  
WHICH PREVENTS CROSS-THREADING

Richard R. Herzog, Arlington Heights, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed Mar. 31, 1994, Ser. No. 220,809

Int. Cl.<sup>6</sup> H01R 4/50

U.S. Cl. 439—340

15 Claims

- 1. A socket for receiving a threaded article therein for complementary threaded engagement between said article and said socket, comprising:

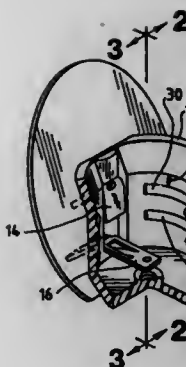
5,480,319  
ELECTRICAL CONNECTOR LATCHING APPARATUS  
Constant G. Vlakandic, 150 Jackson St., Los Gatos, Calif. 95032

Filed Dec. 30, 1993, Ser. No. 176,546

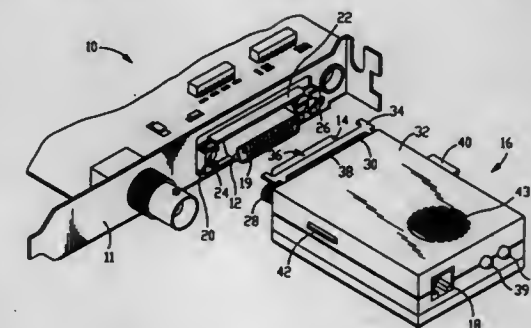
Int. Cl.<sup>6</sup> H01R 4/50

U.S. Cl. 439—347

26 Claims



a first set of threads disposed within axially spaced, radially extending planes and integrally formed upon a first portion of an interior side wall of said socket wherein the entire circumferential length extent of at least one thread of said first set of threads within its respective one of said axially spaced, radially extending planes is shorter than the circumferential lengths of the other threads of said first set of threads within their respective axially spaced, radially extending planes; and at least one engagement member integrally formed upon a second portion of said interior side wall of said socket for cooperative engagement with said article threads in conjunction with said first set of threads of said socket so that upon engagement of said article within said socket, cross-threading is prevented.

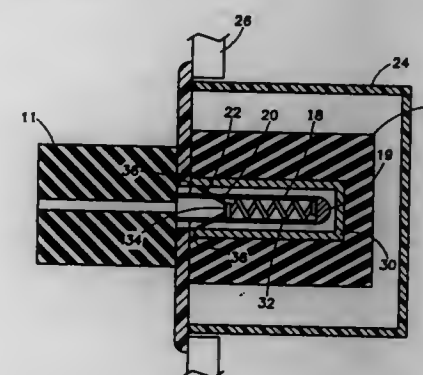


1. An electrical connector latching apparatus for use with a connector for engaging and operating a locking member of a mated connector, the mated connectors defining a locked position and an unlocked position, the locking member being slidable between the two positions, the apparatus comprising:

- a key, the key including:
  - lock engaging means for engaging and sliding the locking member between the locked and the unlocked positions; and
  - support means for slidably disposing the lock engaging means relative to at least one of the connectors.

5,480,318  
CHILDPROOF ELECTRICAL PLUG  
Dale E. Garrison, P.O. Box 157, Richland, Ind. 47634  
Filed Sep. 30, 1994, Ser. No. 315,435  
Int. Cl.<sup>6</sup> H01R 13/639  
U.S. Cl. 439—346

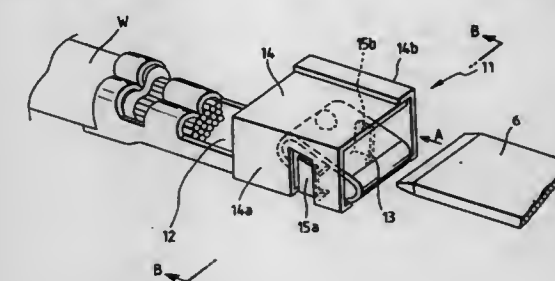
4 Claims



- 1. An electrical plug having a body of insulated material, a pair of contact blades connected to electrical wire conductors and adapted to be received in an electrical receptacle and a grounding means for insertion into a grounding hole of the electrical receptacle, the improvement comprising: a hollow cylindrically shaped grounding blade, sealed at one end and open at the other end, and having a pair of opposed slot like apertures positioned midway between the ends thereof; a V-shaped catch in the hollow grounding blade having arms that are self biased to extend through said slots beyond a wall of the hollow grounding blade, and a spring means positioned in the hollow grounding blade between the catch and the sealed end, said spring means biasing the catch toward the plug body and causing the arms to rest against edges limit of said slots and also to rest against a wall of said grounding hole when said plug is inserted in said receptacle.

5,480,320  
ELECTRICAL CONNECTION ELEMENT  
Tetsuro Saimoto, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan  
Filed Sep. 12, 1994, Ser. No. 304,708  
Claims priority, application Japan, Sep. 14, 1993, 5-251005  
Int. Cl.<sup>6</sup> H01R 11/22  
U.S. Cl. 439—852

7 Claims



- 1. An electrical connection element comprising:
  - a body member including an electrical connection portion for resiliently receiving a male terminal, said electrical connection portion having opposing top and bottom walls and including:
    - a resilient connection portion formed by resiliently deformably folding said bottom wall, said male terminal adapted to be resiliently received between the resilient connecting portion and said top wall; and
    - a plurality of flexure prevention pieces for preventing an excessive deformation of the resilient connection portion, said prevention pieces extending from said bottom wall toward said resilient connecting portion such that distal ends thereof are contacted by a back side of the resilient connecting portion when the resilient connecting portion is deformed to a predetermined degree.

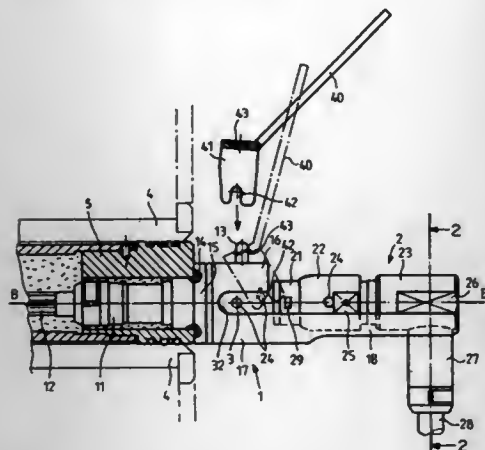


5,480,321

**SOCKET SUITABLE FOR REMOTE MANIPULATION AND PLUG-SOCKET SYSTEM COMPRISING IT**  
Maurice Rouhier, Viroflay, and Jean-Louis Striebig, Chennevières, both of, France, assignors to Framatome Connectors International, Paris la Defense, France  
Filed Nov. 4, 1993, Ser. No. 145,736  
Claims priority, application France, Nov. 4, 1992, 92 13225  
Int. Cl.<sup>6</sup> H01R 13/64

U.S. Cl. 439—374

11 Claims



1. Socket adapted to be manipulated under remote control and having a plug insertion guide fork, wherein one branch of said fork has an extension provided with angular polarizer means and said extension comprises two angular polarizer means and said extension comprises two arms separated by a slot constituting said angular polarizer means, at least one of said arms having a plug bearing region.

5,480,322

**MULTI-POLE CONNECTOR**

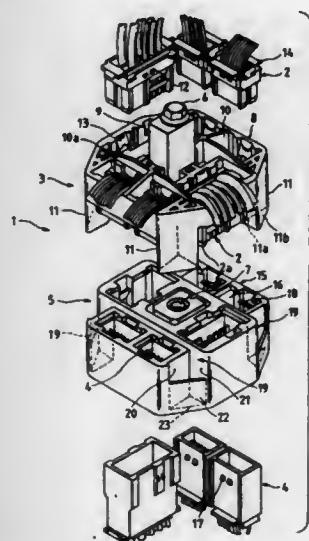
Takashi Ishii, Tamio Watanabe, and Toru Nagano, all of Shi-  
zuoka, Japan, assignors to Yazaki Corporation, Tokyo,  
Japan

Filed Jan. 25, 1994, Ser. No. 186,147

Claims priority, application Japan, Jan. 25, 1993, 5-009824  
Int. Cl.<sup>6</sup> H01R 13/629

U.S. Cl. 439—378

3 Claims



1. A multi-pole connector assembly comprising:

a first frame accommodating a plurality of male connectors in such a manner that the male connectors project from the first frame in a forward direction, each of said male connectors including a discrete housing receiving and retaining a plurality of male terminals;  
a second frame accommodating a plurality of female connectors, for respective engagement with the male connectors, each of said female connectors including a discrete housing with a plurality of female terminals;  
a rib disposed on one of said first frame and said second frame;  
a rib reception guide provided on another of said first and second frames for receiving said rib; and  
connecting means for connecting said first and second frames to each other, wherein the rib reception guide is formed by extending an outer wall of the second frame to a height substantially half of that of the second frame and by a bottom wall which is formed integrally with the outer wall.

5,480,323

**CONNECTION STRUCTURE FOR AT LEAST ONE ELECTRICAL DEVICE**

Hans-Peter Mews, and Norbert Rüster, both of Lüdenscheid, Germany, assignors to Vossloh-Schwabe GmbH, Urbach, Germany

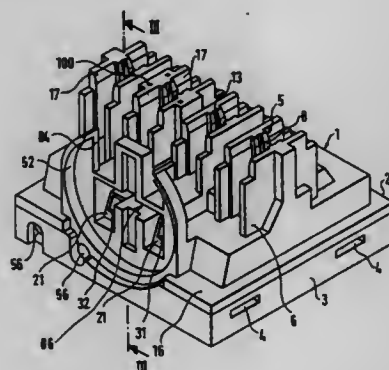
Filed Apr. 20, 1994, Ser. No. 230,056

Claims priority, application Germany, Apr. 20, 1993, 43 12 781.9

Int. Cl.<sup>6</sup> H01R 4/24

U.S. Cl. 439—395

28 Claims



1. A connection structure for at least one electrical device (53), optionally a capacitor, comprising  
a housing (1) of electrically insulating material, said housing being formed with attachment means (74) for attachment to a support;  
spatially separated electrical connection points (16, 31, 32, 38) for electrically conductive parts;  
contact means (21, 22) electrically conductively joined to said connection points,  
at least one (16) connection point being formed as a slit-blade insulation-piercing connector, and at least one other (31, 32, 38) connection point being formed as a plug or push-in connector;  
a reception region, including socket (52), for said electrical device (53) formed on said housing,  
at least one (31) of said connection points being located in the reception region (52); and  
shock-protection means (17, 49, 50, 56) formed from portions of said electrically insulating housing (1) protecting each of said connection points (16, 31, 32, 38) against accidental and undesired electrical contact.

5,480,324

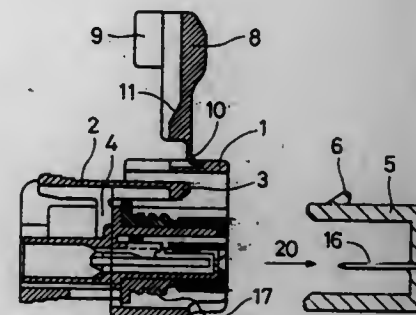
**METHOD AND APPARATUS FOR VISIBLY INDICATING A PROPERLY FITTED CONNECTOR**  
Akihito Maegawa, and Kiyofumi Ichida, both of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Mie, Japan

Filed Jul. 27, 1994, Ser. No. 281,178

Claims priority, application Japan, Jul. 28, 1993, 5-207245  
Int. Cl.<sup>6</sup> H01R 3/00

U.S. Cl. 439—489

18 Claims



1. An electrical connector adapted to be releasably fitted relative to a mating electrical connector, comprising a connector housing having a lock arm that is engageable with an engagement portion provided on a mating housing of said mating connector to hold the connector and mating housings in an engaged condition when the mating connector housing is engaged with the connector housing; a cover for covering said lock arm mounted through a self-hinge portion on said connector housing for pivotal movement between an open position and a closed position; and a non-engagement detection projection for maintaining said cover in a raised position when said lock arm is not engaged, said non-engagement detection projection being formed between said lock arm and said cover.

5,480,325

**COAXIAL CONNECTOR PLUG AND METHOD FOR ASSEMBLY**

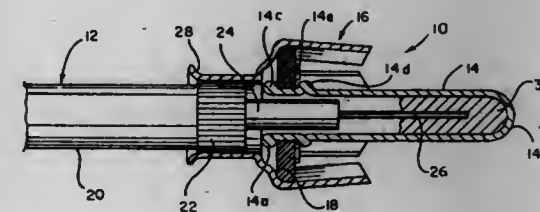
Nam D. Tran; Peter B. Nguyen, and Richard J. MacConnell, all of Fort Worth, Tex., assignors to Tandy Corporation, Fort Worth, Tex.

Filed May 27, 1994; Ser. No. 250,581

Int. Cl.<sup>6</sup> H01R 9/07

U.S. Cl. 439—578

19 Claims



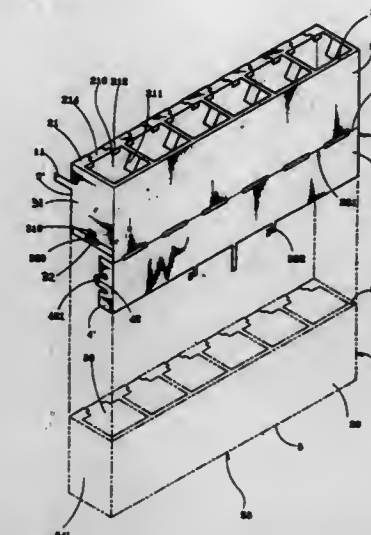
1. A coaxial connector plug comprising:  
a conductive housing;  
a hollow cylindrical center pin extending from said housing, said center pin having an open end for receiving a center conductor of a coaxial cable, and an entirely closed tip;  
means for electrically insulating said housing from said center pin; and  
means disposed in said entirely closed tip of said center pin for establishing a permanent connection between said center pin and said center conductor disposed in said center pin.

5,480,326

**ELECTRICAL JACK ASSEMBLY FOR MODULAR PLUGS**  
Michael Chen, No. 11, Alley 16, Lane 337, Sec. 1, Ta Tung Rd., Hsi Chih Chen Taipei Hsien, Taiwan, Prov. of China  
Filed Mar. 16, 1994, Ser. No. 214,117  
Int. Cl.<sup>6</sup> H01R 13/648

U.S. Cl. 439—607

4 Claims



1. An electrical jack assembly comprising a jack unit and an electrical shielding metal shell covered on said jack unit, said jack unit formed with a rectangular configuration having a front side with a plurality of plug holes, a back side, a top side, a bottom side for mounting on a printed circuit board, and two opposite lateral sides, wherein said electrical shielding metal shell is made from a single metal plate comprising a first panel covered over the front side of said jack unit, a second panel covered over the top side of said jack unit, a third panel covered over the back side of said jack unit, two side panels respectively extended from said first panel at two opposite sides thereof and covered on the two opposite lateral sides of said jack unit, two side wings respectively extended from said third panel at two opposite sides thereof and fastened to said side panels and covered on the two opposite lateral sides of said jack unit at a lower portion of each of said lateral sides a first folding line disposed between said first panel and said second panel, and a second folding line disposed between said second panel and said third panel, each of said side panels including a first flat panel portion extended from a side of said first panel and a second flat panel portion extended and offset from the first flat panel portion said second flat panel portion having a slot in the middle thereof adjacent to said first flat panel portion, said first flat panel portion having a slot in the middle thereof adjacent to said second flat panel portion, each of said side wings including a projection inserted into the slot of the second flat panel portion of either side panel and a hooked portion raised from the projection and hooked in the slot on the first flat panel portion of the corresponding side panel.

5,480,327

**ELECTRICAL CONNECTOR FOR CABLE**

Thomas J. Zola, Harrisburg, Pa., assignor to The Whitaker Corporation, Wilmington, Del.

Filed May 24, 1994, Ser. No. 247,956

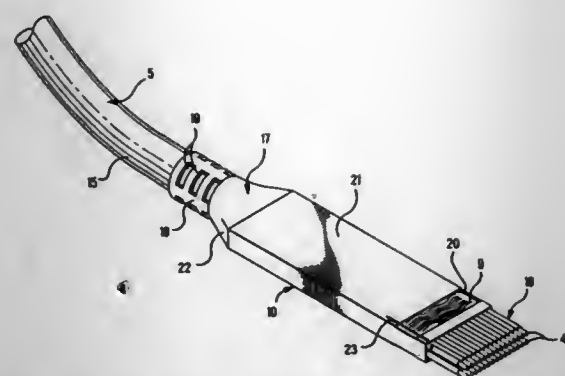
Int. Cl.<sup>6</sup> H01R 13/648

U.S. Cl. 439—607

20 Claims

1. A cable connector comprising: an insulating housing insert mounting electrical contacts connected to respective wires of an electrical cable, conductive shielding encircling the housing insert and being connected to a conductive shield of the cable, an insulative overmold surrounding a section of a round electrical cable transformed into a thin and wide section in which multiple





wires of the cable are grouped together, side by side, within said section, and the conductive shielding encircling the overmold.

5,480,328

### FILTER PLUG CONNECTOR HAVING A SHIELD HOUSING

Michael Roth; Karl Schneider, both of Munich; Ernst Liebich, Geltendorf; Josef Dirmeyer, Bodenwöhr; Egbert Wagner, Barbing, all of, Germany, and Peter Moerkerke, Oostende, Belgium, assignors to Siemens Aktiengesellschaft, Munich, Germany

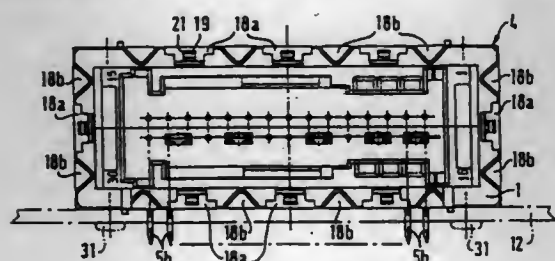
Filed Dec. 29, 1994, Ser. No. 365,690

Claims priority, application Germany, Jun. 29, 1992, 9208703 U

Int. Cl.<sup>6</sup> H01R 13/648

U.S. Cl. 439—607

13 Claims



1. A filter plug connector, comprising:
  - a) a strip body being formed of insulating material and having a front with latching devices, a rear and side walls;
  - b) a ferrite core configuration having holes formed therein;
  - c) a chamber being formed by said strip body, having an open rear for receiving said ferrite core configuration and having a base;
  - d) a number of parallel plug pins being disposed in a grid, entering said chamber from the rear and emerging through said base of said chamber to the front of said strip body, at least some of said plug pins being guided in said chamber by said holes in said ferrite core configuration;
  - e) a shield housing covering said side walls and at least part of the rear of said strip body and of said chamber, said shield housing having a cut out formed therein for said plug pins, having resilient side parts engaging over said side walls of said strip body, having bends on said side parts latching onto said latching devices on the front of said strip body, having edges on said side parts, and having an outer surface;
  - f) a capacitive filter element for receiving a number of said plug pins, said filter element being soldered to said plug pins and to said shield housing at said outer surface of said shield housing opposite said rear of said chamber;
  - g) said bends on said resilient side parts of said shield housing being mutually separate and mutually parallel individual spring arms;
  - h) all of said spring arms being bent inwards from said edges of said side parts;

- i) some of said spring arms on each of said side parts lying alongside one another and alternately forming contact elements for making contact between said shield housing and a mounting panel and sliding and latching elements for connecting said shield housing to said strip body;
- j) said contact elements being bent inwards and inclined relative to a plugging direction;
- k) said sliding and latching elements being bent inwards at right angles from said side parts, having latching devices, and having free ends being bent back transversely relative to the plugging direction to form a radius;
- l) said side walls of said strip body having depressions formed therein for said contact elements and having lead-in and sliding inclines for said sliding and latching elements, to expand said side parts during connection of said shield housing and said strip body; and
- m) said latching devices of said sliding and latching elements springing inwards on said latching devices on the front of said strip body for automatically latching said sliding and latching elements, after passing over said lead-in and sliding inclines.

5,480,329

### PLUG CONNECTOR HOUSING

Anders Karlström, Dammweg 9, D-91728 Gnotzheim; Herbert Haiduk, Am Einsiedel 24, D-91785 Pleinfeld, and Gerhard Schüle, Kaadenerstr. 3, D-91785 Pleinfeld, all of, Germany

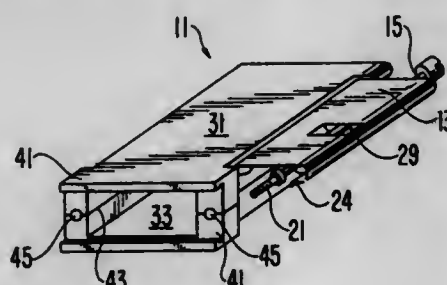
Filed Mar. 17, 1994, Ser. No. 214,898

Claims priority, application Germany, Mar. 19, 1993, 9304119 U

Int. Cl.<sup>6</sup> H01R 13/514

U.S. Cl. 439—731

15 Claims



1. A plug connector housing comprising:
  - a pair of housing pads which are subdivided longitudinally in a direction of plug insertion, the housing pads defining at least one channel in one of two opposing longitudinal sides of the housing pads; at least one spring clamp that is snapped onto the pair of housing parts, which are assembled such that the at least one spring clamp extends over one of the two opposing longitudinal sides of the housing pads; and
  - at least one mounting element insertable through the at least one channel, the at least one mounting element being positioned by the at least one spring clamp, whereby the at least one mounting element extends out an end face of the plug connector housing to secure the plug connector housing to a mating plug connector, the at least one spring clamp is provided with a mounting element fastener for positioning the at least one mounting element such that the mounting element is moveable with respect to the at least one spring clamp, but is not separable therewith, and wherein when the at least one spring clamp is snapped onto the plug housing, the mounting element is disposed in alignment with the channel.

5,480,330

### MARINE PROPULSION PUMP WITH TWO COUNTER ROTATING IMPELLERS

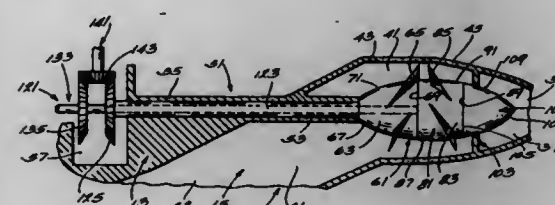
Peter W. Brown, Hartland, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 4, 1994, Ser. No. 321,053

Int. Cl.<sup>6</sup> B63H 11/00

U.S. Cl. 440—38

7 Claims



1. A marine propulsion water pump including a drive housing adapted to be fixed to a boat hull and including a water tunnel having an interior and including an inlet, an outlet, an intermediate portion between said inlet and said outlet and including a forward cylindrical subsection and a rearward conical subsection, and an impeller shaft passage communicating with said interior of said water tunnel, a first impeller located in said cylindrical subsection in said intermediate portion of said water tunnel, a second impeller located partially in said cylindrical subsection and partially in said conical subsection of said intermediate portion of said water tunnel and rearwardly of said first impeller, a first shaft drivingly connected to said first impeller and having a hollow interior, a second shaft drivingly connected to said second impeller, extending in said hollow interior of said first shaft and forwardly therefrom, and means located forwardly of said impeller shaft passage for counter-rotating said first and second shafts.

5,480,331

### FLEXIBLE SURFBOARD FIN

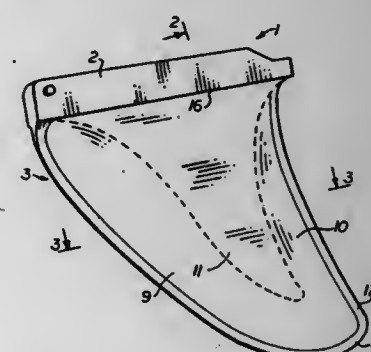
Tommy R. Lewis, Olivenhain, Calif., assignor to John R. Nickel, Cardiff, Calif.

Filed Apr. 17, 1995, Ser. No. 425,034

Int. Cl.<sup>6</sup> B63B 1/00

U.S. Cl. 441—79

8 Claims



1. A resiliently flexible fin or keel for use on watercraft which comprises:
  - a flat core sheet having limited lateral resilient flexibility, said core sheet having a right face and a left face, said core sheet being limited by a mounting side and a peripheral edge extending from fore to aft;
  - a first slab of resiliently compressible material bonded to said right face; and
  - a second slab of resiliently compressible foam material symmetrical to said first slab bonded to said left face.

5,480,332

### MULTIPLE VICTIM RESCUE DEVICE

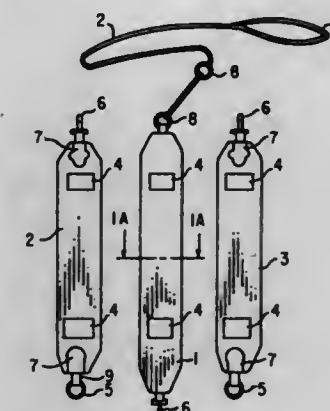
Sam Cynamon, 517 Wyoming Ave., Millburn, N.J. 07041

Filed Apr. 25, 1994, Ser. No. 232,691

Int. Cl.<sup>6</sup> B63C 9/26

U.S. Cl. 441—80

11 Claims



1. A multiple victim rescue flotation device, comprising: at least three elongate resilient buoyant members each having two ends and a peripheral surface with at least one planar outer surface portion; first connecting means provided on the at least one planar surface portion of each of said members for releasably connecting together said members so that when connected together the members form a single flotation unit in which one of said members is centrally arranged and the remaining members are releasably connected to the peripheral surface of the central member whereby the first connecting means permits the elongate members to be disconnected to provide flotation for multiple victims; a tow line fixed to one end of the central member; and second connecting means for releasably connecting said members together end to end and for releasably connecting together both ends of a single one of said members.

5,480,333

### LOCOMOTIVE CONTROL SIMULATOR ATTACHMENT FOR MODEL ELECTRIC TRAIN CONTROLLERS

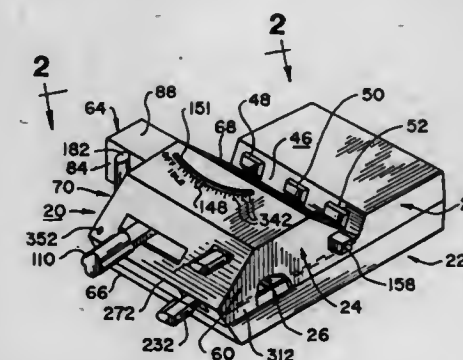
Bradley S. Larson, 5224 Arbor La., Crestwood, Ill. 60445-1206

Filed May 16, 1994, Ser. No. 243,686

Int. Cl.<sup>6</sup> A63H 17/20; 29/20; B60L 15/00

U.S. Cl. 446—7

10 Claims



1. A locomotive control simulator attachment for a model electric train controller, said controller including a throttle control shaft having a portion protruding from the controller and being reciprocally rotatable for regulating the train speed, said attachment comprising, in combination:
  - a support adapted to be attached to said controller in register with said protruding shaft portion;



means engageable with said protruding shaft portion for reciprocally rotating the shaft when said support is attached to said controller;

a throttle control lever simulating a locomotive throttle;

means for mounting said throttle control lever on said support permitting reciprocal pivotal movement of the lever; and

means for connecting said throttle control lever to said engageable means for operating the engageable means to reciprocally rotate said throttle control shaft upon said reciprocally pivotal movement of said throttle control lever, thereby allowing a user to regulate power applied to a model train controlled by said controller having said attachment attached thereto, with said throttle control lever reciprocal movement simulating the movement of a full-scale railroad locomotive throttle.

5,480,334

# **NESTED AUTOMATICALLY SEPARABLE FLYING DISK ASSEMBLY**

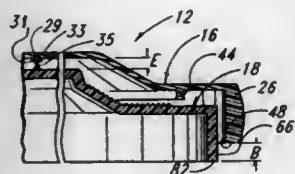
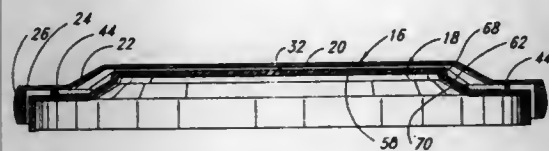
James M. Wilson, 3330 Templeton Gap Rd. #32, Colorado Springs, Colo. 80907, and Dean M. Wilson, 1071 Warren Rd., No. 10, Ithaca, N.Y. 14850

Filed Apr. 22, 1994, Ser. No. 231,165

Int. Cl.<sup>6</sup> A63H 27/00

U.S. Cl. 446—46

15 Claims



1. A nested automatically separable flying disk assembly, comprising:

- a) an outer disk assembly includes a central body section having a first inner diameter;
- b) an inner disk assembly including a top wall section and a first outer diameter;
- c) a separator means between said outer disk assembly and said inner disk assembly;
- d) said first outer diameter is less than said first inner diameter to permit said inner disk assembly to be nested within said outer disk assembly with said separator means maintaining a predetermined spacing between said outer disk assembly and said inner disk assembly to permit air flow therebetween during flight to aid in flight separation therebetween; and
- e) said separator means having a nub projection which is adjustable to increase or decrease said predetermined spacing.

5,480,335

# **TOY FOR MAKING SIMULATED FRENCH FRIES FROM CHEWING GUM STICKS**

Martin J. Caveza, Redondo Beach, Calif., assignor to Mattel, Inc., El Segundo, Calif.

Filed Feb. 2, 1995, Ser. No. 383,154

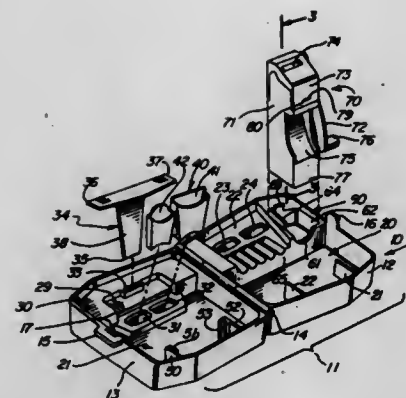
Int. Cl.<sup>6</sup> A63H 33/30

U.S. Cl. 446—75

8 Claims

1. A toy for making simulated french fries from one or more chewing gum sticks comprising:

- a case having a pair of case portions and a coupling hinge, said case portions capable of pivoting between an overlying closed position and an open coplanar position, said case portions



defining a base and a cover and creating an interior cavity when in said closed position;

a gum shredder having means for slicing a stick of gum into a plurality of elongated gum ribbons; said cover having means for snugly receiving said shredder in an operable position and said cavity being sized to house said shredder in a collapsed position and

a gum ribbon holder having a first pocket formed therein for receiving a plurality of said gum ribbons to form a simulated french fry order.

5,480,336

# **WATER TOY CONSTRUCTION KIT**

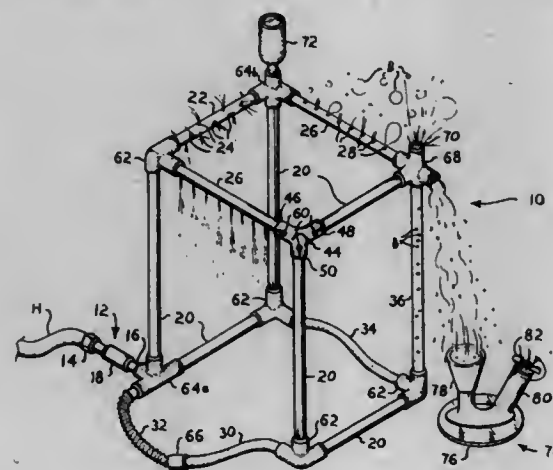
Cheri A. Blanchard, 13625 Timberridge Ave., Baton Rouge, La. 70817

Filed Dec. 14, 1994, Ser. No. 355,698

Int. Cl.<sup>6</sup> A63H 33/04; 33/30

U.S. Cl. 446—89

17 Claims



1. A water toy construction kit, comprising:

a plurality of differently configured tubular elements and a plurality of connectors therefor, at least one of said tubular elements being transparent, with said tubular elements and said connectors being adapted to dispense water therethrough and therefrom and to provide a variety of different effects due to water flowing therethrough and therefrom,

each of said tubular elements including opposite first and second ends having identical outside diameters, and each of said connectors having at least two connecting ends having identical inside diameters, with said outside diameters of said tubular element ends adapted to mate closely with said inside diameters of said connector connecting ends to provide for removable mating frictional attachment of said tubular elements with said connectors and further to produce substantially leak resistant connecting joints when said tubular ele-

ment ends are removably inserted into said connector connection ends to form a structure;

at least one connector with mounting means for the attachment of a container for the introduction of foreign matter into an assembled structure formed of said tubular elements and said connectors, with said foreign matter being water soluble dyes of any of a variety of colors; and

at least one adapter having a threaded end providing for the removable connection of a conventional garden hose having an outlet end to a corresponding one of said connectors of said kit, said adapter having an inlet end compatibly and removably connectible to the conventional garden hose outlet end, an opposite outlet end compatibly and rigidly removably connectible to said at least one of said connectors of said kit, and further including mass means to restrict inadvertent movement of said garden hose outlet end, said adapter, and said at least one of said connectors rigidly connected thereto and any structure connectibly extending therefrom, due to water flow therethrough, whereby the water toy construction kit is used to assemble a structure comprising a plurality of said tubular members removably connected to a plurality of said connectors and is removably connected to the conventional garden hose by means of said adapter, and the garden hose is used to supply water flow to and through the structure with the structure thereby providing a variety of different effects due to water flowing therethrough and therefrom.

5,480,337

# **COMBINATION DIVERSE DOLL AND EDUCATIONAL ACTIVITY PLAYSET METHOD**

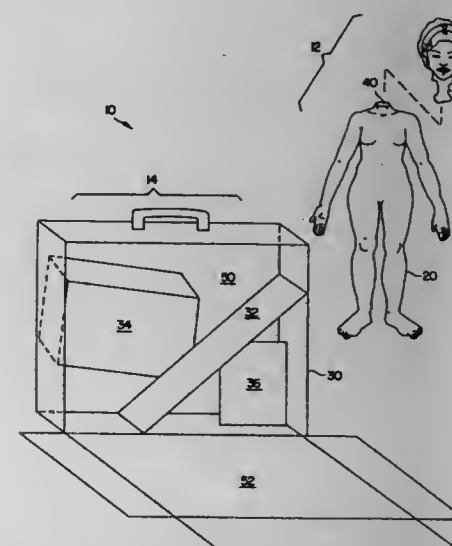
Jennifer K. Baker, 170 W. Laurel St., Philadelphia, Pa. 19123

Filed Sep. 21, 1994, Ser. No. 309,905

Int. Cl.<sup>6</sup> A63H 3/16

U.S. Cl. 446—100

3 Claims



1. A method of educational play with a combination doll and an adult activity, educational playset, comprising the steps of:

- providing a plurality of alternative doll wigs;
- providing a plurality of alternative doll heads and forming the doll heads to include interchangeable means for receiving a given wig chosen from the plurality of alternative doll wigs and a releasable locking means for releasably locking the heads onto a doll body;
- providing a doll body and forming the body with interchangeable means for receiving a given doll head chosen from the plurality of alternative doll heads, said doll body with made from a moldable material, said moldable material being

molded into a female form with enlarged waist, hips and legs to simulate non-ideal, obvious surplus body fat in the waist, hips and legs;

choosing from among the alternative doll wigs and doll head and assembling the doll body with the chosen wig and head to form the doll;

providing a plurality of adult activity, educational playsets for role-playing in a given adult activity, wherein a given adult activity, educational playset is a kit of at least two items selected from the group consisting of an adult activity instruction sheet, an adult activity prop, an adult activity gameboard, and a wardrobe, sized and proportioned to adorn the doll body, styled in a manner to complement role-playing in the corresponding, given adult activity;

choosing from among the adult activity playsets and outfitting the doll in the wardrobe of the given adult activity; and,

allowing the user to role play in the given adult activity, the user being limited in role-playing with the doll in the given adult activity such that the role-playing occurs from the vantage point of an adult with non-idealized rather than idealized proportions in the waist, hips, and legs by virtue of the doll body having obvious surplus fat in the waist, hips and legs, whereby the user is freed of social pressure and apprehensions respecting appearance while role-playing with said combination doll and adult activity, educational playset.

5,480,338

# **LUMINESCENT SCREEN IMAGE MAKING TOY**

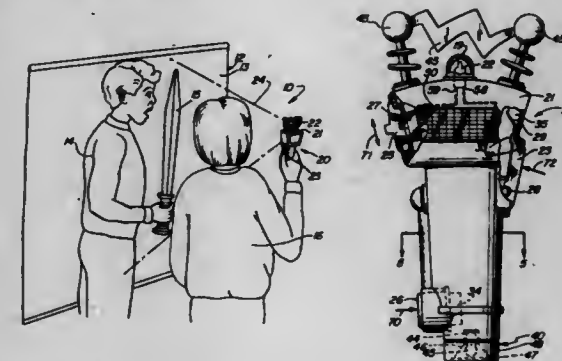
Mark J. Barthold, Redondo Beach, Calif., assignor to Mattel, Inc., El Segundo, Calif.

Filed Feb. 9, 1995, Ser. No. 385,618

Int. Cl.<sup>6</sup> A63H 33/22

U.S. Cl. 446—219

8 Claims



1. A luminescent image making toy comprising:

a luminescent screen defining a luminescent image surface;

a light unit housing defining an interior cavity;

strobe light means for producing a short-duration burst of light energy supported within said interior cavity;

a strobe trigger coupled to said strobe light means;

directed light means for producing a long duration directed beam of light energy supported within said interior cavity; and

a directed light control button for operating said directed light means.

5,480,339

# **AUTOMATICALLY INFLATABLE TOY**

Teng-Hui Wu, Taipei, Taiwan, Prov. of China, assignor to Chieh Chang Co., Ltd., Taiwan, Prov. of China

Filed Jan. 3, 1995, Ser. No. 368,020

Int. Cl.<sup>6</sup> A63H 27/10

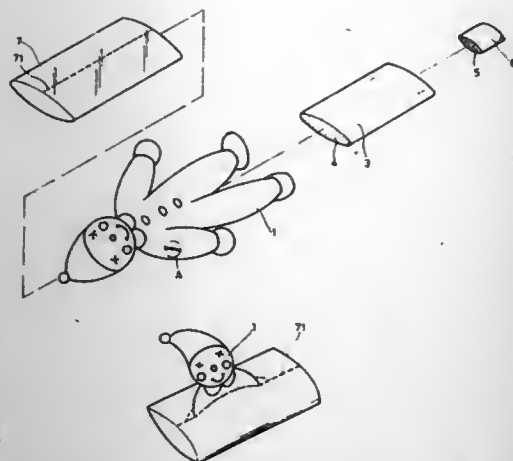
U.S. Cl. 446—220

1 Claim

1. An inflatable toy comprising:

an outer package including a weakening line formed therein;





- a toy body disposed in said outer package and made of multi-layered laminated material and including an inner surface;  
 a first bag disposed in said toy body and made of compound materials;  
 a powder type sodium bi-carbonate material contained in said first bag;  
 a second bag disposed in said toy body and disposed within said powder type sodium bi-carbonate material;  
 a citric acid solution disposed in said second bag, said citric acid solution being moved out of said second bag for acting with said powder type sodium bi-carbonate material so as to generate carbon dioxide and so as to inflate said toy body when said second bag is broken; and  
 a galvanized coating applied to said inner surface of said toy body so as to form an air tight seal for said toy body;  
 said first bag being made of cloth materials for absorbing moisture and for allowing escaping of the carbon dioxide from said first bag to said toy body, and  
 said toy body being movable out of said outer package via said weakening line when said toy body is inflated.

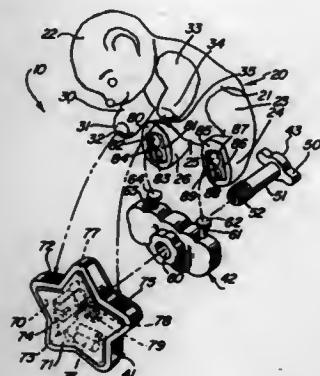
5,480,340

**CRIB TOY HAVING REMOVABLE PLUSH FIGURE**  
 Brett M. Bogar, Torrance, Calif., assignor to Mattel, Inc., El Segundo, Calif.

Filed Sep. 23, 1994, Ser. No. 311,684  
 Int. Cl.<sup>6</sup> A63H 33/00; 21/02; 3/02

U.S. Cl. 446—227

11 Claims



1. For use in combination with a children's crib having a sidewall having spaced apart supports surrounding a crib interior, a crib toy comprising:  
 a front housing defining a front face and a rear face;  
 a rear housing;  
 clamping means for securing said front and rear housings to the crib sidewall with said front housing within said crib interior and said rear housing outside said crib interior;

- a plush toy figure having a plurality of front and rear appendages;  
 first attachment means supported upon said front housing and said front appendages to releasably attach said front appendages to said front housing; and  
 second attachment means supported upon said rear housing and said rear appendages for removably attaching said rear appendages to said rear housing such that said plush toy figure straddles the crib sidewall and such that said second attachment means lock said rear appendages to said rear housing when said plush toy figure is pulled toward said crib interior whereby an infant in said crib interior is prevented from pulling said plush toy figure into said crib interior.

5,480,341

**EDUCATIONAL SKELETON TOY WITH OUTER SHELL**  
 Andrew E. Plakos, Irvine, Calif., assignor to Strotman International, Inc., Irvine, Calif.

Filed Oct. 21, 1994, Ser. No. 327,397  
 Int. Cl.<sup>6</sup> A63H 3/16

U.S. Cl. 446—373

13 Claims



1. An educational and recreational toy structure representative of a dinosaur, comprising:  
 a unitary skeletal body having at least one projecting predetermined part, said body dimensioned and configured to represent the skeleton of a dinosaur, said skeletal body being pigmented with a glow-in-the-dark material;  
 a shell for encasing said skeletal body and having an external configuration and appearance representative of the outer surface skin of said dinosaur;  
 said shell comprising a pair of mating shell halves, dimensioned and configured to cover less than the entire said unitary skeletal body to allow projection of said at least one predetermined part of said unitary skeleton outside said shell; and  
 means for detachably securing said shell about said skeletal body; whereby  
 said shell may be readily attached about said skeletal body and readily detached therefrom so that said toy may be alternately configured to represent a complete dinosaur and the skeletal structure of said dinosaur.

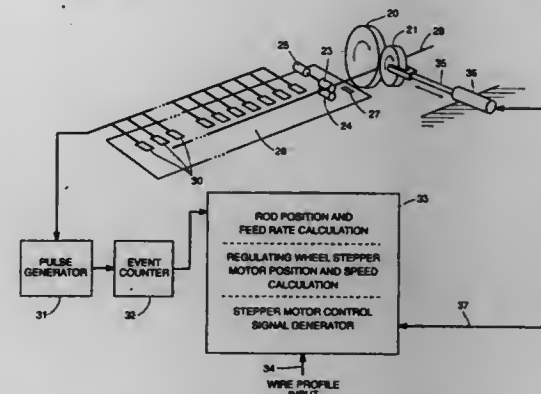
5,480,342  
**CENTERLESS GRINDING MACHINE CONTROL SYSTEM**

John Bannayan, New York, N.Y., and Robert C. Gleason, Butler, N.J., assignors to Glebar Company, Inc., Franklin Lakes, N.J.

Filed Jan. 31, 1994, Ser. No. 188,926  
 Int. Cl.<sup>6</sup> B24B 49/12

U.S. Cl. 451—5

9 Claims



1. In a centerless grinding machine for grinding an object at the nip between a grinding wheel and a regulating wheel, wherein one of the wheels is moveable for being adjustably positioned with respect to the other wheel to vary the amount of grinding to which the object is subjected, a control system for providing output control signals for use in adjusting the position of the moveable wheel, comprising:

sensor means for sensing, throughout a grinding process, the longitudinal position of an elongated object that is being fed into the grinding machine, and for producing signals indicating the position of said object;  
 calculating means coupled to said sensor means for receiving said signals and for calculating a feed rate signal indicating the feed rate of said object throughout the grinding process;  
 processing means coupled to said calculating means for receiving and storing data which defines the desired shape of the object as it is to appear after grinding has been completed and for calculating the desired position and rate of movement that the moveable wheel should assume throughout the grinding process to produce an object in accordance with said stored data, wherein said processing means continuously recalculates said desired regulating wheel position and rate of movement based on updated feed rate signals from said calculating means and generates control signals to control the position of said moveable wheel.

5,480,343

**METHOD OF SHARPENING PROFILE-SHARPENED CUTTING BLADES**

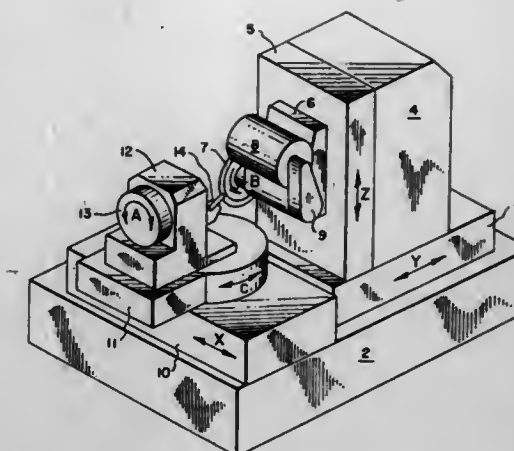
Harry Pederse, Penfield, and Charles G. Ellwanger, Rochester, both of N.Y., assignors to The Gleason Works, Rochester, N.Y.

Continuation-in-part of Ser. No. 23,273, Feb. 26, 1993, Pat. No. 5,305,558. This application Jan. 24, 1994, Ser. No. 185,580  
 Int. Cl.<sup>6</sup> B24B 49/00

U.S. Cl. 451—10

20 Claims

1. A method of sharpening a cutting blade of the profile-sharpened type made from bar stock, said cutting blade comprising a cutting end integral with a shank with said shank having a length and being of a uniform cross-section along said length, said cutting end and shank comprising a front surface including a rake surface and a back face, said shank comprising opposed side surfaces, said cutting end further including a top surface and a cutting profile surface extending between said front rake surface and said back face, the intersection of said front rake face and said cutting surface defining a cutting edge, said method comprising:



- forming first and second relief surfaces on said cutting profile surface by removing stock material from said cutting surface, said first relief surface extending from a location inward of said cutting edge to said back face with said first relief surface being oriented at a first relief angle with respect to one of said opposed side surfaces,  
 said second relief surface extending from said cutting edge to said location inward of said cutting edge with said second relief surface being oriented at a second relief angle with respect to said one of said opposed side surfaces, said second relief angle being less than said first relief angle.

5,480,344

**POLISHING PROCESS FOR OPTICAL CONNECTOR ASSEMBLY WITH OPTICAL FIBER AND POLISHING APPARATUS**

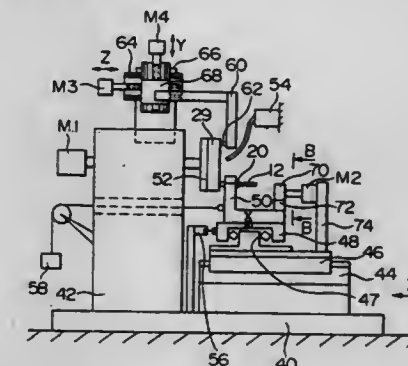
Jie Xu; Kenji Suzuki, and Isamu Kinoshita, all of Ichihara, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 951,855, Sep. 28, 1992, abandoned.  
 This application Oct. 12, 1993, Ser. No. 135,424  
 Claims priority, application Japan, Jan. 1, 1991, 3-280469; Feb. 17, 1992, 4-061144

Int. Cl.<sup>6</sup> B24B 1/00

U.S. Cl. 451—28

22 Claims



13. A polishing process for a multiple optical fiber connector assembly with at least two optical fibers, comprising the steps of:  
 fixing at least two optical fibers in an optical connector assembly made of a different material from that of the optical fibers with the optical fibers exposed from an end face of the optical connector assembly;  
 polishing an end face of the connector assembly with the exposed optical fibers while pressing the connector assembly against a flat polishing surface of a rotating liquid bonded abrasive wheel containing fixed abrasive grains with a constant load and moving the connector assembly linearly and



reciprocally in a chord direction perpendicular to a radial direction of the rotating abrasive wheel producing a mechanochemical reaction during the polishing; and correcting the flat polishing surface of the rotating abrasive wheel by means of a movable truing means which has a tip end in contact with the flat polishing surface of the rotating abrasive wheel at one point and moves in parallel to an axial direction of the rotating abrasive wheel for cutting into the flat polishing surface of the abrasive wheel and in parallel to the flat polishing surface.

5,480,345

## KNIFE SHARPENER

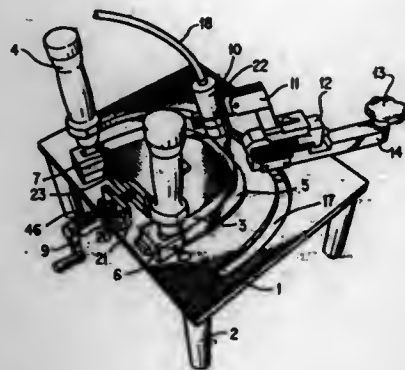
Bobby J. Bethea, 6701 Brighton Ave., Baltimore, Md. 21215

Filed Jun. 6, 1994, Ser. No. 254,752

Int. Cl. B24B 9/04

U.S. Cl. 451-234

6 Claims



1. A knife sharpening device, comprising:
  - a platform means;
  - a first clamping means attached to said platform means for clamping a cutting member, wherein said cutting member has a particular configuration;
  - a handle assembly having a top and a bottom;
  - a second clamping means for supporting a grinding device against said cutting member, wherein said second clamping means is attached to said top of said handle assembly;
  - roller means for moving said second clamping means, said roller means being rotatably attached to said bottom of said handle assembly;
  - track means formed in said platform for receiving said roller means therein, and wherein said track means has a configuration which is substantially the same as said configuration of said cutting member, such that by moving said handle assembly along said track means by rolling action of said roller and said grinding device remains in constant contact with said cutting member during sharpening.

5,480,346

## APPARATUS FOR MANUFACTURING A CHAIN OF LINKED FOOD PRODUCTS

Minoru Kasai, Ebina, and Minoru Nakamura, Tokyo, both of Japan, assignors to Hitec Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1993, Ser. No. 52,757

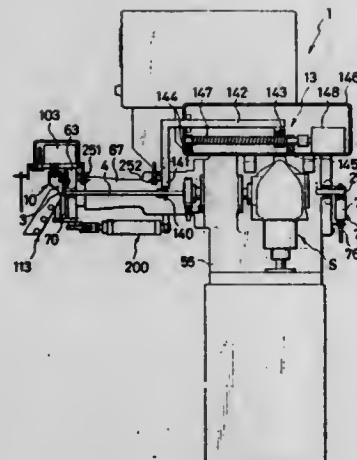
Claims priority, application Japan, Apr. 30, 1992, 4-137758; Jan. 22, 1993, 5-027588

Int. Cl. A22C 11/10

U.S. Cl. 452-47

33 Claims

1. An apparatus for manufacturing a chain of linked food products, comprising:
  - a nozzle having a material-discharging end;
  - material-supplying means for intermittently supplying a substantially fixed amount of a material into said nozzle;



5,480,347

## FISH DEHEADING MACHINE

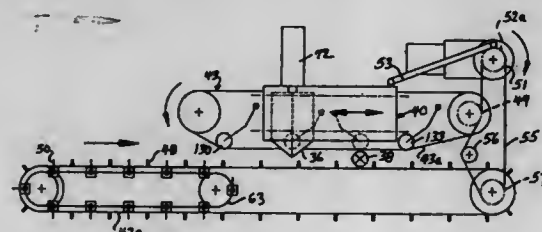
Timothy S. Hicks, Seattle, Wash., assignor to Ftohr Metal Fabricators, Inc., Seattle, Wash.

Filed Oct. 17, 1994, Ser. No. 324,880

Int. Cl. A22C 25/14

U.S. Cl. 452-170

17 Claims



1. A fish processing machine comprising:
  - an endless bottom conveyor for transporting fish along a linear processing path in a forward direction from a loading station to an unloading station;
  - an endless hold-down conveyor above said bottom conveyor for holding fish against the bottom conveyor while being processed;
  - advancing means for advancing said conveyors at a like predetermined constant speed along said path;
  - spacer elements on the bottom conveyor spaced apart along said path at a predetermined constant space interval for positioning fish on the bottom conveyor at said interval for processing;
  - fish processing means beside said path;
  - cycling means for reciprocating said fish processing means forward and backward in a predetermined travel cycle; and
  - operating means for operating said fish processing means while moving forward in said travel cycle and located opposite fish transported along said path on said bottom conveyor.

5,480,348

## COIN HANDLING SYSTEM WITH CONTROLLED COIN DISCHARGE

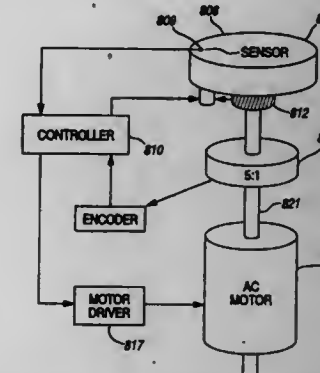
Richard A. Mazur, Naperville; Gary Watts, Buffalo Grove; Donald E. Bateman, Deerfield, and Robert J. Crawford, Palatine, all of Ill., assignors to Cummins-Allison Corp., Mt. Prospect, Ill.

Continuation of Ser. No. 115,319, Sep. 1, 1993, Pat. No. 5,429,550, which is a continuation-in-part of Ser. No. 951,731, Sep. 25, 1992, Pat. No. 5,299,977, which is a continuation-in-part of Ser. No. 904,161, Aug. 21, 1992, Pat. No. 5,277,651, which is a continuation of Ser. No. 524,134, May 14, 1990, Pat. No. 5,141,443. This application Nov. 15, 1994, Ser. No. 340,143

Int. Cl. G07D 3/16

U.S. Cl. 453-10

10 Claims



6. A disc-type coin sorter comprising a stationary guide plate having a contoured lower surface arranged slightly above a coin-carrying resilient disc for rotating at a predetermined speed and sorting coins and discharging said coins at respective exits outside the periphery of the resilient disc according to coin denomination, at least one coin detector for sensing and counting a predetermined number of coins of at least one denomination while the coins are being carried by the resilient disc, and a speed control mechanism for impeding the rotation of the disc in response to said coin detector sensing and counting the predetermined number of coins so that the disc rotates for a substantial period of time at a reduced speed which is less than said predetermined speed.

5,480,349

## PAINT SPRAY BOOTH AIR SPEED CONTROL

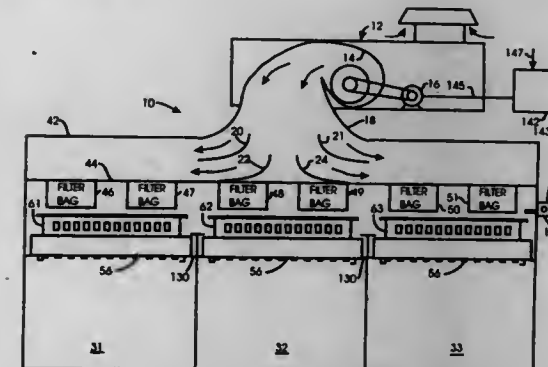
Tibor Kolta, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 19, 1994, Ser. No. 359,176

Int. Cl. B05B 15/12

U.S. Cl. 454-52

11 Claims





3. A threshing machine rotor assembly of the type used for separating a leaf stem from a leaf, the threshing machine rotor assembly comprising:

- a generally cylindrical center body;
- a pair of end plates mounted on opposite ends of the center body;
- a plurality of rotor discs mounted immediately adjacent each other on the center body between the pair of end plates, each of the plurality of rotor discs having
- a plurality of first holes generally circumferentially and equally spaced around a circumference of the rotor disc, and
- a plurality of second holes generally equally spaced between the plurality of first holes;
- a plurality of teeth located with respect to selected ones of the plurality of rotor discs, each of the plurality of teeth having a mounting hole being in general alignment with selected ones of the plurality of second holes;
- a plurality of first shafts extending through the plurality of second holes in the rotor discs and the mounting holes in the plurality of teeth, each of the plurality of first shafts being secured at its ends against the pair of end plates, the plurality of first shafts first, pivotally supporting the plurality of teeth at a first radius with respect to a center of the rotor discs, and second, locating the plurality of rotor discs with respect to each other and the pair of end plates;
- a plurality of spacers located circumferentially around outer peripheries of and between the plurality of rotor discs, each of the plurality of spacers having a plurality of yieldable members connected to form a generally quadrilaterally shaped member having an edge surface abutting against a side of one of the plurality of teeth; and
- a plurality of second shafts extending through the mounting holes in the plurality of spacers and the plurality of first holes in the plurality of rotor discs, the plurality of second shafts pivotally supporting the plurality of spacers with respect to the rotor discs.

5,480,352

## ROD CONVEYOR

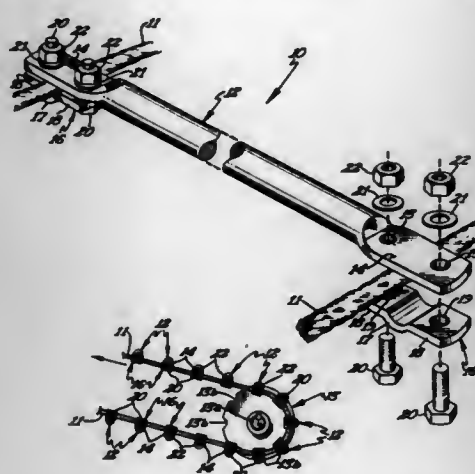
Arthur Luscombe, 1075 530th Ave., Dolliver, Iowa 50531

Filed Oct. 3, 1994, Ser. No. 317,187

Int. Cl.<sup>6</sup> A01F 11/00

U.S. Cl. 460—114

4 Claims



1. A rod conveyor for a harvesting implement for conveying beets, potatoes and similar crop comprising:
- plurality of substantially identical elongate rods,
  - spaced apart laterally opposed sprocket means for engaging said rods, each rod having flattened apertured ends,
  - means substantially connecting said rods together in spaced apart parallel relation, the spacing between adjacent rods being of a magnitude to permit dirt and debris to fall therebetween but supporting a root crops thereon including potatoes, beets and similar crops thereon;

said connecting means including a pair of endless cables, each rod having one end detachably connected to one cable and the other end detachably connected to the other cable, said cables being supported solely by said rods, and clamping means for clamping each flattened end of a rod to a cable including threaded elements and nuts engaging said threaded element, the nuts for each rod being readily disengageable from the associated threaded elements to permit removal and replacement of rods when the latter become damaged.

5,480,353

## SHAKER CRANK FOR A HARVESTER

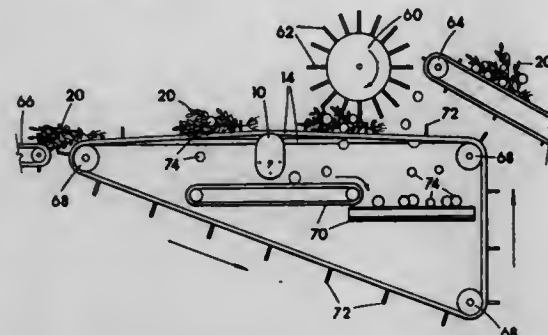
Ponciano Garza, Jr., 3289 McCoy Rd., Colusa, Calif. 95932

Filed Feb. 2, 1995, Ser. No. 382,594

Int. Cl.<sup>6</sup> A01F 11/00

U.S. Cl. 460—148

3 Claims



1. A rotatable crankshaft affixed transversely beneath a plurality of endless loop spaced-apart parallel conveyor belts on a tomato harvester; means affixed to said crankshaft for applying rotary power to axially rotate said crankshaft; said crankshaft including a plurality of offset placed crank journals equal in number to the conveyor belts, with a crank journal located under each of the conveyor belts;

a plurality of elongated tubular bearing sleeves, one of the bearing sleeves affixed over each of the crank journals, the bearing sleeve covered crank journals positioned relative to the conveyor belts so that with rotation of said crankshaft the sleeves are raised individually to impact the respective conveyor belts and impart temporary upward movement in the conveyor belts and thus vibration capable of dislodging tomatoes from vines when riding atop of the conveyor belts, the bearing sleeves covering each crank journal sized with an internal diameter substantially larger than an external diameter of the crank journal to allow both eccentric movement and rotation of the sleeves about the journals, each of the bearing sleeves split lengthwise into two sections connected together by interlocking tongue and groove snap lock means on opposing edges for affixing the two sections of the sleeves together about the crank journals, journal end plates affixed on said crankshaft at two oppositely disposed ends of each crank journal adjacent terminal ends of each sleeve for laterally retaining the sleeves positioned over the crank journals; each of the bearing sleeves being slightly shorter in length relative to the journal length and spacing between journal end plates so that each bearing sleeve is free to rotate about the journal.

5,480,354

## SMART CROP YIELD MONITOR

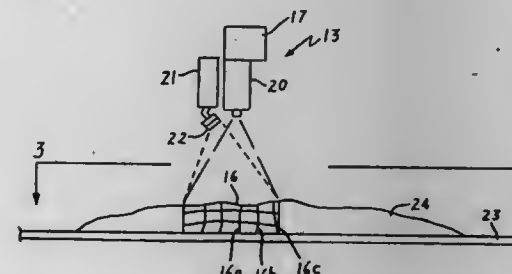
Firooz A. Sadjadi, Minneapolis, Minn., assignor to Loral Corporation, New York, N.Y.

Filed Nov. 3, 1994, Ser. No. 333,636

Int. Cl.<sup>6</sup> A01F 12/50

U.S. Cl. 460—7

7 Claims



6. An apparatus for measuring the volume of grain harvested from a standing crop while the standing crop is continuing to be harvested comprising:

- a conveyor for moving a harvested grain crop from a first position to a second position with the conveyor carrying a pile of grain thereon;
- a light source for projecting a light image onto the pile of grain;
- a light-measuring means for measuring the intensity of the light image at various points on the light image;
- a processor for converting the light measurements into three-dimensional coordinates and for determining the volume of the harvested grain crop by using the three-dimensional coordinates of the pile of grain;
- a light source for projecting a second light image of a first wavelength onto the pile of grain, with the wavelength of the light of a frequency that is responsive to the amount of moisture in the pile of grain;
- a means for measuring the amount of reflectance of the light image of the first wavelength;
- the light source projecting a third light image of a second wavelength onto the pile of grain, with the second wavelength of light in a region where water is not responsive to the amount of moisture in the pile of grain;
- a means for measuring the amount of reflectance of the light image of the second wavelength; and
- a processing means for comparing the ratio of reflectance of the light image of the first wavelength to the reflectance of the light image of the second wavelength to determine the amount of moisture in the pile of grain.

5,480,355

## CHILD'S CAROUSEL

Terry L. Miller, 300 E. Shoop Rd., Tipp City, Ohio 45371

Filed Jun. 17, 1994, Ser. No. 262,018

Int. Cl.<sup>6</sup> A63G 1/00

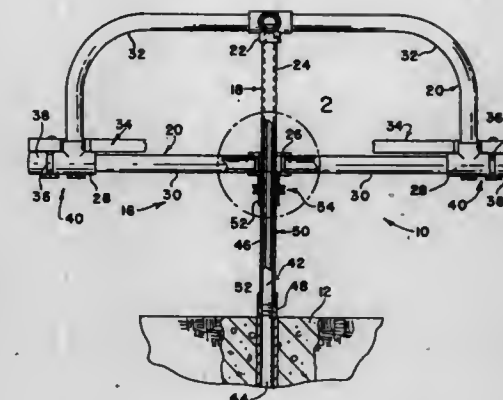
U.S. Cl. 472—29

16 Claims

1. A child's carousel mounted for free rotation about a vertical axis, said carousel comprising 1) a lightweight tubular seat-supporting superstructure surrounding and extending radially outward from said vertical axis to an outer periphery, 2) seating means mounted at said outer periphery at a level above a base surface generally corresponding to the length of a small child's legs between the knees and feet, whereby seated children may propel said carousel by means of their feet against said base surface and 3) a relatively rigid upstanding vertical post adapted to be supported in the base surface and forming said vertical axis about which said carousel is rotatable;

said superstructure comprising an assemblage of elements including:

- a) a vertical central hub journaled on said post, said hub including:



- i) a first fitting atop said hub, said first fitting having a plurality of upper tube-receiving openings facing radially outward therefrom and spaced angularly equidistantly thereabout,
  - ii) a second fitting mounted below said first fitting and having a like plurality of radially outward-facing lower tube-receiving openings, said openings of said second fitting being vertically aligned with the radial openings of said first fitting, and said second fitting having a vertical opening therethrough receiving said post, and
  - iii) a hollow tube interconnecting said first and second fittings;
  - b) a plurality of generally U-shaped tubular cantilevered arms extending radially from said hub with inner ends of each arm closely fitting and fixed into a vertically aligned pair of said upper and lower tube-receiving openings of said first and second fittings, and
- said seating means extending in a horizontal plane between adjacent cantilevered arms and means for fastening said seating means to said superstructure.

5,480,356

## SPEED CHANGE DEVICE FOR BICYCLES

Valentino Campagnolo, Vicenza, Italy, assignor to Campagnolo S.r.l., Vicenza, Italy

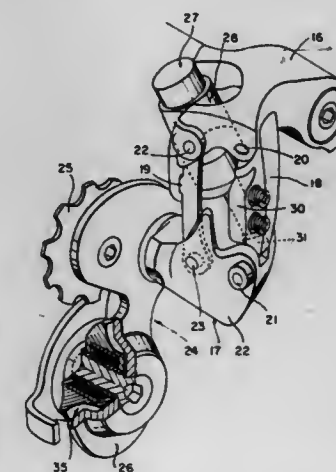
Filed Dec. 27, 1994, Ser. No. 364,459

Claims priority, application Italy, Feb. 24, 1994, TO93A0116

Int. Cl.<sup>6</sup> F16H 9/24; 59/00

U.S. Cl. 474—70

7 Claims



1. Speed change device for bicycles, comprising:



at least one rear derailleur having a first body to be fixed to a bicycle frame and a second body carrying idle wheels for a bicycle chain, said second body being displaceable with respect to said first body into a plurality of positions to cause selective engagement of the chain with a plurality of sprockets carried by the hub of the rear wheel of the bicycle, to provide the various gear ratios of the change device,  
 a d.c. electric motor to control the movement of said second body of the derailleur,  
 electronic control means for controlling said electric motor, manually controlled actuation means connected to said electronic control means, to cause actuation of the electric motor in order to engage a desired gear ratio,  
 electronic means to detect the position of said second body of the derailleur and for signalling this position to said control means to enable said electric motor to be automatically deactivated when the desired gear ratio is reached, wherein said electric motor is mounted on said first body of the derailleur and has an output shaft connected to said second body by interposition of a screw-and-nut coupling and wherein said detecting electronic means is comprised of an encoder directly mounted onto the body of said electric motor and adapted to detect the angular position of the shaft of said electric motor and consequently the position of said second body of the derailleur.

5,480,357

## FREEWHEEL ASSEMBLY FOR BICYCLE

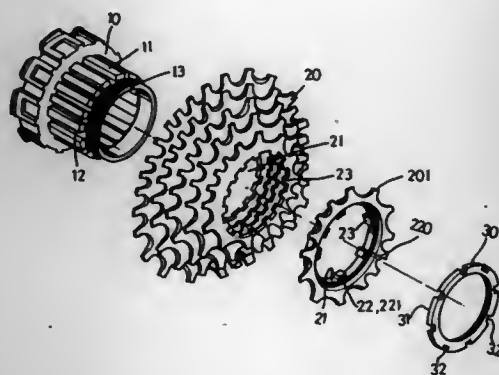
Tzong T. Liang, No. 51 Shui-Yuan Rd., Feng-Yuan City, Taichung County, Taiwan, Prov. of China

Filed Jan. 3, 1995, Ser. No. 390,309

Int. Cl.<sup>6</sup> F16H 9/06

U.S. Cl. 474—77

1 Claim



1. A freewheel assembly comprising:  
 a sprocket ring including an outer peripheral portion having a plurality of ribs formed thereon so as to define a plurality of channels therebetween, said sprocket ring including an outer portion having an outer thread formed thereon,  
 at least one sprocket including a bore formed therein for engaging with said sprocket ring and including a plurality of projections radially extended inward for engaging with said channels so as to secure said sprocket to said sprocket ring, said sprocket including an annular shoulder formed therein so as to define an annular surface, said annular surface including a plurality of first serrated teeth formed thereon, and  
 a lock nut including an inner thread formed therein for engaging with said outer thread of said sprocket ring and including a side surface having a plurality of second serrated teeth for engaging with said first serrated teeth so as to solidly and stably securing said sprocket in place.

5,480,358

## AUTO TENSIONER

Kouichi Sakai, Zama; Hayato Oumi, Chigasaki, and Hiroshi Suzuki, Yokohama, all of Japan, assignors to NSK Ltd., Tokyo, Japan

Division of Ser. No. 278,907, Jul. 22, 1994, which is a continuation of Ser. No. 115,681, Sep. 3, 1993, Pat. No. 5,352,160.

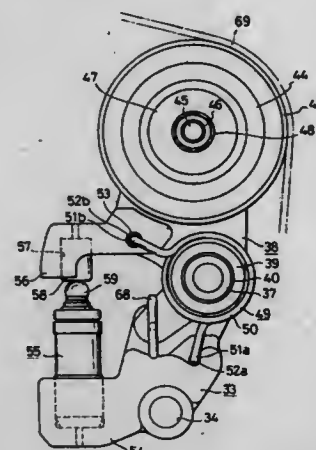
This application Mar. 23, 1995, Ser. No. 408,988

Claims priority, application Japan, Sep. 3, 1992, 4-67543; May 12, 1993, 5-29569

Int. Cl.<sup>6</sup> F16H 7/08

U.S. Cl. 474—117

5 Claims



1. An autotensioner for use in applying a tension to a moving belt, comprising:  
 a mount body having a projection,  
 a rocking member rockingly mounted to the mount body through a first axle and having an arm,  
 a pulley rotatably mounted to the rocking member through a second axle for applying the tension to the moving belt, and  
 a damper apparatus provided within the arm of the rocking member between the projection of the mount body and the arm and having an abutment section which is abutted to the projection of the mount body.

5,480,359

## BICYCLE CHAIN WHEEL ASSEMBLY AND CRANK ARM

Masahiko Tani, Sakai, Japan, assignor to Shimano Inc., Osaka, Japan

Filed Mar. 3, 1994, Ser. No. 205,412

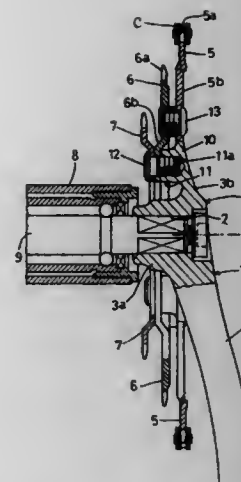
Claims priority, application Japan, Mar. 9, 1993, 5-009787 U

Int. Cl.<sup>6</sup> F16H 55/12

U.S. Cl. 474—160

9 Claims

1. A chain wheel assembly for a bicycle comprising:  
 a large chain wheel;  
 a small chain wheel;  
 a crank arm for supporting said large chain wheel and said small chain wheel, said crank arm having:  
 an arm body;  
 a boss for connecting said crank arm to a crank axle of said bicycle; and  
 wheel mounting extensions extending radially outwardly from said boss and including first connecting means for connecting said small chain wheel;  
 second connecting means arranged radially outwardly of said first connecting means for connecting said large chain wheel



to said small chain wheel, said large chain wheel being connected only to said small chain wheel through said second connecting means.

5,480,360

## DIFFERENTIAL FOR THE AXLE DRIVE OF A MOTOR VEHICLE

Jürgen Patzer, Lenningen, and Peter Meffert, Tiefenbrunn, both of, Germany, assignors to Porsche, Weissach, Germany

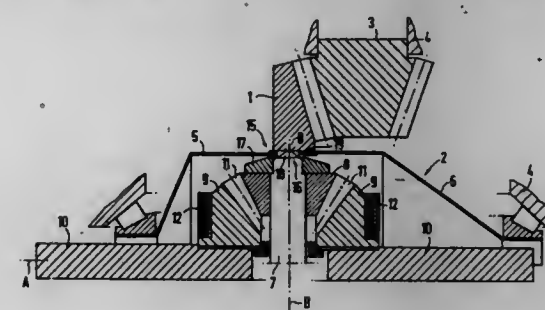
Filed Apr. 25, 1994, Ser. No. 232,608

Claims priority, application Germany, Apr. 23, 1993, 43 13 322.3

Int. Cl.<sup>6</sup> F16H 57/08; 1/40

U.S. Cl. 475—230

20 Claims



1. A differential for the axle drive of a motor vehicle, comprising:  
 a differential case which carries a drive gear;  
 an axle bolt disposed in a recess in the differential case;  
 differential bevel gears carried by the axle bolt;  
 axle drive shafts and axle shaft gears arranged on the axle drive shafts, the differential bevel gears meshing with the axle shaft gears which are arranged on axle drive shafts, the axle shaft gears being bevel gears; and  
 a cage in which the axle shaft gears are disposed and which absorbs the forces acting in a direction of the axle drive shafts.

5,480,361

## CHANGE DIRECTION PLANETARY GEARING FOR CONTINUOUSLY VARIABLE TRANSMISSION

Yoshiyasu Murakami, Nagoya; Hirofumi Okahara; Akito Suzuki, both of Ischarya, and Tsuyoshi Maeda, Atsugi, all of, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, and Aichi Machine Industry Co., Ltd., Nagoya, both of, Japan

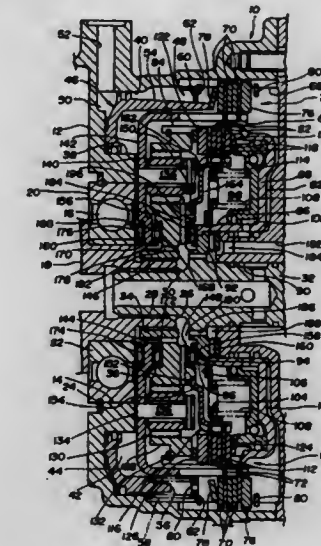
Filed Jan. 27, 1994, Ser. No. 187,286

Claims priority, application Japan, Jan. 27, 1993, 5-031333

Int. Cl.<sup>6</sup> F16H 1/36; 11/06

U.S. Cl. 475—328

11 Claims



1. A planetary gearing, comprising:  
 a casing;  
 a brake including a cylindrical portion;  
 a clutch including a clutch drum received in said cylindrical portion; and  
 a planetary gear set received in said cylindrical portion and connected between said clutch drum and said cylindrical portion wherein said planetary gear set includes a pinion carrier integral with and thus including said cylindrical portion and a ring gear connected in an axially fit manner to said clutch drum, and a sun gear.

5,480,362

## DOUBLE PLANETARY CARRIER

Haruo Tanaka; Noriaki Takahashi, and Tetsuo Suzuki, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1993, Ser. No. 111,059

Claims priority, application Japan, Sep. 3, 1992, 4-235688; Jul. 28, 1993, 5-186334

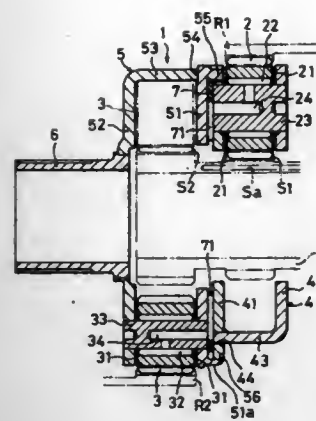
Int. Cl.<sup>6</sup> F16H 3/44

U.S. Cl. 475—346

4 Claims

1. A double planetary carrier for carrying therein two sets of planet gears, one set being axially set apart from the other set, comprising:  
 a first carrier having a pair of side plates which face each other with one set of said planet gears on one axial side being interposed therebetween and which are connected together via intermediate pieces;  
 a second carrier having a pair of side plates which face each other with the other set of said planet gears on the other axial side being interposed therebetween and which are connected together via intermediate pieces, the side plate on the other axial side of said first carrier being defined to be a first side plate, the side plate on the one axial side of said second carrier being defined to be a second side plate;  
 wherein said first side plate and said second side plate are disposed axially opposite to each other;





one of said first side plate and said second side plate has on a periphery thereof a cylindrical portion for receiving therein the other of said first side plate and said second side plate; and said cylindrical portion and a periphery of the other of said first side plate and said second side plate have serrated teeth for engagement with a play therebetween, whereby said first carrier and said second carrier are engaged by means of serrations.

5,480,363

# APPARATUS FOR CONTROLLING SLIP OF LOCK-UP CLUTCH ON MOTOR VEHICLE DURING DECELERATION OF THE VEHICLE

Toru Matsubara, and Kunihiro Iwatsuki, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

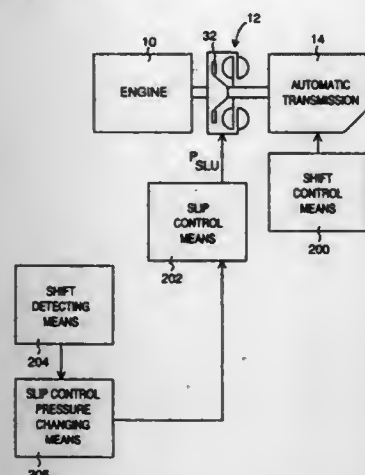
Filed Sep. 7, 1994, Ser. No. 301,771

Claims priority, application Japan, Jan. 6, 1993, 5-250321

Int. Cl.<sup>6</sup> F16H 61/14

U.S. Cl. 477-63

13 Claims



1. An apparatus for controlling an amount of slip of a lock-up clutch disposed between an engine and an automatic transmission of a motor vehicle for direct connection of the engine and the transmission, comprising:

slip control means for controlling a slip control pressure to be applied to said lock-up clutch such that the amount of slip of the lock-up clutch is held within a predetermined range while the vehicle is decelerating;

shift detecting means for detecting that said automatic transmission is in the process of a shifting action during deceleration of the vehicle; and

pressure changing means responsive to detection of a shifting action of said transmission by said shift detecting means, for commanding said slip control means to change said slip

control pressure a predetermined time prior to completion of said shifting action, for reducing an engaging force of said lock-up clutch to a first value lower than a second value corresponding to the amount of slip of the lock-up clutch established by said slip control means when the transmission is not in the process of a shifting action, whereby a shifting shock of the transmission is reduced by the reduced engaging force of the lock-up clutch.

5,480,364

# ELEVATED IDLE SPEED CONTROL AND METHOD OF OPERATING SAME

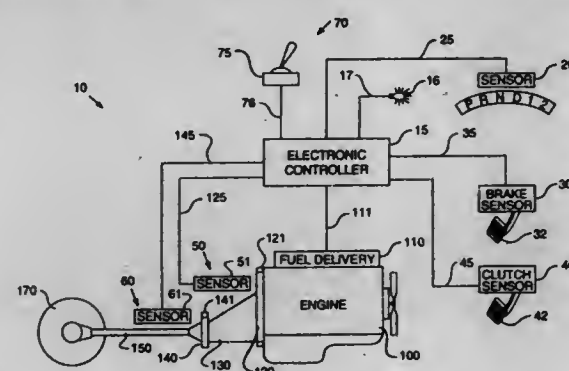
Mark J. Hilbert; Prasad V. Parupalli, and Mark E. Rettig, all of Peoria, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Aug. 15, 1994, Ser. No. 290,263

Int. Cl.<sup>6</sup> B60K 41/06

U.S. Cl. 477-107

14 Claims



1. An apparatus for controlling idling in an internal combustion vehicle engine connected to a transmission, said transmission connected to a drive wheel for propelling a vehicle, comprising in combination:

an electronic controller;

a brake sensor electrically connected to said electronic controller;

vehicle speed sensing means electrically connected to said electronic controller and adapted to produce a vehicle speed signal;

engine speed sensing means electrically connected to said electronic engine controller and adapted to produce an engine speed signal;

high idle mode selection means electrically connected to said electronic controller;

wherein said electronic controller produces an idle speed command corresponding to an elevated idle speed as a function of signals from said brake sensor, said vehicle speed sensing means, said engine speed sensing means, and said high idle mode selection means.

5,480,365

# FOLDABLE HANDLEBAR FOR EXERCISE MACHINE

Christopher B. Lundia, Mantua, N.J., and John Nelson, Levittown, Pa., assignors to Physia, Inc., Bellmawr, N.J.

Filed Aug. 10, 1994, Ser. No. 288,311

Int. Cl.<sup>6</sup> A63B 21/00; B62K 21/16

U.S. Cl. 482-53

8 Claims

1. In an exercise machine of the type having a base frame, laterally spaced foot support members carried by said base frame, a main strut attached to said base member and extending upwardly therefrom, a handlebar for providing support for a person and means for adjustably securing said handlebar to said main strut wherein said means for adjustably securing said handlebar to said main strut includes:

an upper frame positioned atop said main strut;

5,480,367

# ADDUCTOR/ABDUCTOR EXERCISE DEVICE

Alan Bergman, London, England, assignor to Sportsquip Limited, Dublin, Ireland

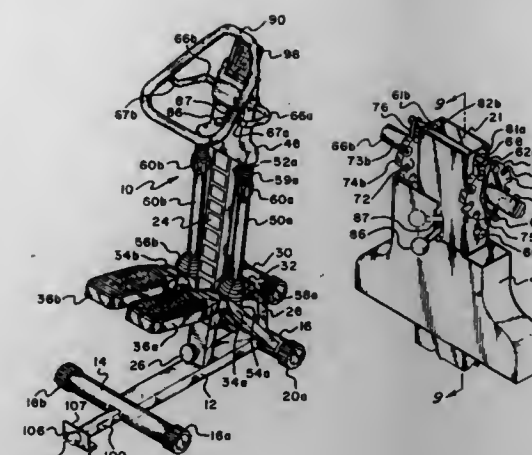
Continuation-in-part of Ser. No. 979,445, Nov. 20, 1992, abandoned, which is a continuation of Ser. No. 854,743, Mar. 19, 1992, abandoned, which is a continuation of Ser. No. 474,015, May 17, 1990, abandoned. This application Oct. 21, 1993, Ser. No. 140,774

Claims priority, application United Kingdom, Jan. 26, 1987, 8725016; Nov. 12, 1987, 8726552

Int. Cl.<sup>6</sup> A63B 21/055; 23/04

U.S. Cl. 482-122

24 Claims



a wheel having a hub, said wheel further having a plurality of notches formed around the periphery of said wheel; an axle secured to said hub of said wheel, said axle being rotatably mounted in and extending through said upper frame, said handlebar being attached to and movable with said axle, and

means selectively movable into and out of said notches for locking said handlebar in place

wherein said selectively movable means for locking said handlebar in place comprises a rod extending through said upper frame and said mainstrut, said rod being engageable with one of said plurality of notches of said wheel for securing said handlebar in a predetermined position.

5,480,366

# STATIONARY BICYCLE TRAINER

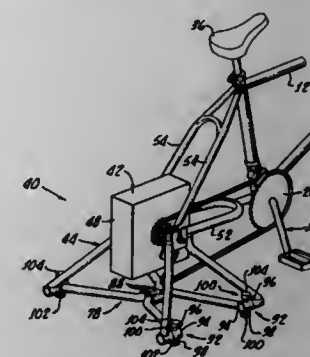
Eric F. Harnden, and Leif Harnden, both of 1030 Berne Dr., Crestline, Calif. 92325

Filed Mar. 17, 1994, Ser. No. 210,011

Int. Cl.<sup>6</sup> A63B 22/06; 69/16

U.S. Cl. 482-61

18 Claims



1. A bicycle trainer apparatus for use with a chain-drive bicycle; said trainer apparatus including rear support stand means for supporting a rear end of said bicycle in a substantially normal riding position, and a chain-drive resistance device carried by said stand means to be driven by the drive chain of said bicycle in substitution for the rear drive wheel and tire assembly of the bicycle, said resistance device including a clamping clamping shaft configured to be accepted into rear wheel drop outs of said bicycle, said resistance device further including a drive cog carried by an annular shaft coaxial with said clamping shaft assembly to be drivingly engaged by said drive chain, said resistance device including a housing portion supported between the rear wheel drop outs of said bicycle by said clamping shaft assembly and drivingly receiving power from said annular shaft.

5,480,368

# MUSCLE EXERCISER

Ming-Chih Huang, No. 33, Lane 1000, Chun Jih Road, Tao Yuan, Taiwan, Prov. of China

Filed Jun. 28, 1994, Ser. No. 266,708

Int. Cl.<sup>6</sup> A63B 21/04; 23/12

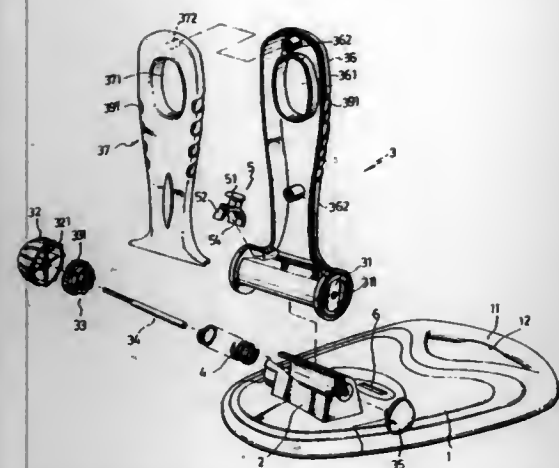
U.S. Cl. 482-123

5 Claims

1. A muscle exerciser comprising:  
a base frame having an axle holder mounted thereon;  
a lever having one end pivotally connected to said axle holder by a pivot axle;  
a ratchet wheel mounted around said pivot axle outside said axle holder;

an elastic means received inside said axle holder and mounted around said pivot axle, said elastic means having one end fixedly connected to said axle holder and an opposite end fixedly connected to said ratchet wheel;





a blocking means carried by said lever and releasably meshed with said ratchet wheel to permit said elastic means to be compressed upon each press of said lever; and an adjusting knob coupled to said pivot axle at one end and capable of being driven to turn said ratchet wheel to adjust the tension of said elastic means when said blocking means is released from said ratchet wheel

wherein said lever comprises a lever arm and a cover shell covered on said lever arm, said lever arm comprising an opening at one end, two opposite side plates bilaterally disposed at an opposite end and mounted around said pivot axle, a plurality of unitary stub tubes raised from an inside wall thereof a plurality of parallel grooves transversely disposed on two opposite sides thereof, said cover shell comprising an opening matching with the opening on said lever arm for the insertion of the thumb, a plurality of stub rods raised from an inside wall thereof and respectively fitted into said stub tubes, and a plurality of parallel grooves transversely disposed on two opposite sides thereof and respectively matched with the parallel grooves on said lever arm for the holding of the fingers.

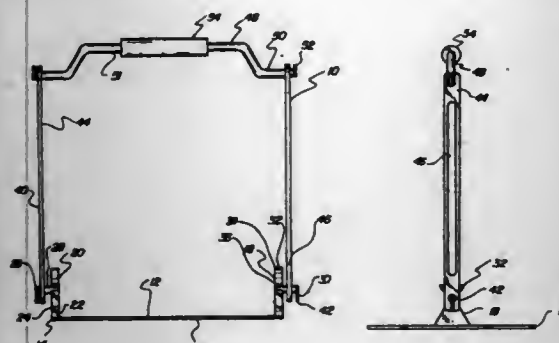
5,480,369

# RESILIENT EXERCISE DEVICE WHEREIN USER'S LEGS PROVIDE A COUNTER FORCE TO EXERCISE OF USER'S ARMS

Randall W. Dudley, 12653 Adobe Rd., Bakersfield, Calif. 93307  
Filed Aug. 3, 1994, Ser. No. 285,168  
Int. Cl.<sup>6</sup> A63B 21/02

U.S. Cl. 482-125

1 Claim.



1. A flex center for exercising comprising, in combination: a standing plate having a rectangular and flat configuration, the plate having two side walls and two base walls; two extension brackets, each of the two brackets having an upper end and a lower end, the two brackets perpendicularly secured to the standing plate with each of the two brackets diametrically opposed adjacent the two side walls of the

standing plate, each of the two brackets having a threaded aperture therethrough;  
two lower L-shaped extensions, each extension having a first end and a second end, each first end secured to the upper end of the two extension brackets;  
two U-shaped bar rest receivers, each receiver having an upper surface and a lower surface, each lower surface secured to the two lower L-shaped extensions;  
a foot bar removably secured within the two threaded apertures of the two extension brackets;  
two elastic bands, each band having a first end with an aperture, a second end with an aperture, and an intermediate extent therebetween with an oblong aperture therein, each first end secured to a corresponding second end of the two lower L-shaped extensions;  
a shoulder bar having an intermediate extent therebetween and two ends off, set from the intermediate extent, each of the two off-set ends having an upper L-shaped extension securely thereon, each of the upper L-shaped extensions secured to the corresponding second end of the two elastic bands, the two off-set ends forming handgrips, a padded element secured to the intermediate extent, the shoulder bar received in the upper surface of the two U-shaped bar rest receivers when not in use.

5,480,370

# SIDE GUIDING MECHANISM FOR OUTSEET FOLDING MACHINE

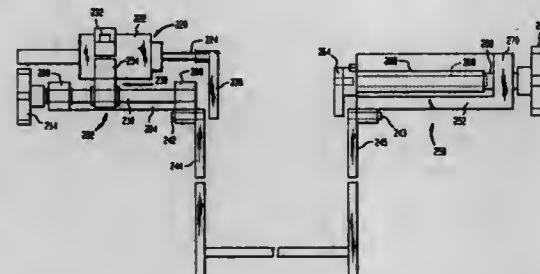
Timothy L. Gelsinger, Long Valley, N.J., assignor to The Challenge Printing Co., Wallington, N.J.

Filed Nov. 19, 1993, Ser. No. 154,959

Int. Cl.<sup>6</sup> B31B 1/02

U.S. Cl. 493-475

8 Claims



1. A side jogging mechanism for aligning a sheet to be folded into an outsert by an outsert folding apparatus, comprising a frame including first and second oppositely disposed side frame members between which said outsert folding apparatus is received,  
an adjustable solenoid assembly mounted on said first side frame member, said solenoid assembly including a solenoid, a plunger extending from and actuated by said solenoid, a pusher mounted at an end of said plunger and located between said first and second side frame members, and means for adjusting the location of said pusher between said first and second side frame members,  
a side stop assembly mounted on said second frame member and including a side stop located between said first and second side frame members,  
wherein said means for adjusting the location of said pusher is located outside said frame, and  
separate means for adjusting the location of said side stop between said first and second side frame members, wherein said means for adjusting the location of said side stop being located outside said frame.

5,480,371

# BOX FORMING EQUIPMENT

Shigeru Morita, Iruma; Hiroshi Ishida, Tsurugaoka, and Isao Hirano, Saitama, all of Japan, assignors to Nippon Flute Company, Ltd., Japan

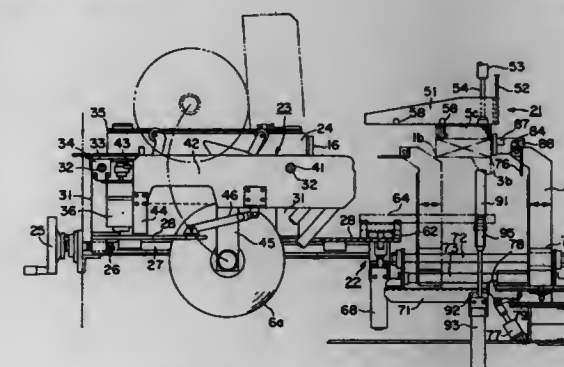
Filed Nov. 24, 1993, Ser. No. 156,820

Claims priority, application Japan, Dec. 1, 1992, 4-322047

Int. Cl.<sup>6</sup> B31B 1/60

U.S. Cl. 493-117

9 Claims



1. A box forming apparatus for closing and taping the bottom of a box comprising:  
a box erecting frame;  
means operably connected to said box erecting forming frame for folding bottom box flaps which fold front and back inner flaps and right and left outer flaps attached to the bottom of the box into a bottom opening plane of the box;  
means operably connected to said box erecting frame for pressing an upper portion of said box located above the means for folding bottom box flaps to control lifting of the box;  
means operably connected to said box erecting frame for sealing edges of the left and right outer flaps with a tape;  
means operably connected to said box erecting frame for transporting the box during a sealing operation by said means for sealing;  
said means for pressing includes a body movable along a vertical axis for ascending and descending movement generally above the means for folding bottom box flaps, said means for pressing further including shaft-supported rollers operably connected to said body and extending in a common plane above said means for folding bottom box flaps to prevent lifting of the box during a bottom flap folding operation; said means for sealing includes a tape head, facing upwardly at a box feed-out side of said means for folding bottom box flaps; and  
said means for transport includes a pair of side belts to catch and convey the box.

5,480,372

# APPARATUS FOR FOLDING AND LOADING MICROWAVE POPCORN BAGS INTO A FIXTURE

Rodney K. Gwiazdon, St. Louis Park, Minn.; John E. Korte, Cedar Rapids, Iowa; Richard S. Deadmond, West Bend, and Wayne A. Smith, Shorewood, both of Wis., assignors to General Mills, Inc., Minneapolis, Minn.

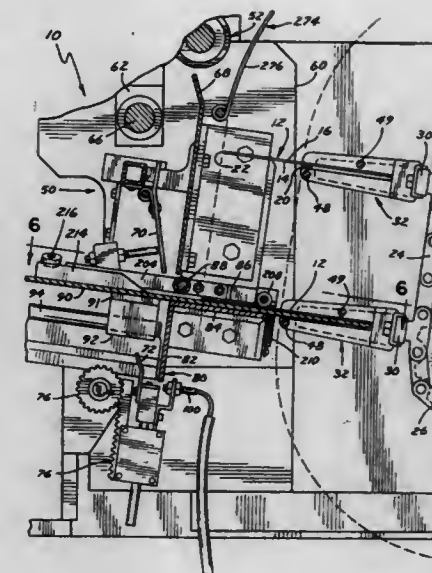
Filed Dec. 10, 1993, Ser. No. 164,740

Int. Cl.<sup>6</sup> B31F 7/00; B65B 63/04

U.S. Cl. 493-437

31 Claims

1. Device for loading a bag into a fixture having a slot formed therein, with the bag including lower and upper ends, first and second side edges, and first and second gusseted sides having inner folds, comprising, in combination: means for positioning the bag generally perpendicular to the slot of the fixture with the slot of the fixture located intermediate the upper and lower ends of the bag; and a tucking plate movable between a retracted position and an extended position, with the tucking plate insertable in the slot of the fixture for driving the bag into the slot of the fixture and



creating a fold in the bag when the tucking plate moves from the retracted position to the extended position with the bag having a U-shaped configuration around the tucking plate; wherein the positioning means includes first and second nip rollers, with each of the nip rollers including first, second and third wheels which abut and roll on each other for engaging the bag intermediate the side edges, with the first wheel engaging the bag intermediate the inner folds of the first and second gusseted sides, with the second wheel engaging the bag intermediate the inner fold of the first gusseted side and the first side edge, and with the third wheel engaging the bag intermediate the inner fold of the second gusseted side and the second side edge.

5,480,373

# DEVICE FOR TRANSPORTING IONS, IN PARTICULAR, PROTONS

Gerhard Fischer, Vaduz, Liechtenstein; Ulrich Warnke, Scheldt, and Herbert König, München, both of Germany, assignors to Dr. Fischer Aktiengesellschaft, Vaduz, Liechtenstein

PCT No. PCT/DE92/00564, § 371 Date Jan. 7, 1994, § 102(e) Date Jan. 7, 1994, PCT Pub. No. WO93/00960, PCT Pub. Date Jan. 21, 1993

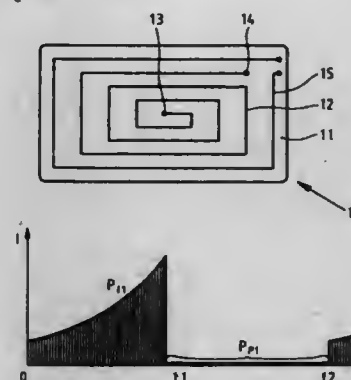
PCT Filed Jul. 3, 1992, Ser. No. 178,305

Claims priority, application Germany, Jul. 9, 1991, 41 22 718.2

Int. Cl.<sup>6</sup> A61N 1/00

U.S. Cl. 600-14

25 Claims



1. A device comprising:  
a generator for generating low-frequency pulsed electric currents;



a transmitter coil connected to said generator for applying electromagnetic fields to a body region of a living organism; said device designed for transporting ions from intra-corporal electrolyte liquids of the living organism into and through surrounding vessel walls and membranes such that a transmitting energy is selected to such a high value that the energy induced within said electrolyte liquid is greater than a thermal energy and is within a cell-specific amplitude window; and wherein pulsed currents generated within said transmitter coil by said generator have the following properties:

- a basic current pulse of a first duration consists of a square current and a superimposed current increasing according to an exponential function;
- a pulse interval subsequent to said basic current pulse having a second duration that is at least equal to said first duration;
- a basic frequency of said basic current pulse with said pulse interval is 100 to 1000 Hz;
- an amplitude of a sequence of said basic current pulses is modulated with a modulation frequency of 0.5 to 35 Hz to yield a modulation amplitude;
- said sequence of said basic current pulse is emitted as a series for a period of 0.3 to 1.0 sec; and
- said series is followed by a series interval of 0.7 to 5.0 sec.

5,480,374

# METHOD AND APPARATUS FOR REDUCING PHYSIOLOGICAL STRESS

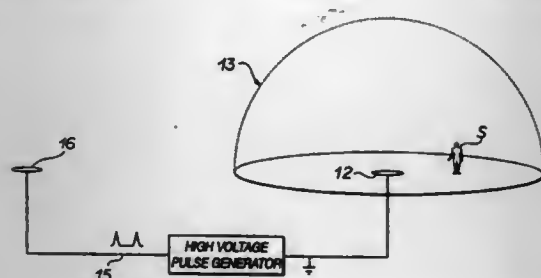
Robert C. Van Dick, 5625 Sugar Creek Ct., Norcross, Ga. 30093

Filed Mar. 28, 1994, Ser. No. 219,088

Int. Cl.<sup>6</sup> A61B 17/52

U.S. Cl. 600—26

10 Claims



1. A method of treating physiological stress in a human subject which comprises the steps of:

- generating a weak electromagnetic field about a grounded electrode by the application of pulses of between 5 and 50 microseconds each at a pulse repetition rate of between 0.5K and 10K pulses per second to a power electrode, the power electrode and grounded electrode being coupled to high voltage pulse generation means for generating high voltage pulses; and
- positioning the subject within the weak electromagnetic field for a period of time sufficient to cause an increase in alpha or theta brain wave levels of the subject.

5,480,375

# PAIN RELIEVING ADJUSTABLE LEG SUPPORT

Hector M. La Fosse, 411 E. 135th St. #2F, Bronx, N.Y. 10454, and George Spector, 233 Broadway Rm. 702, New York, N.Y. 10279

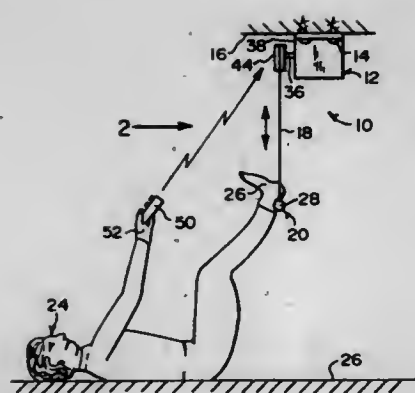
Filed Jun. 14, 1994, Ser. No. 260,244

Int. Cl.<sup>6</sup> A61H 1/02

U.S. Cl. 601—23

2 Claims

- An apparatus to relieve back and leg pain comprising:
  - a housing;



- fasteners for mounting said housing to a ceiling;
- a pair of cable lines extending downwardly from said housing;
- a foot support affixed to the lower ends of said cable lines;
- means within said housing for controlling the vertical movement of said foot support by raising and lowering said cable lines, so that the person can lie down on their back upon a horizontal surface under the ceiling adjacent said foot support and place their feet upon said foot support when lowered and then said foot support can be raised to assist in easing the back and leg pain the person is suffering from; wherein said foot support is a cushioned rod attached at opposite ends to the lower ends of said cable lines to be suspended thereon in a horizontal position; wherein said controlling means includes:
  - a reversible electric motor in said housing, having a drive shaft extending horizontally therefrom within said housing;
  - a pair of spaced, apart drive pulleys-mounted on said drive shaft;
  - a pair of driven shafts in said housing extending horizontally through a front wall of said housing;
  - a pair of driven pulleys, each mounted on an inner end of each said driven shaft within said housing;
  - a pair of continuous belts, each extending about one said drive pulley and one said driven pulley;
  - a pair of spools, each mounted on an outer end of each said driven shaft with the upper ends of said cable lines wound about said spools and
  - a three way switch electrically connected to said electric motor to control the operation of said electric motor, to raise and lower said cushioned rod of said foot support.

5,480,376

# CUSTOM BODY PROTECTIVE PAD WITH CURE-RETARDING STORAGE SYSTEM

Jeffrey E. Duback, Davidson; Eric D. Vaughter, and A. Bruce Parker, both of Charlotte, all of N.C., assignors to Parker Medical Associates, Charlotte, N.C.

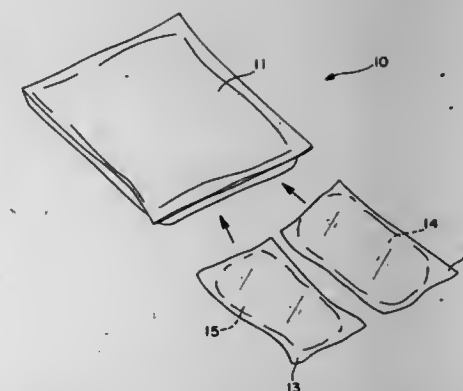
Continuation-in-part of Ser. No. 252,740, Jun. 2, 1994, which is a continuation-in-part of Ser. No. 860,005, Mar. 30, 1992, abandoned. This application Sep. 15, 1994, Ser. No. 306,811

Int. Cl.<sup>6</sup> B32B 7/00

U.S. Cl. 602—8

10 Claims

- A protective pad and storage pouch assembly for being custom-fitted to a body part to be protected, and comprising:
  - first and second protective pads, each of said first and second pads having an initially flexible layer comprised of a fabric impregnated with a moisture-curable resin which hardens upon curing to form a rigid structure of the fabric which retains a body part-defined shape into which it is molded during curing;
  - first and second inner storage pouches, each of said first or second protective pads being sealed in respective ones of the first and second storage pouches, said first and second storage pouches having moisture-transmission retarding properties; and



- a single, outer moisture-proof protective pouch within which elements (a) and (b) are sealed in the absence of moisture until the pad is to be molded to the body part to be protected.

5,480,377

# WOUND DRESSING HAVING A ROLL CONFIGURATION

James V. Cartmell, Xenia; Wayne R. Sturtevant, Centerville; Michael L. Wolf, West Milton, and Michael J. Allaire, Cincinnati, all of Ohio, assignors to New Dimensions in Medicine, Inc., Dayton, Ohio

Continuation of Ser. No. 741,318, Aug. 17, 1991, abandoned.

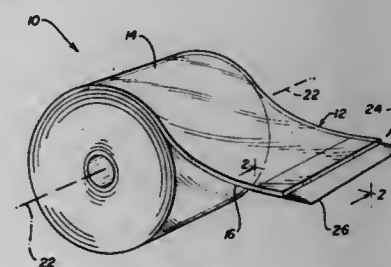
This application Feb. 28, 1994, Ser. No. 202,509

The portion of the term of this patent subsequent to May 26, 2009, has been disclaimed.

Int. Cl.<sup>6</sup> A61F 13/00; 15/00; A61L 15/00

U.S. Cl. 602—48

12 Claims



- A wound dressing product, comprising:
  - a wound dressing laminate comprising a plurality of layers including a backing layer which forms said first side of said wound dressing laminate; and
  - a polyurethane hydrogel layer which forms substantially all of the outer surface of said second side of said wound dressing laminate;
- said wound dressing laminate being spirally wrapped about a center axis such that said wound dressing laminate terminates at a leading end and said first side of said wound dressing laminate forms the outer surface of said wound dressing product, said wound dressing laminate further comprising a reticulated layer being interposed between said backing layer and said hydrogel layer.

5,480,378

# APPARATUS FOR PREPARING A CONCENTRATE OF COAGULATION FACTORS FROM A BLOOD SAMPLE

Ulla Weis-Fogh, 20 Mellemvang, DK-2970 Hørsholm; Niels E. Holm, 10B Julemosevej, DK-3460 Birkerød, and Søren Hern, 41 Sommervej, DK-3520 Forum, all of, Denmark

Continuation of Ser. No. 952,758, Nov. 13, 1993, abandoned.

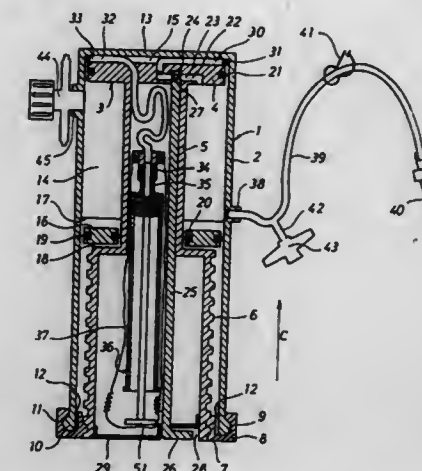
This application Aug. 24, 1994, Ser. No. 295,145

Claims priority, application Denmark, May 14, 1990, 1194/90; WIPO, May 14, 1991, PCT/DK91/00131

Int. Cl.<sup>6</sup> A61M 37/00

U.S. Cl. 604—5

34 Claims



- An apparatus for preparing a concentrate of coagulation factors from a blood sample, the apparatus comprising:
  - a first chamber of variable volume for collection and separation of the blood sample so as to separate a plasma fraction;
  - a second chamber of variable volume for collection of the plasma fraction and for preparation of the concentrate;
  - the first and the second chambers being partially defined by the same integrally formed solid container wall;
  - a displaceable piston which serves as a partition between the first and second chambers, the piston being displaceable in connection with the blood sample collection and the transfer of the plasma fraction between the first and second chambers;
  - the displacement of the piston causing the volumes of the first and second chambers to vary inversely;
  - transfer means for transferring the plasma fraction from the first chamber to the second chamber and from the second chamber to the first chamber; and
  - means for opening and closing the transfer means.

5,480,379

# ULTRASONIC DISSECTOR AND DETACHER FOR ATHEROSCLEROTIC PLAQUE AND METHOD OF USING SAME

Antonio La Rosa, Via Toledina, 2, 27026 Gariasco, Pavia, Italy

Continuation-in-part of Ser. No. 882,976, May 14, 1992, abandoned. This application Oct. 4, 1993, Ser. No. 130,879

Claims priority, application Italy, May 22, 1991, MI91A1415; European Pat. Off., Jun. 6, 1993, 93108759

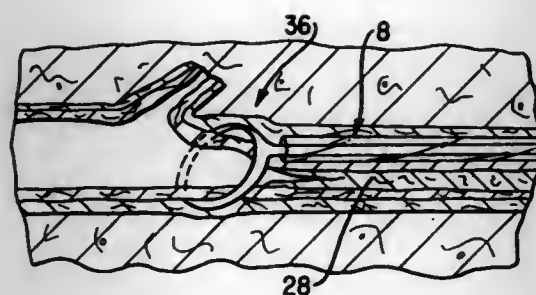
Int. Cl.<sup>6</sup> A61B 17/20

U.S. Cl. 604—22

26 Claims

- Apparatus for use in detaching atherosclerotic plaque from vessel walls by means of ultrasonic vibrations, comprising:
  - a handpiece including an ultrasonic frequency transducer;
  - a source of sterile liquid;
  - a probe having a transmission part attached to said handpiece and coupled to said ultrasonic transducer so that said probe is ultrasonically oscillated by said ultrasonic transducer, said probe including a working part insertable within vessel walls, the working part attached to the transmission part and extend-





ing from a longitudinal axis of the transmission part at an angle between 0° and 90° exclusive; and  
a liquid-conveying catheter completely surrounding the transmission part, a first end of said catheter attached to said source of liquid so that a second end of said catheter is capable of wetting all sides of the working part of the probe with liquid from the source of liquid, said handpiece including a liquid-conveying channel extending through said ultrasonic transducer, said channel having a first end in fluid communication with the source of sterile liquid and a second end attached to said first end of the catheter, wherein the catheter is made from a material having a negligible coefficient of friction relative to the liquid so that ultrasonic oscillation of the probe is not damped by said catheter or by a vessel wall when the probe and catheter are inserted into a vessel.

5,480,380

## COAXIAL DUAL LUMEN CATHETER

Geoffrey S. Martin, Mississauga, Canada, assignor to Med-Pro Design, Inc., Mississauga, Canada

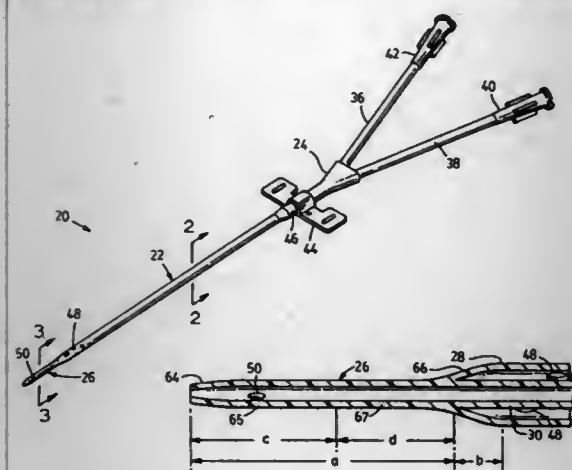
Continuation of Ser. No. 31,982, Mar. 16, 1993, abandoned.

This application Jun. 23, 1994, Ser. No. 264,285

Int. Cl.<sup>6</sup> A61M 3/00

U.S. Cl. 604-43

20 Claims



1. A dual lumen catheter comprising:  
outer tube material and inner tube material;  
a main portion extending axially between proximal and distal ends and having a selected first cross-sectional area, the main portion of the catheter including respective main portions of the outer tube material and the inner tube material and defining an annular intake lumen between the main portions of the inner and outer tube materials and a main part of a return lumen defined by the inner tube material, the main portion of the outer tube material terminating at the distal end of the main portion of the catheter in a converging tapered portion, and the main portion of the catheter having a plurality of side openings in the outer tube material adjacent the distal end of the main portion of the catheter, the openings being spaced around the main portion of the catheter to provide access into the intake lumen;

a tubular transition portion made of both outer and inner tube materials blended together integrally, and having a second cross-section smaller than said first cross-sectional area, the transition portion extending distally from said tapered portion;  
a tip portion made up exclusively of outer tube material and extending distally from the transition portion and being a continuation of the transition portion whereby the tip portion and the transition portion define a tip section which includes a return lumen part which, together with said main part of the return lumen, forms a return lumen having substantially constant cross-section;

a connector attached to the proximal ends of the inner and outer tube materials; and

intake and return tubes attached to the connector for continuous fluid communication with the respective intake and return lumens whereby the catheter can be used for procedures requiring dual flow through a single catheter.

5,480,381

## NEEDLE-LESS INJECTOR

Terence E. Weston, Eye, United Kingdom, assignor to Weston Medical Limited, Suffolk, United Kingdom

PCT No. PCT/GB92/01539, § 371 Date Aug. 4, 1994, § 102(e)

Date Aug. 4, 1994, PCT Pub. No. WO93/03779, PCT Pub.

Date Mar. 4, 1993

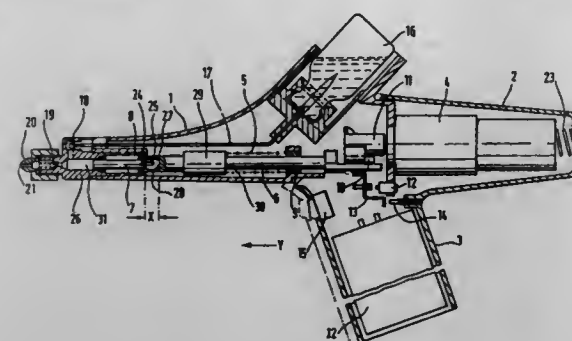
PCT Filed Aug. 21, 1992, Ser. No. 199,198

Claims priority, application United Kingdom, Aug. 23, 1991, 9118204

Int. Cl.<sup>6</sup> A61M 5/30

U.S. Cl. 604-68

12 Claims



1. A needle-less injector comprising:  
a chamber defined within said injector for containing liquid to be injected;  
a front portion having means defining a liquid outlet for said chamber;  
a rear portion having means defining a handle for said injector;  
a dispensing member in contact with the liquid in said chamber and movable in a first direction to reduce the volume of said chamber to cause the liquid contained therein to be expelled through said liquid outlet;  
an impacting member arranged to strike said dispensing member to cause movement thereof in said first direction;  
means for resiliently urging said rear portion away from said front portion; and  
means for actuating said injector, or permitting actuation thereof, in response to the application of a selected amount of axial pressure to said front portion to cause said front portion to move towards said rear portion against the force of said means for resiliently urging.

5,480,382

## STEERABLE MEDICAL DEVICE

Julius G. Hammerslag, San Juan Capistrano, and Gary R. Hammerslag, Dana Point, both of Calif., assignors to Pilot Cardiovascular Systems, Inc., San Clemente, Calif.

Continuation-in-part of Ser. No. 31,810, Mar. 15, 1993, Pat.

No. 5,372,587, which is a continuation-in-part of Ser. No.

865,357, Apr. 8, 1992, Pat. No. 5,203,772, which is a

continuation-in-part of Ser. No. 583,819, Sep. 17, 1990, Pat.

No. 5,108,368, which is a continuation-in-part of Ser. No.

461,049, Jan. 4, 1990, Pat. No. 4,998,916, which is a

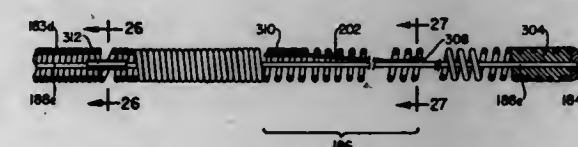
continuation-in-part of Ser. No. 295,124, Jan. 9, 1989, Pat.

No. 4,921,482. This application Sep. 2, 1994, Ser. No. 300,724

Int. Cl.<sup>6</sup> A61M 37/00

U.S. Cl. 604-95

5 Claims



1. A steerable guidewire for percutaneous transluminal insertion into the vascular system and controlled negotiation of branches and turns therein, comprising

an elongated tubular support structure having proximal and distal ends, at least the distal portion of said support structure comprising a spring coil;

a movable pull wire extending axially through said support structure;

a flexible deflection ribbon, the distal end of said deflection ribbon being attached directly to said pull wire and the proximal end of said deflection ribbon being attached directly to said spring coil;

whereby axial movement of the pull wire in a proximal direction relative to the support structure causes lateral deflection of said pull wire and coil spring distally of the point at which the deflection ribbon is attached to the coil spring.

material of the distal portion and supporting a distal extremity of the proximal portion and a proximal extremity of the distal portion; and

c) an inflatable dilatation member on a distal portion of the catheter with a distal extremity secured to the distal extremity of the inner tubular member.

5,480,384

## SYRINGE

Donald J. Highgate, Dorking, United Kingdom, assignor to Roy H. Rengstorff, Bel Air, Md.

Filed Dec. 8, 1994, Ser. No. 355,170

Claims priority, application United Kingdom, Dec. 9, 1993, 9325226

Int. Cl.<sup>6</sup> A61M 5/00

U.S. Cl. 604-110

4 Claims



1. A hypodermic syringe, comprising a chamber for liquid to be injected and a needle having a point for injection of the liquid, wherein the syringe includes, in contact with the liquid flow path through the syringe, a pre-stressed hydrophilic insert that, on hydration by contact with liquid, expands to block the flow path, the needle point is mounted on the insert, the point being deformed on hydration.

5,480,385

## SELF RETRACTING MEDICAL NEEDLE APPARATUS AND METHODS

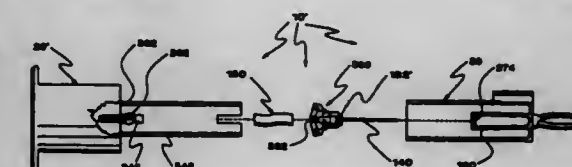
Gale H. Thorne, Bountiful; David L. Thorne, Kaysville, and Sandra A. Thorne, West Jordan, all of Utah, assignors to Specialized Health Products, Inc., Bountiful, Utah

Filed Jan. 10, 1995, Ser. No. 370,728

Int. Cl.<sup>6</sup> A61M 5/00

U.S. Cl. 604-110

31 Claims



1. Apparatus for transporting and using and then withdrawing a medical needle to a safe container after use, said apparatus comprising:

a hermetically sealed container comprising:

a needle exit and reentry end disposed proximal to a site of needle entry into a patient;

a portion proximal to the exit and reentry end being physically distortable without breaking said container;

an opposite end associated with blood delivery to a storage vessel for later use;

an integrally attached needle cover, initially disposed within said container but having a closed, but separable attachment at said needle exit and reentry end such that the cover is physically detachable from the rest of the housing at the needle exit and reentry end and is thereby provided with an exit path through the exit and reentry end;

at least one surface segment comprising a catch for a latch; a medical needle assembly comprising:

5,480,383

## DILATION CATHETER WITH A SMOOTH TRANSITION BETWEEN A STIFF PROXIMAL PORTION AND A FLEXIBLE DISTAL PORTION

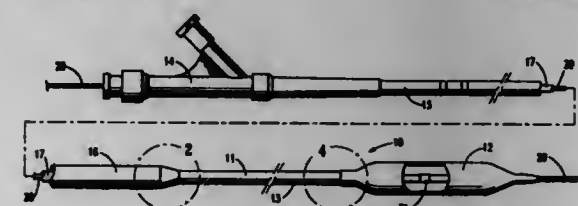
Celso S. J. Bagnolsan, Union City, and Hung V. Ha, San Jose, both of Calif., assignors to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.

Filed May 27, 1994, Ser. No. 250,804

Int. Cl.<sup>6</sup> A61M 25/00

U.S. Cl. 604-96

16 Claims



1. A dilatation catheter for performing angioplasty procedures within a patient's artery, comprising:

a) an outer tubular member having proximal and distal ends and an inner lumen extending therein;

b) an inner tubular member disposed within the inner lumen of the outer tubular member which has an inner lumen extending therein;

a proximal portion formed of a NiTi alloy having a desired modulus of elasticity;

a distal portion formed of a flexible plastic material having a much lower modulus of elasticity than the modulus of elasticity of the NiTi alloy;

a transition sleeve having a modulus of elasticity between the modulus of the NiTi alloy and the modulus of the plastic



a medical needle initially disposed within the needle cover and having a sharpened end disposed toward the needle exit and reentry end;

cover attachment hub means disposed about said medical needle and separably attachable to and detachable from the needle cover, said cover attachment hub being slideably affixed to said needle during transport and before and during blood withdrawal;

said cover attachment hub means further comprising a latch which, prior to blood withdrawal, is positioned to lock, by interaction with said at least one surface segment, said needle assembly at a predetermined position relative to said exit and reentry end whereat the needle extends outward from said housing and is thereby positioned for use;

a needle release assembly firmly affixed to said medical needle at at least an end of the assembly distal from the opposite end, said release assembly comprising:

a releasable attachment to said cover attachment hub;

an attachment release apparatus disposed in close communication with an internal surface of said container such that the release apparatus is actuated after the needle is extended by manual distortion of the physically distortable portion of said container;

means for affixing said needle assembly to a linear motion force storage apparatus which derives return energy for needle retraction from needle extension through the needle exit and reentry end;

a blood containment and delivery pathway from the needle to the opposite end;

means for delivering blood from the containment pathway to the storage vessel.

5,480,386

## PUMP ASSEMBLY FOR MEDICAL USE

Michael Brohy, Corseaux, and Frédéric Neftel, Lausanne, both of, Switzerland, assignors to Debiotech SA, Lausanne, Switzerland

PCT No. PCT/CH93/00222, § 371 Date Jul. 6, 1994, § 102(e) Date Jul. 6, 1994, PCT Pub. No. WO94/06491, PCT Pub. Date Mar. 31, 1994

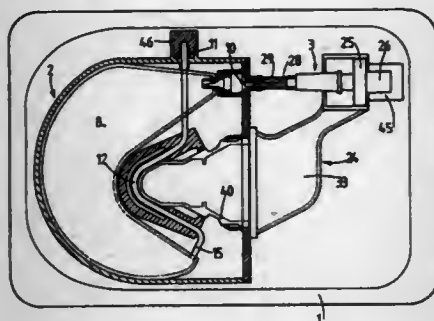
PCT Filed Sep. 14, 1993, Ser. No. 244,028

Claims priority, application Switzerland, Sep. 16, 1992, 2919/92

Int. Cl.<sup>6</sup> A61M 37/00

U.S. Cl. 604—131

11 Claims



1. An assembly forming a portable pump for the parenteral administration of medicamentous solutions, comprising a first module including a storage container for the medicamentous solution; an inlet means for filling said container, an outlet means for delivering said medicamentous solution outside the pump, and a second module having a motor and pumping means, said first module constructed and arranged to cooperate with the second module, said pumping means adapted to operate by the assembling of said first and second module, and said inlet means including a removable sterilizing filter device having readily detachable connection means for connecting and disconnecting the sterilizing filter device to an external face of said inlet means.

5,480,387

## INJECTION DEVICE

Jochen Gabriel, Stuttgart, and Herbert Bechtold, Ehningen, both of, Germany, assignors to Medico Development Investment Company, Zurich, Switzerland

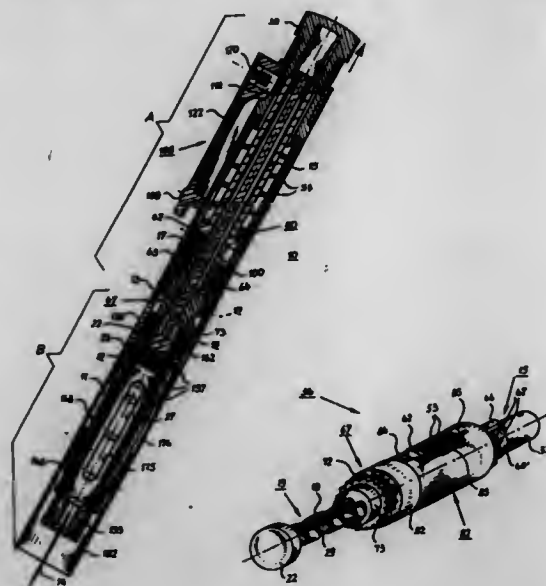
Continuation of Ser. No. 152,249, Nov. 12, 1993, abandoned, which is a continuation of Ser. No. 918,838, Jul. 22, 1992, abandoned. This application Aug. 24, 1994, Ser. No. 295,143

Claims priority, application Germany, Jul. 24, 1991, 41 24 536.9

Int. Cl.<sup>6</sup> A61M 5/20

U.S. Cl. 604—134

23 Claims



1. For combination with a liquid-containing cartridge (11), wherein the cartridge has a plunger (23) displaceably located therein, an injection device for injecting a selected dose of a fluid from the cartridge into a subject, when the injection device is located proximally with respect to the subject, wherein the injection device comprises

a housing (100) dimensioned to receive the cartridge (11);

an adjustable-length tappet (80) which is axially displaceable relative to said housing (100) between a proximal end position and a distal end position thereof, including

a dose-adjusting member (15) located within the housing (100) and having a thread (17), and

a threaded spindle (19) guided in the thread (17) of said dose-adjusting member (15), said threaded spindle (19) being axially aligned with said plunger (23) in said cartridge (11) for acting on said plunger when the cartridge is positioned in the injection device;

a spring means (53) having two ends, which ends are coupled, respectively, to said housing (100) and to said tappet (80) for axially biasing said dose-adjusting member (15) in a proximal direction;

a guide member (67) located in the housing (100), axially slidably located on said threaded spindle (19), and secured against rotation relative to said threaded spindle (19);

rotation-disabling means (92, 93) for disabling rotation of said guide member (67) relative to said housing (100) when said tappet (80) is in the proximal end position thereof while permitting rotation of the guide member (67) in the distal end position of said guide member (67); and

retaining means (42, 118) for retaining said dose-adjusting member (15) in a rotational position, selected by a user when setting the dose to be injected by rotating said dose-adjusting member (15) in a setting direction (190), and wherein said retaining means (42, 118) is enabled when said tappet (80) is in its distal end position, and is disabled when said tappet (80) is in its proximal end position.

5,480,388

## SEMI-AUTOMATIC CANNULATION DEVICE

Filliberto P. Zadini, and Giorgio C. Zadini, both of 2237 Hilltop La., Camarillo, Calif. 93012

Division of Ser. No. 929,182, Aug. 10, 1992, Pat. No.

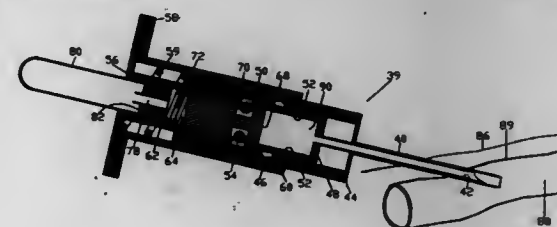
5,312,361, which is a continuation-in-part of Ser. No. 834,161, Feb. 11, 1992, abandoned, which is a continuation-in-part of Ser. No. 759,157, Sep. 13, 1991, abandoned. This application

Dec. 3, 1993, Ser. No. 162,457

Int. Cl.<sup>6</sup> A61M 5/178

U.S. Cl. 604—165

23 Claims



1. The intravascular catheter device for insertion of an intravascular catheter into the interior of a blood vessel comprising:

an intravascular catheter;

a hollow needle, said catheter being concentric to said hollow needle;

a chamber, wherein the pressure within said chamber is a vacuum pressure after the needle is inserted in body tissue, said chamber being in communication with said hollow needle;

means for self-propelled advancement of said intravascular catheter into the interior of a blood vessel;

means for actuating said means for self-propelled advancement of said catheter into the interior of a blood vessel, upon backflow of blood occurring upon blood vessel penetration, said blood being drawn by said vacuum pressure toward said chamber, said actuating means being manually actuatable.

5,480,389

## METHOD AND APPARATUS FOR ADJUSTING THE LENGTH OF A COMBINED SPINAL-EPIDURAL NEEDLE

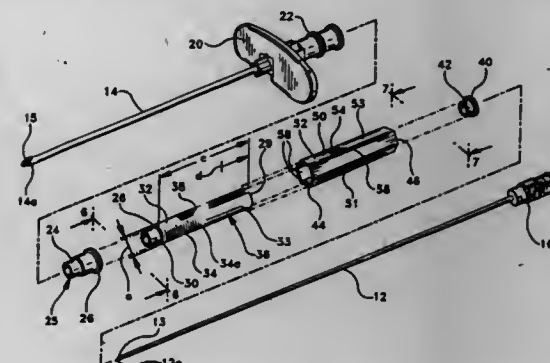
Keith McWha, Waldwick, N.J.; Nigel Talboys, Meylan, France; Joseph J. Gregg, Hasbrouck Heights, and William T. Antoshkiw, Wayne, both of N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Aug. 9, 1994, Ser. No. 287,995

Int. Cl.<sup>6</sup> A61M 19/00

U.S. Cl. 604—165

25 Claims



1. A device for regulating the extension of a spinal needle relative to an epidural needle, comprising:

a first member for securing said epidural needle;

a second member slidably disposed relative to said first member for securing said spinal needle; and

an actuating tab forming a selectably fixed connection between said first and second members, said actuating tab having a

locked position wherein said first member is locked relative to said second member and an unlocked position wherein said second member is slidable relative to said first member.

5,480,390

## SYRINGE APPARATUS

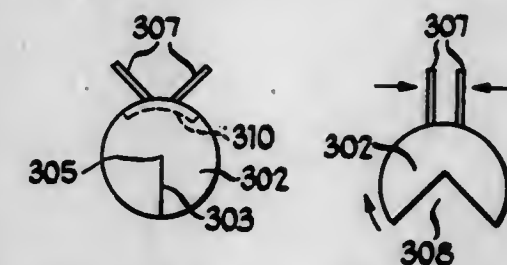
Kaveh-Karimi Hajishoreh, 8101 W. 79th St., Justice, Ill. 60458

Division of Ser. No. 34,244, Mar. 22, 1993. This application Mar. 21, 1994, Ser. No. 215,183

Int. Cl.<sup>6</sup> A61M 5/32; 5/00

U.S. Cl. 604—192

13 Claims



1. An improved cap apparatus for use with a syringe apparatus of the type utilizing interchangeable, disposable needle assemblies, each such assembly including a needle retainer member and a needle member, said improved cap apparatus comprising:

a substantially elongated cap member, having a front end, a rear end and a longitudinal axis, operably configured to substantially surround a needle member and at least a portion of a needle retainer member,

said cap member having a selectively openable and closable lateral aperture therein capable of permitting receipt of a needle member and at least a portion of a needle retainer member therethrough;

means for enabling selective opening of said lateral aperture by said operator; and

means for providing for the automatic substantial closing of said lateral aperture, following selective opening thereof by said operator, operably associated with said cap member.

5,480,391

Patent Not Issued For This Number

5,480,392

## ANGIOGRAPHY CATHETER

Frans Mous, Drachten, Netherlands, assignor to Cordis Corporation, Miami Lakes, Fla.

Filed Feb. 3, 1994, Ser. No. 191,285

Claims priority, application Netherlands, Feb. 4, 1993, 9300231

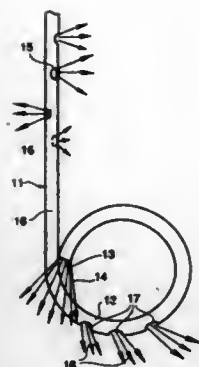
Int. Cl.<sup>6</sup> A61M 25/00; A61B 6/00

U.S. Cl. 604—280

4 Claims

1. An angiography catheter of the "pigtail" type comprising a tubular body having a generally cylindrical wall, a proximal end, a main portion, a distal end portion, a distal end and at least one lumen debouching at the distal end in an end opening, said distal end portion having a permanent, at least partially generally circular curvature that lies in a plane that also contains a distal portion of said main portion and having a number of openings arranged only in a portion of a wall facing outwardly of said generally circular curvature in said distal end portion and in said plane, said openings being arranged in the curvature in a side of said wall of said distal end portion remote from said end opening and facing in a direction in said plane containing said at least partially generally circular curvature and said distal portion of said main portion, whereby





fluid exiting said openings in side of said wall of said distal end portion having said curvature will reduce, if not eliminate, any force of said fluid on said distal end portion having said curvature that tends to "uncurl" said distal end portion having said curvature.

5,480,393

## NEEDLE FREE ACCESS ADAPTER

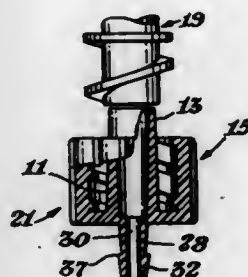
Alexander A. Bommarito, 12555 W. Freeland Rd., Freeland, Mich. 48623

Continuation-in-part of Ser. No. 228,714, Apr. 18, 1994, abandoned, which is a continuation-in-part of Ser. No. 85,160, Jul. 2, 1993, Pat. No. 5,321,906. This application Jan. 13, 1995, Ser. No. 372,775

Int. Cl.<sup>6</sup> A61M 25/00

U.S. Cl. 604-283

5 Claims



1. A needle free removable, cleanable, rotatable and reusable access adapter system comprising at least one member of the group consisting of a male unit and a female unit, each of said units having a first end and a second end, said male unit having a centrally disposed tube having a first end, a mid portion and a second end, said mid portion of said tube being disposed within an internally, circumferentially threaded cup having a base and an open end, said first end of said tube being in the form of a friction-fitting port in the shape of the frustum of a cone for leakless medical device connections extending from said base of said cup, said second end of said tube and said open end of said cup being cooperatively adapted to mate with and engage the threaded lock system of a female Luer fitting of any medical device, said female unit comprising a hollow cylindrical portion in operative communication with said first end and said second end and having internal shoulders positioned toward said first end, said first end being in the form of a friction-fitting port in the shape of the frustum of a cone for leakless medical device connections and said second end comprising a flange adapted to engage with the threaded lock system of a standard syringe and other male Luer fittings in use with medical devices.

5,480,394  
FLEXIBLE MEMBER FOR USE AS A MEDICAL BAG  
Kenji Ishikawa, Kanagawa, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan  
PCT No. PCT/JP92/00749, § 371 Date May 27, 1993, § 102(e) Date May 27, 1993, PCT Pub. No. WO93/05824, PCT Pub. Date Apr. 1, 1993

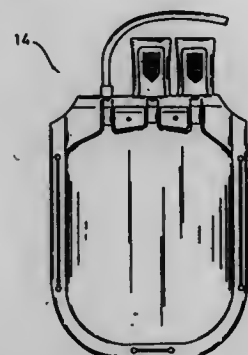
PCT Filed Jun. 11, 1992, Ser. No. 66,015

Claims priority, application Japan, Sep. 27, 1991, 3-249446; Nov. 14, 1991, 3-298959

Int. Cl.<sup>6</sup> A61M 1/00

U.S. Cl. 604-327

7 Claims



1. A flexible member for medical use selected from the group consisting of a blood bag, an infusion bag, a dialysis bag and a peritoneal nutrient bag wherein said flexible member comprises a body and at least one fluid port, and said body is fabricated from a resin composition comprising:

at least one member selected from the group consisting of a polyhydroxyalkanoate and a copolymer thereof; and a glyceride, said glyceride comprising 0.01 to 60% by weight of said resin composition.

5,480,395

Patent Not Issued For This Number

5,480,396

## LASER BEAM OPHTHALMOLOGICAL SURGERY METHOD AND APPARATUS

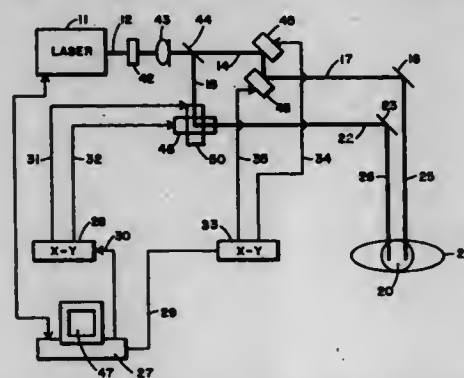
Gabriel Simon, Maestre Nicolau #23-6A, 08021 Barcelona, Spain, and Cheng-Hao Huang, 8843 Larwin La., Orlando, Fla. 32817

Filed Dec. 9, 1994, Ser. No. 352,357

Int. Cl.<sup>6</sup> A61N 5/06; A61B 17/36

U.S. Cl. 606-4

18 Claims



11. A laser ophthalmological surgery apparatus for ablating a portion of a cornea comprising:  
a laser for generating a laser beam;

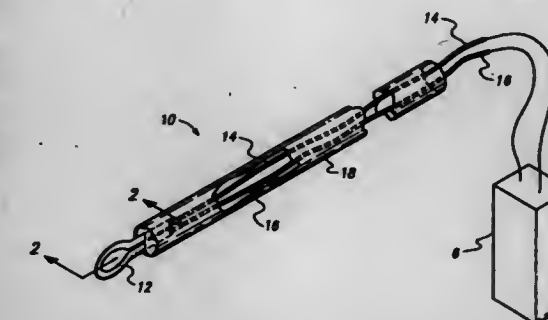
a beam splitter for splitting the laser beam from said laser into a plurality of laser beams;  
a plurality of scanners, each positioned for receiving one of said laser beams from said beam splitter and producing a predetermined scanning pattern from the laser beam impinging thereupon;  
focusing optics positioned between said laser and said beam splitter for focusing each of said laser beams onto one said scanner;  
directing means positioned between said plurality of scanners and said cornea for directing each of said laser beams onto the cornea of a patient's eye simultaneously in a parallel pattern for ablating a portion of the cornea of the eye; and  
a computer connected to each said scanner for controlling each said scanner in a predetermined pattern whereby a plurality of laser beams can perform a surgical procedure on a patient's eye.

5,480,398  
ENDOSCOPIC INSTRUMENT WITH DISPOSABLE AUTO-REGULATING HEATER  
Philip E. Eggers, Dublin, Ohio, assignor to Hemostatic Surgery Corporation, Georgetown, Cayman Islands  
Continuation of Ser. No. 960,471, Oct. 9, 1992, abandoned, which is a continuation-in-part of Ser. No. 877,476, May 1, 1992, abandoned. This application May 17, 1994, Ser. No. 245,304

Int. Cl.<sup>6</sup> A61B 17/32

U.S. Cl. 606-29

40 Claims



5,480,397  
SURGICAL INSTRUMENT WITH AUTO-REGULATING HEATER AND METHOD OF USING SAME

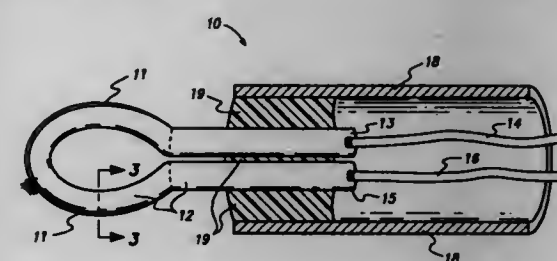
Philip E. Eggers, Dublin, Ohio, and Anthony J. Manlove, Menlo Park, Calif., assignors to Hemostatic Surgery Corporation, Georgetown, Cayman Islands

Continuation of Ser. No. 960,475, Oct. 9, 1992, abandoned, which is a continuation-in-part of Ser. No. 877,476, May 1, 1992, abandoned. This application May 17, 1994, Ser. No. 245,308

Int. Cl.<sup>6</sup> A61B 17/32

U.S. Cl. 606-29

33 Claims



1. An instrument for use in surgery comprising:  
a shaft having a proximal end and a distal end;  
a working end connected to the distal end of the shaft for manipulating and coagulating tissue, the working end having a working surface for contacting tissue and a cross-section extending perpendicularly to the working surface, the working end integrally formed of a heating element, the working surface maintained at an auto-regulated temperature by conducting a current throughout the entire cross-section of the working end, the heating element comprising a material having a skin depth extending substantially throughout the cross-section of the working end responsive to the temperature of the heating element and that decreases as the temperature of the heating element falls below the auto-regulated temperature;  
first and second electrode leads connected to the proximal end of the shaft; and  
means connecting the first and second electrode leads to the working end.

1. A disposable working tip for use in endoscopically manipulating and coagulating tissue, the disposable working tip adapted to be removably connected to the end of a reusable elongated shaft, the disposable working tip comprising:

a working end having a working surface for contacting tissue and a cross-section extending perpendicularly to the working surface, the working end integrally formed of a heating element, the working surface maintained at an auto-regulated temperature by conducting a current throughout the entire cross-section of the working end, the heating element comprising a material having a skin depth extending substantially throughout the cross-section of said working end responsive to the temperature of the heating element and that decreases as the temperature of the heating element falls below the auto-regulated temperature;

first and second terminals electrically coupled to the working end and adapted to be removably coupled to the end of the reusable elongated shaft; and  
means for coupling the disposable working tip to the end of the reusable elongated shaft.

5,480,399

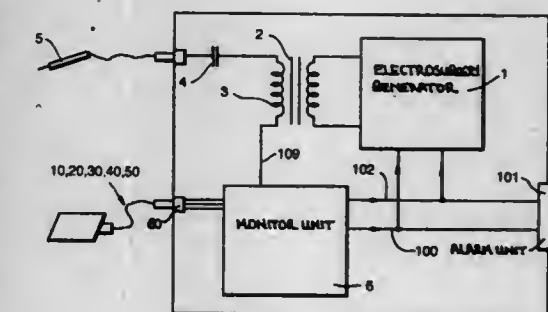
ELECTROSURGERY MONITOR AND APPARATUS  
Kevin A. Hebborn, Hove, England, assignor to Smiths Industries Public Limited Company, London, United Kingdom  
Filed Mar. 14, 1994, Ser. No. 212,739

Claims priority, application United Kingdom, Mar. 30, 1993, 9306637

Int. Cl.<sup>6</sup> A61B 17/39

U.S. Cl. 606-35

10 Claims





1. An electrosurgery monitor assembly comprising: a monitor unit; a large area return electrode; a cable; and a connector, the cable being connected at one end to the electrode and at its other end to the connector, wherein the monitor unit includes first, second and third input connections making electrical connection with the connector, a first oscillator, said oscillator having an input coupled with said first and second input connections such that an output of said oscillator is dependent on a connection being established between said first and second input connections, and detector means responsive to the output of said oscillator to provide an alarm signal in the event of the absence of a correct connection at said first and second input connections; said monitor unit including a first transformer, means connecting the output of said oscillator to a primary winding of said first transformer so as to provide an alternating input to said primary winding when there is a low impedance between said first and second input connections, said detector means being connected to a secondary winding of the first transformer and providing said alarm signal when the signal in the secondary winding falls below a predetermined value, and means connecting said second and third connections to a second primary winding of the first transformer, said detector means also producing an alarm signal if the output of said oscillator is above an upper threshold value, said connector providing a low impedance across said second and third connections so that the second primary winding produces a loading on the first transformer that reduces the output on said secondary winding below the upper threshold value.

5,480,400

# METHOD AND DEVICE FOR INTERNAL FIXATION OF BONE FRACTURES

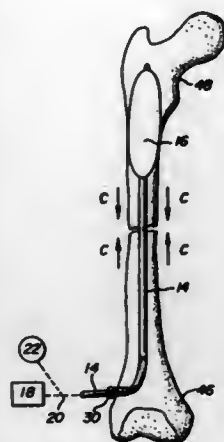
J. Lee Berger, 895 Mohawk Rd., Franklin Lakes, N.J. 07417

Filed Oct. 1, 1993, Ser. No. 130,434

Int. Cl.<sup>6</sup> A61F 5/04; A61M 25/00

U.S. Cl. 606—60

11 Claims



1. A method of setting a fractured bone by compression comprising the steps of:

- cutting an aperture into one portion of the fractured bone away from the site of the fracture allowing communication with the medullary cavity of the bone;
- inserting a balloon catheter device through the aperture cut in the bone into the medullary cavity of the bone;
- guiding the balloon catheter device past the fracture site into another portion of the fractured bone;
- inflating the balloon of the balloon catheter device to a sufficient diameter so that the balloon catheter device is held securely in place by the positive pressure of the balloon applied to the intramedullary walls of the bone; and
- tightening the attached catheter with the fixed balloon in place to align the fracture and compress the proximal and distal portions of the fractured bone together.

5,480,401

# EXTRA-DISCAL INTER-VERTEBRAL PROSTHESIS FOR CONTROLLING THE VARIATIONS OF THE INTER-VERTEBRAL DISTANCE BY MEANS OF A DOUBLE DAMPER

Fernand Navas, Charbonnières-les-Bains, France, assignor to

PSI, Lyons, France

Filed Feb. 10, 1994, Ser. No. 194,276

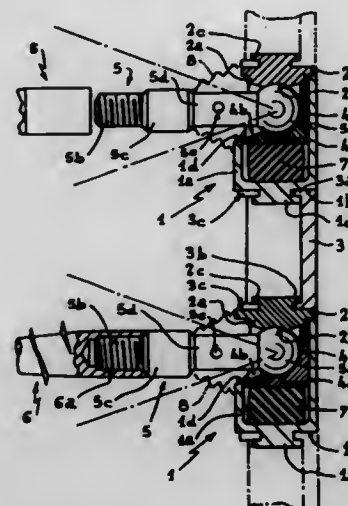
Claims priority, application France, Feb. 17, 1993, 93 02184;

May 17, 1993, 93 06174

Int. Cl.<sup>6</sup> A61B 17/70; A61F 2/44

U.S. Cl. 606—61

25 Claims



1. A damper for regulating the bending-stretching movement between the vertebrae spaced on either side of a disc the damper comprising: a pair of elements, each of said elements including a body, each of said bodies having opposite ends, an opening in each of said bodies intermediate said opposite ends, pivot means in each of said bodies communicating with each of said openings for pivotably mounting a pedicular screw to each of said bodies, at least one chamber within each of said bodies intermediate said pivot means and one of said opposite ends of said bodies, said at least one chamber defining a first volume, an elastic element mounted within said at least one chamber of each of said bodies and being engageable by said pivot means, each of said elastic elements normally defining a lesser volume than said first volume, and means for connecting said bodies in generally an end to end alignment.

5,480,402

# SHOULDER COMPRESSION INTERLOCKING SYSTEM

Andrew C. Kim, 30213 Del Rey Rd., Temecula, Calif. 92591

Filed Aug. 5, 1993, Ser. No. 102,473

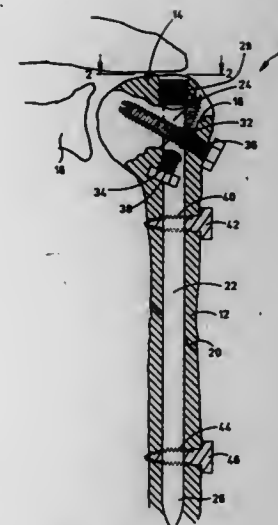
Int. Cl.<sup>6</sup> A61B 17/72

U.S. Cl. 606—64

16 Claims

1. A compression interlocking system for stabilizing upper arm fractures, comprising:

- elongated intramedullary rod means having a proximal end, a distal end and a longitudinal axis, said rod means adapted for extending within a bore generally parallel to a longitudinal axis of a humerus from a proximal end of the humerus to beyond a fracture of the humerus;
- a pair of transverse bores in the rod means for positioning adjacent the fracture; and
- a pair of lag screws for extending across said fracture and through said transverse bores, said transverse bores having longitudinal axes positioned and oriented so that said pair of lag screws positioned therein cross one another when viewed along both the longitudinal axis and in elevation view of the rod means, said bores being spaced along said axis of said rod



means so that said pair of lag screws may be installed therein simultaneously without interference.

5,480,403

# SUTURE ANCHORING DEVICE AND METHOD

Daniel R. Lee, Warsaw, and Thomas W. Sander, Winona Lake, both of Ind., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 284,731, Aug. 2, 1994, abandoned,

which is a continuation of Ser. No. 214,042, Jan. 28, 1994,

abandoned, which is a continuation of Ser. No. 898,799, Jun.

15, 1992, abandoned, which is a continuation-in-part of Ser.

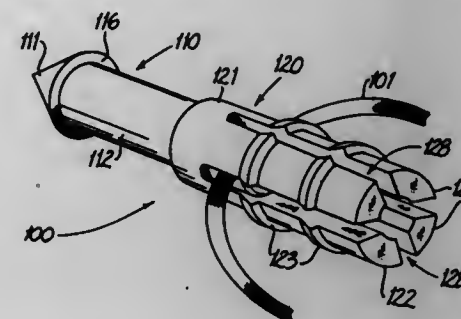
No. 673,953, Mar. 22, 1991, abandoned. This application Oct.

28, 1994, Ser. No. 331,241

Int. Cl.<sup>6</sup> A61F 5/04

U.S. Cl. 606—72

18 Claims



1. A suture anchor, comprising:

- a rivet for insertion distally at least partially into a hole in bone, said rivet including a body portion having a distal end and an axially extending aperture, and at least two legs extending proximally from said body portion, said legs being radially expandable in response to proximal movement of a setting pin;
- a setting pin for slidable positioning through said axially extending aperture, said setting pin having means for holding a suture, said setting pin being movable between a distal position with respect to said rivet wherein said rivet legs are not expanded, and a proximal position with respect to said rivet wherein said rivet legs are urged to a radially expanded configuration, said means for holding a suture being located in proximity to the distal end of said setting pin, and said setting pin further comprising at least two suture accommodating slots extending longitudinally along the sides of said setting pin; and

c) means for preventing rotation of the setting pin within said axially extending aperture, wherein said rivet legs are spaced apart from each other and said suture accommodating slots are aligned with the space between the legs of the rivet.

5,480,404

# SURGICAL TISSUE RETRIEVAL INSTRUMENT

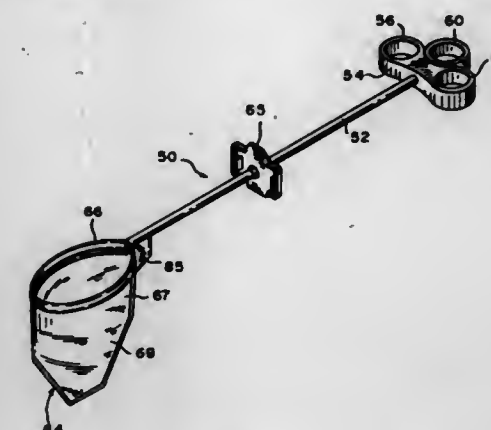
Gene W. Kammerer, East Brunswick; Royce Frederick, So. Bound Brook; Barbara Howard, Plainfield, and Edd Walker, Stockton, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jun. 16, 1993, Ser. No. 78,881

Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 606—113

44 Claims



1. A surgical instrument for retrieving tissue, comprising:

- an elongated support tube;
- a collapsible pouch supported at a distal end of said support tube and having an open end for receiving the tissue to be retrieved;
- a belt slidably mounted, on said support tube and formed into a loop slidably attached about said open end of said pouch; said belt being slidable longitudinally relative to said support tube for expanding said open end of said pouch to receive the tissue and for drawing said open end closed to enclose the tissue in said pouch;
- said pouch having a tapered shape for aligning the tissue in a desired orientation therein; and
- said pouch being elongated in shape with a length or depth substantially greater than its width at said open end.

5,480,405

# ANCHOR APPLIER INSTRUMENT FOR USE IN SUTURING TISSUE

InBae Yoon, 2101 Highland Ridge Dr., Phoenix, Md. 21131

Division of Ser. No. 2,479, Jan. 6, 1993, Pat. No. 5,437,680,

which is a continuation-in-part of Ser. No. 719,281, Sep. 18,

1991, Pat. No. 5,366,459, which is a division of Ser. No.

450,301, Dec. 15, 1989, Pat. No. 5,100,418, which is a

continuation-in-part of Ser. No. 49,504, May 14, 1987, aban-

doned. This application Oct. 18, 1993, Ser. No. 136,857

Int. Cl.<sup>6</sup> A61B 17/04

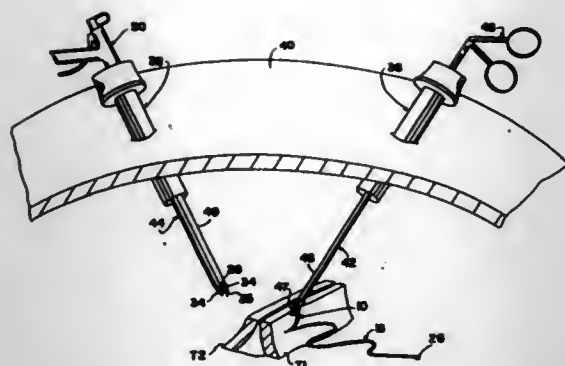
U.S. Cl. 606—139

4 Claims

1. In combination, a length of suture material and an anchor applier instrument for use in suturing tissue in an anatomical cavity during an endoscopic procedure comprising

- a length of suture material for being passed through the tissue to form a looped portion disposed externally of the tissue; and
- an anchor applier instrument for being inserted through a portal in a wall of the anatomical cavity to engage said looped portion and including a barrel housing a plurality of anchors therein for anchoring said suture material in the tissue, said





barrel having a distal end for ejecting said anchors and a length to extend through the portal to a proximal end, a handle receiving said barrel proximal end for manipulating said anchor applicator instrument within the anatomical cavity, and anchor receiver means positioned at said barrel distal end for receiving anchors ejected therefrom, said anchor receiver means having tapered tip means for insertion in said looped portion of said length of suture material to position said looped portion in engagement with anchors received by said anchor receiver means, said anchor receiver means including a pair of opposing jaws for receiving an anchor therebetween, one of said jaws extending beyond the other of said jaws to form said tapered tip means.

5,480,406

# METHOD OF EMPLOYING SURGICAL SUTURING APPARATUS TO TIE KNOTS

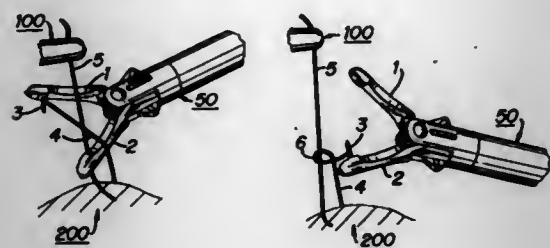
Paul Nolan, Wilton; H. Jonathan Tovey, Milford; Corbett W. Stone, Newtown, all of Conn., and Gregory S. Gardner, Owings Mills, Md., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Oct. 7, 1994, Ser. No. 319,837

Int. Cl.<sup>6</sup> A61B 17/64

U.S. Cl. 606—139

16 Claims



1. A method for forming a knot during endoscopic surgery using a surgical apparatus including the steps of:
  - providing a surgical instrument having first and second jaws which open and close and a surgical needle with length of suture attached, the needle operatively connected to the jaws so that it may be passed between them;
  - passing the needle and a portion of the suture through a piece of tissue to create a first suture portion attached to the needle on one side of the tissue and a second suture portion on the other side of the tissue;
  - creating a first loop of suture around the second portion of suture using the first portion of suture by passing the needle between the jaws.

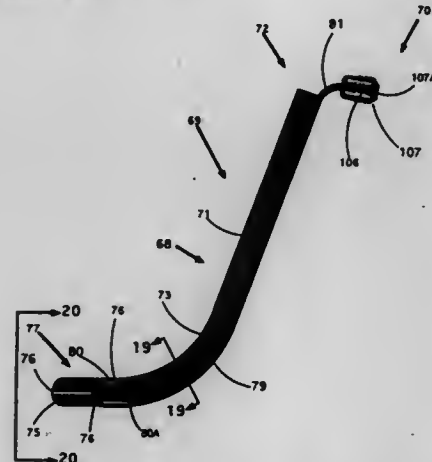
## 5,480,407 SUTURING INSTRUMENT WITH HEMORRHAGING CONTROL

Shaw P. Wan, 603 Lariat La., Rolla, Mo. 65401, and Rosendo Martinez, 790 Prigge Rd., St. Louis, Mo. 63138  
Continuation-in-part of Ser. No. 992,494, Dec. 17, 1992, Pat. No. 5,342,374. This application Jun. 23, 1994, Ser. No. 264,515

Int. Cl.<sup>6</sup> A61B 17/04; A61M 29/02

U.S. Cl. 606—148

22 Claims



1. A suturing instrument for impeding the flow of blood around a suturing site, the instrument comprising,
  - a rigid bent shaft having opposite ends which are distal and proximal relative to a person holding the instrument, the distal end of the shaft being adapted to be inserted into a patient during said procedure,
  - a suture guide at the distal end of the shaft,
  - an expandable annular member of flexible, resilient material encircling the shaft adjacent its distal end, and
  - expansion means for expanding said annular member radially outwardly relative to the shaft, said expansion means being adapted for expanding said annular member when the suturing instrument is positioned in the patient thereby to compress blood vessels adjacent said suturing instrument to occlude the flow of blood around a suturing site.

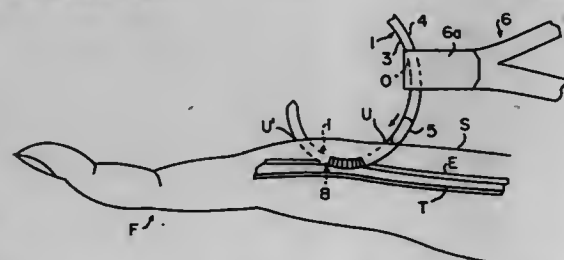
## 5,480,408 ENDOSCOPIC SURGICAL KIT FOR RELEASE OF TRIGGER FINGER

James C. Y. Chow, 3001 Caroline St., Mount Vernon, Ill. 62864  
Filed Oct. 12, 1993, Ser. No. 135,462

Int. Cl.<sup>6</sup> A61B 17/32; 1/00

U.S. Cl. 606—167

9 Claims



1. A surgical kit for performing trigger finger release surgery by which a sheath covering a constricted flexor tendon in a patient's hand is cut to relieve the constriction and release the trigger finger comprising:
  - a cannula having one end insertable through the skin covering the palm of the patient's hand, said cannula being a hollow, concavely curved instrument which by continued insertion of said insertable end into the palm causes said insertable end to

be pushed back out through the skin covering the palm whereby a first puncture wound is made in the skin at an entry site of the cannula and a second puncture wound is made at an exit site thereof, said cannula being adapted to be pushed through the palm of the hand such that the path of said cannula passes through said sheath, said cannula further adapted to being left in place after its insertion, and said cannula being curved along its longitudinal axis and having a longitudinal slot formed on its inner curved surface, said slot extending from said insertable end of the cannula to the other end thereof;

an arthroscope insertable in one end of said cannula for allowing an operating surgeon to view the surgical site; and, a curved, flexible surgical knife insertable in the cannula end opposite to that which an arthroscope is inserted said surgical knife being used by the surgeon to cut said sheath and release the trigger finger with said surgical site being viewable using said arthroscope, said arthroscope and said knife being withdrawn from said cannula after said sheath is cut, and said cannula being withdrawn thereafter, and the diameter of said cannula being such that after its withdrawal, said first and second puncture wounds do not require stitches to close them, and, as said wounds heal, no scars are formed.

5,480,409

## LAPAROSCOPIC SURGICAL INSTRUMENT

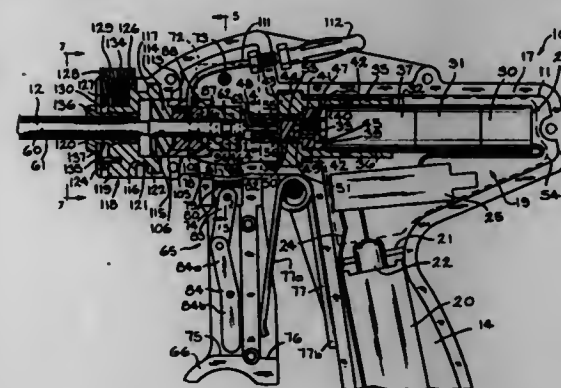
Erol D. Riza, 550 Riverside Dr., Rossford, Ohio 43460

Filed May 10, 1994, Ser. No. 241,035

Int. Cl.<sup>6</sup> A61B 17/28

U.S. Cl. 606—205

37 Claims



1. A surgical instrument comprising:
  - a handle including a body and a trigger arm, said body including a body detent which is movable relative to said body between a first body detent position and a second body detent position, said trigger arm being movable relative to said body and including a trigger arm detent which is movable relative to said trigger arm between a first trigger arm detent position and a second trigger arm detent position; and
  - a tool portion actuable in response to movement of said trigger arm relative to said body, said tool portion including a first shaft and a second shaft, said first shaft being engaged by said body detent when said body detent is in said first body detent position to releasably connect said first shaft to said body, said second shaft being engaged by said trigger arm detent when said trigger arm detent is in said first trigger arm detent position to releasably connect said second shaft to said trigger arm, movement of said trigger arm relative to said body causing relative movement of said first and second shafts to cause actuation of said tool portion.

5,480,410

## EXTRACORPOREAL PNEUMOPERITONEUM ACCESS BUBBLE

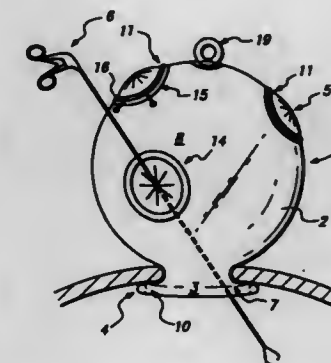
Alfred Cuschieri, Fife, Scotland, and Malcom D. Heaven, Hopewell, N.J., assignors to Advanced Surgical, Inc., Princeton, N.J.

Filed Mar. 14, 1994, Ser. No. 209,278

Int. Cl.<sup>6</sup> A61B 17/04

U.S. Cl. 606—213

24 Claims



1. A medical device for forming an extracorporeal pneumoperitoneum extension comprising an enclosure having an interior and an open end, and deploying means at the open end of the enclosure, the deploying means being deformable to a configuration which permits the open end to pass through a trocar puncture site in an abdominal wall and then expand the open end beneath an inner surface of the abdominal wall such that gas in the abdominal cavity passes into the interior of the enclosure, the enclosure including at least one access opening therein for accessing the interior of the enclosure and allowing surgical operations to be performed beneath the abdominal wall or within the interior of the enclosure.

5,480,411

## METHOD OF SUTURING USING A POLYETHERIMIDE ESTER SUTURE

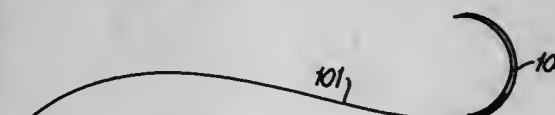
Cheng-Kung Liu, Norwalk, and John C. Brewer, Bristol, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 26,723, May 3, 1993, abandoned, which is a division of Ser. No. 845,100, Mar. 3, 1992, Pat. No. 5,225,485. This application Feb. 27, 1995, Ser. No. 395,278

Int. Cl.<sup>6</sup> A61B 17/04

U.S. Cl. 606—230

13 Claims



1. A method of suturing a wound which comprises:
  - a) passing through tissue needled suture manufactured from a polyetherimide ester composition with comprises the reaction product of
    - i) at least one low molecular weight diol;
    - ii) at least one dicarboxylic acid; and
    - iii) at least one polyoxyalkylene diimide diacid; to create wound closure; and
  - b) removing the needle from said suture.



5,480,412

# SYSTEM AND METHOD FOR DERIVING HEMODYNAMIC SIGNALS FROM A CARDIAC WALL MOTION SENSOR

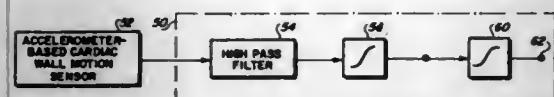
Gabriel Mouchawar, Newhall; Kelly H. McClure, Simi Valley, and Sheldon B. Moberg, Kagel Canon, all of Calif., assignors to Pacesetter, Inc., Sylmar, Calif.

Filed Nov. 16, 1993, Ser. No. 154,800

Int. Cl.<sup>6</sup> A61N 1/365

U.S. Cl. 607—6

26 Claims U.S. Cl. 607—28



1. An implantable cardiac stimulating device for providing therapeutic electrical stimulation to treat cardiac arrhythmias, the implantable cardiac stimulating device having a cardiac wall motion sensor associated therewith for providing a cardiac wall acceleration signal, the implantable cardiac stimulating device comprising:

- electrical stimulation generating circuitry for generating the therapeutic electrical stimulation;
- processing circuitry for deriving a hemodynamic signal representative of cardiac hemodynamic performance from the cardiac wall acceleration signal; and
- control circuitry for regulating the electrical stimulation generating circuitry in accordance with the hemodynamic signal.

5,480,413

# APPARATUS AND METHOD FOR STABILIZING THE VENTRICULAR RATE OF A HEART DURING ATRIAL FIBRILLATION

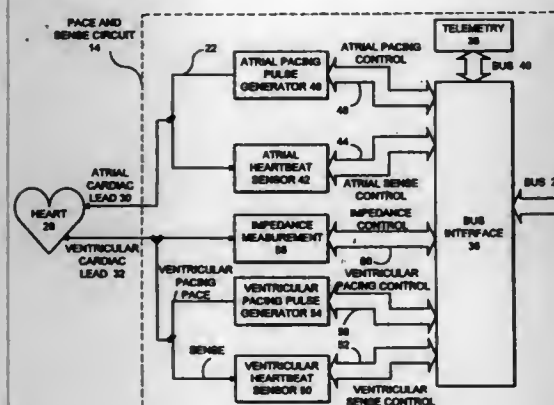
Saul Greenhut, Aurora; Bruce Steinhilber, Parker; Albert Dawson, Littleton, and Tibor Nappholz, Englewood, all of Colo., assignors to Teletronics Pacing Systems, Inc., Englewood, Colo.

Filed Nov. 30, 1994, Ser. No. 347,279

Int. Cl.<sup>6</sup> A61N 1/368

U.S. Cl. 607—14

13 Claims



1. An implantable pacemaker for insertion into a patient for stimulating the patient's heart, said pacemaker comprising: means for detecting R—R intervals between consecutive R-waves in said heart, said R—R intervals defining a ventricular rate in a ventricle of said heart; means for detecting an atrial tachyarrhythmia in an atrium of said heart; means for determining if said ventricular rate is unstable in response to said atrial tachyarrhythmia based on said R—R intervals; means for pacing said ventricle at a ventricular pacing rate; and means for stabilizing said ventricular rate by increasing said ventricular pacing rate when said ventricular rate is unstable.

5,480,414

# METHOD AND APPARATUS FOR CONTROLLING PACEMAKER DURING AUTOMATIC CAPTURE DETECTION

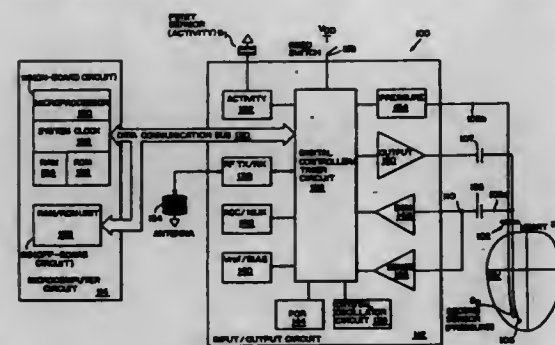
John C. Stroebel, Blaine, and H. Toby Markowitz, Roseville, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Jun. 13, 1994, Ser. No. 259,048

Int. Cl.<sup>6</sup> A61N 1/37

U.S. Cl. 607—28

5 Claims



1. A pacemaker capable of automatically seeking stimulation thresholds comprising:

- a pulse delivery and generator means for being coupled to a patient's heart to deliver primary and backup stimulation pulses;
- a means coupled to receive indications of the capture of said patient's heart in response to a stimulation pulse and in response to said detection generating a signal value related to the amount of time between the delivery of said primary stimulation pulse and said detected capture if one is detected, means for determining amplitude and pulse width thresholds of primary pacing pulses based on said time related signal value; and wherein said backup stimulating pulses are delivered after said primary pulses.

5,480,415

# APPARATUS FOR HIGH SPEED DATA COMMUNICATION BETWEEN AN EXTERNAL MEDICAL DEVICE AND AN IMPLANTABLE MEDICAL DEVICE

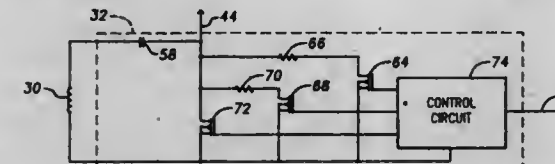
Timothy J. Cox, Lake Jackson, and Randolph K. Armstrong, Missouri City, both of Tex., assignors to Intermedics, Inc., Angleton, Tex.

Continuation of Ser. No. 259,902, Jun. 15, 1994, abandoned, which is a division of Ser. No. 58,752, May 5, 1993, Pat. No. 5,383,912. This application May 9, 1995, Ser. No. 437,514

Int. Cl.<sup>6</sup> A61N 1/37

U.S. Cl. 607—32

15 Claims



1. In an implantable medical device of the type having means for generating data to be communicated to an external device, for use with an external device that transmits discrete pulses of electromagnetic energy to the implantable medical device, the improvement comprising a communication circuit for communicating data from the implantable medical device to the external device including:

- antenna coil means for receiving a first pulse of electromagnetic energy transmitted from the external device such that a first transient electric current is produced therein, and also for

receiving therein a second transient electric current such that a second pulse of electromagnetic energy is radiated therefrom to the external device;

non-linear means, in circuit communication with said antenna coil means, for converting the first transient electric current into a non-zero average electric current;

a storage capacitor in circuit communication with said antenna coil means and said non-linear means and charged by the non-zero average electric current;

switch means, in circuit communication with said storage capacitor and said antenna coil means, for selectively connecting the charged storage capacitor and said antenna coil means in circuit communication such that the charge stored in the storage capacitor is discharged into the antenna coil means as the second transient electric current; and

controller means, in circuit communication with said means for generating data, said antenna coil means, and said switch means, and responsive to said data and said received first pulse of electromagnetic energy, for selectively actuating said switch means after a selected time delay following receipt of the first pulse of electromagnetic energy, the selected time delay having a duration representing data to be communicated;

wherein transmission of data from the implantable medical device to the external device is powered by energy supplied by the external device.

5,480,416

# CARDIAC PACEMAKER WITH UNIVERSAL COATING

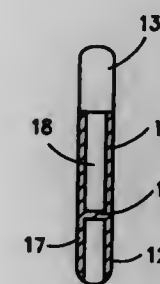
John Garcia, Houston, Tex.; Eckhard Alt, Otterburn, Germany, and Lawrence J. Stotts, Lake Jackson, Tex., assignors to Intermedics, Inc., Angleton, Tex.

Filed Sep. 22, 1994, Ser. No. 310,570

Int. Cl.<sup>6</sup> A61N 1/05

U.S. Cl. 607—36

14 Claims



6. A stimulus generator for a medical device adapted to be implanted in the body of a patient beneath the skin and adjacent the musculus to stimulate and sense electrical activity of preselected excitable body tissue by means of an electrode at the distal end of a conductive lead, comprising an electrically conductive case having two sides and an edge connecting the two sides; a header projecting from a portion of the edge of the case adapted for electrical connection of circuitry of the stimulus generator within the case to the proximal end of the lead; and an electrically insulative film coating the entire surface of the case except a portion of exposed surface of said edge adapted to serve as a complementary electrode contact surface for assisting said stimulation and sensing of electrical activity; whereby to allow implantation of the stimulus generator with either side of the case adjacent the musculus without danger of sensing or stimulating activity of the adjacent musculus during operation of the stimulus generator when implanted.

5,480,417

# METHOD AND APPARATUS FOR THE SURGICAL TREATMENT OF TISSUES BY THERMAL EFFECT, AND IN PARTICULAR THE PROSTATE, USING A URETHRAL MICROWAVE-EMITTING PROBE MEANS

Gérard Hascoet, Paris; Francois LaCoste, Lyons; Muriel Cathaud, Venissieux; Jean-Marie Jacomino, Villeurbanne; Marian Devonec, Miribel, and Paul Perrin, Lyons, all of France, assignors to Technomed Medical Systems, Vaulx-en-Velin, France

Division of Ser. No. 667,847, Mar. 12, 1991, Pat. No. 5,234,004, which is a continuation-in-part of Ser. No. 438,741, Nov. 17, 1989, abandoned. This application May 24, 1993, Ser. No. 66,774

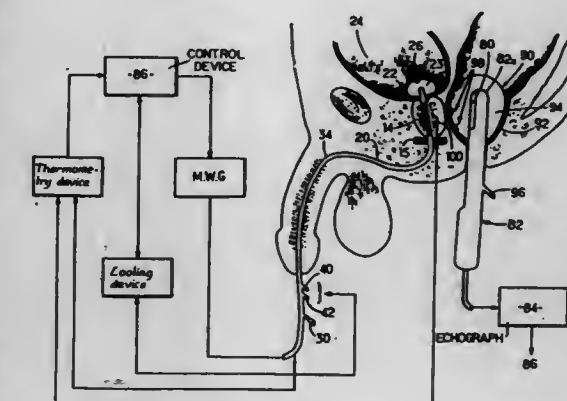
Claims priority, application France, Nov. 21, 1988, 88 15126; Mar. 12, 1990, 90 03121

The portion of the term of this patent subsequent to Aug. 10, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> A61N 5/02

U.S. Cl. 607—101

29 Claims



1. A method for the surgical treatment of a patient having a prostate and a urethra in which the prostate is treated by thermal effect, comprising the steps of:

- positioning a urethral emitting probe in the urethra, said probe having a front end, a rear end and an electromagnetic device for generating heat located in the vicinity of said front end and connected to an external means for generating electromagnetic energy;
- inserting said urethral emitting probe into the urethra until said electromagnetic device reaches a part of the urethra located inside the prostate;
- heat protecting at least the part of the urethra located inside the prostate from the heat produced by said electromagnetic device, when said electromagnetic device is activated;
- activating said electromagnetic energy generating means for generating electromagnetic energy through said electromagnetic device towards the prostate at a frequency and a power effective to heat at least a portion of the prostate to a predetermined temperature range for a period of time sufficient to treat the prostate by thermal effect, while said protecting step minimizes damage to a urethral wall of the urethra by maintaining the part of the urethra in the prostate at a temperature, sufficiently less than the temperature to which at least the portion of the prostate is heated, to prevent thermal damage to the urethral wall.

5,480,418

# THERMAL TRANSFER HAIR TREATMENT CAP

Alyce Zeoli-Jones, 18400 River Rd., Poolesville, Md. 20837

Filed Mar. 11, 1994, Ser. No. 208,518

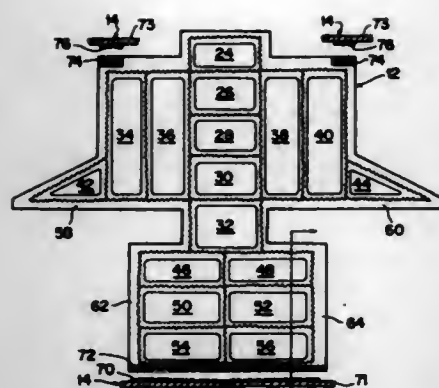
Int. Cl.<sup>6</sup> A61F 7/00

U.S. Cl. 607—110

5 Claims

1. A thermal transfer hair treatment cap comprising:





a liner formed of an inner web and an outer web coupled together in a facing relationship to define a plurality of adjoining top pockets each having longitudinal sides and transverse sides with each longitudinal side of each top pocket being positioned adjacent the longitudinal side of an adjoining top pocket, a plurality of side pockets each having longitudinal sides and transverse sides with the longitudinal side of at least one side pocket being positioned adjacent an individual transverse side of at least one of said top pockets and the longitudinal side of at least another side pocket being positioned adjacent another individual transverse side of at least another of said top pockets, a plurality of triangularly shaped pockets each having a longitudinal side and a transverse side with said transverse side of each triangularly shaped pocket being positioned adjacent an outboard longitudinal side of one of said plurality of side pockets and a plurality of rear pockets each having longitudinal sides and transverse sides with said transverse sides of said rear pockets being joined together in pairs and with a remaining lower longitudinal side of one of said plurality of top pockets being positioned adjacent one of said longitudinal sides of at least one of said rear pockets, at least one of said transverse sides of said rear pockets being joined to said longitudinal side of one of said triangularly shaped pockets and at least another of said transverse sides of said rear pockets being joined to said longitudinal side of another one of said triangularly shaped pockets;

a plurality of gel units, each positioned within one of said pockets; and

a decorative outer covering attached to and surrounding said liner.

5,480,419

### STIMULATION LEAD SPECIALLY CARDIAC WITH AUXILIARY CONNECTION

Marc F. Bemurat, 20 Allées du Bicon, F-33850 Leognan, France

Continuation of Ser. No. 978,762, Nov. 19, 1992, abandoned.

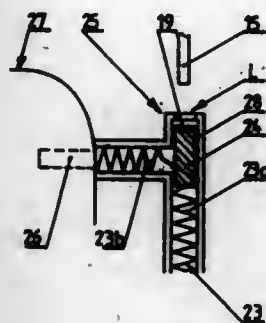
This application Nov. 7, 1994, Ser. No. 339,286

Claims priority, application France, Dec. 17, 1991, 91 15903; European Pat. Off., Jan. 6, 1992, 92450013

Int. Cl.<sup>6</sup> A61N 1/04

U.S. Cl. 607—115

19 Claims



1. A pacemaker lead system, comprising:
  - a flexible spiral electrical conductor having first and second connector means at opposite ends thereof for removably connecting said conductor to a pulse generator and to an electrode stimulation device, respectively;
  - a flexible insulating sheath surrounding said conductor;
  - a sealed access means for providing controlled access to said electrical conductor, said sealed access means including a piece of a rigid electrically conducting material, said piece being electrically connected to said conductor;
  - a sealed covering structure covering said piece; and
  - auxiliary electrical connection means for forming an electrical connection between said piece and an auxiliary electrical circuit, said auxiliary electrical connection means being able to traverse said covering structure and to contact said piece without penetrating material of said piece.

5,480,420

### RESORBABLE TEMPORARY MEDICAL ELECTRODE DEVICE

Kurt Hoegnelid, Vaesterhaninge, Sweden; Hans Thornander, Recloses, France, and Martin Obel, Danderyd, Sweden, assignors to Siemens Elema AB, Solna, Sweden

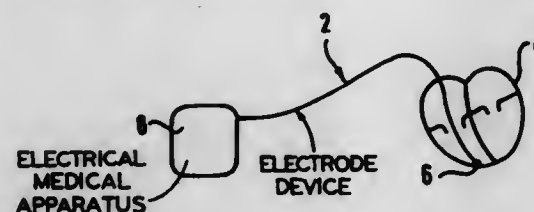
Filed Sep. 1, 1994, Ser. No. 299,345

Claims priority, application Sweden, Sep. 24, 1993, 9303120

Int. Cl.<sup>6</sup> A61N 1/04

U.S. Cl. 607—116

13 Claims



1. An electrode device for at least partial implantation temporarily into living tissue, comprising:
  - an electrically insulating sheath consisting of resorbable material;
  - an electrical conductor contained in said insulating sheath consisting of a non-toxic electrically conductive liquid; and
  - an electrode carried by said insulating sheath and in electrical contact with said electrical conductor, and adapted for electrically interacting with living tissue.

5,480,421

### LEAD WITH STYLET CAPTURE MEMBER

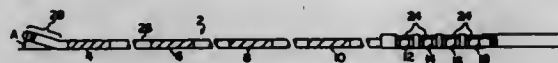
Lynn M. Otten, Blaine, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 969,620, Oct. 30, 1992, Pat. No. 5,360,441. This application Aug. 5, 1994, Ser. No. 286,739

Int. Cl.<sup>6</sup> A61N 1/372

U.S. Cl. 607—122

8 Claims



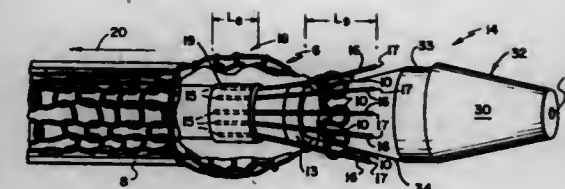
1. An epidural lead having a distal end and a proximal end, the epidural lead comprising:
  - a flexible tubular outer member substantially concentric to a longitudinal axis of the lead, said outer member extending substantially an entire length of the lead,
  - a flexible tubular inner member lying within said outer member, said inner member having a distal end located near the distal end of the lead, said inner member extending substantially to the proximal end of the lead and defining a central lumen,

at least one electrode secured to said outer member near the distal end of the lead,

at least one conductor connected to said at least one electrode for transmitting electrical signals from the proximal end of the lead to said at least one electrode,

a stylet for insertion in the central lumen of the lead, said stylet having an enlarged tip of predetermined shape at a distal end, and

capture means connected to said flexible tubular outer member at the distal end of the lead for releasably securing in a stabilized positional relationship the enlarged tip of said stylet to the lead in a manner that prevents rotation of said lead with respect to said flexible tubular outer member, such that the lead can be positioned in a desired location by at least one of advancing and withdrawing and rotating said stylet.



a prosthesis having a proximal and distal end and a tissue-engaging body therebetween,

said prosthesis including openings through said tissue-engaging body, near the distal end,

said prosthesis having a radially compact form for delivery into the patient, and, being radially expandable along its body for engaging tissue,

said system further including a catheter having a portion for supporting said prosthesis in said compacted form during delivery into the patient,

said supporting portion of said catheter including members, fixed at axial positions on said catheter, said members each including a free end, for engaging a distal portion of said prosthesis by extending through said openings through said prosthesis to maintain the distal portion in compact form at said fixed axial position while proximal portions of said prosthesis radially expand to engage tissue,

said distal portion of said prosthesis engaged by said member being releasable from said fixed axial position of said catheter by relative axial motion between said member and said prosthesis, so that the free ends of said members disengage said prosthesis.

5,480,422

### APPARATUS FOR TREATING CARDIAC ARRHYTHMIAS

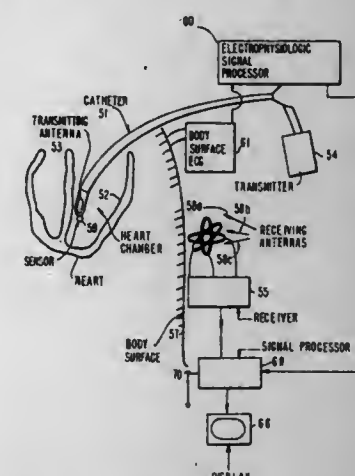
Shlomo Ben-Haim, Haifa, Israel, assignor to Biosense, Inc., Orangeburg, N.Y.

Continuation of Ser. No. 94,539, Jul. 20, 1993, Pat. No. 5,391,199. This application Sep. 23, 1994, Ser. No. 311,594

Int. Cl.<sup>6</sup> A61N 1/18

U.S. Cl. 607—122

28 Claims



1. An apparatus for treating cardiac arrhythmias, which comprises:
  - (a) means for positioning the distal tip of each of one or more catheters at a site adjacent to or within a patient's heart;
  - (b) means for sensing location information at the site;
  - (c) means for sensing local information concerning the heart's electrical activity at the site;
  - (d) means for processing sensed information from means (b) and (c) to create one or more data points;
  - (e) means for repeating the functions of means (a), (b), (c) and (d) one or more times to create sufficient data points for a map of the heart's electrical pathways; and
  - (f) means for ablating a portion of the heart, whose electrical pathways cause said arrhythmias.

5,480,423

### PROSTHESIS DELIVERY

Adrian C. Ravenscroft, Boston, and George T. Roberts, Weston, both of Mass., assignors to Boston Scientific Corporation, Watertown, Mass.

Filed May 20, 1993, Ser. No. 65,238

Int. Cl.<sup>6</sup> A61F 2/06; A61M 29/02

U.S. Cl. 623—1

19 Claims

1. A system for positioning a prosthesis in contact with tissue within a patient, comprising:

### HEART VALVE REPLACEMENT USING FLEXIBLE TUBES

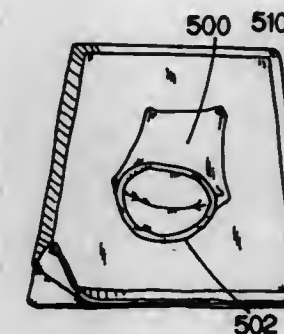
James L. Cox, 7 Dromara Rd., Ladne, Mo. 63124

Filed Nov. 1, 1993, Ser. No. 146,938

Int. Cl.<sup>6</sup> A61F 2/24

U.S. Cl. 623—2

7 Claims



1. An article of manufacture comprising a sealed container and an enclosed intestinal tissue segment suitable for surgical implantation as a replacement valve in a mammalian heart, wherein:
  - (a) the intestinal tissue segment has been harvested from a small intestine of a mammalian species selected from the group consisting of humans, and genetically-engineered hypoallergenic pigs;
  - (b) the intestinal tissue segment remains in a tubular form which facilitates surgical implantation of the segment as a replacement valve in a heart without requiring a longitudinal suture to convert the segment into tubular form for implantation;
  - (c) the intestinal tissue segment is sufficiently long to allow it to be surgically implanted as a replacement valve in a heart in a human patient; and,
  - (d) the sealed container encloses and maintains sterility of the intestinal tissue segment.



5,480,425

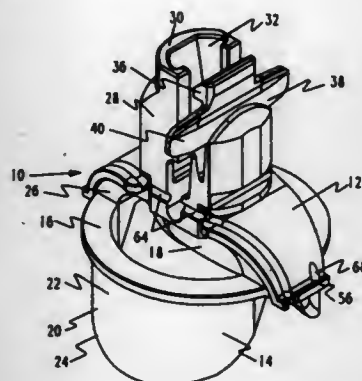
# INTEGRATED HEART VALVE ROTATOR AND HOLDER William F. Ogilvie, Austin, Tex., assignor to CarboMedics, Inc., Austin, Tex.

Filed Jun. 9, 1994, Ser. No. 257,681

Int. Cl.<sup>6</sup> A61F 2/24

U.S. Cl. 623—2

11 Claims



1. An apparatus for supporting a mechanical heart valve during implantation of the heart valve in a patient, the heart valve having an annular valve body, at least one leaflet within said annular valve body and adapted to pivot between open and closed positions, and a sewing ring circumferentially surrounding said annular valve body, the apparatus comprising

- a heart valve rotator having
  - at least one leaflet guard adapted to extend within said annular valve body adjacent said leaflet, and
  - a post connected to said guard and extending away from said valve body,
- a sewing ring holder connected to said heart valve rotator and extending adjacent said sewing ring at at least two distinct points on said ring, said holder having
  - at least one arm extending between said sewing ring and said post, and
  - means releasably connecting said holder to said post
- a single suture having
  - a first end secured to said holder,
  - a middle part releasably attached to said sewing ring at each of said distinct points, and
  - a second end secured to said holder, said single suture holding said sewing ring holder and said heart valve rotator in contact with said heart valve and being releasable from said heart valve by severing said suture at a single point into a first and second portion, said first portion including said first end and said second portion including said second end, whereby said first and second portions remain secured to said holder.

5,480,426

# METHOD OF IMPLANTING AN INTRAOCULAR LENS HAVING HAPTICS FOR SCLERAL FIXATION

Milton W. Chu, 5800 Santa Rosa Rd., Suite 111, Camarillo, Calif. 93012

Continuation-in-part of Ser. No. 929,887, Aug. 22, 1992, Pat. No. 5,336,262, which is a continuation-in-part of Ser. No. 456,809, Dec. 26, 1989, abandoned. This application Jan. 28, 1994, Ser. No. 189,069

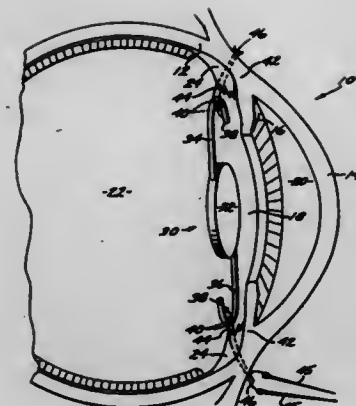
The portion of the term of this patent subsequent to Aug. 9, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> A61F 2/16

U.S. Cl. 623—6

6 Claims

1. A method of implanting an intraocular lens in the posterior chamber of an eye, comprising the steps of:
- providing an intraocular lens having a disk-shaped lens optic with a transverse plane and first and second curved, flexible haptics projecting outwardly from opposite points on the lens



optic's periphery, wherein the haptics each project outwardly from, and then back inwardly toward, the lens optic so as to define an apex, and wherein the haptics each include one or more suture holes; and

implanting the lens in the posterior chamber of the eye, the step of implanting including steps of

- flexing the first and second haptics radially inwardly a combined distance of at least about 1 millimeter, such that they engage the ciliary sulcus of the eye, and
- passing a suture through the one or more suture holes of each of the first and second haptics and through the sclera of the eye, to secure the haptics, and thereby the lens, in place; wherein the step of providing includes a step of locating the one or more suture holes in each of the first and second haptics such that when the lens is implanted in the eye, at least one suture hole in each haptic is located substantially at the haptic's apex, with the center of the suture hole within the first 1.5 millimeters of tangential contact with the ciliary sulcus.

5,480,427

# BIOLOGICALLY COMPATIBLE COLLAGENOUS REACTION PRODUCT AND ARTICLES USEFUL AS MEDICAL IMPLANTS PRODUCED THEREFROM

Charles D. Kelman, New York, N.Y., and Dale P. DeVore; Chelmsford, Mass., assignors to Darby &amp; Darby, New York, N.Y.

Continuation of Ser. No. 991,203, Dec. 15, 1992, abandoned, which is a division of Ser. No. 824,838, Jan. 22, 1992, Pat. No. 5,201,764, which is a division of Ser. No. 486,558, Feb. 28, 1990, Pat. No. 5,104,957. This application Jul. 19, 1994, Ser. No. 278,972

The portion of the term of this patent subsequent to Apr. 13, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> A61F 2/16

U.S. Cl. 623—6

6 Claims



1. A shaped soft tissue implant comprising a biocompatible collagenous polymer of collagen modified with a first acylating agent selected from the group consisting of glutaric anhydride, succinic anhydride, and maleic anhydride and at least one second acylating agent selected from the group consisting of methacrylic anhydride, beta-styrene sulfonyl chloride, ethylene-maleic anhydride copolymer, styrene-maleic anhydride copolymer and poly(vinyl) sulfonic acid.

5,480,428

# CORRECTIVE INTRAOCULAR LENS

Svyatoslav N. Fedorov, and Viktor K. Znev, both of Moscow, Russian Federation, assignors to Mezhotraslevoi Nauchno-Tekhnichesky Komplex "Mikrokhirurgiya Glaza", Moscow, Russian Federation

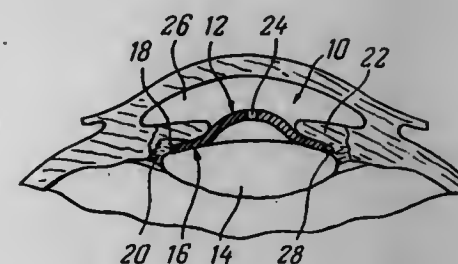
Filed Apr. 22, 1994, Ser. No. 231,549

Claims priority, application Russian Federation, Apr. 22, 1993, 93021177

Int. Cl.<sup>6</sup> A61F 2/16

U.S. Cl. 623—6

10 Claims



1. An intraocular lens for use with a natural crystalline lens of an eye, the eye having an iris, and said intraocular lens having an overall height, said intraocular lens comprising:

- a part spherical optical body including a posterior concave surface with a first radius of curvature, and a periphery, said optical body having a height, with a ratio of the height of said optical body to said overall height being in the range of about 0.25 to about 0.5;
- a part spherical positioning element in surrounding relation to the optical body and connected to the periphery of the optical body, said positioning element including a periphery, and a posterior concave surface with a second radius of curvature greater than said first radius of curvature, a ratio of said first radius of curvature to said second radius of curvature being within a range of about 0.31 to about 0.42; and
- end elements connected with opposite ends of said positioning element, each end element including a proximate end connected with the periphery of the positioning element, a distal end, a posterior concave surface forming a smooth continuation of, and having a curvature identical to, the posterior concave surface of said positioning element, and an anterior surface having a slope such that said end element decreases in thickness from said proximal end to said distal end; and
- said intraocular lens having an outer dimension defined by the distal ends of said end elements which prevents anchoring of said intraocular lens in an eye such that said positioning element and said end elements float on the natural crystalline lens and said optical body is centered in the iris.

5,480,429

# BREAST PROSTHESIS

Georg Weber-Unger, Kufstein, Austria, assignor to Dr. Helbig GmbH &amp; Co Orthopädische Produkte KG, Brannenburg, Germany

Filed May 3, 1994, Ser. No. 237,387

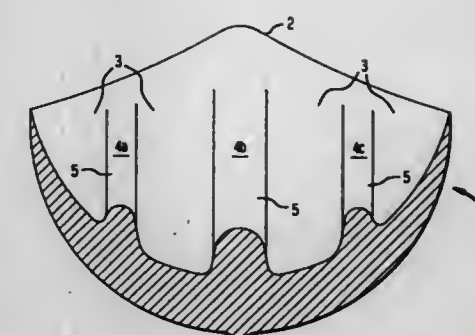
Claims priority, application Germany, Dec. 8, 1993, 9318842 U

Int. Cl.<sup>6</sup> A61F 2/52

U.S. Cl. 623—7

10 Claims

1. A breast prosthesis for a woman who underwent mastectomy, comprising:
- a prosthetic body of soft plastic material, said prosthetic body being configured in form of a cup with a convex front side and a concave rear surface facing a wearer's body and defining a cavity; and



at least one stiffening rib providing reinforcement and stiffness such that said prosthetic body substantially retains its shape, said stiffening rib projecting from said rear surface into said cavity substantially in a straight line and continuous over an entire length from an upper perimeter to a lower perimeter, with said stiffening rib having an upper end terminating before the upper perimeter of said cavity to thereby allow the upper perimeter to sit tightly against the wearer's body.

5,480,430

# SHAPE-RETAINING SHELL FOR A FLUID FILLED PROSTHESIS

Daniel A. Carlisle, Santa Barbara, Calif., and G. Patrick Maxwell, Nashville, Tenn., assignors to McGhan Medical Corporation, Santa Barbara, Calif.

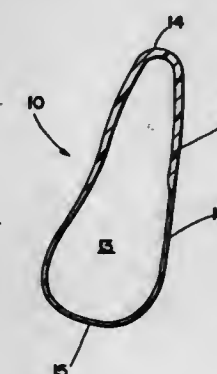
Continuation of Ser. No. 73,682, Jun. 4, 1993, abandoned.

This application Oct. 7, 1994, Ser. No. 320,121

Int. Cl.<sup>6</sup> A61F 2/12; 2/52; 2/02

U.S. Cl. 623—8

4 Claims



1. A fluid-filled prosthesis adapted for permanent implantation beneath the skin of a person comprising an outer shell of varying wall thicknesses, said outer shell having the general shape of a breast, said shell being divided into superior and inferior halves wherein a substantial portion of the superior half having a first wall thickness and the inferior half having a second wall thickness, said first wall thickness being greater than said second wall thickness and wherein said superior portion is that half of the prosthesis which is uppermost when the prosthesis is implanted beneath the skin of the person and the person is erect.



5,480,431

## TRACHEAL STENT

Lutz Freitag, Essen; Armin Singvogel, Remseck, and Klaus Schmitt, Remshalden, all of, Germany, assignors to Willy Rusch AG, Rommelshausen-Kernen, Germany  
PCT No. PCT/DE92/00570, § 371 Date Jan. 10, 1994, § 102(e) Date Jan. 10, 1994, PCT Pub. No. WO93/00869, PCT Pub. Date Jan. 21, 1993

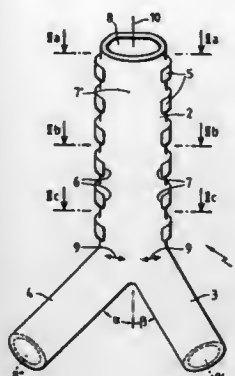
PCT Filed Jul. 8, 1993, Ser. No. 185,984

Claims priority, application Germany, Jul. 11, 1991, 41 22 923.1

Int. Cl.<sup>6</sup> A61F 2/04

U.S. Cl. 623—9

10 Claims



1. A tracheal stent for narrowed, diseased trachea and bronchial sections comprising an elastic plastic shaft having an axis and an axial length, and resilient means integral with the shaft which, in a first state, reduce the outer circumference of the plastic shaft for insertion into the diseased section and, in a second state, expand the plastic shaft over the entire axial length to form a lumen along the axis for supporting and opening the diseased section, the lumen exhibiting a changing cross section which is squarish-oval in a cranial region, oval in a middle region and lengthened-oval in a caudal region to emulate a shape of a natural trachea.

5,480,432

## EXTENDED DWELL VOICE PROSTHESIS

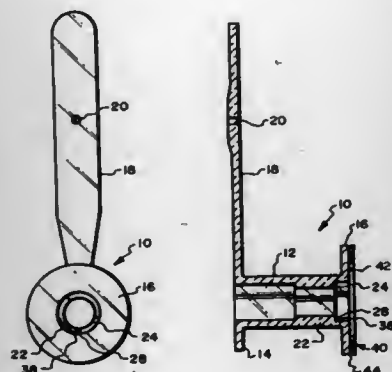
David R. Soding, and Edmund V. Seder, both of Santa Barbara, Calif., assignors to Helix Medical Corporation, Carpinteria, Calif.

Filed Jul. 27, 1994, Ser. No. 282,277

Int. Cl.<sup>6</sup> A61F 2/20; A61B 1/00

U.S. Cl. 623—9

11 Claims



1. A voice prosthesis for insertion into a fistula in a tracheo-esophageal wall of a patient comprising in combination:

a hollow, annular, flexible body to be disposed in and to maintain said fistula open, said body having a first tracheal end and a second esophageal end;  
a first flange connected to the first end of the body;  
a second flange connected to the second end of the body, said second flange being substantially transparent to X-ray radiation;  
an element containing sufficient pigment to be opaque when radiated by X-ray radiation said element adhered to said second flange, having a first, distinctive X-ray, image when the second flange is fully seated on said wall and having a second, distinctive X-ray image when the second flange is not fully seated on said wall said second image being substantially different from said first image; and  
a flapper valve connected to the second end of the body.

5,480,433

## METHOD OF TREATING HEARING LOSS

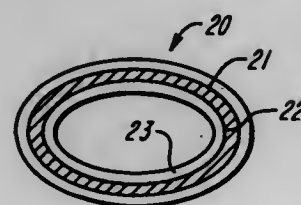
Joseph B. Nadol, Jr., 640 Charles River Rd., Needham, Mass. 02192

Division of Ser. No. 139,557, Oct. 20, 1993, Pat. No. 5,356,430, which is a continuation of Ser. No. 712,430, Jun. 10, 1991, abandoned. This application May 20, 1994, Ser. No. 247,106

Int. Cl.<sup>6</sup> A61F 2/18; 2/04

U.S. Cl. 623—10

3 Claims



1. A method of treating hearing loss due to middle ear fluid congestion, such method comprising the step of implanting in a patient's middle ear within a defined hypotympanic cavity between the eardrum and the round window of a patient's ear a pliant membrane of biocompatible material formed into a gas-filled closed synthetic bubble substantially impermeable to body fluids such that the bubble remains inflated to displace fluid from about the round window allowing compliant motion thereof and such that said closed bubble contains a reservoir of at least one gas at a pressure effective to transmit pressure changes and sound vibrations acoustically through said closed bubble.

5,480,434

## METHOD AND DEVICE FOR CONNECTING BIOLOGICAL DUCT TO A PROSTHESIS

Eugene C. Eckstein, and Norman L. Block, both of Miami, Fla., assignors to The University of Miami, Miami, Fla.

Filed Jul. 13, 1993, Ser. No. 91,818

Int. Cl.<sup>6</sup> A61F 2/04

U.S. Cl. 623—11

20 Claims

1. A method of connecting a biological duct to a prosthetic device comprising:  
providing a prosthesis having a first, open end and side walls depending therefrom;  
resecting a biological duct to which said prosthesis is to be attached to define a free end of said duct;  
selecting a segment of living tissue remote from said duct;  
securing said duct to a first portion of said tissue at a point spaced from the free end of said duct;  
securing a second portion of said tissue spaced from said first portion to said first end of said prosthesis so that said free end of said duct is disposed at least partially in said open end of



said prosthesis, whereby said duct is indirectly coupled to said prosthesis and a passage defined through said duct is in flow communication with said prosthesis through said open end thereof.

5,480,435

Patent Not Issued For This Number

5,480,436

## METHOD FOR PREVENTING TISSUE ADHESION

Dirkjan Bakker, Alpen a/d Rijn; Erica A. Bakkum, Haarlem, and Clemens A. van Blitterswijk, Hekendorp, all of, Netherlands, assignors to Osteotech, Inc., Shrewsbury, N.J.

Division of Ser. No. 78,350, Jun. 21, 1993, which is a continuation-in-part of Ser. No. 873,441, Apr. 24, 1992, abandoned. This application Jul. 15, 1994, Ser. No. 279,811

Int. Cl.<sup>6</sup> A61F 2/02

U.S. Cl. 623—11

22 Claims

1. A process for preventing the binding of tissue to tissue or of tissue to bone, comprising:  
placing between two tissues or between tissue and bone a device comprising a composite of a first layer and a second layer, wherein each of said first layer and said second layer comprises a biodegradable segmented copolymer which comprises a first component which is a polyalkylene glycol, and a second component which is a polyester formed from an alkylene glycol having from 2 to 8 carbon atoms and a dicarboxylic acid, wherein said first layer is selected from the group consisting of a non-porous layer and a porous layer in which essentially all of the pores have a pore size no greater than 3μ, and wherein said second layer includes pores having a pore size of at least about 30μ.

5,480,437

## PRESTRESSED SURGICAL NETWORK

Klaus Draenert, Gabriel-Max-Str., 8000 Munich 90, Germany  
Continuation of Ser. No. 534,330, Jun. 5, 1990, which is a continuation of Ser. No. 348,579, Apr. 27, 1989, abandoned.

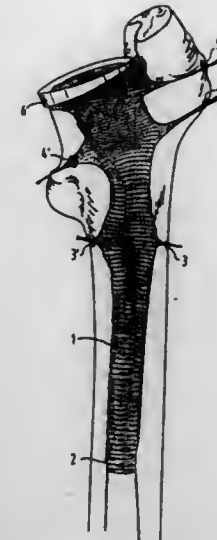
This application Aug. 10, 1992, Ser. No. 928,158

Int. Cl.<sup>6</sup> A61F 2/28

U.S. Cl. 623—16

13 Claims

1. A surgical network for anchoring an endoprosthesis and reinforcing bone cement used for anchoring the endoprosthesis in a bony bed wherein the network comprises a continuous prestressable prosthesis stocking made of at least one layer of threads and means for prestressing and anchoring the network in the bony bed under prestress, wherein the stocking is elongate and has two ends, wherein the stocking is open at least one end thereof such that the stocking is adapted to receive the endoprosthesis through the open



end thereof while the network is anchored under prestress in the bony bed. This is a continuation of application Ser. No. 07/534,330 Filed on Jun. 5, 1990, abandoned as of the date of this application, which is a continuation of application Ser. No. 07/348,579, filed on Apr. 27, 1989, abandoned as of Jun. 5, 1990.

5,480,438

BIOACTIVE CERAMIC COATED SURGICAL IMPLANT  
Yousuke Arima; Shinichi Miyamoto, and Kensho Sahira, all of Saitama, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Sep. 22, 1993, Ser. No. 125,327

Claims priority, application Japan, Sep. 22, 1992, 4-277888

Int. Cl.<sup>6</sup> A61F 2/28

U.S. Cl. 623—16

15 Claims

1. A bioactive ceramic coated surgical implant comprising:  
at least one metallic implant base;  
an inner coating of a bioactive ceramic formed on a surface of said metallic implant base;  
said inner coating being vitrified at a ratio of at least 50 vol %;  
an outer coating of a bioactive ceramic formed on said inner coating; and  
said outer coating being vitrified at a ratio of no more than 50 vol %;  
said outer coating having a porosity substantially greater than a porosity of said inner coating; and  
said inner and outer coatings of a bioactive ceramic being composed of at least one material selected from the group consisting of a glass of Al<sub>2</sub>O<sub>3</sub>, CaO, TiO<sub>2</sub>, CaO—Al<sub>2</sub>O<sub>3</sub> and Al<sub>2</sub>O<sub>3</sub>—SiO<sub>2</sub>.

5,480,439

## METHOD FOR PERIPROSTHETIC BONE MINERAL DENSITY MEASUREMENT

Joseph P. Bisek; James A. Hanson, and Richard B. Mazess, all of Madison, Wis., assignors to Lunar Corporation, Madison, Wis.

Continuation-in-part of Ser. No. 73,264, Jun. 7, 1993, Pat. No. 5,306,306, which is a continuation of Ser. No. 862,096, Apr. 2, 1992, abandoned, which is a continuation of Ser. No. 655,011, Feb. 13, 1991, abandoned. This application Feb. 1, 1994, Ser. No. 189,821

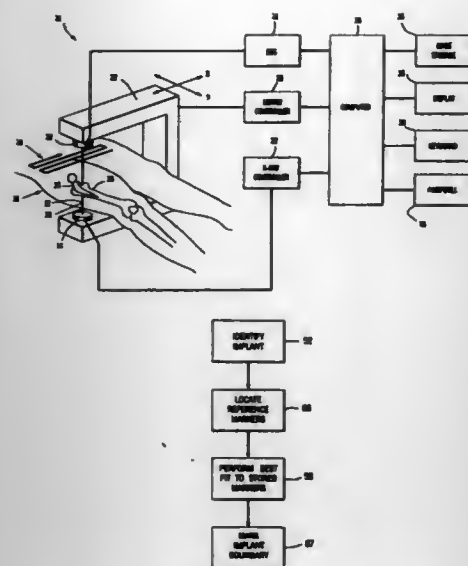
Int. Cl.<sup>6</sup> A61F 2/28; A61B 5/00; 6/00

U.S. Cl. 623—16

10 Claims

1. A method of evaluating bone quality in a patient having a substantially radiolucent prosthesis implanted in a bone, the pros-





thesis having at least one edge and having radiographically detectable reference markers, the method comprising the steps of: collecting bone mineral density data over at least two dimensions, including portions of the prosthesis holding the reference markers, by means of a body penetrating digital imaging instrument, to generate a matrix of data values wherein the value of each data element of the matrix is proportional to the mineral content of the bone at the corresponding location in the dimensions;

employing an electronic computer to:

- analyze the matrix of data values to identify the location of the reference markers;
- determine the best fit of a stored template, having stored reference marker data and at least one stored edge, to the location of the reference markers;
- employ the best fit to identify an implant boundary within the matrix of data values based on the stored template edge;
- establish a measurement boundary translated from the implant boundary by a predetermined distance along a translation axis;
- calculate bone mineral density within a plurality of segments following the path of the measurement boundary to produce a set of segment values; and
- display a plot of segment values versus distance along the implant boundary.

5,480,440

#### OPEN SURGICAL TECHNIQUE FOR VERTEBRAL FIXATION WITH SUBCUTANEOUS FIXATORS POSITIONED BETWEEN THE SKIN AND THE LUMBAR FASCIA OF A PATIENT

Parviz Kambin, Devon, Pa., assignor to Smith & Nephew Richards, Inc., Memphis, Tenn.

Filed Jul. 7, 1993, Ser. No. 88,132

The portion of the term of this patent subsequent to Sep. 7, 2010, has been disclaimed.

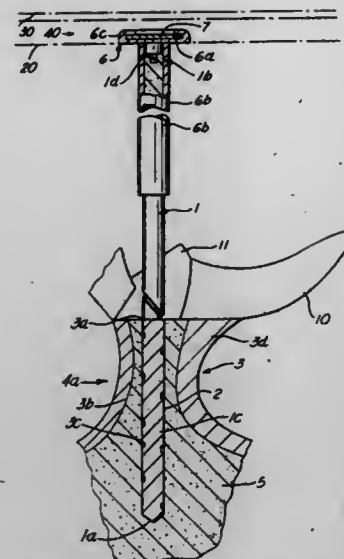
Int. Cl.<sup>6</sup> A61F 2/44

U.S. Cl. 623—17

42 Claims

1. A method for fixation of vertebrae of a patient, said patient having a back covered with skin under which is fascia, said patient also having vertebrae with spinous processes and pedicles, said pedicles having medullary canals, said method comprising the steps of:

- posterolaterally entering the back of a patient by means of forming an incision with an open surgical technique wherein tissue is retracted and vertebrae are exposed;
- introducing a plurality of pedicle screws having proximal ends through a plurality of small incisions into the medullary



- canal of the pedicles of adjacent vertebrae, to a position where the proximal ends of said pedicle screws lie adjacent the fascia of the patient beneath the skin;
- inserting first and second pedicle screw linkage means between the skin of the patient and the fascia of the patient;
- detachably securing said linkage means to said proximal ends of said screws on a same side of the spinous process of said vertebrae to restrict relative movement between said vertebrae; and
- closing the incisions after the linkage means is secured to the screws.

5,480,441

#### RATE-RESPONSIVE HEART PACEMAKER

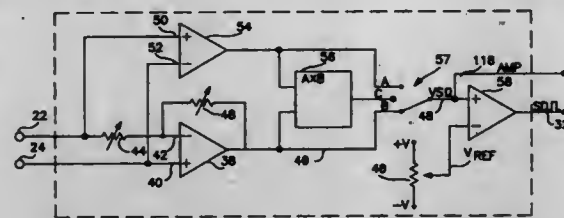
Terrence R. Hodrlik, Fridley, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 30, 1994, Ser. No. 220,757

Int. Cl.<sup>6</sup> A61N 1/36

U.S. Cl. 607—17

9 Claims



1. A rate-responsive cardiac pacemaker for implantation in a patient, comprising: pulse generator means for generating pacing pulses at a defined pacing rate; means for applying said pacing pulses to the heart; first and second electrode means for sensing cardiac depolarization wave fronts passing in the vicinity of said first electrode means; virtual load means coupled to said first electrode means for providing a load impedance less than an effective tissue source impedance presented to said first and second electrode means; active circuit means, coupled to said virtual load means for providing electrical energy to said first electrode means through said virtual load means in response to passage of a cardiac depolarization wave front to counteract depolarization induced variation in relative electrode potentials of said first and second electrode means; monitoring means, coupled to said active circuit means, for monitoring electrical energy provided through said virtual

load means, comprising means for detecting occurrences of cardiac depolarizations and providing cardiac depolarization output signals having a characteristic which varies according to activity level of the patient; signal measuring means for measuring variations of said characteristic and for generating a control signal therefrom representative of the level of activity of said patient; and control means coupled to said pulse generator means and to said signal measuring means for changing the defined pacing rate of pacing pulses generated by said pulse generator means in response to said control signal.

5,480,442

#### FIXEDLY ADJUSTABLE INTERVERTEBRAL PROSTHESIS

Rudolf Bertagnoli, Göttingen, Germany, assignor to MAN Ceramics GmbH, Deggendorf, Germany

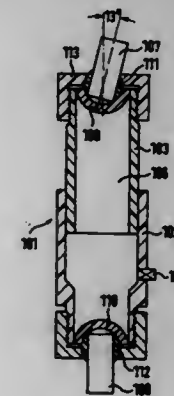
Filed Jun. 24, 1994, Ser. No. 265,190

Claims priority, application Germany, Jun. 24, 1993, 43 20 987.4; May 19, 1994, 44 17 629.5

Int. Cl.<sup>6</sup> A61F 2/44

U.S. Cl. 623—17

19 Claims



1. A vertebral implant for replacing vertebrae, said implant comprising: a central load bearing member configured and arranged to be inserted between adjacent vertebrae having a first and second end; a first support element positioned at said first end; a second support element positioned at said second end; at least one of said first and second support elements having a contact surface for abutting an adjacently arranged vertebra; at least one of said first and second support elements further having universal adjustment means for allowing an angle of said contact surface relative to said central load bearing member to be universally adjusted; and at least one of said first and second support elements having means for fixedly connecting said universal adjustment means to said central load bearing member after adjusting said angle.

5,480,443

#### ARTIFICIAL IMPLANT COMPONENT AND METHOD FOR SECURING SAME

Sarmed G. Elias, 2740 W. Foster, Ste. 301, Chicago, Ill. 60625

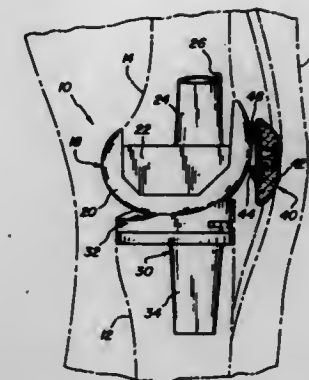
Continuation of Ser. No. 828,638, Jan. 31, 1992, abandoned. This application Mar. 2, 1994, Ser. No. 204,815

Int. Cl.<sup>6</sup> A61F 2/38

U.S. Cl. 623—18

41 Claims

38. An artificial implant component operable to movably articulate with a portion of a joint prosthesis, said artificial implant component adapted to be secured to a portion of the human body having a cavity using bone cement, said artificial implant component comprising:



an articulating portion operable to engage a portion of said joint prosthesis, said articulating portion having an axial centerline; and a plurality of canals partially disposed in said articulating portion of said, artificial implant component, said plurality of canals including at least one canal disposed parallel to said axial centerline of said articulating portion and at least one canal angularly displaced from the said axial centerline of said articulating portion, whereby said canals are operable to receive bone cement when said artificial implant component is secured to the portion of the human body using bone cement.

5,480,444

#### HYBRID TIBIAL TRAY KNEE PROSTHESIS

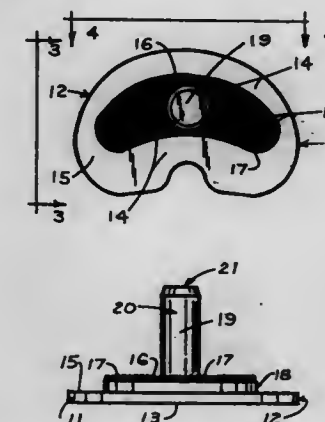
Stephen J. Incavo, 55 Butler Dr., South Burlington, Vt. 05403, and James G. Howe, 8 Beaver Creek Rd., Shelburne, Vt. 05482

Filed Jun. 2, 1994, Ser. No. 252,892

Int. Cl.<sup>6</sup> A61F 2/38

U.S. Cl. 623—20

13 Claims



1. A one-piece hybrid tibial tray component of a knee replacement prosthesis having a bone ingrowth surface that does not require separate attachment, said component comprising: a laterally extending plate having a proximal surface and a distal surface, said distal surface including a peripheral surface for receiving bone cement and a planar central surface which promotes bone ingrowth, said peripheral surface and said planar central surface each having surface areas which are substantially equal; a partition continuously extending around said planar central surface which separates said peripheral surface from said planar central surface to prevent bone cement from flowing into said planar central surface; and a central stem extending from said distal surface and being perpendicular thereto.



5,480,445

## INTERLOCKING TIBIAL PROSTHESIS

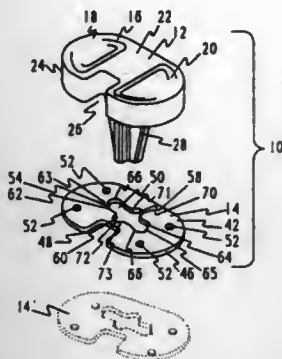
Brian D. Burkinshaw, Pflugerville, Tex., assignor to Intermed-  
les Orthopedics, Inc., Austin, Tex.

Filed Jun. 9, 1994, Ser. No. 257,680

Int. Cl.<sup>6</sup> A61F 2/38

U.S. Cl. 623—20

16 Claims



1. A tibial component of a knee prosthesis comprising a body and a support plate, said body having
  - a proximal plate adapted to lie near a proximal resected surface on a patient's tibia, said plate having a distal surface and an articulating surface forming a medial condyle compartment and a lateral condyle compartment and
  - a central stem integral with said plate adapted to be inserted into a prepared cavity in the medullar canal of the patient, said stem having at least one peripheral slot adjacent and parallel to said distal surface for fastening said support plate to said body, and said support plate having
  - a proximal surface adapted to fit against said distal surface of said proximal plate,
  - an affixation surface adapted to fit against said proximal resected surface on the patient's tibia,
  - a central opening through which the stem fits, and
  - at least one peripheral tab extending into said central opening for engaging said slot whereby said support plate is attached to said body.

5,480,446

## PROSTHETIC KNEE JOINT DEVICES

John W. Goodfellow, Woodeaton, and John J. O'Connor, Headington, both of, England, assignors to British Technol-  
ogy Group Ltd., London, England

Continuation of Ser. No. 104,930, Aug. 12, 1993, Pat. No. 5,358,351, which is a continuation of Ser. No. 842,336, Mar. 23, 1992, abandoned. This application Oct. 7, 1994, Ser. No. 319,606

Claims priority, application United Kingdom, Jun. 12, 1990, 90103025

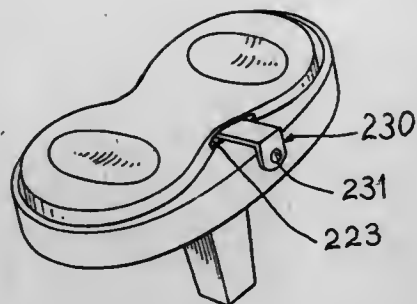
The portion of the term of this patent subsequent to Oct. 25, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> A61F 2/38

U.S. Cl. 623—20

5 Claims

1. A prosthetic knee joint device comprising:
  - a meniscal component; and
  - a tibial component;
 said meniscal and tibial components each being of a bicompart-  
mental form having a pair of mutually spaced end portions  
defining respective condylar articulation surfaces, with the  
end portions of each pair being interconnected by a respective  
intercondylar portion;



- said meniscal component end portions each having a concavely  
dished condylar articulation surface and a relatively flat  
condylar articulation surface in mutual back-to-back disposi-  
tion;
- said tibial component condylar articulation surfaces being of  
complementary shape to and in respective mutual sliding  
engagement with the relatively flat condylar articulation sur-  
faces of said meniscal component for relative rotation and  
translation movements therebetween; and
- one of the respective intercondylar portions of said meniscal and  
tibial components having a projection and the other having a  
recess said projection and recess being interconnected to hold  
said mutual sliding engagement against dislocation and to  
limit both said relative rotation and translation movements  
between said components.

5,480,447

## JOINT IMPLANT

Jeffrey B. Skiba, Tempe, Ariz., assignor to International Poly-  
mer Engineering, Inc., Tempe, Ariz.

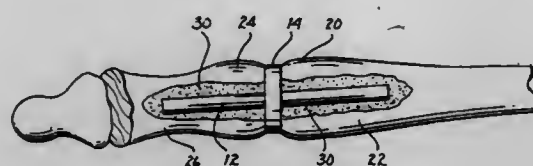
Continuation of Ser. No. 990,415, Dec. 15, 1992, abandoned.

This application Sep. 22, 1994, Ser. No. 310,928

Int. Cl.<sup>6</sup> A61F 2/30; 2/42

U.S. Cl. 623—21

10 Claims



1. A joint implant comprising:
  - a central stem having a longitudinal length and member forming both distal and proximal aspects of the joint implant when implanted into distal and proximal intramedullary canals of bone tissue surrounding a joint wherein said central stem member is substantially comprised of a deformable microporous expanded polytetrafluoroethylene material having a node and fibril microstructure which allows tissue ingrowth into the node and fibril microstructure thereby anchoring the central stem member into the bone tissue to provide implant patency; and
  - an annular spacer having an annulus which receives and accom-  
modates the central stem member therethrough and acts as a  
fulcrum which allows the central stem member to flex along  
said longitudinal length at a position of the annular spacer  
without the annular spacer being substantially deformed  
whereby said central stem member is free to reciprocate in  
said annulus.

5,480,448

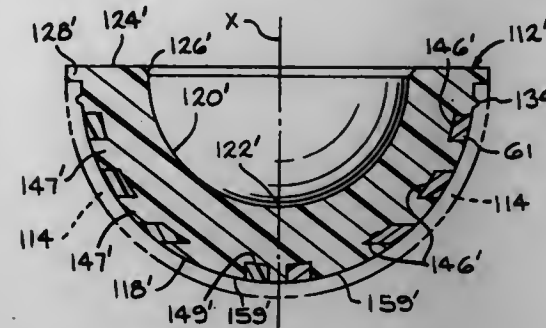
## ACETABULAR CUP GROOVE INSERT

W. E. Michael Mikhail, 4203 Shamley Green, Toledo, Ohio 43623

Continuation-in-part of Ser. No. 129,956, Sep. 20, 1993, aban-  
doned. This application Apr. 26, 1994, Ser. No. 233,296Int. Cl.<sup>6</sup> A61F 2/34

U.S. Cl. 623—22

20 Claims



1. An acetabular cup assembly comprising:
  - (a) metal shell with an interior surface having a generally dome shaped configuration;
  - (b) a plastic acetabular cup member having a smooth interior surface with a generally spherical shape and an exterior surface with a plurality of grooves and ribs, said ribs having said outer surface areas in contact with said metal shell interior surface, a major portion of said grooves being inter-  
connected, including outer surface areas engaged to said metal shell interior surface and inner surface areas spaced from said metal shell interior surface and cooperating there-  
with to define cavities; and
  - (c) at least two insert members positioned in and filling substan-  
tially all of said cavities.

5,480,449

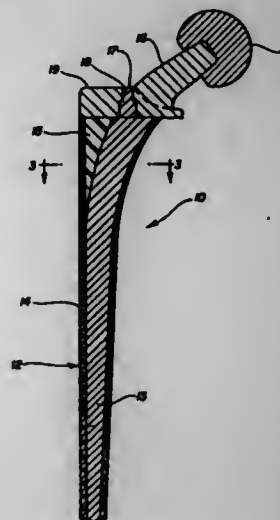
## COMPOSITE PROSTHESIS AND METHOD OF MANUFACTURE

John V. Hamilton, Foxborough; Salvatore Caldarise, Hanson, and Debra J. Treacy, Middleborough, all of Mass., assignors to Johnson &amp; Johnson Orthopaedics, Inc., Raynham, Mass. Division of Ser. No. 881,105, May 11, 1992, Pat. No. 5,314,992. This application Jan. 28, 1993, Ser. No. 10,133

Int. Cl.<sup>6</sup> A61F 2/02; B23Q 9/02

U.S. Cl. 623—66

5 Claims



1. A process of making a prosthesis stem having a metal core and composite fiber shell surrounding said core, comprising pro-

viding a tapered metal core having a predetermined cross sectional configuration and a composite shell having a tapered cavity having the same cross sectional configuration as said tapered metal core, said tapered cavity having a length extending from a first end to a second end of said shell, the cross sectional area of said Second end being smaller than the cross sectional area of said first end, applying an adhesive to said tapered metal core, placing the tapered metal core into the cavity in the composite shell, said core having a length greater than the length of the cavity in said composite shell so that a portion of the core extends beyond the first and the second end of the composite shell, placing the composite shell in an insulated fixture having a length less than the length of said core, heating the metal core and the interior of the shell, applying pressure to the core in a direction from the first end to the second end along the length of the core to force the core against the adhesive within the composite shell thereby bonding the core to said shell.

5,480,450

## METHOD AND APPARATUS FOR REDUCING INTERFACIAL POROSITY IN A CEMENTED FEMORAL PROSTHESIS

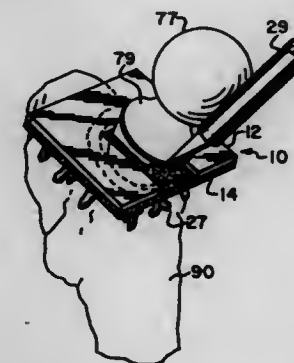
Susan P. James, Boston; Daphne Karydas, Sharon; Frederick M. McGarry, Weston, and William H. Harris, Belmont, all of Mass., assignors to The General Hospital Corporation, Boston, and Massachusetts Institute of Technology, Cambridge, both of Mass.

Filed Feb. 11, 1993, Ser. No. 16,697

Int. Cl.<sup>6</sup> A61F 2/36

U.S. Cl. 623—23

18 Claims



1. A combination comprising:
  - a femoral component adapted to be inserted into an opening of a cement-filled cavity at a proximal end of a femur, and including a stem, a neck and a collar disposed between said stem and said neck, said stem having outer medial, lateral, anterior and posterior surfaces and having a cross-sectional dimension as defined by said medial, lateral, anterior and posterior surfaces;
  - a covering means for covering the opening of the cement-filled cavity at the proximal end of the femur for resisting flow of cement out of the cavity during insertion of said stem of said femoral component, said covering means including a hole having a resilient seal around its perimeter which provides continuous sealing engagement between the covering means and said outer medial, lateral, anterior and posterior surfaces of said stem of said femoral component during insertion of said stem of said femoral component into the cavity, said hole having a cross-sectional dimension no greater than a minimum cross-sectional dimension of said stem of said femoral component.



5,480,451

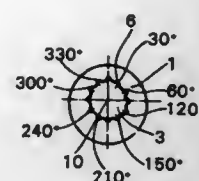
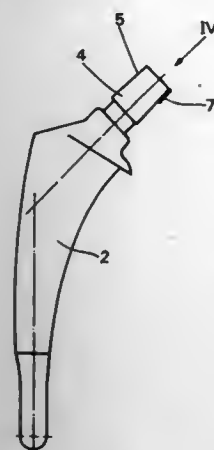
**ANGULARLY ADJUSTABLE OFFSET SPHERICAL HEAD  
ENDOPROSTHESIS**Hans Grunzel, Lübeck, and Heinz Moser, Oestrich-Winkel,  
both of, Germany, assignors to ESKA Medical GmbH & Co.,  
Lübeck, Germany

Filed Aug. 12, 1993, Ser. No. 106,152

Claims priority, application Germany, Aug. 17, 1992, 42 27  
139.8Int. Cl.<sup>6</sup> A61F 2/36; 2/32

U.S. Cl. 623—23

12 Claims



1. A spherical head endoprosthesis comprising a spherical head simulating a natural joint ball connectable by means of a conical interference fit connection with a base piece to be anchored in a bone, wherein the base piece comprises a conical pin and the spherical head comprises an exterior surface and a conical bore having an opening, a longitudinal axis (10) and a center line (11), the longitudinal axis (10) of the conical bore (3) and the center line (11) of the spherical head defining an angle  $\alpha$  of about 7° to 15°, the conical bore (3) in the spherical head being offset in an amount of about 1–4 mm relative to the center line (11), the bore (3) being provided with at least five grooves (6) parallel to the longitudinal axis (10) of the bore, and a single locking projection (7) on a peripheral surface (5) of the conical pin (4), said projection gripping into one of said at least five grooves (6) after assembly of the conical interference fit connection, and markings provided adjacent to said bore (3) on the spherical head to identify at least the one of said at least five grooves (6) into which said projection is to be inserted prior to assembly of the conical interference fit connection.

5,480,452

**FEMORAL PROSTHESIS WITH WEDGE HAVING  
OPPOSED TAPERS**Aaron A. Hofmann, Salt Lake City, Utah, and James E. Williams, Austin, Tex., assignors to Intermedics Orthopedics,  
Inc., Angleton, Tex.

Division of Ser. No. 889,823, May 29, 1992, Pat. No.

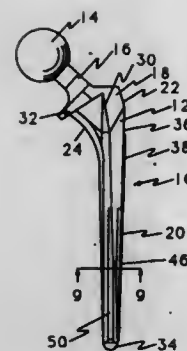
5,258,035. This application Oct. 21, 1993, Ser. No. 140,772

Int. Cl.<sup>6</sup> A61F 2/32; 2/28

U.S. Cl. 623—23

9 Claims

1. An implantable prosthesis comprising an articulating head; and a stem connected to said articulating head for attaching said prosthesis to a bone of a patient, said stem having at least one anterior-posterior side adapted to lie substantially in an anterior-posterior plane when said prosthesis is implanted in a patient and at least one medial-lateral side adapted to lie substantially in a medial-lateral plane when said prosthesis is implanted in a patient, means on said at least one anterior-posterior side for resisting motion in anterior-posterior directions, said means on said anterior-posterior side comprising



anterior-posterior porous fixation means in an anterior-posterior proximal portion; and anterior-posterior immediate fixation means in an anterior-posterior distal portion, said immediate fixation means providing decreasing resistance to anterior-posterior motion from a proximal end of said anterior-posterior distal portion to a distal end of said first distal portion, and

means on said at least one medial-lateral side for resisting motion in medial-lateral directions, said means on said medial-lateral side comprising medial-lateral porous fixation means in a medial-lateral proximal portion; medial-lateral immediate fixation means in a medial-lateral distal portion, said immediate fixation means providing increasing resistance to medial-lateral motion from a proximal end of said medial-lateral distal portion to a distal end of said medial-lateral distal portion.

5,480,453

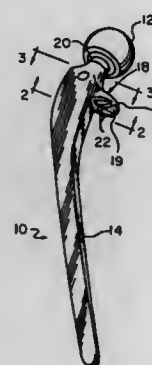
**COLLAR FOR FEMORAL IMPLANT AND METHOD AND  
APPARATUS FOR INSTALLATION THEREOF**Dennis W. Burke, 245 Highland St., Milton, Mass. 02186  
Continuation of Ser. No. 979,615, Nov. 20, 1992, abandoned.

This application Jan. 18, 1994, Ser. No. 183,077

Int. Cl.<sup>6</sup> A61F 2/36

U.S. Cl. 623—23

3 Claims



1. A femoral component for use in a total hip replacement, said component being adapted to be inserted into a femoral cavity formed in the proximal end of the femur and having interior surfaces, said component comprising:

a stem adapted to fit into the cavity formed in the proximal end of the femur, said stem having a direction of elongation, a proximal end and a medial surface; a collar disposed on said proximal end of said stem and extending at least from the medial surface and in a direction generally transverse of the direction of elongation of said stem, said collar having a lower surface adapted to rest in contact with a surface on the proximal end of the femur; and

a projection disposed on said lower surface of said collar, said projection extending in the direction generally transverse of the direction of elongation of said stem and being disposed only beyond said medial surface of said stem, said projection comprising at least two portions, each said portion being elongated and being non-parallel to the other portion, said projection having side surfaces extending from said lower surface of said collar, said projection being structured to extend into a previously formed recess in the proximal end of the femur and not into the interior surfaces of the femoral cavity to retain said stem in a substantially centered position within the femoral cavity with respect to a direction generally transverse to the direction of elongation of said stem.

(d) a bar graph driver circuit for receiving the scaled linear signal from said attenuator potentiometer and for dividing the scaled signal into a plurality of discrete command signals, (e) current driver means operatively associated with said bar graph driver circuit for receiving the discrete command signals from said bar graph driver circuit and for generating electrical drive signals, corresponding to said command signals, and (f) a solenoid/motor arrangement for receiving the drive signals from said current driver means and controlling each of said moveable sub-prosthesis of the prosthetic device by a different one of said drive signals.

5,480,454

**CONTROL SYSTEM FOR PROSTHETIC DEVICES**Richard J. Bozeman, Jr., Dickinson, Tex., assignor to The  
United States of America as represented by the Administrator  
of the National Aeronautics and Space Administration,  
Washington, D.C.

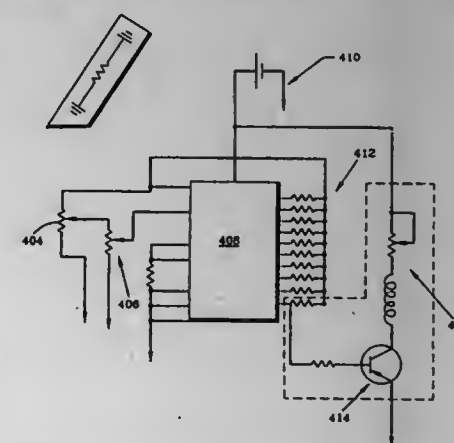
Division of Ser. No. 937,325, Aug. 31, 1992, Pat. No.

5,376,128. This application Jul. 26, 1994, Ser. No. 282,843

Int. Cl.<sup>6</sup> A61F 2/54; 2/70

U.S. Cl. 623—24

3 Claims



1. A control system for use with a prosthetic device, the prosthetic device comprising a plurality of moveable sub-prostheses and incorporating any implementation of harness and shoulder control hardware such that the shoulder shrug control movement associated with a moveable body part ranging from the no-shrug position of the moveable body part through the full-shrug position of the moveable body part provides control by the user to the prosthetic device, the control system comprising:

(a) a shoulder harness for engaging the body part and for receiving the movement from the body part, (b) a linear potentiometer for mechanically receiving the movement from said shoulder harness and for generating a linear sensing signal in consonance with the movement of the body part, (c) an attenuator potentiometer for receiving the linear sensing signal from said linear potentiometer and for scaling the linear sensing signal to be a function of the entire range of body part movement from the no-shrug position of the moveable body part through the full-shrug position of the moveable body part,

5,480,455

**LINING MATERIAL FOR USE WITH PROSTHETICS  
AND SIMILAR DEVICES AND METHOD FOR MAKING  
AND USING SAME**

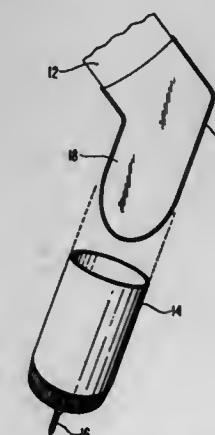
Jean Norvell, Newark, Del., assignor to W. L. Gore &amp; Associates, Inc., Newark, Del.

Filed Aug. 25, 1993, Ser. No. 123,744

Int. Cl.<sup>6</sup> A61F 2/78

U.S. Cl. 623—36

9 Claims



1. A process for producing a liner for a substantially non-breathable shell, the liner being worn in tight contact between the shell and a portion of a wearer's body whereby substantial weight is applied through the liner to the shell, which comprises:

providing a thin membrane which is water repellent yet facilitates adequate moisture vapor transmission; positioning at least two layers of the membrane together; forming the liner by sealing a first portion of the two layers of membrane together into a shape that complements an outline of the part of the wearer's body which will be in contact with the liner, wherein a flat seam which will not irritate the wearer is created along the seal between the two layers of the membrane; separating a second portion of the liner to permit the insertion of the part of the wearer's body between the two layers of the membrane and provide a smooth fit of the liner between the shell and the wearer's body whereby the smooth fit protects the wearer from irritating pressure points when substantial weight is applied through the liner; and positioning the liner between the wearer and the substantially impermeable shell so as to cause the liner to separate and maintain excess moisture apart from the wearer's skin.



## CHEMICAL

### 5,480,456 SILICA SOLS FOR OBTAINING A HIDE WHICH IS CALLED A STABILIZED PICKLED OR WHITE OR STABILIZED WHITE

Jean Pore, Yerres, France; Sergio Cuccodoro, Turino, Italy;  
Jean P. Moretti, Bougival, and Patrice Rouet, Culse Lam-  
otte, both of, France, assignors to Societe Francaise Hoechst,  
Puteaux, France

Continuation of Ser. No. 3,656, Jan. 13, 1993, abandoned.

This application Jun. 3, 1994, Ser. No. 253,578

Claims priority, application France, Jan. 14, 1992, 92 00304

Int. Cl.<sup>6</sup> C14C 1/00; 3/06; 9/00

U.S. Cl. 8—94.18

19 Claims

1. In a method for stabilizing an untanned split hide to form an untanned split pickled or stabilized white which can be subsequently tanned, comprising treating the hide with a brine solution having a density between 1.01 to 1.10, the improvement comprising

adding a pretanning amount of an aldehyde acid or a water-soluble salt thereof and an amount effective of silica sol, to make the untanned split hide resistant to attack by microorganisms, to the brine solution before or during the treatment to form an aqueous silica sol containing about 0.3 to 3% by weight of said silica based on the weight of said hide, and then storing the resultant pickled white or stabilized white hide containing silica prior to tanning.

### 5,480,457 METHOD FOR BLEACHING TEXTILES

Glen A. Dickson, and Donnie R. Gray, both of Dilley, Tex., assignors to Ocean Wash, Inc., Dilley, Tex.

Continuation of Ser. No. 24,736, Mar. 1, 1993, abandoned, which is a continuation of Ser. No. 418,394, Oct. 6, 1989, Pat. No. 5,190,562, which is a continuation of Ser. No. 117,664, Nov. 5, 1987, Pat. No. 4,900,323. This application Apr. 27, 1994, Ser. No. 237,237

The portion of the term of this patent subsequent to Feb. 20, 2007, has been disclaimed.

Int. Cl.<sup>6</sup> D06L 3/00; 3/02

U.S. Cl. 8—111

14 Claims

1. A method for fading a dyed, at least partially nonsynthetic fabric, comprising the steps of:

placing the dyed, at least partially nonsynthetic fabric in a tumbler;

adding a powder bleaching composition comprised of an at least partially water saturated carrier and a bleaching agent to the tumbler;

tumbling the dyed, at least partially nonsynthetic fabric with the powder;

withdrawing the dyed, at least partially nonsynthetic fabric from the tumbler;

rinsing the dyed, at least partially nonsynthetic fabric in a neutralizing solution; and drying the dyed, at least partially nonsynthetic fabric.

### 5,480,458 LONG WEAR LIFE FLAME-RETARDANT COTTON BLEND FABRICS

George R. Fleming, 2709 Dobbs Dr., Phenix City, Ala. 36867, and James R. Green, 22 Robin Dr., Hockessin, Del. 19707

Division of Ser. No. 315,443, Sep. 30, 1994. This application Apr. 17, 1995, Ser. No. 422,913

Int. Cl.<sup>6</sup> B05D 3/02

U.S. Cl. 8—115.58

6 Claims

1. A method for making wash resistant fabrics including woven fabrics comprising steps of: providing fabrics containing 50 to 95% cotton fibers and 5–30% non-flame-retardant thermoplastic fibers in which warp yarns for woven fabrics are comprised of 50 to 95% cotton and 5 to 30% non-flame-retardant thermoplastic fibers; impregnating the cotton and thermoplastic fibers with an

aqueous solution containing a prepolymer condensate of urea and a tetrakis (hydroxymethyl) phosphonium salt; applying a salt/urea prepolymer condensate to the fabrics in a concentration sufficient to apply between 3.0 and 4% phosphorus at a 60 to 80% wet pickup; padded to between 60 and 80% wet pickup and dried to between 8 and 12% moisture; reacting the condensate on the fabrics by passing the fabrics through a chamber flooded with ammonia gas flowing at 2.5 to 3.4 cu m/min (90 to 120 cu ft/min) to form an ammoniated flame retardant; oxidizing the fabrics after said reacting step to form a flame retardant polymer within the cotton fibers; adjusting flame retardant concentration, wet pickup and moisture level of the fabrics to be within preselected ranges such that after five washes and twenty-four hours in boiling water, the fabrics retain at least 2 and no more than 3% phosphorus and burns less than 15 mm (6") at cut edges.

### 5,480,459 OXIDATIVE HAIR DYE BASED ON A CREAMLIKE CARRIER COMPOSITION AS WELL AS PROCESS FOR THE DYEING OF HAIR

Herbert Mager, Marly; Gilbert Pasquier, Praroman, both of, Switzerland; Dieter Hoch, Pfungstadt-Eich, Germany, and Johann Aeby, Marly, Switzerland, assignors to Wella Aktiengesellschaft, Darmstadt, Germany

PCT No. PCT/EP93/00848, § 371 Date Dec. 9, 1993, § 102(e) Date Dec. 9, 1993, PCT Pub. No. WO93/23006, PCT Pub. Date Nov. 25, 1993

PCT Filed Apr. 6, 1993, Ser. No. 150,210

Claims priority, application Germany, May 18, 1992, 42 16 381.1

Int. Cl.<sup>6</sup> A61K 7/13

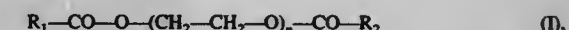
U.S. Cl. 8—408

10 Claims

1. Composition for oxidative dyeing of hair in the form of a cream and consisting of a carrier substance and a dye mixture dissolved therein, said dye mixture containing at least one coupler and at least one developer, and said composition having a pH of 4.5 to 12.5 and, in addition to said dye mixture, consisting essentially of:

(A) 10 to 30 percent by weight of at least one fatty alcohol with 10 to 24 carbon atoms,

(B) 0.2 to 6.0 percent by weight of at least one diester of the following formula



where n is 1, 2 or 3, and R<sub>1</sub> and R<sub>2</sub> are each independently selected from the group consisting of alkyl groups with 12 to 20 carbon atoms,

(C) 0.5 to 20 percent by weight glycerin fatty acid ester with 10 to 24 carbon atoms, and

(D) 0.1 to 10 percent by weight of at least one emulsifier member selected from the group consisting of nonionic emulsifiers, anionic emulsifiers and ampholytic emulsifiers;

and in addition the total content of said at least one fatty alcohol, said at least one diester and said glycerin fatty acid ester is from 25.0 to 56.0 percent by weight, all weights being based on the total weight of the composition.

### 5,480,460 METHOD FOR IMPROVING THE STABILITY IN AIR OF A HAIR DYE CONCENTRATE

Tsutomu Muraoka, Tokyo, Japan, assignor to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 881,320, May 7, 1992, abandoned, which is a continuation of Ser. No. 557,851, Jul. 26, 1990, abandoned. This application Aug. 18, 1994, Ser. No. 292,047

Claims priority, application Japan, Jul. 27, 1989, 1-194473

Int. Cl.<sup>6</sup> A61K 7/13

U.S. Cl. 8—416

5 Claims

1. A method for improving the stability in the air of a hair dye concentrate for keratin fibers consisting essentially of an oxidation



dye having two or more amino groups per molecule in the non-salt or salt free form, wherein said oxidation dye is selected from the group consisting of toluene-2,5-diamine, p-phenylenediamine, m-phenylenediamine, and 2,6-diaminopyridine, and water or an organic solvent, which method comprises adding an inorganic or organic reducing agent selected from the group consisting of salts of sulfurous acid, salts of hydrogensulfurous acid, ascorbic acid, salts of ascorbic acid, erythroic acid, thioglycolic acid, salts of thioglycolic acid, and cysteine derivatives to the hair dye concentrate, wherein the content of the oxidation dye is from about 20% to 50% by weight, based on the total weight of the composition, the content of the reducing agent is from 0.5% to 5% by weight, based on the total weight of the composition, the content of the water or organic solvent is from 45 to 89.5% by weight, based on the total weight of the composition, and wherein the weight ratio of the reducing agent to the oxidation dye is from 0.01 to 0.5, the weight ratio of the water or organic solvent to the oxidation dye is from 0.90 to 8.95 and the weight ratio of the water or organic solvent to the reducing agent is from 10 to 150.

5,480,461

Patent Not Issued For This Number

5,480,462

# METHOD OF FORMING BUTTON-TYPE BATTERY LITHIUM ELECTRODES

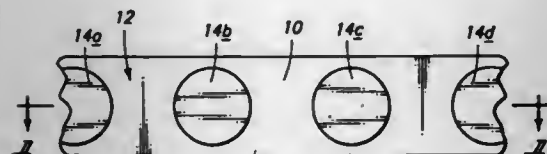
Mark E. Tuttle, Boise, Id., assignor to Micron Communications, Inc., Boise, Id.

Continuation-in-part of Ser. No. 205,611, Mar. 2, 1994, and a continuation-in-part of Ser. No. 205,957, Mar. 2, 1994, Pat. No. 5,432,027, and a continuation-in-part of Ser. No. 206,051, Mar. 2, 1994. This application Jul. 6, 1994, Ser. No. 271,012

Int. Cl.<sup>6</sup> H01M 4/08

U.S. Cl. 29-623.5

20 Claims



1. A method of forming a button-type lithium electrode comprising the following steps:

- providing an electrically conductive sheet having an exposed surface, the electrically conductive sheet being comprised of a material to which elemental lithium will adhere;

masking the electrically conductive sheet with a material to which elemental lithium will not appreciably adhere, the masking defining a masked portion and an unmasked portion, the unmasked portion of the conductive sheet having a cross-sectional size and shape of the desired electrode being formed;

applying molten lithium to the masked electrically conductive sheet to cause elemental lithium to adhere to the unmasked portion but not appreciably adhere to the masked portion; solidifying the elemental lithium on the unmasked portion to in situ form a lithium electrode on the unmasked portion; and after solidifying, removing the masking material from the masked portion of the conductive sheet.

5,480,463

# APPARATUS FOR FLUE GAS CLEANING

Harald Hackl, Hof 1, D-82392 Habach, Germany

PCT No. PCT/DE92/00520, § 371 Date Jun. 9, 1994, § 102(e)

Date Jun. 9, 1994, PCT Pub. No. WO93/00150, PCT Pub.

Date Jan. 7, 1993

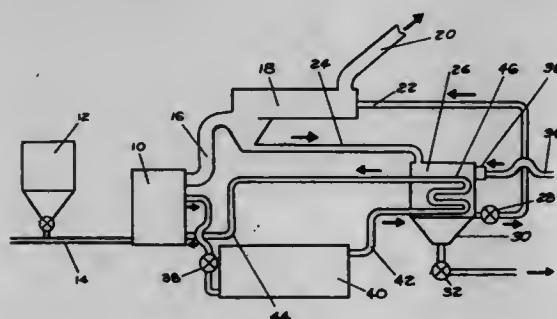
PCT Filed Jun. 25, 1992, Ser. No. 170,300

Claims priority, application Germany, Jun. 28, 1991, 9107979 U

Int. Cl.<sup>6</sup> B01D 47/06; 47/18

U.S. Cl. 55-222

21 Claims



1. Apparatus for flue gas cleaning comprising a scrubbing chamber, a flue gas feed means, a flue gas discharge means, a drain means for used scrubbing water and a device for feeding the scrubbing water, wherein arranged in the scrubbing chamber is a device which is rotatable about a horizontal axis by means of a drive motor and which carries means for atomization of the scrubbing water and fixed to the rotatable device are means for transportation of the flue gas and the atomized scrubbing water in helical movements in a horizontal direction through the scrubbing chamber, said drain means for used scrubbing water is so arranged that a sump of scrubbing water remains in the scrubbing chamber and said means for atomization of the scrubbing water arranged at the rotatable device partially dip into said sump.

5,480,464

# FILTRATION

Pierre De Villiers, Hartbeespoort; Willem J. C. Prinsloo, Pretoria, and Ivor M. Minnaar, Broederstroom, all of, South Africa, assignors to Atomic Energy Corporation of South Africa Limited, and Universal Filtration (Proprietary) Limited, both of, South Africa

Division of Ser. No. 22,339, Feb. 24, 1993, Pat. No. 5,403,367.

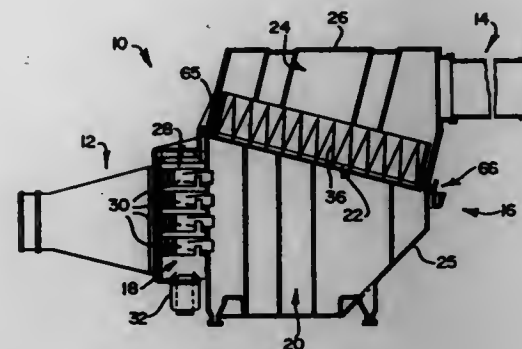
This application Oct. 11, 1994, Ser. No. 321,259

Claims priority, application South Africa, Feb. 27, 1992, 92/1472

Int. Cl.<sup>6</sup> B01D 50/00

U.S. Cl. 55-320

10 Claims



1. A filter apparatus including pre-filter means which comprises at least one axial flow vortex tube including a straight round outer tube having an inlet at one end which will be an upstream end in use and an opposed end which will be a downstream end in use, an axially arranged vortex generator downstream of said inlet, a separation region downstream of the vortex generator, an annular outlet region toward a periphery of the outer tube downstream of the separation region, a central outlet region in the centre of the outer tube downstream of the separation region, an inner round extraction tube which is arranged concentrically in the outer tube such as to separate the annular outlet region and the central outlet region, the extraction tube having an inlet end at a predetermined, relatively upstream, axial position corresponding to a downstream end of the separation region, and an outlet end at a predetermined, relatively upstream, axial position, said inlet end of the inner round extraction tube co-operating with the outer tube to define an annular inlet for the annular outlet region, and a contaminant exhaust for the annular outlet region downstream of said annular inlet for the annular outlet region; final filter means including a media filter element of fibrous material, the media filter element having a first side which will be an upstream side in use and a second side which will be a downstream side in use, having a depth corresponding to the spacing between said first side and said second side, being of non-homogenous structure through said depth, having a first depth portion extending from said first side only partially toward said second side, the first depth portion having a structure including fibres which are free from one another along major portions of lengths thereof which free portions are flexible and are at least slightly resilient such as to have a tendency to return to a relaxed condition after having been deformed, having a second depth portion adjacent and in series with said first depth portion toward the second side, the second depth portion having a structure including fibres which are relatively set by being attached to one another, at least intermittently, along major portions of their lengths.

5,480,465

# AIR/FOREIGN MATERIAL SEPARATOR

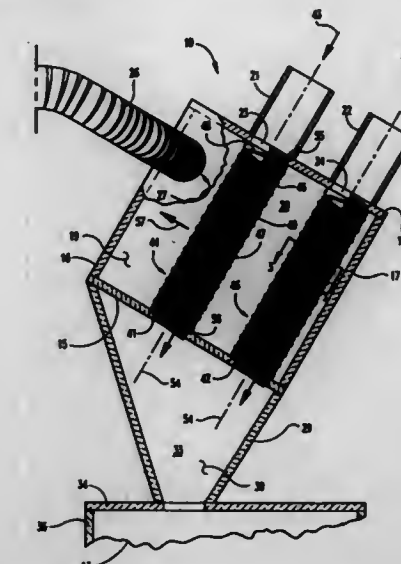
Donald G. Cox, Bartersville, Ind., assignor to Air Equipment & Engineering, Inc., Martinsville, Ind.

Filed Apr. 28, 1994, Ser. No. 234,165

Int. Cl.<sup>6</sup> B01D 45/00

U.S. Cl. 55-472

5 Claims



1. An apparatus for separating foreign material from air comprising: frame means including interior surfaces forming an interior passage with an air and foreign material inlet and a foreign material outlet, said frame means including a storage bin connected to said foreign material outlet; pressure source means having a pressure source outlet between said air and foreign material inlet and said foreign material outlet and in fluid communication with said passage being operable to force air with foreign material into said air and foreign material inlet and to impart forward velocity to said foreign material forcing said air and said foreign material to move in said passage along a straight path in a first direction; and bristle means located in said passage between said air and foreign material inlet and said foreign material outlet and being operable to allow all of said air to be diverted in a second direction toward said pressure source outlet away from said first direction and said straight path while said forward velocity of said foreign material causes said foreign material to continue to move along said straight path and out said foreign material outlet to come to rest in said storage bin, said bristle means forming said passage and including a screen and a plurality of flexible bristles mounted thereto forming a straight tunnel through which said foreign material moves toward said foreign material outlet, said flexible bristles movable to allow air to move from said tunnel to said pressure source outlet while said forward velocity causes said foreign material to continue to move in said first direction.

5,480,466

# AIR FILTRATION MEDIA

Fred L. Jackson, Littleton; Kevin P. McHugh, Denver, and John S. Robertson, Littleton, all of Colo., assignors to Schuller International, Inc., Denver, Colo.

Continuation-in-part of Ser. No. 237,812, May 4, 1994, abandoned. This application Nov. 4, 1994, Ser. No. 334,706

Int. Cl.<sup>6</sup> B01D 29/31

U.S. Cl. 55-528

27 Claims

1. A non-woven, fibrous blanket of air filtration media comprising:



finite length, synthetic polymeric resin microfibers; said microfibers, taken as a whole, having an average fiber diameter between 0.5 and 5 microns; said microfibers having a softening point; and said microfibers comprising between 50% and 90% by weight of the air filtration media;

finite length, synthetic polymeric resin staple fibers; said staple fibers, taken as a whole, having an average fiber diameter between 10 and 30 microns; said staple fibers having a softening point; and said staple fibers comprising between 5% and 45% by weight of the air filtration media;

finite length, synthetic polymeric resin bonding fibers; said bonding fibers, taken as a whole, having an average fiber diameter between 10 and 30 microns; said bonding fibers having thermoplastic surfaces with a lower temperature softening point than the softening points of said microfibers and said staple fibers; and said bonding fibers comprising between 5% and 25% by weight of the air filtration media; and said microfibers, said staple fibers, and said bonding fibers being randomly oriented and randomly intermingled in a blanket; and said bonding fibers bonding said microfibers, said staple fibers and said bonding fibers together to form said blanket.

5,480,467

# DEVICE FOR HEAT TREATING GLASSWARE AND CRYSTALWARE ARTICLES IN A PLANE PERPENDICULAR TO AN AXIS OF ROTATION

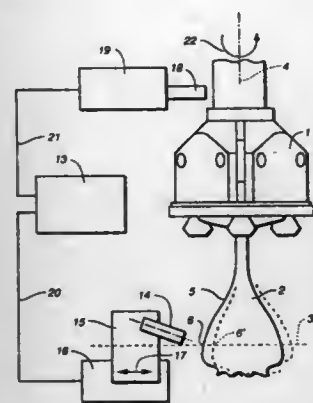
Leon Blebuyck, Obourg, Belgium, assignor to Etablissements Blebuyck S.A., Houdeng-Goegnies, Belgium  
PCT No. PCT/BE92/00007, § 371 Date Sep. 2, 1993, § 102(e) Date Sep. 2, 1993, PCT Pub. No. WO92/15534, PCT Pub. Date Sep. 17, 1992

PCT Filed Mar. 2, 1992, Ser. No. 117,033

Claims priority, application Belgium, Mar. 5, 1991, 9100206  
Int. Cl.<sup>6</sup> C03B 29/00; G01D 9/60

U.S. Cl. 65—158

7 Claims



1. A heat treatment device for treating glassware and crystalware articles in a treatment plane perpendicular to an axis of rotation, including a mandrel maintaining an article to be treated in rotation about the axis perpendicular to the treatment plane, said device comprising:

a heating source for treatment of said article, and mounted on a support for displacement in a direction parallel to said treatment plane;

a first sensor and a second sensor, said first sensor, in the course of a previous data acquisition operation, situated to measure the position of the intersection of an external wall of the rotating article and of said treatment plane as a function of the angular position of said article as measured by said second sensor; and

a data storage and command unit for recording and processing data transmitted by said first and said second sensor, said data enabling said storage and command unit to control the location and said displacement of the heating source, during said treatment, to maintain the spacing between the displaceable heating source, and said intersection substantially constant

regardless of said angular position of said article in continuous rotation about said axis.

5,480,468

# NI-BASE ALLOY FOILS

Ann M. Ritter, Albany; Melvin R. Jackson, Niskayuna; Paul L. Dupree, Scotia; Donald N. Wemple, Jr., Rotterdam, and John R. Hughes, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 27, 1994, Ser. No. 265,891

Int. Cl.<sup>6</sup> B22F 3/00

U.S. Cl. 75—228

21 Claims

1. A Ni-base alloy foil having a controlled concentration of oxygen and nitrogen as impurities, a thickness less than or equal to 0.017 in. and a non-oriented grain microstructure, said foil being formed directly from a powder of the Ni-base alloy having a concentration of oxygen and nitrogen impurities by hot pressing the powder wherein the concentration of oxygen and nitrogen impurities in the foil is the same as the concentration of oxygen and nitrogen impurities in the Ni-base alloy powder.

5,480,469

# POWDER MIXTURE AND METHOD FOR THE PRODUCTION THEREOF

Helge Storstrom, Hoganas, and Bengt Floren, Bjuv, both of, Sweden, assignors to Hoganas AB, Hoganas, Sweden  
Continuation of Ser. No. 137,103, Mar. 15, 1994, abandoned.

This application Mar. 8, 1995, Ser. No. 400,678

Claims priority, application Sweden, Apr. 18, 1991, 91011544

Int. Cl.<sup>6</sup> B22F 1/02

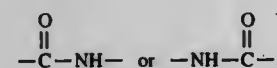
U.S. Cl. 75—228

5 Claims

1. A powder mixture containing a base metal powder, pulverulent additives, a binder and, optionally, a pulverulent lubricant, characterized in that the binder is at least one diamide wax of the general Formula I:



wherein  $R_1$  and  $R_2$  are the same or different and represent a straight, saturated, optionally OH-substituted alkyl group having 13–24 carbon atoms, Q is



and n is 1–10, and that the binder is present in molten and subsequently solidified form for binding together the powder particles of the additives with the powder particles of the base metal.

5,480,470

# ATOMIZATION WITH LOW ATOMIZING GAS PRESSURE

Steven A. Miller, Amsterdam, N.Y.; Roy W. Christensen, Northborough, and David P. Mourer, Danvers, both of Mass., assignors to General Electric Company, Schenectady, N.Y.  
Continuation of Ser. No. 961,942, Oct. 16, 1992, abandoned.

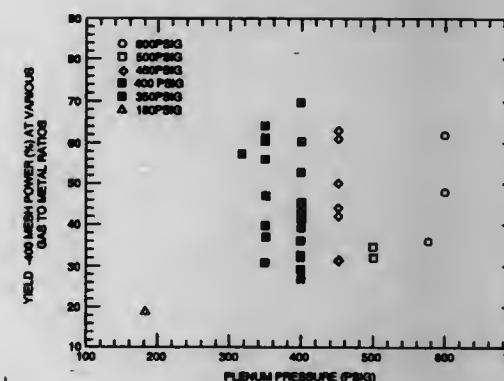
This application Jun. 13, 1994, Ser. No. 259,103

Int. Cl.<sup>6</sup> B22F 9/08

U.S. Cl. 75—338

21 Claims

1. A method for close coupled gas atomization of metals having melting temperatures above 1000° C. comprising the steps of: providing means for supplying a melt to be atomized;



providing melt guide tube means for guiding the melt into an atomization zone;

providing gas supply means for directing atomizing gas into the atomization zone to atomize the melt flowing thereinto from the melt guide tube;

the gas supply means including a gas plenum, at least partially surrounding the melt guide tube, for supplying gas to an orifice;

setting the dimensions of the orifice to satisfy the equation:

$$\dot{m} = AP \sqrt{\frac{K_g}{TR}} \times \left( \frac{K+1}{2} \right)^{\frac{K+1}{2(K-1)}}$$

where:

$\dot{m}$ =mass flow rate in lbs/min,

A=gas orifice area in square inches,

P=pressure in psia,

T=temperature in degrees Rankin,

R=gas constant,

K=specific heat ratio,

$g_c$ =gravitational constant;

adjusting the pressure of the atomizing gas in the plenum to between about 200 and about 600 psia; and

adjusting the gas to metal ratio to between about 2 and about 6 so that a high percentage of -400 mesh powder is produced.

5,480,471

# RE-FE-B MAGNETS AND MANUFACTURING METHOD FOR THE SAME

Andrew S. Kim, Pittsburgh, and Floyd E. Camp, Trafford, both of Pa., assignors to Crucible Materials Corporation, Syracuse, N.Y.

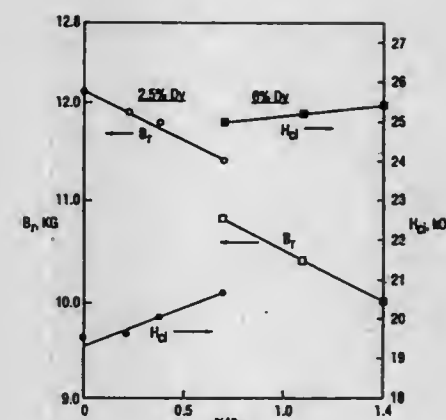
Filed Apr. 29, 1994, Ser. No. 235,279

Int. Cl.<sup>6</sup> B22F 9/08

U.S. Cl. 75—348

15 Claims

14. A method for producing a carbon- and oxygen-containing permanent magnet alloy containing 0.03 to 0.3% carbon and 0.2 to 0.8% oxygen, said method comprising producing an alloy consisting essentially of, in weight percent, 27 to 35 of a rare earth element, including Nd in the amount of at least 50 percent of the total rare element content, optionally further comprising at least one of Pr or La in an amount up to 50 percent of the Nd, 0.8 to 1.3 B, up to 30 Co, 40 to 75 Fe, up to 1 of at least one of Cu, Ga, and Ag; producing pre-alloyed particles and/or blends thereof from said alloy, contacting said particles with a carbon-containing material to produce said carbon content therein and contacting said particles with an oxygen-containing material to produce said oxygen content therein.



5,480,472

# METHOD FOR FORMING AN ELECTRICAL CONTACT MATERIAL

Yasushi Noda; Nobuyuki Yoshioka; Nobutaka Suzuki; Toshimasa Fukui, all of Shizuoka; Tetsuo Yoshihara, and Kojiro Koshiro, both of Osaka, all of, Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Jul. 30, 1991, Ser. No. 738,189

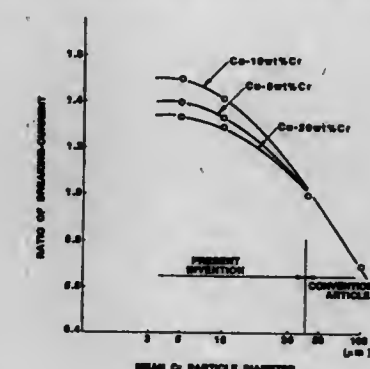
Claims priority, application Japan, Aug. 2, 1990, 2-203887

Int. Cl.<sup>6</sup> B22F 3/00

U.S. Cl. 75—351

7 Claims

1. A method for forming an electrical contact material comprising the steps of:



ing the steps of:

preparing a mixture of copper and chromium,

deoxidizing said mixture by melting said mixture into a molten alloy in atmosphere of inert gas to reduce an oxygen content in said mixture to a level of less than 1000 ppm,

atomizing said molten alloy to obtain an alloy powder, said atomizing step allowing a mean powder diameter of chromium to be less than or equal to 5 μm and being homogeneously dispersed in said alloy powder, and

sintering said alloy powder to form a sintered matrix of copper including chromium particles being fined after sintering to a level of 2 to 20 μm, while maintaining homogeneous dispersion thereof in said sintered matrix to form said electrical contact material.



5,480,473

## METHOD FOR INTENSIFYING THE REACTIONS IN METALLURGICAL REACTION VESSELS

Gregory J. Hardie, East Freemantle, Australia; Paul-Gerhard Mantey, Sulzbach-Rosenberg, Germany, and Mark P. Schwarz, Clayton, Australia, assignors to Technological Resources Pty. Limited, Melbourne, Australia  
Filed Oct. 12, 1993, Ser. No. 134,945

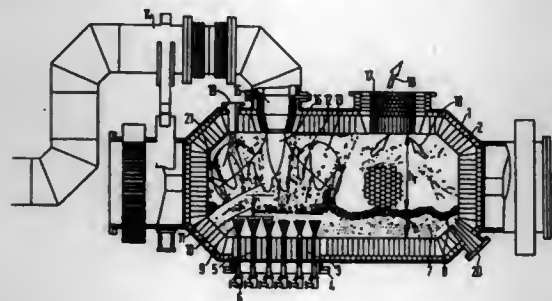
Claims priority, application Germany, Jan. 16, 1992, 42 34 974.5

Int. Cl.<sup>6</sup> C21B 11/00

U.S. Cl. 75—501

15 Claims

1. A method for intensifying reactions occurring in a process of



reducing metal oxide bearing materials in a metallurgical reaction vessel containing a molten bath having a bath surface, comprising feeding reacting agents below and above said bath surface, injecting oxidizing agents into a space in the reaction vessel above said molten bath, afterburning gases emerging from metal bath in said space, introducing gas via underbath tuyères such that fractions of said molten bath in the form of drops, splashes and particles move on ballistic trajectories within said space and produce a disperse metal-drop phase in said space where they pick up energy which is transferred back to said molten bath.

5,480,474

## PROCESS AND APPARATUS FOR SMELTING REDUCTION OF ORES OR PRE-REDUCED METAL CARRIERS

Klaus H. Ulrich, Heiligenhaus, Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Germany  
Filed Jun. 15, 1994, Ser. No. 260,032

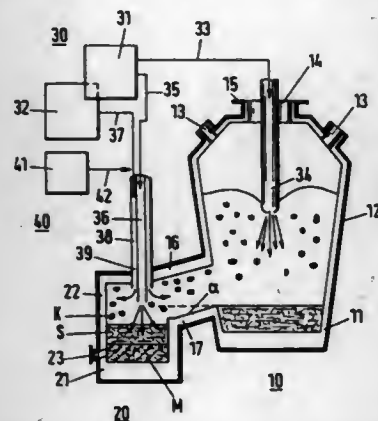
Claims priority, application Germany, Jun. 15, 1993, 43 20 572.0

Int. Cl.<sup>6</sup> C21B 11/00

U.S. Cl. 75—502

9 Claims

1. A process for the smelting reduction of a pre-reduced metal



carrier, wherein the metal comprises iron, to form pig iron having a low carbon content, comprising the steps of:

feeding the metal carrier and a carbon-containing substance to a smelting reduction reactor;

converting the metal carrier and carbon-containing substance in the smelting reduction reactor to an emulsion comprising slag, liquid metal and floating coke particles; passing the emulsion from the smelting reduction reactor through a connection conduit to a separate settling tank; separating the emulsion in the settling tank into an upper layer comprising slag and coke particles and a lower layer comprising metal, wherein at least a portion of the coke particles comprise coke particles floating in an upper portion of the upper layer; and

blowing oxygen into the settling tank to convert the liquid metal of said emulsion to pig iron, said step of blowing oxygen comprising:

blowing a first jet of a first oxygen-containing stream through a first lance into an upper pan of the settling tank, said first jet of the first oxygen-containing stream being focused and being blown with sufficient momentum for penetrating the upper layer and contacting the lower layer; and

blowing a second jet of a second oxygen-containing stream through a second lance into the upper part of the settling tank so as to increase a volume of gas in the settling tank, said second jet of the second oxygen-containing stream being sufficiently unfocused so as to produce a bushy flame and being blown with a momentum less than the momentum of the first jet for at most partially penetrating the slag layer, and said increased volume of gas in the settling tank causing a flow of gas from the settling tank to the reduction reactor through the connection conduit so as to drive the floating coke particles of the emulsion from the settling tank to the smelting reduction reactor opposite a direction of flow of the emulsion from the reduction reactor to the settling tank.

5,480,475

## VAPOR RECOVERY SYSTEM

Willard N. Tuttle, Tulsa, Okla., assignor to Callidus Technologies, Inc., Tulsa, Okla.

Continuation of Ser. No. 73,709, Jun. 9, 1993, abandoned.

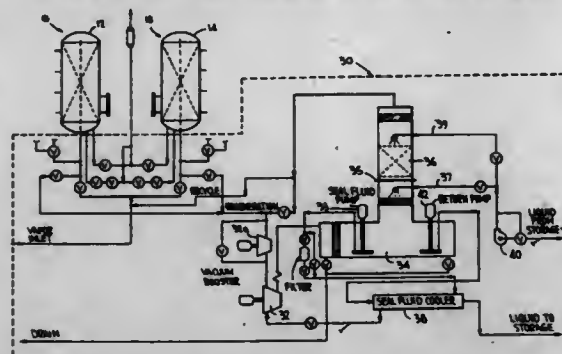
This application Sep. 19, 1994, Ser. No. 307,413

Int. Cl.<sup>6</sup> B01D 53/047; 53/14

U.S. Cl. 96—122

9 Claims

1. A vapor recovery unit comprising a vapor inlet for taking up



hydrocarbon vapor, at least two adsorber vessels, each of said adsorber vessels including an entry port for receiving vapors in the bottom thereof connected to closed pipe means within each of said vessels and which pipe means extends from said entry port to the top of each of said vessels discharging vapors received at the entry port at the top of each of said vessels; a bed of solid adsorbent having an affinity for hydrocarbons contained in each of said adsorber vessels; an outlet port in the bottom of each of said adsorber vessels for discharging vapors from said adsorber vessels after passing through said solid adsorbent; valve means for alternately directing said hydrocarbon vapors from said vapor inlet to one or the other of said entry ports of said at least two adsorber vessels; a vacuum system connected by connector means to an outlet in the bottom of each of said at least two adsorber vessels, said connector means permitting for alternately desorbing said

5,480,478

## RECORDING LIQUID

Hideo Sano; Yukichi Murata; Toru Nishimura; Masahiro Yamada; Hiroshi Takimoto, all of Kanagawa, and Nobuyoshi Satoh, Tokyo, all of Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Nov. 29, 1994, Ser. No. 350,077

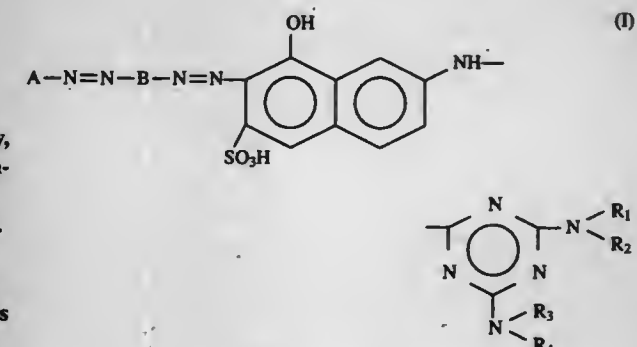
Claims priority, application Japan, Nov. 29, 1993, 5-298186; Dec. 1, 1993, 5-301925; Dec. 1, 1993, 5-301927; Aug. 26, 1994, 6-202056

Int. Cl.<sup>6</sup> G09D 11/02

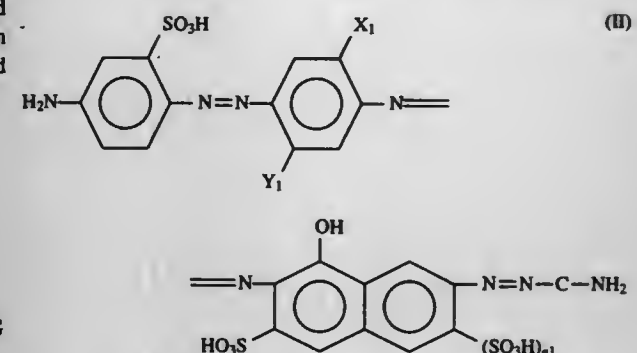
U.S. Cl. 106—22 K

26 Claims

1. A recording liquid comprising an aqueous medium and at least one dye selected from dyes, a free acid form of which is represented by formula (I), (II), (III) or (VI):



wherein A represents a phenyl group or a naphthyl group, each of which is substituted with at least one of a sulfo group and a carboxyl group and may have additional substituents; B represents a phenylene group which may be substituted with a sulfo group, a carboxyl group, a substituted or unsubstituted alkyl group having from 1 to 9 carbon atoms, a substituted or unsubstituted alkoxy group having from 1 to 4 carbon atoms or an acylamino group having from 2 to 7 carbon atoms, or a naphthylene group substituted with a sulfo group; and R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> each independently represents a hydrogen atom, an alkyl group having from 1 to 18 carbon atoms, an alkenyl group having from 1 to 18 carbon atoms, an aryl group, an aralkyl group, a cycloalkyl group or a heterocyclic group wherein each of these groups may have substituents and at least one of R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> represents a group substituted with a carboxyl group,



wherein C represents a phenylene group which may have one or more substituents selected from the group consisting of a substituted or unsubstituted alkyl group having from 1 to 7 carbon atoms, a substituted or unsubstituted alkoxy group having from 1 to 9 carbon atoms, an amino group, a carboxyl group, a hydroxyl group, a sulfo group and a halogen atom; X<sub>1</sub> and Y<sub>1</sub> each independently represents a hydrogen atom, a substituted or unsubstituted alkyl group having from 1 to 7 carbon atoms or a substituted or unsubstituted alkoxy group having from 1 to 9 carbon atoms, and the sum of the carbon atoms in X<sub>1</sub> and Y<sub>1</sub> is 5 or more; and n1 represents 0 or 1,

5,480,476

## ACTIVATED POLISHING COMPOSITIONS

Lee M. Cook, Steelville; Scott B. Lonicki, Lincoln University, both of Pa., and Gregory Brancalone, Newark, Del., assignors to Rodel, Inc., Newark, Del.

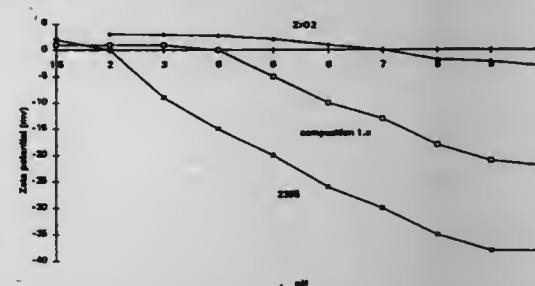
Division of Ser. No. 116,322, Sep. 3, 1993, Pat. No. 5,382,272.

This application Sep. 6, 1994, Ser. No. 301,558

Int. Cl.<sup>6</sup> C09G 1/02

U.S. Cl. 106—3

8 Claims



1. A composition suitable for polishing articles comprising a base abrasive activated by chemical adsorption of a cation whose oxide exhibits a higher polishing rate than said base abrasive alone onto the surface of said base abrasive, said adsorption being accomplished by subjecting said base abrasive and a compound containing said cation to cyclic impact in an aqueous medium whose pH is at level which is favorable for adsorption of said cation onto said base abrasive surface.

5,480,477

## COBALT AS A STABILIZER IN ELECTROLESS PLATING FORMULATIONS

Nathan Feldstein, Princeton, N.J., and Thomas S. Lancsek, Yardley, Pa., assignors to Surface Technology, Inc., Trenton, N.J.

Filed Jun. 2, 1995, Ser. No. 459,429

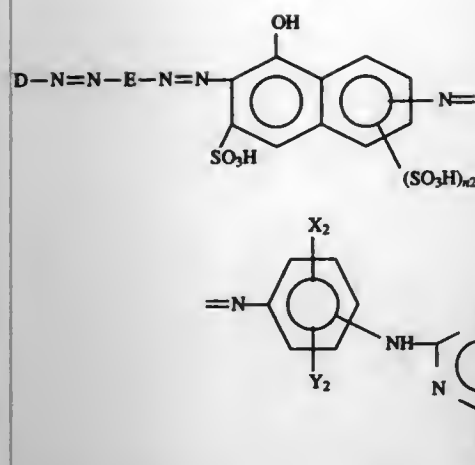
Int. Cl.<sup>6</sup> C23C 18/31

U.S. Cl. 106—1.24

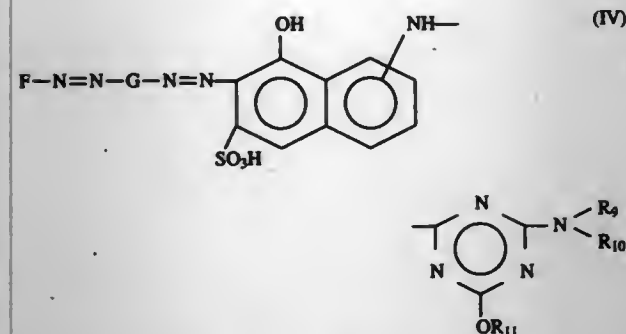
2 Claims

2. A composition of matter useful for electroless plating which comprises; a solvent, a metal salt, and electroless plating reducing agent, a complexing agent and/or chelating agent, and a compound comprising of cobalt in the cobaltic oxidation state.





wherein D represents a substituted or unsubstituted phenyl group or a substituted or unsubstituted naphthyl group; E represents a substituted or unsubstituted phenylene group or a substituted or unsubstituted naphthylene group; X<sub>2</sub> and Y<sub>2</sub> each independently represents a hydrogen atom, an amino group, an acylamino group, a sulfo group, a carboxyl group, a halogen atom, a substituted or unsubstituted alkyl group having from 1 to 9 carbon atom or a substituted or unsubstituted alkoxy group having from 1 to 9 carbon atoms; R<sub>3</sub>, R<sub>6</sub>, R<sub>7</sub> and R<sub>8</sub> each independently represents a hydrogen atom, a substituted or unsubstituted alkyl group having from 1 to 18 carbon atom, a substituted or unsubstituted alkenyl group having from 1 to 18 carbon atoms, a substituted or unsubstituted aryl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted cycloalkyl group, or a substituted or unsubstituted heterocyclic group; and n<sub>2</sub> represents 0 or 1,



wherein F represents a substituted or unsubstituted phenyl group or a substituted or unsubstituted naphthyl group; G represents a phenylene group which may be substituted with a sulfo group, a carboxyl group, a substituted or unsubstituted alkyl group having from 1 to 9 carbon atoms, a substituted or unsubstituted alkoxy group having from 1 to 4 carbon atoms or an acylamino group having from 2 to 7 carbon atoms, or a naphthylene group substituted with a sulfo group; R<sub>9</sub>, R<sub>10</sub> and R<sub>11</sub> each independently represents a hydrogen atom, a substituted or unsubstituted alkyl group having from 1 to 18 carbon atoms, a substituted or unsubstituted alkenyl group having from 1 to 18 carbon atoms, a substituted or unsubstituted aryl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted alicyclic group or a substituted or unsubstituted heterocyclic group, and at least one of R<sub>9</sub>, R<sub>10</sub> and R<sub>11</sub> represents a group substituted with 1 to 4 carboxyl groups.

**5,480,479**  
**WET POWDER FILM-FORMING COMPOSITIONS**  
(III) Charles A. Signorino, King of Prussia, Pa., assignor to Warner-Jenkinson Company, Inc., St. Louis, Mo.  
Division of Ser. No. 73,795, Jul. 27, 1993, which is a continuation of Ser. No. 801,201, Dec. 9, 1991, which is a continuation-in-part of Ser. No. 630,815, Dec. 20, 1990, abandoned. This application Feb. 1, 1995, Ser. No. 382,146  
Int. Cl.<sup>6</sup> C09D 101/28; 103/04; 105/00

U.S. Cl. 106—162

12 Claims

1. A method of making a wet powder, edible, clear, film-forming composition for use in coating tablets and capsules with a clear coating, which composition consists essentially of a clear, film-forming, water soluble or water-dispersible, edible polymer and between approximately 1% and approximately 30% by weight of water, the method comprising applying water onto said polymer in atomized form to form said composition without the formation of fish eyes.

**5,480,480**  
**AQUEOUS MULTICOLOR PAINT**  
James F. Lynch, Schaumburg, and John Fredkells, Glen Ellyn, both of Ill., assignors to Multicolor Specialties, Inc., Cicero, Ill.  
Continuation-in-part of Ser. No. 43,849, Apr. 6, 1993, Pat. No. 5,318,619, which is a continuation-in-part of Ser. No. 851,525, Mar. 16, 1992, Pat. No. 5,199,980, which is a continuation-in-part of Ser. No. 694,311, May 1, 1991, Pat. No. 5,114,485, which is a continuation-in-part of Ser. No. 586,762, Sep. 21, 1990, Pat. No. 5,114,484. This application Jun. 7, 1994, Ser. No. 255,230  
Int. Cl.<sup>6</sup> C09D 5/29

U.S. Cl. 106—311

42 Claims

1. A method for making a water-in-water multicolor paint having a discontinuous aqueous phase dispersed in a continuous aqueous phase said method comprising the steps of:

- (A) providing a first composition comprising on a 100 weight percent basis:
  - (a) about 10 to about 40 weight percent of a water dispersed, film-forming, crosslinkable, polymer system selected from the group consisting of a polyurethane polymer system, a carboxylated polymer system and mixtures thereof, said polyurethane polymer system comprising on a 100 weight percent total crosslinkable solids basis about 75 to and including 100 weight percent of polyurethane polymer and correspondingly from and including 0 to about 25 weight percent of reactive curative, and said carboxylated polymer system comprising on a 100 weight percent total polymer solids basis about 75 to and including 100 weight percent carboxylated polymer and correspondingly from and including 0 up to about 25 weight percent of organic crosslinking agent;
  - (b) about 0.5 to about 2 weight percent of hydroxy (lower alkyl) cellulose;
  - (c) about 0.5 to about 2 weight percent of alkali metal carboxylated (lower alkyl) cellulose;
  - (d) from and including 0 to about 10 weight percent of water dispersed, film-forming, crosslinkable pressure-sensitive contact adhesive selected from the group consisting of polyurethanes and acrylic polymers;
  - (e) from and including 0 to about 30 weight percent dispersed pigment;
  - (f) from and including 0 to about 10 weight percent organic cosolvent; and
  - (g) about 20 to about 80 weight percent water;
- (B) providing a second composition comprising on a 100 weight percent basis:
  - (a) about 0.5 to about 5 weight percent dissolved cationic quaternized cellulose ether, and
  - (b) about 95 to about 99.5 weight percent water;
- (C) providing a third composition comprising on a 100 weight percent basis:

- (a) about 0.5 to about 2 weight percent dissolved peptizing agent;
  - (b) about 5 to about 10 weight percent dispersed water-swelling clay; and
  - (c) about 88 to about 95 weight percent water;
- (D) providing a fourth composition comprising on a 100 weight percent basis:
- (a) about 5 to about 40 weight percent of said water dispersed, film-forming, crosslinkable polymer system;
  - (b) from and including 0 to about 30 weight percent of a water dispersed, film-forming, crosslinkable pressure-sensitive contact adhesive selected from the group consisting of polyurethanes and acrylic polymers;
  - (c) about 1.5 to about 5 weight percent of said dispersed water-swelling clay;
  - (d) about 0.1 to about 0.8 weight percent of said dissolved peptizing agent;
  - (e) from and including 0 to about 30 weight percent of pigment;
  - (f) from and including 0 to about 0.25 weight percent of anti-foaming agent;
  - (g) from and including 0 to about 0.25 weight percent of a wetting agent;
  - (h) from and including 0 to about 0.25 weight percent of an organofunctional silane;
  - (i) from and including 0 to about 5 weight percent of colloidal silica;
  - (j) from and including 0 to about 15 weight percent of an organic cosolvent; and
  - (k) about 30 to about 70 weight percent water;

the relationship between components of said fourth composition being such that said fourth composition has a viscosity in the range of about 1,000 to about 1,500 centipoises;

- (E) providing a fifth composition comprising on a 100 weight percent basis:
  - (a) about 10 to about 45 weight percent of a dissolved inorganic salt having a cation selected from the group consisting of heavy metal and trivalent metals, and
  - (b) about 55 to about 90 weight percent water;
- (F) optionally blending said first composition with a composition selected from the group consisting of:
  - (a) said second composition in the weight ratio range of about 85:15 through about 80:20 of said first composition to said second composition;
  - (b) said third composition in the weight ratio range of about 85:15 to about 80:20 of said first composition to said third composition; and
  - (c) a combination of said second composition and said third composition in the weight ratio range of about 70:15:15 to about 80:10:10 of said first composition to said second composition to said third composition so as to produce a first intermediate disperse phase gel composition having a viscosity in the range of about 25,000 to about 85,000 centipoises;
- (G) blending at least one of either said first composition or said first intermediate disperse phase gel composition with said fifth composition to produce a first product disperse phase gel composition containing about 0.5 to 5 weight percent of said dissolved inorganic salt and having a viscosity in the range of about 25,000 to about 85,000 centipoises; and
- (H) mixing said first product disperse phase gel composition with said fourth composition so that the ratio of the viscosity of said fourth composition to the viscosity of said first product disperse phase composition is in the range of about 1:5 to about 1:10, the mixing shear force used in said mixing being sufficient to break up said first product disperse phase gel composition into discrete gel bodies, thereby forming said discontinuous aqueous phase which is dispersed in said continuous phase composition, said mixing shear force being inversely proportional to the average size of said so formed disperse phase bodies, thereby to produce said multicolor paint.

**5,480,481**  
**ALUMINUM PIGMENTS**  
Shunichi Setoguchi, Kashiwara; Haruzo Katoh, Akashi, and Takashi Matsufuji, Yamato-Koriyama, all of Japan, assignors to Toyo Aluminum Kabushiki Kaisha, Osaka, Japan  
Continuation-in-part of Ser. No. 99,483, Jul. 28, 1993, abandoned. This application Aug. 31, 1994, Ser. No. 298,279  
Claims priority, application Japan, Aug. 5, 1992, 4-209079  
Int. Cl.<sup>6</sup> C09C 1/62

U.S. Cl. 106—404

17 Claims

1. An aluminum pigment comprising aluminum flakes, each of the aluminum flakes being coated with molybdic acid in an amount of 0.1 to 10% by weight in terms of Mo based on the weight of Al.

**5,480,482**  
**REVERSIBLE THERMOCHROMIC PIGMENTS**  
Thomas Novinson, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.  
Continuation-in-part of Ser. No. 787,340, Nov. 4, 1991, abandoned. This application Jul. 27, 1993, Ser. No. 97,802  
Int. Cl.<sup>6</sup> C08K 5/16; C09B 11/08; G02B 5/23; G03C 5/00  
U.S. Cl. 106—498

4 Claims

1. A thermochromic pigment composition which changes color reversibly from a dark color to colorless when said pigment composition is heated to a temperature range of between 50° C. and 70° C. and changes from colorless to said dark color when said pigment composition is cooled to a temperature of about 25° C., said thermochromic pigment composition consisting of:

- (a) a colorless aryl lactone dye capable of ring opening to a colored triarylmethylene carboxylic acid dye wherein said colorless aryl lactone dye is selected from the group consisting of o-cresolphthalein, bromocresol green, sulfobromophthalein, Rose Bengal actone and thymolphthalein;
- (b) an diaminoalkane activator that acts to open the ring of said aryl lactone dye and to produce ring closure of said carboxylic acid dye; and
- (c) a low temperature melting waxy ester which allows said change from said dark color to colorless when said thermochromic pigment composition is heated to said temperature range of between 50° C. and 70° C. and said change from colorless to said dark color when said pigment composition is cooled to a temperature of about 25° C.

**5,480,483**  
**APPARATUS FOR DEPOSITING SOLDER ON THE TERMINAL PADS OF PRINTED CIRCUIT BOARDS**  
Larry N. Velle, El Toro, Calif., assignor to Velle Circuits, Inc., Costa Mesa, Calif.  
Division of Ser. No. 851,912, Mar. 16, 1992, Pat. No. 5,246,731. This application Jul. 29, 1993, Ser. No. 98,847  
Int. Cl.<sup>6</sup> H05K 3/34; B05C 5/04

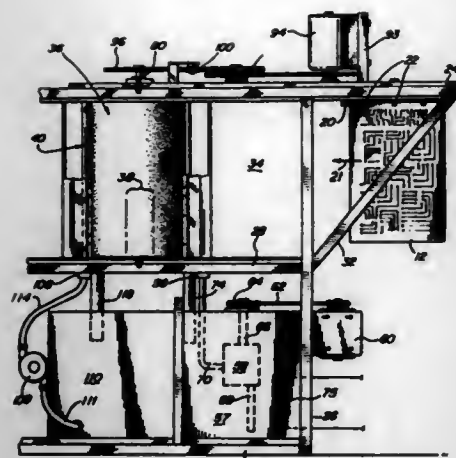
U.S. Cl. 118—45

47 Claims

1. In an apparatus for applying solder to the conductive terminal pads on at least one side of a printed circuit board, the board containing a solder resist layer covering said at least one side except for the areas of the terminal pads, the solder resist layer having a thickness corresponding to the desired height of the solder to be applied and forming cavities extending from the terminal pads to the outer surface of the resist layer, the combination comprising:

- a) means for holding the board in a vertical position and for moving the board along a horizontal axis;
- b) means for directing molten solder against said at least one side of the board while the board is moving along said horizontal axis to fill the cavities with solder;
- c) means for covering the cavities filled with molten solder to retain the solder within the cavities while the board is moving along the axis;





- d) means for cooling the solder within the covered cavities below its solidification temperature; and  
e) means for uncovering the cavities containing solidified solder.

5,480,484

## CYTOLOGY CENTRIFUGE APPARATUS

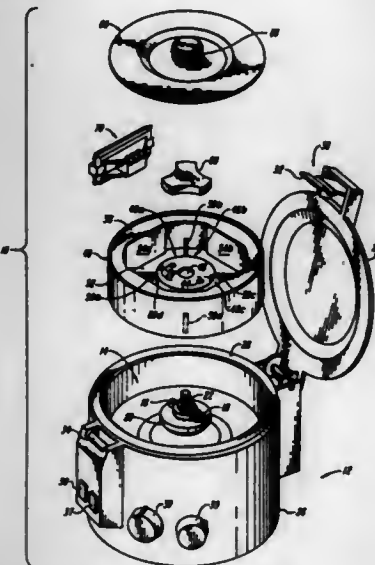
Thomas F. Kelley, Canton, Mass., and Alton D. Floyd, Edwardsburg, Mich., assignors to StatSpin Technologies, Norwood, Mass.

Filed Mar. 1, 1994, Ser. No. 204,608

Int. Cl.<sup>6</sup> B05C 13/00

U.S. Cl. 118—52

29 Claims



1. Centrifuge apparatus comprising:  
a spinner having a central depression;  
a rotor removably supported for rotation in said central depression of said spinner, said rotor having a substantially planar bottom surface portion; and  
a cell concentrator disposed in said rotor for receiving a fluid specimen for centrifugation, said cell concentrator comprising:  
a chamber having a top surface in which a fluid receiving aperture is disposed, a bottom surface, a front surface bordered by a mounting flange and having a fluid expulsion aperture disposed therein, and a rear surface;  
a backing plate having a top edge, a bottom edge, a front surface adjacent to said front chamber surface, and a rear surface; and  
a securing mechanism for securing said backing plate to said chamber, wherein said cell concentrator is stable when rested on said substantially planar bottom surface portion of

said rotor prior to rotation of said rotor, with a front edge of said bottom chamber surface and said bottom backing plate edge contacting said substantially planar bottom surface portion of said rotor so that received fluid specimen is kept away from said front chamber surface and toward said substantially planar bottom surface portion of said rotor.

5,480,485

## APPARATUS FOR TREATING CELLULOSIC FIBER-CONTAINING FABRIC TO IMPROVE DURABLE PRESS AND SHRINKAGE RESISTANCE

David R. McClain, Williamsburg, and Ewart H. Shattuck, Cincinnati, both of Ohio, assignors to American Laundry Machinery, Inc., Cincinnati, Ohio

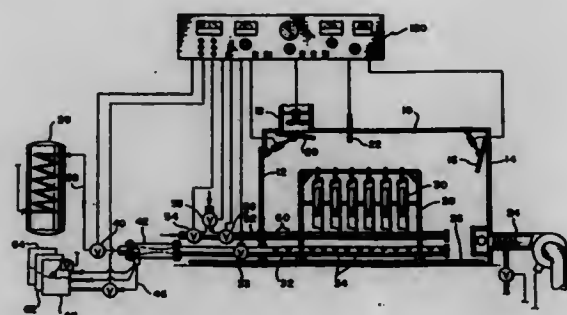
Division of Ser. No. 751,981, Aug. 29, 1991, Pat. No.

5,320,873. This application Apr. 7, 1994, Ser. No. 224,545

Int. Cl.<sup>6</sup> B05C 11/06

U.S. Cl. 118—64

4 Claims



1. Apparatus for treating a fabric article containing cellulosic material in a treating chamber, said treating including cross-linking the cellulosic material in the presence of moisture, cellulosic cross-linking agent and cross-linking promoting catalyst, comprising:

a treating chamber for receiving a fabric article, a source of pressurized treating steam, and a conduit including an outlet in the treating chamber for carrying said pressurized treating steam from said source into and throughout the treating chamber;

an ejector pump associated with said conduit, said pump having a suction zone, an inlet arranged to receive said treating steam from said conduit for driving said pump by generating suction at said suction zone, and an outlet arranged to discharge said treating steam into said conduit for distribution in said treating chamber;

a cross-linking agent supply system for supplying at least a liquid cellulosic cross-linking agent to the suction zone of said pump for entrainment with said treating steam at the pump suction zone;

said source of treating steam constructed and arranged to supply steam at a temperature sufficiently high to vaporize a cellulosic cross-linking agent supplied by said cross-linking agent supply system upon entrainment of the latter into the treating steam;

a catalyst supply system for supplying a cross-linking promoting catalyst into said treating chamber, with said catalyst being in a form enabling it to act as a catalyzing agent for the cross-linking agent supplied by said cross-linking agent supply system;

whereby upon supply of the treating steam to the pump, said cellulosic cross-linking agent is entrained and vaporized in said treating steam at said suction zone and discharged with the treating steam into the treating chamber for treating the cellulosic material in said treating chamber with the cross-linking agent and a catalyst supplied through said catalyst supply system.

5,480,486  
CONTINUOUS ADJUSTABLE BACKING BAR FOR PROFILING COATER BLADE

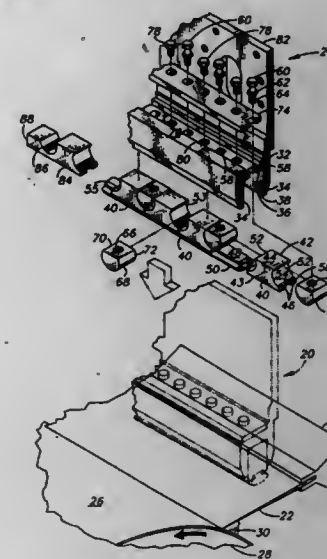
James R. Burns, Springfield, Pa., assignor to Beloit Technologies, Inc., Wilmington, Del.

Filed Dec. 21, 1993, Ser. No. 171,306

Int. Cl.<sup>6</sup> B05C 11/04

U.S. Cl. 118—123

9 Claims



1. A backing bar assembly engaging against a coater blade in a papermaking machine, the assembly comprising:  
a bar housing disposed above the coater blade;  
a plurality of bar units positioned within the housing for vertical displacement therein, wherein two adjacent bar units define an adjacent pair of bar units;  
a lifter member positioned between each adjacent pair of bar units and engaged with the bar units of the pair; and  
an adjustment screw extending between the bar housing and threadably engaging said lifter member, such that rotation of the adjustment screw causes a vertical displacement of the lifter member and the two bar units engaged thereto, and wherein the bar units apply a force to the coater blade to achieve a desired uniformity of blade disposition.

5,480,487

## DISPENSING PROCESS PARTICULARLY FOR A SEALING/ADHESIVE PRODUCT

Aldo Figini, Dresano, and Renato Beylls, Collegno, both of Italy, assignors to Loctite Corporation, Hartford, Conn., and NKE S.r.l., Turin, Italy

PCT No. PCT/EP91/01372, § 371 Date Jan. 26, 1993, § 102(e) Date Jan. 26, 1993, PCT Pub. No. WO92/02306, PCT Pub. Date Feb. 20, 1992

PCT Filed Jul. 23, 1991, Ser. No. 962,224

Claims priority, application Italy, Jul. 27, 1990, 21102/90

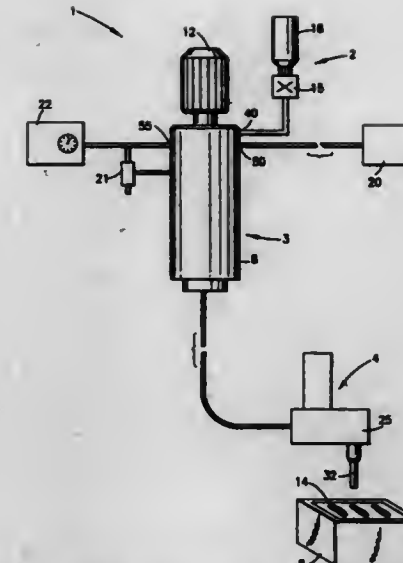
Int. Cl.<sup>6</sup> B05C 11/10; F04B 43/12

U.S. Cl. 118—610

13 Claims

1. An apparatus for batch deaerating and dispensing an anaerobic adhesive product comprising:

- (a) a deaerator comprising a chamber having an upper portion and a lower portion, with an inlet at the upper portion, an outlet at the lower portion, a strainer at the upper portion below the inlet and two ports below the strainer, providing deaerated adhesive product;  
(b) a feeding system which brings adhesive product into the chamber through the inlet;  
(c) a first cutoff valve connected at one end to the feeding system and at the other end to the inlet of the chamber to regulate the flow of the product into the chamber through the strainer;



- (d) a vacuum and pressurizing system comprising a vacuum pump connected to one of the ports of the chamber and a pressurizing device connected to the other port of the chamber;  
(e) a dispensing system which distributes the deaerated adhesive product onto a work piece;  
(f) a transporting system which carries deaerated product from the lower portion of the chamber through the outlet to the dispensing system; and  
(g) a second cutoff valve connected at one end to the transporting system and at the other end to the dispensing system, such that the flow of deaerated adhesive product from the deaerator can be stopped or started into the dispensing system.

5,480,488

APPARATUS FOR SUPPLYING CVD COATING DEVICES  
Hans J. Bltner, Ingelheim; Hans-Jürgen Klein; Thomas Küpper, both of Bad Gandersheim, and Ewald Mörsen, Mörfelden, all of, Germany, assignors to Schott Glaswerke, Mainz, Germany

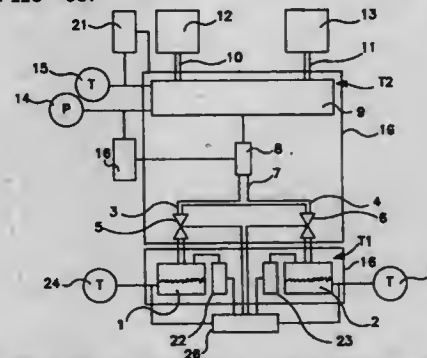
Filed Oct. 28, 1993, Ser. No. 141,363

Claims priority, application Germany, Jan. 28, 1992, 42 36 324.1

Int. Cl.<sup>6</sup> B05C 11/02; 11/10; C23C 16/52

U.S. Cl. 118—667

19 Claims



1. An apparatus for supplying a coating gas into at least one CVD coating device, wherein the apparatus includes at least one heated storage tank for a gaseous coating material and a pipeline system between the storage tank and the at least one CVD coating device, wherein mass flow regulators or valves are arranged in the pipeline system and wherein an unheated intermediate reservoir (9), heated only by gaseous material therein from the at least one heated storage tank for accommodating a gaseous coating material, is located between the at least one heated storage tank for accommodating the gaseous coating material and the at least one CVD



coating device, means for adapting the volume of the intermediate reservoir (9) to a determined, maximum pressure change in the intermediate reservoir (9) upon withdrawal of a mass of gas required for a coating step.

5,480,489

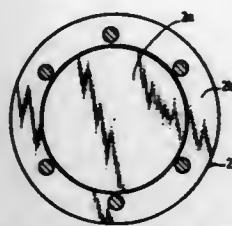
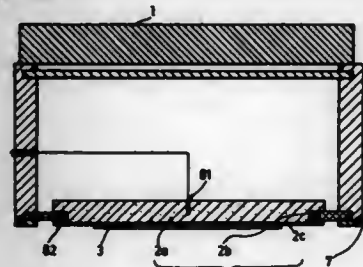
**REACTOR FOR UNIFORM HEATING OF A SUBSTRATE**  
Toshiaki Hasegawa, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 24, 1993, Ser. No. 80,706

Claims priority, application Japan, Jun. 29, 1992, 4-194862  
Int. Cl.<sup>6</sup> C23C 16/00

U.S. Cl. 118—725

10 Claims



2. A CVD reactor useful for forming a film on a surface of a semiconductor substrate, said reactor comprising:

the reactor including a sidewall defining an inner reactor chamber, a support bed having a substrate receiving surface for mounting the semiconductor substrate thereon in the reactor chamber, a heating device for heating said semiconductor substrate by way of said support bed and a source gas supply means for supplying a source gas to the reactor chamber for growing the film on the semiconductor substrate, said support bed being divided into a central contact portion for receiving the semiconductor substrate and a fixed portion disposed along the outer circumference of the support bed and being fixed to the sidewall of the reactor, the material of the central contact portion being more heat conductive than the material of the fixed portion and the substrate receiving surface of said support bed defined by the central contact portion and the fixed portion, each having a film layer defined thereon.

5,480,490

**METHOD FOR PURIFYING BEET JUICE USING RECYCLED MATERIALS**

Laszlo Toth, Thornton, and John E. Sagaser, Denver, both of Colo., assignors to The Western Sugar Company, Denver, Colo.

Filed Feb. 10, 1995, Ser. No. 386,939

Int. Cl.<sup>6</sup> C13D 3/00; C13J 1/02; B01D 15/00

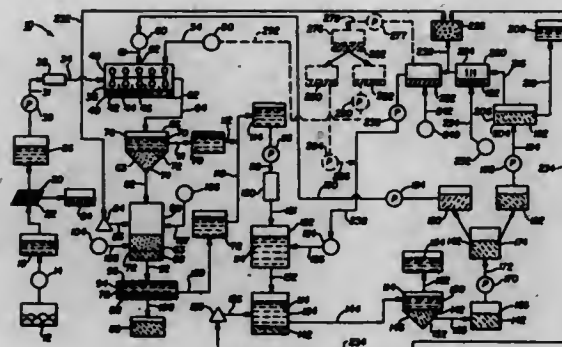
U.S. Cl. 127—42

20 Claims

1. A method for treating and purifying beet juice using recycled lime and recycled calcium carbonate compositions comprising the steps of:

providing a supply of beet juice comprising water, sugar, and dissolved non-sugar impurities therein;

combining said beet juice with a preliminary supply of lime and a preliminary supply of calcium carbonate in a preliming chamber in order to produce a first juice fraction and a second juice fraction, said second juice fraction comprising a plural-



ity of solid floc particles therein, said floc particles being formed from said non-sugar impurities in said beet juice when said preliminary supply of lime and said preliminary supply of calcium carbonate are combined with said beet juice;

separating said first juice fraction from said second juice fraction;

combining said second juice fraction with a primary supply of carbon dioxide gas in a primary carbonation chamber in order to remove said preliminary supply of lime from said second juice fraction, said combining of said second juice fraction and said primary supply of carbon dioxide gas producing a calcium carbonate reaction product in said second juice fraction, said calcium carbonate reaction product encapsulating said solid floc particles within said second juice fraction;

removing said calcium carbonate reaction product and said floc particles encapsulated by said calcium carbonate reaction product from said second juice fraction;

recombining said first juice fraction and said second juice fraction in order to produce a third juice fraction;

combining said third juice fraction with a main supply of lime in a main liming chamber in order to degrade remaining amounts of said dissolved non-sugar impurities which are present within said third juice fraction;

combining said third juice fraction with a secondary supply of carbon dioxide gas in a secondary carbonation chamber in order to remove said main supply of lime therefrom, said combining of said third juice fraction with said secondary supply of carbon dioxide gas producing a calcium carbonate sludge product within said third juice fraction, said calcium carbonate sludge product adsorbing residual amounts of said dissolved non-sugar impurities which are present within said third juice fraction, said secondary carbonation chamber being maintained separately from said primary carbonation chamber;

removing said calcium carbonate sludge product from said third juice fraction in order to produce a treated juice product;

dividing said calcium carbonate sludge product into a calcium carbonate-containing first sludge portion and a calcium carbonate-containing second sludge portion;

routing said first sludge portion into said preliming chamber for use as said preliminary supply of calcium carbonate in treating additional quantities of beet juice materials which enter said preliming chamber;

converting said second sludge portion into a supply of regenerated lime, said converting of said second sludge portion into said regenerated lime comprising heating said second sludge portion to a temperature sufficient to produce said regenerated lime from said second sludge portion; and

routing said regenerated lime into said main liming chamber for use as said main supply of lime in treating additional quantities of beet juice materials which enter said main liming chamber.

5,480,491

**PROCESS FOR THE PREPARATION OF CRYSTALLINE LACTULOSE FROM COMMERCIAL SYRUPS**

Gluseppe Bimbi, Pontedera, Italy, assignor to Inalco S.p.A., Milan, Italy

Filed Apr. 18, 1994, Ser. No. 229,559

Claims priority, application Italy, Apr. 28, 1993, MI93A0833

Int. Cl.<sup>6</sup> C13F 1/00; 1/02; C13T 1/06; C13D 3/12

U.S. Cl. 127—61

8 Claims

1. A process for the preparation of crystalline lactulose having a content of carbohydrates which are different from lactulose that is lower than 1% and a lactulose content of more than 98.5%, said process comprising the following steps:

(a) evaporating a part of the water from an aqueous lactulose syrup under continuous stirring at a temperature of from 50° to 60° C. and at a pressure of from 2660 to 6650 Pa to obtain a concentrated lactulose syrup with a sugar concentration of 70°–80° Brix, said aqueous lactulose syrup having a lactulose content of from 50% to about 62% by weight and a content of carbohydrates which are different from lactulose and include lactose, galactose and other carbohydrates, the lactose content being from 3% to 9% by weight; the galactose content being from 3% to 14% and the other carbohydrate content being from 4% to 7% by weight;

(b) cooling the concentrated syrup obtained in step (a) to a temperature of from 5° to 20° C. prior to adding from 5% to 30% by weight of crystalline trihydrated lactulose based on the total weight of lactulose which is present in said aqueous lactulose syrup;

(c) stirring the product of step (c) for a period of from 20 to 120 hours to crystallize the lactulose which is present as trihydrated lactulose;

(d) separating the crystallized trihydrated lactulose by centrifugation or filtration of the product of step (c) to obtain a mother liquor and separated crystallized trihydrated lactulose; and thereafter washing said separated crystallized trihydrate of lactulose with cold water prior to drying the separated crystallized trihydrate of lactulose at a temperature of from 30° to 60° C., to obtain crystalline lactulose having a water content of less than 0.5%.

5,480,492

**METHOD FOR REMOVING ORGANIC OR INORGANIC CONTAMINANT FROM SILICON SUBSTRATE SURFACE**

Masaharu Udagawa, Tokyo; Juro Yasui, Toyonaka; Masaaki Niwa, Hirakata; Yoshihiko Hirai, Osaka; Kenji Okada, Suita; Kiyoshi Morimoto, and Koichiro Yuki, both of Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 15, 1993, Ser. No. 136,197

Claims priority, application Japan, Nov. 10, 1992, 4-299482

Int. Cl.<sup>6</sup> C23G 5/00; B44C 1/22

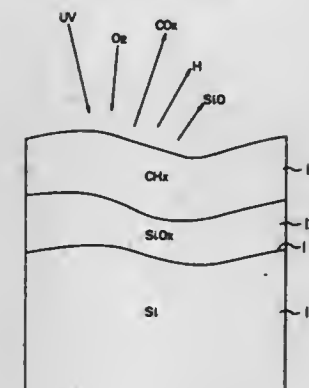
U.S. Cl. 134—2

21 Claims

1. A method for removing an organic or inorganic contaminant on a silicon substrate surface, said method comprising:

causing a temperature of the organic or inorganic contaminant on the silicon substrate surface to be not less than 7500° C.; and

exposing the organic or inorganic contaminant to a gas including ozone while the temperature of the organic or inorganic contaminant is not less than 750° C. and a partial pressure formed by at least one of oxygen atoms (O), oxygen molecules (O<sub>2</sub>) and ozone molecules (O<sub>3</sub>) over the organic or inorganic contaminant on the silicon substrate surface is not higher than 10<sup>1</sup> Pa to prevent the silicon substrate surface from being oxidized.

NOT LESS THAN 7500°C  
SUBSTANTIALLY VACUUMED

5,480,493

**METHOD FOR CLEANING A OVEN SURFACE WITH A COMPOSITION CONTAINING SILICONE**

David R. Harry, Jr., Oak Ridge, N.C., assignor to Kay Chemical Company, Greensboro, N.C.

Division of Ser. No. 41,227, Mar. 31, 1993, Pat. No. 5,389,138.

This application Nov. 10, 1994, Ser. No. 339,258

Int. Cl.<sup>6</sup> B08B 17/00; B05D 1/00

U.S. Cl. 134—4

32 Claims

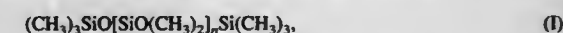
1. A method for cleaning a desired surface which is liable to soiling by organic food deposits comprising the steps of:

a. applying to the surface a food-safe composition consisting essentially of:

i. a food-safe, inorganic thickening agent which is substantially insoluble in an alkaline aqueous composition and which is present in an amount sufficient so that the composition is capable of forming a continuous coating adhered to all desired portions of the surface;

ii. an alkaline, food-safe, water soluble inorganic salt in an amount sufficient so that the composition is readily removable with water or an aqueous solution after the composition has been dried and soiled;

iii. a food-safe silicone polymer of the formula I



wherein n represents the number of polymer units needed to give the overall silicone polymer a minimum viscosity of 350 centistokes, which is present in an amount sufficient so that the continuous coating is transparent or translucent after the composition has been applied to the surface, dried and heated; and optionally

iv. a food-safe mineral oil, wherein, when said food-safe mineral oil is included in said food-safe composition, said mineral oil and said silicone polymer are present in a combined amount sufficient so that the composition is transparent or translucent after the composition has been applied to the surface, dried and heated,

to form a continuous coating on the surface;

b. drying the continuous coating to form a film;

c. allowing the film to become a soiled film; and

d. removing the soiled film by contacting the soiled film with water or an aqueous solution.



5,480,494

**SOLAR CELL MODULE AND INSTALLATION METHOD THEREOF**

Yuji Inoue, Nara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

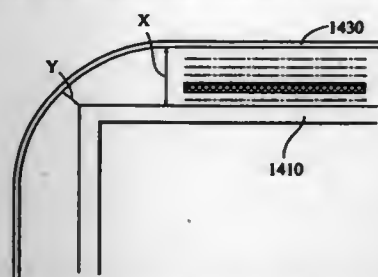
Filed May 11, 1994, Ser. No. 240,891

Claims priority, application Japan, May 18, 1993, 5-115613  
Int. Cl.<sup>6</sup> H01L 31/048

U.S. Cl. 136—251

11 Claims

1. A solar cell module comprising an active solar cell element,



and a filler holding element disposed on said active solar cell element, said active solar cell element and said filler holding element being encapsulated with a filler between a transparent film and a reinforcing member, said solar cell module being characterized in that said reinforcing member, said filler, and said transparent film are bent in a direction opposite to a surface of the solar cell module to be illuminated by sunlight, wherein there is no filler holding element at least in the bent portion.

5,480,495

**MAGNETIC MATERIAL**

Shinya Sakurada; Takahiro Hirai, both of Yokohama; Akihiko Tsubota, Kawasaki, and Masashi Sashiki, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 858,014, Mar. 26, 1992, abandoned.

This application Jul. 6, 1993, Ser. No. 86,379

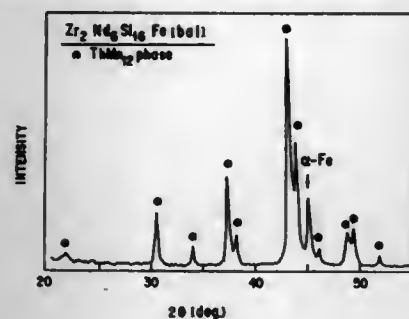
Claims priority, application Japan, Mar. 27, 1991, 3-063280; Dec. 18, 1991, 3-334968

Int. Cl.<sup>6</sup> H01F 1/055

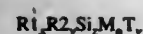
U.S. Cl. 148—301

24 Claims

1. A magnetic material which consists essentially of a general



formula:



where R1 is at least one element selected from Zr and Hf, R2 is at least one element selected from the rare earth elements, M is at least one element selected from C, N and P, T is one material selected from Fe and combinations of Fe and Co,  $x+y+z+u+v=100$ ,  $x, y, z, u, v$ , are atomic percent individually defined as  $0.1 \leq x \leq 20$ ,  $2 \leq y \leq 20$ ,  $0.5 \leq z \leq 20$ ,  $0 \leq u \leq 20$ ,  $v \geq 50$ , wherein the Fe content of said magnetic material is at least 63 atomic percent; and of which the principal phase possesses a TbCu<sub>2</sub> crystal structure.

5,480,496

**METHOD OF MAKING TWIN ROLL CAST CLAD MATERIAL USING DRAG CAST LINER STOCK AND ARTICLE PRODUCED THEREBY**

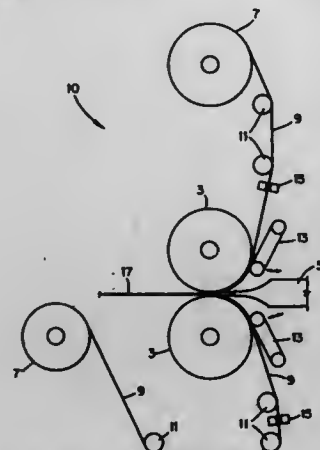
Bennie R. Ward, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Mar. 29, 1994, Ser. No. 219,069

Int. Cl.<sup>6</sup> C22C 21/00; B32B 15/00

U.S. Cl. 148—437

11 Claims



1. A twin roll cast metallic composite strip material comprising:  
a) twin roll cast metallic core material having opposing surfaces; and  
b) a metallic liner material having a drag cast structure bonded to at least a portion of one of said opposing surfaces.

5,480,497

**HIGH SPEED ELECTRICAL DISCHARGE SURFACE PREPARATION INTERNAL SURFACES FOR THERMAL COATINGS**

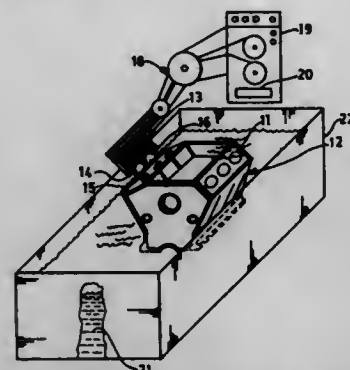
Matthew J. Zaluzec, Canton; Oludele O. Popoola, Ann Arbor; Larry Reatherford, Clarkston, and Thomas W. Rose, West Bloomfield, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 28, 1994, Ser. No. 314,015

Int. Cl.<sup>6</sup> B23H 7/00

U.S. Cl. 148—512

7 Claims



1. A method of preparing metal surfaces for receiving thermal sprayed coatings, comprising:  
melting and rapidly solidifying globules of said metal surface by spark erosion,  
said spark erosion occurring by incidence of an electrical discharge between an electrode and the metal surface closely spaced thereto, the spacing containing an electrolyte with plasma forming capabilities,  
said discharge resulting from application of an electrical current to said electrode having a DC voltage in the range of 60–85 volts and an amperage of 50–110 amps, said current being pulsed on for periods of 150–300 microseconds per spark.

5,480,498

**METHOD OF MAKING ALUMINUM SHEET PRODUCT AND PRODUCT THEREFROM**

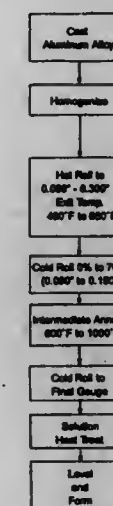
Armand J. Beaudoin, Richmond; J. Daniel Bryant; Alan J. Janousek, both of Midlothian; Rajeev G. Kamat, Richmond; H. Edwin Oliver, Richmond, and Robert M. Ramage, Richmond, all of Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed May 20, 1994, Ser. No. 246,653

Int. Cl.<sup>6</sup> C22F 1/04

U.S. Cl. 148—549

18 Claims



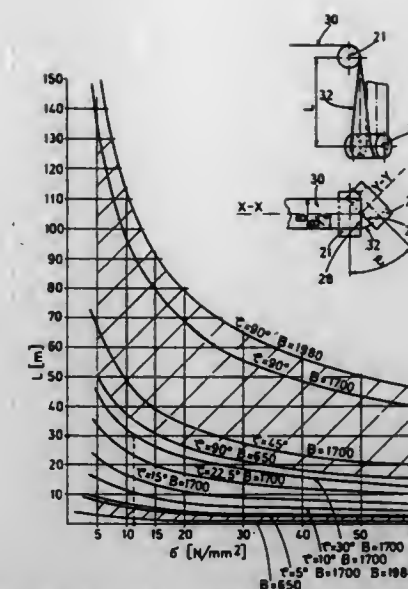
1. In a method of producing an aluminum alloy sheet product comprising casting an aluminum alloy to provide a slab, homogenizing the slab, hot rolling the slab to provide an intermediate gauge product, cold rolling the intermediate gauge product to a final gauge product, and solution heat treating the final gauge product to provide an aluminum alloy sheet product, the improvement comprising:

controlling hot rolling of the slab so that the temperature of the intermediate gauge product exiting the hot rolling step is between about 500° F. and 600° F.; and either

(a) annealing said intermediate gauge product between 700° F. and 900° F. for up to 18 hours and cold rolling said annealed intermediate gauge product to a final gauge product; or

(b) cold rolling said intermediate gauge product to provide a second intermediate gauge product, annealing said second intermediate gauge product between 600° and 900° F. for up to 12 hours, and cold rolling said annealed second intermediate gauge product to a final gauge product;

wherein said aluminum alloy sheet product is substantially free from bands of grains having a similar crystallographic orientation so that said sheet product can be subsequently strained without substantial formation of ridging lines on a surface of said sheet product.



in at least one travel track, wherein the travel direction and the travel track of the strip can be adjusted as desired and the strip can be turned as desired from a bottom side to a top side and vice versa, the method comprising introducing the strip into a strip turning tower, the strip turning tower having a strip entry and a strip exit, the strip turning tower further including a plurality of upper guide rollers and a plurality of lower guide rollers, wherein the upper and lower guide rollers are cambered and vertically spaced apart from each other, the method further comprising guiding the strip alternately around the upper and lower guide rollers and twisting the strip by means of each roller by an angle until twisting of the strip by means of the rollers between strip entry and strip exit results in a total twisting angle of the strip, further comprising adjusting a diameter difference between the diameters of each roller at a middle and a side thereof which determines the camber of the roller, wherein the diameter difference corresponds approximately to an edge elongation caused by twisting of the strip by a certain angle with a given free strip length L between a pair of rollers and causing an elongation of strip edge areas, wherein

$$L = B \cdot \pi \cdot \phi / 720 \cdot \sqrt{E / F_{spec}}$$

wherein

B=strip width

φ=twisting angle

E=modulus of elasticity of the present material

F<sub>spec</sub>=specific strip tension.

5,480,500

**AMMONIUM NITRATE FUEL OIL BLASTING COMPOSITION HAVING IMPROVED WATER RESISTANCE**

Andrew Richard; Grant Simpson, and Earl Reckzin, all of North Bay, Canada, assignors to ETI Explosives, North Bay

Continuation of Ser. No. 327,937, Oct. 24, 1994, abandoned.

This application Apr. 11, 1995, Ser. No. 420,398

Int. Cl.<sup>6</sup> C06B 31/28

U.S. Cl. 149—46

27 Claims

1. A blasting explosive comprising an organic carbonaceous fuel, an inorganic oxidizing salt; a gelling agent and particulate filler material, wherein prior to exposing said particulate filler material and said inorganic oxidizing salt to said organic carbonaceous fuel and said gelling agent, from about 15 to about 60 wt % of said particulate filler material and said inorganic oxidizing salt are retained on a Tyler 10 sieve, from about 15 to about 60 wt % of said particulate filler material and said inorganic oxidizing salt are retained on a Tyler 14 sieve and from about 20 to about 60 wt %

5,480,499

**METHOD FOR GUIDING A STEEL STRIP DURING ITS PASSAGE THROUGH A CONTINUOUS TREATMENT PLANT**

Gerhard Wangerin, Langenfeld, and Withold Richert, Hückelhoven, both of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Germany

Filed Jan. 26, 1994, Ser. No. 188,192

Claims priority, application Germany, Feb. 1, 1993, 43 02 698.2

Int. Cl.<sup>6</sup> B65H 23/26

U.S. Cl. 148—657

6 Claims

1. A method of guiding a steel strip during travel of the steel strip through a continuous strip treatment plant including a plurality of treatment stations, the strip traveling in a travel direction and



of said particulate filler material and said inorganic oxidizing salt are retained on a Tyler 20 sieve.

5,480,501

# ULTRASONIC APPARATUS AND METHOD FOR PLACING INDIVIDUAL CHIPS OF LIGHT LOCK MATERIAL

Wallace S. Stewart, Penfield; Gary E. Merz, Rochester, and Dale C. Marshall, Hamlin, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

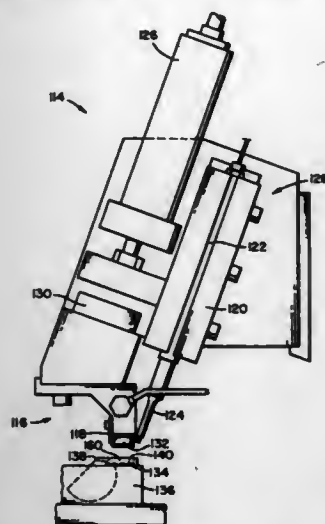
Continuation of Ser. No. 6,298, Jan. 19, 1993, abandoned.

This application Apr. 5, 1994, Ser. No. 223,043

Int. Cl.<sup>6</sup> B32B 31/02; 31/04; G03B 17/26

U.S. Cl. 156—73.1

19 Claims



1. A method for installing a light lock chip in a thermoplastic film cartridge, said chip being of the type having a lead-in edge and a smooth top surface upon which film is to slide and a thermoplastic substrate and said cartridge being of the type having a film dispensing lip and an undercut recess for receiving a lead-in edge of a chip, said method comprising the steps of:

- inserting the lead-in edge of a chip into the undercut recess of a cartridge;
- holding the chip with its lead-in edge in the undercut recess and its substrate against the lip of the cartridge;
- while the chip is so held, securing the substrate to said cartridge proximate the lip at least one point without deforming the smooth top surface of the chip; and
- terminating the holding step.

5,480,502

# METHOD AND APPARATUS FOR APPLYING LABELS TO ARTICLES USING COOLING AIR ON LABEL RECEIVING POSITIONS

Robert M. Rello, Slatington; Michael Yager, Shaver, and Ramon A. Martinez, Wilkes-Barre, all of Pa., assignors to CMS Gilbreth Packaging Systems, Inc., Treviso, Pa.

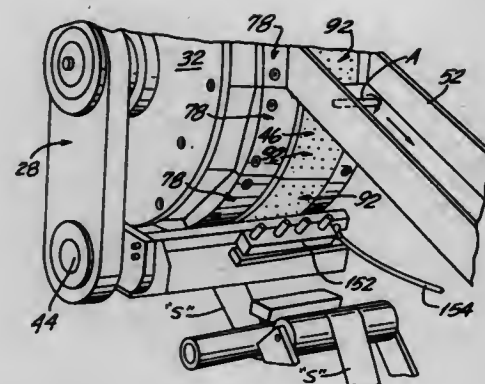
Division of Ser. No. 342,780, Nov. 21, 1994. This application Mar. 28, 1995, Ser. No. 411,456

Int. Cl.<sup>6</sup> B65C 9/00

U.S. Cl. 156—86

18 Claims

1. A method for applying a label onto a substantially cylindrical article comprising the steps of feeding a thin layer, heat activated adhesive backed label onto a label receiving position of a rotating label transport drum having label receiving positions formed of a substantially smooth, resilient material such as silicon, heating the adhesive as the drum rotates so that the adhesive obtains a sufficient temperature to melt,



transferring the label onto a cylindrical article at an article wrapping position, and blowing a jet of air onto the resilient surface for cooling the surface during subsequent label applying and ensuring rapid cooling of melted adhesive during labeling.

5,480,503

# PROCESS FOR PRODUCING CIRCUITIZED LAYERS AND MULTILAYER CERAMIC SUB-LAMINATES AND COMPOSITES THEREOF

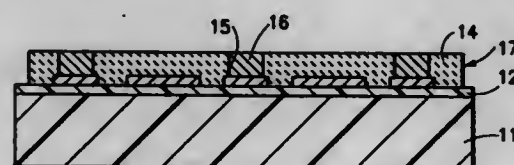
Jon A. Casey, Poughkeepsie; David B. Goland, Croton; Dinesh Gupta, Poughkeepsie; Lester W. Herron, Hopewell Junction; James N. Humenik, LaGrangeville; Thomas E. Lombardi, Wappingers Falls; John U. Knickerbocker, Hopewell Junction; Robert J. Sullivan, Pleasant Valley, all of N.Y., and James R. Wylder, Round Rock, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1993, Ser. No. 175,727

Int. Cl.<sup>6</sup> B32B 31/04; 31/12; 31/28; 31/26

U.S. Cl. 156—89

11 Claims



1. Process for producing circuitized ceramic greensheets while preventing warpage and distortion thereof, comprising the steps of:

- (a) forming a thin ceramic greensheet;
- (b) forming vias in said greensheet, either before or after step (f);
- (c) applying an ablatable release layer to the surface of a temporary rigid carrier support;
- (d) applying a thin non-ablatable, adhesive layer over said release layer;
- (e) forming a conductive patterned circuit layer by plating such layer over said adhesive layer;
- (f) lightly-laminating the thin ceramic greensheet of step (a) over said plated circuit layer;
- (g) applying conductive metal paste to fill the vias and to form interconnections with the patterned conductive circuit layer formed on the adhesive-coated surface of said carrier support to form a circuitized greensheet; and
- (h) ablating said release layer to separate said circuitized greensheet from said temporary rigid carrier support.

5,480,504

# METHOD OF PREFIXING A MOLDING TO A WINDSHIELD

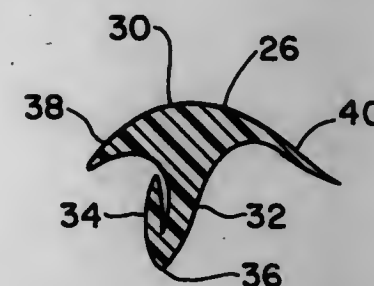
Peter Gold, 389 Peninsula Blvd., Hempstead, N.Y. 11550

Filed May 6, 1994, Ser. No. 239,355

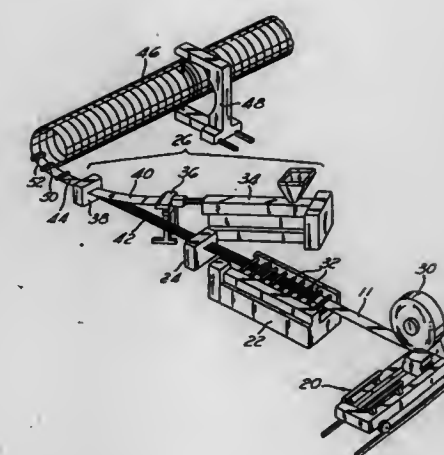
Int. Cl.<sup>6</sup> B60J 1/02

U.S. Cl. 156—108

1 Claim



1. A method of preparing an auto windshield having a peripheral edge for installation in an auto from opening comprising the steps of forming an elastomeric extruded molding into a T-shaped profile presenting an upper crown, a first leg in depending relation therefrom, and a second leg extension of said first leg in a 180 degree turned orientation in relation thereto, selecting a starting location along said windshield peripheral edge, engaging the molding at a location upon the crown portion located laterally of said first leg destined to have an operative position overlying the windshield peripheral edge, positioning the engaged crown portion of the molding in an adjacent clearance position from said starting location, engaging a free end of said second leg proximate said engaged crown portion, causing a 90 degree reversal in orientation of said second leg from its initial 180 degree turned orientation to correspondingly form a U-shaped opening between said engaged crown portion and second leg which is in facing relation to said windshield peripheral edge, urging said U-shaped opening through closing movement from said clearance position onto said starting location of said windshield peripheral edge for positioning said crown and second leg on opposite sides thereof, releasing said second leg and the attendant urgency of its elastomeric construction material incident to providing a seated position of said molding at said starting location of said windshield peripheral edge, and repeating the preceding steps at progressively advanced locations along said windshield peripheral edge, whereby said windshield is adapted to be positioned in an appropriately sized front opening of an auto with said molding in attached relation to complete a commercially acceptable installation thereof.



upon said sheet steel subsequent to the step of forming said sheet steel into a section of pipe.

5,480,506

# ORNAMENTAL TRANSFER SPECIALLY ADAPTED FOR ADHERENCE TO NYLON

John E. Mahn, Sr., 6154 Oakhaven Dr., Cincinnati, Ohio 45238, and John Mahn, Jr., 5878 Valleyway Ct., Cincinnati, Ohio 45247

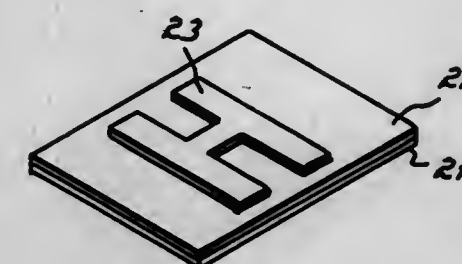
Continuation of Ser. No. 547,338, Jul. 2, 1990, Pat. No. 5,338,603, which is a continuation of Ser. No. 218,709, Jul. 13, 1988, abandoned. This application Jun. 3, 1994, Ser. No. 254,042

The portion of the term of this patent subsequent to Aug. 16, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B32B 31/00

U.S. Cl. 156—230

7 Claims



1. A method of marking a nylon garment comprising heat bonding to said nylon garment an ornamental heat transfer; said ornamental heat transfer comprising an upper indicia bearing layer bonded to a second layer, said second layer comprising a thermosettable, uncured linear saturated polyester in combination with a heat-activated curing agent; said method comprising positioning said second layer on said nylon garment; applying heat and pressure to said ornamental heat transfer causing said heat activated curing agent to activate said thermosettable uncured linear saturated polyester causing said thermosettable uncured linear saturated polyester to bond to said nylon garment.

5,480,505

# METHOD OF FABRICATING A STEEL PIPE WITH INTEGRALLY FORMED LINER

James R. Andre, Newport Beach, Calif., assignor to W. E. Hall Company, Newport Beach, Calif.

Continuation-in-part of Ser. No. 736,108, Jul. 26, 1991, Pat. No. 5,316,606. This application Apr. 8, 1994, Ser. No. 225,440 The portion of the term of this patent subsequent to May 31, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B29C 47/02; B32B 31/30

U.S. Cl. 156—201

29 Claims

1. A method for forming polymer laminated metal pipe comprising the steps of:

- (a) providing sheet steel having a co-extruded polymer layer of ethylene acrylic acid and polyethylene/ethylene acrylic acid blend formed upon at least one surface thereof;
- (b) passing said sheet steel through a profile former to form channels and seam members therein;
- (c) forming said sheet steel into a section of pipe; and
- (d) disposing a liner of heated polyethylene in laminar juxtaposition to said co-extruded polymer layer of ethylene acrylic acid and polyethylene/ethylene acrylic acid blend formed







5,480,512

# METHOD OF CONTROLLING SULFIDITY OF A SULFATE PULP MILL

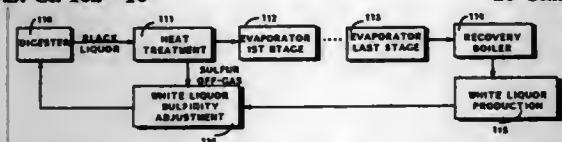
Krister Sannholm, Espoo, Finland, assignor to A. Ahlstrom Corporation, Noormarkku, Finland

Continuation-in-part of Ser. No. 614,722, Nov. 16, 1990, Pat. No. 5,277,759. This application Dec. 27, 1993, Ser. No. 173,111. The portion of the term of this patent subsequent to Jan. 11, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> D21C 11/00

U.S. Cl. 162-16

20 Claims



1. A method of controlling the sulfidity of a sulphate pulp mill, comprising the steps of:

- generating black liquor containing sulfur compounds by treating wood chips in white liquor in a digester including cooking the wood chips at a cooking temperature;
- pressure heating the black liquor to a predetermined temperature higher than the cooking temperature and retaining the heated black liquor at the predetermined temperature for a predetermined retention time, to generate sulphur containing gases;
- removing the sulphur containing gases from the black liquor;
- producing white liquor from the black liquor from step (c);
- adjusting the sulfidity of the white liquor produced in step (d) by controlling the predetermined temperature and retention time from step (b); and
- utilizing said sulfidity-controlled white liquor in the practice of step (a).

5,480,513

# METHOD AND DEVICE FOR CONTROLLING A WIRE IN A FORMING GAP OF A WEB FORMER

Juhani Niskanen, Oulunsalo, and Michael Odell, Jyväskylä, both of, Finland, assignors to Valmet Paper Machinery Inc., Helsinki, Finland

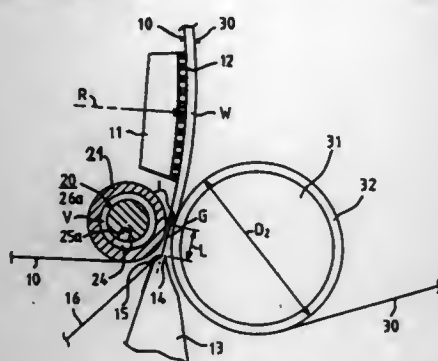
Filed Dec. 8, 1993, Ser. No. 164,134

Claims priority, application Finland, Dec. 8, 1992, 925579

Int. Cl.<sup>6</sup> D21F 1/00

U.S. Cl. 162-203

20 Claims



1. A method for controlling a wire in a forming gap of a twin-wire web former of a paper machine, which gap is defined between first and second forming wires, a pulp suspension jet being fed in a discharge direction out of a discharge opening of a headbox of the paper machine and into the forming gap, said jet having a free flight distance before it contacts the first and second forming wires, comprising the steps of:

- arranging a variable-crown or adjustable-crown breast roll in a loop of the first wire opposite a forming roll arranged in a loop of the second wire in proximity to the forming gap,
- loading a revolving mantle of said breast roll in a first direction substantially parallel to the discharge direction in which the

pulp suspension jet is fed from the discharge opening of the headbox into the forming gap, and adjusting the loading of the mantle to regulate the deflection of the mantle of said breast roll and control at least one of the transverse tightness profile of the first wire and instabilities of the first wire.

5,480,514

# DIAPHRAGM OF ELECTROACOUSTIC TRANSDUCER AND METHOD OF MANUFACTURING THEREOF

Akihisa Suzuki, Higashihiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

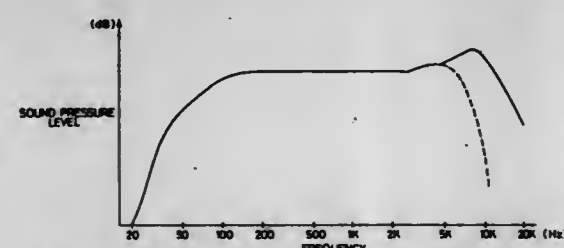
Filed Aug. 3, 1993, Ser. No. 101,034

Claims priority, application Japan, Aug. 4, 1992, 4-208070

Int. Cl.<sup>6</sup> D21J 3/12

U.S. Cl. 162-231

12 Claims



1. A diaphragm for an electroacoustic transducer, comprising: a material including wood fibers having at least two different mean radii at an approximately equal weight ratio, one of said fibers having a mean radius of about 10 μm and a second of said fibers having a mean radius of about 1 μm.

5,480,515

# ELECTROLYSIS CELL AND METHOD FOR GAS-DEVELOPING OR GAS-CONSUMING ELECTROLYTIC PROCESSES

Arnold Gallen, Gothaer Strasse 10 a, 96450 Coburg, Germany

PCT No. PCT/DE92/00499, § 371 Date Feb. 18, 1994, § 102(e) Date Feb. 18, 1994, PCT Pub. No. WO92/22681, PCT Pub. Date Dec. 23, 1992

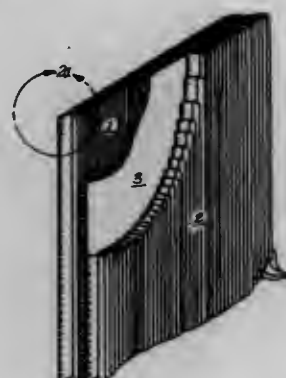
PCT Filed Jun. 12, 1992, Ser. No. 196,240

Claims priority, application Germany, Jun. 12, 1991, 41 19 836.0

Int. Cl.<sup>6</sup> B01D 59/40; C25B 1/00; 3/00

U.S. Cl. 204-1.11

16 Claims



14. A process for operating an electrolysis cell having a starting phase and an operating phase for gas-developing or gas-consuming electrolytic processes comprising the steps of establishing at least one electrolytic level in the electrolysis cell which is sufficiently high that gas bubbles formed are sufficient to raise the electrolyte up to the top edge of an electrode during the starting phase so that the electrode is supplied completely with electrolyte during the

5,480,517

# ELECTROLYTIC PRODUCTION OF HYPOPHOSPHOROUS ACID

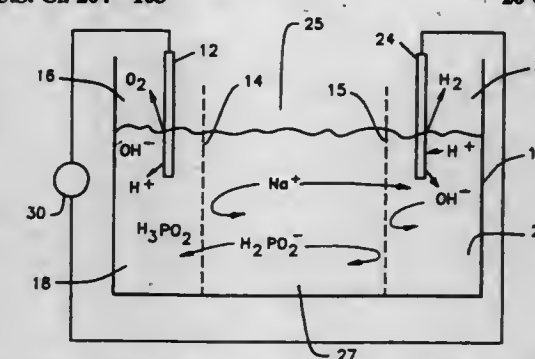
Fred I. Nobel, Sands Point; William Brasch, Nesconset; Donald Thomson, Northport, and Luis H. Garay, Rockville Centre, all of N.Y., assignors to LeaRonald Inc., Freeport, N.Y.

Filed Sep. 16, 1994, Ser. No. 307,923

Int. Cl.<sup>6</sup> C25B 1/22

U.S. Cl. 204-103

20 Claims



1. A method for preparing hypophosphorous acid comprising the steps of:

- providing an insoluble anode in an electrically conductive anolyte and a cathode in an electrically conductive catholyte, providing a hypophosphite salt solution separated from said anolyte by an anionic exchange membrane resistant to cationic diffusion and from said catholyte by a cationic exchange membrane resistant to anionic diffusion, and
- applying a direct current through said insoluble anode to said cathode to transfer hypophosphite anions through said anionic exchange membrane into said anolyte and to generate hydrogen ions in said anolyte, thereby forming hypophosphorous acid in said anolyte.

5,480,518

# HIGH PURITY HYDROGEN AND OXYGEN PRODUCTION USING AN ION EXCHANGE MEMBRANE HAVING CATALYSTS ELECTRICALLY ISOLATED THROUGHOUT

Eric M. Shane, Simsbury, and James F. McElroy, Suffield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

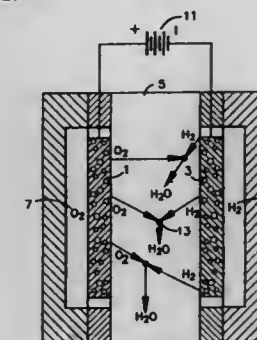
Division of Ser. No. 26,938, Mar. 5, 1993, Pat. No. 5,342,494.

This application May 27, 1994, Ser. No. 250,734

Int. Cl.<sup>6</sup> C25B 1/04; 1/10

U.S. Cl. 204-129

3 Claims



1. A method for producing high purity oxygen and hydrogen, comprising:

- introducing water to an anode chamber in an electrolysis cell, said cell having an anode catalyst, a cathode catalyst, an ion exchange membrane disposed therebetween, and a cathode chamber, wherein said ion exchange membrane has been multiply impregnated with a platinum metal catalyst which forms electrically isolated catalyst sites throughout said ion exchange membrane;

electrolytic process and dropping the electrolyte level during the operating phase only enough so that an uninterrupted supply of electrolyte for the entire electrode is maintained.

5,480,516

# ELECTROLYTIC PRODUCTION OF ACID

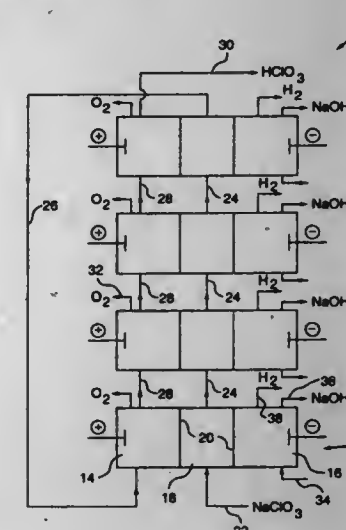
Marek Lipsztajn, Rexdale; Gerald Cowley, Mississauga, and Dana Gourley, Waterloo, all of, Canada, assignors to Sterling Pulp Chemicals, Ltd., Islington, Canada

Filed May 12, 1993, Ser. No. 59,605

Int. Cl.<sup>6</sup> C25B 1/26

U.S. Cl. 204-103

41 Claims



1. A process for the electrolytic production of an acidified solution, which comprises:

- providing a first discrete electrolytic unit containing a first acidifying zone of said first discrete electrolytic unit adjacent to a cathodic zone of said first discrete electrolytic unit, a first ion-permeable structure in said first discrete electrolytic unit separating said first acidifying zone of said first discrete electrolytic unit from said cathodic zone of said first discrete electrolytic unit and a second acidifying zone of said first discrete electrolytic unit adjacent to said first acidifying zone of said first discrete electrolytic unit, and a second ion-permeable structure in said first discrete electrolytic unit separating said second acidifying zone from said first acidifying zone,
- providing a second discrete electrolytic unit separate from said first discrete electrolytic unit containing a first acidifying zone of said second discrete electrolytic unit adjacent to a cathodic zone of said second discrete electrolytic unit and a first ion-permeable structure in said second discrete electrolytic unit separating said first acidifying zone of said second discrete electrolytic unit and said cathodic zone of said second discrete electrolytic unit,

feeding an aqueous solution of a salt which has been partially acidified in said first acidifying zone of said second discrete electrolytic unit to said first acidifying zone of said first discrete electrolytic unit to produce a further acidified salt solution, and

feeding said further acidified salt solution directly to said second acidifying zone of said first discrete electrolytic unit to produce said acidified solution.



- b. electrolyzing said water at said anode catalyst to produce hydrogen ions, oxygen gas, and free electrons;
  - c. passing said hydrogen ions through said ion exchange membrane to said cathode catalyst;
  - d. passing said free electrons through an external circuit to said cathode catalyst;
  - e. combining said hydrogen ions and said free electrons to form hydrogen gas; and
  - f. combining hydrogen gas from said anode chamber and oxygen gas from said anode chamber which diffuse through said ion exchange membrane, at said catalyst sites located throughout said ion exchange membrane, to form water;
- wherein the reaction at said catalyst sites where said hydrogen gas and said oxygen gas combine to form water prevents said hydrogen gas and said oxygen gas from passing to the anode chamber and cathode chamber, respectively.

5,480,519

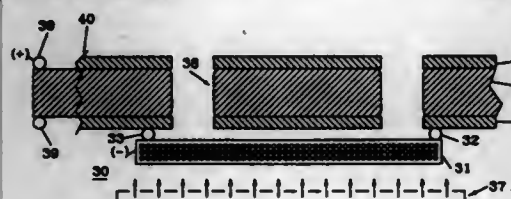
**ELECTROCHEMICAL ETCH SYSTEM AND METHOD**  
Donald C. Abbott, Norton; George A. Dainis, III, Mansfield, and David W. West, Pembroke, all of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 6, 1995, Ser. No. 384,041

Int. Cl.<sup>6</sup> C25F 3/02; 7/00

U.S. Cl. 204—129.35

18 Claims



1. A method for making lead frames for semiconductor devices, comprising the steps of:  
photochemically etching a metal sheet to define a lead frame having openings therein with said openings defined by edges;  
electrochemically etching the defined lead frame opening to eliminate irregularities in said edges.

5,480,520

**APPLYING PRESSURE ON THE WEB AT THE WIRE  
END OF A PAPER MACHINE**

Klaus Esslinger, Natthelm, Germany, assignor to J. M. Voith GmbH, Germany

Filed Jan. 13, 1994, Ser. No. 181,190

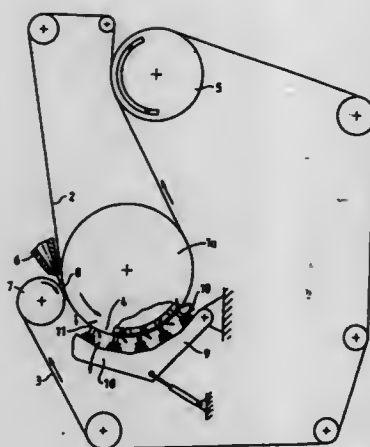
Claims priority, application Germany, Jan. 18, 1993, 43 01 103.9

Int. Cl.<sup>6</sup> D21F 1/00

U.S. Cl. 162—301

27 Claims

1. A wire end of a paper making machine comprising: at least one headbox for supplying a fibrous suspension;  
a first endless wire belt, a second endless wire belt, and a guide member guiding the first and second wire belts to move together through a twin wire zone over part of the lengths of the wire belts, the first and second belts being adapted to receive and transport between them the fibrous suspension which is to be dewatered in the twin wire zone;  
the first and second wire belts having respective outer surfaces which are the surfaces between which the fiber suspension is received; the first and second wire belts having respective inner surfaces, which are the surfaces away from the fiber suspension and for each belt is the respective surface away from the other wire belt;  
a supporting element comprising a forming cylinder located at a stationary position along the twin wire zone and including a rotatable circumferential supporting surface positioned to contact the first wire belt moving through the twin wire zone; at least part of the supporting surface supporting the first wire



belt on the inner surface of the first wire belt and supporting the second wire belt on the outer surface of the second wire belt through at least part of the movement of the wire belts through the twin wire zone; the supporting surface being supported at the supporting element for rotating together with the movement of the wire belts; and

pressure elements for exerting pressure on the inner surface of the second wire belt in the region through the twin wire zone in which the second wire belt outer surface is supported by the supporting surface; the pressure elements being located and operable to apply pressure to the second wire belt against the supporting surface of the forming cylinder, the pressure elements comprising a plurality of metering rods located so as to engage the wire belts against the rotatable supporting surface of the forming cylinder.

12. A wire end of a paper making machine comprising:

at least one headbox for supplying a fibrous suspension;  
a first endless wire belt, a second endless wire belt, and a guide member guiding the first and second wire belts to move together through a twin wire zone, the first and second belts being located to receive and transport between them the fibrous suspension which is to be dewatered in the twin wire zone;

the first and second wire belts having respective outer surfaces which are the surfaces between which the fiber suspension is received; the first and second wire belts having respective inner surfaces which are the surfaces away from the fiber suspension;

a supporting element comprising a forming cylinder located at a stationary position along the twin wire zone and including a rotatable circumferential supporting surface positioned to contact the first wire belt moving through the twin wire zone, at least part of the supporting surface supporting a portion of the first wire belt on the inner surface of the first wire belt and Supporting a portion of the second wire belt on the outer surface of the second wire belt, the supporting surface being rotatably supported for rotating together with the movement of the wire belts; and

pressure elements for exerting pressure on the inner surface of the second wire belt in the region of the twin wire zone in which the second wire belt outer surface is supported by the supporting surface, the pressure elements being located and operable to apply pressure to the second wire belt against the supporting surface of the forming cylinder, wherein the pressure elements each comprise a pressing shoe having a concave pressing surface engaging the wire belts against the rotatable supporting surface of the forming cylinder.

5,480,521

**TENDON FOUNDATION GUIDE CONE ASSEMBLY AND  
ANODE**

Dale R. Snyder, Jr.; James D. Smith; James W. Stevens, and Robert M. Kipp, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

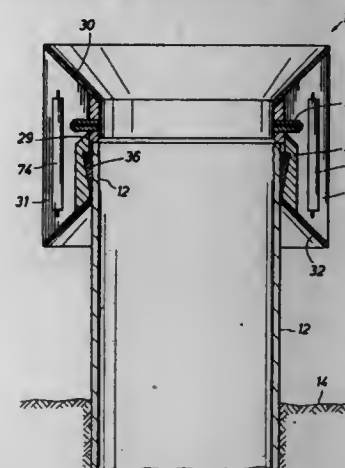
Filed Dec. 16, 1994, Ser. No. 357,830

Int. Cl.<sup>6</sup> C23F 13/00; E02D 31/06

U.S. Cl. 204—148

18 Claims

6. A method of providing cathodic protection to an installed pile,



comprising:

- providing a plurality of anodes on a tendon foundation guide assembly;
- attaching the tendon foundation guide assembly to a lowering unit;
- lowering the tendon foundation guide assembly on the lowering unit to the pile;
- attaching the tendon foundation guide assembly to the installed pile and electrically connecting at least one of the anodes to the pile; and
- releasing the tendon foundation guide assembly from the lowering unit.

5,480,522

**SELF-ENERGIZING FLUID TREATMENT APPARATUS  
EMPLOYING EXTERNAL ELECTRODES**

Jack K. Ibbott, Tokyo, Japan, assignor to Makiko Yoshida, Tokyo, Japan

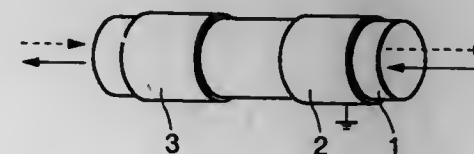
Filed Jan. 4, 1994, Ser. No. 177,130

Int. Cl.<sup>6</sup> C02F 1/46

U.S. Cl. 204—150

5 Claims

1. Apparatus for treating electrically conductive fluid, said appa-



ratus comprising:

- a tubular member of electrically insulative material having an inner peripheral surface defining a fluid passageway and an outer peripheral surface; and
- self-generating means for producing an electric potential without an external power supply, said self-generating means including a positive electrode and a negative electrode, said positive electrode being of electrically conductive material and disposed on the outer peripheral surface of said tubular member,

said negative electrode being of electrically conductive material and disposed on the outer peripheral surface of said tubular member, and

the electrically conductive materials of said electrodes having different electrochemical potentials such that when electrically conductive fluid to be treated in the apparatus flows through said fluid passageway, an electroconductive connection between said electrodes is established through the body of fluid.

5,480,523

**METHOD OF USING OXYGEN MEASURING PROBE**

Alan J. Cocker, Ormskirk, and Esther C. Batchelor, Burrough, both of, United Kingdom, assignors to Pilkington plc, United Kingdom

Continuation of Ser. No. 35,786, Mar. 23, 1993, abandoned.

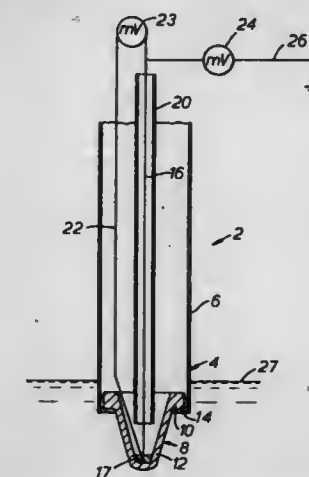
This application Dec. 16, 1994, Ser. No. 357,788

Claims priority, application United Kingdom, Mar. 24, 1992, 9206367

Int. Cl.<sup>6</sup> G01N 27/411

U.S. Cl. 204—153.18

3 Claims



1. In the manufacture of glass using a bath of molten metal, a method of measuring the oxygen concentration in said bath with an elongate tubular member closed by a separate tip part formed of stabilized zirconia which constitutes a solid electrolyte, which tubular member is formed of a different material from zirconia, the zirconia tip part comprising a generally annular portion received within an end of the tubular member, at which the tip part is sealed to the elongate tubular member, and a hollow portion depending therefrom having inwardly sloping walls which meet to define an apex at an end of the zirconia tip part remote from the tubular member, to whereby define a substantially conically shaped portion and wherein a thermocouple is disposed in said substantially conically shaped portion of the tip part and is in contact with an inner surface thereof for measuring the temperature of the zirconia tip part, said thermocouple being located between said inwardly sloping walls and in contact with the inner surface of the tip part at the apex, said method comprising inserting the probe into the molten metal until the zirconia tip part is fully immersed therein, measuring the temperature of the apex with said thermocouple, and measuring the voltage between the inner and outer surfaces of the zirconia tip part as oxygen ions pass through the solid zirconia electrolyte.



5,480,524

# METHOD AND APPARATUS FOR REMOVING UNDESIRABLE CHEMICAL SUBSTANCES FROM GASES, EXHAUST GASES, VAPORS, AND BRINES

Franz D. Oeste, Münzenberg, Germany, assignor to Robert Aalbers, Arnheim, Netherlands, and Olga Dietrich neeLeye, Münster, Germany

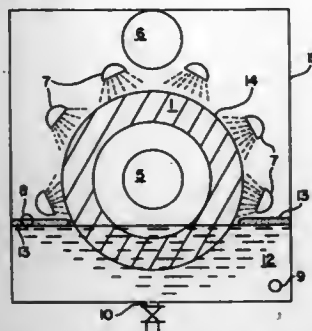
Continuation-in-part of Ser. No. 991,794, Dec. 17, 1992, abandoned. This application May 3, 1994, Ser. No. 237,960

Claims priority, application Germany, Dec. 21, 1991, 41 42 520.0; Dec. 9, 1992, 42 41 451.2

Int. Cl.<sup>6</sup> C07C 63/00

U.S. Cl. 204—158.20

19 Claims



1. A method for purifying substrates in the form of gases, exhaust gases, vapors and brines contaminated with or containing undesirable chemical substances, comprising the steps of: reacting the substrates photocatalytically on the surface of a first or a second catalyst;

feeding the substrates through a physically close system consisting of:

- a catalyst carrier with a large surface area relative to the first or second catalysts used, the carrier being highly resistant to chemical corrosion and shortwave light, and has the mechanical stability needed for mobile mechanical parts;
- a first catalyst, applied to said catalyst carrier, consisting of at least one oxide, mixoxide or a combination thereof with semi-conductor behaviors mixed, loaded or both, with at least one metal of the platinum series of the VIII group of the periodic table of chemical elements;
- a second catalyst, applied to said catalyst carrier, consisting of at least one element of the lanthanides, actinides and the IIIB group of the periodic table of chemical elements;
- at least one source of shortwave light of wavelengths from 250 to 400 nm, as a photon source; and
- at least one washing zone for said catalyst carrier in accordance with (a), having the first and second catalysts applied on it in accordance with (b) and (c), through which transporting and treating said catalyst carrier with polar solvents, whereby quantitatively separating the formed mineralization products from purified gases, exhaust gases, vapors and brines and also avoiding the poisoning of the first and second catalysts.

5,480,525

# MACHINE-ACCESSIBLE ELECTROCHEMICAL DETECTOR FOR CAPILLARY ELECTROPHORESIS

Luis A. Colón, Amherst, N.Y.; Rajeev Dadoo, Stanford, Calif.; William H. Whitted, Palo Alto, Calif.; Richard N. Zare, Stanford, Calif.; Andrew G. Ewing; Sandra S. Ferris, both of State College, Pa., and Jennifer U. Woelker, Madison, Wis., assignors to The Board of Trustees of the Leland Stanford Junior University, Palo Alto, Calif.

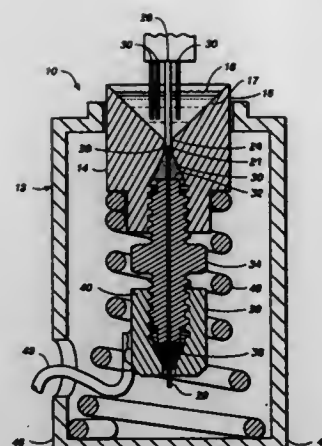
Filed Apr. 29, 1994, Ser. No. 235,299

Int. Cl.<sup>6</sup> B01D 61/42; 61/46

U.S. Cl. 204—180.1

38 Claims

1. An apparatus for aligning a capillary column with a device for detecting one or more sample components in an eluent from the



capillary column, the capillary column having an outlet end from which the eluent exits the capillary column, the outlet end oriented along a direction, comprising:

- an alignment device including a vessel containing an electrolyte, said vessel having a sloped portion at an acute angle to the direction and an opening at or near the sloped portion, said sloped portion positioning the outlet end of the capillary column relative to said opening; and
- a detector positioned within said alignment device and spaced apart from the outlet end of the capillary column by a gap, said alignment device positioning said detector relative to the outlet end of the capillary column.

5,480,526

# METHODS FOR THE DESALTING OF BIOLOGICAL SAMPLES: A SIMPLE APPROACH TO ELIMINATE DISTURBANCES IN ISOELECTRIC FOCUSING CAUSED BY THE PRESENCE OF SALTS

Jia-li Liao; Rong Zhang, both of Upsala, Sweden, and Christopher Siebert, Berkeley, Calif., assignors to Bio-Rad Laboratories, Inc., Hercules, Calif.

Filed Jun. 7, 1994, Ser. No. 255,171

Int. Cl.<sup>6</sup> G01N 27/00

U.S. Cl. 204—182.8

20 Claims



1. A method for desalting a solute sample, said method comprising:

- mixing said solute sample with an ampholytic separation medium to form a mixture, said ampholytic separation medium containing components that form a pH gradient during isoelectric focusing, said pH gradient covering the isoelectric point(s) of the solute(s) present in said solute sample;
- filling a capillary tube with said mixture, said capillary tube having a first end in contact with an anolyte and a second end in contact with a catholyte, said anolyte and said catholyte being ampholytic media, said anolyte differing in pH from said catholyte by a pH differential; and
- applying a voltage between said anolyte and said catholyte of sufficient intensity to cause the salt present in said solute

sample to be replaced by ampholytes present in said ampholytic media of said anolyte and said catholyte.

5,480,527

# RECTANGULAR VACUUM-ARC PLASMA SOURCE

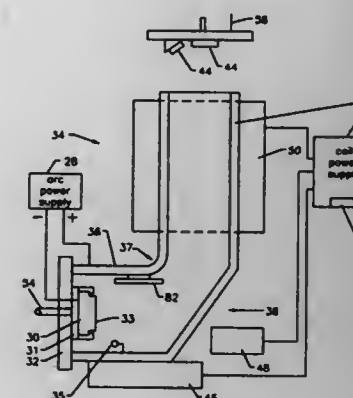
Richard P. Welty, Boulder, Colo., assignor to Vapor Technologies, Inc., Boulder, Colo.

Filed Apr. 25, 1994, Ser. No. 233,006

Int. Cl.<sup>6</sup> C23C 14/32

U.S. Cl. 204—192.38

30 Claims



14. An apparatus for generating a beam of plasma containing an ionized vapor of a cathode material, in which a vacuum arc discharge is used to vaporize said cathode material, comprising:

- a cathode having an evaporable surface of substantially rectangular shape;
- an anode;
- an arc power supply operatively connected to the cathode and the anode;
- a plasma duct for transporting to a substrate area in which an object to be coated or implanted may be located, at least part of a plasma containing an ionized vapor of the cathode, said plasma generated by an arc discharge from said cathode, and said plasma duct having a rectangular cross-sectional shape and a width and a length in substantially the same proportions as and at least as large as those of said cathode, said plasma duct containing a bend in the axis along its centerline, forming in said plasma duct an entrance arm and an exit arm, said cathode being located at or near the end of said entrance arm with said evaporable surface facing into said plasma duct, and said substrate area being located at or near the end of said exit arm;
- magnetic field generating means in electro-magnetic communication with said plasma duct for generating within the plasma duct and over said evaporable surface of said cathode a magnetic field, said magnetic field being represented by magnetic flux lines, at least a first portion of said magnetic flux lines being oriented in a direction substantially parallel to the axis of said duct within said exit arm, and at least a second portion of said flux lines having a predominant component oriented substantially parallel to said evaporable surface of said cathode within the region of said entrance arm at or near said cathode;
- sensor means for sensing an arc spot, said sensor means located adjacent to each end of said rectangular evaporable surface of said cathode, said sensor means being capable of producing a signal whenever said arc spot approaches either end of said evaporable surface; and
- magnetic field reversing means responsive to said signal from the sensor means for reversing the direction of at least said second portion of said magnetic flux lines without substantially changing the shape of said second portion of said flux lines or their orientation with respect to said plasma duct.

5,480,528

# BRUSHLESS ELECTRODEPOSITION APPARATUS

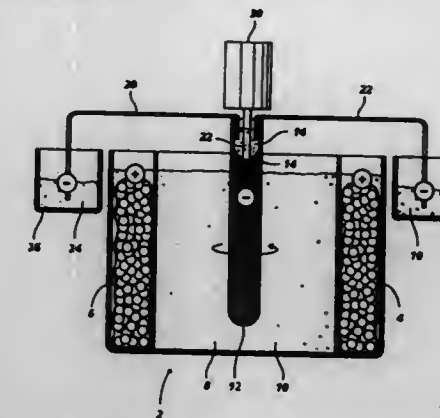
Patricia Bischoff, Webster; Robert P. Altavella, Farmington; Lawrence Kotowicz, Rochester; Peter J. Schmitt, Ontario; William G. Herbert, Williamson, all of N.Y.; Ronald E. Jansen, Palm City, Fla.; John H. Lennon, Canandaigua, N.Y., and Henry G. Grey, Las Vegas, Nev., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 25, 1994, Ser. No. 201,952

Int. Cl.<sup>6</sup> C25D 17/00

U.S. Cl. 204—212

15 Claims



1. An apparatus for depositing metal on a mandrel which provides a brushless electrical current continuity between the mandrel and a current source, comprising:

- an anode electrode;
- a cathodic mandrel, spaced apart from the anode electrode, wherein the mandrel defines a space that is partially or fully filled with a first conductive liquid in electrical contact with the mandrel;
- a second conductive liquid electrically isolated from the anode electrode;
- connecting means for electrically connecting the first conductive liquid and the second conductive liquid; and
- a rotation device, coupled to the mandrel, for rotating the mandrel during deposition of metal thereon.

5,480,529

# APPARATUS FOR DEPOSITING LOW STRESS FILMS

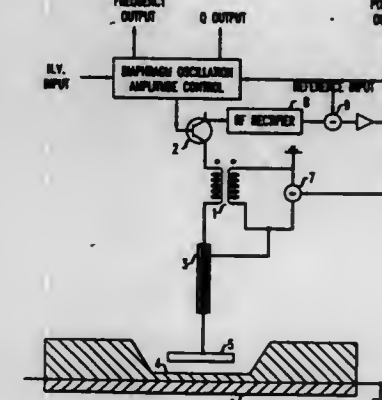
Ratnajl R. Kola, Berkeley Heights; Gabriel L. Miller, Westfield, and Eric R. Wagner, South Plainfield, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Division of Ser. No. 166,672, Dec. 14, 1993, Pat. No. 5,382,340, which is a continuation of Ser. No. 850,639, Mar. 13, 1992, abandoned. This application Nov. 16, 1994, Ser. No. 340,515

Int. Cl.<sup>6</sup> C23C 14/34

U.S. Cl. 204—298.03

4 Claims





## 1. An apparatus, comprising:

- a source that is operable to deposit a film on a substrate; and
- a system for rapidly measuring the resonant frequency of the substrate having the film growing thereon, the system comprising a single electrode and a positioner operable to place the substrate opposite the electrode, an oscillation controller for imposing an oscillating signal on the electrode, a capacitive detector that measures the distance between the electrode and the substrate in a first feedback loop, and a second feedback loop responsive to the capacitive detector and cooperating with the oscillation controller to maintain the substrate with the film growing thereon at its resonant frequency.

5,480,530

## MASK FOR COVERING THE MARGIN OF A DISK-SHAPED SUBSTRATE

Jaroslav Zejda, Rodenbach, Germany, assignor to Leybold Aktiengesellschaft, Hanau, Germany

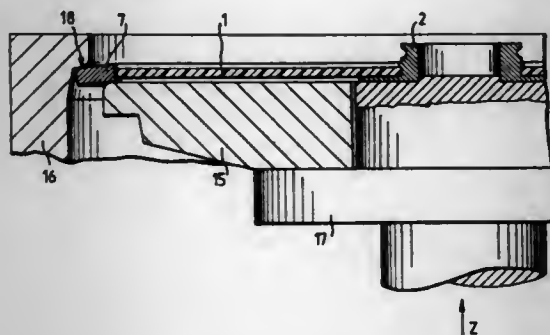
Filed Dec. 8, 1993, Ser. No. 164,009

Claims priority, application Germany, Mar. 9, 1993, 43 07 382.4

Int. Cl.<sup>6</sup> C23C 14/34; 16/04

U.S. Cl. 204—298.11

5 Claims



1. A mask for processing a disk shaped substrate having a thickness, an annular marginal portion defining an outside diameter of said substrate, and a central circular hole defining an inside diameter of said substrate, said mask comprising

- a flat plate having an essentially circular opening defined by an inwardly facing cylindrical wall with a diameter substantially the same as the outside diameter of said substrate, an annular flange extending radially inward from said cylindrical wall, and a plurality of first projections extending inward from said wall about said opening and being movable radially apart, said first projections being spaced from said flange by a distance substantially the same as the thickness of said substrate, said first projections being sized to receive said substrate therebetween when moved apart, and
- a hollow cylindrical portion having an outwardly facing cylindrical wall with a diameter substantially the same as the inside diameter of the hole in said substrate, an annular flange extending outward from said outwardly facing wall, and second projections extending outward from said outwardly facing wall, said second projections being spaced from said outward extending annular flange by a distance substantially the same as the thickness of said substrate, said second projections being mounted for inward resilient movement.

5,480,531  
TARGET FOR CATHODE SPUTTERING AND METHOD OF ITS PRODUCTION

Martin Weigert, Hanau; Uwe Konietzka, Rodenbach, both of Germany, and Bruce Gehman, Morgan Hill, Calif., assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 915,238, Jul. 20, 1992, abandoned. This application Aug. 16, 1993, Ser. No. 106,986  
Claims priority, application Germany, Jul. 24, 1991, 41 24 471.0

Int. Cl.<sup>6</sup> C04B 35/457; C23C 14/08

U.S. Cl. 204—298.13

4 Claims

1. An oxide-ceramic target for cathode sputtering consisting essentially of a partially reduced indium oxide-tin oxide mixture which exhibits a density of more than 75% of the theoretical density and a specific electric resistance in the range of  $89 \times 10^{-3}$  to  $0.25 \times 10^{-3} \Omega \cdot \text{cm}$ , and which exhibits an essentially uniform, defined degree of reduction of 0.02 to 0.30 which does not deviate at any position on the target surface by more than 5% from an average degree of reduction of the target, wherein the degree of reduction is defined as the difference in weight between the stoichiometric oxide mixture and the partially reduced oxide mixture divided by the difference in weight between the stoichiometric oxide mixture and the completely reduced metallic mixture.

5,480,532

## SPUTTER TARGET FOR CATHODIC ATOMIZATION TO PRODUCE TRANSPARENT, CONDUCTIVE LAYERS

Martin Schlott, Hanau; Martin Kutzner, Neuberg; Martin Weigert, Hanau; Uwe Konietzka, Geiselbach, all of Germany; Bruce Gehman, and Shawn Vahlstrom, both of Morgan Hill, Calif., assignors to Leybold Materials, Hanau, Germany

Filed Nov. 9, 1994, Ser. No. 336,769

Claims priority, application Germany, Mar. 9, 1994, 44 07 774.2

Int. Cl.<sup>6</sup> C23C 14/34; C04B 35/457

U.S. Cl. 204—298.13

5 Claims

1. Target for production of transparent electrically conductive coatings by cathode sputtering, said target consisting of a matrix of indium oxide and tin oxide, said matrix having a theoretical density if consisting purely of said oxides, and metallic phase components consisting of at least one of indium and tin, said components being less than 50  $\mu\text{m}$  in size and distributed uniformly throughout said matrix, said target having a density of at least 96% of said theoretical density.

5,480,533

## MICROWAVE PLASMA SOURCE

Yoshikazu Yoshida, Izumi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 924,932, Aug. 5, 1992, abandoned.

This application Apr. 3, 1995, Ser. No. 415,746

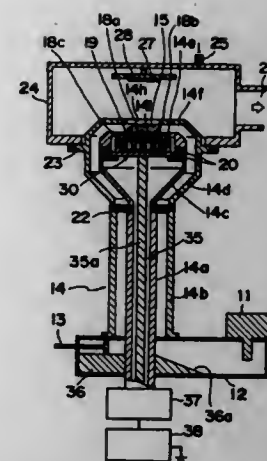
Claims priority, application Japan, Aug. 9, 1991, 3-200639; Mar. 31, 1992, 4-076455

Int. Cl.<sup>6</sup> C23C 14/34

U.S. Cl. 204—298.19

11 Claims

1. A microwave plasma source comprising:
- a microwave source;
  - a ridge waveguide having the microwave source coupled thereto;
  - a coaxial tube connected to the waveguide, the coaxial tube having an outer conductor with an outer door-knob-shaped portion at a first end thereof and an inner conductor having an inner door-knob-shaped portion at a first end thereof, each of the inner and outer door-knob-shaped portions having an opening at an end thereof, the inner conductor being fitted into the waveguide in parallel with a direction of an electric



field in the waveguide, and having a flat portion at the end of the inner door-knob-shaped portion, a glass plate for passing the microwave therethrough and for vacuum sealing being arranged between the inner conductor and the outer conductor;

- a vacuum chamber connected to the opening of the outer conductor, and provided with a gas inlet port and a gas exhaust port;
- a target holder, for holding a target, arranged inside the door-knob-shaped portion of the inner conductor and near the opening thereof and supported by the conductor tube through an electrical insulating member, the target holder including a means for applying high-frequency voltage to the target;
- a plurality of permanent magnets coaxially arranged in the target holder so that the magnets having different poles are adjacent to each other to form a plurality of circular magnetic tunnels for magnetron discharge on the flat portion of the door-knob-shaped portion of the inner conductor; and
- wherein said ridge waveguide comprises a rectangular cavity resonator having a trapezoid iris member mounted therein, said trapezoid iris member having an inclined surface.

5,480,534

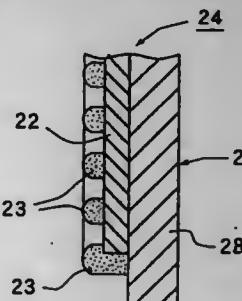
## ELECTRODE FOR MEASURING PH

Akihiko Kato; Masaharu Yamamoto; Tomio Taguchi; Yoshiki Yanagida, all of Saitama, and Teruaki Katube, Tokyo, all of Japan, assignors to Ton Electronics Ltd., Tokyo, Japan  
Continuation-in-part of Ser. No. 747,885, Aug. 19, 1991, Pat. No. 5,320,735. This application Jun. 9, 1994, Ser. No. 255,627  
Claims priority, application Japan, Aug. 22, 1990, 2-220733; Aug. 22, 1990, 2-220861; Jul. 30, 1991, 3-214523

Int. Cl.<sup>6</sup> G01N 27/333

U.S. Cl. 204—419

7 Claims



1. A pH measuring electrode comprising:
- an electrically insulative ceramics substrate;
  - a pH sensitive film comprising iridium oxide deposited on a surface of said substrate, the ratio of iridium to oxygen in said iridium oxide being from 1:2.5 to 1:3.5;
  - a porous insulation film deposited on at least a portion of an outer surface of the iridium oxide film where the iridium

oxide film is to contact a solution whose pH is to be measured, said porous film having pores with a diameter of 3 Å to 15 Å so as to prevent inhibition of the iridium oxide film by inhibiting substances and so as to protect the iridium oxide film; and

a lead-out conductor connected to said pH sensitive film.

5,480,535

THIN FILM MULTILAYERED AIR/FUEL RATIO SENSOR  
Haruyoshi Kondo, Anjo; Hideaki Takahashi; Keiichi Saji, both of Aichi; Masaharu Takeuchi, Owariasahi, and Kozo Satta, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

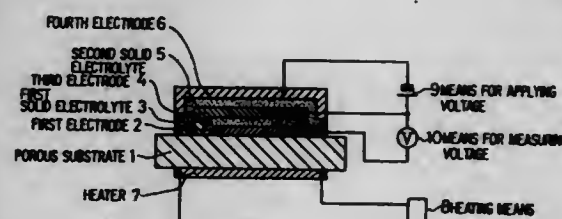
Filed Dec. 27, 1993, Ser. No. 174,126

Claims priority, application Japan, Dec. 28, 1992, 4-361142; Aug. 12, 1993, 5-220630

Int. Cl.<sup>6</sup> G01N 27/41; 27/409

U.S. Cl. 204—425

11 Claims



1. A thin film multilayered air-fuel ratio sensor having a sensor element comprising:

- a first electrode formed on a porous substrate;
- a first solid electrolyte and a second electrode formed on the first electrode in this order, in such a manner that the first electrode is completely covered by the first solid electrolyte and that the first solid electrolyte is completely covered by the second electrode and
- a second solid electrolyte and a third electrode formed on the second electrode in this order, in such a manner that the peripheral portion of the second electrode is left uncovered by the second solid electrolyte and the third electrode and thereby left exposed;
- the first electrode, the second electrode and the third electrode being made of a gas-permeable porous platinum, and the first solid electrolyte and the second solid electrolyte being made of a gas-impermeable dense solid electrolyte having oxygen ion conductivity.

5,480,536

## CORROSION-INHIBITED IRON-BASED MEMBERS AND METHOD OF PRODUCING THE SAME

Atsuo Snehro, Nishin, and Norio Kogashiwa, Owariasahi, both of Japan, assignors to Kowa Industry Works Co., Ltd., Nagoya, Japan

Filed Jun. 24, 1994, Ser. No. 265,012

Claims priority, application Japan, Jun. 29, 1993, 5-187234  
Int. Cl.<sup>6</sup> C25D 5/48

U.S. Cl. 205—151

8 Claims

1. A method of producing a corrosion-inhibited iron-based member which comprises subjecting a corrodible iron-based rod to hard chrome electroplating, heat treatment at a temperature of not less than 150° C., impregnation with a liquid curable resin or sealant under at least subatmospheric pressure to form a hard chrome electroplating layer having cracks and pinholes, a curing agent for curing the impregnating resin or sealant in situ and finish buffing, wherein, in said impregnation step, the cracks and pinholes present in said hard chrome electroplating layer are impregnated with said liquid curable resin or sealant.



5,480,537

# APPARATUS FOR WASTE WATER TREATMENT USING CALCIUM CARBONATE MINERAL AND MICROORGANISMS IN COMBINATION

Kazuyuki Yamasaki, Hiroshima; Yoshihiro Hamaguchi, Kurashiki; Shunji Hosoda, Fukuyama; Kazuyuki Sakata, Fukuyama; Takashi Imai, Fukuyama; Shigetoshi Okatani, Fukuyama; Satoshi Nishio, Fukuyama; Tsyoshi Takahashi, Fukuyama; Kenji Matuura, Fukuyama; Noriyuki Tanaka, Fukuyama; Teruaki Nagayasu, Fukuyama, and Hiroshi Makino, Fukuyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

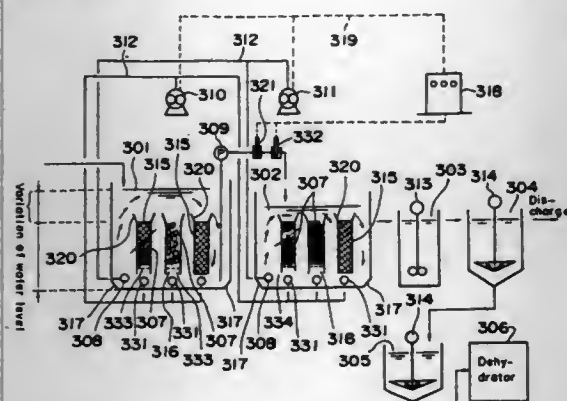
Filed Jul. 29, 1993, Ser. No. 97,857

Claims priority, application Japan, Jul. 31, 1992, 4-205056; Nov. 24, 1992, 4-313393; Mar. 1, 1993, 5-039830; Apr. 14, 1993, 5-086996; Jun. 21, 1993, 5-149349

Int. Cl.<sup>6</sup> C02F 1/52; 3/10

U.S. Cl. 210—96.1

20 Claims



1. An apparatus for treatment of waste water wherein fluorine contained in waste water is converted into a fluoride through chemical reaction, said apparatus comprising:

an open first tank packed with a calcium carbonate mineral for adjusting a pH value and a fluorine concentration of waste water introduced into the first tank by way of a chemical reaction of the fluorine with the calcium carbonate mineral so that the pH value and the fluorine concentration fall within their respective predetermined ranges;

means for introducing waste water to be treated directly into said first tank;

an open second tank packed with a calcium carbonate mineral, wherein an aluminum agent is added to the waste water coming from the first tank so that the pH and the fluorine concentration of the waste water are further adjusted by way of a chemical reaction of the fluorine with the calcium carbonate mineral and aluminum agent so as to fall within their respective target ranges;

means for introducing treated waste water from said first tank into said second tanks;

means for adding aluminum agent to the treated waste water from the first tank;

means for removing treated water from the second tank; and agitating means for agitating the waste water in the first and second tanks, said agitating means comprising an aeration device including an air diffuser provided below said calcium carbonate mineral to facilitate the inclusion of air-borne microorganisms into the waste water.

5,480,538

# APPARATUS FOR TREATING WASTE WATER OXIDATION PONDS TO ABATE MALODORS

David E. McCombs; Colin D. Dougald, and Martin L. Rapp, all of St. Louis, Mo., assignors to Monsanto Enviro-Chem Systems, Inc., St. Louis, Mo.

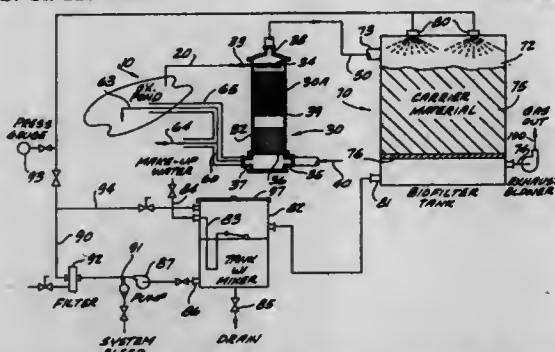
Division of Ser. No. 975,664, Nov. 13, 1992, Pat. No.

5,387,344. This application Aug. 29, 1994, Ser. No. 297,379

Int. Cl.<sup>6</sup> C02F 3/06

U.S. Cl. 210—151

8 Claims



1. An apparatus for treating a body of waste water containing volatile contaminants and a microbial population for the biodegradation of the volatile contaminants the apparatus comprising:

an air-water contact apparatus for intimately contacting a water stream from the body of waste water with an air stream to produce a water stream which has been aerated and an off-gas stream containing the volatile contaminants, the air-water contact apparatus comprising a liquid outlet for the aerated water stream and a gas outlet for the off-gas stream;

a return conduit for returning at least a portion of the aerated water stream to the body of waste water, said return conduit being in fluid communication with said liquid outlet of the air-water contact apparatus and said body of waste water;

a fixed bed type biofilter comprising a housing means which contains a porous filter bed, a gas inlet, a gas outlet and means for maintaining the water content of the filter bed, the filter bed comprising a quantity of carrier material disposed within the housing means and provided with microorganisms which metabolically convert the volatile contaminants in the off-gas stream into environmentally innocuous substances;

a gas conduit for delivering the off-gas stream from the air-water contact apparatus to the fixed bed type biofilter, said gas conduit being in fluid communication with said gas outlet of the air-water contact apparatus and said gas inlet of the fixed bed type biofilter.

5,480,539

# ARRANGEMENT FOR REDUCING THE MOISTURE CONTENT OF SLUDGE

Heiko Schnelder, Oberderdingen, Germany, assignor to Langbein & Engelbracht GmbH & Co. KG, Bochum, Germany

Filed Aug. 12, 1994, Ser. No. 290,035

Claims priority, application Germany, Aug. 14, 1993, 9312198 U

Int. Cl.<sup>6</sup> B01D 1/18

U.S. Cl. 210—177

10 Claims

1. An arrangement for reducing the moisture content of sludge, the arrangement comprising a spray dryer, a separating unit connected downstream of the spray dryer via a transfer line, the separating unit comprising a solids discharge, further comprising a heater for heating gas obtained in the separating unit to a higher temperature level, the heater being connected in a connecting line between the separating unit and the spray dryer, wherein the spray dryer comprises a cylindrical container having upper and lower ends, and conical end portions connected to the upper and lower ends of the cylindrical container, further comprising a two-component nozzle in the cylindrical container at the upper end thereof, means for supplying the sludge to the two-component

5,480,541

# EXTRUDER APPARATUS FOR ISOLATING SOLIDS FROM FLUIDS

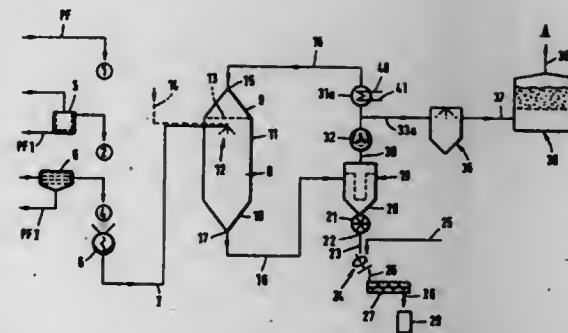
James Day, Scotia; Ganesh Kallanum, and Godavarthi S. Varadarajan, both of Niskayuna, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 268,367, Jun. 30, 1994. This application Aug. 1, 1994, Ser. No. 283,320

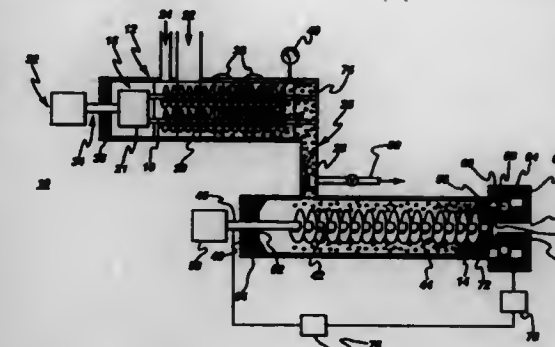
Int. Cl.<sup>6</sup> B30B 9/12

U.S. Cl. 210—198.1

12 Claims



nozzle and means for supplying a dispersion medium in the form of gas or vapor to the two-component nozzle, a distributor mounted above the two-component nozzle, and means for supplying hot gas to the distributor.



5,480,540

# SPRAY APPARATUS FOR SEPARATING SOLIDS FROM FLUIDS

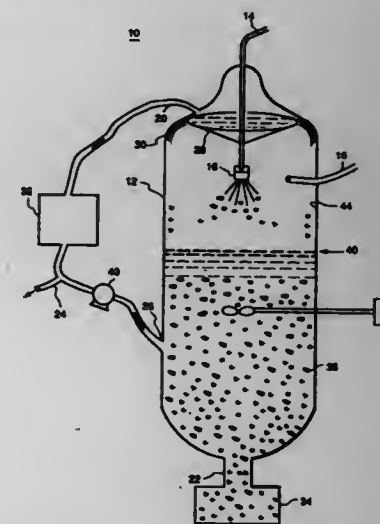
James Day, Scotia; Ganesh Kallanum, Schenectady, and Godavarthi S. Varadarajan, Niskayuna, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 17, 1994, Ser. No. 324,306

Int. Cl.<sup>6</sup> B01D 11/04; 43/00

U.S. Cl. 210—181

4 Claims



1. An apparatus for separating solids from fluids, said apparatus is closed to the atmosphere and pressurized and has a vessel comprising:

(a) a feed spray inlet having a spray nozzle attached thereon;

(b) a gas component inlet;

(c) a recirculated liquid component inlet in conjunction with a distributor cup allowing for liquid overflow;

(d) a liquid component outlet having a filter thereon;

(e) a heat exchanger;

(f) means for recirculating filtered liquid component from said liquid component outlet through said heat exchanger and into said recirculated liquid component inlet; and

(g) a particle passage having a collecting vessel attached thereto.

5,480,542

# PACKINGS COMBINING PROTEIN TO A SUPPORT VIA A SPACER

Naoki Asakawa; Yoshiya Oda, both of Ibaraki; Yutaka Yoshida, Saitama, and Tadashi Sato, Chiba, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Division of Ser. No. 39,511, Mar. 29, 1993, Pat. No. 5,354,461, which is a continuation of Ser. No. 837,290, Feb. 18, 1992, abandoned. This application Aug. 22, 1994, Ser. No. 294,113

Claims priority, application Japan, Feb. 20, 1991, 3-45655; May 20, 1991, 3-142724; Jul. 31, 1991, 3-213173

Int. Cl.<sup>6</sup> B01D 15/08

U.S. Cl. 210—198.2

14 Claims

1. A high performance liquid chromatography column packed with a packing, said packing comprising a protein bound to one end of a spacer via an amide bond and another end of the spacer bound via an amide bond to a support wherein said support is silica gel, said protein is avidin and said spacer is a straight C<sub>6</sub> to C<sub>10</sub> chain.





5,480,543

# DEVICE ON FILTER PRESSES FOR MOVING THE FILTER PLATE WHICH IS THE FOREMOST AT THE TIME

Max Oelbermann, Remscheid, Germany, assignor to Ritter-shaus & Blecher GmbH, Wuppertal, Germany  
Filed Mar. 3, 1994, Ser. No. 205,160

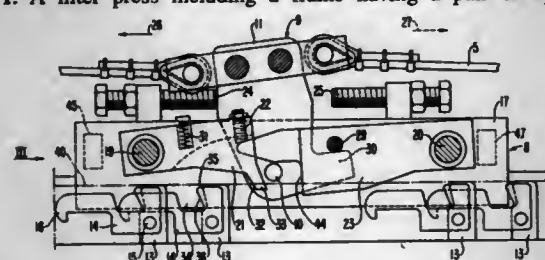
Claims priority, application Germany, Mar. 5, 1993, 43 06 959.2; May 29, 1993, 43 18 009.4

Int. Cl.<sup>6</sup> B01D 25/172

U.S. Cl. 210—230

9 Claims

1. A filter press including a frame having a pair of upper



horizontally disposed guide rails, a filter plate stack including a plurality of vertically disposed filter plates, wherein each said filter plate includes a pillow block and locking pawl at an upper end thereof for locking to an adjacent said filter plate, means for suspending the filter plates from the upper guide rails such that said filter plates are independently movable in a horizontal direction parallel to said guide rails, and a device for engaging the pillow block of and moving a front filter plate of the filter plate stack suspended on upper guide rails, the improvement comprising:

a slide block, means for movably mounting said slide block in a first direction and in a second direction opposite to the first direction along and horizontally parallel to the upper guide rails, a cable line for horizontally moving the block, a driving pawl, means for pivotally supporting one end of the driving pawl on said slide block, means defining a vertical stop on and adjacent the other end of said driving pawl, the driving pawl including forked pawl projections for engaging behind the locking pawl and pillow block of the front filter plate of the filter plate stack each time the slide block moves in the first direction for transporting the front filter plate in said first direction, the driving pawl further including a feed ramp for engaging a front of the pillow block of the front filter plate of the filter stack each time the slide block moves in the second direction, a drop lever including a movable lever end having an upwardly facing portion in contact with the stop of the driving pawl and a stop projection facing toward a front of the pillow block of the front filter plate each time the slide block moves in the second direction, means for pivotally mounting the other end of the drop lever to said block such that said movable lever end grips under the stop of said driving pawl, cam means on said drop lever for defining a cam, means

defining a slide block control lever for gripping under the cam of the drop lever for raising said drop lever and said driving pawl, said control lever being attached at an upper end thereof to the cable line and being pivotable about an axle at the lower end thereof, wherein a portion of the control lever intermediate the upper and lower ends is disposed between two spaced stops provided on the block, whereby the control lever controls a positioning of the drop lever between a first lowered position during a transporting of the front filter plate in the first direction and a second raised-position during movement of the block in the second direction.

5,480,544

# BELT FILTERS

Alan Cottam, Blackburn, Great Britain, assignor to Profit Improvement and Engineering Limited, Lancs, United Kingdom

PCT No. PCT/GB92/02249, § 371 Date Aug. 23, 1994, § 102(e) Date Aug. 23, 1994, PCT Pub. No. WO93/11850, PCT Pub. Date Jul. 24, 1993

PCT Filed Dec. 3, 1992, Ser. No. 244,578

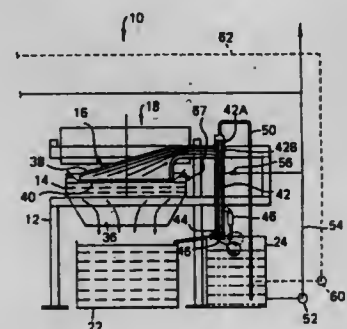
Claims priority, application United Kingdom, Dec. 5, 1991, 9125863; Jun. 2, 1992, 9211609

Int. Cl.<sup>6</sup> B01D 33/04

U.S. Cl. 210—304

16 Claims

1. A liquid filtration apparatus comprising a continuously mov-



able filtering medium, a container of contaminated liquid, means for depressing a section of the filtering medium so as to provide a dish shaped central portion immersed in the contaminated liquid and having elevated edges above the contaminated liquid, driving means for moving the filtering medium, including through the contaminated liquid in the aforesaid immersed region, means for removing cleansed liquid from above the immersed region of the filtering medium, and means for cleaning contaminants from the filtering medium, the means for removing cleansed liquid further comprising a syphon having a tube with a mouth which contacts the filtering medium and serves as the means for depressing the filtering medium.

5,480,545

# CROSS BRACED VACUUM WASHER

Frederick S. Lewis, Nashua, N.H., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Aug. 3, 1994, Ser. No. 285,462

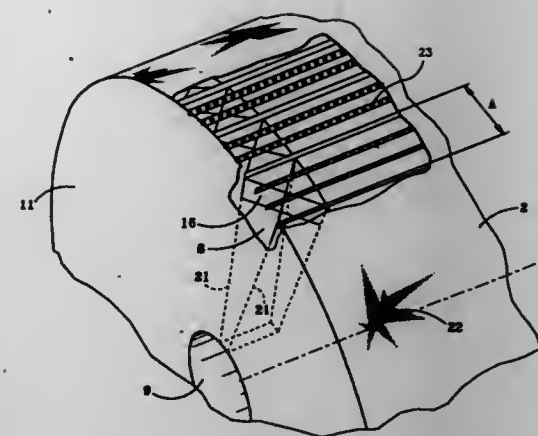
Int. Cl.<sup>6</sup> B01D 33/06

U.S. Cl. 210—380.3

5 Claims

1. A washer drum of the type having generally longitudinal surface collection channels delivering extracted liquid to radially formed channels interspaced between adjacent closely spaced heads disposed at one end of said drum, the improvement comprising:

a diagonal cross brace disposed in said radially formed channel between said heads radially inward of said longitudinal surface collection channel and in supporting contact therewith.



5,480,546

# ROTATING SCREEN DRUM WITH A STAINLESS LINING

Lennart Bergkvist, Forshaga; Sten Gustafsson, Karlstad; Kjell Lindblom, Karlstad; Jan Anderson, Karlstad; Rolf Ekholm, Karlstad, and Ronny Höglund, Skoghall, all of Sweden, assignors to Kvaerner Pulping technologies Aktiebolag, Karlstad, Sweden

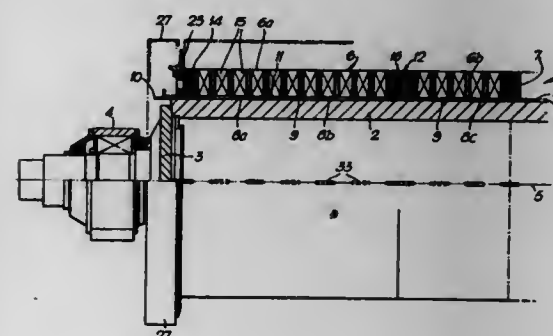
Filed Apr. 5, 1994, Ser. No. 223,128

Claims priority, application Sweden, Feb. 7, 1994, 9400385

Int. Cl.<sup>6</sup> B01D 33/06

U.S. Cl. 210—404

17 Claims



1. A screen drum for the dewatering and/or washing of cellulose pulp, comprising:

a first cylinder made from non-stainless material, which is rotatable about an axis of the first cylinder; a cylindrical screen arranged coaxially on the outside of the first cylinder, but at a distance from the first cylinder; and an annular chamber defined between the screen plate and the first cylinder for receiving liquid passing through the screen, which annular chamber contains passages which extend in an axial direction of the cylinder towards at least one end of the drum for withdrawal of liquid which has passed through the screen;

wherein said chamber is lined with sheet sections of stainless steel lining, disposed side by side in seal-tight arrangement on the first cylinder, wherein stainless steel spacer members are disposed in said chamber between the stainless steel lining on the first cylinder and the cylindrical screen, said spacer members comprising packs of annular discs provided with holes which form said axial passages for the withdrawal of said liquid which has passed through the screen, and wherein each of said annular discs have a bridge portion between each of said holes and an outer periphery of the disc and a bridge portion between each of said holes and an inner periphery of the disc.

5,480,547

# CORROSIVE LIQUID COALESCER

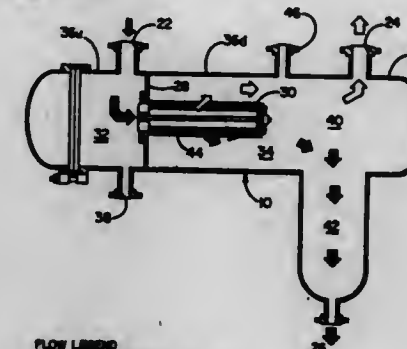
Kenneth M. Williamson, Jamesville; Scott A. Whitney, Marathon, and Alan R. Rausch, Cortland, all of N.Y., assignors to Pall Corporation, East Hills, N.Y.

Filed Mar. 8, 1994, Ser. No. 207,077

Int. Cl.<sup>6</sup> B01D 17/02

U.S. Cl. 210—533

24 Claims



FLOW LEGEND:  
● CONTAMINATED PRODUCT  
○ WATER  
○ CLEAN DRY PRODUCT

1. A liquid purification system capable of separating a first liquid from a second liquid, in which the first liquid is a corrosive aqueous liquid that is wholly or partly immiscible in and forms a discontinuous phase with a second, continuous phase-forming organic liquid comprising:

- a housing;
- a fluid inlet in said housing;
- a first liquid outlet in said housing;
- a second liquid outlet in said housing;
- at least one coalescing assembly for coalescing said first liquid wherein said at least one coalescing assembly comprises at least one coalescing element which includes a halo-carbon polymer packing material which has a solid capture efficiency of as high as 20  $\mu\text{m}$ , which is substantially chemically inert to corrosive liquids and which is adapted to separate liquids differing in interfacial tension of at least about 0.6 dynes/cm; and
- a liquid separating region in said housing.

5,480,548

# WASTEWATER BIOLOGICAL PHOSPHORUS REMOVAL PROCESS

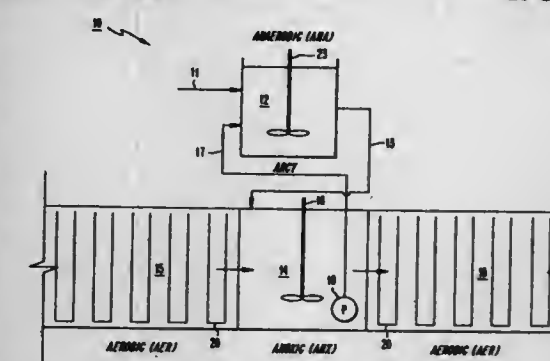
Glen T. Daigger, Englewood, Colo.; Joseph P. Stephenson, Kitchener, Canada; Daniel A. Nolasco, Hamilton, Canada; Dalton R. Stafford, and Douglas M. Kaupp, both of Lethbridge, Canada, assignors to CH2M Hill, Inc., Englewood, Colo.

Filed Dec. 28, 1993, Ser. No. 174,350

Int. Cl.<sup>6</sup> C02F 3/30

U.S. Cl. 210—605

10 Claims



1. A step feed activated sludge wastewater purification process for biological phosphorus removal, comprising treating wastewater in at least one treatment stage, each treatment stage comprising



- treating wastewater influent in at least one upstream aerobic zone;
- feeding effluent from said at least one upstream aerobic zone through at least one anoxic zone;
- recycling a portion of effluent from said at least one anoxic zone to at least one anaerobic zone, with raw or pretreated wastewater being fed into a step feed point in said anaerobic zone;
- returning effluent from said at least one anaerobic zone to said at least one anoxic zone; and
- feeding effluent from said at least one anoxic zone to at least one downstream aerobic zone.

5,480,549

### METHOD FOR PHOSPHATE-ACCELERATED BIOREMEDIATION

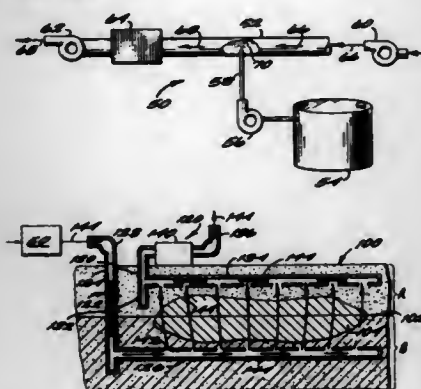
Brian B. Looney, Aiken, S.C.; Kenneth H. Lombard; Terry C. Hazen, both of Augusta, Ga.; Susan M. Pfiffner; Tommy J. Phelps, both of Knoxville, Tenn.; and James W. Borthen, Seattle, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 25, 1994, Ser. No. 186,065

Int. Cl.<sup>6</sup> C02F 3/34

U.S. Cl. 1210—610

12 Claims



1. A method for adding a nutrient to a gas for in situ bioremediation of a contaminated subsurface region, said nutrient being an organophosphorous having a vapor form and a liquid form with a vapor pressure, said method comprising contacting said gas with said liquid nutrient so that a portion of said nutrient vaporizes and mixes with said gas, a mixture of said gas and said vaporized nutrient having a partial pressure of said nutrient vapor no greater than said vapor pressure.

5,480,550

### BIOTREATMENT PROCESS FOR CAUSTICS CONTAINING INORGANIC SULFIDES

Kerry L. Sublette, Tulsa, Okla., assignor to ABB Environmental Services, Inc., Portland, Me.

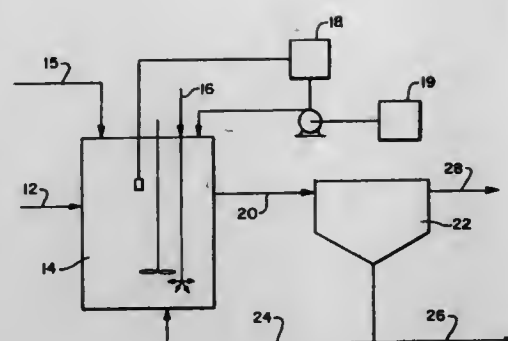
Filed May 5, 1994, Ser. No. 238,466

Int. Cl.<sup>6</sup> C02F 3/34

U.S. Cl. 210—611

10 Claims

- A method of treating an aqueous caustic solution containing inorganic sulfides comprising the steps of:
  - immobilizing an autotrophic bacteria by co-culture with at least one floc-forming heterotroph under aerobic conditions to form a flocculated biomass;
  - suspending said biomass in a mineral salt medium sufficient to support growth of said autotrophic bacteria; and
  - introducing said aqueous caustic solution containing said inorganic sulfide into said suspension whereby said inorganic sulfide is oxidized to sulfate and an acid is produced and wherein said acid at least partially neutralizes said caustic.



5,480,551

### PROCESS FOR THE BIOLOGICAL TREATMENT OF WATER

Pavel Chudoba, Le Pecq, and Michèle Pannier, Croissy S/Selne, both of France, assignors to Degremont, Rueil Malmaison, France

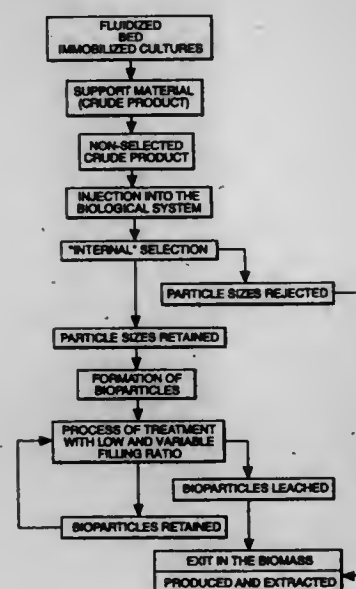
Filed Jun. 22, 1994, Ser. No. 264,146

Claims priority, application France, Jun. 23, 1993, 93 07656

Int. Cl.<sup>6</sup> C02F 3/10

U.S. Cl. 210—616

6 Claims



1. Process for the biological treatment of water using a biological reactor containing a culture of microorganisms, immobilized on a granular support material, according to which an expendable powdery material is injected into the said reactor, said process being performed so as to ensure a self-selection and a self-regulation of the support material of the particle size necessary for the biological process.

5,480,552

### METHOD FOR CONCENTRATING A SOLUTE WITH AN OSCILLATING FILTRATION DEVICE

Paul Soltys, Lake Zurich, and Norma Ofsthun, Rolling Meadows, both of Ill., assignors to Baxter International Inc., Deerfield, Ill.

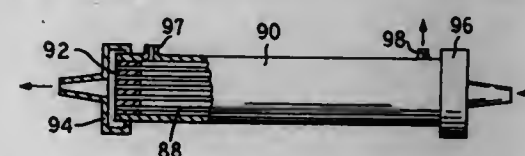
Continuation-in-part of Ser. No. 28,400, Mar. 9, 1993, abandoned, which is a continuation-in-part of Ser. No. 818,851, Jan. 10, 1992, Pat. No. 5,240,614. This application Feb. 9, 1994, Ser. No. 194,213

The portion of the term of this patent subsequent to Jan. 10, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> B01D 61/28

U.S. Cl. 210—645

17 Claims



- A method of removing unwanted material from a bodily fluid comprising the steps of:
  - providing a dialysis device having a plurality of dual-skinned polymeric membranes wherein a first skin of the dual-skinned membrane has a different degree of porosity than its second skin, each membrane having a shell side and a lumen side and each membrane secured at opposite ends in a generally parallel orientation within an enclosure;
  - providing an inflow means for a liquid subjected to dialysis, the inflow means for a liquid subjected to dialysis, the inflow means in fluid communication with the lumen sides of the membranes;
  - providing an outflow means in fluid communication with ends of the membrane for outflow of the bodily fluid after filtration; and
  - causing the bodily fluid to flow through the device a plurality of times wherein at least some of the unwanted material collects in the shell sides of the membranes.

5,480,553

### HOLLOW FIBER MEMBRANE MODULE

Hisayoshi Yamamori, Nagoya; Akira Hoshide, Tokyo, and Masumi Kobayashi, Nagoya, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

PCT No. PCT/JP93/00176, § 371 Date Oct. 7, 1993, § 102(e) Date Oct. 7, 1993, PCT Pub. No. WO93/15827, PCT Pub. Date Aug. 19, 1993

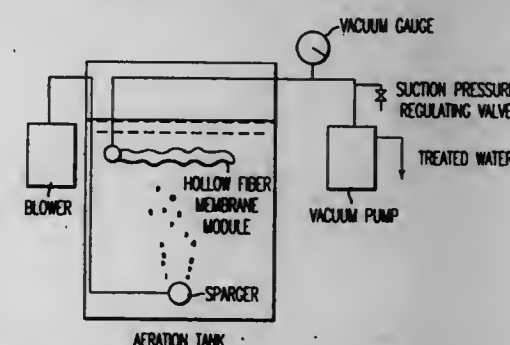
PCT Filed Feb. 12, 1993, Ser. No. 129,078

Claims priority, application Japan, Feb. 12, 1992, 4-025419; Jun. 19, 1992, 4-161322

Int. Cl.<sup>6</sup> B01D 63/02; 65/08

U.S. Cl. 210—650

3 Claims



1. A filtration method which comprises (A) immersing a hollow fiber membrane module in water to be treated, said hollow fiber membrane module comprising (a) hollow fibers, (b) a fastening member for fixing the ends of said hollow fibers while leaving said

ends open, and (c) a structural member for enclosing and supporting said fastening member, said hollow fibers comprising a textile fabric containing hollow fibers as the weft, the cross-section of said fastening member perpendicular to said hollow fibers being in an elongated rectangular shape; and (B) filtering the water by suction from the surface to the inside of said hollow fibers with intermittent or continuous cleaning of the membrane surfaces of said hollow fibers.

5,480,554

### INTEGRITY-TESTABLE WET-DRY-REVERSIBLE ULTRAFILTRATION MEMBRANES AND METHOD FOR TESTING SAME

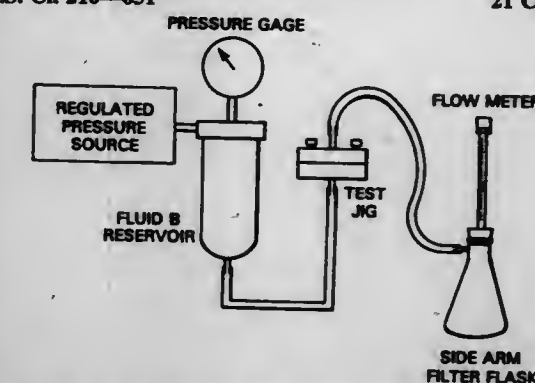
Peter J. Degen, Huntington; John Mischenko, III, Amityville, both of N.Y.; Robert E. Kesting, Sumner, Wash.; Moira H. Billich, Massapequa, and Trevor A. Staff, Bronx, both of N.Y., assignors to Pall Corporation, East Hills, N.Y.

Filed May 13, 1992, Ser. No. 882,473

Int. Cl.<sup>6</sup> B01D 61/20

U.S. Cl. 210—651

21 Claims



11. A process for filtering a fluid comprising causing said fluid to flow through an ultrafiltration polymeric membrane that is capable of excluding 0.1 μm diameter, monodisperse, latex particles with a rejection coefficient greater than 0.998 and is capable of being fully dried without loss of such ultrafiltration properties and which after being wet/dry cycled at least once will have a  $K_{UF}$  flow rate at 10 psi, using 1-butanol saturated with water as the wetting liquid and water saturated with 1-butanol as the displacing liquid at ambient temperature, below 50 cc/min per square foot of membrane area.

5,480,555

### CONTROL SYSTEM FOR A WATER SOFTENER, CONTROL DEVICE THEREFOR AND METHODS OF MAKING THE SAME

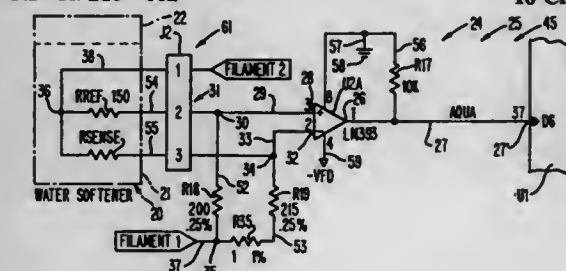
Gregory J. Momber, Grand Rapids, Mich., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jun. 6, 1994, Ser. No. 254,174

Int. Cl.<sup>6</sup> C02F 1/42

U.S. Cl. 210—662

16 Claims



9. In a method of making a control system for a water softener that has an ion exchange bed and a recycling means for said bed, said system comprising a pair of resistor means, reference electrode means sensing electrode means, said electrode means being



disposed in said bed, said electrode means and said resistor means comprising a bridge circuit means having juncture point means, an A.C. power supply means for supplying an A.C. signal means to said bridge circuit means and having a certain phase, a comparator having a first input means for receiving a first signal from one of said juncture point means that is disposed between said reference electrode means and one of said pair of resistor means and having a second input means for receiving a second input signal from another of said juncture point means that is disposed between said sensing electrode means and the other of said pair of resistor means, said comparator having an output means, said output means having a phase, and a microcontroller means having means operatively interconnected to said output mean for receiving output signal means therefrom and having means to effect a subsequent operation of said recycling means when said output signal means is at a certain condition thereof, said system having means for causing said output signal means to have a phase shift relative to said certain phase when said sensing electrode means is at a certain resistance value relative to the resistance value of said reference electrode means, said phase shift comprising said certain condition of said output signal means, the improvement comprising the steps of forming said microcontroller means to have means for detecting said certain condition by comparing said phase of said output signal means to said certain phase, and forming said microcontroller means to have means operatively interconnected to said A.C. power supply means so as to use said certain phase thereof as a reference for comparing with said phase of said output signal means.

5,480,556

## TRAPPING AND SEALING PROCESS

Judith G. Ulan, #126 10951 Mortfield Road, Richmond, British Columbia, Canada

Continuation of Ser. No. 723,788, Jul. 1, 1991, abandoned.

This application Mar. 25, 1994, Ser. No. 218,137

Int. Cl.<sup>6</sup> B01D 53/04

U.S. Cl. 210—681

12 Claims

1. A method of trapping metal ions within one or more channels of a molecular sieve comprising providing a molecular sieve having substantially the crystal structure of VPI-5 being characterized as possessing a channel structure capable of rearranging when heated to a structure possessing periodic blockages, contacting a liquid containing dissolved metal ions with said molecular sieve and subjecting said molecular sieve to heat sufficient to create said periodic blockages and trap said metal ions.

5,480,557

## METHOD FOR PREVENTING ADHESION OF SCALES IN SERVICE WATER OR CIRCULATING INDUSTRIAL WATER BY APPLYING THE MAGNETIC FIELD

Miyoji Kawasaki, Sano; Masanori Hirose, Shimodate; Toshitsugu Suzuki, Ashikaga; Tei Matsuura, Sano, and Yoshinada Yokoyama, Kawachi, Japan, assignors to Heisel Riken Kabushiki Kaisha, Tochigi, Japan

Continuation-in-part of Ser. No. 249,072, May 25, 1994, abandoned, which is a continuation-in-part of Ser. No. 57,841, May 7, 1993, abandoned. This application Jul. 12, 1994, Ser. No. 273,606

Claims priority, application Japan, May 8, 1992, 4-143391

Int. Cl.<sup>6</sup> C02F 1/48

U.S. Cl. 210—695

3 Claims

1. A method of preventing adhesion of scales in industrial water containing calcium carbonate and silicic acid as the main undissolved substances, which comprises:  
a step of providing industrial water containing calcium carbonate and silicic acid as the main undissolved substances;  
a step of circulating the water at a velocity of more than 0.5 m/sec through a pipe;  
and a step of applying a magnetic field having a magnetic flux density of 12000–15000 Gs to the circulating water.

5,480,558

## ELECTRIC ENHANCEMENT OF ADSORBENT FLOTATION SEPARATION

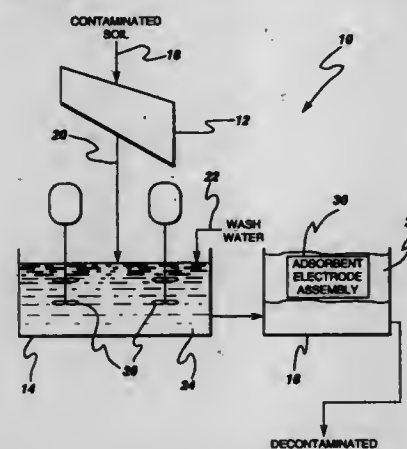
Youssef El-Shoubary, Clifton Park, and Donald E. Woodmansee, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 6, 1994, Ser. No. 254,840

Int. Cl.<sup>6</sup> B01D 17/035

U.S. Cl. 210—703

16 Claims



1. A flotation cell for use in a soil washing system, said flotation cell comprising:  
a tank for receiving a liquid slurry containing liberated contaminants in an emulsion;  
means for injecting gas bubbles into said slurry inside said tank for gathering said contaminants thereto by attachment, with said bubbles and contaminants attached thereto rising by buoyancy to form a froth at the surface of said slurry in said tank;  
an adsorbent electrode assembly disposed in said tank for contacting said froth; and  
a source of electricity having a first pole connected to said adsorbent electrode assembly and a second pole connected to said tank so that said electrode assembly electrically attracts and adsorbs said contaminants in said froth.

5,480,559

## LIQUID TREATMENT

Robert P. M. Smisson, Clevedon, United Kingdom, assignor to Hydro International PLC, England

PCT No. PCT/GB92/00894, § 371 Date Nov. 15, 1993, § 102(e) Date Nov. 15, 1993, PCT Pub. No. WO92/20627, PCT Pub. Date Nov. 26, 1992

PCT Filed May 18, 1992, Ser. No. 146,159

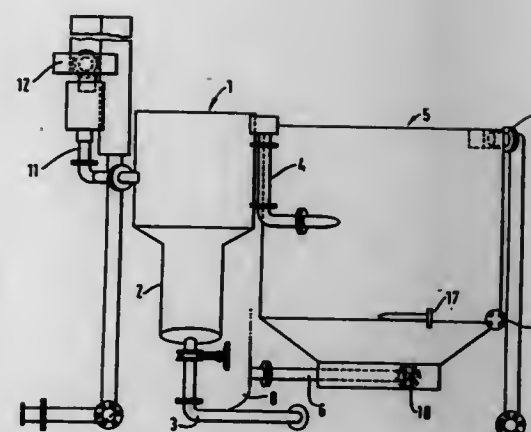
Claims priority, application United Kingdom, May 17, 1991, 9110733; Dec. 19, 1991, 9126941

Int. Cl.<sup>6</sup> C02F 1/56

U.S. Cl. 210—727

10 Claims

1. A method of treating sewage carrying suspended solids and bacteria comprising the following steps:  
(i) introducing said sewage into a primary treatment vessel and causing agglomeration of solids suspended in the liquid to form flocs including said bacteria which are not settleable to any substantial degree while said sewage is permitted to remain in the primary vessel;  
(ii) transferring an aqueous component comprising the flocs from the primary treatment vessel to a hydro-dynamic separating device where a floc including said bacteria of a settleable nature is caused to form; and  
(iii) permitting said floc to settle under gravity in said hydro-dynamic separating device and recovering an aqueous component having a substantially reduced concentration of suspended solids relative to the sewage introduced into the primary treatment vessel in step (i);



wherein the sewage is subjected in the primary vessel to flow patterns, including a circulating flow about a vertical axis of the primary vessel sufficient to provide conditions suitable for the formation of the substantially non-settleable flocs containing suspended solids and bacteria from the sewage introduced into the primary treatment vessel in step (i);  
and wherein the aqueous component from the primary treatment vessel is subjected in the hydro-dynamic separating device to flow patterns, including a circulating flow about a vertical axis of said hydro-dynamic separating device sufficient to provide conditions suitable for rapid formation of flocs and subsequent rapid settlement thereof, the sewage is dosed with coagulant at the primary treatment vessel or upstream thereof and the aqueous component from the primary treatment vessel is dosed with a flocculent to enhance the flocculating conditions in the secondary treatment vessel.

5,480,560

Patent Not Issued For This Number

5,480,561

## METHOD AND APPARATUS FOR TREATING WASTEWATER

Harold L. Ball, Roseburg; Eric S. Ball, Winchester; Jeffrey L. Ball, and Terry R. Bounds, both of Roseburg, all of Oreg., assignors to Orenco Systems, Inc., Roseburg, Oreg.

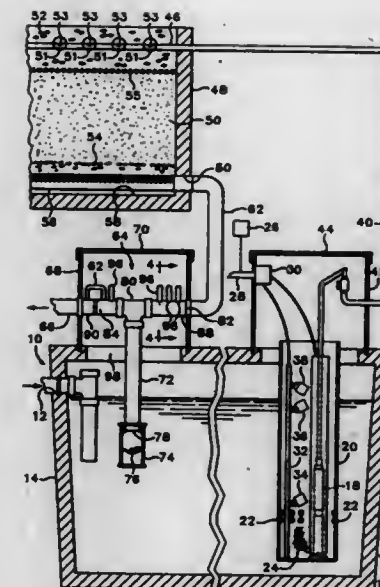
Filed Jun. 28, 1994, Ser. No. 267,316

Int. Cl.<sup>6</sup> C01D 37/04

U.S. Cl. 210—744

4 Claims

1. A method of treating sewage wastewater, comprising:  
(a) removing solids from said wastewater by gravitational separation;  
(b) thereafter flowing said wastewater to a tank;  
(c) flowing at least a portion of said wastewater from said tank to a filter comprised of filter media and thereafter flowing at least said portion through said media to produce a filtrate;  
(d) sensing the amount of wastewater in said tank;  
(e) returning a fraction, less than all but more than none, of said filtrate from said filter to said tank when the amount of wastewater sensed in step (d) is at least a predetermined amount; and  
(f) returning more than said fraction of said filtrate from said filter to said tank when the amount of wastewater sensed in step (d) is less than said predetermined amount by decreasing resistance to flow of said filtrate to said tank.



5,480,562

## METHOD OF PURIFYING WATER CONTROLLED BY LASER SCANNING

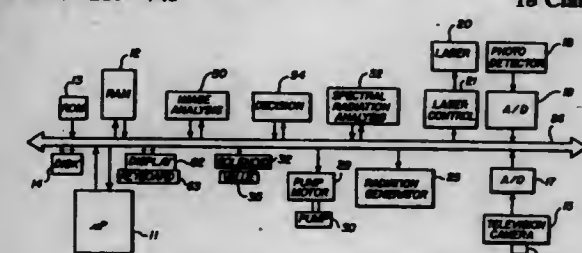
Jerome H. Lemelson, Suite 286, Unit 802, 930 Tahoe Blvd., Incline Village, Nev. 89451-9436

Filed Dec. 28, 1993, Ser. No. 173,972

Int. Cl.<sup>6</sup> B01D 17/12

U.S. Cl. 210—745

18 Claims



1. A method for purifying water comprising the steps of:  
scanning a select amount of water with a laser, irradiating substrates in the water with laser radiation and generating scanning signals containing information indicative of the presence of select substrates in the water with a photodetector for detecting radiation emanating from said substrates;  
wherein said laser radiation is controllably varied during scanning to detect different biological substrates in the water;  
computer processing and analyzing said scanning signals and code signals relating thereto; and  
employing said code signals to control the operation of a device for neutralizing the substrates so detected.

5,480,563

## METHOD FOR REMOVING ELECTROSTATIC CHARGE FROM HIGH RESISTIVITY LIQUID

Kenichi Mitsumori; Yasuhiko Kasama, both of Sendai; Akira Nakano, Furukawa; Akira Abe, and Tadahiro Ohmi, both of Sendai, all of Japan, assignors to Frontec Incorporated, Sendai, Japan

Filed Mar. 29, 1994, Ser. No. 219,154

Claims priority, application Japan, Apr. 9, 1993, 5-107642

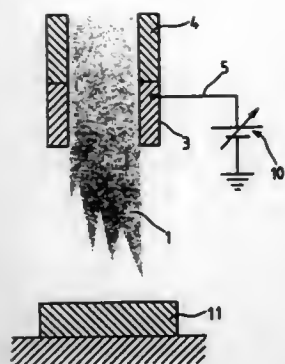
Int. Cl.<sup>6</sup> C02F 1/48

U.S. Cl. 210—748

5 Claims

1. A method of removing electrostatic charges from high resistivity liquid comprising:  
coating a conductive element with an insulating film on the surface thereof, said insulating film having a thickness which





permits a tunneling current to flow through said insulating film from said high resistivity liquid to said conductive element; maintaining said conductive element at a specific electric potential such that a difference exists between the specific electric potential and the electrostatic charge of the high resistivity liquid, and contacting said insulating film with the high resistive liquid such that electrons tunnel through the coating to the conductive element, thereby discharging the electrostatic charge of the high resistivity liquid.

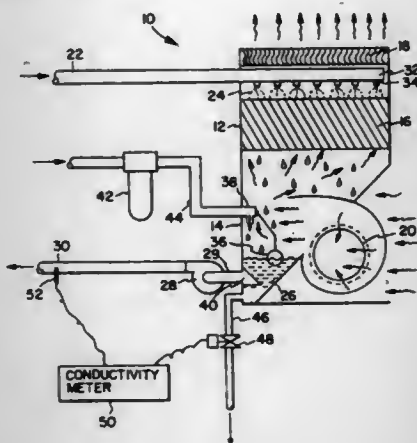
5,480,564

## WATER TREATMENT SYSTEM

Daniel H. Pope, Georgetown, Tex.; Dennis R. Honchar, Ellicott City, and Wilbur L. Medairy, Elkridge, both of Md., assignors to Baltimore Aircoil Company, Inc., Jessup, Md. Division of Ser. No. 900,244, Jun. 17, 1992, Pat. No. 5,405,544. This application Apr. 19, 1994, Ser. No. 229,797 Int. Cl.<sup>6</sup> C02F 1/50

U.S. Cl. 210—753

9 Claims



1. A method for treating a body of fluid comprising the steps of: providing a treatment device containing a treatment chemical, said device comprising a flow section and a container section, conveying a flow of fluid to the flow section of said device through a first passage, providing a venturi in said first passage, drawing a secondary flow stream of said fluid from a first outlet in said first passage upstream of said venturi, passing said secondary flow stream through tube means, said tube means having a first end opening in direct flow connection with said first outlet, said tube means passing from said flow section to said container section of said treatment device, said tube means releasing said secondary flow stream from a second end of said tube means to allow said secondary flow

stream to then flow through said treatment chemical to allow said secondary flow to become saturated with said treatment chemical, and providing a second outlet within said flow section directly to said venturi in said first passage such that said secondary flow enters said venturi to rejoin said flow of fluid in said first passage.

5,480,565

## METHODS FOR DISINFECTING DIALYZERS

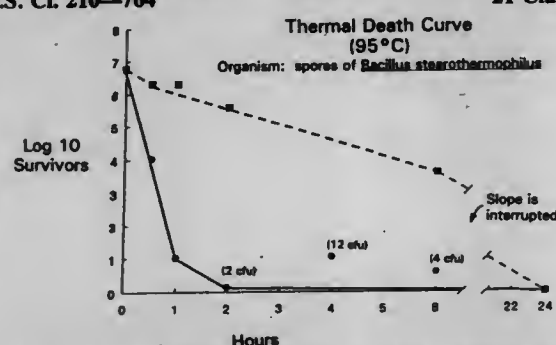
Nathan Levin, 401 E. 34 St.-Apt. N30B, New York, N.Y. 10016, and Hans-Dietrich Polaschegg, Grunwiesenweg 9, D 61440 Oberursel, Germany

Filed Oct. 8, 1993, Ser. No. 134,098

Int. Cl.<sup>6</sup> B01D 65/02; 65/06; A61L 2/16

U.S. Cl. 210—764

21 Claims



1. A method for disinfecting a dialyzer which contains a semi-permeable membrane which divides the dialyzer into a blood compartment and a dialysate compartment, said method comprising the steps of: (a) filling the blood and dialysate compartments of the dialyzer with an aqueous solution which comprises citric acid at a concentration of between about 1.0 and about 5.0 weight percent per volume; and (b) subjecting the dialyzer containing the aqueous solution to an elevated temperature less than 100° C. for a predetermined period of time, said time and temperature being sufficient to kill pathogenic organisms and viruses contained within the dialyzer for the concentration of citric acid in the aqueous solution.

5,480,566

## METHOD FOR RELEASING AND SEPARATING OIL FROM OIL SANDS

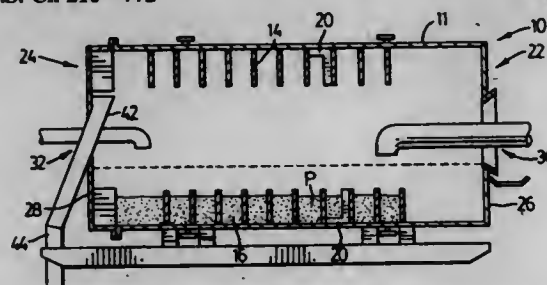
William L. Strand, Edmonton, Canada, assignor to Bitmin Corporation, Toronto, Canada PCT No. PCT/CA91/00415, § 371 Date Nov. 22, 1993, § 102(e) Date Nov. 22, 1993, PCT Pub. No. WO92/09672, PCT Pub. Date Jun. 11, 1992

PCT Filed Nov. 27, 1991, Ser. No. 66,044

Claims priority, application Canada, Nov. 27, 1990, 2030934 Int. Cl.<sup>6</sup> C10G 1/04

U.S. Cl. 210—772

3 Claims



1. A method of releasing and separating bitumen from oil sands containing clay, comprising the steps of submerging oil sands to be

treated into a bath of hot water, gently rolling the oil sands within the bath to form a pulp beneath a continuous water layer, resultant agitation of the water and pulp being insufficient to prevent liberated oil droplets from migrating to the surface of the bath, and the rolling of the pulp being insufficiently aggressive to cause substantial dispersion of clay present in the oil sands, but sufficient to provide prolonged contact with the hot water to ensure substantial release and separation of bitumen coating granules of the oil sands, removing solid constituents of the oil sands from one end of the bath, and removing water and oil from the other end of the bath, oil sands and hot water being supplied at opposite ends of the bath to those at which they are removed.

5,480,567

## SURFACTANT MIXTURES FOR FABRIC CONDITIONING COMPOSITIONS

Andrew C. Lam, Yorktown, N.Y.; Samuel Q. Lin, Paramus, N.J.; Timothy J. Taylor, Edison, N.J., and John R. Winters, Dumont, N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Jun. 14, 1994, Ser. No. 259,706

Int. Cl.<sup>6</sup> D06M 13/46; 10/08; B05D 3/12

U.S. Cl. 252—8.8

13 Claims

1. A tumble dryer article comprising: (a) a mixture of at least two surfactants, (i) a first surfactant present in an amount of about 5 wt.% to about 70 wt.% and having an endotherm peak temperature of from about 75° C. to about 155° C., the first surfactant selected from the group consisting of N,N-di(tallowoyl-oxy-ethyl)-N,N-dimethyl ammonium methyl sulfate, N,N-di(tallowoyl-oxy-propyl)-N,N-dimethylammonium methyl sulfate, ethylene bis-stearamide and mixtures thereof, (ii) a second surfactant present in an amount of about 30 wt.% to about 95 wt.% and having an endotherm peak temperature of from about 35° C. to about 70° C., the second surfactant selected from the group consisting of long chain fatty acids, a glycerol derivative, a C<sub>8</sub>-C<sub>20</sub> alkoxylated alcohol and mixtures thereof, wherein the mixture has at least two endotherm peak temperatures different from each other by at least about 1° C. up to about 40° C. as measured in a differential scanning calorimeter device and a melting transition temperature about 50° C. to about 120° C.; and (b) dispenser means for dispensing the mixture onto fabrics in a tumble dryer.

5,480,568

ALKYL ARYL SULFONES AND THEIR USE AS LUBRICANTS IN HIGH TEMPERATURE AND MAGNETIC RECORDING MEDIA APPLICATIONS Chester E. Pawloski, Bay City, and Bassam S. Nader, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

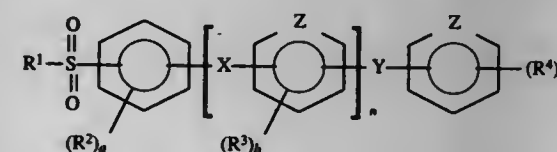
Filed Jul. 22, 1994, Ser. No. 279,036

Int. Cl.<sup>6</sup> C10M 135/10

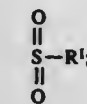
U.S. Cl. 252—46.7

22 Claims

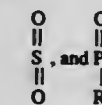
1. An alkyl aryl sulfone of the formula:



R<sup>3</sup> is independently in each occurrence a substituent selected from the group F, C<sub>m</sub>F<sub>2m+1</sub>, OC<sub>m</sub>F<sub>2m+1</sub>, phenyl, and phenoxy; b is 0 or an integer less than or equal to 4 inclusive when Z is carbon, and 0 or an integer less than or equal to 3 inclusive when Z is nitrogen; R<sup>4</sup> is independently in each occurrence a substituent selected from the group F, C<sub>m</sub>F<sub>2m+1</sub>, OC<sub>m</sub>F<sub>2m+1</sub>, and



c is 0 or an integer less than or equal to 5 inclusive; n is 0 or an integer less than or equal to 5 inclusive; m is an integer from 1 to 10 inclusive; and X and Y are independently in each occurrence selected from the group: bond, O, C(CH<sub>3</sub>)<sub>2</sub>, C(CF<sub>3</sub>)<sub>2</sub>,



wherein R<sup>5</sup> is independently in each occurrence an alkyl having from 1 to 12 carbon atoms inclusive, or an aryl having from 1 to 12 carbon atoms inclusive.

5,480,569

## DOPED CRYSTALLINE TITANYL ARSENATES AND PREPARATION THEREOF

Albert A. Ballman, Toms River, N.J., and Lap K. Cheng, Bear, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del. Division of Ser. No. 954,174, Sep. 30, 1992, Pat. No. 5,326,423, which is a continuation-in-part of Ser. No. 857,050, Mar. 25, 1992, abandoned. This application Apr. 15, 1994, Ser. No. 228,615

The portion of the term of this patent subsequent to Jul. 5, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> C01G 28/06

U.S. Cl. 252—62.9

11 Claims

1. A composition consisting essentially of doped single domain crystalline MTiOAsO<sub>4</sub> wherein M is selected from the group consisting of K, Rb, Cs and mixtures thereof, wherein said doped MTiOAsO<sub>4</sub> contains at least about 10 ppm total of at least one dopant selected from the group consisting of Fe, Sc and In.

5,480,570

## LOW COERCIVE IRON OXIDE PIGMENTS AND A PROCESS FOR THEIR PREPARATION

Karl-Heinz van Bonn, Moers; Hendrik Kathrein, Jüchen-Aldenhoven, and Gerhard Franz, Krefeld, all of Germany, assignors to Toda Kogyo Corp., Hiroshima, Japan Continuation of Ser. No. 17,266, Feb. 12, 1993, abandoned. This application Jun. 6, 1994, Ser. No. 254,471 Claims priority, application Germany, Feb. 25, 1992, 42 05 634.9

Int. Cl.<sup>6</sup> C01G 49/02; H01F 1/10; 1/11

U.S. Cl. 252—62.56

2 Claims

1. Cobalt coated, needle-shaped berthollide iron oxide pigments comprising: an iron oxide core having the composition (Fe<sub>x</sub><sup>2+</sup>, Fe<sub>2-3x</sub><sup>3+</sup>) O<sub>3+2x</sub>, wherein 0.3 < x < 0.75, a cobalt coating, the quantity of cobalt being from 0.1 to 1.5% by weight based on the weight of the core, and a berthollide Zn-containing compound coating composed of a berthollide compound having the composition (Fe<sub>x</sub><sup>2+</sup>, Fe<sub>2-3x</sub><sup>3+</sup>)



$O_{3-x}$ , wherein  $0.3 < x < 0.75$ , and Zn, the berthollide Zn-containing compound coating being situated between the cobalt coating and the iron oxide core, the quantity of Zn in said coating being from 0.1 to 2% by weight based on the weight of the core,

said cobalt coated, needle-shaped berthollide iron oxide pigments having characteristics that when the specific saturation magnetization is greater than 102mWb.m/kg and the coercive field strength is from 30 to 37 kA/m, the printing attenuation measured after incorporation of the pigments in an audio tape according to DIN IEC 94 Part 5 is greater than 50 dB, based on a magnetic layer thickness of 12  $\mu$ m and an ash content of 11 g/m<sup>2</sup>; and

produced by the process comprising:

dispersing the iron oxide core material in water to form a dispersion;

adding an aqueous iron salt solution and an aqueous zinc salt solution to the dispersion;

adding an alkaline solution to the dispersion to precipitate the iron and zinc salts, thereby forming the berthollide Zn-containing compound coating on the iron oxide core material;

introducing air to the dispersion; and

then coating the obtained material with a cobalt compound using a soluble cobalt salt in alkaline medium under a nitrogen atmosphere.

5,480,571

#### PROCESS FOR PRODUCING ACICULAR GOETHITE PARTICLES AND ACICULAR MAGNETIC IRON OXIDE PARTICLES

Masaru Isoai; Toshiharu Harada; Tokihiro Kurata; Kazuhiko Fujita; Kazushi Takama, and Shigekazu Jikuhara, all of Hiroshima, Japan, assignors to Toda Kogyo Corp., Hiroshima, Japan

Division of Ser. No. 22,847, Feb. 25, 1993, Pat. No. 5,378,380, which is a division of Ser. No. 733,726, Jul. 22, 1991, abandoned. This application Sep. 21, 1994, Ser. No. 309,743

Claims priority, application Japan, May 31, 1991, 3-157829; May 31, 1991, 3-157830

The portion of the term of this patent subsequent to Feb. 25, 2013, has been disclaimed.

Int. Cl.<sup>6</sup> C01G 49/06; 49/08

U.S. Cl. 252—62.56

14 Claims



(x 30000)

1. A process for producing acicular goethite particles having an aspect ratio of not less than 20 comprising the step of blowing an oxygen-containing gas into a ferrous salt reaction solution containing either colloidal ferrous hydroxide which is obtained by reacting an aqueous ferrous salt solution with less than one equivalent of an aqueous hydroxide solution based on Fe<sup>2+</sup> in said aqueous ferrous salt solution or iron-containing colloidal precipitates which are obtained by reacting an aqueous ferrous salt solution with less than one equivalent of an aqueous alkali carbonate solution or an aqueous hydroxide and carbonate solution based on Fe<sup>2+</sup> in said aqueous ferrous salt solution, at a temperature not higher than 80° C. so as to oxidize said colloidal ferrous hydroxide or iron-containing colloidal precipitates and to produce acicular goethite particles through green rust which is produced at a pH of 5 to 7, wherein (a) from 0.01 to 5.0 mol % ascorbic acid or a salt thereof calculated as ascorbic acid based on Fe in the ferrous

salt reaction solution and (b) at least one compound selected from the group consisting of compounds containing P, Si and Al are present in the solution before said acicular goethite particles are produced.

5,480,572

#### COMPOSITIONS INCLUDING A THREE CARBON CYCLIC FLUOROETHER

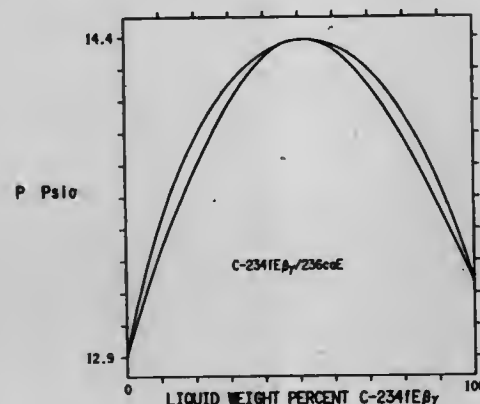
Barbara H. Minor, Elkton, Md., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 77,353, Jun. 16, 1993, abandoned. This application May 13, 1994, Ser. No. 242,749

Int. Cl.<sup>6</sup> C09K 5/04

U.S. Cl. 252—67

6 Claims



1. An azeotropic or azeotrope-like composition consisting essentially of about 80 to about 99 weight percent 2,2,4,4-tetrafluorooxetane and about 1 to about 20 weight percent 1-difluoromethoxy-1,1,2,2-tetrafluoroethane wherein said composition has a vapor pressure of about 16.8 psia at 25° C., or about 15 to about 99 weight percent 2,2,4,4-tetrafluorooxetane and about 1 to about 85 weight percent 1-difluoromethoxy-1,2,2,2-tetrafluoroethane wherein said composition has a vapor pressure of about 17.5 psia at 25° C.

2. An azeotropic or azeotrope-like composition consisting essentially of about 10 to about 99 weight percent 2,2,3,3-tetrafluorooxetane and about 1 to about 90 weight percent 1-difluoromethoxy-1,1,2,2-tetrafluoroethane wherein said composition has a vapor pressure of about 14 psia at 25° C., or about 1 to about 60 weight percent 2,2,3,3-tetrafluorooxetane and about 40 to about 99 weight percent 1-difluoromethoxy-1,2,2,2-tetrafluoroethane wherein said composition has a vapor pressure of about 16 psia at 25° C.

5,480,573

#### ELECTRORHEOLOGICAL FLUID COMPOSITIONS CONTAINING ALKYL METHYLSILOXANES

Loren D. Durfee, and Randall G. Schmidt, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 947,699, Sep. 21, 1992, abandoned. This application Apr. 29, 1994, Ser. No. 243,655

Int. Cl.<sup>6</sup> C10M 169/04; 171/00; C09K 3/00

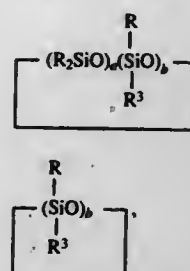
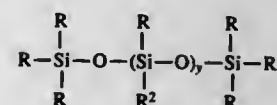
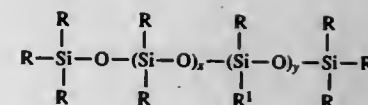
U.S. Cl. 252—78.3

18 Claims

1. An electrorheological fluid composition comprising:

(A) solid particles having a specific gravity of less than 1.8;

(B) an alkylmethylsiloxane compound having a specific gravity of between 0.8 and 1.0 and having its formula selected from the group consisting of:



and mixtures thereof; and

(C) an organofluoro compound having a specific gravity of greater than 1.5 and selected from the group consisting of perfluoropolyethers, perfluorodecalin, perfluoromethyldecalin, and a compound selected from the group consisting of

(i)  $(CR^3R^4-CR^3R^4)_n$ , and

(ii)  $F_3C(CF_2-CF_2)_nCF_3$ ;

wherein each R is a radical independently selected from the group consisting of alkyl radicals having from 1 to 20 carbon atoms and aryl radicals, R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, and R<sup>4</sup> have the general formula  $(CH_2)_xCH_3$ , and d has an average value from 5 to 11, x has an average value from 1 to 100, y has an average value from 1 to 100, a has an average value from 1 to 9, b has an average value from 1 to 10, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, and R<sup>8</sup> are selected from hydrogen, chlorine, or fluorine, with the proviso that at least one of R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, and R<sup>8</sup> is a fluoro group, and n is such that the viscosity of (i) and (ii) is less than 500 centistokes at 25° C. with the proviso that the mixture has a viscosity of below 10,000 centistokes at 25° C., with the proviso that (B) is miscible with (C), and wherein the average specific gravity of (B) plus (C) is within 0.2 of the specific gravity of (A).

5,480,574

#### 2-AMINOCARBOXYLIC ACID HYDROCHLORIDE COMPOSITIONS FOR REMOVAL OF HARD-WATER DEPOSITS

Gary M. Singerman, 38 Falling Star Ct., The Woodlands, Tex. 77381

Filed Jan. 27, 1995, Ser. No. 380,346

Int. Cl.<sup>6</sup> C02F 5/10

U.S. Cl. 252—82

5 Claims

1. A composition for removing hard-water deposits from metal, glass, plastic, ceramic surfaces comprising 50 to 95 weight percent water and 5 to 50 weight percent of a 2-aminocarboxylic acid hydrochloride selected from the group consisting of glycine hydrochloride, alanine hydrochloride, valine hydrochloride, leucine hydrochloride, isoleucine hydrochloride, serine hydrochloride, threonine hydrochloride, methionine hydrochloride, aspartic acid hydrochloride, glutamic acid hydrochloride, lysine hydrochloride, proline hydrochloride, betaine hydrochloride, their optical isomers, or mixtures thereof, and further comprising from 0.1 to 7.0 weight percent of a thickening agent, from 10.0 to 45.0 weight percent of an abrasive agent, or from 0.1 to 10.0 weight percent of a surfactant or mixtures thereof.

5. A method for removing hard-water deposits from metal, glass, plastic, and ceramic surfaces comprising the steps of:

a. applying to the surface a deposit-removing composition comprising 5 to 50 weight percent active ingredients and a balance of water, said active ingredients comprising the hydrochloride

salts of naturally-occurring 2-aminocarboxylic acids, their optical isomers, or mixtures thereof, and

b. allowing said deposit-removing composition to remain on the surface, optionally with mechanical abrasion, until at least 90 percent of the deposit is dissolved and loosened, and

c. removing said deposit-removing composition together with the dissolved and loosened deposit by washing with water.

5,480,575

#### ADJUNCTS DISSOLVED IN MOLECULAR SOLID SOLUTIONS

Paul A. Altieri, Belle Mead; James Eden, East Millstone, both of N.J.; Michael C. Gribnau; Leendert Hoogendijk, both of Vlaardingen, Netherlands; Lambertus B. Krijnen, Rotterdam, Netherlands; Daniel B. Solarek, Belle Mead, N.J., and Ton Swarthoff, Helvoetsluis, Netherlands, assignors to Lever Brothers, Division of Conopco, Inc., New York, N.Y.

Filed Dec. 1, 1993, Ser. No. 160,538

Claims priority, application European Pat. Off., Dec. 3, 1992, 92203753

Int. Cl.<sup>6</sup> C11D 7/54; 3/37; 3/22; 17/08; 3/395

U.S. Cl. 252—94

18 Claims

1. A particulate adjunct product comprising 0.01% to 30% by weight of an adjunct selected from the group consisting of bleach catalysts, bleach catalyst precursors, and bleach precursors, dissolved as a molecular solid solution in a biopolymer, the product having a water content of less than 20% by weight.

5,480,576

#### 1,3-N AZOLE CONTAINING DETERGENT COMPOSITIONS

Richard G. Gary, West New York, and Petrus A. Angevaere, Ho-ho-kus, both of N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 136,791, Oct. 14, 1993, abandoned. This application Sep. 7, 1994, Ser. No. 301,459

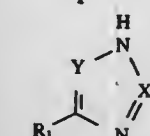
Int. Cl.<sup>6</sup> C11D 3/395; 3/28; 7/32; 7/54

U.S. Cl. 252—95

20 Claims

1. An automatic dishwashing detergent composition comprising: a) 1 to 20 weight percent of a bleaching agent selected from the group of a peroxygen agent, a hypochlorite agent and its corresponding salts, and mixtures thereof;

b) 0.05 to about 10 weight percent of a 1,3-N azole compound which prevents silver tarnishing having a formula:



wherein X is C—R<sub>3</sub> or X is nitrogen if, and only if Y is nitrogen, Y is nitrogen or C—R<sub>2</sub>, and R<sub>1</sub>, R<sub>2</sub>, and R<sub>3</sub> are each independently a hydrogen, an amine, an amido, a straight or branched alkyl chain having from 1 to 20 carbon atoms, an amino or carboxylic containing chain, an alkoxy, an alkylthio, a hydroxy, a hydroxyalkyl, and an alkenyl, or R<sub>1</sub> and R<sub>2</sub> taken together form a substituted or unsubstituted aryl and salts corresponding thereto

provided that the 1,3-N azole compound has a pK<sub>a</sub> value of more than 1 unit below a pH value of an aqueous solution of an automatic dishwashing detergent composition in which it is incorporated;

c) 1 to 75 weight percent of a builder; and

d) 0 to 40 weight percent of a surfactant,

wherein the automatic dishwashing composition substantially prevents tarnishing of silver and silver plated articles and the composition has a pH in a range of about 7 to about 8.8.



5,480,577

## ENCAPSULATES CONTAINING SURFACTANT FOR IMPROVED RELEASE AND DISSOLUTION RATES

John R. Nicholson, Ramsey, N.J., and David J. Lang, Ossining, N.Y., assignors to Lever Brothers Company, division of Conopco, Inc., New York, N.Y.

Filed Jun. 7, 1994, Ser. No. 255,146

Int. Cl.<sup>6</sup> C11D 1/00

U.S. Cl. 252—174.13

14 Claims

1. A wax-encapsulated core material particle for use in liquid cleaning compositions, the encapsulated particles comprising:

(a) 10% to 80% by wt. of a core particle or an aggregate of core particles which are water soluble or water dispersible, or which dissolve, disperse or melt in a temperature range of from about 40° C. to about 50° C., the particle or particles comprising:

i) a bleaching compound selected from a group consisting of an organic peroxy acid, a diacyl peroxide, an inorganic peroxygen compound, a bleach catalyst, a peroxygen bleach precursor and mixtures thereof, and

ii) 0.01% to about 5% of a surfactant; and

(b) 20% to 90% by weight of a continuous coherent waxy coating, the coating comprising one or more paraffin waxes wherein the coating mixtures has a melting point of from about 40° C. to about 50° C., a solids content of from about 35% to 100% at 40° C. and a solids content of from 0% to about 15% at 50° C., and being from 100 to 1500 microns thick,

the surfactant in the encapsulated particle substantially aiding in the dispersion of the coherent waxy coating to promote more rapid dissolution of the bleaching compound.

5,480,578

## DETERGENT ADDITIVE FOR DETERGENTS CONTAINING A FABRIC SOFTENER

Rüdiger Hirsch, Rhineland; Reinhard Hahn, Lower Bavaria, and Norbert Schall, Upper Bavaria, all of, Germany, assignors to Sud-Chemie AG, Munich, and Dall-Werke, Stolberg, both of, Germany

Filed Mar. 3, 1994, Ser. No. 205,935

Claims priority, application Germany, Mar. 3, 1993, 43 06 665.8

Int. Cl.<sup>6</sup> C11D 3/0802; 3/12; C04B 33/02

U.S. Cl. 252—174.25

5 Claims

1. A process for preparing a detergent additive comprising agglomerating a powdered smectic layered silicate by adding water at a total water content of about 20 to 40 wt %, based on the dry powder, to form moist agglomerates having an agglomerate size range of from 0.2 to 2.0 mm, mixing a powdered cation exchanger with the agglomerates without further substantial size reduction of the agglomerates until the cation exchanger covers the surface of the agglomerates to form a mixture, and drying the mixture.

5,480,579

## COMPOSITION FOR DEHALOGENATION AND DEGRADATION OF HALOGENATED ORGANIC CONTAMINANTS

Alan G. Seech, Mississauga; James E. Cairns, Toronto, and Igor J. Marvan, Mississauga, all of, Canada, assignors to W. R. Grace &amp; Co.-Conn., New York, N.Y.

Division of Ser. No. 126,343, Feb. 24, 1993, Pat. No. 5,411,664.

This application Feb. 13, 1995, Ser. No. 387,644

Claims priority, application Canada, Sep. 28, 1992, 2079282

Int. Cl.<sup>6</sup> C02F 1/58

U.S. Cl. 252—181

11 Claims

1. A composition useful for dehalogenating and/or degrading halogenated organic compounds in water, sediment, or soil comprising a mixture of fibrous organic matter which is capable of supporting bacterial or fungal growth and multi-valent metal par-

ticles wherein the weight ratio of metal particles:organic matter ranges from 1:1 to 1:500,000 respectively.

5,480,580

OPTICALLY ACTIVE COMPOUND HAVING A  $\delta$ -VALEROLACTONE RING AND LIQUID CRYSTAL COMPOSITION CONTAINING SAME

Keiichi Sakashita, Otake; Yoshitaka Kageyama, and Tetsuya Ikemoto, both of Kawasaki, all of, Japan, assignors to Mitsubishi Rayon Company Ltd., Japan

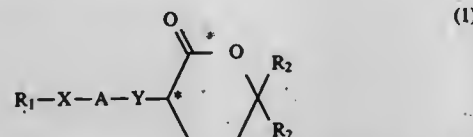
Continuation of Ser. No. 263,215, Jun. 17, 1994, abandoned, which is a continuation of Ser. No. 732,756, Jul. 19, 1991, abandoned. This application Jan. 23, 1995, Ser. No. 376,307

Claims priority, application Japan, Jul. 20, 1990, 2-192015; Jan. 3, 1990, 2-265807

Int. Cl.<sup>6</sup> C09K 19/34

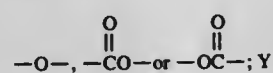
U.S. Cl. 252—299.61

6 Claims

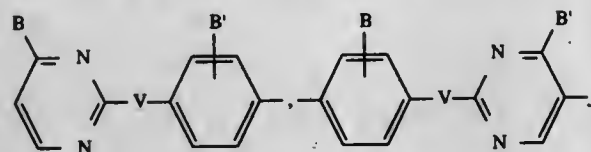
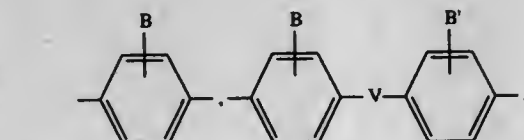
1. An optically active compound having a  $\delta$ -valerolactone ring, which is represented by the formula (1):

wherein R<sub>1</sub> represents a straight-chain or branched alkyl group having 1 to 18 carbon atoms, a straight-chain or branched alkenyl group having 2 to 18 carbon atoms, a straight-chain or branched alkoxyalkyl group having 1 to 3 carbon atoms in the alkoxy portion and 1 to 18 carbon atoms in the alkyl portion, or any of said groups wherein at least one hydrogen atom is substituted with a halogen, provided that when R<sub>1</sub> has a structure capable of having an optically active group, it may be an optically active group or a racemic modification; two R<sub>2</sub>'s are the same and each represents an alkyl group having 1 to 18 carbon atoms;

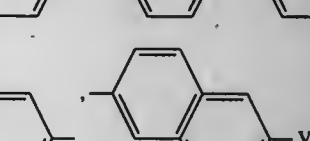
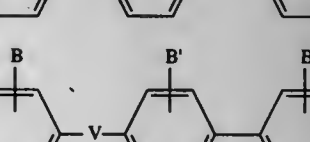
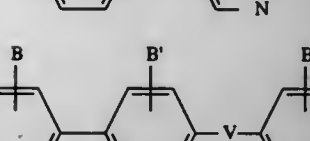
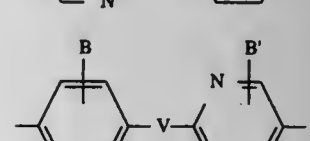
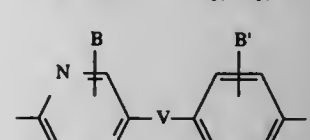
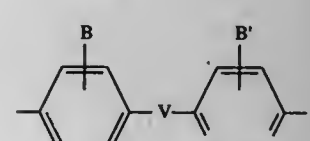
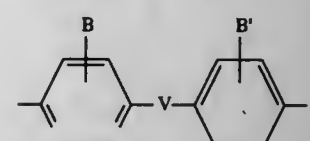
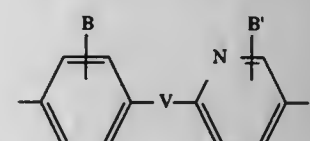
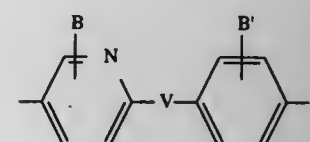
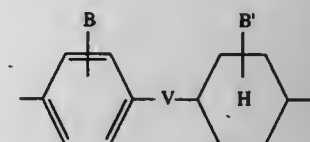
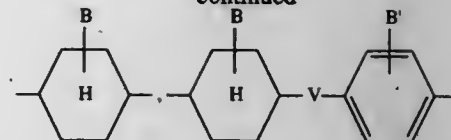
X represents a direct bond, —O—,



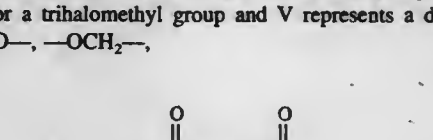
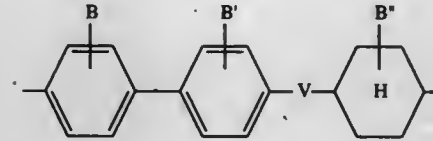
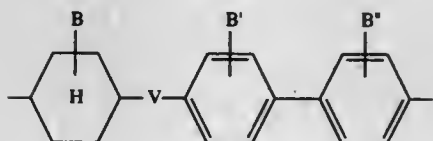
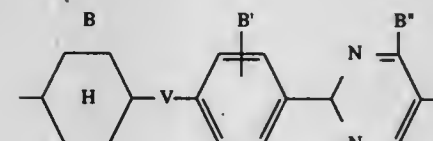
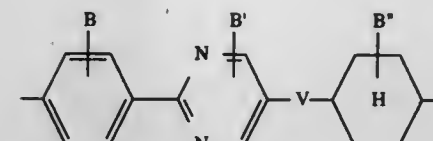
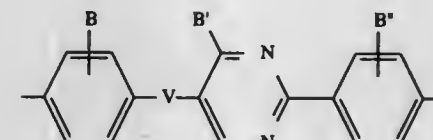
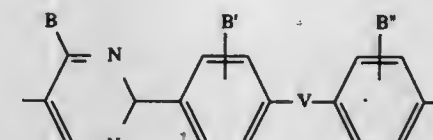
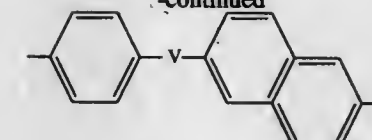
represents a direct bond,

—O—, —CH<sub>2</sub>O— or —OCH<sub>2</sub>—; A represents

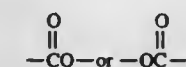
-continued



-continued



wherein B, B' and B'' each independently represent a hydrogen atom, a halogen atom, a cyano group, a methyl group, a methoxy group or a trihalomethyl group and V represents a direct bond, —CH<sub>2</sub>O—, —OCH<sub>2</sub>—,



and \* represents an asymmetric carbon atom.



5,480,581

## LIQUID-CRYSTALLINE MEDIUM

Herbert Plach, Darmstadt; Ulrich Finkenzeller, Plankstadt; Volker Reiffenrath, Rosdorf; Elke Poetsch, Mühlal; Bernhard Rieger, and Hiroshi Numata, both of Yokohama, all of Japan, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Germany

Continuation of Ser. No. 781,151, Oct. 31, 1991, abandoned.

This application Apr. 7, 1994, Ser. No. 224,377

Claims priority, application Germany, Aug. 3, 1990, 40 24 760.0; Mar. 6, 1991, 41 07 119.0

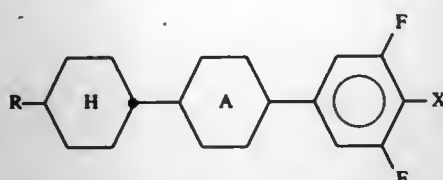
The portion of the term of this patent subsequent to Mar. 28, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> C09K 19/30; 19/12

U.S. Cl. 252-299.63

23 Claims

1. A liquid-crystalline medium based on a mixture of polar compounds having positive dielectric anisotropy, comprising: one or more compounds of formula I

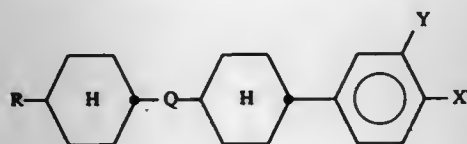


in which X is fluorine, chlorine, OCF<sub>3</sub> or OCHF<sub>2</sub>, ring A is trans-1,4-cyclohexylene or 1,4-phenylene, and R is alkyl, oxaalkyl, fluoroalkyl or alkenyl, in each case having up to 7 carbon atoms; and

one or more compounds selected from formula II



one or more compounds selected from formula IV



wherein

R is as defined above,  
Q is —C<sub>2</sub>H<sub>4</sub>—, —C<sub>6</sub>H<sub>4</sub>— or —CO—O—,  
X' is F, Cl, CF<sub>3</sub> or OCHF<sub>2</sub>,  
Y is H or F,  
A' is trans-1,4-cyclohexylene, and  
r is 0 or 1.

5,480,582

## PROCESS FOR SYNTHESIZING AMORPHOUS SILICA MICROSPHERES WITH FLUORESCENCE BEHAVIOR

Edward J. A. Pope, 447 Lorenzo Dr., Agoura, Calif. 91301

Filed Jun. 30, 1993, Ser. No. 84,876

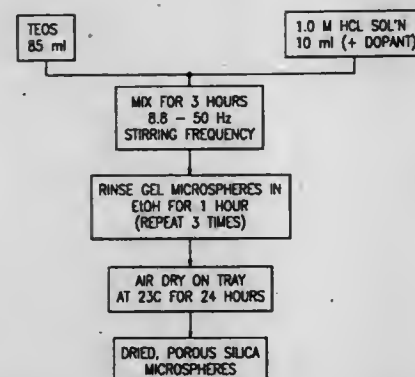
Int. Cl.<sup>6</sup> C04B 35/624

U.S. Cl. 252-301.4 F

2 Claims

1. A process for synthesizing amorphous silica microspheres comprising the steps of:

a. placing into a container an organosilicon precursor wherein said organosilicon precursor is selected from a group consisting of tetraethoxysilane (TEOS), tetrabutoxysilane (TBOS), tetramethoxysilane (TMOS) and tetrapropoxysilane (TPOS), and an acidic solution having an acid molar concentration in the range of 0.05 to 2.5 wherein said acidic solution is



selected from a group consisting of nitric acid (HNO<sub>3</sub>) and hydrochloric acid (HCl) wherein said organosilicon precursor and said acidic solution are immiscible whereby a volumetric ratio of said organosilicon precursor to said acidic solution is in the range from 8 to 1 to 18 to 1;

b. stirring said organosilicon precursor and said acidic solution at a stirring rate in the range between 8 Hz to 50 Hz to form droplets of said organosilicon precursor in said acidic solution whereby water in said acidic solution hydrolyzes said droplets of said organosilicon precursor to form amorphous silica microspheres; and

c. rinsing with a solvent to remove excess of said organosilicon precursor from said amorphous silica microspheres.

5,480,583

## EMULSION OF VISCOUS HYDROCARBON IN AQUEOUS BUFFER SOLUTION AND METHOD FOR PREPARING SAME

Hercilio Rivas, Caracas; Socrates Acevedo, Edo. Miranda, and Xiomara Gutierrez, Caracas, all of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Continuation-in-part of Ser. No. 801,472, Dec. 2, 1991. This

application Jan. 4, 1993, Ser. No. 413

Int. Cl.<sup>6</sup> B01J 13/00; C10L 1/32; F17D 1/17

U.S. Cl. 252-311.5

1 Claim

1. A viscous hydrocarbon-in-aqueous buffer solution emulsion, comprising:

a viscous hydrocarbon discontinuous phase having a salt content by weight of less than or equal to about 15 ppm and having a water content of less than or equal to about 0.1%, said discontinuous oil phase comprises a viscous hydrocarbon having an API gravity of  $\leq 15$  and a viscosity at 1 sec<sup>-1</sup> and 30° C. of >5000 cps and being characterized by two distinct oil droplet sizes D<sub>L</sub> and D<sub>S</sub> wherein D<sub>L</sub> is about 10-40  $\mu$ m and D<sub>S</sub> is  $\leq 5$   $\mu$ m, the ratio of D<sub>L</sub>/D<sub>S</sub> is  $\geq$  about 4 and about 72-80% by wt. of the viscous hydrocarbon has a large droplet size D<sub>L</sub>; and

a basic aqueous buffer solution continuous phase containing a buffer additive and a natural surfactant, the natural surfactant being an inactive surfactant naturally contained in the viscous hydrocarbon which inactive surfactant is extracted and activated by the buffer additive so as to stabilize the viscous hydrocarbon-in-aqueous buffer solution emulsion wherein the inactive natural surfactant is selected from the group consisting of carboxylic acids, phenols, esters and mixtures thereof.

5,480,584

## METHOD FOR DUST-CONTROL TREATMENT

Teruo Urano, Sano; Hiroshi Miyaji, Utsunomiya; Masatsune Ogura, Ichikawa; Tetsuya Shimoda, Hachioji, and Katuaki Ishikawa, Yokohama, all of Japan, assignors to Murakashi Lime Industry Co., Ltd.; Nippon Hodo Co., Ltd., and Dupont-Mitsu Fluorochemicals Co., Ltd., Japan

Continuation of Ser. No. 215,680, Mar. 22, 1994, abandoned, which is a continuation of Ser. No. 933,686, Aug. 24, 1992, abandoned, which is a division of Ser. No. 247,606, Sep. 22, 1988, abandoned. This application Apr. 26, 1995, Ser. No. 427,856

Claims priority, application Japan, Sep. 24, 1987, 62-237422; Sep. 24, 1987, 62-237423

Int. Cl.<sup>6</sup> C09K 3/00

U.S. Cl. 252-384

1 Claim

1. In a method for dust control treatment of a dusty powder capable of passing through a 100 mesh sieve by blending the dusty powder with fibrillatable polytetrafluoroethylene and subjecting the blended powder to compression-shear and heating to fibrillate the polytetrafluoroethylene and enclose the dusty powder with fibrils thus formed, the improvement comprises a step of blending the dusty powder with fibrillatable polytetrafluoroethylene, water and a material selected from the group consisting of alkali earth metal oxide, alkali earth metal peroxide, calcium carbide, calcium phosphide, calcium aluminate, calcium silicate and gypsum at ambient temperature and causing exothermic hydration reaction to heat the blended materials to 50-300° C.

5,480,585

## STRIPPING LIQUID COMPOSITIONS

Shinichiro Shiotsu, Hyogo, and Yoshiaki Horiuchi, Horiuchi, both of Japan, assignors to Nagase Electronic Chemicals, Ltd., Osaka, Japan

Continuation of Ser. No. 107,159, Aug. 17, 1993, abandoned.

This application Apr. 28, 1995, Ser. No. 430,604

Claims priority, application Japan, Apr. 2, 1992, 4-109323

Int. Cl.<sup>6</sup> C11D 1/40; 1/70; 1/755; G03C 5/30

U.S. Cl. 252-544

6 Claims

1. A stripping liquid composition for stripping off a photoresist film applied on a substrate, comprising:

(a) an alkanol amine compound expressed by the structural formula H<sub>3-n</sub>N((CH<sub>2</sub>)<sub>n</sub>OH)<sub>n</sub> (where n is 2 or 3, and n is 1, 2 or 3),

(b) a sulfone compound or sulfoxide compound expressed by the structural formula R<sub>1</sub>—SO<sub>2</sub>—R<sub>2</sub> or R<sub>1</sub>—SO—R<sub>2</sub> (where R<sub>1</sub> and R<sub>2</sub> are independently alkyl groups with 1 or 2 carbon atoms, or mutually coupled and formed cyclic alkylene groups with 4, 5 or 6 carbon atoms), and

(c) a hydroxy compound expressed by the structural formula C<sub>6</sub>H<sub>5-n</sub>(OH)<sub>n</sub> (where n=1, 2 or 3) or C<sub>6</sub>H<sub>5-m-n</sub>(OH)<sub>n</sub>R<sub>m</sub> (where n=1, 2, or 3, m=1 or 2, having at least a hydroxy group and at least an alkyl group or at least an alkoxy group added to a cyclic alkylene group), wherein the ratio of the ingredients (a)-(c) is in the proportion of 3:6:1.

5,480,586

## LIGHT DUTY LIQUID DETERGENT COMPOSITION COMPRISING A SULFOSUCCINAMATE-CONTAINING SURFACTANT BLEND

Gary Jakubicki, Robbinsville, and Elizabeth F. McCandish, Highland Park, both of N.J., assignors to Colgate-Palmolive Co., Piscataway, N.J.

Continuation-in-part of Ser. No. 231,356, Apr. 22, 1994, which is a continuation-in-part of Ser. No. 854,048, Mar. 18, 1992, abandoned, which is a continuation-in-part of Ser. No. 685,118, Apr. 15, 1991, abandoned. This application Sep. 26, 1994, Ser. No. 314,399

Int. Cl.<sup>6</sup> C11D 1/28; 1/83; 3/22; 3/48

U.S. Cl. 252-545

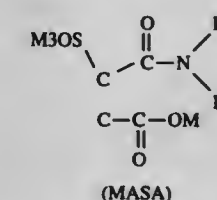
6 Claims

1. A liquid dishwashing detergent composition providing stable foaming characteristics and which is mild to the hands and is effective in removing greasy soils, said composition by weight comprising:

(a) a surfactant system comprising:

(1) from about 8 to 12% by weight of a salt of a C<sub>10</sub>-C<sub>14</sub> linear alkyl benzene sulfonate anionic surfactant, said salt being selected from the group consisting of alkali metal salts, alkaline earth metal salts and mixtures thereof;

(2) from 0.5 to about [8]6% of anionic C<sub>10</sub>-C<sub>18</sub> mono alkyl [sulfosuccinate or] sulfosuccinamate, wherein the alkyl group may be ethoxylated with up to 8 moles of ethylene oxide, said monoalkyl [sulfosuccinate or] succinamate [being selected from the group consisting of] having the structure:



where R is an aliphatic radical, of from 10 to 18 carbon atoms, and M is a cation, selected from the group consisting of sodium, potassium, ammonium and alkanolamine

(3) from about 10 to 16% of anionic C<sub>10</sub>-C<sub>20</sub> alkyl ether sulfate having from 1 to 2 moles ethylene oxide per mole of alkyl group; and

(4) from about 5 to 10% by weight of an alkyl ether type polyglucoside having from 12 to 16 carbon atoms, on average, in the alkyl chain, and an average degree of polymerization in the range of from about 1 to about 3;

(b) from 1 to 5% of a foam stabilization system comprising lauric/myristic monoethanolamide; the total weight of components (a) and (b) ranging from about 28 to 42% by weight of the composition;

(c) up to about 5% of ethanol;

(d) up to about 6% of hydrotrope;

(e) about 0 to about 0.35% of trichlorohydroxy diphenyl ether; and  
(f) up to about 20% in total of one or more optional additives selected from the group consisting of chelating or sequestering agents, coloring agents, perfumes, fungicides, preservatives, sunscreens, agents, pH buffering agents, opacifiers, thickeners, and proteins; and

(g) the balance being water.



5,480,587

**MATERIALS FOR USE AS FIRE RETARDANT ADDITIVES**

Lawrence L. Musselman, Apollo, Pa., and Howard L. Greene, Mogadore, Ohio, assignors to Aluminum Company of America, Pittsburgh, Pa.

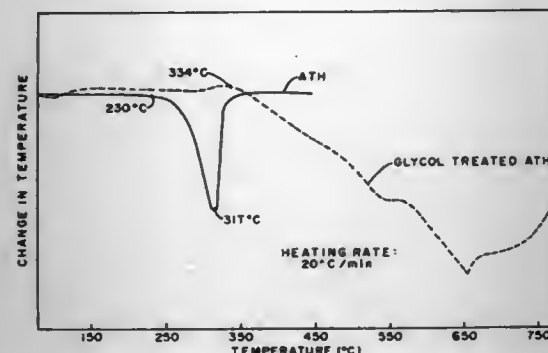
Filed Dec. 21, 1988, Ser. No. 287,070

Int. Cl.<sup>6</sup> C09K 21/00; B27N 9/00

U.S. Cl. 252-609

26 Claims

15. A fire retardant material having enhanced usefulness in a



OSC OF ALUMINA TRIHYDRATE (ATH) AND GLYCOL TREATED ATH

polymer or paper system, said fire retardant material formed by the steps of:

treating a first material containing water of hydration or carbonates to remove the portion of water hydration or carbonate of said first material which evolves as a gas that is detrimental to the processing of the polymer or paper system; and combining a second material with said first material to create said fire retardant material which has a reduced tendency to evolve gas at a temperature which is detrimental to said processing of the polymer or paper system.

18. A filler material for use in a polymer or paper system, said filler material formed by the steps of:

heating a first inorganic material which evolves gas heating to remove the portion of said first material which evolves as a gas that is detrimental to the processing of the polymer or paper system; and sealing the surface of said first material at the site where said gas evolved from said first material to create a new filler material having a reduced tendency to evolve gas at a temperature which is detrimental to said processing of said polymer or paper system.

5,480,588

**HUMIDIFIER WITH EXPOSED SPACED BOTTLES**

Mark J. Tomasiak, O'Fallon; Gregory F. Dix, Florissant, both of Mo., and John F. Moody, Bunker Hill, Ill., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 5, 1994, Ser. No. 349,189

Int. Cl.<sup>6</sup> B01F 3/04

U.S. Cl. 261-72.1

28 Claims

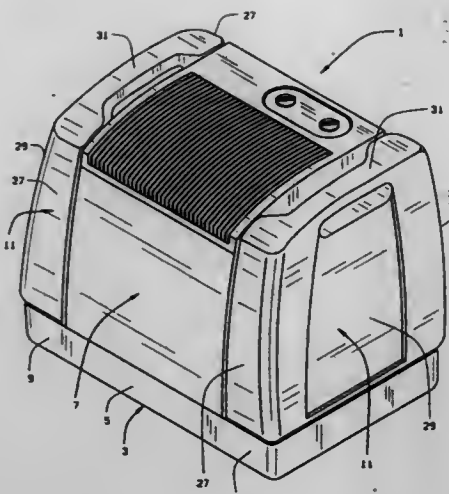
1. A humidifier comprising:

a water reservoir base having a central portion and spaced end portions;

a humidification unit mounted on the central portion of said base;

spaced water bottles mounted on the spaced end portions of said base for dispensing water into said base, said bottles being positioned immediately adjacent to and on opposite sides of said humidification unit;

said bottles being individually removable from said base for filling while also providing lifting and carrying means for lifting and carrying the humidifier.



5,480,589

**METHOD AND APPARATUS FOR PRODUCING CLOSED CELL FOAM**

Robert S. Belser, Bay Village; John R. Tark, Avon Lake, and Charles A. Hall, Lorain, all of Ohio, assignors to Nordson Corporation, Westlake, Ohio

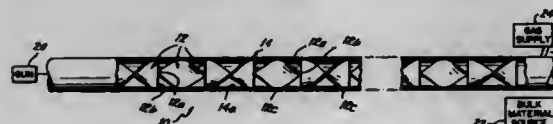
Filed Sep. 27, 1994, Ser. No. 313,359

Int. Cl.<sup>6</sup> B01F 3/04

U.S. Cl. 261-76

31 Claims

1. Apparatus for mixing gas with viscous polymeric material



within a conduit to produce a closed cell foam, said apparatus comprising:

a pump for delivering said polymeric material at a pressure through said conduit;

a pressurized gas supply connected to said conduit for injecting pressurized gas into said polymeric material within said conduit downstream of said pump; and,

a static mixer for mixing said gas into a homogeneous solution within said polymeric material, said static mixer having inlet and outlet ends and being contained in a conduit downstream of both said pump and said gas supply, said static mixer further comprising at least about 90 curved flat elements extending longitudinally within said conduit, each element having a curvature to turn the direction of material flow through said conduit, and wherein leading and trailing edges of adjacent elements are disposed at a substantial angle to each other.

5,480,590

**AERATOR**

Amir M. Neshat, Jonesboro; William G. Badley, Pocahontas; Marnie L. Johnson, Saffell; Barry L. Woodward, Black Rock, and James D. Gearhart, Jonesboro, all of Ark., assignors to The Scott Fetzer Company, Westlake, Ohio

Filed Aug. 9, 1994, Ser. No. 287,667

Int. Cl.<sup>6</sup> B01D 47/02

U.S. Cl. 261-30

18 Claims

10. An aerator for attachment to a container for live fish, said aerator comprising:

a one-piece molded plastic housing, said housing including a lid portion, a body portion and a hinge portion pivotally connect-

5,480,592

**SIDE DRAFT CARBURETOR FOR MOTORCYCLES**

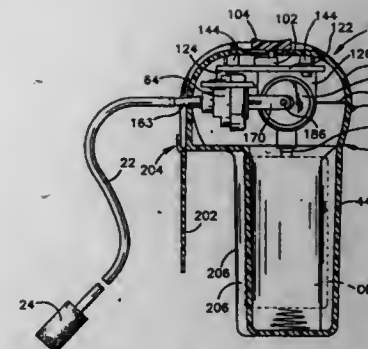
Carl D. Morrow, 9339 Santa Fe Springs Rd., Santa Fe Springs, Calif. 90670

Filed Mar. 6, 1995, Ser. No. 399,033

Int. Cl.<sup>6</sup> F02M 9/06

U.S. Cl. 261-44.4

9 Claims



ing said lid portion and said body portion, said body having space for an operating battery and storage space for a spare battery;

a first latch portion attached to said body portion;

an attachment device molded to said lid portion, said attachment device defining a second latch portion that cooperates with said first latch portion to releasably secure said lid portion in a closed position relative to said body portion;

an air pump and a motor operably connected to said air pump, wherein said air pump and said motor are attached to said lid portion of said housing and electrical connection between the motor and the operating battery is completed when said lid portion is pivoted to the closed position relative to said body portion; and

a frame for supporting said air pump and said motor, said frame being attached to said lid portion.

5,480,591

**DYNAMIC DIFFUSER OF A SUBSTANCE SUCH AS A PERFUME**

Patrick Lagneaux, Onnaing, and Christian Peretti, Valenciennes, both of, France, assignors to Prodifa (S.A.R.L.), France

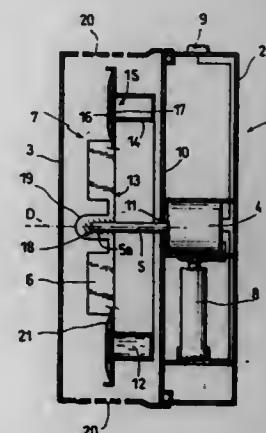
Filed Mar. 15, 1995, Ser. No. 404,529

Claims priority, application France, Mar. 16, 1994, 94 03304

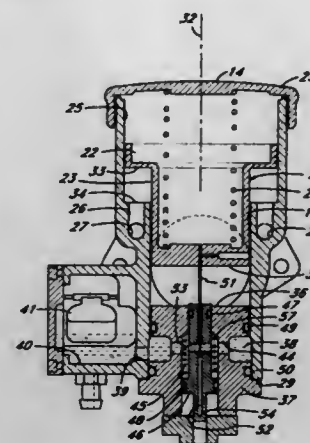
Int. Cl.<sup>6</sup> B01F 3/04

U.S. Cl. 261-30

8 Claims



1. A dynamic diffuser for a naturally diffusing liquid substance such as a perfume, the diffuser comprising a receptacle for the liquid substance and air-flow generating means situated in a diffusion zone, wherein the receptacle is closed by a membrane that is impermeable to liquid and permeable to gas, at least a portion of said membrane constituting a vertical flank of the receptacle, and including means for moving the receptacle so as to cause it to revolve about a horizontal axis, thereby causing the liquid substance to be put at least intermittently into contact with the membrane constituting said vertical flank.



1. A side draft carburetor for motorcycles comprising:

a carburetor body having an inlet side, an exit side, a top and a bottom, an air flow passageway having a horizontal central axis passing from the inlet side to the exit side and a butterfly valve near the exit side within said air flow passageway;

an upper cylinder having a vertical axis and having a large inside diameter and a closable top and a lower cylinder positioned below said upper cylinder having a smaller inside diameter, said lower cylinder intersecting said air flow passageway so that its central axis intersects said horizontal central axis and said lower cylinder extending below said air flow passageway;

a piston member having an upper piston is held in an air tight but freely vertically movable manner in the upper cylinder and a lower piston closely fitted in the lower cylinder, said upper piston being open at the top and said lower piston being closed at the bottom except for air passageway means through said closed bottom and said piston member being vertically movable so that the lower piston blocks most of said air flow passageway when said piston is in its lowermost position and is above most of said air flow passageway when in its uppermost position, said upper large upper cylinder being vented to an exterior of said carburetor body so that said piston member may freely move up and down and a spring positioned between said upper piston and said closable top and means for preventing said piston member from turning in the upper or lower cylinder;

a tapered needle axially held by said lower piston extending downwardly therefrom;

a jet holding member held in said lower cylinder below said air flow passageway, said jet holding member having a central passageway and an annular fuel flow ring, said jet holding member being sealed to said lower cylinder by O-rings above and below said annular fuel flow ring;

means for passing fuel into said annular fuel flow ring; and

a jet assembly sealingly held in said central passageway of said jet holding member, said jet assembly having a vertical cylindrical passageway closed at the bottom and having a fuel passageway to said annular fuel flow ring and said tapered needle being movably positioned in said vertical cylindrical passageway, said tapered needle moving up and down as said piston member moves up and down and said jet assembly being vertically adjustable whereby when any air is pulled through said air flow passageway, the air pressure in said air flow passageway decreases causing the piston and needle to rise by the reduced pressure above the upper piston permitting more fuel to be mixed in said air passing through said air flow passageway.



5,480,593

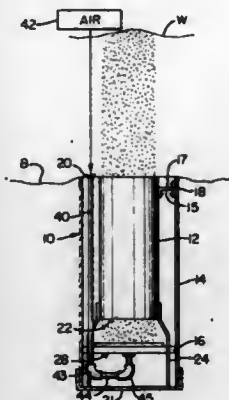
**SUBTERRANEAN AIR LIFT DIFFUSER ASSEMBLY**  
Thomas J. Marcum, Larkspur, and Douglas L. Meurer, Lakewood, both of Colo., assignors to Wilfley Weber, Inc., Denver, Colo.

Filed Nov. 18, 1993, Ser. No. 154,589

Int. Cl.<sup>6</sup> B01F 3/04

U.S. Cl. 261—77

13 Claims



1. In an air lift diffuser assembly for aerating a body of water wherein an air lift assembly comprises a straight air lift tube having an upper open end and a lower open end vertically oriented in predetermined spaced relation to a gas diffuser, said gas diffuser including a fixed, non-rotating bubble-emitting surface spaced beneath said open end of said air lift tube, and air supply means are provided for directing air under pressure upwardly from said gas diffuser through said lower open end for upward advancement through said tube and discharge from said upper open end into said body of water, the improvement comprising:

suspension means for suspending said air lift diffuser assembly in a vertical bore extending beneath said body of water with said upper open end of said air lift tube in open communication with said body of water, said suspension means including a casing disposed in outer surrounding relation to said air lift tube and said gas diffuser and complementary locking elements at spaced circumferential intervals between said upper open end of said air lift tube and said casing whereby said lift tube is rotatable into and out of locking engagement with said casing, said casing having an upper end terminating substantially at a bottom surface of said body of water and a lower end terminating beneath said gas diffuser, and an unrestricted annular space between said air lift tube and said casing, said space being of a cross-sectional area greater than the cross-sectional area across said tube.

5,480,594

**METHOD AND APPARATUS FOR DISTRIBUTING AIR THROUGH A COOLING TOWER**

II. Joe Wilkerson, 11628 Gates Mill Dr., Knoxville, Tenn. 37922, and Dudley J. Benton, 1611 Hightop Trail, Knoxville, Tenn. 37923

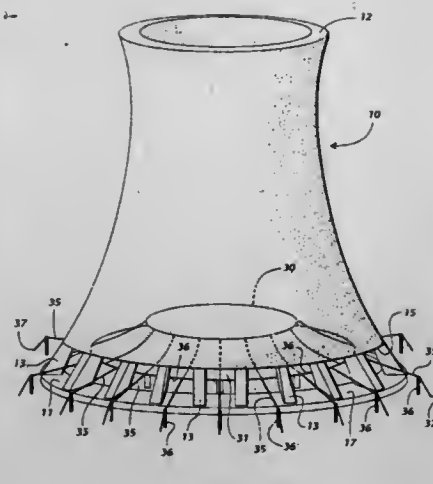
Filed Sep. 2, 1994, Ser. No. 300,155

Int. Cl.<sup>6</sup> B01F 3/04

U.S. Cl. 261—109

11 Claims

1. A natural draft water cooling tower comprising a substantially vertical axis draft channel above an air inlet volume served by an inlet perimeter of substantially horizontally flow inlet air; hot process water dispersion means disposed within said draft channel and above said air inlet volume for direct, heat exchange contact of dispersed hot process water with air flow from said inlet air perimeter; and, baffle means disposed within said air inlet volume to divide inlet air flow between a first portion to an axial core section of said draft channel and a second portion to a substantially annular section of draft channel around said core section, said baffle means comprising a substantially annular canopy having an outer rim perimeter proximate of said inlet air perimeter and an interior aperture substantially coaxial with said axial core.



5,480,595

**VAPOR-LIQUID CONTACT TRAY AND DOWNCOMER ASSEMBLY AND METHOD EMPLOYING SAME**

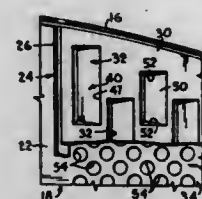
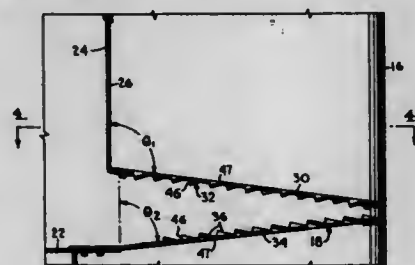
Neil Yeoman, Merrick, N.Y.; Verne E. Griffith, Wichita, Kans., and Chang-Li Hsieh, Carlisle, Mass., assignors to Koch Engineering Chemical, Inc., Wichita, Kans.

Filed Apr. 28, 1994, Ser. No. 234,188

Int. Cl.<sup>6</sup> B01F 3/04

U.S. Cl. 261—114.1

38 Claims



1. A mass transfer column comprising:

an external shell defining an interior region open to the flow of vapor and liquid streams;

a plurality of generally horizontally disposed and vertically spaced apart trays positioned in said open interior region to facilitate contact between the vapor and liquid streams when flowing in the interior region of the column, said trays having an upper surface along which the liquid stream can flow;

at least one downcomer associated with each of said trays and extending downwardly toward an underlying tray to deliver liquid from the associated tray to the underlying tray, said downcomer having an inlet region through which liquid enters the downcomer and an outlet region through which liquid exits the downcomer, said outlet region of the downcomer being positioned above a liquid receiving area of the underlying tray;

a bottom plate closing the outlet region of the downcomer;

a plurality of spaced apart louvers positioned in and extending below said downcomer bottom plate, each of said louvers comprising a channel extending below the bottom plate, said channel having an outlet end lying in a plane intersecting a plane in which the bottom plate lies to allow liquid to exit the outlet end with an at least partially horizontal velocity to

reduce a vertically downward force with which the liquid impacts the liquid receiving area of the underlying tray; and a plurality of apertures in said trays through which ascending vapor may flow to interact with the liquid stream flowing across the upper surface of the trays.

5,480,596

**OPTICAL RECORDING MEDIUM SUBSTRATE SHEET PRODUCING APPARATUS HAVING ROLL STAMPER WITH ELASTOMER LAYER OF PREDETERMINED HARDNESS**

Yukitoshi Okubo; Tsuyoshi Santoh; Miki Tamura, all of Yokohama; Chieko Mihara, Kawasaki; Hiroyuki Sugata, Yamato; Osamu Kanome, Kawasaki, and Masataka Yashima, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

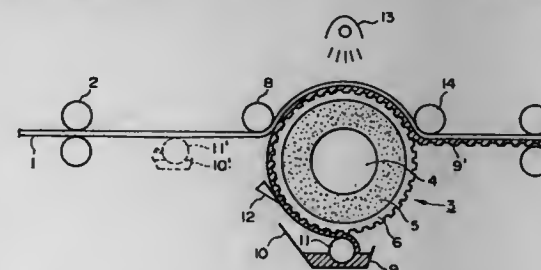
Continuation of Ser. No. 45,306, Apr. 12, 1993, which is a continuation of Ser. No. 879,450, May 1, 1992, which is a continuation of Ser. No. 549,912, Jul. 9, 1990. This application Nov. 21, 1994, Ser. No. 345,339

Claims priority, application Japan, Jul. 12, 1989, 1-180831; Sep. 21, 1989, 1-243386

Int. Cl.<sup>6</sup> B29D 11/00; B29C 59/04

U.S. Cl. 264—1.33

8 Claims



1. An apparatus for producing a substrate for an optical recording medium having preformatting information on a surface of the optical recording medium, said apparatus comprising:

a roll stamper having on its periphery a preformat pattern corresponding to the preformatting information;

a nip roll disposed opposite to said roll stamper; means for feeding an elongated sheet to a nip formed by said roll stamper and said nip roll;

means for feeding a liquid photo-curable resin layer between the sheet and said roll stamper periphery; and means for curing the liquid photo-curable resin layer while the photo-curable resin layer is in continuous close contact with the periphery of said roll stamper;

said roll stamper comprising a core roll made of metal which has an elastomer layer on its periphery and a flat-sheet stamper, made of metal and having said preformat pattern, fixed on said elastomer layer, said elastomer layer having a hardness of from 10 to 80 according to JIS-A-hardness.

7. A method for producing a substrate for an optical recording medium having preformatting information on a surface of the optical recording medium by using an apparatus that comprises a roll stamper having on its periphery a preformat pattern corresponding to the preformatting information and a nip roll disposed opposite to the roll stamper, wherein the roll stamper comprises a core roll made of metal that has an elastomer layer on its periphery and a flat-sheet stamper, made of metal and having the preformat pattern, fixed on the elastomer layer, the elastomer layer having a hardness of from 10 to 80 according to JIS-A-hardness, said method comprising the steps of:

feeding a sheet to a nip formed by the roll stamper and the nip roll;

feeding a liquid photo-curable resin layer between the sheet and the roll stamper periphery;

curing the liquid photo-curable resin layer while the photo-curable resin layer is in continuous close contact with the periphery of the roll stamper; and

peeling the sheet with the photo-cured resin layer adhered thereto from the roll stamper.

5,480,597

**METHOD FOR BLENDING A GAS INTO A HIGH VISCOSITY LIQUID**

Koichi Ishida; Teruyuki Nakagawa, and Takehiro Watanabe, all of Chiba, Japan, assignors to Dow Corning Toray Silicone Co., Ltd., Tokyo, Japan

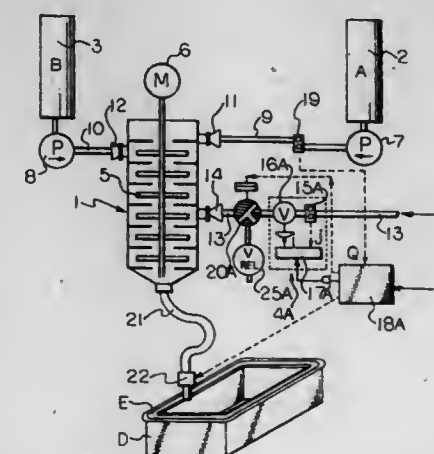
Filed Sep. 22, 1994, Ser. No. 310,603

Claims priority, application Japan, Sep. 28, 1993, 5-241798; Sep. 28, 1993, 5-241800; Jan. 6, 1993, 5-250645

Int. Cl.<sup>6</sup> B29C 44/34

U.S. Cl. 264—40.4

10 Claims



1. A method for preparing and dispensing a foamable composition by blending a pressurized gas with a high viscosity liquid in a mixing chamber to which is connected the outlet of at least one liquid supply line for said liquid, the outlet of a high pressure supply line for the introduction of said gas into said chamber and a nozzle for dispensing said composition from said chamber, wherein said high pressure supply line contains means for regulating the flow of gas in said high pressure supply line to provide a predetermined ratio between the flow rates of said gas and liquid, wherein said means comprise at least one electrically actuated valve that is actuated by a first electrical signal generated by a control element, wherein the presence and duration of said signal is a function of a) a second electrical signal received by said control element, said second signal being a function of the flow rate of said liquid in said liquid supply line and b) a third electrical signal received by said control element that is a function of a predetermined variable which is either the difference between the feed pressures for said gas and said liquid or the ratio between the volumes of said liquid and said gas to be combined in said mixing chamber, and wherein

the flow rate of said gas in said gas supply line is controlled as a function of the flow rate of the high-viscosity liquid in said liquid supply line to obtain a predetermined volume ratio for said gas relative to said liquid, and

the starting time for introduction of said gas into said mixing chamber is adjusted to precede by from 0.1 to one second the starting time for the introduction of said liquid into said mixing chamber.



5,480,598

## PROCESS OF AND APPARATUS FOR MAKING HOLLOW FIBERS

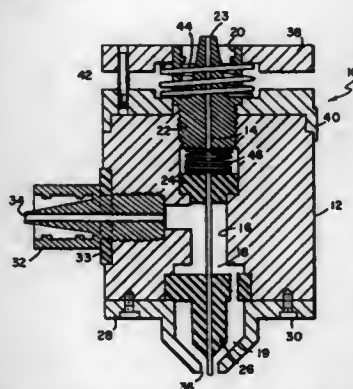
Frank T. Gentile, Warwick; Michael J. Lysaght, East Greenwich, both of R.I., and Nicholas F. Warner, Belmont, Mass., assignors to Brown Univ. Research Foundation, Providence, R.I.

PCT No. PCT/US92/04290, § 371 Date Sep. 17, 1992, § 102(e) Date Sep. 17, 1992, PCT Pub. No. WO92/20843, PCT Pub. Date Nov. 26, 1992

Continuation-in-part of Ser. No. 703,360, May 21, 1991, abandoned. This PCT application May 21, 1992, Ser. No. 927,509 Int. Cl.<sup>6</sup> D01D 5/24; 5/247

U.S. Cl. 264—41

10 Claims



1. A nozzle assembly (10) for use in producing hollow fiber membranes comprising a housing (12), an elongated retractable first tubular means (14) extending through the housing (12), the housing defining a stationary second tubular means concentric with at least a portion of the first tubular means (14) so as to form an annular channel (18) between the two tubular means, said retractable first tubular means (14) being movable during operation of the assembly relative to said second tubular means for retraction and extension within the housing, the first and second tubular means each having input (23, 34) and output ends, the output end of the second tubular means comprising a cap (28) which is detachable from the housing (12) and which enables changing of the orientation of the annular channel (18) relative to the first tubular means (14) by the use of different caps.

9. A method of forming a hollow fiber membrane by extruding of a membrane-forming fluid material around a core material composition through a nozzle assembly having an inner bore for supplying the core material composition comprising the steps of (i) starting the extrusion with the inner bore positioned such that the core material composition and the membrane-forming fluid material do not first meet until they are both exiting the nozzle assembly, (ii) thereafter retracting the inner bore to increase the time during which the two materials are in contact within the nozzle assembly before exiting the nozzle and (iii) forming a hollow fiber membrane.

5,480,599

## METHOD OF MANUFACTURING FOAM BEADS

Thomas Leven, Lüdenscheid; Michael Träger, Haltern, and Horst Perl, Marl, all of Germany, assignors to Huels Aktiengesellschaft, Marl, Germany

Continuation of Ser. No. 35,192, Mar. 22, 1993, abandoned.

This application Aug. 12, 1994, Ser. No. 289,546

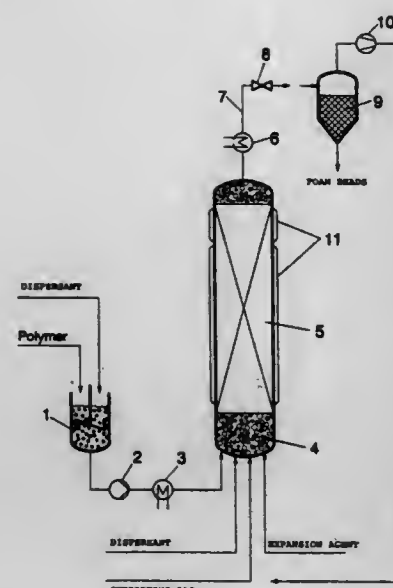
Claims priority, application Germany, Apr. 9, 1992, 42 11 972.3

Int. Cl.<sup>6</sup> C08J 9/228

U.S. Cl. 264—53

19 Claims

1. A method for manufacturing foam polymer beads comprising: i) continuously feeding polymer particles and a dispersing medium into an unstirred mass transfer column having a length to diameter ratio of from 3 to 60 and operating under pressure;



ii) subjecting a dispersion of said polymer particles and said dispersing medium to thermal processing under pressure in said column, said dispersing medium also serving as an expansion agent; and

iii) spraying the formed dispersion into a low pressure space, wherein said dispersion is depressurized, causing expansion of said polymer particles by expansion of said dispersing medium associated with said polymer particles.

5,480,600

## METHOD FOR MANUFACTURING THIN PROGRESSIVE ADDITION LENSES

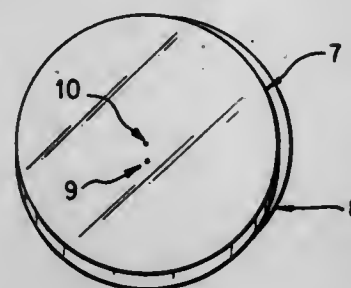
Amitava Gupta, San Marino, Calif., and Ronald D. Blum, Roanoke, Va., assignors to Innotech, Inc., Roanoke, Va.

Filed Mar. 24, 1993, Ser. No. 36,637

Int. Cl.<sup>6</sup> B29D 11/00

U.S. Cl. 264—1.7

13 Claims



1. A method of casting a progressive addition lens from a mold incorporating a spherical portion of concave curvature and an add zone, a preformed lens having a convex curvature correlated with the concave curvature of the mold, and a polymerizable resin, said method comprising the steps of:

placing the resin into a cavity of the mold;

placing the preformed lens into the mold such that a layer of resin spreads out and covers any intervening space between the lens and the mold;

displacing superiorly the optical center of the preformed lens with respect to the geometrical center of the mold to decrease the thickness of said progressive addition lens;

curing the resin layer; and

demolding the finished progressive addition lens.

5,480,601

## METHOD FOR PRODUCING AN ELONGATED SINTERED ARTICLE

Susumu Yamamoto; Teruyuki Mural; Nozomu Kawabe, and Masaaki Tobloka, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 92,861, Jul. 16, 1993, abandoned, which is a continuation of Ser. No. 883,368, May 15, 1992, Pat. No. 5,252,288, which is a continuation of Ser. No. 606,850, Oct. 31, 1990, Pat. No. 5,114,641, which is a continuation of Ser. No. 63,228, Jun. 17, 1987, Pat. No. 5,006,289.

This application Dec. 14, 1994, Ser. No. 355,814

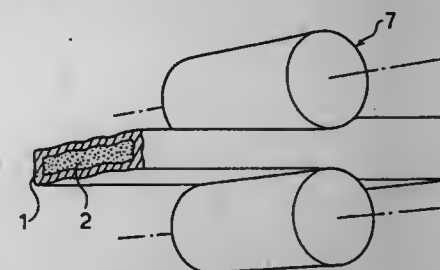
Claims priority, application Japan, Jun. 17, 1986, 61-141566; Aug. 13, 1986, 61-190891; Sep. 10, 1986, 61-214487; Jan. 17, 1986, 61-246937; Dec. 5, 1986, 61-291216; Dec. 26, 1986, 61-312958; Jan. 9, 1987, 62-3060

The portion of the term of this patent subsequent to Apr. 19, 2008, has been disclaimed.

Int. Cl.<sup>6</sup> C04B 33/34

U.S. Cl. 264—61

29 Claims



1. Method for producing an elongated sintered article, characterized by the steps including filling powder material in a pipe, carrying out plastic deformation of the pipe filled with the powder material, said plastic deformation being performed by at least one of: wire-drawing and rolling, and heating the pipe filled with the powder material to burn and/or sinter the powder material, wherein the powder material is a powder material of ceramics and the pipe is a metal pipe.

5,480,602

## EXTRUDED PARTICLE BOARD

Laxmi Nagaich, 6592 Hawthorne St., Worthington, Ohio 43085

Filed Jun. 17, 1994, Ser. No. 261,969

Int. Cl.<sup>6</sup> C08J 1/02; B29C 47/00

U.S. Cl. 264—122

14 Claims

12. A method for extruding particle board comprising the steps of:

a) mixing at least 50% by weight of lignocellulosic particles finer than approximately 40 mesh with extrudable plastic; and,

b) blending therein approximately 3% by weight of a coupling agent, said coupling agent comprising a polyurethane coupling agent, resulting in an extrudable mixture; and,

c) extruding said mixture at a temperature of approximately 260 degrees Fahrenheit.

5,480,603

## METHOD FOR PREPARING PREFORMS FOR MOLDING PROCESSES

Leonardo C. Lopez, and Ronald R. Pelletier, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 19, 1994, Ser. No. 246,020

Int. Cl.<sup>6</sup> B29C 70/40

U.S. Cl. 264—131

20 Claims

1. A method for preparing preforms which comprises (1) coating one or more reinforcement fibers with an aqueous dispersion of a

tackifier, (2) drying the coated reinforcement fibers at a temperature and for a time sufficient to remove the water present and to partially, but not completely, melt the tackifier and (3) forming the coated reinforcement fibers into a preform.

5,480,604

## MOLDED SEAM FOR PAPERMAKERS FABRIC AND METHOD

C. Barry Johnson, Summerville, and Rachel H. Kramer, Charleston, both of S.C., assignors to Asten, Inc., Charleston, S.C.

Filed Jan. 23, 1991, Ser. No. 644,455

Int. Cl.<sup>6</sup> B29C 45/00; B29D 5/00

U.S. Cl. 264—138

11 Claims



1. A method for making papermakers fabric comprising: providing a fabric having opposing ends and a body of selected caliper and permeability;

preparing said opposing fabric ends for molding including cutting said fabric to a selected length based upon a given set of machine requirements for papermaking equipment on which said fabric is to be used;

providing at least one selectively configured mold; and

plastic injection molding a seam component on each prepared end of said fabric using said mold whereby mating engagement of said respective seam components with each other renders said fabric endless and defines a seam having a caliper substantially equal to said caliper of said fabric body.

5,480,605

## METHOD AND APPARATUS FOR MANUFACTURING COIN POUCH

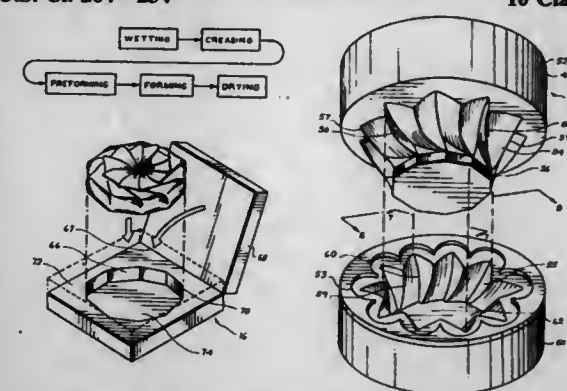
Peter L. Skaalen, Jr., Hartford; Thomas W. Papez, and Roy A. Scheunemann, both of West Bend, all of Wis., assignors to Amity Leather Products Company, West Bend, Wis.

Filed Apr. 18, 1994, Ser. No. 228,698

Int. Cl.<sup>6</sup> B68F 1/00; B29C 69/00; C14B 1/00

U.S. Cl. 264—234

10 Claims



5. A method for manufacturing a coin pouch from a leather assembly comprising a substantially flat, flexible leather cover laminated to a substantially flat, more rigid centerpiece, said method comprising the following steps:

wetting said leather assembly;

creasing said leather assembly into a creased leather assembly;

preforming said creased leather assembly wherein said preforming is accomplished by a generally frusto-conical preforming die having male and female members which are pressed together to bring said creased leather assembly into a configuration facilitating manual manipulation of said leather assembly into a spirally closing pouch;

forming said creased leather assembly into a foldedly raised formed leather assembly with spiral closure; and



drying said formed leather assembly.

5,480,606

# METHOD AND APPARATUS FOR REVERSE GATED COMPRESSION MOLDING OF THERMOPLASTIC MATERIAL

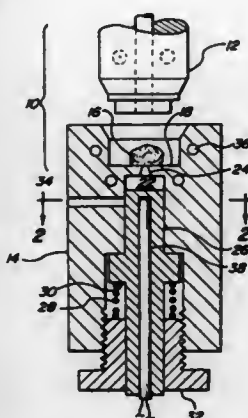
Randall K. Julian, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Dec. 7, 1994, Ser. No. 351,504

Int. Cl.<sup>6</sup> B29C 43/36; 45/34; 45/56

U.S. Cl. 264—328.7

12 Claims



1. A method of compression molding a part with thermoplastic material comprising the following steps:

- providing a core block;
- providing a cavity block with a cavity arranged to form a part when the core block is pressed into the cavity block;
- providing a pressure chamber in communication with the cavity through a gate orifice;
- introducing a charge of thermoplastic material to the cavity in excess of the amount material to form the part;
- pressing the core block into the cavity block, forming the part while allowing excess material to pass from the cavity through the gate into the pressure chamber;
- venting excess material from the pressure chamber;
- cooling the cavity block, allowing the part to cure and solidify;
- maintaining pressure in said pressure chamber to cause a flow of material from the pressure chamber through the gate orifice into the cavity as the material in the cavity shrinks as the material is being cooled;
- closing the gate orifice;
- separating the core block from the cavity block;
- removing the molded part from the cavity.

5,480,607

# METHOD AND APPARATUS FOR MOLDING PLASTIC PRODUCTS WITH FLASH REMOVED

Gerald R. Hobson, 21721 Walnut St., Shell Rock, Iowa 50670  
Continuation-in-part of Ser. No. 35,300, Mar. 22, 1993, abandoned. This application Mar. 16, 1994, Ser. No. 214,827

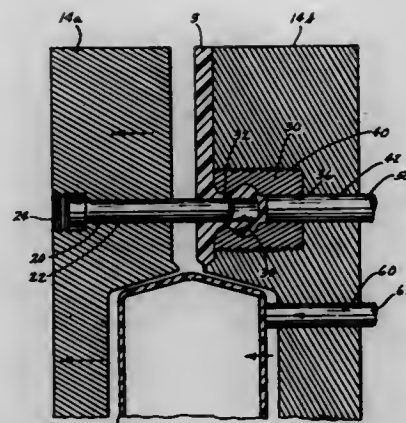
Int. Cl.<sup>6</sup> B29C 37/02; 49/50

U.S. Cl. 264—536

19 Claims

15. In a method for molding plastic products wherein flash is formed when the plastic product is molded, the improvement comprising the steps of:

- placing a hollow plastic parison between a first and a second mold section;
- moving said first and second mold sections together to form a plastic product having flash disposed substantially completely around the periphery thereof;
- securing the plastic flash to one section of the mold;



- removing one of the plastic product and the flash from the mold sections while leaving the other in the mold sections whereby the flash is removed from the plastic product; and
- removing the other one of the plastic product and the flash from the first and second mold sections whereby the mold sections are ready to receive a new plastic parison for forming another plastic product.

5,480,608

# FERRITIC STAINLESS STEEL HAVING AN EXCELLENT OXIDATION RESISTANCE

Masaomi Tsuda, Chuo; Yoshito Fujiwara; Yuji Ikegami, both of Kawasaki; Masao Sato, Tokyo, and Hiroyuki Fujii, Kawasaki, all of Japan, assignors to Nippon Yakin Kogyo Co., Ltd., Tokyo, Japan

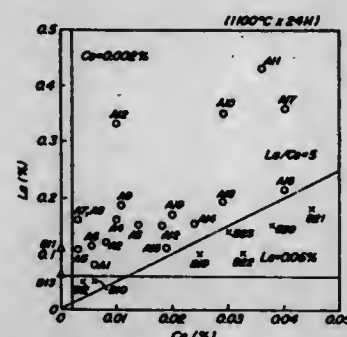
PCT No. PCT/JP93/00326, § 371 Date Dec. 13, 1994, § 102(e)  
Date Dec. 13, 1994, PCT Pub. No. WO94/21836, PCT Pub. Date Sep. 29, 1994

PCT Filed Mar. 19, 1993, Ser. No. 338,447

Int. Cl.<sup>6</sup> C22C 38/06; 38/28

U.S. Cl. 420—40

4 Claims



1. A ferritic stainless steel having an excellent oxidation resistance, comprising C: not more than 0.030 wt %, Si: not more than 1.0 wt %, Mn: not more than 1.0 wt %, Ni: not more than 0.5 wt %, Cr: 15–25 wt %, Al: 3.5–15.0 wt %, Ti: 0.010–0.30 wt %, N: not more than 0.030 wt %, P: not more than 0.020 wt %, S: not more than 0.0050 wt %, O: not more than 10 ppm, and containing 0.001–0.20 wt % of one or more of Ca, Mg and Ba as [Ca]+[Mg]+½[Ba], La: 0.06–0.5 wt % and Ce: 0.002–0.050 wt %, provided that these elements satisfy relations of the following equations (1)–(3):

$$[S] \leq [Ca] + [Mg] + \frac{1}{2}[Ba] \quad (1)$$

$$[La]/[Ce] \geq 5 \quad (2)$$

$$Ti \geq 48/12[C] + 48/14[N] \quad (3)$$

and the remainder being Fe and inevitable impurities.

5,480,609

# AUSTENITIC STAINLESS STEEL WITH HIGH RESISTANCE TO CORROSION BY CHLORIDE AND SULPHURIC MEDIA AND USES

François Dupolron, Le Creusot; Jean-Christophe Gagnepain, Lyons, and Michel Verneau, Le Creusot, all of France, assignors to Creusot-Loire Industrie, Puteaux, France

Filed May 27, 1994, Ser. No. 250,687

Claims priority, application France, May 28, 1993, 93 06468  
Int. Cl.<sup>6</sup> C22C 38/44; 38/42; 30/00

U.S. Cl. 420—45

6 Claims

1. An austenitic stainless steel with high mechanical strength and corrosion resistance comprising iron, and, by weight:

- 20% ≤ Cr ≤ 30%
- 25% ≤ Ni ≤ 32%
- 6% ≤ Mo ≤ 7%
- 0.35% ≤ N ≤ 0.8%
- 0.5% ≤ Mn ≤ 5.4%
- C ≤ 0.06%
- Si ≤ 1%
- optionally 0.5% ≤ Cu ≤ 3%
- optionally 0.001% ≤ Nb ≤ 0.3%
- optionally 0.001% ≤ V ≤ 0.3%
- optionally 0.001% ≤ Al ≤ 0.1%
- optionally 0.0001% ≤ B ≤ 0.003%

and impurities resulting from production and having a PREN = % Cr + 3.3 (% Mo) + 16 (% N) ≥ 50.

5,480,610

# PROCESS AND APPARATUS FOR THE DISINFECTION OF WASTE

Michaela Birkholz; Stefan Drauscke, and Gerhard Hörber, all of Berlin, Germany, assignors to Krankenhausesorgungsgesellschaft mbH, Berlin, Germany

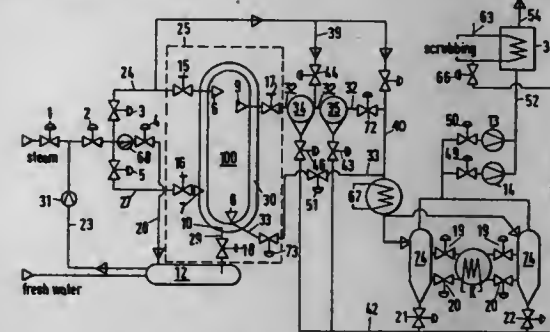
Filed Feb. 11, 1993, Ser. No. 15,197

Claims priority, application Germany, Feb. 14, 1992, 42 04 444.8

Int. Cl.<sup>6</sup> A61L 2/06; 2/26

U.S. Cl. 422—26

30 Claims



1. In a process for the disinfection of waste by a fractional vacuum-steam process with at least one of a plurality of atmospheric pressure steam phases and a final superatmospheric steam phase with an evacuation following any such steam phase in an autoclave, the autoclave having upper and lower regions, including providing a load of waste to be disinfected and an autoclave, loading the waste into the autoclave, introducing steam into the autoclave at atmospheric pressure a plurality of times, evacuating the autoclave after each steam introduction step, and charging the autoclave with saturated steam at superatmospheric pressure during a final steam introduction step and maintaining the steam pressure until the autoclave is disinfected, wherein the improvement comprises: in the evacuation following an atmospheric pressure steam phase, removing by suction the atmosphere from an upper region of the autoclave; eliminating micro-organisms from the removed atmosphere, wherein the elimination of the micro-organisms is effected by apparatus connected to the autoclave and subjected to the same conditions as the autoclave; condensing and separating the steam fraction from the remaining gaseous fraction

as a liquid fraction having approximately ambient temperature, eliminating odorous substances from the gaseous fractions and discharging the gaseous fractions to the environment; in the evacuation following a superatmospheric pressure steam phase, eliminating, from the lower region of the autoclave, the condensate which is collected there and feeding it to waste water at approximately ambient temperature, and then removing the atmosphere in the autoclave by suction, from one of the lower region and upper region of the autoclave and eliminating from the atmosphere, so removed, the odorous substances prior to discharge of the atmosphere into the environment.

5,480,611

# CARBON DIOXIDE DETECTOR

Andrew Mills, 49, Gwydr Crescent, Uplands, Swansea, West Glamorgan SA2 0AB, and Qing Chang, Singleton Park, Swansea, West Glamorgan SA2 8PP, both of, United Kingdom

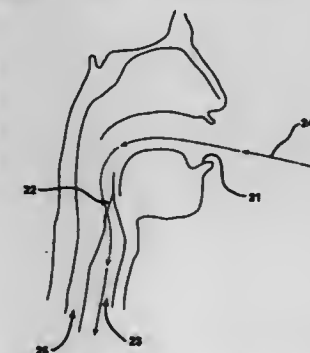
PCT No. PCT/GB93/00049, § 371 Date Sep. 28, 1994, § 102(e)  
Date Sep. 28, 1994, PCT Pub. No. WO93/14399, PCT Pub. Date Jul. 22, 1993

PCT Filed Jan. 11, 1993, Ser. No. 256,468

Int. Cl.<sup>6</sup> G01N 22/00

U.S. Cl. 422—55

14 Claims



1. A carbon dioxide detector which comprises an indicating member comprising an intimate mixture of a polymer vehicle and a carbon dioxide sensing medium comprising an anionic fluorimetric dye and a lipophilic organic quaternary cation.

5,480,612

# KIT FOR DETECTING EXPLOSIVES

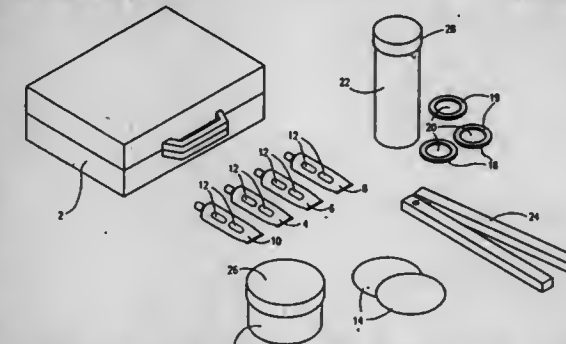
Yair Margalit, Rehovot, Israel, assignor to The State of Israel represented by the Prime Minister's Office, Israel Institute For Biological Research, Ness Ziona, Israel

Continuation of Ser. No. 939,828, Sep. 3, 1992, Pat. No. 5,296,380. This application Aug. 12, 1993, Ser. No. 105,714

Int. Cl.<sup>6</sup> G01N 37/00

U.S. Cl. 422—61

24 Claims



1. In a test kit for detecting explosives, which kit contains reagents for detecting inorganic nitrates, chlorates and bromates, and reagents for detecting explosive substances selected from



nitroaromatics, organic nitrates and nitramines, the improvement which comprises incorporating in said test kit at least one of the following two items:

- an inorganic nitrate detecting reagent which comprises an admixture of zinc powder with liquid comprising at least one water-miscible organic solvent and which on shaking gives a suspension of said zinc powder therein, wherein said admixture is contained in dispensing means; and
- a chlorate or bromate detecting reagent which comprises an aniline salt in a homogeneous acidic solution including at least one water-miscible organic solvent, wherein said acidic solution is contained in dispensing means.

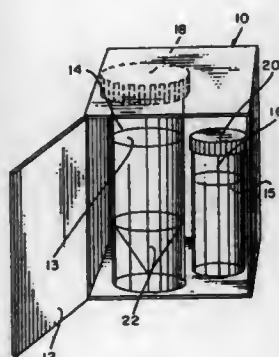
5,480,613

# APPARATUS KIT FOR DETECTING DIENTAMOEBIA FRAGILIS

Neil H. Riordan, 7715 E. 32nd N., Wichita, Kans. 67226  
Division of Ser. No. 964,874, Oct. 22, 1992, Pat. No. 5,334,509.  
This application May 9, 1994, Ser. No. 239,731  
Int. Cl.<sup>6</sup> G01N 37/00; 33/48; C12Q 1/04

U.S. Cl. 422-61

10 Claims



1. An apparatus kit for detecting *Dientamoeba fragilis* in a sample including feces or intestinal mucosa, comprising:

- a centrifugable sample vessel for holding said sample and having therein at least a quantity of isotonic solution, said vessel presenting converging sidewalls defining a region having sediment containing *Dientamoeba fragilis* and residual material derived from centrifugation of said sample therein;
- a quantity of a staining agent means comprising an acridine compound for contacting and staining said sediment in said sample vessel, said quantity of staining agent means in said kit being present in a container selected from the group consisting of said sample vessel and a staining agent vessel separate from said sample vessel,
- said sample vessel having a sufficient volume to simultaneously accommodate said isotonic solution, said staining agent means and said sediment therein,
- said quantity of staining agent means causing said *Dientamoeba fragilis* in said sediment to stain a first color and said residual material of the sediment to stain a second color; and
- means for viewing a portion of said stained sediment through a fluorescent microscope for detecting said first color as an indication of the presence of the *Dientamoeba fragilis* in said sample.

5,480,614

# MICRO-REACTOR DEVICE FOR MINUTE SAMPLE ANALYSIS

Masao Kamahori, Saitama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

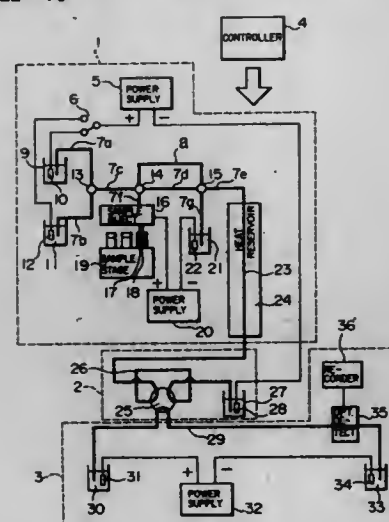
Filed Mar. 16, 1994, Ser. No. 213,526

Claims priority, application Japan, Mar. 16, 1993, 5-055327

Int. Cl.<sup>6</sup> G01N 27/30; 27/447

U.S. Cl. 422-70

11 Claims



1. A micro-reactor device for causing a reaction between a sample and a reagent, said device comprising:

- a sample reservoir for holding a sample;
- a reagent reservoir for holding a reagent;
- a first waste reservoir for holding a first waste solution;
- a second waste reservoir for holding a second waste solution;
- means defining a first passage connecting said reagent reservoir and said first waste reservoir;
- a first passage switch in said first passage, for controlling flow therethrough;
- a second passage switch in said first passage, intermediate said first passage switch and said first waste reservoir, for controlling flow therethrough;
- means defining a second passage connecting said sample reservoir and said first passage at a first junction intermediate said first and second passage switches;
- a third passage switch in said second passage, for controlling flow therethrough;
- means defining a third passage connecting said second waste reservoir and said first passage at a second junction intermediate said first and second passage switches;
- a fourth passage switch in said third passage, for controlling flow therethrough;
- generating means for applying a voltage to said passage to cause electroosmotic flow of fluids in said passages; and
- a controller for controlling said passage switches and said generating means, to cause electroosmotic flow of reagent in said first passage followed by electroosmotic flow of a predetermined volume of sample in said first sample passage between the first junction and the second junction and then electroosmotic flow of reagent in said first passage.

5,480,615

# GERMICIDE DIFFUSER

Jeanette Curry, 945 E. 27th St., Paterson, N.J. 07513

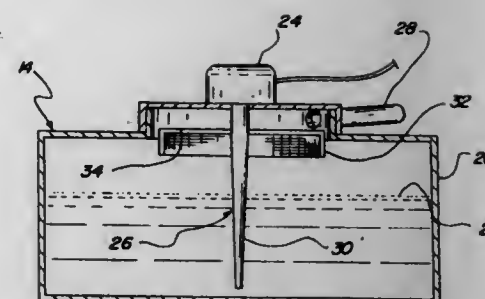
Filed Dec. 12, 1994, Ser. No. 354,375

Int. Cl.<sup>6</sup> A61L 9/03

U.S. Cl. 422-124

5 Claims

1. A germicide diffuser comprising:
- a housing positionable within a room to be disinfected;
  - a vapor generating means mounted within the housing for mechanically atomizing a fluid germicide, the vapor generat-



ing means comprising a fluid reservoir within which a germicidal fluid is positionable, a motor mounted to a top end of the fluid reservoir, a centrifugal atomizer coupled to the motor and extending into the fluid reservoir, and a vapor conduit extending from an upper extent of the fluid reservoir to a remote location to thus permit exiting of atomized fluid germicide;

- a blower means in fluid communication with the vapor generating means for diluting and heating a fluid vapor generated by the vapor generating means; and
- a diffuser means mounted to an exterior of the housing and fluidly communicating with the blower means for distributing diluted and heated vapor.

5,480,616

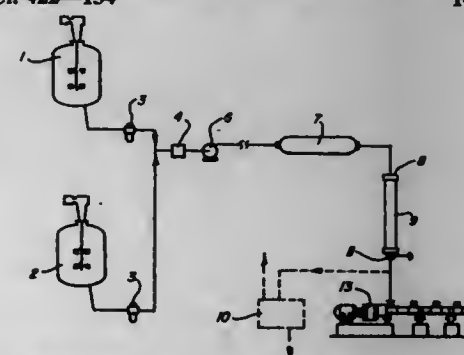
# POLYCONDENSATION APPARATUS

Joel A. Richardson, Naperville; Wassily Poppe, Lombard; Benjamin A. Bolton, and Edward E. Paschke, both of Wheaton, Ill., assignors to Amoco Corporation, Chicago, Ill.  
Continuation of Ser. No. 970,577, Nov. 3, 1992, abandoned, which is a continuation of Ser. No. 651,475, Feb. 6, 1991, abandoned, which is a continuation of Ser. No. 350,147, May 10, 1989, abandoned, which is a division of Ser. No. 47,905, May 7, 1987, Pat. No. 4,831,108, which is a continuation of Ser. No. 715,609, Mar. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 640,672, Aug. 13, 1984, abandoned, which is a continuation of Ser. No. 466,904, Feb. 16, 1983, abandoned. This application Jul. 26, 1994, Ser. No. 280,702

Int. Cl.<sup>6</sup> C08F 2/00; B01J 8/04

U.S. Cl. 422-134

14 Claims



1. An apparatus for preparing a condensation polymer, said apparatus comprising:

- mixing means for mixing reactants to form a feed mixture;
- pressurizing means connected to said mixing means for pressurizing said feed mixture;
- heating means for receiving said pressurized feed mixture from said pressurizing means and heating said mixture;
- at least one reactor connected to said heating means, said reactor comprising means for heating said reactor to temperatures of about 400° F. to about 1000° F. and designed to maintain turbulent flow of a dispersion of particles of liquid or solid in a continuous vapor phase;
- means for forming a dispersion of particles of liquid or solid in a continuous vapor phase from said heated feed mixture, said means located at an entrance to said reactor;

throttling means located at an exit from said reactor to control the pressure in said reactor; and  
finishing means connected to the exit from the reactor to post-polymerize a reactor product.

5,480,617

# APPARATUS FOR CONTINUOUS FLUIDISED BED AGGLOMERATION

Hans Uhlemann, Solingen; Josef Schmoll, Goslar, and Manfred Bücheler, Overath, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

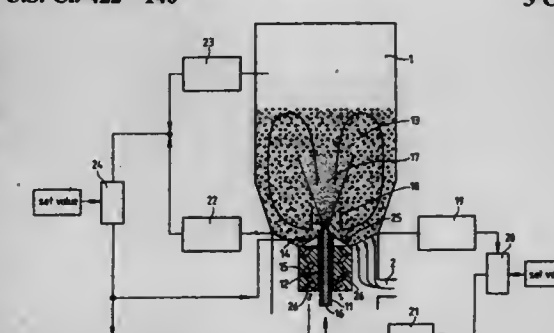
Filed Feb. 8, 1994, Ser. No. 193,836

Claims priority, application Germany, Feb. 15, 1993, 43 04 405.0

Int. Cl.<sup>6</sup> B01J 2/02; 8/22

U.S. Cl. 422-140

3 Claims



1. Apparatus for the continuous fluidised bed agglomeration of a solid in powder form, comprising a fluidised bed granulator with a gas distributor, a three-phase nozzle for spraying a solid in powder form to be agglomerated as one phase, a granulating liquid as a second phase, and propellant air as a third phase, and feed lines for supplying the solid, the granulating liquid and the propellant air to said three-phase nozzle, and a gas classifier at the bottom of said fluidised bed granulator for the classifying discharge of finished granular material, wherein said three-phase nozzle for spraying a three-phase mixture of solid, granulating liquid and propellant air is arranged axially in the bottom center of the fluidised bed granulator and said gas distributor is located concentrically to said three-phase nozzle.

5,480,618

# GAS GENERATOR ARRANGEMENT

Staffan Calsson, and Torsten Persson, both of Karlskoga, Sweden, assignors to Autoliv Development AB, Värmdö, Sweden

PCT No. PCT/SE93/00613, § 371 Date Apr. 13, 1994, § 102(e) Date Apr. 13, 1994, PCT Pub. No. WO94/01307; PCT Pub. Date Jan. 20, 1994

PCT Filed Jul. 6, 1993, Ser. No. 204,161

Claims priority, application Sweden, Jul. 6, 1992; 9202078

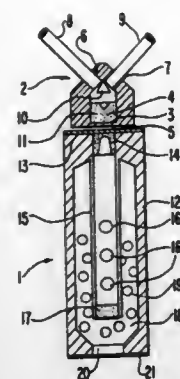
Int. Cl.<sup>6</sup> B60R 21/16

U.S. Cl. 422-164

21 Claims

1. A gas generator apparatus for generating gas for inflating a motor vehicle airbag, comprising:
- an ignition device including a first housing, a first pyrotechnic charge disposed in said first housing, a plurality of shock tubes connected to said first housing and a non-return valve mechanism cooperating with each shock tube for preventing a shock transmitted to the first housing by one of the shock tubes from being transferred to another of the shock tubes;
  - a gas generator including a second housing having an opening, a sealing membrane covering the opening for hermetically sealing the second housing and being located adjacent to the first pyrotechnic charge in the first housing, a second pyrotechnic charge located in the second housing adjacent to said membrane, and a gas generating pyrotechnic material arranged in





said second housing to be responsive to a combustion of the second pyrotechnic charge;  
wherein a combustion of the first pyrotechnic charge initiates a combustion of the second pyrotechnic charge through said membrane which in turn initiates combustion of the gas generating pyrotechnic material.

5,480,619

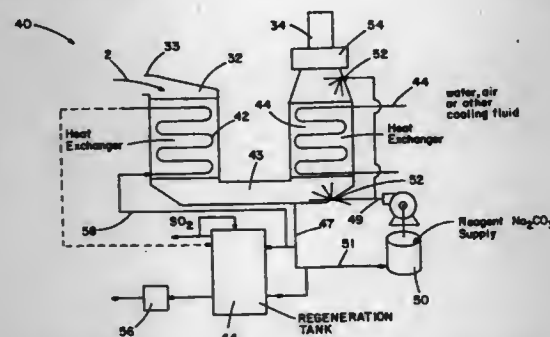
# REGENERATIVE SCRUBBER APPLICATION WITH CONDENSING HEAT EXCHANGER

Dennis W. Johnson, Barberton, and Pervaje A. Bhat, North Canton, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jun. 28, 1994, Ser. No. 267,263  
Int. Cl.<sup>6</sup> B01D 53/18

U.S. Cl. 422-168

3 Claims



1. A system for removing SO<sub>2</sub> from a flue gas comprising:  
a housing having an inlet and an outlet for channeling the flue gas into and out of the housing;  
first heat exchanger means in the housing near the inlet for contacting a downward flow of the flue gas in order to cool the flue gas to a temperature above a dew point of the flue gas, the first heat exchanger means having a first cooling fluid passing therethrough;  
second heat exchanger means in the housing near the outlet for contacting an upward flow of the flue gas in order to further cool the flue gas, the second-heat exchanger means having a second cooling fluid passing therethrough;  
a transition section between the first and second heat exchanger means for channeling the flue gas from the first heat exchanger means to the second heat exchanger means;  
reagent scrubbing means for spraying a scrubbing solution as the flue gas enters and exits the second heat exchanger means to remove SO<sub>2</sub> from the flue gas with a reagent in order to form reaction products;  
regeneration means connected to the transition section for regenerating the reagent from the reaction products for use in the reagent scrubbing means and for recovering the SO<sub>2</sub> from the reaction product; and  
means for supplying an effluent stream which includes excess reagent and reaction products to the first heat exchanger means as the first cooling fluid and then to the regeneration

means, the first cooling fluid being heated by the flue gas to supply heat to the regeneration means.

5,480,620

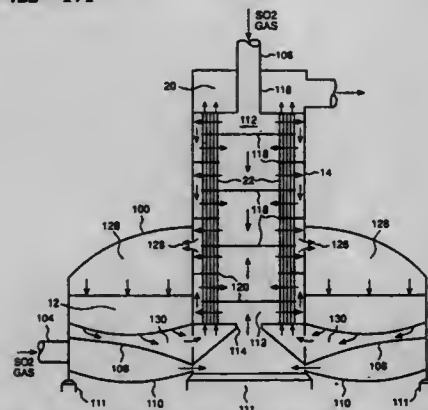
# CATALYTIC CONVERTER

Gordon M. Cameron, 40 Wellesbourne Crescent, Willowdale, Ontario, Canada

Filed Aug. 17, 1994, Ser. No. 291,819  
Int. Cl.<sup>6</sup> B01D 50/00

U.S. Cl. 422-171

5 Claims



1. A converter comprising: an exterior shell of a heat resistant weldable metal; foundation means from which said shell vertically extends; an interior tube of said metal vertically disposed within said shell and defining a passage; said interior tube having  
i. a first inlet aperture through which said passage receives a first portion of a sulfur dioxide-containing gas from a source of sulfur dioxide-containing gas;  
ii. a second inlet aperture through which said passage receives a second portion of said sulfur dioxide-containing gas; and  
iii. an outlet aperture;  
at least one catalyst bed including an annular bed extending fully between said shell and said interior tube for converting said sulfur dioxide-containing gas to sulfur trioxide-containing gas; wherein said annular bed is in direct gaseous communication within said shell with said passage through said outlet aperture; a plurality of axial heat exchange tubes within said interior tube for conducting heated sulfur trioxide-containing gas from said catalyst bed though said heat exchange tubes to effect heat transfer with and to heat said first and second portions of said sulfur dioxide-containing gas and to cool said heated sulfur-trioxide containing gas, means for directing said heated sulfur trioxide-containing gas from said catalyst bed to said heat exchange tubes; and means for directing said heated first and second portions of said sulfur-dioxide containing gas through said outlet aperture to said annular bed.

5,480,621

# ELECTRICALLY CONDUCTIVE HONEYCOMB AS AN EXHAUST GAS CATALYST CARRIER BODY

Hans-Jürgen Breuer, Overath; Theodor Cyron, Bergisch Gladbach; Wolfgang Maus, Bergisch Gladbach; Helmut Swars, Bergisch Gladbach, and Ludwig Wieres, Overath, all of, Germany, assignors to Emitec Gesellschaft fuer Emissionstechnologie mbH, Lohmar, Germany

Division of Ser. No. 604,199, Oct. 25, 1990, Pat. No. 5,322,672.  
This application Apr. 27, 1993, Ser. No. 54,348

Claims priority, application Germany, Apr. 25, 1988, 38 13 928.6

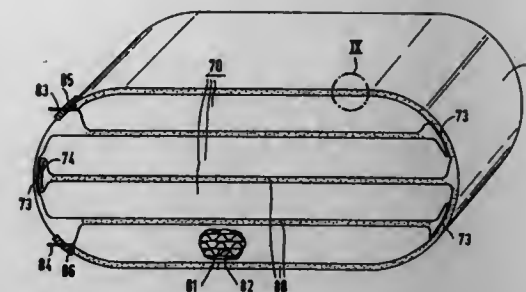
The portion of the term of this patent subsequent to Jun. 21, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B01D 53/92; F01N 3/10; 3/28

U.S. Cl. 422-174

33 Claims

10. A carrier body for exhaust gas catalysts, comprising sheet-metal layers being at least partially structured and high-



temperature corrosion-proof metallic structures, said metallic structures forming a multiplicity of channels through which a fluid can flow in a general axial direction and defining catalytically active surfaces in said channels, means disposed in said metallic structures for electrically dividing the carrier body cross-sectionally and forming at least one electric current path through said metallic structures, such that the carrier body has an electric resistance of between substantially 0.03 and substantially 2  $\Omega$ , wherein said means divide the carrier body into zones being at least partly insulated from one another, said zones forming groups, and including electrical connecting bridges for electrically connecting said groups in series.

5,480,622

# ELECTRICALLY HEATABLE CATALYST DEVICE USING ELECTRICALLY CONDUCTIVE NON-METALLIC MATERIALS

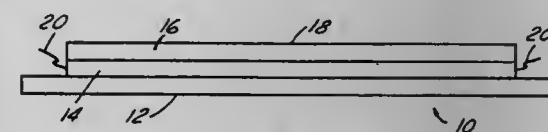
Chaitanya K. Narula, Ann Arbor; Jacobus H. Visser, Southfield, and Andrew A. Adamczyk, Jr., Dearborn, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 5, 1994, Ser. No. 270,617

Int. Cl.<sup>6</sup> F01N 3/10

U.S. Cl. 422-174

9 Claims



1. An electrically heatable catalyst device comprising:  
an electrically insulating substrate;  
a layer of an electrically conductive material selected from the group consisting of fluorine-doped tin oxide and tin oxide-doped indium oxide applied over a surface of the substrate;  
a washcoat carried on a surface of the electrically conductive material layer; and  
a catalyst carried on a surface of the washcoat.

5,480,623

# NON-RECIRCULATING COLLECTION SYSTEM FOR STERILIZER EFFLUENT

Robert H. Rotolo, Rochester, N.Y.; Charles B. Swenson, Palos Verdes, Calif., and Dale R. Fine, Rochester, N.Y., assignors to MDT Corporation, Torrance, Calif.

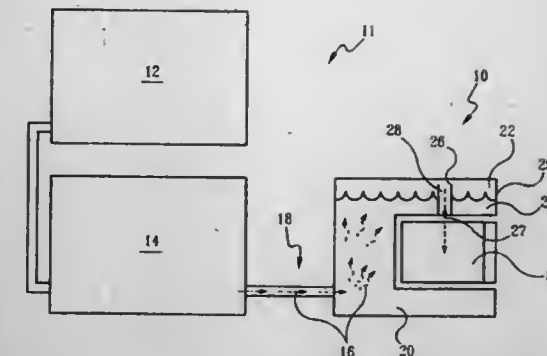
Filed Nov. 5, 1993, Ser. No. 148,465

Int. Cl.<sup>6</sup> A61L 2/20

U.S. Cl. 422-295

8 Claims

1. In a table top sterilizer system in which sterilant is introduced to a sterilization chamber, is withdrawn from said chamber in the vapor state and is introduced as vapor to a pool of liquid coolant comprising liquid sterilant, the improvement which comprises:  
a tank for said liquid coolant remote from said sterilization chamber, said tank including:



an interior volume configured to provide a vertical travel path upward through liquid contained by said volume from an inlet near the bottom of said tank to an outlet near the top of said tank;  
a fixture associated with said inlet constructed and arranged to receive vapor; and  
means associated with said outlet for directing liquid displaced from said tank to a disposal target;  
vapor transfer structure positioned to deliver vapor from said chamber to said inlet; and  
liquid receiving means, associated with said disposal target, constructed and arranged to receive liquid displaced from said tank.

5,480,624

METHOD FOR PURIFICATION OF WASTE GASES  
Reijo Kuivalainen, San Diego, Calif., assignor, to A. Ahlstrom Corporation, Noormarkku, Finland  
PCT No. PCT/FI91/00260, § 371 Date Mar. 8, 1994, § 102(e) Date Mar. 8, 1994, PCT Pub. No. WO93/03824, PCT Pub. Date Mar. 4, 1993

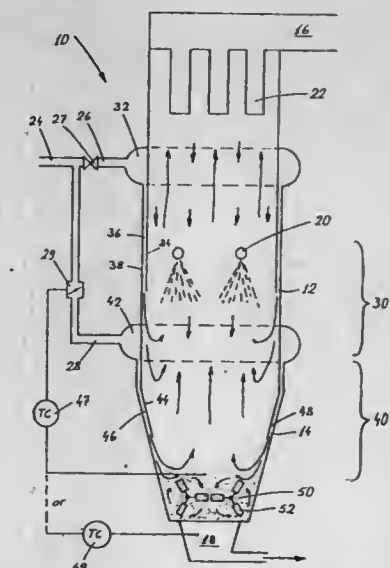
PCT Filed Aug. 22, 1991, Ser. No. 196,134

The portion of the term of this patent subsequent to May 10, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B01D 53/14; 53/50; 53/68; 53/74

U.S. Cl. 423-210

20 Claims



1. A method of purifying gases produced during combustion, gasification, or chemical processes, the gases including pollutants including sulphur oxides, chlorine compounds or fluorine compounds, utilizing a wetting reactor having a drying zone in a lower section thereof, and a wetting zone above the drying zone, comprising the steps of:



- (a) either during or after the combustion, gasification, or chemical process, adding to the gases at least one of a reagent and an absorbent capable of chemically reacting with or extracting at least one pollutant in the gases;
- (b) introducing the gases into the drying zone of the wetting reactor, and then causing the gases to pass into the wetting zone to wet the gases, reagent and absorbent with water in order to activate the reagent or absorbent;
- (c) separating completely or partially reacted reagent and absorbent, and other particles, from the gases prior to discharging the gases from the wetting reactor;
- (d) after step a), discharging the gases from the wetting reactor; and
- (e) maintaining a dry layer of particles separated from the gases below the inlet of the gases into the lower section of the wetting reactor, in the layer homogenizing the particles being homogenized and any water droplets falling from the wetting reactor wetting zone.

5,480,625

# ENHANCING CARBON DIOXIDE SORPTION RATES USING HYGROSCOPIC ADDITIVES

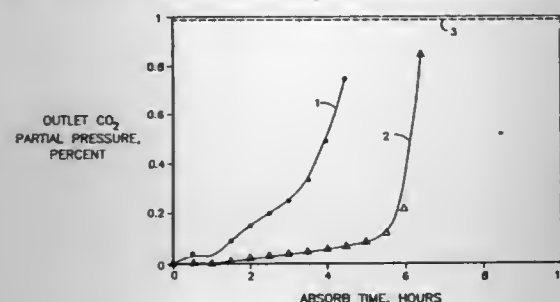
Timothy A. Nalette, Tolland, and Philip J. Birbara, Windsor Locks, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 840,228, Feb. 24, 1992, Pat. No. 5,214,019. This application Sep. 8, 1992, Ser. No. 941,826

Int. Cl.<sup>6</sup> C01B 31/20; 5/00; B01D 53/14

U.S. Cl. 423—230

5 Claims



1. A method for removing carbon dioxide from the atmosphere in a closed human habitable environment comprising the steps of: passing a stream of the atmosphere containing carbon dioxide through a reactor containing a carbon dioxide sorbent; contacting the sorbent with the stream to absorb carbon dioxide to onto said sorbent, thereby removing said carbon dioxide from the stream, wherein the sorbent comprises:

- a metal oxide;
- an alkali metal carbonate; and
- hygroscopic alkali fluoride;

wherein said sorbent removes carbon dioxide from the gaseous stream including removal at relative humidities below about 25%.

## METHOD FOR PRODUCING SPHERICAL GRANULATED MATERIALS FROM POWERED SOLIDS AND GRANULATED MATERIALS PRODUCED THEREBY

Claas-Jürgen Klasen, Rodenbach; Martin Foerster, Büdingen; Andreas Höfler, Alzenau; Klaus-Peter Bauer, Malotal; Herbert Riemenschneider, Gelnhausen; Oliver Franta, Frankfurt, and Rainer Gilg, Gründau, all of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Germany

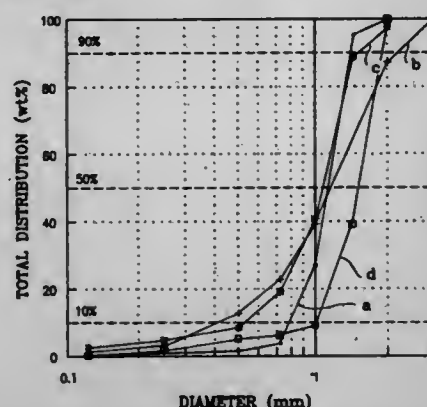
Filed Nov. 15, 1993, Ser. No. 151,994

Claims priority, application Germany, Nov. 14, 1992, 42 38 495.8; Jan. 27, 1993, 43 36 548.5

Int. Cl.<sup>6</sup> C09C 1/58; B29B 9/08

U.S. Cl. 423—449.1

23 Claims



15. A spherical granulated material comprising powdered solids selected from the group consisting of rubber carbon blacks, pigment carbon blacks, and conductivity carbon blacks, produced by a method comprising adding a moistening agent and optionally an additive to powdered solids in a mixer, uniformly moistening said solids, mixing and pressing said solids into cylindrical strands with a ring collar mill that has a variable slip between ring matrix and press roller, and shaping to form said spherical granulated material, wherein said ring collar mill has press channels with a length-to-diameter ratio of 1:1 to 10:1 and a roller gap between ring matrix and press roller of 0.05 to 2 mm, wherein said powdered solids are selected from the group consisting of rubber carbon black, pigment carbon blacks, and conductivity carbon blacks.

5,480,627

## METHOD FOR TREATING SUBSTRATE FOR ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER AND METHOD FOR MAKING ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

Tetsuya Takai; Hirokazu Ohtoshi, both of Nagahama; Ryuji Okamura; Hiroyuki Katagiri, both of Shiga, and Yasuyoshi Takai, Nagahama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 841,989, Feb. 26, 1992, Pat. No. 5,314,780. This application Feb. 23, 1994, Ser. No. 200,651

Claims priority, application Japan, Feb. 28, 1991, 3-55598; May 30, 1991, 3-153720; May 30, 1991, 3-153748; May 30, 1991, 3-153753; Jul. 3, 1991, 3-188300

Int. Cl.<sup>6</sup> G03G 5/10; B23B 51/06

U.S. Cl. 430—127

20 Claims

1. A method of manufacturing an electrophotographic photosensitive member having a substrate provided thereon with at least a photoconductive layer, by a process comprising the steps of:

- cutting the surface of said substrate;
- cleaning the cut substrate with water;
- in 30 minutes or less after said water-cleaning step, bringing the water-cleaned substrate into contact with an alcohol medium, said alcohol medium at a temperature from 10° C. to 50° C. and said alcohol medium contact step conducted over a period from 10 seconds to 10 minutes; and

- (d) forming said photoconductive layer on the substrate having been contacted with said alcohol medium.

5,480,628

## COLOR DEVELOPER AND PROCESSING METHOD USING THE SAME

Takatoshi Ishikawa, and Masakazu Yoneyama, both of Minami, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 70,870, Jun. 3, 1993, abandoned.

This application Aug. 8, 1994, Ser. No. 287,596

Claims priority, application Japan, Jun. 3, 1992, 4-166759

Int. Cl.<sup>6</sup> G03C 7/413

U.S. Cl. 430—493

16 Claims

1. A color developer for processing a silver halide color photographic material, which comprises 0.01–10 g/l of a water-soluble silicone compound and 0.5–10 g/l of an aromatic primary amine color developing agent, said color developer being substantially free of sulfite ions such that the concentration of sulfite ions is  $3.0 \times 10^{-3}$  mol or less per liter of said color developer.

5,480,629

## CATALYTIC PRODUCTION OF HYDROGEN PEROXIDE

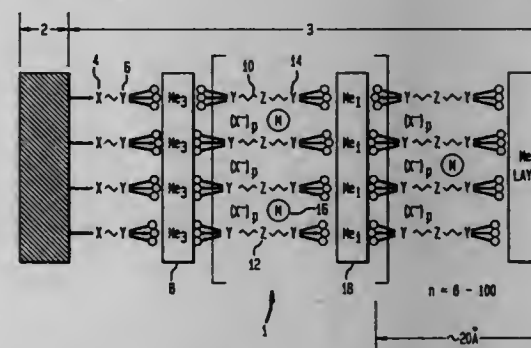
Mark E. Thompson, Hamilton Square; Jonathan L. Snover, Mercerville; Vijay Joshi, Livingston, all of N.J., and Lori A. Vermeulen, Hurst, Ill., assignors to The Trustees of Princeton University, Princeton, N.J.

Continuation-in-part of Ser. No. 103,968, Aug. 9, 1993. This application Aug. 8, 1994, Ser. No. 287,140

Int. Cl.<sup>6</sup> C01B 15/01

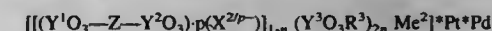
U.S. Cl. 423—584

20 Claims



1. A catalytic process for producing hydrogen peroxide from oxygen and hydrogen comprising the steps of:

- treating an aqueous suspension of heterogeneous catalyst with a source of oxygen and a source of hydrogen;
- separating the catalyst; and,
- isolating the produced hydrogen peroxide, wherein said catalyst is a complex of the formula:



wherein

- each of  $Y^1$ ,  $Y^2$ , and  $Y^3$ , independently of the other, is phosphorus or arsenic;
- $Z$  is a divalent group which reversibly forms a stable reduced form, said group containing two conjugated cationic centers which together have a negative  $E^{\circ}_{red}$  value;
- $Me^2$  is a trivalent or tetravalent metal of Group III, IVA, or IVB having an atomic number of at least 21 or a lanthanide;
- $X$  is anion;
- $n$  has a value of from 0 to 0.8; and
- $p$  has a value of 1, 2 or 3; and
- $R^3$  is a nonreducible capping group.

5,480,630

## PROCESS FOR PRODUCING FINE METAL OXIDE PARTICLES

Kunio Arai, and Tadafumi Ajiri, both of Sendai, Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Filed Jun. 12, 1991, Ser. No. 714,225

Claims priority, application Japan, Jun. 15, 1990, 2-157317

Int. Cl.<sup>6</sup> C01F 7/02

U.S. Cl. 423—625

4 Claims



1. A process for producing fine aluminum oxide particles having particle size of 20 to 2000 nm comprising the steps of heat-treating an aqueous solution of a water-soluble metal salt of aluminum at a temperature of not lower than 200° C. at a pressure of 250 to 500 kg/cm<sup>2</sup> for 1 second to 10 minutes to achieve a decomposition reaction of said metal salt to form fine aluminum oxide particles, wherein said aqueous solution of said metal salt is continuously supplied to a tubular reactor in such a manner as to remain in a reaction zone of the tubular reactor at a temperature of not lower than 200° C. and a pressure of 250 to 500 kg/cm<sup>2</sup> for 1 second to 10 minutes, and separating said fine aluminum oxide particles.

5,480,631

## RADIOIODINATED BENZAMINES AND METHOD OF THEIR USE AS RADIOIMAGING

Tomas De Paulis; Robert M. Kessler; Howard E. Smith, all of Nashville; Aaron Janowski, Portland, and Jeffrey A. Clanton, Nashville, all of Tenn., assignors to Vanderbilt University, Nashville, Tenn.

Continuation-in-part of Ser. No. 708,110, May 28, 1991, Pat. No. 5,154,913, which is a continuation of Ser. No. 604,370, Oct. 26, 1990, abandoned, which is a continuation of Ser. No. 122,390, Nov. 19, 1987, abandoned. This application May 28, 1992, Ser. No. 889,646

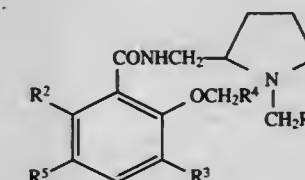
The portion of the term of this patent subsequent to Oct. 13, 2099, has been disclaimed.

Int. Cl.<sup>6</sup> A61K 51/04; 31/40; C07D 207/08; A01N 43/36

U.S. Cl. 424—185

8 Claims

1. A method of radioimaging a human brain comprising the steps of: systemically administering an effective amount of a radioiodinated substituted benzamide to a patient, the benzamide having the formula:



wherein  $R^5$  is  $^{123}I$ ,  $^{125}I$ , or  $^{131}I$ , and  $R^1$  is a hydrogen atom, a lower



alkyl group consisting of 1-4 carbon atoms, a cycloalkyl group consisting of 3-6 carbon atoms, an alkenyl group which contains 2-4 carbon atoms, or an alkynyl group consisting of 2-4 carbon atoms; R<sup>2</sup> is a hydrogen atom or a hydroxyl group; R<sup>3</sup> is a hydrogen atom, a chlorine atom, a methoxy group, or a methyl group, and R<sup>4</sup> is a hydrogen atom, or a methyl group, and wherein R<sup>3</sup> and R<sup>4</sup> are not both hydrogen when R<sup>2</sup> is a hydroxyl such that said administration results in uptake levels of the substituted benzamide in dopamine D2 receptor poor regions which are relatively lower than uptake levels of the substituted benzamide in dopamine D2 receptor rich regions;

detecting gamma radiation emitted by said composition; and forming a high contrast image therefrom.

5,480,632

### NON-AQUEOUS COSMETIC COMPOSITIONS WITH HIGH SOLIDS CONTENT

Carl C. Orr, Raleigh, N.C.; John Caradonna, Memphis, Tenn.; Robert J. Edmundson, Germantown, Tenn., and Terry C. Jacks, Memphis, Tenn., assignors to Maybelline, Inc., Wilmington, Del.

Continuation of Ser. No. 97,036, Sep. 16, 1987, abandoned.

This application Jul. 8, 1993, Ser. No. 87,357

Int. Cl.<sup>6</sup> A61K 7/032; 31/74

U.S. Cl. 424—63

3 Claims

1. A non-aqueous eyeliner composition comprising about 7% by weight beeswax, about 7.5% by weight of a copolymer of hexadecene and vinyl pyrrolidone, from about 0% to about 5% by weight of solvent comprising a mixture of branched chain saturated C<sub>5</sub>-C<sub>12</sub> hydrocarbons, from about 57% to about 60% by weight of organophilic clay gel suspending agent comprising hectorite clay modified by cation exchange reaction with quaternary ammonium salt, from about 0.25% to about 3.0% by weight of a dispersing agent comprising a polymeric acid amine which is a condensation product of an hydroxy acid of the formula HO—X—COOH, or (b) a mixture of the hydroxy acid of the formula and a carboxylic acid which is free from hydroxy groups, with an amine selected from the group consisting of lower alkyl amines, di-lower alkyl amines, tri-lower alkyl amines, and di-lower alkyl amino lower alkyl amines, wherein lower alkyl means straight or branched alkyl groups of 1 to 6 carbon atoms, and X is a divalent saturated or unsaturated aliphatic carbon chain which may be interrupted by O, N or S and contains 12 to 50 carbon atoms, with at least four carbon atoms separating the hydroxy and carboxylic groups, and from about 20 to about 25% by weight of cosmetically acceptable colorant.

5,480,633

### MILD CLEANSER AND CONDITIONER TO YIELD SOFT SMOOTH SKIN

Frederick A. Simion, Hazlet; Robert H. Cagan, Lawrenceville; Linda D. Rhein, Somerville; John C. Blake-Haskins, Piscataway, and Stephen W. Babulak, Kendall Pk., all of N.J., assignors to Colgate-Palmolive Company, Piscataway, N.J.

Continuation of Ser. No. 751,860, Aug. 29, 1991, abandoned, which is a continuation of Ser. No. 128,013, Dec. 2, 1987, abandoned. This application Sep. 27, 1993, Ser. No. 126,751

The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.

Int. Cl.<sup>6</sup> A61K 7/06; 9/08

U.S. Cl. 424—70.1

53 Claims

1. A liquid skin cleanser and conditioner composition consisting essentially of a major amount of about 84-98% by weight of water, about 0.25-6% by weight of a nonionic surfactant as the sole surfactant, about 0.05-5% by weight of an organic acid having a pKa from 4.5-6.5, said composition adjusted to have a pH of 4.5-6.5, whereby said composition is effective in reducing the deposition of soap and surfactant residue on the skin prior to such

skin being washed with a soap or surfactant containing material or in removing soap and surfactant residue from skin after such skin has been washed with a soap or surfactant containing material and simultaneously conditions the skin to feel soft, smooth and moisturized.

5,480,634

### HAIR-CARE PRODUCTS CONTAINING COPOLYMERS FORMED FROM UNSATURATED HYDROPHILIC MONOMERS AND UNSATURATED MONOMERS HAVING A POLYSILOXANE GROUP

Kazuhide Hayama; Kanji Narazaki, and Sigeoki Kawaguchi, all of Yokkaichi, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Continuation of Ser. No. 935,032, Aug. 25, 1992, abandoned,

which is a division of Ser. No. 549,485, Jul. 6, 1990, Pat. No. 5,166,276. This application Dec. 2, 1993, Ser. No. 170,447

Claims priority, application Japan, Jul. 12, 1989, 1-179811

Int. Cl.<sup>6</sup> A61K 7/075

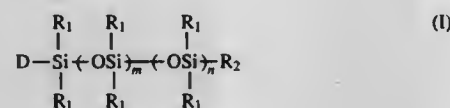
U.S. Cl. 424—70.12

7 Claims

1. A hair-care product for hair setting with improved combing, gloss and silkiness comprising a polymer dissolved in a solvent selected from the group consisting of water and an alcohol in a concentration of 0.1 to 10% by weight, said polymer having a molecular weight in the range of 1,000 to 500,000 and being a copolymer comprising:

(a) a unit of a hydrophilic ethylenically unsaturated monomer in a quantity of 15 to 59.5% by weight, said monomer being selected from the group consisting of nonionic monomers, anionic monomers, cationic monomers, and amphoteric monomers having an anionic nature and a cationic nature in one molecule, wherein the nonionic monomers are selected from the group consisting of acrylamide and methacrylamide, derivatives of acrylamide and methacrylamide, derivatives of acrylic and methacrylic acid, N-vinylpyrrolidone the anionic monomers are selected from the group consisting of acrylic and methacrylic acid, maleic acid, maleic anhydride, derivatives of acrylic and methacrylic acid and derivatives of acrylamide and methacrylamide, acrylates and methacrylates having a sulfonic acid group, and acrylates and methacrylates having phosphoric acid group; the cationic monomers are selected from the group consisting of derivatives of acrylic and methacrylic acid and derivatives of acrylamide and methacrylamide; and the amphoteric monomers are selected from the group consisting of derivatives of acrylic and methacrylic acid and derivatives of acrylamide and methacrylamide;

(b) a unit of an ethylenically unsaturated monomer having a polysiloxane group, which comprises one or more of the monomers represented by the formula (I)



wherein D, R<sub>1</sub>, R<sub>2</sub>, m and n have the following meanings, respectively:

D=an unsaturated group having radical polymerizability selected from the group consisting of a vinyl group, a vinylalkylene group, a vinylhydroxyalkylene group, an acryloyloxyalkylene group, methacryloyloxyalkylene group and a (meth)acryloyloxyhydroxyalkylene group formed by reacting (meth)acrylic acid and an epoxy group;

R<sub>1</sub>=hydrogen atom, a phenyl group, an alkyl group having 1 to 10 carbon atoms, a polyalkylene group, a polyoxyalkylene group of which end has been substituted by an ether or ester group, a polyalkylenepolyamine group, a fatty acid group or a polysiloxane group, respectively;

R<sub>2</sub>=a hydrogen atom, a phenyl group, an alkyl group having 1 to 10 carbon atoms, a polyalkylene group, a polyoxyalkylene group of which end has been substituted by an ether or ester group, a polyalkylenepolyamine group, a fatty acid group or a polysiloxane group, or an unsaturated group having radical polymerizability selected from the group consisting of a vinyl group, a vinylalkylene group, a vinylhydroxyalkylene group, an acryloyloxyalkylene group and a methacryloyloxyalkylene group;

m=an integer from 4 to 150; and

n=an integer from 0 to 150, wherein the sum of m and n is within 150, in a quantity of 0.5 to 45% by weight;

(c) a unit of a hydrophobic ethylenically unsaturated monomer in a quantity of 40 to 84.5% by weight, said monomer being selected from the group consisting of alkyl (meth)acrylates having 1 to 24 carbon atoms in the alkyl, hydrophobic (meth)acrylates and their derivatives selected from the group consisting of butoxyethyl (meth)acrylate, benzyl (meth)acrylate, tetrahydrofurfuryl (meth)acrylate, ethylenglycol di(meth)acrylate, 1,3-butylenglycol di(meth)acrylate, diacetoneacrylamide, aromatic unsaturated monomers, and vinyl esters,

whereby hair with excellent brilliance and gloss and a smooth feeling can be provided.

5,480,635

Patent Not Issued For This Number

5,480,636

### TITANIUM OXIDE PARTICLES AND METHOD OF SCAVENGING NOXIOUS MATERIALS

Masatsuyo Maruo; Hitoshi Ando; Mitsuru Watanabe, and Chitoshi Mukai, all of Kusatsu, Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Filed Jun. 1, 1993, Ser. No. 69,416

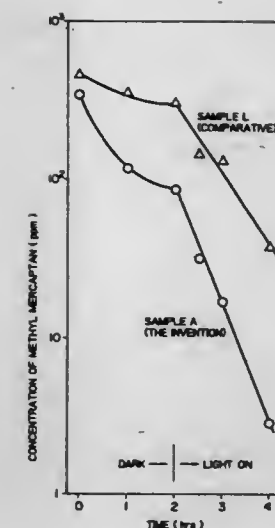
Claims priority, application Japan, Jun. 3, 1992, 4-168380; Nov. 12, 1992, 4-327342

Int. Cl.<sup>6</sup> A61L 9/20

U.S. Cl. 424—76.21

1 Claim

1. A method of scavenging a noxious material by applying to the noxious material in need of said scavenging, a scavengingly effective amount of a scavenger said scavenger decomposing noxious materials by a photocatalytic reaction, comprising:



particulate titanium oxide substrate having a zinc oxy compound and a silicon oxy compound supported thereon in a molar ratio of the total Ti amount included in the substrate to the Zn amount of said zinc oxy compound, being Ti:Zn=9.9:0.1 to 5:5, and in a molar ratio of the Zn amount of said zinc oxy compound to the Si amount of said silicon oxy compound, being Zn:Si=9:1 to 0.1:9.9, respectively, wherein said scavenger decomposes noxious materials by a photocatalytic reaction.

5,480,637

### ALKYLMETHYLSILOXANE CONTAINING GELS

Janet M. Smith, Baycity, Mich., assignor to Dow Corning Corporation, Midland, Mich.

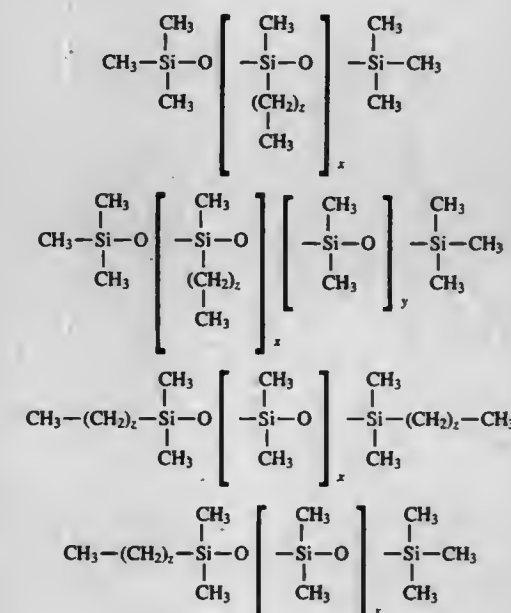
Filed Oct. 17, 1994, Ser. No. 324,045

Int. Cl.<sup>6</sup> A61K 7/32; 7/38; 31/765

U.S. Cl. 424—78.02

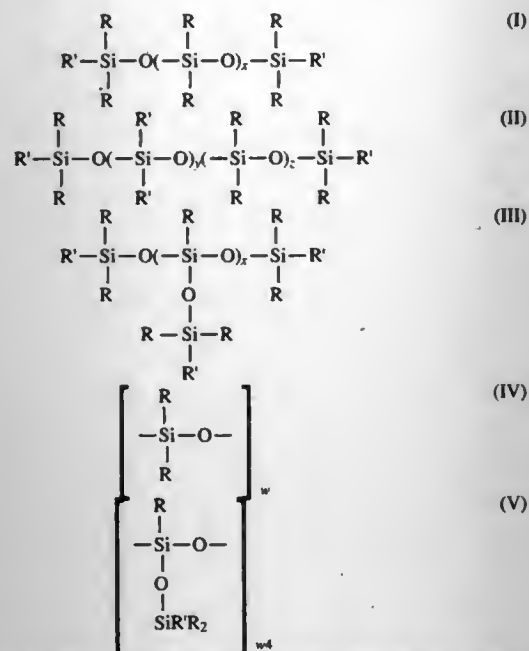
1 Claim

1. A gel comprising an 0.1 to 10 percent by weight of an amide-free gelator selected from the group consisting of 12-hydroxystearic acid and metal salts of 12-hydroxystearic acid; 0.1 to 10 percent by weight of an alkyldimethylsiloxane selected from the group consisting of:





in which x has a value of 1-50; y has a value of 1-100; and z has a value of 10-40; 80 to 99.8 percent by weight of selected from the group consisting of:



wherein R is selected from the group consisting of an alkyl radical with 1 to 7 carbon atoms, a phenyl radical, and an phenalkyl radical; R' is an alkyl radical of 1 to 7 carbon atoms; x has a value of zero to 1,000; w has a value of 3 to 6; y and z are each integers with a sum of 2 to 1,000; provided there are at least two phenyl groups as substituents on silicon atoms wherein the turbidity of the gel is less than 100 Nephelometric Turbidity Units.

5,480,638

## INSECTICIDE BAIT COMPOSITION

Barry C. Erwin, 707 Park Ave., Monroe, La. 71201

Filed Feb. 25, 1994, Ser. No. 201,892

Int. Cl.<sup>6</sup> A01N 25/12; 59/14; 65/00

U.S. Cl. 424-84

1 Claim

1. An environmentally safe insecticide composition comprising a comminuted, flowable mixture of dry pet food comprising by weight at least from about 8% to about 12% fat, a colloidal drying agent for coating and absorbing moisture from said pet food, powdered boric acid present in said composition in a weight percent of from about 10% to about 18% and a synthetic pyrethrin present in said composition in a weight percent of from about 0.25% to about 0.55%.

5,480,639

## METHODS FOR ISOLATING INDIVIDUAL TAXANES

Hala N. ElSohly; Edward M. Croom, Jr.; Mahmoud A. ElSohly, all of Oxford; and James D. McChesney, Etta; all of Miss., assignors to The University of Mississippi, University, Miss.

Continuation of Ser. No. 690,805, Apr. 19, 1991, abandoned.

This application Jul. 21, 1993, Ser. No. 95,817

Int. Cl.<sup>6</sup> A61K 35/78; 31/335

U.S. Cl. 424-195.1

20 Claims

1. A process for obtaining taxanes from Taxus plants which comprises:

- separating intact clippings from live Taxus plants wherein said intact clippings include leaves attached to stems;
- drying the intact clippings of step (a) at a temperature of between 20° C. and 70° C. to form dried plant matter;

(c) contacting the dried plant matter from step (b) which an organic solvent selected from the group consisting of ethanol, acetone, ethyl acetate, methylene chloride, methanol, methyl ethyl ketone, methyl isobutyl ketone, methyl t-butyl ether and mixtures thereof, wherein the weight:volume ratio of plant matter to organic solvent ranges from about 1:8 to about 1:12, for a time sufficient to extract taxanes from the dried plant matter and obtaining a taxane-containing extract;

(d) evaporating the taxane-containing extract formed in step (c) to form a residue and partitioning the residue between water and an organic solvent selected from the group consisting of ethyl acetate, ether, methyl-t-butyl ether, methylene chloride, chloroform and mixtures thereof to form a two phase solution comprising a taxane-containing organic phase and a polar aqueous phase;

(e) removing the polar aqueous phase from the taxane-containing organic phase;

(f) evaporating the taxane-containing organic phase of step (e) to form a second taxane-containing residue;

(g) separating individual taxanes from the second taxane-containing residue of step (f); and

(h) recovering the individual taxanes from step (g).

5,480,640

## ALPHA INTERFERON FOR TREATING PROSTATE CANCER

Alvaro Morales, and James W. L. Wilson, both of Kingston, Canada, assignors to Schering Corporation, Kenilworth, N.J.

Filed May 2, 1995, Ser. No. 432,742

Int. Cl.<sup>6</sup> A61K 38/21

U.S. Cl. 424-85.7

7 Claims

1. A method for treating cancer of the prostate comprising administering a therapeutically effective amount of alpha interferon by intraprostatic or intralesional injection.

5,480,641

## FEED ADDITIVE WHICH CONSISTS OF WHEY AND LACTOBACILLUS REUTERI AND A METHOD OF DELIVERING LACTOBACILLUS REUTERI TO THE GASTROINTESTINAL TRACT

Ivan A. Casas-Perez, Raleigh, N.C., assignor to Biogala AB, Stockholm, Sweden

Continuation of Ser. No. 646,863, Jan. 28, 1991, abandoned, which is a continuation-in-part of Ser. No. 539,014, Jun. 15, 1990, abandoned. This application Jun. 15, 1993; Ser. No. 77,895

Int. Cl.<sup>6</sup> C12N 1/20; A61K 35/74; A23L 1/28

U.S. Cl. 424-93.45

8 Claims

1. A feed additive consisting essentially of powdered whey and a biologically pure culture of lyophilized *Lactobacillus reuteri* cells suspended in oil; wherein said additive is produced by:

- compacting powdered whey at a pressure of 10-15 lb/in<sup>2</sup> to produce compacted whey particles; and
- coating said compacted whey particles with a biologically pure culture of lyophilized *Lactobacillus reuteri* cells suspended in oil to produce said feed additive;

and wherein said *Lactobacillus reuteri* cells retain viability for at least four days after being mixed with feed.

5,480,642

## SYNTHETIC IMMUNOREGLATORS, AND METHODS OF USE AND PREPARATION

Robert E. McCarthy, Omaha, Nebr., assignor to The Board of Regents of the University of Nebraska, Lincoln, Nebr.

Continuation-in-part of Ser. No. 809,290, Dec. 16, 1985, abandoned, which is a continuation-in-part of Ser. No. 451,016, Dec. 20, 1982, Pat. No. 4,590,181. This application Jul. 21, 1988, Ser. No. 224,191

The portion of the term of this patent subsequent to May 20, 2003, has been disclaimed.

Int. Cl.<sup>6</sup> A61K 45/00; 31/715

U.S. Cl. 424-278.1

5 Claims

1. A method for reducing hypersensitivity reactions and anaphylactic shock comprising the steps of:

obtaining an immunoregulator that stimulates immune responses to an antigen without anaphylactic shock, said immunoregulator comprising a polysaccharide compound having a molecular weight between 1,000 and 600,000 selected from a group consisting of sulfated mycodextran, sulfated pustulan and acylated pustulan wherein a polyanionic heavy-molecule regulator which is not cytotoxic is formed; and inoculating a subject having the antigen with a dose of the immunoregulator which is not toxic to the subject and which reacts selectively with a component of the subject's immune response system within a predetermined time of the appearance of an immune response in the subject caused by the antigen.

5,480,643

## STABLE ANTIMICROBIAL DIALDEHYDE COMPOSITION AND METHODS OF USE

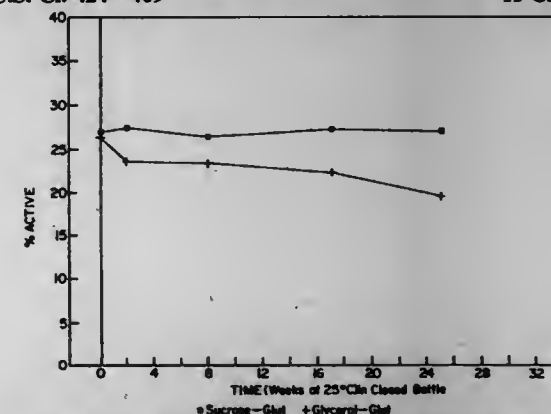
Daniel J. Donovan, St. Paul; David D. McSherry, Little Canada, and Dale L. Fredell, Lindstrom, all of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 887,312, May 22, 1992, abandoned, which is a division of Ser. No. 777,782, Oct. 16, 1991, Pat. No. 5,158,778. This application Jul. 6, 1993, Ser. No. 65,289

Int. Cl.<sup>6</sup> A01N 25/08

U.S. Cl. 424-409

11 Claims



1. A process for cleaning and disinfecting an aqueous biological spill using a solid, moisture-absorbent antimicrobial composition, said process comprising the steps of contacting said antimicrobial composition with said biological spill for a period of time effective to absorb and disinfect said biological spill, said composition comprising:

- about 2 to 50 wt-% of an antimicrobial saturated C<sub>2</sub> to C<sub>6</sub> dialdehyde compound;
- about 1 to 50 wt-% of a carbohydrate compound selected from the group consisting of a monosaccharide compound, an oligosaccharide compound, saccharide esters or ethers thereof, and mixtures thereof;
- about 1 to 30 wt-% of a buffering agent that can maintain a pH for optimum antimicrobial activity when said composition is in an active antimicrobial form; and

(d) about 10 to 97 wt-% of an absorbing agent selected from the group consisting of precipitated silica, a silicate, polyacrylate, diatomaceous earth, ground corn cobs and mixtures thereof.

5,480,644

## USE OF INJECTABLE BIOMATERIALS FOR THE REPAIR AND AUGMENTATION OF THE ANAL SPHINCTERS

Jeffrey S. Freed, New York, N.Y., assignor to JSF Consultants Ltd., New York, N.Y.

Filed Feb. 28, 1992, Ser. No. 843,124

Int. Cl.<sup>6</sup> A61F 2/02; A61K 38/39; C07K 15/20

U.S. Cl. 424-436

13 Claims

1. A method of improving the competency of incompetent anal sphincters comprising (1) selecting an injectable biomaterial capable of persisting at a site of its injection for at least three months, and (2) injecting an effective amount of the injectable material into the anal sinuses between the blood vessels, sufficient to improve competency of the incompetent anal sphincter.

5,480,645

## HYDROXYAMINES N-ACYL DERIVATIVES HAVING SCAVENGER ACTIVITY AND USEFUL IN ACUTE AND CHRONIC PATHOLOGIES ASSOCIATED WITH PEROXIDATION AND INFLAMMATION PHENOMENA

Francesco Della Valle; Silvana Lorenzi, both of Padova, and Gabriele Marcolongo, Carrara S. Giorgio, all of, Italy, assignors to LifeGroup S.p.A., Rome, Italy

Filed Dec. 29, 1993, Ser. No. 175,233

Claims priority, application Italy, Dec. 31, 1992, MI92A2997

Int. Cl.<sup>6</sup> C07D 307/78; A61K 31/40; 31/335

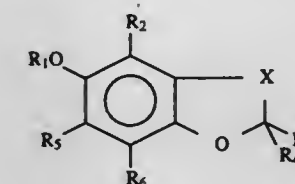
U.S. Cl. 424-439

21 Claims

1. Amides having a primary or secondary hydroxyamine attached to a carboxylic acid in an amidic linkage between the aminic group of the hydroxyamine and the acyl group of the carboxylic acid, wherein the hydroxyamine is selected from the group consisting of:

aliphatic hydroxyamines, whose linear or branched alkyl chains have from 1 to 20 carbon atoms and are optionally substituted with at least one functional group selected from NH<sub>2</sub> and COOH, and

5 or 6 membered heterocyclic hydroxyamines, whose ring contains at least one heteroatom, wherein the heteroatom can only be nitrogen and at least one of the heteroatoms is linked to one H atom, said ring being optionally substituted with at least one -COOH group; and wherein the carboxylic acid has formula (I):



wherein

X is a bivalent alkylenic or alkylidenic radical selected from the group consisting of: -CH<sub>2</sub>-, -CH<sub>2</sub>-CH<sub>2</sub>-, -CH=CH-,

R<sub>1</sub> is selected from the substituents as defined in one of the following classes:

- hydrogen atom,
- a phosphoryl radical
- L-COOH wherein L is a bivalent radical selected from the group consisting of:

a) a linear or branched saturated or unsaturated alkylenic chain of from 1 to 20 carbon atoms, optionally substituted with at least one amino group, said amino group



being optionally N-acylated with a  $C_1-C_3$  carboxylic acid; optionally substituted in the aliphatic chain with at least one hydroxy group;

b) an arylene, and

c) a saturated or aromatic bivalent heterocyclic radical, whose ring has from 5 to 6 atoms and containing at least one heteroatom selected from the group consisting of N, O and S;

D)  $-CO-M-COOH$  wherein M is a bivalent radical selected from the group consisting of:

a) a linear or branched alkylene chain of from 1 to 20 carbon atoms, optionally containing at least one ethylenic unsaturation, and

b) an arylene,

E) is a linear or branched alkyl radical of from 1 to 20 carbon atoms, optionally substituted with at least one aryl or hydroxy group;

F)  $R-CO-$ , wherein R is a linear or branched saturated or unsaturated alkyl radical of from 1 to 20 carbon atoms, optionally substituted with at least one group selected from the group consisting of  $-SH$ ,  $-OH$ ,  $-OAc$  and  $-N^+(CH_3)_3$ ;

$R_2$ ,  $R_5$ ,  $R_6$  equal or different from each other are selected from the group consisting of H, methyl, benzyl and tertbutyl,

$R_3$  is selected from the group consisting of H, methyl, ethyl and tertbutyl,

$R_4$  is  $-COOH$ , a linear or branched saturated or unsaturated aliphatic chain of from 1 to 20 carbon atoms or  $-W-COOH$ , wherein W is an alkylene radical of from 1 to 20 carbon atoms; provided that:

i)  $R_4$  is always  $-COOH$  or  $-W-COOH$  when  $R_1$  has one of the meanings as defined in one of the above mentioned classes A, B, E and F;

ii) when  $R_1$  is  $-H$ ,  $R_2=R_5=R_6=CH_3$ ,  $R_4=COOH$ ,  $X=CH_2-CH_2$ , the hydroxyamine forming the amide must be different from ethanolamine.

5,480,646

## PAD FOR APPLYING MEDICAMENTS

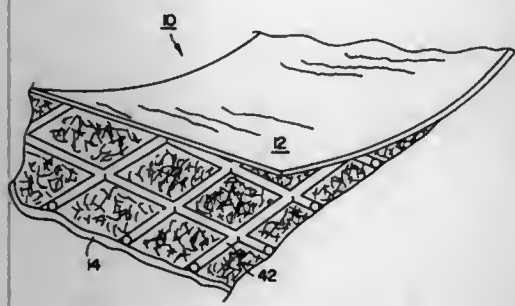
Van N. Vu, 72 Maple Ave., Atherton, Calif.

Filed Oct. 12, 1994, Ser. No. 322,265

Int. Cl.<sup>6</sup> A61K 9/14; A61F 13/00

U.S. Cl. 424-443

15 Claims



1. A pad for inducing diaphoretic response to an area of the skin which comprises:

an impervious flexible panel;

a pervious flexible panel joined to said impervious panel such as to form a plurality of closed chambers;

said pervious panel having an open structure such that powder particles are prevented from passing there through but through which vapors emanating from said powders can pass there-through;

each chamber bounded by an area of said pervious panel opposite an area of said impervious panel;

a portion of a powder composition in each chamber from which said closed chamber said portion cannot escape but from which emanations from said powder, can escape;

said powder composition being a mixture of powders of Aloe wood in an amount of 15% to 25%, anise star in an amount ranging from 10% to 20%, and Cinnamon in an amount from 55% to 75%;

means for pressing said pervious side of said pad against said area;

said means being one of:

(i) said pad having a shape of an insole adapted for positioning in a shoe against a sole of a foot;

(ii) at least one band arranged in operable combination with said pad adapted for strapping said pad to a part of a human body with said pervious panel forced against said area of skin;

whereby pressure on said pad actuates vapors to emanate from said powder contained in said plurality of chambers through said pervious panel to said area of skin.

5,480,647

## FAR-INFRARED RADIATING MEDICAL COMPOUND AND AN ADHESIVE SURGICAL TAPE LAYERING THE COMPOUND

Chung Y. Tsai, Taipei, Taiwan, Prov. of China, assignor to Fu Hsiang Textile Co., Ltd., Taipei, Taiwan, Prov. of China

Filed Oct. 18, 1994, Ser. No. 325,926

Int. Cl.<sup>6</sup> A61K 9/00

U.S. Cl. 424-443

7 Claims

1. A medical compound comprising: 70 wt %–90 wt % of powdered perlite and 10 wt %–30 wt % of at least one metallic oxide of which the metal is selected from the group of tantalum, niobium, palladium, nickel, germanium, titanium, and zirconium.

5,480,648

## TRANSDERMAL PROSTAGLANDIN COMPOSITION

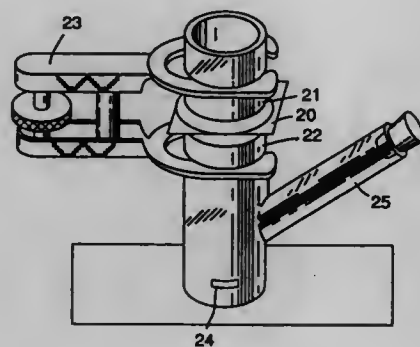
Hanns Wendel, and Franz-Josef Braun, both of Borken, Germany, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 155,126, Nov. 19, 1993, Pat. No. 5,380,760. This application Oct. 18, 1994, Ser. No. 324,577

Int. Cl.<sup>6</sup> A61F 13/02; A61L 15/16

U.S. Cl. 424-448

6 Claims



1. An adhesive coated sheet material comprising a flexible backing bearing on one surface thereof a formulation comprising a combination of:

(i) a therapeutically effective amount of prostaglandin  $E_1$  or a pharmaceutically acceptable salt or lower alkyl ester thereof;

(ii) a skin penetration enhancing amount of an excipient selected from the group consisting of isopropyl myristate, ethyl oleate, and a mixture thereof; and

(iii) a polyisobutylene pressure sensitive adhesive.

5,480,649

## PROCATEROL-CONTAINING PREPARATION FOR APPLICATION TO THE SKIN

Mitsuji Akazawa; Teruo Hama, both of Kagawa; Yukio Kimura, and Yoshinobu Yasuda, both of Tokushima, all of Japan, assignors to Teikoku Seisaku Kabushiki Kaisha, Kagawa, Japan

PCT No. PCT/JP91/01527, § 371 Date Jun. 19, 1992, § 102(e) Date Jun. 19, 1992, PCT Pub. No. WO92/08449, PCT Pub. Date May 29, 1992

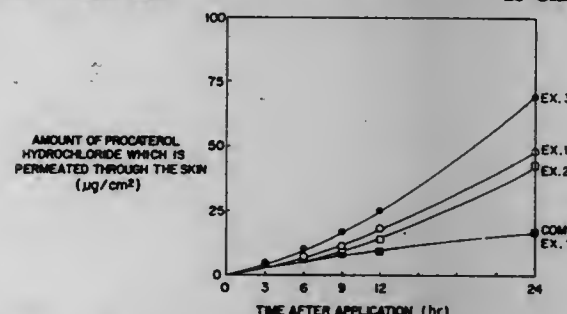
PCT Filed Nov. 7, 1991, Ser. No. 861,805

Claims priority, application Japan, Nov. 9, 1990, 2-305023

Int. Cl.<sup>6</sup> A61L 15/58; 15/44; A61K 9/10; 9/70

U.S. Cl. 424-449

23 Claims



1. A procaterol-containing preparation for application to the skin which comprises a drug-retaining layer provided on a support, wherein said drug-retaining layer is a substantially water-free adhesive gel consists essential of 1 to 20% by weight of polyacrylic acid, a crosslinking agent selected from the group consisting of aluminum chloride, aluminum sulfate, aluminum potassium sulfate, ammonium aluminum sulfate, magnesium aluminate silicate, magnesium aluminate metasilicate, and dihydroxy aluminum acetate, 50 to 95% by weight of at least one lower alcohol or polyvalent alcohol, and 0.1 to 5% by weight of procaterol, or a pharmaceutically acceptable salt thereof.

5,480,650

## PROGRAMMED RELEASE TABLETS CONTAINING NAPROXEN

Egidio Marchi, and Leone G. Rotini, both of Bologna, Italy, assignors to Alfa Wassermann S.p.A., Alanno, Italy

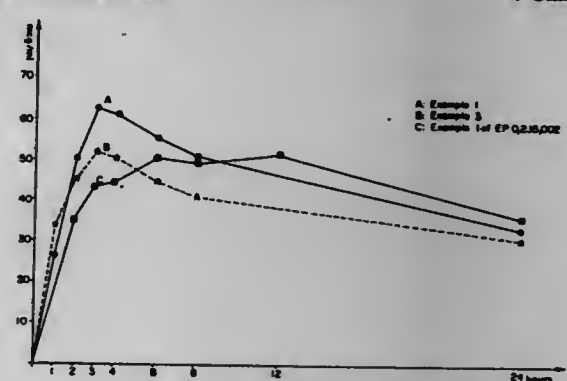
Filed Sep. 1, 1993, Ser. No. 115,897

Claims priority, application Italy, Sep. 11, 1992, BO92A0315

Int. Cl.<sup>6</sup> A61K 9/20

U.S. Cl. 424-464

4 Claims



1. A programmed release tablet containing from 500 to 1,200 mgs. of naproxen, said tablet being prepared by the steps of

1) preparing an immediate release dry granulate containing from 5% to 28% of the entire amount of naproxen in the tablet in admixture with a binding agent, a disintegrating agent and a lubricating agent; said binding agent being a member selected from the group consisting of polyvinylpyrrolidone and lactose and mixtures thereof, said disintegrating agent being a member selected from the group consisting of starch and sodium

starch glycolate and mixtures thereof, said lubricating agent being magnesium stearate,

2) preparing a controlled release dry granulate containing from 72% to 95% of the entire amount of naproxen in the tablet in admixture with a retarding agent, said retarding agent being a member selected from the group consisting of ethylcellulose, hydrogenated castor oil and mixtures thereof.

3) mixing said immediate release granulate from step 1) with said controlled release granulate from step 2) to obtain a mixture;

4) adding reticulated polyvinyl pyrrolidone in an amount between 2% and 10% of the entire amount of the tablet as a disintegrating agent to said mixture from step 3) to obtain said mixture having said reticulated polyvinylpyrrolidone applied thereon and

5) compressing said mixture from step 4) to obtain a tablet.

5,480,651

## COMPOSITION AND METHOD FOR TREATING NICOTINE CRAVING IN SMOKING CESSATION

Enoch Callaway, Tiburon, Calif., assignor to Regents of the University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 121,606, Sep. 15, 1993, abandoned, which is a continuation-in-part of Ser. No. 851,914, Mar. 16, 1992, abandoned. This application Mar. 15, 1994,

Ser. No. 213,111

Int. Cl.<sup>6</sup> A61K 9/28

U.S. Cl. 424-464

8 Claims

1. A method for relieving craving in a nicotine-habituated person abstaining from or reducing nicotine intake by administering an admixture consisting essentially of a first component that either prolongs or mimics the effect of acetylcholine and a second component being a muscarinic antagonist wherein the first component is selected from the group consisting of physostigmine, physostigmine analogues, tacrine, methacholine, edrophonium, and water soluble derivatives thereof, and wherein the second component is selected from the group consisting of scopolamine, atropine, and water soluble derivatives thereof, with the first and second components being in a weight ratio ranging from about 1:1 to 10:1.

5,480,652

## EFFERVESCENT PHARMACEUTICAL COMPOSITION CONTAINING IBUPROFEN AND ITS METHOD OF PREPARATION

Nicole Bru-Magntez, Paris; Jean-Francois Cordoliani, Layrac; Gérard Thauvin, Agen, and Jehan-Yves Drouin, Verrieres le Buisson, all of France, assignors to Laboratoires UPSA, Agen, France

Filed Feb. 8, 1993, Ser. No. 14,530

Claims priority, application France, Dec. 9, 1992, 92 14851

Int. Cl.<sup>6</sup> A61K 9/46; 9/14

U.S. Cl. 424-466

8 Claims

1. A composition for the preparation of effervescent tablets, which comprises, per 100 parts by weight of ibuprofen or pharmaceutically acceptable salt:

from 150 to 1100 parts by weight of an organic acid selected from the group consisting of citric acid, fumaric acid, adipic acid, tartaric acid and mixtures thereof;

from 120 to 900 parts by weight of an alkaline carbonate capable of reacting with said organic acid to generate carbon dioxide gas selected from the group consisting of alkali metal carbonates, and calcium carbonate;

from 0.021 to 0.084 parts by weight of alpha-tocopherol as said antioxidant, and, optionally:

from 400 to 1000 parts by weight of a pharmaceutically acceptable diluent selected from the group consisting of lactose, sucrose and magnesium citrate; and

from 10 to 150 parts by weight of magnesium citrate as internal dehydrating agent.



5. A composition for the preparation of effervescent powders, which comprises, per 100 parts by weight of ibuprofen or pharmaceutically acceptable salt thereof:

from 40 to 1125 parts by weight of an organic acid selected from the group consisting of citric acid, fumaric acid, adipic acid, tartaric acid and mixtures thereof;

from 25 to 1200 parts by weight of an alkaline carbonate capable of reacting with said organic acid to generate carbon dioxide gas selected from the group consisting of alkali metal carbonates, and calcium carbonate;

from 0.021 to 0.084 parts by weight of alpha-tocopherol as said antioxidant, and, optionally:

from 90 to 6000 parts by weight of a pharmaceutically acceptable diluent selected from the group consisting of lactose, sucrose, magnesium citrate and mixtures thereof; and

from 0 to 100 parts by weight of magnesium citrate as an internal dehydrating agent.

5,480,653

# FORMULATIONS FOR SUSTAINED RELEASE DRESSINGS AND THEIR USE

Louis M. J. Agudisch, Valbonne, and Alain Etienne, Grasse, both of, France, assignors to Dow Corning France S.A., Valbonne, France

Continuation of Ser. No. 598,295, Oct. 16, 1990, abandoned.

This application May 26, 1992, Ser. No. 890,334

Claims priority, application France, Jan. 23, 1989, 89 13819

Int. Cl.<sup>6</sup> A61K 9/10; 9/70; 47/34; A61L 15/26

U.S. Cl. 424—486

12 Claims

1. A sustained release formulation suitable for use as a dressing in or on the human or animal body comprising 10–70 parts by weight of a therapeutic or diagnostic agent (A) dispersed in 90–30 parts by weight of a vehicle (B) therefor which vehicle includes

(1) from 5 to 40 weight % of a hydrophilic component selected from the group consisting of polyethylene glycols, propylene glycols, glycerol, sorbitol, mannitol and lactose;

(2) a curable silicone composition which is formulated to cure at room temperature within 10 minutes of mixing and application to the body, the curable composition consisting of a polysiloxane having alkylhydrogen siloxane units, a polysiloxane having unsaturated groups for reaction therewith and a platinum or rhodium catalyst for the hydrosilylation reaction; and

(3) a modulating component which is different from the hydrophilic component (1) and serves to modulate release of the therapeutic or diagnostic agent (A) from a dressing formed from the formulation when the dressing is in use, the modulating component being provided by 10–40 weight % of an organic substance having two or more hydroxyl groups per molecule or 10–45 weight % of a hydrophilic polymer which swells in an aqueous medium.

5,480,654

# PROLONGED RELEASE DOSAGE FORM OF DRUG AND METHOD FOR PRODUCING THE SAME

Nagahiko Tanaka, Narimichi Takei, and Kazuomi Unosawa, all of Tokyo, Japan, assignors to Freund Industrial Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 780,941, Oct. 23, 1991, abandoned.

This application Nov. 2, 1994, Ser. No. 333,248

Claims priority, application Japan, Jan. 23, 1990, 2-285539

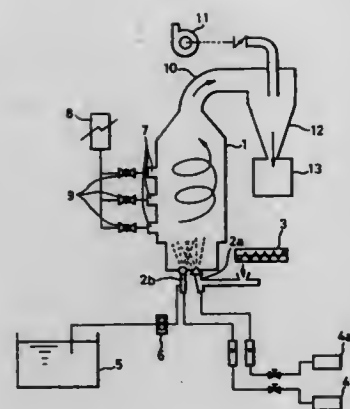
Int. Cl.<sup>6</sup> A61K 9/14; 9/16; 9/22

U.S. Cl. 424—490

5 Claims

1. A method for producing a prolonged release form of drug, which comprises:

(1) obtaining a coated ungranulated medicinal particle by: jetting a solution or a liquid dispersion from a first nozzle and jetting an ungranulated medicinal particle from a second nozzle into a processing vessel from without said vessel without altering the size of said medicinal particle in said



vessel, said solution or liquid dispersion containing a compound which is physiologically acceptable and does not dissolve in members selected from the group consisting of water and gastric juice, and said ungranulated medicinal particle having a size when jetted into said vessel within a range of from 0.1 to 100  $\mu$ m, said jets colliding to adhere the solution or the liquid dispersion on the surface of the ungranulated medicinal particle to form a coating layer of the compound on the particle;

drying the coated medicinal particle in the processing vessel; and subsequently,

(2) granulating or tableting the coated and dried medicinal particles.

5,480,655

# PROCESS FOR PREPARING NONCOHESIVE COATING LAYER

Hiroaki Jizomoto, Ibaraki; Kotchiro Hirano, Hyogo, and Eri Kanaoka, Osaka, all of, Japan, assignors to Shionogi Selyaku Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 725,670, Jul. 3, 1991, abandoned.

This application Jan. 28, 1993, Ser. No. 13,538

Claims priority, application Japan, Aug. 31, 1990, 2-230185

Int. Cl.<sup>6</sup> A61K 9/50; B01J 13/10; 13/22

U.S. Cl. 424—492

6 Claims

1. A process for preparing microcapsules each having a noncohesive coating layer at the surface, which comprises

(a) forming a slurry of microcapsules in water by coacervation, said microcapsules each comprising a pharmaceutical substance in a liquid or solution state as the core and an adhesive coating layer of a coating material at the surface,

(b) adding a pharmaceutically acceptable inorganic substance insoluble in said water to said slurry, the amount of the inorganic substance being from 1 to 100% by weight based on the weight of the coating material in the adhesive coating layer, to form a noncohesive coating layer of the inorganic substance at the surface of each of the microcapsules,

(c) recovering the microcapsules having a noncohesive coating layer from the slurry without previous addition of any hardening agent thereto, and

(d) drying the recovered microcapsules to prepare microcapsules which are fluidic and of uniform size.

2. The process according to claim 1, wherein the coating material is gelatin or gelatin and acacia.

5,480,656

# PROLONGED RELEASE MICROCAPSULES

Hiroaki Okada, Saita; Yayoi Inoue, Kyoto, and Yasuaki Ogawa, Otokuni, all of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 649,727, Feb. 1, 1991, abandoned.

This application Jan. 31, 1994, Ser. No. 188,918

Claims priority, application Japan, Feb. 13, 1990, 2-033133

Int. Cl.<sup>6</sup> A61K 9/52; 9/62

U.S. Cl. 424—493

3 Claims

1. A microcapsule exhibiting zero order release of (pyr)Glu-His-Trp-Ser-Tyr-D-Leu-Leu-Arg-ProNHC<sub>2</sub>H<sub>5</sub> for a period of at least two months upon administration, which is produced by preparing a water-in-oil emulsion comprising an inner aqueous phase free from a drug retaining substance containing 35 to 60% (W/W) of (pyr)Glu-His-Trp-Ser-Tyr-D-Leu-Leu-Arg-ProNHC<sub>2</sub>H<sub>5</sub>, and an oil phase containing a homopolymer of lactic acid having a weight-average molecular weight of 14,100 to 18,200 and a dispersion degree (ratio of weight-average molecular weight to number-average molecular weight) of 1.5 to 2.5, as the material for forming an outer wall of the microcapsule and then subjecting said water-in-oil emulsion to microencapsulation.

5,480,657

# COMPOSITION COMPRISING CAFFEINE CHROMIUM AND FRUCTOSE FOR WEIGHT CONTROL AND USE THEREOF

Ann de Wees T. Allen, 2831 Gallows Rd., Ste. 206, Falls Church, Va. 22042

Filed Oct. 27, 1993, Ser. No. 141,604

Int. Cl.<sup>6</sup> A61K 31/62; 31/34; 31/28; 33/24

U.S. Cl. 424—617

9 Claims

1. A composition for the prevention or treatment of weight gain, said composition comprising approximately 30 to 150 mg of caffeine, approximately 2 to 20 grams fructose and approximately 5 mcg to 500 mcg chromium, per serving.

5,480,658

# EAR AND SKIN CLEANSER

Steven A. Melman, 8909 Iverleigh Ct., Potomac, Md. 20854

Filed Jul. 23, 1993, Ser. No. 96,715

Int. Cl.<sup>6</sup> A01N 59/14

U.S. Cl. 424—659

9 Claims

1. A composition comprising a water base, a solvent, a non-ionic surfactant, acetic acid in the range of from about 0.5–5.0% by volume, and boric acid in the range of from about 0.5–5.0% by volume.

5,480,659

# SOW LACTATION DIET CONTAINING VALINE

Mike D. Tokach, Abilene; Jim L. Nelissen, and Robert D. Goodband, both of Manhattan, all of Kans., assignors to Kansas State University Research Foundation, Manhattan, Kans.

Continuation-in-part of Ser. No. 35,599, Mar. 23, 1993. This

application Mar. 22, 1994, Ser. No. 216,762

Int. Cl.<sup>6</sup> A23J 3/16; A23K 1/14; 1/16; 1/18

U.S. Cl. 426—2

23 Claims

1. In a method of feeding lactating sows a diet including from about 12–30% by weight of total protein calculated as 6.25 $\times$ total nitrogen, wherein at least a portion of said total protein is derived from soy, the improvement of including in said diet at least about 0.75% by weight lysine of which at least about 0.05% by weight is synthetic lysine and from about 0.01–1.2% by weight of synthetic valine, the valine:lysine weight ratio being at least about 1:1.

5,480,660

# HYPOALLERGENIC WHEAT PREPARATION, PROCESS FOR PRODUCING THE SAME, AND PROCESSED FOOD INCLUDING THE SAME

Zenro Ikezawa, Yokohama; Shumpei Yokota, Chigasaki; Kazufumi Tsubaki, Tokyo; Hiroshige Kohno, Tokyo; Hiromi Sugiyama, Tokyo; Kenji Ikeda, Tokyo, and Takashi Suzuki, Tokyo, all of, Japan, assignors to Asahi Denka Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 914,998, Jul. 16, 1992, abandoned, which is a division of Ser. No. 685,516, Apr. 15, 1991, abandoned. This application Jul. 11, 1994, Ser. No. 273,273

Claims priority, application Japan, Apr. 16, 1990, 2-99562

Int. Cl.<sup>6</sup> A23J 3/00

U.S. Cl. 426—2

3 Claims

1. A method for preventing the onset of allergies of a person afflicted with allergies to wheat, comprising administering to said person, a processed food containing a wheat preparation with a reduced content of proteins of molecular weights of 14,000 to 19,000, 21,000 to 26,000, 26,000 to 29,000 and 50,000 to 70,000, said wheat preparation with the reduced content being produced by affecting an ordered sequence of treatment to wheat flour with water, then a saline solution and further water to remove soluble components, and wherein said treatment resulted in a concentration of said proteins of molecular weights of 14,000 to 19,000, 21,000 to 26,000 and 26,000 to 29,000, being not more than 5000  $\mu$ g/ml, as determined in a supernatant obtained by adding 10 ml of 1M-NaCl to 1 g of said wheat preparation with the reduced content and stirring for 30 minutes at room temperature, and a concentration of said proteins of molecular weights of 50,000 to 70,000, included in said supernatant, being not more than 100  $\mu$ g/ml.

5,480,661

# VITAMIN A AND D ADDITIVE FOR MILK PRODUCTS

Larry D. Ellis; Phillip F. Dressel, and Cornelis A. van Deutekom, all of St. Louis County, Mo., assignors to Consolidated Flavor Corporation, Bridgeton, Mo.

Filed May 23, 1994, Ser. No. 247,309

Int. Cl.<sup>6</sup> A23C 9/158

U.S. Cl. 426—73

24 Claims

1. An oil based vitamin A and vitamin D preparation having a specific gravity greater than 1.0 to fortify milk products, which milk products include a fat containing cream portion and a low fat milk portion, said preparation comprising:

vitamin A palmitate, vitamin D<sub>3</sub>, an emulsifying agent, a vegetable oil, and an amount of a food compatible oil compatible product having a specific gravity greater than 1.0 sufficient to raise the specific gravity of the preparation to a level greater than 1.0 whereby said preparation remains with the low fat milk portion of the milk product when the fat containing cream is separated.

5,480,662

# FAT-REDUCED LAMINATED DOUGHS

Karin Boode-Boissevain, Gorichem, and Jeannette D. Van Houdt-Moree, Gouda, both of, Netherlands, assignors to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Filed Mar. 24, 1994, Ser. No. 217,521

Claims priority, application European Pat. Off., Mar. 25, 1993, 932861

Int. Cl.<sup>6</sup> A21D 2/00

U.S. Cl. 426—94

12 Claims

1. A laminated dough comprising subsequent layers of dough and layers of an other ingredient, wherein at least part of the layers of the other ingredient, at least partly, includes an aqueous gel, obtained by gelling in water of a product containing maltodextrin and  $\beta$ -glucan or maltodextrin and pentosans, or maltodextrin,  $\beta$ -glucan and pentosans, as obtained by hydrolysing cereal flour or a blend of cereal flour and starch with  $\alpha$ -amylase and recovering of the water soluble fraction, so that the aqueous gel includes 20–50



wt. % of maltodextrin, and 0.001–30 wt. % of  $\beta$ -glucan or pentosans or  $\beta$ -glucan and pentosans, and water.

5,480,663

# AVOIDANCE OF BROWNING OF A FOOD PRODUCT

Sven Heyland, Weiningen, and Violette Roth, Winterthur, both of, Switzerland, assignors to Nestec S.A., Vevey, Switzerland  
Filed Oct. 20, 1992, Ser. No. 963,854

Claims priority, application Switzerland, Nov. 1, 1991, 3201/91

Int. Cl.<sup>6</sup> A23L 1/238

U.S. Cl. 426—262

16 Claims

1. A process for treating a soy sauce composition comprising incorporating into a soy sauce composition a substance selected from the group consisting of cystine and thiamine and compounds which contain a thiol group in an amount of from 0.01 part to 0.1 part by weight and then heat treating the soy sauce and substance at a temperature of from 95° C. to 110° C. for from 1 hour to 5 hours to obtain a treated soy sauce composition.

5,480,664

# METHOD FOR APPLYING COATINGS STARTING FROM FLOWABLE SUBSTANCES

Pietro Ferrero, Waterloo, Belgium, assignor to Soremartec S.A., Schoppach-Arlon, Belgium

Division of Ser. No. 5,850, Jan. 19, 1993, Pat. No. 5,370,734.

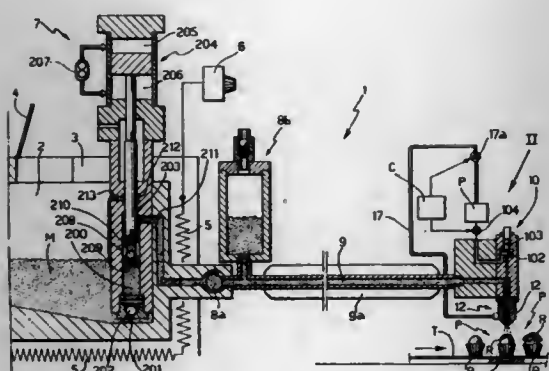
This application Nov. 2, 1994, Ser. No. 334,337

Claims priority, application Switzerland, Jan. 21, 1992, 00158/92

Int. Cl.<sup>6</sup> A23G 3/20

U.S. Cl. 426—307

16 Claims



1. A process for applying flowable food substances onto food products, the process comprising steps of:  
providing a supply tank containing flowable food substance having a hardening temperature at which the food substance hardens;  
maintaining the supply of flowable food substance at a temperature that falls within a range of about 10° C. above said hardening temperature;

pumping the flowable food substance from the supply tank to an application unit while maintaining the temperature of the flowable food substance within said temperature range and the pressure of the flowable food substance within a range of from about 15 to about 25 atmospheres; and  
applying the flowable food substance from the application unit to a food product by spraying the flowable food substance onto the food product, wherein the temperature of the sprayed food substance is slightly above said hardening temperature and the sprayed food substance hardens substantially upon application to the food product with substantially no streaks or blemishes.

5,480,665

# APPARATUS AND METHOD FOR REMOVING COMPOUNDS FROM A SOLUTION

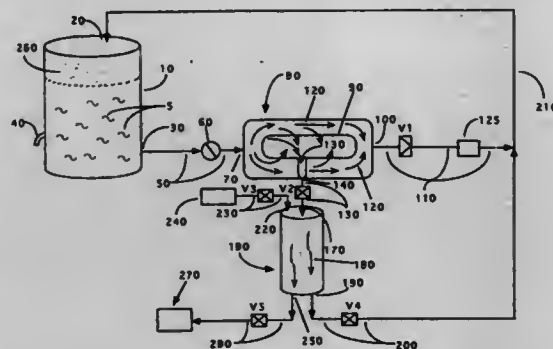
Clark R. Smith, 557 Mission Blvd., Santa Rosa, Calif. 95409

Continuation-in-part of Ser. No. 880,659, May 8, 1992, abandoned. This application Mar. 28, 1994, Ser. No. 218,920

Int. Cl.<sup>6</sup> B01D 63/00; C12G 3/00; C12H 1/00

U.S. Cl. 426—490

25 Claims



12. A method for treatment of a solution to remove at least one predetermined component, including the steps of:

- (1) processing the solution by reverse osmosis for producing a retentate and a raw permeate, with the raw permeate containing the predetermined component;
- (2) treating the raw permeate by passing it through an anion exchange column for removing at least a portion of the predetermined component and for producing a purified permeate; and
- (3) combining the retentate with the purified permeate for producing a treated solution.

5,480,666

# METHOD FOR MAKING BLOCKS OF PASTA FILATA CHEESE

Donald S. Lindgren, 1035 S. Webster Ave., Green Bay, Wis. 54301

Filed May 20, 1994, Ser. No. 246,770

Int. Cl.<sup>6</sup> A23C 19/00; A01J 25/00

U.S. Cl. 426—512

14 Claims

1. A method of forming blocks of pasta filata cheese, comprising the following steps:

- a. extruding, a ribbon of warm, plastic, pasta filata cheese, onto a conveyor;
- b. transporting said ribbon on said conveyor;
- c. chilling the ribbon, while the ribbon is being transported, by contacting the ribbon with a chilling medium;
- d. maintaining contact of the chilling medium with the ribbon of pasta filata, while the ribbon is being transported, until the ribbon sets up;

5,480,668

# N-SUBSTITUTED DERIVATIVES OF ASPARTAME USEFUL AS SWEETENING AGENTS

Claude Nofre, 119 Cours Albert Thomas, 69003 Lyon, and Jean-Marie Tinti, 5 Impasse de la Drelatière, 69680 Chas-sieu, both of, France

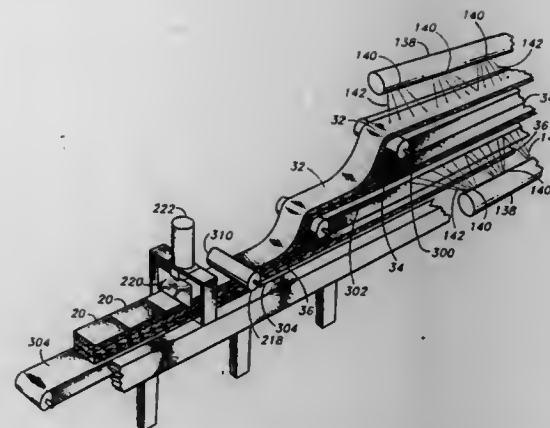
Filed Nov. 9, 1993, Ser. No. 149,365

Claims priority, application France, Nov. 12, 1992, 92 13615  
Int. Cl.<sup>6</sup> A23L 1/236

U.S. Cl. 426—548

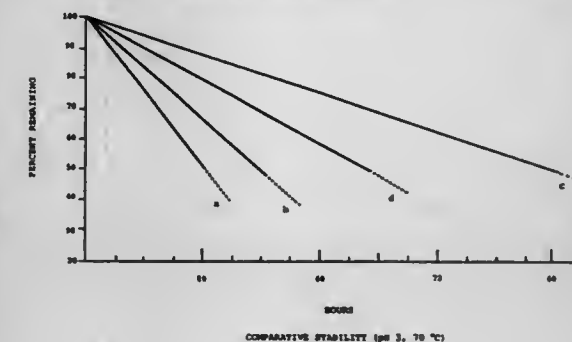
7 Claims

1. A compound of the general formula



e. laminating ribbons by stacking, one on top of stack another, set up ribbons, to a desired height, while the ribbons are being transported; and

f. cutting the stacked ribbons into desired lengths.



5,480,667

# NONDIGESTIBLE FAT COMPOSITIONS CONTAINING DIVERSELY ESTERIFIED POLYOL POLYESTER FOR PASSIVE OIL LOSS CONTROL

Patrick J. Corrigan; John K. Howie, and Peter Y. T. Lin, all of 6071 Center Hill Ave., Cincinnati, Ohio 45224-1703

Continuation of Ser. No. 968,780, Oct. 30, 1992, abandoned.

This application Oct. 11, 1994, Ser. No. 321,381

The portion of the term of this patent subsequent to Jun. 6, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> A23L 1/00

U.S. Cl. 426—531

19 Claims

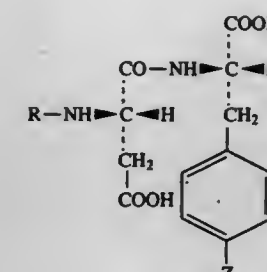
1. A nondigestible fat composition useful as a replacement for triglyceride fats or oils in foods, which composition has a Solid Fat Content profile slope between 70° F. and 98.6° F. of from 0 to about -0.75 % solids/°F. and which composition comprises:

A. a liquid nondigestible oil having a complete melting point below about 37° C.; and

B. nondigestible solid particles of polyol polyester material dispersed in said oil in an amount sufficient to control passive oil loss upon ingestion of said composition, said nondigestible solid particles having a complete melting point above about 37° C. and a thickness of about 1 micron or less, wherein the ester groups forming said polyol polyester material consist essentially of

- (i) at least about 15% ester groups formed from C<sub>20</sub>–C<sub>26</sub> long chain saturated fatty acid radicals, and
- (ii) other ester groups formed from fatty or other organic acid radicals which are dissimilar to said long chain saturated fatty acid radicals;

the molar ratio of said dissimilar radicals to said long chain saturated fatty acid radicals ranging from about 0.1:7.9 to about 3:5, provided further that said dissimilar radicals not consist solely of C<sub>2</sub>–C<sub>12</sub> short chain saturated fatty acid radicals, C<sub>12</sub> or higher long chain unsaturated fatty acid radicals, or a combination of said short chain saturated or said long chain unsaturated fatty acid radicals.



in which R is selected from CH<sub>3</sub>(CH<sub>2</sub>)<sub>2</sub>CH<sub>2</sub>, (CH<sub>3</sub>)<sub>2</sub>CHCH<sub>2</sub>, (CH<sub>3</sub>)<sub>2</sub>CHCH<sub>2</sub>CH<sub>2</sub>, CH<sub>3</sub>CH<sub>2</sub>CH(CH<sub>3</sub>)CH<sub>2</sub>, (CH<sub>3</sub>CH<sub>2</sub>)<sub>2</sub>CHCH<sub>2</sub>, (CH<sub>3</sub>)<sub>3</sub>CCH<sub>2</sub>CH<sub>2</sub>, cyclohexyl, cycloheptyl, cyclooctyl, cyclopentylmethyl, cyclohexylmethyl, 3-phenylpropyl, 3-methyl-3-phenylpropyl, 3,3-dimethylcyclopentyl, 3-methylcyclohexyl, 3,3,5,5-tetramethylcyclohexyl, 2-hydroxycyclohexyl, 3-(4-hydroxy-3-methoxyphenyl)propyl, 3-(4-hydroxy-3-methoxyphenyl)-2-propenyl, 3-(4-hydroxy-3-methoxyphenyl)-1-methylpropyl and 3-(4-hydroxy-3-methoxyphenyl)-1-methyl-2-propenyl groups, X is selected from CH<sub>3</sub>, CH<sub>2</sub>CH<sub>3</sub>, CH(CH<sub>3</sub>)<sub>2</sub>, CH<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub> and C(CH<sub>3</sub>)<sub>3</sub> groups and Z is a hydrogen atom or an OH group; and edible salts thereof.

5,480,669

# METHOD FOR INCREASING EXPANSION AND IMPROVING TEXTURE OF FIBER FORTIFIED EXTRUDED FOOD PRODUCTS

James P. Zallie, Hillsborough; Paul A. Altieri, Belle Mead; Chung-Wal Chiu, Westfield, and Matthew Henley, Somerville, all of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 36,603, Mar. 24, 1993, abandoned. This application Mar. 24, 1994, Ser. No. 217,784

Int. Cl.<sup>6</sup> A21D 2/36; A23L 1/0522

U.S. Cl. 426—549

4 Claims

1. A method to increase the expansion and improve the texture of extruded food products comprising

- (a) providing an uncooked cereal dough mix,
- (b) adding resistant starch to the cereal dough mix in an amount of 10–25% by weight of the uncooked dough mix,
- (c) adding sufficient water to the cereal dough to attain a moisture content of 14–22% by weight,



(d) cooking the cereal dough in an extruder, through varied temperature ranges 60°–170° C. at pressures within the range of  $2 \times 10^6$ – $4.3 \times 10^6$  N/m<sup>2</sup> (PA) [having an] to exit a die of a predetermined shape and size at a pressure within the range from  $1.38 \times 10^6$ – $6.21 \times 10^6$  N/m<sup>2</sup> (PA) to yield an expanded dough extrudate, having a moisture content of 8–11% by weight,

(e) drying the extruded dough to a final moisture content of less than about 3%.

5,480,670

# LOW FAT, LOW CHOLESTEROL, AND LOW CALORIE DAIRY LIGHTENER

William T. Pordy, New York, N.Y., assignor to Carberry Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 890,803, Jun. 1, 1992, Pat. No. 5,366,751. This application Nov. 21, 1994, Ser. No.

342,917

Int. Cl.<sup>6</sup> A23C 11/02

U.S. Cl. 426—580

19 Claims

1. A liquid coffee lightener which consists essentially of milk having approximately 8.5% milk solids by weight and 1–3.57% butterfat by weight; 2–12% by weight of additional milk solids added to said skim milk; and a natural fat substitute 03.3–10% by weight, said coffee lightener having total solids content within the range of 11–28% by weight and total fat and fat mimetic content to simulate the taste, body, appearance, mouthfeel and organoleptic properties of Half & Half while being substantially lower in total fat, saturated fat, and calorie content of and not exceeding the cholesterol content of conventional creamers.

5,480,671

# EMULSIFIED COMPOSITION OF OIL AND FAT, AND BREAD MADE BY USING SAME

Satoshi Nii, 18-7, Seijo 9-chome, Setagaya-ku, Tokyo, Japan

Filed Feb. 25, 1994, Ser. No. 202,199

Claims priority, application Japan, Mar. 31, 1993; 5-109712

Int. Cl.<sup>6</sup> A23L 1/20

U.S. Cl. 426—613

3 Claims

1. An emulsified composition comprising:  
oil and fat;  
said oil being a natural edible oil, said natural edible oil is vegetable oil, soybean oil, rape oil, animal oil or fish oil;  
said fat being a natural edible fat, said natural edible fat is a vegetable fat, palm fat, palm kernel fat, peanut fat, animal fat, beef tallow or lard;  
said oil and fat being 3% to 97% by weight of said emulsified composition;  
a fermented uncooked soybean paste;  
said soybean paste being 3% to 97% by weight of said emulsified composition; and  
said percentage by weight of said oil and fat being inversely proportional to said percentage by weight of said soybean paste so that when said weight of said oil and fat is increased in said emulsified composition, said weight of said soybean paste is decreased therein, and when said weight of said oil and fat is decreased in said emulsified composition, said weight of said soybean paste is increased therein.

5,480,672

# PROCESS FOR MAKING PRESERVED EDIBLE FOODS FROM ROOTCROPS

Keigo Kusano, Komamoto; Osamu Matsunaga, and Naomasa Hayashida, both of Tochigi, all of, Japan, assignors to Mitsui Kouzan Kabushiki Kaisha, Tokyo, Japan

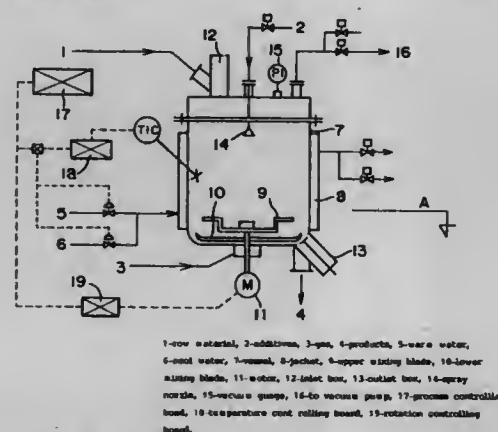
Filed Mar. 2, 1993, Ser. No. 25,287

Claims priority, application Japan, Mar. 2, 1992, 4-081539

Int. Cl.<sup>6</sup> A23K 3/00

U.S. Cl. 426—615

9 Claims



1. A process for making preserved edible foods from a rootcrop by processing such rootcrop into a dry powder, the process comprising the steps of:

- placing the rootcrop in a closable vessel;
- subjecting the rootcrop to chopping or cutting while the vessel is evacuated;
- drying the chopped/cut rootcrop by the application of heat thereto within the temperature range 25–55 degrees C. in order to remove moisture therefrom;
- injecting an inert gas into the dried root crop;
- crushing the rootcrop;
- spraying an aqueous mixture of an organic acid onto the crushed mass;
- spraying a mixture of water and a leaf extract thereonto;
- effecting a secondary drying of the resultant mass; and
- mixing the dried mass to a dispersed state.

5,480,673

# EXTRUDED HIGH SOLUBLE PROTEIN ANIMAL FEED AND METHOD OF PREPARING SAME

Galen J. Rokey, Sabetha, Kans., assignor to Wenger Manufacturing, Inc., Sabetha, Kans.

Filed Oct. 25, 1994, Ser. No. 329,070

Int. Cl.<sup>6</sup> A23K 1/00; A23P 1/12

U.S. Cl. 426—635

29 Claims

1. A process for the production of a feed product containing a soluble protein fraction, said process comprising the steps of:  
providing starting ingredients for said feed product including starch-bearing and proteinaceous ingredients;  
splitting said starting ingredients into respective fractions, one fraction containing said starch-bearing ingredient, and another fraction containing said proteinaceous ingredient;  
mixing said one fraction with water and passing the one fraction into and through an elongated cooking extruder having a barrel equipped with an inlet and a spaced, endmost extrusion die, and, during such passage, subjecting the one fraction to elevated temperature, pressure and shear for at least partial cooking of said starch-bearing ingredient; and  
introducing said other fraction into said barrel at a point between said inlet and extrusion die for mixing thereof with said one fraction, and, during passage of the other fraction from said point to and through said extrusion die, subjecting the other fraction to conditions of temperature, pressure and shear insufficient to completely denature and insolubilize said proteinaceous ingredient,

said one and said other fraction being simultaneously extruded through said extrusion die, the residence time of said one fraction within said extruder being greater than the residence time of said other fraction in said extruder.

5,480,674

# FLAVOR COMPOSITION FOR AN ORAL ELECTROLYTE REHYDRATION SOLUTION

Robert J. Peterson, Imlaystown, N.J., assignor to Firmenich Incorporated, Plainsboro, N.J.

Continuation of Ser. No. 83,002, Jun. 25, 1993, abandoned.

This application Nov. 29, 1994, Ser. No. 346,355

Int. Cl.<sup>6</sup> A23L 1/22; 2/00

U.S. Cl. 426—534

4 Claims

1. An oral electrolyte rehydration solution having a flavoring composition mixed therewith, the flavoring composition comprising:

- an ethyl ester component selected from the group consisting of ethyl acetate, ethyl butyrate, ethyl caproate, ethyl 2-methylbutyrate, ethyl heptanoate and mixtures thereof;
  - a citrus oil component selected from the group consisting of citral, orange oil, terpeness, orange oil 5-fold, mandarin oil, lemon oil, orange oil and mixtures thereof;
  - a sweet and fruity flavor component selected from the group consisting of ethyl vanillin, ethyl praline, benzaldehyde, amyl acetate and mixtures thereof; and
  - 4-Hydroxy-2,5-dimethyl-3(2H)-furanone;
- wherein said flavored oral electrolyte rehydration solution is free of allyl ester.

5,480,675

# METHOD OF AND APPARATUS PLATING PRINTED CIRCUIT BOARD

Tomoo Murakami; Hidebumi Ohnuki; Takanori Tsunoda, and Ryo Maniwa, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Continuation of Ser. No. 978,983, Nov. 19, 1992, abandoned.

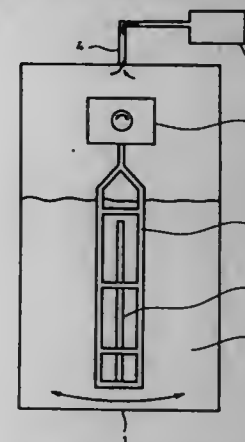
This application Mar. 10, 1994, Ser. No. 209,606

Claims priority, application Japan, Nov. 20, 1991, 3-303691

Int. Cl.<sup>6</sup> B05D 5/12

U.S. Cl. 427—98

9 Claims



1. A method for plating a printed circuit board in which the printed circuit board includes both a through hole and a cul-de-sac formed by a non-through hole for connecting a surface conductive layer and an interlayer wiring layer, said printed circuit board being immersed in a plating liquid in a vessel and being simultaneously subjected to both vibration and swinging actions, said method comprising the additional step of reducing the pressure inside the vessel simultaneously with the printed circuit board being subjected to the vibration and swinging actions in order to

remove any bubbles existing inside the cul-de-sac formed by said non-through hole, said swinging actions upending said cul-de-sac so that said bubbles float upwardly and out of said cul-de-sac.

5,480,676

# METHOD OF MAKING CERAMIC COMPOSITE BODIES HAVING A PROTECTIVE SURFACE REGION THEREON AND BODIES MADE THEREBY

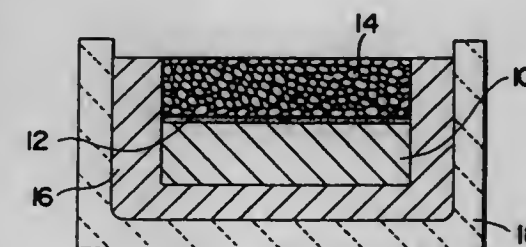
Birol Sonupariak, Newark; Kenneth S. Hatton, Wilmington; Dennis J. Landini, Newark; Sylvia J. Canino, Newark; Michael K. Aghajanian, Newark, and Aspi N. Patel, Newark, all of Del., assignors to Lanxide Technology Company, L.P., Newark, Del.

Continuation of Ser. No. 80,464, Jun. 21, 1993, abandoned, which is a continuation of Ser. No. 746,678, Aug. 16, 1991, Pat. No. 5,221,558, which is a continuation-in-part of Ser. No. 464,171, Jan. 12, 1990, abandoned. This application Jan. 17, 1995, Ser. No. 374,389

Int. Cl.<sup>6</sup> B05P 1/12

U.S. Cl. 427—180

20 Claims



1. A method for producing a self-supporting ceramic structure comprising (i) a ceramic matrix obtained by oxidation of a parent metal to form a polycrystalline material comprising an oxidation reaction product and at least one additional constituent, and (ii) a protective surface region on at least a portion of a surface of the ceramic matrix comprising a primary chemical constituent different from the primary chemical constituent of the ceramic matrix, comprising the steps of:

- (a) heating a parent metal in the presence of an oxidant to a temperature above the melting point of said parent metal but below the melting point of said oxidation reaction product to form a body of molten parent metal;
- (b) reacting said body of molten parent metal with said oxidant at said temperature to permit said polycrystalline material comprising an oxidation reaction product and at least one additional constituent to form;
- (c) maintaining at least a portion of said oxidation reaction product in contact with and between said molten parent metal and said oxidant at said temperature to progressively draw molten parent metal through said oxidation reaction product towards said oxidant to permit fresh oxidation reaction product to continue to form at an interface between said oxidant and previously formed oxidation reaction product, thereby forming said polycrystalline material comprising an oxidation reaction product and at least one additional constituent;
- (d) subjecting said polycrystalline material to a treatment to remove at least a portion of said at least one additional constituent; and
- (e) heating said polycrystalline material to a second temperature, said second temperature being sufficient to induce at least two constituents of said polycrystalline material to react to form at least one protective surface region on at least a portion of the surface of the ceramic matrix to form said ceramic structure.



5,480,677

# PROCESS FOR PASSIVATING METAL SURFACES TO ENHANCE THE STABILITY OF GASEOUS HYDRIDE MIXTURES AT LOW CONCENTRATION IN CONTACT THEREWITH

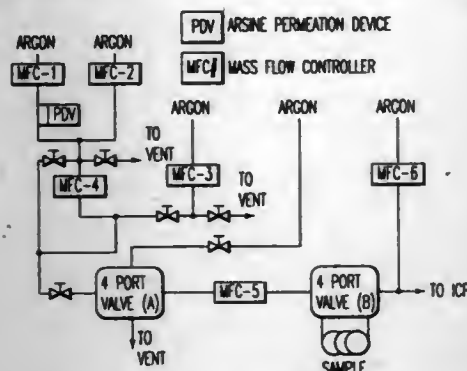
Yao-En Li, Buffalo Grove; John Rizos, Frankfort, and Gerhard Kasper, Downers Grove, all of Ill., assignors to American Air Liquide Chicago Research Center, Countryside, Ill.

Continuation of Ser. No. 215,016, Mar. 21, 1994, abandoned, which is a continuation of Ser. No. 709,183, Jun. 3, 1991, abandoned. This application Nov. 9, 1994, Ser. No. 338,230

Int. Cl.<sup>6</sup> C23C 16/00; F26B 3/00

U.S. Cl. 427-248.1

18 Claims



1. A process for enhancing stability of a stored gas mixture containing one or more gaseous hydrides selected from the group consisting of phosphine, arsine, and stibine, in contact with a metal surface, which comprises:

- purging a first gas in contact with said metal surface with a second inert gas to remove said first gas;
- exposing the metal surface to a passivating agent comprising an amount of a gaseous hydride of silicon, germanium, tin or lead sufficient for passivating substantially all of said metal surface to be in contact with said stored gas mixture, and for a time sufficient to form a passivated surface on substantially all of said metal surface, said metal surface being exposed to said passivating agent at a temperature up to about 100° C.;
- purging said passivating agent with said second inert gas; and
- contacting said passivated metal surface with said stored gas mixture, whereby stability of said stored gas mixture is enhanced.

5,480,678

# APPARATUS FOR USE WITH CVI/CVD PROCESSES

James W. Rudolph, Colorado Springs, Colo.; Mark J. Purdy, Akron, and Lowell D. Bok, Anna, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 16, 1994, Ser. No. 340,677

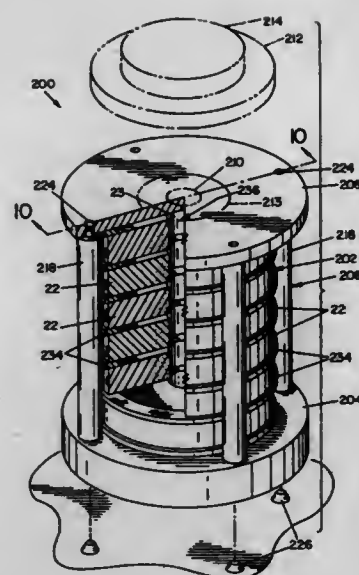
Int. Cl.<sup>6</sup> C23C 16/00

U.S. Cl. 427-248.1

28 Claims

1. A fixture with porous structures to be pressure gradient CVI/CVD densified inside a furnace, comprising:

- a stack of porous structures, each porous structure having an aperture therethrough;
- a base plate adapted to be secured inside the furnace, said base plate having a base plate aperture therethrough;
- a top plate spaced from and facing said base plate;
- a spacing structure disposed between said base plate and said top plate, said spacing structure engaging said base plate and said top plate, said stack of porous structures being disposed between said base plate and said top plate with one of said porous structures adjacent said base plate and another of said porous structures adjacent said top plate; and,
- at least one ring-like spacer disposed within said stack of porous structures between each pair of neighboring porous structures, said ring-like spacer encircling the neighboring porous structure apertures;



wherein said base plate, said stack of porous structures, and said at least one ring-like spacer define an enclosed cavity extending from said base plate aperture, including each porous structure aperture, and terminating proximate said top plate.

5,480,679

# PREVENTION OF ENZYME MEDIATED DISCOLORATION OF WOOD

Elmer L. Schmidt, Shoreview, Minn., and Terry L. Amburgey, Starkville, Miss., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Apr. 30, 1993, Ser. No. 56,685

Int. Cl.<sup>6</sup> C23C 16/00; B32B 9/04

U.S. Cl. 427-254

11 Claims

8. A method for treating unmilled logs in order to obtain wood products which have not been discolored by enzyme mediated discoloration, comprising the steps of:

- selecting, unmilled logs which have not been discolored by enzyme mediated discoloration and placing the selected logs in an enclosure prior to the formation of enzyme mediated discoloration;
- applying an effective amount of a gas or liquid phytotoxic fumigant composition under atmospheric pressure and at ambient temperature to the unmilled logs so as to kill substantially all parenchyma cells and thereby prevent enzyme mediated discoloration in the finished wood products, while maintaining the structural integrity of the logs; and
- manufacturing lumber from said logs.

5,480,680

# METHOD FOR REFINISHING WOOD

Todd T. Vieyra, Jonesboro, Ga., assignor to Furniture Medic, Inc., Forest Park, Ga.

Filed Sep. 9, 1993, Ser. No. 119,331

Int. Cl.<sup>6</sup> B05D 5/06; I/36

U.S. Cl. 427-388.4

7 Claims

1. A method for coloring nitrocellulose lacquer-finished wood with a surface wood grain that comprises applying to the wood a translucent layer of a composition that includes a water-based coloring agent and a water-based lacquer in such a manner that the surface wood grain is visible through the translucent layer, wherein the water-based coloring agent is selected from the group consisting of acid metal dyes, neutral metal dyes, Colour Index acid yellow Number 151, Colour Index acid red Number 337, Colour Index acid yellow Number 49, and combinations thereof.

5,480,681

# METHOD OF COATING WITH A GUMMER ROLL APPARATUS

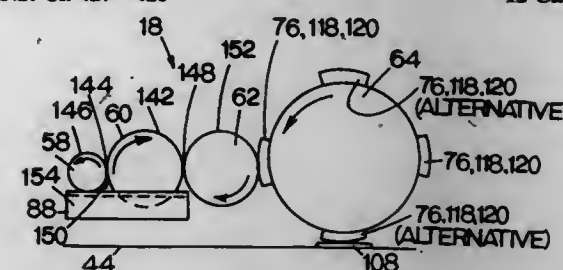
H. Richard VerMehren, 3865 N. Palafox St., Pensacola, Fla. 32505

Continuation-in-part of Ser. No. 494,679, Mar. 16, 1990, abandoned. This application Mar. 12, 1992, Ser. No. 850,428

Int. Cl.<sup>6</sup> B05D 1/28

U.S. Cl. 427-428

42 Claims



1. A method of transferring an adhesive, the method comprising the steps of:

- providing adhesive in a container having a reservoir means;
- rotating a first roller means through the adhesive in the container and collecting adhesive on the first roller means, the first roller means rotated in a first direction;
- rotating a second roller means in a second direction of rotation; skidding the second roller means against the first roller means, the first roller means and the second roller means rotating in opposite directions;
- transferring a portion of the adhesive carried on the first roller means to the second roller means through the skidding contact between the rollers;
- returning an excess portion of the adhesive to the adhesive means container;
- rotating the first roller means and the second roller means in skidding contact, thereby returning the excess adhesive to the adhesive container without substantially foaming the adhesive prior to its return to the container;
- transferring adhesive from the first roller means to a third roller means in operative contact with the adhesive carried on the first roller means;
- rotating the third roller means in the first direction;
- transferring adhesive from the third roller means to a fourth roller means in operative contact with the adhesive carried on the third roller means;
- rotating the fourth roller means in the second direction; and
- driving at least the first and the second of the roller means with a gear train, thereby providing rotational motion to the rollers associated with the adhesive container.

5,480,682

# NON-CRYOGENICALLY GENERATED NITROGEN ATMOSPHERE FOR RADIATION CURING

John J. Kaiser, Whitehall, and Diwakar Garg, Emmaus, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 66,183, May 21, 1993, abandoned. This application Aug. 25, 1994, Ser. No. 296,338

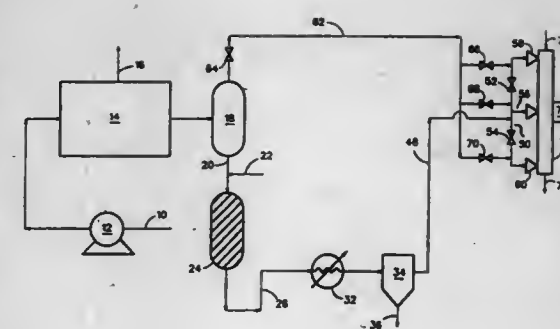
Int. Cl.<sup>6</sup> B05D 3/06; B01D 59/10

U.S. Cl. 427-495

9 Claims

1. A method of generating a nitrogen atmosphere and radiation curing of a moisture insensitive material to be cured in said nitrogen atmosphere, comprising the steps of:

- separating air to produce a nitrogen-rich gas containing residual oxygen gas by a separation selected from the group consisting of adsorptive separation to produce said nitrogen-rich gas containing residual oxygen gas and a membrane permeation separation to produce said nitrogen-rich gas containing residual oxygen gas;
- contacting said nitrogen-rich gas containing residual oxygen gas with a reducing gas to react with said residual oxygen gas



in the presence of a catalyst to generate a nitrogen-rich gas containing moisture and 10 ppm or less by volume of oxygen gas;

- passing said moisture insensitive material to be cured into a first zone of controlled atmosphere having a low oxygen gas content up to 5% by volume oxygen gas to reduce the concentration of oxygen gas at a barrier layer near a surface of said moisture insensitive material wherein said first zone is controlled to have said low oxygen gas content by introduction of a gas selected from the group consisting of said nitrogen-rich gas containing residual oxygen gas and said nitrogen-rich gas containing moisture and 10 ppm or less by volume of oxygen gas;
- passing said moisture insensitive material to be cured into a second zone of a nitrogen atmosphere having less than 100 ppm by volume oxygen gas and irradiating said moisture insensitive material to cure said moisture insensitive material with a source of radiation wherein said second zone is controlled to have said nitrogen atmosphere having less than 100 ppm by volume oxygen gas by the introduction of said nitrogen-rich gas containing moisture and 10 ppm or less by volume oxygen gas into said second zone; and
- removing said moisture insensitive material from said second zone having at least partially cured said moisture insensitive material.

5,480,683

# PROCESS FOR REDUCING THE COEFFICIENT OF FRICTION AND WEAR BETWEEN A METAL PART AND AN ORGANIC POLYMER-OR COPOLYMER-BASED PART AND ITS APPLICATION TO ARTIFICIAL LIMB-JOINTS AND FITTINGS WORKING IN MARINE ENVIRONMENTS

Claude Chabrol, Villeurbanne; Marc Robelet, Urieux; Robert Leveque, Firminy; Anne L. M. Pichat néc Nedelec; Jean F. E. Rieu, both of St Etienne; Louis M. Rabbe, Fraisses, and Andre Rambert, Lyons, all of France, assignors to Nitramid, Argenteuil, France

Continuation of Ser. No. 19,332, Feb. 17, 1993, abandoned, which is a continuation of Ser. No. 356,305, May 24, 1989, abandoned. This application Dec. 16, 1993, Ser. No. 167,111

Claims priority, application France, May 24, 1988, 88 06890

Int. Cl.<sup>6</sup> B05D 3/06

U.S. Cl. 427-525

5 Claims

1. A process for simultaneously reducing the coefficient of friction and the wear between a metal part and an organic polymer- or copolymer-based part, in an aqueous medium containing chlorides, comprising the step of:

- submitting the organic polymer- or copolymer-based part to a surface treatment by ionic implantation of elements selected from the group consisting of nitrogen, argon, oxygen and carbon in an amount and under conditions sufficient to impart a reduced coefficient of friction and wear to the part as compared to an organic polymer- or copolymer-based part which is untreated.



5,480,684

# METHOD OF REDUCING CARBON INCORPORATION INTO FILMS PRODUCED BY CHEMICAL VAPOR DEPOSITION INVOLVING ORGANOMETALLIC PRECURSOR COMPOUNDS

Gortej S. Sandhu, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Sep. 1, 1994, Ser. No. 299,505

Int. Cl.<sup>6</sup> C23C 14/14; 14/48

U.S. Cl. 427—531

28 Claims



1. A chemical vapor deposition method of providing a layer of material atop a semiconductor wafer using an organometallic precursor, the method comprising the following steps:

positioning the wafer within a chemical vapor deposition reactor;

injecting an organometallic precursor and a carrier gas to within the reactor having the wafer positioned therein;

maintaining the reactor at a temperature and a pressure which in combination are effective to deposit a layer of material onto the wafer which incorporates metal and carbon from the organometallic precursor;

after depositing the layer of material, ion implanting a late transition metal into the layer to a selected dose; and

after ion implanting, annealing the layer in the presence of a hydrogen source gas which effectively diffuses into the layer, hydrogen of the hydrogen source gas being catalyzed by the late transition metal within the layer into hydrogen atoms or radicals, the hydrogen atoms or radicals reacting with carbon in the layer to produce gaseous products which diffuse outwardly of the wafer and are expelled from the reactor.

5,480,685

# METHOD OF MAKING A MAGNETIC RECORDING MEDIUM COMPRISING TWO MAGNETIC LAYERS

Masayasu Suzuki, Toshiyoshi Mochizuki, and Hiroshi Kawashima, all of Shizuoka, Japan, assignors to Tomoeagawa Paper Co., Ltd., Tokyo, Japan

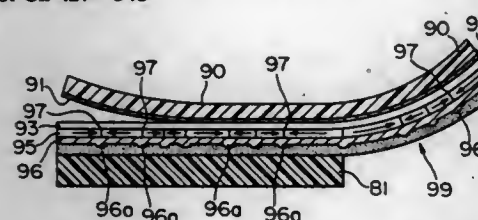
Filed Dec. 10, 1993, Ser. No. 165,734

Claims priority, application Japan, Jan. 22, 1993, 5-265177; Jan. 22, 1993, 5-265178

Int. Cl.<sup>6</sup> G11B 5/00

U.S. Cl. 427—548

7 Claims



1. A method for making a magnetic recording medium, having pre-recorded and fixated identifier coding information for forgery prevention, comprising the steps of:

forming a first magnetic layer comprising a dried binder medium and magnetic particles having a high coercive force of not less than 250 oersted and not more than 5,000 oersted on a non-magnetic holding material;

recording identifier coding information on said first magnetic layer magnetically;

forming a second magnetic layer comprising a binder medium containing a solvent, and magnetic particles of a coercive force of not more than 100 oersted so as to serve as a coding layer by duplicating said magnetic information recorded on said first magnetic layer in said second magnetic layer which is produced by forming protrusions having localized regions of different concentrations of magnetic particles in said second magnetic layer while the magnetic particles are mobile within said binder medium;

fixating said protrusions by removing said solvent from said binder medium by evaporation so as to harden said binder medium in said second magnetic layer so as to fixate said magnetic particles in-situ;

placing an adhesive layer on top of said second magnetic layer to form a magnetic transfer tape; and

transferring said first magnetic layer and said second magnetic layer defining the coding layer from said magnetic transfer tape to a non-magnetic base material to make said magnetic recording medium.

5,480,686

# PROCESS AND APPARATUS FOR CHEMICAL VAPOR DEPOSITION OF DIAMOND FILMS USING WATER-BASED PLASMA DISCHARGES

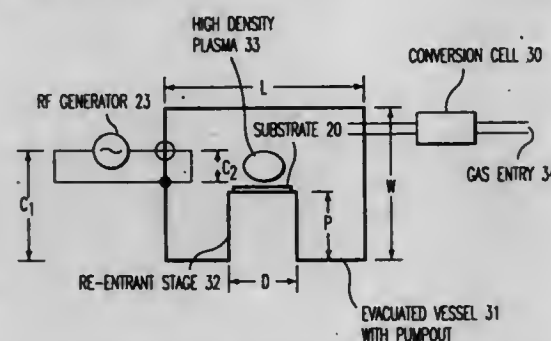
Ronald A. Rudder, Wake Forest; George C. Hudson, Clayton; Robert C. Hendry, Hillsborough; Robert J. Markunas, Chapel Hill, and Michael J. Mantini, Raleigh, all of N.C., assignors to Research Triangle Institute, Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 61,291, May 14, 1993, Pat. No. 5,418,018, which is a continuation of Ser. No. 787,891, Nov. 5, 1991, abandoned. This application Nov. 12, 1993, Ser. No. 151,184

Int. Cl.<sup>6</sup> B05D 3/06

U.S. Cl. 427—562

46 Claims



1. A water-based process for depositing a diamond film on a surface of a substrate, comprising:

providing a deposition apparatus including an inlet, a conversion zone coupled to the inlet, a dissociation zone coupled to said conversion zone, a deposition zone in which said dissociation zone is disposed, and an outlet;

introducing a feedstock gas phase mixture constituting by gas volume percentage at least 20% water and a carbon precursor containing compound into said inlet at a flow rate so that there is a net flow of said mixture through said conversion zone and a net flow through said dissociation zone, past said substrate in the deposition zone, and through said outlet;

reacting said mixture as said mixture flows through said conversion zone to produce reactant species saturated with respect to molecules containing carbon atoms and including H<sub>2</sub>, CO, C<sub>2</sub>H<sub>2</sub>, CH<sub>4</sub> with some residual water and substantially no O<sub>2</sub>, said reactant species flowing to said dissociation zone;

dissociating the reactant species produced in said reacting step in the dissociation zone to produce OH species, H species and carbon species; and

supplying the dissociated reactant species to said substrate in said deposition zone to produce said diamond film on the surface of said substrate.

5,480,687

# OPTICAL WAVEGUIDE WITH A SUBSTANTIALLY PLANAR SUBSTRATE AND PROCESS FOR ITS PRODUCTION

Martin Heming, Saulheim; Roland Hochhaus, Mainz; Ralf Kersten, Bremthal; Dieter Krause, Mainz; Jürgen Otto, Mainz; Volker Paquet, Mainz; Johannes Segner, Stromberg, all of Germany, and Christof Fattinger, Blauen, Switzerland, assignors to Schott Glaswerke, Mainz, Germany, and Hoffmann-La Roche, A.G., Basel, Switzerland

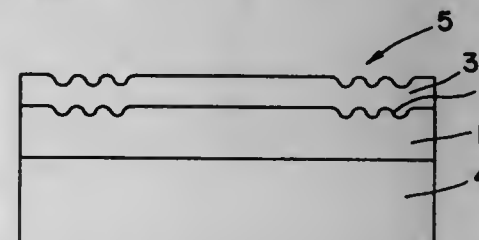
Continuation of Ser. No. 102,177, Aug. 4, 1993, which is a division of Ser. No. 946,072, Sep. 18, 1992, Pat. No. 5,369,722. This application Apr. 7, 1995, Ser. No. 418,895

Claims priority, application Germany, Sep. 18, 1991, 41 30 985.5; Apr. 24, 1992, 42 13 454.4; Aug. 29, 1992, 42 28 853.3

Int. Cl.<sup>6</sup> B05D 3/06

U.S. Cl. 427—573

35 Claims



1. A process for the production of an optical waveguide, said optical waveguide comprising a substantially planar substrate having a top surface, said substrate being a synthetic resin substrate or a substrate having a high organic proportion, and an inorganic waveguide layer wherein, during operation, light propagates through said waveguide layer, said process comprising:

optionally applying at least one intermediate layer onto said top surface of said substrate,

heating said synthetic resin substrate to a temperature less than the glass transition temperature of said synthetic resin substrate or heating said substrate having an organic proportion to a temperature less than 300° C., and

applying said inorganic waveguide layer, by plasma chemical vapor deposition, directly to said top surface of said substrate or onto the surface of said at least one intermediate layer positioned on said top surface of said substrate,

wherein said substrate having a high organic proportion contains hydrocarbon groups and metallic ions of metal oxides, and the ratio of the number of said hydrocarbon groups to the number of said metallic ions of metal oxides is greater than 0.1.

5,480,688

# SHAPED FLEXIBLE DECORATIVE ARTICLES AND METHOD FOR MAKING SAME

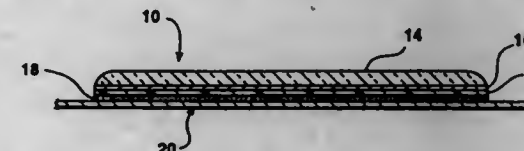
Michael W. Kaumeyer, Lancaster, Ohio, assignor to The Auld Company, Columbus, Ohio

Filed Jun. 13, 1994, Ser. No. 258,931

Int. Cl.<sup>6</sup> B60R 13/04

U.S. Cl. 428—13

5 Claims



1. A three-dimensional shaped non-planar decorative article comprising:

a flexible plastic substrate having sharply defined effective edges;

a cured plastic cap cast on and integral to said substrate, said cap providing a lens effect over said substrate;

said cured plastic cap being a flexible, abrasion resistant polyurethane;

a layer of adhesive material on the side of said substrate opposite to the side upon which said plastic cap is cast; and said substrate and said cap having a substantially non-planar shape.

5,480,689

# DECORATIVE SLEEVE FOR FURNITURE LEG

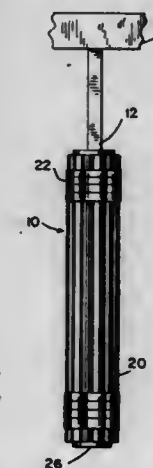
Randall B. Shepard, Albany, and Richard C. Hannum, Ross, both of Calif., assignors to The McGuire Furniture Company, San Francisco, Calif.

Filed Mar. 7, 1995, Ser. No. 400,143

Int. Cl.<sup>6</sup> B32B 1/08

U.S. Cl. 428—15

15 Claims



1. A sleeve assembly for a furniture leg, comprising: a sleeve having a central bore with an open end, the sleeve being adapted to be placed around a furniture leg;

a plurality of essentially cylindrical members positioned around the sleeve;

wrapping means for securing the essentially cylindrical members to the sleeve;

a support plate member for the cylindrical members, the support member being positioned at an end of the sleeve; and

a fastener adapted to extend through the support plate member into the central bore.

5,480,690

# MULTI-LAYER POLYAMIDE-BASED PACKAGING CASING

Karl Stenger, Ruedesheim; Ludwig Klenk, Oestrich-Winkel, and Dieter Beissel, Wiesbaden, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 642,852, Jan. 18, 1991, abandoned.

This application Sep. 27, 1993, Ser. No. 127,138

Claims priority, application Germany, Jan. 20, 1990, 40 01 612.9

Int. Cl.<sup>6</sup> B65D 85/72; 81/34

U.S. Cl. 428—34.8

28 Claims

1. polyamide-based biaxially stretch-oriented multi-layer tubular packaging casing for packaging pasty products, having a wall thickness of about 30 to 60 microns, wherein said casing includes a barrier layer with reduced oxygen permeability, an outer layer disposed on a first surface of said barrier layer, and an inner layer disposed on a second surface of said barrier layer,

said barrier layer comprising a polymer admixture, therein 30 to 95% by weight, relative to the weight of the polymer admix-



ture of the barrier layer is at least one of a saturated linear aliphatic polyamide or saturated linear aliphatic copolyamide; in admixture with at least one polymer selected from the group consisting of a partially-aromatic polyamide and a partially-aromatic copolyamide, wherein said partially aromatic polyamide or partially aromatic copolyamide consists essentially of, in a first embodiment, diamine units, of which at least 95 mole-% are aromatic and, optionally up to 5 mole-% aliphatic, and dicarboxylic acid units, of which at least 95 mole-% are aliphatic and, optionally, up to 5 mole-% are aromatic or, in a second embodiment, b) diamine units, of which least 95 mol % are aliphatic and, optionally, up to 5 mole-% are aromatic, and dicarboxylic acid units, of which at least 95 mole-% are aromatic and, optionally, up to 5 mole-% are aliphatic, and said outer and inner layers comprising a material selected from the group consisting of a saturated aliphatic polyamide, a saturated aliphatic copolyamide and a first polymer mixture which includes at least one saturated aliphatic polyamide or saturated aliphatic copolyamide, wherein said casing is formed by coextruding the polymers forming the individual layers through an annular die.

5,480,691

## TUBULAR FOOD CASING HAVING IMPROVED PEELABILITY

Klaus-Dieter Hammer, Mainz; Leo Mans, Saulheim, and Manfred Siebrecht, Wiesbaden, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany  
Filed Jul. 19, 1994, Ser. No. 277,039

Claims priority, application Germany, Jul. 19, 1993, 43 24 168.9

Int. Cl.<sup>6</sup> F16L 11/02; A22C 13/00

U.S. Cl. 428—34.8

19 Claims

1. A tubular food casing comprising:  
a cellulose containing casing; and  
a coating located on the inner side of said casing for improved peelability, wherein said coating comprises an admixture of about 450 to 800 mg/m<sup>2</sup> of lecithin and about 30 to 300 mg/m<sup>2</sup> of polytetrafluoroethylene.

5,480,692

## PROCESS TO INCREASE THE RESISTANCE TO TEARING OF A HEAT-RESETTABLE MATERIAL WEB

Norbert Nicolai, Dorsten; Heinz Koppe, Castrop Rauxel; Thomas Schwabe, Dorsten, and Jürgen Vogel, Leuna, all of, Germany, assignors to Stewing Nachrichtentechnik GmbH & Co., Berlin, Germany

Filed Apr. 22, 1994, Ser. No. 231,613

Claims priority, application Germany, Apr. 22, 1993, 43 13 153.0; Apr. 22, 1993, 43 43 166.6; Feb. 26, 1994, 44 06 406.3

Int. Cl.<sup>6</sup> B29C 55/00; 61/02; B65B 53/02; D01D 5/12

U.S. Cl. 428—35.1

15 Claims

1. A process for producing a heat-resettable web for use as a heat-shrinkable sheath about an object, said method comprising the steps of:

- extruding a crosslinkable polymer composition at a processing temperature and with a certain cross-linking density corresponding to a rubber-elastic modulus of substantially 10<sup>-4</sup> N/mm<sup>2</sup> to 10 N/mm<sup>2</sup> to form a base web;
- subsequently cooling the base web;
- heating said base web by exposing a side thereof to a heat source to create a temperature gradient across a thickness of said base web which is of reduced temperature away from said side toward a core of the base web;
- hot stretching said base web at a temperature of a lower part of said gradient which is below a crystallite temperature of any crystalline polymers of said composition and a glass

transition temperature of any amorphous polymers of said composition, thereby imparting an orientation to the base web over a full cross section thereof; and  
(e) thereafter cooling said base web to produce a heat-shrinkable web of high tear resistance capable of being heat shrunk around said object.

5,480,693

## COMPOSITE INTEGRAL SHEET OF HIGHLY ABSORBENT WRAP MATERIAL WITH HYDROPHOBIC WATER-VAPOR-PERMEABLE PELLICLE

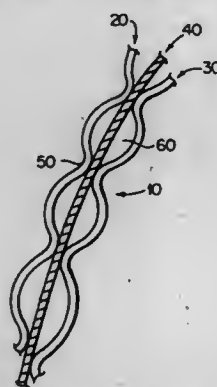
Robert Patterson, Neenah; Daniel J. Geddes, Appleton; David H. Hollenberg, Neenah, and Patrick L. Maynard, Combined Locks, all of Wis., assignors to The James River Corporation of Virginia, Richmond, Va.

Continuation of Ser. No. 158,171, Nov. 24, 1993, abandoned, which is a continuation of Ser. No. 714,928, Jun. 13, 1991, abandoned. This application Jan. 12, 1995, Ser. No. 371,670

Int. Cl.<sup>6</sup> B32B 7/04

U.S. Cl. 428—36.7

25 Claims



1. A foldable composite integral food wrap, comprising: a foldable sheet having a water-vapor-impermeable polymeric layer disposed between a printable layer and an absorbent layer; wherein at least one of said printable layer and said absorbent layer is discontinuously bonded to said polymeric layer at spaced locations, so that at least one of said printable layer and said absorbent layer forms air pockets with said polymeric layer at locations between the bond locations, said absorbent layer being fibrous and having a foraminous hydrophobic water-vapor-permeable pellicle on at least those fibers of the face of said absorbent layer opposite to said water-vapor-impermeable polymeric layer, said absorbent layer comprising the reaction product of in-situ cross-linking of an absorbent water soluble polymer, said reaction product being water insoluble and exhibiting a water-retention capacity of at least about 10 grams of water per gram of reaction product, the amount of reaction product present on an area basis being sufficient to absorb at least about 0.001 grams of water per square centimeter, the total amount of reaction product in said sheet being sufficient to absorb at least 1 gram of water.

5,480,694

## MAGNETIC RECORDING MEDIUM

Hideo Daimon, Toride; Osamu Kitakami, and Hideo Fujiwara, both of Ibaraki, all of, Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Jun. 4, 1990, Ser. No. 532,756

Claims priority, application Japan, Jun. 5, 1989, 1-142599; Nov. 29, 1989, 1-310070

Int. Cl.<sup>6</sup> B32B 3/02; G11B 5/66

U.S. Cl. 428—64.1

8 Claims

1. A magnetic recording medium comprising an aluminum or aluminum alloy substrate and a magnetic alumite layer formed on said substrate, said magnetic alumite layer, formed by anodic oxidation of said aluminum or aluminum alloy, comprising fine

5,480,696

## SILICA POWDERS FOR POWDER EVACUATED THERMAL INSULATING PANEL AND METHOD

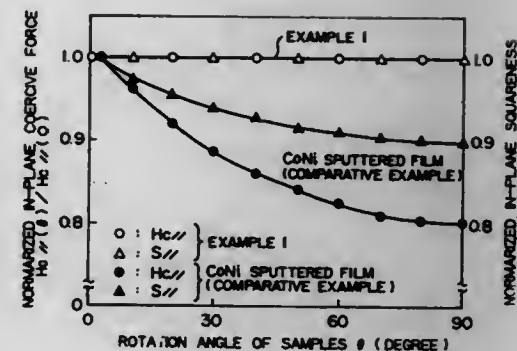
Michael T. Harris, Knoxville; Osman A. Basaran; Thomas G. Kollie, both of Oak Ridge, and Fred J. Weaver, Knoxville, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 237,083, May 3, 1994, Pat. No. 5,395,604, which is a division of Ser. No. 90,346, Jul. 9, 1993, Pat. No. 5,376,449. This application Aug. 31, 1994, Ser. No. 298,719

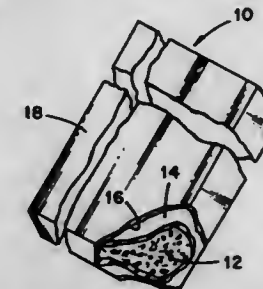
Int. Cl.<sup>6</sup> B32B 1/06

U.S. Cl. 428—69

4 Claims



pores filled with a ferromagnetic material to provide said magnetic layer in a discrete form, said magnetic alumite layer having an in-plane remanence at least 3.6 times greater than a perpendicular remanence, said ferromagnetic material being selected from at least one member of the group consisting of Co containing P, and a Co alloy containing P, content of said P in said ferromagnetic material being within a range of from 0.05 at % to 33 at %, said magnetic alumite layer having a thickness of from 500 to 5000 angstroms, said alumite layer having a porosity of from 0.1 to 0.75 and said recording medium having an in-plane coercive force of from 500 to 1500 Oe.



1. A powder evacuated thermal insulation panel comprising housing means having a cavity therein, an enclosed substantially gas impervious envelope means disposed within the cavity of the housing means, and porous substantially spherical silica particles encased within the enclosed envelope means in the presence of an ambient pressure substantially less than atmospheric pressure, said silica particles having a median diameter of less than about 100 nanometers, an internal porosity sufficiently small to significantly restrict motion of gas molecules therein for substantially preventing thermal conduction by collision of gas molecules within the silica particles, an external surface area in the range of about 90 to 600 m<sup>2</sup>/g, and a pour density of about 0.4 to 0.6 g/cm<sup>3</sup>.

5,480,695

## CERAMIC SUBSTRATES AND MAGNETIC DATA STORAGE COMPONENTS PREPARED THEREFROM

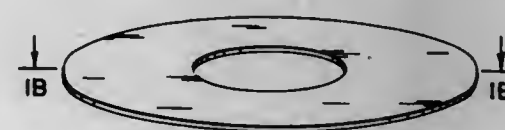
Michael A. Tenhover, 4 Buttonwood La., East Amherst, N.Y. 14051, and Irving R. Ruppel, 996 Colvin Blvd., Kenmore, N.Y. 14217

Filed Aug. 10, 1994, Ser. No. 288,386

Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428—65.5

10 Claims



1. A magnetic storage medium comprising:

- a non-oxide ceramic base having a density of at least about 90 percent of theoretical density and a coefficient of thermal expansion of from about 2 to about 7 ppm/° C.;
- a substantially amorphous smoothing layer comprised of silicon carbide corresponding to the formula SiC<sub>x</sub>, wherein x is the molar ratio of carbon to silicon and is greater than 1, the smoothing layer having an inner surface contacting at least one surface of the ceramic base and an outer surface with a surface roughness of about 100 Å Ra or less; and
- a magnetic layer capable of storing data and having an inner surface and an outer surface, the magnetic layer being disposed over the smoothing layer.

5,480,697

## STRUCTURAL PART BASED ON A SANDWICH FABRIC

Wolfgang Böttger, Ködnitz, and Werner Pensel, Kulmbach, both of, Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Germany

Continuation of Ser. No. 818,808, Jan. 9, 1992, abandoned.

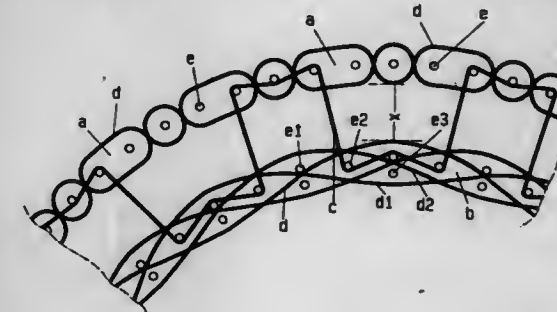
This application Apr. 8, 1993, Ser. No. 43,966

Claims priority, application Germany, Jan. 12, 1991, 41 00 738.7

Int. Cl.<sup>6</sup> B32B 3/02; 5/12; 7/00

U.S. Cl. 428—86

8 Claims



1. A structural part having a curvature and including a laminar fabric, said laminar fabric comprising at least one first fabric layer and at least one second fabric layer and intermediate links connecting said at least one first layer and said at least one second layer, the laminar fabric being composed of a high tenacity yarn of a fiber selected from the group consisting of aramid, carbon, ceramic, and glass fibers;

wherein, said laminar fabric is impregnated with a resin, the resin is cured, and said intermediate links serve as rigid



spacing elements between said at least one first layer and said at least one second layer;  
 said at least one second layer is woven in an open weave;  
 said open weave is curved and comprises a plurality of warp threads and a plurality of filling layers of weft threads and, said open weave provides that each of said warp threads alternates through a plurality of said filling layers of weft threads;  
 said at least one first layer comprises weft threads and warp threads which alternate through the weft threads of said at least one first layer; and  
 said intermediate links comprise further threads which enter into said open weave and alternate as warp threads among weft threads of said open weave, said further threads entering into said at least one first layer and alternating as warp threads among weft threads of said at least one first layer.

5,480,698

# ACRYLIC OR POLYCARBONATE SHEET-LACQUER LAMINATES AND ARTICLES OF FURNITURE MADE THEREFROM

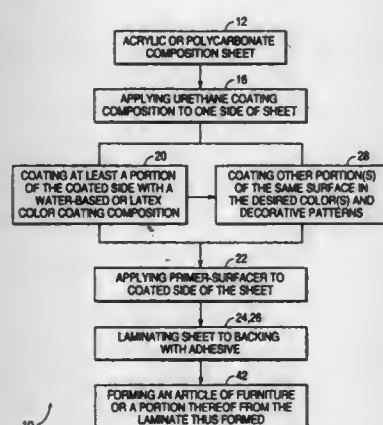
Charles Hayman-Chaffey, 138 E. 26th St., New York, N.Y. 10010

Filed Sep. 13, 1994, Ser. No. 305,190

Int. Cl.<sup>6</sup> B32B 3/00; 27/08; 27/00; B05B 5/00

U.S. Cl. 428—86

23 Claims



1. A method of making a decorative laminated article comprising the steps of:

- providing an acrylic or polycarbonate composition sheet which includes a pair of opposed surfaces;
- applying a clear urethane coating composition to at least a portion of one surface of the acrylic or polycarbonate composition sheet;
- applying a water-based or latex color coating composition over at least that portion of one surface of the sheet to which the urethane coating has been applied;
- applying a urethane primer-surfacer coating composition over at least that portion of one surface of the sheet to which the color coating has been applied; and
- adhesively bonding the surface of said sheet to which the urethane coating composition, the color coating and the primer-surfacer coating have been applied to a backing member, said backing member comprising a fiber composition, whereby the uncoated surface of the acrylic sheet layer forms the outer layer of the laminated article.

5,480,699

# PAD FOR APPLYING LIQUID OR SEMI-SOLID MATERIAL

Gerd Gerhardt, Bichwil, and Ernst Werner, Flawil, both of, Switzerland, assignors to Flawa Schweizer Verbandstoff-und Waffefabriken AG, Flawil, Flawil, Switzerland  
 Continuation of Ser. No. 110,213, Aug. 23, 1993, abandoned, which is a continuation of Ser. No. 915,385, Jul. 20, 1992, abandoned, which is a continuation of Ser. No. 614,577, May 1, 1990, abandoned, which is a continuation of Ser. No. 96,307, Sep. 8, 1987, abandoned. This application Aug. 10, 1994, Ser. No. 288,884

Claims priority, application Switzerland, Sep. 8, 1986, 3592/86

Int. Cl.<sup>6</sup> B32B 5/14; 27/00; 27/34

U.S. Cl. 428—171

17 Claims

1. A pad consisting essentially of:
  - a first outer layer made of fibrous absorbent material having inner and outer surfaces wherein the outer surface of said first outer layer is embossed;
  - a substantially uncompressed intermediate layer made of one ply of carded web fibrous absorbent material;
  - a second outer layer made of fibrous absorbent material having inner and outer surfaces wherein the outer surface of said second outer layer is embossed;
 wherein the inner surface of said first outer layer and the inner surface of said second outer layer contact said intermediate layer;  
 said intermediate layer being laterally coextensive with said first outer layer and said second outer layer;  
 wherein the absorbent material is selected from the group consisting of cotton, viscose, synthetic fiber and mixtures thereof; and  
 said pad being formed by assembling the first outer layer, the intermediate layer and the second outer layer and the resulting assembly is stamped, wherein said stamping unites said layers.

5,480,700

LABEL, AND LABEL SHEET AND INK THEREFOR  
 Katsuya Kume; Yozo Oishi; Mitsuo Kuramoto, and Itsuroh Takenoshita, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed Jun. 14, 1994, Ser. No. 260,265

Claims priority, application Japan, Jun. 16, 1993, 5-169509

Int. Cl.<sup>6</sup> B32B 3/00

U.S. Cl. 428—195

14 Claims



1. A label consisting essentially of:
  - a label sheet comprising an ink-receiving layer comprising a polyolefin having a viscosity average molecular weight of from 5,000 to 6,000,000 as a film-forming component and heat-transferred patterns comprising an ink comprising a polyolefin having a viscosity average molecular weight of from 5,000 to 300,000 and a coloring agent, formed on the ink-receiving layer,
 wherein said ink-receiving layer has a thickness of from 1 to 100  $\mu$ m.

5,480,701

# LAMINATE SHEET AND CARD

Junichi Hiroi, Tokyo, Japan, assignor to Dai Nippon Printing Co., Ltd., Japan

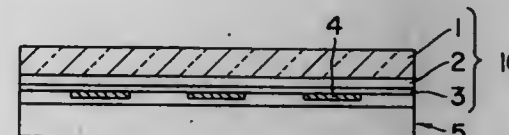
Continuation of Ser. No. 111,275, Aug. 24, 1993, abandoned, which is a division of Ser. No. 769,371, Oct. 19, 1991, abandoned. This application Dec. 19, 1994, Ser. No. 357,984

Claims priority, application Japan, Jan. 4, 1990, 2-265109

Int. Cl.<sup>6</sup> B41M 5/26; B32B 27/14

U.S. Cl. 428—204

33 Claims



1. A laminated structure comprising:
  - a sheet material having a surface in which a thermally transferred image is formed; and
  - a laminate sheet comprising (i) a base sheet having a first major surface and an opposed, second major surface; (ii) a first bonding layer laminated on said first major surface of said base sheet, said first bonding layer comprising ionomer resin; and (iii) a second bonding layer laminated on said first bonding layer, said second bonding layer comprising at least one resin selected from the group consisting of polyamide resin and vinyl chloride/vinyl acetate copolymer resin;
 wherein said laminate sheet is bonded to said surface of said sheet material through direct contact with said second bonding layer.

5,480,702

# ARTICLE HAVING INDICIA-RECEIVING LAYER

Tajji Matsumoto, Neyagawa; Atsuhiko Suda, Kyoto; Kenji Sumiya, Suita, and Yoshinori Yamamoto, Takatsuki, all of, Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan  
 Continuation of Ser. No. 110,754, Aug. 23, 1993, abandoned, which is a continuation of Ser. No. 829,600, Feb. 3, 1992, abandoned, which is a continuation of Ser. No. 515,350, Apr. 30, 1990, abandoned, which is a continuation of Ser. No. 264,876, Oct. 31, 1988, abandoned. This application Oct. 13, 1994, Ser. No. 322,033

Claims priority, application Japan, Jan. 31, 1987, 62-276339; Nov. 13, 1987, 62-287914

Int. Cl.<sup>6</sup> B32B 27/20; 27/30; 27/40

U.S. Cl. 428—209

8 Claims

1. An information receptive article which receives an indicia made by an ink containing a pigment and a binder resin by thermal transfer printing to which a sliding contact force is applied by a reading and writing machine, said article comprising a substrate and an indicia receiving layer formed on at least one surface of said substrate which layer comprises a pigment and a binder resin which consists essentially of a blend of (1) a copolymer of vinyl chloride, vinyl acetate and an acrylic monomer having a hydroxyl group, said copolymer having from 0.1 to 7.0% by weight of acrylic hydroxyl groups to enhance dispersability and (2) a polyurethane resin with aromatic rings in an amount of from 0.05 to 6.0 mmol/g to increase stiffness, decrease stickiness and increases durability of said indicia image thermally transferred to said indicia-receiving layer.

5,480,703

# HEAT-RESISTANT THERMAL TRANSFER RECORDING MEDIUM

Hideki Suematsu, Osaka, Japan, assignor to Fujicopian Co., Ltd., Japan

Filed Apr. 28, 1994, Ser. No. 234,534

Claims priority, application Japan, Apr. 30, 1993, 5-104650

Int. Cl.<sup>6</sup> B41M 5/26

U.S. Cl. 428—212

2 Claims

1. A heat-resistant thermal transfer recording medium comprising a foundation, a release layer provided on the foundation and a heat-meltable ink layer provided on the release layer, wherein the heat-meltable ink layer comprises a vehicle and a coloring agent, the vehicle comprising a wax and 10 to 50 parts by weight of a heat-meltable resin per 100 parts by weight of the vehicle, the wax comprising 50 to 100 parts by weight of an oxidized polyethylene wax per 100 parts by weight of the wax, and the heat-meltable ink layer has a melting or softening point of not lower than 95° C., wherein the release layer comprises 50 to 100 parts by weight of a wax per 100 parts by weight of the release layer, the wax comprising 60 to 100 parts by weight of a polyethylene wax per 100 parts by weight of the wax, and the release layer has a melting point of not lower than 90° C.

5,480,704

# THERMAL TRANSFER PRINTING MEDIUM

Jun Sogabe, Osaka, Japan, assignor to Fujicopian Co., Ltd., Japan

Filed Sep. 19, 1994, Ser. No. 308,598

Claims priority, application Japan, Sep. 20, 1993, 5-233518; Mar. 22, 1994, 6-050550

Int. Cl.<sup>6</sup> B41M 5/26

U.S. Cl. 428—212

3 Claims

1. A thermal transfer printing medium comprising a foundation, a release layer comprising a wax, a first thermal transfer layer comprising a heat-meltable material containing 20 to 100% by weight of a resin, said resin having a glass transition point of not lower than 50° C. and a melt viscosity of not higher than 1 $\times$ 10<sup>4</sup> cps/160° C., and a second thermal transfer layer comprising a heat-meltable material and having a melt viscosity of not lower than 1 $\times$ 10<sup>5</sup> cps/160° C., the release layer, the first thermal transfer layer and the second thermal transfer layer being provided in this order on the foundation, at least one of the first and second thermal transfer layers containing a coloring agent.

5,480,705

# HIGH STRENGTH NON-CHLORINATED MULTI-LAYERED POLYMERIC ARTICLE

Howard R. Tolliver, and Terry R. Bailey, both of Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 24, 1993, Ser. No. 82,037

Int. Cl.<sup>6</sup> B32B 7/02

U.S. Cl. 428—217

24 Claims



1. A multilayered article that comprises:
  - a fabric having first and second sides; and
  - a first sheet disposed on the first side of the fabric, and a second sheet disposed on the second side of the fabric, the first sheet comprising polymeric layers A and B and the second sheet comprising polymeric layers A' and B', wherein:



polymeric layers A and A' each include a non-chlorinated, copolymer that contains ethylene units and has a Shore A hardness less than 85; polymeric layers B and B' each include a non-chlorinated polymer having a Shore A hardness greater than 85; and polymeric layers A and A' are disposed between the fabric and layers B and B', respectively.

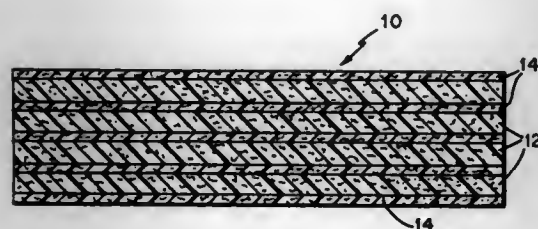
5,480,706

# FIRE RESISTANT BALLISTIC RESISTANT COMPOSITE ARMOR

Hsin L. Li, Parsippany; Young D. Kwon, Mendham, and Dusan C. Prevorsek, Morristown, all of N.J., assignors to AlliedSignal Inc., Morris Township, N.J.  
Continuation of Ser. No. 71,868, Jun. 2, 1993, abandoned, which is a continuation of Ser. No. 755,231, Sep. 5, 1991, abandoned. This application Jun. 16, 1994, Ser. No. 260,661  
Int. Cl.<sup>6</sup> B32B 5/12; 7/00; B27N 9/00

U.S. Cl. 428—113

31 Claims



1. A fire resistant complex multilayer ballistic resistant article comprising a plurality of alternating first and second plies, wherein said first ply comprises one or more first layers comprising a network of flammable polymeric fibers in a first matrix, said fibers having a tenacity of at least about 7 g/denier, a tensile modulus of at least about 160 g/denier and an energy-to-break of at least about 8 joules/grams; and said second ply comprises one or more second layers comprising a network of fire resistant organic or inorganic fibers in a second matrix material wherein said second matrix material is a fire retardant material and is different from said first matrix material.

5,480,707

# TOUGHENED CERAMIC COMPOSITE MATERIALS COMPRISING COATED REFRACTORY FIBERS IN A CERAMIC MATRIX WHEREIN THE FIBERS ARE COATED WITH CARBON AND AN ADDITIONAL COATING OF CERAMIC MATERIAL AND CARBON MIXTURE

Wayne S. Steffier, Huntington Beach, Calif., assignor to HyperTherm High-Temperature Composites, Inc., Huntington Beach, Calif.

Filed Oct. 6, 1993, Ser. No. 132,671

Int. Cl.<sup>6</sup> D03D 3/00; C04B 35/03; 35/52

U.S. Cl. 428—229

6 Claims

1. A ceramic composite material comprising refractory reinforcing fibers coated with a first coating of fugitive carbon having a thickness of 50–500 angstroms and a second coating of pseudoporous material comprising a refractory metal carbide ceramic material with fugitive carbon and having a thickness of 0.5–5.0 microns, wherein the coated fibers are embedded in a ceramic matrix.

5,480,708

# CONFORMABLE ORTHOPEDIC CASTING TAPE

Peiwen Cheng, Raynham, Mass., assignor to Johnson & Johnson Professional, Inc., Raynham, Mass.

Filed Jan. 27, 1995, Ser. No. 379,387

Int. Cl.<sup>6</sup> A61F 5/01; B32B 5/04; 5/08; 5/20; 25/08

U.S. Cl. 428—231

10 Claims

1. An orthopaedic casting tape containing a fibrous substrate impregnated with a water-reactive polyurethane prepolymer, said substrate comprising a combination of an inelastic fiber and an elastomeric fiber which is not substantially reactive with the prepolymer and which will maintain its elastic properties for at least 12 months in contact with the prepolymer, the elastomeric fiber being incorporated in the substrate in the length direction of the substrate to give the substrate an extensibility of between 40% and 200% in the length direction, said substrate having a power such that the force necessary to extend the substrate to 30% elongation is between 40 and 175 grams per inch of substrate width the elastomeric fiber comprising a blend of a cured olefin rubber and an olefin resin which has a Shore A hardness of less than 80 a 100% tensile module of less than 1000 PSI and an elongation of at least 200%.

5,480,709

# ELASTIC FABRIC FOR SUPPORT ARTICLES

Jean-Pierre Sauvignat, Saint Etienne, France, assignor to Etablissements Antonine Bertheas & Cie, France

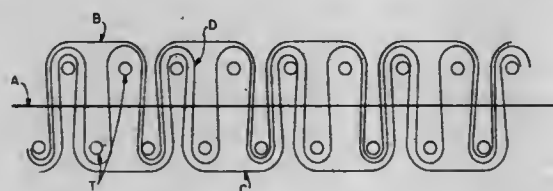
Filed Feb. 28, 1995, Ser. No. 396,427

Claims priority, application France, Mar. 3, 1994, 94 02682

Int. Cl.<sup>6</sup> D03D 3/00

U.S. Cl. 428—231

4 Claims



1. A fabric for support-articles, having a high degree of elasticity in its warp direction, of the type comprising a hybrid warp composed of highly extensible yarns (A) making it possible to give the fabric elasticity, yarns making it possible to provide comfort and the feel as well as to adjust the degree of support, and the filling (T) itself being constituted by a man-made monofilament yarn (bristle), and the weave being such that, after production, the elastic yarns (A) remain positioned in the central part of the fabric and are concealed by the comfort-providing yarns, wherein the warp is composed of at least three types of yarns of different kinds working according to different weaves with respect to the weft yarns, namely:

highly elastic yarns (A) of the "covered yarn" type working according to a plain weave;

two series of yarns (B, C) called "ground threads" consisting of textured man-made yarns and working according to a weave such that they form floats visible on both faces after production, at least one of these series of yarns consisting of elementary filaments as fine as possible;

a series of yarns called "binding threads" consisting of textured man-made yarns working according to a taffeta weave and keeping the highly extensible yarns (A) in the central part of the fabric and blocking the ground threads (B, C).

5,480,710

# NEW FIBERBALLS

Michael S. Frankosky, Hockessin, Del., and Adrian C. Snyder, Greenville, N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 129,624, Sep. 30, 1993, abandoned. This application Mar. 17, 1995, Ser. No. 406,355

Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428—288

6 Claims

1. Fiberballs, of average diameter 2 to 15 mm, consisting essentially of randomly-arranged, entangled, crimped polyester fiberfill having a cut length of 10 to 100 mm, characterized in that the polyester is poly (1,4-cyclohexanedimethylene terephthalate).

5,480,711

# NANO-POROUS PTFE BIOMATERIAL

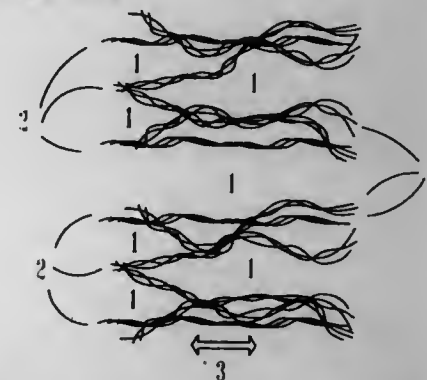
Bruce G. Ruefer, 3305 66th St., Lubbock, Tex. 79413

Filed Jul. 12, 1994, Ser. No. 273,460

Int. Cl.<sup>6</sup> H01B 7/18

U.S. Cl. 428—315.5

6 Claims



1. A nano-porous PTFE biomaterial consisting of highly amorphous polytetrafluoroethylene polymer, wherein said material is characterized by a microstructure of voids created by separation of parallel and semi-parallel polymeric chains and has unidirectional high strength and soft and flexible mechanical properties.

5,480,712

# NON-HOLLOW ADSORBENT POROUS FIBER

Isamu Takahashi; Shigeki Hayashi, and Yoshio Iida, all of Gifu, Japan, assignors to Ube-Nitto-Kasei Co., Ltd., Tokyo, Japan

PCT No. PCT/JP91/01690, § 371 Date Jun. 3, 1992, § 102(e) Date Jun. 3, 1992

PCT Filed Dec. 4, 1991, Ser. No. 852,259

Claims priority, application Japan, Jan. 31, 1991, 3-286715; Jan. 31, 1991, 3-286716; Jan. 31, 1991, 3-286717; Jan. 31, 1991, 3-311309

Int. Cl.<sup>6</sup> B32B 3/26

U.S. Cl. 428—316.6

5 Claims



1. A porous fiber comprising a main fiber body formed of a high-density polyethylene having a melt flow rate of 0.3 to 20 g/10 minutes and numerous pores formed by mixing the above high-

5,480,713

# MAGNETIC RECORDING MEDIUM

Kunitsuna Sasaki; Narito Goto; Katsuyuki Takeda; Nobuyuki Sekiguchi; Hideki Takahashi; Ryosuke Isobe, and Takahiro Mori, all of Hino, Japan, assignors to Konica Corporation, Japan

Continuation of Ser. No. 815,052, Dec. 27, 1991, abandoned.

This application Sep. 1, 1993, Ser. No. 115,903

Claims priority, application Japan, Dec. 28, 1990, 2-417542; Apr. 12, 1991, 3-108442

Int. Cl.<sup>6</sup> B32B 5/16; G11B 5/66

U.S. Cl. 428—323

6 Claims



1. A magnetic recording medium comprising: a non magnetic support having provided thereon a plurality of layers including an outermost layer having a maximum thickness of 1 μm, said outermost layer containing a binder and a magnetic metal Fe-Al powder having a maximum major axis length of less than 250 nm, and a ratio of an average major axis length to an average X-ray measured particle size of less than 12.

5,480,714

# CHIPPING-RESISTANT RESIN MOLDED ARTICLE

Toshiyasu Ito; Yasuhiko Ogisu; Shigeyuki Takahashi; Toshiya Uemura, all of Inazawa; Minoru Nohata, Omiya; Ippai Nagaike, Omiya; Shigeru Noguchi, Omiya, and Kenjiro Arai, Omiya, all of Japan, assignors to Toyoda Gosei Co., Ltd., Aichi, Japan

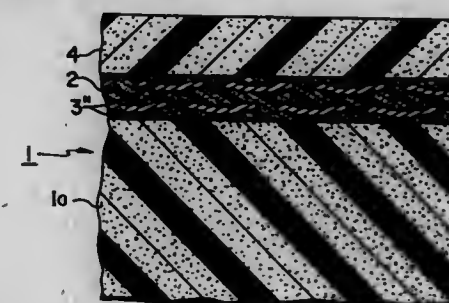
Filed Apr. 9, 1993, Ser. No. 44,507

Claims priority, application Japan, Apr. 28, 1992, 4-109487; Apr. 28, 1992, 4-109488; Apr. 28, 1992, 4-109489; Apr. 28, 1992, 4-134438; Apr. 28, 1992, 4-134439

Int. Cl.<sup>6</sup> B32B 5/16

U.S. Cl. 428—324

4 Claims



1. A resin molded article comprising a main body of resin molded material, an intermediate coating layer, comprising a resin constituent which resin constituent comprises a mixture of an amine-modified acrylic resin, an epoxy compound having at least two epoxy groups said epoxy compound selected from the group consisting of bisphenol A and glycidyl ether of a polyhydric alcohol and a chlorinated polyolefin having a chlorine content of 20% to 40% and scaly pieces of matter in an amount of 2% to 60%



based on said resin constituent which scaly pieces of matter have a particle diameter of 1 to 300  $\mu\text{m}$  and an aspect ratio of 3 to 150 and are oriented parallel to the surface of said main body, and a finish coating layer formed on the outermost surface of said intermediate coating layer.

5,480,715

# POLYMERIC FILM CONTAINING SILICONE RESIN PARTICLES

David A. Mills, Darlington, and Karl Rakos, Nr. Ferryhill, both of, United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Filed Dec. 21, 1993, Ser. No. 170,802

Claims priority, application United Kingdom, Dec. 23, 1992, 9226866; Dec. 23, 1992, 9226867

Int. Cl.<sup>6</sup> B32B 5/16; 27/06; 27/36

U.S. Cl. 428—327

2 Claims



1. A transparent polymeric film comprising an essentially unfilled primary layer of polyester material having on at least one surface thereof a secondary layer of polyester material comprising, based upon the weight of the polyester in the secondary layer, from 200 to 400 ppm of silicone resin particles having a volume distributed median particle diameter of 1.9 to 3.5  $\mu\text{m}$ , and from 100 to 250 ppm of silicone resin particles having a volume distributed median particle diameter of 0.6 to 0.9  $\mu\text{m}$ , said film having a wide angle haze, for a 75  $\mu\text{m}$  thick film, of less than 0.8% and wherein the static coefficient of friction of the secondary layer measured against itself is less than 0.4.

5,480,716

# MAGNETIC RECORDING MEDIUM COMPRISING FERROMAGNETIC PARTICLES AND A COMPOUND WITH A PYRIMIDINE OR TETRAZAINdene STRUCTURE

Koji Naoe, and Kiyomi Ejiri, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

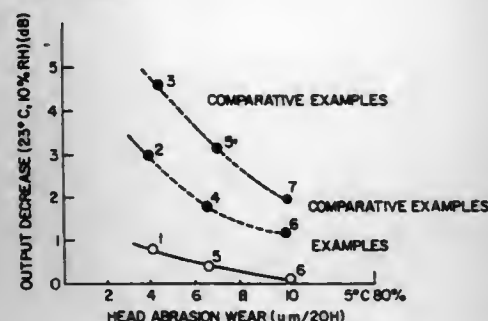
Filed Jun. 21, 1994, Ser. No. 262,843

Claims priority, application Japan, Jun. 21, 1993, 5-172048

Int. Cl.<sup>6</sup> G11B 5/00

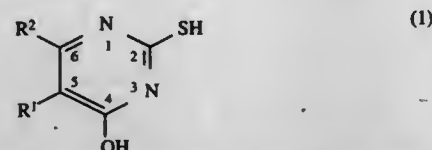
U.S. Cl. 428—328

4 Claims

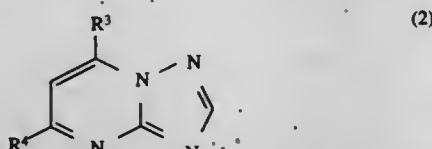


1. A magnetic recording medium, comprising a nonmagnetic support and a magnetic layer provided thereon, said magnetic layer comprising mainly ferromagnetic metal particles and a binder resin, said ferromagnetic metal particles containing Al in an amount of from 0.5 to 6% by weight per the total weight of metal components contained in the ferromagnetic metal particles and

further containing on the surfaces thereof at least one compound selected from the group consisting of: a compound represented by the following formula (1):



wherein R<sup>1</sup> and R<sup>2</sup> each represents H or an alkyl or aryl group, provided that at least one of R<sup>1</sup> and R<sup>2</sup> is an alkyl or aryl group; and a compound represented by the following formula (2):



wherein R<sup>3</sup> and R<sup>4</sup> each represents an —OH group, an alkyl or aryl group, provided that at least one of R<sup>3</sup> and R<sup>4</sup> is an alkyl or aryl group.

5,480,717

# HYDROGEL LAMINATE BANDAGES AND COMPOSITES

Nikhil K. Kundel, Piscataway, N.J., assignor to Johnson & Johnson Consumer Products, Inc., Skillman, N.J.

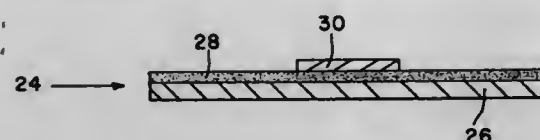
Continuation of Ser. No. 990,722, Dec. 15, 1992, abandoned.

This application Aug. 3, 1994, Ser. No. 285,617

Int. Cl.<sup>6</sup> B32B 27/08; A61L 15/01

U.S. Cl. 428—338

15 Claims



1. A laminate useful in bandages comprising a substrate coated on at least one surface with at least one adhesive polymer and, adjacent to said adhesive polymer coating, a layer of hydrogel comprising at least one hydrophilic polymer, wherein at least one of said at least one adhesive polymer and at least one of said at least one hydrophilic polymer are copolymerized with one another.

5,480,718

# LAMINATED FILM OR SHEET AND BOX-SHAPED VESSEL PREPARED THEREFROM

Hiromi Shigemoto, and Katsumi Noritomi, both of Waki, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 509,302, Apr. 16, 1990, abandoned.

This application Apr. 23, 1992, Ser. No. 873,623

Claims priority, application Japan, Apr. 17, 1989, 1-95292; Apr. 17, 1989, 1-95293; May 24, 1989, 1-128668; May 18, 1989, 1-125413

The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.

Int. Cl.<sup>6</sup> B32B 7/12; 27/08

U.S. Cl. 428—342

16 Claims

1. A laminated film or sheet having at least two layers, which comprises (A) a layer consisting essentially of poly-4-methyl-1-pentene having a melting point of 190° to 230° C. and (B) a paper layer laminated directly to layer (A).

5,480,719

# SECURING TAPE

Dennis R. Tollini, 12 Palmdale Dr., Williamsville, N.Y. 14221

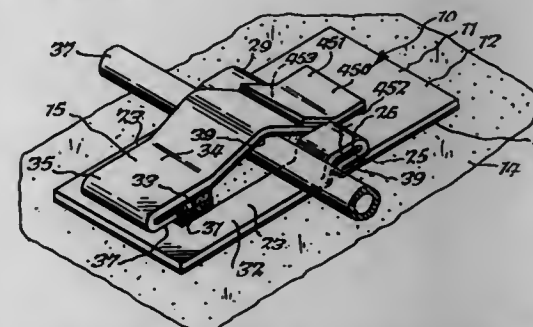
Continuation-in-part of Ser. No. 140,232, Oct. 20, 1993, Pat. No. 5,397,639, which is a continuation-in-part of Ser. No. 981,506, Nov. 25, 1992, Pat. No. 5,266,401. This application

Sep. 1, 1994, Ser. No. 299,897

Int. Cl.<sup>6</sup> B32B 7/12

U.S. Cl. 428—345

37 Claims



1. A securing tape for securement to a foreign body comprising an elongated tape including a base portion and a tab, said base portion and said tab having first and second sides, an adhesive layer on said first side of said tape for securing said base portion to a foreign body, said tab having a fixed end and a free end, said tab being formed by cutting it out of said tape while leaving said fixed end integrally attached to said base portion, an opening in said base portion, said opening being formed in the location from which said tab was cut out of said tape, an outer end on said opening remote from said fixed end of said tab, relocating means located solely proximate said free end of said tab and said outer end of said opening for effectively relocating said free end of said tab and said outer end of said opening relative to each other to permit said free end of said tab to be secured relative to said base portion, securing means for securing said free end of said tab to said base portion, and reinforcing means at the junction of said base portion and said fixed end of said tab for reinforcing said tab and said base portion proximate said junction to thereby strengthen said junction.

5,480,720

# ADHESIVE COMPOSITION

Eric K. Eisenhart, Doylestown; Louis C. Graziano, Warrington, and Jose P. Lalas, Harleysville, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Mar. 1, 1994, Ser. No. 204,929

Int. Cl.<sup>6</sup> B32B 27/38

U.S. Cl. 428—414

24 Claims

1. An adhesive composition, comprising: from about 30 weight percent to about 70 weight percent solids dispersed in an aqueous medium, wherein the solids comprise: from about 60 weight percent to about 97.9 weight percent of a polymer having a glass transition temperature of about -40° C. to about 10° C., said polymer comprising first repeating units derived from an alkyl (meth)acrylate monomer, a vinyl ester monomer, a styrenic monomer or a mixture thereof, second repeating units derived from a hydroxyalkyl (meth)acrylate monomer, a monoethylenically unsaturated nitrogenous monomer or a mixture thereof; from about 2 weight percent to about 30 weight percent of a polyfunctional epoxy resin, said polyfunctional epoxy resin including two or more epoxide groups per molecule; from about 0.1 weight percent to about 10 weight percent of a polyfunctional curing agent, said polyfunctional curing agent including two or more functional groups, each selected from the group consisting of amino groups and amido groups, per molecule; and from about 0.01 weight percent to about 30 weight percent of a metal salt.

5,480,721

# MULTI LAYER STRUCTURES OF FLUORINATED AND NON-FLUORINATED THERMOPLASTIC POLYMERS

Massimo Pozzoli, Milan; Glandomenico Vita, Como, both of, Italy, and Larry L. Chapoy, Barrington Hills, Ill., assignors to Ausimont, S.p.A., Milan, Italy

Filed Sep. 9, 1994, Ser. No. 303,385

Claims priority, application Italy, Sep. 9, 1993, MI93A1929; Jun. 9, 1994, MI94A1213

Int. Cl.<sup>6</sup> B32B 27/08; 27/32; 27/34; 27/36

U.S. Cl. 428—422

18 Claims

1. Multilayer structures comprising at least a fluorinated thermoplastic polymer, a non-fluorinated thermoplastic polymer, and an adhesive intermediate layer, wherein the adhesive intermediate layer comprises a blend which comprises a fluorinated thermoplastic, a non-fluorinated thermoplastic and one or more ionomers comprising copolymers having reactive groups.

5,480,722

# ULTRAVIOLET RAY ABSORBENT GLASS AND METHOD FOR PREPARING THE SAME

Hiroyuki Tomonaga; Takeshi Morimoto, and Kazuya Hiratsuka, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

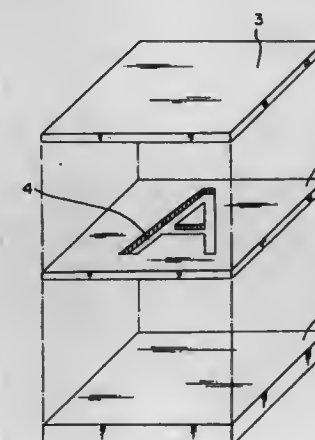
Filed Jun. 30, 1993, Ser. No. 83,526

Claims priority, application Japan, Jul. 3, 1992, 4-200683; Feb. 3, 1993, 5-039432

Int. Cl.<sup>6</sup> B32B 17/06

U.S. Cl. 428—428

9 Claims



1. An ultraviolet ray absorbent glass which comprises: a substrate glass, an ultraviolet ray absorbent film having a thickness of 100-800 nm comprising at least two members selected from the group consisting of zinc oxide, titanium oxide and cerium oxide, and a transparent metal oxide intermediate film comprising at least two components selected from the group consisting of silicon oxide, germanium oxide, aluminum oxide, zirconium oxide, titanium oxide, tin oxide, indium oxide, tantalum oxide, zinc oxide and cerium oxide, provided that at least one component is selected from the group consisting of zing oxide, titanium oxide and cerium oxide, having refractive index which is between the refractive indices of the ultraviolet ray absorbent film and the substrate glass, the intermediate film having an optical film thickness of  $\lambda/4 \pm 10\%$  as large as the wavelength of visible light of 400-700 nm, said intermediate film being located between the ultraviolet ray absorbent film and the substrate glass, whereby iridescence by the ultraviolet ray absorbent film is reduced, and a heat reflecting function is imparted.







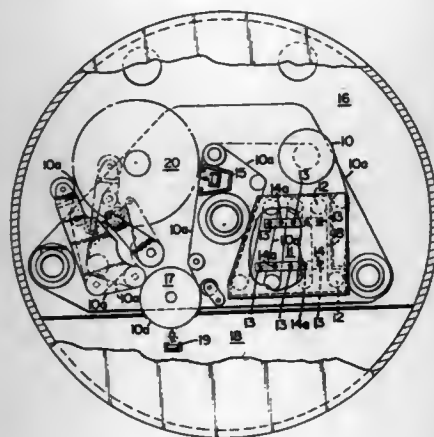
**5,480,730**  
**METAL-FILM LAMINATE RESISTANT TO DELAMINATION**

Richard L. Swisher, Northfield, Minn., assignor to Sheldahl, Inc., Northfield, Minn.

Continuation of Ser. No. 909,058, Aug. 4, 1992, Pat. No. 5,364,707, which is a division of Ser. No. 681,073, Apr. 5, 1991, Pat. No. 5,137,791, which is a division of Ser. No. 580,505, Sep. 13, 1990, Pat. No. 5,111,462. This application Nov. 14, 1994, Ser. No. 339,029  
Int. Cl.<sup>6</sup> B32B 3/10

U.S. Cl. 428—621

45 Claims



1. A metal-film laminate, resistant to the delamination of the metal from the film, which laminate comprises:

- (a) a film layer having at least one through hole, said layer bearing a non-continuous random distribution of metal-oxide, said metal-oxide selected from the group consisting of oxides of iron, chromium, nickel, molybdenum, manganese, zirconium and mixtures thereof, said distribution less than 20 atomic layers in thickness; and
- (b) a metal surface adhered to the film and through-hole through the random distribution, said metal surface comprising:
  - (i) a first metal layer, formed on the metal-oxide regions by vapor metallization, having a thickness of about 50 to 500 nanometers; and
  - (ii) a second metal layer having a thickness of 0.1 to 40  $\mu\text{m}$  formed on the first metal layer;

wherein the peel strength of the metal-film laminate is at least pounds per inch.

**5,480,731**

**HOT DIP TERNE COATED ROOFING MATERIAL**

Jay F. Carey, II, Follansbee, W. Va., and Mehrooz Zamanzadeh, Pittsburgh, Pa., assignors to The Louis Berkman Company, Steubenville, Ohio

Continuation of Ser. No. 153,026, Nov. 17, 1993, Pat. No. 5,395,703, which is a division of Ser. No. 858,662, Mar. 27, 1992, Pat. No. 5,314,758. This application Jan. 30, 1995, Ser. No. 380,372

The portion of the term of this patent subsequent to May 24, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B32B 15/18; C22C 13/02

U.S. Cl. 428—648

27 Claims

1. A metal strip coated by a hot dip process with a single phase protective coating, said coating comprising a majority tin, less than 0.1 weight percent lead and at least 0.05 weight percent metallic stabilizer, wherein said metallic stabilizer is 0.05–5.7 weight percent of said coating and is selected from the group consisting of antimony, bismuth and mixtures thereof.

**5,480,732**  
**MAGNETIC RECORDING MEDIUM**

Nobuyuki Aoki, Hirakata; Hideo Hatanaka, Neyagawa; Kouji Inoue, Kobe, and Yasuhiro Ueyama, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

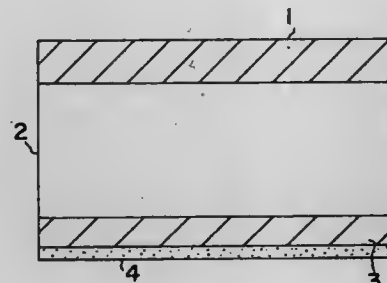
Filed Dec. 22, 1992, Ser. No. 995,001

Claims priority, application Japan, Dec. 26, 1991, 3-344314

Int. Cl.<sup>6</sup> G11B 5/66

U.S. Cl. 428—694 B

3 Claims



1. A magnetic recording medium comprising a non-magnetic support, a magnetic layer on one surface of said non-magnetic support, a back coating layer on the other surface of said non-magnetic support and a primer layer between said non-magnetic support and at least one of said magnetic layer and said back coating layer, said primer layer containing acicular hexagonal ferrite magnetic powder particles having an axis of easy magnetization in a direction of a minor axis of the acicular particle, which axis is oriented in a direction of thickness of said magnetic recording medium or in a length direction of said magnetic recording medium.

**5,480,733**

**METAL THIN FILM MAGNETIC RECORDING MEDIUM**

Yoshinobu Okumura; Xingbo Yang, and Isao Endo, all of Osaka, Japan, assignors to Kubota Corporation, Osaka, Japan

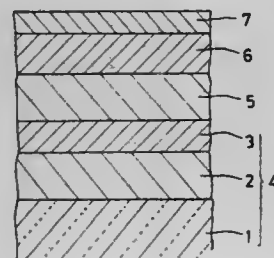
Filed Mar. 11, 1994, Ser. No. 208,958

Claims priority, application Japan, Mar. 15, 1993, 054155

Int. Cl.<sup>6</sup> H01F 1/00; B32B 9/00; G11B 5/66; 5/70

U.S. Cl. 428—694 T

10 Claims



1. A metal thin film magnetic recording medium wherein an underlying Cr layer, a magnetic layer and a protection layer are laminated in this order on a non-magnetic medium substrate, wherein said medium substrate comprises a NiPX layer laminated on a non-metallic base plate in this order, wherein X consists of one or more elements belonging to a group of IVB, VB and VIB in a periodic table with the content thereof being less than 20 at % in total, wherein said NiPX layer has a thickness of 250Å to 1000Å.

**5,480,734**  
**RECHARGEABLE ACCUMULATOR**

Juergen Schulz, Amoenburg, and Bernd Hofacker, Kuenzelsau, both of Germany, assignors to Adolf Wurth GmbH & Co. KG, Germany

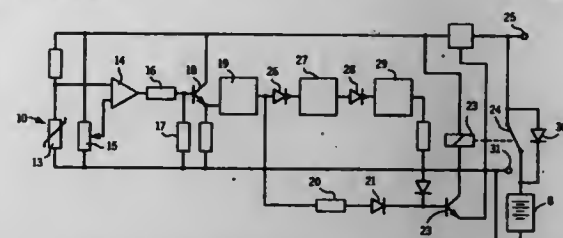
Filed Aug. 31, 1993, Ser. No. 115,977

Claims priority, application Germany, Jan. 10, 1992, 42 34 231.7

Int. Cl.<sup>6</sup> H01M 10/48

U.S. Cl. 429—7

18 Claims



1. An accumulator pack with accumulator cells for connection to an electrical device through two electrical contacts, a temperature sensor for sensing the temperature of the accumulator cells during discharge of the accumulator, and a switching device operatively connected to the temperature sensor, and responsive to the temperature sensor sensing a temperature corresponding to an accumulator discharge time limit, to cause emission of a user-perceptible signal and, after a time interval, to interrupt the connection of at least one of the accumulator cells to at least one of the electrical contacts.

**5,480,735**

**HIGH CURRENT ALKALINE FUEL CELL ELECTRODES**  
Douglas A. Landsman, Hartford, Conn., and Paul A. Plasse, Blandford, Mass., assignors to International Fuel Cells Corporation, South Windsor, Conn.

Continuation of Ser. No. 994,434, Dec. 21, 1992, abandoned, which is a continuation of Ser. No. 927,861, Aug. 10, 1992, abandoned, which is a continuation of Ser. No. 542,934, Jun. 25, 1990, abandoned. This application Mar. 29, 1994, Ser. No. 218,991

Int. Cl.<sup>6</sup> H01M 4/86

U.S. Cl. 429—13

21 Claims

1. An electrode for conducting an electrochemical reaction in a fuel cell, comprising:

a gas and liquid permeable porous substrate having two major surfaces; and

a porous catalyst layer supported on one of said major surfaces of the substrate, including a flocculated combination of a catalytically effective amount of catalyst particles that are catalytically active in promoting the electrochemical reaction and a hydrophobic binder forming a network of hydrophobic gas transport pathways that establish communication between the substrate pores and the catalyst particles,

the improvement comprising:

hydrophobic particles substantially catalytically inactive in promoting electrochemical oxidation of hydrogen hydrophilic particles said forming hydrophilic liquid transport pathways in an interpenetrating relationship with said network of hydrophobic gas transport pathways, wherein said hydrophilic liquid transport pathways enhance transport of aqueous liquid throughout the catalyst layer.

14. The electrode of claim 1, wherein said hydrophilic particles have surfaces wettable by water and wherein the hydrophilic particles are incorporated into the catalyst layer in a manner which maintains the wettability of the surfaces of the hydrophilic particles.

19. An alkaline fuel cell, said fuel cell comprising:

at least two electrodes, at least one of said electrodes comprising a porous substrate having a flocculated combination of catalyst layer thereon, said catalyst layer having catalyst particles and hydrophobic binder which form hydrophobic gas trans-

port pathways, and hydrophilic particles which are inactive in promoting electrochemical oxidation of hydrogen, which form hydrophilic liquid transport pathways, wherein said hydrophilic liquid transport pathways are in an interpenetrating relationship with said hydrophobic gas transport pathways; and an alkaline electrolyte filled matrix interposed between said electrodes.

**5,480,736**

**FUEL CELL GENERATION APPARATUS AND A METHOD FOR STARTING THE SAME**

Takashi Ujile, and Makoto Ito, both of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

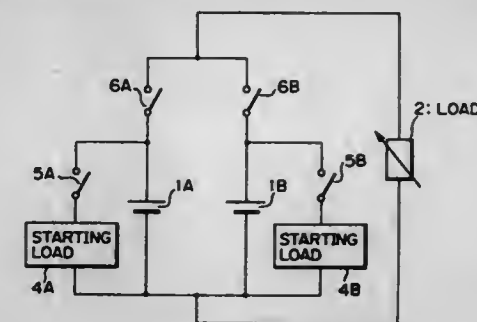
Filed Jan. 11, 1995, Ser. No. 371,553

Claims priority, application Japan, Jan. 20, 1994, 6-004301

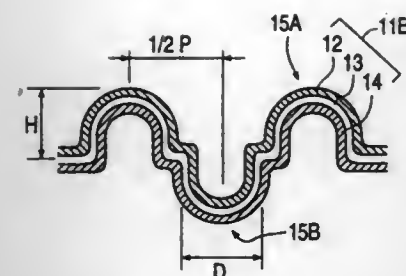
Int. Cl.<sup>6</sup> H01M 8/04

U.S. Cl. 429—13

4 Claims







5,480,738

## FUEL CELL MODULE

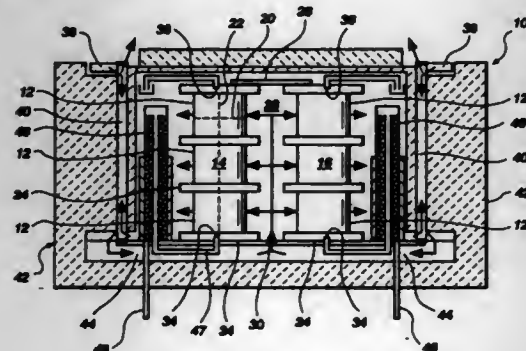
Singaravelu Elangovan, Sandy; Ashok C. Khandkar, Salt Lake City, and Joseph J. Hartvigsen, Kaysville, all of Utah, assignors to Ceramtec, Inc., Salt Lake City, Utah

Filed Feb. 4, 1994, Ser. No. 192,416

Int. Cl.<sup>6</sup> H01M 8/04

U.S. Cl. 429—32

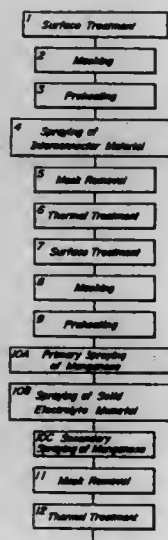
20 Claims



## 1. A fuel cell module comprising:

- a module housing for containing components of said fuel cell module therein and for attaching components of said fuel cell module thereto;
- a plurality of fuel cell stacks disposed within said module housing, said fuel cell stacks comprising a plurality of interconnectors alternately sandwiched between a plurality of planar electrolyte plates, said electrolyte plates having a fuel face with an anode associated therewith and an air face opposite said fuel face having a cathode associated therewith, said interconnectors having a first surface with fuel flow channels therein sealed to, and in fluid communication with, the fuel face of an adjacent electrolyte plate and a second surface opposite said first surface with air flow channels therein sealed to, and in fluid communication with, the air face of an adjacent electrolyte plate;
- a plurality of hollow manifold frames joining and sealing multiple fuel cell stacks into columns thus channeling fuel flow through said fuel cell stacks in a column having air flow channels through said fuel cell stacks, and wherein pairs of said columns are spaced apart and arranged such that said air flow channels in each of said pairs of spaced-apart columns are in fluid communication;
- a central air plenum comprising the space between said spaced apart columns and in fluid communication with said air flow channels in said columns, said plenum having two walls comprised of said spaced-apart columns and two walls comprised of plenum plates extending between and sealed to said columns, said plenum having an open end and a sealed end and configured and arranged to receive air through the open end and distribute air to the air flow channels in said columns;
- a fuel intake associated with said housing for supplying fuel gas to the fuel flow channels in said columns; and
- an air intake associated with said housing for supplying air to said open end of said air plenum.

5,480,739  
SOLID OXIDE FUEL CELLS AND PROCESS FOR THE PRODUCTION OF THE SAME  
Shinji Kawasaki, Nagoya, and Shigenori Ito, Kasugai, both of, Japan, assignors to NGK Insulators, Ltd., Japan  
Filed Sep. 9, 1993, Ser. No. 124,659  
Claims priority, application Japan, Sep. 18, 1992, 4-249834  
Int. Cl.<sup>6</sup> H01M 8/02; 8/10; 8/12  
U.S. Cl. 429—33 16 Claims



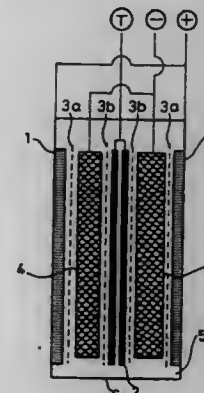
## 1. A process for producing a solid oxide fuel cell, comprising the steps of:

- providing a substrate;
- treating a surface of said substrate;
- placing a mask on said substrate;
- preheating said substrate;
- forming a sprayed film on said substrate by spraying a material for the formation of an electrically conductive film, while a thickness of a sprayed film formed per one pass of a spraying gun is suppressed to not more than 10 μm;
- removing said mask from said substrate; and
- forming said electrically conductive film by thermally treating said sprayed film.

5,480,740  
HYDROGEN STORAGE ALLOY AND ELECTRODE THEREFROM  
Hajime Seri, Izumiotsu; Yasuhiro Yamamura, Katano; Yochiro Tsuji, Hirakata; Naoko Owada, Katano, and Tsutomu Iwaki, Yawata, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan  
Filed Feb. 16, 1994, Ser. No. 197,432  
Claims priority, application Japan, Feb. 22, 1993, 5-057856; Feb. 22, 1993, 5-057872  
Int. Cl.<sup>6</sup> H01M 4/38; C22C 22/00  
U.S. Cl. 429—59 4 Claims

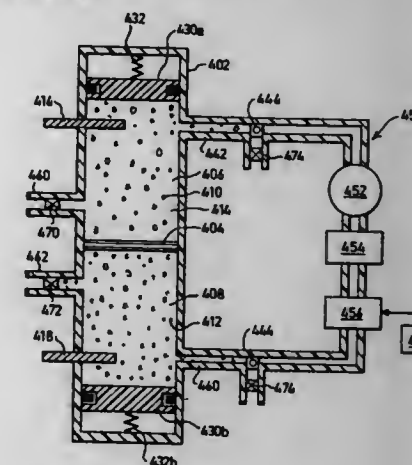
- 1. An alloy represented by the general formula  $ZrM_nV_xMo_yM_zNi$ , wherein M is selected from the group consisting of Fe and Co, and wherein  $0.4 \leq w \leq 0.8$ ,  $0 \leq x \leq 0.3$ ,  $0.05 \leq b \leq 0.2$ ,  $b \leq x$ ,  $0 \leq y \leq 0.2$ ,  $1.0 \leq z \leq 1.5$ , and  $2.0 \leq w+x+b+y+z \leq 2.4$ , said alloy having C15-type Laves phases of a crystal structure similar to that of  $MgCu_2$  as a main alloy phase, and a lattice constant "a" such that  $7.05 \text{ \AA} \leq a \leq 7.13 \text{ \AA}$ .

5,480,741  
CELL PROVIDED WITH GASEOUS DIFFUSION ELECTRODE, AND METHOD OF CHARGING AND DISCHARGING THE SAME  
Tetsuo Sakai, Ikeda, and Tsutomu Iwaki, Yawata, both of, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan  
Filed Mar. 28, 1995, Ser. No. 411,975  
Claims priority, application Japan, Apr. 6, 1994, 6-093708  
Int. Cl.<sup>6</sup> H01M 10/44; 10/52  
U.S. Cl. 429—59 13 Claims



- 1. A cell provided with a gaseous diffusion electrode: comprising a gaseous diffusion electrode, a hydrogen-absorbing alloy electrode, and a chargeable auxiliary electrode wherein nickel hydroxide is used as the active material thereof.

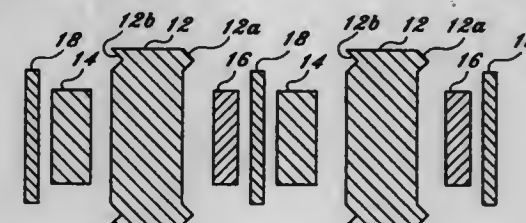
5,480,742  
ELECTROCHEMICAL CELL INCLUDING COMPRESSED, UNBONDED, ELECTRODE GRANULES AND LIQUID ELECTROLYTE  
Mordechai Erez, 19 Sharsheret Street, 69697 Tel-Aviv, and Israel Reshef, 38 Hameri Street, 53330 Givataim, both of, Israel  
Filed May 9, 1994, Ser. No. 240,001  
Claims priority, application Israel, May 13, 1993, 105688  
Int. Cl.<sup>6</sup> H01M 2/38  
U.S. Cl. 429—66 20 Claims



- 1. An electrochemical cell including a housing containing a cathode electrode, an anode electrode, electrode terminals, and a liquid electrolyte; characterized in that each of said electrodes is in the form of granules which are unbonded to each other so as to be freely flowing when in an unconfined state, said unbonded granules being located in separate compartments within said housing separated from each other by a separator; said granules filling their respective compartments and being subjected to a compressive force pressing them against each other; each of said compartments being of a depth many times the largest dimension of said

unbonded granules such that said compressive force presses the unbonded granules against each other from all sides to enhance electrical contact between their outer surfaces; said electrolyte filling the interstitial spaces between said granules.

5,480,743  
BIPOLAR COMPRESSION CELL FOR A WATER-ACTIVATED BATTERY  
Walter K. McCarter, Davie, and Jorgen T. Fischer, Margate, both of Fla., assignors to ACR Electronics, Inc., Fort Lauderdale, Fla.  
Filed Aug. 17, 1993, Ser. No. 108,120  
Int. Cl.<sup>6</sup> H01M 21/14  
U.S. Cl. 429—96 1 Claim



- 1. A bipolar, water-activated battery having a plurality of bipolar compression cells that are stacked in a side-by-side array, said cells separated by sealable frames, the number of cells determining the total voltage output of the water-activated battery, said battery comprising:

- a plurality of bipolar compression cells, each cell including an elastomeric frame; a cuprous iodide electrode; and a magnesium electrode, said elastomeric frame having a central opening, said elastomeric frame having a first surface edge indentation to engage said cuprous iodide electrode on one side of said frame and a second frame surface edge indentation on an opposite side for engaging said magnesium electrode on the opposite side of the frame, said frame forming a spaced enclosure for receiving electrolyte between said iodide electrode on one side and said magnesium electrode on the opposite side;
- said frame spacing allowing for receipt of an electrolyte when the battery is activated; said frame including a third surface edge indentation around the frame perimeter;
- a foil barrier having a peripheral edge, said third surface edge indentation for receiving the peripheral edge of said foil barrier, said foil barrier being made of a material that does not react with either cuprous iodide or magnesium or the electrolyte of the battery; said foil barrier being mounted in contact with said third surface edge indentation of said frame;
- said foil barrier separating the cuprous iodide electrode from the magnesium electrode between compression cells; said elastomeric frame including a gasket portion having a wedge-shaped protrusion on one side of said frame and a wedge-shaped groove on the other side of said frame, said wedge-shaped protrusion on one frame being sized to fit into said wedge-shaped groove on an identical frame and aligned to interlock said frames together in a sealed liquid impervious relationship; said battery including a plurality of cells including at least two or more frames compressed together and fit together in said wedge-shaped groove and said wedge-shaped protrusions side to side to form a total cell array;
- each cell frame including a top part and a bottom part and a plurality of openings along the top and bottom parts which allow for the electrolyte to be received into each cell, said frame openings being aligned with adjacent frames to form a passageway to allow for venting of gases during battery operation;
- a battery housing having a first part and a second part, said housing including fastening means and having interlocking teeth to allow the first housing part to be locked to the second housing part within which said individual frames are mounted together forming a plurality of bipolar cells, said cells being



mounted in compression so that there is compression on the cell frames forcing the frame gaskets to interlock tightly when the housing first and second parts are locked together.

the total weight of polyethylene and polypropylene is from 2 to 40% by weight and the polyethylene content is changed in the direction of the thickness of the film.

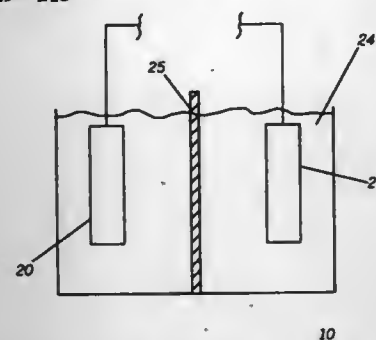
# 5,480,744 BISMUTH BASED ELECTRODES FOR ELECTROCHEMICAL CELLS

Lijun Bai, Vernon Hills, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 4, 1994, Ser. No. 222,776

Int. Cl.<sup>6</sup> H01M 4/36

U.S. Cl. 429—218



1. An electrochemical cell comprising:  
an anode consisting of an electrochemical charge storage material having a mixed composition of:



where

X is selected from the group consisting of oxygen, hydrogen, phosphorus, fluorine, chlorine, bromine, iodine, carbon, and combinations thereof;

M is a modifier selected from the group consisting of C, Ni, Fe, Mn, Mg, Co, Cu, graphite, teflon, and combinations thereof;

x is in the range of 1 to 4;

y is in the range of 0 to 7;

z is in the range of 0 to 5 and

y+z is at least 1;

a cathode; and an electrolyte.

# 5,480,745 POROUS FILM AND USE OF THE SAME

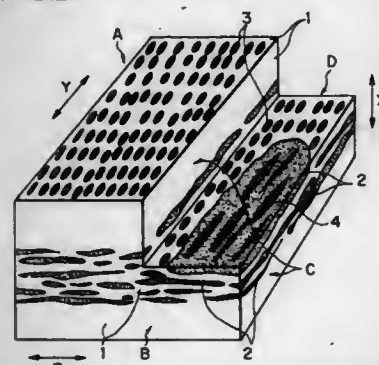
Soji Nishiyama; Hiroyuki Higuchi; Kiichiro Matsushita, and Ryoichi Matsushima, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed Jan. 31, 1995, Ser. No. 381,395

Claims priority, application Japan, Jan. 31, 1994, 6-009318

Int. Cl.<sup>6</sup> H01M 2/16

U.S. Cl. 429—242



1. A porous film comprising a polyethylene and a polypropylene as the essential components, wherein the polyethylene content in

# 5,480,746 PHOTOMASK AND METHOD OF FORMING RESIST PATTERN USING THE SAME

Hideyuki Jinbo, and Yoshio Yamashita, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 954,033, Sep. 30, 1992, abandoned.

This application May 16, 1994, Ser. No. 248,633

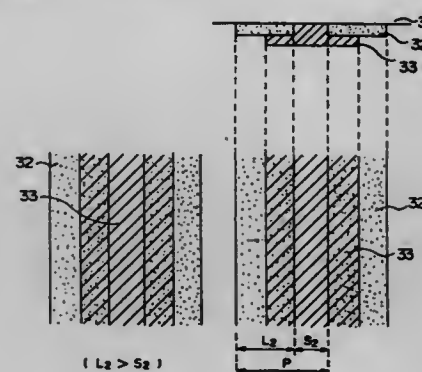
Claims priority, application Japan, Jan. 1, 1991, 3-278965;

Mar. 13, 1992, 4-088317

Int. Cl.<sup>6</sup> G03F 9/00

U.S. Cl. 430—5

5 Claims



1. A method of forming a line and space resist pattern by projection exposure of a positive type resist, comprising the steps of:

providing a photomask including

a mask substrate comprising light-transmissive material;  
an array of opaque stripes having spaces therebetween formed on said substrate, said opaque stripes being arranged on said substrate at a given pitch and having widths which are greater than the spaces between adjacent opaque stripes; and

phase shifters formed on said substrate in the spaces between every other opaque stripe; and

performing projection exposure on said positive resist using said photomask in a single step for enough time to prevent transfer of edges of said phase shifters onto said resist pattern and to enable a line and a space of said resist pattern to have substantially the same width.

# 5,480,747 ATTENUATED PHASE SHIFTING MASK WITH BURIED ABSORBERS

Prahalad K. Vasudev, Austin, Tex., assignor to Sematech, Inc., Austin, Tex.

Filed Nov. 21, 1994, Ser. No. 342,939

Int. Cl.<sup>6</sup> G03F 9/00

U.S. Cl. 430—5

26 Claims

1. An attenuated phase shifting photolithography mask for use in projecting an image pattern onto a target comprising:

a mask substrate formed from a substantially transparent material for permitting light transmission therethrough;

an absorber pattern, formed from a light absorbing material and buried a set distance below a surface of said substrate and not adjacent to said surface, for absorbing a significant portion of light transmission therethrough to form a phase shifting attenuator pattern in said substrate, such that light attenuation and phase shifting achieved in phase shifting regions of said mask are both obtained from said light absorbing material at a set wavelength of transmitted light;

# 5,480,749 REVERSIBLE CHIRAL OPTICAL DATA STORAGE USING MAJORITY RULE OF POLYMER CONFORMATION

Mark M. Green, 174 W. 76th St., New York, N.Y. 10023

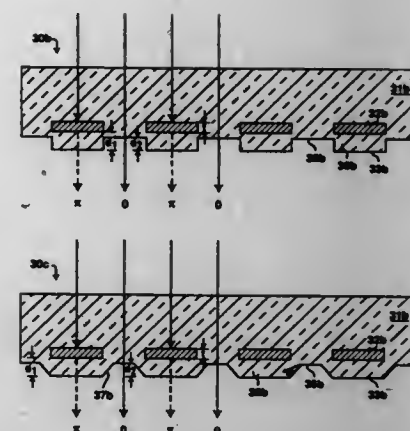
Filed Sep. 27, 1994, Ser. No. 313,378

Int. Cl.<sup>6</sup> G03C 1/73; G11B 7/00

U.S. Cl. 430—19

15 Claims

11. A method for reversibly storing optical data comprising providing a material comprised of a mixture of a stiff polymer having interconvertible left- and right-handed helical portions and connected units, said units being capable of optical activity and capable of changing its optical activity and irradiating said material with light capable of changing the optical activity of said material.



wherein having said attenuator pattern buried below said surface of said substrate but not adjacent to said surface, allows for light scattered from surface areas of said attenuator pattern to be reflected back into said substrate at a surface interface of said substrate, in order to improve image feature definition at said target; and

wherein having said attenuator pattern buried below said surface at said set distance is of sufficient depth in order to provide for a maximum depth of focus of an exposure system being utilized to reside within said substrate, such that surface defects and contaminants at said surface interface are not imaged on to said target.

# 5,480,748 PROTECTION OF ALUMINUM METALLIZATION AGAINST CHEMICAL ATTACK DURING PHOTORESIST DEVELOPMENT

Paul E. Bakeman, Jr., South Burlington; Hyun K. Lee, Essex Junction, and Stephen E. Luce, Underhill, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

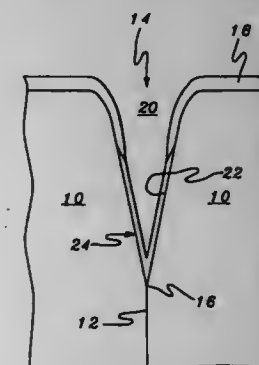
Division of Ser. No. 964,677, Oct. 21, 1992. This application

Apr. 26, 1994, Ser. No. 233,679

Int. Cl.<sup>6</sup> G03F 7/16

U.S. Cl. 430—11

14 Claims



1. A protective structure in a microelectronic device, comprising: a passivation layer overlaying a conductive layer and having at least one defect through which the conductive layer is exposed to photoresist developer; and

a protective film formed on said conductive layer within the boundary of the defect, using a chemical reaction wherein said film is of sufficient thickness to protect said conductive layer from chemical attack by the photoresist developer, a portion of said conductive layer comprising at least one of the reactants to said chemical reaction.

# 5,480,750 ELECTROPHOTOGRAPHIC PROCESS AND ELECTROPHOTOGRAPHIC APPARATUS

Masaya Kawada, Kyoto; Koji Yamazaki; Shigenori Ueda, both of Nara; Toshiyuki Ehara, Yokohama, and Hiroaki Niino, Nara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1994, Ser. No. 209,876

Claims priority, application Japan, Mar. 15, 1993, 5-078635

Int. Cl.<sup>6</sup> G03G 13/045

U.S. Cl. 430—31

10 Claims

1. An electrophotographic apparatus employing:  
(a) a photosensitive member provided with at least an amorphous photoconductive layer containing at least silicon, atoms of Group III of the Periodic Table in amounts not exceeding 4.0 ppm and at least one of hydrogen and halogen atoms;  
(b) at least one of a main charge eliminating light source, a main charger, an image exposure light source and a blank exposure light source; and  
(c) means for increasing the mobility of photocarriers in the photosensitive member to reduce photomemory effect comprising means for driving the photosensitive member and means for applying an electric field to the photosensitive member in accordance with the following equation (1):

$$A = 1/n(n-1)n(S)/1n(E) \quad (1)$$

wherein:

n: density in mm<sup>-3</sup> of localized energy levels within a range d-0.95 eV in the photoconductive layer;

d: energy depth in eV of possible thermal excitation of carriers within the time of movement of a given part of the photosensitive member from the source of photomemory whether image exposure or blank exposure to the main charger, wherein in case of plural photomemory sources, the smaller one being taken;

E: electric field in V/mm applied to the photoconductive member;

S: moving speed in mm/sec of the surface of the photosensitive member; and

A is 19.0 or less.

# 5,480,751 TRI-LEVEL BACKGROUND SUPPRESSION SCHEME USING AN AC SCOROTRON WITH FRONT ERASE

James E. Williams, Rochester, and Richard P. Germain, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 30, 1994, Ser. No. 268,593

Int. Cl.<sup>6</sup> G03G 13/045

U.S. Cl. 430—42

16 Claims

1. A method of creating highlight color images, said method including the steps of:  
uniformly charging an imaging member capable of retaining electrostatic charges;



selectively discharging said uniformly charge imaging member to form two image areas and a background area, said background area being disposed intermediate said two image areas;

developing said two image areas using black and color toners having opposite charge polarities to form two visible images at first and second charge levels without disturbing said background level;

shifting the charge level of said background area from said position intermediate said two image areas such that it is at a greater or lesser charge level than both of said two image charge levels; and

subsequent to said step of shifting, exposing said imaging member to corona discharge for changing the polarity of one of said two images to the same polarity as the other of said two images.

5,480,752

# ELECTROPHOTOGRAPHIC LITHOGRAPH PRINTING PLATE MATERIAL

Yoshiharu Nishikiori, Tokyo; Masahiro Yamana, Hasuda, and Shiro Nakano, Yokohama, all of Japan, assignors to New Oji Paper Co., Ltd., Tokyo, Japan

Filed Sep. 21, 1994, Ser. No. 309,674

Claims priority, application Japan, Feb. 23, 1994, 6-047944  
Int. Cl.<sup>6</sup> G03G 13/32

U.S. Cl. 430—49

16 Claims

1. An electrophotographic lithograph printing plate precursor comprising:  
a substrate;

an intermediate layer formed on a front surface of the substrate, said intermediate layer comprising a mixture of a binder comprising a polymeric material, a dispersing agent, pigment particles and electroconductive whiskers uniformly dispersed in the binder, said dispersing agent comprising at least one member selected from the group consisting of polyisoprene-sulfonic acid and carboxylic acid-modified polyisoprene-sulfonic acids; and a photoconductive layer formed on a surface of the intermediate layer and comprising a mixture of an electrically insulating binder and photoconductive pigment uniformly dispersed in the binder.

5,480,753

# ELECTROPHOTOGRAPHIC PHOTOCONDUCTOR COMPRISING DIAMINE COMPOUND

Tomoyuki Shimada, Shizuoka; Masaomi Sasaki, Susono, and Chikaki Tanaka, Shizuoka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 202,238, Feb. 25, 1994, Pat. No. 5,420,332. This application Jul. 19, 1994, Ser. No. 277,024

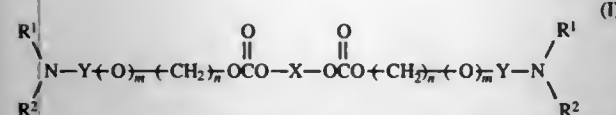
Claims priority, application Japan, Feb. 26, 1993, 5-062773; Jun. 15, 1993, 5-168515; Jul. 19, 1993, 5-200061; Aug. 9, 1993, 5-217030; Sep. 2, 1993, 5-242070; Dec. 7, 1993, 5-340078

Int. Cl.<sup>6</sup> G03G 5/047

U.S. Cl. 430—59

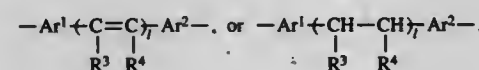
6 Claims

1. An electrophotographic photoconductor comprising:  
an electroconductive support, and  
a photoconductive layer formed thereon which comprises as a photoconductive material at least one diamine compound having carbonate groups of formula (I):



wherein R<sup>1</sup> and R<sup>2</sup> each is a hydrogen atom, an alkyl group which may have a substituent, an aryl group which may have a substituent;

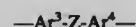
ent; R<sup>1</sup> and R<sup>2</sup> may form a ring in combination of N bonded thereto; Y is an arylene group which may have a substituent,



in which Ar<sup>1</sup> and Ar<sup>2</sup> each is an arylene group which may have a substituent, R<sup>3</sup> and R<sup>4</sup> each is a hydrogen atom, an alkyl group which may have a substituent or an aryl group which may have a substituent, and l is an integer of 1 or 2; and

R<sup>1</sup> and Y may together form a ring,

X is an alkylene group which may have a substituent, a dialkylene ether group, or an arylene group which may have a substituent,



in which Ar<sup>3</sup> and Ar<sup>4</sup> each is an arylene group which may have a substituent; Z is an alkylene group which may have a substituent, a dialkylene ether group or a cycloalkylidene group which may have a substituent, an oxygen atom, a sulfur atom, a vinylene group, m is an integer of 0 or 1; and n is an integer of 0 to 6.

5,480,754

# ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER AND METHOD OF MANUFACTURING THE SAME

Tetsuya Takei, Nagahama; Yoshio Segi, Nara, and Hiroyuki Katagiri, Tsuzuki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1994; Ser. No. 215,644

Claims priority, application Japan; Mar. 23, 1993, 5-086872  
Int. Cl.<sup>6</sup> G03G 5/10

U.S. Cl. 430—65

92 Claims

1. A method for manufacturing an electrophotographic photosensitive member comprising: dissolving sufficient carbon dioxide in water for cleaning to provide a conductivity from 2 μS/cm to 40 μS/cm; cleaning surface of an aluminum substrate with the carbon dioxide-dissolved water and forming a functional film on the cleaned aluminum substrate.

5,480,755

# MAGNETIC TONER, IMAGE FORMING METHOD, SURFACE-MODIFIED FINE SILICA POWDER AND PROCESS FOR ITS PRODUCTION

Masaki Uchiyama, Ichikawa; Yoshinobu Jo, Toride; Yasutaka Akashi, Yokohama; Masaaki Taya, Kawasaki, and Makoto Unno, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 846,902, Mar. 6, 1992, abandoned.

This application Aug. 19, 1994, Ser. No. 293,115

Claims priority, application Japan, Mar. 8, 1991, 3-067751; Mar. 8, 1991, 3-067752

Int. Cl.<sup>6</sup> G03G 9/083

U.S. Cl. 430—106.6

20 Claims

1. A magnetic toner comprising magnetic resin particles containing at least a binder resin, a charge control agent and a magnetic powder, and a surface-modified fine silica powder; said surface-modified fine silica powder being a fine silica powder having been treated with hydrophobicizing agent, said surface-modified fine silica powder having a specific surface area of not less than 180 m<sup>2</sup>/g, a hydrophobicity of from 60% to 95% and a bulk density of from 35 g/lit. to 49 g/lit., wherein said surface-modified fine silica powder comprises a hydrophobic fine silica powder prepared by a process comprising the steps of:

mixing 100 parts by weight of a fine silica powder having a specific surface area of not less than 300 m<sup>2</sup>/g, a water content of from 0.5% by weight to 5% by weight and a bulk density

of not more than 40 g/lit. and from 15 parts by weight to 25 parts by weight of hexamethyldisilazane; and heating said fine silica powder mixed with said hexamethyldisilazane at a temperature not lower than the boiling point of said hexamethyldisilazane.

5,480,756

# HIGH GLOSS, LOW MELT CROSSLINKED RESINS AND TONERS

Hadi K. Mahabadi; Enno E. Agur, both of Toronto; T. Brian McAneney, Burlington; Sheau V. Kao; Gerald R. Allison, both of Oakville; Michael S. Hawkins, Cambridge, all of Canada; William H. Hollenbaugh, Jr., Webster, N.Y.; Robert M. Jacobs, Ontario, N.Y., and Che C. Chow, Penfield, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 31, 1994, Ser. No. 334,012

Int. Cl.<sup>6</sup> G03G 9/087

U.S. Cl. 430—109

40 Claims

1. A toner resin comprising uncrosslinked portions and crosslinked portions, said crosslinked portions being comprised of high density crosslinked microgel particles, wherein said microgel particles have a gel content of from about 2 to about 9 weight percent, and wherein said resin is substantially free of sol.

5,480,757

# TWO COMPONENT ELECTROPHOTOGRAPHIC DEVELOPERS AND PREPARATION METHOD

Thomas A. Jadwin, Rochester; Hans W. Osterhoudt, Spencerport; John M. Spence, Mendon, and Dinesh Tyagi, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 8, 1994, Ser. No. 253,446

Int. Cl.<sup>6</sup> G03G 9/097

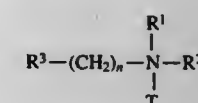
U.S. Cl. 430—110

20 Claims

1. A two component electrophotographic developer including carrier particles and toner particles, said toner particles each comprising a substantially uniform mixture of:

polymeric binder;

a first agent selected from the group consisting of compounds having the general structure:



wherein

n is from about 7 to about 21;

R<sup>1</sup> and R<sup>2</sup> are each independently H or alkyl having from 1 to about 3 carbons;

T represents an unshared electron pair or a proton and a counterion; and

R<sup>3</sup> is substituted or unsubstituted alkyl, alkylamide, aryl, or heteroaryl; and

a second agent comprising quaternary ammonium salt.

5,480,758

# METHOD AND DEVICE FOR THE TRANSFER OF MAGNETIC TONER

Yoshihito Suwa, Shizuoka, Japan, assignor to Tomoe-gawa Paper Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 31,909, Mar. 16, 1993, abandoned.

This application Nov. 23, 1994, Ser. No. 347,155

Claims priority, application Japan, Mar. 19, 1992, 4-092410  
Int. Cl.<sup>6</sup> G03G 13/14

U.S. Cl. 430—126

8 Claims

1. A method of transferring a magnetic toner to a paper sheet comprising the steps of:

disposing said magnetic toner on a surface of an image supporting member;

superimposing said paper sheet on said surface of said image supporting member; and

transferring said magnetic toner to said paper sheet via transferring means, wherein said transferring means comprises a transferring corona generator which oppositely charges said paper sheet with respect to a charge on said magnetic toner and transfers said magnetic toner to said paper sheet via a magnetic force equal to at least 200 Gauss of a magnetic field produced by said transferring corona generator.

5,480,759

# TONER IMAGE TRANSFER METHOD

Takashige Kasuya, Sohka; Noboru Kashimura; Tatsuya Nakamura, both of Tokyo; Tatsuhiko Chiba, Kamakura, and Kohji Inaba, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 267,655, Jun. 29, 1994, abandoned.

This application Apr. 19, 1995, Ser. No. 425,355

Claims priority, application Japan, Jun. 29, 1993, 5-182208; Jul. 23, 1993, 5-202037

Int. Cl.<sup>6</sup> G03G 13/22; 13/16

U.S. Cl. 430—126

44 Claims

1. An image forming method, comprising:

forming an electrostatic image on an electrophotographic photosensitive member, the electrophotographic photosensitive member comprising at least an electroconductive support, a charge generation layer and a charge transport layer, the electrophotographic photosensitive member having a surface layer containing a transition metal atom at 0.1–10 ppm,

developing the electrostatic image to form a toner image on the electrophotographic photosensitive member,

transferring the toner image onto a transfer-receiving medium, and

removing a residual toner from the electrophotographic photosensitive member;

wherein the toner comprises at least a binder resin and a colorant, the binder resin comprising a resin component having a polar group, the binder resin having a molecular weight distribution according to gel permeation chromatography including a peak in a molecular weight region of 5×10<sup>3</sup>–5×10<sup>4</sup>.

5,480,760

# SULFAMOYL HYDROGEN BOND DONATING GROUPS ON THERMAL SOLVENTS FOR IMAGE SEPARATION SYSTEMS

David S. Bailey, and Albert J. Mura, Jr., both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 8, 1993, Ser. No. 73,822

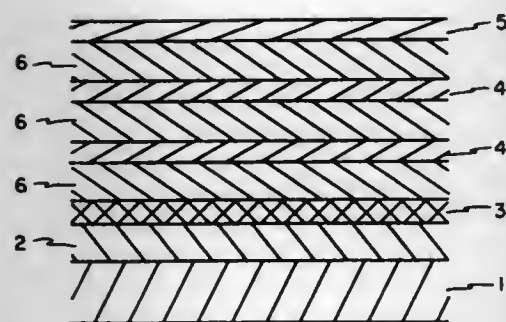
Int. Cl.<sup>6</sup> G03C 8/10; 8/40

U.S. Cl. 430—203

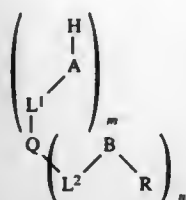
39 Claims

21. A process for forming an improved dye image comprising the steps of:





providing in an aqueous-developable chromogenic photographic heat-transferable non-aqueous dye-diffusion-transfer photographic element comprising radiation sensitive silver halide, a heat-transferable dye-providing compound that forms or releases a heat-transferable image dye upon reaction of said compound with the oxidation product of a primary amine developing agent, a hydrophilic binder, and a thermal solvent for facilitating non-aqueous diffusion transfer wherein said thermal solvent has the formula according to formula (I)



wherein

AH is either  $-\text{SO}_2\text{NH}_2$  or  $-\text{NHSO}_2\text{R}^1$ , where  $\text{R}^1$  is an alkyl group or a fluorinated alkyl group of 1 to 4 carbons;

$\text{L}^1$  and  $\text{L}^2$  are each independently divalent linking groups consisting of groups of 1 to 12 atoms or are independently absent;  $m$  is 1, 2, or 3;

Q comprises a group of 2 to 15 carbon atoms selected from the group consisting of aromatic rings, alkyl chains, alkyl rings, or ring-chain combinations, optionally substituted with substituents, Z, consisting of alkyl groups or halogens;

B is a hydrogen bond accepting group with an aqueous  $\text{pK}_a$  for proton gain of less than 6;

$n$  is 1 or 2;

at least one of the groups AH and B cannot hydrogen bond to form a ring of either 5 or 6 atoms;

R is an alkyl, aryl or alkylaryl group of from 1 to 18 carbon atoms;

the calculated log of the octanol/water partition coefficient (clogP) is greater than 3 and less than 10;

exposing said non-aqueous dye-diffusion transfer element to actinic radiation;

contacting said element with an aqueous-developing solution, wherein said solution comprises a primary amine developing agent;

contacting said element with an aqueous bath of acidic pH; drying said element;

providing a dye-receiving layer and a contiguous, dimensionally stable, support where said dye receiving layer is in physical contact with said dye-diffusion transfer element;

heating said dye-diffusion transfer element and dye-receiving layer to effect dye-diffusion transfer; and

separating said dye-receiving layer and contiguous support from said dye transfer element.

# 5,480,761 ALIPHATIC HYDROXYL HYDROGEN BOND DONATING GROUPS ON THERMAL SOLVENTS FOR IMAGE SEPARATION SYSTEMS

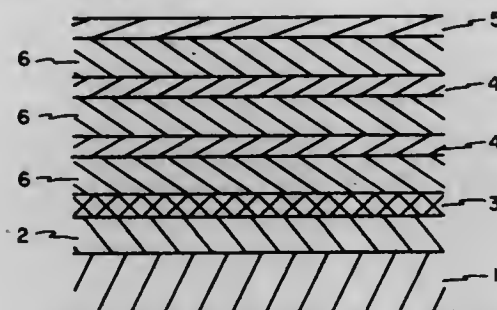
David S. Bailey, and Albert J. Mura, Jr., both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 8, 1993, Ser. No. 73,825

Int. Cl. G03C 8/10; 8/40

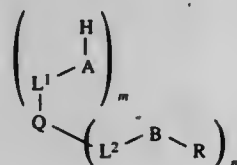
U.S. Cl. 430—203

43 Claims



22. A process for forming an improved dye image comprising the steps of:

providing in an aqueous-developable chromogenic photographic heat-transferable non-aqueous dye-diffusion-transfer photographic element comprising radiation sensitive silver halide, a heat-transferable dye-providing compound that forms or releases a heat-transferable image dye devoid of functional groups with an aqueous  $\text{pK}_a$  for proton loss of less than 6 upon reaction of said compound with the oxidation product of a primary amine developing agent, a hydrophilic binder, and a thermal solvent for facilitating nonaqueous diffusion transfer wherein said thermal solvent has the formula according to formula (I)



wherein

AH is OH;

$\text{L}^1$  and  $\text{L}^2$  are each independently divalent linking groups consisting of groups of 1 to 12 atoms where  $\text{L}^2$  may be absent;  $m$  is 1, 2, or 3;

Q comprises a group of 2 to 15 carbon atoms selected from the group consisting of aromatic rings, alkyl chains, alkyl rings, or ring-chain combinations, optionally substituted with substituents, Z, consisting of alkyl groups or halogens;

B is a hydrogen bond accepting group with an aqueous  $\text{pK}_a$  for proton gain of less than 7;

$n$  is 1 or 2;

at least one of the groups AH and B cannot hydrogen bond to form a ring of either 5 or 6 atoms;

R is an alkyl, aryl or alkylaryl group of from 1 to 18 carbon atoms;

the calculated log of the octanol/water partition coefficient (clogP) is greater than 3 and less than 10;

exposing said non-aqueous dye-diffusion transfer element to actinic radiation;

contacting said element with an aqueous-developing solution, wherein said solution comprises a primary amine developing agent;

contacting said element with an aqueous bath of acidic pH; drying said element;

heating said dye-diffusion transfer element to effect dye-diffusion transfer to a dye-receiving layer and a contiguous, dimensionally stable support where said dye receiving layer is in physical contact with said dye-diffusion transfer element; and

separating said dye-receiving layer and contiguous support from said dye transfer element.

# 5,480,762 METHOD FOR PREPARING LITHOGRAPHIC PRINTING PLATE

Tadao Toyama, and Kenji Kunichika, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 22, 1991, Ser. No. 796,437

Claims priority, application Japan, Nov. 28, 1990, 3-327111

Int. Cl. G03F 7/30; 7/32

U.S. Cl. 430—302

11 Claims

1. A method for preparing a lithographic printing plate which comprises imagewise exposing: a presensitized plate for use in making a lithographic printing plate comprising an aluminum substrate having an anodized layer and a light-sensitive layer including an o-quinone diazide compound applied on one side of the substrate and a coating layer on the surface of the aluminum substrate opposite to the surface carrying the light-sensitive layer, said coating layer having a thickness of from 0.05  $\mu\text{m}$  to 10  $\mu\text{m}$  and containing an organic polymeric compound insoluble in alkaline silicate developers and being a member selected from the group consisting of polyethylene, polypropylene, polybutene, polybutadiene, polyamide, polyurethane, polyurea, polyimide, polysiloxane, polycarbonate, epoxy resin, condensed alkylphenol/aldehyde resin, acetal resin, polyvinyl chloride, polyvinylidene chloride, polystyrene, acrylic resin and copolymer resins thereof, and then developing the exposed plate with a developer comprising an aqueous solution of an alkali metal silicate, while compensating for changes in the developer due to the development of the exposed plate by supplementing, to the developer, a replenisher comprising an aqueous solution of an alkali metal silicate, wherein the replenisher is an aqueous solution of an alkali metal silicate having a ratio:  $(\text{SiO}_2)/(\text{M}_2\text{O})$  (wherein  $(\text{SiO}_2)$  means molar concentration (mol/l) of  $\text{SiO}_2$  and  $(\text{M}_2\text{O})$  means molar concentration (mol/l) of oxide  $\text{M}_2\text{O}$  of an alkali metal (M)) ranging from 0.3 to 1.0 and an  $\text{SiO}_2$  content ranging from 0.5 to 4.0% by weight of the aqueous solution.

# 5,480,763 METHOD FOR MANUFACTURING A STAMPER FOR HIGH-DENSITY RECORDING DISCS

Tetsuya Kondo; Kei Murata, both of Yokohama; Yoshikazu Nagai, Yokosuka, and Katunori Ohshima, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 157,244, Nov. 26, 1993, abandoned, which is a division of Ser. No. 816,895, Jan. 3, 1992, abandoned. This application Mar. 27, 1995, Ser. No. 411,075

Claims priority, application Japan, Jan. 11, 1991, 3-13669

Int. Cl. G03F 7/00

U.S. Cl. 430—320

6 Claims

1. A method of manufacturing a stamper for use in producing high-density recording disks which comprises the steps of:

coating a film of photoresist over a flat surface of a glass substrate;

scanning said photoresist film with a light beam which is modulated in accordance with an information signal pattern said light beam having a power level of less than or equal to about 13.6 mW;

executing a reverse bake operation of heating said glass substrate and photoresist film at a temperature of less than or equal to about 125° C. for a predetermined time period;

subjecting said photoresist film to overall flood exposure to light;

applying an alkaline solution to remove all portions of said photoresist film other than portions which had been exposed to said light beam, to leave a photoresist film pattern corresponding to said information signal pattern;

executing etching of said surface of the glass substrate, to form a pattern of protrusions thereon which have a pit width that is within a range of from 0.15  $\mu\text{m}$  to less than 0.6  $\mu\text{m}$ , using said photoresist film pattern as a mask; and removing all remaining portions of said photoresist film.

# 5,480,764 GRAY SCALE MICROFABRICATION FOR INTEGRATED OPTICAL DEVICES

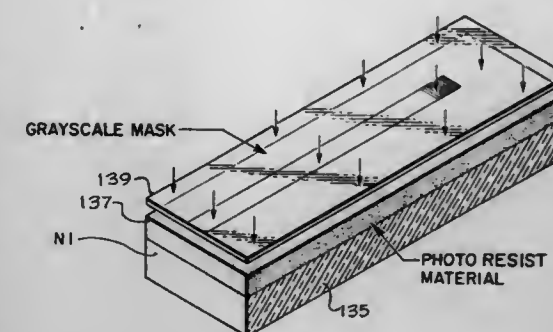
George Gal, Palo Alto; William W. Anderson, Half Moon Bay; Bruce J. Herman, Mountain View, and Marc A. Stiller, Boulder Creek, all of Calif., assignors to Lockheed Missiles and Space Company, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 982,514, Nov. 27, 1992, Pat. No. 5,310,623. This application Mar. 4, 1994, Ser. No. 206,134

Int. Cl. G02B 6/136

U.S. Cl. 430—321

13 Claims



1. A method of fabricating within a volume of a photoresist material a replica of a photonic waveguide surface of any designed curved or inclined planar surface, using a single exposure mask, and then producing the replica directly in a substrate material as the waveguide surface for ultimate use in photonic applications, said method comprising:

constructing a single exposure mask with a plurality of precisely located and sized light transmitting openings formed with sufficiently small specific opening sizes and located at a sufficiently large number of specific locations, correlated to related locations on the configuration of the designed curved or inclined planar photonic waveguide surface, to enable a replica image of the said designed surface to be produced within a volume of a photoresist material,

exposing a related photoresist material to light of a selected wavelength and transmitted through said openings in said single mask for a selected duration of time,

processing the exposed photoresist material to produce a replica within the photoresist material of said designed surface, which replica can be used subsequently for producing a copy of the photoresist replica of said desired surface directly within the substrate material as the waveguide surface, placing the photoresist material replica on a first substrate material having a first index of refraction.

processing the replica and the first substrate material to produce a copy of the photoresist replica of said desired surface directly within the substrate material as the waveguide surface and to remove a volume of the first substrate material which is bounded by the waveguide surface produced in the first substrate, and

filling the removed volume with a second substrate material having a second index of refraction different from the first index of refraction of the first substrate material so that said waveguide surface is contained within the first substrate material at an interface between the first substrate material and the second substrate material.







- c) contacting said pretreated nucleus from said step b with an activating egg extract to activate said pretreated nucleus.

5,480,773

# METHOD FOR PRESERVING BLOOD USING ASCORBIC ACID TOCOPHERYL PHOSPHATE ESTERS

Kazumi Ogata, Osaka, and Kenichi Yoshida, Kobe, both of Japan, assignors to Senju Pharmaceutical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 121,372, Sep. 15, 1993, abandoned.

This application Sep. 7, 1994, Ser. No. 301,387

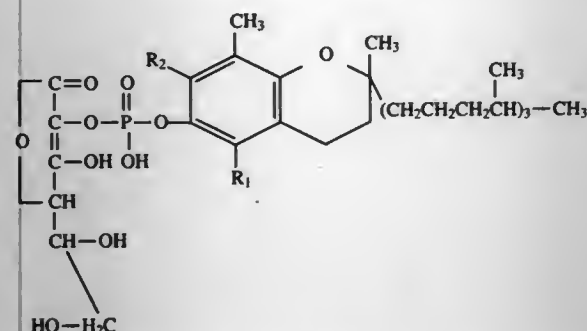
Claims priority, application Japan, Sep. 30, 1992, 4-261311

Int. Cl.<sup>6</sup> A01N 1/02

U.S. Cl. 435-2

1 Claim

1. In a method for the preservation of ATP level or energy charge in haemocytes which comprises admixing the haemocytes with a preserving composition therefor, the improvement comprising adding to the preserving composition, a haemocytes' ATP level or energy charge preserving effective amount of a phosphoric acid diester of the following formula:



wherein R<sub>1</sub> and R<sub>2</sub> are the same or different and each is a hydrogen atom or a methyl group or a pharmacologically acceptable salt thereof.

5,480,774

# DETERMINATION OF GENOMIC SEX IN SALMONIDS

Choy L. Hew, Thornhill, Canada, and Shao J. Du, Seattle, Wash., assignors to A/F Protein, Inc., W. Newton, Mass.

Filed Oct. 14, 1993, Ser. No. 137,252

Int. Cl.<sup>6</sup> C12Q 1/68; C12P 19/34; C07H 21/04; C12N 15/00

U.S. Cl. 435-6

26 Claims



1. A method of determining genomic sex of a member of the genus *Oncorhynchus* of the salmonid family by detecting a presence or absence of a growth hormone pseudogene (GH-Ψ), said method comprising:

- obtaining DNA from a salmonid species in which only males carry the GH-Ψ pseudogene; and
- detecting the GH-Ψ, where said detecting includes either the amplification of a select subsequence specific to the pseudogene or duplex formation of a nucleic acid hybridizing specifically to the pseudogene and to no other genome of the salmonid species.

5,480,775

# METHOD FOR MEASURING A SPECIMEN BY THE USE OF FLUORESCENT LIGHT

Yuji Ito, Chigasaki, and Atsushi Saito, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 644,328, Jan. 22, 1991, abandoned.

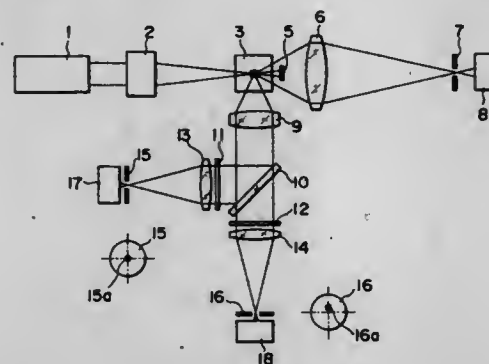
This application May 3, 1993, Ser. No. 55,759

Claims priority, application Japan, Jan. 26, 1990, 2-16551; Jan. 26, 1990, 2-16552

Int. Cl.<sup>6</sup> G01N 33/554

U.S. Cl. 435-7.2

14 Claims



5. A specimen measuring method, comprising: applying a light beam to a predetermined position; passing a specimen dyed with a fluorescence dye through the predetermined position; detecting forward scattered light from the specimen from the predetermined position within a period in which said light beam is applied; setting a period of time in which said light beam is not applied after said detection of scattered light; and detecting at least one fluorescence light from said specimen at a position downstream of the light applying predetermined position within said period in which said light beam is not applied whereby qualitative or quantitative measurements are provided for said specimen.

5,480,776

# METHOD FOR PREDICTION OF PREMATURE LABOR

Vivian K. Dullien, Boulder, Colo., assignor to Biex, Inc., Boulder, Colo.

Continuation of Ser. No. 952,438, Sep. 28, 1992. This application May 12, 1994, Ser. No. 242,834

Int. Cl.<sup>6</sup> G01N 33/74; 33/53

U.S. Cl. 435-7.9

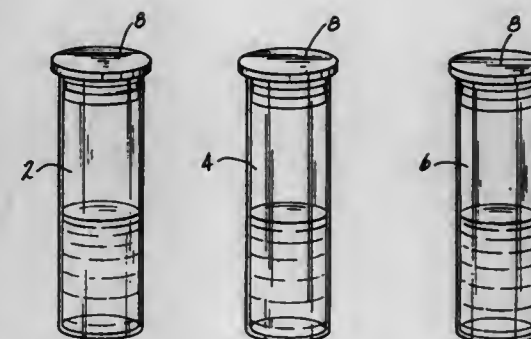
9 Claims

1. A method of screening for the potential onset of preterm labor in a pregnant human at 36 weeks gestation or earlier, which comprises:

- (a) analyzing a sample body fluid from said pregnant human to determine unconjugated estriol concentration in the body fluid;
- (b) correlating said concentration determined in step (a) with (1) a predetermined standard unconjugated estriol concentration for said body fluid, or (2) a previously measured unconjugated estriol concentration in said body fluid of said pregnant human to determine a rate of increase in unconjugated estriol concentration in the body fluid of said pregnant human; and
- (c) relating a higher concentration of unconjugated estriol in the body fluid of said pregnant human relative to said predetermined standard unconjugated estriol concentration, or relating an elevated rate of increase in unconjugated estriol concentration in the body fluid of said pregnant human as an indication of potential onset of pre-term labor in said pregnant human, wherein said relating does not consider progesterone concentration in said body fluid.

9. A method of screening for the potential onset of preterm labor in a pregnant human at 36 weeks gestation or earlier, which comprises:

- (a) analyzing a saliva sample from said pregnant human to determine the estriol concentration in said saliva sample;
- (b) correlating said concentration determined in step (a) with (1) a predetermined standard estriol concentration for saliva, or (2) a previously measured estriol concentration in saliva of said pregnant human to determine a rate of increase in estriol concentration in saliva of said pregnant human; and
- (c) relating a higher concentration of estriol in the saliva sample of said pregnant human relative to said predetermined standard estriol concentration, or relating an elevated rate of increase in estriol concentration in the saliva of said pregnant human, as an indication of potential onset of pre-term labor in said pregnant human, wherein said relating does not consider progesterone concentration in said saliva.



- a) three transparent stoppered incubation containers for receiving whole blood samples, said containers including:
  - i) a first container containing said suspect antigen in a pH controlled medium;
  - ii) a second container containing said pH controlled medium, said second container being devoid of said suspect antigen; and
  - iii) a third container containing an antigen to which prior patient exposure has been shown; and
- b) a colorant having an affinity for activated lymphocytes or lymphoblasts which result from incubation of a whole blood sample in said containers.

5,480,777

# KINETIC ENZYME ASSAY FOR DETERMINING THE CO<sub>2</sub> CONTENT OF BODY FLUIDS USING PEP CARBOXYLASE WITH INHIBITOR

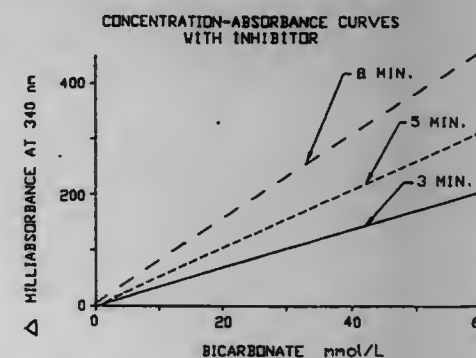
Bryce A. Cunningham, Coralville; George F. Johnson, Iowa City, and Rublo R. Punzalan, Iowa City, all of Iowa, assignors to Bio-Research Products, Inc., Oakdale, Iowa

Division of Ser. No. 119,586, Sep. 13, 1993, Pat. No. 5,429,930, which is a continuation of Ser. No. 820,617, Feb. 7, 1992, abandoned, which is a continuation-in-part of Ser. No. 383,851, Jul. 21, 1989, abandoned. This application Jan. 20, 1995, Ser. No. 375,946

Int. Cl.<sup>6</sup> C12Q 1/48; 1/32; C12N 9/10; 9/88

U.S. Cl. 435-15

7 Claims



1. In a reagent for the determination of dissolved CO<sub>2</sub> in a body fluid which includes respective quantities of phosphoenolpyruvate and phosphoenolpyruvate carboxylase, the improvement which comprises an inhibitor in said reagent which yields from about 60 to 100 mmol/L of an anion in the reagent selected from the group consisting of ClO<sub>3</sub><sup>-</sup>, ClO<sub>4</sub><sup>-</sup>, SCN<sup>-</sup> and I<sup>-</sup>.

5,480,778

# DETERMINATION OF LYMPHOCYTE REACTIVITY TO SPECIFIC ANTIGENS IN BLOOD

Robert A. Levine, 31 Pilgrim La., Guilford, Conn. 06437, and Stephen C. Wardlaw, 191 N. Cove Rd., Old Saybrook, Conn. 06475

Continuation of Ser. No. 785,099, Oct. 31, 1991, abandoned, which is a division of Ser. No. 340,248, Apr. 19, 1989, abandoned. This application Jan. 21, 1993, Ser. No. 6,766

Int. Cl.<sup>6</sup> G01N 33/53

U.S. Cl. 435-7.24

1 Claim

1. Paraphernalia for determining a patient's prior exposure to a suspect antigen to which lymphocytes in whole blood may have become sensitized, said paraphernalia comprising:

5,480,779

# CYCLOSPORINE ASSAY

Gunter Fischer, Halle, and Namen G. Küllertz, Brandenburg, both of German Dem. Rep., assignors to Arzneimittelwerk Dresden GmbH, Radebeul, Germany

Continuation of Ser. No. 703,590, May 20, 1991, abandoned, which is a continuation-in-part of Ser. No. 398,092, Aug. 24, 1989, abandoned. This application Jan. 12, 1993, Ser. No. 4,643

Claims priority, application Germany, Sep. 7, 1988, WPG01F/319577.4

Int. Cl.<sup>6</sup> C12Q 1/37; C07K 5/00

U.S. Cl. 435-23

10 Claims

1. A process for determining the concentration of cyclosporine in a cyclosporine containing sample, which comprises adding to the sample an amount of an isomerase enzyme which isomerizes a peptide linkage N-terminally to proline wherein the enzyme activity achieves the range of 10-90% of the level found in a reference solution devoid of cyclosporine, then measuring the enzyme-catalyzed isomerization of a proline-containing peptide substrate, and determining the concentration of cyclosporine on an axis of a calibration curve plotting enzyme activity as a function of cyclosporine concentration.

5,480,780

Patent Not Issued For This Number







- (b) combining cells from the embryonic callus of step (a) with *Agrobacterium* cells carrying the exogenous DNA sequence in a cocultivation medium containing nutrients, an energy source, and an induction compound under conditions which allow the *Agrobacterium* cells to infect the embryonic callus cells and transfer the exogenous DNA sequence to the embryonic callus cell chromosomes;
- (c) culturing embryonic callus cells from step (b) in a selection medium containing nutrients, an energy source, an auxin, a cytokinin, and an agent which inhibits the growth of embryonic callus cells which do not express the selectable marker gene; and
- (d) culturing the cells selected in step (c) in a maintenance medium containing nutrients, an energy source, an antibacterial agent, and a growth regulator, other than an auxin or a cytokinin, present in amounts effective to produce viable somatic embryos capable of being regenerated into transformed plantlets.

5,480,790

## WATER-SOLUBLE PROTEINS MODIFIED BY SACCHARIDES

Wilhelm Tischer, Peissenberg; Joachim Klein; Braunschweig; Rolf-Joachim Müller, Gifhorn; and Stephan Engelke, Drensfurt, all of, Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, and Gesellschaft für Biotechnologische Forschung mbH, Braunschweig, both of, Germany

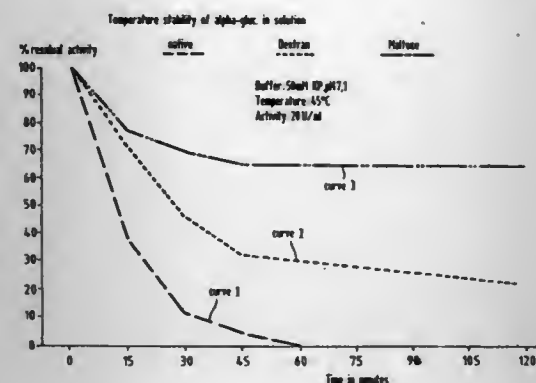
Filed Apr. 4, 1991, Ser. No. 680,334

Claims priority, application Germany, Apr. 5, 1990, 40 11 084.2

Int. Cl.<sup>6</sup> C07K 1/113; C12N 9/96

U.S. Cl. 435—188

27 Claims



1. Water-soluble protein-saccharide conjugate wherein the protein is covalently bound to a poly(vinylsaccharide) via a saccharide residue.

5,480,791

## METHOD OF DETECTING PHOSPHATASE

Satoshi Fujita; Naoto Kagiya; Masayoshi Momiyama, and Yasumitsu Kondo, all of Sapporo, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 23, 1993, Ser. No. 155,819

Claims priority, application Japan, Nov. 24, 1992, 4-353462; Jan. 7, 1993, 5-277499

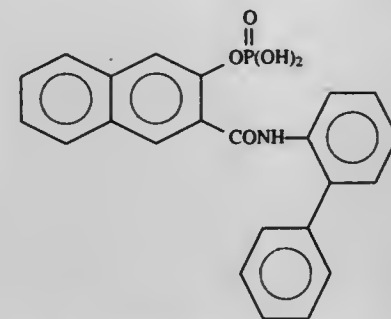
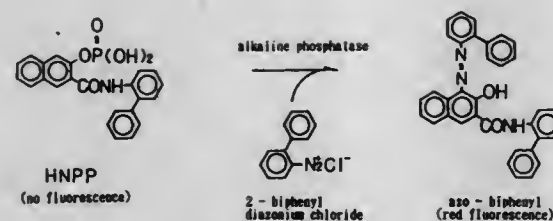
Int. Cl.<sup>6</sup> C12Q 1/68; C12N 9/16

U.S. Cl. 435—196

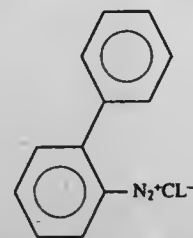
4 Claims

1. A method for detecting the presence of phosphatase in a sample comprising the following steps:

- (i) reacting a phosphatase contained in the sample with the 3-hydroxy-N-2'-biphenyl-2-naphthalenecarboxamide phosphate ester compound represented by the formula below:



- (ii) reacting the resultant dephosphorylated 3-hydroxy-N-2'-biphenyl-2-naphthalenecarboxamide phosphate-phosphatase reaction product with a diazonium salt represented by formulas below to produce an azo dye reaction product:



(2-Biphenyldiazonium chloride)

- (iii) detecting emitted fluorescence of the azo-dye under irradiation of ultra-violet light to detect whether phosphatase is present in the sample.

5,480,792

## ANTIBODIES TO COMPLEXES OF LIGAND RECEPTORS AND LIGANDS AND THEIR UTILITY IN LIGAND-RECEPTOR ASSAYS

Kenneth F. Buechler, San Diego, and Gunars E. Valkirs, Escondido, both of Calif., assignors to Biosite Diagnostics, Inc., San Diego, Calif.

Continuation of Ser. No. 583,556, Sep. 14, 1990; abandoned.

This application Jun. 1, 1993, Ser. No. 71,203

Int. Cl.<sup>6</sup> C12Q 1/68; G01N 33/53; 33/531; 33/577

U.S. Cl. 435—6

21 Claims

1. Method for determining the presence of at least one target ligand in a fluid sample suspected of containing said target ligand comprising the steps of:

- a. contacting said fluid sample with a ligand receptor conjugate and an antibody wherein the binding affinity of said antibody for the complex of said target ligand and said ligand receptor conjugate is at least a factor of 10 greater than the affinity of said antibody for said target ligand when measured in the presence of a concentration of said target ligand that is substantially greater than the concentration of said ligand receptor conjugate, and wherein no detectable assay response results from the binding of antibody and ligand receptor.

conjugate in the absence of target ligand and the amount of ligand receptor conjugate bound to antibody is related to the amount of target ligand in the fluid sample;

b. measuring the amount of said complex bound to said antibody;

c. relating said amount to the presence of said target ligand in said fluid sample;

wherein sandwich immunoassays of said ligand are subject to a hook-effect at high ligand concentration.

5,480,793

## NUCLEIC ACID CODING FOR THE HUMAN ANGIOTENSIN CONVERTING ENZYME (ACE), AND ITS USES, ESPECIALLY FOR THE IN VITRO DIAGNOSIS OF ARTERIAL HYPERTENSION

Florent Soubrier; Francois Alhenc-Gelas, both of Paris; Christine Hubert, Sevres, and Pierre Corvol, Paris, all of, France, assignors to Institut National De La Sante Et De La Recherche Medicale, Paris, France

Division of Ser. No. 460,126, May 23, 1990, abandoned. This application Aug. 12, 1994, Ser. No. 288,709

Claims priority, application France, Sep. 27, 1988, 88 12620

Int. Cl.<sup>6</sup> C12N 9/48; 15/63; 1/21; 15/57; C12P 21/02

U.S. Cl. 435—212

3 Claims

1. A biologically functional plasmid or viral DNA vector including a DNA sequence encoding human angiotensin converting enzyme.

5,480,794

## OVERPRODUCTION AND PURIFICATION OF SOLUBLE PHA SYNTHASE

Oliver P. Peoples, Arlington; Tillman U. Gerngross, Cambridge, and Anthony J. Sinskey, Boston, all of Mass., assignors to Massachusetts Institute of Technology and Metabolix, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 71,574, Jun. 3, 1993, and a continuation-in-part of Ser. No. 234,721, Apr. 28, 1994, abandoned, which is a continuation of Ser. No. 73,603, Jun. 7, 1993, abandoned, which is a continuation of Ser. No. 944,881, Sep. 14, 1992, abandoned, which is a division of Ser. No. 700,109, May 8, 1991, Pat. No. 5,245,023, which is a continuation of Ser. No. 378,155, Jul. 10, 1989, abandoned, which is a continuation-in-part of Ser. No. 67,695, Jun. 29, 1987, abandoned. This application Aug. 12, 1994, Ser. No. 290,131

Int. Cl.<sup>6</sup> C12N 9/88; 15/60

U.S. Cl. 435—232

23 Claims

1. A method for the overproduction and purification of soluble polyhydroxyalkanoate (PHA) synthase expressed from an isolated structural gene comprising expressing the isolated structural gene encoding the synthase in a vector in an expression system not expressing an enzyme cleaving the synthase selected from the group consisting of bacteria, yeast, fungi, and plants.

5,480,795

## CURCULIN B AND DNA ENCODING SAME, AND PROCESS FOR PRODUCTION THEREOF

Yoshie Kurihara, 4-7, Okuzawa 7-chome, Setagaya-ku, Tokyo 116; Soichi Arai, 38, Nanashimacho, Kanagawa-Ku, Yokohama-shi, Kanagawa-ken 221; Keiko Abe, Warabi, and Haruyuki Yamashita, Arakawa, all of, Japan, assignors to Yoshie Kurihara, Tokyo; Soichi Arai, Yokohama, and Asahi Denka Kogyo K.K., Tokyo, all of, Japan

Filed Mar. 4, 1992, Ser. No. 845,592

Claims priority, application Japan, Mar. 4, 1991, 3-061012

Int. Cl.<sup>6</sup> C12N 15/29; C12P 19/34; 21/02

U.S. Cl. 435—91.4

9 Claims

1. A purified DNA molecule comprising a base sequence encoding a polypeptide of an amino acid sequence of the formula (I):

Asp Asn Val Leu Leu Ser Gly Gln Thr Leu His Ala Asp His Ser  
Leu Gln Ala Gly Ala Tyr Thr Leu Thr Ile Gln Asn Lys Cys Asn  
Leu Val Lys Tyr Gln Asn Gly Arg Gln Ile Trp Ala Ser Asn Thr  
Asp Arg Arg Gly Ser Gly Cys Arg Leu Thr Leu Leu Ser Asp Gly  
Asn Leu Val Ile Tyr Asp His Asn Asn Asn Asp Val Trp Gly Ser  
Ala Cys Trp Gly Asp Asn Gly Lys Tyr Ala Leu Val Leu Gln Lys  
Asp Gly Arg Phe Val Ile Tyr Gly Pro Val Leu Trp Ser Leu Gly  
Pro Asn Gly Cys Arg Arg Val Asn Gly (I). SEQ ID. NO. 1

5,480,796

## ANTIBODIES AGAINST THE RECEPTOR PROTEIN FOR HUMAN B CELL STIMULATORY FACTOR-2

Tadamitsu Kishimoto, 5-31, Nakancho 3-chome, Tondabayashi-shi, Osaka, Japan

Division of Ser. No. 298,694, Jan. 19, 1989, Pat. No. 5,171,840.

This application Jul. 2, 1992, Ser. No. 907,650

Claims priority, application Japan, Jan. 22, 1988, 63-012387;

Jan. 25, 1988, 63-012599; Aug. 4, 1988, 63-194885; Jan. 14, 1989, 1-7461

Int. Cl.<sup>6</sup> C12N 5/00; A61K 35/14

U.S. Cl. 435—240.27

3 Claims

1. A hybridoma capable of producing an antibody that is capable of reacting specifically with a B cell stimulating factor-2 receptor protein that consists of the following amino acid sequence (I):

(N-terminal)

Met Leu Ala Val Gly Cys Ala Leu Leu Ala Ala

Leu Leu Ala Ala Pro Gly Ala Ala Leu Ala Pro

Arg Arg Cys Pro Ala Gln Glu Val Ala Arg Gly

Val Leu Thr Ser Leu Pro Gly Asp Ser Val Thr

Leu Thr Cys Pro Gly Val Glu Pro Glu Asp Asn

Ala Thr Val His Trp Val Leu Arg Lys Pro Ala

Ala Gly Ser His Pro Ser Arg Trp Ala Gly Met

Gly Arg Arg Leu Leu Leu Arg Ser Val Gln Leu

His Asp Ser Gly Asn Tyr Ser Cys Tyr Arg Ala

Gly Arg Pro Ala Gly Thr Val His Leu Leu Val

Asp Val Pro Pro Glu Glu Pro Gln Leu Ser Cys

Phe Arg Lys Ser Pro Leu Ser Asn Val Val Cys

Glu Trp Gly Pro Arg Ser Thr Pro Ser Leu Thr

Thr Lys Ala Val Leu Leu Val Arg Lys Phe Gln

Asn Ser Pro Ala Glu Asp Phe Gln Glu Pro Cys

Gln Tyr Ser Gln Glu Ser Gln Lys Phe Ser Cys

Gln Leu Ala Val Pro Glu Gly Asp Ser Ser Phe

Tyr Ile Val Ser Met Cys Val Ala Ser Ser Val

Gly Ser Lys Phe Ser Lys Thr Gln Thr Phe Gln

Gly Cys Gly Ile Leu Gln Pro Asp Pro Pro Ala

Asn Ile Thr Val Thr Ala Val Ala Arg Asn Pro

Arg Trp Leu Ser Val Thr Trp Gln Asp Pro His

Ser Trp Asn Ser Ser Phe Tyr Arg Leu Arg Phe

Glu Leu Arg Tyr Arg Ala Glu Arg Ser Lys Thr



-continued

Phe Thr Thr Trp Met Val Lys Asp Leu Gln His  
His Cys Val Ile His Asp Ala Trp Ser Gly Leu  
Arg His Val Val Gln Leu Arg Ala Gln Glu Glu  
Phe Gly Gln Gly Glu Trp Ser Glu Trp Ser Pro  
Glu Ala Met Gly Thr Pro Trp Thr Glu Ser Arg  
Ser Pro Pro Ala Glu Asn Glu Val Ser Thr Pro  
Met Gln Ale Leu Thr Thr Asn Lys Asp Asp Asp  
Asn Ile Leu Phe Arg Asp Ser Ala Asn Ala Thr  
Ser Leu Pro Val Gln Asp Ser Ser Ser Val Pro  
Leu Pro Thr Phe Leu Val Ala Gly Gly Ser Leu  
Ala Phe Gly Thr Leu Leu Cys Ile Ala Ile Val  
Leu Arg Phe Lys Lys Thr Trp Lys Leu Arg Ala  
Leu Lys Glu Gly Lys Thr Ser Met His Pro Pro  
Tyr Ser Leu Gly Gln Leu Val Pro Glu Arg Pro  
Arg Pro Thr Pro Val Leu Val Pro Leu Ile Ser  
Pro Pro Val Ser Pro Ser Ser Leu Gly Ser Asp  
Asn Thr Ser Ser His Asn Arg Pro Asp Ala Arg  
Asp Pro Arg Ser Pro Tyr Asp Ile Ser Asn Thr  
Asp Tyr Phe Phe Pro Arg

(C-terminal).

5,480,797

## AUGMENTER OF LIVER REGENERATION (ALR)

Antonio T. Francavilla, Pittsburgh, Pa.; Michio Hagiya, Shiga, Japan, and Thomas E. Starzl, Pittsburgh, Pa., assignors to Toyobo Co., Ltd., Osaka, Japan, and University of Pittsburgh, Pittsburgh, Pa.

Filed Feb. 16, 1994, Ser. No. 197,496

Int. Cl.<sup>6</sup> C12N 1/21;5/10;15/12;15/63

U.S. Cl. 435—240.2

8 Claims

Met Arg Thr Gln Gln Lys Arg Asp Ile Lys Phe Arg Glu Asp Cys Pro  
1 5 10 15  
Gln Asp Arg Glu Glu Leu Gly Arg Asn Thr Trp Ala Phe Leu His Thr  
20 25 30  
Leu Ala Ala Tyr Tyr Pro Asp Met Pro Thr Pro Glu Gln Gln Asp  
35 40 45  
Met Ala Gln Phe Ile His Ile Phe Ser Lys Phe Tyr Pro Cys Glu Glu  
50 55 60  
Cys Ala Glu Asp Ile Arg Lys Arg Ile Asp Arg Ser Gln Pro Asp Thr  
65 70 75 80  
Ser Thr Arg Val Ser Phe Ser Gln Trp Leu Cys Arg Leu His Asn Glu  
85 90 95  
Val Asn Arg Lys Leu Gly Lys Pro Asp Phe Asp Cys Ser Arg Val Asp  
100 105 110  
Glu Arg Trp Arg Asp Gly Trp Lys Asp Gly Ser Cys Asp  
115 120 125

1. An isolated DNA comprising a nucleotide sequence encoding mammalian augments of liver regeneration, wherein said DNA has the nucleotide sequence of SEQ ID NO:1.

5,480,798  
BAKER'S YEAST HAVING A LOW TEMPERATURE INACTIVATION PROPERTY  
Christof Gysler; Herbert Hottinger, both of Blonay, and Peter Niederberger, Epalinges, all of, Switzerland, assignors to Nestec S.A., Vevey, Switzerland  
Division of Ser. No. 777,029, Oct. 16, 1991, abandoned. This application Jun. 30, 1993, Ser. No. 86,012  
Claims priority, application Switzerland, Nov. 9, 1990, 03 565/90

Int. Cl.<sup>6</sup> C12N 1/18

U.S. Cl. 435—255.2

7 Claims

1. An isolated diploid strain of *Saccharomyces cerevisiae* which grows on a plate in a medium comprising, by weight, 2% glycerol, 1% yeast extract and 2% peptone, and forms a colony size of 0.5 mm to 1.5 mm after 3 days of culture at 30° C.; which raises a 20 cm diameter/0.5 cm thick pizza dough stored in a sealed plastic wrapping for 21 days at 8° C. to an about 2 cm thick pizza crust when baked at 180° C. for 15 minutes; which produces CO<sub>2</sub> at a level of less than 20 ml/g pressed yeast after 7 days in a medium containing 2% by weight maltose refrigerated at from 3° C. to 10° C.; and which produces CO<sub>2</sub> at a level of at least 40 ml/g pressed yeast after 6 days in a medium containing 2% by weight maltose kept at a temperature of at least 14° C.

5,480,799

SPERM ANTIGEN CORRESPONDING TO A SPERM ZONA BINDING PROTEIN AUTOANTIGENIC EPITOPE  
Michael G. O'Rand; Esther E. Widgren; Richard T. Richardson, and Isabel A. Lea, all of Chapel Hill, N.C., assignors to The University of North Carolina at Chapel Hill, Chapel Hill, N.C.

Filed Dec. 10, 1993, Ser. No. 166,195

Int. Cl.<sup>6</sup> C12N 1/21;15/12;1/19;5/10

U.S. Cl. 435—252.3

5 Claims

1. Isolated DNA encoding an Sp 17 protein selected from the group consisting of:

- isolated DNA having the nucleotide sequence given herein as SEQ ID NO:1 which encodes the human Sp 17 protein having the amino acid sequence given herein as SEQ ID NO:2;
- isolated DNA which hybridizes to isolated DNA of (a) above under conditions represented by a wash stringency of 0.3M NaCl, 0.03M sodium citrate, and 0.1% SDS at 60° C., and which encodes a human Sp 17 protein; and
- isolated DNA differing from the isolated DNAs of (a) and (b) above in nucleotide sequence due to the degeneracy of the genetic code, and which encodes a human Sp 17 protein.

5,480,800

DNA FRAGMENT CARRYING THE GENE ENCODING THE ENZYME FOR FRAGMENTING N-ACETYLHEPAROSAN AND THE ADJACENT SEQUENCES PERMITTING ITS EXPRESSION, RECOMBINANT ENZYME INTENDED FOR FRAGMENTING N-ACETYLHEPAROSAN AND ITS USE  
Richard Legoux, Le Saget; Philippe Lelong, and Marc L. V. Salomé, both of Castanet Tolosan, all of, France, assignors to Sanofi, Paris, France

Filed Aug. 17, 1994, Ser. No. 291,896

Claims priority, application France, Aug. 17, 1993, 93 10050

Int. Cl.<sup>6</sup> C12N 15/70;9/24;15/63;1/21

U.S. Cl. 435—252.33

7 Claims

1. DNA fragment carrying a gene encoding an enzyme that fragments high molecular mass N-acetylheparosan and the expression systems permitting its biosynthesis, said DNA fragment having 3089 bp and corresponding to the nucleotide sequence SEQ ID NO:1.

5,480,801  
PURIFIED PH NEUTRAL RHIZOCTONIA LACCASES AND NUCLEIC ACIDS ENCODING SAME  
Jill A. Wahleithner, Davis, Calif.; Bjoern E. Christensen, Holte, and Palle Schneider, Ballerup, both of, Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark  
Continuation-in-part of Ser. No. 122,230, Sep. 17, 1993, abandoned, Ser. No. 122,827, Sep. 17, 1993, abandoned, and Ser. No. 162,827, Dec. 3, 1993, abandoned. This application Dec. 22, 1993, Ser. No. 172,331

Int. Cl.<sup>6</sup> C12N 5/14;5/16;15/31;15/52

U.S. Cl. 435—254.3

30 Claims

1. An isolated nucleic acid fragment containing a nucleic acid sequence encoding a *Rhizoctonia solani* laccase which functions optimally at a pH between about 6.0 and 8.5.

5,480,802

Patent Not Issued For This Number

5,480,803

## APPARATUS FOR TREATING ANALYTES

Nicholas Thomas, Cardiff, United Kingdom, assignor to Amersham International PLC, Buckinghamshire, United Kingdom

PCT No. PCT/GB91/00308, § 371 Date Jul. 22, 1993, § 102(e) Date Jul. 22, 1993, PCT Pub. No. WO91/13345, PCT Pub. Date Sep. 5, 1991

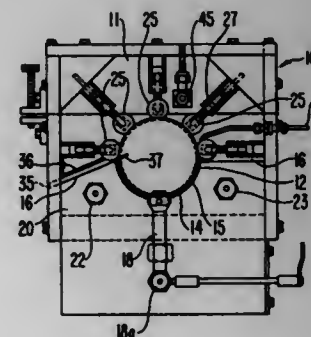
PCT Filed Feb. 28, 1991, Ser. No. 923,807

Claims priority, application United Kingdom, Mar. 1, 1990, 9004596

Int. Cl.<sup>6</sup> C25D 1/12

U.S. Cl. 435—286.1

21 Claims



4. An apparatus for use in processing an analyte carried by a transporting medium, said apparatus comprising:

- a processing chamber;
- a bath wall mounted in said processing chamber and defining a bath container;
- a liquid inlet communicating with said bath container;
- a liquid outlet communicating with said bath container;
- a horizontally-disposed rotary drum rotatably mounted in said processing chamber and having a bottom portion thereof projected into said bath container such that a periphery of said drum is disposed adjacent but separated from said bath wall by a narrow gap; and
- a leading edge engagement means disposed on said rotary drum for releasably engaging only a leading edge of the transporting medium such that, upon rotation of said rotary drum, the transporting medium is pulled by its leading edge about said rotary drum and through said narrow gap.

5,480,804  
METHOD OF AND APPARATUS FOR DETECTING MICROORGANISMS

Motohiro Niwa; Tetsuji Yasui, both of Tokyo, and Takahiro Ode, Yokohama, all of, Japan, assignors to Kirin Beverage Corporation, Tokyo, Japan

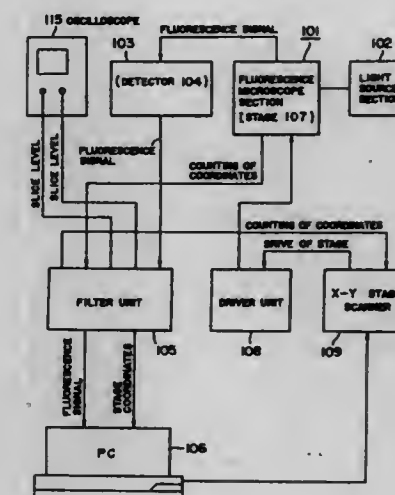
Continuation-in-part of Ser. No. 546,097, Jun. 27, 1990, abandoned. This application Apr. 13, 1993, Ser. No. 47,606

Claims priority, application Japan, Jun. 28, 1989, 1-165635; Nov. 10, 1989, 1-292998

Int. Cl.<sup>6</sup> C12M 1/34

U.S. Cl. 435—286.1

8 Claims



1. An apparatus for detecting fluorescent substances in a micro-organism sample, the apparatus comprising:

- stage means for placing thereon a microorganism sample subjected to fluorescent staining, and for transporting the sample to permit the same to be scanned;
- light source means for protecting excitation light of a predetermined wavelength onto the sample so that a fluorescent light is originated from the sample;
- slit means having a slit of a predetermined width through which the fluorescent light from the sample passes;
- sensor means for sensing the fluorescent light which has passed through the slit to obtain an electric signal;
- signal filter means for limiting a frequency band of the electric signal from the sensor means to a frequency band predetermined depending on a width of the slit as imaged onto the sample and a speed of the scanning of the sample; and
- signal processing means for processing the band-limited electric signal so as to detect fluorescent substances in the sample, wherein the sample includes a plurality of colonies of microorganisms having diameters in the range of D<sub>1</sub> to D<sub>2</sub> and the frequency band of the electric signal is selected to obtain electric signals at a frequency R that corresponds to the diameter of an individual colony, where

$$R = S(W + D) \text{ (Hz)}$$

wherein S is the speed of the scanning of the sample, W is the width of the slit as imaged onto the sample, and D is the diameter of a colony being scanned, and the frequency range extends at least from a frequency R<sub>1</sub> for colonies of diameter D<sub>1</sub> to a frequency R<sub>2</sub> for colonies of diameter D<sub>2</sub>.



5,480,805

## COMPOSITION FOR MODULATING STEROLS IN YEAST

Fred R. Wolf, Naperville, and Richard E. Cuellar, Glen Ellyn, both of Ill., assignors to Amoco Corporation, Naperville, Ill.  
Continuation of Ser. No. 929,764, Aug. 12, 1992, abandoned.  
This application May 10, 1994, Ser. No. 240,496

Int. Cl.<sup>6</sup> C12N 15/61; 15/81; 1/19

U.S. Cl. 435—320.1

7 Claims

1. An isolated DNA segment comprising a nucleotide sequence that encodes *Saccharomyces cerevisiae*  $\Delta 8-7$  isomerase, said isomerase having the amino acid residue sequence shown in SEQ ID NO: 2.

5,480,806

## METHOD FOR DETERMINING DECOMPOSABLE ORGANIC CARBON COMPOUNDS PRESENT IN A GASEOUS PHASE

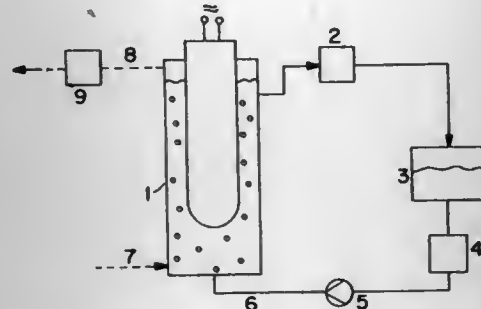
Hans Duve, Duermen, Germany, assignor to Huls Aktiengesellschaft, Marl, Germany

Continuation-in-part of Ser. No. 492,970, Mar. 13, 1990, abandoned. This application Jun. 1, 1994, Ser. No. 284,394  
Claims priority, application Germany, Mar. 21, 1989, 39 09 227.5

Int. Cl.<sup>6</sup> G01N 31/12

U.S. Cl. 436—52

8 Claims



1. A method for determining decomposable organic carbon compounds present in a gaseous phase, comprising the steps:  
continuously conducting a gaseous flow to be tested through a limited quantity of water located in an aqueous circuit, said circuit including a reactor for decomposing the organic carbon compounds, an ion detector, an ion exchanger and a circulation pump;  
continuously irradiating said limited quantity of water which is continuously circulated within said aqueous circuit within said reactor using ultraviolet light whereby the decomposable organic carbon compounds introduced into said aqueous circuit through said gaseous flow are decomposed;  
continuously determining said decomposable organic carbon compound contents within said limited quantity of water by use of said ion detector immersed in said limited quantity of water before said limited quantity of water contacts said ion exchanger;  
removing ions from said limited quantity of water by said ion exchanger; whereby,  
said decomposable organic carbon compound contents are detected during circulation of said limited quantity of water through said aqueous circuit.

5,480,807

## PROCESS FOR ASSESSING THE BIOLOGICAL AGE OF A TISSUE

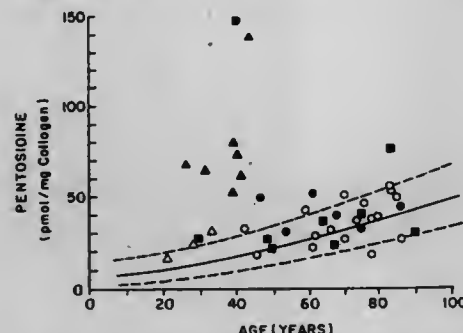
Vincent M. Monnier, Shaker Heights, and David R. Sell, Cleveland Heights, both of Ohio, assignors to Case Western Reserve University, Cleveland, Ohio

Continuation of Ser. No. 44,840, Apr. 8, 1993, abandoned, which is a continuation-in-part of Ser. No. 899,727, Jun. 17, 1992, abandoned, which is a division of Ser. No. 453,959, Dec. 20, 1989, Pat. No. 5,214,138. This application Oct. 19, 1994, Ser. No. 331,276

Int. Cl.<sup>6</sup> G01N 33/483

U.S. Cl. 436—86

3 Claims



1. A process for assessing the biological age of a tissue by determining the amount of pentosidine present in the tissue, the process comprising isolating the pentosidine by:  
(a) acid hydrolyzing the tissue;  
(b) evaporating the acid and dissolving the residue in water;  
(c) conducting reverse phase liquid chromatography using fluorescence with 335/385 nm excitation/emission wavelengths;  
(d) collecting the fractions containing the 335/385 nm fluorophore; and,  
(e) determining the biological age of the tissue by comparing the results against a known standard for normal tissue pentosidine levels.

5,480,808

## VOLTAMMETRIC METHOD FOR MEASURING PEROXIDE CONCENTRATION IN HYDROCARBON FUELS

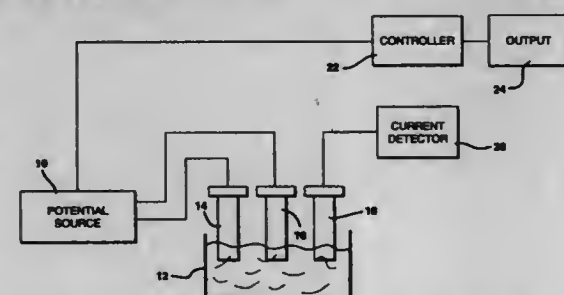
Robert E. Kauffman, Centerville, and James D. Wolf, Kettering, both of Ohio, assignors to The University of Dayton, Dayton, Ohio

Continuation-in-part of Ser. No. 189,516, Jan. 31, 1994, abandoned. This application Jan. 26, 1995, Ser. No. 378,480

Int. Cl.<sup>6</sup> G01N 33/26; 33/03

U.S. Cl. 436—135

12 Claims



1. A method for measuring the peroxide content of a fuel comprising:  
reacting a supply of fuel to be tested with a solution containing a water-soluble salt and an acidic iodide containing aqueous solution to reduce any peroxide present in said supply of material and produce iodine;  
allowing the resulting mixture to separate into an aqueous phase and a fuel phase;  
bringing electrodes into contact with the aqueous phase;

applying an electric potential to the aqueous phase to produce an electric current therethrough;  
varying the potential in a single sweep from a first potential value to a second potential value; and,  
measuring and recording the current during said potential sweep; wherein the peroxide content is determined from the measured current.

5,480,809

## METHOD AND APPARATUS FOR REMOVAL OF RESIDUAL INTERFERING NEBULIZED SAMPLE

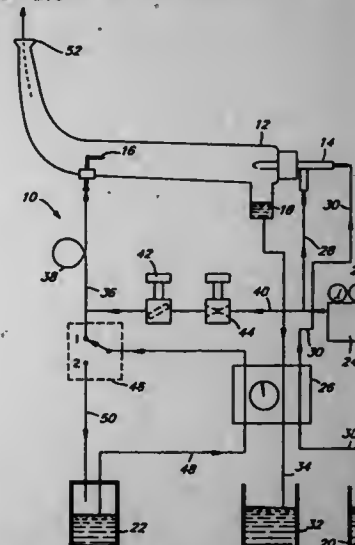
Eric D. Salin, Beaconsfield, and Jean-Guy J. Lévesque, St-Bruno, both of, Canada, assignors to McGill University, Montreal, Canada

Filed Jul. 27, 1994, Ser. No. 281,428

Int. Cl.<sup>6</sup> B01D 59/44

U.S. Cl. 436—173

21 Claims



12. In a method of inductively coupled plasma analysis in which discrete nebulized samples of a liquid are developed by a nebulizer means in a sample chamber for analysis and in which a wash out of the sample chamber is carried out after removal of a discrete nebulized sample from the chamber and prior to development of a subsequent discrete nebulized sample, said nebulizer means including means for supplying sample the improvement in which  
at least one jet of wash liquid is directed against said nebulizer means, at least one jet of flushing gas is directed against said nebulizer means from a position in generally opposed spaced apart relationship with said nebulizer means, to flush out residual nebulized sample, a mixture of said wash liquid and residual sample is collected in a well in a floor of the chamber, said well being vertically below said nebulizer means, and the mixture is drained from the well.

5,480,810

## METHOD OF FABRICATING A RADIATION IMAGER WITH COMMON PASSIVATION DIELECTRIC FOR GATE ELECTRODE AND PHOTODIODE

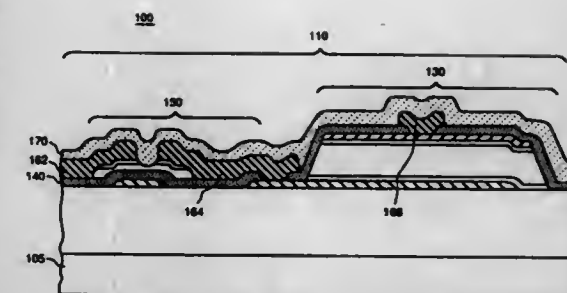
Ching-Yu Wei, Roger S. Salisbury, Robert F. Kwamnick, all of Schenectady, and Brian W. Giambattista, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.  
Division of Ser. No. 261,592, Jun. 17, 1994, Pat. No. 5,435,608. This application Feb. 6, 1995, Ser. No. 384,093

Int. Cl.<sup>6</sup> H01L 21/84; 21/31

U.S. Cl. 437—2

9 Claims

1. A method of fabricating an imager array having a plurality of pixels, each pixel comprising a respective pixel thin film transistor and pixel photodiode, the method comprising, for each respective pixel, the steps of:



depositing a first conductive layer on a substrate;  
forming a gate electrode and a photodiode bottom electrode from said first conductive layer;  
forming a photodiode body disposed on at least a portion of said photodiode bottom electrode;  
depositing a common dielectric layer over said gate electrode so as to form a gate dielectric, and over said photodiode body and exposed portions of said photodiode bottom electrode so as to form a photodiode passivation layer, said common dielectric layer comprising a monolithic dielectric material; and  
completing fabrication of said pixel TFT and said pixel photodiode such that said pixel TFT's electrically are coupled to the respective pixel photodiode.

5,480,811

## ISOLATION OF PHOTOGENERATED CARRIERS WITHIN AN ORIGINATING COLLECTING REGION

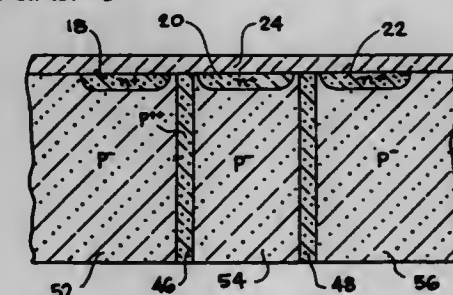
Shang-Yi Chiang, 295 La Casa Via, Walnut Creek, Calif. 94598, and John Moll, 4111 Old Trace Rd., Palo Alto, Calif. 94306

Continuation of Ser. No. 735,199, Jul. 24, 1991, abandoned, which is a continuation of Ser. No. 538,307, Jun. 14, 1990, abandoned. This application Apr. 30, 1992, Ser. No. 876,663

Int. Cl.<sup>6</sup> H01L 21/76

U.S. Cl. 437—3

4 Claims



1. A method of making a photosensing array to produce an array for optical imaging comprising,  
forming an array of spaced apart photosensing elements on a first surface of a semiconductor substrate, said semiconductor substrate having a first type of electrical conductivity and a first level of electrical conductivity, said semiconductor substrate being doped with a conductive impurity to have a uniform conductivity type and a uniform concentration of said conductive impurity, and  
creating collecting regions within said monolithic semiconductor material and between said photosensing elements comprising the substeps of:  
depositing a metal on said first surface between adjacent photosensing elements, and  
forming downwardly extending thin recrystallization regions into said semiconductor substrate to a distance from said first surface that is less than the thickness of said semiconductor substrate using thermal gradient zone melting, the depth of the recrystallization regions being such that the recrystallization regions substantially impedes the migration of photogenerated carriers from one collecting region to an adjacent collecting region.



5,480,812

## ADDRESS LINE REPAIR STRUCTURE AND METHOD FOR THIN FILM IMAGER DEVICES

Roger S. Salisbury, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

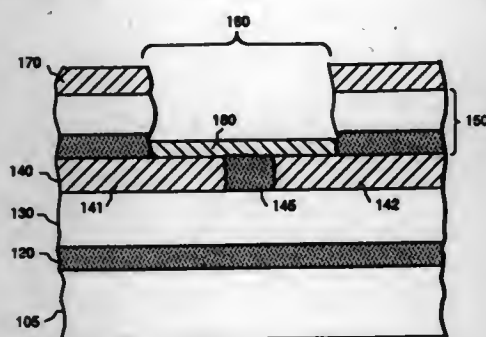
Continuation of Ser. No. 169,260, Dec. 20, 1993, abandoned.

This application May 8, 1995, Ser. No. 436,681

Int. Cl.<sup>6</sup> H01L 31/18; 21/26; 1/62

U.S. Cl. 437-3

22 Claims



11. A method of repairing a defect in a thin film electronic imager device having a plurality of conductive components disposed in respective levels in the device, the method comprising the steps of:

forming a selected repair area on said device, said selected repair area being disposed so as to expose an open-circuit defect in a damaged first conductive component and selected adjoining portions of said first conductive component; and depositing conductive material to form a second and succeeding conductive component disposed over said first conductive component and to coincidentally form a repair shunt in said selected repair area disposed in electrical contact with said damaged first conductive component so as to electrically bridge said defect in said damaged first conductive component, said repair shunt being electrically isolated from said second conductive component.

5,480,813

## ACCURATE IN-SITU LATTICE MATCHING BY REFLECTION HIGH ENERGY ELECTRON DIFFRACTION

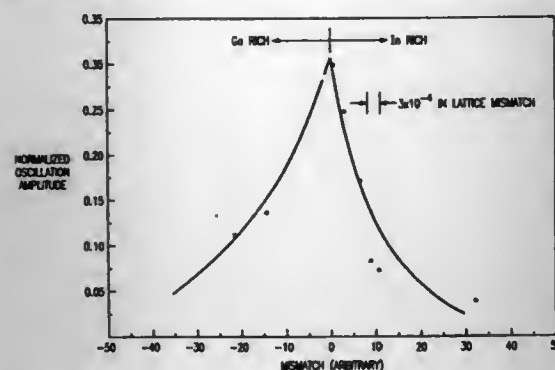
John E. Cunningham, Lincroft; Keith W. Goossen, Aberdeen, and Rajiv N. Pathak, Matawan, all of N.J., assignors to AT&amp;T Corp., Murray Hill, N.J.

Filed Jun. 21, 1994, Ser. No. 263,305

Int. Cl.<sup>6</sup> H01L 21/205

U.S. Cl. 437-7

8 Claims



1. A method for in-situ lattice matching of semiconductor layers comprising the steps of:

(a) providing a substrate of a first semiconductor material; (b) initiating growth of a second semiconductor material on said substrate semiconductor material;

- (c) monitoring intensity of reflection high energy electron diffraction spot of the second semiconductor material and said substrate over multiple waveform cycles; (d) determining a maximum  $I^+$  and minimum  $I^-$  intensity of each waveform cycle; (e) determining the intensity drop  $\Delta I$  from initial reflectivity, measured prior to initiation of growth, to minimum reflectivity measured after starting growth; (f) calculating a normalized figure of merit FM for each said waveform cycle wherein

$$FM = \frac{\Sigma(I^+ - I^-)}{\Delta I}$$

for each waveform cycles;

- (g) adjusting cell temperature to maximize FM and optimize lattice matching; and (h) repeating steps (c) through (g) as needed to form a plurality of layers of said second semiconductor material.

5,480,814

## PROCESS OF MAKING A POLYSILICON BARRIER LAYER IN A SELF-ALIGNED CONTACT MODULE

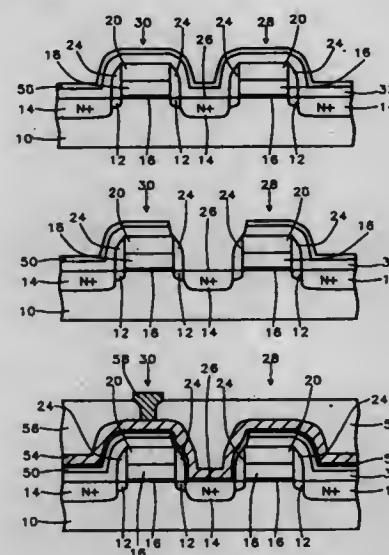
Shou-Gwo Wu, Chu-Gong Hsinchu; Mong-Song Liang, Hsinchu; Chuan-Jung Wang, Chu-Tong, and Chung-Hui Su, Hsinchu, all of, Taiwan, Prov. of China, assignors to Taiwan Semiconductor Manufacturing Co., Ltd., Hsin-Chu, Taiwan, Prov. of China

Filed Dec. 27, 1994, Ser. No. 365,049

Int. Cl.<sup>6</sup> H01L 21/265; 21/70; 27/00; 21/44

U.S. Cl. 437-41

21 Claims



1. A method of fabricating an integrated-circuit device which includes a self aligned contact area between two gate structures on a semiconductor substrate; the substrate containing buried impurity layers; each gate structure comprising a first gate oxide, a gate formed on the gate oxide, a top oxide formed on the gate, sidewall spacers formed on sidewalls of the gate oxide, said gate, and said top oxide; the method comprising:

- forming inter-poly oxide layer on said substrate and said gate structures; forming a polysilicon layer over said inter-poly oxide layer; implanting impurity ions into said polysilicon layer; removing portions of said inter-poly oxide layer and said polysilicon layer in the contact area between the gate structures to expose said contact area; depositing a barrier layer over said polysilicon layer, said sidewall spacers and said contact area;

depositing a first metal layer silicide over the barrier layer thereby forming an electrical connection between the first metal layer silicide and the substrate in said contact area; and forming a dielectric layers and metal layers over said first metal layer silicide and forming interconnections to said first metal layer silicide and said buried impurity layers in said contact area to complete the integrated circuit device.

5,480,815

## METHOD OF MANUFACTURING A BIOPOLAR TRANSISTOR IN WHICH AN EMITTER REGION IS FORMED BY IMPURITIES SUPPLIED FROM DOUBLE LAYERED POLYSILICON

Takeshi Watanabe, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

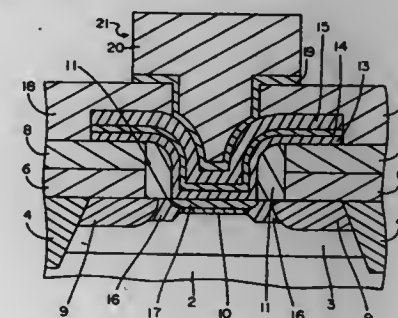
Filed Aug. 19, 1993, Ser. No. 108,291

Claims priority, application Japan, Aug. 19, 1992, 4-219876

Int. Cl.<sup>6</sup> H01L 21/328

U.S. Cl. 437-31

11 Claims



5. A method of fabricating a semiconductor device comprising the steps of:

- forming a base region of a first conductivity type in a collector region of a second conductivity type; forming a first polysilicon film on a surface of said base region while doping an impurity of said second conductivity type into said first polysilicon film; forming a second polysilicon film of said second conductivity type over a said first polysilicon film; and performing heat treatment for diffusing an impurity of said second conductivity type from said first polysilicon film to said base region in order to form an emitter region of said second conductivity type in said base region.

5,480,816

## METHOD OF FABRICATING A BIPOLAR TRANSISTOR HAVING A LINK BASE

Kimihiro Uga; Hiroki Honda; Masahiro Ishida, and Yoshiyuki Ishigaki, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 970,828, Nov. 3, 1992, abandoned. This application Jul. 12, 1994, Ser. No. 273,915

Claims priority, application Japan, Feb. 17, 1992, 4-029562

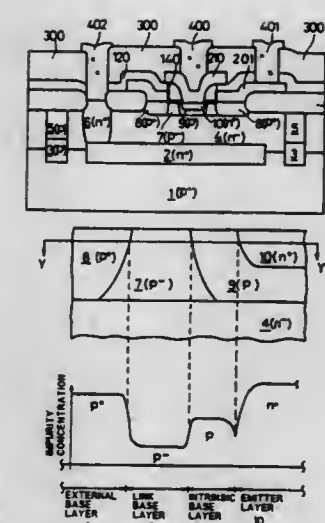
Int. Cl.<sup>6</sup> H01L 21/265; 21/225; 21/385

U.S. Cl. 437-31

13 Claims

1. A method of fabricating a semiconductor device, comprising the steps of:

- (a) providing a semiconductor layer of a first conductivity type; (b) selectively forming an intrinsic base layer of a second conductivity type in an upper surface of said semiconductor layer; (c) forming a link base layer of the second conductivity type surrounding said intrinsic base layer in the upper surface of said semiconductor layer, the impurity concentration of said link base layer being lower than the impurity concentration of said intrinsic base layer;



- (d) forming an external base layer of the second conductivity type surrounding said link base layer in the upper surface of said semiconductor layer, the impurity concentration of said external base layer being higher than said impurity concentration of said intrinsic base layer; and (e) selectively forming an emitter layer of the first conductivity type in an upper surface of said intrinsic base layer.

5,480,817

## CATIONIC LIPIDS AND STABLE MIXED LIPID DISPERSIONS

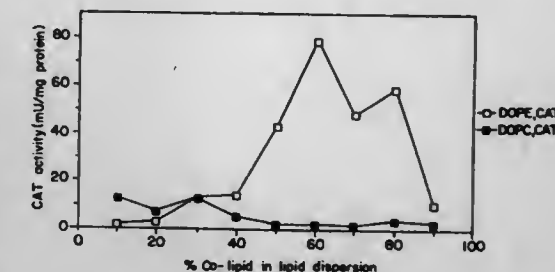
Leaf Huang, Wexford, Pa.; Richard M. Epand, Hamilton, and Remo Bottega, Ancaster, both of, Canada, assignors to The University of Tennessee Research Corporation, Knoxville, Tenn., and McMaster University, Ontario, Canada

Continuation-in-part of Ser. No. 751,873, Aug. 28, 1991, Pat. No. 5,283,185. This application Jan. 31, 1994, Ser. No. 189,594

Int. Cl.<sup>6</sup> A61K 9/127

U.S. Cl. 424-450

24 Claims



1. A stable aqueous dispersion of mixed lipids which dispersion comprises a cationic lipid of a structure which comprises the cholesteryl group of cholesterol, a linker joined to the 3 position of the said cholesteryl group, which linker is selected from the group consisting of carboxy amide and carbamoyl, a spacer arm having from 1 to 20 carbon atoms in a branched or unbranched linear alkyl chain, wherein the linker links the said cholesteryl group to the spacer arm, and a cationic amino group selected from the group consisting of primary, secondary, tertiary and quaternary amino groups, and a co-lipid which is a neutral phospholipid.



5,480,818

**METHOD FOR FORMING A FILM AND METHOD FOR MANUFACTURING A THIN FILM TRANSISTOR**

Tomotaka Matsumoto; Jun Inoue; Teruhiko Ichimura; Yuji Murata; Junichi Watanabe; Yoshio Nagahiro; Mari Hodate; Kenichi Oki, and Masahiro Okabe, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

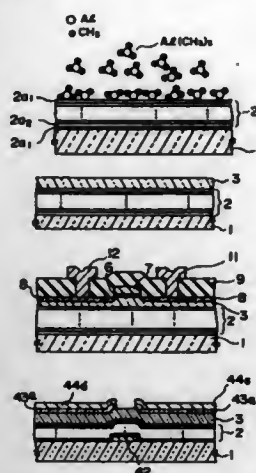
Filed Feb. 9, 1993, Ser. No. 15,512

Claims priority, application Japan, Feb. 10, 1992, 4-023986

Int. Cl.<sup>6</sup> H01L 21/86

U.S. Cl. 437—40

24 Claims



1. A method for forming a film comprising the steps of:
  - a) depositing a film formed of a binary system material on a base substance by an atomic layer deposition method in which the base substance on which the film is formed is exposed separately to two or more ambiances, one of which contains a first atom of the binary system material and the other of which contains a second atom of the binary system material; and
  - b) growing poly-crystalline silicon on the film formed of the binary system material, the binary system material film is  $\text{Al}_2\text{O}_3$ , and crystal orientation of the top face of the film orients to a face (012), and crystal orientation of the top face of the poly-crystalline silicon orients to a face (100).

5,480,819

**METHOD OF MANUFACTURE OF HIGH COUPLING RATIO FLASH MEMORY CELL**

Heng-Sheng Huang, Taipei, Taiwan, Prov. of China, assignor to United Microelectronics Corporation, Hsinchu, Taiwan, Prov. of China

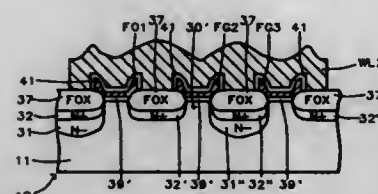
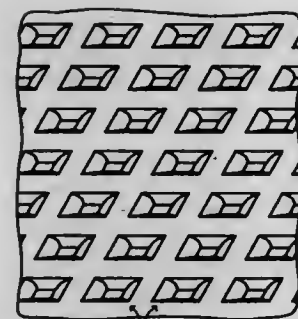
Filed Jul. 15, 1994, Ser. No. 275,271

Int. Cl.<sup>6</sup> H01L 21/8747

U.S. Cl. 437—43

4 Claims

4. A process of fabricating an array of floating gate memory devices on a substrate comprising:
  - forming elongated spaced apart parallel ion implanted field implant regions in said substrate by implanting boron from dopant ion sources composed of  $\text{BCl}_2$ ,  $\text{B}^{11}$ , or  $\text{BF}_2$ ;
  - forming elongated spaced apart parallel  $\text{N}^+$  buried bit lines doped with a dopant selected from the group consisting of arsenic and phosphorus, said buried bit lines being formed in said substrate orthogonally directed relative to said field implant regions, with at least one of said buried bit lines being double doped with  $\text{N}^+$  regions formed over  $\text{N}^-$  regions;
  - forming square pocket regions for an array of unit cells by surrounding said pocket regions with field oxide regions so that said field oxide regions completely surround said pocket regions on all sides, and
  - growing a silicon dioxide layer over said substrate between said field oxide regions;
  - forming a plurality of first floating gate members from a first layer of polysilicon, said first gate members being disposed over said silicon dioxide layer and said pocket regions;



- forming an ONO dielectric layer over said first gate members having a thickness of approximately 150 Å;
- forming elongated second gate, word line members from a second layer of polysilicon over said ONO layer interpoly-silicon dielectric and over said first gate members, and said second gate, word line members extending perpendicular to said buried bit lines and across said first floating gate members over said pocket regions.

5,480,820

**METHOD OF MAKING A VERTICALLY FORMED NEURON TRANSISTOR HAVING A FLOATING GATE AND A CONTROL GATE AND A METHOD OF FORMATION**

Scott S. Roth; William C. McFadden, and Alexander J. Pepe, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

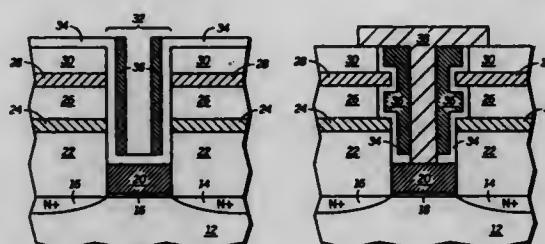
Continuation of Ser. No. 38,305, Mar. 29, 1993, abandoned.

This application Apr. 17, 1995, Ser. No. 425,267

Int. Cl.<sup>6</sup> H01L 21/8247

U.S. Cl. 437—43

25 Claims



1. A method for forming a transistor device comprising the sequential steps of:
  - providing a substrate;
  - forming  $\text{N}^+$  control gates overlying the substrate wherein  $\text{N}$  is a positive integer greater than one, the  $\text{N}$  control gates each being used to control the transistor device;
  - forming a dielectric layer adjacent the  $\text{N}$  control gates; and
  - forming a floating gate portion overlying the substrate and laterally adjacent each of the  $\text{N}$  control gates, the floating gate portion being capacitively coupled to each of the  $\text{N}$  control gates through the dielectric layer to selectively allow charge within the floating gate to be manipulated via voltages placed onto the  $\text{N}$  control gates, the floating gate portion being formed after the  $\text{N}$  control gates are formed.

5,480,821

**METHOD OF FABRICATING SOURCE-COUPLED, SPLIT-GATE, VIRTUAL GROUND FLASH EEPROM ARRAY**

Ming-Bing Chang, Santa Clara, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

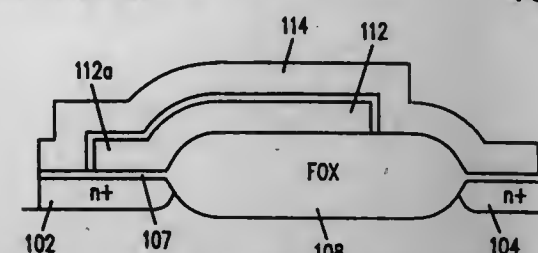
Division of Ser. No. 941,745, Sep. 8, 1992, Pat. No. 5,412,238.

This application May 2, 1995, Ser. No. 434,036

Int. Cl.<sup>6</sup> H01L 21/8247

U.S. Cl. 437—43

4 Claims



1. A method of fabricating a source-coupled, split-gate, virtual ground (SSVG) flash EEPROM array in a silicon substrate of P-type conductivity, the method comprising:
  - forming a plurality of spaced-apart, parallel  $\text{n}^+$  bit lines in the silicon substrate to define alternating source and drain lines;
  - forming a plurality of spaced-apart field oxide islands between adjacent source and drain lines to define substrate channel regions therebetween;
  - for each channel region, forming a poly1 floating gate over a first portion of said channel region and separated therefrom by a layer of floating gate oxide, said floating gate including a tunnelling portion that extends over the source line associated with said channel region and is separated therefrom by tunnel oxide; and
  - for each floating gate, forming a poly2 word line over said floating gate and separated therefrom by a layer of oxide/nitride/oxide (ONO), said word line running perpendicular to the buried  $\text{n}^+$  bit lines and extending over a second portion of said channel region and separated from said second portion of said channel region by said layer of ONO.

5,480,822

**METHOD OF MANUFACTURE OF SEMICONDUCTOR MEMORY DEVICE WITH MULTIPLE, ORTHOGONALLY DISPOSED CONDUCTORS**

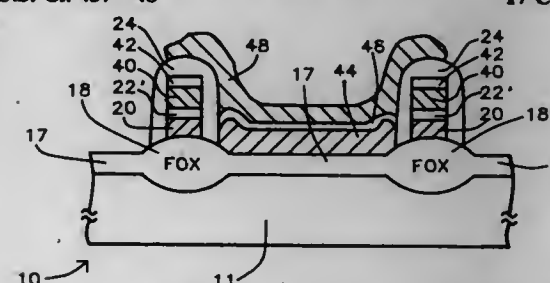
Chen-Chiu Hsue, and Ming-Tzong Yang, both of Hsin Chu, Taiwan, Prov. of China, assignors to United Microelectronics Corporation, Hsinchu, Taiwan, Prov. of China

Filed Nov. 28, 1994, Ser. No. 345,127

Int. Cl.<sup>6</sup> H01L 21/265

U.S. Cl. 437—48

17 Claims



1. A method of manufacture of a semiconductor memory device on a semiconductor substrate in which an active region has been formed comprising the following steps:
  - a) forming field oxide structures on portions of a semiconductor substrate, said field oxide structures being juxtaposed with said active region and said field oxide structures leaving exposed surfaces elsewhere on said substrate;
  - b) forming a gate oxide layer on said exposed surfaces of said substrate;

- c) forming a first word line layer on said device;
- d) patterning said first word line layer by forming a first patterned mask with a first set of openings therein and etching said first word line layer through said openings in said first mask to form conductor lines extending in the y direction;
- e) forming a first dielectric layer on a surface of said conductor lines on said device;
- f) forming a second word line layer on said first dielectric layer;
- g) patterning said second word line layer by forming a second patterned mask with a second set of openings therein and etching portions of said second word line layer through said second set of openings in said second patterned mask to form conductor lines extending in the x direction orthogonal to said y direction;
- h) forming a second dielectric layer on a surface of said second word line layer on said device, performing S/D ion implantation into said substrate forming doped regions in said substrate, and
- i) implanting ions of dopant into locations into said semiconductor substrate of said device, said dopant being of sufficient concentration to form a ROM coded region therein.

5,480,823

**METHOD OF MAKING HIGH DENSITY ROM, WITHOUT USING A CODE IMPLANT**

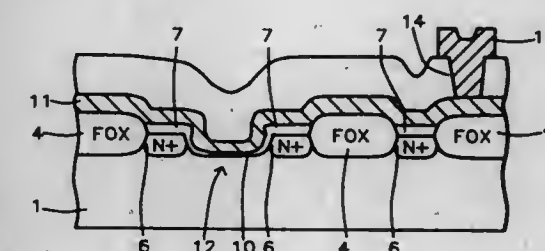
Chen-Chung Hsu, Taichung, Taiwan, Prov. of China, assignor to United Microelectronics Corporation, Hsinchu, Taiwan, Prov. of China

Filed Jan. 19, 1995, Ser. No. 374,966

Int. Cl.<sup>6</sup> H01L 21/8246

U.S. Cl. 437—48

20 Claims



1. A method of fabricating a read only memory, (ROM), cell on a semiconductor substrate comprising the steps of:
  - forming a field oxide pattern on specific regions of said substrate, while leaving exposed silicon on remaining regions of said substrate;
  - ion implanting first conductivity imparting dopants into said exposed silicon regions;
  - growing an oxide on said exposed, ion implanted silicon regions;
  - photolithography to expose a specific field oxide region;
  - removal of oxide from said specific field oxide region, to leave bare silicon;
  - growing a gate oxide on said bare silicon;
  - depositing a polysilicon layer on said gate oxide, on said field oxide regions, and on said oxide, grown on said exposed, ion implanted silicon;
  - ion implanting a first conductivity imparting dopant into said polysilicon layer; and
  - patterning to form polysilicon gate structures on said gate oxide, on said field oxide, and on said oxide, grown from said exposed, ion implanted silicon.



5,480,824

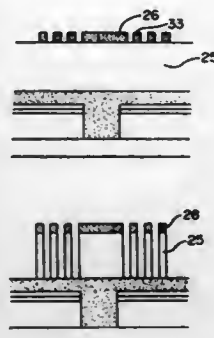
## SEMICONDUCTOR MEMORY CELL CAPACITOR AND FABRICATION METHOD THEREOF

Young-Kwon Jun, Seoul, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Cheongju, Rep. of Korea  
Filed Jun. 18, 1993, Ser. No. 79,186

Claims priority, application Rep. of Korea, Jun. 18, 1992, 92-10546

Int. Cl.<sup>6</sup> H01L 21/70

U.S. Cl. 437—52



1. A method for fabricating a capacitor of a semiconductor memory cell, comprising the steps of:

- (1) forming a first insulating layer on a substrate, forming a second insulating layer on the first insulating layer, forming a third insulating layer on the second insulating layer, and forming a capacitor contact hole to the substrate through the first, second and third insulating layers;
- (2) forming a first conductive layer on the third insulating layer and in the capacitor contact hole, and forming a fourth insulating layer on the first conductive layer;
- (3) forming a second conductive layer on the fourth insulating layer, and patterning the second conductive layer to form a projected portion of the second conductive layer on the fourth insulating layer;
- (4) forming a plurality of stacked layers, the plurality of stacked layers con, rising third conductive layers and interlayers alternately formed in a multi-layer form on the fourth insulating layer and over the projected portion of the second conductive layer, wherein the interlayers comprise a material have a higher etch rate than the material of the third conductive layers;
- (5) etching the third conductive layers and the interlayers so that portions of the third conductive layers remain in the form of multi-layer rims on the fourth insulating layer;
- (6) etching the fourth insulating layer using the multi-layer rims as a mask, wherein a multi-layer cylinder is formed, the multi-layer cylinder comprising projections of the fourth insulating layer under the multi-layer rims;
- (7) forming a fourth conductive layer on the first conductive layer, on the multi-layer rims of the second conductive layer, and between the projections of the fourth insulating layer;
- (8) etching the fourth conductive layer, third conductive layer, and first conductive layer, wherein projections of the fourth conductive layer are formed between the projections of the fourth insulating layer;
- (9) etching the fourth insulating layer and the third insulating layer by a wet etching process to form a first storage electrode; and
- (10) forming a dielectric layer on the first storage electrode and a capacitor plate electrode on the dielectric layer.

5,480,825

## AG-F A HUMAN T CELL LINE WITH UNIQUE PHENOTYPE AND CYTOKINE SECRETIONS

Yair Gazitt, 14507 Beack Bear Dr., Little Rock, Ark. 72212  
Filed Sep. 2, 1993, Ser. No. 116,885

Int. Cl.<sup>6</sup> C12N 5/08

U.S. Cl. 435—240.25

1 Claim

1. The substantially pure human T cell line designated AGF, deposited with ATCC accession number CRL 11391.

8 Claims

5,480,826

## METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE HAVING A CAPACITOR

Kazuyuki Sugahara, and Hideaki Arima, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

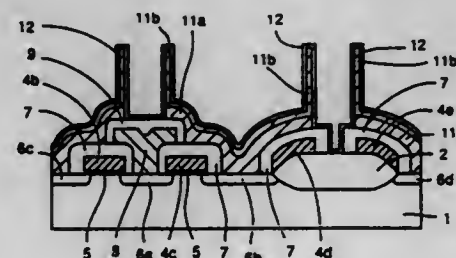
Continuation of Ser. No. 207,519, Mar. 8, 1994, abandoned, which is a division of Ser. No. 8,020, Jan. 22, 1993, Pat. No. 5,315,140. This application Feb. 3, 1995, Ser. No. 383,539

Claims priority, application Japan, Apr. 24, 1992, 4-106759

Int. Cl.<sup>6</sup> H01L 21/70; 27/00

U.S. Cl. 437—52

6 Claims



1. A method of manufacturing a semiconductor device, comprising the steps of:

- forming a first insulating layer located on a major surface of a semiconductor substrate and having an opening which reaches said major surface of said semiconductor substrate;
- forming a first conductive layer located in said opening and being in contact with a surface of said first insulating layer;
- forming a second insulating layer above said first conductive layer;
- forming an amorphous silicon layer having a thickness of not more than 0.1  $\mu\text{m}$  and covering at least said second insulating layer to form a lower electrode of a cylindrical capacitor;
- removing said amorphous silicon layer at least from an upper surface of said second insulating layer and thereby exposing said upper surface of said second insulating layer;
- removing said exposed second insulating layer by etching;
- forming a capacitor insulating layer covering said amorphous silicon layer;
- polycrystallizing said amorphous silicon layer to form a polysilicon layer; and
- forming a second conductive layer covering said capacitor insulating layer.

5,480,827

## USE OF POROUS POLYCRYSTALLINE ARAGONITE AS A SUPPORT MATERIAL FOR IN VITRO CULTURE OF CELLS

Genevieve Guillemin; Pascal Christel; Jean-Louis Patat, all of Paris, and Alain Meunier, Coulommiers, all of, France, assignors to Inotek, Saint Gonnery, France

PCT No. PCT/FR92/00707, § 371 Date May 3, 1993, § 102(e) Date May 3, 1993, PCT Pub. No. WO93/02181, PCT Pub. Date Feb. 4, 1993

PCT Filed Jul. 20, 1992, Ser. No. 30,134

Claims priority, application France, Jul. 19, 1991, 91 09205  
Int. Cl.<sup>6</sup> C12N 5/00

U.S. Cl. 435—240.23

8 Claims

1. A method for culturing mammalian cells in vitro comprising:
  - a) immersing a three-dimensional solid support in a liquid cell culture media;
  - b) inoculating mammalian cells in said medium; and
  - c) culturing said cells for a time and under conditions to allow growth of said cells on said three-dimensional solid support thereby obtaining a product;
 wherein said three-dimensional solid support consists of porous polycrystalline aragonite.

5,480,828

## DIFFERENTIAL GATE OXIDE PROCESS BY DEPRESSING OR ENHANCING OXIDATION RATE FOR MIXED 3V CMOS PROCESS

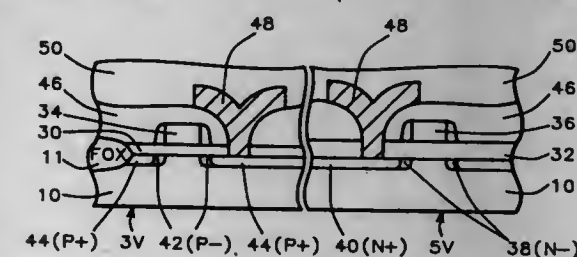
Shun-Liang Hsu, Hsin-Chu; Jyh-Min Tsaur, Miao-Lini; Mou S. Lin, and Jyh-Kang Ting, both of Hsin-Chu, all of, Taiwan, Prov. of China, assignors to Taiwan Semiconductor Manufacturing Corp. Ltd., Hsin-Chu, Taiwan, Prov. of China

Filed Sep. 30, 1994, Ser. No. 316,084

Int. Cl.<sup>6</sup> H01L 21/8234

U.S. Cl. 437—56

16 Claims









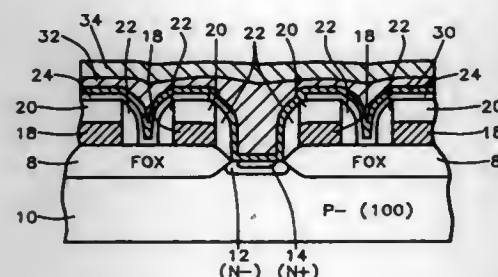
5,480,837

# PROCESS OF MAKING AN INTEGRATED CIRCUIT HAVING A PLANAR CONDUCTIVE LAYER

Ing-Ruey Liaw, Hsinchu, and Shun-Ho Lin, Ping Tung, both of Taiwan, Prov. of China, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan, Prov. of China  
Filed Jun. 27, 1994, Ser. No. 266,499  
Int. Cl.<sup>6</sup> H01L 21/44; 21/48

U.S. Cl. 437—193

14 Claims



8. A method for fabricating an integrated circuit having a planar conductive layer, comprising the steps of:

- selectively forming relatively thick field oxide areas on the surface of a semiconductor substrate while leaving exposed device areas for fabricating field effect devices;
- forming a gate oxide on said device areas of said substrate;
- depositing a first polysilicon layer and then a first insulating layer on said device areas and on said field oxide areas;
- patterning said first insulating layer and first polysilicon layer forming gate electrode structures on said device areas and forming portions on said field oxide areas, and thereby forming interconnecting electrically conducting word lines;
- forming by implanting source/drain structures in said device areas and adjacent to said gate electrode structures and thereby forming field effect devices;
- forming insulating sidewall spacers on said gate electrodes; and
- forming by implanting source/drain contacts to said source/drain structures;
- depositing a second insulating layer over said first insulating layer and said insulating sidewall spacers on said gate electrodes and elsewhere on said substrate;
- forming opening in said second insulating layer over said source/drain areas thereby forming electrical contact openings;
- depositing a second polysilicon layer over and in said contacts and elsewhere over said substrate and doping with impurities said second polysilicon layer, and thereby forming ohmic contacts to said source/drain areas;
- depositing a conformal third polysilicon layer being sufficiently thick to thereby fill the spaces between said patterned first polysilicon layer;
- etching back said third polysilicon layer to said second polysilicon layer leaving portions of said third polysilicon layer in some spaces between said patterned first polysilicon layer, and thereby forming an essentially planar surface locally over and between said gate electrodes and over and between said patterned conducting layers elsewhere on said field oxide areas;
- depositing a silicide layer over said second polysilicon layer and over portions of said third polysilicon layer forming a planar conductive layer, and thereby providing a surface for an optical exposure and development of a distortion free photoresist image; and
- patterning by masking and etching said silicide layer, and said second and third polysilicon layers to said second insulating layer forming and completing said patterned planar conductive layer electrically contacting said field effect devices source/drain areas, and thereby forming electrically conducting bit lines for said integrated circuits.

5,480,838

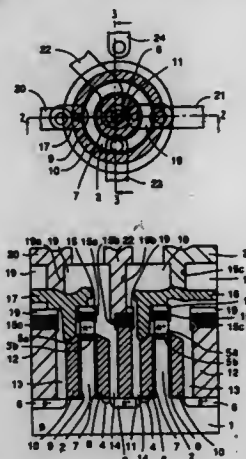
# METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE HAVING VERTICAL TRANSISTOR WITH TUBULAR DOUBLE-GATE

Katsuyoshi Mitsui, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan  
Division of Ser. No. 69,036, May 28, 1993, Pat. No. 5,382,816.  
This application Nov. 4, 1994, Ser. No. 334,083

Claims priority, application Japan, Jul. 3, 1992, 4-176791  
Int. Cl.<sup>6</sup> H01L 21/265; 21/44; 21/48

U.S. Cl. 437—203

4 Claims



1. A method of manufacturing a semiconductor device, comprising the steps of:
- forming a standing wall portion having inner and outer surfaces and extending in a tubular manner on a main surface of a semiconductor substrate of first type conductivity;
- forming a first tubular gate electrode on the inner surface of said standing wall portion with a first gate insulating film therebetween;
- forming a second tubular gate electrode on the outer surface of said standing wall portion with a second gate insulating film therebetween;
- forming a first source/drain region by implanting a first impurity of second type conductivity to the top end of said standing wall portion; and
- forming a second source/drain region by implanting a second impurity of the second type conductivity to the bottom surface of said semiconductor substrate surrounded by the inner surface of said standing wall portion.

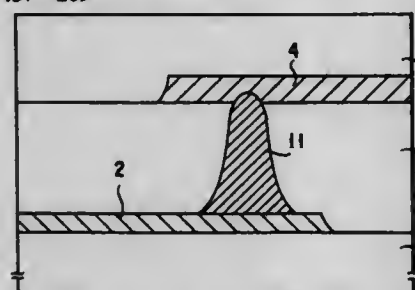
5,480,839

# SEMICONDUCTOR DEVICE MANUFACTURING METHOD

Hirokazu Ezawa, Tokyo, and Masahiro Miyata, Urayasu, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan  
Filed Jan. 11, 1994, Ser. No. 179,714  
Claims priority, application Japan, Jan. 15, 1993, 5-021738  
Int. Cl.<sup>6</sup> H01L 21/60

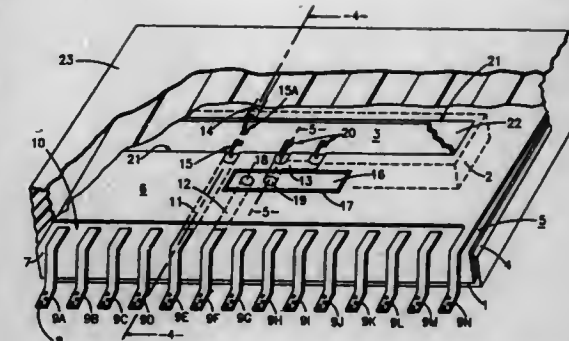
U.S. Cl. 437—209

7 Claims



1. A semiconductor device manufacturing method comprising the steps of:

forming a lower-layer interconnection on a circuit board on which a plurality of semiconductor chips are mounted; forming a metal pillar on said circuit board so that the pillar may contact with at least said lower-layer interconnection, the metal pillar forming step including the step of effecting screen printing of a metal paste using a screen plate with openings corresponding to desired positions on the lower-layer interconnection and the step of drying and calcining said printed metal paste by heat treatment to form the metal pillar; forming an insulating film covering said lower-layer interconnection and said metal pillar so that the tip of said metal pillar may be exposed; and forming an upper-layer interconnection on said insulating film so that this layer may contact with the exposed tip of said metal pillar.



positioning a portion of said wiring layer of said multi layer wiring member adjacent the chip connection pads on a surface of said chip, joining with a conductive bond member at least one conductor of said wiring layer to at least one chip connection pad, and encapsulating said bonds, said chip surface and said multi layer wiring member.

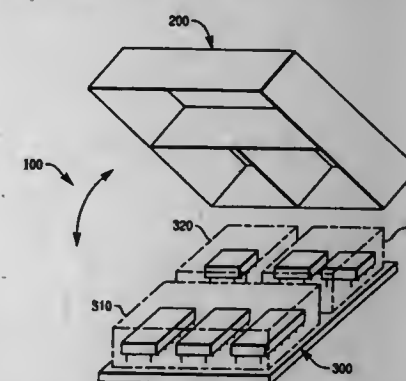
5,480,840

# MULTI-CHIP MODULE WITH MULTIPLE COMPARTMENTS

Lawrence C. Barnes, and Gary R. Thornberg, both of Colorado Springs, Colo., assignors to AT&T Global Information Solutions Company, Dayton, Ohio; Hyundai Electronics America, Milpitas, Calif., and Symbios Logic Inc., Fort Collins, Colo.  
Division of Ser. No. 913,100, Jul. 14, 1992, Pat. No. 5,369,552.  
This application Aug. 18, 1994, Ser. No. 292,448  
Int. Cl.<sup>6</sup> H01L 21/60

U.S. Cl. 437—209

3 Claims



1. A method of making a multi-chip module, including the step of arranging the components within the module in such a manner that circuit components requiring specific thermal environments are located in discrete areas dedicated to accommodate the components.

5,480,841

# PROCESS OF MULTILAYER CONDUCTOR CHIP PACKAGING

Harry R. Bickford, Ossining; Paul W. Coteus, Yorktown Heights, and Linda C. Matthew, Peekskill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.  
Division of Ser. No. 26,427, Mar. 4, 1993, Pat. No. 5,399,902.  
This application Sep. 7, 1994, Ser. No. 302,084  
Int. Cl.<sup>6</sup> H01L 21/60

U.S. Cl. 437—209

13 Claims

1. The process of manufacturing a semiconductor chip package comprising in combination the steps of:
- providing a multi layer wiring member having at least one combination of a wiring layer and a broad metal layer separated by a layer of dielectric,
- isolating at least one portion of said broad metal layer from the remaining portions of said broad metal layer,

1. A method for fabricating a plurality of smart card semiconductor die from a full thickness semiconductor wafer including the following steps:

- (a) mapping the semiconductor wafer to identify, specific semiconductor die, thus permitting the locations of bad or defective die to be specified for future reference;
- (b) taping a first surface of the semiconductor wafer with protective tape;
- (c) grinding the semiconductor wafer to a thickness of approximately 155 um;
- (d) allowing the protective tape to remain on the wafers for a period of time not to exceed 24 hours;
- (e) during the period of time specified in step (d), chemically etching the semiconductor wafer to strengthen the wafer by removing crystal defects and by repairing crystal lattice damage; the etching process including the step of immersing the wafer in an acid bath of approximately 7:2:1 Nitric Acid: Hydrofluoric Acid: Acetic Acid for approximately one minute at ambient room temperature;
- (f) rinsing the wafer in a deionized water bath for a period of about 10 minutes to remove residual acid;
- (g) blowing the wafer dry with a Nitrogen gun;



- (h) positioning the wafer on a flat, porous ceramic wafer chuck; the chuck equipped to apply a substantially uniform vacuum across the wafer surface to prevent wafer flexure during step (j);
- (i) detaping the protective tape from the wafer;
- (k) taping the wafer with dicing tape;
- (l) dicing the wafer using a dicing saw;
- (m) exposing the wafers to UV light to cure the UV dicing tape on the wafers and to reduce the adhesion of the tape to the die; and
- (n) ejecting the die from the UV dicing tape using non-piercing ejector pins and soft rubber or plastic die pickup heads, thereby reducing or eliminating die damage.

SiO<sub>2</sub> . . . 40-65 wt. %  
 MgO . . . 3-16 wt. %  
 MgF<sub>2</sub> . . . 6.5-17 wt. %  
 K<sub>2</sub>O . . . 7.5-18 wt. %  
 ZrO<sub>2</sub> . . . 0.01-15 wt. %  
 CaO . . . 0.1-20 wt. %  
 P<sub>2</sub>O<sub>5</sub> . . . 0.1-20 wt. %  
 BaO and/or SrO . . . 0.1-13 wt. %

and has crystalline phases composed primarily of tetrasilicon fluorimica and formed in a glass matrix phase.

5,480,845

## FLUORINATED GLASSES

Gwendael Maze, Saint Erblon; Marcel Poulain, Rennes; Jean-Yves Carre, Saint Erblon, all of France; Abdelouhed Soufi-ane, Casablanca, and Younes Messaddeq, Kenitra, both of Morocco, assignors to Le Verre Fluore SA, France

PCT No. PCT/FR93/00283, § 371 Date Jan. 24, 1994, § 102(e) Date Jan. 24, 1994, PCT Pub. No. WO93/19014, PCT Pub. Date Sep. 30, 1993

Continuation of Ser. No. 146,153, Jan. 24, 1994, abandoned.

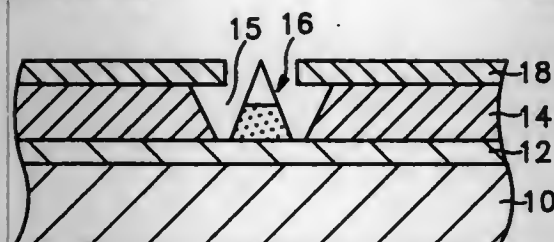
This PCT application Mar. 19, 1993, Ser. No. 425,214

Claims priority, application France, Mar. 20, 1992, 92 03568

Int. Cl.<sup>6</sup> C03C 3/32; 13/04

U.S. Cl. 501-40

7 Claims



1. A method for making a field emission cathode comprising the steps of:

depositing a cathode electrode on a substrate;

depositing an insulating layer on top of the deposited cathode electrode;

depositing a gate electrode on top of the deposited insulating layer;

forming a cavity through the deposited gate electrode and insulating layer;

depositing a parting layer on the gated electrode layer and the opening perimeter for narrowing the opening;

Then forming a truncated buffer layer on the cathode electrode by deposition of a material from a source outside the cavity while the cavity opening is being simultaneously narrowed, thereby giving a conical shape to the buffer layer;

forming a field emission cathode tip on the truncated buffer layer by deposition of metal from a source outside the cavity while the cavity opening is being simultaneously narrowed to complete closure, thereby giving a conical shape to the cathode tip; and

then removing the parting layer and all layers deposited on it.

5,480,844

## CRYSTALLIZED-GLASS-MADE ARTIFICIAL NUCLEUS FOR PEARL, PRODUCTION PROCESS OF THE ARTIFICIAL NUCLEUS, AND PEARL PRODUCED USING THE ARTIFICIAL NUCLEUS

Akira Matsui, Kyoto; Yoshinori Morita, Shiga; Hiroyuki Inoue, Shizuoka, and Yoshiaki Inoue, Mie, all of Japan, assignors to J. Morita Mfg. Corp., Kyoto, Japan

Filed Jan. 5, 1995, Ser. No. 368,802

Claims priority, application Japan, Jan. 5, 1994, 6-011281

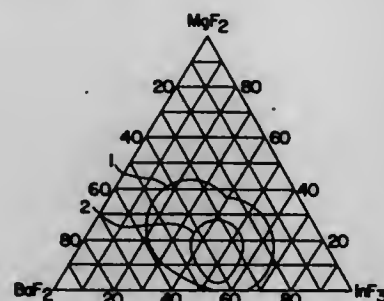
Int. Cl.<sup>6</sup> C03C 10/16

U.S. Cl. 501-3

7 Claims

1. In an artificial nucleus for a pearl, said nucleus being made of a crystallized glass, the improvement wherein the crystallized glass has been produced using a batch of the following composition:

1. A fluorinated glass composition comprising indium fluoride, zinc fluoride and MF<sub>2</sub> fluorides, wherein the sum of indium fluoride, zinc fluoride, and MF<sub>2</sub> is at least 70 mole % of the composition, and M is at least one element selected from a group consisting of Ba, Sr, Ca, Pb, the amount of lead fluoride being limited to 1-10 mole %, and at least one stabilizing element from a group consisting of 2-12 mole % of gadolinium fluoride, 2-10 mole % of magnesium fluoride, or a mixture of these two fluorides in a proportion not exceeding 20 mole %.



5,480,846

## BOROSILICATE GLASS

Glenn Sundberg, Townsend, and Russell Yeckley, Oakham, both of Mass., assignors to Saint-Gobain/Norton Industrial Ceramics Corp., Worcester, Mass.

Division of Ser. No. 371,238, Jan. 11, 1995. This application Apr. 21, 1995, Ser. No. 426,937

Int. Cl.<sup>6</sup> C03C 3/089

U.S. Cl. 501-65

5 Claims

1. A borosilicate glass for use in glass hiping consisting essentially of:

- boron oxide,
- silica,
- between about 2 w/o and about 6 w/o K<sub>2</sub>O,
- less than about 1 w/o Na<sub>2</sub>O, and
- between about 3.6 w/o and about 5.4 w/o magnesia.

5,480,847

## BRAKE ASSEMBLY

Lindsay E. Derriman, Kallaroo, and Stephen M. A. Cortese, Shelley, both of Australia, assignors to Ceram-Eng Pty Ltd., Kallaroo, Australia

PCT No. PCT/AU89/00185, § 371 Date Nov. 2, 1990, § 102(e) Date Nov. 2, 1990, PCT Pub. No. WO89/11052, PCT Pub. Date Nov. 16, 1989

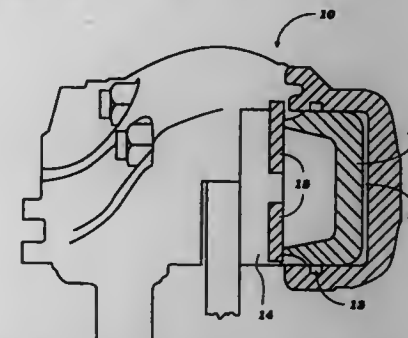
PCT Filed May 1, 1989, Ser. No. 603,779

Claims priority, application Australia, May 3, 1988, PI 8033

Int. Cl.<sup>6</sup> B60T 15/00; F16J 1/00

U.S. Cl. 501-128

8 Claims



1. A hydraulic brake piston slidable in a bore and actuated by a pressurized hydraulic fluid in said bore, the improvement comprising said piston being formed of a clay based ceramic material formed to be permeable to water and/or water vapor but not to the hydraulic fluid.

5,480,848

## CATALYST COMPOSITION AND THE USE IN OLEFIN POLYMERIZATION

Rolf L. Geerts, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 80,899, Jun. 22, 1993, Pat. No. 5,354,721.

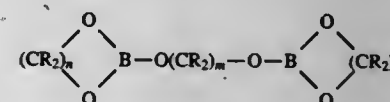
This application May 2, 1994, Ser. No. 236,810

Int. Cl.<sup>6</sup> C08F 4/42

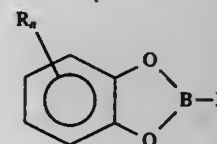
U.S. Cl. 502-103

26 Claims

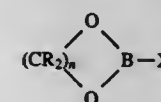
1. An olefin polymerization catalyst system comprising at least one transition metal-containing olefin polymerization catalyst and the solid alkylaluminumoxy product produced by contacting a solution of an organoaluminumoxy with a suitable amount of an acidic hydrogen free organic borane compound selected from those having the formulas



and

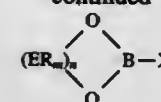


and



and

-continued



and R<sub>2</sub>BOBR<sub>2</sub>, wherein each R is individually selected from hydrogen and hydrocarbyl radicals, preferably aryl or alkyl radicals having 1 to 20 carbon atoms; n, m, and r are integers preferably in the range of 1 to 10; each E is individually selected from C, Si, Ge, Sn, B, Ga, In, P, As with the proviso that at least one E is not C, and Sb; and X is selected from hydrogen, hydrocarbyl radicals having 1 to 20 carbon atoms, halides, hydrocarbyloxy radicals having 1 to 20 carbon atoms, and —NR<sub>2</sub> radicals.

5,480,849

## METHOD FOR THE PREPARATION OF A POLYMERIZING CATALYST COMPONENT, A POLYMERIZING CATALYST COMPONENT PREPARED BY THE METHOD AND ITS USE

Bill Gustafsson; Arja Kostialinen, and Pekka Sormunen, all of Porvoo, Finland, assignors to Borealis Holding A/S, Lyngby, Denmark

PCT No. PCT/FI91/00391, § 371 Date Aug. 16, 1993, § 102(e) Date Aug. 16, 1993, PCT Pub. No. WO92/11296, PCT Pub. Date Jul. 9, 1992

PCT Filed Dec. 17, 1991, Ser. No. 75,596

Claims priority, application Finland, Dec. 19, 1990, 906281

Int. Cl.<sup>6</sup> B01J 31/12; C08F 4/42; 2/00

U.S. Cl. 502-115

11 Claims

1. A process for the preparation of a solid procatalyst composition of a catalyst system for the polymerization of olefins wherein a carrier is impregnated with a solution or a suspension of a magnesium halide in an alkyl ester of a monocarboxylic acid, and the impregnated carrier is reacted with an organometallic compound selected from the members of Groups IA-III A and contacted with a catalytically active transition metal compound, wherein a hydroxy-containing carrier is used which prior to the impregnation step is kept at a temperature of at most about 200° C. so that the hydroxyl groups are essentially retained in the carrier until the impregnation step.

5,480,850

## ETHYLENE/PROPYLENE COPOLYMER RUBBERS

Kevin J. Cann, Rocky Hill; James W. Nicoletti, Piscataway, and Sergey A. Vasnetsov, Somerville, all of N.J., assignors to Union Carbide Chemical & Plastics Technology Corporation, Danbury, Conn.

Filed Jun. 28, 1993, Ser. No. 83,988

Int. Cl.<sup>6</sup> C08F 4/68

U.S. Cl. 502-127

3 Claims

1. A catalyst system comprising:

- a catalyst precursor consisting essentially of the reaction product of vanadium (acetylacetonate)<sub>3</sub> and an alkylaluminum halide having the formula AlR<sub>(3-n)</sub>X<sub>n</sub> wherein each R is independently alkyl having 1 to 14 carbon atoms; each X is independently chlorine, bromine, or iodine; and a is 1 or 2; the atomic ratio of aluminum to vanadium in the precursor is 1:1 to 3:1; and the oxidation state of the vanadium in the reaction product is plus 2; and
- optionally, a support for said precursor;
- a halide substituted hydrocarbyl aluminum cocatalyst; and
- a promoter, which is a chlorinated ester having at least 2 chlorine atoms; a saturated or unsaturated aliphatic halocarbon having at least 3 carbon atoms and at least 6 halogen atoms; or a haloalkyl substituted aromatic hydrocarbon wherein the haloalkyl substituent has at least 3 halogen atoms.



5,480,851

## PROCESS OF PREPARING CATALYST SUPPORTING HIGHLY DISPERSED METAL PARTICLES

Kazunori Tsurumi, Kanagawa, Japan, and Paul Stonehart, Madison, Conn., assignors to Tanaka Kikinzoku Kogyo K. K., Japan, and Stonehart Associates Inc., Madison, Conn.  
Filed Jul. 6, 1993, Ser. No. 88,073

Claims priority, application Japan, Jul. 6, 1992, 4-202002  
Int. Cl.<sup>6</sup> B01J 29/04; 31/00

U.S. Cl. 502—185

6 Claims

1. A process for preparing a catalyst comprising a stable support material having highly dispersed catalytic metal particles thereon, said process comprising the steps of:

- adding propargyl alcohol to a solution containing ions of said catalytic metal and said support material, whereby the substance resulting from such addition is deposited on said support material; and
- thermally treating the support material containing said substance in a hydrogen-containing reduction gas, at a temperature sufficient to effect reduction of said substance, to thereby provide said metal particles on the support material.

5,480,852

## PHILLIPS CATALYST AND ITS USE FOR THE PREPARATION OF ETHYLENE/ALPHA-OLEFIN COPOLYMERS

Hans-Joachim Mueller, Gruenstadt; Kaspar Evertz, Schifferstadt; Siegfried Weber, Weinheim; Guido Funk, Worms; Rainer Konrad, Goennheim, and Roland Salve, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany  
Continuation of Ser. No. 16,529, Feb. 11, 1993, abandoned.  
This application May 23, 1994, Ser. No. 247,479

Claims priority, application Germany, Feb. 13, 1992, 42 04 260.7

Int. Cl.<sup>6</sup> B01J 27/182

U.S. Cl. 502—210

2 Claims

1. A Phillips catalyst for the copolymerization of ethylene with  $\alpha$ -olefins, consisting essentially of, as a catalytically active component, a finely divided, aluminum silicate-supported phosphorus-containing chromium catalyst which is prepared by

- applying at least one organic phosphorus compound selected from the group consisting of phosphates, phosphonates and phosphites and at least one chromium (III) compound which does not react with said phosphorus compounds under the reaction conditions used, in succession in any order or simultaneously, to a finely divided aluminum silicate hydrogel or xerogel to form a catalyst intermediate and
- activating the catalyst intermediate by heating the intermediate in an oxidizing atmosphere, with the result that the chromium catalyst is formed.

5,480,853

## PHOSPHORUS/VANADIUM CATALYST PREPARATION

Arie Bortinger, Ridgewood, N.J., assignor to Scientific Design Company, Inc., Little Ferry, N.J.  
Filed Jul. 15, 1994, Ser. No. 276,040

Int. Cl.<sup>6</sup> B01J 27/06

U.S. Cl. 502—224

12 Claims

1. A process for the conversion of a chloride containing vanadium/phosphorus mixed oxide catalyst precursor to a vanadium/phosphorus mixed oxide catalyst containing not more than 0.2 wt % chloride which is useful for the oxidation of non-aromatic hydrocarbons to maleic anhydride which comprises drying the precursor at a temperature up to 180° C., calcining the dried precursor at a temperature of 200°–300° C., and activating the calcined precursor by contact with a gas comprised of molecular oxygen and an organic reducing agent at a temperature in the range 350°–550° C.

5,480,854

## CATALYST

Raj R. Rajaram, Slough; John W. Hayes, Reading; Graham P. Ansell, Twyford, and Helen A. Hatcher, Reading, all of, United Kingdom, assignors to Johnson Matthey Public Limited Company, United Kingdom  
Filed Dec. 10, 1993, Ser. No. 164,405

Claims priority, application United Kingdom, Dec. 18, 1992, 9226434

Int. Cl.<sup>6</sup> B01J 23/10; 23/40

U.S. Cl. 502—304

10 Claims

1. A catalyst composed of metal oxide particles among which are uniformly incorporated noble metal particles, the catalyst having such a high interaction between the noble metal particles and the metal oxide particles that, without hydrogen reduction pretreatment, it exhibits the formation of anionic vacancies on the metal oxide surface at a temperature lower than that of the corresponding catalyst, without hydrogen reduction pre-treatment, containing the same amount of the metal oxide particles and noble metal particles and prepared by impregnating the metal oxide particles with noble metal precursor and calcining to convert the precursor to the noble metal particles, wherein the metal oxide comprises CeO<sub>2</sub> and wherein the noble metal is one or more Pt, Pd, Rh and Au.

2. A process for preparing a catalyst composed of metal oxide particles comprising CeO<sub>2</sub> among which are uniformly incorporated noble metal particles, the noble metal being one or more of Pt, Pd, Rh and Au, which process comprises co-precipitating the noble metal particles and the metal oxide particles comprising CeO<sub>2</sub>.

5,480,855

## THERMOGRAPHIC RECORDING FILM INCLUDING IMPROVED WASHCOAT

Edward J. Dombrowski, Bellingham, and Robert L. Jones, Dracut, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 161,146, Dec. 2, 1993, abandoned. This application Feb. 8, 1994, Ser. No. 193,223

Int. Cl.<sup>6</sup> B41M 5/40

U.S. Cl. 503—207

31 Claims

1. A thermographic recording film comprising a support carrying:

- a thermographic image-forming system comprising at least one layer;
- a protective layer positioned above said image-forming system or positioned below the surface of said support opposite that which carries said image-forming system, and comprising: at least one colloidal silica, and a binder; and
- a washcoat layer positioned over the surface of said protective layer which is remote from said support, said washcoat layer comprising: a compound containing at least two epoxide moieties and at least one quaternary ammonium salt including at least one hydroxyl functional group.

5,480,856

## 1,2,4-TRIAZOLO[1,2-A]PYRIDAZINE-1,3(2H)-DIONE HERBICIDES FOR CITRUS, SUGARCANE, OIL PALM AND THE LIKE

Kofi S. Amuti, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.  
Continuation of Ser. No. 90,150, Jul. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 649,355, Feb. 1, 1991, abandoned. This application Jul. 22, 1994, Ser. No. 278,764

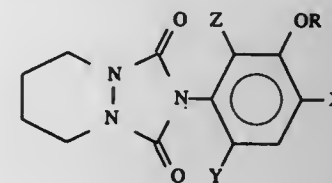
Int. Cl.<sup>6</sup> A01N 43/58; 43/653

U.S. Cl. 504—236

6 Claims

1. A method for controlling undesired weeds in crops selected from the group of citrus, sugarcane, coffee, oil palm, grapes, and

nut trees which comprises applying to the locus of the weeds a herbicidally effective amount of a compound of Formula I



wherein

R is propargyl;

X is Cl;

Y is F; and

Z is H.

5,480,857

## HERBICIDAL 4-HETEROAROYLISOXAZOLE DERIVATIVES

Susan M. Cramp, and Phillip H. G. Smith, both of Essex, England, assignors to Rhone-Poulenc Agriculture Limited, Essex, England

Filed Sep. 17, 1993, Ser. No. 128,605

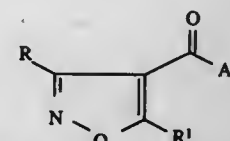
Claims priority, application United Kingdom, Sep. 18, 1992, 9219779

Int. Cl.<sup>6</sup> A01N 43/54; 43/76; 43/50; 43/78

U.S. Cl. 504—239

30 Claims

1. A compound of the formula:



or an agriculturally acceptable salt thereof, wherein:

Ar is a monocyclic or fused bicyclic, heterocyclic system Het having a heterocyclic first ring and an optional second ring, said second ring when present being fused to said first ring, said first ring being attached to the carbonyl group in the 4-position of the isoxazole ring, said first ring having from 1 to 4 hetero ring atoms and from 4 to 7 total ring atoms, said hetero ring atoms being selected from the group consisting of oxygen, nitrogen and sulphur, said first ring being aromatic or non-aromatic and being optionally substituted by from 1 to 4 R<sup>2</sup> groups, which are the same or different, said second ring having from 0 to 4 hetero ring atoms and from 4 to 7 total ring atoms, said hetero ring atoms when present being selected from the group consisting of oxygen, nitrogen and sulphur, said second ring being aromatic or non-aromatic and being optionally substituted by from 1 to 4 R<sup>2</sup> groups, which are the same or different;

R is hydrogen;

cycloalkyl having from three to six carbon atoms, optionally substituted by one or more groups R<sup>4</sup>;

R<sup>2</sup> is:

halogen;

straight- or branched-chain alkyl having up to six carbon atoms, substituted by a group —OR<sup>4</sup>, —OH, R<sup>4</sup>, —SR<sup>4</sup>, —SOR<sup>4</sup>, —SO<sub>2</sub>R<sup>4</sup>, —O—SO<sub>2</sub>R<sup>4</sup>, —CO<sub>2</sub>R<sup>4</sup>, —COR<sup>4</sup>, —OR<sup>4</sup>, —NR<sup>4</sup>, —N(R<sup>4</sup>)SO<sub>2</sub>R<sup>4</sup>, nitro, cyano, —O(CH<sub>2</sub>)<sub>m</sub>—OR<sup>4</sup> or —(CR<sup>2</sup>R<sup>10</sup>)—SO<sub>2</sub>R<sup>4</sup>;

provided that when said optional second ring of Het is non-aromatic, then R<sup>2</sup> can also be =O, =S, cyclic ketal or cyclic thioketal;

R<sup>3</sup> and R<sup>4</sup> which are the same or different, are each straight- or branched-chain alkyl having up to six carbon atoms, optionally substituted by one or more halogen;

R<sup>5</sup> is:a group R<sup>4</sup>; or

(I) phenyl optionally substituted by from one to five members selected from the group consisting of halogen, R<sup>4</sup>, —CO<sub>2</sub>R<sup>4</sup>, —COR<sup>4</sup>, —OR<sup>4</sup>, nitro, cyano and —O(CH<sub>2</sub>)<sub>m</sub>—OR<sup>4</sup>;

R<sup>6</sup> and R<sup>7</sup> which are the same or different, are each hydrogen or straight- or branched-chain alkyl having up to six carbon atoms, optionally substituted by one or more halogen;

R<sup>8</sup> is:

hydrogen; or

straight- or branched-chain alkyl, alkenyl or alkynyl having up to ten carbon atoms, optionally substituted by one or more halogen;

R<sup>9</sup> and R<sup>10</sup>, which are the same or different, are each:

hydrogen;

straight- or branched-chain alkyl having up to 6 carbon atoms, optionally substituted by one or more halogen; or

phenyl optionally substituted by from one to five groups R<sup>21</sup>, which are the same or different;

m is one, two or three;

t is one, two or three; and

R<sup>21</sup> is:

halogen;

straight- or branched-chain alkyl having up to three carbon atoms, optionally substituted by one or more halogen; or

a member selected from the group consisting of nitro, cyano, —OR<sup>4</sup> and —S(O)<sub>p</sub>R<sup>4</sup> wherein p is zero, one or two.

5,480,858

## CYCLOHEXANEDIONE DERIVATIVES

Masashi Sakamoto; Mitsuru Shibata; Ichiro Nasuno, and Kazuyoshi Koike, all of Sodegaura, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

PCT No. PCT/JP93/01107, § 371 Date Jan. 13, 1995, § 102(e) Date Jan. 13, 1995, PCT Pub. No. WO94/04524, PCT Pub. Date Mar. 3, 1994

PCT Filed Aug. 6, 1993, Ser. No. 373,218

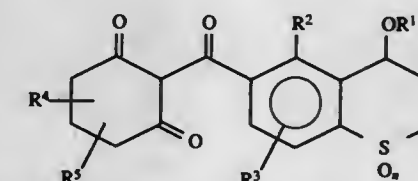
Claims priority, application Japan, Aug. 18, 1992, 4-219477

Int. Cl.<sup>6</sup> A01N 43/18; 43/16; C07D 335/06

U.S. Cl. 504—288

27 Claims

1. A cyclohexanedione derivative of the formula (I),



wherein R<sup>1</sup> is a C<sub>1</sub>–C<sub>6</sub> alkyl group, R<sup>2</sup> is a C<sub>1</sub>–C<sub>4</sub> alkyl group, each of R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> is independently hydrogen or a C<sub>1</sub>–C<sub>4</sub> alkyl group, and n is an integer of 0 to 2, or a salt thereof.



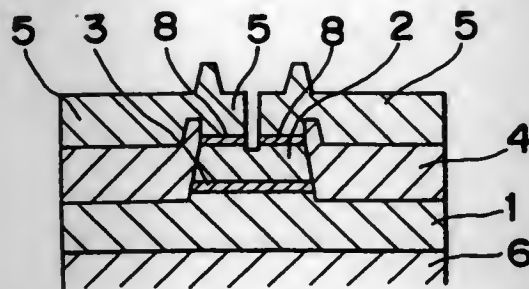
5,480,859

**BI-SR-CA-CU-O SUPERCONDUCTOR JUNCTION THROUGH A BI-SR-CU-O BARRIER LAYER**

Koichi Mizuno, Nara; Hidetaka Higashino, Matsubara, and Kentaro Setsune, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan  
Continuation of Ser. No. 810,971, Dec. 16, 1991, abandoned, which is a continuation of Ser. No. 597,303, Oct. 12, 1990, abandoned. This application Jan. 21, 1994, Ser. No. 183,795  
Claims priority, application Japan, Jan. 13, 1989, 1-266439  
Int. Cl.<sup>6</sup> H01L 39/22; 39/12

U.S. Cl. 505—190

5 Claims



1. A superconductor device including a substrate, a base electrode formed on said substrate which is made of a Bi system oxide superconductive material containing an alkaline earth metal represented by  $\text{Bi}_2\text{-Sr}_2\text{-Ca}_1\text{-Cu}_2\text{-O}_x$  (x is optionally selected) or  $\text{Bi}_2\text{-Sr}_2\text{-Ca}_2\text{-Cu}_3\text{-O}_x$  (x is optionally selected) as a main phase,
- a barrier layer formed on said base electrode which is made of a non-superconductive material containing a Bi oxide represented by  $\text{Bi}_2\text{-Sr}_2\text{-Cu}_1\text{-O}_x$  (x is optionally selected) as a main phase, said barrier layer having a thickness of 10 nm or more,
- a counter electrode formed on said barrier layer which is made of a Bi system oxide superconductive material containing an alkaline earth metal represented by  $\text{Bi}_2\text{-Sr}_2\text{-Ca}_1\text{-Cu}_2\text{-O}_x$  (x is optionally selected) or  $\text{Bi}_2\text{-Sr}_2\text{-Ca}_2\text{-Cu}_3\text{-O}_x$  (x is optionally selected) as a main phase,
- each of said base electrode, barrier layer and counter electrode being oriented in the same direction perpendicular to the substrate,
- a contact electrode formed so as to contact said counter electrode, and
- a separation layer for separating said contact electrode from said base electrode.

5,480,860

**METHODS FOR REDUCING SULFIDES IN SEWAGE GAS**

Edward T. Dillon, Pasadena, Tex., assignor to Petrolite Corporation, St. Louis, Mo.  
Continuation of Ser. No. 200,857, Feb. 22, 1994, abandoned, which is a continuation of Ser. No. 837,554, Feb. 14, 1992, abandoned, which is a continuation of Ser. No. 557,255, Jul. 24, 1990, abandoned, which is a continuation-in-part of Ser. No. 452,539, Dec. 18, 1989, Pat. No. 4,978,512, which is a continuation-in-part of Ser. No. 289,352, Dec. 23, 1988, abandoned. This application Jan. 12, 1995, Ser. No. 371,667  
The portion of the term of this patent subsequent to Dec. 18, 2007, has been disclaimed.

Int. Cl.<sup>6</sup> B01D 53/48; 53/52

U.S. Cl. 423—228

25 Claims

15. A method comprising the step of contacting a gas stream comprising a sulfide selected from the group consisting of hydrogen sulfide and methyl mercaptan, with a triazine composition comprising a reaction product of (i) a compound of formula  $\text{NH}_2\text{-CHR'-R''}$ , where R' is H, an alkyl group of 1 to 6 carbons, a hydroxyalkyl of an alkyl group of 1 to 6 carbons or an N,N-dialkylalkylene amine of an alkyl group of 1 to 6 carbons and R'' is H or an alkyl of 1 to 6 carbons and (ii) formaldehyde or paraform-

aldehyde, said reaction product consisting essentially of a hexahydro-1,3,5-triazine, said method comprising reduction of sulfide in the gas due predominantly to the conversion of sulfide to dithiazines.

5,480,861

**LAYERED STRUCTURE COMPRISING INSULATOR THIN FILM AND OXIDE SUPERCONDUCTOR THIN FILM**

So Tanaka, and Michitomo Iiyama, both of Osaka, Japan, assignors to Sumitomo Electric Industries Ltd., Osaka, Japan

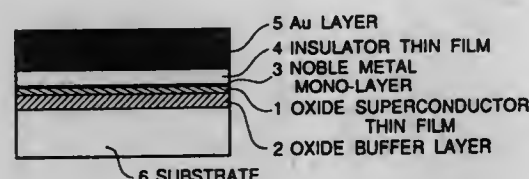
Filed Jul. 14, 1994, Ser. No. 274,781

Claims priority, application Japan, Jul. 14, 1993, 5-196810

Int. Cl.<sup>6</sup> H01B 12/00; H01L 29/06; B05D 5/12

U.S. Cl. 505—236

10 Claims



1. A layered structure comprising:  
a substrate;  
an oxide superconductor thin film disposed on said substrate;  
a noble metal monolayer disposed on said oxide superconductor thin film; and  
an insulator thin film disposed on said noble metal monolayer.

5,480,862

**METHOD FOR THE PREPARATION OF PRECURSORS FOR SUPERCONDUCTORS AND COMPOUNDS THUS OBTAINED**

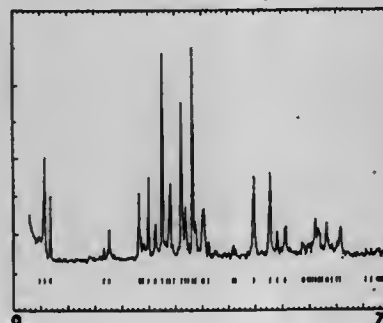
Giorgio S. Miszenti, Novara, Italy, assignor to Pirelli Cavi S.p.A., Milan, Italy

Filed Jul. 30, 1993, Ser. No. 99,949

Int. Cl.<sup>6</sup> C04B 35/624; 35/453

U.S. Cl. 505—440

12 Claims



1. A method for preparing a precursor for a superconductor, comprising adding a condensation product to an aqueous solution of metal salts, totally or partially removing water from the mixture thus obtained to make a viscous mass, subsequently processing the viscous mass, wherein the condensation product is an esterification product of citric acid with ethylene glycol which is prepared prior to adding it to the aqueous solution of metal salts and the solution of metal salts is substantially a solution of an acetate of a metal selected from the group consisting of yttrium, barium, bismuth, copper, lead, strontium, calcium and mixtures thereof, in water and acetic acid.

5,480,863

**BRINE VISCOSIFICATION**

Johnna E. Oakley, Caney, Kans.; Kelly B. Fox, Bartlesville, Okla.; Alvin Evans, Jr., Bartlesville, Okla., and Wayne S. Stewart, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 16, 1993, Ser. No. 18,133

Int. Cl.<sup>6</sup> C09K 7/00; E21B 43/00

U.S. Cl. 507—225

22 Claims

1. A composition comprising a zinc bromide-containing brine, a viscifying copolymer of acrylamide and sodium 2-acrylamido-2-methylpropanesulfonate, and a surfactant of dimethyl alkyl benzyl ammonium chloride wherein the alkyl has 12 to 16 carbon atoms; wherein said viscifying copolymer is the only viscifying polymer present in the said composition.

5,480,864

**MODIFIED MAXADILAN PROTEIN, ITS PREPARATION AND USE, AND DNA ENCODING THE PROTEIN**

Masahiro Tajima, Yokohama; Manami Ohnuma, Kanagawa, both of Japan, and Ethan L. Lerner, Brookline, Mass., assignors to Shiseido Co., Ltd., Japan, and The General Hospital, Mass.

Filed Aug. 6, 1993, Ser. No. 102,757

Int. Cl.<sup>6</sup> A61K 38/00; C12P 21/06; C12N 9/48; C07H 19/00

U.S. Cl. 514—2

13 Claims

1. A modified maxadilan protein, wherein the peptide G-S-I-L SEQ ID NO: 1 is fused to the N-terminus of native maxadilan protein.

5,480,865

**NUTRITIONAL COMPOSITION**

Douglas J. Kingham, Kettleby, Canada, assignor to Parkinson's Charitable Trust, Toronto, Canada

Filed Feb. 25, 1994, Ser. No. 202,065

Int. Cl.<sup>6</sup> A61K 31/00; A23J 1/00

U.S. Cl. 514—2

22 Claims

1. A nutritional composition for the management of protein intake which comprises a first weight-to-weight ratio of carbohydrate to protein of from about 3.5:1 to about 12:1, and a second A:B weight-to-weight ratio of from about 3:1 to about 6.5:1 wherein:  
A is the group of amino acids consisting of glycine, serine, lysine, alanine, aspartic acid, glutamic acid, proline, arginine and hydroxyproline; and  
B is the group of amino acids consisting of phenylalanine, tryptophan, threonine, valine, isoleucine, histidine, leucine, tyrosine and methionine.

5,480,866

**HEMOPROTEINS FOR INHIBITION OF NITRIC OXIDE-MEDIATED HYPOTENSION AND SEPTIC SHOCK**

Joseph Bonaventura, Beaufort, N.C.; Joseph DeAngelo, Hamtramck, Mich., and Robert G. Kilbourn, Houston, Tex., assignors to Duke University; Apex Bioscience, Inc., both of Durham, N.C., and Board of Regents, The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 838,603, Feb. 19, 1992, Pat. No. 5,296,466. This application Jan. 18, 1994, Ser. No. 184,637  
The portion of the term of this patent subsequent to Mar. 22, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> A61K 38/42

U.S. Cl. 514—6

14 Claims

1. A method for treating a deleterious physiological effect in an animal caused by nitric oxide synthesis induced by a biological response modifier, the method comprising administering a therapeutically effective amount of a transition metal-hemoprotein

selected from the group consisting of myoglobin, hemalbumin or methemalbumin to said animal.

5,480,867

**GLUCAGON ANALOGS WITH SERINE REPLACEMENTS**

Robert B. Merrifield, Creskill, N.J., and Cecilia G. Unson, New York, N.Y., assignors to The Rockefeller University, New York, N.Y.

Continuation of Ser. No. 175,137, Dec. 29, 1993, abandoned.

This application Jun. 8, 1994, Ser. No. 255,558

Int. Cl.<sup>6</sup> A61K 38/26; C07K 14/00; 14/605

U.S. Cl. 514—12

37 Claims

1. A peptide consisting of a glucagon analog wherein  
(a) Histidine at the 1-position is either present or absent,  
(b) the aspartic acid residue at the 9-position is either absent or replaced with another amino acid residue,  
(c) the serine residue at the 11-position is optionally replaced with an aliphatic amino acid residue,  
(d) the serine residue at the 16-position is replaced with an aliphatic amino acid residue,  
(e) the aspartic acid residue at the 21-position is optionally replaced with an aliphatic amino acid residue, and  
(f) the carboxy terminus is optionally amidated,  
said analog being further characterized by a relative membrane receptor binding activity compared to glucagon of at least about 40%, an inhibition index up to about 10 and an adenylate cyclase activity up to about 1% of that of glucagon and pharmaceutically acceptable acid addition salts of said analogs.

5,480,868

**SUSTAINED-RELEASE PREPARATION**

Shigeru Kamel, Takarazuka; Yasutaka Igari, Kobe, and Yasuaki Ogawa, Ohyamazaki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 7, 1993, Ser. No. 162,698

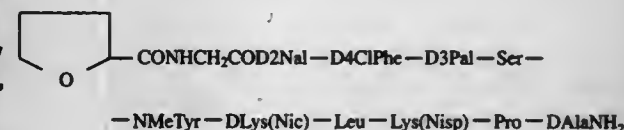
Claims priority, application Japan, Dec. 7, 1992, 4-327070; Feb. 5, 1993, 5-018978; Jun. 16, 1993, 5-145134

Int. Cl.<sup>6</sup> A61K 38/00; C08G 63/91; 63/08; C08L 67/00

U.S. Cl. 514—15

10 Claims

1. A sustained-release preparation comprising a physiologically active peptide of the following formula:



or an acetate salt thereof, and  
a biodegradable polymer having a terminal carboxyl group.







5,480,874

## PHOSPHONIC DIESTER DERIVATIVES

Yasuo Shoji; Yoshihiko Tsuda, both of Naruto; Kazuhiko Tsutsumi, Tokushima, and Yasuhide Inoue, Naruto, all of Japan, assignors to Otsuka Pharmaceutical Factory, Inc., Tokushima, Japan

Filed Jan. 12, 1995, Ser. No. 318,860

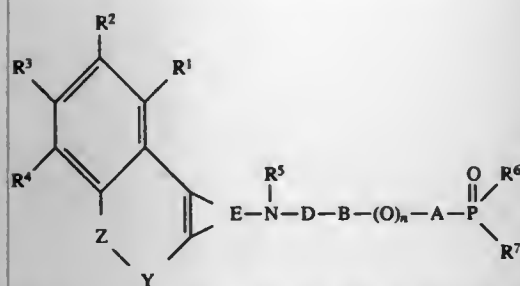
Claims priority, application Japan, Feb. 15, 1993, 5-025732

Int. Cl.<sup>6</sup> A61K 31/675; C07F 9/28

U.S. Cl. 514—80

8 Claims

1. A phosphonic diester derivative of the formula:



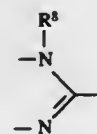
wherein R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> are the same or different and each represents a hydrogen atom, a lower alkyl group, a lower alkoxy group, a halogen-substituted lower alkyl group, a nitro group, a halogen atom, a cyano group, a phenylthio group, a phenylsulfinyl group, a phenylsulfonyl group, a phenyl(lower)alkoxy group, a phenyl(lower)alkylthio group or a benzoyloxy group having a di(lower alkoxy)phosphoryl(lower)alkyl group, and R<sup>3</sup> and R<sup>4</sup> may jointly represent a group of the formula —CH=CH—CH=CH—; R<sup>5</sup> represents a hydrogen atom, a lower alkyl group or a phenyl group; R<sup>6</sup> and R<sup>7</sup> are the same or different and each represents a lower alkoxy group, a phenyl group or a phenyl(lower)alkoxy group; A represents a lower alkylene group optionally having a phenyl group as a substituent; B represents a benzene ring or thiophene ring; D represents a group of the formula —CO—, —CS— or —SO<sub>2</sub>—; E represents a group of the formula



a group of the formula



or a group of the formula



(wherein R<sup>8</sup> represents a lower alkyl group); —Z— represents a single bond or —O—; Y represents a lower alkylene group optionally having a phenyl group as a substituent or a vinylene group; and n is an integer of 0 or 1.

5,480,875

## CRYSTAL OF MONOHYDRATE OF HETEROCYCLIC BIS(PHOSPHONIC ACID) DERIVATIVE

Yasuo Isomura; Makoto Takeuchi, both of Ibaraki; Mamoru Hamada; Yoshisaburo Kaneko, both of Saitama, and Noriya Yamamoto, Ibaraki, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP93/00821, § 371 Date Dec. 21, 1994, § 102(e) Date Dec. 21, 1994, PCT Pub. No. WO94/00462, PCT Pub. Date Jan. 6, 1994

PCT Filed Jun. 18, 1993, Ser. No. 360,701

Claims priority, application Japan, Jun. 23, 1992, 4-205872

Int. Cl.<sup>6</sup> C07D 471/04

U.S. Cl. 514—80

9 Claims

1. A crystal selected from the group consisting of crystals D and E of 1-hydroxy-2-(imidazo[1,2-a]pyridin-3-yl)ethane-1,1-bis(phosphonic acid) monohydrate having the following physico-chemical properties

(1) crystal D: has the lattice spacing and relative intensity shown in Table 1 in the powder X-ray diffraction spectrum obtained by using Cu-Kα ray and a dehydration peak temperature of 135° to 149° C. according to TG-DSC thermogravimetric analysis

TABLE 1

Lattice spacing (Å)	Relative intensity
8.77 ± 0.10	medium
6.50 ± 0.05	"
5.73 ± 0.03	"
5.48 ± 0.04	strong
5.21 ± 0.03	medium
4.86 ± 0.03	"
4.73 ± 0.03	strong
4.42 ± 0.03	medium
4.37 ± 0.03	"
3.38 ± 0.02	slightly strong
3.23 ± 0.02	strong
3.19 ± 0.02	medium

(2) Crystal E: has the lattice spacing and relative intensity shown in the above Table 1 in the powder X-ray diffraction spectrum obtained by using Cu-Kα ray and a dehydration peak temperature of 160° to 170° C. according to TG-DSC thermogravimetric analysis.

5,480,876

## PHOSPHONOMETHYL-IMIDAZO[1,2-A]PYRIMIDINE-2-CARBOXYLIC ACID COMPOUNDS FOR TREATMENT OF NEUROTOXIC INJURY

Alexis A. Cordi, Suresnes, France, and Eric T. Sun, San Diego, Calif., assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 982,819, Nov. 30, 1992, Pat. No.

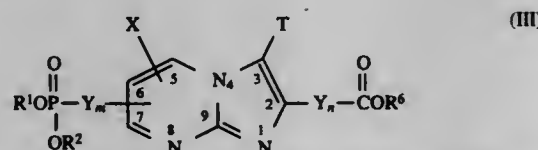
5,302,586, which is a continuation-in-part of Ser. No. 810,242, Dec. 19, 1991, abandoned. This application Mar. 14, 1994, Ser. No. 212,618

Int. Cl.<sup>6</sup> A61K 31/505; C07F 9/09

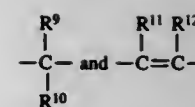
U.S. Cl. 514—81

7 Claims

1. A method to treat neurotoxic injury in a subject, which method comprises treating a subject susceptible to neurotoxic injury with a therapeutically-effective amount of a compound of Formula III:

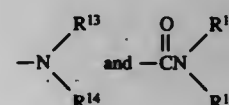


wherein each of Y<sub>m</sub> and Y<sub>n</sub> is a spacer group independently selected from one or more groups of the formula



with the proviso that the total number of carbon atoms in each of Y<sub>m</sub> or Y<sub>n</sub> cannot exceed ten carbon atoms; wherein each of R<sup>9</sup> and R<sup>10</sup> is independently selected from hydrido, alkyl, cycloalkyl, halo, haloalkyl, hydroxy, hydroxyalkyl, alkoxy, alkoxyalkyl and alkanoyl; wherein R<sup>9</sup> and R<sup>10</sup> may be taken together to form oxo or exomethylene; wherein each of R<sup>11</sup> and R<sup>12</sup> is independently selected from hydrido, alkyl, haloalkyl, phenyl, hydroxyalkyl and alkoxyalkyl; wherein m is a number selected from one to three, inclusive; wherein n is a number selected from zero to three, inclusive;

wherein X is one or more groups attachable at one or more of the 5-, 6- and 7-ring positions of the imidazo[1,2-a]pyrimidine ring system; wherein each X and T is independently selected from hydrido, halo, alkyl, cycloalkyl, cycloalkylalkyl, haloalkyl, alkenyl, alkynyl, phenyl, benzyl, hydroxy, hydroxyalkyl, alkoxy, phenoxy, alkoxyalkyl, benzyloxy, cyano, alkanoyl, alkylthio and arylthio,



wherein each of R<sup>13</sup>, R<sup>14</sup>, R<sup>15</sup> and R<sup>16</sup> is independently selected from hydrido, alkyl and phenyl;

wherein each of R<sup>1</sup>, R<sup>2</sup> and R<sup>6</sup> is independently selected from hydrido, alkyl, allyl, cycloalkyl, cycloalkylalkyl, phenyl and benzyl;

or a pharmaceutically-acceptable salt thereof.

5,480,877

## USE OF LYSOPHOSPHATIDIC ACIDS TO ENHANCE FIBRONECTIN BINDING

Deane F. Mosher, Jr., and William J. Checovich, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

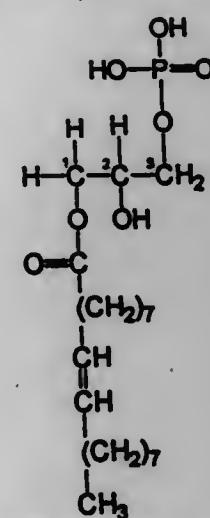
Continuation of Ser. No. 146,246, Nov. 2, 1993, abandoned.

This application Apr. 14, 1995, Ser. No. 422,738

Int. Cl.<sup>6</sup> A61K 31/66

U.S. Cl. 514—134

1 Claim



1. A method for enhancing fibronectin binding to endothelial or epithelial human cells in a skin wound, the method comprising the steps of:

exposing the cells to an exogenous supply of a lysophosphatidic acid in an amount sufficient to enhance said fibronectin binding, wherein the supply is essentially free of lipoprotein and protein from blood serum; and exposing those cells to fibronectin; whereby fibronectin binding to the exterior of said cells is enhanced.

5,480,878

## METHOD FOR TREATING PROSTATIC HYPERTROPHY WITH ESTRADIOL DERIVATIVES

Koichi Nishimura, Warabi; Takako Kawabe, Hasuda; Tsutomu Wada, Fuchu; Tsuyoshi Saitoh, Toride, and Kenji Bannai, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 317,644, Sep. 26, 1994. This application

Mar. 22, 1995, Ser. No. 408,389

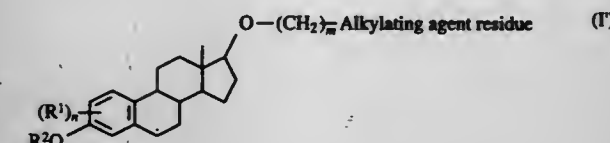
Claims priority, application Japan, Jan. 5, 1993, 5-273014

Int. Cl.<sup>6</sup> A61K 31/565

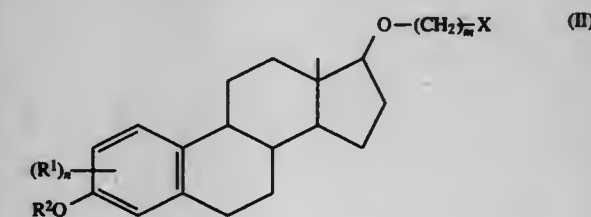
U.S. Cl. 514—182

1 Claim

1. A method for treatment of prostatic hypertrophy, which comprises administering to a patient suffering from prostatic hypertrophy, an effective amount of an estradiol derivative-alkylating agent conjugate of the formula (I):



wherein R<sup>1</sup> is C<sub>1-4</sub> alkyl or C<sub>1-4</sub> alkoxy; R<sup>2</sup> is acyl or benzyl; m is an integer of 1 to 3; and n is an integer of 0 to 3, or an effective amount of an estradiol derivative of the formula (II):



wherein R<sup>1</sup> is C<sub>1-4</sub> alkyl or C<sub>1-4</sub> alkoxy; R<sup>2</sup> is acyl or benzyl; m is an integer of 1 to 3; n is an integer of 0 to 3; and X is hydroxy or halogen.



5,480,879

## QUINOLONECARBOXYLIC ACIDS

Uwe Petersen, Leverkusen; Wilfried Schröck; Dieter Häblich, both of Wuppertal; Andreas Krebs, Odenthal; Thomas Schenke, Bergisch Gladbach; Thomas Philipps, Cologne; Klaus Grobe, Odenthal; Rainer Endermann, Wuppertal; Klaus-Dieter Bremm, Wuppertal, and Karl-Georg Metzger, Wuppertal, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 1, 1993, Ser. No. 131,253

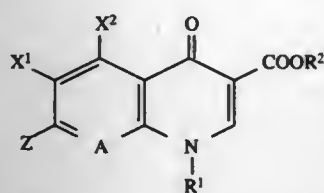
Claims priority, application Germany, Jan. 9, 1992, 42 34 078.0

Int. Cl.<sup>6</sup> C07D 487/04; A61K 31/545

U.S. Cl. 514—202

9 Claims

1. A compound of the formula



in which

X<sup>1</sup> represents halogen,

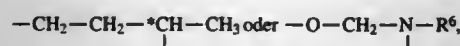
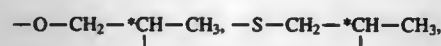
X<sup>2</sup> represents hydrogen, amino, alkylamino having 1 to 4 carbon atoms, dialkylamino having 1 to 3 carbon atoms per alkyl group, hydroxyl, alkoxy having 1 to 4 carbon atoms, mercapto, alkylthio having 1 to 4 carbon atoms, arylthio, halogen or methyl,

R<sup>1</sup> represents alkyl having 1 to 4 carbon atoms, alkenyl having 2 to 4 carbon atoms, cycloalkyl having 3 to 6 carbon atoms, bicyclo[1.1.1]pent-1-yl, 1,1-dimethylpropargyl, 3-oxetanyl, 2-hydroxyethyl, 2-fluoroethyl, methoxy, amino, methylamino, ethylamino, dimethylamino, or phenyl which is optionally substituted by 1 or 2 fluorine atoms,

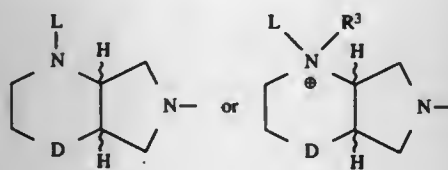
R<sup>2</sup> represents hydrogen, alkyl having 1 to 5 carbon atoms, which is optionally substituted by hydroxyl, methoxy, amino, methylamino or di-methylamino, or (5-methyl-2-oxo-1,3-dioxol-4-yl)-methyl,

A represents N or C—R<sup>5</sup>, in which

R<sup>5</sup> represents hydrogen, halogen, methyl, alkenyl having 2 to 3 carbon atoms, alkynyl having 2 to 3 carbon atoms, hydroxyl or methoxy, or can, together with R<sup>1</sup>, form a bridge of the structure



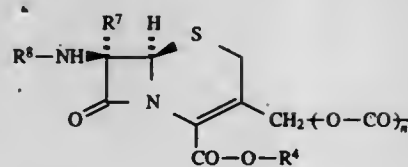
in which R<sup>6</sup> denotes hydrogen, methyl or formyl, and Z represents a residue of the structure



in which

D represents CH<sub>2</sub> or O,R<sup>3</sup> represents methyl or ethyl and

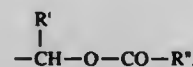
represents the structure



in which

n represents 0 or 1,

R<sup>4</sup> represents H, benzyl, 4-methoxybenzyl, benzhydryl, allyl, (5-methyl-2-oxo-1-dioxol-4-yl)-methyl or a radical



in which

R' denotes H or methyl and

R<sup>6</sup> denotes ethoxy or tert-butyl,R<sup>7</sup> represents H or methoxy and

represents H, tri-(C<sub>1</sub>-C<sub>4</sub>-alkyl)-silyl, acyl, C<sub>1</sub>-C<sub>4</sub>-alkoxycarbonyl, benzyloxycarbonyl, allyl-oxycarbonyl or isopropenyloxycarbonyl,

and their pharmaceutically utilisable hydrates and acid-addition salts, as well as the alkali metal, alkaline earth metal, silver and guanidinium salts of the underlying carboxylic acids.

5,480,880

## PENEM DERIVATIVES

Giuseppina Visentin, Biassono; Franco Zarini, Settimo Milanese; Daniela Jabes, Milan; Ettore Perrone, Boffalora Ticino; Costantino della Bruna, Rho, and Marco Alpegiani, Milan, all of, Italy, assignors to Farmitalia Carlo Erba S.r.l., Milan, Italy

PCT No. PCT/EP92/01396, § 371 Date Apr. 9, 1993, § 102(e) Date Apr. 9, 1993, PCT Pub. No. WO93/00345, PCT Pub. Date Jan. 7, 1993

PCT Filed Jun. 22, 1992, Ser. No. 972,444

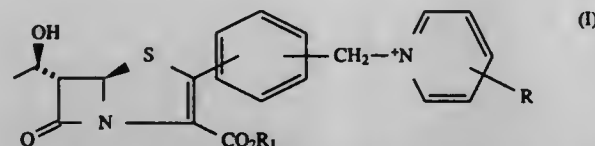
Claims priority, application United Kingdom, Jun. 21, 1991, 9113427

Int. Cl.<sup>6</sup> A61K 31/43; C07D 499/00

U.S. Cl. 514—210

5 Claims

1. A compound of the following formula I:



wherein R<sub>1</sub> is a hydrogen atom, a negative charge or an ester residue selected from the group consisting of: acyloxymethyl and 1-(acyloxy)ethyl, wherein the acyl moiety is selected from the group consisting of straight and branched C<sub>2</sub>-C<sub>10</sub> alkanoyl and C<sub>4</sub>-C<sub>8</sub> cycloalkanoyl groups;

benzyloxymethyl and 1- (benzyloxy) ethyl, either unsubstituted or substituted on the ring by a free, methylated or acetylated hydroxy or amino group;

alkoxycarbonyloxymethyl and 1- (alkoxycarbonyloxy) ethyl;

3-phthalidyl;

2-oxo-1,3-dioxolan-4-yl, optionally substituted at position 5 by a C<sub>1</sub>-C<sub>4</sub> alkyl group;

(2-oxo-1,3-dioxolen-4-yl) methyl, optionally substituted at position 5 by a phenyl or C<sub>1</sub>-C<sub>4</sub> alkyl group;

a group —CH<sub>2</sub>CO<sub>2</sub>R' wherein R' is C<sub>1</sub>-C<sub>4</sub> straight or branched alkyl, or benzyl; and

JANUARY 2, 1996

CHEMICAL

419

5,480,882

BENZOXAZINONE AND BENZOTHAZINONE DERIVATIVES HAVING CARDIOVASCULAR ACTIVITY

Alberto Sala, Monza; Roberto Barani, Paderno Dugnano; Francesca Benedini, Milan; Giorgio Bertolini, Sesto San Giovanni; Giancarlo Dona', Milan; Gianni Gromo, Milan, and Silvio Levi, Milan, all of, Italy, assignors to Italfarmaco S.p.A., Milan, Italy

Continuation of Ser. No. 46,759, Apr. 15, 1993, abandoned.

This application Nov. 23, 1994, Ser. No. 347,217

Claims priority, application Italy, Apr. 16, 1992, MI92A0940

Int. Cl.<sup>6</sup> A61K 31/535; 31/54; C07D 279/08; 265/22

U.S. Cl. 514—224.2

9 Claims

1. A compound of formula I

2-oxotetrahydrofuran-5-yl, optionally substituted at position 4 by a C<sub>1</sub>-C<sub>4</sub> alkyl group;

R is:

(a) —(CH<sub>2</sub>)<sub>n</sub>—A—CO<sub>2</sub>H, —(CH<sub>2</sub>)<sub>n</sub>—A—SO<sub>3</sub>H or —(CH<sub>2</sub>)<sub>n</sub>—A—PO<sub>3</sub>H<sub>2</sub>, wherein n is either zero, one or two and A is a group —CH=CH— (either E or Z), —OCH<sub>2</sub>—, —SCH<sub>2</sub>— or —CHOH—;

(b) —(CH<sub>2</sub>)<sub>n</sub>—PO<sub>3</sub>H<sub>2</sub>, —(CH<sub>2</sub>)<sub>n</sub>SO<sub>2</sub>NHCN, —(CH<sub>2</sub>)<sub>n</sub>NHSO<sub>3</sub>H, —(CH<sub>2</sub>)<sub>n</sub>CONHSO<sub>2</sub>CH<sub>3</sub> or —(CH<sub>2</sub>)<sub>n</sub>—CONHSO<sub>2</sub>CF<sub>3</sub>, wherein n is as defined above;

(c) —(CH<sub>2</sub>)<sub>m</sub>—W—(CH<sub>2</sub>)<sub>n</sub>—Z, wherein W is an arylene group or a heterocyclydiyl group selected from the group consisting of a furanediyl, thiophenediyl, tetrazolediyl, thiazolediyl, isothiazolediyl, oxazolediyl, isoxazolediyl, thiadiazolediyl and pyrrolediyl group, m is 0 or 1, n is as above defined, and Z represents CO<sub>2</sub>H, PO<sub>3</sub>H<sub>2</sub>, SO<sub>2</sub>NHCN, NHSO<sub>3</sub>H, CONHSO<sub>2</sub>CH<sub>3</sub> or CONHSO<sub>2</sub>CF<sub>3</sub>;

wherein Y is O or NH and X is NH, N—OH or N—O—(CH<sub>2</sub>)<sub>n+1</sub>—COOH wherein n is as defined as above; or

(e) —(CH<sub>2</sub>)<sub>m</sub>—W' wherein W' is a heterocyclyl group convertible into an anion at physiological pH and m is as defined above;

or when R<sup>1</sup> is other than a negative charge, a pharmaceutically acceptable salt thereof.

wherein

R represents hydrogen, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>5</sub>-C<sub>7</sub> cycloalkyl, methylene-dioxy or phenyl which may be substituted by one or two groups independently selected from hydroxy, halogen, nitro, C<sub>1</sub>-C<sub>6</sub> alkyl or C<sub>1</sub>-C<sub>6</sub> alkoxy; R<sub>1</sub> and R<sub>2</sub> independently represent hydrogen, —COOR<sub>3</sub>, —CONR<sub>4</sub>R<sub>5</sub>,

—OCONR<sub>4</sub>R<sub>5</sub>, —OCOR<sub>3</sub>, —OCOOR<sub>6</sub>, —NR<sub>3</sub>CONR<sub>4</sub>R<sub>5</sub>, —N=CH—NR<sub>4</sub>R<sub>5</sub>, CN, OH or H, wherein R<sub>3</sub> is hydrogen or C<sub>1</sub>-C<sub>6</sub> alkyl, and R<sub>4</sub> and R<sub>5</sub> independently are hydrogen or C<sub>1</sub>-C<sub>6</sub> alkyl, R<sub>6</sub> is C<sub>1</sub>-C<sub>6</sub> alkyl, with the proviso that R<sub>1</sub> and R<sub>2</sub> cannot be hydrogen at the same time; X is oxygen or sulphur; Y represents an ethylene group; or a pharmaceutically acceptable salt thereof.

5,480,881

TREATMENT OF DISEASE WITH PAF-ACETHER ANTAGONISTS AND PROCEDURE DETERMINING THEIR EFFICACY

Ruth Korth, Palestrinastr. 9, D-8000 Munchen 19, Germany  
Continuation of Ser. No. 844,882, Mar. 3, 1992, abandoned, which is a continuation-in-part of Ser. No. 704,554, May 23, 1991, abandoned. This application Aug. 11, 1993, Ser. No. 104,599

Claims priority, application Germany, Jun. 1, 1990, 40 17 818.8; Jan. 26, 1990, 40 34 090.2

Int. Cl.<sup>6</sup> A61K 31/55

U.S. Cl. 514—220

1 Claim

1. A method for treating hyperlipidemia in a patient, comprising the step of administering to the patient an effective amount of a triazolothieno diazepine wherein the triazolothieno diazepine is selected from the group consisting of 3-(4-(2-chlorophenyl)-9-methyl-6H-thieno (3,2-f) (1,2,4) triazolo-(4,3-a)(1,4) diazepine-2-yl-1-(4-morpholinyl)-1-propanone (WEB 2086); 3-(4-(2-chlorophenyl)-9-cyclopropyl-6H-thieno (3,2-f) (1,2,4) triazolo-(4,3-a) (1,4) diazepine-2-yl-1-(4-morpholinyl)-1-propanone (WEB 2098); or tetrahydro-4,7,8,10 methyl-(chloro-2-phenyl) 6(dimethoxy-3,4-phenylthio)methylthiocarbonyl-9-pyrido[4,3'-4,5]thieno[3,2-f]triazolo-1,2,4[4,3-a]diazepine-1,4 (BN 50739).

5,480,883

BIS MONO- AND BICYCLIC ARYL AND HETEROARYL COMPOUNDS WHICH INHIBIT EGF AND/OR PDGF RECEPTOR TYROSINE KINASE

Alfred P. Spada, Lansdale; Michael R. Myers, Reading; Martin P. Maguire, Mont Clare, and Paul E. Persons, King of Prussia, all of Pa., assignors to Rhone-Poulenc Rorer Pharmaceuticals Inc., Collegeville, Pa.

Continuation-in-part of Ser. No. 988,515, Dec. 10, 1992, abandoned, which is a continuation-in-part of Ser. No. 698,420, May 10, 1991, abandoned. This application Dec. 10, 1993, Ser. No. 166,199

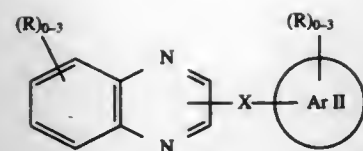
Int. Cl.<sup>6</sup> A61K 31/495; 31/535; C07D 241/52; 241/54

U.S. Cl. 514—249

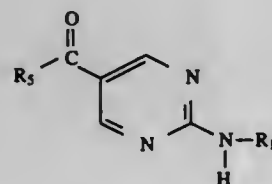
20 Claims

1. A method of inhibiting cell proliferation in a patient suffering from a disorder characterized by such proliferation comprising administering to a patient a pharmaceutical composition comprising an EGF and/or PDGF receptor inhibiting effective amount of a compound of the formula

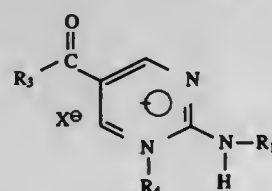




$R_2$ ,  $R_3$  and  $R_4$  together with the nitrogen atoms to which they are attached and the carbon atom to which the said nitrogen atoms are attached form a pyrimidine ring of formula II or a pyrimidinium ring of formula IIA:



II



IIA

wherein:

Ar II is a substituted or unsubstituted mono- or bicyclic aryl or heteroaryl ring system of about 5 to about 12 atoms and where each monocyclic ring may contain 0 to about 3 hetero atoms, and each bicyclic ring may contain 0 to about 4 hetero atoms or at least one ring is a substituted or unsubstituted saturated carbocyclic of about 3 to about 7 atoms where each monocyclic ring may contain 0 to about 2 hetero atoms and where the hetero atoms are selected from N, O and S provided said hetero atoms are not vicinal oxygen and/or sulfur atoms and where the substituents may be located at any appropriate position of the ring system and are described by R;

X is  $(CHR_1)_{0-4}$  or  $(CHR_1)_m-Z-(CHR_1)_n$ ;

Z is O, NR', S, SO or SO<sub>2</sub>;

m and n are 0-3 and m+n=0-3;

R substitution besides hydrogen independently includes alkyl, alkenyl, phenyl, aralkyl, aralkenyl, hydroxy, hydroxyalkyl, alkoxy, alkoxyalkyl, aralkoxy, acyloxy, halo, haloalkyl, nitro, amino, mono- and di-alkylamino, acylamino, carboxy, carboxyalkyl, carbalkoxy, carbalkoxy, carbalkoxyalkyl, carbalkoxyalkenyl, aminoalkoxy, amido, mono- and di-alkylamido and N,N-cycloalkylamido, phenyl, halophenyl, thienyl, halothieryl, pyridyl, 1H-tetrazolyl or benzoyl;

R and R' together may also be keto;

$R_1$  and  $R'$  are hydrogen or alkyl; or an N-oxide or a pharmaceutically acceptable salt thereof, in admixture with a pharmaceutically acceptable carrier.

in which:

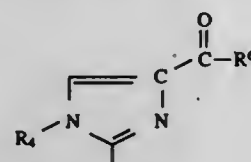
n=0, 1, 2,

$R_4$  is a  $(C_1-C_4)$  alkyl radical, a  $(C_7-C_9)$  aralkyl radical, a phenyl radical or a hydrogen atom,

$R_5$  is a  $(C_1-C_4)$  alkyl radical or a  $(C_7-C_9)$  aralkyl radical,

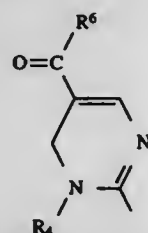
$R_6$  is a hydroxyl radical, a  $(C_1-C_4)$  alkoxy radical or an amino radical,

X is a pharmacologically acceptable cation or  $R_2$ ,  $R_3$  and  $R_4$  together form with the nitrogen atoms to which they are attached and the carbon atom to which the said nitrogen atoms are attached an imidazole ring of the formula:



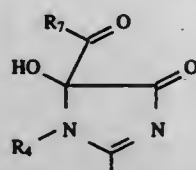
III

or 1,6-dihydropyrimidine of formula



IV

$R_6$  having one of the meanings of  $R_5$  or  $R_2$ ,  $R_3$  together form with the nitrogen atoms to which they are attached and the carbon atom to which the said nitrogen atoms are attached a ring of formula:



V

$R_7$  being a  $(C_1-C_4)$  alkoxy radical or a glyceryl radical, or a pharmacologically acceptable salt thereof.

5,480,884

#### COMPOUNDS HAVING A GUANIDINE STRUCTURE

Claude Thal, Sceaux; Catherine Quirosa-Gullou, Verrieres Le Buisson; Pierre Potier, Paris; Dolor Renko, Gif Sur Yvette; Jean-Pierre Zanetta, Griesheim/Souffel; Marie-Madeleine Portier, Verrieres Le Buisson; Monique Sensenbrenner, Strasbourg; Janine Koenig, and Herbert Koenig, both of Bordeaux, all of, France, assigns to Centre National De La Recherche Scientifique, Paris, France

PCT No. PCT/FR92/01080, § 371 Date Jul. 22, 1993, § 102(e) Date Jul. 22, 1993, PCT Pub. No. WO93/10102, PCT Pub. Date May 27, 1993

PCT Filed Nov. 20, 1992, Ser. No. 90,188

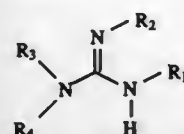
Claims priority, application France, Nov. 22, 1991, 91 14474

Int. Cl.<sup>6</sup> A61K 31/505; 31/415; C07D 239/42; 233/88

U.S. Cl. 514-275

9 Claims

1. A compound of formula:



I

wherein  $R_1$  is an isopropyl radical, a benzyl radical which is optionally substituted by one or more  $(C_1-C_6)$  alkoxy radicals or a radical;

5,480,885

#### ERGOLINE DERIVATIVES OF 1-PROPINYLAMINE, A PROCESS FOR THE MANUFACTURE THEREOF AND THE USE THEREOF FOR MEDICAMENTS

Rudolf Ručman; Breda Bole-Vunduk; Magdalena Ocvirik; Bogomila Lavrič, and Igor Krisch, all of Ljubljana, Slovenia, assigns to Lek, Tovarna Farmaceutskih in Kemičnih, Verovskova, Slovenia

Continuation-in-part of Ser. No. 901,983, Jun. 22, 1992, Pat. No. 5,288,724. This application Dec. 2, 1993, Ser. No. 160,271

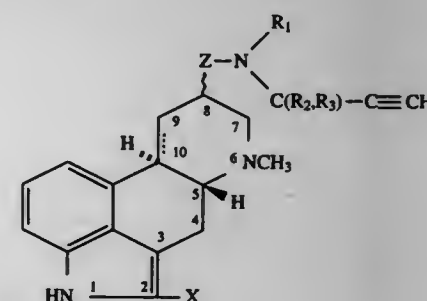
Claims priority, application Yugoslavia, Jul. 1, 1991, 1154/91

Int. Cl.<sup>6</sup> A61K 31/44

U.S. Cl. 514-288

3 Claims

1. A method of treating psychosis in a patient in a need of such treatment comprising administering to said patient, antipsychotically effective amount of an ergolinyl derivative of 2-propinyllamine of the formula I



wherein,

$R_1$ ,  $R_2$  and  $R_3$  independently represent a hydrogen atom or a straight-chain or branched-chain  $C_1-C_6$  alkyl group,

X represents a hydrogen or a halogen atom,

Z represents a carbonyl or methylene group and

$C_9 \dots C_{10}$  represents a single or a double bond, diastereomeric forms, racemates and acid addition salts thereof.

5,480,886

#### SILVER HALIDE PHOTOGRAPHIC MATERIAL

Kazuki Yamazaki; Nobuaki Inoue; Seichi Yamamoto; Toshihide Ezoe; Minoru Sakai; Tadashi Ikeda; Masaki Okazaki, and Toshiaki Fujiwara, all of Kanagawa, Japan, assigns to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 161,580, Dec. 6, 1993, abandoned.

This application Nov. 3, 1994, Ser. No. 334,362

Claims priority, application Japan, Dec. 7, 1992, 4-351136; Dec. 11, 1992, 4-352393; Dec. 17, 1992, 4-354748; Dec. 22, 1992, 4-356502; Feb. 23, 1993, 5-33722; Mar. 10, 1993, 5-75084; Apr. 1, 1993, 5-96449

Int. Cl.<sup>6</sup> G03C 1/06

U.S. Cl. 430-264

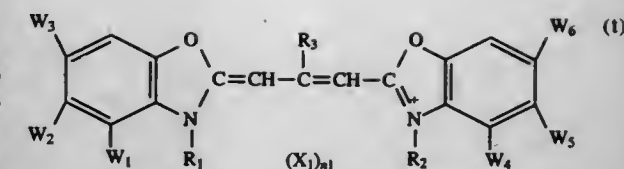
4 Claims

1. A silver halide photographic material having at least one silver halide emulsion layer on a support and containing a hydrazine derivative in the emulsion layer or in other hydrophilic colloid layer(s), in which the silver halide emulsion comprises silver halide grains containing:

(a) from  $1 \times 10^{-8}$  to  $1 \times 10^{-6}$  mol, per mol of silver, of an iridium compound, and

(b) from  $1 \times 10^{-8}$  to  $1 \times 10^{-6}$  mol, per mol of silver, of a rhodium compound or from  $1 \times 10^{-9}$  to  $1 \times 10^{-5}$  mol, per mol of silver, of a rhenium compound, ruthenium compound or osmium compound,

and having a silver chloride content of about 50 mol % or more, and having been color-sensitized with a sensitizing dye of the following general formula (1), (2) or (3):



where

$W_1$  and  $W_4$  each represent a hydrogen atom;

$W_3$  and  $W_6$  each represents a hydrogen atom, a methyl group or a methoxy group;

$W_2$  represents an optionally branched alkyl group having 6 or less carbon atoms as a whole, an alkoxy group having 5 or less carbon atoms as a whole, a bromine atom, an iodine atom, or an aryl group having 9 or less carbon atoms as a whole; or  $W_2$  may be bonded to  $W_1$  or  $W_3$  to form a benzene ring; or  $W_2$  may also be a chlorine atom when  $W_3$  is a methyl group or a methoxy group;

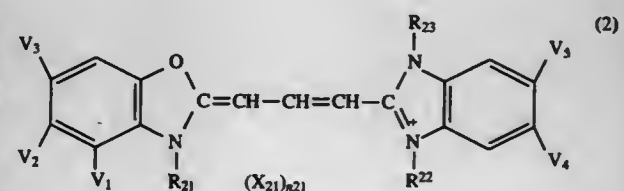
$W_5$  represents an optionally branched alkyl group having 6 or less carbon atoms as a whole, an alkoxy group having 5 or less carbon atoms as a whole, a halogen atom, a hydroxyl group, an aryl group having 9 or less carbon atoms as a whole, an aryloxy group having 9 or less carbon atoms as a whole, an arylthio group having 8 or less carbon atoms as a whole, an alkylthio group having 4 or less carbon atoms as a whole, or an acylamino group having 4 or less carbon atoms as a whole, and  $W_5$  may be bonded to  $W_4$  or  $W_6$  to form a benzene ring;

$R_1$  and  $R_2$  may be the same or different and each represents an alkyl or alkenyl group having 10 or less carbon atoms as a whole, and at least one of  $R_1$  and  $R_2$  has a sulfo group or a carboxyl group;

$R_3$  represents an alkyl group;

$X_1$  represents a pair ion necessary for neutralizing the charge of the molecule;

$n_1$  represents 0 or 1, and it is 0 when the molecule is an internal salt,



where

$V_1$  represents a hydrogen atom;

$V_2$  represents a hydrogen atom, a halogen atom, a hydroxyl group, an optionally branched alkyl group, a lower alkoxy group, an aryl group having 9 or less carbon atoms as a whole, an aryloxy group having 9 or less carbon atoms as a whole, an arylthio group having 8 or less carbon atoms as a whole, a lower alkylthio group, or an acylamino group having 4 or less carbon atoms as a whole, and  $V_2$  may be bonded to  $V_1$  or  $V_3$  to form a benzene ring;

$V_3$  represents a hydrogen atom, a methyl group or a methoxy group;

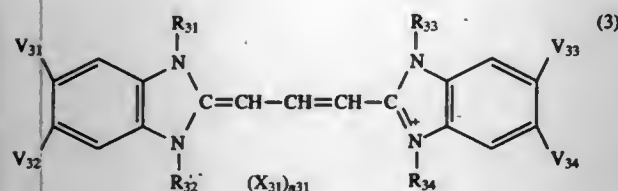
$V_4$  represents an electron-withdrawing group;

$V_5$  represents a hydrogen atom, a fluorine atom, a chlorine atom or a bromine atom;

$R_{21}$ ,  $R_{22}$  and  $R_{23}$  may be the same or different and each represents an alkyl or alkenyl group having 10 or less carbon atoms as a whole, and at least one of  $R_{21}$ ,  $R_{22}$  and  $R_{23}$  has a sulfo group or a carboxyl group;



$X_{21}$  represents a counter ion necessary for neutralizing the charge of the molecule;  
 $n_{21}$  represents 0 or 1, and it is 0 when the molecule is an internal salt,



where

$V_{31}$  and  $V_{33}$  each represents a hydrogen atom or an electron-withdrawing group;

$V_{32}$  and  $V_{34}$  each represents an electron-withdrawing group;

$R_{31}$ ,  $R_{32}$ ,  $R_{33}$  and  $R_{34}$  may be the same or different and each represents an alkyl or alkenyl group having 10 or less carbon atoms as a whole, and at least one of  $R_{31}$ ,  $R_{32}$ ,  $R_{33}$  and  $R_{34}$  has a sulfo group or a carboxyl group;

$X_{31}$  represents a counter ion necessary for neutralizing the charge of the molecule;

$n_{31}$  represents 0 or 1, and it is 0 when the molecule is an internal salt.

5,480,887

#### PROTEASE INHIBITORS

William J. Hornback; John E. Munroe, and Timothy A. Shepherd, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

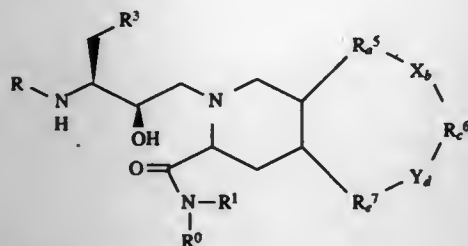
Continuation-in-part of Ser. No. 190,810, Feb. 2, 1994, abandoned. This application Aug. 31, 1994, Ser. No. 299,186

Int. Cl.<sup>6</sup> A61K 31/435; 31/47; C07D 495/04; 215/20

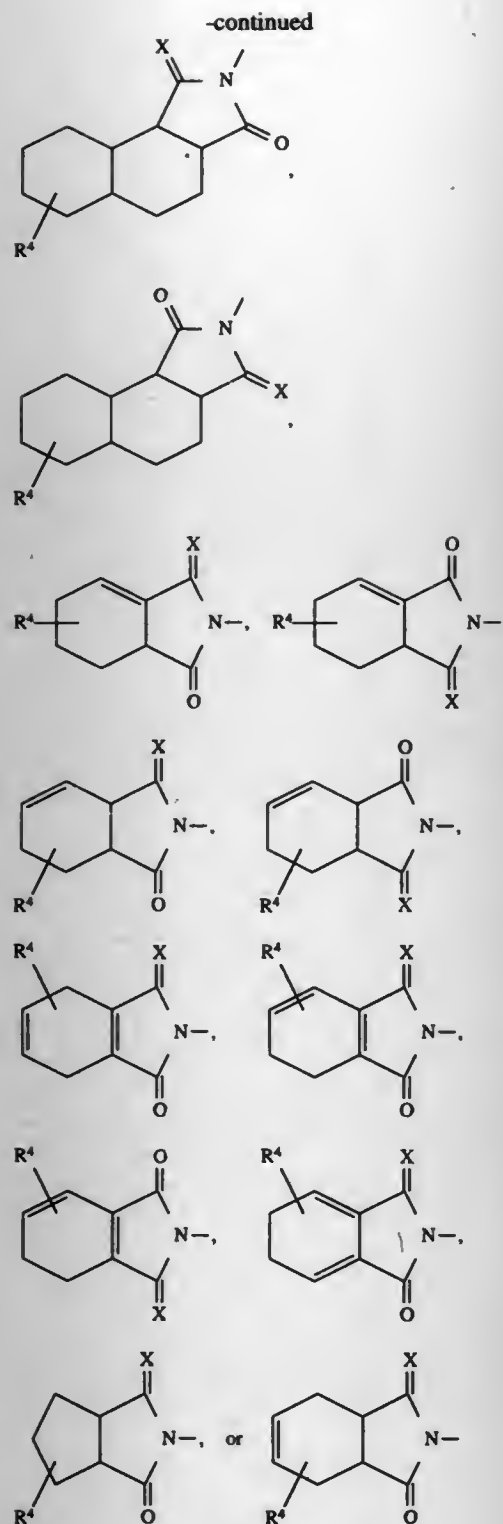
U.S. Cl. 514—301

12 Claims

1. A compound of formula (I)







$R^3$  is cycloalkyl of 3 to 8 carbon atoms;  
 $R^4$  is 1-4 substituents independently selected from the group consisting of H, halogen,  $\text{NO}_2$ ,  $\text{NH}_2$ , haloalkyl of 1 to 3 carbon atoms and 1 to 7 halogen atoms,  $\text{C}_1\text{-C}_3$  alkyl,  $\text{NHCOR}^7$ ,  $\text{NHCO-phenyl}$ , OH,  $\text{OR}^8$  and  $\text{Ar}^9$ ;  
 $R^7$  and  $R^8$  independently are H or alkyl of 1 to 3 carbon atoms;  
 $X$  is O; (H, H); (H, OH); ( $R^9$ , OH); ( $\text{Ar}^{10}$ , OH); (H,  $R^9$ ); or (H,  $\text{OR}^{10}$ );  
 $\text{Ar}$ ,  $\text{Ar}^9$ ,  $\text{Ar}^{10}$  and  $\text{Ar}^{11}$  independently are phenyl, naphthyl, each optionally substituted with 1-5 substituents independently selected from the group consisting of:

H, halogen, OH, alkoxy of 1 to 3 carbon atoms,  $\text{NR}^{11}\text{R}^{12}$ , SH,  $\text{S(O)}_t\text{R}^{13}$ , where  $t$  is 0-2, haloalkyl of 1 to 3 carbon atoms and 1 to 7 halogen atoms, alkyl of 1 to 3 carbon atoms,  $\text{CO}_2\text{H}$ , carboalkoxy of 2 to 6 carbon atoms, CN,  $\text{NO}_2$ ,  $\text{SO}_2\text{NH}_2$ ,  $\text{SO}_3\text{H}$ ,  $\text{CO}_2\text{NR}^{14}\text{R}^{15}$ , or phenyl;  
 $R^9$  is selected from the group consisting of:  
 alkyl of 1-20 carbon atoms or alkenyl or alkynyl of 2-20 carbon atoms, said alkyl, alkenyl, or alkynyl group being optionally substituted with substituents independently selected from:  
 1-2 cycloalkyl groups of 3-8 carbons, 1-6 halogen, 1-3 OH, 1-3  $\text{OR}^{10}$ , 1-2  $\text{Ar}^{11}$ ; cycloalkyl of 3-8 carbon atoms; or  $\text{Ar}^{11}$ ;  
 $R^{10}$  is alkyl of 1-3 carbon atoms;  
 $\text{Ar}^{11}$  is phenyl, naphthyl, pyrrolyl, furyl, thienyl, indolyl, benzofuryl, benzothienyl, pyridyl, pyrimidyl, quinolyl, or isoquinolyl, each of which may be substituted with 0-5 groups independently selected from the group consisting of:  
 H, halogen, OH, alkoxy of 1 to 3 carbon atoms,  $\text{NR}^{11}\text{R}^{12}$ , SH,  $\text{S(O)}_t\text{R}^{13}$ , where  $t$  is 0-2, haloalkyl of 1 to 3 carbon atoms and 1 to 7 halogen atoms, alkyl of 1 to 3 carbon atoms,  $\text{CO}_2\text{H}$ , carboalkoxy of 2 to 6 carbon atoms, CN,  $\text{NO}_2$ ,  $\text{SO}_2\text{NH}_2$ ,  $\text{SO}_3\text{H}$ ,  $\text{CO}_2\text{NR}^{14}\text{R}^{15}$ , or phenyl;  
 $R^{11}$ ,  $R^{12}$ ,  $R^{13}$ ,  $R^{14}$ , and  $R^{15}$  independently are H or alkyl of 1 to 3 carbon atoms; and  
 $R^{16}$  is H; alkyl of 1-12 carbons; 2- and 3- thienyl; or phenyl or 1- and 2- naphthyl said phenyl or naphthyl being optionally substituted with one or two substituents independently selected from the group consisting of: F, Cl, Br, I, alkyl, perfluoroalkyl, alkoxy;  
 with the proviso that when  $a$  is a single bond and  $(\text{CH}_2)_n\text{R}^2$  is attached at the 4 position of the piperidine ring, then  $R^{16}$  is not 2- and 3- thienyl.

## 5,480,893

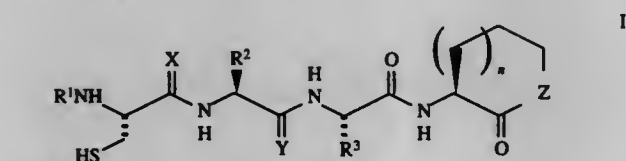
**INHIBITORS OF FARNESYL PROTEIN TRANSFERASE**  
 Samuel L. Graham, Schwenksville, and S. Jane deSolms, Norristown, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 768,798, Sep. 30, 1991, Pat. No. 5,340,828.  
 This application May 13, 1994, Ser. No. 242,575

The portion of the term of this patent subsequent to Jul. 5, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> A61K 31/44; 31/415; C07D 313/04

U.S. Cl. 514-336 12 Claims  
 1. A compound which inhibits farnesyl-protein transferase of the formula:



wherein:  
 $X$  and  $Y$  are independently  $\text{H}_2$  or O, provided that at least one of these is  $\text{H}_2$ ;  
 $R^1$  is an alkyl group, an acyl group, an alkylsulfonyl group or arylsulfonyl group, wherein the alkyl and the alkyl portion of the acyl is a straight chain or branched chain hydrocarbons of 1 to 6 carbon atoms, or in the alternative  $\text{R}^1\text{NH}$  may be absent;  
 $R^2$  and  $R^3$  are independently selected from:  
 a) a side chain of naturally occurring amino acids;  
 b) an aliphatic group selected from:  
 i) allyl,  
 ii) cyclohexyl, and  
 iii) a branched or unbranched saturated chain of 2 to 8 carbons;  
 wherein the aliphatic group is optionally substituted with an aromatic or heteroaromatic ring;

c) phenyl, and  
 d) a heteroaromatic group selected from pyridyl and imidazolyl;  
 $Z$  is O or S; and  
 $n$  is 0, 1 or 2;  
 or a pharmaceutically acceptable salt thereof.

## 5,480,894

**3-HYDROXYPYRIDIN-4-ONE DERIVATIVES AS CHELATING AGENTS**

Robert C. Hider, Clacton; Surinder Singh, West Croydon; Gary S. Tillbrook, Gerrards Cross, and Paul S. Dobbin, Colchester, all of England, assignors to British Technology Group Limited, London, United Kingdom

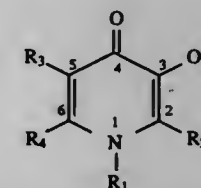
PCT No. PCT/GB93/01007, § 371 Date Mar. 7, 1994, § 102(e) Date Mar. 7, 1994, PCT Pub. No. WO94/04498, PCT Pub. Date Mar. 3, 1994

PCT Filed May 18, 1993, Ser. No. 204,202

Claims priority, application United Kingdom, Aug. 12, 1992, 9217099

Int. Cl.<sup>6</sup> C07D 211/74; A61K 31/44

U.S. Cl. 514-348 22 Claims  
 1. A compound being a 3-hydroxypyridin-4-one of formula (I)



in which  $R_1$  is a methyl, ethyl, 2-( $\alpha$ -methylpropionyloxy)ethyl or 2-pivaloyloxyethyl group and  $R_2$ ,  $R_3$  and  $R_4$  are each separately selected from hydrogen and methyl, ethyl, 2-( $\alpha$ -methylpropionyloxy)ethyl and 2-pivaloyloxyethyl groups with the provisos that (a) one only of  $R_1$  to  $R_4$  is either a 2-( $\alpha$ -methylpropionyloxy)ethyl group or a 2-pivaloyloxyethyl group, (b) at least one of  $R_2$  and  $R_3$  is other than hydrogen and (c) the total number of carbon atoms in  $R_1$  to  $R_4$  is no more than eleven, the compound optionally being in the form of a physiologically acceptable salt.

## 5,480,895

**METHOD OF PRODUCING ANTIBODIES TO A RESTRICTED POPULATION OF T LYMPHOCYTES, ANTIBODIES PRODUCED THEREFROM AND METHODS OF USE THEREOF**

Steven M. Friedman, Tenafly, N.J.; Mary K. Crow, and David Posnett, both of New York, N.Y., assignors to New York Society for the Relief of the Ruptured and Crippled, Maintaining the Hospital for Special Surgery, New York, N.Y.

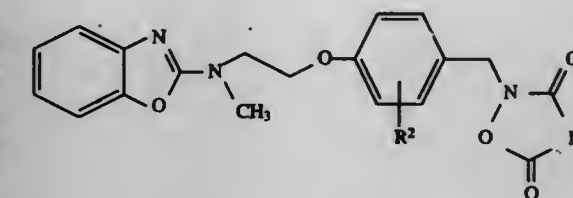
Filed Sep. 27, 1991, Ser. No. 766,751

Int. Cl.<sup>6</sup> G01N 33/577

U.S. Cl. 435-7.24 14 Claims  
 1. A method of obtaining polyclonal anti-T cell antibodies specific to a subset of T cells having common TCR V $\beta$  gene usage comprising the steps of:

- incubating T cells with an effective amount of a superantigen under conditions and for a time sufficient to allow division and growth of T cells reactive to the superantigen;
- injecting the incubated T cells from step (a) into a mammal; and
- removing blood from the mammal and isolating from said blood serum containing the antibodies from the mammal.

5,480,896  
**ARALKYL-1,2,4-OXADIAZOLIDINE-3,5-DIONES AS ANTIHYPERGLYCEMIC AGENTS**  
 Michael S. Malamas, Jamison, Pa.; Cynthia L. Palka, Bordentown, and Iwan Gunawan, Somerset, both of N.J., assignors to American Home Products Corporation, Madison, N.J.  
 Filed Jan. 27, 1994, Ser. No. 188,517  
 Int. Cl.<sup>6</sup> C07D 271/07; A61K 31/41  
 U.S. Cl. 514-364 2 Claims  
 1. A compound according to the formula:



wherein  
 $R^2$  is hydrogen or methyl; or a pharmaceutically acceptable salt thereof.

## 5,480,897

**ANILIDE DERIVATIVES AND THEIR USE FOR COMBATING BOTRYTIS**

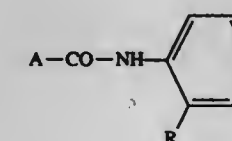
Karl Eicken, Wachenheim; Norbert Goetz, Worms; Albrecht Harreus, Ludwigshafen; Eberhard Ammermann, Heppenheim; Gisela Lorenz, Neustadt, and Harald Rang, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Division of Ser. No. 973,976, Nov. 9, 1992, Pat. No. 5,330,995.  
 This application Mar. 21, 1994, Ser. No. 215,463

Claims priority, application Germany, Nov. 22, 1991, 41 38 387.7; Feb. 18, 1992, 42 04 764.1; Feb. 18, 1992, 42 04 766.8; Feb. 18, 1992, 42 04 767.6; Feb. 18, 1992, 42 04 768.4

Int. Cl.<sup>6</sup> A01N 43/78; C07D 277/24; 277/28

U.S. Cl. 514-365 11 Claims  
 1. A method for treating Botrytis infestation comprising applying to a subject in need thereof, an effective amount of a compound of formula



wherein A has the following meaning:  
 thiazol-5-yl substituted in the 2- and 4-positions by hydrogen, methyl, chlorine or trifluoromethyl; and  
 $R$  has the following meanings: unsubstituted  $\text{C}_3\text{-C}_{12}$ -alkyl, unsubstituted  $\text{C}_3\text{-C}_{12}$ -alkenyl,  $\text{C}_3\text{-C}_6$ -alkynyl, unsubstituted  $\text{C}_3\text{-C}_{12}$ -alkenyloxy,  $\text{C}_3\text{-C}_{12}$ -alkynyloxy, unsubstituted or  $\text{C}_1\text{-C}_4$ -alkyl-substituted  $\text{C}_3\text{-C}_6$ -cycloalkyl, unsubstituted or  $\text{C}_1\text{-C}_4$ -alkyl-substituted  $\text{C}_3\text{-C}_6$ -cycloalkenyl, unsubstituted or  $\text{C}_1\text{-C}_4$ -alkyl substituted  $\text{C}_3\text{-C}_6$ -cycloalkyloxy, unsubstituted or  $\text{C}_1\text{-C}_4$ -alkyl substituted  $\text{C}_3\text{-C}_6$ -cycloalkenyloxy, or phenyl which is unsubstituted or substituted by  $\text{C}_1\text{-C}_4$ -alkyl,  $\text{C}_1\text{-C}_4$ -alkoxy,  $\text{C}_3\text{-C}_6$ -alkylthio or halogen;



in a suitable carrier.

5,480,898

# STORAGE-STABLE AQUEOUS SOLUTIONS OF ISOTHIAZOLIN-3-ONES

Wolfgang Lindner, Seelze, Germany, assignor to Riedel-de Haen Aktiengesellschaft, Seelze, Germany

Filed Nov. 7, 1994, Ser. No. 334,959

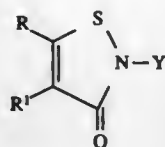
Claims priority, application Germany, Nov. 18, 1993, 43 39 248.2

Int. Cl.<sup>6</sup> A01N 43/80; C07D 275/03

U.S. Cl. 514—372

16 Claims

1. Storage-stable microbically active aqueous solution comprising from about 0.1 to about 50% by weight based on the total weight of the solution of one or more isothiazolin-3-ones of formula I



wherein

Y is hydrogen, (C<sub>1</sub>-C<sub>3</sub>)-alkyl, (C<sub>2</sub>-C<sub>18</sub>)-alkenyl, (C<sub>3</sub>-C<sub>12</sub>)-cycloalkyl or (C<sub>6</sub>-C<sub>10</sub>)-aryl, and R and R<sup>1</sup> independently of one another are hydrogen, halogen, (C<sub>1</sub>-C<sub>4</sub>)-alkyl or C<sub>4</sub>-alkenyl, or, together with the carbon atoms carrying the, form a 3- to 6-membered carbon ring which contains 1, 2 or 3 double bonds; and a stabilizing effective amount of a noble metal ion in an amount of up to about 1 g/kg of compound of the formula I.

5,480,899

# OXAZOLIDINE DERIVATIVES AND PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shingo Yano; Tomoyasu Ohno, both of Hannou; Kazuo Ogawa; Haruo Yamada, both of Iruma; Tetsuhiko Shirasaka, Kawagoe; Hiroyuki Kawamura, Ichikawa, and Shinichi Watanabe, Ohtsu, all of, Japan, assignors to Taiho Pharmaceutical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP93/00559, § 371 Date Dec. 21, 1993, § 102(e) Date Dec. 21, 1993, PCT Pub. No. WO93/22298, PCT Pub. Date Nov. 11, 1993

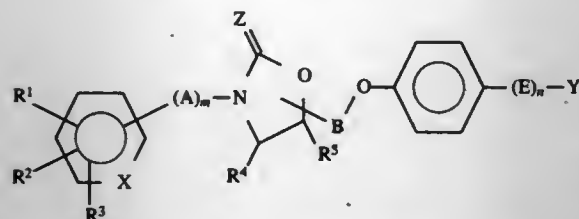
PCT Filed Apr. 28, 1993, Ser. No. 167,798

Claims priority, application Japan, Apr. 30, 1992, 4-111773 Int. Cl.<sup>6</sup> C07D 263/24; A61K 31/42

U.S. Cl. 514—376

11 Claims

1. An oxazolidine derivative represented by the formula (I)



wherein R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> are the same or different, and each represents a hydrogen atom, a lower straight- or branched-chain alkyl group optionally having one or more halogen atoms, a lower

alkoxy group optionally having one or more halogen atoms, a hydroxyl group, a halogen atom, a nitro group, an amino group optionally having one or more acetyl or lower alkyl groups, a carboxyl group, a lower alkoxy carbonyl group, a cyano group, a lower alkanoyl group or a 2-oxazolyl group, or R<sup>1</sup> and R<sup>2</sup> may be combined with each other to represent an alkylene chain —(CH<sub>2</sub>)<sub>p</sub>— or an alkylendioxy chain —O(CH<sub>2</sub>)<sub>q</sub>O— wherein p is 3, 4 or 5, q is 1, 2 or 3, thus forming a cyclic structure, m and n are each 0 or 1, R<sup>4</sup> and R<sup>5</sup> are the same or different and each represents a hydrogen atom or a lower alkyl group, X is a carbon atom, Y is a carboxy group, A is a lower alkylene group, a carbonyl group or a sulfonyl group, B is a lower alkylene group, E is a lower alkylene group which may be halogen-substituted or is a lower alkenylene group, Z is an oxygen atom or a sulfur atom, with the proviso that a compound wherein at least two of R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> represent a nitro group is excluded, and that a compound, wherein at least two of R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> represent a branched-chain alkyl group and the substitution positions of these branched-chain alkyl groups are adjacent to each other, is excluded; or a pharmaceutically acceptable salt thereof.

5,480,900

# COMBINATIONS OF PROSTAGLANDINS AND CLONIDINE DERIVATIVES FOR THE TREATMENT OF GLAUCOMA

Louis DeSantis, Jr., Fort Worth, and Verney L. Sallee, Southlake, both of Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation of Ser. No. 213,380, Mar. 14, 1994, abandoned, which is a continuation of Ser. No. 960,065, Oct. 13, 1992, abandoned. This application Apr. 10, 1995, Ser. No. 422,570 Int. Cl.<sup>6</sup> A61K 31/415; 31/215; 31/19

U.S. Cl. 514—392

20 Claims

1. A topical ophthalmic composition for the treatment of glaucoma, without significant inflammatory response, comprising a combination of a pharmaceutically effective amount of a prostaglandin and a pharmaceutically effective amount of a clonidine derivative.

5,480,901

# METHOD FOR REDUCING UNWANTED CELLULAR ADHESIONS

Margaret A. Baker, Philadelphia, and Betsy M. Ohlsson-Wilhelm, Berwyn, both of Pa., assignors to Zynaxis, Inc., Malvern, Pa.

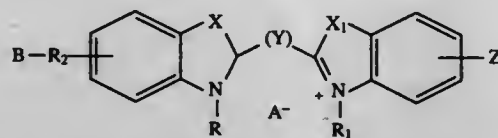
Filed Oct. 7, 1994, Ser. No. 320,189

Int. Cl.<sup>6</sup> A01N 43/38

U.S. Cl. 514—419

34 Claims

1. A method for reducing unwanted cell adhesion at a compromised site comprising treating said site with a composition comprising a conjugate of a drug and a cell binding agent, in an amount effective to inhibit attachment to said site of cells susceptible to unwanted adhesion, said conjugate having the formula:



wherein B represents a drug having an inhibitory effect on cell adhesion and R and R<sub>1</sub> in said cell binding agent represent hydrocarbon substituents having from 1 to about 30 carbon atoms;

X and X<sub>1</sub> in said cell binding agent may be the same or different and represent O, S, C(CH<sub>3</sub>)<sub>2</sub> or Se;

Y in said cell binding agent represents a linking group selected from —CR<sub>6</sub>—, —CR<sub>6</sub>—CR<sub>6</sub>—, —CR<sub>6</sub>—CR<sub>6</sub>—, —CR<sub>6</sub>—CR<sub>6</sub>—, or —CR<sub>6</sub>—CR<sub>6</sub>—

CR<sub>6</sub>—CR<sub>6</sub>—CR<sub>6</sub>—CR<sub>6</sub>—, wherein R<sub>6</sub> is selected from H, CH<sub>3</sub>, CH<sub>2</sub>CH<sub>3</sub>, CH<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub> or CH(CH<sub>3</sub>)<sub>2</sub>;

Z in said cell binding agent represents a substituent selected from the group H, alkyl, OH, —O— alkyl, COOH, CONH<sub>2</sub>, SO<sub>3</sub>H, SO<sub>2</sub>NH<sub>2</sub>, SH, S-alkyl, CONH-alkyl, CON-(alkyl)<sub>2</sub>, NH-acyl, NH-alkyl, N(alkyl)<sub>2</sub>, NO<sub>2</sub>, halogen, Si(alkyl)<sub>3</sub>, O—Si(alkyl)<sub>3</sub>, Sn(alkyl)<sub>3</sub> or —Hg— halogen, the alkyl groups comprising said Z substituent having from 1 to 4 carbon atoms;

R<sub>2</sub> represents a linking moiety which links said drug to said cell binding agent; and

A— represents a pharmaceutically acceptable anion.

5,480,902

# THIENYL PYRROLE FUNGICIDAL AGENTS

Roger W. Addor, Pennington; Joseph A. Furch, III, Lawrenceville, and Laurence A. Duncan, East Windsor, all of N.J., assignors to American Cyanamid Company, Wayne, N.J.

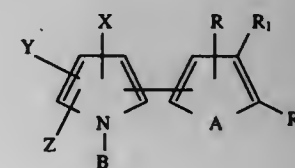
Filed Aug. 31, 1993, Ser. No. 114,810

Int. Cl.<sup>6</sup> A61K 31/38; 31/40; 31/415; 31/42

U.S. Cl. 514—422

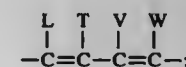
20 Claims

1. A method for control or amelioration of a disease caused by a phytopathogenic fungus which comprises contacting said fungus with a fungicidally effective amount of a compound having the structural formula



wherein

R, R<sub>1</sub> and R<sub>2</sub> are each independently hydrogen, halogen, NO<sub>2</sub> or CHO, and when R<sub>1</sub> and R<sub>2</sub> are taken together with the carbon atoms to which they are attached, they may form a ring in which R<sub>1</sub>R<sub>2</sub> is represented by the structure:



L, T, V and W are each independently hydrogen, halogen, CN or NO<sub>2</sub>;

A is S;

X is CN, NO<sub>2</sub>, C<sub>1</sub>-C<sub>6</sub> haloalkyl, S(O)<sub>m</sub>CF<sub>2</sub>R<sub>3</sub> or C(S)NR<sub>4</sub>R<sub>5</sub>;

R<sub>3</sub> is hydrogen, F, Cl, Br, C CCl<sub>3</sub>;

m is an integer of 0, 1 or 2;

R<sub>4</sub> and R<sub>5</sub> are each independently hydrogen,

C<sub>1</sub>-C<sub>4</sub> alkyl optionally substituted with one or more halogen atoms, or

phenyl optionally substituted with one or more halogen atoms,

NO<sub>2</sub> groups,

CN groups,

C<sub>1</sub>-C<sub>4</sub> alkyl groups optionally substituted with one or more halogen atoms, or

C<sub>1</sub>-C<sub>4</sub> alkoxy groups optionally substituted with one or more halogen atoms;

Y is hydrogen, halogen, C<sub>1</sub>-C<sub>6</sub> haloalkyl, S(O)<sub>m</sub>CF<sub>2</sub>R<sub>3</sub>, CN or phenyl optionally substituted with one or more halogen atoms,

NO<sub>2</sub> groups,

CN groups,

C<sub>1</sub>-C<sub>4</sub> alkyl groups optionally substituted with one or more halogen atoms, or

Cl-C<sub>4</sub> alkoxy groups optionally substituted with one or more halogen atoms;

Z is hydrogen, halogen or C<sub>1</sub>-C<sub>6</sub> haloalkyl;

B is R<sub>6</sub>, OR<sub>6</sub> or CN;

R<sub>6</sub> is hydrogen, C(O)R<sub>7</sub>, CHR<sub>8</sub>NHC(O)R<sub>9</sub>, CH<sub>2</sub>SO<sub>2</sub>, CHR<sub>10</sub>OC(O) (CR<sub>11</sub>R<sub>12</sub>)<sub>q</sub>Q<sub>1</sub>,

C<sub>1</sub>-C<sub>6</sub> alkyl optionally substituted with one to three halogen atoms,

one tri(C<sub>1</sub>-C<sub>4</sub> alkyl)silyl,

one hydroxy,

one cyano,

one or two C<sub>1</sub>-C<sub>4</sub> alkoxy groups optionally substituted with one to three halogen atoms,

one C<sub>1</sub>-C<sub>4</sub> alkylthio,

one phenyl optionally substituted with one to three halogen atoms, one to three C<sub>1</sub>-C<sub>4</sub> alkyl groups or one to three C<sub>1</sub>-C<sub>4</sub> alkoxy groups,

one phenoxy group optionally substituted with one to three halogen atoms, one to three C<sub>1</sub>-C<sub>4</sub> alkyl groups or one to three C<sub>1</sub>-C<sub>4</sub> alkoxy groups,

one benzoyloxy group optionally substituted on the phenyl ring with one to three halogen atoms, one to three C<sub>1</sub>-C<sub>4</sub> alkyl groups or one to three C<sub>1</sub>-C<sub>4</sub> alkoxy groups,

one C<sub>1</sub>-C<sub>6</sub> alkylcarbonyloxy group optionally substituted with one to three halogen atoms,

one C<sub>2</sub>-C<sub>6</sub> alkenylcarbonyloxy group optionally substituted with one to three halogen atoms,

one phenylcarbonyloxy group optionally substituted with one to three halogen atoms, one to three C<sub>1</sub>-C<sub>4</sub> alkyl groups or one to three C<sub>1</sub>-C<sub>4</sub> alkoxy groups,

one C<sub>1</sub>-C<sub>6</sub> alkoxy carbonyl group optionally substituted with one to three halogen atoms or one to three C<sub>1</sub>-C<sub>4</sub> alkoxy groups, or

one benzylcarbonyloxy group optionally substituted on the phenyl ring with one to three halogen atoms, one to three C<sub>1</sub>-C<sub>4</sub> alkyl groups or one to three C<sub>1</sub>-C<sub>4</sub> alkoxy groups,

C<sub>3</sub>-C<sub>6</sub> alkenyl optionally substituted with one to three halogen atoms or one phenyl group, or

C<sub>3</sub>-C<sub>6</sub> alkynyl optionally substituted with one to three halogen atoms or one phenyl group;

R<sub>7</sub> is C<sub>1</sub>-C<sub>6</sub> alkyl or C<sub>3</sub>-C<sub>6</sub> cycloalkyl each optionally substituted with one to three halogen atoms,

one hydroxy,

one cyano,

one or two C<sub>1</sub>-C<sub>4</sub> alkoxy groups optionally substituted with one to three halogen atoms,

one C<sub>1</sub>-C<sub>4</sub> alkylthio,

one phenyl group optionally substituted with one to three halogen atoms, one to three C<sub>1</sub>-C<sub>4</sub> alkyl groups or one to three C<sub>1</sub>-C<sub>4</sub> alkoxy groups,

one phenoxy group optionally substituted with one to three halogen atoms, one to three C<sub>1</sub>-C<sub>4</sub> alkyl groups or one to three C<sub>1</sub>-C<sub>4</sub> alkoxy groups,

one benzoyloxy group optionally substituted on the phenyl ring with one to three halogen atoms, one to three C<sub>1</sub>-C<sub>4</sub> alkyl groups or one to three C<sub>1</sub>-C<sub>4</sub> alkoxy groups,

one C<sub>1</sub>-C<sub>6</sub> alkylcarbonyloxy group optionally substituted with one to three halogen atoms,

one C<sub>2</sub>-C<sub>6</sub> alkenylcarbonyloxy group optionally substituted with one to three halogen atoms,

one phenylcarbonyloxy group optionally substituted with one to three halogen atoms, one to three C<sub>1</sub>-C<sub>4</sub> alkyl groups or one to three C<sub>1</sub>-C<sub>4</sub> alkoxy groups,

one C<sub>1</sub>-C<sub>6</sub> alkoxy carbonyl group optionally substituted with one to three halogen atoms or one to three C<sub>1</sub>-C<sub>4</sub> alkoxy groups, or

one benzylcarbonyloxy group optionally substituted on the phenyl ring with one to three halogen atoms, one to three C<sub>1</sub>-C<sub>4</sub> alkyl groups or one to three C<sub>1</sub>-C<sub>4</sub> alkoxy groups,

C<sub>3</sub>-C<sub>6</sub> alkenyl optionally substituted with one to three halogen atoms or one phenyl group,

C<sub>3</sub>-C<sub>6</sub> alkynyl optionally substituted with one to three halogen atoms or one phenyl group;

phenyl optionally substituted with one or more halogen atoms, C<sub>1</sub>-C<sub>4</sub> alkyl groups, C<sub>1</sub>-C<sub>4</sub> alkoxy groups, phenoxy groups, C<sub>1</sub>-C<sub>4</sub> alkylthio groups, tri(C<sub>1</sub>-C<sub>4</sub> alkyl)silyl



groups, C<sub>1</sub>-C<sub>4</sub> alkylsulfinyl groups, C<sub>1</sub>-C<sub>4</sub> alkylsulfonyl groups, CN groups, NO<sub>2</sub> groups or CF<sub>3</sub> groups, phenoxy optionally substituted with one or more halogen atoms, C<sub>1</sub>-C<sub>4</sub> alkyl groups, C<sub>1</sub>-C<sub>4</sub> alkoxy groups, C<sub>1</sub>-C<sub>4</sub> alkylthio groups, tri(C<sub>1</sub>-C<sub>4</sub> alkyl)silyl groups, C<sub>1</sub>-C<sub>4</sub> alkylsulfinyl groups, C<sub>1</sub>-C<sub>4</sub> alkylsulfonyl groups, CN groups, NO<sub>2</sub> groups or CF<sub>3</sub> groups, 1- or 2-naphthyl, 2-, 3-, or 4-pyridyl optionally substituted with one to three halogen atoms, C<sub>1</sub>-C<sub>6</sub> alkoxy optionally substituted with one to three halogen atoms, or C<sub>2</sub>-C<sub>6</sub> alkenyloxy optionally substituted with one to three halogen atoms;

R<sub>4</sub> is hydrogen or C<sub>1</sub>-C<sub>4</sub> alkyl;

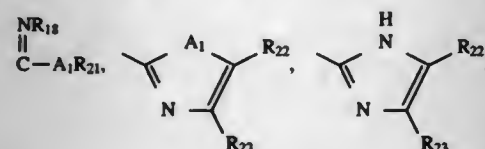
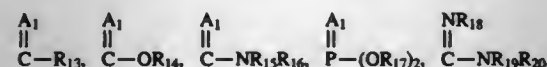
R<sub>5</sub> is C<sub>1</sub>-C<sub>6</sub> alkyl optionally substituted with one to three halogen atoms,

phenyl optionally substituted with one to three halogen atoms, CN groups, NO<sub>2</sub> groups, C<sub>1</sub>-C<sub>4</sub> alkyl groups, C<sub>1</sub>-C<sub>4</sub> alkoxy groups or CF<sub>3</sub> groups,

2- or 3-thienyl, or

2- or 3-furyl;

Q is



CN,

C<sub>1</sub>-C<sub>6</sub> alkyl optionally substituted with one or more halogen atoms, CN groups or phenyl groups, or phenyl optionally substituted with one or more halogen atoms, C<sub>1</sub>-C<sub>4</sub> alkyl groups, C<sub>1</sub>-C<sub>4</sub> alkoxy groups, CN groups, NO<sub>2</sub> groups, CF<sub>3</sub> groups or NR<sub>24</sub>R<sub>25</sub> groups;

A<sub>1</sub> is O or S;

R<sub>13</sub> is C<sub>1</sub>-C<sub>6</sub> alkyl or phenyl;

R<sub>14</sub> is C<sub>1</sub>-C<sub>6</sub> alkyl;

R<sub>15</sub> and R<sub>16</sub> are each independently hydrogen, C<sub>1</sub>-C<sub>6</sub> alkyl or may be taken together with the atom to which they are attached to form a 5- to 7-membered ring;

R<sub>17</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl;

R<sub>18</sub> is hydrogen, C<sub>1</sub>-C<sub>4</sub> alkyl or may be taken together with either R<sub>19</sub> or R<sub>21</sub> and the atoms to which they are attached to form a 5- to 7-membered ring optionally substituted with one or two C<sub>1</sub>-C<sub>4</sub> alkyl groups;

R<sub>19</sub> and R<sub>20</sub> are each independently hydrogen or C<sub>1</sub>-C<sub>4</sub> alkyl;

R<sub>21</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl or when taken together with R<sub>18</sub> and the atoms to which they are attached may form a 5- to 7-membered ring optionally substituted with one or two C<sub>1</sub>-C<sub>4</sub> alkyl groups;

R<sub>22</sub> and R<sub>23</sub> are each independently hydrogen or C<sub>1</sub>-C<sub>4</sub> alkyl or when taken together may form a ring wherein R<sub>22</sub>R<sub>23</sub> is represented by —CH=CH—CH=CH—;

R<sub>24</sub> and R<sub>25</sub> are each independently hydrogen or C<sub>1</sub>-C<sub>4</sub> alkyl;

R<sub>10</sub> is hydrogen or C<sub>1</sub>-C<sub>4</sub> alkyl;

R<sub>11</sub> and R<sub>12</sub> are each independently hydrogen,

C<sub>1</sub>-C<sub>6</sub> alkyl optionally substituted with one or more halogen atoms,

C<sub>1</sub>-C<sub>6</sub> alkoxy optionally substituted with one or more halogen atoms,

C<sub>1</sub>-C<sub>6</sub> alkylthio optionally substituted with one or more halogen atoms, or

phenyl optionally substituted with one or more halogen atoms,

NO<sub>2</sub> groups;

CN groups;

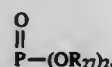
C<sub>1</sub>-C<sub>4</sub> alkyl groups optionally substituted with one or more halogen atoms, or

C<sub>1</sub>-C<sub>4</sub> alkoxy groups optionally substituted with one or more halogen atoms, or

when R<sub>11</sub> and R<sub>12</sub> are taken together with the atom to which they are attached may form a C<sub>3</sub>-C<sub>6</sub> cycloalkyl group optionally substituted with one to three C<sub>1</sub>-C<sub>4</sub> alkyl groups, C<sub>2</sub>-C<sub>6</sub> alkenyl groups or phenyl groups, or R<sub>11</sub> or R<sub>12</sub> may be taken together with R<sub>26</sub> and the atoms to which they are attached to form a 4- to 7-membered heterocyclic ring;

n is an integer of 0, 1, 2, 3 or 4;

Q<sub>1</sub> is A<sub>2</sub>R<sub>26</sub>.



NR<sub>28</sub>R<sub>29</sub>, CR<sub>30</sub>R<sub>31</sub>C(O)R<sub>32</sub>, or C<sub>3</sub>-C<sub>6</sub> cycloalkyl optionally substituted with one or more C<sub>1</sub>-C<sub>6</sub> alkyl groups,

C<sub>2</sub>-C<sub>6</sub> alkenyl groups, or phenyl groups optionally substituted with one or more halogen atoms,

NO<sub>2</sub> groups,

CN groups,

C<sub>1</sub>-C<sub>4</sub> alkyl groups optionally substituted with one or more halogen atoms, or

C<sub>1</sub>-C<sub>4</sub> alkoxy groups optionally substituted with one or more halogen atoms;

A<sub>2</sub> is O or S(O)<sub>p</sub>;

p is an integer of 0, 1 or 2;

R<sub>26</sub> is hydrogen,

C<sub>1</sub>-C<sub>6</sub> alkyl

C<sub>2</sub>-C<sub>6</sub> alkenyl,

C<sub>2</sub>-C<sub>6</sub> alkynyl,

phenyl optionally substituted with one or more halogen atoms,

NO<sub>2</sub> groups,

CN groups,

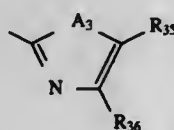
C<sub>1</sub>-C<sub>4</sub> alkyl groups optionally substituted with one or more halogen atoms,

C<sub>1</sub>-C<sub>4</sub> alkoxy groups optionally substituted with one or more halogen atoms,

C(O)R<sub>33</sub> provided p is O,

C(O)R<sub>34</sub> provided p is O,

(CH<sub>2</sub>CH<sub>2</sub>O)<sub>4</sub>R<sub>33</sub>, or



R<sub>26</sub> may be taken together with either R<sub>11</sub> or R<sub>12</sub> and the atoms to which they are attached to form a 4- to 7-membered heterocyclic ring;

A<sub>3</sub> is O or S;

R<sub>33</sub> is C<sub>1</sub>-C<sub>6</sub> alkyl,

C<sub>2</sub>-C<sub>6</sub> alkenyl,

C<sub>2</sub>-C<sub>6</sub> alkynyl, or

phenyl optionally substituted with one or more halogen atoms,

NO<sub>2</sub> groups,

CN groups,

C<sub>1</sub>-C<sub>4</sub> alkyl groups optionally substituted with one or more halogen atoms, or

C<sub>1</sub>-C<sub>4</sub> alkoxy groups optionally substituted with one or more halogen atoms;

q is an integer of 1, 2 or 3;

R<sub>34</sub> is OR<sub>37</sub> or NR<sub>38</sub>R<sub>39</sub>;

R<sub>37</sub> is C<sub>1</sub>-C<sub>6</sub> alkyl or phenyl optionally substituted with one or more halogen atoms,

NO<sub>2</sub> groups,

CN groups,

C<sub>1</sub>-C<sub>4</sub> alkyl groups optionally substituted with one or more halogen atoms, or

C<sub>1</sub>-C<sub>4</sub> alkoxy groups optionally substituted with one or more halogen atoms;

R<sub>38</sub> and R<sub>39</sub> are each independently hydrogen or C<sub>1</sub>-C<sub>4</sub> alkyl; R<sub>35</sub> and R<sub>36</sub> are each independently hydrogen or C<sub>1</sub>-C<sub>4</sub> alkyl, or when taken together may form a ring wherein R<sub>35</sub>R<sub>36</sub> is represented by —CH=CH—CH=CH—;

R<sub>27</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl;

R<sub>28</sub> is hydrogen,

C<sub>1</sub>-C<sub>6</sub> alkyl,

C<sub>2</sub>-C<sub>6</sub> alkenyl,

C<sub>2</sub>-C<sub>6</sub> alkynyl, or

phenyl optionally substituted with one or more halogen atoms,

NO<sub>2</sub> groups,

CN groups,

C<sub>1</sub>-C<sub>4</sub> alkyl groups optionally substituted with one or more halogen atoms, or

C<sub>1</sub>-C<sub>4</sub> alkoxy groups optionally substituted with one or more halogen atoms, or

R<sub>28</sub> may be taken together with either R<sub>11</sub> or R<sub>12</sub> and the atoms to which they are attached to form a 4- to 7-membered heterocyclic ring;

R<sub>29</sub> is hydrogen,

C<sub>1</sub>-C<sub>6</sub> alkyl,

C<sub>2</sub>-C<sub>6</sub> alkenyl,

C<sub>2</sub>-C<sub>6</sub> alkynyl,

phenyl optionally substituted with one or more halogen atoms,

NO<sub>2</sub> groups,

CN groups,

C<sub>1</sub>-C<sub>4</sub> alkyl groups optionally substituted with one or more halogen atoms, or

C<sub>1</sub>-C<sub>4</sub> alkoxy groups optionally substituted with one or more halogen atoms,

C(A<sub>4</sub>)R<sub>40</sub>,

CN,

SO<sub>2</sub>R<sub>41</sub>, or

C(O)CHR<sub>42</sub>NHR<sub>43</sub>;

A<sub>4</sub> is O or S;

R<sub>40</sub> is OR<sub>44</sub>, CO<sub>2</sub>R<sub>44</sub>, NR<sub>45</sub>R<sub>46</sub>,

C<sub>1</sub>-C<sub>6</sub> alkyl optionally substituted with one to three halogen atoms,

C<sub>2</sub>-C<sub>6</sub> alkenyl,

C<sub>2</sub>-C<sub>6</sub> alkynyl, or

phenyl optionally substituted with one or more halogen atoms,

NO<sub>2</sub> groups,

CN groups,

C<sub>1</sub>-C<sub>4</sub> alkyl groups optionally substituted with one or more halogen atoms, or

C<sub>1</sub>-C<sub>4</sub> alkoxy groups optionally substituted with one or more halogen atoms;

R<sub>44</sub> is C<sub>1</sub>-C<sub>6</sub> alkyl optionally substituted with one phenyl group, or

phenyl optionally substituted with one or more halogen atoms,

NO<sub>2</sub> groups,

CN groups,

C<sub>1</sub>-C<sub>4</sub> alkyl groups optionally substituted with one or more halogen atoms, or

C<sub>1</sub>-C<sub>4</sub> alkoxy groups optionally substituted with one or more halogen atoms;

R<sub>45</sub> and R<sub>46</sub> are each independently hydrogen or C<sub>1</sub>-C<sub>4</sub> alkyl;

R<sub>41</sub> is NR<sub>47</sub>R<sub>48</sub>,

C<sub>1</sub>-C<sub>6</sub> alkyl,

C<sub>2</sub>-C<sub>6</sub> alkenyl,

C<sub>2</sub>-C<sub>6</sub> alkynyl, or

phenyl optionally substituted with one or more halogen atoms,

NO<sub>2</sub> groups,

CN groups,

C<sub>1</sub>-C<sub>4</sub> alkyl groups optionally substituted with one or more halogen atoms, or

C<sub>1</sub>-C<sub>4</sub> alkoxy groups optionally substituted with one or more halogen atoms;

R<sub>47</sub> and R<sub>48</sub> are each independently hydrogen or C<sub>1</sub>-C<sub>4</sub> alkyl;

R<sub>42</sub> is hydrogen,

C<sub>1</sub>-C<sub>4</sub> alkyl optionally substituted with one hydroxy group,

one SR<sub>49</sub> group,

one C(O)NH<sub>2</sub> group,

one NH<sub>2</sub> group,

one NHC(=NH)NH<sub>2</sub> group,

one CO<sub>2</sub>H group,

one phenyl group optionally substituted with one hydroxy group,

one 3-indolyl group or

one 4-imidazolyl group;

R<sub>49</sub> is hydrogen or C<sub>1</sub>-C<sub>4</sub> alkyl;

R<sub>43</sub> is C(A<sub>4</sub>)R<sub>50</sub>;

R<sub>50</sub> is C<sub>1</sub>-C<sub>6</sub> alkyl optionally substituted with one or more halogen atoms,

C<sub>1</sub>-C<sub>6</sub> alkoxyalkyl,

C<sub>1</sub>-C<sub>6</sub> alkylthio,

phenyl optionally substituted with one or more halogen atoms,

NO<sub>2</sub> groups,

CN groups,

C<sub>1</sub>-C<sub>4</sub> alkyl groups optionally substituted with one or more halogen atoms, or

C<sub>1</sub>-C<sub>4</sub> alkoxy groups optionally substituted with one or more halogen atoms,

OR<sub>44</sub>,

CO<sub>2</sub>R<sub>44</sub> or

NR<sub>45</sub>R<sub>46</sub>;

R<sub>30</sub> and R<sub>31</sub> are each independently hydrogen,

C<sub>1</sub>-C<sub>6</sub> alkyl optionally substituted with one or more halogen atoms,

C<sub>1</sub>-C<sub>6</sub> alkoxy optionally substituted with one or more halogen atoms,

C<sub>1</sub>-C<sub>6</sub> alkylthio optionally substituted with one or more halogen atoms,

phenyl optionally substituted with one or more halogen atoms,

CN groups,

NO<sub>2</sub> groups,

C<sub>1</sub>-C<sub>4</sub> alkyl groups optionally substituted with one or more halogen atoms, or

C<sub>1</sub>-C<sub>4</sub> alkoxy groups optionally substituted with one or more halogen atoms, or

when R<sub>30</sub> and R<sub>31</sub> are taken together with the atom to which they are attached may form a C<sub>3</sub>-C<sub>6</sub> cycloalkyl group optionally substituted with one to three C<sub>1</sub>-C<sub>4</sub> alkyl groups,

C<sub>2</sub>-C<sub>6</sub> alkenyl groups or phenyl groups;

R<sub>32</sub> is OR<sub>51</sub>, NR<sub>47</sub>R<sub>48</sub>, C<sub>1</sub>-C<sub>4</sub> alkyl or phenyl optionally substituted with one or more halogen atoms,

CN groups,

NO<sub>2</sub> groups,

C<sub>1</sub>-C<sub>4</sub> alkyl groups optionally substituted with one or more halogen atoms, or

C<sub>1</sub>-C<sub>4</sub> alkoxy groups optionally substituted with one or more halogen atoms; and

R<sub>51</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl or phenyl optionally substituted with one or more halogen atoms,

CN groups,

NO<sub>2</sub> groups,

C<sub>1</sub>-C<sub>4</sub> alkyl groups optionally substituted with one or more halogen atoms, or

C<sub>1</sub>-C<sub>4</sub> alkoxy groups optionally substituted with one or more halogen atoms;

provided that when X is S(O)<sub>m</sub>CF<sub>2</sub>R<sub>3</sub> and Z is hydrogen, then Y is hydrogen, halogen, C<sub>1</sub>-C<sub>6</sub> haloalkyl, S(O)<sub>m</sub>CF<sub>2</sub>R<sub>3</sub> or CN; and further provided that when the pyrrole ring is substituted with hydrogen at each of the pyrrole carbon atoms adjacent to the ring nitrogen atom, then X cannot be CN or NO<sub>2</sub>.



5,480,903

## 3,4-DIARYLCHROMANS FOR INHIBITING CALMODULIN ACTIVITY

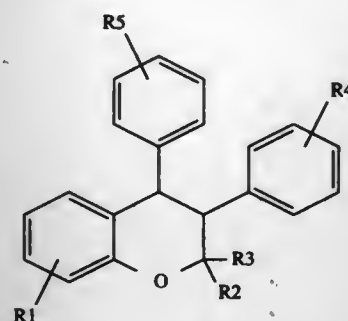
James R. Piggott, Bothell, Wash., assignor to ZymoGenetics, Inc., Seattle, Wash.

Continuation of Ser. No. 29,739, Mar. 11, 1993. This application Apr. 17, 1994, Ser. No. 423,594  
Int. Cl.<sup>6</sup> A61K 31/35; 31/40

U.S. Cl. 514—422

8 Claims

1. A method for inhibiting calmodulin activity in a patient comprising administering to a patient a compound of the formula



or a pharmaceutically acceptable salt thereof wherein:

R1, R4 and R5 are individually hydrogen, hydroxy, halo, trifluoromethyl, lower alkyl, lower alkoxy or tertiary amino lower alkoxy; and

R2 and R3 are individually hydrogen or lower alkyl, in combination with a pharmaceutically acceptable carrier, in an amount sufficient to inhibit calmodulin activity.

5,480,904

## METHODS FOR INHIBITING UTERINE FIBROSIS

Henry U. Bryant, and Timothy A. Grese, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

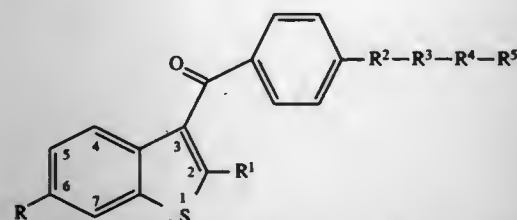
Filed Oct. 28, 1993, Ser. No. 145,016

Int. Cl.<sup>6</sup> A61K 31/38

U.S. Cl. 514—443

9 Claims

1. A method of inhibiting uterine fibrosis comprising administering to a human in need of treatment an effective amount of a compound having the formula

wherein R is hydrogen; hydroxy; C<sub>1</sub>-C<sub>6</sub> alkoxy; a group of the formula —O—C(O)—R<sup>a</sup>, wherein R<sup>a</sup> is hydrogen, C<sub>1</sub>-C<sub>6</sub> alkyl optionally substituted with amino, halo, carbonyl, C<sub>1</sub>-C<sub>6</sub> alkoxy, carbonyl, C<sub>1</sub>-C<sub>7</sub> alkanoyloxy, carbamoyl and/or aryl; or R<sup>a</sup> is C<sub>1</sub>-C<sub>6</sub> alkenyl optionally substituted with aryl; or R<sup>a</sup> is a C<sub>3</sub>-C<sub>7</sub> cycloalkyl; or R<sup>a</sup> is aryl optionally substituted with hydroxy, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy, and/or halo; or R<sup>a</sup> is —O-aryl, said aryl optionally substituted with hydroxy C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy, and/or halo;or R is a group of the formula —O—SO<sub>2</sub>—R<sup>b</sup> wherein R<sup>b</sup> may be C<sub>1</sub>-C<sub>6</sub> alkyl or aryl optionally substituted with C<sub>1</sub>-C<sub>6</sub> alkyl;or R is carbamoyloxy wherein the nitrogen may be substituted once or twice with C<sub>1</sub>-C<sub>6</sub> alkyl;or R is a group of the formula —O—C(O)R<sup>c</sup>—O—(C<sub>1</sub>-C<sub>6</sub> alkyl) wherein R<sup>c</sup> is a bond or C<sub>1</sub>-C<sub>6</sub> alkanediyl;R<sup>1</sup> is halo, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>7</sub> alkyl substituted with C<sub>1</sub>-C<sub>6</sub> alkyl, substituted or unsubstituted C<sub>3</sub>-C<sub>7</sub> cycloalkyl, or substituted or unsubstituted C<sub>3</sub>-C<sub>7</sub> cycloalkenyl;R<sup>2</sup> is O or CH<sub>2</sub>;R<sup>3</sup> is CH<sub>2</sub> or (CH<sub>2</sub>)<sub>2</sub>;R<sup>4</sup> isCH<sub>2</sub>, or a bond; andR<sup>5</sup> is amino, nitrilo optionally substituted once or twice with C<sub>1</sub>-C<sub>6</sub> alkyl; or an N-heterocyclic ring which optionally has another hetero atom selected from N, O, or S in said ring; or a pharmaceutically acceptable salt or solvate thereof.

5,480,905

## BENZODIOXANE DERIVATIVES

Akira Koda; Tatsuo Miyachi; Yoshitake Kanbe, and Hirokazu Hamada, all of Shizuoka, Japan, assignors to Chugai Selyaku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 75,490, Jun. 21, 1993, abandoned.

This application Jan. 6, 1995, Ser. No. 369,924

Claims priority, application Japan, Jan. 22, 1991, 3-274036; Apr. 27, 1992, 4-107570; Jan. 16, 1992, 4-278776

Int. Cl.<sup>6</sup> A61K 31/335; C07D 319/16

U.S. Cl. 514—452

12 Claims

1. A compound of N-[[2-(8-methyl-1,4-benzodioxan-2-ylmethyl)amino]ethyl]tricyclo[3,3,1,1<sup>3</sup>, 7] decane-1-carboxamide or a salt thereof.

5,480,906

## STEREOCHEMICAL WORTMANNIN DERIVATIVES

Lawrence C. Creemer, and Herbert A. Kirst, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

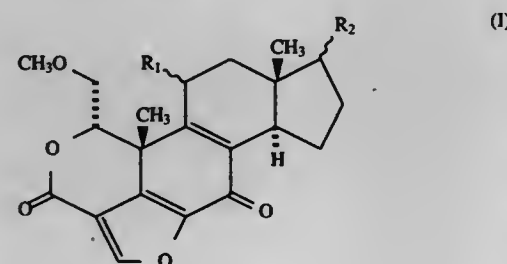
Filed Jul. 1, 1994, Ser. No. 269,716

Int. Cl.<sup>6</sup> A61K 31/365; C07D 311/78

U.S. Cl. 514—453

35 Claims

1. A compound of the formula:



wherein:

R<sub>1</sub> isor OR<sub>3</sub>;

5,480,908

β<sub>3</sub>-ADRENERGIC AGENTS BENZODIOXOLE DICARBOXYLATES AND THEIR USE IN PHARMACEUTICAL COMPOSITIONS

Joseph W. Epstein; Gary H. Birnberg, both of Monroe; Minn D. Dutia, West Nyack, all of N.Y.; Thomas H. Claus, Montvale, N.J., and Elwood E. Largis, Nanuet, N.Y., assignors to American Cyanamid Company, Pearl River, N.Y.

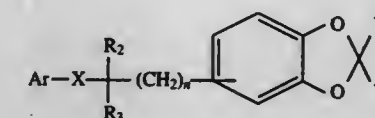
Filed Dec. 13, 1993, Ser. No. 166,115

Int. Cl.<sup>6</sup> A61K 31/36; C07D 317/46

U.S. Cl. 514—465

6 Claims

1. A compound of the formula:

R<sub>2</sub> isor OR<sub>3</sub>;each R<sub>3</sub> individually is hydrogen, arylacyl, C<sub>3</sub>-C<sub>8</sub> acyl or substituted acyl; and when R<sub>1</sub> isor OH, R<sub>2</sub> is notwherein: Ar is naphth-(1 or 2)-yl; substituted naphth-(1 or 2)-yl wherein the substitution is straight or branched (C<sub>1</sub>-C<sub>6</sub>) alkyl, bromo, chloro, fluoro, iodo (C<sub>1</sub>-C<sub>6</sub>)alkoxy, difluoromethyl or trifluoromethyl; 1,2,3,4-tetrahydro-(5 or 6)-naphthyl; substituted 1,2,3,4-tetrahydro-(5 or 6)-naphthyl where the substitution is hydrogen, straight or branched (C<sub>1</sub>-C<sub>6</sub>) alkyl, bromo, chloro, fluoro, iodo, (C<sub>1</sub>-C<sub>6</sub>) alkoxy, difluoromethyl or trifluoromethyl; R<sub>2</sub> and R<sub>3</sub> are (C<sub>1</sub>-C<sub>4</sub>)alkyl; n is an integer from 0-3; Y is hydrogen; —CO<sub>2</sub>R<sub>8</sub> wherein R<sub>8</sub> is hydrogen, straight or branched (C<sub>1</sub>-C<sub>10</sub>)alkyl; or CONR<sub>9</sub>R<sub>10</sub> wherein R<sub>9</sub> and R<sub>10</sub> are hydrogen, straight or branched (C<sub>1</sub>-C<sub>10</sub>) alkyl, or methoxymethyl; with the proviso that only one Y may be hydrogen; X is a divalent radical;

5,480,907

## AROMATIC AMIDE COMPOUNDS AND THEIR PRODUCTION AND USE

Kyoza Hayashi, and Munekazu Inuma, both of Gifu, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed May 13, 1992, Ser. No. 882,025

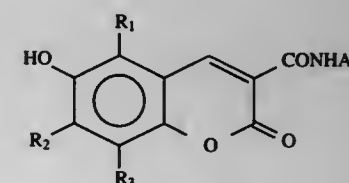
Claims priority, application Japan, May 16, 1991, 3-111973

Int. Cl.<sup>6</sup> A61K 31/35

U.S. Cl. 514—457

10 Claims

1. A compound of the formula

wherein R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are independently hydrogen, a lower alkyl or lower alkoxy group and Ar is an aromatic group of 6-10 carbon atoms which is unsubstituted or is substituted by halogen, hydroxy, lower alkyl, lower alkoxy or nitro or a pharmaceutically acceptable salt thereof.

5,480,909

## METHOD FOR INHIBITING GENERATION OF FREE-RADICALS

Ronald T. Stanko, Pittsburgh, Pa., assignor to University of Pittsburgh Medical Center, Pittsburgh, Pa.

Filed Aug. 8, 1994, Ser. No. 286,946

Int. Cl.<sup>6</sup> A61K 31/19; 31/40; 31/195

U.S. Cl. 514—557

7 Claims

1. The method for inhibiting free-radical generation and concurrently scavenging internally generated-free radicals in a mammal in need thereof comprising administering to said mammal a therapeutically effective quantity of pyruvate.







Component (D) from 0.1–5% by weight, based on the total weight of monomers (A) and (B), of a polymerization initiator using the action of ultraviolet radiation.

5,480,918

## INITIATOR FOR PHOTOPOLYMERIZATION

Yusuke Sasaki, Shintone, Japan, assignor to Antex, Inc., Japan Division of Ser. No. 919,016, Jul. 23, 1992, Pat. No. 5,389,700.

This application Oct. 14, 1994, Ser. No. 323,519

Claims priority, application Japan, Jan. 30, 1991, 3-310048

Int. Cl.<sup>6</sup> C08F 2/46

U.S. Cl. 522—64

7 Claims

1. A method for photopolymerization of cationically polymerizable organic material, comprising exposing said cationically polymerizable organic material to light in the presence of an initiator, wherein said initiator is a composite obtainable from a reaction between:

- a charge-transfer complex; and
- 0.1–2 equivalents per stoichiometric amount of said charge-transfer complex of at least one salt selected from the group consisting of sodium, potassium and silver salts of tetrafluoroborates, hexafluorophosphates and hexafluoroantimonates; wherein said charge transfer complex is obtained by reacting in the presence of a good affinity solvent;
- a biscyclopentadienyl iron compound wherein said biscyclopentadienyl iron compound has a general formula



wherein R and R' are straight or branched, saturated or unsaturated alkyl groups, substituted or non-substituted aryl groups, carboxyl groups, nitril groups, or amino groups, n and m are integers ranging from 0 to 5; with

- 0.1–2 equivalents per stoichiometric amount of said biscyclopentadienyl compound of a quinoid.

5,480,919

## FUNCTIONAL POLYORGANOSILOXANE EMULSIONS FROM MONOHYDROLYZABLE SILANES AND PHOTO CURABLE COMPOSITIONS THEREFROM

Donald T. Liles, and David L. Murray, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 268,349, Jun. 30, 1994, Pat. No. 5,449,716. This application Oct. 28, 1994, Ser. No. 330,891

Int. Cl.<sup>6</sup> C08K 5/34

U.S. Cl. 522—86

18 Claims

- A non-crosslinked polymer emulsion obtained by mixing:
  - a preformed aqueous polydiorganosiloxane emulsion comprising water, a surfactant, and a plurality of silanol-terminated polydiorganosiloxane molecules;
  - a functionalizing moiety selected from the group consisting essentially of
    - a silane having the formula:



- partial hydrolysis products of (i),
- condensation products of (ii), and
- mixtures of (i), (ii), and (iii);

where

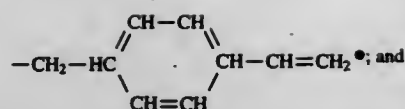
X is a hydrolyzable group,

Q is selected from the group consisting of an acryloxypropyl, methacryloxypropyl, vinyl, allyl, chloroalkyl, hexenyl, acrylamidopropyl, trifluoropropyl, glycidopropyl, cyanoalkyl, mercaptoalkyl, a group represented by the formula



and a group of the formula  $HCl \cdot ZN(H)-CH_2CH_2-N(H)-CH_2CH_2CH_2-$ ,

wherein Z is



and

R is a saturated monovalent hydrocarbon group of from one to six carbon atoms, n is 1, 2, or 3; and (C) an organotin catalyst.

5,480,920

## OZONE-FRIENDLY CORRECTION FLUID

Mahendra K. Sharma; Suzanne W. Dobbe, and John J. Hiller, all of Kingsport, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

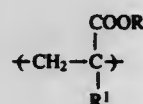
Filed Aug. 12, 1994, Ser. No. 289,455

Int. Cl.<sup>6</sup> C09D 11/10

U.S. Cl. 523—161

12 Claims

- An ozone-friendly correction fluid having a solids content of 50 to 80 percent comprising:
  - 5 to 20 weight percent of an acrylic polymer having repeating units of the formula:



wherein R is selected from the group consisting of hydrogen and an alkyl group having 1 to 20 carbon atoms, and R<sup>1</sup> is selected from the group consisting of hydrogen and methyl, provided the acrylic polymer has a weight average molecular weight less than 40,000;

- 20 to 60 weight percent an opacifying pigment; and
- 15 to 25 weight percent of acetone.

5,480,921

## PROCESS FOR PREPARING NOVEL HIGH SOLIDS NON-AQUEOUS POLYMER COMPOSITIONS

Wood E. Hunter, Pittsburgh; Kevin W. Frederick, Wexford, and Randy J. Loeffler, Carnegie, all of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

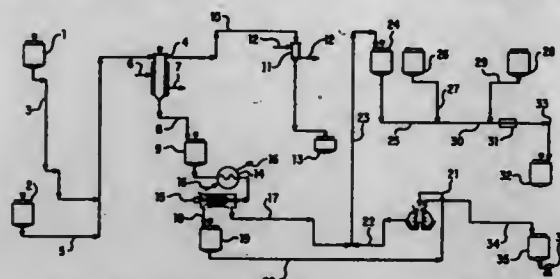
Continuation of Ser. No. 993,738, Dec. 21, 1992, abandoned.

This application Sep. 1, 1994, Ser. No. 299,689

Int. Cl.<sup>6</sup> C08K 5/01; C08L 33/02; 33/26; C08J 9/28

U.S. Cl. 523—331

16 Claims



- A method for preparing a pourable, concentrated water soluble polymer/emulsifying surfactant/hydrophobic liquid composition from a starting water-in-oil polymer composition comprising a water soluble polymer, one or more emulsifying surfactants, water and a hydrophobic liquid, which method comprises: a) dehydrating said starting water-in-oil polymer composition in a

falling film evaporator to form a dehydrated water soluble polymer/emulsifying surfactant/hydrophobic liquid composition, and b) treating said dehydrated water soluble polymer/emulsifying surfactant/hydrophobic liquid composition in a centrifuge to remove some portion of a said hydrophobic liquid therefrom, thereby producing a centrifuge raffinate and a pourable concentrated water soluble polymer/emulsifying surfactant/hydrophobic liquid composition containing less than about 5%, based on total composition weight, of water and greater than about 60%, based on total composition weight, of polymer, wherein said polymer is prepared from an ethylenically unsaturated monomer or monomers.

5,480,922

## PLASTICIZED CELLULOSE ACETATE, PROCESS FOR ITS PRODUCTION AND ITS USE FOR PRODUCING FILAMENTS

Rolf Mülhaupt, Freiburg; Joachim Schätzle, Kenzingen, and Holger Warth, Freiburg, all of Germany, assignors to Rhone-Poulenc Rhodia Aktiengesellschaft, Freiburg, Germany

Filed Jul. 27, 1994, Ser. No. 281,416

Claims priority, application Germany, Jul. 28, 1993, 43 25 352.0

Int. Cl.<sup>6</sup> C08L 1/12; C08J 3/18; C08B 3/22; D01F 2/30

U.S. Cl. 524—41

22 Claims

- A plasticized cellulose acetate which comprises a mixture of component A and component B, said component A being a modified cellulose acetate, said modified cellulose acetate being cellulose acetate grafted with an oligomer A1 of a cyclic ester, said cyclic ester being a lactone having 3 to 6 carbon atoms and one or two oxygen atoms in the ring, said component B being a plasticizing agent, said plasticizing agent being an oligomer B1 of said cyclic ester, said oligomer B1 having a terminal carboxyl group, said terminal carboxyl group being esterified with a member selected from the group consisting of a monohydroxy alcohol, a polyhydroxy alcohol and an alcohol derivative, said alcohol derivative being a polyhydroxy alcohol containing one or more free hydroxyl groups and one or more alkoxy groups, said monohydroxy alcohol, said polyhydroxy alcohol and said alcohol derivative each having a boiling point of at least 120° C. or a melting point up to 180° C., the ratio of weight of said component A and said component B being according to the formula (1)

$$3 \leq A/(A+B) \leq 95 \text{ (1)}$$

5,480,923

## THERMOPLASTICALLY PROCESSIBLE COMPOSITION OF STARCH ACRYLATE COPOLYMERS

Eduard Schmid, Bonaduz; Friedrich S. Buehler, Thusis, and Hans-Joachim Schultze, Chur, all of Switzerland, assignors to EMS-Inventa AG, Switzerland

Continuation of Ser. No. 908,321, Jul. 2, 1992, abandoned.

This application Aug. 12, 1994, Ser. No. 289,835

Claims priority, application Germany, Jul. 4, 1991, 41 22 212.1

Int. Cl.<sup>6</sup> C08L 3/00; 89/00; 3/04

U.S. Cl. 524—47

49 Claims

- A thermoplastically processible melt composition comprising as melt components,
  - destructured, at least partly chemically modified, starch;
  - 1% to 15%, based on (a) and (b), of at least one acrylate copolymer having a molecular weight of more than 400,000;
  - 2% to 15%, based on (a) to (d), of total water; and
  - at least 5%, based on (a) to (d), of an additive taken from the class consisting of plasticizers and lubricants.

5,480,924

## CONDUCTIVE POLYMER DOPED BY A SULPHONATED CYCLODEXTRIN SALT AND DEVICE FOR OBTAINING AND/OR SUPPLYING AN ACTIVE SUBSTANCE INCORPORATING SAID POLYMER

Eric Vieil, Meylan; Gérard Bidan, Grenoble; Andrée Gadelle, Montbonnot, and Maria-Fatima Mendes-Viegas, Lyons, all of France, assignors to Commissariat à l'Energie Atomique, Paris, France

Filed May 19, 1994, Ser. No. 246,125

Claims priority, application France, Jun. 3, 1993, 93 06655

Int. Cl.<sup>6</sup> C08L 3/02

U.S. Cl. 524—48

10 Claims

- Electrically conductive polymer doped by a dopant, characterized in that the dopant is a cyclodextrin having at least one sulphonate group.

5,480,925

## SELF-FADING COLOR ADHESIVE

Hisao Masuzaki, and Shinji Sugii, both of Tokyo, Japan, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

PCT No. PCT/US92/09828, § 371 Date Jul. 20, 1994, § 102(e) Date Jul. 20, 1994, PCT Pub. No. WO93/09197, PCT Pub. Date May 13, 1993

PCT Filed Nov. 6, 1992, Ser. No. 211,285

Claims priority, application Japan, Nov. 8, 1991, 3-293470

Int. Cl.<sup>6</sup> C08K 5/13; 5/34

U.S. Cl. 524—86

5 Claims

- A sprayable, self-fading color adhesive comprising the following four components:
  - clear or slightly colored adhesive dissolved in an organic solvent,
  - basic material which readily volatilizes at ambient temperatures,
  - acid-base indicator which is colored in a basic environment and fades to clear upon drying, and
  - spraying agent.

5,480,926

## BLENDS OF ULTRAVIOLET ABSORBERS AND POLYESTERS

David R. Fagerburg, Kingsport, and Michael E. Donelson, Gray, both of Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

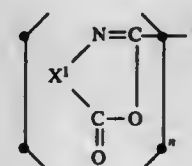
Filed Apr. 28, 1995, Ser. No. 430,662

Int. Cl.<sup>6</sup> C08K 5/34

U.S. Cl. 524—86

18 Claims

- A photo-stabilized polymer blend comprising:
  - at least one polyethylene terephthalate-based copolymer comprising 1,4-cyclohexane-dimethanol, and
  - an ultraviolet absorber, at least one compound selected from the group consisting of cyclic imino esters represented by the following formula (1)

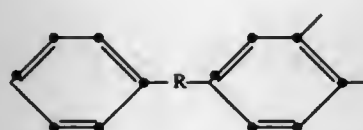


wherein X<sup>1</sup> represents 1,2-phenylene, 1,2-naphthylene, 2,3-naphthylene, a group represented by the formula (a)





wherein R is —O—, —CO—, —S—, —SO<sub>2</sub>—, —CH<sub>2</sub>—, —(CH<sub>2</sub>)<sub>2</sub>— or —C(CH<sub>3</sub>)<sub>2</sub>—, or a group represented by the formula (b)



wherein R is as defined above, and n is 1, 2 or 3, and R<sup>1</sup> represents a hydrocarbon residue having a valence of n.

5,480,927

# METHOD OF INCREASING THE CONCENTRATION OF RADIATION-ABSORBING AGENTS IN OPTICAL AND OPHTHALMIC LENSES

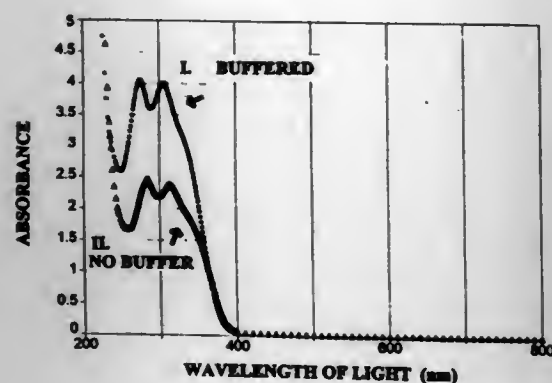
Robert A. Janssen, Alpharetta; Charlotte L. Cooper, Chamblee; Deborah J. Mulcahy, Duluth; Judy L. Peeples, Atlanta, and Leslie F. Stebbins, Roswell, all of Ga., assignors to Ciba Geigy Corporation, Tarrytown, N.Y.

Filed May 20, 1994, Ser. No. 246,654

Int. Cl.<sup>6</sup> C08K 5/3412; D06F 5/00

U.S. Cl. 524—100

24 Claims



1. A method of incorporating a radiation-absorbing additive into an optical or ophthalmic lens, comprising the steps of:

- forming a solution containing a radiation-absorbing additive;
- buffering said solution to a pH of about 6 to about 8;
- applying said buffered solution to said lens at sufficient conditions and for a sufficient time to incorporate said additive into said lens in an amount sufficient to reduce radiation transmission through said lens; and
- raising said solution pH to a sufficient basic level for a sufficient time to affix said additive to said lens.

5,480,928

# PREPARATION OF STABLE DISPERSIONS OF ETHYLENE OXIDE POLYMERS

Julius J. Stratta, New City, N.Y.; Julian K. Rose, South Charleston, and Herbert J. Paxton, Jr., Elkview, both of W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Dec. 1, 1971, Ser. No. 203,876

Int. Cl.<sup>6</sup> C08K 5/05; 5/06; B05D 5/08; C08L 71/02

U.S. Cl. 524—386

7 Claims

1. A process for producing a stable dispersion of ethylene oxide polymer which comprises (a) a slurry of granular ethylene oxide polymer in a first inert normally-liquid hydrocarbon diluent, said polymer having an average molecular weight of at least about 100,000; with (b) a second inert, normally-liquid organic diluent (i) which is a non-solvent for said granular ethylene oxide polymer, (ii) which has a boiling point higher than said first hydrocarbon diluent, (iii) which is composed of carbon, hydrogen, and oxygen atoms, said atoms being of the group consisting of alcoholic hydroxylic oxygen, aliphatic etheric oxygen, and mixtures thereof, and (iv) which is selected from the group consisting of propylene glycol, 1,3-butylene glycol, 1,4-butylene glycol, 1,6-hexylene glycol, ethylene glycol, 2-methylpentane-2,4-diol, octane-1,2-diol, dodecanediol, diethylene glycol, dipropylene glycol, dibutylene glycol, glycerol, erythritol, pentaerythritol, 1,1,1-trimethylolthane, glycols, polyoxypropylene glycols, mixed polyoxyethylene-oxypropylene glycols, mono-lower alkyl ethers of ethylene glycol, propylene glycol, butylene glycol, diethylene glycol, dipropylene glycol, dibutylene glycol, polyoxyethylene glycols, and polypropylene glycols; di-lower alkyl ethers of ethylene glycol, propylene glycol, butylene glycol, diethylene glycol, dipropylene glycol, dibutylene glycol, polyoxyethylene glycols, and polypropylene glycols; and (c) a suspending agent which is non-reactive with said ethylene oxide polymer, said first diluent, and said second diluent; (d) under agitation which is sufficient to provide intimate mixing of said ethylene oxide polymer and said suspending agent with said diluent; and (e) recovering a stable dispersion comprising particulate ethylene oxide polymer and suspending agent in second diluent.

5,480,929

# FLAME-RETARDANT RESIN COMPOSITION

Shigeo Miyata, Takamatsu, Japan, assignor to Kabushiki Kaisha Katsui Kagaku Kenkyujo, Fukuoka, Japan

Division of Ser. No. 173,064, Dec. 27, 1993, Pat. No.

5,422,092. This application Mar. 3, 1995, Ser. No. 397,890

Int. Cl.<sup>6</sup> C08K 3/22

U.S. Cl. 524—413

6 Claims

1. A flame-retardant resin and/or rubber composition containing 100 parts by weight of a resin and/or a rubber and 20 to 250 parts by weight of a composite metal hydroxide of the following formula (1):



wherein M is at least one metal selected from the group consisting of Mg, Mn, Fe, Co, Ni, Cu and Zn, x is in the range of 0.001 ≤ x < 0.995, and the composite metal hydroxide is at least one of a calcium hydroxide solid solution comprising a solution of the metal in calcium hydroxide, a metal hydroxide solid solution comprising a solution of calcium in the metal hydroxide, and a mixture thereof.

5,480,930

# FLUOROCARBON RUBBERS MODIFIED BY SILICONE RESINS

Thomas M. Gentle, and Gerald A. Gornowicz, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Aug. 18, 1994, Ser. No. 292,305

Int. Cl.<sup>6</sup> C08K 3/32; C08F 8/00

U.S. Cl. 524—414

20 Claims

1. A fluorocarbon rubber base composition comprising:
  - (a) 50 to 95% by weight of a fluorocarbon elastomer having a Mooney viscosity of 5 to 160,
  - (b) 5 to 50% by weight of an amorphous silicone resin having a degree of substitution of about 0.9 to 1.8,
  - (c) 0 to 40% by weight of polydiorganosiloxane gum, and
  - (d) 0 to 40% by weight of hydrocarbon polymer elastomer.

5,480,931

# PLASTIC CASTINGS HAVING FILLER AND FLAKEY PARTICLES DISPERSED IN A POLYMER MATRIX TO IMPROVE SCRATCH RESISTANCE

Klaus Hock, Regen; Lothar Frank, deceased, late of Pfüderhausen, and Friedrich Schock, Sr., Schorndorf, all of Germany, assignors to Schock & Co. GmbH, Schorndorf, Germany

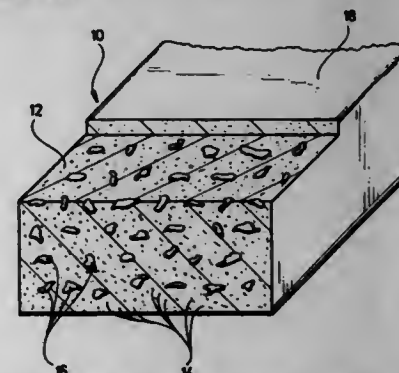
Filed Dec. 13, 1991, Ser. No. 806,658

Claims priority, application Germany, Dec. 19, 1990, 40 40 602.4

Int. Cl.<sup>6</sup> C08J 5/10; C08K 3/34; C08L 33/00

U.S. Cl. 524—449

26 Claims



1. A plastic casting having an organic polymer matrix which includes a particle-shaped inorganic filler and a further component comprising flake-shaped particulate material dispersed with said filler in said matrix at least in a surface region of said casting in an amount effective to improve removal of visible scratching from a casting surface using an abrasive cleaning agent.

5,480,932

# POLYPROPYLENE RESIN COMPOSITION AND A MOLDED ARTICLE THEREOF

Yutaka Kobayashi, Ichihara; Osamu Aoki, Wako; Kenji Hamabe, Wako; Atsushi Takeuchi, Wako, and Takayuki Onda, Wako, all of Japan, assignors to Idemitsu Petrochemical Co., Ltd., and Honda Giken Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 27, 1994, Ser. No. 266,495

Claims priority, application Japan, Jun. 29, 1993, 5-159209

Int. Cl.<sup>6</sup> C08L 23/10; 47/00; 53/00; 23/16

U.S. Cl. 524—451

16 Claims

1. A polypropylene resin composition comprising:
  - (a) 50 to 90% by weight of polypropylene,
  - (b) 50 to 10% by weight of an ethylene-α-olefin copolymer elastomer having a Moony viscosity (ML 1+4(100° C.)) of 10 to 100 or a melt index (230° C., 2.16 kg) of 0.5 to 25 g/10 minutes,

(c) 0.5 to 10 parts by weight per 100 parts by weight of the total of the amounts of the components (a) and (b) of hydrogenated hydroxyl containing isoprene polymer which is liquid at room temperature, and

(d) 0.5 to 15 parts by weight per 100 parts by weight of the total of the amounts of the components (a) and (b) of hydrogenated hydroxyl containing butadiene polymer having a melting point of about 70° to about 90° C. and a number-average molecular weight of 1500 to 6000.

5,480,933

# ACCELERATION OF GELATION OF WATER SOLUBLE POLYMERS

Kelly B. Fox, and Alvin Evans, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla. Division of Ser. No. 908,673, Jun. 29, 1992, Pat. No.

5,447,986. This application Oct. 28, 1994, Ser. No. 330,872

Int. Cl.<sup>6</sup> C08K 3/28; 5/16

U.S. Cl. 524—554

25 Claims

1. A process for accelerating gelation of a gellable composition comprising the steps of: (a) preparing said gellable composition; and (b) contacting said gellable composition with an ammonium ion donor wherein said gellable composition comprises: (1) a water soluble acrylamide-containing polymer; (2) a first crosslinking component selected from the group consisting of aldehydes, aldehyde-generating compounds, and mixtures thereof; (3) a second crosslinking compound selected from the group consisting of aromatic compounds and alcohols, and mixtures thereof; wherein said aromatic compound is selected from the group consisting of carboxylic acids, phenolic compounds, and mixtures thereof; and (4) water; wherein an effective amount of said ammonium ion donor is present to effect the acceleration of gelation of the composition.

5,480,934

# METHOD FOR THE PRODUCTION OF A LOW-VISCOSITY, WATER-SOLUBLE POLYMERIC DISPERSION

Bernfried Messner, Greensboro, N.C.; Carl Joachim, Darmstadt, Germany; Gunter Schmitt, Darmstadt, Germany; Manfred Braum, Mainz, Germany, and Peter Quis, Darmstadt, Germany, assignors to Roehm GmbH Chemische Fabrik, Darmstadt, Germany

Filed May 12, 1994, Ser. No. 241,577

Claims priority, application Germany, May 14, 1993, 43 16 200.2

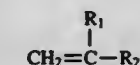
Int. Cl.<sup>6</sup> C08L 13/02

U.S. Cl. 524—458

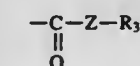
20 Claims

1. A method for the production of aqueous low-viscosity, water-soluble polymeric dispersions, containing a polymer (A) consisting of the monomeric components:

- (a1) 99 to 70 wt. % of at least one water-soluble monomer;
- (a2) 1 to 30 wt % of at least one hydrophobic monomer, which is a compound of the formula (I):



wherein R<sub>1</sub> is hydrogen or alkyl with 1 to 4 carbon atoms, and R<sub>2</sub> is alkyl with 1 to 4 carbon atoms, cycloalkyl with 5 to 12 carbon atoms, aryl with 6 to 12 carbon atoms, or:





wherein  $R_2$  is alkyl with 2 to 8 carbon atoms, cycloalkyl 5 to 12 carbon atoms or aryl or 6 to 12 carbon atoms, and Z is O, NH or  $NR_3$ ; and

(a3) 0 to 20 wt % of at least one amphiphilic monomer, whereby the monomer components (a1), (a2) and (a3) together form 100 wt % of the polymer and the polymer (A) has an average molecular weight  $M_w$  (mean weight) of at least  $5 \times 10^5$  Dalton, the method comprising:

- (i) reacting said monomeric components in a first step in an aqueous dispersion in the presence of at least one polymeric dispersing agent (D), thereby preparing a dispersion of polymer (A); and
- (ii) adding at least one polymeric dispersion agent (D), in an aqueous solution, in a second step, to the dispersion.

5,480,935

## CYANOACRYLATE ADHESIVE COMPOSITIONS

Richard J. Greff, Yorba Linda, Calif.; Patrick J. Tighe, Littleton, Colo.; Michael M. Byram, and Leonard V. Barley, both of Colorado Springs, Colo., assignors to MedLogic Global Corporation, Colorado Springs, Colo.

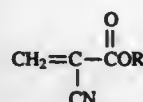
Filed Sep. 1, 1994, Ser. No. 299,993

Int. Cl. C08K 5/09

U.S. Cl. 524-776

9 Claims

1. An alkyl cyanoacrylate composition which comprises
  - (a) from about 75 to 82 weight percent of an alkyl cyanoacrylate;
  - (b) from about 50 to 500 parts per million of  $SO_2$ , based on the entire weight of the composition, as a polymerization inhibitor; and
  - (c) from about 18 percent to about 25 percent by weight of a biocompatible plasticizer which biocompatible plasticizer is a dialkyl phthalate wherein each alkyl group is independently from 1 to 10 carbon atoms
 wherein the alkyl cyanoacrylate, in monomeric form, is represented by formula I:



where R is alkyl of 4 to 10 carbon atoms.

5,480,936

## EMULSIFIER-FREE COATING AGENT, MANUFACTURE AND USE THEREOF

Volker Duecoffre; Carmen Flosbach; Walter Schubert; Manfred Krumme; Werner Stephan, all of Wuppertal, and Fritz Sadowski, Pulheim-Brauweiler, all of Germany, assignors to Herberts Gesellschaft mit beschränkter Haftung, Wuppertal, Germany

Filed May 27, 1994, Ser. No. 250,449

Claims priority, application Germany, May 28, 1993, 43 17 792.1

Int. Cl. C08L 75/06; C08F 3/30; 282/02

U.S. Cl. 524-839

6 Claims

1. An emulsifier-free thermosettable coating agent in the form of an aqueous emulsion in which the resin component consists of:
  - A) 30 to 70 wt % of a polyester oligomer polyacrylate dilutable with water after neutralisation with bases and obtainable by radical polymerisation of
  - 50 to 95 wt % of one or more esters of unsaturated carboxylic acids with hydrophobic and hydrophilic components, in which
  - a) the hydrophobic components are based on monomeric esters of unsaturated carboxylic acids with secondary OH groups, which can be present in a mixture with comonomers free from OH groups, and

b) the hydrophilic components are based on monomeric esters of unsaturated carboxylic acids with primary OH groups and unsaturated monomers with COOH groups, which can be present in a mixture with comonomers free from OH groups, and

the numerical ratio of primary to secondary OH groups originating from components b) and a) in the copolymer is 1 : 1.5 to 1 : 2.5, in

5 to 50 wt % of one or more hydroxyfunctional polyester oligomers obtainable by polycondensation of one or more diols and/or polyols and one or more dicarboxylic acids and/or semiesters of dicarboxylic acids, optionally with use of one or more monoalcohols and/or one or more monocarboxylic acids, with a calculated molecular weight of 200 to 1000, a hydroxyl number of 100 to 600 and an acid number of 0 to 15,

the monomers a) and b) being added in quantities such that the polyester oligomer polyacrylate has a hydroxyl number of 100 to 390, an acid number of 16 to 50 and a number average molecular weight ( $M_n$ ) of 1000 to 10 000, and the percentages by weight in each case relating to the content of solids and adding up to 100 wt %; and

B) 70 to 30 wt % of one or more polyisocyanates with free NCO groups,

the percentages by weight of components A) and B) in each case relating to the solids content of the resins and adding up to 100 wt %, and the ratio of OH groups in component A) to free NCO groups in component B) being between 0.5 : 1 and 2 : 1, and

additionally containing water and optionally one or more organic solvents, pigments, fillers and/or conventional lacquer auxiliary substances and additives.

5,480,937

## THERMOPLASTIC RESIN COMPOSITION AND USE THEREOF

Yukio Yoshihara, Kuga, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 49,590, Apr. 20, 1993, abandoned, which is a continuation of Ser. No. 929,499, Aug. 18, 1992, abandoned, which is a continuation of Ser. No. 522,585, May 14, 1990, abandoned. This application Jan. 24, 1994, Ser. No. 185,158

Claims priority, application Japan, May 12, 1989, 1-119077; May 12, 1989, 1-119078; Mar. 30, 1990, 2-85201; Mar. 30, 1990, 2-85207

Int. Cl. C08L 77/00

U.S. Cl. 525-66

2 Claims

1. A thermoplastic resin composition comprising
  - 80-40 parts by weight of an aromatic polyamide (A) having an intrinsic viscosity ( $\eta$ ) of 0.5-3.0 dl/g, as measured in concentrated sulfuric acid at 30° C., and a melting point of at least 280° C.; and
  - 20-60 parts by weight of a modified polyolefin (B) having a glass transition temperature of at least 90° C. and an intrinsic viscosity ( $\eta$ ) of 0.4-35 dl/g, with the proviso that the sum total of component (A) and component (B) is 100 parts by weight;
 wherein said aromatic polyamide (A) is composed of recurring units (i) comprising 30-100 mol% of terephthalic acid component units, 0-40 mol% of aromatic dicarboxylic acid component units other than the terephthalic acid component units and 0-70 mol% of aliphatic dicarboxylic acid component units, with the proviso that the sum total of all the dicarboxylic acid component units is 100 mol%; and recurring units (ii) comprising at least one unit selected from the group consisting of aliphatic alkylenediamine component units and alicyclic alkylenediamine component units; and
 wherein said modified polyolefin (B) has been graft modified with  $\alpha,\beta$ -unsaturated carboxylic acid or anhydride thereof.

5,480,938

## LOW SURFACE ENERGY MATERIAL

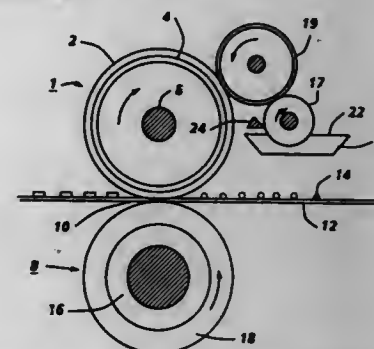
Santokh S. Badesha, Pittsford; George J. Heeks, Rochester; Arnold W. Henry, Pittsford; David H. Pan, Rochester; Louis D. Fratangelo, Fairport, and Robert M. Ferguson, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 22, 1993, Ser. No. 155,351

Int. Cl. C08L 83/05

U.S. Cl. 525-104

6 Claims



1. A low surface energy material comprising an elastomer composition which is a substantially uniform integral interpenetrating network of a hybrid composition of a fluoroelastomer and a polyorganosiloxane, said elastomer composition having been formed by dissolving said fluoroelastomer in a solvent and by dehydrofluorination of said fluoroelastomer by a nucleophilic dehydrofluorinating agent to increase the number of double bond sites, followed by a hydrosilation reaction by the addition of a hydrogen functionally terminated polyorganosiloxane and a hydrosilation reaction catalyst, wherein the polyorganosiloxane is grafted to the dehydrofluorinating agent subjected fluoroelastomer at the double bond sites.

5,480,939

## PRIMER FOR POLYOLEFIN CONTAINING CHLORINATED POLYOLEFIN AND RUBBERIZED EPOXY

Michael L. Jackson, LaGrange; Robert J. Abbate; Nicholas J. Sopcich, both of Calumet City, Ill.; Raymond J. Moeller, Jr., Cedar Lake; Mark Hodapp, Schererville, both of Ind., and Greg Palagi, Tinley Park, Ill., assignors to Bee Chemical Company, Lansing, Ill.

Continuation-in-part of Ser. No. 300,303, Sep. 2, 1994, abandoned. This application Jun. 5, 1995, Ser. No. 463,599

Int. Cl. C08L 23/28; 63/10

U.S. Cl. 525-120

2 Claims

1. A primer composition consisting essentially of a homogeneous mixture of:
  - A) a chlorinated polyolefin formed from a polyolefin selected from the group consisting of polyethylene, polypropylene, polybutene, polypentene, polyhexene, copolymers thereof, and mixtures thereof, said polyolefin being chlorinated to between about 10 and about 30 wt % chlorine,
  - B) a rubberized epoxy which is the reaction product of
    - i) 100 parts of a Bisphenol epoxy resin having a weight average molecular weight of between about 300 and about 6000 and an epoxy equivalent weight of between about 150 and about 250, and
    - ii) between about 50 and about 80 parts by weight relative to said 100 parts of Bisphenol epoxy resin of a rubber polymer formed from between about 50 mole percent and 100% of a conjugated diene selected from the group consisting of butadiene, isoprene and mixtures thereof, balance, comonomers selected from the group consisting of styrene, substituted styrene, acrylic acid, substituted acrylic acid, esters of acrylic acid, substituted esters of acrylic acid, acrylonitrile and mixtures thereof; said rubber polymer having a weight average molecular weight of between about 2500 and about 4000, said rubber polymer being terminated with an epoxy-

reactive moiety selected from the group consisting of carboxyl, amine, hydroxy and mixtures thereof,

said rubberized epoxy having an epoxy equivalent weight of between about 200 and about 1000;

said chlorinated polyolefin A) comprising between about 30 and about 60 wt % of said primer composition and said rubberized epoxy comprising between about 40 and about 70 wt % of said primer composition,

said chlorinated polyolefin A) containing no chemical moieties that are reactive with said rubberized epoxy B), said primer composition containing no epoxy curative or epoxy cure catalyst, whereby said homogeneous primer composition when applied to a substrate and in dry form may be dissolved from the substrate in an organic solvent in which said components A) and B) are mutually soluble.

5,480,940

## POLYDICYCLOPENTADIENE HAVING IMPROVED STABILITY AND TOUGHENED WITH POLYMERIC PARTICLES

Nitya P. Khasat, Newark, and Douglas Leach, Wilmington, both of Del., assignors to Metton America, Inc., Abingdon, Va.

Continuation of Ser. No. 273,544, Jul. 11, 1994, abandoned, which is a continuation of Ser. No. 997,370, Dec. 23, 1992, abandoned. This application Mar. 7, 1995, Ser. No. 400,445

Int. Cl. C08F 4/78; 232/08; 277/00

U.S. Cl. 525-290

20 Claims

1. A polymeric composition comprising:
  - a) a thermoset polymer prepared by the metathesis polymerization of a monomer mixture comprising dicyclopentadiene; and
  - b) other polymeric particles, dispersed throughout the thermoset polymer, that are made of a core elastomer surrounded by a shell material, said particles being bead-like spheres or oblate spheroids having a particle size of about 1  $\mu$ m to about 100  $\mu$ m, said core elastomer comprising one or more elastomeric polymers selected from the group consisting of polybutadiene, butadiene-styrene copolymer, polyisoprene, and polyisobutylene, said shell material comprising one or more polymers selected from the group consisting of polymethylmethacrylate, polyethylmethacrylate, polymethylacrylate, polybutylacrylate, polyethylacrylate, and methacrylate-styrene copolymer, said shell material being cross-linked and substantially insoluble in said monomer mixture, and said polymeric particles being dispersed throughout said thermoset polymer in an amount sufficient to give the composition a notched izod impact strength of greater than about 2.7 ft.-lbs./in. notch.

5,480,941

## ELASTOMER/ARAMID FIBER DISPERSION

Arnold Frances, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 45,781, Apr. 14, 1993, Pat. No. 5,391,623.

This application Aug. 10, 1994, Ser. No. 288,636

Int. Cl. C08K 7/02; C08J 5/04; C08L 23/34; 77/10

U.S. Cl. 525-178

4 Claims

1. A dispersion consisting essentially of elastomer in the form of flakes with, as a sole particulate component, aramid fibers distributed uniformly throughout wherein the aramid fibers have an average length of from 0.1 to 6 millimeters and are present in the elastomer from 50 to 300 weight parts per hundred parts of elastomer and wherein the particles have a thickness of about 0.05 to 2 millimeters and an aspect ratio of 1 to 30.



5,480,942

# PROPYLENE POLYMERS GRAFTED WITH POLYALKENYLENES AND PROCESS FOR THEIR PREPARATION

Antonio Addeo, Novara; Corrado Brichta, Milan; Francesco  
Mascia, Guanzate, and Arturo Marchionni, Cuveglio, all of,  
Italy, assignors to Spherilene S.r.l., Italy

Filed May 9, 1994, Ser. No. 239,712

Claims priority, application Italy, May 13, 1993, MI93A0975  
Int. Cl.<sup>6</sup> C08F 255/02

U.S. Cl. 525—194

7 Claims

1. A graft-modified propylene polymer comprising a polyalk-  
enylene grafted onto a propylene polymer.

5,480,943

# HYDROXY-FUNCTIONAL ACRYLATE RESINS

Shao-Hua Guo, West Goshen, Pa., assignor to ARCO Chemical  
Technology, L.P., Greenville, Del.

Division of Ser. No. 341,823, Nov. 18, 1994. This application  
Jun. 6, 1995, Ser. No. 470,602

Int. Cl.<sup>6</sup> C08F 8/30; C08L 63/00

U.S. Cl. 525—330.5

6 Claims

1. A thermoset polymer which comprises the reaction product of:  
(a) a low-molecular-weight, hydroxy-functional acrylate resin  
which comprises recurring units of:

- (1) a propoxylated allylic alcohol;
- (2) a C<sub>1</sub>–C<sub>20</sub> alkyl or aryl acrylate or methacrylate monomer;  
and
- (3) optionally, one or more ethylenic monomers selected from  
the group consisting of vinyl aromatic monomers, unsatur-  
ated nitriles, vinyl esters, vinyl ethers, vinyl halides,  
vinylidene halides, unsaturated anhydrides, unsaturated  
dicarboxylic acids, acrylic and methacrylic acids, acryla-  
mide and methacrylamide, and conjugated dienes;

wherein the acrylate resin has a hydroxyl number within the  
range of about 50 to about 450 mg KOH/g, and a number  
average molecular weight within the range of about 500 to  
about 10,000; and

- (b) a member selected from the group consisting of:
- (1) a melamine resin, to produce a melamine thermoset;
- (2) a di- or polyisocyanate or an isocyanate-terminated pre-  
polymer, to produce a polyurethane;
- (3) an epoxy resin, to produce an epoxy thermoset;
- (4) an anhydride, to produce a thermoset polyester;
- (5) a styrene-maleic anhydride copolymer, to produce a  
crosslinked polymeric resin;
- (6) a fatty acid and a low-molecular-weight polyol, to produce  
an alkyl; and
- (7) a fatty acid, a low-molecular-weight polyol, and a di- or  
polyisocyanate, to produce a polyurethane-modified alkyl.

5,480,944

# INTERPENETRATING BLENDS OF LINEAR POLYMERS AND COMPATIBLE FRACTAL POLYMERS

Shaul M. Aharoni, Morris Plains, N.J., assignor to AlliedSignal  
Inc., Morris Township, N.J.

Filed Aug. 23, 1993, Ser. No. 110,745

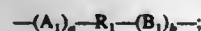
Int. Cl.<sup>6</sup> C08L 77/00

U.S. Cl. 525—432

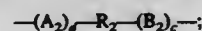
18 Claims

1. A blend comprising a polymer matrix comprising one or more  
linear polyamide polymers and copolymers thereof having dis-  
persed therein a non-reactive compatible porous fractal polymer  
comprising a three dimensional highly branched polymeric entity,  
said polymeric entity comprising:

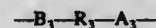
- (a) one or two aromatic nuclei of the formula:



- (b) a branched polymeric moiety bonded to and projecting away  
from said nuclei having a plurality of branching recurring  
monomeric units of the formula:



- (c) a plurality of linear linking polymeric segments having one  
or more recurring extension monomeric units of the formula:



said segments bonded to said branching monomeric units; and  
(d) a plurality of reactive moieties on the exterior of said  
branched polymeric moiety and bonded thereto, said exterior  
moieties of the formula:



when d is greater than c, and said exterior moieties of the  
formula:



when c is greater than d,  
wherein:

a and b are different and are integers equal to 0, or between 3  
and 6, with the proviso that a or b is 0;

R<sub>1</sub> and R<sub>2</sub> are the same or different at each occurrence and are  
selected from the group consisting of phenylene, naphthylene,  
and an aromatic moiety formed by two phenylene groups  
optionally connected by a linking group selected from the  
group consisting of amide, ester, carbonyl, sulfone, sulfide,  
alkylene from 1 to 10 carbon atoms, ether, and urethane,  
wherein said phenylene may be unsubstituted or substituted  
with a moiety selected from the group consisting of alkyl,  
aryl, alkoxy, aryloxy, and halo;

R<sub>3</sub> is selected from the group consisting of R<sub>1</sub> and R<sub>2</sub> divalent  
moieties;

A<sub>1</sub>, A<sub>2</sub>, and A<sub>3</sub> are of the formula —N(H)—;

B<sub>1</sub>, B<sub>2</sub>, and B<sub>3</sub> are of the formula



Z<sub>2</sub> is R<sub>2</sub>C(O)N(H)—, wherein R<sub>2</sub> is selected from the group  
consisting of phenyl, aryl, and alkyl, and X is a moiety of the  
formula —OR<sub>4</sub> or —R<sub>4</sub> wherein R<sub>4</sub> is aryl or alkyl; and  
Z<sub>1</sub> is of the formula selected from the group consisting of  
—(CO)X, and R<sub>2</sub>N(H)C(O)—, wherein R<sub>2</sub> is selected from  
the group consisting of phenyl, aryl, and alkyl, and X is a  
moiety of the formula —OR<sub>4</sub> or —R<sub>4</sub> wherein R<sub>4</sub> is aryl or  
alkyl; and

c and d are different and are integers equal to or greater than 1,  
with the proviso that the sum of c and d is equal to 3 or 4, and  
with the further proviso that when a is equal to 0 then d is  
greater than c and that when b is equal to 0 then c is greater  
than d.

5,480,945

# AMORPHOUS NYLON COPOLYMER AND COPOLYAMIDE FILMS AND BLENDS

Stephen J. Vick, Darien, Ill., assignor to Viskase Corporation,  
Chicago, Ill.

Division of Ser. No. 685,950, Apr. 16, 1991, Pat. No. 5,344,679,  
which is a division of Ser. No. 235,258, Aug. 23, 1988, Pat.  
No. 5,053,259. This application Jun. 30, 1994, Ser. No.

268,359

Int. Cl.<sup>6</sup> C08L 77/00

U.S. Cl. 525—432

20 Claims

1. A nylon resin blend comprising a blend of: (a) an amorphous  
nylon copolymer consisting of hexamethylene isophthalamide-

hexamethylene terephthalamide units and having no measurable  
melting point (less than 0.5 calories per gram) or no heat of fusion,  
as measured by differential scanning calorimetry, which is present  
in an amount of from about 10 to about 50 weight percent of said  
blend, and

- (b) a nylon %12 or nylon %66 copolyamide having a melting point  
of at least 145° C.

5,480,946

# UNSATURATED UREA POLYSILOXANES

Karl F. Mueller, New York, and Michael C. Bochnik, Yonkers,  
both of N.Y., assignors to Ciba Geigy Corporation, Tarry-  
town, N.Y.

Continuation-in-part of Ser. No. 108,769, Aug. 18, 1993, aban-  
doned, which is a continuation of Ser. No. 979,387, Nov. 19,  
1992, abandoned, which is a continuation of Ser. No. 514,893,  
Apr. 26, 1990, abandoned. This application Jun. 9, 1994, Ser.  
No. 257,230

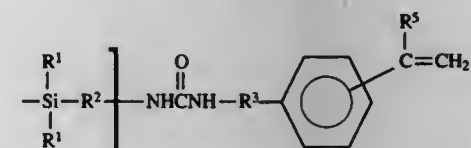
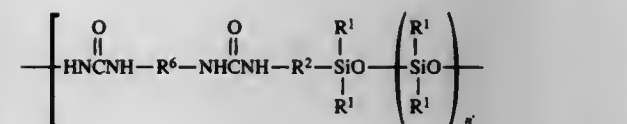
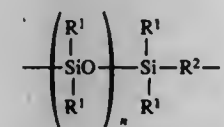
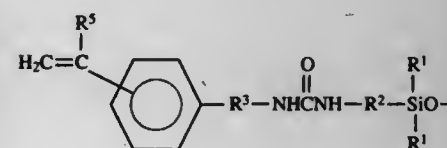
Int. Cl.<sup>6</sup> C08F 283/12

U.S. Cl. 525—479

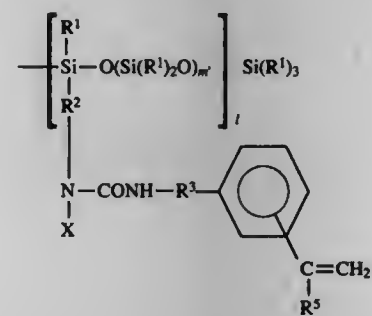
9 Claims

1. A contact lens formed from a polymer, which comprises the  
crosslinked copolymerization product of

- (A) from about 10 to about 100% by weight of said polymer of  
a polysiloxane macromer of formula A-1 or A-2:

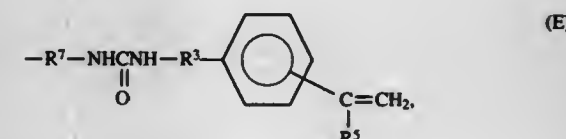


or



wherein

R<sup>1</sup> is a methyl-, phenyl or 3,3,3-trifluoropropyl radical,  
R<sup>2</sup> is a divalent saturated linear or branched hydrocarbon radical  
of from 1–6 carbon atoms,  
R<sup>3</sup> is a direct bond or, has the same definition as R<sup>2</sup>,  
R<sup>4</sup> is hydrogen or methyl,  
R<sup>5</sup> is the divalent residue of a aliphatic, cycloaliphatic or aro-  
matic diisocyanate of structure  
OCN—R<sup>5</sup>—NCO,  
n and n' are integers from 2 to 250, with the proviso that the sum  
n+n' is not greater than 250,  
m and m' are integers from 2 to 200, with the proviso that the  
sum of m+m' is not greater than 250,  
y is 0–2,  
l has a value of 1 to 10,  
X is hydrogen or has the structure E



wherein

R<sup>7</sup> has the same definition as R<sup>2</sup>.

wherein said polysiloxane macromer has a number average  
molecular weight from about 400 to about 10,000, said macromer  
containing at least two terminal polymerizable olefinic groups, said  
groups being attached to the polysiloxane through a urea linkage;  
and

- (B) from 90% to 0% by weight of said polymer of one or more  
mono-, di- or trifunctional vinyl monomers polymerizable by  
free radical polymerization.

5,480,947

# DIGUANAMINES AND PREPARATION PROCESS, DERIVATIVES AND USE THEREOF

Tetsuya Oishi; Hiroshi Ozawa, both of Kanagawa; Minato  
Karasawa, Chiba; Masamitsu Inomata, Chiba; Izumi Mega,  
Chiba; Atsuyoshi Yamauchi; Kazunori Kamada, both of  
Kanagawa; Shigeru Nakahata; Katsumi Sakamoto, both of  
Osaka; Tatsunobu Nakashima, Chiba; Akito Watanabe,  
Osaka; Jin Suzuki, Tokyo; Kouhei Ohkawa, Kanagawa;  
Satoshi Furusawa, Chiba; Hiroshi Ono, Osaka, and Kazuo  
Sugazaki, Kanagawa, all of, Japan, assignors to Mitsui  
Toatsu Chemicals, Inc., Tokyo, Japan

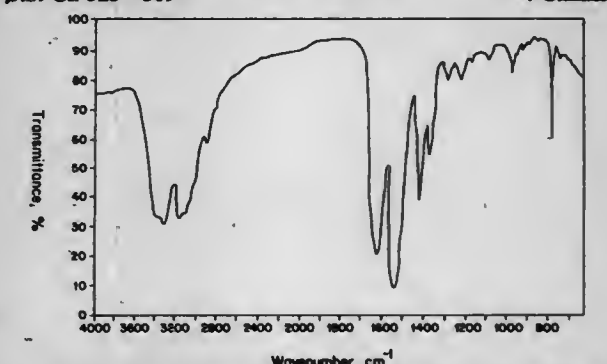
Division of Ser. No. 201,391, Feb. 24, 1994, which is a  
continuation-in-part of Ser. No. 186,550, Jan. 26, 1994, aban-  
doned, which is a continuation of Ser. No. 983,855, Mar. 2,  
1993, abandoned. This application Mar. 30, 1995, Ser. No.  
414,007

Claims priority, application Japan, Feb. 24, 1993, 5-035198;  
Feb. 24, 1993, 5-035199; Feb. 24, 1993, 5-035200; Mar. 3, 1993,  
5-043048; Mar. 12, 1993, 5-051775; Apr. 14, 1993, 5-087499

Int. Cl.<sup>6</sup> C08G 8/36

U.S. Cl. 525—509

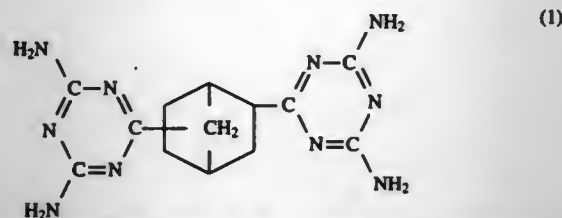
4 Claims



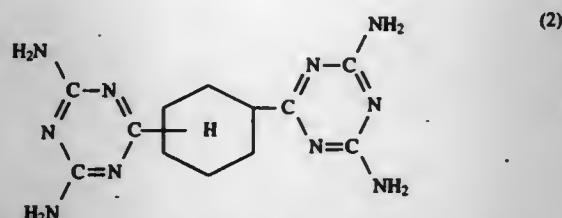
1. An N-methylol diguanamine obtained by subjecting a digua-  
namine and an aldehyde to an addition reaction, wherein said



diguanamine is at least one compound selected from diguanamines represented by the following formula (1):



wherein the bonding sites of the 4,6-diamino-1,3,5-triazin-2-yl groups are the 2,5- or 2,6-positions, or by the following formula (2):



wherein the bonding sites of the 4,6-diamino-1,3,5-triazin-2-yl groups are the 1,2-, 1,3- or 1,4-positions.

5,480,948

## OLEFIN POLYMERIZATION PROCESS

Rolf L. Geerts, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 227,926, Apr. 15, 1994, Pat. No. 5,436,212. This application Mar. 28, 1995, Ser. No. 412,382

Int. Cl.<sup>6</sup> C08F 4/44

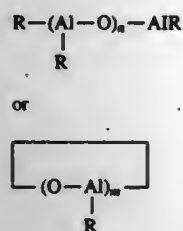
U.S. Cl. 526—142

7 Claims

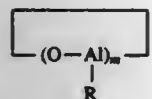
1. A polymerization process comprising contacting at least one olefin containing from 2 to 18 carbon atoms under polymerization conditions with a catalyst system comprising an organoaluminosy product and at least one transition metal-containing catalyst:

wherein the organoaluminosy product is prepared by reacting an organoaluminosy and an oxygen-containing compound, wherein the oxygen-containing compound is selected from the group consisting of organic peroxides, alkylene oxides, and organic carbonates;

wherein the organoaluminosy is represented by the formulas:



or



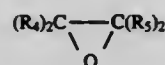
wherein each R is a hydrocarbyl radical containing 1 to 8 carbon atoms, n is 2 to 50, and m is 3 to 50;

wherein the organic peroxide is represented by the formula

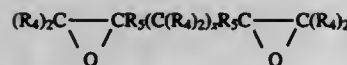


wherein R<sub>2</sub> and R<sub>3</sub> are individually selected from hydrogen, hydrocarbyl, and hydrocarbonyl radicals selected from the group consisting of alkyl, cycloalkyl, aryl, alkenyl, and alkynyl radicals containing 1 to 24 carbon atoms with the proviso that at least one of R<sub>2</sub> or R<sub>3</sub> is a hydrocarbyl or hydrocarbonyl radical;

wherein the alkylene oxide is represented by the formulas

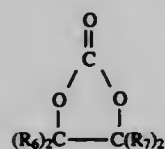


or



wherein R<sub>4</sub> and R<sub>5</sub> are individually selected from the group consisting of hydrogen and alkyl radicals containing 1 to 12 carbon atoms;

wherein the organic carbonate is represented by the formulas



or



wherein R<sub>6</sub> and R<sub>7</sub> are independently selected from the group consisting of hydrogen and an alkyl radical containing 1 to 10 carbon atoms, R<sub>8</sub> is a hydrocarbyl radical selected from the group consisting of alkyl, cycloalkyl, aryl, aralkyl, and alkaryl radicals having 1 to 12 carbon atoms;

wherein the organoaluminosy is present in an amount in the range of from about one mole to about 1000 moles per mole of oxygen-containing compound; and

wherein the transition metal-containing catalyst is represented by the formula ML<sub>x</sub>, wherein M is a Group IVB or VB transition metal, x is the valence of the transition metal, and each L is individually selected from the group consisting of cyclopentadienyl-type radicals containing 5 to 20 carbon atoms, hydrocarbyl radicals containing 1 to 12 carbon atoms, alkoxy radicals containing 1 to 12 carbon atoms, aryloxy radicals containing 6 to 12 carbon atoms, halogen and hydrogen.

wherein cyclopentadienyl-type radicals are unsubstituted cyclopentadienyl, substituted cyclopentadienyl, unsubstituted indenyl, substituted indenyl, unsubstituted fluorenyl, and substituted fluorenyl, wherein the substituents are hydrocarbyl radicals containing 1 to 12 carbon atoms, alkoxy radicals containing 1 to 12 carbon atoms, or halogen.

5,480,949

Patent Not Issued For This Number

5,480,950

## HIGH REFRACTIVE INDEX HYDROGELS AND USES THEREOF

Yading Wang, Arcadia; Stephen Q. Zhou, Hacienda Heights; Thomas P. Richards, Los Angeles, and Xugao Liao, San Diego, all of Calif., assignors to Kabi Pharmacia Ophthalmics, Inc., Monrovia, Calif.

Continuation-in-part of Ser. No. 951,775, Sep. 28, 1992, Pat. No. 5,316,704. This application Jul. 23, 1993, Ser. No. 96,932

Int. Cl.<sup>6</sup> C08F 26/06; 26/08

U.S. Cl. 526—258

6 Claims

1. A hydrogel comprising a cross-linked polymer prepared from a mixture of monomers comprising N-vinylpyrrolidone, 4-vinylpyrimidine, and a vinyl pyridine, and a cross-linking agent selected from the group consisting of diethylene glycol diacrylate, tetraethylene glycol diacrylate, and 1,4-diacryloylpiperazine.

5,480,952

## ZIRCONIUM AND HAFNIUM-CATALYZED POLYMERIZATION OF METHYLENOCYCLOPROPANE

Tobin J. Marks, Evanston, Ill.; Xinmin Yang, Somerset, N.J., and Li Jia, Evanston, Ill., assignors to Northwestern University, Evanston, Ill.

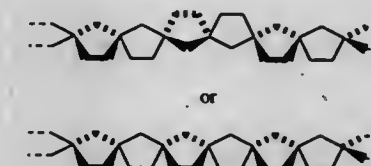
Filed Mar. 6, 1995, Ser. No. 399,390

Int. Cl.<sup>6</sup> C08F 32/02

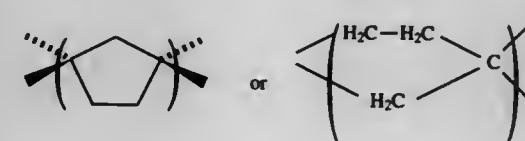
U.S. Cl. 526—308

1 Claim

1. A polymer having the structure:



Poly (1,4,2: 2-butanetetrayl) or the repeating unit of:



5,480,951

## CURABLE COMPOSITIONS INCORPORATING ANHYDRIDE-FUNCTIONAL POLYMERS DERIVED FROM ALKENYL SUCCINIC ANHYDRIDE

Richard S. Valpey, III, Matteson; Thomas W. Yokoyama, Chicago; John D. Kraan, Hometown, all of Ill., and H. James Harwood, Stow, Ohio, assignors to The Sherwin-Williams Company, Cleveland, Ohio

Filed Jan. 3, 1994, Ser. No. 176,046

Int. Cl.<sup>6</sup> C08F 222/04; 224/00; 222/02; 220/10

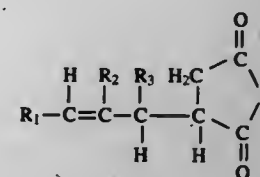
U.S. Cl. 526—271

24 Claims

1. A curable composition which comprises:

(a) an anhydride-functional polymer obtained by polymerizing under free radical addition polymerization conditions, a monomer mixture comprising:

(i) 20 to 75 weight percent of an alkenyl succinic anhydride having the structure:



wherein R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are each independently hydrogen or alkyl or substituted alkyl of 1 to about 30 carbons; and

(ii) 25 to 80 weight percent of at least one (meth)acrylic monomer copolymerizable with the alkenyl succinic anhydride; and, optionally,

(iii) 0 to 75 weight percent of at least one unsaturated monomer, other than a (meth)acrylic monomer, which is copolymerizable with the anhydride and the (meth)acrylic monomer; and

(b) a compound having an average of at least two functional groups per molecule which are reactive with anhydride groups.

5,480,953

## HYDROPHILIC MATERIAL AND SEMIPERMEABLE MEMBRANE MADE THEREFROM

Hiroyuki Sugaya; Masahiro Minaga, both of Otsu; Ryoze Terada, Kamakura; Toshikazu Tayama, Otsu; Kazumi Tanaka, Otsu, and Fumiaki Fukui, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

PCT No. PCT/JP93/01378, § 371 Date Jul. 27, 1994, § 102(c) Date Jul. 27, 1994, PCT Pub. No. WO94/07931, PCT Pub. Date Apr. 14, 1994

PCT Filed Sep. 28, 1993, Ser. No. 244,555

Claims priority, application Japan, Sep. 29, 1992, 4-285540

Int. Cl.<sup>6</sup> C08F 20/26

U.S. Cl. 526—320

18 Claims

1. A hydrophilic material characterized in that said material comprises a copolymer composed of a monomer (A) having a polyalkylene oxide unit and a polymerizable carbon-carbon double bond in its molecule, a methacrylic ester monomer or an acrylic ester monomer (B) and a monomer (C) having a polymerizable carbon-carbon double bond other than said monomer (A) and monomer (B), and the content of said monomer (C) is not less than 5% by weight and not more than 90% by weight.

5,480,954

## ALLYL ESTER COPOLYMERS WITH ALLYLIC ALCOHOLS OR PROPOXYLATED ALLYLIC ALCOHOLS

Shao-Hua Guo, West Goshen, Pa., assignor to ARCO Chemical Technology, L.P., Greenville, Del.

Filed Sep. 21, 1994, Ser. No. 309,699

Int. Cl.<sup>6</sup> C08F 218/08

U.S. Cl. 526—330

6 Claims

1. A copolymer which consists essentially of recurring units of: (a) an allyl ester of the formula CH<sub>2</sub>=CR'-CH<sub>2</sub>-O-CO-R in which R is hydrogen or a saturated linear, branched, or cyclic C<sub>1</sub>-C<sub>30</sub> alkyl, aryl, or aralkyl group, and R' is selected from the group consisting of hydrogen and C<sub>1</sub>-C<sub>5</sub> alkyl; and

(b) an allylic alcohol of the formula CH<sub>2</sub>=CR'-CH<sub>2</sub>-OH in which R' is selected from the group consisting of hydrogen and C<sub>1</sub>-C<sub>5</sub> alkyl;



wherein the copolymer has an average hydroxyl functionality within the range of about 2 to about 10, and a number average molecular weight within the range of about 300 to about 15,000.

5,480,955

## ALIPHATIC SPRAY POLYUREA ELASTOMERS

Dudley J. Primeaux, II, Elgin, Tex., assignor to Huntsman Corporation, Salt Lake City, Utah

Continuation of Ser. No. 402,296, Sep. 5, 1989, abandoned.

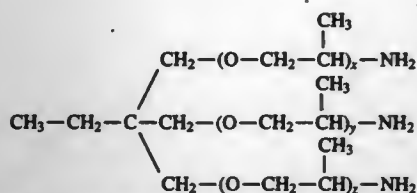
This application Sep. 7, 1993, Ser. No. 117,962

Int. Cl.<sup>6</sup> C08G 18/02; 18/10

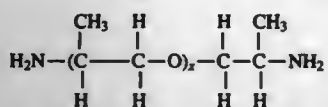
U.S. Cl. 528—60

11 Claims

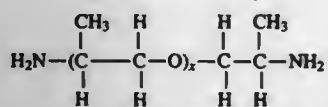
1. An aliphatic spray polyurea elastomer comprising an (A) component which includes an aliphatic isocyanate and a (B) component which includes (1) a primary amine terminated polyoxyalkylene polyol having a molecular weight of at least about 2000 and an amine equivalent weight of at least about 750 and (2) a primary amine terminated polyoxyalkylene chain extender selected from a compound represented by the formula:



wherein  $x+y+z$  has a value of about 5.3 and wherein the average amine hydrogen equivalent weight is about 67;



wherein  $x$  has a value of about 5.6 and wherein the average amine hydrogen equivalent weight is about 100;



wherein  $x$  has a value of about 2.6 and wherein the average amine hydrogen equivalent weight is about 57.5; or

(iv) a combination of at least two of compounds (i), (ii) and (iii).

5,480,956

## FELINE INTERFERON AND PROCESS FOR PRODUCTION THEREOF

Akira Yanai, Yoshizumi Ueda, Toru Sakurai, and Masahiro Satoh, all of Kamakura, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 904,477, Jun. 25, 1992, abandoned, which is a division of Ser. No. 544,504, Jun. 27, 1990, Pat. No. 5,194,381. This application Feb. 23, 1994, Ser. No. 290,297

Claims priority, application Japan, Jun. 29, 1989, 1-167415

Int. Cl.<sup>6</sup> C12P 21/02; C12N 15/00

U.S. Cl. 435—69.51

6 Claims

1. A process for the production of an acid-stable feline interferon which comprises:

i) infecting a silkworm cell with a recombinant silkworm nuclear polyhedrosis virus which encodes an acid-stable feline interferon, wherein said acid-stable feline interferon has the amino acid sequence shown in FIG. 6;

ii) culturing the infected silkworm cells under conditions such that the recombinant virus expresses said acid-stable feline interferon;

iii) recovering the acid-stable feline interferon.

5,480,957

## SPHERICAL CURING AGENT FOR EPOXY RESIN, CURING AGENT MASTERBATCH FOR EPOXY RESIN AND THEIR PREPARATION

Souichi Muroi, Shizuoka, and Hsi-Chuan Tsai, Kanagawa, both of, Japan, assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation of Ser. No. 706,131, May 28, 1991, abandoned.

This application Feb. 18, 1993, Ser. No. 22,607

Int. Cl.<sup>6</sup> C08G 59/00

U.S. Cl. 528—87

12 Claims

1. A curing agent for epoxy resin which is fine substantially spherical particles of an amine compound having only one active amino-hydrogen/polyfunctional epoxy compound adduct wherein the size of said particles is in the range of 0.1  $\mu\text{m}$  to 30  $\mu\text{m}$ , said particles being obtained by reacting an amine compound having only one active amino-hydrogen and a polyfunctional epoxy compound at a ratio of the epoxy group in said epoxy compound to the active amino-hydrogen in said amine compound of substantially 1:1 in the presence of a dispersion stabilizer in an organic solvent capable of dissolving both said amine compound and said epoxy compound but incapable of dissolving the adduct formed therefrom at elevated temperatures with agitation, said dispersion stabilizer being a polymeric compound having high affinity to both said organic solvent and said adduct formed.

5,480,958

## POLYEPOXIDE RESINS INCORPORATING EPOXY TERMINATED URETHANES AS TOUGHENERS

William E. Starner, Nesquehoning, and Richard S. Myers, Kutztown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

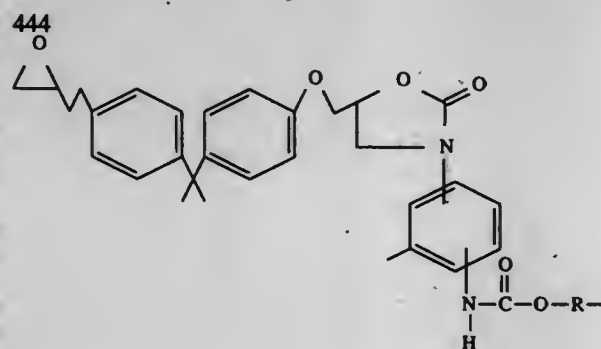
Filed Sep. 21, 1994, Ser. No. 309,712

Int. Cl.<sup>6</sup> C08G 18/58

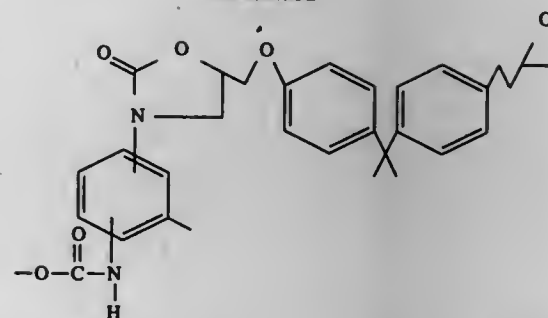
U.S. Cl. 528—96

7 Claims

1. In a one-part curable epoxy resin comprising a polyglycidyl ether of a phenol having terminal 1,2-epoxy groups, a latent curative and an accelerator, the improvement for enhancing toughness of the epoxy resin which comprises incorporating an epoxy-terminated urethane prepolymer incorporating an oxazolidone structure into the one-part curable epoxy resin represented by the formula:



-continued



wherein R is the residue of an aliphatic polyether glycol having a weight average molecular weight of about 3,000, wherein said curable epoxy resin contains 5 to 20 parts by weight epoxy-terminated urethane prepolymer and 80 to 95 parts by weight said polyglycidyl ether of a phenol, based on 100 parts of the total weight of the two combined.

5,480,959

## SUBSTANTIALLY PURE BISPHENOLS AND POLYMERS COMPRISING BISPHENOLS

John C. Schmidhauser, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 61,948, May 17, 1993, abandoned.

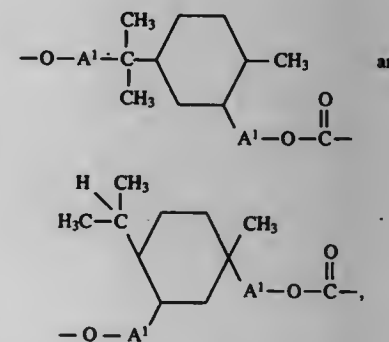
This application Apr. 11, 1994, Ser. No. 226,099

Int. Cl.<sup>6</sup> C08G 64/00

U.S. Cl. 528—198

5 Claims

1. A bisphenol polycarbonate polymer consisting of aromatic polycarbonate units and comprising at least one of the structural units of the formulae



wherein each A<sup>1</sup> is independently a divalent substituted or unsubstituted aromatic radical.

5,480,960

## PROCESS FOR THE PREPARATION OF AN ACID FUNCTIONAL POLYESTER RESIN

Jan Freriks, Pieter Groenvelt, Petrus G. Kooijmans, and Werner T. Raudenbush, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 14, 1994, Ser. No. 274,949

Claims priority, application European Pat. Off., Jul. 15, 1993, 93202081

Int. Cl.<sup>6</sup> C08G 63/02

U.S. Cl. 528—198

15 Claims

1. A process for the preparation of a linear tertiary aliphatic carboxyl functional polyester resin comprising reacting, in a reactor,

- at least one compound A' comprising one monofunctional primary- or secondary hydroxyl group and/or at least one compound A'' comprising one primary- or secondary hydroxyl group and one tertiary aliphatic carboxyl group and
- at least one aromatic or cycloaliphatic dicarboxylic acid compound B comprising two aromatic- or secondary aliphatic carboxyl groups or the anhydride thereof and
- at least one diol compound C comprising two aliphatic hydroxyl groups wherein each is independently a primary or a secondary hydroxyl group and
- at least one dihydroxymonocarboxylic acid compound D comprising a tertiary aliphatic carboxyl group and two aliphatic hydroxyl groups, wherein each is independently a primary or secondary hydroxyl group.

the molar ratio of compounds A':A'':B:C:D being

M:N:X+Y+1:X:Y,

wherein M+N=2,

X ranges from 2 to 8, and

Y ranges from 2-N to 8,

at a temperature within the range of from about 100° to about 240° C., until essentially all of the nontertiary carboxyl groups as initially present in the reaction mixture have been reacted.

5,480,961

## BIOABSORBABLE POLYMERS DERIVED FROM CYCLIC ETHER ESTERS AND SURGICAL ARTICLES MADE THEREFROM

Ying Jiang, North Haven, and John S. Bobo, Guilford, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

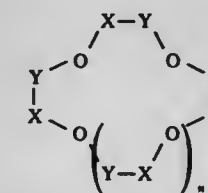
Filed Nov. 3, 1994, Ser. No. 333,807

Int. Cl.<sup>6</sup> C08G 8/02

U.S. Cl. 528—220

7 Claims

1. A bioabsorbable polymer derived from at least one type of cyclic ether-ester monomeric unit of the formula:



wherein each X is the same or different and individually selected from the group consisting of  $\text{CH}_2$ ,  $\text{—CHR}_1$ , and  $\text{—CR}_2\text{R}_3$ — wherein  $\text{R}_1$ ,  $\text{R}_2$  and  $\text{R}_3$  are individually selected from alkyl groups having from 1 to 3 carbons;

each Y is the same or different and is individually selected from the group consisting of X and



provided that at least two of the Y's are





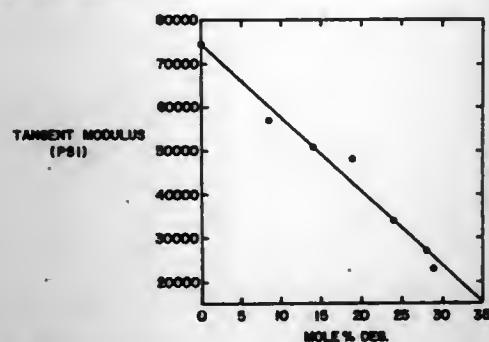
n is at least 1.

# 5,480,962 COPOLYESTERS HAVING REPEAT UNITS DERIVED FROM SUCCINIC ACID

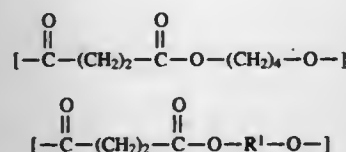
Alan W. White, Kingsport; Barry G. Percy, Mount Carmel; Allan S. Jones, Church Hill; Charles M. Buchanan, Bluff City, and Robert M. Gardner, Gray, all of Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.  
Division of Ser. No. 96,752, Jul. 22, 1993. This application Mar. 7, 1994, Ser. No. 209,500  
Int. Cl.<sup>6</sup> C08G 63/20

U.S. Cl. 528—272

16 Claims



1. An aliphatic copolyester comprising repeat units having the structure (A):



wherein R<sup>1</sup> is selected from the group consisting of C<sub>2</sub>-C<sub>12</sub> alkylene, provided that said C<sub>2</sub>-C<sub>12</sub> alkylene is other than  $\text{---}(\text{CH}_2)_4\text{---}$ ; C<sub>4</sub>-C<sub>12</sub> cycloalkylene; and C<sub>4</sub>-C<sub>12</sub> oxyalkylene, and wherein the mole % of R<sup>1</sup> is from 5 to 35 mole % and further wherein a branching agent is used in the polymerization of said copolyester at a level of from about 0.1 to about 2.0% by weight based on the total weight of the copolyester.

# 5,480,963 ABSORBABLE COPOLYMERS DERIVED FROM TRICARBOXYLIC ACIDS AND SURGICAL ARTICLES MADE THEREFROM

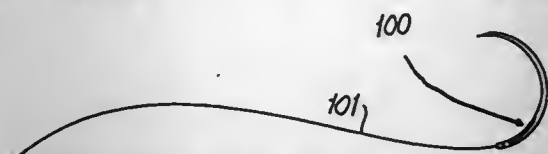
Ying Jiang, North Haven; John S. Bobo, Guilford, and Elliott A. Gruskin, Killingworth, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Jul. 22, 1994, Ser. No. 279,126

Int. Cl.<sup>6</sup> C08G 63/12

U.S. Cl. 528—350

16 Claims



1. A bioabsorbable copolymer comprising:  
a) monomeric units derived from a tricarboxylic acid; and  
b) monomeric units derived from a triol wherein at least a portion of the units derived from a triol includes a substituent selected from the group consisting of amine and carboxymethyl groups.

5,480,964

# NEGATIVE BIREFRINGENT POLYIMIDE FILMS

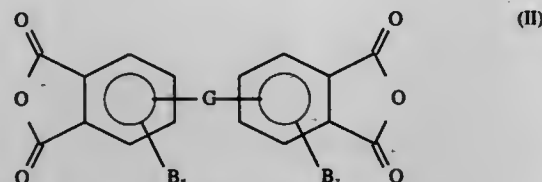
Frank W. Harris, and Stephen Z. D. Cheng, both of Akron, Ohio, assignors to The University of Akron, Akron, Ohio  
Continuation-in-part of Ser. No. 72,137, Jnn. 4, 1993, Pat. No. 5,344,916, which is a continuation-in-part of Ser. No. 51,068, Apr. 21, 1993, abandoned. This application Apr. 21, 1994, Ser. No. 230,729

Int. Cl.<sup>6</sup> C08G 77/10; 69/26

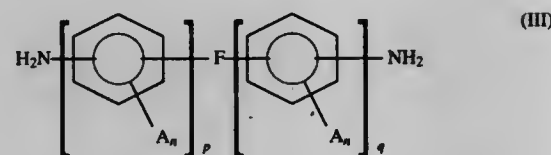
U.S. Cl. 528—353

12 Claims

1. A homopolymer polyimide film for use in negative birefringence layers in liquid crystal displays, the film having a negative birefringence of 0.001 to 0.2, the film having been prepared from solutions of soluble polyimides having an aromatic dianhydride of general formula (II):



and a polyaromatic diamine of formula (III)



where

F and G are selected independently from the group consisting of a covalent bond, a CH<sub>2</sub> group, a C(CH<sub>3</sub>)<sub>2</sub> group, a C(CX<sub>3</sub>)<sub>2</sub> group where X is a halogen, a CO group, an O atom, a S atom, a SO<sub>2</sub> group, a Si(R)<sub>2</sub> group wherein R is a substituent selected independently from the group consisting of H, phenyl, halogenated phenyl, alkyl and halogenated alkyl from 1 to 20 carbons, and a N(R) group wherein R is as defined previously;

A is selected from the group consisting of hydrogen, halogen, alkyl, halogenated alkyl, nitro, cyano, thioalkyl, alkoxy, halogenated alkoxy, aryl and halogenated aryl, aliphatic and aromatic esters and combinations thereof of from 1 to 20 carbons;

B is selected from the group consisting of halogens, C<sub>1-3</sub> alkyls, C<sub>1-3</sub> halogenated alkyls, phenyl or substituted phenyl wherein the substituents on the phenyl ring include halogens, C<sub>1-3</sub> alkyls, C<sub>1-3</sub> halogenated alkyls and combinations thereof;

z is an integer from 0 to 3;

n is an integer from 0 to 4; and

p and q are integers from 0 to 3 and 1 to 3 respectively, and when p and q are greater than 1, the linking group between benzyl or substituted benzyl groups is F; and

wherein the negative birefringence of the film is determined by controlling the degree of in-plane orientation of the polyimide by the selection of G, F, B and A, and the values of n, p, q and z which affects the polyimide backbone chain rigidity and linearity, the higher the rigidity and linearity of the polyimide backbone, the larger the value of the negative birefringence of the polyimide film.

5,480,965

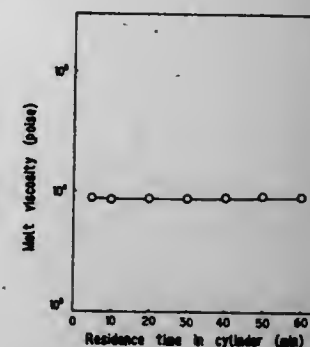
# READILY SOLUBLE, AMORPHOUS POLYIMIDE, AND PREPARATION PROCESS OF SAME

Wataru Yamashita; Yuichi Okawa; Hideaki Oikawa; Tadashi Asanuma; Yuko Ishihara; Mitsunori Matsuo, all of Kanagawa; Keizaburo Yamaguchi, Chiba; Akihiro Yamaguchi, and Shoji Tamai, both of Kanagawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan  
Continuation-in-part of Ser. No. 63,322, May 19, 1993, abandoned. This application Jul. 26, 1994, Ser. No. 280,551

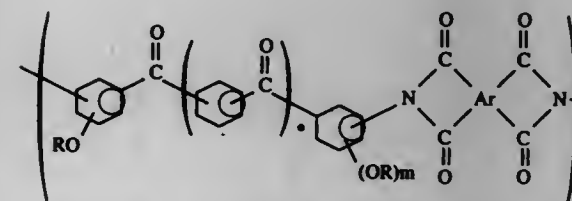
Int. Cl.<sup>6</sup> C08G 69/26; 73/10; C08L 79/08; 77/00

U.S. Cl. 528—353

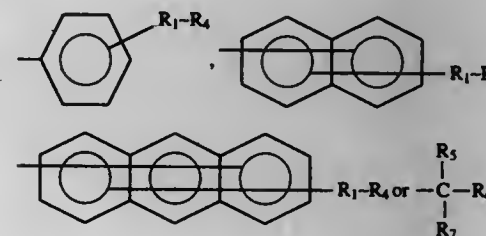
32 Claims



1. A polyimide comprising a requisite structural unit consisting of one or more recurring structural units of the formula (I):



wherein m and n are individually an integer of 0 or 1, and R is



wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are individually a hydrogen atom, halogen atom, alkyl having 1 to 8 carbon atoms, aryl, alkenyl, aralkyl or alkoxy having 1 to 5 carbon atoms; R<sub>5</sub>, R<sub>6</sub> and R<sub>7</sub> are individually a hydrogen atom, alkyl having 1 to 8 carbon atoms, aryl, alkenyl, aralkyl or ω-alkyloxyoligo-(alkyleneoxy)alkyl having 1 to 10 carbon atoms and 1 to 3 oxygen atoms; and Ar is a tetravalent radical having 2 to 27 carbon atoms and being selected from the group consisting of an aliphatic radical, alicyclic radical, monoaromatic radical, condensed polyaromatic radical and non-condensed aromatic radical connected to each other with a direct bond or a bridge member, or said polyimide having at the polymer chain end thereof an aromatic ring which is essentially unsubstituted or substituted with a radical having no reactivity with amine and/or dicarboxylic anhydride.

5,480,966

# PEPTIDES DERIVED FROM THE ENVELOPE GLYCOPROTEIN OF HIV VIRUSES, THEIR APPLICATIONS TO THE DETECTION OF INFECTION CAUSED BY THESE VIRUSES AND TO THE VACCINATION AGAINST AIDS

Gérard Sommé, Gif-Sur-Yvette, and Jacques Martin, Paris, both of France, assignors to Clonatec, S.A., Paris Cedex, France

Continuation of Ser. No. 641,455, Jan. 14, 1991, abandoned. This application Sep. 2, 1993, Ser. No. 116,252

Claims priority, application France, Jan. 16, 1990, 90 00455; Jan. 16, 1990, 90 00456

Int. Cl.<sup>6</sup> C07K 14/155; 17/00; A61K 39/24; G01N 33/536

U.S. Cl. 530—324

12 Claims

1. An L-amino acid peptide having a formula selected from the group consisting of

X-Arg-Ile-Leu-Ala-Val-Glu-Arg-Tyr-Leu-Lys-Asp-Gln-Gln-Leu-Leu-Gly-Ile-Trp-Gly-Cys-Ser-Gly-Leu-Ile-Cys-Z (SEQ ID No. 1) (I); and

X-Ala-Ile-Glu-Lys-Tyr-Leu-Gln-Asp-Gln-Ala-Arg-Leu-Asn-Ser-Trp-Gly-Cys-Ala-Phe-Arg-Gln-Val-Cys-Z (SEQ ID No. 2) (II), wherein

X represents NR<sub>2</sub>, where R is hydrogen or (C<sub>1</sub>-C<sub>3</sub>) alkyl; Z represents OR, wherein R is hydrogen or (C<sub>1</sub>-C<sub>3</sub>) alkyl; and at least one of the Cys residues is substituted with Ser; and combinations thereof.

5,480,967

# HIV-1 CORE PROTEIN FRAGMENTS

Andre J. McMichael; Douglas F. Nixon; Alain R. M. Townsend, and Frances M. Gotch, all of Oxford, Great Britain, assignors to United Biomedical, Inc., Hauppauge, N.Y.

PCT No. PCT/GB91/00013, § 371 Date Jul. 6, 1992, § 102(e) Date Jul. 6, 1992, PCT Pub. No. WO91/09069, PCT Pub. Date Jul. 11, 1991

PCT Filed Jan. 4, 1991, Ser. No. 854,629

Claims priority, application United Kingdom, Jan. 5, 1990, 9000287; Feb. 16, 1990, 9003577

Int. Cl.<sup>6</sup> C07K 5/00; A61K 39/12; C12Q 1/70; C12N 15/00

U.S. Cl. 530—326

8 Claims

8. A peptide having the amino acid sequence of a fragment of HIV which interacts specifically with a particular human lymphocyte antigen (HLA) class I molecule, to stimulate cytotoxic T lymphocyte immunity, wherein said peptide is selected from the group consisting of:

NH<sub>2</sub>-valine-glutamine-asparagine-alanine-asparagine-proline-aspartic acid-cysteine-lysine-threonine-isoleucine-leucine-lysine-alanine-leucine-tyrosine-COOH,

NH<sub>2</sub>-phenylalanine-arginine-aspartic acid-tyrosine-valine-aspartic acid-arginine-phenylalanine-tyrosine-lysine-threonine-leucine-arginine-alanine-glutamic acid-cysteine-COOH,

NH<sub>2</sub>-leucine-glutamic acid-glutamic acid-methionine-methionine-threonine-alanine-cysteine-glutamine-glycine-valine-glycine-glycine-proline-glycine-tyrosine-COOH,

NH<sub>2</sub>-cysteine-valine-glycine-glycine-proline-glycine-histidine-lysine-alanine-arginine-valine-leucine-COOH,

NH<sub>2</sub>-aspartic acid-leucine-asparagine-threonine-methionine-leucine-asparagine-threonine-valine-glycine-glycine-histidine-glutamine-alanine-alanine-cysteine-COOH, and

NH<sub>2</sub>-valine-histidine-glutamine-alanine-isoleucine-serine-proline-arginine-threonine-leucine-asparagine-alanine-tryptophan-valine-lysine-cysteine-COOH.



5,480,968

## ISOLATED POLYPEPTIDE ERBB-3, RELATED TO THE EPIDERMAL GROWTH FACTOR RECEPTOR AND ANTIBODY THERETO

Matthias H. Kraus, Bethesda, Md., and Stuart A. Aaronson, Vienna, Va., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 444,406, Dec. 4, 1989, Pat. No. 5,183,884. This application Nov. 10, 1992, Ser. No. 978,895

Int. Cl.<sup>6</sup> C07K 4/12; 5/04; 14/71; 16/18

U.S. Cl. 530—326

7 Claims

1. An isolated polypeptide having the amino acid sequence SEQ ID NO:4, or a portion of SEQ ID NO:4 sufficient to provide an erbB-3 receptor protein binding site for an antibody thereto which antibody is further characterized by not binding to erbB-2 or erbB.

5,480,969

## ANTAGONISTS OF LHRH

Cyril Y. Bowers, New Orleans, La.; Karl A. Folkers; Anders Ljungqvist, both of Austin, Tex.; Dong-Mei Feng, Harleysville, Pa., and Anna Janceka, Austin, Tex., assignors to The Administrators of the Tulane Educational Fund, New Orleans, La., and Board of Regents, The University of Texas System, Austin, Tex.

Filed Sep. 15, 1992, Ser. No. 946,056

Int. Cl.<sup>6</sup> C07K 7/00; 7/06; A61K 38/00

U.S. Cl. 530—328

4 Claims

1. N-AcD-3-Qal<sup>1</sup>, DpC1Phe<sup>2</sup>, D-3-Pal<sup>3</sup>, Ser<sup>4</sup>, c-PzACala<sup>5</sup>, DPicLys<sup>6</sup>, Leu<sup>7</sup>, Arg<sup>8</sup>, Pro<sup>9</sup>DalaNH<sub>2</sub><sup>10</sup>.

5,480,970

## METAL CHELATORS

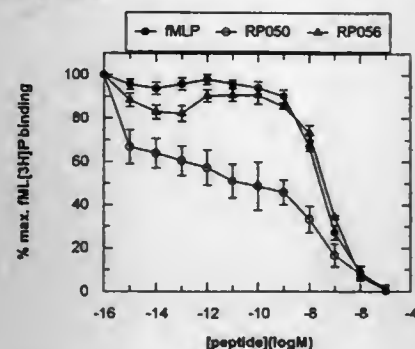
Alfred Pollak, and Anne Goodbody, both of Toronto, Canada, assignors to Resolution Pharmaceuticals, Mississauga, Canada

Filed Dec. 22, 1993, Ser. No. 171,737

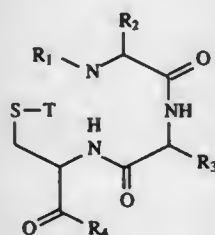
Int. Cl.<sup>6</sup> A61K 38/00; C07K 5/00; 7/00

U.S. Cl. 530—328

16 Claims



1. A compound of the general formula:



wherein

R<sub>1</sub> and R<sub>2</sub> together form a 5- or 6-membered heterocyclic ring which is optionally fused to a 5- or 6-membered ring, wherein either ring is optionally substituted with a conjugating group or with a conjugating group having a targeting molecule coupled thereto;

R<sub>3</sub> is selected from H; alkyl; and alkyl substituted by a group selected from amino, aminoacyl, carboxyl, guanidyl, hydroxyl, thiol, phenyl, phenolyl, indolyl and imidazolyl;

R<sub>4</sub> is selected from hydroxyl; alkoxy; any amino acid residue; and a targeting molecule; and

T is H or a sulfur protecting group;

with the proviso that R<sub>1</sub> and R<sub>2</sub> do not form a pyridine or pyrrolidine ring.

5,480,971

## PERALKYLATED OLIGOPEPTIDE MIXTURES

Richard A. Houghten, Solana Beach; John M. Ostresh, Encinitas, and Sylvie Blondelle, La Jolla, all of Calif., assignors to Houghten Pharmaceuticals, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 79,144, Jun. 17, 1993. This application Jun. 9, 1994, Ser. No. 257,782

Int. Cl.<sup>6</sup> C07K 7/06; A61K 38/00

U.S. Cl. 530—328

4 Claims

1. A permethylated oligopeptide having the formula



(SEQ ID NO:35)

wherein Xaa<sub>1</sub> at the first position is an α-trimethylammonium Leu or Phe residue;

Xaa<sub>2</sub> at the third position is Ile or Phe;

Xaa<sub>3</sub> at the fifth position is His or Phe; and

Xaa<sub>4</sub> at the sixth position is a C-terminal N-methylcarboxamide His or Phe, with the proviso that at least one of Xaa<sub>2</sub> and Xaa<sub>3</sub> is Phe.

5,480,972

## ALLERGENIC PROTEINS FROM JOHNSON GRASS POLLEN

Asil Avjloglu, Towson, Md.; Mohan B. Singh, Templestowe, and Robert B. Knox, North Balwyn, both of Australia, assignors to The University of Melbourne, Parkville, Australia, and ImmuLogic Pharmaceutical Corporation, Waltham, Mass.

Filed Oct. 30, 1992, Ser. No. 971,096

Int. Cl.<sup>6</sup> C12P 21/02; A61K 39/36; C07H 21/04

U.S. Cl. 530—379

9 Claims

1. Isolated *Sor h* I protein produced in a host cell transformed with a nucleic acid comprising a nucleotide sequence of FIG. 5 (SEQ ID NO: 1).

5,480,973

## GEL PRODUCTS AND A PROCESS FOR MAKING THEM

John S. Goodlad, West Bridgeford; Jonathan R. Cant, Melton Mowbray, and Stephen Harford, Oakham, all of, United Kingdom, assignors to Nadreph Limited, Slough, United Kingdom

PCT No. PCT/GB92/00736, § 371 Date Oct. 21, 1993, § 102(e) Date Oct. 21, 1993, PCT Pub. No. WO92/18018, PCT Pub. Date Oct. 29, 1993

PCT Filed Apr. 22, 1992, Ser. No. 137,098

Claims priority, application United Kingdom, Apr. 22, 1991, 9108604

Int. Cl.<sup>6</sup> A23J 3/00; A23L 1/0562; A23P 1/08; C07K 1/113

U.S. Cl. 530—386

36 Claims

1. A proteinaceous product comprising a thermally irreversible and stable, substantially clear gel formed by the reaction product of globular protein and reducing sugar.

5,480,974

## ANTIBODIES TO HUMAN CSA RECEPTOR

Edward L. Morgan, San Diego; Julia A. Ember, Rancho Santa Fe, and Tony E. Hugli, San Diego, all of Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Filed Jun. 18, 1993, Ser. No. 79,051

Int. Cl.<sup>6</sup> C07K 15/28; 15/00; C12N 5/12

U.S. Cl. 530—387.9

5 Claims

1. An antibody which binds to a peptide having the amino acid sequence of Sequence ID No. 1 and conservative variations thereof.

5,480,975

## INDUCTION OF VASCULAR ENDOTHELIAL GROWTH FACTOR (VEGF) BY TRANSITION METALS

Mark A. Goldberg, Boston, and Andrew P. Levy, Brookline, both of Mass., assignors to Brigham and Women's Hospital, Boston, Mass.

Filed Feb. 8, 1994, Ser. No. 193,569

Int. Cl.<sup>6</sup> A61K 33/24; 33/30; 33/32; 33/34

U.S. Cl. 530—399

26 Claims

1. A method of increasing vascularization of tissue in a patient in need thereof by administering a composition comprising a transition metal ion capable of stimulating vascularization in an amount suitable to stimulate said vascularization.

5,480,976

## REACTIVE DYES CONTAINING A VINYL SULFONYL-SUBSTITUTED 2-AMINONAPHTHALENE COUPLING COMPONENT AND A HALOACRYLOYLANILINE DIAZO COMPONENT OR THE LIKE

Athanasios Trikas, Pratteln, and Claudia Carlsch, Reinach, both of, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Oct. 7, 1994, Ser. No. 320,085

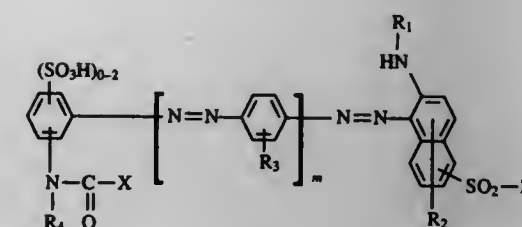
Claims priority, application Switzerland, Jan. 12, 1993, 3073/93

Int. Cl.<sup>6</sup> C09B 62/47; 62/507; D06P 1/384

U.S. Cl. 534—642

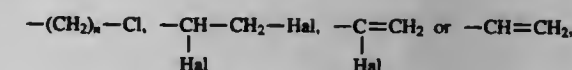
16 Claims

1. A reactive dye of formula



wherein

X is a radical of formula



wherein Hal is halogen and n is 1, 2, 3 or 4,

Z is a group of formula  $-\text{CH}=\text{CH}_2$  or  $-\text{CH}_2-\text{CH}_2-\text{Y}$ , and Y is a leaving group,

R<sub>1</sub> and R<sub>4</sub> are each independently of the other hydrogen or unsubstituted or substituted C<sub>1</sub>-C<sub>4</sub>alkyl,

R<sub>2</sub> is hydrogen, sulfo or hydroxy,

R<sub>3</sub> is hydrogen, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy,

C<sub>2</sub>-C<sub>4</sub>alkanoylamino, halogen or sulfo, and

m is 0 or 1.

5,480,977

## DISAZO DYES HAVING AMINOBENZOYLAMINO GROUP

Kazuya Ogino, Minoo; Narutoshi Hayashi, Toyonaka, and Takashi Omura, Kobe, all of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 13, 1993, Ser. No. 134,942

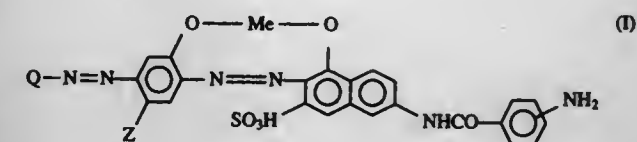
Claims priority, application Japan, Jan. 13, 1992, 4-274120

Int. Cl.<sup>6</sup> C09B 45/24; F21V 9/14

U.S. Cl. 534—717

5 Claims

1. A disazo compound represented by the formula (I) as shown in the form of free acid:



wherein Q is a substituted or unsubstituted phenyl or naphthyl group; Me is a copper, nickel, zinc or iron atom; and Z is a hydrogen atom, a methyl, ethyl, methoxyl, ethoxyl, or acetyl amino group.

5,480,978

## PROCESS FOR THE REMOVAL OF ALCOHOLS

Wilhelm Johannsbauer, Erkrath; Hermann Koerner, Duesseldorf, and Michael Nitsche, Solingen, all of, Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

Continuation of Ser. No. 844,570, Mar. 27, 1992, abandoned.

This application Jul. 28, 1994, Ser. No. 282,409

Claims priority, application Germany, Sep. 27, 1989, 39 32 173.8

Int. Cl.<sup>6</sup> C07H 1/06; 15/04

U.S. Cl. 536—4.1

13 Claims

1. In a process for the removal of alcohols containing from 8 to 30 carbon atoms from a mixture of alkyl glycosides and such alcohols, the improvement wherein the alcohols are removed from said mixture in two stages comprising the steps of

a) passing said mixture through a falling-film evaporator to obtain partial removal of alcohols from the mixture, wherein the sump temperature is maintained in the range of from about 140° to about 220° C., and the pressure is maintained in the range of from about 1 to about 20 mbar, and

b) passing the mixture from step a) through a thin-layer evaporator to remove further quantities of alcohols, wherein the sump temperature is in the range of from about 160° to about 250° C., and the pressure is maintained in the range of from about 0.1 to about 5 mbar.



5,480,979

## PROCESS FOR THE PRODUCTION OF ALKYL AND/OR ALKENYL OLIGOGLYCOSIDES

Manfred Weuthen, Solingen; Karlheinz Hill, Erkrath, and Paul Schulz, Wuppertal, all of, Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP92/02552, § 371 Date May 13, 1994, § 102(e) Date May 13, 1994, PCT Pub. No. WO93/10132, PCT Pub. Date May 27, 1993

PCT Filed Nov. 6, 1992, Ser. No. 244,053

Claims priority, application Germany, Nov. 15, 1991, 41 37 636.6

Int. Cl.<sup>6</sup> C07H 15/04; 15/08; 1/00

U.S. Cl. 536—18.6

5 Claims

1. A process for making an alkyl or alkenyl oligoglycoside which comprises reacting glucose with a fatty alcohol in the presence of an acid catalyst selected from the group consisting of sulfonocarboxylic acids having from 2 to 8 carbon atoms, anhydrides of sulfonocarboxylic acids having from 2 to 8 carbon atoms, mixed cyclic sulfonic acid carboxylic acid anhydrides, and mixtures thereof.

5,480,980

## 7-DEAZA-2'-DEOXYGUANOSINE NUCLEOTIDES AND NUCLEIC ACIDS ANALOGS THEREOF

Frank Seela, Paderborn, Germany, assignor to Boehringer Mannheim GmbH, Mannheim, Germany

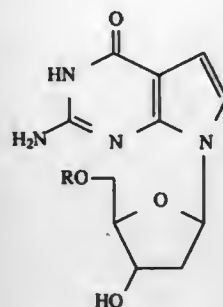
Division of Ser. No. 896,657, Aug. 13, 1986, Pat. No. 4,804,748. This application Nov. 14, 1988, Ser. No. 269,999

Int. Cl.<sup>6</sup> C07H 19/173; 21/04; 19/20

U.S. Cl. 536—23.1

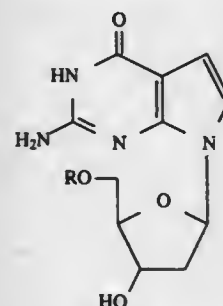
9 Claims

1. A compound of the formula



wherein R is PO<sub>3</sub>H<sub>2</sub>, P<sub>2</sub>O<sub>6</sub>H<sub>3</sub> or an alkali metal, alkaline earth metal, or ammonium salt thereof.

7. A nucleic acid sequence having a terminal nucleotide derived from a nucleotide of the formula:



where R is P<sub>2</sub>O<sub>6</sub>H<sub>3</sub> or P<sub>3</sub>O<sub>9</sub>H<sub>4</sub> or an alkali metal, alkaline earth metal or ammonia salt thereof.

5,480,981

## CD30 LIGAND

Raymond G. Goodwin; Craig A. Smith, both of Seattle; Richard J. Armitage, and Hans-Juergen Gruss, both of Bainbridge Island, all of Wash., assignors to Immunex Corporation, Seattle, Wash.

Continuation-in-part of Ser. No. 966,775; Oct. 27, 1992, abandoned, which is a continuation-in-part of Ser. No. 907,224, Jul. 1, 1992, abandoned, which is a continuation-in-part of Ser. No. 899,660, Jun. 15, 1992, abandoned, which is a continuation-in-part of Ser. No. 892,459, Jun. 2, 1992, abandoned, which is a continuation-in-part of Ser. No. 889,717, May 26, 1992, abandoned. This application Apr. 12, 1994, Ser. No. 225,989

Int. Cl.<sup>6</sup> C07H 21/04; C12N 15/19; 15/63; C07K 14/52; 1/00  
U.S. Cl. 536—23.5 20 Claims

1. An isolated DNA sequence encoding a CD30 ligand (CD30-L) polypeptide, wherein said CD30-L comprises an amino acid sequence selected from the group consisting of amino acids 1-220 of SEQ ID NO: 19, amino acids 1-215 of SEQ ID NO:23, amino acids 1-239 of SEQ ID NO:6, and amino acids 1-234 of SEQ ID NO:8.

5,480,982

## CRYSTALLINE POTASSIUM SALT OF THINONICOTINAMIDE ADENINE DINUCLEOTIDE PHOSPHATE

Kouji Sugita, Osakafu; Tetsuo Kitahara, Osaka; Masatsugu Nonobe, Hyogo, and Tsuyosi Fujita, Osaka, all of, Japan, assignors to Oriental Yeast Company, Ltd., Tokyo, Japan

PCT No. PCT/JP92/00260, § 371 Date Nov. 5, 1992, § 102(e) Date Nov. 5, 1992, PCT Pub. No. WO92/15527, PCT Pub. Date Sep. 17, 1992

PCT Filed Mar. 5, 1992, Ser. No. 945,989

Claims priority, application Japan, Mar. 5, 1991, 3-123182

Int. Cl.<sup>6</sup> C07H 21/02

U.S. Cl. 536—26.24

1 Claim

1. Crystalline potassium salt of thionicotinamide adenine dinucleotide phosphate.

5,480,983

## ADENOSINE DERIVATIVES, PREPARATION METHODS AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Nicole Bru-Magniez, Paris; Timur Güngör, Ruell Malmanson, and Jean-Marie Teulon, La Celle St. Cloud, all of, France, assignors to Laboratoires UPSA, Agen, France

PCT No. PCT/FR92/01241, § 371 Date Jun. 29, 1994, § 102(e) Date Jun. 29, 1994, PCT Pub. No. WO93/14102, PCT Pub. Date Jul. 22, 1993

Continuation-in-part of Ser. No. 832,576, Feb. 7, 1992, Pat. No. 5,229,505. This PCT application Dec. 29, 1992, Ser. No. 256,081

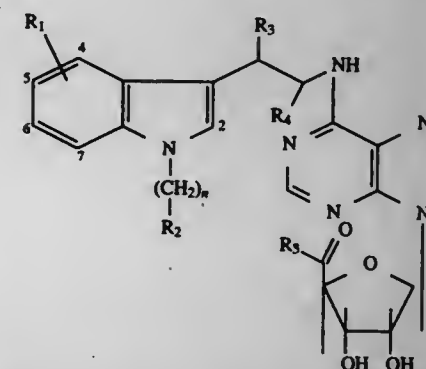
Claims priority, application France, Jan. 8, 1992, 92 00138  
The portion of the term of this patent subsequent to Apr. 5, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> C07H 19/167

U.S. Cl. 536—27.62

15 Claims

1. An adenosine derivative of general formula (I):



Formula (I)

in which:

R<sub>1</sub> is a hydrogen atom, a halogen atom, a C<sub>1</sub>-C<sub>6</sub> alkyl radical, a C<sub>1</sub>-C<sub>6</sub> O-alkyl radical, a C<sub>1</sub>-C<sub>6</sub> S-alkyl radical or a phenyl radical located in the 2-, 4-, 5-, 6- or 7-position of the indole; n is an integer from 0 to 4;

R<sub>2</sub> is a C<sub>1</sub>-C<sub>6</sub> alkyl radical, a C<sub>1</sub>-C<sub>6</sub> alkenyl radical, C<sub>1</sub>-C<sub>6</sub> alkynyl radical, a C<sub>3</sub>-C<sub>7</sub>-cycloalkyl radical or C<sub>1</sub>-C<sub>6</sub> O-alkyl radical;

a phenyl or naphthyl radical which is unsubstituted or substituted by one to four identical or different substituents selected from the group consisting of a halogen atom, a nitro, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> O-alkyl or C<sub>1</sub>-C<sub>6</sub> S-alkyl group and a group —NR<sub>7</sub>R<sub>8</sub>, R<sub>7</sub> and R<sub>8</sub> being the hydrogen atom or a C<sub>1</sub>-C<sub>6</sub> alkyl radical;

a heterocyclic radical selected from the group consisting of pyridine and thiophene which is unsubstituted or substituted by one to four identical or different substituents selected from the group consisting of a halogen atom and a nitro, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> O-alkyl and C<sub>1</sub>-C<sub>6</sub> S-alkyl group;

or, when n is equal to 2, 3 or 4, a group —NR<sub>9</sub>R<sub>10</sub>, R<sub>9</sub> and R<sub>10</sub> simultaneously being a C<sub>1</sub>-C<sub>6</sub> alkyl radical or forming, together with the nitrogen atom to which they are attached, a heterocycle selected from the group consisting of morpholine, piperidine and pyrrolidine;

R<sub>3</sub> and R<sub>4</sub> which are identical or different, are a hydrogen atom or a C<sub>1</sub>-C<sub>6</sub> alkyl radical; and

R<sub>5</sub> is a group —NHR<sub>11</sub>, R<sub>11</sub> being a C<sub>1</sub>-C<sub>6</sub> alkyl radical, a C<sub>3</sub>-C<sub>7</sub>-cycloalkyl radical, a C<sub>1</sub>-C<sub>6</sub> alkyl chain possessing an alcohol or ether functional group, or a group —(CH<sub>2</sub>)<sub>n</sub>—NR<sub>9</sub>R<sub>10</sub>, n, R<sub>9</sub> and R<sub>10</sub> being as defined above.

5,480,984

## PROCESS OF PREPARING HIGH SOLIDS LOW VISCOSITY POLYSACCHARIDES

John D. Angerer; Jashwant J. Modi, both of Hockessin, Del., and Robert C. Szafranski, Hopewell, Va., assignors to Aquilon Company, Wilmington, Del.

Division of Ser. No. 546,866, Jul. 2, 1990. This application Feb. 11, 1992, Ser. No. 834,163

Int. Cl.<sup>6</sup> C08B 11/20

U.S. Cl. 536—88

4 Claims

3. A process for producing a high solids low viscosity aqueous polysaccharide composition consisting essentially of the steps of:

- (1) reacting a polysaccharide at a solids content of 5 to 15% by weight with a hydrogen peroxide oxidizing agent in an aqueous solution;
- (2) adding additional hydrogen peroxide oxidizing agent and polysaccharide and reacting at a solids content of 10 to 20% by weight with an oxidizing agent;
- (3) adding additional hydrogen peroxide oxidizing agent and polysaccharide and reacting at a solids content of 15 to 25% by weight with an oxidizing agent;
- (4) adding additional hydrogen peroxide oxidizing agent and polysaccharide and reacting at a solids content of 20 to 30% by weight with an oxidizing agent;
- (5) terminating the reaction and recovering the polysaccharide composition with a solids content above 20% and ranging up to about 50% and a viscosity below 9500 mPa.s at 25° C. in solution.

5,480,985

## PROCESS FOR PREPARING BRANCHED CYCLODEXTRINS

Rolf Hirsenkorn, München; Petra Grauvogl, Pfaffenhofen, and Silke Scheiding, Unterschleißheim, all of, Germany, assignors to Consortium für elektrochemische Industrie GmbH, Munich, Germany

Filed Jul. 8, 1994, Ser. No. 272,144

Claims priority, application Germany, Jul. 26, 1993, 43 25 057.2

Int. Cl.<sup>6</sup> C08B 37/16

U.S. Cl. 536—124

12 Claims

1. A process for preparing branched cyclodextrins comprising reacting at least one cyclodextrin or cyclodextrin derivative with at least one glycosyl donor selected from the group consisting of glucose, mannose, galactose, xylose, maltose and the mixtures thereof in a molar ratio of cyclodextrin/glycosyl donor of from 1:1 to 1:20 at a temperature between 0° C. and 100° C. and under a pressure of between 100 mm Hg and 1000 mm Hg over a period of from 1 to 72 hours in the presence of a catalyst and in a solvent;

the catalyst being selected from the group consisting of a water-free mineral acid and an acidic anion exchanger; and the solvent being selected from the group consisting of dimethylformamide and N-methylpyrrolidone.

5,480,986

## METAL COMPLEXES OF SUBSTITUTED GABLE PORPHYRINS AS OXIDATION CATALYSTS

James E. Lyons, Wallingford; Paul E. Ellis, Jr., Downingtown, and Richard W. Wagner, Murrysville, all of Pa., assignors to Sun Company, Inc. (R&M), Philadelphia, Pa.

Filed Jul. 30, 1993, Ser. No. 100,516

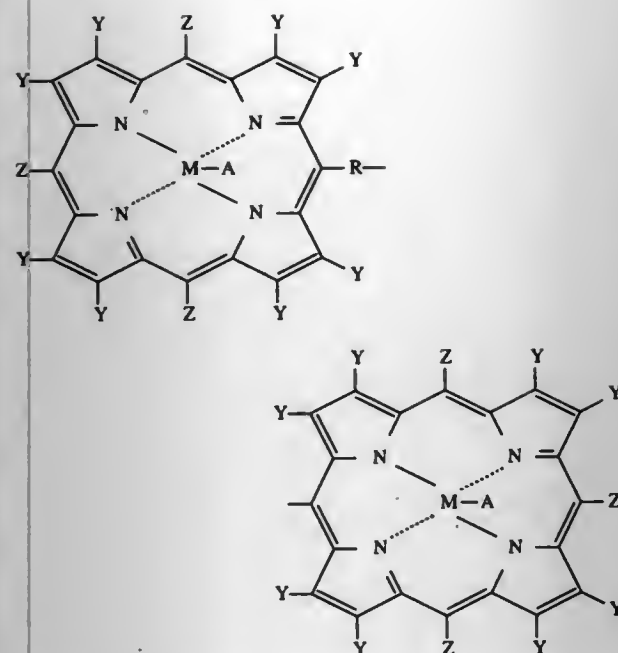
Int. Cl.<sup>6</sup> C07C 29/50; C07D 487/22

U.S. Cl. 540—145

21 Claims

1. A composition of matter comprising Gable porphyrins having the formula:





wherein M is a transition metal from selected from Groups I, VI, VII or VIII of the Periodic Table; Y is hydrogen or alkyl or an electron-withdrawing substituent for hydrogen; Z is halohydrocarbon or halocarbonyl; R is an aromatic group; and A is an anion or is absent.

5,480,987

## 2-SUBSTITUTED ALKYL-3-CARBOXY CARBAPENEMS AS ANTIBIOTICS AND A METHOD OF PRODUCING THEM

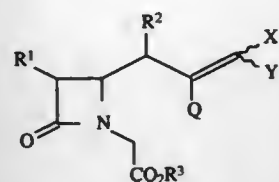
Carl B. Ziegler, Jr.; William V. Curran, both of Pearl River, and Gregg Feigelson, Spring Valley, all of N.Y., assignors to American Cyanamid Company, Wayne, N.J.  
Division of Ser. No. 87,944, Jul. 6, 1993, Pat. No. 5,369,102, which is a continuation of Ser. No. 749,019, Aug. 23, 1991, abandoned, which is a division of Ser. No. 507,271, Apr. 10, 1990, Pat. No. 5,068,232. This application Apr. 28, 1994, Ser. No. 234,905

Int. Cl.<sup>6</sup> C07D 205/08; C07F 7/18; A61K 31/40

U.S. Cl. 540—200

23 Claims

1. A substituted allylazetidinone compound having the formula:



wherein

R<sup>1</sup> is hydrogen; a straight-chain or branched lower alkyl group selected from methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl, sec-butyl, tert-butyl, n-pentyl, or isopentyl; a straight-chained or branched lower alkoxy group selected from methoxy, ethoxy, n-propoxy, isopropoxy, n-butoxy, isobutoxy, sec-butoxy, or tert-butoxy; or a R<sup>4</sup> B group wherein R<sup>4</sup> is hydroxyl; a lower alkoxy group selected from

methoxy, ethoxy, n-propoxy, or isopropoxy; fluoride; an acyloxy group selected from acetoxy, propionyloxy, n-butyryloxy, or isobutyryloxy or an aralkyloxycarbonyloxy group selected from benzyloxycarbonyloxy or p-nitrobenzyloxycarbonyloxy; a lower alkylsulfonyloxy group selected from methanesulfonyloxy, ethanesulfonyloxy, or propanesulfonyloxy; an arylsulfonyloxy group selected from benzenesulfonyloxy or p-toluenesulfonyloxy; a lower trialkylsilyloxy group selected from trimethylsilyloxy or tert-butyltrimethylsilyloxy; mercapto; a lower alkylthio group selected from methylthio, ethylthio, n-propylthio, or isopropylthio; amino; or a lower aliphatic acylamino group selected from acetamino, propionylamino, n-butyrylamino, or isobutyrylamino; and B is selected from methylene, ethylene, ethylidene, trimethylene, propylidene, isopropylidene, tetramethylene, butylidene, pentamethylene, pentylidene, 2,2,2-trifluoroethylidene, 3,3,3-trifluoropropylidene, or benzylidene;

R<sup>2</sup>=hydrogen, C<sub>1</sub>–C<sub>6</sub> alkyl, phenyl and substituted phenyl, the substituents selected from C<sub>1</sub>–C<sub>6</sub> alkyl;

R<sup>3</sup> is hydrogen; a straight-chain or branched lower alkyl group selected from methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl, or tert-butyl; a lower haloalkyl group selected from 2-iodoethyl, 2,2-dibromoethyl, or 2,2,2-trichloroethyl; a lower alkoxyethyl group selected from methoxymethyl, ethoxymethyl, n-propoxymethyl, isopropoxymethyl, n-butoxymethyl, or isobutoxymethyl; a lower aliphatic acyloxymethyl group selected from acetoxymethyl, propionylloxymethyl, n-butyryloxymethyl, isobutyryloxymethyl, or pivaloyloxymethyl; a 1-(lower alkoxy)carbonyloxyethyl group selected from 1-methoxycarbonyloxyethyl, 1-ethoxycarbonyloxyethyl, 1-n-propoxycarbonyloxyethyl, 1-isopropoxycarbonyloxyethyl, 1-n-butoxycarbonyloxyethyl, or 1-isobutoxycarbonyloxyethyl; an aralkyl group selected from benzyl, p-methoxybenzyl, o-nitrobenzyl, or p-nitrobenzyl; benzhydryl; phthalidyl; a silyl group selected from trimethylsilyl or t-butyltrimethylsilyl or 2-trimethylsilylethyl; an allylic group selected from allyl, 2-chloro-2-propenyl, 2-butenyl, 3-methyl-2-butenyl or 2-cinnamyl;

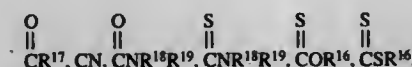
Q=a suitable leaving group selected from the group consisting of:

F, Cl, Br, I, R<sup>21</sup>S, R<sup>21</sup>SO<sub>2</sub>, [NR<sup>21</sup>]<sub>3</sub>, PR<sup>21</sup><sub>3</sub>, OR<sup>21</sup>, OCOR<sup>2</sup>, OOH, OOR<sup>21</sup>, —OP(O) (OPH)<sub>2</sub>, —OP(O) (OCCl<sub>3</sub>)<sub>2</sub>, —OSO<sub>2</sub>(4-OSO<sub>2</sub>(4-nitrophenyl)), —OSO<sub>2</sub>CH<sub>3</sub> and CN;

R<sup>21</sup>=a straight or branched chain alkyl having 1–10 carbon atoms; a phenyl-substituted alkyl group selected from benzyl, benzhydryl CH(C<sub>6</sub>H<sub>5</sub>)<sub>2</sub>, 2-phenylethyl; phenyl, optionally substituted by 1–3 substituents independently selected from fluoro, chloro, bromo, C<sub>1</sub>–C<sub>3</sub> alkyl, SO<sub>2</sub>, R<sup>17</sup>, CO<sub>2</sub>, R<sup>16</sup>, CONR<sup>18</sup>, R<sup>19</sup>;

X=fluorine, chlorine, bromine, iodine, hydrogen;

Y=a suitable electron withdrawing group selected from the group consisting of



F, Cl, Br, I;

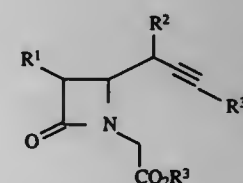
R<sup>16</sup>=a straight-chain or branched lower-alkyl group selected from methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl; a lower haloalkyl group selected from 2-chloroethyl, 3-chloropropyl, 2-iodoethyl, 2,2-dibromoethyl or 2,2,2-trichloroethyl; a lower trimethylsilylalkyl group selected from 2-trimethylsilylethyl; substituted allyl group selected from 2-chloro-2-propenyl, 3-methyl-2-propenyl, 3-methyl-2-butenyl, 3-phenyl-2-propenyl; a lower alkyl-t-butyltrimethylsilyloxy group selected from 2-(t-butyltrimethylsilyloxy) ethyl or 2-(t-butyltrimethylsilyloxy)

propyl; a lower alkyl-hydroxy group of 2–4 carbon atoms selected from 2-hydroxyethyl, 3-hydroxypropyl or 3-hydroxy-n-butyl; phenyl; an alkylheterocycle group with the alkyl moiety having 1–3 carbon atoms attached to a 5- or 6-membered ring that contains 1–4 O, N or S atoms through a ring carbon or ring nitrogen;

R<sup>17</sup>=1) phenyl, optionally substituted by 1–3 substituents independently selected from: 1a) halogens (F, Cl, Br, I) and/or trifluoromethyl; 1b) C<sub>1</sub>–C<sub>4</sub> branched or linear alkyl; 1c) hydroxy or a protected hydroxy group, amino or a protected amino group, thiol or a protected thiol group; 1d) an alkenyl or alkynyl group having 1–4 carbon atoms selected from ethenyl, 1-propenyl, 2-propenyl, 3-propenyl, ethynyl, 1-propynyl; 1e) carboxy or carboxamido 1f) a heterocycle group that contains 1–4 O, N or S atoms attached through a ring carbon or nitrogen;

R<sup>18</sup> and R<sup>19</sup> are independently selected from hydrogen; alkyl having from 1–10 carbon atoms; cycloalkyl having from 1–10 carbon atoms; phenyl alkyl and heterocycloalkyl wherein the alkyl has 1–6 carbon atoms and the heteroatom or atoms are selected from O, N and S.

16. A propargyl azetidinone compound having the formula:



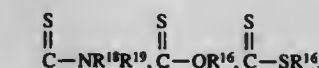
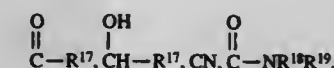
wherein

R<sup>1</sup> is hydrogen; straight-chain or branched lower alkyl group selected from methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl, sec-butyl, tert-butyl, n-pentyl, or isopentyl; a straight-chained or branched lower alkoxy group selected from methoxy, ethoxy, n-propoxy, isopropoxy, n-butoxy, isobutoxy, sec-butoxy, or tert-butoxy; or a R<sup>4</sup> B group wherein R<sup>4</sup> is hydroxyl; a lower alkoxy group selected from methoxy, ethoxy, n-propoxy, or isopropoxy; fluoride; an acyloxy group selected from acetoxy, propionyloxy, n-butyryloxy, or isobutyryloxy or an aralkyloxycarbonyloxy group selected from benzyloxycarbonyloxy or p-nitrobenzyloxycarbonyloxy; a lower alkylsulfonyloxy group selected from methanesulfonyloxy, ethanesulfonyloxy, or propanesulfonyloxy; an arylsulfonyloxy group selected from benzenesulfonyloxy or p-toluenesulfonyloxy; a lower trialkylsilyloxy group selected from trimethylsilyloxy or tert-butyltrimethylsilyloxy; mercapto; a lower alkylthio group selected from methylthio, ethylthio, n-propylthio, or isopropylthio; amino; or a lower aliphatic acylamino group selected from acetamino, propionylamino, n-butyrylamino, or isobutyrylamino; and B is selected from methylene, ethylene, ethylidene, trimethylene, propylidene, isopropylidene, tetramethylene, butylidene, pentamethylene, pentylidene, 2,2,2-trifluoroethylidene, 3,3,3-trifluoropropylidene, or benzylidene;

R<sup>2</sup>=hydrogen, C<sub>1</sub>–C<sub>6</sub> alkyl, phenyl and substituted phenyl, the substituents selected from C<sub>1</sub>–C<sub>6</sub> alkyl;

R<sup>3</sup> is hydrogen; a straight-chain or branched lower alkyl group selected from methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl, or tert-butyl; a lower haloalkyl group selected from 2-iodoethyl, 2,2-dibromoethyl, or 2,2,2-trichloroethyl; a lower alkoxyethyl group selected from methoxymethyl, ethoxymethyl, n-propoxymethyl, isopropoxymethyl, n-butoxymethyl,

or isobutoxymethyl; a lower aliphatic acyloxymethyl group selected from acetoxymethyl, propionylloxymethyl, n-butyryloxymethyl, isobutyryloxymethyl, or pivaloyloxymethyl; a 1-(lower alkoxy) carbonyloxyethyl group selected from 1-methoxycarbonyloxyethyl, 1-ethoxycarbonyloxyethyl, 1-n-propoxycarbonyloxyethyl, 1-isopropoxycarbonyloxyethyl, 1-n-butoxycarbonyloxyethyl, or 1-isobutoxycarbonyloxyethyl; an aralkyl group selected from benzyl, p-methoxybenzyl, o-nitrobenzyl, or p-nitrobenzyl; benzhydryl; phthalidyl; a silyl group selected from trimethylsilyl or t-butyltrimethylsilyl or 2-trimethylsilylethyl; an allylic group selected from allyl, 2-chloro-2-propenyl, 2-butenyl, 3-methyl-2-butenyl or 2-cinnamyl; or a water soluble cation selected from lithium, sodium, potassium, ammonium or tetraalkyl ammonium (alkyl of C<sub>1</sub>–C<sub>4</sub>);



SO<sub>2</sub>, R<sup>17</sup>, SOR<sup>17</sup>, SR<sup>17</sup>, F, Cl, Br, I, trimethylsilyl;

R<sup>16</sup>=a straight-chain or branched lower alkyl group selected from methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl; a lower haloalkyl group selected from 2-chloroethyl, 3-chloropropyl, 2-iodoethyl, 2,2-dibromoethyl or 2,2,2-trichloroethyl; a lower trimethylsilylalkyl group selected from 2-trimethylsilylethyl; substituted allyl group selected from 2-chloro-2-propenyl, 3-methyl-2-propenyl, 3-methyl-2-butenyl, 3-phenyl-2-propenyl; a lower alkyl-t-butyltrimethylsilyloxy group selected from 2-(t-butyltrimethylsilyloxy) ethyl or 2-(t-butyltrimethylsilyloxy) propyl; a lower alkyl-hydroxy group of 2–4 carbon atoms selected from 2-hydroxyethyl, 3-hydroxypropyl or 3-hydroxy-n-butyl; phenyl; an alkylheterocycle group with the alkyl moiety having 1–3 carbon atoms attached to a 5- or 6-membered ring that contains 1–4 O, N or S atoms through a ring carbon or ring nitrogen;

R<sup>17</sup>=1) phenyl, optionally substituted by 1–3 substituents independently selected from: 1a) halogens (F, Cl, Br, I) and/or trifluoromethyl; 1b) C<sub>1</sub>–C<sub>4</sub> branched or linear alkyl; 1c) hydroxy or a protected hydroxy group, amino or a protected amino group, thiol or protected a thiol group; 1d) an alkenyl or alkynyl group having 1–4 carbon atoms selected from ethenyl, 1-propenyl, 2-propenyl, 3-propenyl, ethynyl, 1-propynyl; 1e) carboxy or carboxamido 1f) a heterocycle group that contains 1–4 O, N or S atoms attached through a ring carbon or nitrogen;

R<sup>18</sup> and R<sup>19</sup> are independently selected from hydrogen; alkyl having from 1–10 carbon atoms; cycloalkyl having from 1–10 carbon atoms; phenyl alkyl and heterocycloalkyl wherein the alkyl has 1–6 carbon atoms and the heteroatom or atoms are selected from O, N and S.



5,480,988

## CARBAMATES OF RAPAMYCIN

Amedeo A. Faill, Princeton Junction, N.J.; Oleg I. Bleyman, Holland, Pa.; Wenling Kao, Paoli, Pa., and Magid A. Abou-Gharbia, Glen Mills, Pa., assignors to American Home Products Corporation, Madison, N.J.

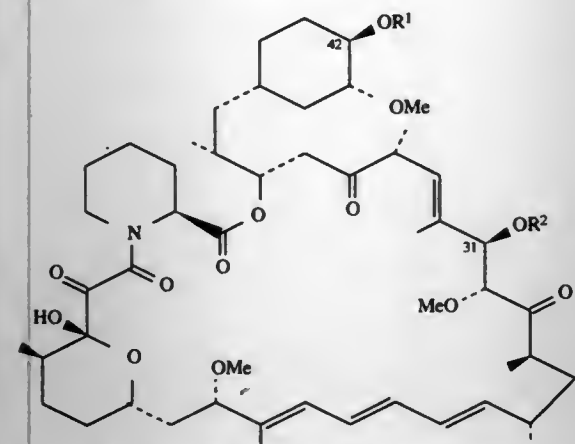
Continuation-in-part of Ser. No. 160,984, Dec. 1, 1993, abandoned, which is a division of Ser. No. 54,655, Apr. 23, 1993, Pat. No. 5,302,584, which is a continuation-in-part of Ser. No. 960,597, Oct. 13, 1992, abandoned. This application Aug. 2, 1994, Ser. No. 284,764

Int. Cl.<sup>6</sup> C07D 498/16; A61K 31/395

U.S. Cl. 540—456

11 Claims

1. A compound of the structure



wherein R<sup>1</sup> and R<sup>2</sup> are each, independently, hydrogen, —CONR<sup>3</sup>(CR<sup>4</sup>R<sup>5</sup>)<sub>m</sub>(CR<sup>6</sup>R<sup>7</sup>)<sub>n</sub>(CR<sup>8</sup>R<sup>9</sup>)<sub>p</sub>NR<sup>10</sup>R<sup>11</sup>;

R<sup>3</sup> is hydrogen, alkyl of 1–6 carbon atoms, or arylalkyl of 4–10 carbon atoms;

R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, and R<sup>9</sup> are each, independently, hydrogen, alkyl of 1–6 carbon atoms, —OH, —CF<sub>3</sub>, or —F;

R<sup>6</sup> is hydrogen or —OR<sup>14</sup>;

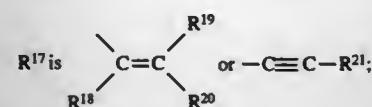
R<sup>7</sup> is hydrogen or alkyl of 1–6 carbon atoms;

R<sup>10</sup> is hydrogen, alkyl of 1–6 carbon atoms, or arylalkyl of 4–10 carbon atoms;

R<sup>11</sup> is —(CR<sup>15</sup>R<sup>16</sup>)<sub>p</sub>R<sup>17</sup>;

R<sup>14</sup> is hydrogen, alkyl of 1–6 carbon atoms, tri-(alkyl of 1–6 carbon atoms)silyl, tri-(alkyl of 1–6 carbon atoms)silylethyl, triphenylmethyl, benzyl, alkoxymethyl of 2–7 carbon atoms, tri-(alkyl of 1–6 carbon atoms)silylethoxymethyl, or tetrahydropyranyl;

R<sup>15</sup> and R<sup>16</sup> are each, independently, hydrogen or alkyl of 1–6 carbon atoms;



R<sup>18</sup>, R<sup>19</sup>, R<sup>20</sup>, and R<sup>21</sup> are each, independently, hydrogen, alkyl of 1–6 carbon atoms, halogen, or phenyl, wherein the phenyl group may be optionally mono-, di-, or tri-substituted with a group selected from alkyl of 1–6 carbon atoms arylalkyl of 7–10 carbon atoms, alkoxy of 1–6 carbon atoms, trifluoroalkoxy of 1–6 carbon atoms, cyano, halo, hydroxy, nitro, carbalkoxy of 2–7 carbon atoms, trifluoromethyl, amino, dialkylamino of 1–6 carbon atoms per alkyl group, dialkylaminoalkyl of 3–12 carbon atoms, hydroxyalkyl of 1–6 carbon atoms, alkoxyalkyl of 2–12 carbon atoms, alkylthio of 1–6 carbon atoms, —SO<sub>3</sub>H, —PO<sub>3</sub>H, and —CO<sub>2</sub>H;

R<sup>22</sup> is hydrogen, alkyl of 1–6 carbon atoms, or arylalkyl of 4–10 carbon atoms;

m=0–6;

n=1–6;

p=0–6; and

r=1–6

with the proviso that R<sup>1</sup> and R<sup>2</sup> are both not hydrogen, or a pharmaceutically acceptable salt thereof.

5,480,989

## CARBAMATES OF RAPAMYCIN

Wenling Kao, Paoli; Magid A. Abou-Gharbia, Glen Mills, both of Pa., and Robert L. Vogel, Stratford, N.J., assignors to American Home Products Corporation, Madison, N.J.

Continuation-in-part of Ser. No. 160,984, Dec. 1, 1993, abandoned, which is a division of Ser. No. 54,655, Apr. 23, 1993, Pat. No. 5,302,584, which is a continuation-in-part of Ser. No. 960,597, Oct. 13, 1992, abandoned. This application Sep. 1, 1994, Ser. No. 297,663

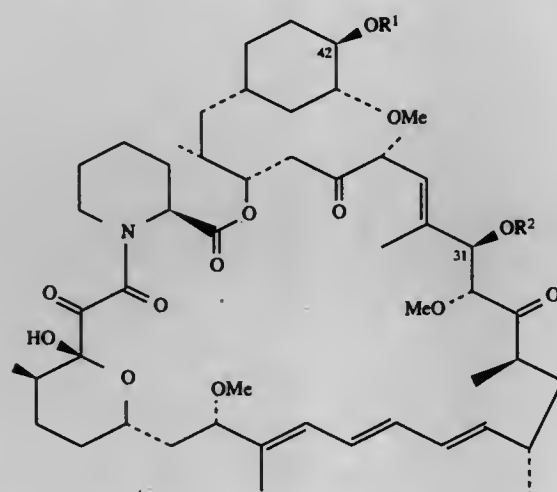
II The portion of the term of this patent subsequent to Apr. 12, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> C07D 491/06; A61K 31/395

U.S. Cl. 540—456

26 Claims

1. A compound of the structure



wherein R<sup>1</sup> and R<sup>2</sup> are each, independently, hydrogen, or —CONH—[(CR<sup>3</sup>R<sup>4</sup>)<sub>m</sub>(—A—(CR<sup>5</sup>R<sup>6</sup>)<sub>n</sub>)]<sub>p</sub>—B;

R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, and R<sup>6</sup> are each, independently, hydrogen, alkyl of 1–6 carbon atoms, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, hydroxyalkyl of 1–6 carbon atoms, alkoxyalkyl of 2–12 carbon atoms, alkylthioalkyl of 2–12 carbon atoms, dialkylaminoalkyl of 3–12 carbon atoms, arylalkyl of 7–10 carbon atoms, cycloalkyl of 3–8 carbon atoms, —OR<sup>7</sup>, —SR<sup>7</sup>, halogen, —CN, —NO<sub>2</sub>, —CF<sub>3</sub>, —COR<sup>7</sup>, —CO<sub>2</sub>R<sup>7</sup>, —CONHR<sup>7</sup>, —SO<sub>2</sub>R<sup>7</sup>, —OSO<sub>3</sub>R<sup>7</sup>, —NR<sup>7</sup>R<sup>8</sup>, —NHCOR<sup>7</sup>, —NHSO<sub>2</sub>R<sup>7</sup>, or Ar;

B is hydrogen, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, hydroxyalkyl of 1–6 carbon atoms, alkylthioalkyl of 2–12 carbon atoms, alkylaminoalkyl of 2–12 carbon atoms, dialkylaminoalkyl of 3–12 carbon atoms, —OR<sup>7</sup>, —SR<sup>7</sup>, —CN, —CF<sub>3</sub>, —COR<sup>7</sup>, —CONHR<sup>7</sup>, —OSO<sub>3</sub>R<sup>7</sup>, —NR<sup>7</sup>R<sup>8</sup>, —NHCOR<sup>7</sup>, —NHSO<sub>2</sub>R<sup>7</sup>, or Ar;

R<sup>7</sup> and R<sup>8</sup> are each, independently, hydrogen, alkyl of 1–6 carbon atoms, arylalkyl of 7–10 carbon atoms, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, hydroxyalkyl of 1–6 carbon atoms, alkoxyalkyl of 2–12 carbon atoms, alkylthioalkyl of 2–12 carbon atoms, dialkylaminoalkyl of 3–12 carbon atoms, cycloalkyl of 3–8 carbon atoms, or Ar;

A is —CH<sub>2</sub>—, —NR<sup>7</sup>—, —O—, —S—, —SO—, —PR<sup>7</sup>—, —NHCO—, —NHSO—, or —P(O)(R<sup>7</sup>)—;

Ar is naphthyl, pyridyl, quinolyl, isoquinolyl, quinoxalyl, thienyl, thionaphthyl, furyl, benzofuryl, benzodioxyl, benzoxazolyl, benzisoxazolyl, indolyl, thiazolyl, isoxazolyl, pyrimidinyl, pyrazinyl, imidazolyl, benzopyranyl, benz[b]thiophenyl, benzimidazolyl, benzthiazolyl, benzodioxyl, piperidinyl, morpholinyl, piperazinyl, tetrahydrofuranyl, or pyrrolidinyl; wherein the Ar

group may be optionally mono-, di-, or tri-substituted with a group selected from alkyl of 1–6 carbon atoms, arylalkyl of 7–10 carbon atoms, alkoxy of 1–6 carbon atoms, cyano, halo, hydroxy, nitro, carbalkoxy of 2–7 carbon atoms, trifluoromethyl, amino, dialkylamino of 1–6 carbon atoms per alkyl group, dialkylaminoalkyl of 3–12 carbon atoms, hydroxyalkyl of 1–6 carbon atoms, alkoxyalkyl of 2–12 carbon atoms, alkylthio of 1–6 carbon atoms, —SO<sub>3</sub>H, —PO<sub>3</sub>H, and —CO<sub>2</sub>H;

with the proviso that R<sup>1</sup> and R<sup>2</sup> are not both hydrogen and further provided that B is not hydrogen if q is 1;

m=0–6;

n=0–6;

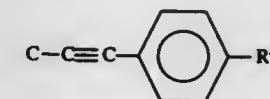
p=0–1;

q=0–1;

or a pharmaceutically acceptable salt thereof.

X and Y<sup>1</sup> are defined as before;

A=CH, N, C—Br, C—Cl, C—OR<sup>1</sup>, C—OR<sup>2</sup>, N<sup>+</sup>—R<sup>3</sup> X<sup>−</sup>, or



where:

R<sup>1</sup>=H, C<sub>1</sub>–C<sub>3</sub> alkyl, benzyl, or benzyl substituted with at least one R<sup>4</sup>;

R<sup>2</sup> is C<sub>1</sub>–C<sub>16</sub> alkylamino;

R<sup>3</sup> is C<sub>1</sub>–C<sub>16</sub> alkyl, benzyl, or benzyl substituted with at least one R<sup>4</sup>;

R<sup>4</sup> is defined as before;

X<sup>−</sup> is Cl<sup>−</sup>, Br<sup>−</sup>, I<sup>−</sup> or H<sub>3</sub>CCO<sub>2</sub><sup>−</sup>;

Q and Z independently are CH, N, N<sup>+</sup>—R<sup>3</sup> X<sup>−</sup>, C—CH<sub>2</sub>—OR<sup>1</sup> or C—C(O)—R<sup>5</sup>;

R<sup>1</sup> and R<sup>3</sup> are defined as above;

R<sup>5</sup> is —O—(C<sub>1</sub>–C<sub>3</sub> alkyl), OH or NHR<sup>6</sup>;

R<sup>6</sup> is C<sub>1</sub>–C<sub>3</sub> alkyl;

X<sup>−</sup> is defined as above; and

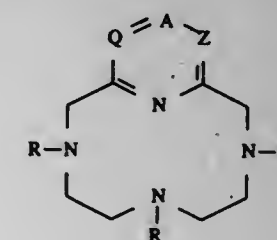
with the proviso that:

a) when Q, A or Z is N or N<sup>+</sup>—R<sup>3</sup> X<sup>−</sup>, then the other two groups must be CH;

b) when A is C—Br, C—Cl, C—OR<sup>1</sup> or C—OR<sup>2</sup> then both Q and Z must be CH;

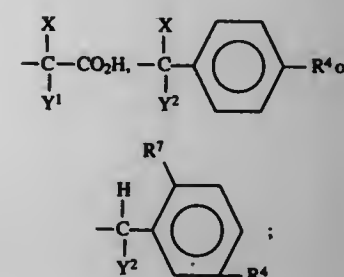
c) the sum of the R<sup>2</sup> and R<sup>4</sup> terms may not exceed one, and one of R<sup>2</sup> or R<sup>4</sup> must be present; and

(i) d) only one of Q or Z can be C—C(O)—R<sup>5</sup> and when one of Q or Z is C—C(O)—R<sup>5</sup>, then A must be CH; and complexed with a metal ion selected from Gd<sup>3+</sup>, Mn<sup>2+</sup> or Fe<sup>3+</sup>; or pharmaceutically-acceptable salts thereof.



wherein:

R is



where:

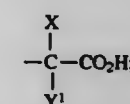
X and Y<sup>1</sup> are independently H, OH or C<sub>1</sub>–C<sub>3</sub> alkyl;

Y<sup>2</sup> is H or COOH;

R<sup>7</sup> is H, OH or OCH<sub>3</sub>; and

R<sup>4</sup> is H, NO<sub>2</sub>, NH<sub>2</sub>, isothiocyanato, semicarbazido, thiosemicarbazido, maleimido, bromoacetamido or carboxyl;

with the proviso that at least two R terms must be



where

5,480,991

# 2-ALKOXY-4-HYDROAZINOPYRIMIDINE COMPOUNDS AND THEIR USE IN THE PREPARATION OF 5-ALKOXY-1,2,4-TRIAZOLO[4,3-C]PYRIMIDINE-3(2H)-THIONE COMPOUNDS

Jon A. Orvik, Midland, and Dawn Shiang, Sanford, both of Mich., assignors to DowElanco, Indianapolis, Ind.

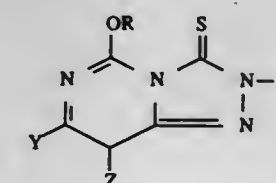
Filed Nov. 5, 1993, Ser. No. 148,789

Int. Cl.<sup>6</sup> C07D 471/02

U.S. Cl. 544—263

23 Claims

1. A 5-alkoxy-1,2,4-triazolo-pyrimidine-3(2H)-thione compound of the formula:



wherein

one of Y and Z represents F, Cl, Br, R<sup>1</sup>, or OR<sup>1</sup> and the other represents H; and

R and R<sup>1</sup> each independently represents CH<sub>3</sub> or C<sub>2</sub>H<sub>5</sub>, and the trialkylammonium salts thereof which are adducts of said compound and a trialkylamine-compound having three to twenty-one carbon atoms and a pKa of about 9.4 to about 11.4.



5,480,992

## ANOMERIC FLUORORIBOSYL AMINES

Larry W. Hertel; Charles D. Jones; Julian S. Kroin, and Thomas E. Mabry, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

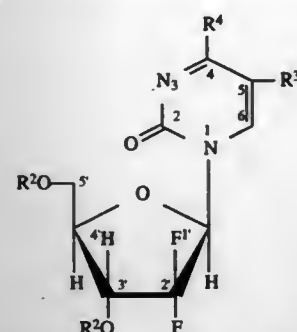
Filed Sep. 16, 1993, Ser. No. 122,876

Int. Cl.<sup>6</sup> C07D 239/30; 239/36; 307/12

U.S. Cl. 544—313

4 Claims

1. A process for preparing a compound of the formula

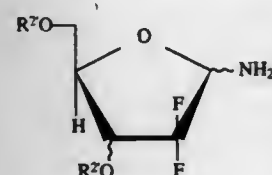


wherein each R<sup>2</sup> is H or is the same or different hydroxy protecting group; R<sup>3</sup> is H, C<sub>1</sub>-C<sub>4</sub> alkyl, bromo, chloro, fluoro or iodo; and R<sup>4</sup> is NH<sub>2</sub> or OH;

or a salt thereof,

which comprises

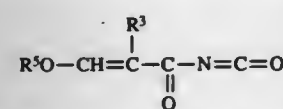
(a) condensing a compound of formula I



formula I

wherein

each R<sup>2</sup> is the same or different hydroxy protecting group, or a salt thereof; with an acyclic compound of formula VI



formula VI

wherein R<sup>3</sup> is as defined above and R<sup>5</sup> is C<sub>1</sub>-C<sub>4</sub> alkyl;

- cyclizing the reaction product from step (a);
- optionally deprotecting the reaction product from step (b);
- optionally converting the 4-position hydroxy functionality of the reaction product from step (c) with an amine group; and
- optionally salifying the reaction product from step (d).

5,480,993

## PROCESS FOR PREPARATION OF SULFONYLUREA DERIVATIVES AND INTERMEDIATES FOR THE PROCESS AND PROCESS FOR PREPARING THE SAME

Jong K. Choi; In B. Chung; Jae C. Lee; Byoung W. Suh; Jong S. Sa, and Tae H. Heo, all of Daejeon, Rep. of Korea, assignors to Lucky Ltd., Seoul, Rep. of Korea

Filed Mar. 3, 1994, Ser. No. 205,400

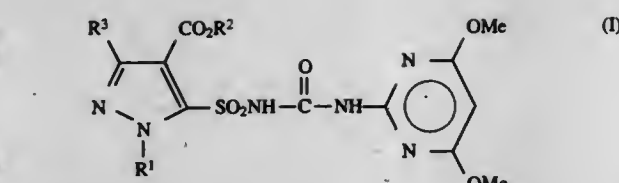
Claims priority, application Rep. of Korea, Mar. 5, 1993, 93-3308; Apr. 16, 1993, 93-6409; Jan. 7, 1993, 93-20759

Int. Cl.<sup>6</sup> C07D 239/52

U.S. Cl. 544—320

8 Claims

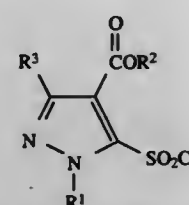
1. A process for preparing sulfonylurea derivatives having the following general formula (I),



wherein

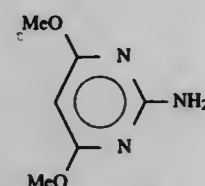
R<sup>1</sup> represents hydrogen, C<sub>1</sub>-C<sub>4</sub> alkyl or phenyl; R<sup>2</sup> represents hydrogen, C<sub>1</sub>-C<sub>4</sub> alkyl, allyl or propargyl; and R<sup>3</sup> represents hydrogen, methyl, ethyl or phenyl, comprising reacting

a sulfonylchloride of formula (V),



(V)

wherein R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> are as defined above, with 2-amino-4,6-dimethoxypyrimidine of formula (VII),



(VII)

in the presence of a metal cyanate and an organic base catalyst selected from the group consisting of trialkylamines, pyridine derivatives and cyclic tertiary amines.

5,480,994

## AMINOKETONE SENSITIZERS FOR AQUEOUS SOLUBLE PHOTOPOLYMER COMPOSITIONS

M. Zaki Ali, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

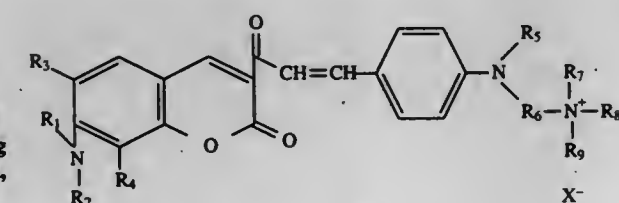
Division of Ser. No. 234,575, Apr. 28, 1994, Pat. No. 5,455,143, which is a continuation-in-part of Ser. No. 182,671, Jan. 14, 1994, abandoned, which is a continuation of Ser. No. 784,467, Oct. 25, 1991, abandoned. This application May 10, 1995, Ser. No. 438,252

Int. Cl.<sup>6</sup> C07D 405/00; 453/02; 311/02

U.S. Cl. 546—196

6 Claims

1. An aminoketone sensitizer for aqueous-developable photopolymer compositions having the formula:



wherein

R<sub>1</sub> and R<sub>2</sub> each represent an alkyl group having 1 to 6 carbon atoms, and R<sub>3</sub> and R<sub>4</sub> each represent hydrogen; or at least one of R<sub>1</sub> and R<sub>3</sub> or R<sub>2</sub> and R<sub>4</sub> together represent an alkylene group having 2 to 4 carbon atoms;

R<sub>5</sub> represents an alkyl group having 1 to 6 carbon atoms or H;

5,480,996

Patent Not Issued For This Number

5,480,997

## PYRIDINE-SUBSTITUTED BENZENEMETHANAMINE DERIVATIVES

Marcel A. C. Janssen, Vosselaar; Georges H. P. Van Daele, Turnhout; Jean-Paul R. M. A. Boumans, Edegem; Marc G. C. Verdonck, Gierle, and Paul A. J. Janssen, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica N.V., Belgium

PCT No. PCT/EP92/02993, § 371 Date May 12, 1994, § 102(e)

Date May 12, 1994, PCT Pub. No. WO93/13069, PCT Pub.

Date Jul. 8, 1993

PCT Filed Dec. 22, 1992, Ser. No. 240,737

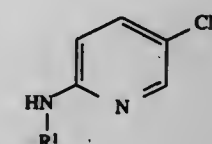
Claims priority, application European Pat. Off., Dec. 30, 1991, 91203431

Int. Cl.<sup>6</sup> C07D 213/57; 213/69; 213/72; 213/78

U.S. Cl. 546—289

5 Claims

1. A compound of the formula:

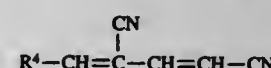


(I)

in which

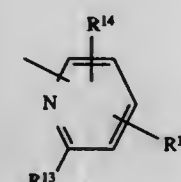
R<sup>1</sup> denotes hydrogen, straight-chain or branched C<sub>1</sub>-C<sub>8</sub>-alkyl, C<sub>3</sub>-C<sub>8</sub>-alkenyl, C<sub>2</sub>-C<sub>8</sub>-alkoxyalkenyl, C<sub>3</sub>-C<sub>8</sub>-cycloalkyl, C<sub>7</sub>-C<sub>10</sub>-aralkyl or -N(R<sup>2</sup>R<sup>3</sup>),

where R<sup>2</sup> and R<sup>3</sup> independently of one another denote hydrogen, straight-chain or branched C<sub>1</sub>-C<sub>8</sub>-alkyl, phenyl, tolyl, or C<sub>7</sub>-C<sub>10</sub>-aralkyl or R<sup>2</sup> and R<sup>3</sup> together with the N atom to which they are bonded from a 5- to 8-membered ring wherein said ring is selected from the group consisting of pyrrolidine, pyrrolidine, pyrazolidine, imidazolidine, thiazolidine, piperazine, piperidine, morpholine, azepine, or dihydroazacine, wherein a methylene-glutacononitrile of the formula



a pharmaceutically acceptable acid addition salt form or a stereochemically isomeric form thereof, wherein:

R<sup>1</sup> and R<sup>2</sup> each independently are halo or methyl; R<sup>3</sup> is hydrogen, halo, nitro or trifluoromethyl; R<sup>4</sup> is—trifluoromethyl or methyl carbonyl; or —a radical —C(=X)—NR<sup>5</sup>R<sup>6</sup> wherein X is O or S, and R<sup>5</sup> and R<sup>6</sup> each independently are hydrogen or C<sub>1</sub>-alkyl; or a radical —Alk—R<sup>7</sup>, wherein Alk is C<sub>1</sub>-alkanedyl; and R<sup>7</sup> is hydrogen or hydroxy; and Het is a heterocyclic radical of the formula:



(d)

in which

R<sup>4</sup> represents —OR<sup>5</sup> or —N(R<sup>5</sup>R<sup>6</sup>)

where R<sup>5</sup> and R<sup>6</sup> independently of R<sup>1</sup> and independently of one another have the scope of meaning of R<sup>1</sup> with the exception of hydrogen, additionally R<sup>5</sup> and R<sup>6</sup> together with the N atom to which they are bonded can form a 5- to 6-membered ring wherein said ring is selected from the group consisting of pyrrolidine, piperazine, piperidine, or morpholine, is reacted with a nitrogen compound of the formula



in which

R<sup>1</sup> has the abovementioned meaning, at a temperature from 0° to 200° C. and where the molar ratio of the nitrogen compound to glutacononitrile is from 1 to 100:1, optionally in the presence of an inert solvent.

wherein:

R<sup>13</sup> is hydrogen or hydroxy; R<sup>14</sup> is hydrogen, nitro, cyano, halo, C<sub>1</sub>-alkyl, C<sub>1</sub>-alkyloxy, or C<sub>1</sub>-alkylcarbonyl; and R<sup>15</sup> is hydrogen, nitro, cyano, halo, C<sub>1</sub>-alkyl, C<sub>1</sub>-alkyloxy, or C<sub>1</sub>-alkylcarbonyl, wherein in the heterocyclic radical (d), the nitrogen atom can optionally be oxidized.



5,480,998

## OXIME DERIVATIVE

Nobuyuki Hamanaka, Kanji Takahashi, and Hidekado Tokumoto, all of Osaka, Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 93,614, Jul. 20, 1993, abandoned.

This application Mar. 17, 1994, Ser. No. 215,019

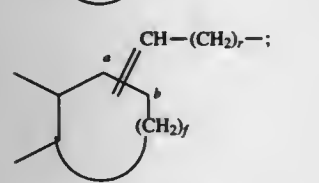
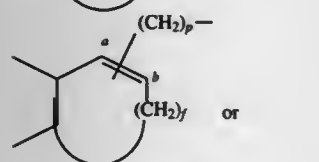
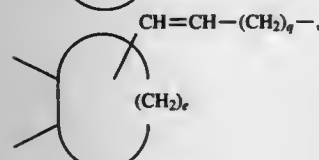
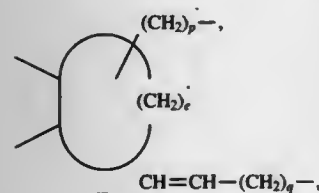
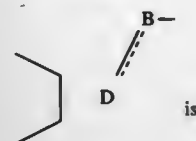
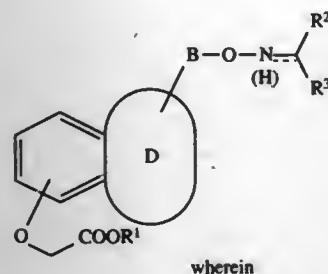
Claims priority, application Japan, Jul. 21, 1992, 4-215457

Int. Cl.<sup>6</sup> C07D 213/30; 213/42; 213/53; 213/54

U.S. Cl. 546—333

14 Claims

1. An oxime derivative of the formula (I):



R¹ is hydrogen or C1-4 alkyl;

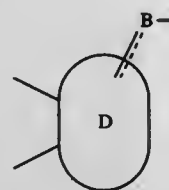
R² is

- (i) hydrogen,
- (ii) C1-8 alkyl,
- (iii) phenyl or C4-7 cycloalkyl, p2 (iv) 4-7 membered monocyclic ring containing one nitrogen,
- (v) C1-4 alkyl substituted by a benzene ring or C4-7 cycloalkyl or
- (vi) C1-4 alkyl substituted by a 4-7 membered monocyclic ring containing one nitrogen;

R³ is

- (i) C1-8 alkyl,
- (ii) phenyl or C4-7 cycloalkyl,
- (iii) 4-7 membered monocyclic ring containing one nitrogen,
- (iv) C1-4 alkyl substituted by a benzene ring or C4-7 cycloalkyl or

- (v) C1-4 alkyl substituted by a 4-7 membered monocyclic ring containing one nitrogen;
- e is 3-5, f is 1-3, p is 1-4, q is 1 or 2, r is 1-3; with the proviso that, when



is (iii) or (iv),  $-(CH_2)_p-$  and  $=CH-(CH_2)_e-$  are bonded at the position a or b on the ring, and the ring in R² and R³ may be substituted by one to three of C1-4 alkyl, C1-4 alkoxy, halogen, nitro or trihalomethyl; and non-toxic salts thereof.

5,480,999

# DUAL INHIBITORS OF NO SYNTHASE AND CYCLOOXYGENASE, THERAPEUTICAL COMPOSITIONS CONTAINING THEM

Pierre-Etienne Chabrier De Lassauniere, Paris; Pierre Braquet, Garches; Colette Broquet, Boulogne, and Serge Auvin, Michel-Sur-Orge, all of France, assignors to Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.), France

Filed Dec. 23, 1992, Ser. No. 995,792

Claims priority, application United Kingdom, Jan. 4, 1992, 92 00114

Int. Cl.<sup>6</sup> C07D 209/28; 207/33; C07C 229/26; 251/04; A61K 31/405; 31/155

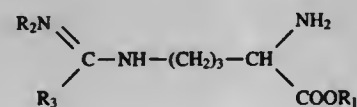
U.S. Cl. 548—500

14 Claims

1. Compounds of the formula AB, wherein:

A represents a cyclooxygenase inhibitor having an acidic function, the said cyclooxygenase inhibitor being of the formula RCOOH wherein COOH stands for the acidic function and R stands for a radical which corresponds to the radical of the selected cyclooxygenase inhibitor, and

B represents the L-form of arginine analogues of the formula



wherein R₁ represents a hydrogen atom or a methyl or ethyl group, R₂ represents a hydrogen atom or a nitro group and R₃ represents an amino, methylamino, ethylamino, hydrazino, methyl or ethyl group, with the proviso that if AB is a salt wherein R₂ represents a hydrogen atom, then R₃ does not represent an amino group.

5,481,000

PROCESS FOR PREPARING CHIRAL [(2-BROMOETHYL)-AMINO]METHYL-2-NITRO-1H-IMIDAZOL-1-ETHANOL AND RELATED COMPOUNDS

Vladimir G. Beylin; Anthony D. Serce; Howard D. H. Showalter, all of Ann Arbor, Mich.; Gerald E. Adams, Wheatley, England; Edward M. Fielden, Blewbury, England; Matthew A. Naylor, Woking, England, and Ian J. Stratford, Faringdon, England, assignors to Warner-Lambert Company, Morris Plains, N.J.

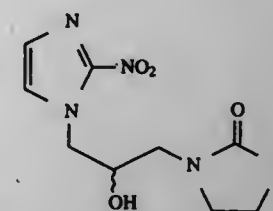
Division of Ser. No. 245,718, May 18, 1994, abandoned, which is a division of Ser. No. 102,658, Aug. 5, 1993, Pat. No. 5,342,959, which is a continuation of Ser. No. 923,209, Jul. 31, 1992, abandoned. This application Dec. 19, 1994, Ser. No. 359,226

Int. Cl.<sup>6</sup> C07D 233/64

U.S. Cl. 548—229

1 Claim

1. A chiral compound of the formula



wherein the compound has the (S) configuration at the carbon having the OH substituent and is substantially free of the (R) configuration.

5,481,001

# LIGHT SCREENING AGENT

Ulrich Huber, Zurich, Switzerland, assignor to Glvaudan-Roure Corporation, Clifton, N.J.

Continuation of Ser. No. 949,853, Nov. 19, 1992, abandoned.

This application Dec. 22, 1994, Ser. No. 361,869

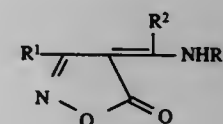
Claims priority, application Switzerland, Mar. 28, 1991, 948/91; Feb. 20, 1992, 512/92

Int. Cl.<sup>6</sup> C07D 261/12

U.S. Cl. 548—243

6 Claims

1. A compound of the formula



wherein

R¹ is selected from H, C₁-₁₉-alkyl, C₂-₂₉-alkenyl, and C₂-₂₉-alkynyl,

R² is selected from H, C₁-₂₉-alkyl, C₂-₂₉-alkenyl, C₂-₂₉-alkynyl, phenyl, and lower-alkyl substituted phenyl or oxy-lower alkyl substituted phenyl,

R³ is selected from H, C₁-₁₉-alkyl, C₁-₁₉-hydroxyalkyl, C₁-₁₉-polyhydroxyalkyl, C₂-₂₉-alkenyl, phenyl, lower-alkyl substituted phenyl, oxy-lower alkyl substituted phenyl, pyridyl, lower-alkyl substituted pyridyl, oxy-lower alkyl substituted pyridyl, polyether, and phenylsulphonic acid

and R² and R³ together with the N atom can also form a ring, and wherein the sum of the carbon atoms R¹+R²+R³=9-30 and the number of phenyl groups per molecule does not exceed 1.

5,481,002

# AZOLYL THERMOCHROMIC COMPOUNDS

Walter Fischer, Reinach; Beat Schmidhalter, Oberkirch, and Heinz Wolleb, Marly, all of Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Dec. 14, 1993, Ser. No. 166,782

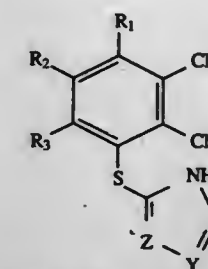
Claims priority, application Switzerland, Dec. 23, 1992, 3945/92

Int. Cl.<sup>6</sup> C07D 249/12; 249/04

U.S. Cl. 548—264.2

14 Claims

1. A compound of formula 1



wherein R₁, R₂ and R₃ are each independently of one another hydrogen, a straight-chain or branched C₁-C₁₂alkyl group, which is unsubstituted or substituted by alkoxy, alkylthio, aryloxy, arylthio, halogen, —CN, —COOH, —COOR₇, —NR₈R₉ or —CONR₈R₉, a C₁-C₁₂alkoxy group in which the alkyl moiety is straight-chain or branched and unsubstituted or substituted by alkoxy, alkylthio, aryloxy, arylthio, halogen, —CN, —COOH, —COOR₇, —NR₈R₉ or —CONR₈R₉, a C₁-C₁₂alkylthio group in which the alkyl moiety is straight-chain or branched and unsubstituted or substituted by alkoxy, alkylthio, aryloxy, arylthio, halogen, —CN, —COOH, —COOR₇, —NR₈R₉ or —CONR₈R₉, a C₅-C₆cycloalkyl group which is unsubstituted or substituted by alkyl, alkoxy, alkylthio, aryloxy, arylthio, halogen, —CN, —COOH, —COOR₇, —NR₈R₉ or —CONR₈R₉, a C₅-C₆cycloalkoxy group which is unsubstituted or substituted by alkyl, alkoxy, alkylthio, aryloxy, arylthio, halogen, —CN, —COOH, —COOR₇, —NR₈R₉ or —CONR₈R₉, a C₅-C₆cycloalkylthio group which is unsubstituted or substituted by alkyl, alkoxy, alkylthio, aryloxy, arylthio, halogen, —CN, —COOH, —COOR₇, —NR₈R₉ or —CONR₈R₉, a C₆-C₁₀aryl group which is unsubstituted or substituted by alkyl, alkoxy, alkylthio, aryloxy, arylthio, halogen, —CN, —COOH, —COOR₇, —NR₈R₉ or —CONR₈R₉, a C₆-C₁₀aryloxy group in which the aryl moiety is unsubstituted or substituted by alkyl, alkoxy, alkylthio, phenyl, phenoxy, phenylthio, halogen, —CN, —COOH, —COOR₇, —NR₈R₉ or 13 CONR₈R₉, a C₆-C₁₀arylthio group in which the aryl moiety is unsubstituted or substituted by alkyl, alkoxy, alkylthio, phenyl, phenoxy, phenylthio, halogen, —CN, —COOH, —COOR₇, —NR₈R₉ or —CONR₈R₉ or R₁, R₂, R₃ are independently of one another nitro, halogen, cyano, —COOH, —COOR₇, —NR₈R₉ or —CONR₈R₉, and wherein R₇ is C₁-C₂₀alkyl, C₅-C₆cycloalkyl, phenyl or phenyl-C₁-C₄alkyl, and R₈ and R₉ are each independently of the other hydrogen, C₁-C₈alkyl, phenyl or phenyl-C₁-C₄alkyl; X is nitrogen or CR₄, Y is nitrogen or CR₅ and Z is nitrogen or CR₆, and R₄, R₅ and R₆ are each independently of one another hydrogen, a straight-chain or branched C₁-C₁₂alkyl group which is unsubstituted or substituted by alkoxy, alkylthio, aryloxy, arylthio, halogen, —CN, —COOH, —COOR₇, —NR₈R₉ or —CONR₈R₉, or a C₆-C₁₀aryl group which is unsubstituted or substituted by alkyl, alkoxy, alkylthio, aryloxy, arylthio, halogen, —CN, —COOH, —COOR₇, —NR₈R₉ or —CONR₈R₉, or when X is CR₄ and Y is CR₅ and Z is nitrogen or CR₆, or when Y is CR₅ and Z is CR₆ and X is nitrogen or CR₄, then each pair of substituents R₄ and R₅ and R₅ and R₆ forms a group







5,481,008

## PROCESS FOR THE PREPARATION OF OPTICALLY ACTIVE COMPOUNDS

Emil A. Broger, Magden; Martin Karpf, Reinach, and Ulrich Zutter, Basel, all of, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 31, 1994, Ser. No. 298,734

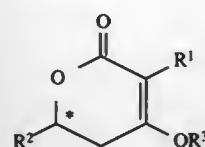
Claims priority, application Switzerland, Sep. 13, 1993, 2738/93

Int. Cl.<sup>6</sup> C07D 309/32; 309/30

U.S. Cl. 549—292

7 Claims

1. A process for the enantioselective manufacture of an optically active compound of the formula



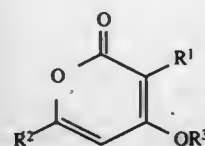
wherein

R<sup>1</sup> and R<sup>2</sup> are alkyl, which is optionally interrupted by an O atom in a position other than the α- or β-position, or optionally substituted benzyl,

R<sup>3</sup> is hydrogen, lower alkyl, optionally substituted benzyl, —CO—R<sup>4</sup>, —COOR<sup>4</sup> or —CONR<sup>4</sup>, and

R<sup>4</sup> is lower alkyl or aryl,

which process comprises asymmetrically hydrogenating a compound of the formula



wherein R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> have the significances given above, in the presence of a complex of an optically active, atropisomeric diphosphine ligand with a metal of Group VIII.

5,481,009

## METHODS OF PRODUCING CARBOXYLIC ACID ESTER DERIVATIVES AND INTERMEDIATES FOR USE IN THE METHODS

Masakatsu Matsumoto, Sagami-hara; Nobuko Watanabe, Tokyo; Eiko Mori, Tokyo; Hisako Kobayashi, Tokyo, and Hiroshi Ikawa, Tokyo, all of, Japan, assignors to Fujirebio Inc., Tokyo, Japan

Filed Aug. 9, 1994, Ser. No. 288,197

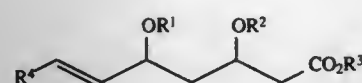
Claims priority, application Japan, Aug. 9, 1993, 5-214812; Aug. 25, 1993, 5-230769

Int. Cl.<sup>6</sup> C07D 319/06; C07C 69/616

U.S. Cl. 549—375

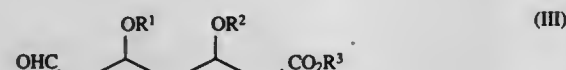
11 Claims

1. A method of producing a carboxylic acid ester derivative of formula (II),



wherein R<sup>1</sup> and R<sup>2</sup> are independently a protective group for hydroxyl group, or R<sup>1</sup> and R<sup>2</sup> integrally constitute a protective group for hydroxyl groups; R<sup>3</sup> is an alkyl group having 1 to 12 carbon atoms, or an aryl group; and R<sup>4</sup> is a substituted aryl group, a substituted heterocyclic group, a substituted vinyl group, or a substituted cycloalkenyl group, comprising the steps of:

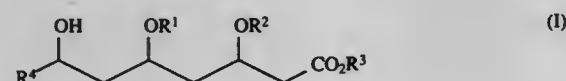
allowing a heptanoate derivative of formula (III),



wherein R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> are respectively the same as defined in formula (II), to react with an organometallic reagent derived from a halogenated compound having formula (IV),



wherein R<sup>4</sup> is the same as defined in formula (II), and X<sup>1</sup> is a halogen atom, to obtain a carboxylic acid ester derivative of formula (I),



wherein R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> are respectively the same as defined in formula (II), and subjecting said carboxylic acid ester derivative of formula (I) to a dehydration reaction.

5,481,010

## 7-DEACETOXY BECCATINE IV DERIVATIVE AND PREPARATION AND USE THEREOF

Alain Ahond, Malakoff; Laurent Ettouati, Rouen; Pierre Potier, Paris, and Christiane Poupot, Plaisir, all of, France, assignors to Centre National de la Recherche Scientifique, Paris, France

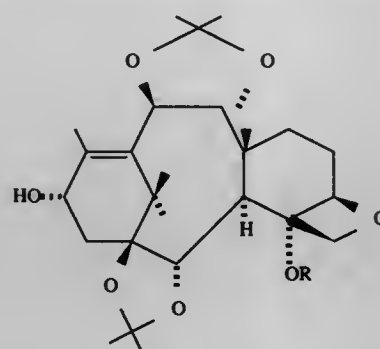
Filed Jan. 14, 1994, Ser. No. 178,322

Int. Cl.<sup>6</sup> C07D 407/04

U.S. Cl. 549—432

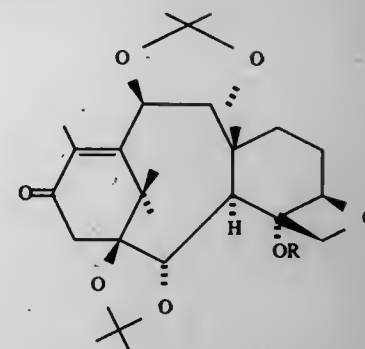
2 Claims

1. A 7-deacetoxybeccatin IV derivative of formula:

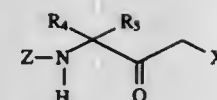


in which R represents a hydrogen atom or an acetyl radical.

2. The product of formula:



in which R represents a hydrogen atom or the acetyl radical.



wherein X is selected from X<sub>1</sub> or X<sub>2</sub>; and  
(b) converting the compound XIII to the aminoepoxide.

5,481,012

## PROCESS FOR SELECTIVE EPOXIDATION OF UNSATURATED (METH)ACRYLIC COMPOUNDS AND NEW BIFUNCTIONAL (METH)ACRYLATES OBTAINED

Paul Caubere, Nancy; Yves Fort, Vandoeuvre les Nancy, and Agnès Ortat, Jarny, all of, France, assignors to Atochem, Paris la Defense, France

Continuation of Ser. No. 26,235, Mar. 1, 1993, abandoned,

which is a continuation of Ser. No. 630,972, Dec. 21, 1990, abandoned. This application Nov. 3, 1994, Ser. No. 335,960

Claims priority, application France, Dec. 22, 1989, 89/17134

Int. Cl.<sup>6</sup> C07D 301/12; 303/16

U.S. Cl. 549—531

12 Claims

1. A process for the selective epoxidation of a non-acrylic

ethylenic double bond in an unsaturated (meth) acrylic compound of formula:



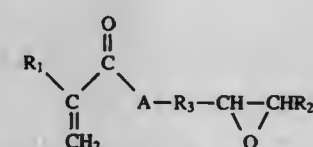
wherein:

R<sub>1</sub> is hydrogen or alkyl having 1–5 carbon atoms;  
R<sub>2</sub> is hydrogen, alkyl, or aryl;  
R<sub>3</sub> is a straight-chain, branched, or cyclic alkylene or oxyalkylene radical having 1–12 carbon atoms and, optionally, when R<sub>2</sub> is alkyl, one of the carbon atoms thereof may be linked to one of the carbon atoms of R<sub>3</sub> to form a ring; and  
A is oxygen, sulfur, NH, or NR<sub>4</sub>, R<sub>4</sub> being alkyl having 1–12 carbon atoms,

comprising reacting hydrogen peroxide with said unsaturated (meth)acrylic compound at a temperature of between 10°–50° C. and a pH of 1.3 to 3.5, in contact with at least one catalyst, said catalyst being an alkali metal molybdate or an alkali metal tungstate, and in the presence of at least one phase transfer agent,

wherein the concentration of hydrogen peroxide is 5 to 50%, and the molar ratio between hydrogen peroxide and the unsaturated (meth)acrylic compound is at least 1 mole of peroxide per mole of said compound, and

wherein the compound of formula (I) is converted in a selective manner, with a degree of conversion of more than 70% to an epoxide of formula



(II)

9. A process according to claim 1, wherein the compound of formula (I) is allyl (meth)acrylate or allyl acrylate.

5,481,011

## PROCESS FOR PREPARING N-PROTECTED AMINO ACID α-HALOMETHYL KETONES AND ALCOHOLS FROM N-PROTECTED AMINO ACID ESTERS

Ping Chen; Peter T. W. Cheng, both of Lawrenceville, N.J.; Steven H. Spergel, Bensalem; Joel C. Barrish, Holland, both of Pa.; John K. Thottathil, Robbinsville, N.J.; Robert Zahler, Pennington, N.J.; Richard P. Polniaszek, South Brunswick, N.J., and Xuebao Wang, East Brunswick, N.J., assignors to Bristol-Myers Squibb Company, New York, N.Y.

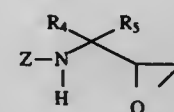
Filed Dec. 13, 1994, Ser. No. 355,373

Int. Cl.<sup>6</sup> C07D 301/02; 303/12; 303/36

U.S. Cl. 549—514

16 Claims

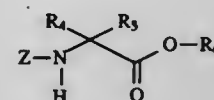
1. A process for preparing an aminoepoxide compound of formula (XV)



(XV)

wherein R<sub>4</sub> and R<sub>5</sub> are independently selected from hydrogen, lower alkyl, aryl, alkyl substituted lower alkyl, or R<sub>4</sub> and R<sub>5</sub> are taken together with the carbon atom to which they are bonded to form a substituted or unsubstituted carbocyclo group, which comprises:

(a) reacting a compound of formula (XI)



(XI)

wherein Z is a carbamate group having the formula R<sub>7</sub>O<sub>2</sub>C—, wherein R<sub>7</sub> is selected from lower alkyl or arylalkyl, and wherein R<sub>6</sub> is selected from lower alkyl or benzyl, with at least 2 molar equivalents of a compound of formula (XII):



(XII)

wherein X<sub>1</sub> and X<sub>2</sub> are independently selected from chloro, bromo, iodo or fluoro, provided at least one of X<sub>1</sub> or X<sub>2</sub> is bromo or iodo, to form a compound of formula (XIII):



5,481,013

## CARBOXYLIC ACID DERIVATIVES

Peter Malenfisch, Rodersdorf; Thomas Pittner, Basel, both of Switzerland, and Manfred Böger, Weil am Rhein, Germany, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Jun. 23, 1993, Ser. No. 81,598

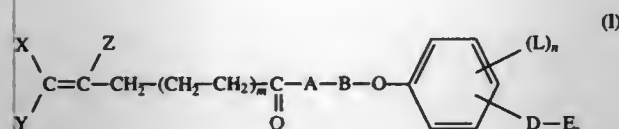
Claims priority, application Switzerland, Jun. 30, 1992, 2038/92

Int. Cl.<sup>6</sup> C07C 69/62

U.S. Cl. 554—226

22 Claims

1. A compound of the formula



in which

A is oxygen, sulfur or —NR<sub>1</sub>—;

B is C<sub>2</sub>–C<sub>6</sub>alkylene, D–E is —O–E–S–E–O–CH<sub>2</sub>–E–O–C(=O)–E–O–C(=O)–O–E–O–C(=O)–N(H)–E or —O–C(=S)–N(H)–E;

E is phenyl; phenyl which is substituted by one to three substituents selected from the group, consisting of halogen, C<sub>1</sub>–C<sub>4</sub>alkyl, halo-C<sub>1</sub>–C<sub>4</sub>alkyl, C<sub>1</sub>–C<sub>4</sub>alkoxy, halo-C<sub>1</sub>–C<sub>4</sub>alkoxy, cyano, nitro and methylenedioxy; a five-membered aromatic heterocycle which has one to three hetero atoms selected from the group, consisting of nitrogen, oxygen and sulfur; a five-membered aromatic heterocycle which has one to three hetero atoms selected from the group, consisting of nitrogen, oxygen and sulfur, and which is substituted by one or two substituents selected from the group, consisting of halogen, C<sub>1</sub>–C<sub>4</sub>alkyl and C<sub>1</sub>–C<sub>4</sub>haloalkyl; a six-membered aromatic heterocycle which has one to three nitrogen atoms; or a six-membered aromatic heterocycle which has one to three nitrogen atoms and which is substituted by one or two substituents selected from the group, consisting of halogen, C<sub>1</sub>–C<sub>4</sub>alkyl and C<sub>1</sub>–C<sub>4</sub>haloalkyl;

L is halogen or methyl;

X is fluorine;

Y is chlorine or fluorine;

Z is hydrogen, fluorine or methyl;

m is the number zero, one, two, three, four or five;

n is the number zero, one or two and

R<sub>1</sub> is hydrogen, C<sub>1</sub>–C<sub>4</sub>alkyl, phenylthio or tolylthio, in free form or, where appropriate, in salt form.

5,481,014

## SILYL PHOSPHONATE AS STABILIZING AGENT FOR POLYDIORGANOSILOXANES

Daniel Graiver; Eric J. Hough, both of Midland, and Arnold W. Lomas, Rhodes, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed May 8, 1995, Ser. No. 438,586

Int. Cl.<sup>6</sup> C07F 7/08

U.S. Cl. 556—401

17 Claims

1. A method for stabilizing polydiorganosiloxanes, the method comprising: contacting a mixture comprising a polydiorganosiloxane and an alkali metal with a stabilizing amount of a silyl phosphonate described by formula



where each R<sup>1</sup> and R<sup>2</sup> is an independently selected hydrocarbyl radical comprising less than about twelve carbon atoms, a=1 or 2, b=0 or 1, and a+b=1 or 2.

5,481,015

## METHOD FOR PREPARATION OF SILOXANYL PHOSPHATE

Toshihiko Nomura, Chiba, Japan, assignor to Dow Corning Toray Silicone Co., Ltd., Tokyo, Japan

Filed Jan. 5, 1995, Ser. No. 369,206

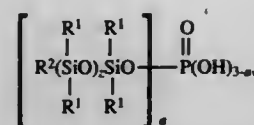
Claims priority, application Japan, Jan. 27, 1994, 6-024778

Int. Cl.<sup>6</sup> C07F 7/08

U.S. Cl. 556—405

16 Claims

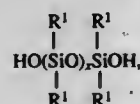
1. A method for preparing siloxanyl phosphates described by formula



where each R<sup>1</sup> is an independently selected monovalent hydrocarbon group, R<sup>2</sup> is a hydroxyl group or monovalent hydrocarbon group and at least one R<sup>2</sup> is a hydroxyl group, z is an integer of 1 or greater, and a is an integer of 1 to 3, the method comprising reacting a mixture comprising

(A) phosphoric acid and

(B) a hydroxyl-ended diorganosiloxane described by formula



where each R<sup>1</sup> is an independently selected monovalent hydrocarbon group and x is an integer of 1 or greater.

5,481,016

## ALCOHOLS AND SILATED ALCOHOLS AS ACCELERATORS FOR HYDROSILATION

Howard M. Bank, Freeland, and Gary T. Decker, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Apr. 17, 1995, Ser. No. 422,470

Int. Cl.<sup>6</sup> C07F 7/08; 7/18

U.S. Cl. 556—479

21 Claims

1. A hydrosilation process comprising: contacting (A) a silicon hydride described by formula



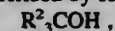
where each R<sup>1</sup> is independently selected from a group consisting of alkyls comprising one to 20 carbon atoms, cycloalkyls comprising four to 12 carbon atoms, and aryls; each X is independently selected from a group consisting of halogen and organooxy radicals described by formula —OR<sup>1</sup> where R<sup>1</sup> is as previously described a=0 to 3, b=1 to 3, and a+b=1 to 4; and

(B) an unsaturated reactant selected from a group consisting of (i) substituted and unsubstituted unsaturated organic compounds,

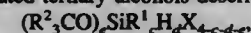
(ii) silicon compounds comprising substituted or unsubstituted unsaturated organic substituents, and

(iii) mixtures of (i) and (ii);

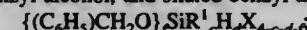
in the presence of a platinum catalyst selected from a group consisting of platinum compounds and platinum complexes, and an accelerator selected from a group consisting of tertiary alcohols described by formula



silated tertiary alcohols described by formula



benzyl alcohol, and silated benzyl alcohol described by formula



where R<sup>1</sup> and X are as previously described, each R<sup>2</sup> is independently selected from a group consisting of straight-chain alkyls comprising one to 20 carbon atoms, c=0 to 3, d=0 to 3, c+d=0 to 3, e=1 to 4, and f=1 to 4.

5,481,017

## METHOD FOR PREPARING

## 6H-DIBENZO[C,E][1,2]OXAPHOSPHORIN-6-ONE

Hans-Jerg Kleiner, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jun. 30, 1994, Ser. No. 268,829

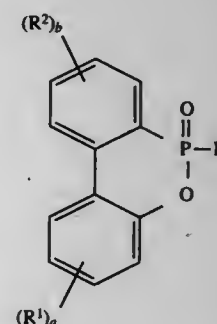
Claims priority, application Germany, Jul. 3, 1993, 43 22 168.8

Int. Cl.<sup>6</sup> C07F 9/6574

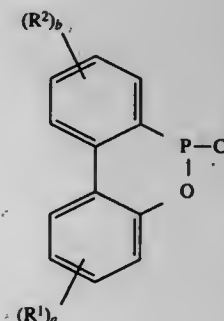
U.S. Cl. 558—82

10 Claims

1. A process for the preparation of 6H-dibenzo[c,e] [1,2]-oxaphosphorin-6-one of the formula



in which R<sup>1</sup> and R<sup>2</sup> are identical or different and are halogen or an alkyl or alkoxy group having from 1 to 6 carbon atoms and a and b are identical or different and are 0, 1, 2 or 3, which comprises reacting a 6-chloro-(6H)-dibenzo[c,e] [1,2]oxaphosphorin of the formula



in which R<sup>1</sup>, R<sup>2</sup>, a and b are as defined above, with water in a molar ratio of 1:1 at from 50° to 250° C., in the presence if desired of a solvent, and separating off gaseous hydrogen chloride at the rate at which it is formed.

5,481,018

## AMINO NITRILE INTERMEDIATE FOR THE PREPARATION OF ALANINE DIACETIC ACID

Phillip S. Athey, Lake Jackson; David A. Wilson, Richwood, and Druce K. Crump, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

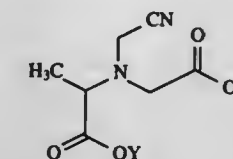
Filed Mar. 31, 1995, Ser. No. 414,606

Int. Cl.<sup>6</sup> C07C 255/28

U.S. Cl. 558—442

1 Claim

1. A compound represented by the following formula:



wherein X and Y are each independently hydrogen or an alkali metal or alkaline earth metal.

5,481,019

## (I) PROCESS FOR THE PREPARATION OF ALKALI METAL SALTS OF CYANOACETONE

Jürgen Muhr, Alfter, and Marcel Feld, Köln, both of Germany, assignors to Huels Aktiengesellschaft, Marl, Germany

Filed Apr. 7, 1994, Ser. No. 224,151

Claims priority, application Germany, May 5, 1993, 43 14 848.4

Int. Cl.<sup>6</sup> C07C 253/30

U.S. Cl. 558—451

15 Claims

1. The method of preparing an alkali metal salt of cyanoacetone which comprises reacting acetonitrile with an acetic acid ester containing alkanol components in which the alkyl moiety is a substituted or unsubstituted, straight-chain, branched-chain or cyclic aliphatic radical of 1 to 20 carbon atoms, in the presence of an alkali metal alcoholate in which the alcohol moiety is a substituted or unsubstituted, straight-chain, branched-chain or cyclic aliphatic radical of 1 to 20 carbon atoms at elevated temperatures, without removing the alcohol formed by the reaction.

5,481,020

## OPIATE RECEPTOR LIGANDS

Simon Ng, Walnut Creek; Robert L. Warne, San Francisco; Ronald N. Zuckermann, Berkeley; Eric J. Martin, El Cerrito, and Reyna J. Simon, Felton, all of Calif., assignors to Chiron Corporation, Emeryville, Calif.

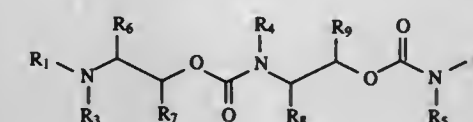
Filed Dec. 30, 1994, Ser. No. 366,830

Int. Cl.<sup>6</sup> C07C 271/10

U.S. Cl. 560—27

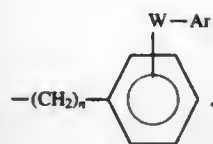
6 Claims

1. A compound of Formula 1 which binds to the opioid receptor:



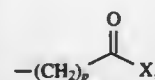


wherein  $R_1$  is a group of the formula



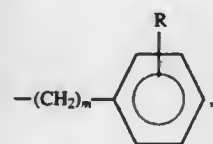
where  $W$  is  $-(CH_2)_a-$  (where  $a$  is 0, 1, or 2),  $-O-$ ,  $-NH-$ ,  $-S-$ ,  $-SO-$ , or  $-SO_2-$ , and  $Ar$  is phenyl, phenyl-alkyl, phenyl substituted with 1-3 halo, nitro, lower alkyl, hydroxy, amino, alkylamino, dialkylamino, and/or hydroxy-lower alkyl groups, and  $n$  is 0, 1, 2, 3, or 4;

$R_2$  and  $R_3$  are each independently H, lower alkyl, or



where  $X$  is H, OH, lower alkyl, or lower alkoxy, and  $p$  is 0, 1, 2, or 3;

$R_4$  is



where  $m$  is 0, 1, 2, or 3, and  $R$  is 1-3 halo, nitro lower alkyl, hydroxy, amino, alkylamino, dialkylamino, and/or hydroxy-lower alkyl groups;

$R_5$  is cycloalkyl, bicycloalkyl, or tricycloalkyl;

$R_6$ ,  $R_7$ ,  $R_8$ , and  $R_9$  are each independently H or lower alkyl.

5,481,021

#### PHENYL AMIDINES DERIVATIVES USEFUL AS PLATELET AGGREGATION INHIBITORS

Robert B. Garland, Northbrook, Ill.; Masateru Miyano, Salem, S.C.; Jeffery A. Zablocki, Mt. Prospect, and Lori A. Schretzman, Gurnee, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

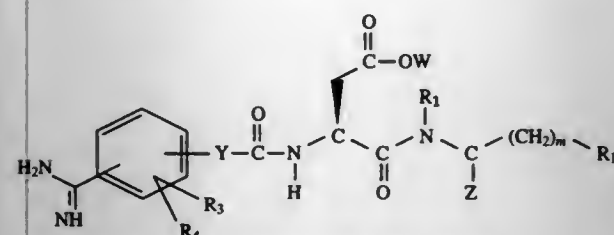
PCT No. PCT/US92/01531, § 371 Date Nov. 19, 1993, § 102(e) Date Nov. 19, 1993, PCT Pub. No. WO92/15607, PCT Pub. Date Sep. 17, 1992

Continuation-in-part of Ser. No. 665,119, Mar. 6, 1991, abandoned. This PCT application Mar. 5, 1992, Ser. No. 90,127 Int. Cl.<sup>6</sup> C07C 229/36

U.S. Cl. 560—35

44 Claims

1. A compound of the formula



or a pharmaceutically acceptable salt thereof, wherein

$R_1$  is selected from phenyl; substituted phenyl wherein each substituent can be selected from the group consisting of alkyl having 1 to 6 carbon atoms, halo, alkoxy having 1 to 6 carbon atoms, trifluoromethyl, hydroxy and carboxyl; alkyl having 1 to 6 carbon atoms wherein said alkyl may be substituted by

alkyl having 1 to 4 carbon atoms; carboxyl; and a fully unsaturated heteromonocyclic ring structure having 5 or 6 ring carbon atoms wherein 1 of the ring carbon atoms is replaced by nitrogen, oxygen or sulfur and wherein said heteromonocyclic ring is fused to a benzene ring;

$R_2$  is hydrido; alkyl having 1 to 6 carbon atoms; phenyl; phenyl-alkyl wherein the alkyl is 1 to 6 carbon atoms and wherein the phenyl ring may be independently substituted one or more times by a substituent selected from alkyl having 1 to 6 carbon atoms, halo, and alkoxy having 1 to 6 carbon atoms;

$R_3$  and  $R_4$  are each independently selected from the group consisting of hydrido, alkyl having 1 to 6 carbon atoms, hydroxy, alkoxy having 1 to 6 carbon atoms and halo;  $W$  is hydrido or alkyl having 1 to 6 carbon atoms;

$Y$  is alkyl having 1 to 6 carbon atoms wherein said alkyl may be substituted one or more times by a substituent independently selected from alkyl having 1 to 6 carbon atoms, hydroxy and oxo; alkenyl having 2 to 6 carbon atoms; alkynyl having 2 to 6 carbon atoms;

$Z$  is hydrido, carboxyl, alkoxycarbonyl having 1 to 6 carbon atoms or alkylcarboxyl having 1 to 6 carbon atoms; and

$m$  is an integer from 0 to 4.

5,481,022

#### N-ARYLOXYACYL-N-PHENYLTETRAHYDROPHTHALMIC ACID DERIVATIVES, METHODS OF PRODUCING SAME, AND HERBICIDES CONTAINING SAME AS EFFECTIVE COMPONENTS

Tetsuo Takematsu, Utsunomiya; Takashi Kume, Kawagoe; Shoji Yamaoka, Kawagoe; Takeo Komata, Kawagoe; Kiyoshi Suzuki, Utsunomiya; Yukio Ikeda, Kawachi; Matsue Kawamura, Kawagoe; Yumiko Koda, Kawagoe, and Kaoru Mori, Kawagoe, all of Japan, assignors to Central Glass Company, Ltd., Yamaguchi, Japan

PCT No. PCT/JP93/01756, § 371 Date Jul. 19, 1994, § 102(e) Date Jul. 19, 1994, PCT Pub. No. WO94/12469, PCT Pub. Date Jun. 9, 1994

PCT Filed Dec. 2, 1993, Ser. No. 256,646

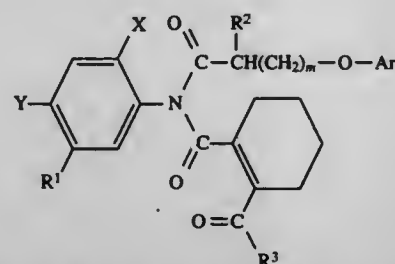
Claims priority, application Japan, Dec. 2, 1992, 4-323468

Int. Cl.<sup>6</sup> C07C 229/38; A01N 37/10

U.S. Cl. 560—45

9 Claims

1. An N-aryloxyacyl-N-phenyltetrahydrophthalamic acid derivative represented by the general formula [I],



wherein  $X$  and  $Y$  each individually represent hydrogen atoms or halogen atoms,  $Ar$  represents a substituted or unsubstituted phenyl group or naphthyl group,  $R^1$  represents a hydrogen atom, a halogen atom, a lower alkyl group, a lower alkoxy group, a lower alkenyloxy group, a lower alkynyloxy group, a lower alkoxyalkoxy group or a lower alkoxycarbonylalkoxy group,  $R^2$  represents a hydrogen atom or a lower alkyl group,  $R^3$  represents a hydroxyl, a lower alkoxy group, a lower alkenyloxy group, a lower alkynyloxy group, a lower alkoxyalkoxy group, a benzyloxy group or a lower alkoxycarbonylalkoxy group, and  $m$  is an integer ranging from 0 to 5.

5,481,023

#### PROCESS FOR THE PREPARATION OF HYDROXYPHENYLCARBOXYLATES

Christoph Kleiner, Frick; Samuel Evans, Marly, both of, Switzerland, and Ralf Schmitt, Bensheim, Germany, assignors to Clba-Gelgy Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 958,890, Oct. 9, 1992, abandoned.

This application Sep. 30, 1993, Ser. No. 129,789

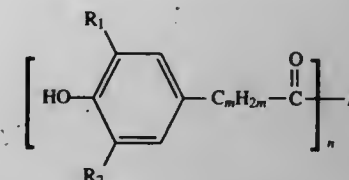
Claims priority, application Switzerland, Jan. 15, 1991, 3028/91

Int. Cl.<sup>6</sup> C07C 69/76

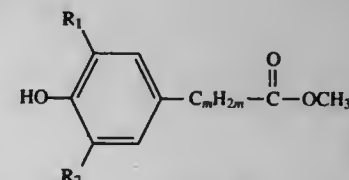
U.S. Cl. 560—75

12 Claims

1. A process for the preparation of a compound of formula I



wherein  $R_1$  and  $R_2$  are each independently of the other  $C_1$ - $C_8$ alkyl,  $m$  is 0, 1, 2 or 3,  $n$  is 1 or 2, and  $A$ , if  $n=1$ , is  $OR_3$ , and  $R_3$  is  $C_4$ - $C_{20}$ alkyl or  $C_5$ - $C_{12}$ cycloalkyl, or  $A$ , if  $n=2$ , has the formula  $-O-C_4H_2-O-$  or  $-O-(CH_2CH_2O)_x-CH_2CH_2O-$ ,  $x$  is a number from 2 to 8 and  $a$  is a number from 1 to 12, by reacting a compound of formula II



with a compound of formula III



the reaction being carried out in the presence of an aluminium trialkoholate or triphenolate as catalyst.

5,481,024

#### PROCESS FOR THE PREPARATION OF MONOMERIC TEREPHTHALIC DIESTERS AND DIOLS FROM POLYESTERS

Ulrich Hertenstein, Gablingen, and Rudolf Neugebauer, Mellingen, both of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Aug. 16, 1993, Ser. No. 107,236

Claims priority, application Germany, Aug. 18, 1992, 42 27 299.8

Int. Cl.<sup>6</sup> C07C 67/48

U.S. Cl. 560—78

20 Claims

1. A two-step process for the preparation of terephthalic diesters and diols by depolymerization of a polyester in the presence of transesterification catalysts for said polyester, which comprises carrying out the depolymerization in the presence of an ester in a first reactor and subsequently converting the mixture obtained in the first reactor in another reactor into terephthalic diester and diol by transesterification by means of a monohydric alcohol.

5,481,025

#### SATURATED BRANCHED FATTY ACIDS CONTAINING 20 TO 28 CARBON ATOMS OR ESTERS THEREOF WITH $C_{1-36}$ ALKANOLS, A PROCESS FOR THEIR PRODUCTION AND THEIR USE

Alfred Laufenberg, Dormagen, and Arno Behr, Duesseldorf, both of, Germany, assignors to Henkel Kommanditgesellschaft auf Aktien TFP/Patentabteilung, Duesseldorf, Germany

PCT No. PCT/EP91/00053, § 371 Date Jul. 24, 1992, § 102(e) Date Jul. 24, 1992, PCT Pub. No. WO91/11426, PCT Pub. Date Aug. 8, 1991

PCT Filed Jan. 15, 1991, Ser. No. 915,845

Claims priority, application Germany, Jan. 24, 1990, 40 02 011.8

Int. Cl.<sup>6</sup> C11C 3/12

U.S. Cl. 554—142

2 Claims

1. A process for producing saturated, branched  $C_{20-28}$  fatty acids or esters thereof esterified with  $C_{1-36}$  alkanols comprising: (a) reacting at least one unsaturated fatty acid containing 18 to 22 carbon atoms and more than one olefinic bond or an ester thereof esterified with a  $C_{1-36}$  alkanol with ethylene at a temperature of from about 50° C. to about 140° C. and at a pressure of from about 5 to about 40 bar in the presence of a catalyst consisting essentially of at least one transition metal compound selected from the group consisting of Ru, Rh, Pd, Ir, and Pt, and optionally a phosphine or phosphite ligand and/or an inorganic promoter, wherein the molar ratio of ethylene fatty acid or fatty acid ester is from about 1:1 to about 3:1 to form at least one olefinically unsaturated adduct and, (2) hydrogenating said at least one adduct in the presence of a hydrogenation catalyst at a temperature of from about 70° C. to about 120° C. and under a hydrogen pressure of from 10 to about 30 bar.

5,481,026

#### OPTICALLY ACTIVE AMINO ACID SULPHOXIDE AND AMINO ACID SULPHONE DERIVATIVES

(III) Michael Grosse-Bley, Köln; Bruno Bömer, Bergisch Gladbach; Rolf Grosser, Leverkusen; Walter Lange, Köln; Franz-Peter Hoefer, Köln, and Dieter Arit, Köln, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 81,537, Jun. 23, 1993, Pat. No. 5,357,001.

This application Jul. 1, 1994, Ser. No. 270,077

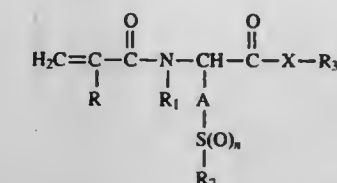
Claims priority, application Germany, Jul. 2, 1992, 42 21 711.3

Int. Cl.<sup>6</sup> C07C 323/41

U.S. Cl. 560—153

5 Claims

1. Optically active S-oxides-containing amino acid derivatives of the formula (I)



in which

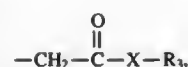
$n$  has the value 1 or 2,

$R$  represents hydrogen, methyl or fluorine,

$R_1$  represents hydrogen or  $C_1$ - $C_4$ -alkyl or together with  $R_2$  forms a methylene group or a dimethylene group, each of which can be mono- or disubstituted by  $C_1$ - $C_4$ -alkyl,

$R_2$  represents a straight-chain, branched or cyclic alkyl radical having up to 10 C atoms,  $C_6$ - $C_{14}$ -aryl,





ps C<sub>2</sub>-C<sub>10</sub>-acyl, benzoyl or benzyl or together with R<sub>1</sub> forms a bridge, R<sub>3</sub> represents a straight-chain, branched or cyclic alkyl radical having up to 20 C atoms which is unsubstituted or mono- to trisubstituted by halogen, alkoxy having 1 to 4 C atoms, aralkoxy having 7 to 16 C atoms or aryl having 6 to 10 C atoms,

X denotes oxygen or an NR<sub>4</sub> group in which R<sub>4</sub> represents hydrogen or C<sub>1</sub>-C<sub>4</sub>-alkyl or together with R<sub>3</sub> forms a nitrogen-containing 5- to 7-membered ring which may be mono- or disubstituted by C<sub>1</sub>-C<sub>4</sub>-alkyl- or C<sub>1</sub>-C<sub>6</sub>-alkoxycarbonyl, and

A represents a methylene or dimethylene group which is unsubstituted or mono- or disubstituted by C<sub>1</sub>-C<sub>4</sub>-alkyl.

5,481,027

## FLUOROCARBAMATE SOIL-RELEASE AGENTS

Jack R. Kirchner, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 843,708, Feb. 28, 1992, abandoned, and a continuation-in-part of Ser. No. 190,704, Feb. 21, 1994, Pat. No. 5,414,111, which is a continuation of Ser. No. 34,628, Mar. 22, 1993, abandoned, which is a continuation of Ser. No. 790,097, Nov. 6, 1991, abandoned, which is a continuation-in-part of Ser. No. 459,060, Dec. 29, 1989, abandoned. This application Mar. 7, 1994, Ser. No. 207,527

Int. Cl.<sup>6</sup> C07C 267/00; 265/02; D06M 15/576

U.S. Cl. 560—160 9 Claims

1. A self-emulsifiable aqueous soil-release composition comprising urea linkage-containing alkoxy polyoxalkylene fluorocarbamate prepared by reacting (a) at least one polyisocyanate which contains at least three isocyanate groups per molecule with (b) at least one fluorochemical reagent which contains per molecule a single functional group which has at least one reactive Zerewitinoff hydrogen atom and at least two carbon atoms each of which contains at least two fluorine atoms, said fluorochemical reagent reacting with about 7% to about 24% of said isocyanate groups, (c) at least one hydrophilic reagent able to be solvated by water which contains per molecule a single functional group which has at least one reactive Zerewitinoff hydrogen atom, and said hydrophilic reagent reacting with about 8% to about 37% of said isocyanate groups, and (d) at least one reagent which contains at least one reactive Zerewitinoff hydrogen atom and which on reaction with an isocyanate group yields functionality which has abeyant chemical reactivity with fibrous substrates which contain reactive Zerewitinoff hydrogen atoms, said reagent which yields said abeyant chemical reactivity reacting with about 15% to about 60% of said isocyanate groups, and then with (e) water, the equivalent weights of said polyisocyanate and said reagents (b), (c) and (d) being such that said reagents will react with 55% to 95% of said isocyanate groups, and water will react with all of the remaining isocyanate groups.

5,481,028

## LEWIS ACID CATALYZED CONJUGATED IODOFLUORINATION OF FLUOROOLEFINS

Viacheslav A. Petrov, and Carl G. Krespan, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 99,679, Jul. 29, 1993, abandoned. This application Aug. 12, 1994, Ser. No. 290,326

Int. Cl.<sup>6</sup> C07C 69/66; 43/00; 17/08

U.S. Cl. 560—184 19 Claims

1. A process for the preparation of RCFICF<sub>2</sub>X wherein R is selected from the group consisting of F and C<sub>n</sub>F<sub>2n+1</sub>, n has a value

of 1-10, X is selected from the group consisting of F and OR', and R' is a perfluoroalkyl containing up to about 10 carbon atoms, branched or straight, optionally containing in-chain ether oxygen, and having F, SO<sub>2</sub>F, or CO<sub>2</sub>CH<sub>3</sub> as an end group, provided that when X is OR', R is F, which process comprises reacting a compound of the formula RCF=CFX where R, X and n are as defined above, with an ICl/HF mixture in the presence of a Lewis acid catalyst which increases the H<sub>0</sub> acidity of HF of -11 to at least -13, at a temperature of from about 0° to about 200° C., wherein the Lewis acid catalyst is selected from the group consisting of BF<sub>3</sub>, TaF<sub>5</sub> and NbF<sub>5</sub>, and wherein the yield of RCFICF<sub>2</sub>X product is at least 50%.

5,481,029

## PROCESS FOR PREPARATION OF KETONES

Max Braun, Wedemark; Johannes Elcher, Garbsen; Werner Rudolph, Hannover, and Kerstin Elchholz, Langenhagen, all of, Germany, assignors to Solvay Fluor und Derivate GmbH, Hannover, Germany

Filed Apr. 26, 1994, Ser. No. 233,622

Claims priority, application Germany, Apr. 27, 1993, 43 13 794.6; Jun. 24, 1993, 43 21 017.1

Int. Cl.<sup>6</sup> C07C 67/10

U.S. Cl. 560—234 21 Claims

1. A process for preparing a ketone from a β-ketoester compound, comprising transesterifying the β-ketoester compound with a carboxylic acid to obtain a liberated ketoacid, and decarboxylating the liberated ketoacid to obtain a corresponding ketone.

5,481,030

## PHOSPHONIC ACID COMPOUNDS

Guillaume de Nanteuil, Suresnes; Georges Remond, Versailles, and Tony Verbeuren, Vernouillet, all of, France, assignors to Adir Et Compagnie, Courbevoie, France

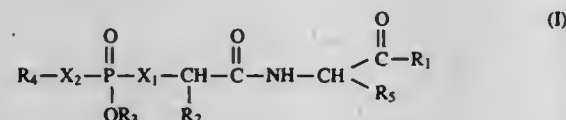
Filed Jun. 29, 1994, Ser. No. 267,971

Claims priority, application France, Jun. 30, 1993, 93 07927

Int. Cl.<sup>6</sup> C01B 25/00

U.S. Cl. 562—10 5 Claims

1. A compound of formula (I):



in which:

R<sub>1</sub> represents hydroxyl, linear or branched (C<sub>1</sub>-C<sub>6</sub>) alkoxy or amino, which is (unsubstituted or substituted with 1 or 2 linear or branched (C<sub>1</sub>-C<sub>6</sub>) alkyl,

R<sub>2</sub> represents linear or branched (C<sub>1</sub>-C<sub>6</sub>) alkyl, unsubstituted or substituted with phenyl or (C<sub>3</sub>-C<sub>7</sub>) cycloalkyl,

X<sub>1</sub> represents —NH—,

X<sub>2</sub> represents —O—,

R<sub>3</sub> represents hydrogen, linear or branched (C<sub>1</sub>-C<sub>6</sub>) alkyl or phenyl,

R<sub>4</sub> represents linear or branched (C<sub>1</sub>-C<sub>6</sub>) alkyl which is substituted with one or more hydroxyl, benzyloxy, benzyloxycarbonylamino, amino, linear or branched (C<sub>1</sub>-C<sub>6</sub>) mono- or dialkylamino, acetoxy, or 2,2-dimethyl-1,3-dioxolan-4-yl, such groups being identical or different,

R<sub>5</sub> represents 3-indolylmethyl, naphthylmethyl, linear or branched (C<sub>1</sub>-C<sub>6</sub>) alkyl, phenyl, or benzyl,

its enantiomers, diastereoisomers and epimers as well as its addition salts with a pharmaceutically-acceptable acid or base.

5,481,031

## PROCESS FOR PREPARING NARROW RANGE ALKOXYLATED ISETHIONATES

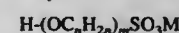
Leonora Iardi, Englewood, and Christine Wenzel, Ridgewood, both of N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 54,660, Apr. 23, 1993, abandoned. This application Oct. 19, 1994, Ser. No. 325,857

Int. Cl.<sup>6</sup> C07C 309/10; 303/02

U.S. Cl. 562—110 22 Claims

1. A one step process for producing alkoxyated isethionate:



wherein n is 2 to 4; the yield of product where m equals 2 is at least about 28% by weight of the total product; M is selected from the group consisting of hydrogen, alkali metals, an alkaline earth metal, ammonium alkyl ammonium wherein the alkyl group is a straight chain group having 1 to 22 carbons, alkanolamine, a cationic amino acid and salt forming cations; and wherein the process comprises:

reacting bisulfite, an average 2 to 5 mols alkylene oxide per mol bisulfite and at least 10% by weight water in a reaction batch wherein the temperature ranges from about 20° C. to about 95° C., the pressure is 0 to 150 psig and the stir rate is about 50 rpm.

5,481,032

## PROCESS FOR THE PREPARATION OF HALOGENATED BENZOIC ACIDS

Ralf Pfirmann, Griesheim, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Germany

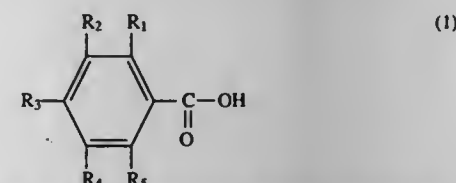
Filed Nov. 29, 1993, Ser. No. 159,087

Claims priority, application Germany, Nov. 29, 1992, 42 40 020.1

Int. Cl.<sup>6</sup> C07C 229/52

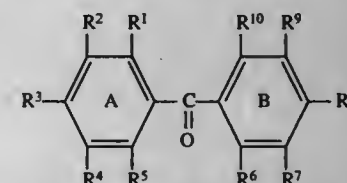
U.S. Cl. 562—418 16 Claims

1. A process for the preparation of halogenated benzoic acids of general formula (I):



in which R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub> and R<sub>5</sub> are hydrogen, fluorine, chlorine or bromine atoms or C<sub>1</sub>-C<sub>6</sub>-alkyl, C<sub>1</sub>-C<sub>6</sub>-alkoxy, nitro, cyano, trifluoromethyl, aldehyde, C<sub>1</sub>-C<sub>4</sub>-alkoxycarbonyl, -SO<sub>2</sub>-C<sub>1</sub>-C<sub>4</sub>-alkyl, -SO<sub>2</sub>-phenyl, -CONH<sub>2</sub>, -CON(C<sub>1</sub>-C<sub>4</sub>-alkyl)<sub>2</sub>, hydroxy, carboxy, -NH<sub>2</sub> or -N(C<sub>1</sub>-C<sub>4</sub>-alkyl)<sub>2</sub> groups, at least one of the substituents R<sub>1</sub>-R<sub>5</sub> being one of said halogen atoms, which comprises the step of:

reacting 1 mol of the benzophenone, asymmetrically substituted on the benzene rings A and B, of general formula (2):



in which R<sup>1</sup>-R<sup>10</sup> are as defined above for R<sub>1</sub>-R<sub>5</sub>, and in which the number of electron-attracting radicals in the ring A is at least 1 greater than the number of electron-attracting radicals minus the number of alkyl or alkoxy groups, in the ring B with about 1 to about 10 mol of an oxidizing agent selected from the group, consisting of hydrogen peroxide, urea/hydrogen peroxide addition

product, an alkali metal peroxide, ammonium, alkali metal or alkaline earth metal peroxodisulfates, pertungstates, perberates or percarbonates, ozone, alkyl- or aryl-percarboxylic acids, alkyl- or aryl-persulfonic acids, and persulfuric acid, at temperatures from about -20° to about +100°.

5,481,033

## PURIFICATION PROCESS FOR AROMATIC DICARBOXYLIC ACIDS

Gregory R. Alms, Hockessin, and Michael R. Samuels, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 22, 1994, Ser. No. 362,334

Int. Cl.<sup>6</sup> C07C 51/42

U.S. Cl. 562—486 12 Claims

1. A process for the purification of an aromatic dicarboxylic acid, said process comprising the steps of:

(A) contacting an aromatic dicarboxylic acid with an aliphatic diamine in the presence of water to form an aqueous salt solution containing a salt formed by the aromatic dicarboxylic acid and the aliphatic diamine, wherein the aliphatic diamine is of the formula



and Ris a saturated hydrocarbylene containing 4 to 14 carbon atoms;

(B) recovering from the aqueous salt solution the salt formed by the aromatic dicarboxylic acid and the aliphatic diamine;

(C) dissolving said recovered salt in an aqueous solvent to form a second aqueous salt solution containing the salt formed by the aromatic dicarboxylic acid and the aliphatic diamine;

(D) contacting said second aqueous salt solution with an aliphatic dicarboxylic acid of the formula



where R<sup>2</sup> is a saturated hydrocarbylene containing 2 to 12 carbon atoms; and

(E) recovering a precipitated purified aromatic dicarboxylic acid.

5,481,034

## FLUORINATED ABSICISIC ACID DERIVATIVES AND PLANT GROWTH REGULATOR THEREOF

Bum-Tae Kim; Yong-Ki Min; No-Kyun Park; Tae-Jun Kim, and Kwang-Yun Cho, all of Daejeon, Rep. of Korea, assignors to Korea Research Institute of Chemical Technology, Daejeon, Rep. of Korea

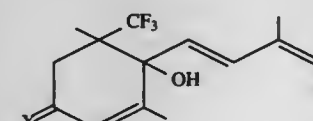
Filed Nov. 29, 1994, Ser. No. 346,520

Claims priority, application Rep. of Korea, May 2, 1994, 1994-9591; May 2, 1994, 1994-9592

Int. Cl.<sup>6</sup> C07C 61/08

U.S. Cl. 562—507 2 Claims

1. Fluorinated abscisic acid derivative represented by the formula of:



wherein:

X is O(CH<sub>2</sub>)<sub>2</sub>O or O; and,

R is hydroxymethyl, aldehyde, C<sub>1</sub>-2 alkoxy carbonyl or carboxyl group.



**5,481,035**  
**PROCESS FOR THE PREPARATION OF**  
**ASYMMETRICALLY SUBSTITUTED UREAS,**  
**CARBAMATES, THIOCARBAMATES AND**  
**SUBSTITUTED ISOCYANATES**

Martin Müller, Traun; Gerhard Stern, Sonnberg, and Markus Rössler, Linz, all of, Austria, assignors to Chemie Linz Gesellschaft m.b.H., Linz, Austria

Division of Ser. No. 958,155, Oct. 9, 1992, Pat. No. 5,248,755, which is a continuation-in-part of Ser. No. 807,606, Dec. 16, 1991, abandoned, and a continuation-in-part of Ser. No. 791,214, Nov. 13, 1991, abandoned, which is a division of Ser. No. 552,696, Jul. 12, 1990, Pat. No. 5,091,553. This application Jul. 6, 1993, Ser. No. 85,815

Claims priority, application Austria, Jul. 28, 1989, 1831/89; Jul. 28, 1989, 1832/89; Jul. 28, 1989, 1833/89; Jan. 18, 1991, 111/91

Int. Cl.<sup>6</sup> C07C 273/18

U.S. Cl. 564—61

8 Claims

1. Process for the preparation of N-mono- or N,N-disubstituted ureas, comprising reacting ammonium isocyanate with a primary or secondary amine in a diluent wherein isocyanic acid is not formed in the reaction process.

to selectively form the alkylamides of the primary and secondary amine contaminants; and separating the alkylamides from the tertiary amine by distillation.

**5,481,038**  
**BORANE-N,N-DIISOPROPYLALKYLAMINE**  
**HYDROBORATION AGENTS**

Herbert C. Brown, West Lafayette, Ind., assignor to Aldrich Chemical Company, Inc., Milwaukee, Wis.

Filed May 9, 1995, Ser. No. 437,585

Int. Cl.<sup>6</sup> C07F 5/02

U.S. Cl. 568—1

4 Claims

1. Borane-N,N-diisopropylalkylamines represented by the formula:



wherein Pr' is isopropyl, R is branched-chain alkyl or cycloalkyl having 3 to 6 carbon atoms and b is boron.

**5,481,039**  
**COMPOSITIONS COMPRISING 2,2',2"-**  
**NITRILOTRIETHANOL CYCLOMETALATES**

Hermann O. Wirth, Bensheim, and Hans-Helmut Friedrich, Lautertal, both of, Germany, assignors to Ciba-Gelby Corp., Tarrytown, N.Y.

Division of Ser. No. 99,874, Jul. 30, 1993, Pat. No. 5,380,344, which is a division of Ser. No. 638,601, Jan. 7, 1991, Pat. No. 5,256,323. This application Oct. 21, 1994, Ser. No. 327,245

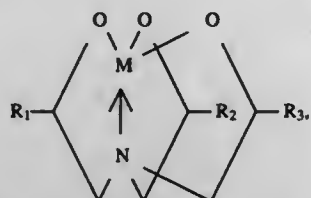
Claims priority, application Switzerland, Jan. 11, 1990, 85/90

Int. Cl.<sup>6</sup> C07F 5/02

U.S. Cl. 568—6

1 Claim

1. A compound of formula I



wherein M is B and R<sub>1</sub> is —CH<sub>2</sub>—S—R, where R is an alkyl group of 1 to 18 carbon atoms, and R<sub>2</sub> and R<sub>3</sub> are each independently —H or C<sub>1</sub>—C<sub>12</sub>alkyl which is substituted by up to 6 hydroxyl groups, or, independently of R<sub>1</sub>, have the same meanings as R<sub>1</sub>.

**5,481,037**  
**DECONTAMINATION OF TERTIARY AMINES FROM**  
**PRIMARY AND SECONDARY AMINES**

Eberhard Fuchs, Frankenthal; Tom Witzel, Ludwigshafen, and Klaus P. Stadler, Neustadt, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Aug. 31, 1994, Ser. No. 299,065

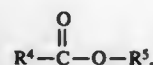
Claims priority, application Germany, Sep. 20, 1993, 43 31 840.1

Int. Cl.<sup>6</sup> C07C 209/84; 209/86

U.S. Cl. 564—437

15 Claims

1. A process for the purification of tertiary amines contaminated with undesirable primary and secondary amines, which comprises: treating a crude mixture of the tertiary amine containing said primary and secondary amines at temperatures ranging from 0° to 200° C. and pressures of from 1 to 200 bar with a carboxylate of the formula



in which R<sup>4</sup> and R<sup>5</sup> are selected from the group consisting of C<sub>1</sub>—C<sub>20</sub>-alkyl, C<sub>3</sub>—C<sub>12</sub>-cycloalkyl, C<sub>4</sub>—C<sub>20</sub>-cycloalkylalkyl, and aryl or C<sub>7</sub>—C<sub>20</sub>-aralkyl, both optionally mono- to penta-substituted by C<sub>1</sub>—C<sub>8</sub>-alkyl, C<sub>3</sub>—C<sub>6</sub>-cycloalkyl, or C<sub>4</sub>—C<sub>12</sub>-cycloalkylalkyl, and R<sup>4</sup> also represent hydrogen,

**5,481,040**  
**PROCESS FOR THE PREPARATION OF PHOSPHONIUM**  
**SALTS**

Takehiko Fukumoto; Kazushi Hirokawa, and Kurao Okada, all of Niigata, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1995, Ser. No. 412,912

Int. Cl.<sup>6</sup> C07F 9/02

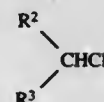
U.S. Cl. 568—9

2 Claims

1. A process for the preparation of phosphonium salts which comprises reacting a phosphine compound of the general formula



wherein R<sup>1</sup> is a phenyl group or a straight-chain alkyl group having 2 to 8 carbon atoms, with a primary or secondary chloride of the general formula



wherein R<sup>2</sup> is a hydrogen atom, an alkyl group, a hydrocarbon group having an unsaturated bond, or a hydrocarbon radical having a hydroxyl group protected by a protecting group in the molecule, and R<sup>3</sup> is a hydrogen atom, a saturated hydrocarbon radical or an unsaturated hydrocarbon radical, in one or more solvent selected from the group consisting of N,N-dimethylformamide, N,N-dimethylacetamide and N,N-1,3-dimethyl-2-imidazolidinone, and in the presence of an alkali metal salt of the general formula



or



wherein M is Li, Na or K.

**5,481,041**  
**ISOLATION OF TRIPHENYLPHOSPHINE**

Peter Lechtken, Frankenthal; Friedrich Sauer, Obersulzen; Matthias Fankhaenel, Ludwigshafen, and Dieter Hermeling, Frankenthal, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Aug. 3, 1994, Ser. No. 285,098

Claims priority, application Germany, Aug. 11, 1993, 43 26 953.2

Int. Cl.<sup>6</sup> C07F 9/50

U.S. Cl. 568—17

2 Claims

1. In a process for isolating triphenylphosphine (TPP) from a triphenylphosphine/aluminum chloride complex dissolved in chlorobenzene by decomplexation, hydrolysis and extraction using water and subsequent separation of the liquid/liquid dispersion, which is composed of a TPP-containing chlorobenzene phase and of an aqueous phase containing Al and Cl compounds into a TPP-containing chlorobenzene phase and into a TPP-free, aqueous phase, containing Al and Cl compounds, the improvement which comprises:

dispersing water in the chlorobenzene phase in a ratio of 0.6–0.95 kg of water per kg of chlorobenzene solution in a first mixing apparatus in such a way that the temperature resulting from the hydrolysis is in the range from 60° to 90° C., the dispersion being carried out with residence times of 5–30 minutes and energy densities of 2–10 kW/m<sup>3</sup>, carrying out a second dispersion step in a second mixing apparatus with residence times of 5–60 minutes and energy densities of 0.35–0.5 kW/m<sup>3</sup> to form dispersed drops having a diameter greater than >100 μm, and separating the heavier TPP-containing chlorobenzene phase from the lighter TPP-free, aqueous phase containing Al and Cl compounds in a phase separator.

**5,481,042**  
**PROCESSES PRODUCING METHYL MERCAPTAN**

John L. Burba, III; James T. Ayres; Preston E. Spires, all of El Dorado, Ark., and John E. Hill, West Lafayette, Ind., assignors to Great Lakes Chemical Corp., West Lafayette, Ind.

Filed Apr. 11, 1994, Ser. No. 225,592

Int. Cl.<sup>6</sup> C07C 319/02

U.S. Cl. 568—70

25 Claims

1. A process for producing methyl mercaptan, comprising: stripping a geothermal brine containing bromide ions and hydrogen sulfide to remove the hydrogen sulfide as a gas;

contacting the hydrogen sulfide gas with an aqueous medium containing an alkali or alkaline earth metal hydroxide to form an aqueous medium containing an alkali or alkaline earth metal hydrosulfide;

intimately contacting and reacting the aqueous medium containing the alkali or alkaline earth metal hydrosulfide with methyl bromide in a reactor so as to form methyl mercaptan; and recovering the methyl mercaptan from the reactor.

**5,481,043**  
**PHENONE COMPOUNDS, MANUFACTURING METHOD**  
**AND PHARMACEUTICAL PREPARATIONS**  
**CONTAINING THEM**

Hildebert Wagner, Breithrann am Chiemsee; Walter Dorsch, München, both of, Germany; Hermann Stuppner, Innsbruck, Austria, and Sandor Antus, Budapest, Hungary, assignors to Plantamed Arzneimittel GmbH, Neumarkt/OPF, Germany

Filed Feb. 18, 1992, Ser. No. 838,156

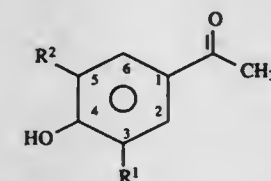
Claims priority, application Germany, Feb. 26, 1991, 41 06 028.8; Jan. 24, 1992, 42 01 942.7

Int. Cl.<sup>6</sup> C07H 15/203; C07C 47/575; A61K 31/70

U.S. Cl. 568—309

9 Claims

1. A method of prophylaxis and treatment of inflammatory diseases of the lung comprising inflammatory and/or allergic processes, asthma and obstructive bronchitis by administering an antiinflammatory preparation comprising at least one compound selected from the group of compounds having the formula:



in which

R<sup>1</sup> and R<sup>2</sup> are each radicals independently selected from the group consisting of H, Cl, Br, I, methyl, hydroxy, methoxy, propoxy, isopropoxy and ethoxy, wherein R<sup>1</sup> and R<sup>2</sup> are not simultaneously H, and the pharmaceutically acceptable salts, ethers and esters thereof and a pharmaceutically acceptable carrier therefor.

**5,481,044**  
**PROCESS FOR THE PREPARATION OF α-ALKYL**  
**SUBSTITUTED ALDEHYDES**

Jürgen Weber, and Helmut Springer, both of Oberhausen, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Dec. 15, 1994, Ser. No. 356,909

Claims priority, application Germany, Dec. 23, 1993, 43 44 064.9

Int. Cl.<sup>6</sup> C07C 45/50

U.S. Cl. 568—451

17 Claims

1. A process for the preparation of α-alkyl aldehydes having 8 to 17 carbon atoms comprising isomerizing of at least one terminally unsaturated olefin at 160° C. to 210° C. in a liquid phase in the presence of iron carbonyl as an isomerization catalyst to form an isomerization mixture, said mixture comprising internally unsaturated olefins and, without separating out said isomerization catalyst, hydroformylizing of said mixture with hydrogen and carbon monoxide at 80° C. to 200° C. under 5 to 50 MPa pressure in the presence of rhodium as a hydroformylizing catalyst.



5,481,045

**SULFONATED 2,2'-BIS  
(DIPHENYLPHOSPHINOMETHYL)-1,1'-  
BINAPHTHALENES, PROCESS FOR THEIR  
PREPARATION AND THEIR USE IN A PROCESS FOR  
THE HYDROFORMYLATION OF OLEFINICALLY  
UNSATURATED COMPOUNDS**

Wolfgang A. Herrmann, Giggenshausen; Rainer Manetsberger, München; Helmut Bahrmann, Hamminkeln; Christian Kohlpaintner, Stephanskirchen, and Peter Lappe, Dinslaken, all of, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Division of Ser. No. 66,553, May 25, 1993, Pat. No. 5,347,045.  
This application May 11, 1994, Ser. No. 240,902

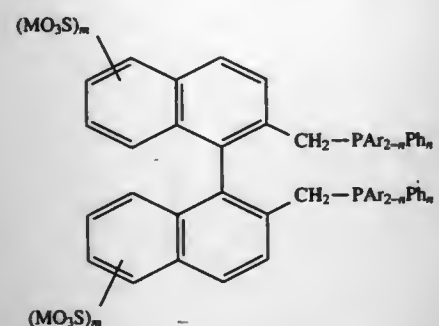
Claims priority, application Germany, May 29, 1992, 42 17 803.7; Dec. 28, 1992, 42 44 274.5

Int. Cl.<sup>6</sup> C07C 47/02; 47/11

U.S. Cl. 568—454

13 Claims

1. A process for the preparation of aldehydes comprising reacting compounds selected from the group consisting of monoolefins, nonconjugated polyolefins, cycloolefins, and derivatives thereof with carbon monoxide and hydrogen at a reaction temperature of 20° to 150° C. and a reaction pressure of 0.1 to 30 MPa in the presence of an aqueous catalyst solution composed of water soluble compounds of rhodium complexed with at least one sulfonated 2,2'-bis(diphenylphosphinemethyl)-1,1'-binaphthyl of the formula



in which Ar is m-C<sub>6</sub>H<sub>4</sub>-SO<sub>3</sub>M, M is selected from the group consisting of hydrogen, ammonium, a monovalent metal, and the chemical equivalent of a polyvalent metal, Ph is phenyl, the m's are individually 1 or 2, and the n's are individually 0, 1, or 2 wherein 1 to 130 tool of sulfonated diphosphines are used per mol of rhodium.

5,481,046

**TELECHELIC TELOMERS OF  
CHLOROTRIFLUOROETHYLENE**

Richard D. Chambers, Durham; Martin P. Greenhall, Birmingham, both of, Great Britain, and Antony P. Wright, Rhodes, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation of Ser. No. 992,345, Aug. 5, 1993, abandoned, which is a division of Ser. No. 745,308, Aug. 15, 1991, Pat. No. 5,262,025. This application Jul. 5, 1994, Ser. No. 270,843

Int. Cl.<sup>6</sup> C07C 41/00; 19/07

U.S. Cl. 568—684

2 Claims

1. A telechelic telomer of the average formula I(R<sup>1</sup>)<sub>m</sub>(CF<sub>2</sub>CFCl)<sub>n</sub>(R<sup>1</sup>)<sub>p</sub>I where R<sup>1</sup> is selected from the group consisting of —(CF<sub>2</sub>CF(CF<sub>3</sub>))—, —CF<sub>2</sub>CF<sub>2</sub>— and CF<sub>2</sub>CF(ORf), where Rf is a perfluoroalkyl radical containing 1 or 2 carbon atoms, the average value of n is from 2 to 10 and the average values of m and p are individually 0 or a positive integer.

5,481,047

Patent Not Issued For This Number

5,481,048

**METHOD FOR PREPARING COPPER-CONTAINING  
HYDROGENATION REACTION CATALYST AND  
METHOD FOR PRODUCING ALCOHOL**

Kiyoshi Tsukada; Yasuyuki Hattori, and Taku Mimura, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Dec. 13, 1994, Ser. No. 357,173

Claims priority, application Japan, Dec. 13, 1993, 5-342536

Int. Cl.<sup>6</sup> C07C 29/36; 31/125

U.S. Cl. 568—885

16 Claims

1. A method for producing an alcohol, comprising the steps of: reducing a precursor of a copper-containing hydrogenation catalyst with hydrogen gas or a mixture of hydrogen and an inert gas by liquid phase reduction in a stream of a solvent which does not react with copper oxide or metallic copper, in a fixed bed continuous reaction system in temperature range of from 50° to 140° C.; and reducing an organic carboxylic acid or an ester thereof by catalytic reduction with hydrogen.

5,481,049

**PROCESS FOR PRODUCING ALKADIENOLS**

Kelichi Sato; Yoko Seto, both of Tokyo, and Iwao Nakajima, Yokohama, all of, Japan, assignors to Mitsubishi Chemical Corporation, Japan

Filed Mar. 22, 1994, Ser. No. 216,106

Claims priority, application Japan, Mar. 30, 1993, 5-072045

Int. Cl.<sup>6</sup> C07C 29/36; 33/02

U.S. Cl. 568—909.5

20 Claims

1. A process for producing an alkadienol, which comprises reacting a conjugated alkadiene and water in the presence of carbon dioxide using a palladium compound and a phosphine compound as catalyst, the reaction being carried out with a free phosphine compound present in the reaction solution in an amount of 1 to 150 moles based upon one mole of palladium, the phosphine compound being a triarylphosphine compound having at least one aryl group having a substituent at the ortho-position.

5,481,050

**PROCESSES FOR THE PREPARATION OF  
FLUORINATED OLEFINS AND  
HYDROFLUOROCARBONS USING FLUORINATED  
OLEFIN**

Michael Van Der Puy, Cheektowaga; G. V. Bindu Madhavan, Amherst; Alagappan Thenappan, Cheektowaga, and Hsueh S. Tung, Getzville, all of N.Y., assignors to AlliedSignal Inc., Morristown, N.J.

Division of Ser. No. 242,899, May 16, 1994. This application Mar. 28, 1995, Ser. No. 412,476

Int. Cl.<sup>6</sup> C07C 19/01; 19/08; 19/10; 21/18

U.S. Cl. 570—135

3 Claims

1. A compound of the formula CF<sub>3</sub>CF<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CF.  
2. A compound of the formula CF<sub>3</sub>CCl=CHCH<sub>2</sub>Cl.  
3. A compound of the formula CF<sub>3</sub>CCl<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>Cl.

5,481,051

**2,2-DICHLOROHEXAFLUOROPROPANE  
HYDROGENOLYSIS**

V. N. Mallikarjuna Rao, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 8, 1994, Ser. No. 351,927

Int. Cl.<sup>6</sup> C07K 19/08

U.S. Cl. 570—176

1 Claim

1. A process for the monohydrogenolysis of 2,2-dichlorohexafluoropropane to 2-chloro-2-hydrohexafluoropropane, comprising:

reacting said 2,2-dichlorohexafluoropropane with hydrogen at an elevated temperature of about 150° C. or less in the presence of a catalyst containing a catalytically effective amount of palladium supported on trivalent chromium oxide in the presence of an acid of the formula HZ, where Z is selected from the group consisting of Cl, F and mixtures thereof, to produce 2-chloro-2-hydrohexafluoropropane with a selectivity of over 70% based upon the 2,2-dichlorohexafluoropropane converted.

5,481,052

**POLYMER CRACKING**

Stephen Hardman, Herts, England; Stephen A. Leng, West Lothian, and David C. Wilson, Stirling, both of, Scotland, assignors to BP Chemicals Limited, London, England

Filed Apr. 8, 1993, Ser. No. 44,646

Claims priority, application United Kingdom, Apr. 22, 1992, 9208729; Apr. 23, 1992, 9208794

Int. Cl.<sup>6</sup> C07C 1/08; 4/00

U.S. Cl. 585—241

7 Claims

1. A process for cracking a polymer into hydrocarbon products which comprises contacting a polymer with a fluidized bed comprising (i) one or more particulate materials of quartz, sand, silica, ceramics, carbon black, and refractory oxides and (ii) an acidic catalyst in the presence of a fluidizing gas which does not oxidize the hydrocarbon products and at a temperature of 300°–600° C. and under pressure, said hydrocarbon products comprising saturated and unsaturated aliphatic and aromatic hydrocarbons:

- which have less than 20% w/w of gases comprising C1–C4 hydrocarbons,
- containing no more than 10% w/w of aromatic hydrocarbons associated with the weight of polyolefin polymers in the feed, and
- which are substantially free of a high molecular weight tail comprising hydrocarbons having a molecular weight of at least 700 as measured by GPC,

the amount of high molecular weight tail product being minimized by fractionating the products to separate product with a high molecular weight tail and recycling said high molecular weight tail product back to the fluidized bed for re-cracking.

5,481,053

**PROCESS FOR PREPARING ALPH-METHYLSTYRENE  
UNSATURATED DIMER**

Masashi Inaba; Shiroh Inui; Hideki Kurokawa, and Fujio Mizutani, all of Mie, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Sep. 22, 1994, Ser. No. 310,395

Claims priority, application Japan, Sep. 22, 1993, 5-257502; Dec. 7, 1993, 5-339829

Int. Cl.<sup>6</sup> C07C 2/72; 2/74

U.S. Cl. 585—406

6 Claims

1. A process for preparing unsaturated dimers of α-methylstyrene, comprising:

dimerizing an α-methylstyrene using an activated clay or an acid clay as a catalyst, in the presence of a carbonic acid ester to form a mixture, and

adding said α-methylstyrene incrementally to said mixture in a period of 1 to 10 hours while maintaining the temperature between 50° to 150° C.;

wherein said catalyst is present in an amount of from 0.0005 to 0.1 parts by weight based on the weight of α-methylstyrene, and

wherein said carbonic acid ester is a di-C<sub>1–4</sub> alkyl carbonate or a C<sub>2–3</sub> alkylene carbonate, and is present in an amount of from 0.1 to 1 parts by weight based on the weight of α-methylstyrene.

5,481,054

**IMMOBILIZED LEWIS ACID CATALYSTS**

Tze-Chiang Chung, State College, Pa.; Frank J. Chen, Edison; Jon E. Stanat, Westfield, both of N.J., and Alok Kumar, Vashi, Ind., assignors to Exxon Chemical Patents Inc., Linden, N.J.

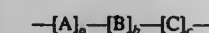
Division of Ser. No. 905,582, Jun. 26, 1992, Pat. No. 5,409,873, which is a continuation-in-part of Ser. No. 723,130, Jun. 28, 1991, Pat. No. 5,288,677. This application Mar. 3, 1995, Ser. No. 398,637

Int. Cl.<sup>6</sup> C07C 2/70; 2/58

U.S. Cl. 585—459

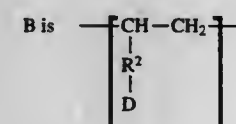
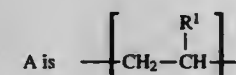
18 Claims

1. A process for alkylating a substrate selected from the group consisting of olefin, alkane, alkyl halide, aromatic compound, and hydroxy aromatic compound with an alkylating agent selected from at least one member of the group consisting of olefin, alkane, and alkyl halide which comprises contacting a mixture of substrate and alkylating agent in the presence of immobilized Lewis Acid catalyst in a manner and under conditions sufficient to alkylate the substrate with the alkylating agent subject to the proviso that the alkylating agent is selected to be different from the substrate employed; and wherein the immobilized catalyst comprises polymer having at least one Lewis Acid immobilized within the structure therein, said polymer having monomer units represented by the structural formula:

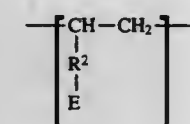


wherein

- a represents about 1 to about 99 mole %
  - b represents about 0 to about 50 mole %
  - c represents about 1 to about 99 mole %
- a+b+c is preferably about 100%;



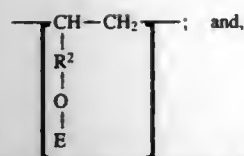
C is selected from the group consisting of:



(I)



-continued



(III) combinations thereof, wherein D is OH, halide, OR<sup>4</sup>, NH<sub>2</sub>, NHR<sup>3</sup>, OM<sup>1</sup>, or OM<sup>2</sup>; E is the residue of the reaction of at least one Lewis Acid with the D substituent of monomer unit B; R<sup>1</sup> represents proton, C<sub>1</sub>-C<sub>24</sub> alkyl group, or C<sub>3</sub>-C<sub>24</sub> cycloalkyl; R<sup>2</sup> represents C<sub>1</sub>-C<sub>24</sub> alkylene group, C<sub>3</sub>-C<sub>24</sub> cycloalkylene, C<sub>6</sub>-C<sub>18</sub> arylene, or C<sub>7</sub>-C<sub>30</sub> alkylarylene; R<sup>3</sup> represents C<sub>1</sub>-C<sub>24</sub> alkyl, C<sub>3</sub>-C<sub>24</sub> cycloalkyl, C<sub>1</sub>-C<sub>24</sub> aryl, or C<sub>7</sub>-C<sub>30</sub> alkylaryl; R<sup>4</sup> represents C<sub>1</sub>-C<sub>24</sub> alkyl, C<sub>3</sub>-C<sub>24</sub> cycloalkyl, C<sub>1</sub>-C<sub>24</sub> aryl, or C<sub>7</sub>-C<sub>30</sub> alkylaryl; M<sup>1</sup> represents alkali metal; and M<sup>2</sup> represents alkaline-earth metal, wherein said immobilized catalyst is derived from a functionalized copolymer having a number average molecular weight of from 3,000 to 10,000,000 and having the structural formula



wherein A, B and a are defined above and d represents about 1 to about 99 mole %, and being equal to the sum of b+c.

5,481,055

# METHOD FOR ISOMERIZING DIMETHYLNAPHTHALENE

Makoto Takagawa; Ryusuke Shigematsu, and Takayo Sasaki, all of Tsukuba, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation of Ser. No. 214,977, Mar. 17, 1994. This application Mar. 20, 1995, Ser. No. 406,642

Claims priority, application Japan, Apr. 19, 1993, 5-091503 Int. Cl.<sup>6</sup> C07C 5/22

U.S. Cl. 585—481

12 Claims

1. A method for producing 2,6-dimethylnaphthalene which comprises isomerizing dimethylnaphthalene in a gaseous phase at an isomerization reaction temperature of 100° to 200° C. in the presence of (i) a solvent in a gaseous phase, said solvent comprising an aromatic hydrocarbon having a boiling point of at most 150° C. and (ii) a catalyst consisting essentially of mordenite and 5 to 50 parts by weight alumina, based on the weight of mordenite, said mordenite having a molar ratio of silica to alumina of at least 20 and having no more than 1% by weight of alkali metals and alkaline earth metals.

5,481,056

PROCESS FOR THE PREPARATION OF POLYOLEFINS Fumiharu Takahashi, Yokkaichi, Yutaka Naito, Mie; Mitsuhiko Mori, Aichi, and Sadaki Nishimura, Yokkaichi, all of Japan, assignors to Tosoh Corporation, Shinnanyo, Japan

Filed Jul. 20, 1993, Ser. No. 93,679

Claims priority, application Japan, Jul. 21, 1992, 4-214764; Jul. 21, 1992, 4-214765

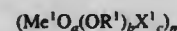
Int. Cl.<sup>6</sup> C07C 2/22

U.S. Cl. 585—512

6 Claims

1. A process for producing polyolefins, comprising polymerizing at least one α-olefin in the presence of a catalyst comprising components (A) and (B), wherein component (A) is a solid catalyst component obtained by the steps of:

- i) reacting a homogenous solution of (a) metallic magnesium and an alcohol, organosilanol or phenol, or (b) an oxygen-containing compound of magnesium, with at least one oxygen-containing organic compound of a transition metal of the formula



wherein R<sup>1</sup> is a C<sub>1-20</sub> hydrocarbon group other than cyclopentadienyl, M<sup>1</sup> is a transition metal of Groups IVa, Va or VIa in the Periodic Table, X<sup>1</sup> is a halogen atom, a, b and c are numbers such that b>0 and 4+c≥0 and a≥0 and compatible with the atomic valence of Me, and m is an integer of from 1 to 6,

- (ii) dissolving at least one compound of a transition metal of Groups IVa, Va or VIa in the Periodic Table containing cyclopentadienyl as ligand in the resulting solution,

- (iii) reacting such resulting solution of step (ii) with at least one halogenated organoaluminum compound at a temperature of from -50° C. to 300° C. for 0.5 to 50 hours to precipitate a solid catalyst component and isolating said solid catalyst component, and

- component (B) comprises an organoaluminum compound other than the halogenated organoaluminum compound used in step (iii).

5,481,057

# ALKYLATION WITH ACTIVATED EQUILIBRIUM FCC CATALYST

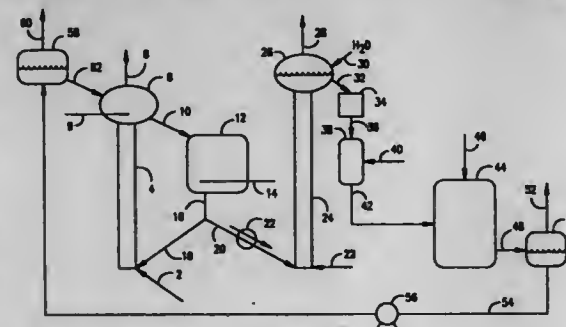
Weldon K. Bell, Pennington; Tracy J. Huang, Lawrenceville, both of N.J.; Rudolph M. Lago, Yardley; Ying-Yen P. Tsao, Lahaska, both of Pa., and D. Duayne Whitehurst, Titusville, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Mar. 25, 1994, Ser. No. 217,819

Int. Cl.<sup>6</sup> C07C 2/58; 4/06

U.S. Cl. 585—722

10 Claims



1. A combined fluidized catalyst cracking (FCC) and olefin alkylation process for conversion of 650° F.+ hydrocarbons to products including catalytically cracked naphtha and alkylate comprising:

- contacting said feed with a stream of regenerated, phosphorus-containing equilibrium faujasite cracking catalyst (E-Cat) having an average particle size within the range of 60-80 microns and an alpha activity in a cracking reactor to produce cracked products including naphtha boiling range material and light olefins including propylene and butylene and spent catalyst;

- separating cracked products from spent catalyst in a product fractionator and gas purifier plant to produce a naphtha boiling range product and a light olefin product stream comprising at least one of propylene and butylene;

- stripping spent catalyst with steam to produce stripped catalyst; regenerating said stripped catalyst in a catalyst regeneration means by contact with an oxygen containing gas to produce regenerated, phosphorus-containing E-Cat and flue gas containing entrained catalyst and fines;

- recycling to said cracking reactor a major portion by weight of said regenerated E-Cat;

- charging to an activation reactor a minor portion by weight of said regenerated E-Cat and activating said E-Cat by contact

with water or steam at catalyst activation conditions sufficient to increase the alpha activity of the E-Cat at least 100% and produce activated E-Cat;

charging said activated E-Cat to an alkylation reactor for use as alkylation catalyst;

alkylating at olefin alkylation conditions in said alkylation reactor isobutane and at least a portion of said light olefinic product comprising at least one of propylene and butylene to produce alkylate and spent alkylation catalyst;

recovering by settling, flashing, or fractionation alkylate from spent alkylation catalyst to produce alkylate as a product of said alkylation process and to produce spent alkylation catalyst;

recycling, at least periodically, said spent alkylation catalyst to said regenerator.

5,481,058

# SUPERCRITICAL FLUID EXTRACTION INVOLVING HYDROFLUOROALKANES

John A. Blackwell, Oakdale; Daniel T. Chen, St. Paul; Todd D. Alband, Eagan, and Craig A. Perman, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 7, 1994, Ser. No. 178,935

Int. Cl.<sup>6</sup> C07C 7/00

U.S. Cl. 585—833

20 Claims

1. A process for separating a first component of a composition from a second component of a composition, which first component has a solubility differing from that of the second component in a supercritical fluid comprising a hydrofluoroalkane in the supercritical state and selected from the group consisting of 1,1,1,2-tetrafluoroethane and 1,1,1,2,3,3,3-heptafluoropropane, comprising the steps of:

- (i) contacting the composition with the supercritical fluid under conditions and for a time sufficient to dissolve the first component and not the second component of the composition in the supercritical fluid to provide a supernatant supercritical fluid; and

- (ii) removing the supernatant supercritical fluid from contact with the composition.

5,481,059

SETTLING AIDS FOR SOLIDS IN HYDROCARBONS Gene F. Brock, Oxnard, Calif.; Mark S. Binford, and Paul R. Hart, both of The Woodlands, Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Oct. 7, 1994, Ser. No. 319,753

Int. Cl.<sup>6</sup> C07C 7/00; C10G 17/00

U.S. Cl. 585—866

6 Claims

1. A method for accelerating the settling of finely divided solids in hydrocarbon fluids comprising adding to said hydrocarbons an effective settling amount of a polyacrylic acid adducted alkylphenolformaldehyde resin alkoxylate compound.

5,481,060

# PROCESS FOR THE REMOVAL OF HEAVY HYDROCARBONACEOUS CO-PRODUCTS FROM A VAPOR EFFLUENT FROM A NORMALLY GASEOUS HYDROCARBON DEHYDROGENATION REACTION ZONE

Norman H. Scott; Joseph E. Zimmermann, both of Arlington Heights, and Bryan K. Glover, Algonquin, all of Ill., assignors to UOP, Des Plaines, Ill.

Filed Apr. 20, 1995, Ser. No. 425,520

Int. Cl.<sup>6</sup> C07C 7/00

U.S. Cl. 585—867

8 Claims

1. A process for the removal of trace quantities of polynuclear aromatic compounds from the vapor effluent of a hydrocarbon

dehydrogenation zone comprising normally gaseous olefinic hydrocarbons, trace mononuclear aromatic compounds and trace polynuclear aromatic compounds which process comprises:

- (a) contacting said vapor effluent of a hydrocarbon dehydrogenation zone with a lean liquid absorption stream comprising at least one mononuclear aromatic compound to absorb at least a portion of said trace mononuclear aromatic compounds and said trace polynuclear aromatic compounds to produce a rich liquid absorption stream and a gaseous olefinic hydrocarbon stream having a reduced concentration of mononuclear aromatic compounds and polynuclear aromatic compounds;

- (b) recovering said gaseous olefin-containing hydrocarbon stream having a reduced concentration of mononuclear aromatic compounds and polynuclear aromatic compounds;

- (c) separating said rich liquid absorption stream from step (a) to produce a stream rich in mononuclear aromatic compounds and a stream comprising polynuclear aromatic compounds;

- (d) recycling at least a portion of said stream rich in mononuclear aromatic compounds to step (a) to provide at least a portion of said lean liquid absorption stream; and

- (e) recovering said stream comprising polynuclear aromatic compounds.

5,481,061

# METHOD FOR SOLIDIFYING RADIOACTIVE WASTE

Kiyomi Funabashi, Katsuta; Koichi Chino; Osamu Kuriyama, both of Hitachi; Tsutomu Baba, Katsuta; Shunsuke Uchida, and Makoto Kikuchi, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 785,200, Nov. 1, 1991, abandoned, which is a continuation of Ser. No. 650,991, Feb. 4, 1991, abandoned, which is a continuation of Ser. No. 273,515, Nov. 4, 1988, abandoned. This application Oct. 27, 1993, Ser. No. 141,541

Claims priority, application Japan, Mar. 13, 1987, 62-56610 Int. Cl.<sup>6</sup> G21F 9/00

U.S. Cl. 588—4

5 Claims

1. A method for solidifying a radioactive waste with cement as a main solidifying material to produce a solidified radioactive waste, comprising:

- mixing water, a hydrophilic polymer emulsion and cement to form a first mixture, said cement having a coefficient of linear expansion of 0.1 to 0.5% with respect to volume change upon hardening and containing an expanding agent selected from the group consisting of calcium sulfate, calcium sulfoaluminate and calcium oxide; adding radioactive waste to said first mixture and kneading the radioactive waste and first mixture to form a kneaded mixture, said radioactive waste being a water-absorptive; and packing the kneaded mixture into a solidifying container.

5,481,062

# METHOD OF DESTROYING EXPLOSIVE SUBSTANCES

Stefan Lamnevik, Ersta, Sweden, assignor to Forsvarets Forskningsanstalt, Sundbyberg, Sweden

PCT No. PCT/SE93/00171, § 371 Date Aug. 25, 1994, § 102(e) Date Aug. 25, 1994, PCT Pub. No. WO93/17295, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 26, 1993, Ser. No. 295,689

Claims priority, application Sweden, Feb. 26, 1992, 9200576 Int. Cl.<sup>6</sup> C06B 21/00

U.S. Cl. 588—203

10 Claims

1. A method of destroying explosive substances, characterized by dissolving or by suspending the explosive substance in a combustible liquid which has no available oxygen or only a small amount of available oxygen, wherein the proportion of liquid used is so large as to reduce the energy content of the mixture to 1 MJ/kg or less in the absence of available atmospheric oxygen; and burning the mixture in a combustion apparatus by delivering the



mixture to said combustion apparatus via a liquid fuel burner or a burner for solid fuel/liquid fuel suspensions.

5,481,063

# TREATMENT OF PROCESS GASES CONTAINING HALOGENOUS COMPOUNDS

Matti Hiltunen, Karhula; Harry Lampenius, and Kurt Westermund, both of Helsinki, all of, Finland, assignors to A. Ahlstrom Corporation, Karhula, Finland  
PCT No. PCT/FI90/00134, § 371 Date Nov. 22, 1991, § 102(e) Date Nov. 22, 1991, PCT Pub. No. WO90/14559, PCT Pub. Date Nov. 29, 1990

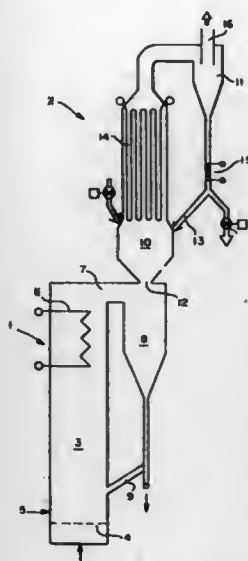
PCT Filed May 16, 1990, Ser. No. 776,403

Claims priority, application Finland, May 18, 1989, 892381; Jnl. 3, 1989, 893225

Int. Cl. F23B 7/00; C01B 7/00

U.S. Cl. 588—205

18 Claims



1. A method of treating heterogeneous combustible material which contains halogenated hydrocarbon compounds, comprising the steps of:

- (a) combusting the material under conditions and at a temperature sufficient to decompose polyhalogenated compounds in

the material, producing flue gases containing compounds capable of forming dioxins and furans; and  
(b) rapidly cooling the flue gases through the temperature range of 250°–400° C., to below 250° C., to prevent the formation of dioxins and furans in the flue gases.

5,481,064

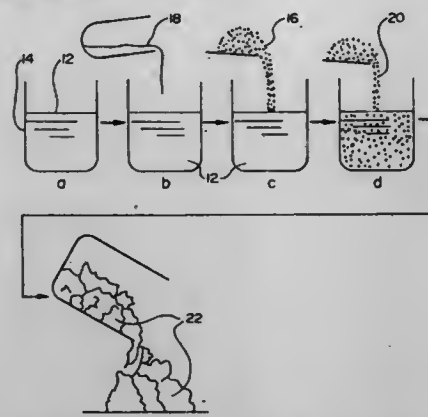
# WASTE FLUID TREATMENT PROCESS

Kobei Kato, and Tohru Yoshioka, both of Tokyo, Japan, assignors to Sanko Motor Chemical Co., Ltd., Tokyo, Japan  
Continuation of Ser. No. 881,023, May 8, 1992, abandoned.  
This application Mar. 3, 1994, Ser. No. 206,100

Int. Cl. A62D 3/00

U.S. Cl. 588—205

4 Claims



1. A process for treatment of a liquid, comprising:

- (1) providing a waste aqueous liquid comprising a used organic antifreeze solution, said organic antifreeze solution comprising a liquid organic compound containing at least one OH group;
- (2) forming a solidification mixture consisting essentially of said waste aqueous liquid, a water-absorbing acrylic polymer and an ion adsorption agent, said ion adsorption agent selected from the group consisting of diatomaceous earth, zeolite, activated carbon, silica gel and calcium carbonate, said mixture formed by first mixing said ion adsorption agent with said waste aqueous liquid and then adding said water-absorbing acrylic polymer to said mixture of said ion adsorption agent and said waste aqueous liquid; and
- (3) agitating said solidification mixture for a time effective to solidify said solidification mixture.

## ELECTRICAL

5,481,065

# ELECTRONIC MUSICAL INSTRUMENT HAVING PRE-ASSIGNED MICROPROGRAM CONTROLLED SOUND PRODUCTION CHANNELS

Hideo Yamada, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan

Continuation of Ser. No. 954,268, Sep. 30, 1992, abandoned.

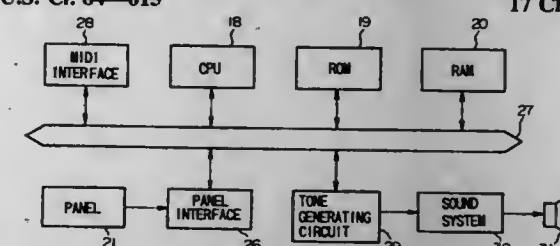
This application Apr. 10, 1995, Ser. No. 422,602

Claims priority, application Japan, Jan. 7, 1991, 3-259452

Int. Cl. G10H 1/18; 7/00

U.S. Cl. 84—615

17 Claims



1. An electronic musical instrument comprising:  
plural channel tone generating means generating musical tones by executing given programs sequentially in which at least some of the channels comprise an excitation means for generating an excitation signal and sound producing means having input means for producing a musical tone signal in response to said excitation signal, delaying said musical tone signal and feeding said musical tone signal back to said input means;

memory means for storing a plurality of said programs for realizing sound production algorithms, the algorithms for use in the tone generating means;

designating means for designating which of said plurality of sound production algorithms is to be used by a respective one of said plural channels; and

assignment means for retrieving a designated sound production algorithm from the memory means and transferring said designated sound production algorithm to said respective channel for storage in the channel.

5,481,066

# AUTOMATIC PERFORMANCE APPARATUS FOR STORING CHORD PROGRESSION SUITABLE THAT IS USER SETTABLE FOR ADEQUATELY MATCHING A PERFORMANCE STYLE

Minoru Kitamura, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

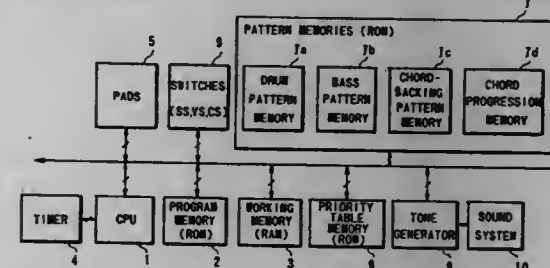
Filed Dec. 15, 1993, Ser. No. 168,068

Claims priority, application Japan, Dec. 17, 1992, 4-337660

Int. Cl. G10H 7/00; 1/38

U.S. Cl. 84—637

12 Claims



1. An automatic performance apparatus comprising:  
performance style designating means for designating a desired performance style from among a plurality of performance styles;

storage means for storing a chord progression pattern with respect to each of said plurality of performance styles;

read-out means for accessing said storage means to read out said chord progression pattern concerned with the desired performance style which is designated by said performance style designating means;

chord controlling means that is actuatable for overriding said chord progression that is read out of said storage means and designating a specific chord to be used as said chord progression; and

automatic performance means for playing an automatic performance in accordance with said chord progression pattern.

5,481,067

# ELECTRONIC MUSICAL INSTRUMENT UNDER CONTROL OF MULTIPLE TASK REQUIREMENT

Takeo Shibukawa, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan

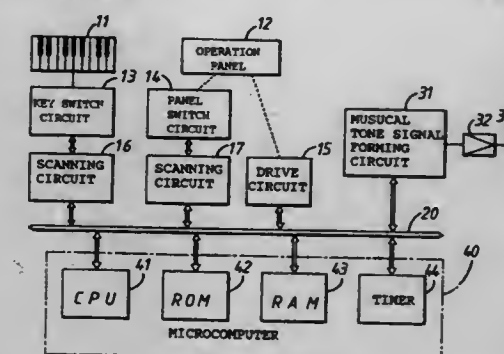
Filed Mar. 3, 1993, Ser. No. 25,698

Claims priority, application Japan, Mar. 4, 1992, 4-047087

Int. Cl. G10H 5/02

U.S. Cl. 84—659

5 Claims



3. An electronic musical instrument having a plurality of first operation elements arranged to be operated for designating a tone pitch of a musical tone to be produced, a plurality of second operation elements arranged to be operated for selecting a tone color of the musical tone, and a musical tone signal production circuit to be applied with a plurality of first data indicative of operation of the first operation elements and a second data indicative of operation of the second operation elements, comprising:

a timer for generating a timer-interrupt signal at a predetermined time interval;

memory means for storing a plurality of first task requirement flags representing each requirement for processing a key task, a timer task and a key-scan task for the first data and a second task requirement flag representing requirement for processing an operation-scan task for the second data;

first setting means for setting one of the first task requirement flags for the key task in response to the timer-interrupt signal from the said timer and for subsequently setting the remaining first task requirement flags for the timer task and the key-scan task in sequence in response to the timer-interrupt signal from said timer;

second setting means for successively setting the second task requirement flag for the operation-scan task when the first task requirement flag for the timer task has been set plural times; and

means for successively processing the plurality of first data based on the first task requirement flags to apply the processed first data to said musical tone signal production circuit and for processing the second data based on the second task requirement flag to apply the processed second data to said musical tone signal production circuit.



5,481,068

**ELECTRICAL CABLE**

Stanley M. Norden, Swindon, England, assignor to Raychem Limited, Swindon, England

Continuation of Ser. No. 74,835, Jun. 11, 1993, abandoned.

This application Jan. 3, 1995, Ser. No. 368,255

Claims priority, application United Kingdom, Dec. 13, 1990, 9027110

Int. Cl.<sup>6</sup> H01B 7/34

U.S. Cl. 174—36

8 Claims



1. An electrical cable which comprises one or more elongate electrical conductors, a layer of insulation surrounding the or each electrical conductor, and a metal braid electrical shield surrounding the conductor or conductors and the insulation, the cable including a pull-thread that extends along the length of the cable under the shield so that the shield can be cut longitudinally by pulling the thread.

5,481,069

**RIBBON CABLE WITH TERMINAL EDGE REINFORCEMENT**

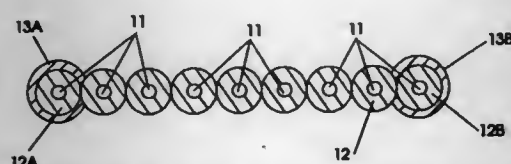
Mark E. Andresen, Deerfield Beach; Jay H. Neer, Boca Raton, and Richard J. Nelson, Boynton Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 3, 1994, Ser. No. 176,984

Int. Cl.<sup>6</sup> H01B 7/08

U.S. Cl. 174—117 F

20 Claims



1. A multiconductor ribbon cable for transmitting electromagnetic signals comprising:

- a plurality of conductors arranged in side-by-side spaced apart and axially extending relation; said plurality of conductors including one edge conductor at each edge of the cable,
- a web of thermoplastic insulation material surrounding said plurality of conductors and holding said conductors in a spaced apart, electrically insulated from-one-another position; said insulation material axially extending along laterally spaced apart terminal edges covering each edge conductor; and axially extending, laterally spaced apart, reinforcing means substantially circumscribing only exposed portions of the laterally spaced apart terminal edges of said cable said reinforcing means including a layer of insulating material extruded on the terminal, axially extending, outer edges of said multiconductor cable thereby forming said reinforcing means on said terminal edges.

5,481,070

**DIRECT CURRENT OIL-FILLED SELF CONTAINED CABLE**

Masayuki Hirose; Ryosuke Hata, and Yoshiteru Nakaura, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

PCT No. PCT/JP93/00872, § 371 Date Feb. 25, 1994, § 102(e) Date Feb. 25, 1994, PCT Pub. No. WO94/00853, PCT Pub. Date Jan. 26, 1994

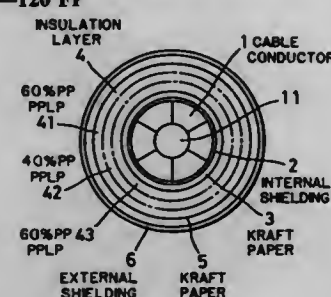
PCT Filed Jun. 28, 1993, Ser. No. 199,276

Claims priority, application Japan, Jun. 26, 1992, 4-193285

Int. Cl.<sup>6</sup> H01B 7/02; 9/06

U.S. Cl. 174—120 FP

15 Claims



1. A DC OF cable, comprising:
  - a cable conductor having an interior oil passage;
  - a main insulation surrounding said cable conductor, said main insulation comprising a composite tape that is composed of a low dielectric loss plastic film laminated with kraft paper; and
  - a carbon winding layer comprising 3-5 sheets of carbon paper located at at least one of a first position inside said main insulation and outside of said cable conductor and a second position outside of said main insulation.

5,481,071

**ELECTRONIC BALANCE WITH A KEY FOR ENABLING A SPECIFIC FUNCTION**

Tadeusz Wojnarski, Wallisellen, Switzerland, assignor to Mettler-Toledo AG, Greifensee, Switzerland

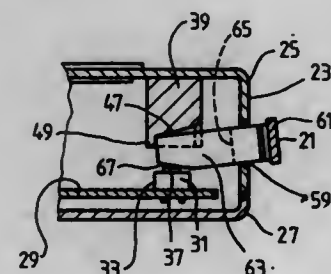
Filed Sep. 10, 1993, Ser. No. 119,965

Claims priority, application Switzerland, Sep. 29, 1992, 3036/92

Int. Cl.<sup>6</sup> G01G 23/02; H01H 27/00

U.S. Cl. 177—124

9 Claims



1. An electronic balance comprising a balance housing, a locking means for securing at least one balance function against unauthorized actuation, the locking means comprising a switch for switching on and off the balance function, the balance housing having an opening for inserting into the balance housing at least one closing means for closing the balance housing, the closing means having an inner side, and an actuating member for actuating the switch being mounted on the inner side of the closing means.

5,481,072

**LOW PROFILE LOAD CELL FOR A WEIGHTING MACHINE**

Michael W. Ford, West Midlands, England, assignor to GEC Avery Limited, England

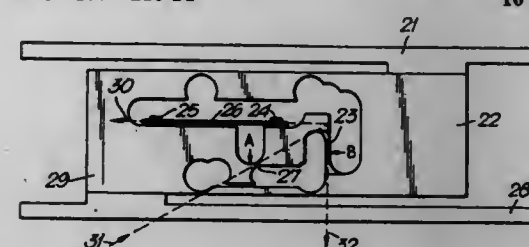
Filed Aug. 31, 1993, Ser. No. 114,789

Claims priority, application United Kingdom, Sep. 9, 1992, 9219074

Int. Cl.<sup>6</sup> G01G 3/14; 3/08

U.S. Cl. 177—210 FP

10 Claims



1. A low profile load cell in a machine for weighing a load exerting a load force in a vertical direction on a load support located above a base, said load cell comprising:

- a) a one-piece body extending along a horizontal direction between one body end at which the body is cantilever mounted on the base, and another opposite body end at which the load support is mounted, said body being distortable during weighing along a diagonal direction inclined relative to the vertical and horizontal directions;
- b) an elongated vibrating beam sensor having opposite sensor ends, and being driven into flexural vibrations during weighing; and
- c) means for mounting the sensor on the body in a horizontal plane extending along the horizontal direction to translate the vertically directed load force into a horizontal force applied to the sensor to cause said vibrations, said sensor ends being individually supported at spaced-apart points in said horizontal plane.

5,481,073

**MODULAR BROADBAND BIDIRECTIONAL PROGRAMMABLE SWITCH SYSTEM WITH STACKED MODULAR SWITCH ARRANGEMENT**

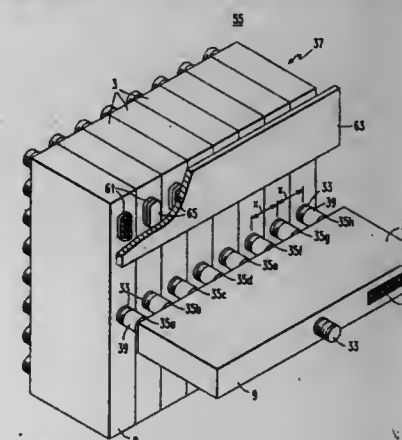
Samuel Singer, Indiana; Francis J. DeSantis, Shelocta, and Harry Krasnikoff, Indiana, all of Pa., assignors to Quintech, Inc., Indiana, Pa.

Filed Jun. 9, 1994, Ser. No. 257,820

Int. Cl.<sup>6</sup> H01H 67/00; H01P 1/10; H05K 1/00; H04Q 11/00

U.S. Cl. 200—1 R

24 Claims



1. A modular bidirectional switch system comprising: an assembly of switch modules each of said switch modules comprising:

a housing having an elongated front face and an opposite elongated rear face, a single first electrical connector mounted in said elongated rear face, a plurality of second electrical connectors mounted in spaced relation along said elongated front face and circuit means within said housing for selectively electrically connecting said single first electrical connector with at least any one of said plurality of second electrical connectors, said assembly further comprising a plurality of said switch modules stacked side by side with said first electrical connectors aligned to form a stack of switch modules, and an additional switch module having a different second electrical connector connected to the first electrical connector of each of the switch modules in said stack of switch modules.

5,481,074

**COMPUTER KEYBOARD WITH CANTILEVER SWITCH AND ACTUATOR DESIGN**

George P. English, Coeur d'Alene, Id., assignor to Key Tronic Corporation, Spokane, Wash.

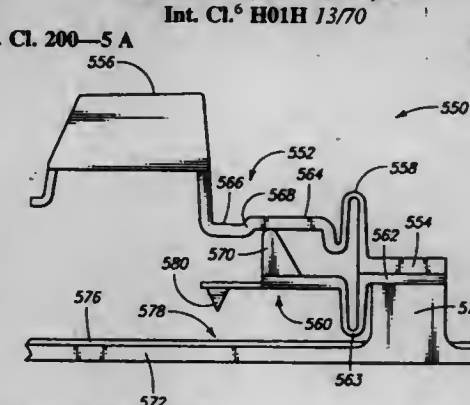
Continuation-in-part of Ser. No. 17,466, Feb. 12, 1993, Pat. No. 5,329,079, which is a continuation-in-part of Ser. No. 931,691, Aug. 18, 1992, Pat. No. 5,360,955. This application

Jun. 18, 1993, Ser. No. 79,007

Int. Cl.<sup>6</sup> H01H 13/70

U.S. Cl. 200—5 A

20 Claims



1. In a computer keyboard, a plurality of cantilever supported keys arranged in computer keyboard rows; wherein at least one row has a plurality of cantilever supported keys that are pivotally connected to a common mounting strip means to enable each key to independently pivot between an elevated non-actuated position and a depressed actuation position; each of said cantilever supported keys having a key cap portion, a keylever portion and a flexible hinge portion, in which the keylever portion extends between the key cap portion and the hinge portion and the hinge portion is flexibly connected to the mounting strip means; a plurality of cantilever spring elements associated with the keys of the one row and operatively pivotally connected to the mounting strip means; wherein each cantilever spring element engages the associated key and biases such key from the depressed actuation position to the elevated non-actuation position; wherein the cantilever spring element and the keylever portion of an associated key have complementary rubbing surfaces that slide relative to each other when the associated key moves between the elevated non-actuation position and the depressed actuation position; and wherein at least one of the complementary rubbing surfaces has (1) a first surface section having a first surface property sufficient to retard relative sliding movement between the complementary rubbing surfaces to increase the force required to pivot the key and move the key toward the depressed actuation position, and (2) a second surface section having a second surface property sufficient to facilitate relative movement between the complementary rubbing surfaces



to decrease the force required to pivot and further move the key toward the depressed actuation position to simulate a tactile "break over" sensation as the key is moved from the elevated non-actuation position to the depressed actuation position.

5,481,075

# COMPACT MOTOR CONTROLLER WITH AN IMPROVED ARRANGEMENT FOR DISCONNECTING AND WITHDRAWING A DRAWOUT UNIT

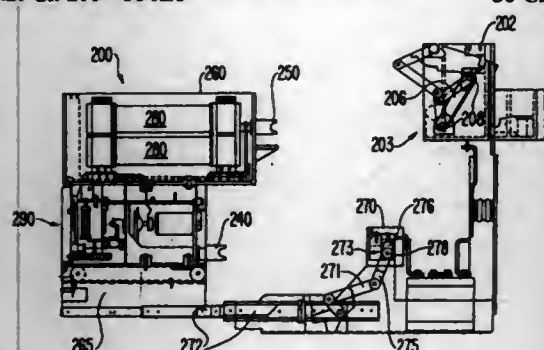
John D. Kleinecke, and George A. Houche, both of Houston, Tex., assignors to Toshiba International Corporation, Calif.

Filed Mar. 11, 1994, Ser. No. 208,709

Int. Cl.<sup>6</sup> H01H 9/20; H02B 11/12

U.S. Cl. 200—50 AA

30 Claims



1. A motor controller comprising:
  - (a) an isolation switch having a main power supply terminal and a bolted pressure contact; and
  - (b) a drawout unit including a line terminal for engaging the bolted pressure contact when the drawout unit is in an inserted position.
2. A motor controller as set forth in claim 1 wherein the isolation switch further includes:
  - (a) an arrangement of arms which is connected to an operating handle such that when the operating handle is moved to a closed position one arm moves clockwise to tighten a clamping bolt and another arm moves counter-clockwise to tighten another clamping bolt to apply contact pressure to the line terminal.

5,481,076

# ASTRAGAL FOR CLOSURE MEMBERS

Willis Mullet, Pensacola Beach; Albert W. Mitchell; Joseph D. Hudson, both of Pace, and Eric J. Wiborg, II, Cooper City, all of Fla., assignors to Wayne-Dalton Corp., Mt. Hope, Ohio

PCT No. PCT/US93/03604, § 371 Date Mar. 30, 1994, § 102(e) Date Mar. 30, 1994, PCT Pub. No. WO93/21414, PCT Pub. Date Oct. 28, 1993

Continuation-in-part of Ser. No. 870,299, Apr. 17, 1992, Pat. No. 5,259,143. This PCT application Apr. 16, 1993, Ser. No. 50,013

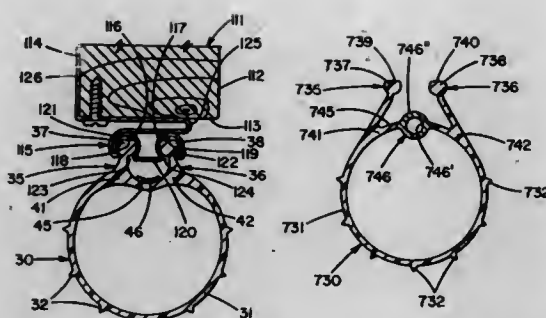
The portion of the term of this patent subsequent to Nov. 9, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> H01H 3/16

U.S. Cl. 200—61.43

15 Claims

1. An astragal for attachment between a movable closure member and a fixed surface having a sealing device and having an electrical switching device to signal engagement with an object comprising, retainer means having an electrically conductive contact section secured to one of the closure member and the fixed surface, an elongate generally tubular sealing means for engaging the other of the closure member and the fixed surface when in close proximity, circumferential ends of said tubular sealing means



selectively affixed to said retainer means at spaced locations, resilient carrier means disposed within said tubular sealing means, and electrically conductive strip means of substantially annular configuration incorporated in said carrier means in unobstructed facing relation to said contact section of said retainer means and temporarily movable into engagement with said contact section of said retainer means when an object displaces said tubular sealing means and said resilient carrier means to effect electrical contact therebetween.

5,481,077

# SHIFTER MOUNTED ACCESSORY CONTROL PANEL

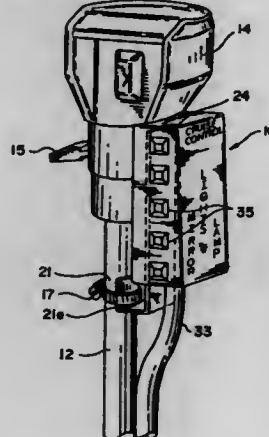
Wren A. Clegg, 103 Meals Dr., Carlisle, Pa. 17013, and William S. Reisinger, 2078 Spring St., York, Pa. 17404

Filed Aug. 18, 1994, Ser. No. 291,917

Int. Cl.<sup>6</sup> H01H 9/06

U.S. Cl. 200—61.88

17 Claims



1. A shifter mounted accessory control panel which fits onto a shifter pole to cooperate with an existing shifter knob comprising:
  - (a) a housing with a bore running from top to bottom to accommodate the pole of a shifter;
  - (b) a first set of switches for controlling vehicle accessories mounted on a first side of said housing;
  - (c) a second set of switches for controlling vehicle accessories mounted on a second side of said housing opposite said first side; and
  - (d) a front display face attached to and between the front edges of said opposite sides so as to be sloped inwardly from bottom to top toward said bore for displaying indicia corresponding to said switches to a seated driver.

5,481,078

# OPERATOR PRESENCE SENSOR FOR OPERATOR'S SEAT

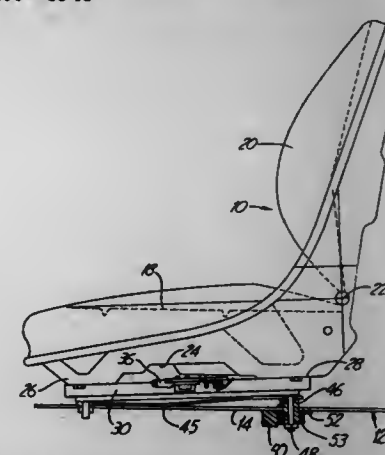
James E. Asche, Milnor, N. Dak., assignor to Clark Equipment Company, South Bend, Ind.

Filed Feb. 18, 1994, Ser. No. 198,285

Int. Cl.<sup>6</sup> B60K 28/00; H01H 3/14

U.S. Cl. 200—85 A

10 Claims



1. An operator presence sensor for the seat of a vehicle comprising a base plate, a longitudinal rail member supporting the seat, a forward end of the rail member mounted relative to the base plate to permit movement of a rear end of the rail member, a leaf spring mounted relative the base plate and proximate the forward end, the leaf spring extending along substantially the entire length of the longitudinal rail member and having a portion that is bent to bear directly on the rail member and deflect the rear end of the rail member and the seat upwardly, the rear end of the rail member being movable toward and away from the base plate, a position sensor having two components, one mounted relative to the rail member and the other component being mounted relative to the base member to sense movement of the rear end of the rail member when a predetermined load is placed on the seat and the leaf spring deflects a predetermined amount.

5,481,079

# COMPACT GAS TUNGSTEN ARC WELDING TORCH APPARATUS

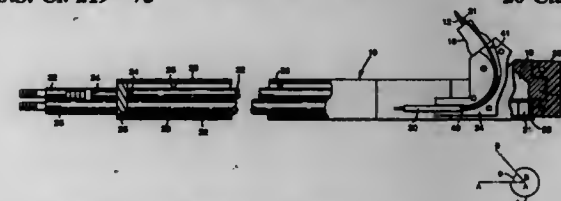
Thomas D. Erichsen, Los Altos; Gary L. Boerman, Santa Clara; Daniel J. Richard, San Jose, all of Calif., and Ian C. B. Gordon, East Whitburn, Scotland, assignors to FMC Corporation, Chicago, Ill.

Filed Jul. 29, 1994, Ser. No. 282,333

Int. Cl.<sup>6</sup> B23K 9/00

U.S. Cl. 219—75

20 Claims



1. An arc welding apparatus, comprising:
  - (a) a gas feed pipe;
  - (b) a coolant feed pipe;
  - (c) a housing surrounding the gas feed pipe and the coolant feed pipe, wherein the housing has a first end and a second end and a linear length extending from the first end of the housing to the second end of the housing;
  - (d) an angular support piece mechanically connected to the second end of the housing;
  - (e) an electrode with a first end and a second end, wherein the first end of the electrode is electrically connected to the electrical lead and mechanically connected to the angular support piece

at a fixed angle with respect to the housing, and wherein the electrode has a length from the first end to the second end, and wherein the length of the housing and the length of the electrode form a reflex angle within the range from 282° to 320°;

a feed tube with a length adjacent to the housing, wherein the feed tube has a first end and a second end;

a first plate supported by the angular support piece, with a first groove for receiving the second end of the feed tube, and a second groove for receiving feed material and wherein the second groove forms an arc from which ranges from 282° to 320°; and

means for covering the first groove and the second groove.

5,481,080

# PLASMA TORCH WITH A LEAD-IN TUBE

Steinar Lynum; Kjell Haugsten, both of Oslo; Ketil Hox, and Jan Hugdahl, both of Trondheim, all of Norway, assignors to Kvaerner Engineering A.S., Lysaker, Norway

PCT No. PCT/NO92/00198, § 371 Date Aug. 12, 1994, § 102(e) Date Aug. 12, 1994, PCT Pub. No. WO93/12634, PCT Pub. Date Jun. 24, 1993

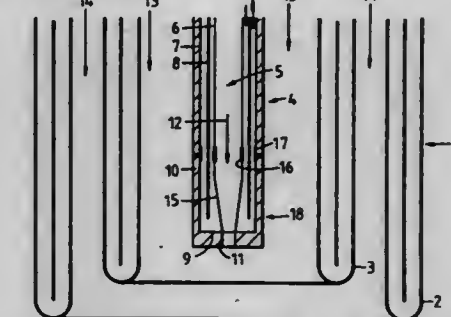
PCT Filed Dec. 11, 1992, Ser. No. 244,299

Claims priority, application Norway, Dec. 12, 1991, 914911

Int. Cl.<sup>6</sup> B23K 10/00

U.S. Cl. 219—121.48

2 Claims



1. A lead-in tube for the supply of reactant, said lead in tube having a longitudinal axis and disposed centrally in an inner electrode of a plasma torch, said plasma torch comprising at least two tubular electrodes located coaxially with one inside the other of said two electrodes, said lead-in tube having cooling passages and having an outer surface and a nozzle end which are provided with a thermally insulating coating, said lead-in tube being movable in a direction along said longitudinal axis to adjust the position of said nozzle end relative to the plasma flame, said nozzle end being detachable for replacement and having a conical wall portion forming a venturi passage to provide optimum gas velocity for the reactant.

5,481,081

# METHOD AND APPARATUS OF SYNTHESIZING DIAMOND IN VAPOR PHASE

Akihiko Ikegaya, and Naoji Fujimori, both of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 40,366, Mar. 30, 1993, abandoned. This application Aug. 26, 1994, Ser. No. 298,713

Claims priority, application Japan, Mar. 30, 1992, 4-106016

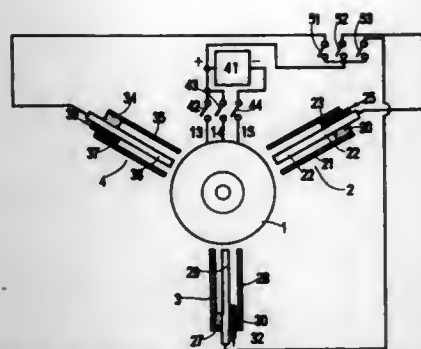
Int. Cl.<sup>6</sup> B23K 10/00

U.S. Cl. 219—121.48

11 Claims

1. An apparatus for synthesizing diamond by dissolving and activating a material gas by DC plasma generated by a DC voltage applied between an anode and a cathode of a plasma torch and by spraying activated plasma on a substrate body comprising:
  - (a) a vacuum chamber being able to be made vacuum,
  - (b) a vacuum pump for making the vacuum chamber vacuum,





a supporter for holding the substrate body installed in the vacuum chamber,  
 more than one cathode-torch installed in the vacuum chamber for producing a DC plasma jet, the cathode-torch having a cathode bar, outer electrodes as anodes mounted coaxially around the cathode bar, passageways among the cathode bar and the outer electrodes and gas inlets for introducing gas into the passageways,  
 more than two anode-nozzles having an anode bar, a cylinder enclosing the anode bar and gas inlets introducing gas between the anode bar and the cylinder,  
 plural gas supplying nozzles for spurring a carbon-containing gas or a mixture of a carbon-containing gas and hydrogen gas to the plasma jets ejected from the cathode-torches and the anode-nozzles,  
 power sources for supplying a DC voltage or a DC voltage superposed with an RF voltage between the cathode bar and the outer electrodes of the cathode-torches or between the anode bars of the anode-nozzles and the cathode bar of the cathode-torch,  
 connection cords for connecting the cathode-torch and the anode-nozzles to the power sources,  
 plural switches provided in the connection cords for turning on or turning off the voltage supply to the cathode-torch or the anode-nozzles,  
 the cathode-torch being able to form an individual inner arc plasma from the gas introduced in the passageways by applying the DC voltage between the cathode bar and the outer electrodes as anodes,  
 any of the anode-nozzles forming an outer transferable plasma jet with some cathode-torch by applying the DC voltage between the anode bar of the anode-nozzle and the cathode bar of the cathode-torch, and  
 all the outer transferable plasma jets being integrated into a wide unified plasma jet flame by turning on or turning off the switches.

5,481,082

#### APPARATUS AND METHOD FOR DIE BONDING SEMICONDUCTOR ELEMENT

Yousuke Yamamoto, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1994, Ser. No. 231,469

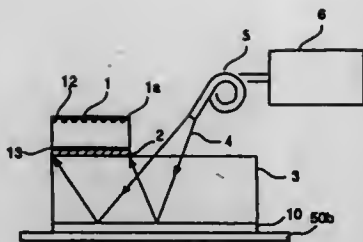
Claims priority, application Japan, Jul. 19, 1993, 5-177777

Int. Cl.<sup>6</sup> B23K 26/02

U.S. Cl. 219—121.63

5 Claims

1. A method for die bonding a semiconductor element to a submount comprising:  
 forming a metal film on a rear surface of a submount, placing a soldering material on a front surface of said submount, and placing said semiconductor element on said soldering material; and  
 obliquely irradiating part of the front surface of said submount with laser light of a wavelength transmitted through said submount and reflected from said metal film, thereby irradiating, heating, and melting said soldering material with the laser light reflected from the rear surface of said submount to bond said semiconductor element to said submount.



5,481,083

#### SYSTEM AND METHOD FOR STACKING AND LASER CUTTING MULTIPLE LAYERS OF FLEXIBLE MATERIAL

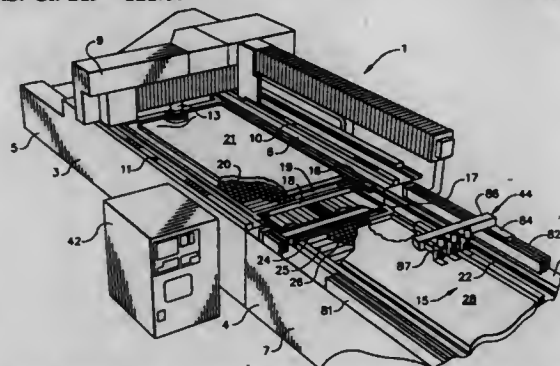
Dale C. Smyth, Jr., Lawrenceberg, Ind., assignor to Cincinnati, Incorporated, Cincinnati, Ohio

Filed Dec. 23, 1993, Ser. No. 172,439

Int. Cl.<sup>6</sup> B23K 26/14

U.S. Cl. 219—121.67

27 Claims



1. A stacking and laser cutting system for cutting multiple layers of flexible material, said system comprising a CNC laser center and a cutting and stacking machine, said laser center including a cutting zone, a loading and unloading zone, a laser cutting head assembly shiftable anywhere within said cutting zone, an upper carriage supporting a pallet and a lower carriage supporting a pallet, means for shifting said upper and lower carriages and their pallets between said cutting zone and said loading and unloading zone, said pallet of said upper carriage occupying a predetermined vertical level, means to raise said pallet of said lower carriage to the same predetermined vertical level when said lower carriage and its pallet are in said loading and unloading zone, said cutting and stacking machine comprising a material supply section and a cutting and stacking section, said material supply section providing at least one material web to said cutting and stacking section, said cutting and stacking section being mounted on said laser center over said loading and unloading zone thereof, a first one of said upper and lower carriages and their pallets being located in said loading and unloading zone and a second one of said upper and lower carriages and their pallets being located in said cutting zone, means in said cutting and stacking section for gripping said at least one web from said material supply section and pulling said at least one web over said pallet of said first one of said upper and lower carriages within said loading and unloading zone, means for cutting said at least one web to form at least one ply on said pallet in said loading and unloading zone, means to actuate said gripping and pulling means and said cutting means until a stack of a desired number of plies is deposited on said pallet in said loading and unloading zone, means to actuate said carriage and pallet shifting means to shift said first one of said upper and lower carriages and their pallets to said cutting zone for cutting patterns from said stack thereon, and to shift said second one of said upper and lower carriages and their pallets to said loading and unloading zone whereby a stack of material plies is formed thereon for subsequent shifting to said cutting zone.

5,481,084

#### METHOD FOR TREATING A SURFACE SUCH AS A METAL SURFACE AND PRODUCING PRODUCTS EMBODYING SUCH INCLUDING LITHOPLATE

Edward P. Patrick, Murrysville, and A. Victor Pajerski, New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 3,094, Jan. 11, 1993, which is a division of Ser. No. 670,576, Mar. 18, 1991, Pat. No. 5,187,046. This application Oct. 8, 1993, Ser. No. 134,165

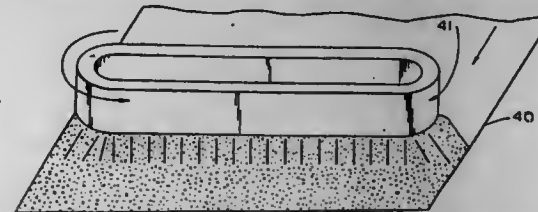
The portion of the term of this patent subsequent to Oct. 31, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> B23K 9/04

U.S. Cl. 219—123

108 Claims

1. A method of treating metal sheet for lithoplate application



having a substantial surface to which a substantially stable electric arc can be applied comprising continuously moving an electric arc on said surface by magnetic impulsion around a loop periphery path established by a loop electrode, the loop of which is in an arc passing relationship with said surface and effecting relative movement between one or more such electric arcs and said surface in such a manner as to contact a major portion of said surface and increase its surface area.

5,481,085

#### APPARATUS AND METHOD FOR MEASURING 3-D WELD POOL SHAPE

Radovan Kovacevic, and Yu M. Zhang, both of Lexington, Ky., assignors to University of Kentucky Research Foundation, Lexington, Ky.

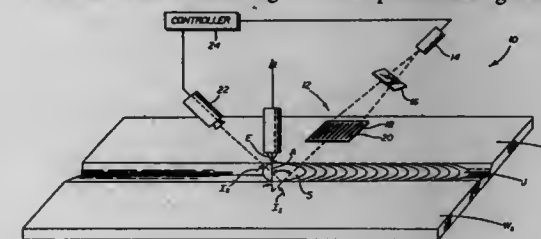
Filed Sep. 9, 1994, Ser. No. 303,980

Int. Cl.<sup>6</sup> B23K 9/095

U.S. Cl. 219—130.01

15 Claims

1. A method for determining 3-D weld pool surface geometry in



the presence of a welding arc during a welding operation, comprising the steps of:

illuminating the weld pool surface with diffused, structured light directed at an incident angle of substantially 45° relative to the welding arc;  
 detecting specular reflection of the diffused, structured light from the weld pool surface at an incident angle of substantially 45° relative to the welding arc and substantially 90° relative to the direction of illumination so as to produce an acquired image; and  
 analyzing the acquired image to determine the geometry of the weld pool surface.

5,481,086

#### HIGH TEMPERATURE DEFORMABLE CRUCIBLE FOR USE WITH SELF-RESISTIVELY HEATED SPECIMENS

Ferguson Hugo S., Averill Park, N.Y., assignor to Dynamic Systems Inc., Poestenkill, N.Y.

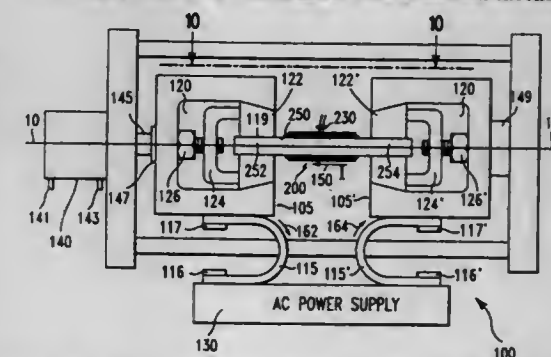
Filed Aug. 9, 1994, Ser. No. 287,954

Int. Cl.<sup>6</sup> F27D 11/00

U.S. Cl. 219—385

16 Claims

1. A crucible usable in combination with a thermal-mechanical



material testing system wherein the system holds an electrically conductive test specimen between two axially aligned opposing assemblies, first and second ends of the specimen being securely held by corresponding first and second ones of the assemblies, the system passing electrical heating current serially through the first one of said assemblies, the specimen and the second one of the assemblies to controllably and self-resistively heat the specimen such that a central region of the specimen becomes semi-solid, and the system controllably deforming the specimen while the central region of the specimen is semi-solid, and wherein the crucible holds the specimen while both the specimen is self-resistively heated to where the central portion attains a semi-solid state and the specimen is subsequently deformed, the crucible comprising:

an elongated deformable shell having an upwardly directed opening therein and a suitable cross-section shape axially along the shell and in conformity with the shape of the specimen such that the shell is securely positionable over said specimen to confine the central region thereof; and  
 an electrically and thermally insulating flexible layer interposed between and in abutting contact with both said specimen and the shell, said layer having a cross-sectional shape substantially identical to that of the shell but extending beyond the shell so as to thermally insulate the shell from self-resistive heat generated in the specimen and to prevent current from flowing in the shell;  
 wherein the insulating flexible layer is capable of developing a sufficiently large thermal gradient thereacross such that, when the central region of the specimen located on one side of the insulating layer is at a liquid temperature, the temperature of the shell at a location on an opposing side of the layer remains sufficiently below a liquidus temperature of the shell so that the shell possesses sufficient mechanical strength to mechanically support the central region of the specimen and wherein the insulating flexible layer has a maximal porosity such that substantially no liquefied specimen material in the central region permeates through the insulating flexible layer and contacts the shell.



5,481,087

**SOLDERING APPARATUS WITH IMPROVED FILTER**  
Lambertus P. C. Willemsen, Dorst, Netherlands, assignor to Soltec B.V., Oosterhout, Netherlands  
PCT No. PCT/NL93/00063, § 371 Date Nov. 17, 1993, § 102(e) Date Nov. 17, 1993, PCT Pub. No. WO93/01882, PCT Pub. Date Sep. 30, 1993

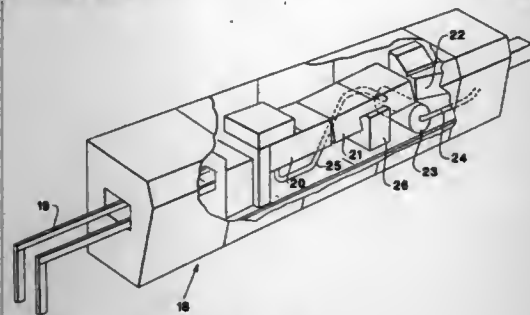
PCT Filed Mar. 16, 1993, Ser. No. 119,129

Claims priority, application Netherlands, Mar. 17, 1992, 9200498

Int. Cl.<sup>6</sup> F27B 9/04; 9/30

U.S. Cl. 219—388

13 Claims



1. In a soldering device comprising:  
a chamber;  
soldering means for soldering objects for soldering which are transported through the chamber;  
a transporting means in the chamber for transporting the objects for soldering along a transport route;  
a cleaning means for cleaning gases present in the chamber, said cleaning means being connected to the chamber with a feed line and a discharge line; and  
a fan situated in one of the lines, the improvement comprising:  
means for cooling said gases being situated in one of the lines.

5,481,088

### COOLING SYSTEM FOR A HORIZONTAL DIFFUSION FURNACE

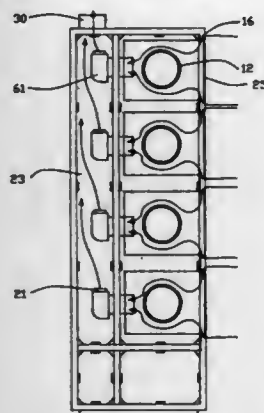
Kevin B. Peck, Soulsbyville; Ronald E. Erickson, Jamestown, and Stephen H. Matthews, Sonora, all of Calif., assignors to Thermtec, Inc., Sonora, Calif.

Division of Ser. No. 898,552, Jun. 15, 1992. This application Apr. 21, 1994, Ser. No. 230,598

Int. Cl.<sup>6</sup> F27B 5/14

U.S. Cl. 219—390

18 Claims



1. An apparatus for cooling a plurality of heating elements radiating thermal energy in a high temperature diffusion furnace using a source of air, comprising:  
a panel in the high temperature diffusion furnace having an intake vent arrangement;  
means, adapted to be coupled to the high temperature diffusion furnace, for extracting the air through the intake vent arrangement to produce a flow of air across a first heating element

radiating thermal energy which transfers the thermal energy of the first heating element to the flow of air;  
means, coupled to the high temperature diffusion furnace, for extracting the air through the intake vent arrangement to produce a flow of air across a second heating element radiating thermal energy which transfers the thermal energy of the second heating element to the flow of air; and  
means, coupled to the high temperature diffusion furnace, for separating the flow of air across the first heating element from the flow of air across the second heating element so that the flow of air across the first heating element can be controlled separately from the flow of air across the second heating element.

5,481,089

### HEATER CONTROL DEVICE FOR IMAGE FORMING APPARATUS

Hideki Furuta, Saitama, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

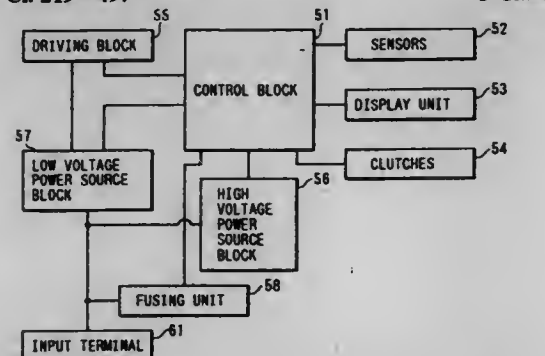
Filed Jun. 23, 1992, Ser. No. 902,743

Claims priority, application Japan, Jun. 24, 1991, 3-151551

Int. Cl.<sup>6</sup> H05B 1/02

U.S. Cl. 219—497

3 Claims



1. A heater control device for an image forming apparatus comprising:  
a switch for connecting and disconnecting an application of an alternating current voltage to a heater used in an image forming apparatus, the alternating current voltage being received from a commercial power source;  
a temperature detecting device provided in the proximity of the heater for detecting the ambient temperature in the proximity of said heater; and  
switch control means for varying a period of time for the application of the alternating current voltage to the heater per unit period of time by controlling said switch in accordance with a value of the alternating current voltage received from the commercial power source and a temperature detected by said temperature detecting device.

5,481,090

### SAP FLOW GAUGE

Randall S. Senock, Riley, and Jay M. Ham, Manhattan, both of Kans., assignors to Kansas State University Research Foundation, Manhattan, Kans.

Division of Ser. No. 85,614, Jun. 30, 1993, Pat. No. 5,367,905.

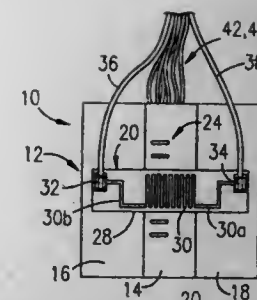
This application Jun. 6, 1994, Ser. No. 254,746

Int. Cl.<sup>6</sup> H05B 3/36

U.S. Cl. 219—535

1 Claim

1. A resistance-type electrical heating element, comprising:  
an elongated strip of dielectric synthetic resin material presenting a central region and a pair of opposed end regions;  
a resistance heating element located only in the central region of said strip,  
the length of each of said end regions being at least equal to the length of said heating element; and



a pair of terminal pads respectively electrically coupled with opposed ends of said heating element,  
each of said pads being located on a corresponding end region of said strip.

5,481,091

### THERMOPLASTIC WELDING

Robert A. Grimm; Wanda F. Wine, both of Columbus, and John A. Molnar, Dublin, all of Ohio, assignors to Edison Welding Institute, Columbus, Ohio

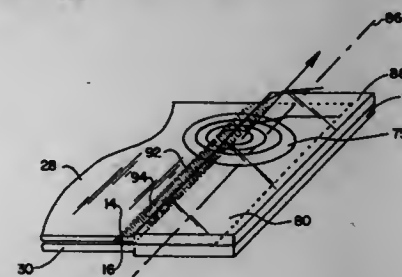
Division of Ser. No. 821,981, Jan. 15, 1992, Pat. No. 5,313,034.

This application May 16, 1994, Ser. No. 243,623

Int. Cl.<sup>6</sup> H05B 6/10

U.S. Cl. 219—633

24 Claims



12. A method of thermoplastic welding comprising:  
a. forming a bond line from bonding surfaces of at least one substrate;  
b. placing and flattening a braid-tube susceptor in said bond line, said braid-tube susceptor formed from current-conducting elements and inherently having a flattened width, and said bond line containing a thermoplastic material as at least one of 1) said bonding surfaces forming said bond line, 2) said braid-tube susceptor, and 3) a separate layer;  
c. forming an electromagnetic field with an induction coil, said electromagnetic field inherently having a width and a characteristic frequency; and  
d. heating said braid-tube susceptor in said bond line with said electromagnetic field to bond said bonding surfaces together with said thermoplastic material.

5,481,092

### MICROWAVE ENERGY GENERATION DEVICE USED TO FACILITATE REMOVAL OF CONCRETE FROM A METAL CONTAINER

Paul A. Westmeyer, 9012 Horton Rd., Laurel, Md. 20708

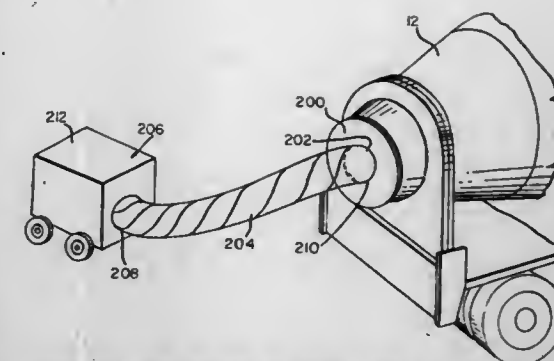
Filed Dec. 2, 1994, Ser. No. 353,357

Int. Cl.<sup>6</sup> H05B 6/80

U.S. Cl. 219—679

31 Claims

1. A combination of a concrete mixing container and device for removing hardened concrete therefrom, comprising:  
a metal container adapted to contain concrete, said metal container having inner walls and internal mixing fins connected to said inner walls, said internal mixing fins extending from said inner walls inwardly into said container for mixing or agitating concrete placed within said container, said inner



walls and said mixing fins being prone to concrete rigidly adhering thereto when said concrete hardens; and  
a microwave energy generation device for generating microwave radiation energy into said metal container and being capable of liberating water molecules from said concrete placed in said container so as to weaken the chemical structure of said concrete to thereby facilitate breakage of said hardened concrete rigidly adhered to said inner walls and said mixing fins and thus removal of said concrete from said container.

5,481,093

### GOLF ROUND TIMING DEVICE

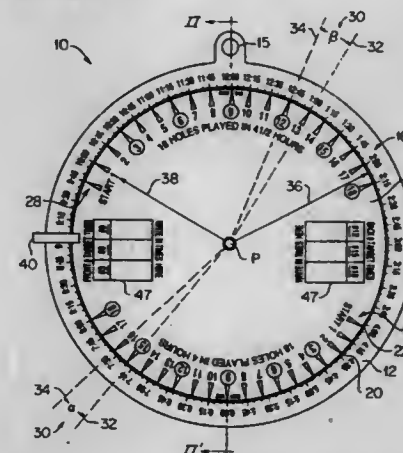
Zebulon W. Rogerson, Vienna, Va., assignor to Ajay A. Jagtari, Centreville, Va.

Filed Feb. 8, 1993, Ser. No. 14,513

Int. Cl.<sup>6</sup> G06C 27/00; 3/00

U.S. Cl. 235—78 R

14 Claims



1. A golf timing device for determining the exact time a golfer should finish a golf hole on a golf course, said golf timing device comprising:

a base, said base having an outer arcuate row of indicia indicative of time intervals; and  
a circular disk member of lesser radius than said outer arcuate row, said circular disk member rotatable mounted at a mounting point on said base and concentric with said outer arcuate row of indicia on said base, said circular disk member having at least one inner arcuate row of indicia indicative of holes on the golf course so that when said inner arcuate row of indicia is aligned with said outer arcuate row of indicia the time at which the golfer is to finish the golf hole may be determined; wherein said inner arcuate row of indicia has hole marks disposed at 0.11 radian intervals along said inner arcuate row, said intervals corresponding to four hours of play time for eighteen holes of the golf course.



5,481,094

## POINT-OF-SALE TERMINAL

Hiroshi Suda, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

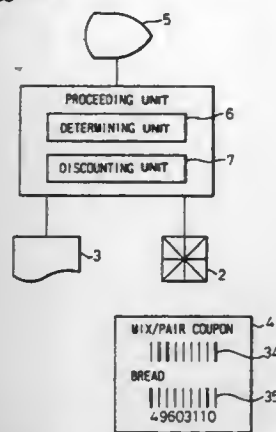
Filed Mar. 17, 1994, Ser. No. 214,312

Claims priority, application Japan, May 28, 1993, 5-126442

Int. Cl.<sup>6</sup> G06F 17/60

U.S. Cl. 235—383

8 Claims



1. A POS terminal for making a package discount intended to allow a discount for a combination of specified commodities, comprising:

input means for inputting information concerning a commodity eligible for the package discount and purchased previously; determining means for determining whether a package discount is provided by analyzing information, which is entered at the input means, concerning a commodity eligible for the package discount and purchased previously, and information concerning a commodity eligible for the package discount and currently being purchased; and discount means for allowing a discount from the price of the commodity currently being purchased when the package discount is provided.

5,481,095

## CODE READING PATTERN AND AN IMAGE PICKUP APPARATUS FOR READING THE PATTERN

Hiroshi Mitsuda; Masahiko Sakamoto; Hitoshi Tanaka; Nobuyuki Kosaka, and Yoshinori Ito, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 17,738, Feb. 16, 1993, abandoned.

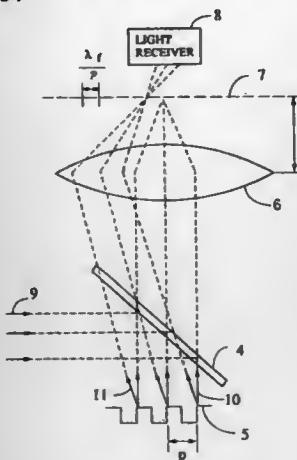
This application Aug. 22, 1994, Ser. No. 293,741

Claims priority, application Japan, Feb. 17, 1992, 4-029582; Jan. 15, 1992, 4-276871; Jan. 13, 1993, 5-019483

Int. Cl.<sup>6</sup> G06K 7/10

U.S. Cl. 235—454

18 Claims



1. An image pickup apparatus for reading a code reading pattern, the code reading pattern having repeated markings of constant pitch, the markings formed on a surface of an object, the markings defining an area having at least one boundary, the at least one boundary defining an outline of a symbol, the symbol representing significant information, the apparatus comprising:

lighting means for illuminating the markings of the code reading pattern with parallel light to generate reflected light; image means for directing the reflected light from the markings to various points along a near back focal plane of the image means, wherein diffracted light of one or more selected nth orders, wherein n is an integer, and from different markings is directed to the near back focal plane, the reflected light including regular reflected light and diffracted light; transmission means, including a spatial frequency filtering system located at the near back focal plane of the image means, for transmitting the diffracted light of the one or more selected nth orders, and for blocking the regular reflected light, and for blocking the diffracted light of a non-selected nth order; and receiving means for receiving an image of the symbol formed by the diffracted light transmitted through the transmission means.

5,481,096

## BAR CODE READER AND METHOD FOR ITS OPERATION

Heinrich Hippenmeyer, Frelamt, and Reinhold Kilian, Waldkirch, both of, Germany, assignors to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Germany

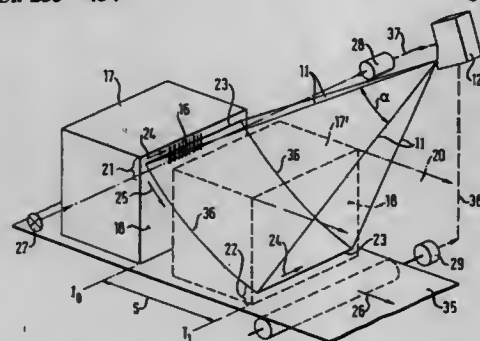
Filed Oct. 20, 1994, Ser. No. 325,974

Claims priority, application Germany, Jan. 22, 1993, 43 36 137.4

Int. Cl.<sup>6</sup> G06K 7/10; 7/14

U.S. Cl. 235—454

6 Claims



1. Method of operating a bar code reader for codes (16) applied to an article (17) which moves at least substantially in one direction (26) using a scanner (12) which generates a scanning light beam (11) which travels linewise along a scanning surface (18, 19) of the article (17), which has a light receiving arrangement (13) with an electronic evaluation and control circuit (14) with which bar codes (16) on the scanning surface (18, 19) of the article (17) and scanned by the scanning light beam (11) can be recognized, and which is arranged outside of the path of movement (20) of the article (17) and directed onto the front or rear scanning surface (18, 19) of the article (17) as seen in the direction of movement, characterised in that, with an article (17) to be moved towards the scanner (12), the scanning light beam (11) is directed before the start of the scanning, to the region (21) of the scanning surface (18) lying closest to the scanner (12) and/or, with an article (17) to be moved away from the scanner (12), to the region (22) of the scanning surface (19) which is furthest removed from the scanner (12); and in that the advance (25) of the scanning line (22) substantially perpendicular to the scanning direction which brings about the linewise scanning is synchronised with the speed of movement of the article (17) in such a way that the spacing of the scanner (12) from the scanning line (23) on the scanning surface (18, 19) of the article (17) remains at least substantially constant.

5,481,097

## APPARATUS AND METHOD FOR DECODING BAR CODES

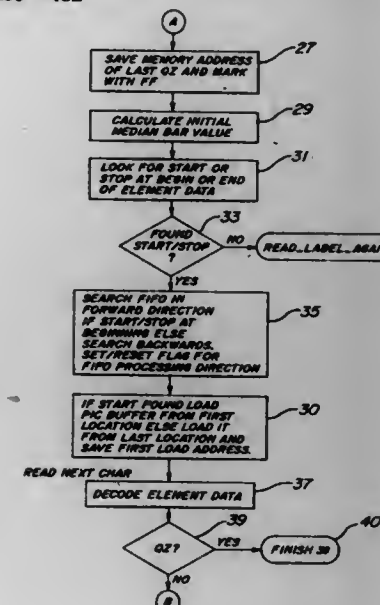
Benny R. Tafoya, Doylestown, Pa., assignor to PSC Inc., Webster, N.Y.

Filed Jan. 25, 1993, Ser. No. 8,701

Int. Cl.<sup>6</sup> G06K 7/10

U.S. Cl. 235—462

35 Claims



1. An apparatus for interpreting a bar coded symbol formed of bars and spaces comprising,

- means for generating a plurality of random scans which respectively impinge upon and produce reflected signals related to partial information carried by said symbol, and said symbol being comprised of elements of data;
  - means for loading said partial information into a first memory from any one of said random scans, and said partial information being accompanied by beginning and ending quiet zones;
  - means for searching for a START or, alternatively, a STOP code in combination with said partial information in said memory for determining a direction for processing said data;
  - means for decoding said partial information when data is valid and converting it into characters for placement into an end of a second memory in accordance with whether the START or STOP code was located;
  - means to load additional partial information in said first memory wherein said additional partial information is obtained from any other one of said plurality of random scans, said additional partial information comprising new data which is accompanied by different beginning and ending quiet zones;
  - means for searching for a START or, alternatively, a STOP code that was not previously obtained,
  - means for decoding said additional partial information by converting said data into characters for placement into a different end of said second memory to complete an acquisition of said symbol;
  - means for receiving said decoded data and translating it into readable form,
  - whereby a symbol of small aspect ratio may be determined.
13. An apparatus in accordance with claim 1 and further including means for pre-processing said reflected signals with respect to their dimensional characteristics.

5,481,098

## METHOD AND APPARATUS FOR READING MULTIPLE BAR CODE FORMATS

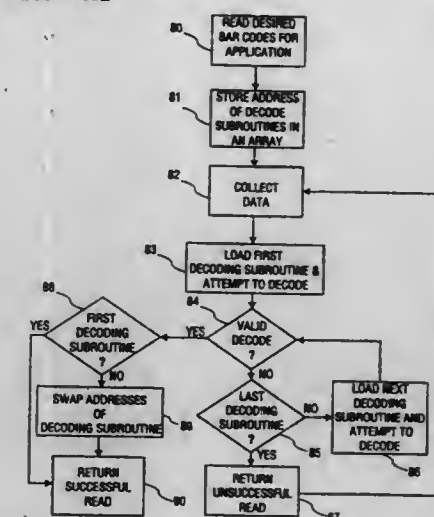
Glen Davis, Junction City, and Phillip W. Shepard, Eugene, both of Oreg., assignors to Spectra-Physics Scanning Systems, Inc., Eugene, Oreg.

Filed Nov. 9, 1993, Ser. No. 149,205

Int. Cl.<sup>6</sup> G06K 7/10

U.S. Cl. 235—462

30 Claims



8. A method for recognizing multiple symbologies comprising the steps of:

- arranging a plurality of symbologies in an order of priority, reading a symbol,
- identifying a symbology of said symbol from among the plurality of symbologies by testing said symbol against each of the plurality of symbologies in accordance with said order of priority until the symbology of said symbol is identified, and adjusting the order of priority of said symbologies.

5,481,099

## SCANNING ARRANGEMENT FOR THE IMPLEMENTATION OF OMNI-DIRECTIONAL SCANNING PATTERNS OVER INDICIA

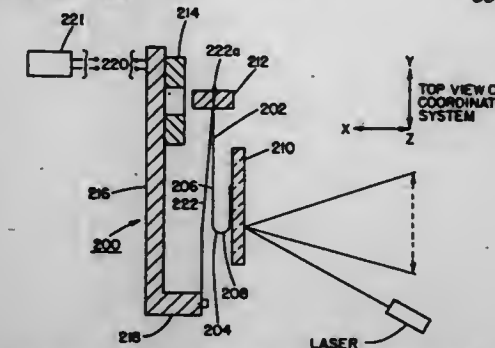
Paul Dvorkis, Stony Brook, N.Y., assignor to Symbol Technologies, Inc., Bohemia, N.Y.

Division of Ser. No. 880,256, May 8, 1992, abandoned, which is a continuation-in-part of Ser. No. 520,464, May 8, 1990, Pat. No. 5,168,149, which is a continuation-in-part of Ser. No. 428,770, Oct. 30, 1989, Pat. No. 5,099,110. This application May 18, 1994, Ser. No. 245,520

Int. Cl.<sup>6</sup> G06K 7/10

U.S. Cl. 235—462

33 Claims



1. A scanner for reading indicia having portions of differing light reflectivity; comprising:

- means for directing a light beam from said scanner towards said indicia;
- means for collecting reflected light returning from said indicia; and



(c) an arrangement for scanning the indicia with said light beam, said scanning arrangement comprising:

- (i) a scanner component;
- (ii) first and second vibratory means supporting said scanner component for angular oscillatory movement to scan said light beam in a first scan direction and in a second scan direction orthogonal to said first scan direction;
- (iii) read-start means for moving said scanner component to simultaneously scan said light beam in said first and second scan directions; and
- (iv) control means operatively connected to said read-start means for imparting differing signals to said read-start means to (1) alternatively drive fast and slow vibrations of said first and second vibratory means so as to vary the scanning of said light beam in said first scan direction and (2) to drive vibration of only said second vibratory means so as to cause the scanning of said light beam in said second scan direction, wherein the scanning of said light beam in said first and said second scan directions generates a scan pattern over the indicia.

5,481,100

## SPIRALLY ARRANGED BAR CODE

Junichi Terachi, Ibaragi, Japan, assignor to Riso Kagaku Corporation, Tokyo, Japan

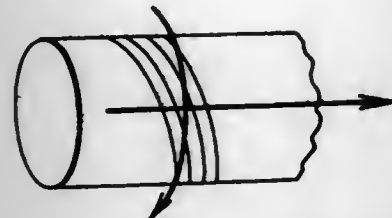
Continuation of Ser. No. 44,178, Apr. 8, 1993, abandoned.

This application Jul. 20, 1994, Ser. No. 278,111

Claims priority, application Japan, Apr. 14, 1992, 4-094212; Apr. 24, 1992, 4-027422 U

Int. Cl.<sup>6</sup> G06K 7/10

U.S. Cl. 235—462



1. A bar code device comprising, an elongated member having a circumferential surface and at least a predetermined longitudinal length, and a bar code spirally provided on the circumferential surface of the elongated member, said bar code completely surrounding an entire area of the circumferential surface of the elongated member in said predetermined longitudinal length so that when the bar code is scanned with respect to a sensor for reading the bar code in one of a longitudinal direction of the elongated member for the predetermined longitudinal length and a direction perpendicular to the longitudinal direction along the circumferential surface of the elongated member, the bar code is surely ready.

5,481,101

## TWO DIMENSIONAL CODE DATA READING APPARATUS AND METHOD

Hirokazu Yoshida, Osaka, Japan, assignor to Teiryō Sangyo Co., Ltd., Osaka, Japan

Filed Dec. 10, 1993, Ser. No. 164,941

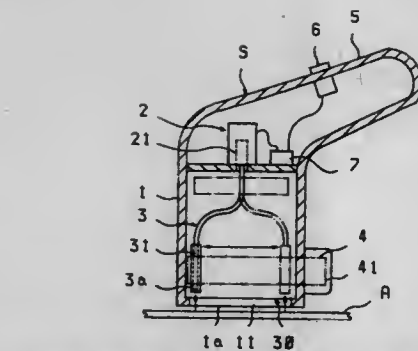
Int. Cl.<sup>6</sup> G06K 7/10

U.S. Cl. 235—472

13 Claims

1. A portable, hand-held reading apparatus for reading two-dimensional code data comprising:

line sensor detection means for reading the two-dimensional code data, said line sensor detection means including an optical fiber band cable having multiple optical fibers, one end of said multiple optical fibers being connected to a line sensor



element unit and another end of said multiple optical fibers being disposed adjacent to an opening made in said reading apparatus;

detection unit moving means for moving said multiple optical fibers parallel along a surface to be detected in an orthogonal direction so as to move said line sensor detection means within a range of the opening and read the two-dimensional code data; and

housing means, including a handle, for enclosing said line sensor detection means and said detection unit moving means.

5,481,102

## MICROMECHANICAL/MICROELECTROMECHANICAL IDENTIFICATION DEVICES AND METHODS OF FABRICATION AND ENCODING THEREOF

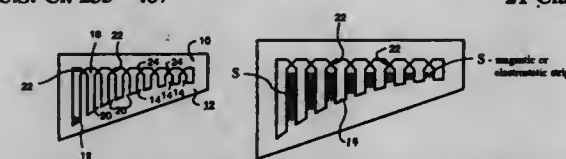
George A. Hazelrigg, Jr., 4623 N. 4th Rd., Arlington, Va. 22203

Filed Mar. 31, 1994, Ser. No. 220,506

Int. Cl.<sup>6</sup> G06K 7/06; 7/08; 19/00

U.S. Cl. 235—487

21 Claims



13. A device for encoding data comprising a comb-like structure including a support member and a plurality of cantilevered tines extending from said support member, the lengths of said tines varying from line to tine and each of said different length tines having a characteristic frequency of vibration, and each of said tines including a necked-in portion facilitating removal of selected tines from said device.

15. A device for encoding data comprising a structure having a pair of spaced apart first and second sides, the space between said sides varying along the length of said structure, and a plurality of spaced apart beams extending across said space, each of said beams having opposite ends connected to respective ones of said first and second sides, the lengths of said beams varying from beam to beam, and each of said beams including a necked-in portion facilitating severing said beams at said necked-in portions for converting selected beams to cantilevered tines having respectively different resonant frequencies of vibration.

5,481,103

## PACKET BAR CODE WITH DATA SEQUENCE ENCODED IN ADDRESS/DATA PACKETS

Yanjiun P. Wang, Fort Myers, Fla., assignor to Metanetics Corporation, Fort Myers, Fla.

Filed Jul. 26, 1994, Ser. No. 280,490

Int. Cl.<sup>6</sup> G06K 19/06

U.S. Cl. 235—494

32 Claims

15. A packet code, in the form of a machine readable bar code, comprising:

5,481,105

## NEUTRON BACKSCATTER GRAVEL PACK LOGGING SONDE WITH AZIMUTHAL SCAN CAPABILITY

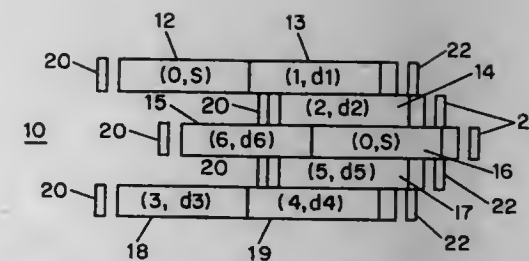
Randy Gold, Houston, Tex., assignor to Halliburton Company, Dallas, Tex.

Filed Jun. 4, 1993, Ser. No. 71,170

Int. Cl.<sup>6</sup> G01V 5/10

U.S. Cl. 250—266

10 Claims



a plurality of nominally rectangular address/data packets each including a series of bar type elements spaced in a first width direction; and

each of said address/data packets including:

- a data portion representative of a data unit selected from a sequence of data; and
- an address portion identifying the position of said data unit relative to said sequence of data to enable reassembly of data units into proper positions in said sequence of data independently of the order in which said address/data packets are read and decoded.

5,481,104

## PHOTODETECTOR CIRCUIT WITH ACTIVELY DAMPED TUNED INPUT

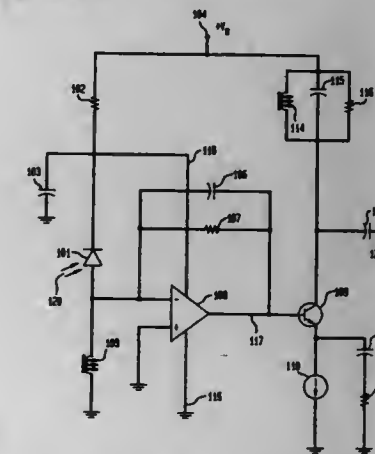
Gabriel L. Miller, Westfield, and Eric R. Wagner, South Plainfield, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Sep. 30, 1994, Ser. No. 316,587

Int. Cl.<sup>6</sup> H01J 40/14

U.S. Cl. 250—214 C

10 Claims



1. A photodetector circuit for use in extracting an output signal from a modulated optical carrier of frequency  $f_0$ , said circuit to be connected to a voltage supply  $V_b$  which is subject to a change  $\Delta V_b$  in voltage, said circuit comprising a photodetector diode having a capacitance of  $C_d$  at the nominal voltage of  $V_b$ , an inductor, means for connecting said photodetector diode and said inductor such that said photodetector diode and said inductor are in parallel at said frequency  $f_0$  and said photodetector diode is back-biased by said voltage supply, the capacitance of said photodetector diode being subject to change with changes in the voltage from said voltage supply, and an inverting amplifier having an input and an output and a change in gain  $\Delta G$  which depends on said change  $\Delta V_b$ , means for connecting the input of said amplifier to the parallel resonant combination of said photodetector diode and said inductor, characterized in that said circuit further includes an impedance connected between the input and output of said amplifier, said impedance having a capacitive element  $C_f$  which provides a capacitive component to the input impedance of said inverting amplifier, thereby resulting in a parallel resonant tank circuit consisting of the photodetector diode, the inductance, and said capacitive component.

5,481,106

## ENCODER WITH AN OPTICAL SCALE AND INTERFERENCE OF ZERO AND FIRST ORDER DIFFRACTION BEAMS

Masaru Nyui, Masahiko Igaki, both of Ohta, and Ko Ishizuka, Ohmiya, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 4, 1993, Ser. No. 70,996

Claims priority, application Japan, Jun. 17, 1992, 4-184506

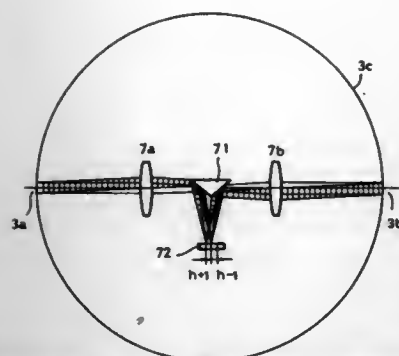
Int. Cl.<sup>6</sup> H01J 3/14

U.S. Cl. 250—237 G

6 Claims

1. An encoder comprising: a first optical scale consisting of a grating of a fixed pitch; light irradiation means for irradiating said first optical scale with light; a second optical scale consisting of a grating of a fixed pitch, light transmitted through said first optical scale being caused to impinge upon said second optical scale; light receiving means for receiving light transmitted through said second optical scale; and





light adjustment means for intercepting or attenuating either a +1st order or -1st order diffracted ray of rays of light obtained by diffraction at said first optical scale out of the light transmitted therethrough; wherein

said light adjustment means includes a prism member having a reflection surface for totally reflecting a ray of light incident upon it at a predetermined incident angle, said +1st order or -1st order diffracted ray of light being reflected by said reflection surface.

5,481,107

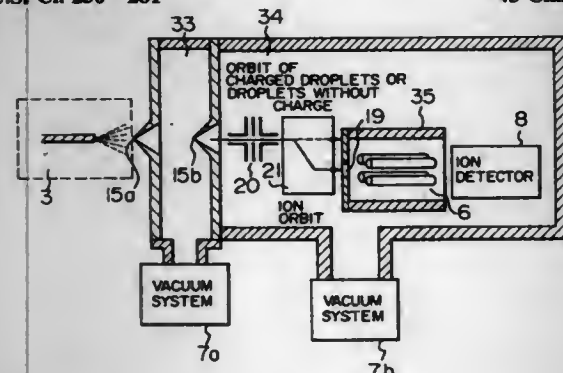
## MASS SPECTROMETER

Yasuaki Takada, Kokubunji; Minoru Sakairi, Kawagoe; Atsumu Hirabayashi, Kokubunji, and Youichi Ose, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Filed Sep. 8, 1994, Ser. No. 302,555

Claims priority, application Japan, Sep. 20, 1993, 5-232833  
Int. Cl.<sup>6</sup> H01J 49/06

U.S. Cl. 250—281

43 Claims

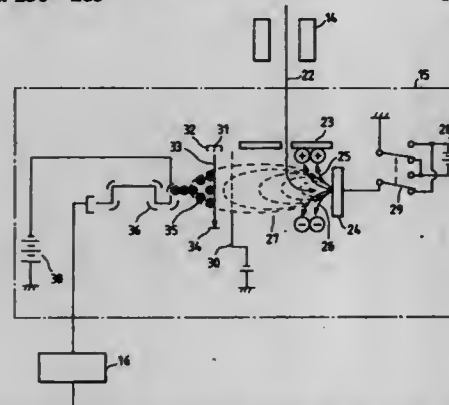


1. A mass spectrometer comprising: an ionization region for ionizing a sample under atmosphere pressure; an ion sampling aperture for introducing ions generated in said ionization region into a vacuum; and a mass analysis region for mass analyzing said ions on the basis of a high-frequency electric field, wherein: an electrostatic lens for deflecting a direction of movement of said ion from a center axis of said ion sample aperture is arranged between said ionization region and said mass analysis region; and a center axis of an aperture for introducing ions into said mass analysis region and the center axis of said ion sample aperture are arranged in parallel and offset from each other.

5,481,108  
METHOD FOR ION DETECTION AND MASS SPECTROMETRY AND APPARATUS THEREOF  
Masayoshi Yano, Hitachinaka, and Kohei Mochizuki, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Filed Nov. 30, 1994, Ser. No. 351,155  
Claims priority, application Japan, Dec. 28, 1993, 5-334911  
Int. Cl.<sup>6</sup> H01J 43/02

U.S. Cl. 250—283

30 Claims



1. A method for ion detection, comprising the steps of: converting negative ions to neutral particles by sputtering; and detecting a signal corresponding to said neutral particles.

5,481,109

## SURFACE ANALYSIS METHOD AND APPARATUS FOR CARRYING OUT THE SAME

Ken Ninomiya, Higashi-Matsuyama; Hideo Todokoro; Tokuo Kure, both of Tokyo; Yasuhiro Mitsui, Fuchu; Katsuhiko Kuroda, and Hiroyasu Shichi, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
PCT No. PCT/JP93/01373, § 371 Date Apr. 11, 1994, § 102(e)  
Date Apr. 11, 1994, PCT Pub. No. WO94/08232, PCT Pub. Date Apr. 14, 1994

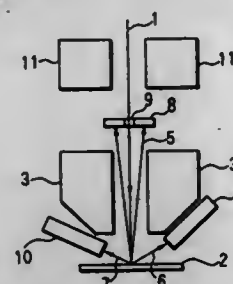
PCT Filed Sep. 27, 1993, Ser. No. 211,575

Claims priority, application Japan, Sep. 28, 1992, 4-257789

Int. Cl.<sup>6</sup> G01N 23/23; 23/225; H01J 37/252

U.S. Cl. 250—310

80 Claims



1. A surface analysis method for analyzing residues inside small holes on the surface of a sample by irradiating an accelerated and focused electron beam into said small holes and by observing fluorescence X-rays emitted therefrom in return, said surface analysis method comprising the step of observing said fluorescence X-rays within an angle  $\alpha$  with respect to the center axis of the electron beam, said angle being defined as

$$\tan \alpha = (a/d)$$

where, a multiplied by 2 stands for the inner diameter of any one of said small holes and d for the depth thereof.

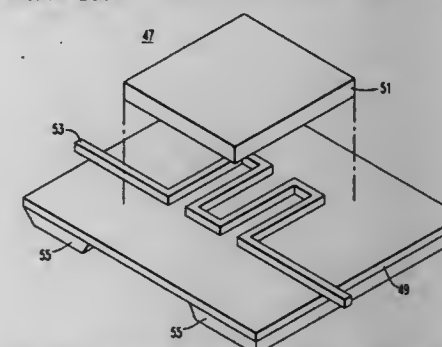
5,481,110

## THIN FILM PRECONCENTRATOR ARRAY

Silaipillayarputhur V. Krishnaswamy, Monroeville, and Carl B. Freidhoff, Murrsville, both of Pa., assignors to Westinghouse Electric Corp., Baltimore, Md.  
Continuation-in-part of Ser. No. 124,873, Sep. 22, 1993, Pat. No. 5,386,115. This application Oct. 7, 1994, Ser. No. 320,468  
Int. Cl.<sup>6</sup> B01D 59/44; H01J 49/00

U.S. Cl. 250—288

16 Claims



1. A preconcentrator for use in a solid state mass spectrograph for analyzing a sample gas, said mass spectrograph being formed from a semiconductor substrate having a cavity with an inlet, a gas ionizing section adjacent said inlet, a mass filter section adjacent said gas ionizing section and a detector section adjacent said mass filter section, said preconcentrator being provided in said mass spectrograph between said inlet and said gas ionizing section, said preconcentrator comprising a dielectric membrane deposited on a semiconductor substrate, an absorber provided on said membrane for collecting and concentrating said sample gas and heater means provided on said membrane for releasing said absorbed sample gas from said absorber.

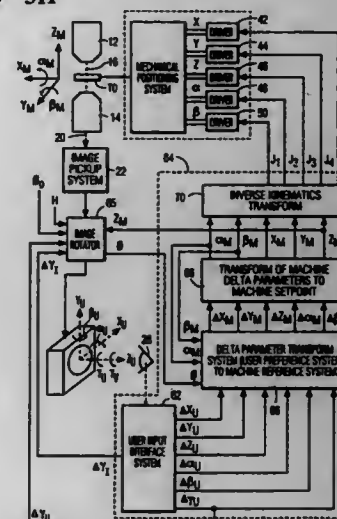
5,481,111

## ELECTRON MICROSCOPE HAVING A GONIOMETER CONTROLLED FROM THE IMAGE FRAME OF REFERENCE

Madeleine E. Rosar, Suffern; Karen I. Trovato, Putnam Valley, both of N.Y.; Leendert Dorst, Amsterdam, and Thomas P. H. Warmerdam, Eindhoven, both of Netherlands, assignors to Philips Electronics North America Corporation, New York, N.Y.  
Filed Jan. 3, 1994, Ser. No. 176,051  
Int. Cl.<sup>6</sup> H01J 37/26

U.S. Cl. 250—311

5 Claims



1. An electron microscope having an electron beam column of electrons following a helical path and a mechanical positioning system for physically positioning a specimen with respect to the electron beam column, said electron microscope displaying an

electron image of said specimen positioned in said column, said electron microscope utilizing a machine frame of reference defined by said mechanical positioning system and a user frame of reference defined by the displayed electron image of said specimen, said electron microscope comprising:

a user interface system for inputting repositioning commands from a user in said user frame of reference; transform means for converting said repositioning commands from said user frame of reference into repositioning commands in said machine frame of reference; and electro-mechanical drivers for causing said mechanical positioning system to reposition said specimen in response to said repositioning commands in said machine frame of reference, whereby a user can control said mechanical positioning system from said user frame of reference while viewing the displayed electron image.

5,481,112

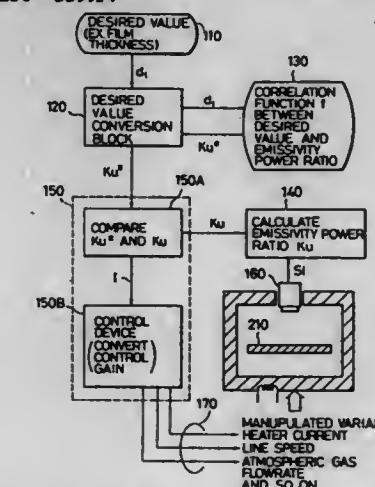
## METHOD AND APPARATUS FOR PROCESS CONTROL OF MATERIAL EMITTING RADIATION

Tomohiro Marui, Fuchu, and Kazuo Arai, Chiba, both of Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan  
Continuation of Ser. No. 988,844, Dec. 10, 1992, abandoned.  
This application Aug. 29, 1994, Ser. No. 296,168  
Claims priority, application Japan, Dec. 13, 1991, 3-330958; Dec. 16, 1991, 3-352797

Int. Cl.<sup>6</sup> G01N 21/35; G01J 5/10

U.S. Cl. 250—339.14

13 Claims



1. A method for controlling a high temperature process, the high temperature process having a heated material emit radiation energy, the method comprising the steps of: detecting simultaneously said radiation energy under one of the following conditions: at a plurality of different wavelengths, at a plurality of different measurement angles, or at a plurality of different polarization filtering angles; obtaining at least one measured emissivity power ratio from the detected radiation energy, each measured emissivity power ratio being derived from radiation energy detected under said one of said conditions at two of said plurality of different wavelengths, measurement angles, or polarization filtering angles, the measured emissivity power ratio expressed as: emissivity power ratio =  $\exp \{C_2(1/S_2 - 1/S_1)\}$  where:  $S_1$  = a first measurement of detected radiation under said one condition,  $S_2$  = a second measurement of detected radiation under said one condition,  $C_2$  = Planck's second radiation constant; converting desired value of control into an indirect desired emissivity power ratio; and automatically controlling the high temperature process of said heated material using said indirect desired emissivity power



ratio as a target and said at least one measured emissivity power ratio as an at least one controlled variable.

5,481,113

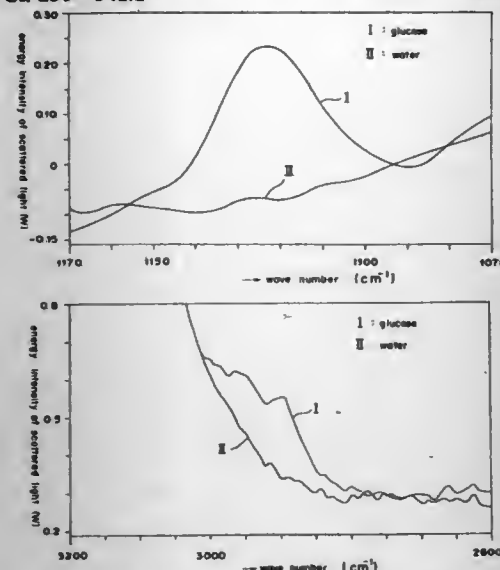
# APPARATUS AND METHOD FOR MEASURING CONCENTRATIONS OF COMPONENTS WITH LIGHT SCATTERING

Xiaoming Dou, and Harumi Uenoyama, both of Kyoto, Japan, assignors to Kyoto Daiichi Kagaku Co., Ltd., Kyoto, Japan  
Filed Aug. 2, 1994, Ser. No. 284,213

Claims priority, application Japan, Aug. 5, 1993, 5-194653  
Int. Cl.<sup>6</sup> G01N 21/47

U.S. Cl. 250—341.1

4 Claims



1. An apparatus for measuring concentrations of components with light scattering, comprising:  
a light irradiator for irradiating excited light in a near-infrared wavelength range to a measuring object;  
a photodetector for receiving and spectrally separating Raman scattered light derived from the measuring object; and  
an arithmetic unit for calculating concentration of a component in the measuring object from intensity of the Raman scattered light and outputting a calculation result,  
wherein said component is glucose and said Raman scattered light has a wave number of 1090 to 1150  $\text{cm}^{-1}$ .

5,481,114

# PROCESS AND APPARATUS FOR THE SIMULTANEOUS SELECTIVE DETECTION OF NEUTRONS AND X OR GAMMA PHOTONS

Georges Daniel, Palaiseau; Edouard Marienbach, Fontainebleau, and Jean-Louis Szabo, Bagnolet, all of France, assignors to Commissariat à l'Energie Atomique, France

PCT No. PCT/FR92/00647, § 371 Date May 9, 1994, § 102(c) Date May 9, 1994, PCT Pub. No. WO93/01507, PCT Pub. Date Jan. 21, 1993

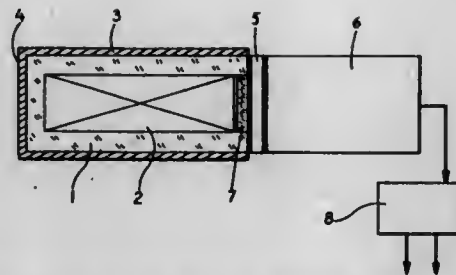
PCT Filed Jul. 7, 1992, Ser. No. 178,284

Claims priority, application France, Jul. 8, 1991, 91 08542  
Int. Cl.<sup>6</sup> G01T 1/20; 3/00; 3/06

U.S. Cl. 250—390.11

6 Claims

1. A process for the simultaneous selective detection of neutrons and X or gamma photons using a detector having two scintillators, one sensitive to the neutrons and the other sensitive to the X or gamma photons, combined with a photomultiplier-type apparatus (6), comprising: (a) providing a scintillator sensitive to the X or gamma photons which is of an organic, monocrystalline nature, and (b) utilizing as distinguishing characteristics of the two scintillators (1,2) and a wavelength converter (7) placed between the



scintillators and the photomultiplier apparatus scintillations due to the neutrons and the photoelectric peak of the scintillations due to the X or gamma photons which are in energy bands which are clearly separated from one another and from the electronic background noise of the said apparatus.

3. Apparatus for the simultaneous selective detection of neutrons and X or gamma photons, characterized by comprising a detector having a monocrystalline, inorganic scintillator sensitive to the gamma or X photons (2) located in an external  $^6\text{Li}$  doped glass sleeve serving as the scintillator (1) sensitive to the neutrons, said glass sleeve scintillator being of sufficient thickness to prevent neutrons from passing through and providing a protection against said neutrons from the X or gamma scintillator, a light reflector (3) of limited thickness transparent to the neutrons and to the X or gamma photons, covering the  $^6\text{Li}$  doped glass scintillator and whose reflecting surface is turned towards the latter, an optical confinement enclosure (4) covering the light reflector and ensuring the sealing of the assembly of the detector with respect to the exterior, a photomultiplier means (6) located at the output of the two scintillators (1,2) and associated with the latter across an optical coupler (5) and a dual channel spectrometric measuring system (8) located at the output of the photomultiplier means (6) and separately forming in each channel the counting respectively of the scintillations due to the neutrons and the scintillations due to the X or gamma photons.

5,481,115

# ELECTRONIC CALIBRATION OF SINGLE PHOTON EMISSION COMPUTED TOMOGRAPHY CAMERAS

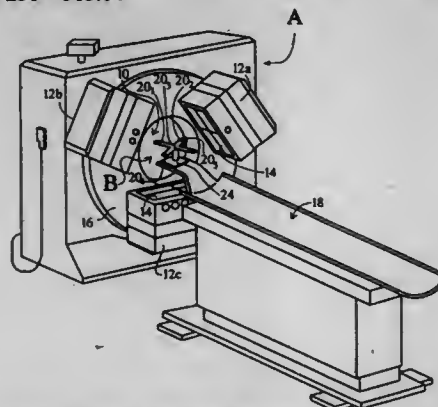
Yu-Lung Hsieh; Gengsheng L. Zeng, and Grant T. Gullberg, all of Salt Lake City, Utah, assignors to University of Utah, The, Salt Lake City, Utah

Continuation-in-part of Ser. No. 27,882, Mar. 8, 1993, Pat. No. 5,338,936, which is a continuation-in-part of Ser. No. 712,676, Jun. 10, 1991, Pat. No. 5,210,421. This application  
Dec. 20, 1993, Ser. No. 170,811

Int. Cl.<sup>6</sup> G01T 1/166; 1/20

U.S. Cl. 250—363.04

18 Claims



1. A nuclear camera system comprising:  
at least one radiation detector head for detecting radiation in an examination region, the radiation detection head including a collimator;  
a means for moving the detector head relative to the examination region;

5,481,117

# SHIPPING CONTAINER FOR A NUCLEAR FUEL ASSEMBLY

Charles B. Gilmore, and Nick W. Hille, both of Columbia, S.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

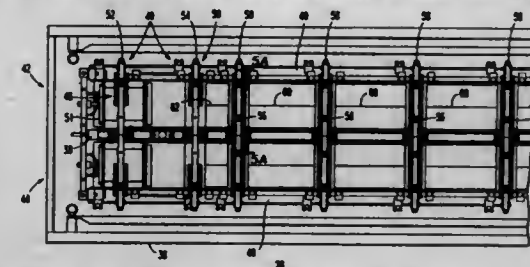
Filed Sep. 1, 1994, Ser. No. 299,697

Int. Cl.<sup>6</sup> G21C 19/00

U.S. Cl. 250—507.1

6 Claims

1. A shipping container for at least one nuclear fuel assembly



including a top nozzle, a plurality of fuel rods held in an array by a plurality of grids spaced longitudinally along the fuel rods, and a bottom nozzle; said shipping container comprising:

- support means for supporting the top nozzle, the plurality of grids, and the bottom nozzle; said support means having a first surface for abutting the array and a second surface which is about perpendicular to the first surface of said support means;
- housing means for housing said support means and said at least one nuclear fuel assembly;
- top nozzle holding means secured to said support means for holding the top nozzle of said at least one nuclear fuel assembly;
- a plurality of grid support means for supporting the array, each of said plurality of grid support means for supporting a corresponding one of the plurality of grids on the second surface of said support means;
- a plurality of clamping means for clamping the array, each of said plurality of clamping means for clamping a corresponding one of said plurality of grids to a corresponding one of said plurality of grid support means;
- a plurality of guide plate means for guiding said at least one nuclear fuel assembly between adjacent ones of said plurality of grid support means; and
- bottom nozzle holding means secured to said support means for holding the bottom nozzle of said at least one nuclear fuel assembly.

5,481,116

# MAGNETIC SYSTEM AND METHOD FOR UNIFORMLY SCANNING HEAVY ION BEAMS

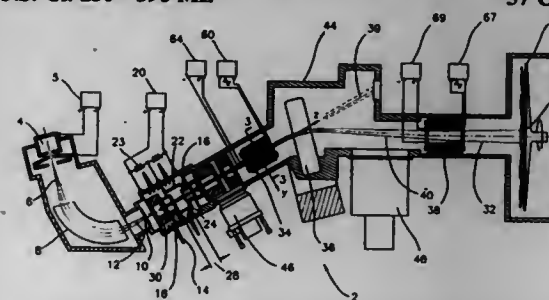
Hilton F. Glavish, Incline Village, Nev., and Michael A. Guerra, deceased, late of Exeter, N.H., assignors to IBIS Technology Corporation, Danvers, Mass.

Filed Jun. 10, 1994, Ser. No. 259,919

Int. Cl.<sup>6</sup> H01J 37/147

U.S. Cl. 250—396 ML

37 Claims



1. A magnetic deflection system for scanning an ion beam over a selected surface comprising:  
a magnetic structure having poles with associated scanning coils and respective pole faces that define therebetween a gap through which the ion beam passes;  
a primary current source coupled to said scanning coils adapted to apply to said scanning coils an excitation current to generate a primary magnetic field in said gap that substantially alternates in polarity as a function of time to cause scanning of the ion beam;  
secondary coils disposed adjacent said gap to produce a secondary magnetic field in said gap, said secondary coils being substantially free from inductive coupling with said scanning coils; and  
a secondary current source coupled to said secondary coils adapted to apply to said secondary coils a current that generates the secondary magnetic field in said gap, said primary and secondary magnetic fields in said gap having a sufficient superimposed resultant magnitude to prevent the transverse cross-section of the ion beam from substantially fluctuating in size while the ion beam is being scanned across the selected surface.

5,481,118

# ON-CHIP LIGHT SENSOR

Claude E. Tew, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 2,310, Jan. 8, 1993, abandoned. This application Jan. 26, 1995, Ser. No. 378,915

Int. Cl.<sup>6</sup> G02B 27/00

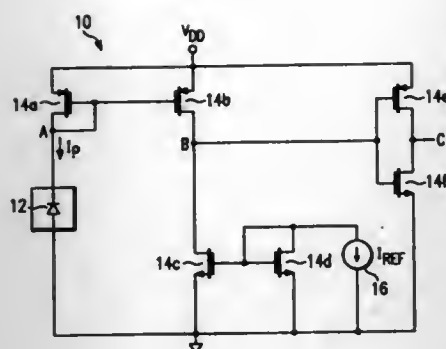
U.S. Cl. 250—551

20 Claims

1. A circuit for providing an electrical signal to indicate when incident light exceeds or falls below a certain level of brightness, comprising:

- a photodiode for detecting incident light and generating an input current;
- a first current mirror for receiving and amplifying said input current and delivering the amplified input current to an intermediate node;
- a current source for providing a reference current;
- a second current mirror for receiving and amplifying said reference current and for delivering the amplified reference current to said intermediate node; and
- an inverter for receiving the current from said intermediate node and for changing state at its output when said amplified input current exceeds said amplified reference current.





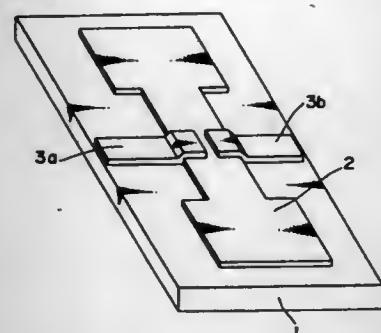
5,481,119

## SUPERCONDUCTING WEAK-LINK BRIDGE

Hidetaka Higashino, Matsubara; Koichi Mizuno, Nara, and Kentaro Setsune, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan  
Continuation of Ser. No. 733,018, Jul. 19, 1991, abandoned, which is a continuation of Ser. No. 522,927, May 14, 1990, abandoned. This application Aug. 7, 1992, Ser. No. 926,020  
Claims priority, application Japan, May 12, 1989, 1-118944  
Int. Cl.<sup>6</sup> H01L 39/22

U.S. Cl. 257-34

11 Claims



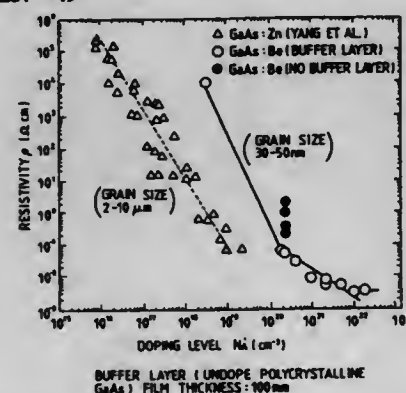
1. A superconducting element comprising:
  - a substrate having a surface;
  - a superconducting thin film extending lengthwise along the surface of said substrate in a first direction, the first direction coinciding with a superconducting current flow of said superconducting thin film, said superconducting thin film having opposite first and second side edge portions which define an intersection region within the superconducting thin film therebetween, the intersection region extending widthwise in a second direction which is substantially perpendicular to the first direction from the first side edge portion to the second side edge portion of the superconducting thin film;
  - control electrode means, made of a nonsuperconductor material and located along a first surface portion of the intersection region of the superconducting thin film and terminating at a remaining second surface portion of the intersection region, for selectively varying a superconducting current path in the second direction of the superconducting thin film by injecting quasiparticles into the first surface portion of the intersection region of said superconducting thin film, wherein a portion of the intersection region located below the remaining second surface portion is a weak-coupling bridge region in which the superconducting current flow in said superconducting thin film is variably controlled responsive to said control electrode means.

5,481,120  
SEMICONDUCTOR DEVICE AND ITS FABRICATION METHOD

Kazuhiro Mochizuki, Tokyo; Tomoyoshi Mishima, Shiki, both of Japan; Tohru Nakamura, San Diego, Calif.; Hiroshi Masuda, Tokyo, Japan; Tomonori Tanoue, Tokyo, Japan; Tooru Haga, Tokyo, Japan, and Yoshihisa Fujisaki, Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Filed Dec. 10, 1993, Ser. No. 164,801  
Claims priority, application Japan, Dec. 28, 1992, 4-347688; Mar. 15, 1993, 5-053722  
Int. Cl.<sup>6</sup> H01L 27/02

U.S. Cl. 257-49

35 Claims



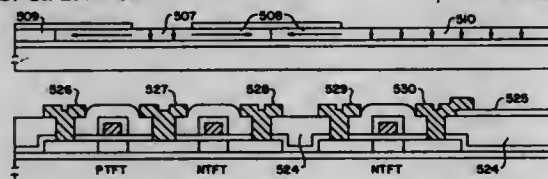
1. A semiconductor device comprising:
  - a single crystalline compound semiconductor substrate;
  - a dielectric film formed on said semiconductor substrate; and
  - a polycrystalline compound-semiconductor film with a resistivity of 0.04 Ωcm or less which is formed on said dielectric film.

5,481,121  
SEMICONDUCTOR DEVICE HAVING IMPROVED CRYSTAL ORIENTATION

Hongyong Zhang; Toru Takayama, and Yasuhiko Takemura, all of Kanagawa, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan  
Filed May 25, 1994, Ser. No. 248,682  
Claims priority, application Japan, May 26, 1993, 5-147004  
Int. Cl.<sup>6</sup> H01L 23/54; 27/01; 29/167

U.S. Cl. 257-64

7 Claims



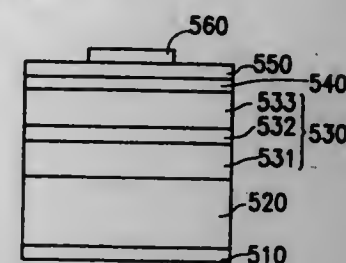
1. A semiconductor device, comprising:
  - a substrate; and
  - a plurality of thin film transistors formed on the substrate, wherein a part of the plurality of thin film transistors has a crystalline silicon film having a crystal growth direction approximately parallel to a surface of the substrate and the other part of the plurality of thin film transistors has a crystalline silicon film having a crystal growth direction approximately vertical to the surface of the substrate.

5,481,122  
SURFACE LIGHT EMITTING DIODE WITH ELECTRICALLY CONDUCTIVE WINDOW LAYER

Ming-Jiunn Jou; Chuan-Ming Chang; Bing-Jye Lee, all of Hsinchu, and Jyh-Feng Lin, Hua-Lien, all of Taiwan, Prov. of China, assignors to Industrial Technology Research Institute, Taiwan, Prov. of China  
Filed Jul. 25, 1994, Ser. No. 279,874  
Int. Cl.<sup>6</sup> H01L 33/00

U.S. Cl. 257-9

18 Claims



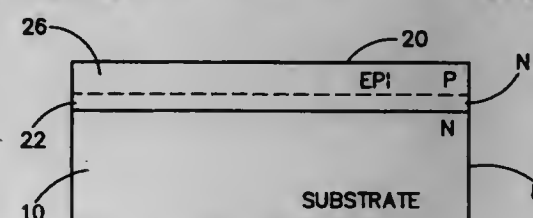
1. A light emitting diode comprising:
  - a GaAs substrate of a first conductivity type, which has a back electrical contact;
  - a double hetero-structure of AlGaInP on the substrate;
  - a transparent ohmic contact layer on the double hetero-structure;
  - a conductive transparent ITO window layer over the ohmic contact layer; and
  - a front electrical contact on the window layer.

5,481,123  
LIGHT EMITTING DIODE WITH IMPROVED BEHAVIOR BETWEEN ITS SUBSTRATE AND EPITAXIAL LAYER

Ralph H. Johnson, Murphy, and Edward W. Mehal, Blue Ridge, both of Tex., assignors to Honeywell Inc., Minneapolis, Minn.  
Filed Dec. 20, 1994, Ser. No. 359,804  
Int. Cl.<sup>6</sup> H01L 33/00

U.S. Cl. 257-102

4 Claims



1. A light emitting diode, comprising:
  - a substrate comprising gallium arsenide; and
  - an epitaxial layer deposited on a first surface of said substrate, said epitaxial layer comprising gallium arsenide doped with an amphoteric material, said substrate being doped with a group VI material.

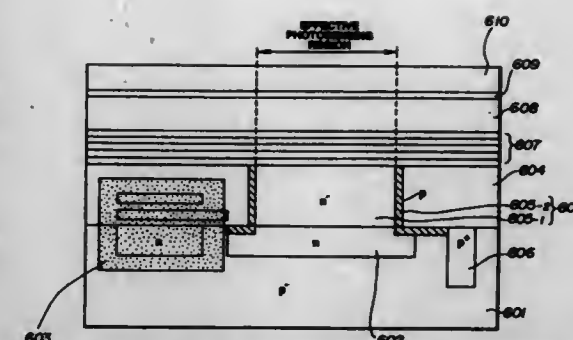
5,481,124  
LAMINATED SOLID-STATE IMAGE PICKUP DEVICE

Hiraku Kozuka, Hiratsuka; Shigetoshi Sugawa, and Hisae Shimizu, both of Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Filed Aug. 10, 1994, Ser. No. 288,546  
Claims priority, application Japan, Aug. 24, 1993, 5-229605; Jul. 26, 1994, 6-174292  
Int. Cl.<sup>6</sup> H01L 27/14; 31/00

U.S. Cl. 257-185

40 Claims

1. A laminated solid-state image pickup device comprising:



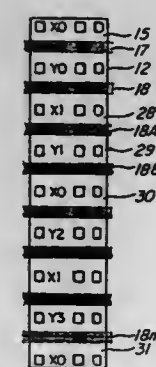
- a semiconductor circuit substrate, comprising accumulating portions for accumulating electric signals, and reading means for reading the electric signals;
- an insulating layer formed on said semiconductor circuit substrate except at at least parts of said accumulating portions;
- connecting members formed in contact with said accumulating portions; and
- a photoconductive film laminated on said insulating layer and said connecting members, wherein said photoconductive film comprises a non-crystalline semiconductor configured by laminating a carrier multiplication layer, a light absorbing layer, a charge injection inhibiting layer of a second conduction type, and wherein each of said connecting members comprises a first semiconductor region of a first conduction type, intrinsic or having a low impurity density, surrounded by a second semiconductor region of the second conduction type.

5,481,125  
COMPACT CMOS ANALOG CROSSPOINT SWITCH MATRIX

Colin Harris, New Westminster, Canada, assignor to Mitel Corporation, Kanata, Canada  
Continuation of Ser. No. 756,064, Sep. 6, 1991, abandoned, which is a continuation of Ser. No. 352,543, May 16, 1989, abandoned. This application Jun. 29, 1993, Ser. No. 85,458  
Claims priority, application Canada, Jun. 21, 1988, 570038  
Int. Cl.<sup>6</sup> H01L 27/10

U.S. Cl. 257-203

2 Claims



1. A semiconductor crosspoint switch for switching each of a plurality of first terminals of a matrix of terminals to a plurality of second terminals of said matrix of terminals, comprising an integrated circuit comprised of a series of more than two field effect transistors (FETs) of similar conductivity type each formed of a pair of impurity diffused regions separated by a channel region underlying an insulated gate, pairs of FETs sharing adjacent diffused regions, the number of diffused regions being equal to twice a larger number of the first and second terminals plus one, each terminal of said larger number of the first and second terminals being respectively connected in sequence to a corresponding even numbered diffused region, each terminal of a pair of the smaller number of the first and second terminals being connected to alternate odd numbered diffused regions respectively, and means



for applying a switching signal to a gate of a transistor to which a first and a second terminal are connected whereby an FET having said gate can conduct, thereby connecting the first terminal and the second terminal connected to said FET together.

5,481,126

# SEMICONDUCTOR-ON-INSULATOR ELECTRONIC DEVICES HAVING TRENCH ISOLATED MONOCRYSTALLINE ACTIVE REGIONS

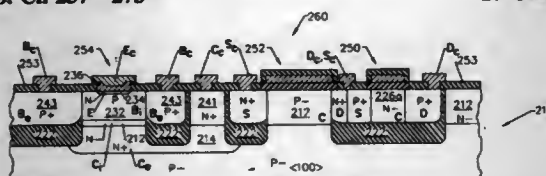
Chitra K. Subramanian, Austin, Tex., and Gerold W. Neudeck, West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Sep. 27, 1994, Ser. No. 313,893

Int. Cl.<sup>6</sup> H01L 29/80; 31/112

U.S. Cl. 257—273

27 Claims



1. A semiconductor-on-insulator electronic device, comprising: a monocrystalline semiconductor substrate; a first monocrystalline semiconducting region of a first conductivity type in said monocrystalline semiconductor substrate; a first trench in said monocrystalline semiconductor substrate at a face thereof, said first trench having a bottom and first and second opposing sidewalls which extend from the bottom of said first trench to the face of said monocrystalline semiconductor substrate; a first trench insulating layer on the bottom of said first trench and on the second sidewall of said first trench so that the bottom and the second sidewall of said first trench define an interface between said monocrystalline semiconductor substrate and said first trench insulating layer; a second epitaxial monocrystalline semiconducting region on said first trench insulating layer, opposite the first trench bottom, said second epitaxial monocrystalline semiconducting region forming a semiconductor junction, selected from the group consisting of rectifying and non-rectifying semiconductor junctions, with said first monocrystalline semiconductor region at the first sidewall of said first trench; a first electronic device active region in said first monocrystalline semiconducting region; and a second electronic device active region in said second epitaxial monocrystalline semiconducting region.

5,481,127

# SEMICONDUCTOR MEMORY DEVICE HAVING A CAPACITOR

Toshiaki Ogawa, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1993, Ser. No. 63,820

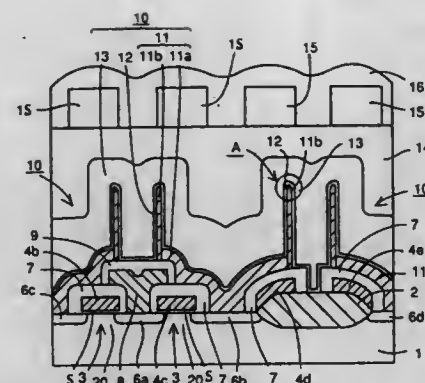
Claims priority, application Japan, Nov. 4, 1992, 4-294988

Int. Cl.<sup>6</sup> H01L 29/68; 29/78; 29/92

U.S. Cl. 257—308

15 Claims

1. A semiconductor device, comprising: a semiconductor substrate of a second conductivity type having a major surface and an impurity region of a first conductivity type located in said major surface; an insulating layer formed on said major surface of said semiconductor substrate and having an opening reaching said impurity region; a capacitor lower electrode having a first portion, which is in contact with a surface of said impurity region and a surface of said insulating layer, and a second portion, which is located along an outer periphery of said first portion and extends substantially perpendicularly to said major surface of said



- semiconductor substrate, said second portion of said capacitor lower electrode having a substantially round tip end and having a side surface of which roughness is not more than 200 Å;
- a capacitor insulating layer covering said surface of said capacitor lower electrode; and
- a capacitor upper electrode covering the surface of said capacitor insulating layer;
- wherein said second portion of said capacitor lower electrode has a thickness in a direction parallel to said major surface of said semiconductor substrate which is smaller than a thickness of said first portion of said capacitor lower electrode in a direction perpendicular to said major surface of said semiconductor substrate.

5,481,128

# STRUCTURE FOR FLASH MEMORY CELL

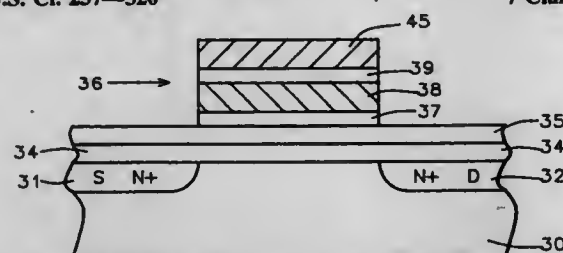
Gary Hong, Hsinchu, Taiwan, Prov. of China, assignor to United Microelectronics Corporation, Hsinchu, Taiwan, Prov. of China

Continuation of Ser. No. 195,099, Feb. 14, 1994, abandoned, which is a division of Ser. No. 94,744, Jul. 22, 1993, Pat. No. 5,298,447. This application Apr. 20, 1995, Ser. No. 426,493

Int. Cl.<sup>6</sup> H01L 29/788; 29/68

U.S. Cl. 257—320

7 Claims



1. A self-aligned flash memory MOS field effect transistor device comprising: a silicon semiconductor substrate having an upper surface, a source region and a drain region formed in said substrate on said upper surface, a tunnel oxide structure formed over the surface of said substrate including said surface over said source and said drain regions, said tunnel oxide structure including only two layers comprising a thermal oxide layer having a thickness between about 50 Å and about 100 Å formed upon said substrate and a film of silicon rich oxide having a thickness between about 50 Å and about 200 Å formed upon said thermal oxide layer, and a gate structure composed of a stack formed upon said silicon rich oxide film, said stack comprising a floating gate electrode, a dielectric layer formed upon said floating gate layer and a control electrode polysilicon layer formed upon said dielectric layer, said floating gate electrode of said gate structure including a lower portion composed of relatively smaller grain size crystals with substantial asperities and having a thickness between about 300 Å and about 600 Å, and an upper portion having a

thickness between about 1,000 Å and about 2,000 Å of having a smoother surface than said lower portion, said lower portion of said floating gate electrode of said gate structure comprising a polysilicon structure formed by LPCVD at a temperature of about 630° C. and said upper portion of said floating gate electrode comprising silicon with a large grain size and a smooth surface.

5,481,129

# ANALOG-TO-DIGITAL CONVERTER

Glenn A. DeJong, Merritt Island; Kantilal Bacrania, Palm Bay; Michael D. Church, Sebastian; Gregory J. Fisher, Indiantic; John T. Gasner, Satellite Beach; Akira Ito; Jeffrey M. Johnston, both of Palm Bay, all of Fla.; Dave Kutchmarick, Mountaintop, Pa., and Choong-Sun Rhee, Palm Bay, Fla., assignors to Harris Corporation, Melbourne, Fla.

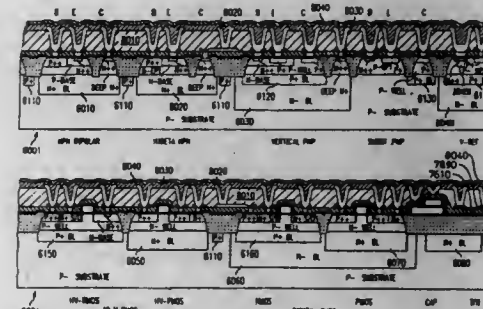
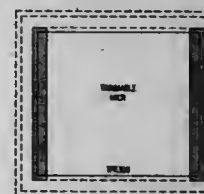
Continuation of Ser. No. 785,400, Oct. 30, 1991, abandoned.

This application Feb. 21, 1995, Ser. No. 391,490

Int. Cl.<sup>6</sup> H01L 29/8605

U.S. Cl. 257—360

14 Claims



1. An integrated circuit, comprising: (a) a laser-trimmed resistor; and (b) a silicon nitride layer over said resistor, said layer characterized by a silicon-hydrogen bonded content of an amount in a range between 0 and approximately 12% atomic.

5,481,130

# SEMICONDUCTOR ILL DEVICE WITH DIELECTRIC AND DIFFUSION ISOLATION

Yasuki Yoshihisa, and Masaaki Ikegami, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1994, Ser. No. 264,119

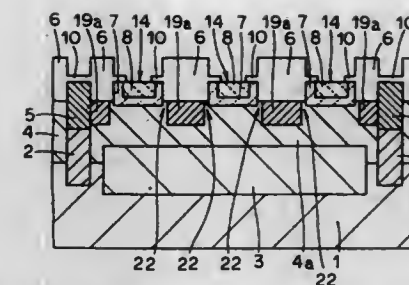
Claims priority, application Japan, Feb. 21, 1994, 6-022571

Int. Cl.<sup>6</sup> H01L 29/732; 29/735

U.S. Cl. 257—512

10 Claims

1. A semiconductor device including at least two bipolar transistors separated by an insulating layer, said semiconductor device including: a semiconductor substrate of a first conductivity type having a main surface; a first conductive layer formed on the main surface of said semiconductor substrate, including an impurity of a second conductivity type of a first concentration; a buried layer of said second conductivity type formed in said first conductive layer and in said substrate, wherein the concentration of said second conductivity type in said buried layer is greater than in said first conductive layer;



- a pair of second conductive layers of the first conductivity type formed a predetermined distance apart in the surface of said first conductive layer;
- an element isolation insulating layer formed in said first conductive layer between said pair of second conductive layers;
- an impurity region formed in said first conductive layer directly under said element isolation insulating layer and adjacent to a lower surface of said element isolation insulating layer and spaced apart from said buried layer of said second conductivity type, said impurity region including an impurity of the second conductivity type of a second concentration higher than said first concentration; and
- a third conductive layer of the second conductivity type formed in each of said pair of second conductive layers.

5,481,131

# INTEGRATED CIRCUIT HAVING PASSIVE CIRCUIT ELEMENTS

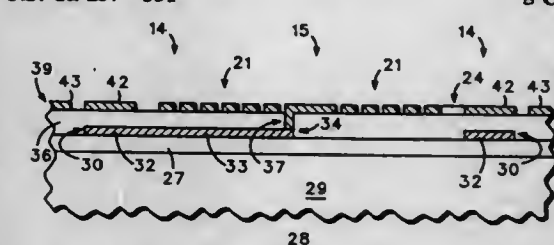
Joseph Staudinger, Gilbert; Warren L. Seely, Chandler, and Howard W. Patterson, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 115,833, Sep. 3, 1993, Pat. No. 5,416,356. This application Sep. 29, 1994, Ser. No. 287,336

Int. Cl.<sup>6</sup> H01L 29/00

U.S. Cl. 257—531

8 Claims



1. An integrated circuit having passive circuit elements capable of storing energy, comprising: a first conductive material having a first portion of a first passive circuit element that is capable of storing energy and a first portion of a second passive circuit element that is capable of storing energy; a second conductive material, the second conductive material comprising a first passive circuit element region having a second portion of the first passive circuit element that is capable of storing energy and a second passive circuit element region having a second portion of the second passive circuit element that is capable of storing energy, the first passive circuit element region substantially surrounding the second passive circuit element region and the first passive circuit element that is capable of storing energy being of a different type than the second passive circuit element that is capable of storing energy; and a dielectric material formed between the first conductive material and the second conductive material, wherein a portion of the first conductive material is coupled to a portion of the second conductive material.



5,481,132

**TRANSISTOR WITH A PREDETERMINED CURRENT GAIN IN A BIPOLAR INTEGRATED CIRCUIT**

Jean-Michel Moreau, Grenoble, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

Continuation of Ser. No. 889,917, May 29, 1992, abandoned.

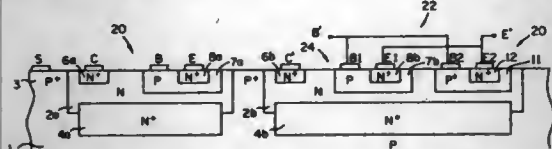
This application Nov. 18, 1993, Ser. No. 154,379

Claims priority, application France, May 31, 1991, 91 06896

Int. Cl.<sup>6</sup> H01L 29/72

U.S. Cl. 257-566

20 Claims



1. A bipolar integrated circuit with wells of a first conductivity type, formed in a substrate of a second conductivity type, comprising:

in a first well, a first transistor, said first well forming a collector region of said first transistor and having formed therein a base region of the second conductivity type, said base region having formed therein an emitter region of the first conductivity type; and

in a second well, a composite second transistor, said second well forming a collector region of said composite transistor, said composite second transistor including

(i) a first elemental transistor comprising emitter and base regions formed in said second well and having doping levels equal to respective doping levels of said base and emitter regions of said first transistor; and

(ii) a second elemental transistor formed in said second well and including a base region having a doping level higher than a doping level of said base region of said first elemental transistor and an emitter region having a doping level substantially equal to said doping level of said emitter region of said first transistor,

the emitters and bases of the first and second elemental transistors being respectively interconnected to form emitter and base regions of said composite second transistor.

5,481,133

**THREE-DIMENSIONAL MULTICHIP PACKAGE**

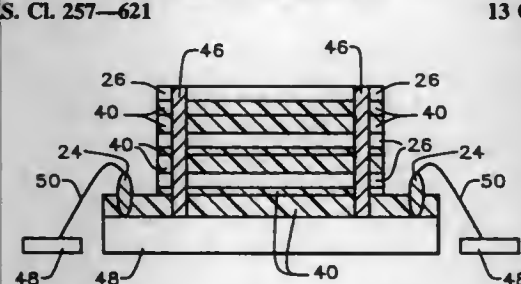
Chen-Chung Hsu, Taichung, Taiwan, Prov. of China, assignor to United Microelectronics Corporation, Hsinchu, Taiwan, Prov. of China

Division of Ser. No. 214,990, Mar. 21, 1994, Pat. No. 5,380,681. This application Dec. 29, 1994, Ser. No. 368,144

Int. Cl.<sup>6</sup> H01L 29/40

U.S. Cl. 257-621

13 Claims



1. A three-dimensional multichip array package having a master integrated circuit semiconductor device supporting and interconnected with a densely stacked array of subordinate integrated circuit semiconductor devices comprising:

a base semiconductor substrate provided with interconnected integrated circuit elements, an inner peripheral row of contact pads electrically connected to said circuit elements, and an outer peripheral row of terminal pads electrically connected to said contact pads, said base substrate constituting a master semiconductor device;

a plurality of subordinate semiconductor substrates, each provided with interconnected integrated circuit elements, a peripheral row of contact pads electrically connected to said circuit elements, said row of contact pads arranged in a pattern that matches the pattern of the contact pads on said master semiconductor substrate, said subordinate semiconductor substrate constituting subordinate semiconductor devices;

an insulating layer of organic material on the surfaces of said base substrate and said subordinate substrates;

central openings through each of said contact pads of said subordinate semiconductor devices;

a dielectric coating on the walls of said central openings that extend up to but not covering the edges of said contact pads;

said subordinate semiconductor devices stacked to form an array with said central openings in registry, said array of devices supported on said master semiconductor device with said central openings in registry with said contact pads of said master semiconductor device; and

an electrically conductive material within said central openings that established electrical contact between said contact pads of said subordinate semiconductor devices and said contact pads of said master semiconductor devices.

5,481,134

**STACKED HIGH DENSITY INTERCONNECTED INTEGRATED CIRCUIT SYSTEM**

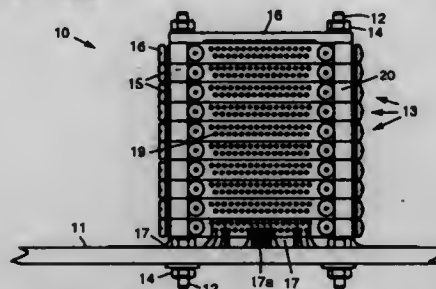
Mohi Sobhani, Encino, and John M. Brauninger, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 3, 1994, Ser. No. 237,701

Int. Cl.<sup>6</sup> H01L 23/02

U.S. Cl. 257-686

16 Claims



1. A three dimensional stacked high density interconnected integrated circuit system comprising:

(a) a mother board;

(b) a plurality of stacked integrated circuit subassemblies secured to the mother board that each comprise:

(1) a base;

(2) an integrated circuit disposed on the base; and

(3) an X-Y flexprint circuit comprising printed interconnects coupled to the integrated circuit and terminating in a plurality of rings to thereby provide conducting paths to said integrated circuit, wherein the flexprint circuit is folded around the edges of the base such that said rings are exposed at said edges of said base;

(c) a plurality of Z-flex circuits secured to the plurality of stacked integrated circuit subassemblies and the mother board wherein said Z-flex circuits comprise printed leads that terminate in a plurality of bumps to thereby provide conducting paths between the mother board and the respective plurality of stacked integrated circuit subassemblies when said bumps on said Z-flex circuit are brought into contact with said rings on said X-Y flexprint circuit;

(d) a plurality of vertical rods and a plurality of nuts located at the ends of the respective rods and between the mother board and the plurality of stacked interconnected integrated circuit subassemblies that secure the plurality of stacked integrated circuit subassemblies to the mother board; and

(e) a plurality of pressure plates and screws that secure the Z-flex circuit to the plurality of stacked integrated circuit subassemblies.

5,481,135

**HERMETIC PROTECTION FOR INTEGRATED CIRCUITS**

Grish Chandra, and Keith W. Michael, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation of Ser. No. 937,086, Aug. 31, 1992, abandoned.

This application Mar. 10, 1994, Ser. No. 209,324

Int. Cl.<sup>6</sup> H01L 23/053; 23/12

U.S. Cl. 257-701

6 Claims

1. Sealed bond pads on an integrated circuit consisting essentially of:

a circuit subassembly having bond pads;

a first ceramic layer covering the surface of the subassembly around the bond pads;

one or more additional ceramic layers selected from the group consisting of SiO<sub>2</sub> coatings, SiO<sub>2</sub>/ceramic oxide coatings, silicon coatings, silicon carbon containing coatings, silicon nitrogen containing coatings, silicon oxygen nitrogen containing coatings, silicon carbon nitrogen containing coatings and diamond like carbon coatings covering the first ceramic layer; and

a non-corroding, conductive layer covering the bond pads; wherein the first ceramic layer comprises a silicon oxide ceramic material which is deposited by a process comprising coating the surface of the subassembly with hydrogen silsesquioxane resin followed by converting the resin to a ceramic layer.

5,481,136

**SEMICONDUCTOR ELEMENT-MOUNTING COMPOSITE HEAT-SINK BASE**

Kenichiro Kobamoto, Itami, and Mitsuo Osada, Sakata, both of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 141,592, Oct. 27, 1993, abandoned.

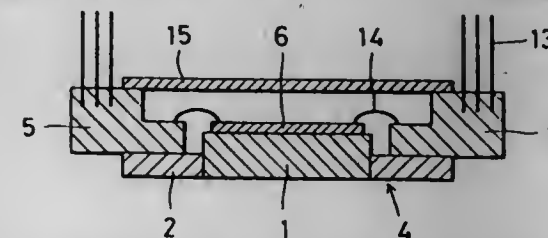
This application Apr. 11, 1995, Ser. No. 420,901

Claims priority, application Japan, Jan. 28, 1992, 4-313968

Int. Cl.<sup>6</sup> H01L 23/34; 23/52

U.S. Cl. 257-712

22 Claims



1. An electronic component-mounting structure comprising: a heat-sink base including an electronic component receiving member, and an attaching member integrally bonded to said electronic component receiving member; wherein said electronic component receiving member is formed of a Cu-W or Cu-Mo composite alloy containing 5 to 25% by weight of copper and having a thermal expansion coefficient of  $6.4 \times 10^{-6} \text{ deg}^{-1}$  to  $9 \times 10^{-6} \text{ deg}^{-1}$ , inclusive; and wherein said attaching member is formed of a Cu-W or Cu-Mo composite alloy containing 40 to 70% by weight of copper and having a thermal expansion coefficient of  $11.1 \times 10^{-6} \text{ deg}^{-1}$  to  $16 \times 10^{-6} \text{ deg}^{-1}$ , inclusive.

5,481,137

**SEMICONDUCTOR DEVICE WITH IMPROVED IMMUNITY TO CONTACT AND CONDUCTOR DEFECTS**

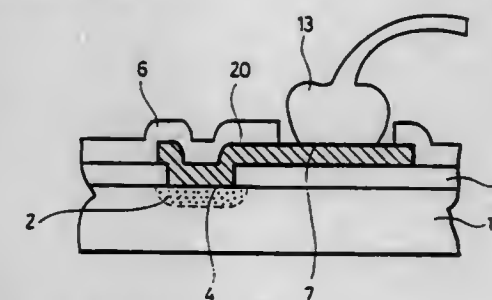
Shigeru Harada; Hisao Masuda, and Reiji Tamaki, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 80,149, Jun. 23, 1993, abandoned, which is a continuation of Ser. No. 508,507, Apr. 12, 1990, Pat. No. 5,260,604, which is a continuation of Ser. No. 249,906, Sep. 27, 1988, abandoned. This application May 18, 1994, Ser. No. 246,375

Int. Cl.<sup>6</sup> H01L 23/48; 29/46; 29/34; 29/62

U.S. Cl. 257-742

4 Claims



1. A semiconductor device comprising: a semiconductor layer having a predetermined element as a constituent element thereof, an impurity diffused layer formed in a predetermined region of said semiconductor layer of said semiconductor device, and an interconnection layer of an aluminum alloy film having aluminum as the major constituent and formed on at least said impurity diffused layer so as to receive and send electrical signals from and to said impurity diffused layer, said interconnection layer of the aluminum alloy film including at least one element in elemental form from a first group consisting of boron, gallium, indium, thallium, phosphorus, arsenic, antimony and bismuth, the content of at least one element defined as y, said interconnection layer of the aluminum alloy film further including silicon, the content of silicon in the interconnection layer defined as x, wherein x is selected to satisfy  $0 < x < 0.8 \text{ wt. \%}$ , y is selected to satisfy  $0.2 \text{ wt. \%} < y < 2.0 \text{ wt. \%}$  and  $x+y < 2.0 \text{ wt. \%}$  substantially throughout said aluminum alloy film.

5,481,138

**STRUCTURE AND A METHOD FOR REPAIRING ELECTRICAL LINES**

Laertis Economikos, Wappingers Falls, and Richard P. Surprenant, Red Hook, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

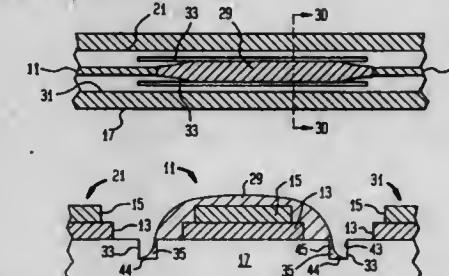
Division of Ser. No. 94,633, Jul. 21, 1993, Pat. No. 5,384,953.

This application May 26, 1994, Ser. No. 249,413

Int. Cl.<sup>6</sup> H01L 23/48; 23/52; 29/40

U.S. Cl. 257-773

12 Claims



1. A repaired structure comprising a carrier having at least one electrical line, wherein at least a portion of said electrical line has a slug that provides electrical continuity to said electrical line and wherein said slug is formed subsequent to the formation of said



electrical line, wherein there is at least one trench adjacent to at least a portion of said slug, and wherein at least a portion of the material of said slug is contained inside a portion of said at least one trench, wherein said electrical line comprises of at least one electrically conductive material, and, wherein said electrically conductive material is selected from a group consisting of aluminum, antimony, bismuth, chromium, cobalt, copper, gold, indium, iron, lead, molybdenum, nickel, palladium, platinum, silver, tantalum, tin, titanium, tungsten, and alloys thereof.

5,481,139

## SAFETY CIRCUIT BREAKER FOR VEHICLES

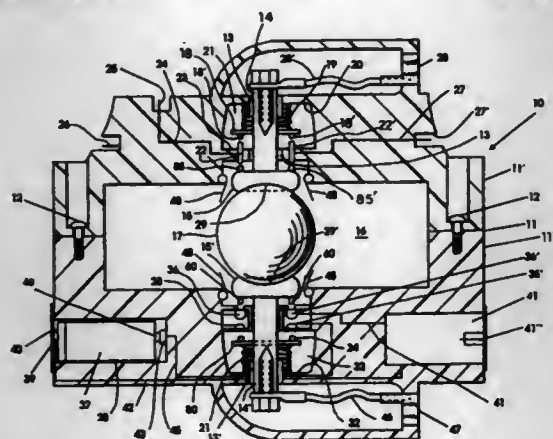
Daniel Lucas, 202 Pine Tree Dr., Robersonville, N.C. 27871

Filed Sep. 20, 1993, Ser. No. 122,938

Int. Cl.<sup>6</sup> B60L 3/00

U.S. Cl. 307—9.1

16 Claims U.S. Cl. 307—11



1. A collision activated safety system for vehicles comprising: an electrically conductive ball;
- a first electrically conductive ball support having a first concave surface, said first ball support biased toward said ball;
- a second electrically conductive ball support having a second concave surface, said second ball support biased toward said ball, said ball retained between said concave surfaces of said first and said second ball supports;
- a housing containing said ball, said first ball support, and said second ball support, said housing including an electrical contact proximate to said first ball support;
- input means for electrically connecting said first ball support to a primary electricity source;
- output means for electrically connecting said second ball support to at least one electrical device, said ball providing an electrical connection between said input means and said output means;
- an electrically conductive contact plate attached to said first ball support proximate said electrical contact;
- first contact means for electrically contacting said electrical contact, said first contact means disposed on said first ball support; and
- second contact means for electrically contacting said electrical contact, said second contact means disposed upon said contact plate;
- whereby upon a sudden shock to the collision activated safety system, said ball initially acts upon said first and said second concave surfaces to force said first ball support and said second ball support apart thus activating said first contact means thereby providing electricity from the primary electricity source to said electrical contact, and
- whereby subsequent to said ball forcing said first and second ball supports apart, said ball withdraws completely from between said first and second ball supports to allow said ball supports to approach one another, thus breaking electrical contact between said input means and said output means and

activating said second contact means, thereby providing electricity from the primary electricity source to said electrical contact.

5,481,140

## DEMAND CONTROL APPARATUS AND POWER DISTRIBUTION CONTROL SYSTEM

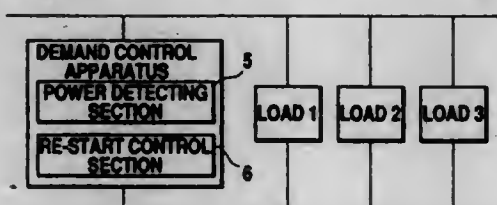
Kazuhiro Maruyama; Masahiro Inoue; Noriyuki Kushiro, and Rieko Iwatsubo, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1993, Ser. No. 26,552

Claims priority, application Japan, Mar. 10, 1992, 4-051941; Mar. 30, 1992, 4-074634

Int. Cl.<sup>6</sup> H02J 3/06

33 Claims



1. A demand control apparatus connected to a group of loads and adapted to shut off a power supply to loads in accordance with set priority levels so that a total quantity of working current in the group of loads will be equal to or lower than a set quantity of current, said apparatus comprising:

power detecting means for computing a quantity of working current in each of the loads from a difference in the total quantity of working current before and after shutoff of the power supply to each of said loads; and

restart control means for comparing the quantity of working current in each of said loads with a difference between the set quantity of current and the total quantity of working current at a present time in accordance with information of the quantity of working current in each of the loads detected by said power detecting means, and for controlling the restart of one or more loads in accordance with the set priority levels of the loads and said difference between the set quantity of current and the total quantity of working current at the present time.

5,481,141

## POTENTIOMETER INCLUDING A PLURALITY OF RESISTIVE ELEMENTS

Richard L. Brown, Pekin, and Maurice J. Dust, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Jul. 1, 1993, Ser. No. 86,779

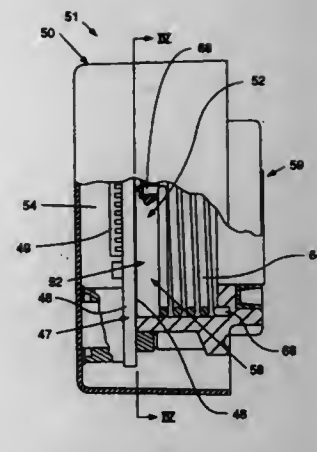
Int. Cl.<sup>6</sup> F02D 11/10; H01C 10/00

U.S. Cl. 307—106

11 Claims

1. In a device for generating a pulse width modulated signal corresponding to a position of a movable mechanical member, the device having a potentiometer with a movable wiper and a stationary portion, wherein said stationary portion includes a mother board and a daughter board, the device further having a conditioning circuit positioned on the mother board, said conditioning circuit being electrically connected to said daughter board and adapted to produce a pulse-width modulated signal responsive to a position of said movable wiper on said stationary portion, wherein the daughter board comprises:

at least two resistive elements, said conditioning circuit being electrically connected to at least one of said resistive elements.



5,481,142

## TUNED VIBRATION ABSORBERS FOR AC MOTORS

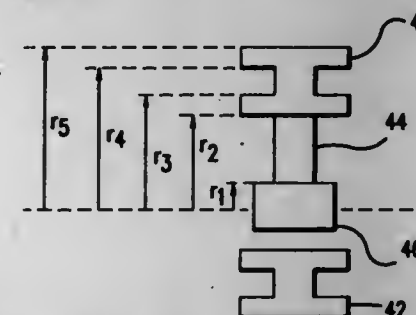
Courtney D. James, Decatur, Ga.; William J. Nowak, Webster, and David K. Shogren, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 1, 1994, Ser. No. 269,502

Int. Cl.<sup>6</sup> H02K 37/22; F16F 7/104; 15/10

U.S. Cl. 310—51

16 Claims



1. A tuned vibration absorber for attenuating an angular velocity error in a motor comprising: a hub connected to an armature shaft of the motor;
- an I-beam shaped inertia ring for generating an inertia to the armature shaft; and
- a plurality of spokes for providing a torsional resonance of the inertia ring, each spoke directly coupling the inertia ring and the hub, wherein the inertia ring and the plurality of spokes have a combined resonant frequency approximately equal to a forcing frequency of the armature shaft that produces an anti-resonance to attenuate the angular velocity error in the motor.

5,481,143

## SELF STARTING BRUSHLESS D.C. MOTOR

Brian K. Burdick, 80 Overland Trail, West Henrietta, N.Y. 14586

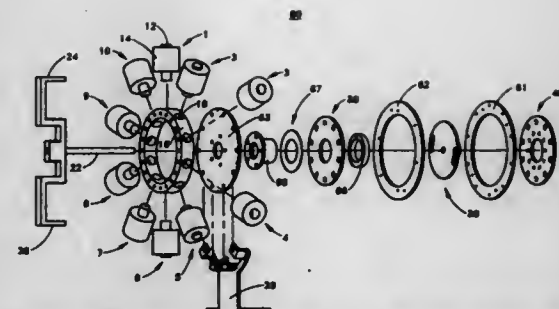
Filed Nov. 15, 1993, Ser. No. 151,809

Int. Cl.<sup>6</sup> H02K 11/00; 1/22; H02P 5/162

U.S. Cl. 310—68 B

4 Claims

1. A self-starting, brushless direct current motor comprising: (a) a stator assembly;
- (b) a rotor assembly which is rotatably disposed within said stator assembly, said rotor assembly comprising a shaft, a slotted disk member, said disk member being connected to a first end of said shaft, and a pair of C-shaped channel members, said channel members being connected to a second end of said shaft;



- (c) said stator assembly comprising a circular ring member and a plurality of electromagnets positioned circumferentially around said circular ring member; and
- (d) triggering means for energizing and deenergizing each of said electromagnets in a predetermined sequence to produce a rotary motion of said rotor assembly.

5,481,144

## WIRE GUIDE AND ADHESIVE RETAINING RING FOR DISC DRIVE SPINDLE MOTOR

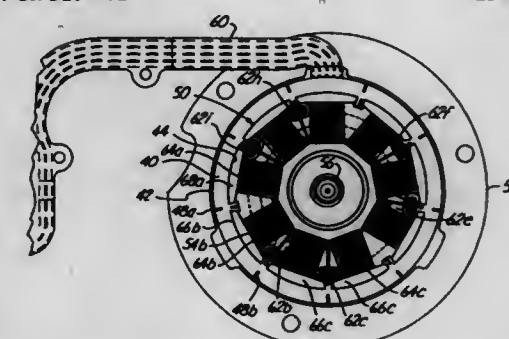
John C. Dunfield, Santa Cruz; Steven C. Knoche, Corralitos, and Klaus D. Kloeppel, Watsonville, all of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Jun. 3, 1994, Ser. No. 253,757

Int. Cl.<sup>6</sup> H02K 11/00

U.S. Cl. 310—71

15 Claims



9. A disc drive motor for use in a disc drive for storing information, comprising: a motor base;
- a rotor rotatably coupled to the base for rotatably carrying a storage disc;
- a magnet coupled to the rotor;
- a stator assembly having an outer radius including a plurality of stator windings;
- an adhesive at least partially covering the stator assembly and the motor base thereby adhering the stator assembly to the motor base and providing increased stiffness; and
- an adhesive retaining ring adjacent an outer circumference of the stator assembly thereby blocking flow of the adhesive beyond the retaining ring and preventing the adhesive from interacting with the rotor, the adhesive retaining ring further having a guide structure adjacent each stator winding to position wires of the stator windings encompassing the outer radius of the stator assembly wherein the stator assembly is positioned within a circumference of the adhesive retaining ring.



5,481,145

## POWER RECOVERY PLANT

Wolf-Ruediger Canders; Norbert Ueffing, both of Osterode, and Klaus Reuter, Grenzach-Wyhlen, all of, Germany, assignors to Anton Piller GmbH & Co. KG, Osterode am Harz, Germany, and BOC AG, Basel, Switzerland

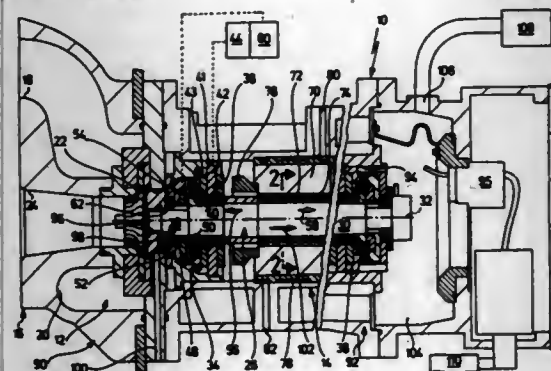
Filed Jul. 20, 1993, Ser. No. 94,853

Claims priority, application Germany, Nov. 18, 1992, 9215696 U

Int. Cl.<sup>6</sup> H02K 7/09

U.S. Cl. 310—90.5

27 Claims



1. A power recovery plant comprising:
  - a plant housing;
  - a gas expansion turbine connected to a long distance pipeline for gas;
  - said gas expansion turbine having a radially outer inlet passage, a central outlet passage and a turbine wheel driven by said gas when flowing from said inlet passage to said outlet passage;
  - an electric generator having a rotor driven by said turbine wheel, said rotor and said turbine wheel forming a rotor unit rotating as a whole within said plant housing;
  - said rotor unit being rotatably mounted within said plant housing by magnetic bearings, one of said magnetic bearings supporting said rotor unit radially between said turbine wheel and said rotor and another of said magnetic bearings supporting said rotor unit at the opposite side of said rotor;
  - said magnetic bearings and said rotor being arranged in a coherent interior space of said plant housing, said interior space enclosing a gas at a defined pressure level.

5,481,146

## PASSIVE NULL FLUX COIL MAGNETIC BEARING SYSTEM FOR TRANSLATION OR ROTATION

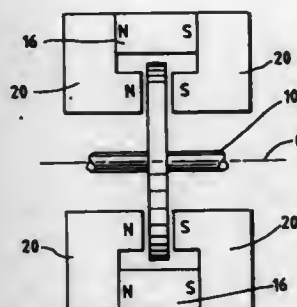
Kent R. Davey, Lithonia, Ga., assignor to Park Square, Inc., Marietta, Ga.

Filed Sep. 10, 1993, Ser. No. 120,003

Int. Cl.<sup>6</sup> H02K 7/09

U.S. Cl. 310—90.5

42 Claims



1. An apparatus comprising:
  - a first path of magnetic flux perpendicular to and penetrating a first plane in space;

- a second path of magnetic flux perpendicular to said first plane and having a gradient such that no net flux passes said first plane; and
- a passive first null flux coil adjacent to said first plane; whereby when one of said first null flux coil and a combination of said paths is moving, said first null flux coil and said paths, combinatorially, are magnetically induced into alignment with respect to said first plane.

5,481,147

## SYNCHRONOUS INDUCTOR ELECTRIC MOTOR

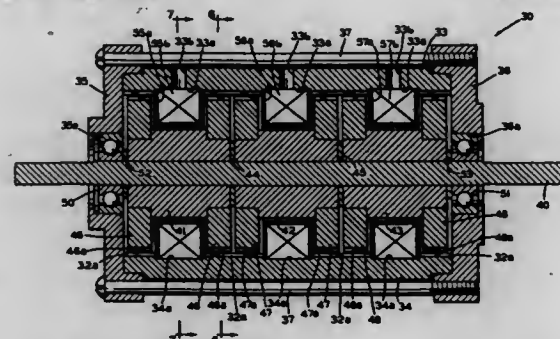
Martin Kaplan, Avon, and Peter Senak, Jr., Bristol, both of Conn., assignors to Dana Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 839,200, Feb. 20, 1992. This application Jan. 3, 1994, Ser. No. 177,357

Int. Cl.<sup>6</sup> H02K 1/02; 21/28

U.S. Cl. 310—154

20 Claims



1. An electric motor comprising:
  - a hollow stator formed from a magnetically permeable material, said stator having an inner surface;
  - a plurality of permanent magnets disposed adjacent to said inner surface of said stator, each of said plurality of permanent magnets being polarized from an inner surface exhibiting a first polar magnetization to an outer surface exhibiting a second polar magnetization, said polar magnetizations of said plurality of permanent magnets alternating about said inner surface of said stator;
  - a stator tooth member disposed adjacent to said inner surface of each of said plurality of permanent magnets, each of said stator tooth members having a plurality of inwardly extending stator poles formed thereon, each of said stator tooth members being formed from a magnetically permeable material such that said stator poles thereon exhibit a polar magnetization which is the same as said polar magnetization exhibited by said inner surface of said permanent magnet disposed adjacent thereto;
  - a rotor assembly supported within said stator for rotation relative thereto, said rotor assembly including a shaft, a pair of rotor packs mounted on said shaft for rotation therewith, and an electromagnetic coil disposed about said shaft between said pair of rotor packs, each of said pair of rotor packs having a plurality of outwardly extending rotor poles formed thereon which are disposed adjacent to said stator poles of said stator tooth members, each of said pair of rotor packs being formed from a magnetically permeable material; and
  - means for connecting said electromagnetic coil to a source of electrical current so as to generate a magnetic circuit which attracts said rotor poles toward said stator poles so as to cause said rotor assembly to rotate relative to said stator.

5,481,148

## PERMANENT MAGNET TYPE ROTATING MACHINE

Satoshi Moribayashi; Shuzou Isozumi, and Takeo Gotou, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

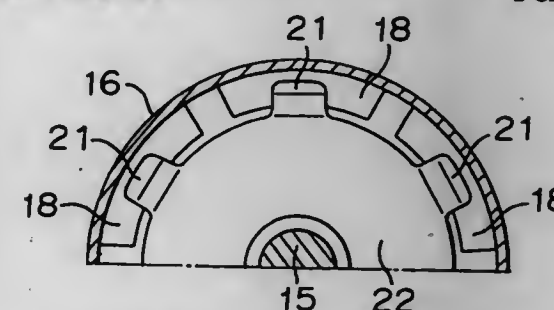
Filed Mar. 8, 1994, Ser. No. 207,199

Claims priority, application Japan, Mar. 26, 1993, 5-068215

Int. Cl.<sup>6</sup> H02K 1/18

U.S. Cl. 310—154

2 Claims



1. A permanent magnet type rotating machine comprising:
  - a cylindrical yoke;
  - a plurality of permanent magnets installed on an inner periphery of said cylindrical yoke;
  - a rotor rotatably installed at an inner peripheral portion of said plurality of permanent magnets;
  - a plate having an outer peripheral portion disposed proximate to said cylindrical yoke and having an inner peripheral portion disposed proximate to a rotating shaft of said rotor; and
  - a retaining portion integrally provided on said plate to elastically retain said plurality of permanent magnets in an axial direction.

5,481,149

## HOMOPOLAR DYNAMOELECTRIC MACHINE

Yoshitaka Kambe, Toyota, and Tamio Shinozawa, Anjo, both of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

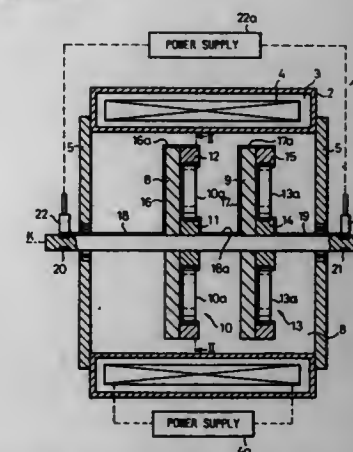
Filed Nov. 10, 1994, Ser. No. 338,753

Claims priority, application Japan, Nov. 12, 1993, 5-283573

Int. Cl.<sup>6</sup> H02K 31/00

U.S. Cl. 310—178

20 Claims



1. A homopolar dynamoelectric machine comprising:
  - a solenoid coil for excitation, a cylindrical cavity formed around an axis thereof;
  - a rotor, provided in the cavity, rotatable about the axis of the coil, having a proximal portion and a distal portion;
  - a rotating body, rotatably supported by the rotor about an axis of the rotor, the rotatable body extending from the proximal portion to the distal portion of the rotor;

- a first electric current path extending from the proximal portion to the distal portion of the rotor, through which an electric current passes from the proximal portion to the distal portion of the rotor; and
- a second electric current path extending from the distal portion to the proximal portion of the rotor, through which an electric current passes from the distal portion to the proximal portion of the rotor, the second electric current path being electrically connected in series with the first electric current path, and the first and second electric current paths being adapted to be electrically connected to a power supply in order to supply a direct current to the first and second electric current paths; wherein the rotor comprises one of the first and second electric current paths, and the rotating body comprises the other of the first and second electric current paths.

5,481,150

## BRUSH AND COMMUTATOR MOTOR HAVING BRUSH DEVICE USING THE SAME

Motoyuki Tanaka, Tokyo; Yasunori Hatano, Hiratsuka, and Tadashi Ozawa, Hadano, all of, Japan, assignors to Kabushiki Kaisha Tec, Shizuoka, Japan

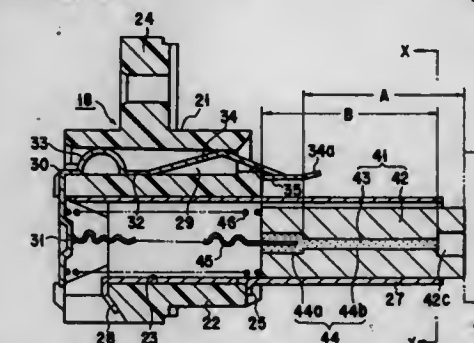
Continuation of Ser. No. 872,790, Apr. 22, 1992, Pat. No. 5,387,832. This application May 4, 1994, Ser. No. 237,723

Claims priority, application Japan, Apr. 25, 1991, 3-95563; Jul. 29, 1991, 3-188940; Jul. 29, 1991, 3-188941; Aug. 28, 1991, 3-215723; Sep. 30, 1991, 3-251014; Jan. 3, 1992, 3-281857; Dec. 24, 1991, 3-340534; Jan. 30, 1992, 4-15045; Jan. 31, 1992, 4-15739

Int. Cl.<sup>6</sup> H02K 13/00

U.S. Cl. 310—249

18 Claims



1. A brush having a wear portion which wears upon making contact with a commutator, almost all of the wear portion comprising at least two types of materials having different electric resistivities, and extending along a main current direction of the brush, comprising:
  - a good conductive portion made of a first one of said at least two types of materials having a lowest electric resistivity, and said good conductive portion extending along the main current direction of said brush;
  - a brush main portion made of a second one of said at least two types of materials having an electric resistivity higher than that of said good conductive portion, and said brush main portion extending along the main current direction of said brush;
  - said brush main portion having a widthwise dimension larger than a respective widthwise dimension of said good conductive portion, as measured in a cross section of said brush perpendicular to the main current direction of said brush;
  - said brush main portion having a proximal end surface, a commutator-side end surface which is opposed to said proximal end surface, and a hole therein which extends along the main current direction of said brush;
  - said hole having a small cross sectional area portion arranged between a position near said commutator-side end surface and a position near said proximal end surface, and a large cross sectional area portion arranged between said position near said proximal end surface and said proximal end surface, said



large cross sectional area portion having a larger cross sectional area than that of said small cross sectional area portion, said large cross sectional area portion being communicated at said position near said proximal end surface with said small cross sectional area portion, and said large cross sectional area portion having an opening in said proximal end surface; said good conductive portion being embedded in said hole from said large cross sectional area portion to said small cross sectional area portion; and a lead line made of a material having an electric resistivity lower than that of said second one of said materials for said brush main portion, and said lead line being inserted into and embedded in a part of said good conductive portion in said large cross sectional area portion of said hole of said brush main portion via said opening of said large cross sectional area portion.

5,481,151

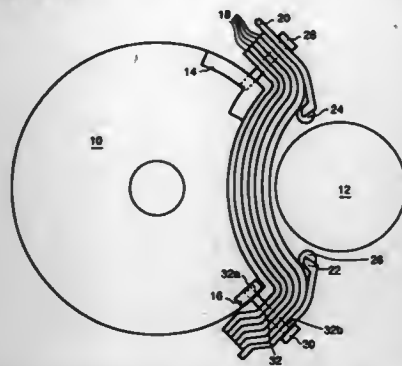
### ELECTROMAGNETIC SHIELD FOR ALTERNATING CURRENT INDUCTION RAILWAY MOTORS

Len E. Stacy, Erie, and George J. Wnukoski, North East, both of Pa., assignors to General Electric Company, Erie, Pa. Continuation of Ser. No. 265,907, Jun. 27, 1994, abandoned. This application Mar. 24, 1995, Ser. No. 409,920

Int. Cl.<sup>6</sup> H02K 1/12

U.S. Cl. 310-256

17 Claims



1. An AC induction railway motor for driving an axle, the motor comprising:

- a motor housing;
- an electromagnetic shield for the motor adapted to be positioned between the motor and the axle, the shield comprising a stack of ferro-magnetic shield layers, each one of the shield layers at least partially electrically insulated from the others of the shield layers and having at least two openings, each of the openings of any one of the shield layers being substantially aligned with corresponding openings in others of the shield layers to form a set of aligned openings, and
- at least two fasteners, each fastener extending through a respective set of aligned openings and into a corresponding opening in the motor housing for fastening the shield layers over a portion of the motor housing facing the axle.

5,481,152

### PIEZOELECTRIC ACTUATOR

Rainer Buschulte, Bad Schönborn, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany. Filed Jun. 8, 1994, Ser. No. 255,479

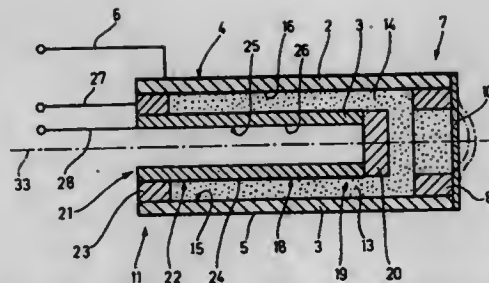
Claims priority, application Germany, Jun. 8, 1993, 43 18 978.4

Int. Cl.<sup>6</sup> H01L 41/08

U.S. Cl. 310-328

17 Claims

1. Piezoelectric actuator having at least one piezoelectric element assigned to an electrode for applying a control voltage, comprising a hollow body in the form of a first tube having a



closed chamber formed therein filled with an incompressible liquid, a liquid-tight elastic membrane closing an opening formed in said hollow body, means for controlling the piezoelectric element so as to vary said volume of said hollow body during a deformation of said elastic membrane caused by said incompressible liquid, and a second tube, one of said tubes being received within the other.

5,481,153

### ACOUSTIC NON-DESTRUCTIVE TESTING

Charles W. Turner, Virginia Water, England, assignor to British Technology Group Ltd., London, England

PCT No. PCT/GB92/02253, § 371 Date Aug. 22, 1994, § 102(e) Date Aug. 22, 1994, PCT Pub. No. WO93/11528, PCT Pub. Date Jun. 10, 1993

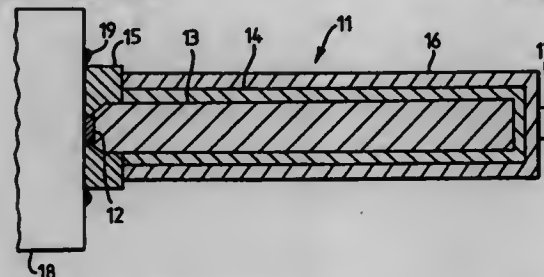
PCT Filed Dec. 4, 1992, Ser. No. 244,550

Claims priority, application United Kingdom, Dec. 6, 1991, 9126082

Int. Cl.<sup>6</sup> H01L 41/08

U.S. Cl. 310-334

8 Claims



1. An acoustic probe comprising:

- a piezoelectric ceramic transducer element, energizable to emit ultrasonic signals in a first direction and in a second direction opposite to said first direction, and mountable on a sample to be tested so as to transmit thereto signals emitted in said first direction,
- a rod-shaped acoustic waveguide having one end coupled to said transducer element to receive signals emitted by said transducer element in said second direction and to transmit said signals along said waveguide,
- lossy cladding material acoustically coupled to a surface of said waveguide at least at a part of said waveguide remote from said one end, and
- coupling means surrounding and mechanically secured and acoustically coupled to said transducer element and said one end of the waveguide, said coupling means having a surface adapted to be secured to the sample to be tested and to transmit thereto signals emitted by the transducer element, wherein said waveguide includes a recess at said one end and said transducer element includes a part that is partially set into said recess and a part that partially projects therefrom, and wherein said coupling means is a collar that surrounds and is mechanically secured and acoustically coupled to said one end of said waveguide and said part of said transducer projecting from said recess.

5,481,154

### PIEZO-RESONATOR

Hiroaki Kaida, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

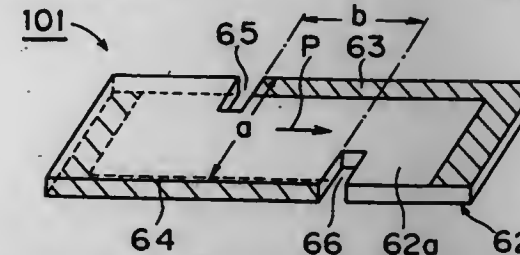
Filed Sep. 26, 1994, Ser. No. 312,409

Claims priority, application Japan, Sep. 28, 1993, 5-241748; Jan. 21, 1993, 5-263769

Int. Cl.<sup>6</sup> H01L 41/08

U.S. Cl. 310-368

16 Claims



1. A piezo-resonator utilizing a shear mode, comprising: a piezoelectric body being provided with a pair of opposite rectangular surfaces having longer and shorter sides, and polarized in a certain direction; and first and second resonance electrodes being arranged on an outer surface of said piezoelectric body at a prescribed distance from each other, for applying a voltage in a direction being perpendicular to said direction of polarization, a ratio b/a being set in a range of ±10% from the following value:

$$b/a = n(3\sigma + 1.48)$$

(1)

where b and a represent lengths of said longer and shorter sides of said rectangular surfaces of said piezoelectric body respectively,  $\sigma$  represents the Poisson's ratio of the material forming said piezoelectric body, and n represents an integer.

5,481,155

### LINEAR INDEX FOR RECTILINEAR DRIVING DEVICE

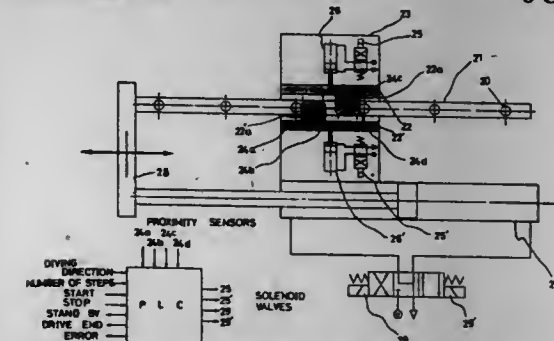
Yeh S. Hong, Seoul, Rep. of Korea, assignor to Korea Institute of Science and Technology, Seoul, Rep. of Korea. Filed Feb. 16, 1994, Ser. No. 197,240

Claims priority, application Rep. of Korea, Dec. 21, 1993, 28839/1993

Int. Cl.<sup>6</sup> H02K 41/00

U.S. Cl. 318-135

8 Claims



1. A linear index for stepwise driving of a linear driving device comprising:

- a linear index bar having a plurality of index protrusions, said protrusions being spaced at regular intervals;
- an index unit for stepwise moving said linear index bar by 1/2 of the interval between said index protrusions in accordance with electric control signals, said index unit including a pair of index parts oppositely positioned to face each other with said linear index bar being interposed therebetween, a projection extending from each of said index parts toward said linear index bar, a pair of proximity sensors mounted on opposed sides of said projection and sensing the approach of said index

protrusions of the index bar, and drive means for moving said index parts forward and backward in accordance with said electric control signals; and a programmable logic controller for outputting said electric control signals to said index unit, whereby said linear index allows a stepwise movement of the linear driving device throughout a total driving stroke of the linear driving device.

5,481,156

### FIELD EMISSION CATHODE AND METHOD FOR MANUFACTURING A FIELD EMISSION CATHODE

Jong-deuk Lee, Seoul; Hyeon-su Woo, Bucheon; Sun-jeong Choi, and Gang-ok Lee, both of Suwon, all of, Rep. of Korea, assignors to Samsung Display Devices Co., Ltd., Kyungki-do, Rep. of Korea

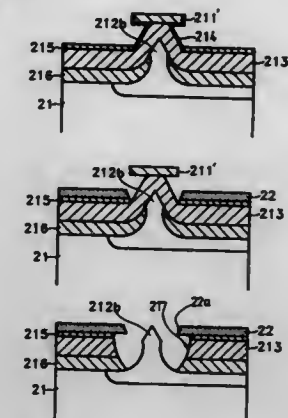
Filed Sep. 8, 1994, Ser. No. 302,517

Claims priority, application Rep. of Korea, Sep. 16, 1993, 93-18662

Int. Cl.<sup>6</sup> H01J 9/02

U.S. Cl. 313-309

7 Claims



1. A method of manufacturing a field emission cathode comprising the steps of:

- doping an N-type impurity on a substrate;
- thermally oxidizing a surface of said substrate so as to form a first thermal oxide layer having a predetermined thickness;
- partially etching said first thermal oxide layer of said substrate so as to form a predetermined mask pattern;
- etching said substrate perpendicular to the surface on a portion in which said mask pattern is not formed so as to form a protrusion of a predetermined height;
- thermally oxidizing said substrate so as to form a second thermal oxide layer on the surface of said substrate;
- forming a nitride layer having a predetermined thickness on the overall surface of said first and second oxide layers;
- removing said nitride layer excluding a portion of said nitride layer formed on a periphery of said protrusion;
- thermally oxidizing said substrate so as to form a third thermal oxide layer above and below said second thermal oxide layer, said third thermal oxide layer excluding an upper portion of said protrusion;
- etching and removing a remaining portion of said nitride layer covering said protrusion;
- depositing a metal on the surface of said second thermal oxide layer excluding a portion covering said protrusion so as to form a gate electrode; and
- etching said substrate in which said gate electrode is formed, and partially removing said second and third thermal oxide layers so as to expose said protrusion between portions of said gate electrode.



5,481,157

**ELECTRON GUN FOR CATHODE-RAY TUBE**

Chie-Takahashi, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

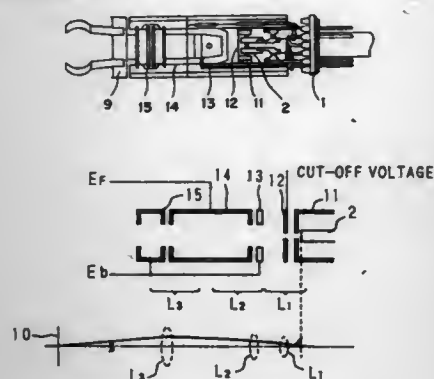
Filed Apr. 1, 1994, Ser. No. 221,517

Claims priority, application Japan, Apr. 23, 1993, 5-097879; Dec. 22, 1993, 5-324141

Int. Cl.<sup>6</sup> H01J 29/62

U.S. Cl. 313-409

19 Claims



1. A cathode-ray tube electron gun comprising:
  - a cathode for emitting an electron beam;
  - a cathode prefocusing lens unit, located adjacent to said cathode, including a first plurality of grids having electron beam apertures for passage of the electron beam;
  - an early stage lens unit, located adjacent to said cathode prefocusing lens unit, including a second plurality of grids having electron beam apertures configured as a first bipotential form lens; and
  - a main lens unit, located adjacent to said early stage lens unit, including a third plurality of grids having electron beam apertures configured as a second bipotential form lens independent from said first bipotential form lens;
- wherein said early stage lens unit and said main lens unit include a common grid, and a length of the common grid is at least about 5.6 times larger than an aperture size located at the early stage lens unit side of the common grid.

5,481,158

**ELECTRON MULTIPLIER WITH IMPROVED DYNODE GEOMETRY FOR REDUCED CROSSTALK**

Hisaki Kato; Suenori Kimura; Kiyoshi Nakatsugawa; Tsuguo Uchino; Itsuo Ozawa, and Hiroyuki Onda, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamatsu, Japan

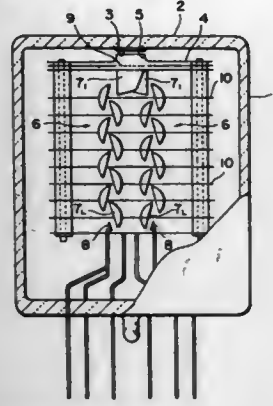
Filed Nov. 8, 1993, Ser. No. 148,280

Claims priority, application Japan, Nov. 9, 1992, 4-298608

Int. Cl.<sup>6</sup> H01J 43/10

U.S. Cl. 313-533

24 Claims



1. A photomultiplier comprising:
  - a transparent sealed container;

an incident window on which light to be measured is incident, said incident window being formed on one end face of said transparent sealed container;

first and second transmission-type photoelectric surfaces formed on an inner surface of said incident window and adjacently aligned;

first and second dynode arrays, both having a respective plurality of stages of dynodes, including respective first-stage and second-stage dynodes, for multiplying photoelectrons supplied from said first and second transmission-type photoelectric surfaces, respectively; and

respective photoelectron incident ports of said first-stage dynodes of said first and second dynode arrays, said photoelectron incident ports opposing said first and second transmission-type photoelectric surfaces, respectively,

wherein said first-stage dynodes are arranged in a substantially side-by-side manner, such that a direction of secondary electron emission of said first-stage dynode of said first dynode array is opposite to and away from a direction of secondary electron emission of said first-stage dynode of said second dynode array, and such that the directions of secondary electron emission of said first-stage dynodes of said first and second dynode arrays are substantially perpendicular to a direction along which said first and second transmission-type photoelectric surfaces are aligned.

5,481,159

**METAL VAPOR DISCHARGE LAMP**

Tatsumi Hiramoto, Tokyo; Tatsushi Igarashi, Himeji; Hiromitsu Matsuno, Himeji; Yukio Yasuda, Himeji, and Akiyasu Yamaguchi, Himeji, all of Japan, assignors to Ushiodenki Kabushiki Kaisha, Tokyo, Japan

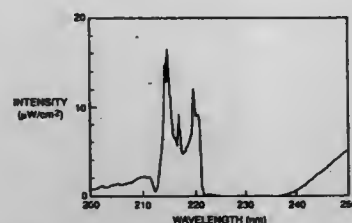
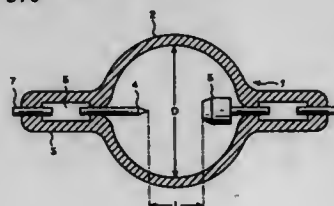
Filed May 4, 1994, Ser. No. 237,906

Claims priority, application Japan, May 7, 1993, 5-130103

Int. Cl.<sup>6</sup> H01J 61/12

U.S. Cl. 313-570

4 Claims



1. A metal vapor discharge lamp comprising:
  - a pair of electrodes having a reciprocal spacing no larger than 12 mm and stabilizing an arc of said lamp, and
  - means for encapsulating cadmium, as a major emission material, in a quantity resulting in a partial pressure, in operation, of  $3 \times 10^3$  Pa to  $1.3 \times 10^5$  Pa, lamp operation being performed in a state in which  $0.7 < J_L / P^{1/4} < 15.0$ , wherein P represents a partial pressure of the cadmium and  $J_L$  represents a lamp current.

5,481,160

**ELECTRONIC BALLAST WITH FET BRIDGE INVERTER**

Ole K. Nilssen, 408 Caesar Dr., Barrington, Ill. 60010

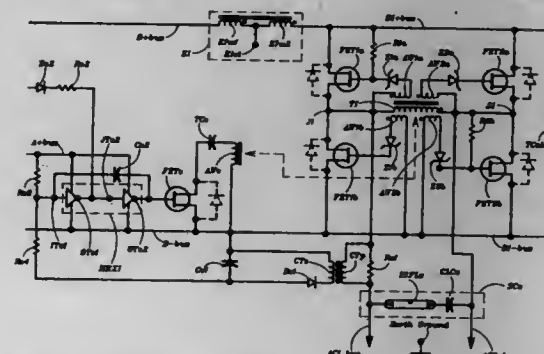
Continuation of Ser. No. 20,696, Feb. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 840,528, Feb. 25, 1992, Pat. No. 5,189,342, which is a continuation of Ser. No. 646,497, Jan. 28, 1991, abandoned, which is a continuation of

Ser. No. 107,795, Oct. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 658,423, Oct. 5, 1984, abandoned, which is a continuation of Ser. No. 555,426, Nov. 23, 1983, abandoned, which is a continuation of Ser. No. 178,107, Aug. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 973,741, Dec. 28, 1978, abandoned, which is a continuation-in-part of Ser. No. 890,586, Mar. 20, 1978, Pat. No. 4,184,128. This application Oct. 28, 1994, Ser. No. 330,605

Int. Cl.<sup>6</sup> H05B 41/29; 41/36

U.S. Cl. 315-209 R

50 Claims



1. An arrangement comprising:
  - a DC source operative to provide a DC supply voltage at a pair of DC supply terminals;
  - a loading means including an electric lamp and a pair of load terminals; and

inverter circuit having a pair of DC input terminals connected with the DC supply terminals and a pair of AC output terminals connected with the load terminals; the inverter circuit being characterized by providing across the AC output terminals an AC output voltage characterized by having (i) a first fundamental period consisting of two first half-periods of approximately equal duration but of opposite polarity, each first half-period starting and ending at a voltage cross-over point at which the instantaneous magnitude of the AC output voltage changes polarity, and (ii) a first waveform being sinusoidal except for a first brief period in near proximity of each voltage cross-over point, during which first brief period the slope of the first waveform is distinctly steeper than it would have been if it had remained of sinusoidal waveform throughout the first brief period; the inverter circuit being further characterized by including (i) tank-inductor means, (ii) tank-capacitor means, (iii) transistors connected in circuit with the tank-inductor means and the tank-capacitor means, each transistor having transistor control terminals, and (iv) drive voltage assembly connected with the transistor control terminals and operative to provide transistor drive voltages thereto; the drive voltage assembly being further operative to cause each transistor to periodically alternate between being conductive and being non-conductive; the transistors being rendered conductive and non-conductive at such particular moments in time as to cause the AC output voltage to assume said first waveform.

5,481,161

**VARIABLE FREQUENCY GENERATOR FOR RESONANT POWER FEEDBACK**

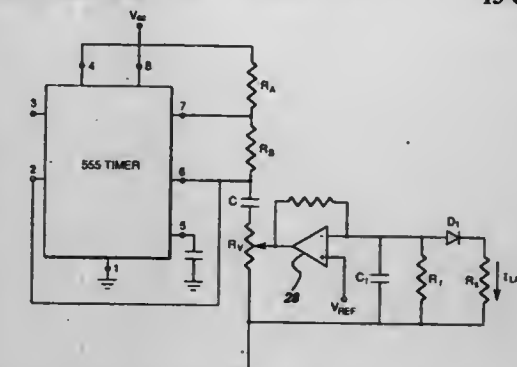
Sayed-Amr El-Hamamsy, and Mustansir H. Kheraluwala, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 10, 1995, Ser. No. 386,570

Int. Cl.<sup>6</sup> H05B 37/02

U.S. Cl. 315-224

13 Claims



1. A fixed duty ratio, variable frequency, square wave generator, comprising:

an astable multivibrator including a pair of resistors coupled in series between a supply voltage terminal and a capacitor, said multivibrator generating a square wave voltage across said capacitor which varies between predetermined fractions of said supply voltage with a fixed duty ratio; and

a controllable, high-gain, variable resistance connected between said capacitor and a ground potential, said variable resistance varying with input voltage thereto, said capacitor of said multivibrator charging and discharging through the series connection of said resistors and said variable resistance with charging and discharging times that vary with the input voltage thereto.

5,481,162

**METHOD OF SUPPLYING CURRENT TO A SODIUM HIGH-PRESSURE DISCHARGE LAMP, AND CURRENT SUPPLY SYSTEM**

Michael Boenigk; Klaus Guenther, both of Berlin; Hans-Georg Kloss, Hohen Neuendorf, and Teja Lehmann, Berlin, all of Germany, assignors to Patent-Treuhand-Gesellschaft F. Elektrische Gluehlampen mbH, Munich, Germany

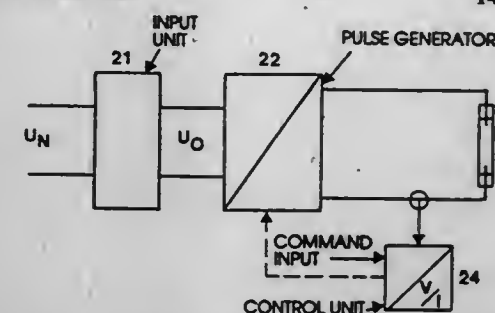
Filed Jan. 18, 1994, Ser. No. 182,596

Claims priority, application Germany, Jan. 19, 1993, 43 01 276.0

Int. Cl.<sup>6</sup> H05B 41/36

U.S. Cl. 315-307

14 Claims



1. In the combination of a sodium high-pressure discharge lamp, with a controlled energy supply apparatus coupled to said lamp, wherein said controlled energy supply apparatus supplies the sodium high-pressure lamp with electrical operating energy sufficient to cause operation of the lamp under saturated condition,



a method of stabilized operation of said lamp comprising the steps of  
establishing a predetermined command value for the quotient of lamp voltage and lamp current ( $V_L/I_L$ ) of supplied electrical energy; and  
controlling the energy output of said energy supply apparatus to meet said predetermined command value.

5,481,163

## DISCHARGE LAMP CURRENT CONTROLLING CIRCUIT

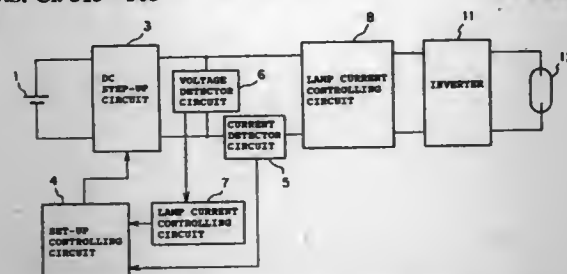
Kenji Nakamura, and Nobuo Ukita, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1994, Ser. No. 277,487

Claims priority, application Japan, Aug. 3, 1993, 5-192223  
Int. Cl.<sup>6</sup> G05F 1/00

U.S. Cl. 315—308

34 Claims



1. A discharge lamp lighting device, comprising:  
voltage applying means for applying an alternating voltage to a discharge lamp;  
discharge starting means for applying a high voltage to the discharge lamp to start the discharge lamp;  
voltage detecting means for detecting the voltage applied across the discharge lamp;  
current detecting means for detecting a current supplied to the discharge lamp; and  
a lamp current controller including  
means for deciding a value of current to be supplied to the discharge lamp based on the luminous efficiency of the discharge lamp and the voltage detected by said voltage detecting means, said luminous efficiency depending on the voltage applied across the discharge lamp, and  
means for controlling a voltage output from said voltage applying means such that said decided value of current coincides with the value of current detected by said current detecting means.

5,481,164

## VARIABLE AXIS STIGMATOR

Guenther O. Langner, Fultonville, and Paul F. Petric, Brewster, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

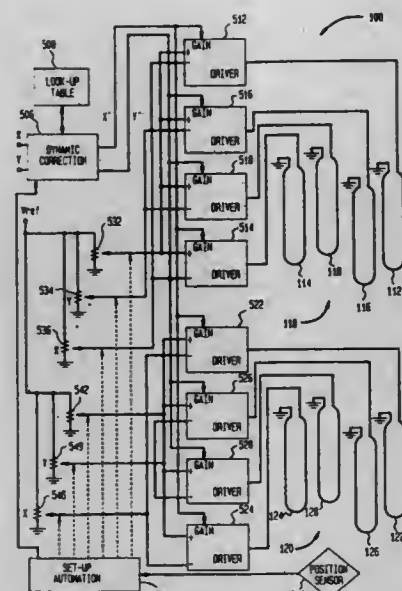
Continuation of Ser. No. 915,798, Jul. 16, 1992, Pat. No. 5,389,858. This application Aug. 26, 1994, Ser. No. 296,138

Int. Cl.<sup>6</sup> G09G 1/04; G21K 1/08; H01J 3/14

U.S. Cl. 315—370

14 Claims

1. An arrangement for shifting the axis of a quadrupole field including  
a yoke having at least four coils arranged in pairs in a quadrupole configuration wherein at least the coils of at least one said pair of coils are individually electrically accessible,  
means for individually driving said coils of said at least one pair of coils including means for individually deriving current values for each coil of said at least one pair of coils in accordance with a position to which said axis is to be shifted,



wherein said means for individually driving said coils of said at least one pair of coils is responsive to means for detecting deflection of a beam of charged particles in response to change of current in said at least one pair of coils.

5,481,165

## DRIVE DEVICE FOR A SEWING MACHINE

Akiyoshi Urano, and Hiroaki Tsuboyama, both of Chofu, Japan, assignors to Juki Corporation, Tokyo, Japan

Filed Jul. 26, 1994, Ser. No. 279,867

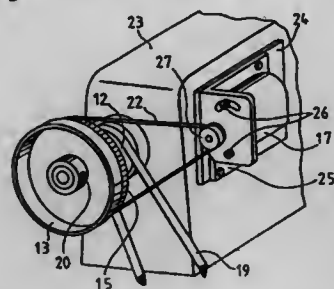
Claims priority, application Japan, Dec. 20, 1993, 5-072942

U

Int. Cl.<sup>6</sup> D05B 69/12

U.S. Cl. 318—5

2 Claims



1. A drive device for a sewing machine comprising:  
an upper shaft for driving the sewing machine;  
a power transmitting flywheel fixedly mounted on said upper shaft so that said power transmitting flywheel and said upper shaft turn as one unit;  
a high speed motor for rotating said power transmitting flywheel;  
a one-way clutch mounted about said upper shaft;  
power transmitting pulley mounted outside of said one-way clutch; and  
a low speed motor for rotating said power transmitting pulley at lower speed than said power transmitting flywheel.

5,481,166

## MOTOR CONTROL FOR BRUSHLESS PERMANENT MAGNET USING ONLY THREE WIRES

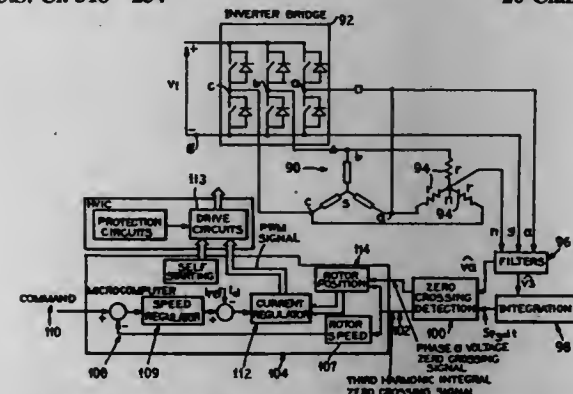
Julio C. Moreira, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 30, 1993, Ser. No. 175,596

Int. Cl.<sup>6</sup> H02P 7/00

U.S. Cl. 318—254

20 Claims



1. A method of controlling a brushless permanent magnet motor having stator windings connected in a star configuration which provides a stator neutral node and in which windings are induced back EMF fundamental and third harmonic components, and a rotor which rotates relative to the stator windings, the motor being driven by an inverter having electrical nodes, including phase nodes to which are coupled a star network of resistors which provides an artificial neutral node separate and apart from, but in correspondence with, the stator neutral node, comprising the steps of:

extracting a first signal in which the third harmonic component is dominant from across one of the nodes of the inverter and the artificial neutral node without requiring connection to the stator neutral node;  
filtering the first signal to generate a second signal which substantially contains only the third harmonic component; and  
communicating the second signal to a controller which controls operation of the inverter based in part on information in the second signal.

5,481,167

## AMPLIFIER AND METHOD FOR DETECTING THE BEMF OF A COIL OF A POLYPHASE SENSORLESS DC MOTOR

Mark E. Rohrbaugh, and Francesco Carobolante, both of Phoenix, Ariz., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

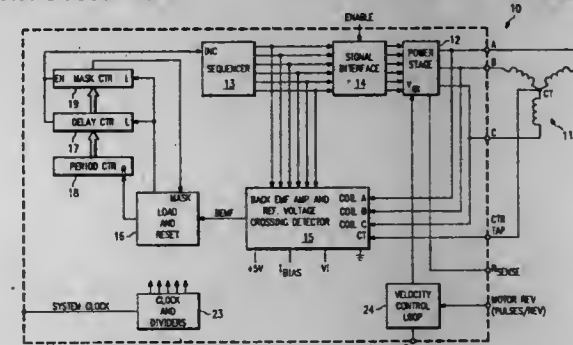
Continuation of Ser. No. 843,564, Feb. 28, 1992, abandoned.

This application May 2, 1994, Ser. No. 236,668

Int. Cl.<sup>6</sup> H02K 23/00

U.S. Cl. 318—254

33 Claims



1. A circuit for detecting a back emf signal of a motor coil, comprising:  
circuitry for providing a differential voltage proportional to the back emf of the motor coil;

circuitry for adding a first hysteresis bias current to said circuitry for providing a differential voltage, to modify the produced differential voltage;

circuitry for adding a second hysteresis bias current to said circuitry for providing a differential voltage, to modify the produced differential voltage responsive to the back emf approaching a zero crossing from a predetermined direction, said second hysteresis bias current opposing and of greater magnitude than said first hysteresis bias current; and  
a comparator connected to receive the modified differential voltage to produce an output state change when the modified differential voltage exceeds a predetermined value.

5,481,168

## ELECTRIC VEHICLE TORQUE CONTROLLER

Nobuyoshi Mutoh, Katsuta; Tazou Miyazaki, Hitachi; Ryoso Masaki, Hitachi; Tsutomu Ohmae, Hitachi, and Sanshiro Obara, Tokai, all of Japan, assignors to Hitachi, Ltd., Japan

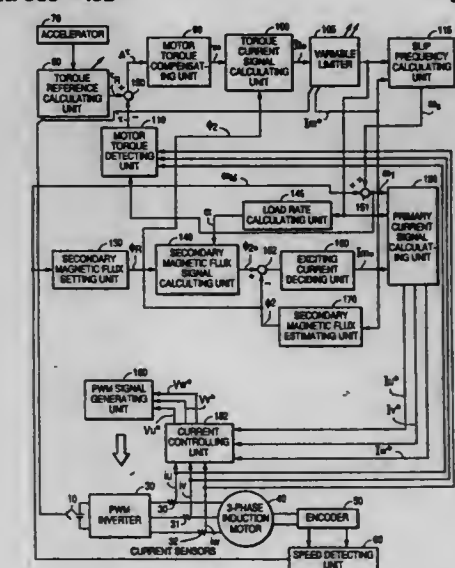
Filed Jan. 28, 1994, Ser. No. 187,526

Claims priority, application Japan, Jan. 29, 1993, 5-013971

Int. Cl.<sup>6</sup> H02P 7/00

U.S. Cl. 318—432

31 Claims



1. Torque controller for an electric vehicle motor comprising:  
a torque reference calculator for generating a torque reference value in response to an input command signal;  
a motor torque detecting unit for generating a motor torque signal indicative of instantaneous value of an output torque of said motor;  
a comparing unit coupled to receive said torque reference value and said motor torque signal, and generate a torque difference signal indicative of a difference between instantaneous values of said torque reference value and said motor torque signal;  
means for generating three phase A.C. current signals responsive to instantaneous values of said torque difference signal;  
a current control unit responsive to said A.C. current signals for generating three phase A.C. voltage signals indicative of instantaneous values thereof;  
a pulse width modulator coupled to receive said A.C. voltage signals and generate a plurality of pulse width modulated signals indicative of instantaneous values thereof; and  
an inverter coupled to receive said pulse width modulated signals and generate a three phase A.C. voltage for driving said motor in response thereto;  
wherein said means for generating three phase A.C. current signals comprises:  
a torque current signal calculator for generating a torque current signal in response to said torque difference signal;



a secondary magnetic flux signal calculator for generating a secondary magnetic flux signal based on an output speed of said motor; and  
means for modulating said secondary magnetic flux signal generated in said secondary magnetic flux calculator, in response to said torque current signal.

5,481,169

# DEVICE FOR CONTROLLING THE OPERATION OF AN APPLIANCE WITH A SERVO-ASSISTED MOTOR

Daniele Turetta, Ispra, and Adriano Scaburri, Somma Lombardo, both of Italy, assignors to Whirlpool Corporation, Benton Harbor, Mich.

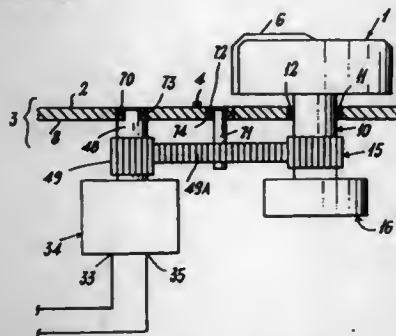
Filed Apr. 12, 1993, Ser. No. 46,051

Claims priority, application Italy, Apr. 14, 1992, MI92U0369

Int. Cl.<sup>6</sup> G05B 11/01

U.S. Cl. 318—560

14 Claims



1. A device for controlling the operation of a household electrical appliance, comprising:  
an electronic circuit arranged to control the operation of said electrical appliance;  
a selector for inputting predetermined program steps to said electronic control, said selector including:  
a knob;  
a position sensing element mechanically interconnected to said knob, said position sensing element supplying an electrical input signal to said electronic circuit responsive to the angular position of said knob relative to an initial position, said electrical input signal being used by said electronic circuit to control the operation of the electrical appliance;  
an actuator operatively controlled by said circuit for moving said knob, so that said knob is made to move during the execution of the selected operating program and hence display the progress of said program.

5,481,170

# METHOD AND APPARATUS FOR CONTROLLING SHIFT FORCE IN AN AUTOMATED MECHANICAL TRANSMISSION

Stephen A. Edelen, Battle Creek, Mich.; Syed F. Hussain, Anaheim Hills, Calif., and Chiau-Chieh Ong, Novi, Mich., assignors to Eaton Corporation, Cleveland, Ohio

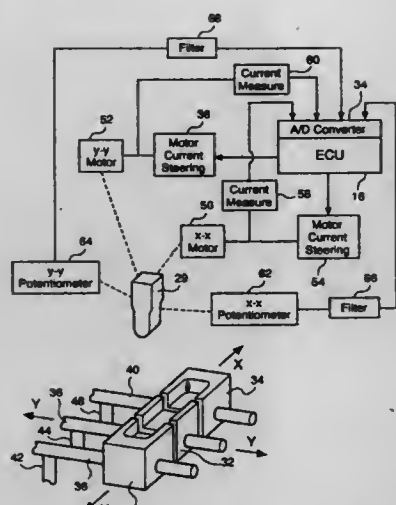
Filed Aug. 11, 1993, Ser. No. 104,725

Int. Cl.<sup>6</sup> G05F 1/10

U.S. Cl. 318—650

6 Claims

1. A method of controlling the force applied to the shifting mechanism of an automated mechanical transmission during shifting movements, the transmission including at least one shift rail, the shifting mechanism including a shift member driven by a motor, the shift member cooperating with the shift rail to effect shifting of the transmission, said method comprising the steps of:  
energizing the motor with a variable duty cycle pulse width modulated control signal to cause a target current to be applied to said motor;  
sensing the current drawn by the motor; and



adjusting the duty cycle of said control signal as a function of the sum of the error between the current sensed and said target current plus the rate of change of said error, to reduce said error toward zero.

5,481,171

# METHOD AND APPARATUS FOR SYMMETRICAL CURRENT STARTING OF POLYPHASE INDUCTION MOTORS

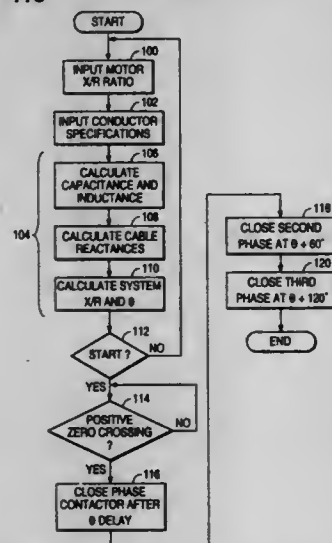
Thomas J. Woginrich, Jr., Springfield, Oreg., assignor to James River Corporation of Virginia, Richmond, Va.

Filed Feb. 7, 1994, Ser. No. 192,625

Int. Cl.<sup>6</sup> H02P 1/26

U.S. Cl. 318—778

19 Claims



1. A method of starting a polyphase electric induction motor using an automatic motor starter individually controlling the application of a plurality of phases of an AC power source to the motor, comprising the steps of:

receiving and storing a value of a selected electrical parameter, said value specific to the particular motor, where said parameter is a parameter that takes on a different value depending on asymmetrical startup current characteristics produced by physical structure of the motor;  
calculating, based on said stored electrical parameter value, a time delay interval defining a time between when a voltage zero crossing of one of said phases occurs and a time when the same phase is to be connected to the motor to minimize transient asymmetrical startup currents drawn by the motor;

monitoring at least a first of said phases of the power source to detect a power phase voltage zero crossing of the first phase; upon detection of said phase voltage zero crossing of the first phase, waiting for said time delay interval and then connecting said first phase of the power source to the motor; after connection of said first phase of the power source, connecting the phases other than said first phase to the motor individually thereafter at timed intervals established to minimize transient asymmetrical startup currents drawn by the motor.

5,481,172

# CIRCUIT FOR CONTROLLING POWER CONVERTING APPARATUS

Hirofumi Minowa; Shinichi Ishii; Takao Yanase, and Masaru Yamazoe, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

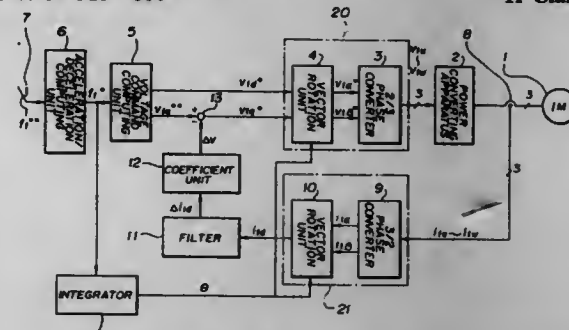
Filed Apr. 26, 1993, Ser. No. 51,944

Claims priority, application Japan, Apr. 27, 1992, 4-154063

Int. Cl.<sup>6</sup> H02M 7/00; H02P 5/40

U.S. Cl. 318—800

11 Claims



1. A control circuit for controlling a power converting apparatus in response to one or more command values, said control circuit comprising:

exciting current obtaining means for obtaining an exciting current component from a detected signal of each phase of primary currents of an induction motor, wherein said exciting current obtaining means comprises vector rotation means for resolving said primary currents of said induction motor into a d-axis component and a q-axis component on an orthogonal d-q axis coordinate system by using a reference angle that rotates at an angular velocity identical with that of an output of said power converting apparatus, and outputs said d-axis component of said primary currents of said induction motor as said exciting current component;

oscillation component obtaining means for obtaining an oscillation component of the exciting current from said exciting current component;

correcting quantity obtaining means for obtaining a correcting quantity from said oscillation component of the exciting current, wherein said correcting quantity obtaining means obtains from said oscillation component of the exciting current an exciting voltage oscillation component  $\Delta v$ , and outputs said exciting voltage oscillation component  $\Delta v$  as said correcting quantity; and

command providing means for correcting at least one of said command values using said correcting quantity, and for providing said power converting apparatus with stator axis voltage command values obtained on the basis of said corrected command values, wherein said command providing means comprises correcting means for correcting said command values, which are provided in the form of a q-axis voltage command value and a d-axis voltage command value on said orthogonal d-q axis coordinate system, in a manner that said q-axis voltage command is corrected by said exciting voltage oscillation component  $\Delta v$  while said d-axis voltage command value is set to zero, and coordinate transformation means for transforming said corrected q-axis voltage command value and said d-axis voltage command value into said stator axis voltage command values.

5,481,173

# VECTOR CONTROL SYSTEM FOR INDUCTION MOTOR

Yasuhiro Yamamoto, Tokyo, Japan, assignor to Kabushiki Kaisha Meidensha, Tokyo, Japan

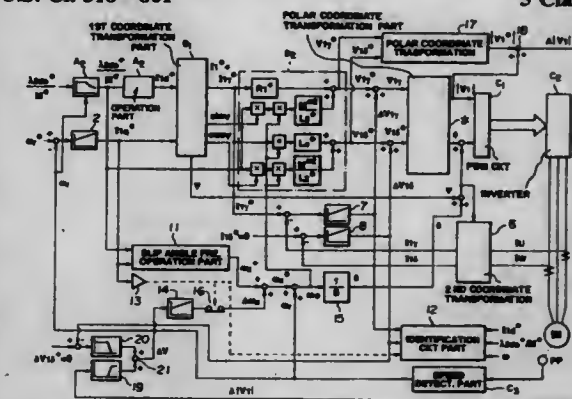
Filed Jan. 5, 1994, Ser. No. 177,396

Claims priority, application Japan, Jan. 11, 1993, 5-002228; Mar. 18, 1993, 5-058750

Int. Cl.<sup>6</sup> H02P 7/00

U.S. Cl. 318—801

5 Claims



1. A vector control system for an induction motor which is driven by an inverter controlled by a pulse width modulation circuit, the system carrying out compensation for variation of a secondary resistance, comprising:

first means for calculating target values  $I_d^*$  and  $I_q^*$  of d- and q-axis components of a primary current of the induction motor on d-q coordinates having a secondary magnetic flux set as a reference axis, said d-q coordinates being rotational coordinates which rotate in synchronism with a power source angular frequency of the induction motor;

a first coordinate transformation part arranged to calculate in accordance with said target values  $I_d^*$  and  $I_q^*$  of said d- and q-axis components a target value  $I_1^*$  ( $=I_d^*$ ) of a  $\gamma$ -axis component of the primary current and a phase difference  $\psi$  on  $\gamma$ - $\delta$  coordinates having said phase difference  $\psi$  with respect to d-q axes and having said primary current  $I_1$  set as a reference axis;

a slip angular frequency operation part arranged to input and calculate a ratio  $\lambda_{2s}^*/M^*$  and said target value  $I_q^*$  of said q-axis component so as to output a target value  $\omega_s^*$  of a slip angular frequency;

second means for calculating target values  $V_1^*$  and  $V_2^*$  of  $\gamma$ - and  $\delta$ -axis components of a primary voltage in accordance with a ratio  $\lambda_{2s}^*/M^*$  of a target value  $\lambda_{2s}^*$  of said secondary magnetic flux to a target value  $M^*$  of an exciting inductance, calculation results of said first coordinate transformation part and a command value  $\omega_0$  of said power source angular frequency;

a second coordinate transformation part arranged to transform a detection value of said primary current into actual  $\gamma$ - and  $\delta$ -axis components  $I_1\gamma$  and  $I_1\delta$  on said  $\gamma$ - $\delta$  coordinates;

third means for calculating a variation  $\Delta V_1\delta$  with respect to said  $V_1\delta^*$  of said  $\delta$ -axis component of said primary voltage in accordance with said target values  $I_1\gamma^*$  and  $I_1\delta^*$  of said  $\gamma$ - and  $\delta$ -axis components of said primary current and said actual  $\gamma$ - and  $\delta$ -axis components  $I_1\gamma$  and  $I_1\delta$  derived from said second coordinate transformation part;

a polar coordinate transformation part arranged to add said target values  $V_1\gamma^*$  and  $V_1\delta^*$  derived from said second means to said variation  $\Delta V_1\delta$  derived from said third means so as to output a magnitude  $|V_1|$  of a vector of said primary voltage and a phase angle  $\phi$  thereof with respect to a  $\gamma$  axis; and

fourth means for minimizing an error with regard to compensation for variation of the secondary resistance, and including

a first operation part arranged to carry out a polar coordinate transformation of said target values  $V_1\gamma^*$  and  $V_1\delta^*$  of said second means so as to output an amplitude component  $|V_1^*|$ ; a second operation part arranged to calculate a deviation between said amplitude component  $|V_1^*|$  of said first operation



tion part and said magnitude  $|V_1|$  of said vector of said primary voltage so as to output an amplitude variation error  $\Delta V_1$ ;

third and fourth operation parts arranged to input said amplitude variation error  $\Delta V_1$  derived from said second operation part and said variation  $\Delta V_2$  derived from said third means and provide outputs by switching the two; and  
a third adder arranged to add said outputs of said third and fourth operation parts so as to input said voltage variation control part.

5,481,174

### METHOD OF RAPIDLY CHARGING A LITHIUM ION CELL

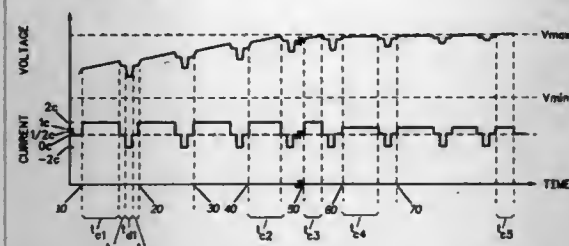
Lara J. Martin, Newport News, Va., and Scott M. Garrett, Boca Raton, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 27, 1993, Ser. No. 172,975

Int. Cl.<sup>6</sup> H02J 7/10

U.S. Cl. 320-14

15 Claims



1. A method for rapidly charging a Lithium ion electrochemical cell, said method comprising the steps of:

- providing a Lithium ion electrochemical cell;
- applying an electrical charge pulse current to said electrochemical cell, said charge pulse terminating upon the occurrence of either a pre-selected maximum charge time, or a pre-selected maximum cell voltage;
- providing a rest period during which no load or current is applied to said cell; and
- applying a discharge pulse to said electrochemical cell, said discharge pulse terminating upon the occurrence of either a pre-selected discharge period of time, or a pre-selected minimum cell voltage.

5,481,175

### SYSTEM AND METHOD FOR CHARGING AUXILIARY BATTERIES

John Qualich, Buffalo Grove; Cary Chmielewski, Prospect Heights, and Kirk Slevens, Roselle, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 20, 1993, Ser. No. 169,284

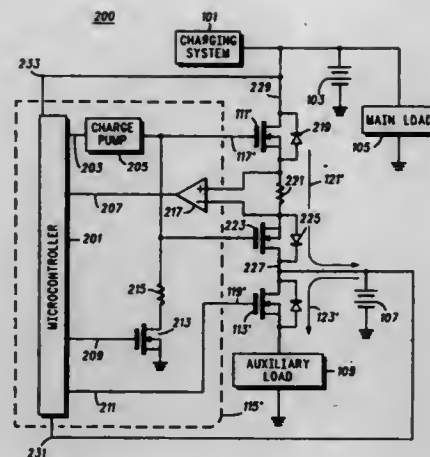
Int. Cl.<sup>6</sup> H01M 10/46

U.S. Cl. 320-15

26 Claims

7. A system for charging an auxiliary battery that drives an auxiliary load, said system comprising:

- regulator means having a control input and an output, wherein the output is coupled to said auxiliary battery for providing a charge current variable dependent on a parameter of a control signal provided to the control input;
- switch means for providing a coupling and a decoupling between said auxiliary battery and said auxiliary load, responsive to a command signal; and
- control means for providing the command signal that decouples said auxiliary battery from said auxiliary load via said switch means, and responsive thereto, for providing the control signal dependent on a voltage present across said regulator means.



5,481,176

### ENHANCED VEHICLE CHARGING SYSTEM

Charles J. DeBiasi, Allen Park; Vikas Tuteja, Novi; Zeljko Deljevic, Westland, and John F. Renchan, South Lyon, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

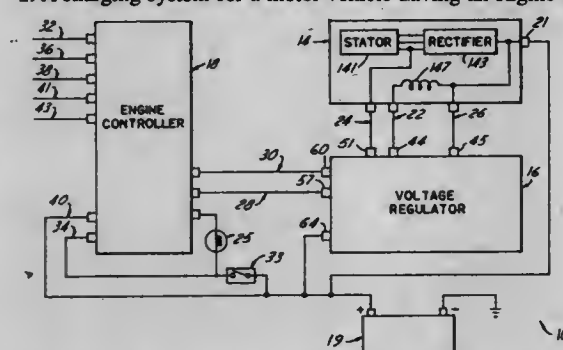
Filed Jul. 5, 1994, Ser. No. 270,570

Int. Cl.<sup>6</sup> H02J 1/00

U.S. Cl. 322-7

13 Claims

1. A charging system for a motor vehicle having an engine with



an air intake and a throttle, said motor vehicle further having brakes and a battery, said charging system comprising:

- an alternator for generating electrical energy including an output voltage;
  - a voltage regulator adapted to control said output voltage of said alternator, said voltage regulator having a first input adapted to receive a signal representing a desired output voltage of said alternator and a first output adapted to provide a signal representing a mechanical load of said alternator on said engine; and
  - an engine controller adapted to control an idle speed of said engine, said engine controller further comprising a second input adapted to receive said signal provided by said first output and a second output adapted to provide said signal received by said first input;
- wherein said first output is coupled to said second input and said second output is coupled to said first input.

5,481,177

### ELECTRONIC CHARGING SYSTEM

James P. Hamley, 2922 Cottonwood Dr. SE., Mill Creek, Wash. 98012

Continuation of Ser. No. 931,862, Aug. 18, 1992, abandoned.

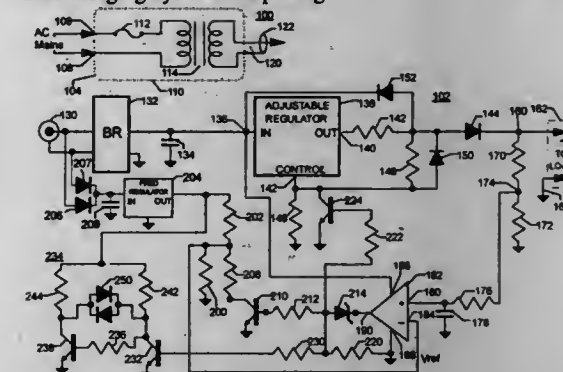
This application Sep. 29, 1993, Ser. No. 129,023

Int. Cl.<sup>6</sup> H01M 10/46

U.S. Cl. 320-23

30 Claims

1. A charging system comprising:



an input terminal for coupling to a power source;

an output terminal for coupling to a load to be charged;

an adjustable regulator having an input coupled to said input terminal, an output coupled to said output terminal and a control terminal, said adjustable regulator producing a controlled signal at its output responsive to the control signal applied to said control terminal;

controller means having an input coupled to said output terminal and an output coupled to said control terminal, said controller means including means to sense the state of charge of the and, responsive thereto:

- apply a predetermined charge-on control signal to said control terminal responsive to the load's charge state being less than a predetermined full charge level to cause said adjustable regulator output to charge the load;
  - apply a predetermined charge-off control signal to said control terminal, responsive to the load's charge state being greater than a predetermined full charge level, to cause said adjustable regulator output to cease charging the load; and
  - reapply said predetermined charge-on control signal to said control terminal responsive to the state of charge of the load dropping from said predetermined full charge level to a different predetermined recharge level; and,
- means for predeterminedly tapering charge rate to the load as the load approaches said full charge level.

5,481,178

### CONTROL CIRCUIT AND METHOD FOR MAINTAINING HIGH EFFICIENCY OVER BROAD CURRENT RANGES IN A SWITCHING REGULATOR CIRCUIT

Milton E. Wilcox, Saratoga, and Randy G. Flatness, Los Gatos, both of Calif., assignors to Linear Technology Corporation, Milpitas, Calif.

Filed Mar. 23, 1993, Ser. No. 36,047

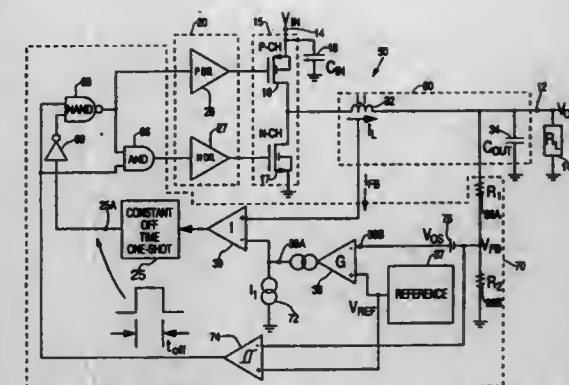
Int. Cl.<sup>6</sup> G05F 1/618

U.S. Cl. 323-287

57 Claims

1. A circuit for controlling a switching voltage regulator, the regulator having (1) a switch circuit coupled to receive an input voltage and including a pair of synchronously switched switching transistors and (2) an output circuit including an output terminal and an output capacitor coupled thereto for supplying current at a regulated voltage to a load, the control circuit comprising:

- a first circuit for monitoring a signal from the output terminal to generate a first feedback signal;
- a second circuit for generating a first control signal during a first state of circuit operation, the first control signal being responsive to the first feedback signal to vary the duty cycle of the



switching transistors to maintain the output terminal at the regulated voltage; and

a third circuit for generating a second control signal during a second state of circuit operation to cause both switching transistors to be simultaneously OFF for a period of time if a sensed condition of the regulator indicates that the current supplied to the load falls below a threshold fraction of maximum rated output current for the regulator, whereby operating efficiency of the regulator at low output current levels is improved.

5,481,179

### VOLTAGE REFERENCE CIRCUIT WITH A COMMON GATE OUTPUT STAGE

Brent Keeth, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

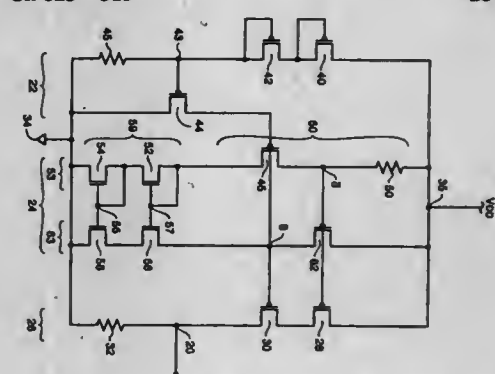
Continuation of Ser. No. 137,679, Oct. 14, 1993, abandoned.

This application Nov. 17, 1994, Ser. No. 342,392

Int. Cl.<sup>6</sup> G05F 3/26

U.S. Cl. 323-315

28 Claims



1. An integrated circuit for generating an output voltage, the circuit comprising:

- a current mirror comprising a reference node and a mirrored node, wherein during operation current through the reference node is equal to current through the mirrored node;
- biasing means for establishing a current through the reference node;
- a first regulator for regulating current through the mirrored node, the first regulator comprising a first control terminal coupled to the reference node; and
- an output stage for regulating an output current so that the output voltage is generated across a load resistor when the output current passes therethrough, the output stage comprising:
  - a second regulator for regulating the output current, the second regulator comprising a second control terminal coupled to the reference node; and
  - a third regulator in series with the second regulator for regulating the output current, the third regulator comprising a third control terminal coupled to the mirrored node.



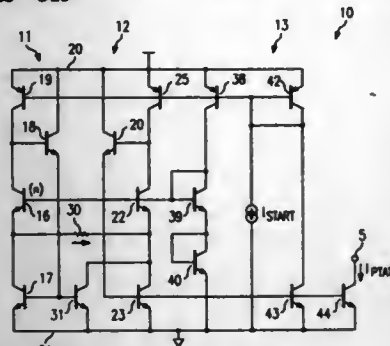
5,481,180

## PTAT CURRENT SOURCE

Marc H. Ryat, Santa Clara, Calif., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.  
Continuation-in-part of Ser. No. 70,276, Jun. 1, 1993, and a continuation-in-part of Ser. No. 70,274, Jun. 1, 1993, and a continuation-in-part of Ser. No. 31,647, Mar. 15, 1993, and a continuation-in-part of Ser. No. 950,091, Sep. 23, 1992, abandoned. This application Aug. 27, 1993, Ser. No. 112,807  
Claims priority, application France, Sep. 30, 1991, 91 12278; European Pat. Off., Sep. 28, 1992, 92420333  
Int. Cl.<sup>6</sup> G05F 3/26

U.S. Cl. 323-315

25 Claims



## 1. A PTAT current source, comprising:

first and second half cascode current mirror circuits, connected to produce a difference in a base-emitter voltage drop of a first cascode transistor of said first half cascode mirror circuit from a base-emitter voltage drop across a second cascode transistor of said second half cascode mirror circuit is produced that is a function of a thermal voltage times a logarithm of a size ratio between emitter areas of said first and second cascode transistors that is converted into a current in said second half cascode mirror circuit;

an output circuit, connected to said second mirror circuit to provide an output current that is mirrored from a current in an output transistor of said second half cascode current mirror circuit.

5,481,181

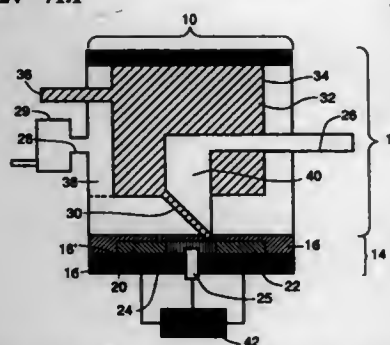
## REAL-TIME TOXIC METALS MONITOR DEVICE AND METHOD

John McHardy, Westlake Village; Carl W. Townsend, Los Angeles, and Clifford A. Megerle, Thousand Oaks, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 1, 1994, Ser. No. 283,457  
Int. Cl.<sup>6</sup> G01N 27/42

U.S. Cl. 324-71.1

19 Claims



1. A device for monitoring the concentration of toxic metals in workplace air, comprising a monitor cell comprising a base and a removable assembly, wherein

(a) said removable assembly comprises (1) a flat, electrically insulating substrate having a first surface, (2) an electrolyte cell having an anode and a cathode disposed on said first

surface, said anode and cathode spaced apart to define a controlled volume for holding a quantity of an electrolyte, and (3) means for applying a controlled electrical potential to said cathode of said electrolyte cell; and

(b) said base comprises (1) an air inlet portion for sampling air, (2) an air outlet portion connected to an air sampling pump, (3) a channel connecting said air inlet and said air outlet and adapted to introduce said air to said electrolyte, (4) a reservoir for storing said electrolyte for said electrolyte cell, (5) wick means for supplying said electrolyte from said reservoir to said electrolyte cell and (6) wick means for providing contact between said air and said electrolyte in said channel whereby said toxic metals dissolve in said electrolyte.

5,481,182

## UP/DOWN SPECTRUM SCALING OF SIGNALS

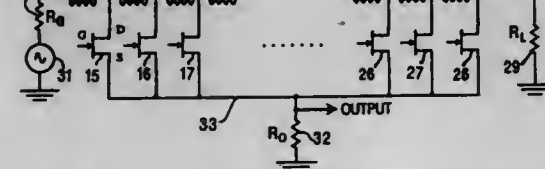
Gopalkrishna G. Nadkarni, 2962 Beltline Rd., #1310, Garland, Tex. 75044, and Lingappa K. Mestha, 417 Flameleaf La., Cedar Hill, Tex. 75104

Filed Dec. 30, 1993, Ser. No. 175,796

Int. Cl.<sup>6</sup> G01R 23/175

U.S. Cl. 324-76.24

3 Claims



1. A method of processing a signal for spectral scaling thereof, comprising the steps of:  
dynamically propagating a source signal down a line with a defined velocity;  
effectively moving a sampling device along the line at a velocity that is different from the propagation velocity of the source signal, thereby producing a Doppler effect;  
obtaining sample data from the line, said sample data having characteristics representative of the source signal, and coupling the sample data to an output, whereby spectral scaling of the source signal is achieved.

5,481,183

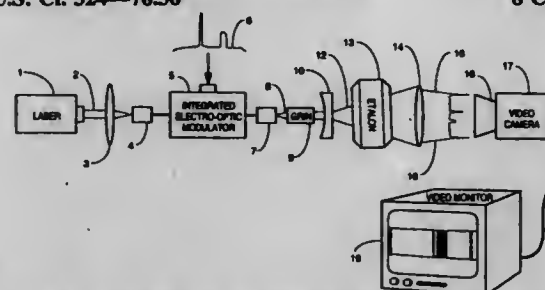
## ELECTRO-OPTIC SPECTRUM ANALYZER

Paul A. Johnson, 10467 Hawley Rd., El Cajon, Calif. 92021; Ri-Chee Chon, 10525 Earthstar Ct., San Diego, Calif. 92127; Chris A. Martin, 8949 Lombard Pl. #426, San Diego, Calif. 92122; Brett Spivey, 131 Seeman Dr., Encinitas, Calif. 92024, and John Lovberg, 5771 Lodi St., San Diego, Calif. 92117  
Continuation of Ser. No. 60,659, May 13, 1993, abandoned.  
This application Apr. 19, 1995, Ser. No. 425,135

Int. Cl.<sup>6</sup> G01R 23/17

U.S. Cl. 324-76.36

8 Claims



1. A spectrum analyzer for analyzing the spectrum of an electromagnetic signal containing one or more signal frequencies within a range of high frequency radio and microwave frequencies comprising:

5,481,185

## SOLENOID, TYPE VOLTAGE, POLARITY AND CONTINUITY TESTER

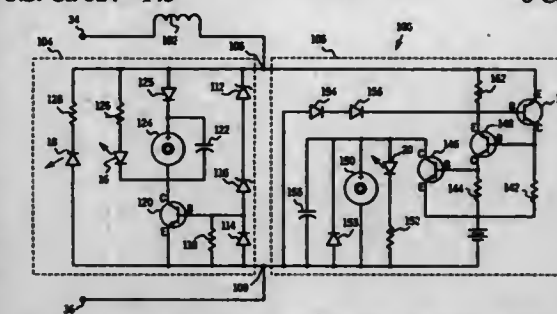
Peter B. Lane, Thiensville, and William M. Hinz, Twin Lakes, both of Wis., assignors to GB Electrical Inc., Milwaukee, Wis.

Filed Dec. 5, 1994, Ser. No. 349,711

Int. Cl.<sup>6</sup> G01R 19/00

U.S. Cl. 324-145

8 Claims



1. A solenoid type voltage, polarity and continuity tester, comprising:

a housing;  
a voltage meter in said housing, said meter having a solenoid and an indicator which is visible by a user of said tester;  
a negative polarity indicator in said housing, said indicator being visible to a user of said tester;  
a positive polarity indicator in said housing, said indicator being visible to a user of said tester;  
a continuity indicator in said housing, said indicator being visible to a user of said tester;  
a pair of test probes;  
a pair of terminals, each of said terminals being for connection to a separate one of said test probes;  
a polarity indication circuit for discriminately energizing said polarity indicators in response to a voltage applied across said probes; and  
a continuity indication circuit for energizing said continuity indicator in response to said probes being placed in electrical contact with one another;  
wherein said solenoid, said polarity indication circuit and said continuity indication circuit are connected between said terminals so that said continuity indication circuit does not energize said continuity indicator unless said solenoid has continuity.

5,481,184

## MOVEMENT ACTUATOR/SENSOR SYSTEMS

Stephen C. Jacobsen, Salt Lake City, Utah, assignor to Sarcos Group, Salt Lake City, Utah

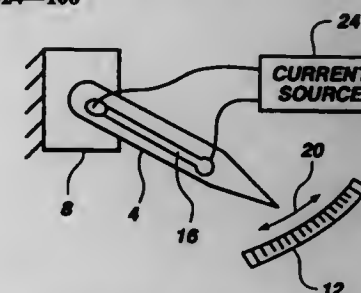
Continuation-in-part of Ser. No. 816,628, Dec. 31, 1991, Pat. No. 5,269,882. This application Jun. 12, 1992, Ser. No.

898,216

Int. Cl.<sup>6</sup> H02M 7/00

U.S. Cl. 324-106

6 Claims



1. A movement actuator comprising  
elongate element means made of a flexible material,  
a piece of actuatable material disposed on a surface of a side of the elongate element means, said actuatable material being responsive to an actuation signal for changing its shape to thereby cause the elongate element means to move to accommodate the change in shape of the piece of actuatable material in proportion to actuation signal strength, thereby quantitatively indicating the actuation signal strength by a measure of elongate element means deformation, and  
means for selectively applying actuation signals to the piece of actuatable material.

5,481,186

## METHOD AND APPARATUS FOR INTEGRATED TESTING OF A SYSTEM CONTAINING DIGITAL AND RADIO FREQUENCY CIRCUITS

Michael S. Heutmaker, Trenton; Madhuri Jarwala, Lawrenceville, both of N.J., and Duy K. Le, Levittown, Pa., assignors to AT&T Corp., Murray Hill, N.J.

Filed Oct. 3, 1994, Ser. No. 317,070

Int. Cl.<sup>6</sup> G01R 35/00

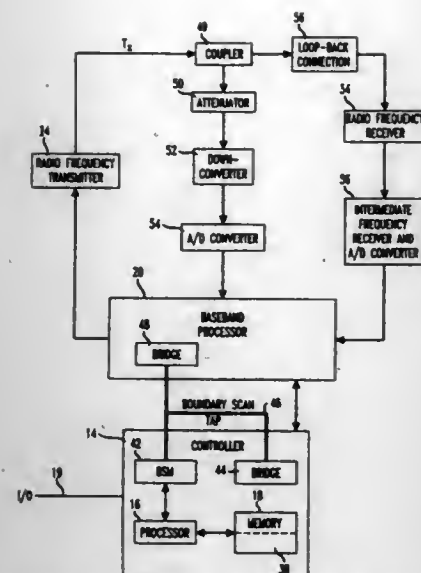
U.S. Cl. 324-158.1

8 Claims

1. A method for testing a digital RF system that includes a digital controller, a base-band processor, an RF transmitter and an RF receiver, the method comprising the steps of:

(a) testing the digital controller and the base-band processor by a digital structural test technique;  
(b) down-loading at least one test pattern from the digital controller to the base-band processor;  
(c) applying the test pattern to the RF transmitter to cause the transmitter to transmit at least one RF signal;  
(d) converting the RF signal transmitted by the transmitter into a first digital signal stream for receipt by the base-band processor;  
(e) processing the first digital signal stream at the base-band processor to verify the operation of the RF transmitter;  
(f) receiving, at the receiver, the transmitted RF signal;





- (g) conveying the RF signal received by the receiver into a second digital signal stream; and  
(h) processing the second digital signal stream at the base-band processor to verify the operation of the receiver.

5,481,187

# METHOD AND APPARATUS FOR DETERMINING THE POSITION OF AN ARMATURE IN AN ELECTROMAGNETIC ACTUATOR

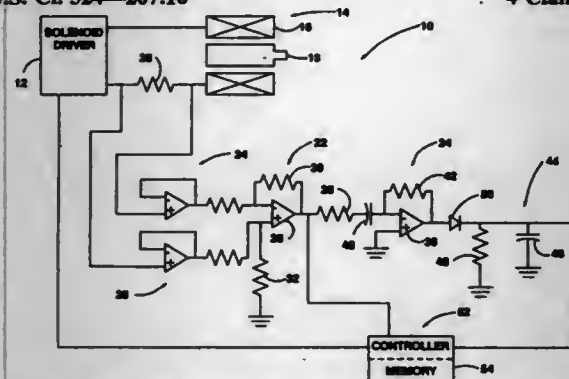
Tony L. Marcott, Matthew G. Branch, and Andrew H. Nippert, all of Peoria, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Nov. 29, 1991, Ser. No. 800,815

Int. Cl.<sup>6</sup> G01B 7/14; G01R 27/26

U.S. Cl. 324-207.16

4 Claims



1. An apparatus for determining the position of an armature of an electromagnetic actuator having a coil, the armature being movable to and between first and second positions in response to a current flowing in the coil, comprising:

means for measuring the magnitude of current in the coil and producing a magnitude signal;  
means for measuring the rate of change of current in the coil and producing a rate of change signal;  
means for receiving the rate of change signal, measuring the peak magnitude of the rate of change signal and producing a peak value signal; and  
means for determining the position of the armature with respect to the coil in response to the magnitude and peak value signals.

5,481,188

# METHOD AND APPARATUS FOR DETECTING THE MOVEMENT OF AN OBJECT WITH A MICRO MACHINE THAT RESPONDS TO A CHANGE IN MAGNETIC FLUX ASSOCIATED WITH THE OBJECT

Takao Mizutani, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

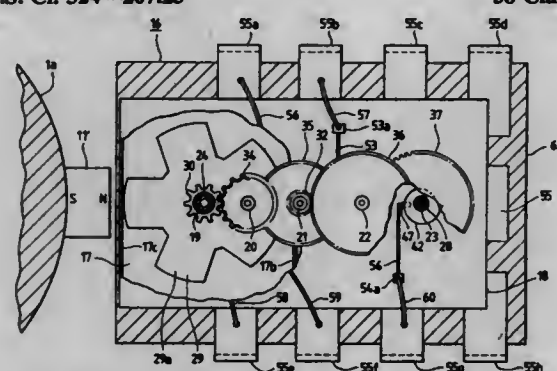
Filed Mar. 2, 1993, Ser. No. 24,772

Claims priority, application Japan, Mar. 2, 1993, 4-044736

Int. Cl.<sup>6</sup> G01B 7/14; G01D 5/00

U.S. Cl. 324-207.25

58 Claims



2. An apparatus for detecting a displacement of an object comprising:

magnetic flux generating means mounted on said object for generating a magnetic flux which changes as a displacement of said object changes, wherein said magnetic flux generating means moves as said object is displaced;

a micro machine which has a plurality of mechanical components and which is disposed proximate to said magnetic flux generating means, wherein at least one of said mechanical components moves to a certain position when said magnetic flux changes and wherein said certain position of said at least one of said mechanical components corresponds to said displacement of said object; and

displacement calculating means for calculating said displacement of said object based upon signals from said micro machine wherein said signals correspond to said certain position of said at least one of said mechanical components of said micro machine.

5,481,189

# ELECTRON TUNNELING MAGNETIC FIELD SENSOR WITH CONSTANT TUNNELING CURRENT MAINTAINED BETWEEN TUNNELING TIP AND ROTATABLE MAGNET

Daniel DiLella, Lorton, and Richard J. Colton, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 7, 1994, Ser. No. 193,690

Int. Cl.<sup>6</sup> G01R 33/02

U.S. Cl. 324-259

19 Claims

1. An electron tunneling magnetic device for sensing rotation of a magnet due to a change in the surrounding magnetic field comprising:

a magnet mounted on a support for rotation thereabout;  
a tunneling tip electrically biased with respect to and being in close proximity to said magnet creating a gap between said tip and said magnet such that a measurable tunneling current is established; and  
means for maintaining an essentially constant tunneling current between said tip and said magnet.

5,481,191

# SHIELDED GRADIENT COIL FOR NUCLEAR MAGNETIC RESONANCE IMAGING

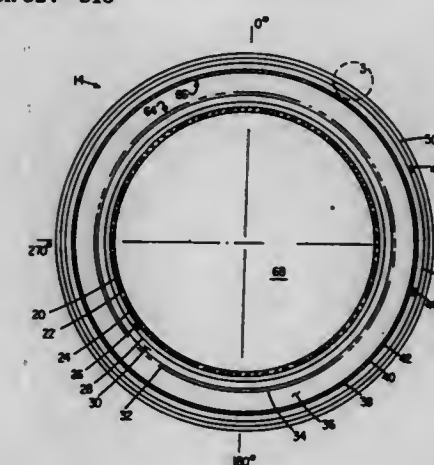
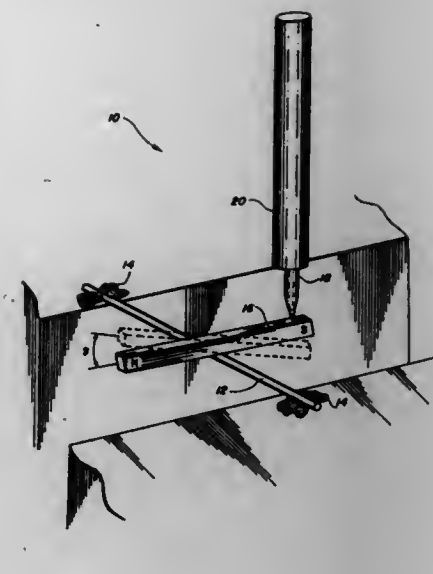
Richard Rzedzian, Lexington, Mass., assignor to Advanced NMR Systems, Inc., Wilmington, Mass.

Continuation of Ser. No. 133,733, Oct. 17, 1993, abandoned, which is a continuation of Ser. No. 921,411, Jul. 23, 1992, abandoned, which is a continuation of Ser. No. 545,888, Jun. 29, 1990, abandoned. This application May 13, 1994, Ser. No. 242,706

Int. Cl.<sup>6</sup> G01V 3/00

U.S. Cl. 324-318

1 Claim



5,481,190

# MRI AUTO POWER CONTROL METHOD AND SYSTEM

Satoshi Suglura, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

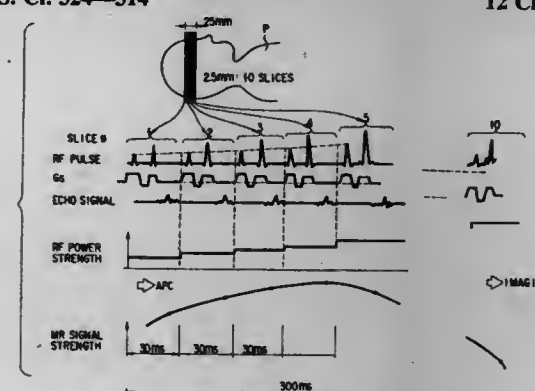
Continuation-in-part of Ser. No. 914,797, Jul. 16, 1992, abandoned. This application Dec. 12, 1994, Ser. No. 354,473

Claims priority, application Japan, Jul. 19, 1991, 3-179850

Int. Cl.<sup>6</sup> G01V 3/00

U.S. Cl. 324-314

12 Claims



1. An MRI automatic power control method for imaging a plurality of regions of a subject under examination, comprising:

a first step of exciting each of the plurality of regions of the subject under examination that are close to one another in sequence with excitation radio-frequency pulses of different powers to excite the plurality of regions before passing relaxation time (longitudinal relaxation time)  $T_1$  of the regions;  
a second step of acquiring magnetic resonance signals from said plurality of regions excited by said first step;  
a third step of identifying a maximum magnetic resonance signal contained in said magnetic resonance signals acquired by said second step from said plurality of regions of said subject; and  
a fourth step of storing the power of an excitation radio-frequency pulse that has provided said maximum magnetic resonance signal identified by said third step as the optimum power of said excitation radio-frequency pulses.

1. A method of manufacturing a gradient coil assembly for use in magnetic resonance imaging, said method comprising

providing a primary coil assembly manufactured by placing a primary coil about a first generally cylindrical surface of a first substrate, said primary coil generating a first magnetomotive force and a spatially varying magnetic field in a region radially inside said first surface when driven with a first pulsed current signal;

positioning a secondary coil assembly radially outside said first coil assembly, said secondary coil assembly being manufactured by placing a shielding coil for said primary coil about a second generally cylindrical surface of a second substrate;

aligning said primary and secondary coil assemblies so that said second surface is substantially coaxial with said first surface, and so that said shielding coil generates a second magnetomotive force in a direction substantially opposed to said first magnetomotive force and thereby substantially cancels said magnetic field in a region radially outside said second surface when driven with a second pulsed current signal that is substantially 180° out-of-phase with respect to said first pulsed current signal;

introducing a curable compound into the annular region between said first and said second substrates to substantially fill said annular region; and

curing said compound, said compound being sufficiently stiff and/or massive when cured to mechanically couple said first and said second substrates to substantially cancel said first and said second magnetomotive forces.



35,481,192

**MAGNETIC RESONANCE APPARATUS WITH NOISE CANCELLATION**

Antoon F. Mehlkopf, and Cornelis L. G. Ham, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 10, 1993, Ser. No. 150,655

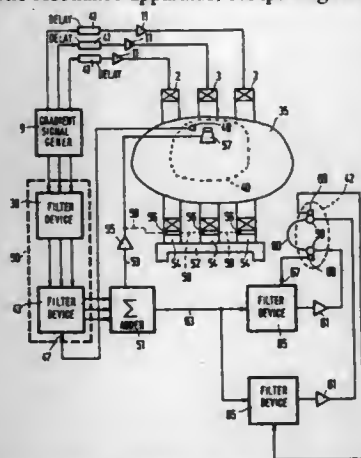
Claims priority, application European Pat. Off., Nov. 10, 1992, 92203435

Int. Cl.<sup>6</sup> G01V 3/00

U.S. Cl. 324—318

20 Claims

1. A magnetic resonance apparatus, comprising a magnet system



for generating a steady magnetic field in a measuring space, a gradient coil system for generating gradient fields in the measuring space, a power supply source for the gradient coils which comprises at least a gradient signal generator and a number of gradient amplifiers, each of which is connected between an output of the gradient signal generator and at least one of the gradient coils, and also a noise cancellation device for generating a compensating sound signal which is, in at least one region which is referred to as a region of silence, in phase opposition with a sound signal generated by the gradient coils in the region of silence, which noise cancellation device comprises means for deriving said compensating sound signal at least partly from said gradient signal generator.

5,481,193

**REAL-TIME COMPUTERIZED ENGINE ANALYZER USING MULTIPLE ANALOG-TO-DIGITAL CONVERSION SYSTEM**

Steve Mueller, Big Bend; Scott Meyers, West Allis; Chris Lambach, Milwaukee; Glenn Stern, West Bend; Joseph Cochenet, Sussex; John T. Werth, III, Waukesha; Carlos E. Rodriguez, Milwaukee; John N. Wozniak, Waukesha; John Hintz; Richard W. Hansen, both of New Berlin, and Steve Trotter, Oconomowoc, all of Wis., assignors to SPX Corporation, Muskegon, Mich.

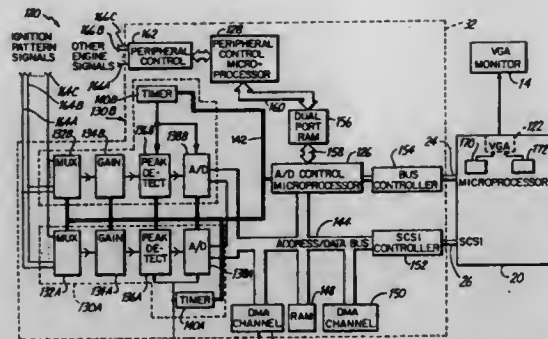
Filed Feb. 3, 1992, Ser. No. 829,399

Int. Cl.<sup>6</sup> F02P 17/00; G06F 15/20; 19/00; G06G 7/70

U.S. Cl. 324—379

29 Claims

1. An apparatus for monitoring waveforms of an internal combustion engine, comprising:  
means for providing a periodic analog input waveform representative of operation of the internal combustion engine;  
first analog-to-digital converter means for converting the periodic analog waveform into a first digital signal representative of periodically sampled values of the periodic analog waveform sampled during a first portion of a sample period;  
second analog-to-digital converter means for converting the periodic analog waveform into a second digital signal representative of periodically sampled values of the periodic analog waveform sampled during a second portion of the sample period different than the first portion, wherein sampled values



carried in the first digital signal are taken at different times than sampled values carried in the second digital signal; and means for storing the first digital signal and the second digital signal.

5,481,194

**FAULT DETECTION CIRCUIT FOR SENSING LEAKAGE CURRENTS BETWEEN POWER SOURCE AND CHASSIS**

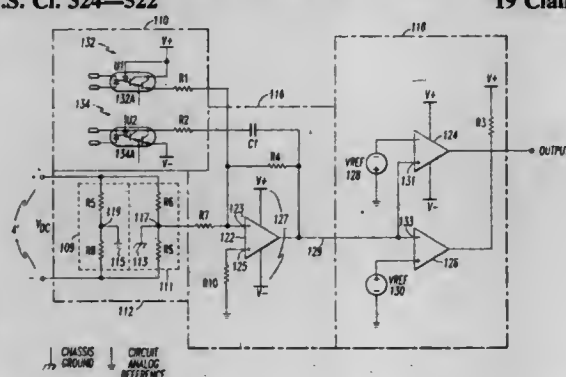
David L. Schantz, Ellicott City, and James L. Munro, Severna Park, both of Md., assignors to Westinghouse Electric Corp., Baltimore, Md.

Filed Jun. 10, 1994, Ser. No. 258,179

Int. Cl.<sup>6</sup> G01R 31/02

U.S. Cl. 324—522

19 Claims



1. An electric vehicle fault detection circuit for detecting leakage currents between a DC power source and a chassis of the vehicle, comprising:

- a voltage sensor receiving voltages from the DC power source, said voltage sensor being connected to an analog reference and a chassis ground, said voltage sensor outputting a sensed analog reference signal and a sensed chassis ground signal;
- a differential amplifier receiving said sensed analog reference signal and said sensed chassis ground signal from said voltage sensor, said differential amplifier detecting variations of said chassis ground signal from said analog reference signal and outputting a difference signal; and
- a voltage comparator unit receiving said difference signal, for determining whether a magnitude of said difference signal output from said differential amplifier exceeds a predetermined threshold value.

5,481,195

**METHOD FOR FINDING A FAULT ON AN ELECTRICAL TRANSMISSION LINE**

Stephan Meyer, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 19, 1994, Ser. No. 356,184

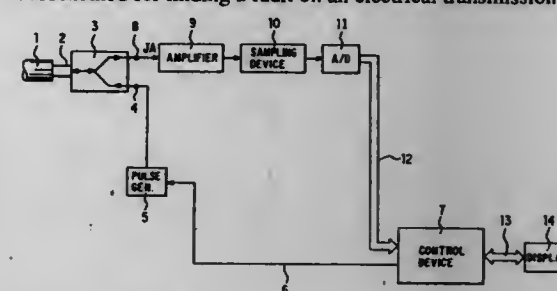
Claims priority, application Germany, Jun. 19, 1992, 42 20 410.0

Int. Cl.<sup>6</sup> G01R 31/11

U.S. Cl. 324—534

9 Claims

1. A method for finding a fault on an electrical transmission line,



comprising the steps of:

- a) applying a pulse to one end of the transmission line
- b) detecting a reflected signal at said one end;
- c) determining a plurality of line pulse responses (J1, J2, J3) for different line lengths of a line of a similar type as said transmission line;
- d) storing said plurality of line pulse responses (J1, J2, J3);
- e) calculating, when a direct pulse is applied to the transmission line, the correlation coefficient ( $r_1, r_2, r_3$ ) from sections of the detected pulse response (JA) of the transmission line as the reflected signal and from said stored line pulse responses (J1, J2, J3), which in each case correspond to the sections in time, of the line of the similar type;
- f) forming a computation variable ( $V_{xy,1}$ ) as a function of the quotient of a value ( $X_i$ ) from a corresponding section of the pulse response (JA) of the transmission line and a value ( $Y_i$ ) which corresponds in time, of the plurality of line pulse responses (J1, J2, J3) of the line of the similar type;
- g) determining from the computation variable ( $V_{xy,1}$ ) the reflection factor ( $R(t)$ ) by multiplication by the corresponding correlation coefficient ( $r_{j1}$ ); and
- h) calculating a value ( $R_{ab}(t)$ ) of the resistance at the point of the fault using the reflecting factor ( $R(t)$ ) in accordance with the relationship

$$R_{ab}(t) = \frac{1}{2} \times Z \times \left( \frac{1}{R(t)} + 1 \right)$$

wherein Z designates the characteristic impedance of the telecommunications transmission line.

5,481,196

**PROCESS AND APPARATUS FOR MICROWAVE DIAGNOSTICS AND THERAPY**

Eugene Nosov, Omaha, Nebr., assignor to Nebraska Electronics, Inc., Omaha, Nebr.

Filed Nov. 8, 1994, Ser. No. 336,392

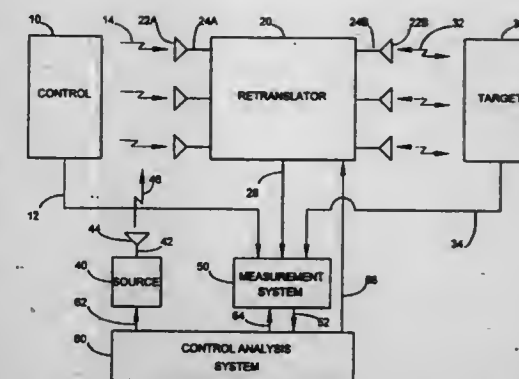
Int. Cl.<sup>6</sup> G01R 23/16

U.S. Cl. 324—637

8 Claims

1. A process for receiving, analyzing, generating and transmitting microwave spectra comprising:

- (a) receiving a first microwave spectrum from selected biologically active points of a first living organism;
- (b) receiving a second microwave spectrum from selected biologically active points of a second living organism;
- (c) comparing the first and second microwave spectra of the first and second living organisms;



- (d) selecting all spectral characteristics received from the first organism which differ from those spectral characteristics received from the second organism;
- (e) generating a third microwave spectrum identical to that received from the first organism and not received from the second organism;
- (f) transmitting said third microwave spectrum to selected biologically active points of the second organism; and
- (g) continuously monitoring biophysical information from the first and second organisms.

5,481,197

**HIGH PRESSURE, LEAK RESISTANT EXPLOSIONPROOF CAPACITANCE PROBE**

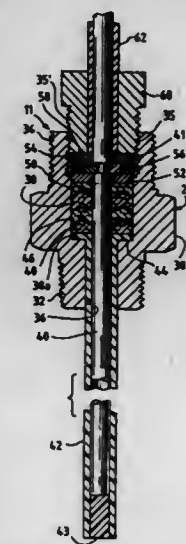
Gary G. Sanders, Rock Falls; Brian C. Gorge, Moline, and Burt L. Beach, Prophetstown, all of Ill., assignors to Penberthy, Inc., Prophetstown, Ill.

Filed Sep. 17, 1993, Ser. No. 122,849

Int. Cl.<sup>6</sup> G01F 23/26

U.S. Cl. 324—690

19 Claims



1. A capacitance probe for use in a vessel, wherein the wall of the vessel is used as one plate of a coaxial capacitor, comprising:  
a mounting gland having a longitudinal bore extending through, said longitudinal bore having a nominal diameter and an enlarged portion, the enlarged portion defining a stuffing box and a stuffing box bottom;
- a metallic center rod used as a center plate of the coaxial capacitor, said center rod extending through the bore of said mounting gland;
- an insulating sheath surrounding a lower portion of said center rod, said insulating sheath having a flanged end that forms an angle of about 90° with the remainder of the insulating sheath, said flanged end extending into said stuffing box;



sealing means for sealing the stuffing box between the center rod and the mounting gland and for electrically insulating the center rod from the mounting gland; and means for preventing longitudinal movement of said center rod relative to said mounting gland.

5,481,198

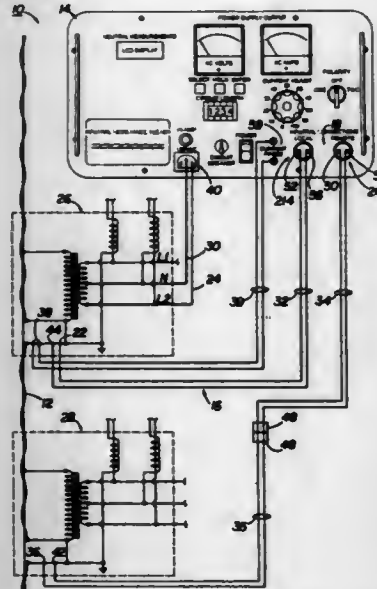
# METHOD AND DEVICE FOR MEASURING CORROSION ON A PORTION OF A METALLIC PATH CARRYING AN UNDETERMINED LOAD CURRENT

Shashikant G. Patel, Atlanta, Ga., assignor to The Georgia Power Company, Atlanta, Ga.

Filed Aug. 26, 1994, Ser. No. 296,497

Int. Cl.<sup>6</sup> G01N 27/04; G01R 31/02

U.S. Cl. 324-700



1. A method of determining whether a portion of a metallic path under test carrying an undetermined load current is so corroded as to require replacement, comprising:

- applying a pre-determined alternating test current to the portion of the metallic path under test between two selected points separated by a known length, said two selected points being chosen so that they are disposed on the portion of the metallic path under test;
- measuring a total current with a current sensing probe applied to the portion of the metallic path under test said total current being equal to the sum of the undetermined load current and the test current passing through the metallic path under test;
- measuring a voltage between the two selected points on the metallic path under test;
- calculating the resistance of the portion of the metallic path under test between the two selected points from the values of the total current and the voltage; and
- correlating the resistance of the portion of the metallic path under test between the two selected points to the resistance of metallic paths of known corrosion to determine the degree of corrosion on the metallic path under test.

5,481,199

# SYSTEM FOR IMPROVING MEASUREMENT ACCURACY OF TRANSDUCER BY MEASURING TRANSDUCER TEMPERATURE AND RESISTANCE CHANGE USING THERMOELECTRIC VOLTAGES

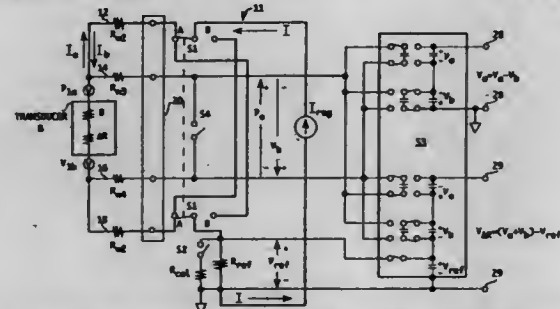
Karl F. Anderson, 43634 N. Gadsden, and Allen R. Parker, 815 W. Ave. L, both of Lancaster, Calif. 93534

Filed Sep. 24, 1993, Ser. No. 125,888

Int. Cl.<sup>6</sup> G01R 27/02; 1/22

U.S. Cl. 324-705

30 Claims



24 Claims

1. A constant current loop measuring system measuring a property including a temperature of a sensor responsive to an external condition being measured, comprising: thermocouple conductors connected to the sensor, sensing first and second induced voltages responsive to the external condition; current generating and reversing means for generating a constant current, and for supplying said constant current to said thermocouple conductors in forward and reverse directions generating first and second measured voltages, each of said first and second measured voltages including said first and second induced voltages; and determining means for receiving said first and second measured voltages from said current generating and reversing means, and for determining the temperature of the sensor responsive to said first and second measured voltages.

5,481,200

# FIELD TRANSMITTER BUILT-IN TEST EQUIPMENT

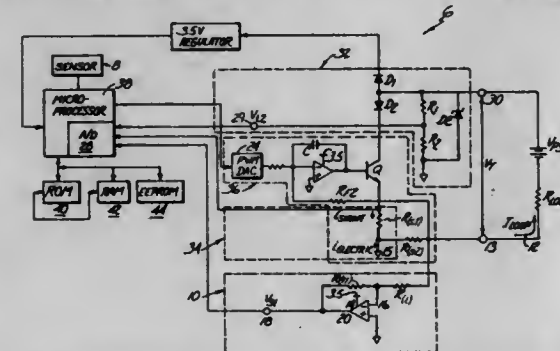
Kevin D. Voegelé, Shakopee; Jane B. Lancot, Minneapolis, and Brian L. Westfield, Victoria, all of Minn., assignors to Rosemont Inc., Eden Prairie, Minn.

Filed Sep. 15, 1993, Ser. No. 121,064

Int. Cl.<sup>6</sup> G01R 27/08

U.S. Cl. 324-718

8 Claims



1. A measurement transmitter coupling to a two-wire process control loop, comprising: two terminals for coupling to the two-wire process control loop; a sensor for sensing a process variable; circuitry for transmitting the process variable over the two-wire loop; current setting circuitry for setting a current through the two-wire loop to a first current level and to a second current level; voltage sense circuitry providing a sensed voltage output related to a sensed voltage potential between the two terminals; and

a microprocessor coupled to the voltage sense circuitry and the current setting circuitry for calculating loop resistance of the two-wire current loop based upon a difference between the first and second current levels and a first voltage potential sensed at the first current level and a second voltage potential sensed at the second current level.

5,481,201

# CIRCUIT FOR GENERATING A CURRENT LINEARLY PROPORTIONAL TO DISPLACEMENT OF A MOVABLE MEMBER

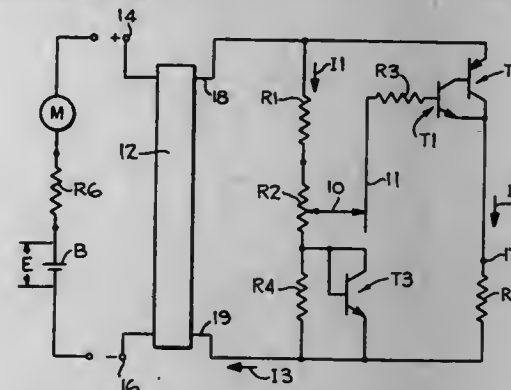
John Dimeff, 5346 Greenside Dr., San Jose, Calif. 95127

Filed Apr. 8, 1993, Ser. No. 44,020

Int. Cl.<sup>6</sup> G01B 7/18

U.S. Cl. 324-720

19 Claims



1. A circuit for receiving a supply voltage from a remote monitoring device having a particular internal resistance and for presenting a resistance to said monitoring device to cause a current to be delivered thereto that is linearly proportional to displacement of a movable member from an initial unstimulated position, said circuit comprising a pair of terminals for receiving said supply voltage: an elongate resistive element having a pair of opposed ends and being comprised of a thin layer of conductive material extending in the direction of movement of said movable member said element being connected at a first end thereof with the first one of the terminals and at the second end thereof with the second one of said terminals; a contactor including means for fixedly connecting it to said movable member for movement therewith and having a first segment arranged for sliding contact with said resistive element; a fixed conductive member said contactor having a second segment arranged for sliding contact with said fixed conductive member; a transistor connected between said conductive member and said first terminal with the base of the transistor being connected to the conductive member and the current input of the transistor being connected to the first terminal; and a resistor connected between the current output of the transistor and said second terminal whereby movement of said movable member from its unstimulated position will cause a current to flow between said terminals which is linearly proportional to the amount of movement of said movable member and the contactor carried thereby.

5,481,202

# OPTICAL SCAN AND ALIGNMENT OF DEVICES UNDER TEST

Ronald E. Frye, Jr., Newman, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

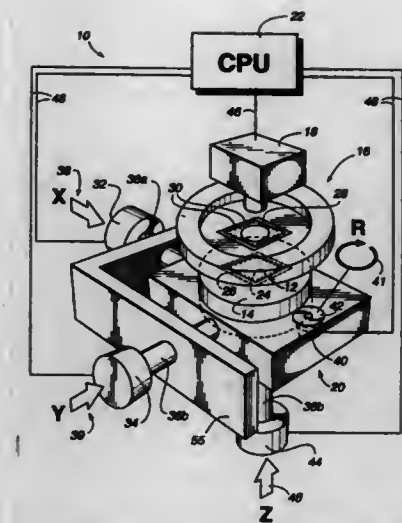
Filed Jun. 17, 1993, Ser. No. 79,180

Int. Cl.<sup>6</sup> G01R 31/01

U.S. Cl. 324-754

28 Claims

1. An apparatus for testing a device under test (DUT), the apparatus comprising: an integrated circuit test head including a probe card having a plurality of electrical leads;



- a DUT nest for receiving and holding a DUT, said DUT being an integrated circuit chip having a plurality of electrical leads extending therefrom;
- an image forming device aligned with said probe card for forming an image of said DUT and said probe card;
- a scanning controller coupled to said image forming device for controlling said image forming device to examine said plurality of electrical leads of said DUT for defects; and
- a displacement controller coupled to said DUT nest for controllably moving said DUT nest in a plane containing said DUT and along an axis perpendicular to said plane containing said DUT;

whereby said DUT may be moved so that each DUT electrical lead makes contact with a corresponding electrical lead of said probe card.

5,481,203

# ADAPTER FOR QUAD FLAT PACK FAILURE-ANALYSIS SOCKET

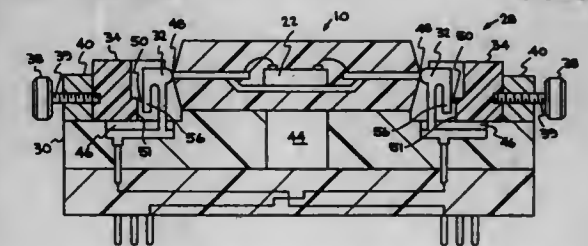
Brian M. Appold, Fremont, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Aug. 5, 1994, Ser. No. 286,563

Int. Cl.<sup>6</sup> G01R 1/06

U.S. Cl. 324-755

8 Claims



a test socket having a base on which is mounted and supported, in both a die-up or a die-down orientation, a cavity-down QFP integrated-circuit package having a die, with the package for the cavity-down QFP integrated-circuit being mounted to the test socket with the die up so that the die of the cavity-down QFP integrated-circuit package is positioned on the test socket to be exposed for probing and analysis, or alternatively, with the package for the cavity-down QFP integrated-circuit being mounted to the test socket with the die down so that the die of the cavity-down QFP integrated-circuit package is positioned on the test socket to be not exposed for probing and analysis;



said test socket having a plurality of resilient contact blades mounted to said base for engagement with a corresponding flush cutoff lead of the QFP package;

said test socket including a plurality of external test connection pins mounted in said base, wherein each of the external test connection pins is connected to respective ones of said contact blades when the cavity-down QFP integrated-circuit is mounted with the die up and wherein each of the external test connection pins is connected to other respective ones of said contact blades when the cavity-down QFP integrated-circuit is mounted with the die down;

means for unscrambling the connections between the external test connection pins of the test socket and a group of test input sockets of an automatic test equipment for testing integrated circuits so that a cavity-down QFP mounted mounted with the die down can be tested with the same test socket and test input socket configuration as the cavity-down QFP device mounted the die down.

5,481,204

#### CONNECTOR TERMINAL CHECKING DEVICE AND METHOD OF CHECKING CONNECTOR TERMINAL

Jiro Aikawa, Shizuoka, Japan, assignor to Yazaki Corporation, Japan

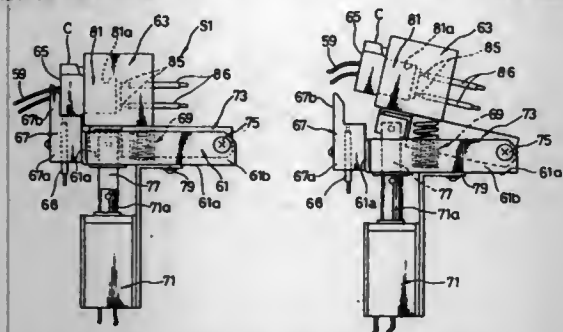
Filed Aug. 22, 1994, Ser. No. 293,803

Claims priority, application Japan, Aug. 20, 1993, 5-206334

Int. Cl.<sup>6</sup> G01R 31/04

U.S. Cl. 324-756

18 Claims



1. A connector terminal checking device comprising:

- a base;
- a conduction checking part supported by said base so as to rotate between a stand-by position where a connector having connector terminals is attached and detached and a conduction check position where the conductive condition of said connector terminals is checked, said conduction checking part being provided with pins for checking the conduction;
- an abutting part attached to said base so as to come into contact with a rear end of said connector mounted on said conduction checking part arranged in said conduction check position, wherein said abutting part comprises abutting portions which are constructed so as to come into contact with the rear end of said connector and which are provided on respective upper ends thereof with slants for facilitating the contact of said abutting part with the rear end of said connector;
- urging portion for urging said conduction checking part against said stand-by position; and
- holding portion for holding said conduction checking part in said conduction check position when checking the conduction of said connector terminals.

#### 5,481,205 TEMPORARY CONNECTIONS FOR FAST ELECTRICAL ACCESS TO ELECTRONIC DEVICES

Robert C. Frye, Piscataway; Maureen Y. Lau, Keyport, and King L. Tai, Berkeley Heights, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

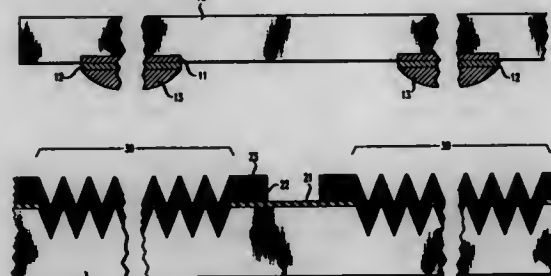
Continuation of Ser. No. 906,072, Jun. 29, 1992, abandoned.

This application Nov. 23, 1994, Ser. No. 344,393

Int. Cl.<sup>6</sup> G01R 1/06; H01L 23/48

U.S. Cl. 324-757

28 Claims



1. A method of temporarily electrically connecting together a plurality of mutually spaced-apart I/O terminals of a first device to a plurality of mutually spaced-apart I/O pads of a second device, the terminals being located on a major planar surface of the first device, comprising the steps of

- (a) providing the second device having the I/O pads including the steps of
  - providing a substrate initially having a planar top surface, wet etching into said top surface at each of a plurality of selected mutually spaced-apart portions thereof, each of which portion is located at areas defined by the I/O pads, the grooves having sufficiently small widths that a multiplicity of grooves are present within each of the areas, and forming a layer of substance overlying the top surface including the grooves, whereby an exposed top surface of each of the pads comprises the layer of substance having a corrugated exposed surface, the substance comprising either a metal whose oxide is electrically conducting or a non-oxidizable electrically conducting material;
- (b) pressing together the terminals and the pads into electrical contact; and
- (c) nondestructively pulling apart the terminals from the pads, whereby both the first and second devices remain intact.

5,481,206

#### CIRCUIT FOR FAST CARRY AND LOGIC

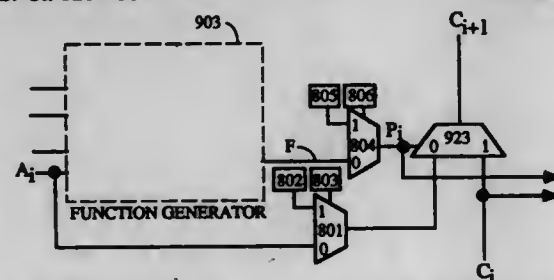
Bernard J. New, Los Gatos, Calif., and Kerry M. Pierce, Canby, Oreg., assignors to Xilinx, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 116,659, Sep. 2, 1993, Pat. No. 5,349,250. This application Sep. 20, 1994, Ser. No. 310,113

Int. Cl.<sup>6</sup> H03K 19/20

U.S. Cl. 326-38

2 Claims



1. A programmable logic device comprising an array of logic blocks, each logic block having at least one circuit comprising: an input terminal for providing a first input signal (A<sub>i</sub>); a ripple-in terminal (C<sub>i</sub>) and a ripple-out terminal (C<sub>i+1</sub>);

- a ripple-chain multiplexer (923) for connecting one of said input terminal and said ripple-in terminal to said ripple-out terminal;
- a lookup table (903) for generating a function of said first input signal and at least one other input signal; and
- a control multiplexer (804) for controlling said ripple-chain multiplexer, said control multiplexer being controlled to select from at least two input signals, one of said signals being provided by said lookup table.

5,481,207

#### HIGH SPEED, LOW POWER INPUT/OUTPUT CIRCUIT FOR A MULTI-CHIP MODULE

Harold S. Crafts, Colorado Springs, Colo., assignor to AT&T Global Information Solutions Company, Dayton, Ohio, and Hyundai Electronics America, Milpitas, Calif.

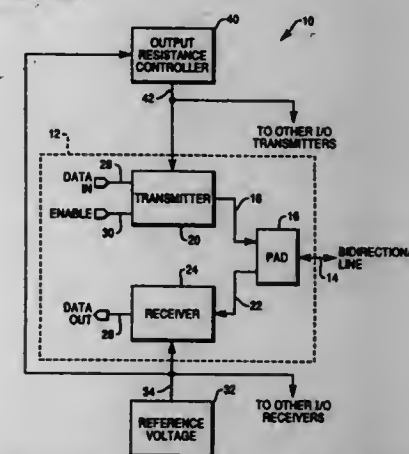
Continuation of Ser. No. 997,472, Mar. 18, 1993, abandoned.

This application Apr. 19, 1995, Ser. No. 427,916

Int. Cl.<sup>6</sup> H03K 17/16

U.S. Cl. 326-86

23 Claims



1. An input/output transceiver circuit for an integrated circuit, comprising:

- a pad located on an integrated circuit substrate;
  - a receiving circuit connected to said pad for receiving digital circuits inputted thereon; and
  - a transmitting circuit connected to said pad for transmitting digital signals to said pad;
- said transmitting circuit during data transmission has an output resistance that is controlled to a constant value.

5,481,208

#### PIECEWISELY-CONTROLLED TRI-STATE OUTPUT BUFFER

Yen-Tsai Huang, Chung-Li, Taiwan, Prov. of China, assignor to United Microelectronics Corp., Hsinchu, Taiwan, Prov. of China

Filed Oct. 28, 1993, Ser. No. 144,576

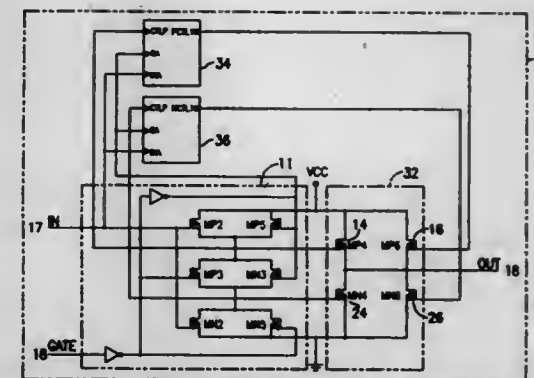
Int. Cl.<sup>6</sup> H03K 19/02

U.S. Cl. 326-87

3 Claims

1. A piecewisely-controlled tri-state output buffer comprising a signal buffer portion, an output falling-edge detector capable of generating a falling edge control signal at its output terminal, an output rising-edge detector capable of generating a rising-edge control signal at its output terminal, and a signal output portion; and said piecewisely-controlled tri-state output buffer being characterized in that:

- said output falling-edge detector and said output rising-edge detector each being connected to an input terminal of the piecewisely-controlled tri-state output buffer, said signal output portion includes one pair of PMOS transistors connected together in parallel and one pair of NMOS transistors con-



ected together in parallel, one of said pair of PMOS transistors having a structural width larger than that of another PMOS transistor, one of said pair of NMOS transistors having a structural width larger than that of another NMOS transistor, and the gate electrode of said one PMOS transistor being connected to the output terminal of said output rising-edge detector, the gate electrode of said one of said pair of PMOS transistors to be controlled by said rising-edge control signal generated by said rising-edge detector in response to a rising-edge of an input signal input at said input terminal into the signal buffer portion, while the gate electrode of said one NMOS transistor being connected to the output terminal of said output falling-edge detector, the gate electrode of said one of said pair of NMOS transistors to be controlled by said falling-edge control signal generated by said output falling-edge detector in response to a falling edge of the input signal input at said input terminal into the signal buffer portion.

5,481,209

#### CLOCK DISTRIBUTION AND CONTROL IN AN INTEGRATED CIRCUIT

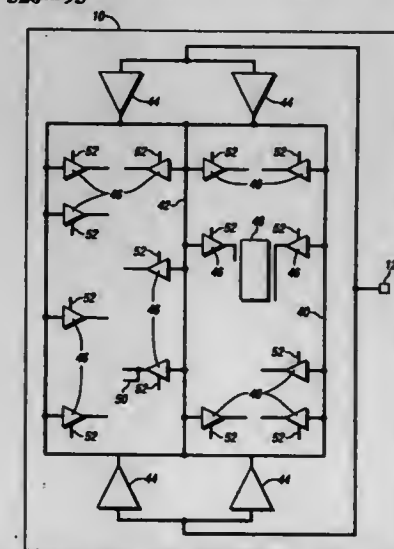
Raymond Lim, Tanja Chur, and Jen-Hsun Huang, all of San Jose, Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Sep. 20, 1993, Ser. No. 124,093

Int. Cl.<sup>6</sup> H03K 19/00; H01L 25/00

U.S. Cl. 326-93

5 Claims



4. An apparatus for reducing clock skew within an integrated circuit chip die by utilizing a clock signal distribution system having a plurality of signal tributaries, comprising:

- a plurality of integrated circuit chip die circuit loads requiring clock signals;
- a clock signal distribution ring substantially around the perimeter of the integrated circuit chip die;



- a clock signal distribution trunk bisecting said distribution ring and connected thereto;
- a plurality of clock signal distribution tributaries proximately connected to said distribution ring or said distribution trunk; and
- a plurality of clock signal buffers connected between said distribution tributaries and said distribution ring, or between said distribution tributaries and said distribution trunk, said plurality of clock signal buffers having clock inhibiting circuits for inhibiting a clock signal to a connected circuit load for reducing the power consumption of the integrated circuit.

5,481,210

# METHOD FOR CONTROLLING CLOCK FREQUENCY OF A DIGITAL LOGIC SEMICONDUCTOR ACCORDING TO TEMPERATURE

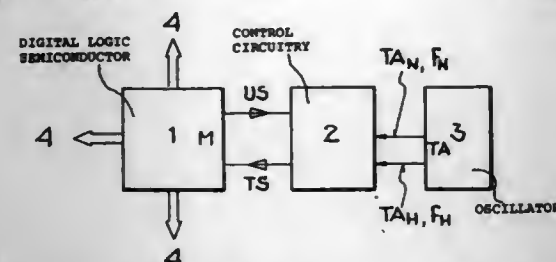
Michael Genzel, Rosstal, Germany, assignor to Temic Telefunken microelectronic GmbH, Heilbronn, Germany  
Filed Nov. 9, 1994, Ser. No. 338,747

Claims priority, application Germany, Nov. 26, 1993, 43 40 284.4

Int. Cl.<sup>6</sup> H03K 7/00; 19/00

U.S. Cl. 326—93

11 Claims



1. Method for operating a digital logic semiconductor component, where:

- depending on environmental temperature ( $T_c$ ), logic semiconductor component (1) may be operated in several operational modes M at respective fixed clock cycles,
- each operational mode (M) is allocated a respective clock cycle (TA) with a different clock frequency (f),
- each operational mode (M) is allocated a temperature dependent limit value and for each value a respective different limit temperature ( $T_c$ ), which when reached causes a change in the operational mode (M), and
- the clock frequency (f) is reduced when changing to an operational mode (M) with increased limit temperature ( $T_c$ ), and increased when changing to an operational mode (M) with lower limit temperature ( $T_c$ ).

5,481,211

# AUTOMATIC POLARITY SWITCHING OUTPUT CIRCUIT

Helmut Vietze; Bruno Weisshaupt, both of Frauenfeld, Switzerland; Robin J. Miller, Havant, United Kingdom, and Albrecht Schoy, San Jose, Calif., assignors to Baumer Electric AG, Frauenfeld, Switzerland

Continuation-in-part of Ser. No. 862,128, Apr. 2, 1992, abandoned, which is a continuation-in-part of Ser. No. 536,688, Jul. 10, 1990, abandoned. This application Jan. 21, 1994, Ser. No. 181,749

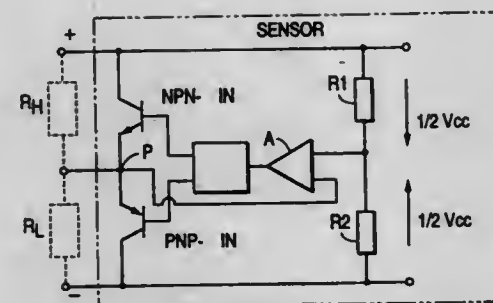
Claims priority, application Switzerland, Nov. 18, 1988, 4289/88

Int. Cl.<sup>6</sup> G01R 19/14

U.S. Cl. 327—29

11 Claims

6. An output circuit for supplying current to a load having a polarity in accordance with the polarity of the load, the output circuit having a common terminal and two differently poled terminals for connection of the load between the common terminal and one of the differently poled terminals, the output circuit comprising the combination of



nals for connection of the load between the common terminal and one of the differently poled terminals, the output circuit comprising the combination of

- first and second current sources of opposite polarities;
- means connected to the load for sensing the polarity of the load;
- storage means having two states, said storage means being connected to said sources so that only one of said sources is operatively connected to said load in each of the states during operation times of said output circuit; and
- means responsive to said means for sensing for setting the storage means to one of said states in accordance with the polarity of said load.

5,481,212

# SAMPLE-AND-HOLD CIRCUIT DEVICE

Takeshi Shima, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

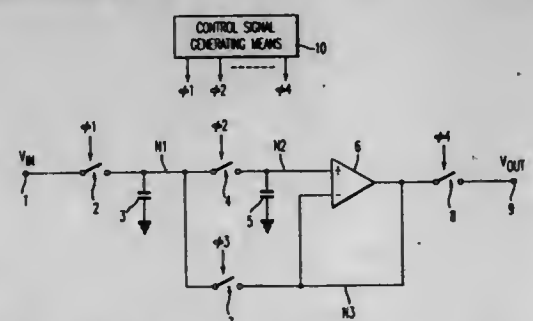
Filed Mar. 11, 1994, Ser. No. 208,812

Claims priority, application Japan, Mar. 12, 1993, 5-052039

Int. Cl.<sup>6</sup> G11C 27/02

U.S. Cl. 327—94

22 Claims



1. A sample-and-hold circuit device comprising:
  - an input terminal for receiving an input signal;
  - first switch means, responsive to a first control signal, for selectively coupling said input terminal and a first internal terminal;
  - second switch means, responsive to a second control signal, for selectively coupling said first internal terminal and a second internal terminal;
  - first potential holding means coupled between said second internal node and a reference potential terminal;
  - control signal generating means to generate said first and second control signals;
  - control signal generating means to generate said first and second control signals to close the first and second switch means to sample an input potential of the input signal in said first potential holding means as a holding potential, to generate said second control signal to open the second switch means to hold said holding potential in said first potential holding means, and to generate said first and second control signals to open the first switch means and close the second switch means to obtain said holding potential in said first potential holding means.

5,481,213

# CROSS-CONDUCTION PREVENTION CIRCUIT FOR POWER AMPLIFIER OUTPUT STAGE

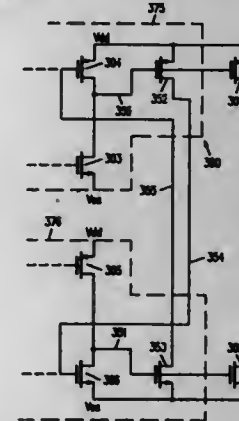
Nicky M. Johnson, Los Altos, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 17, 1993, Ser. No. 168,443

Int. Cl.<sup>6</sup> H03K 3/00; 17/16; G06G 7/12; H03F 3/45

U.S. Cl. 327—106

8 Claims



1. In an output circuit of an audio system, a circuit for controlling a high side power transistor and a low side power transistor, said circuit comprising:

- a low side control circuit, said low side control circuit receiving as input first and second input signals and providing as output first and second output signals, each of said input and output signals having an active state and an inactive state, wherein, when said first input signal is received in said active state, said low side control circuit provides (i) said first output signal in said active state to enable conduction in said low side power transistor, and (ii) said second output signal in said active state, and wherein, when said second input signal is received in said active state, said low side control circuit provides (i) said first output signal in said inactive state to disable conduction in said low side power transistor, and (ii) said second output signal in said inactive state; and
  - a high side control circuit, said high side control circuit receiving as input a third input signal and said second output signal of said low side control circuit, and providing as output a third output signal and said second input signal of said low side control circuit, wherein, when said third input signal is received in said active state, said high side control circuit provides (i) said third output signal in said active state to enable conduction in said high side power transistor and (ii) said second input signal of said low side control circuit in said active state, and wherein, when said second output signal is received in said active state, said high side control circuit provides (i) said third output signal in said inactive state to disable conduction in said high side power transistor and (ii) said second input signal of said low side control circuit in said inactive state;
- wherein said first output signal of said low side control circuit is coupled to a gate terminal of a transistor, said transistor being connected such that a drain terminal of said transistor provides as output said second output signal of said low side control circuit.

5,481,214

# VOLTAGE TO PULSE-WIDTH CONVERSION CIRCUIT

Takashi Tamaki, and Mitsuya Ohie, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1994, Ser. No. 277,063

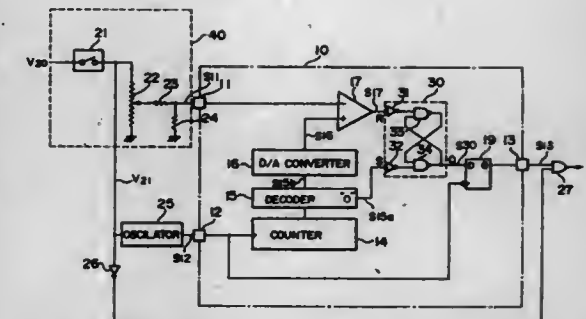
Claims priority, application Japan, Jul. 22, 1993, 5-181669

Int. Cl.<sup>6</sup> H03K 3/017

U.S. Cl. 327—172

14 Claims

1. A voltage to pulse-width conversion circuit comprising:



- a clock input terminal for receiving a clock signal having a reference frequency;
- a reference voltage input terminal for supplying a reference voltage;
- an output node for applying a pulse-width signal;
- a counter receiving the clock signal and producing a digital output signal having a multi-bit digital value corresponding to a count of cycles of the reference frequency;
- a decoder for decoding the multi-bit digital value of the digital output signal and outputting first and second decoded signals;
- a digital/analog converter for receiving the first and second decoded signals and producing an analog signal having an analog voltage corresponding to the first and second decoded signals;
- a comparator for comparing the reference voltage and the analog voltage and producing a comparison result signal corresponding to the voltage difference between the reference voltage and the analog voltage; and
- a setting circuit for setting the level of the output node to a first logic level in response to the first decoded signal and to a second logic level in response to the comparison result signal after the first decoded signal, wherein said setting circuit comprises a reset-set flip flop having a reset terminal receiving the comparison result signal and a set terminal receiving the first decoded signal.

5,481,215

# COHERENT MULTIPLEXER CONTROLLER

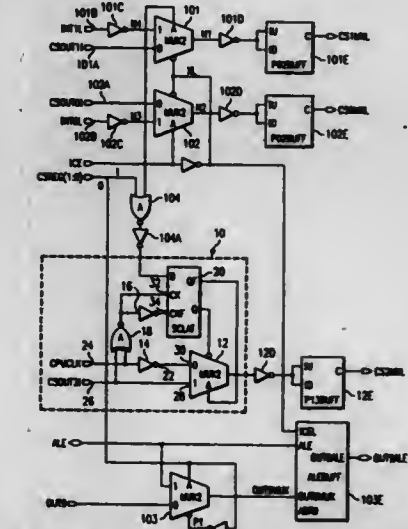
Mark Luedtke, Del Valle, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jul. 20, 1993, Ser. No. 94,610

Int. Cl.<sup>6</sup> H03K 3/037; 19/21

U.S. Cl. 327—218

7 Claims



1. A control circuit for a multiplexer, said multiplexer having a first multiplexer input terminal, a second multiplexer input terminal,



nal, a first selection terminal, and a second selection terminal, said control circuit comprising:

- a first controller input terminal;
  - a second controller input terminal;
  - a first inverter connected in circuit between said first controller input terminal and said first multiplexer input terminal;
  - a d-type flip-flop, said d-type flip-flop having three input terminals, said d-type flip-flop having two output terminals, one output terminal being connected in circuit to said first selection terminal and the other output terminal connected in circuit to said second selection terminal;
  - an exclusive-NOR gate connected in circuit between said first controller input terminal and said second controller input terminal, and two of said three input terminals of said d-type flip-flop;
  - a second inverter connected in circuit between said exclusive-NOR gate and one of said three input terminals of said d-type flip-flop; and
- means for inputting a data signal to the third input terminal of said d-type flip-flop whereby a control signal derived from said data signal is applied to a selection terminal of said multiplexer at times avoiding glitching being processed through said multiplexer.

5,481,216

#### TRANSISTOR DRIVE CIRCUIT WITH SHUNT TRANSISTOR SATURATION CONTROL

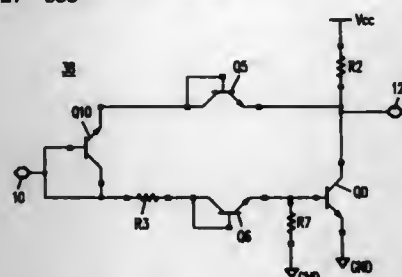
Pak-Ho Yeung, San Jose, Calif., assignor to National Semiconductor Corporation, Del.

Filed May 31, 1994, Ser. No. 251,389

Int. Cl.<sup>6</sup> H03K 17/04; 3/33

U.S. Cl. 327—333

6 Claims



1. A drive circuit, comprising:

- a drive transistor having a base, an emitter, and a collector, said base coupled to a circuit input and said collector coupled to a circuit output such that the drive transistor responds to a base current received at said base by providing an output current at the circuit output;
- a first resistive element connected between said circuit input and said base of said drive transistor for sensing the base current, a voltage developed across said first resistive element indicating the amount of the base current;
- a shunt transistor having a collector, a base, and an emitter, said collector of said shunt transistor and said base of said shunt transistor coupled together and to said circuit input, and said emitter of said shunt transistor coupled to said circuit output and responsive to said indicated amount of base current for diverting a portion of an input current received at said circuit input to said circuit output, the remaining portion of said input current being provided as the base current
- first level shifting means connected between said emitter of said shunt transistor and said circuit output for buffering said shunt transistor;
- second level shifting means connected between said base of said drive transistor and said first resistive element, said first level shifting means and said second level shifting means collectively for shifting the voltage at said collector of said drive transistor to be at a TTL-compatible level; and
- a resistive element coupling the base of said drive transistor to a power supply lower rail that provides an active discharge path

for said base of said drive transistor, wherein said collector of said drive transistor is coupled to said circuit output and said emitter of said drive transistor is also coupled to the power supply lower rail.

5,481,217

#### HIGH CURRENT TEST SIGNAL CONVERTER CIRCUIT

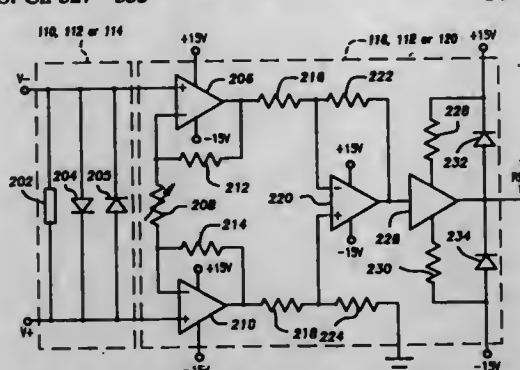
Dung Hieu Nguyen, Houston, Tex., assignor to Houston Industries Incorporated, Houston, Tex.

Filed Sep. 21, 1994, Ser. No. 310,263

Int. Cl.<sup>6</sup> H03L 5/00

U.S. Cl. 327—333

20 Claims



1. An interface circuit for transforming a high current signal provided by a testing device for testing electro-mechanical relays into a signal for connection to an input of a digital relay, wherein the digital relay is capable of receiving only low current and low voltage input signals, the circuit comprising:
  - means for receiving the high current signal from the testing device;
  - means connected to said receiving means for converting the high current signal into a low voltage signal;
  - amplifying means having a gain and being connected to said converting means for providing an amplified signal having a voltage that is a predetermined gain of said low voltage signal; and
  - buffer means connected to said amplifying means for providing the digital relay input signal.

5,481,218

#### LOGARITHMIC CONVERTER

Ernst Nordholt, Berkel & Rodenrijs, and Johannes Stoffels, Hague, both of, Netherlands, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

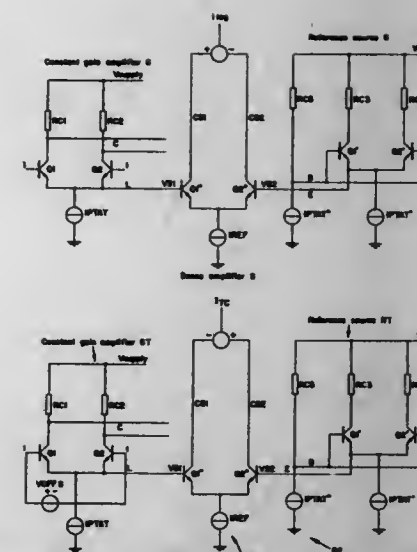
Filed Sep. 30, 1994, Ser. No. 312,917

Int. Cl.<sup>6</sup> G06F 7/556

U.S. Cl. 327—350

10 Claims

1. A logarithmic converter for generating an electrical output signal having a value that is substantially a logarithm of a value of an electrical input signal provided to the converter comprising:
  - a cascade of log converter sections, wherein each log converter section comprises:
    - means for differentially amplifying an electrical section input signal, wherein the amplifying means has a gain that is substantially constant with a temperature of the logarithmic converter and generates a linear output signal having a value that is substantially linearly related to the value of the electrical section input signal and a log output signal having a value that is substantially a logarithm of the value of the electrical section input signal;
    - means for generating a first reference voltage that is substantially equal to a common-mode component of the electrical section input signal, wherein the reference voltage generating means comprises a differential amplifier having a gain that is substantially constant with the temperature of the logarithmic converter; and



means for generating a section output signal having a value that is accurately logarithmically related to the value of the electrical section input signal for a predetermined operating range, wherein the section output signal is based on the log output signal and on the first reference voltage and compensates a temperature dependency of the log output signal; and

- the electrical input signal provided to the converter is the electrical section input signal for a first log converter section in the cascade; the linear output signal of the amplifying means in one log converter section is the electrical section input signal amplified by the amplifying means in an immediately succeeding log converter section in the cascade;
- means for generating a temperature-compensating signal, comprising:
  - first means for generating an electrical signal having a value that is substantially logarithmically related to a value of an offset voltage;
  - means for generating a second reference voltage that is substantially equal to a common-mode component of the electrical input signal provided to the converter; and
  - second means for generating an electrical signal having a value that is proportional to the temperature of the logarithmic converter based on the electrical signal generated by the first means and on the second reference voltage; and
- output means for generating a temperature-compensated electrical signal having a value accurately logarithmically related to the value of the electrical input signal provided to the converter based on the section output signals and the temperature-compensating signal.

5,481,219

#### APPARATUS AND METHOD FOR GENERATING NEGATIVE BIAS FOR ISOLATED MOSFET GATE-DRIVE CIRCUITS

Mark E. Jacobs, Dallas; Vijayan J. Thottuvelli, Richardson, and Kenneth J. Tlmm, Rockwall, all of Tex., assignors to AT&T Corp., Murray Hill, N.J.

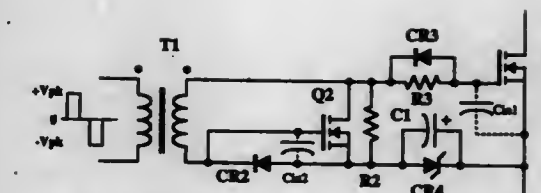
Filed Jul. 20, 1994, Ser. No. 278,474

Int. Cl.<sup>6</sup> H03K 17/04; 17/16

U.S. Cl. 327—434

2 Claims

1. A gate driver for a power MOSFET switch having gate, source and drain electrodes, comprising:
  - a drive transformer including a secondary winding connected for supplying a drive voltage to drive circuitry connected to drive the power MOSFET switch;
  - the drive circuitry including,
  - a drive MOSFET device having gate, source and drain electrodes, connected to be responsive to the second winding



and having its drain-source connected to control a gate-source voltage of the power MOSFET switch;

a bias circuit connecting the drain-source of the drive MOSFET device to the gate-source of the power MOSFET and providing a voltage differential therebetween, of a polarity to prevent spurious turn-on of the power MOSFET switch, the bias circuit comprising: a zener diode operating as a non-linear semiconductor breakdown device having a defined breakdown voltage, and the bias circuit further including a capacitor.

5,481,220

#### DUAL MATCHING CURRENT SINK TOTAL TEMPERATURE CIRCUIT

James W. Mildren, Rio Rancho, N.M., assignor to Honeywell Inc., Minneapolis, Minn.

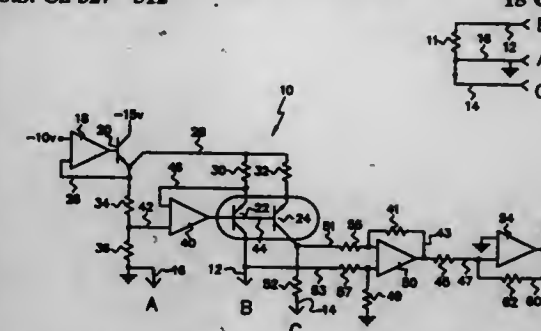
Continuation of Ser. No. 81,455, Jun. 22, 1993, abandoned.

This application Apr. 13, 1995, Ser. No. 422,682

Int. Cl.<sup>6</sup> H01L 35/00; G01K 7/00

U.S. Cl. 327—512

18 Claims



1. An analog monitoring circuit for use with a temperature sensitive resistance probe and an air data computer, said circuit comprising:
  - reference buffer means for creating adequate operating current in response to input from a reference voltage source operable at a selected voltage;
  - matching dual current means operatively connected to said reference buffer means through ratio-metric voltage divider means, said matching dual current means is also connected to the probe and provides an output representative of the resistance of the probe and thereby the temperature of the probe; and
  - differential amplifier means operatively connected to the matching dual current means for developing a desired gain.

5,481,221

#### CHARGE PUMP CIRCUIT FOR LOW SUPPLY VOLTAGE APPLICATIONS

Roberto Gariboldi, Lacchiarella, and Francesco Pulvirenti, Acireale, both of, Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, and Co.R.I.M. Me., Catania, both of, Italy

Filed Feb. 16, 1994, Ser. No. 197,077

Claims priority, application European Pat. Off., Feb. 17, 1993, 93830059

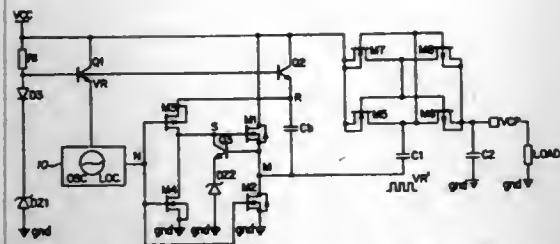
Int. Cl.<sup>6</sup> G05F 1/10

U.S. Cl. 327—536

23 Claims

1. A charge pump circuit comprising:





a storage capacitor, coupled between an output node of the charge pump circuit and a ground node;

two switching devices, connected in series between a supply node, coupled to a supply voltage, and said output node;

a charge transfer capacitor, coupled to an intermediate node between said two series switching devices and a driving node;

a voltage regulator, having an input coupled to the supply node, which provides a regulated voltage from the supply voltage and has a regulator output node for outputting the regulated voltage;

a driving oscillator for producing a local oscillation signal including a local oscillator output node for outputting the oscillation signal;

a power stage having an input coupled to the regulator output node and an output node which is said driving node, wherein said power stage is a half-bridge stage comprising a series combination of a high-side power transistor and a low-side power transistor;

an inverter having an input coupled to the local oscillator output node and an output coupled to a control terminal of the high side power transistor; and

a bootstrap capacitor coupled between said driving node and said regulator output node.

5,481,222

**POWER CONSERVING INTEGRATED CIRCUIT**

Hubert Utz, Munich, Germany, assignor to National Semiconductor Corporation, Santa Clara, Calif.

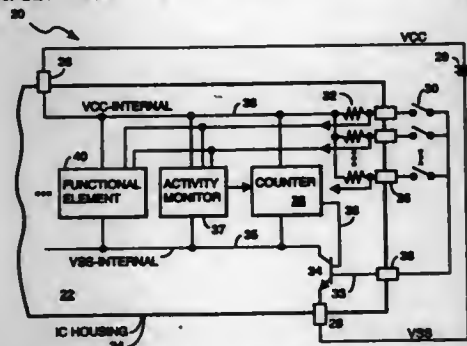
Continuation of Ser. No. 813,113, Dec. 23, 1991, abandoned.

This application Jan. 19, 1993, Ser. No. 6,665

Int. Cl.<sup>6</sup> H02J 1/00

U.S. Cl. 327-544

8 Claims



1. A power conserving integrated circuit comprising:

a power supply terminal for coupling to an external power supply;

a plurality of signal terminals for receiving externally derived event signals;

circuitry coupled to said power supply terminal by an integrated switch;

said integrated switch, coupled to said plurality of signal terminals, for coupling said circuitry to said power supply terminal in response to an initial one of said externally derived event signals received on any one of said plurality of signal terminals, said circuitry being dormant when said circuitry is not coupled to said power supply terminal;

said circuitry including an activity monitoring circuit for detecting said coupling of said circuitry to said power supply terminal; and

said circuitry including timing circuit, responsive to said activity monitoring means, for maintaining said integrated switch in a closed state so as to maintain a connection between said power supply terminal and said circuitry for a predetermined period after said initial, externally derived event signal, and for releasing said connection so that said circuitry returns to dormancy.

5,481,223

**BI-DIRECTIONAL SPATIAL POWER COMBINER GRID AMPLIFIER**

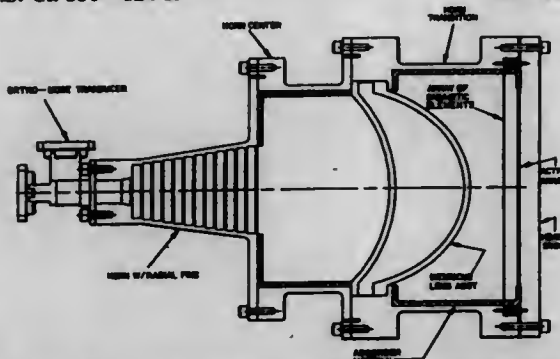
Sam H. Wong, Yorba Linda, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Sep. 13, 1994, Ser. No. 305,245

Int. Cl.<sup>6</sup> H03F 3/68

U.S. Cl. 330-124 R

18 Claims



1. A bi-directional spatial power combiner grid amplifier including a lens, a bi-directional grid amplifier, and an array of parasitic elements situated between the lens and the bi-directional grid amplifier, wherein the array of parasitic elements has a first impedance in a first polarization direction and has a second impedance, different from the first impedance, in a second polarization direction orthogonal to the first polarization direction.

5,481,224

**DIFFERENTIAL AMPLIFIER CIRCUIT HAVING A DRIVER WITH SQUARE-LAW CHARACTERISTIC**

Katsuji Kimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

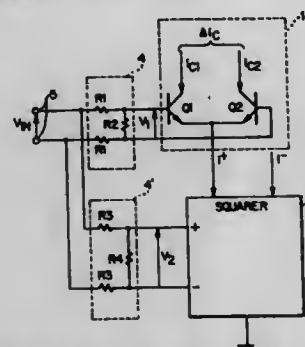
Filed Jan. 27, 1994, Ser. No. 187,387

Claims priority, application Japan, Jan. 27, 1993, 5-011849; Dec. 15, 1993, 5-315460

Int. Cl.<sup>6</sup> H03F 3/45

U.S. Cl. 330-253

20 Claims



1. A differential amplifier circuit comprising:

a pair of input terminals to which a signal to be amplified is applied;

a first divider circuit which receives said signal to be amplified and produces as an output a first input signal, said first input signal being different in amplitude from said signal to be amplified;

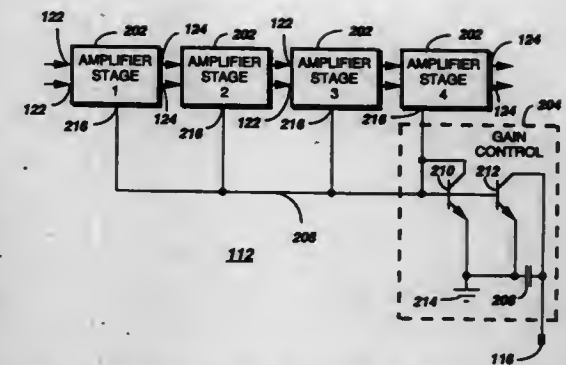
a second divider circuit which receives said signal to be amplified and produces as an output a second input signal, said second input signal being different in amplitude from said signal to be amplified;

a first differential pair formed of first and second transistors; input ends of said first differential pair being applied with said first input signal, said first input signal being proportional in amplitude to said signal to be amplified;

a driver circuit for driving said first differential pair by an output current of said driver circuit, said output current having a square-law characteristic; and

input ends of said driver circuit being applied with said second input signal, said second input signal being proportional in amplitude to said signal to be amplified;

wherein a transconductance of said first differential pair is compensated in nonlinearity by said output current of said driver circuit.



5,481,225

**VARIABLE GAIN DIFFERENTIAL AMPLIFIER CIRCUIT**

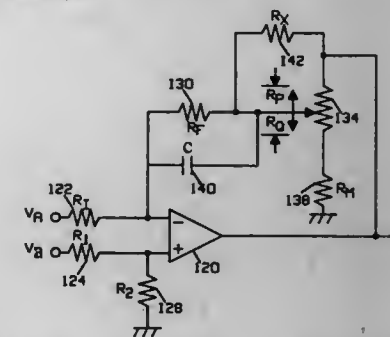
John Lumsden, and Alan Flum, both of Boca Raton, Fla., assignors to Sony Electronics Inc., Park Ridge, N.J.

Filed Jun. 3, 1994, Ser. No. 253,652

Int. Cl.<sup>6</sup> H03F 3/45

U.S. Cl. 330-254

16 Claims



1. A differential amplifier circuit with variable gain, comprising in combination:

an operational amplifier having an inverting input, a non-inverting input and an output;

a pair of input resistors  $R_1$  and  $R_2$ , each having a first terminal respectively connected to said inverting input and said non-inverting input, and each having a second terminal for receiving a differential input signal;

a resistor  $R_3$  connected from said non-inverting terminal to a point of AC ground;

a potentiometer having a wiper, a first end and a second end, said second end connected to said output for controlling a differential gain of said differential amplifier;

a resistor  $R_4$  connected between said first end of said potentiometer and ground;

a resistor  $R_5$  connected between said wiper of said potentiometer and said inverting terminal of said operational amplifier and a feedback compensation capacitor in parallel with  $R_5$ .

5,481,226

**LOW-VOLTAGE INTERMEDIATE FREQUENCY AMPLIFIER PROVIDING AUTOMATIC GAIN CONTROL OF A SOURCE AMPLIFIER**

John J. Parkes, Jr., Boynton Beach, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 25, 1994, Ser. No. 329,103

Int. Cl.<sup>6</sup> H03G 3/30; H04B 1/06

U.S. Cl. 330-279

10 Claims

1. A low-voltage intermediate frequency (IF) amplifier for providing automatic gain control (AGC) of a source amplifier supply-

ing an IF input signal to the low-voltage IF amplifier, the low-voltage IF amplifier comprising:

a plurality of cascaded amplifier stages, at least some of the plurality of cascaded amplifier stages comprising:

an amplifier element having an input for receiving a stage input signal, and an output for generating an amplified stage output signal in response to the stage input signal; and

a received signal strength detector (RSSD) coupled to the amplifier element for generating a gain control current responsive to the stage input signal,

wherein the low-voltage IF amplifier further comprises:

a current summer coupled to the plurality of cascaded amplifier stages for summing the gain control currents generated by the RSSDs thereof to produce a total gain control current; and

a gain control element coupled to the source amplifier and coupled to the current summer for controlling gain of the source amplifier in response to the total gain control current, such that signal levels within the source amplifier are maintained within a linear operating range, wherein the gain control element comprises a current mirror that generates a source amplifier gain control current proportional to the total gain control current, the source amplifier gain control current coupled to the source amplifier for controlling the gain thereof.

5,481,227

**OSCILLATOR, SYNTHESIZER TUNER CIRCUIT AND AM SYNCHRONOUS DETECT CIRCUIT EMPLOYING THE OSCILLATOR**

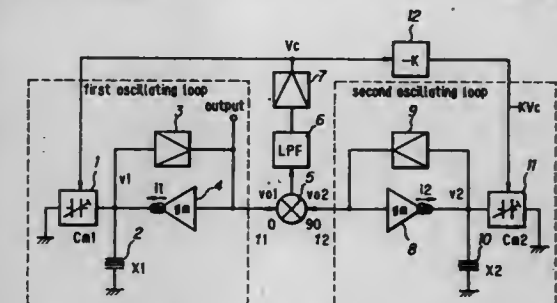
Kenji Komori, and Atsushi Hirabayashi, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 21, 1995, Ser. No. 391,065

Int. Cl.<sup>6</sup> H03B 5/36; H03D 1/00; 3/00; H03L 7/16

U.S. Cl. 331-2

12 Claims



1. An oscillator outputting a plurality of signals of differing frequencies, comprising:

first oscillating means oscillating at a desired frequency in response to a voltage from a first resonator and first voltage-variable capacitor connected in parallel to a first current feedback loop of a first amplifier for controlling a voltage applied to the first voltage-variable capacitor;

second oscillating means oscillating at a desired frequency in response to a voltage from a second resonator and second



voltage-variable capacitor connected in parallel to a second current feedback loop of a second amplifier for controlling a voltage applied to the second voltage variable capacitor; voltage generating means for generating the voltage applied to the first voltage-variable capacitor and the voltage applied to the second voltage-variable capacitor by comparing an output of the first oscillating means and an output of the second oscillating means; and control means for making an oscillating frequency of the first oscillating means and an oscillating frequency of the second oscillating means coincide in a phase-locked loop constructed such that the polarities of the voltages applied to the first and second voltage-variable capacitors are different.

5,481,228

# METHOD AND APPARATUS FOR CONTROLLING OSCILLATOR DUTY CYCLE

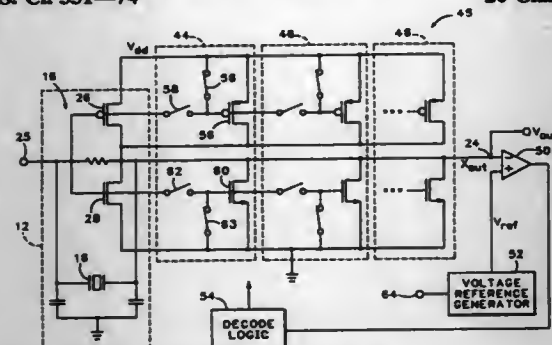
Rajeev Badyal, Fort Collins, Colo., assignor to Hewlett-Packard Corporation, Palo Alto, Calif.

Filed Oct. 15, 1993, Ser. No. 138,276

Int. Cl.<sup>6</sup> H03B 5/36

U.S. Cl. 331-74

20 Claims



1. An oscillator control system comprising: an oscillator for generating a repetitive activation signal including an amplifier circuit having an input for receiving the repetitive activation signal and an output for providing a digital logic timing signal with a timing signal duty cycle, the amplifier circuit having a bias voltage; and a control circuit, responsive to the amplifier bias voltage, including multiple selectable transistor stages for both switchably increasing and switchably decreasing the amplifier bias voltage and coupled to the amplifier circuit for controlling the timing signal duty cycle according to the amplifier bias voltage.

5,481,229

# LOW POWER TEMPERATURE COMPENSATED CRYSTAL OSCILLATOR

Lawrence E. Connell, Naperville; Timothy J. Collins; Downers Grove; Anthony F. Keller, Chicago; Dennis F. Marvin, Carol Stream, and Michael L. Bushman, Hanover Park, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

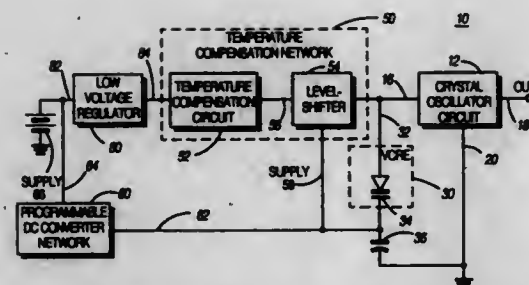
Filed Nov. 29, 1994, Ser. No. 346,452

Int. Cl.<sup>6</sup> H03L 1/02

U.S. Cl. 331-158

18 Claims

1. A low power temperature compensated crystal oscillator, comprising: a crystal oscillator circuit having a crystal, an input and an output at a predetermined frequency; a voltage controlled reactance element for providing a variable reactance to the input of the crystal oscillator circuit for selectively adjusting the output frequency over a predetermined temperature range, having a first terminal and a second terminal; a temperature compensation network for measuring the temperature in proximity to the crystal and providing a control signal



to the voltage controlled reactance element, to adjust the output frequency within a desired range over a predetermined temperature range; and a programmable DC-DC converter network including an output comprising a reference voltage, connected to at least one of the voltage controlled reactance element and the temperature compensation network.

5,481,230

# PHASE MODULATOR HAVING INDIVIDUALLY PLACED EDGES

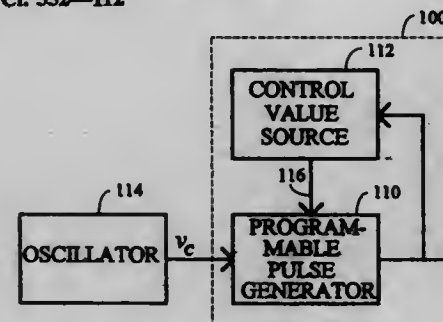
Paul Chang, Westford; Dan H. Wolaver, West Brookfield, both of Mass., and J. Howell Mitchell, Jr., Amherst, N.H., assignors to Tektronix, Inc., Wilsonville, Oreg.

Filed Nov. 14, 1994, Ser. No. 339,420

Int. Cl.<sup>6</sup> H03C 3/00

U.S. Cl. 332-112

33 Claims



1. A dynamic phase modulator comprising: a programmable pulse generator for producing a pulsed output signal wherein the position of each pulse edge of the output signal is determined in response to a control value provided to the programmable pulse generator; and a control value source coupled to the programmable pulse generator for producing a dynamic sequence of control values, the control values determining the times between successive output pulses.

5,481,231

# LUMPED ELEMENT FOUR PORT COUPLER

Michael Dydyk, Scottsdale, and Craig E. Lindberg, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

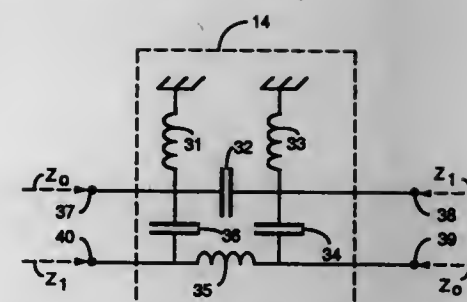
Filed Jun. 21, 1994, Ser. No. 262,811

Int. Cl.<sup>6</sup> H01P 5/16; 5/19

U.S. Cl. 333-112

10 Claims

1. A four port coupler comprising: a first port having a first impedance  $Z_0$ ; a second port having a second impedance  $Z_1$ , wherein said first impedance  $Z_0$  is related to said second impedance  $Z_1$  by a factor in the range of from one and one half to ten; a third port having said first impedance; and a fourth port having said second impedance; a first inductor having a first lead coupled to said first port and a second lead coupled to ground; a first capacitor having a first lead coupled to said first port and a second lead coupled to said second port;



- a second inductor having a first lead coupled to said second port and a second lead coupled to ground;
- a second capacitor having a first lead coupled to said second port and a second lead coupled to said third port;
- a third inductor having a first lead coupled to said third port and a second lead coupled to said fourth port; and
- a third capacitor having a first lead coupled to said first port and a second lead coupled to said fourth port.

5,481,232

# OPTICALLY CONTROLLED MULTILAYER COPLANAR WAVEGUIDE PHASE SHIFTER

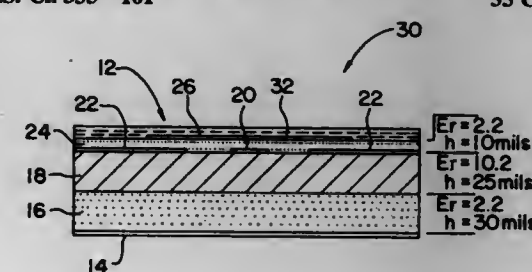
Shih-Chang Wu, Parsippany, and Haim Grebel, Livingston, both of N.J., assignors to New Jersey Institute of Technology, Newark, N.J.

Filed Apr. 19, 1995, Ser. No. 424,210

Int. Cl.<sup>6</sup> H01P 1/18

U.S. Cl. 333-161

33 Claims



23. A phase shifting device, said phase shifting device comprising: a multilayer coplanar waveguide having a dielectric substrate with a conductive signal carrier formed thereon; a first dielectric layer formed on said conductive signal carrier and said dielectric substrate; a plurality of fine-patterned conductive strips formed on said first dielectric layer; and a photosensitive material layer formed on said plurality of fine-patterned conductive strips and said first dielectric layer.

5,481,233

# MICROWAVE SELECTIVE DEVICES USING LOCALIZED MODES IN WEAKLY ASYMMETRIC RESONANT CAVITIES

Florin Manolache, Str. A. Panu Nr. 30, BL. 28, S.C.C., Ap.11, Iasi 6600, Romania, and Sorin Costiner, C/O Putinar, 41484 Avenida de la Reina, Temecula, Calif. 92592

Filed Mar. 25, 1994, Ser. No. 218,359

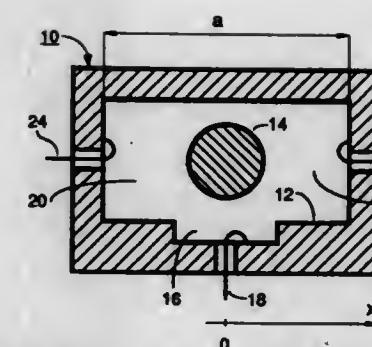
Claims priority, application Israel, Mar. 28, 1993, 105184

Int. Cl.<sup>6</sup> H01P 7/06

U.S. Cl. 333-227

8 Claims

1. A frequency separator for separating two or more frequency bands, said frequency separator comprising: a resonant cavity, said resonant cavity including one input and two or more outputs for coupling electromagnetic energy



between said two or more frequency bands, wherein said resonant cavity comprises two or more branches and includes a rod symmetrically placed with respect to said two or more branches;

said rod defining separator means for determining two or more localized modes, said resonant cavity resonating in said two or more localized modes, wherein electromagnetic field of each of said localized modes being of substantial amplitude in a different branch and said electromagnetic field being of small amplitude in the other branches;

an input portion wherein electromagnetic fields of said two or more localized modes are coupled to said input, said electromagnetic fields of said two or more localized modes being of small and of comparable amplitude in said input portion, each of said outputs being placed in a branch where the electromagnetic field of only one of said two or more localized modes is of substantial amplitude, whereby said frequency bands being determined by the resonant frequencies of said localized modes.

5,481,234

# PHASE TRIMMED STRIP TRANSMISSION LINES AND METHOD FOR TRIMMING

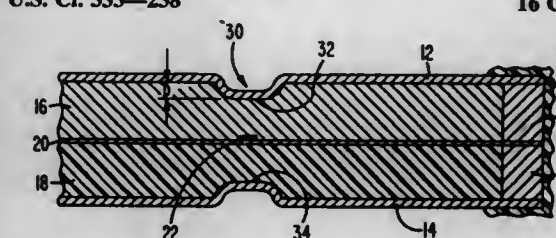
Norman R. Landry, Mount Laurel, and Edward J. Kent, Haddonfield, both of N.J., assignors to Martin Marietta Corp., Moorestown, N.J.

Filed Dec. 19, 1983, Ser. No. 562,524

Int. Cl.<sup>6</sup> H01P 3/08

U.S. Cl. 333-238

16 Claims



1. In a strip transmission line of the type including a relatively narrow strip-like conductor spaced a given distance from a relatively broad substantially planar ground conductor by a dielectric medium, said substantially planar ground conductor and said dielectric medium together being deformable, said strip transmission line having a first given electrical length, the improvement for changing the electrical length comprising:

a conductive projection extending in depth from said substantially planar ground conductor toward said narrow conductor and in length along a portion of the length of said narrow conductor, said projection depth and length selected to produce a desired electrical length change and being in the form of a permanent deformation of said substantially planar ground conductor.



5,481,235

## CONDUCTING SPRING FOR A CIRCUIT INTERRUPTER TEST CIRCUIT

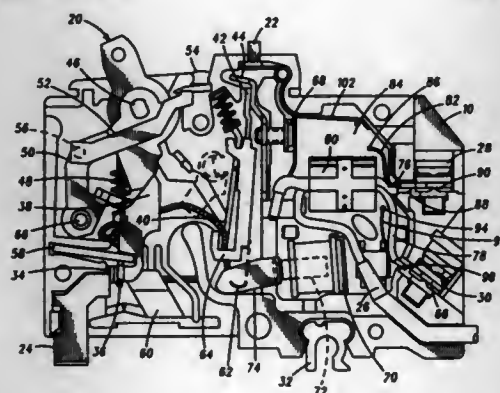
James A. Heise; Duane L. Turner; Jeffrey M. Kaufman, all of Cedar Rapids, Iowa, and Thomas C. Leach, Lexington, Ky., assignors to Square D Company, Palatine, Ill.

Filed Mar. 31, 1994, Ser. No. 221,424

Int. Cl.<sup>6</sup> H01M 73/00

U.S. Cl. 335—18

21 Claims



1. A spring exerting a biasing force against a test button to open a circuit interrupter test circuit, the spring comprising: a one-piece, elongated cantilever having a first and second end, the cantilever being formed from an electrically conducting material, one of the cantilever ends being adapted to directly secure to a first terminal of the test circuit, the other cantilever end being adapted to directly and reversibly contact a second terminal of the test circuit; means for resiliently flexing the second end of the cantilever in relation to the first end, the flexing means being integrally formed with the cantilever; and the cantilever having a first arm extending from the first end to the flexing means and a second arm extending from the second end to the flexing means, the second arm being adapted to abut a test button and exert a biased force against the test button.

5,481,236

## ENGAGING RELAY FOR THE STARTER OF AN INTERNAL COMBUSTION ENGINE

Walter Ruehle, Kornthal; Ngoc-Thach Nguyen, Grossbottwar; Arno-Albert Binnenwies, Hildesheim, and Hartmut Schuette, Sibbesse, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE92/00329, § 371 Date Oct. 14, 1993, § 102(e) Date Oct. 14, 1993, PCT Pub. No. WO92/22082, PCT Pub. Date Dec. 10, 1992

PCT Filed Apr. 24, 1992, Ser. No. 133,180

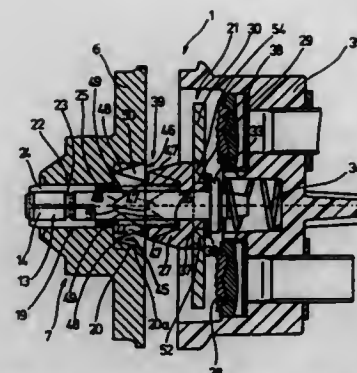
Claims priority, application Germany, May 27, 1991, 41 17 242.6

Int. Cl.<sup>6</sup> H01H 67/02

U.S. Cl. 335—126

18 Claims

1. Engaging relay for a starter device of an internal combustion engine, said engaging relay comprising a magnetic core having an assigned relay coil and provided with a through-opening having a guide section; an armature including a switching axle penetrating the through-opening of the magnetic core; a bushing mounted in an axially displaceable manner around the switching axle and in said guide section of said through-opening; a contact bridge carried by said bushing and fixed to said bushing to prevent rotation of said bushing relative to said contact bridge; main current contacts positioned opposite to the contact bridge;



- spring means for holding said contact bridge away from said main current contacts in a resting position of said contact bridge; and anti-rotation means for preventing rotation of said bushing in said guide section relative to said magnetic core to constantly maintain said contact bridge in a rotationally fixed relationship with said main current contacts in said housing cover.

5,481,237

## SOLENOID VALVE WITH ELECTRICAL CONNECTION ELEMENTS AND INTEGRATED SAFETY DEVICES

Georges Sarfati, Monnetier-Mornex, France; Peter Merz, and Freddy Sarfati, both of Versoix, Switzerland, assignors to Fluid Automation Systems S.A., Versoix, Switzerland

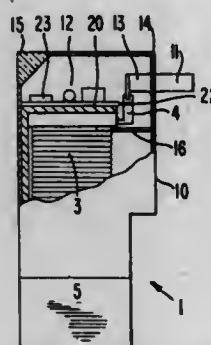
Continuation of Ser. No. 744,086, Aug. 12, 1991, abandoned, which is a continuation of Ser. No. 457,582, Dec. 27, 1989, abandoned. This application Jul. 7, 1994, Ser. No. 271,573

Claims priority, application Switzerland, Dec. 27, 1988, 4801/88

Int. Cl.<sup>6</sup> H01F 7/00; F16K 31/02; E03B 7/07

U.S. Cl. 335—278

5 Claims



1. A solenoid valve assembly which comprises a valve body (5); an electromagnet (2) with a solenoid coil (3), the electromagnet being functionally attached to the valve body (5), and a protective cap (10), said cap being press-fitted and snugly attached onto said valve body (5) and enclosing at least an upper part of the electromagnet (2) and the solenoid coil (3), said cap including at least two electrical connection elements (11) which pass through and are rigidly and permanently attached to a wall of the cap (10), the electrical elements (11) each having a split end (13) which elastically grips and is removably connected with a pin (4) attached electrically to the solenoid coil (3) of the electromagnet (2) within the cap (10), said protective cap (10) further containing a circuit board unit (20) housed in a cavity (12) within the cap, said circuit board unit including electrical and electronic elements which complement the function of the valve and having connection means (22) which are in electrical contact with said electrical connection elements (11, 13) and said pins (4) of the solenoid coil (3), whereby said protective cap (10) is easily attachable onto said valve body (5) by fitting it snugly over the electromagnet (2) and thereby simultaneously connecting the elastic split ends (13) of the lugs (11) onto the pins (4) and the circuit board connection means (22), and the protective cap (10) is also easily removable from the

valve body (5) by pulling it upwardly from the valve body 5 and thereby simultaneously disconnecting the electrical elements (11, 13) from the pins (4) of the solenoid coil (3) and from the connection means (22) of the circuit board unit (20).

5,481,238

## COMPOUND INDUCTORS FOR USE IN SWITCHING REGULATORS

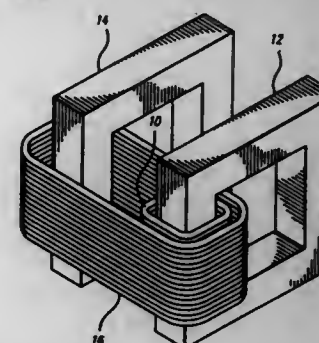
Bruce W. Carsten, Vancouver, and Christopher D. Davidson, North Vancouver, both of Canada, assignors to Argus Technologies Ltd., Burnaby, Canada

Filed Apr. 19, 1994, Ser. No. 229,950

Int. Cl.<sup>6</sup> H01F 27/24; G05F 1/24

U.S. Cl. 336—214

17 Claims



1. A compound inductor assembly wherein the inductor is an energy storage type, comprising: a first inductor having a first winding on a first magnetic core; a second inductor having a second magnetic core outside the first winding of the first inductor, and a second winding around the first winding of the first inductor and the second core; one end of the first winding and the corresponding end of the second winding connected to a common connection such that voltages induced in the first winding and the second winding from an alternating current flowing in the first winding have the same polarity.

5,481,239

## LIMITER INDICATOR

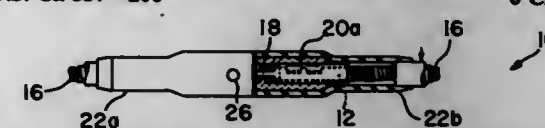
Gary W. Di Troia, Nashua, N.H., assignor to Burndy Corporation, Norwalk, Conn.

Filed Aug. 5, 1994, Ser. No. 286,170

Int. Cl.<sup>6</sup> H01H 85/30; H01R 13/68; 4/00

U.S. Cl. 337—206

6 Claims



1. A limiter indicator for an electrical distribution system having a plurality of cables comprising a fusible element having receptacles for receiving and connecting the ends of adjacent network cables, a composition shell encasing the fusible element, an insulating sleeve covering the shell, cable ends, and fusible element and together therewith defining a limiter assembly, the insulating sleeve having resettable and reusable means communicating with the interior of the limiter assembly, said means having a normal position for visually indicating that the fusible element is whole, and a blown position visually indicating that the fusible element has vaporized.

5,481,240

## THERMISTOR-TYPE TEMPERATURE SENSOR

Matuo Fukaya, Obu; Junichi Nagai, Gifu, and Kaoru Kuzuoka, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

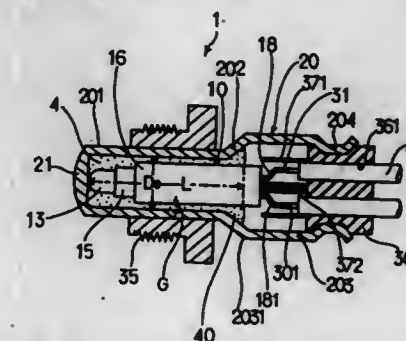
Filed Jan. 28, 1994, Ser. No. 187,512

Claims priority, application Japan, Feb. 2, 1993, 5-037465

Int. Cl.<sup>6</sup> H01C 7/10

U.S. Cl. 338—22 R

9 Claims



1. A thermistor-type temperature sensor comprising: a metal tube having an open rear end and a closed front end; a thermo unit including a thermistor element and exposed electrical lead wires, said thermo unit being positioned axially within said metal tube; a cement filling a longitudinal space between said metal tube and said thermo unit, said cement fixing said thermo unit in position within said metal tube, and said cement covering an outer surface of said thermo unit between said thermistor element to a vicinity of said exposed electrical lead wires; and reserve space means formed between said metal tube and said thermo unit at a portion between said thermistor element and said exposed electrical lead wires, for providing an enlarged space to accommodate overfilled cement, said enlarged space being continuous with said longitudinal space between said metal tube and said thermo unit.

5,481,241

## FILM-TYPE HEAT SINK-MOUNTED POWER RESISTOR COMBINATION HAVING ONLY A THIN ENCAPSULANT, AND HAVING AN ENLARGED INTERNAL HEAT SINK

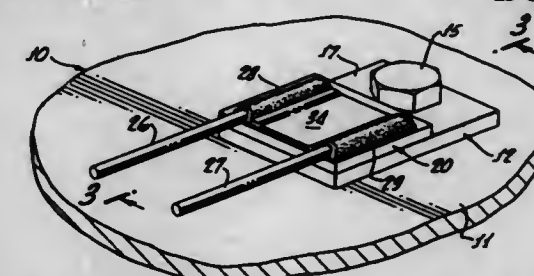
Richard E. Caddock, Jr., Winchester, Oreg., assignor to Caddock Electronics, Inc., Riverside, Calif.

Filed Nov. 12, 1993, Ser. No. 151,430

Int. Cl.<sup>6</sup> H01C 1/08

U.S. Cl. 338—51

23 Claims



1. A heat sink-mounted power film resistor combination, which comprises: (a) a flat heat-conductive electrically-insulating substrate having upper and lower surfaces that are parallel to each other, and that are close to each other for effective conduction of heat through said substrate from said upper surface to said lower surface; (b) a resistive film provided on said upper surface; (c) thin environmentally-protective coating means provided on said upper surface over said resistive film; (d) first and second relatively stiff leads respectively mechanically connected to different portions of said upper surface of



said substrate, and respectively electrically connected to different portions of said resistive film, said leads being spaced from each other, said different portions of said resistive film being spaced from each other,

- (e) an internal metal heat sink having upper and lower surfaces that are parallel to each other,
- (f) means to bond said lower surface of said substrate to said upper surface of said internal metal heat sink in heat-transfer relationship,
- (g) an external heat sink having a flat surface portion, and
- (h) means to secure said lower surface of said internal heat sink to said flat surface portion of said external heat sink in heat-transfer relationship, characterized in that there is no molded housing around said substrate, and in that there is no molded housing around said internal heat sink, and in that there is no molded housing around said environmentally-protective coating means.

5,481,242

#### DEBRIS-REDUCING TELEPHONE RESISTOR COMBINATION AND METHOD

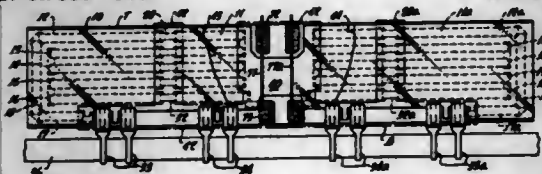
Richard E. Caddock, Jr., Winchester, Oreg., assignor to Caddock Electronics, Inc., Riverside, Calif.

Filed May 10, 1994, Ser. No. 240,322

Int. Cl.<sup>6</sup> H01C 1/012

U.S. Cl. 338—306

43 Claims



1. A resistor characterized by reduced possibility that debris resulting from fracture will fall onto underlying elements, said resistor comprising:

- (a) a thin flat substrate having such thermal coefficient of expansion that it will fracture in response to thermal stress, said substrate having two opposed edges,
- (b) a resistive film provided on a large part of at least the frontside of said substrate,
- (c) first and second terminal means for said resistive film, said terminal means connecting to one of said opposed edges and to said resistive film,
- (d) first and second cold arms extending generally between said opposed edges and with at least large parts of said arms being in spaced relationship from each other, said cold arms being parts of said substrate that are not subjected to major frontside heating caused by current flowing through said resistive film, said cold arms having at least a substantial part of said resistive film located between them, said substantial part of said resistive film extending to adjacent the other of said opposed edges, said cold arms and said substrate being so dimensioned and so located and so related to each other that a sufficient overload voltage will reliably and repeatedly cause said substrate to fracture in the region between said cold arms, and with the direction of fracture being generally between said one opposed edge and said other opposed edge, thereby breaking a circuit through said resistive film between said terminal means, whereby the fractured components of said substrate are held, by said terminal means, against falling away from said terminal means and any support to which said terminal means are connected.

5,481,243

#### BRAKING SYSTEM HAVING VARIABLE INTENSITY LIGHT AND SOUND WARNING

Ranan R. Lurie, 9 Mountain Laurel Dr., Greenwich, Conn. 06831; Daniel Putnam, Stenben Rd., Box 212, Peekskill, N.Y. 10566, and Isaac Tabib, 16 Carthage La., Scarsdale, N.Y. 10583

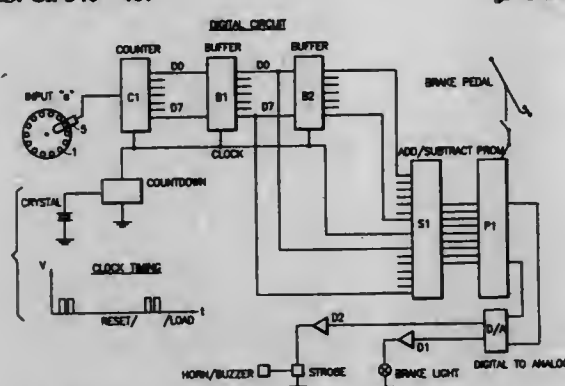
Continuation of Ser. No. 972,008, Nov. 5, 1992, abandoned.

This application Jul. 26, 1994, Ser. No. 280,712

Int. Cl.<sup>6</sup> B60Q 1/50

U.S. Cl. 340—467

3 Claims



1. A braking system for a vehicle for providing a combined audio and visual warning, comprising:

a pulse generator means having a spinning wheel positioned in a U-shaped photoelectric sensor, for providing a pulsed square wave signal indicative of the speed of the vehicle;

deceleration detection circuit means, having a vehicle velocity differential circuit comprising:

a counter means, for counting the pulsed square wave signal in a given interval of time, for providing an n-bit counter signal;

means for generating a load clock signal;

a first buffer means, responsive to the n-bit counter signal, for storing a first buffer counter signal upon encountering said load clock signal;

a second buffer means, for storing the first buffer counter signal from the first buffer means in the form of a second buffer counter signal upon encountering a subsequent load clock signal;

said first buffer means storing a new first buffer counter signal responsive to the n-bit counter signal upon encountering said subsequent load clock signal;

an add/subtract means, responsive to the new first buffer counter signal, and further responsive to the second buffer signal, for providing an add/subtract signal indicating the difference between the new first buffer counter signal and the second buffer counter signal indicative of differential vehicle velocity deceleration rate;

programmable read only memory means, responsive to the add/subtract signal, and further responsive to a depression of a brake pedal, for providing a digital audio indication signal, and for further providing a digital visual indication signal;

digital-to-analog converter means, responsive to the digital audio indication signal, for providing an analog audio indication signal, and further responsive to the digital visual indication signal, for providing an analog visual indication signal;

visual brake warning means, responsive to the analog visual indication signal, for providing a variable visual warning display depending on the rate of deceleration of the vehicle; and

audio brake warning means, responsive to the analog audio indication signal, for providing a variable audio warning depending on the rate of deceleration of the vehicle.

5,481,244

#### LOAD EXTENSION SIGNALING DEVICE

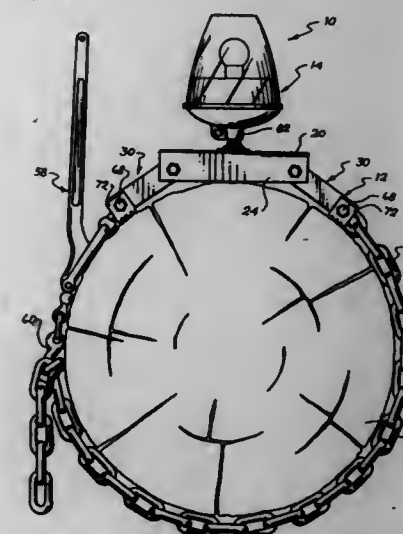
Grant D. Dicke, Downers Grove, Ill., assignor to Dicke Tool Company, Downers Grove, Ill.

Filed Nov. 17, 1993, Ser. No. 154,170

Int. Cl.<sup>6</sup> B60Q 7/00

U.S. Cl. 340—473

14 Claims



1. An adjustable mounting device for a signal which device releasably attaches to the outer surface of an elongated object having a longitudinal axis, the mounting device comprising:

a rigid mount base having at least two opposed flanges extending downward therefrom, the flanges adapted to engage the surface of the elongated object;

at least two rigid arms, each arm having a pivotal coupling with the mounting base, each arm including gripping teeth spaced from the pivotal coupling, the teeth adapted to engage the surface of the elongated object as the arms are swingingly pivoted toward the surface of the object;

a chain adapted to wrap around the surface of the object and interconnect the arms when the signal is mounted onto the object and the chain is wrapped around the surface of the object; and

a tensioning device to pull the flanges into the surface of the object and pivotally engage the teeth into the surface of the object to releasably anchor the signal to the object.

5,481,245

#### MONITORED ENVIRONMENT CONTAINER

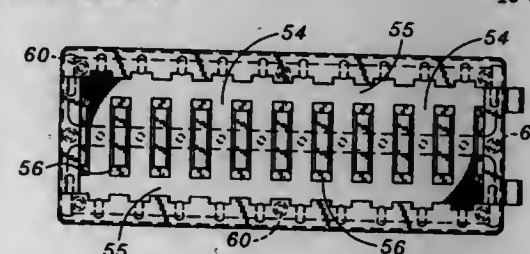
Boris Moldavsky, Dana Point, Calif., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jan. 11, 1994, Ser. No. 179,925

Int. Cl.<sup>6</sup> G08B 21/00

U.S. Cl. 340—540

10 Claims



10. A container for transporting and handling sensitive items, said container comprising:

- a) a housing comprising a plurality of partitions defining a plurality of inner and outer cells;

b) a monitoring system for individually monitoring the inner cells for a plurality of separate parameters to which the sensitive items are sensitive, the monitoring system comprising:

- (i) a microprocessor;
- (ii) memory in electrical communication with said microprocessor;
- (iii) a battery providing electrical power to said microprocessor;
- (iv) a plurality of sensors individually allotted for the inner cells in electrical communication with said microprocessor and selected from a group consisting of:
  - (a) a vibration sensor;
  - (b) a shock sensor;
  - (c) a temperature sensor;
  - (d) a humidity sensor;
  - (e) a magnetic field sensor;
  - (f) an unauthorized opening sensor; and
  - (g) an attitude sensor;
- c) a display responsive to said monitoring system; and
- d) a port for communicating with an external device;
- e) said inner cells being configured to receive the sensitive item(s) and said outer cells containing at least a portion of said monitoring system;
- f) wherein said monitoring system monitors desired ones of said sensors within desired ones of said cells, and wherein said display displays messages regarding parameters monitored by said sensors, and wherein said port facilitates downloading of instructions regarding the parameters to be monitored and uploading of monitoring results.

5,481,246

#### ALARM DEVICE HAVING A PICK-UP FORMED AS A CONDENSER WITH PIEZOELECTRIC DIELECTRIC

Alessandro Seravalli, Montier, Switzerland, and Henri Moniere, Herblay, France, assignors to Verres Industries SA, Montier, Switzerland

Continuation of Ser. No. 25,186, Mar. 2, 1993, abandoned.

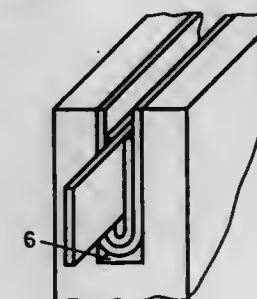
This application Feb. 17, 1995, Ser. No. 390,829

Claims priority, application Switzerland, Mar. 12, 1992, 799/92

Int. Cl.<sup>6</sup> G08B 13/00

U.S. Cl. 340—550

15 Claims



1. Alarm device for monitoring a space which is bounded at least on one side by a surface barrier, said alarm device comprising at least one pick-up in the form of a condenser having a piezoelectric dielectric, said condenser being fastened to said barrier, said barrier having a rim around a periphery of the barrier, said condenser being rigidly fastened along the rim of the barrier, on at least a part of said periphery thereof, said barrier having a slit in an edge of the rim of the barrier, said condenser being fastened in said slit.



5,481,247

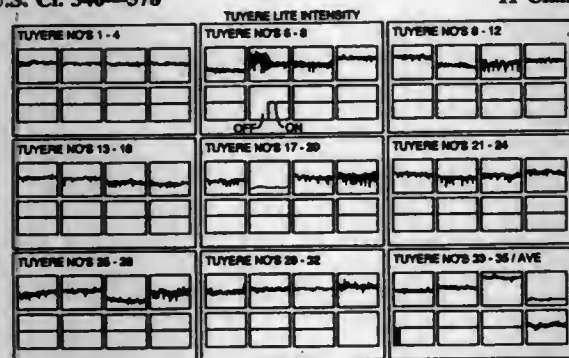
**BLAST FURNACE TUYERE SENSOR SYSTEM**

James M. Alexander, 604 Stratford Ter., Valparaiso, Ind. 46383, and Russell K. McComb, Jr., 345 Birch St. NW, DeMotte, Ind. 46310

Filed Jul. 29, 1994, Ser. No. 282,554  
Int. Cl.<sup>6</sup> G08B 17/12

U.S. Cl. 340—578

11 Claims



1. In the operation of a blast furnace tuyere system of the type including a plurality of photosensitive resistor sensors corresponding to the number of tuyeres in the blast furnace and for which the electrical resistance of each sensor and, correspondingly in accordance with Ohm's law, the voltage varies proportionally to the intensity of light falling on the sensor, a method of continuously detecting and measuring changing intensity of light from each blast furnace tuyere through which a fuel is injected, comprising impressing on an electrical conditioning circuit including the sensor, a D.C. power supply and a potentiometer, a predetermined supply voltage greater than zero, with use of the potentiometer adjusting the circuit voltage to a base load value greater than zero and less than the supply voltage, generating an analog D.C. voltage signal proportional to the light intensity falling on each such sensor, measuring the generated analog voltage signal; and responsive to determining whether the measured analog voltage signal is being above or being below the base load voltage to greater than a respective predetermined percentage of a maximum analog signal voltage, whether a sensor is being unresponsive, and whether the measured analog voltage signal is straight line or unstable, actuating one or more alarms indicating tuyere conditions.

5,481,248

**OVERHEAD CRANES HAVING COLLISION AVOIDANCE CAPABILITIES**

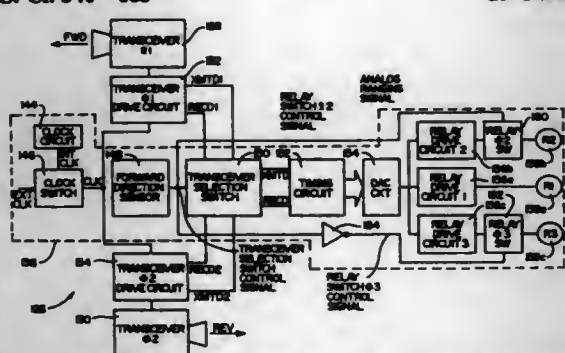
Brian A. Krub, 11917 SE. 169th Pl., Renton, Wash. 98058

Filed Mar. 11, 1993, Ser. No. 29,683

Int. Cl.<sup>6</sup> G08B 21/00

U.S. Cl. 340—685

15 Claims



1. An apparatus for controlling an overhead crane in a manner that reduces the likelihood that the crane and objects suspended therefrom will contact another object, comprising:  
a. control means for controlling the speed and direction of the crane based on a plurality of operator control signals; and  
b. a collision avoidance system comprising

- i. an ultrasonic transceiver for generating an ultrasonic signal and receiving a reflected ultrasonic signal that has been reflected off of the other object, the reflected ultrasonic signal being indicative of a distance between the crane and the other object;
- iii. means for generating an analog ranging signal based on the reflected ultrasonic signal, the level of the ranging signal being substantially proportional to the distance between the crane and the other object;
- iii. a plurality of relays, and
- iv. relay driver means associated with each of the relays for operating the relay associated therewith, the relay driver means being operator adjustable to allow the relays associated therewith to be operated based on a desired level of the ranging signal; wherein

the relays are so arranged and the relay driver means are so adjusted that, when the crane is likely to contact the other object, the relay driver means so operates the relays that the relays cause the control means initially to limit the speed of the crane and then to stop the crane; and

the control means controls the crane to travel in a first direction when a first operator control signal is present, to travel in a second direction when a second operator control signal is present, and to accelerate when a third operator control signal is present, to maintain a constant speed when a fourth operator control signal is present, to decelerate when neither the third nor the fourth operator control signal is present, and to stop when neither the first nor the second operator control signals are present, where (i) a first relay of the plurality of relays is so arranged that, when operated, it prevents the third and fourth operating signals from being present and (ii) a second relay of the plurality of relays is arranged so that, when operated, it prevents at least the first and second operating signals from being present.

5,481,249

**BIDIRECTIONAL COMMUNICATION APPARATUS FOR TRANSMITTING/RECEIVING INFORMATION BY WIRELESS COMMUNICATION OR THROUGH A POWER LINE**

Hideaki Sato, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 15,821, Feb. 10, 1993, abandoned.

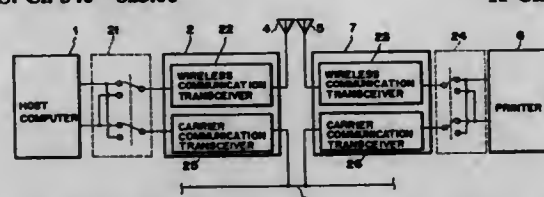
This application Jan. 31, 1995, Ser. No. 380,939

Claims priority, application Japan, Feb. 14, 1992, 4-028233

Int. Cl.<sup>6</sup> G05B 23/02

U.S. Cl. 340—825.06

11 Claims



1. A bidirectional communication apparatus powered from a power line, comprising:  
first means for transmitting and receiving information by wireless communication;  
second means connected to the power line for receiving and transmitting information through the power line; and  
switching means for switching said apparatus between a first state in which transmission to another communication apparatus is effected by wireless communication using said first means and reception from the other communication apparatus is effected through the power line using said second means, and a second state in which transmission to the other communication apparatus is effected through the power line using said second means and reception from the other communication apparatus is effected by wireless communication using said first means.

5,481,250

**CRT OPERATION APPARATUS**

Kazumi Hano, Fuchu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

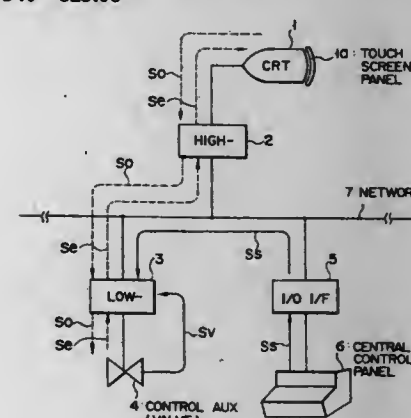
Continuation of Ser. No. 180,814, Jan. 10, 1994, abandoned, which is a continuation of Ser. No. 829,528, Feb. 3, 1992, abandoned, which is a continuation of Ser. No. 552,549, Jul. 16, 1990, abandoned. This application May 1, 1995, Ser. No. 432,589

Claims priority, application Japan, Jul. 18, 1989, 1-183564

Int. Cl.<sup>6</sup> H04Q 1/00

U.S. Cl. 340—825.06

5 Claims



1. A CRT operation apparatus for controlling a plant having terminal units, said CRT operation apparatus comprising:

CRT display means for displaying a system image of the plant, including icons indicating said terminal units and for selecting one of said terminal units by using said icons;

high-rank controller means, connected to said CRT display means, for supplying operation commands to one of said terminal units selected by said CRT display means;

low-rank controller means, connected to said terminal units, for controlling said terminal units;

network means for connecting said high-rank controller means and said low-rank controller means;

central control means, connected to said network means and having a manual operating member, for supplying operation commands to said terminal units by using the manual operating member;

first detecting means for detecting whether or not one of said terminal units selected by said CRT display means is in trouble;

second detecting means for detecting whether or not the operation command supplied from said CRT means is inconsistent with the operation command supplied from said central control means;

means, when one of said terminal units is selected by said CRT display means, for supplying a first abnormal-signal to said CRT display means if said first detecting means detects that the terminal unit is in trouble, a second abnormal signal to said CRT display means if said second detecting means detects that the operation command supplied from said CRT means is inconsistent with the operation command supplied from said central control means, and a use-permission signal to said display means if said second detecting means detects that the operation command supplied from said CRT means is not inconsistent with the operation command supplied from said central control means and said first detecting means detects that the terminal unit is not in trouble.

5,481,251

**MINIMAL FUNCTION REMOTE CONTROL WITHOUT DIGIT KEYS AND WITH A POWER TOGGLE PROGRAM AND WITH A CHANNEL ROTATION PROGRAM**

Menno Buys, Hengelo, Netherlands; Patrick Hayes, Mission Viejo, and Kim-thoa Nguyen, Yorba Linda, both of Calif., assignors to Universal Electronics Inc., Del.

Filed Nov. 29, 1993, Ser. No. 158,601

Int. Cl.<sup>6</sup> G05B 19/02

U.S. Cl. 340—825.22

10 Claims



1. A remote control comprising:  
a microprocessor including a CPU and memory means; a keypad including several keys coupled to said microprocessor for operating said remote control, one of said keys being a "POWER" key;

lamp driver circuitry coupled to said microprocessor; means, including said microprocessor, for generating infrared (IR) signals coupled to said IR lamp driver circuitry;

code data for executing command functions for operating a home entertainment device stored in said memory means; a power toggle program stored in said memory means for effecting the sending of one of an IR code for "STANDBY" and an IR code for a number digit each time said power key is pressed; and,

said power toggle program being operable to check, each time said "POWER" key is pressed, which one of said IR code for "STANDBY" and said IR code for said number digit was last sent by said remote control and then causes said remote control to send the opposite IR code without the need to press a digit key to turn on said home entertainment device.

5,481,252

**MODE CONVERSION METHOD FOR MULTIFUNCTIONAL PROGRAMMABLE REMOTE CONTROLLER**

Sun-don Kwon, Seoul, and Hyeon-su Kim, Suwon, both of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea

Continuation of Ser. No. 770,242, Oct. 3, 1991, abandoned.

This application May 4, 1994, Ser. No. 237,912

Claims priority, application Rep. of Korea, Jan. 26, 1990, 90-17222

Int. Cl.<sup>6</sup> G08C 17/00

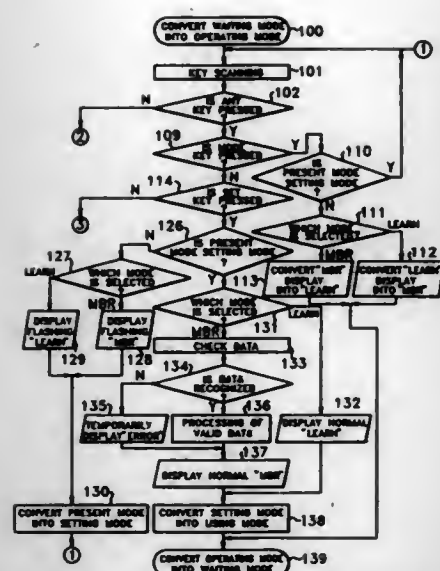
U.S. Cl. 340—825.22

24 Claims

1. A mode conversion method for a multifunctional programmable remote controller, comprising the steps of:

converting a waiting mode of said multifunctional programmable remote controller into an operating mode and performing a key scanning step to detect whether an input key from a key matrix is one of a mode key, a set key and normal keys; checking a current setting condition of said set key when no input key has been detected so that when the setting condition is not in progress, the power of said multifunctional programmable remote controller is turned off and the operating mode





is converted back to the waiting mode, and when said setting condition is in progress, checking whether a predetermined time has elapsed to convert the setting condition into a using mode and convert the operating mode back to the waiting mode after a selected mode is displayed according to a current mode, and returning to said key scanning step when said predetermined time has not elapsed;

checking whether said mode key has been detected in said key scanning step and determining the setting condition of said set key when said mode key has been detected so that when said setting condition is not in progress, each mode display is toggled to represent a mode conversion and the power is turned off; and that when said setting condition is in progress, returning to said key scanning step;

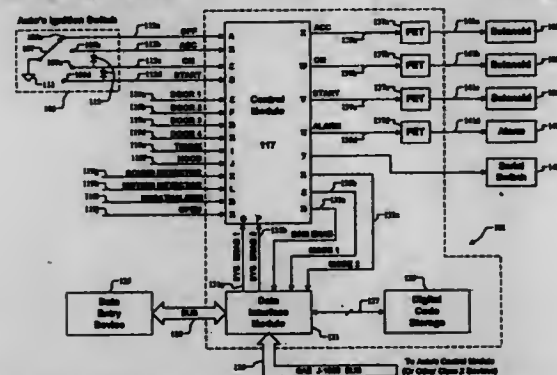
determining whether the current mode is one of said using mode and a setting mode when said set key has not been selected and when said mode key has not been detected in said key scanning step so that when said current mode is said using mode, corresponding data are displayed in a display unit in response to whether the current mode is one of a multi-brand remote control mode and a learning mode, and converting said operating mode back to said waiting mode and turning off the power, when said current mode is said setting mode, corresponding data are processed, displayed and stored in a memory in response to whether said current mode is one of said learning mode and said multi-brand remote control mode, and returning to said key scanning step; and

checking said current setting condition of the set key when said set key has been detected in said key scanning step so that when said setting condition is not in progress, each mode display is flashed for said current mode and said current mode is converted into said setting mode before returning to said key scanning step, when said setting condition is in progress, and when said current mode is said learning mode, result of a learning mode data setting completion is displayed in the display unit and said setting mode is converted into said using mode, when said current mode is said multi-brand remote control mode, corresponding setting data are checked for validity, when said corresponding setting data is valid, the valid data are processed and stored in the memory, when said corresponding setting data is not valid, an error is displayed on said display unit and a result of said multi-brand remote control mode data setting completion is displayed, and turning off said power after converting said setting mode into said using mode.

5,481,253  
AUTOMOTIVE SECURITY SYSTEM  
Michael D. Phelan, 100 Eagle Nest, Irving, Tex. 75063, and  
Keith N. St. John, 2006 Sunset Ct. N., League City, Tex.  
77573  
Continuation of Ser. No. 838,066, Feb. 18, 1992, abandoned.  
This application Jun. 23, 1994, Ser. No. 264,622  
Int. Cl.<sup>6</sup> B60R 25/04

U.S. Cl. 340—825.31

21 Claims



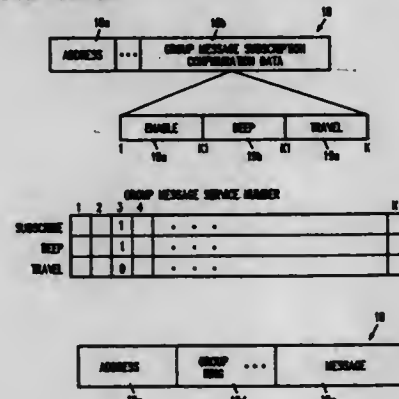
1. Apparatus for deterring defeat of a multiple-position ignition switch of an automobile, the ignition switch adapted for turning successively through each of a plurality of positions in a predetermined sequence, each position enabling a respective one of a plurality of circuits in the automobile; the apparatus comprising:  
means for receiving from a driver a numerical code;  
means for matching the numerical code to a preset code and communicating a match signal indicative of a match; and  
control means having a plurality of inputs each receiving from a respective one of a plurality of positions of a multiple-position automobile ignition switch a switch signal indicative of the position, and further having an output for providing a signal for enabling a circuit necessary for operation of the automobile;

wherein the control means includes means for generating the signal for enabling the circuit necessary for operation of the automobile in response to receiving the match signal and receiving the plurality of switch signals in a predetermined sequence, indicating that the switch signals are being produced by turning of the ignition switch through each of the plurality of positions in a predetermined sequence.

5,481,254  
GROUP MESSAGE DELIVERY IN A TIME-DIVISION  
MULTI-PLEXED PAGING SYSTEM  
Garold B. Gaskill, Tualatin; Dennis J. O'Brien, West Linn, and  
Michael C. Park, Portland, all of Oreg., assignors to Seiko  
Communications Holding N.V., Netherlands  
Filed Nov. 2, 1993, Ser. No. 147,834  
Int. Cl.<sup>6</sup> H04Q 7/00; H04J 3/24

U.S. Cl. 340—825.52

18 Claims

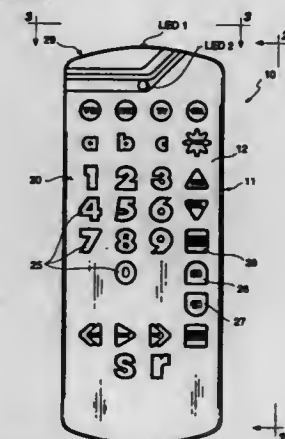


1. In a paging system delivering individual messages addressed to specific paging devices, a method of delivering a group message to a set of paging devices, the method comprising the steps:  
providing in said individual messages addressed to specific paging devices a group ring indicator field, the group ring indicator field indicating pending transmission of said group message; and  
causing said set of paging devices to collect said group message in response to said group ring indicator.

5,481,256  
DIRECT ENTRY REMOTE CONTROL WITH CHANNEL  
SCAN  
Paul Darbee, Santa Ana, Calif., and Menno Buys, Hengelo,  
Netherlands, assignors to Universal Electronics Inc., Del.  
Continuation-in-part of Ser. No. 990,854, Dec. 11, 1992, which  
is a continuation-in-part of Ser. No. 913,523, Jul. 14, 1992,  
abandoned, which is a continuation-in-part of Ser. No.  
586,957, Sep. 24, 1990, abandoned, which is a continuation of  
Ser. No. 127,999, Dec. 2, 1987, Pat. No. 4,959,810, which is a  
continuation-in-part of Ser. No. 109,336, Oct. 14, 1987, aban-  
doned. This application Nov. 29, 1993, Ser. No. 158,600  
Int. Cl.<sup>6</sup> H04Q 1/00

U.S. Cl. 340—825.56

17 Claims



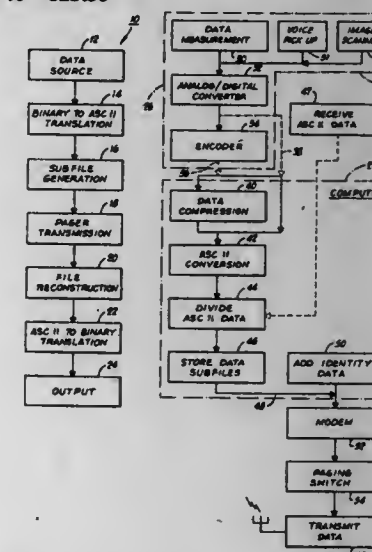
5,481,255  
PAGING TRANSMISSION SYSTEM  
David E. Albert, and Aziz El Idrisi, both of Oklahoma City,  
Okla., assignors to Data Critical Corp., Oklahoma City,  
Okla.

Filed Feb. 10, 1993, Ser. No. 15,869

Int. Cl.<sup>6</sup> H04Q 1/00

U.S. Cl. 340—825.55

43 Claims



1. A method for transmitting selected data from a source to a remote position comprising:  
generating said selected data as digital binary data at the source;  
converting each successive three 8-bit bytes of binary data to four 7-bit bytes of selected alphanumeric code data and dividing all alphanumeric code data into at least one successive sub-files, each sub-file being of pre-selected maximum message size;  
transmitting the divided 7-bit alphanumeric code data sequence via a paging switch;  
receiving the 7-bit alphanumeric code data via paging receiver at the remote position; and  
downloading the 7-bit alphanumeric code data to a selected programmable computer which recombines the at least one sub-files and retranslates from 7-bit alphanumeric code data to digital binary data for subsequent output display.

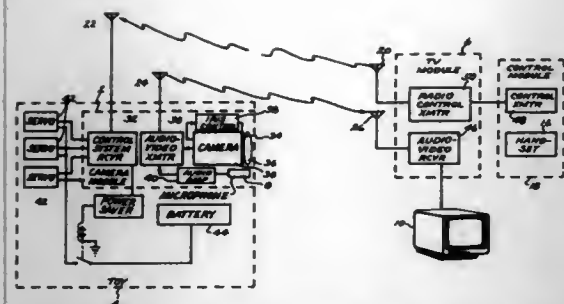
5,481,257  
REMOTELY CONTROLLED VEHICLE CONTAINING A  
TELEVISION CAMERA  
Curtis M. Brubaker, 10560 Dolcedo Way, Los Angeles, Calif.  
90077; Harry B. Wykes, Manhattan Beach; Harold D.  
Pierce, Canoga Park, all of Calif.; Robert C. Dixon, Palmer  
Lake, Colo., and Lawrence H. Post, Ballwin, Mo., assignors to  
Curtis M. Brubaker, Los Angeles, Calif.  
Continuation of Ser. No. 97,094, Jul. 23, 1993, abandoned,  
which is a continuation of Ser. No. 793,258, Nov. 12, 1991,  
abandoned, which is a continuation of Ser. No. 593,100, Oct.  
5, 1990, abandoned, which is a continuation of Ser. No.  
22,019, Mar. 5, 1987, abandoned. This application May 24,  
1994, Ser. No. 248,542  
Int. Cl.<sup>6</sup> G08C 19/16

U.S. Cl. 340—825.69

8 Claims

1. A method of operating a vehicle from a remote location wherein the vehicle is of a scale size that is too small to accommodate a human operator, the method comprising the following steps:  
providing a real-time video camera view of an environment in the vicinity of said vehicle, the view being of a wide angle





and having relatively high resolution in the center of the field of view to provide a wide angle image having a high depth of field and being relatively distorted at large angles from the center of the field of view to provide less detail at the periphery of said wide angle image;

converting said wide angle image to corresponding electrical image signals;

transmitting said electrical image signals to a display location remote from said vehicle;

receiving said electrical image signals and displaying said wide angle image, including portions of the image which are relatively distorted at large angles from the center of the field of view, of the environment in the vicinity of said vehicle at said display location to provide a visual perception of operation of the vehicle in the environment;

generating control signals at a remote control location for controlling the operation of said vehicle;

transmitting said control signals to said vehicle;

receiving said control signals at said vehicle; and

operating motion control mechanisms associated with said vehicle in response to received control signals to maneuver the vehicle from the remote control location.

5,481,258

# METHOD AND APPARATUS FOR COORDINATING CLOCKS IN A SIMULCAST NETWORK

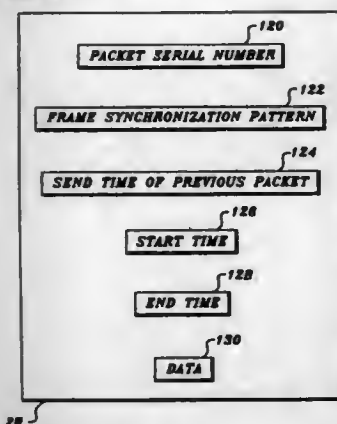
Glenn S. Fawcett, Vancouver, Canada; Mark L. Witsaman, and David W. Glessner, both of Quincy, Ill., assignors to Glenayre Electronics, Inc., Charlotte, N.C.

Filed Aug. 11, 1993, Ser. No. 105,436

Int. Cl.<sup>6</sup> G05B 23/02; G08B 5/22; H04B 1/00; 7/00

U.S. Cl. 340—825.47

26 Claims



1. A paging system comprising:

(a) a system controller including a system clock for maintaining a system time, said system controller being operative to generate paging data blocks, said paging data blocks containing pages to be broadcast, each of said paging data blocks containing a start time and timing information, said timing information being derived from said system clock and comprised of a time mark and a time mark send time, said time mark send time indicating the time of transmit as indicated by said system clock of a previously transmitted time mark; and

(b) a plurality of paging stations for receiving said timing information, each of said paging stations including:

(i) a link receiver for receiving said paging data blocks from said system controller;

(ii) a transmitter for broadcasting said pages contained in said paging data blocks; and

(iii) a station controller including a paging station clock for maintaining a station time, said station controller receiving said paging data blocks from said system controller and forwarding said pages contained in said paging data block to said transmitter for broadcast when said station time of said paging station clock equals said start time contained in said paging data block;

wherein said paging station clock of at least one of said paging stations utilizes said timing information contained in said paging data blocks to calibrate said paging station clock to said system clock.

5,481,259

# METHOD FOR READING A PLURALITY OF REMOTE METERS

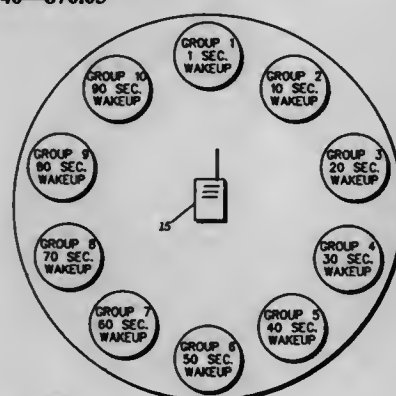
Ronald L. Bane, Stone Mountain, Ga., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 2, 1994, Ser. No. 236,078

Int. Cl.<sup>6</sup> G08C 17/00

U.S. Cl. 340—870.03

17 Claims



1. A method of reading meter status information from a plurality of remote meter interface units using a meter reading device, the plurality of remote meter interface units are partitioned into at least first and second meter groups, all of the meter interface units assigned to the first meter group have a first sleep period assigned to them, while all of the meter interface units assigned to the second meter group have a second sleep period assigned to them, the method comprising the steps of:

(a) transmitting, by the meter reading device, a message indicating operation of a meter read process;

(b) receiving, by a select one of the meter interface units in the first meter group, the message;

(c) operating the select one meter interface unit in a sleep mode for a duration of the first sleep period;

(d) requesting, by the meter reading device, meter status information from the select one meter interface unit;

(e) transmitting the meter status information from the select one meter interface unit in the first meter group to the meter reading device; and

(f) changing the sleep period assigned to the select one meter interface unit from the first sleep period to the second sleep period.

11. In a meter reading system having a plurality of meter interface units and a meter reading device, a method comprising the steps of:

assigning a sleep period to each meter interface unit of the plurality of meter interface units, the sleep period of each meter interface unit differing from that of at least one other of the plurality of meter interface units;

transmitting, by the meter reading device, a message indicating operation of a meter read process;

detecting, by a particular meter interface unit, the message from the meter reading device indicating operation of the meter read process;

operating the particular meter interface unit in a sleep mode for the assigned sleep period before placing the particular meter interface unit in an operational state for at least a predetermined time period to await communications from the meter reading device.

5,481,260

# MONITOR FOR FLUID DISPENSING SYSTEM

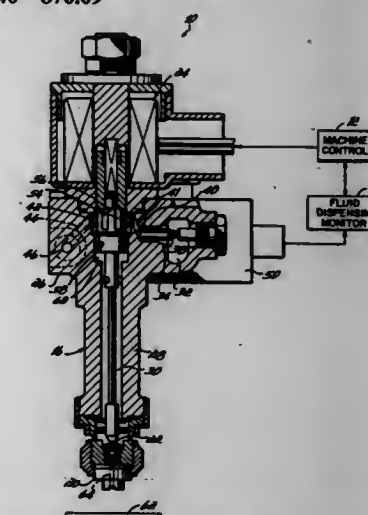
Jeffrey M. Buckler, Stow; Thomas A. Loparo, Elyria, and Joseph C. Waryu, Amherst, all of Ohio, assignors to Nordson Corporation, Westlake, Ohio

Filed Mar. 28, 1994, Ser. No. 218,675

Int. Cl.<sup>6</sup> G08B 19/00

U.S. Cl. 340—870.09

45 Claims



1. A method of monitoring fluid flow conditions in a fluid dispensing system controlling flow of a fluid through a fluid dispenser, the fluid dispenser including a sensor producing an input signal having values representing a characteristic of fluid flow through the fluid dispenser, the method comprising the steps of:

storing an alarm limit value of the characteristic of fluid flow and a warning limit value of the characteristic of fluid flow, the warning limit value having a magnitude between the alarm limit value and an acceptable value of the characteristic of fluid flow;

periodically sampling, during a sampling period the input signal to detect sampled values of the characteristic values of the fluid flow;

comparing each sampled value to the alarm and warning limit values; and

producing a warning error code in response to predetermined relationships between the sampled values and the alarm and warning limit values.

5,481,261

# WARNING FOR REMOTE CONTROL SYSTEM

Isao Kanno, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 2, 1991, Ser. No. 740,045

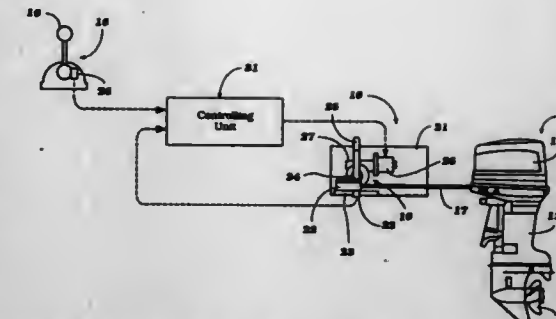
Claims priority, application Japan, Aug. 10, 1990, 2-210228

Int. Cl.<sup>6</sup> B63B 22/00

U.S. Cl. 340—870.16

7 Claims

1. A remote control system for transmitting control movement to a controlled element comprising, a controlling unit, a remote control unit having an operator movable between a plurality of



positions, first means for detecting the position of said operator and outputting a signal to said controlling unit indicative of the detected position of said operator, second means for detecting the position of said controlled element and outputting a signal to said controlling unit indicative of the detected position of said controlled element, an actuator unit including electric actuating means for actuating said controlled element on the basis of the signals received by said controlling unit, and a warning circuit having a timer for generating a warning signal if the detected position of said controlled element does not correspond with the detected position of said operator within a predetermined period of time after said operator is moved.

5,481,262

# SYSTEM MONITORING PROGRAMMABLE IMPLANATABLE TRANSPONDER

Donald J. Urbas, Evergreen, and David Ellwood, Golden, both of Colo., assignors to Bio Medic Data Systems, Inc., Maywood, N.J.

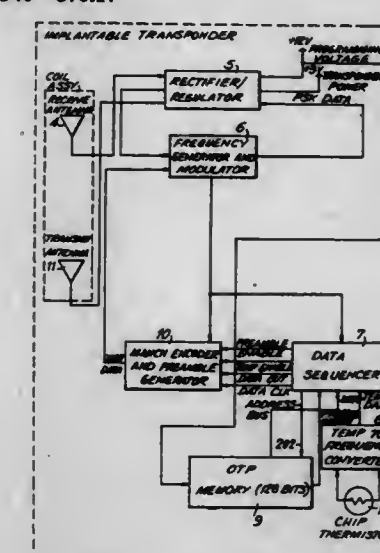
Continuation of Ser. No. 2,762, Jan. 11, 1993, abandoned, which is a continuation of Ser. No. 562,300, Aug. 3, 1990, Pat. No. 5,252,962. This application Dec. 29, 1993, Ser. No. 174,854

The portion of the term of this patent subsequent to Oct. 12, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> G08C 19/16

U.S. Cl. 340—870.17

11 Claims



1. A passive transponder comprising encapsulation means including therein receive antenna means for receiving an input signal from a signal source outside of said encapsulation means, and transmit antenna means for transmitting an output signal to said signal source, programmable memory means for storing data received by said transponder from said signal source, said programmable memory means being programmed in response to said input signal after completion of manufacture of said transponder, said programmable memory means having a plurality of memory



addresses and said programmable memory means outputting an inhibit signal to prevent said input signal from reprogramming said memory means once each of said addresses has been accessed during programming; said output signal including said data stored by said programmable memory means, and said output signal being generated in response to said input signal; and data sequencing means; said data sequencing means receiving said input signal and said inhibit signal and generating a divided input signal having a frequency substantially less than said frequency of said input signal and sequentially accessing said programmable memory means at said input signal frequency when said inhibit signal is present and sequentially accessing said programmable memory means at said divided input signal frequency when said inhibit signal is not present.

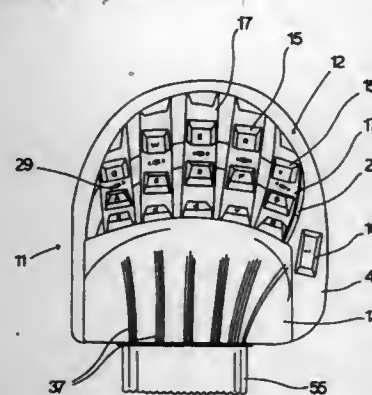
5,481,263

### COMPUTER WITH SEPARATE LEFT HAND AND RIGHT HAND OPERATED KEYBOARD UNITS

Man S. Choi, c/o 63 Primrose La., Closter, N.J. 07624  
Continuation-in-part of Ser. No. 487,182, Mar. 1, 1990, abandoned. This application Nov. 29, 1991, Ser. No. 800,469  
Int. Cl.<sup>6</sup> H01H 13/70

U.S. Cl. 341-20

5 Claims



1. A pair of keyboard units comprising housing frames carrying respective key pads with sets of keys having individual key designations serially arranged, respectively, in conformity with left hand and right hand operated sides of a QWERTY touch typing keyboard and handrests for supporting each hand during typing, means on each housing frame supporting the respective set of keys extending in front of and at a lower level than the handrest, means on each housing frame mounting the keys on the keypad for adjustment of their transverse positions relative to a typist's finger and comprising a series of transversely extending ribs and a series of longitudinally extending arcuate members carrying respective group of keys associated with the respective fingers and mounted for movement longitudinally of the transverse ribs to provide the transverse adjustment.

5,481,264

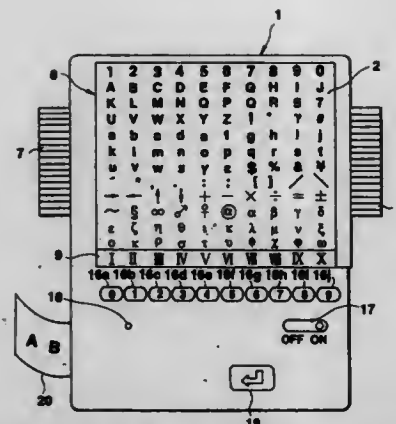
### DATA INPUTTING APPARATUS USING ROTARY DATA DRUM

Hiroki Kim, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan  
Filed May 25, 1994, Ser. No. 249,259  
Claims priority, application Japan, May 31, 1993, 5-128963  
Int. Cl.<sup>6</sup> H03M 11/00

U.S. Cl. 341-20

15 Claims

1. A data inputting apparatus comprising:  
a rotary member rotatably provided with respect to a rotation shaft thereof, said rotary member having a surface on which marks corresponding to input data are represented in a matrix form such that said marks are arranged in plural rows along a rotation direction of said rotary member and also in plural columns along an axial direction of said rotation shaft;



index means provided at a predetermined position of an outer peripheral portion of said rotary member, for positioning one row among said plural rows of marks represented on said rotary member;

row selecting means having a major unit which is assembled into said rotary member, said major unit including switch means for detecting a rotation position of said rotary member and for producing a row detection signal corresponding to said one row among said plural rows of marks represented on said rotary member, which is positioned by said index means

column selecting means for producing a column detection signal to select one column among said plural columns of marks represented on said rotary member; and  
control means for outputting a selection signal of input data corresponding to one mark among said plural marks represented on the surface of said rotary member in response to both said row detection signal obtained from said row selecting means and said column selecting signal obtained from said column detection means, said selection signal being outputted to a document forming device.

5,481,265

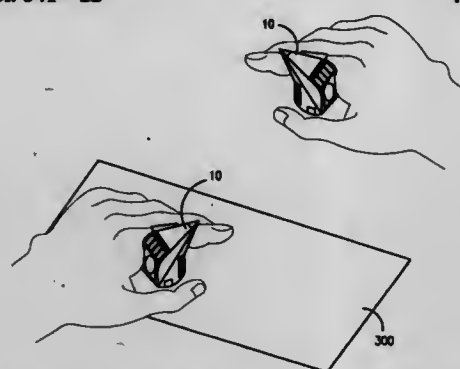
### ERGONOMIC CUSTOMIZEABLE USER/COMPUTER INTERFACE DEVICES

David C. Russell, 2967 Aldgate Dr., Bloomfield Hill, Mich. 48013

Continuation-in-part of Ser. No. 440,771, Nov. 22, 1989, abandoned. This application May 7, 1992, Ser. No. 879,374  
Int. Cl.<sup>6</sup> G06F 3/033

U.S. Cl. 341-22

41 Claims



1. A method of interfacing a user with a at least one computer, comprising the steps of:

operating a plurality of discrete switches on a user interface device with one of a single finger and a thumb, wherein said user interface device is attached to a different single finger of a user than the finger or thumb which operates the device, and wherein said switches are operable by at least one finger tip of such user;

generating computer control signals by performing said operating step;  
transmitting said computer control signals through at least one communications channel;  
receiving said transmitted computer control signals in a base computer interface device;  
decoding said transmitted signals;  
relaying said decoded signals to said at least one computer such that said at least one computer is controlled by said user interface device; and  
controlling operation of said at least one computer in response to said decoded signals.

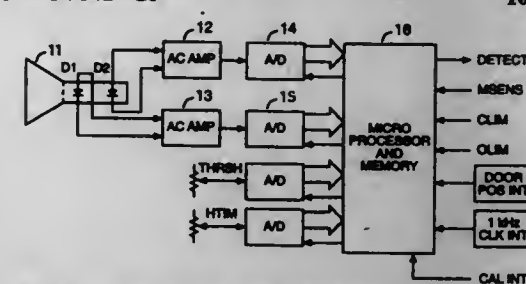
5,481,266

### AUTODYNE MOTION SENSOR

Warren F. Davis, 43 Holden Rd., West Newton, Mass. 02165  
Filed Nov. 17, 1994, Ser. No. 341,009  
Int. Cl.<sup>6</sup> G01S 13/56; 13/62

U.S. Cl. 342-28

10 Claims



1. An autodyne motion sensor apparatus comprising:
  - a source of phase coherent radiation,
  - means for producing autodyne demodulation signals from reflections of said phase coherent radiation,
  - a microprocessor,
  - a stored program executed by said microprocessor comprising a motion detection algorithm,
  - means for entering said autodyne demodulation signals into said microprocessor,
  - means for entering control signals into said microprocessor,
  - means for entering into said microprocessor values parametrizing said detection algorithm,
  - means for transmitting a detection signal from said microprocessor,
  - means for recording said autodyne demodulation signals characteristic of a specific object within the field of said source as a function of position,
  - means for subtracting said recorded autodyne demodulation signals from said autodyne demodulation signals entered into said microprocessor prior to processing by said detection algorithm,

whereby said autodyne motion sensor can be made selectively insensitive to said object within the field of said source and whereby said autodyne motion sensor tends to acquire presence detection properties as said source is shielded.

5,481,267

### SAMPLING RATE CONVERTER

Satoru Miyabe; Akira Toyama, and Minoru Takeda, all of Tokyo, Japan, assignors to Nippon Precision Circuits Inc., Tokyo, Japan

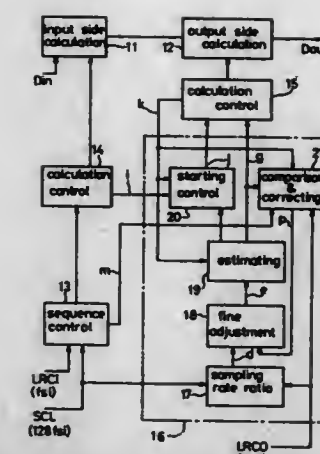
Filed Jan. 3, 1994, Ser. No. 176,560  
Claims priority, application Japan, Jan. 7, 1993, 5-001158; Jan. 28, 1993, 5-270451

Int. Cl.<sup>6</sup> H03M 7/00

U.S. Cl. 341-61

5 Claims

1. A sampling rate converter for converting a first signal of a first sampling rate to a second signal of a second sampling rate, said sampling rate converter comprising:



- a first data-generating circuit for generating first data which corresponds to the ratio of said second sampling rate to said first sampling rate;
- a second data-generating circuit for generating second data by correcting said first data with corrective data;
- a third data-generating circuit for generating, based on said second data, third data which corresponds to estimated output timing of said second signal;
- a comparator circuit for generating comparative data by comparing said third data with fourth data which corresponds to actual output timing of said second signal;
- a correcting circuit for generating said corrective data, based on said comparative data; and
- a second signal-generating circuit for generating said second signal based on said first and third data.

5,481,268

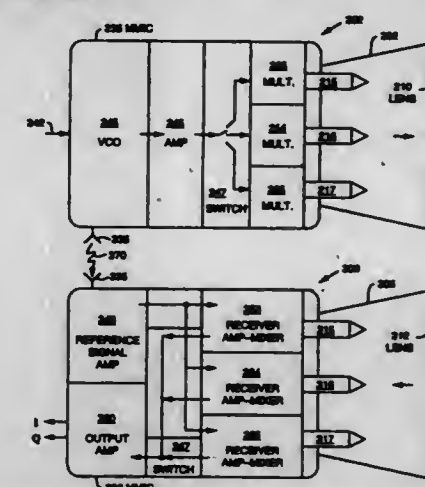
### DOPPLER RADAR SYSTEM FOR AUTOMOTIVE VEHICLES

J. Aiden Higgins, Westlake Village, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Jul. 20, 1994, Ser. No. 277,466  
Int. Cl.<sup>6</sup> G01S 13/93

U.S. Cl. 342-70

11 Claims



1. A Doppler radar system for an automotive vehicle, comprising a transmitter module comprising a first monolithic microwave integrated circuit (MMIC) chip for generating a transmit signal and a first waveguide antenna system connected to said transmitter MMIC chip for transmitting said transmit signal; said first MMIC chip comprising a voltage controlled oscillator (VCO) for generating a VCO frequency signal and a multiplier connected between said VCO and said first waveguide antenna system for multiplying said VCO frequency signal to produce said transmit signal;



a receiver module comprising a second MMIC chip and a second waveguide antenna system connected to said second MMIC chip for receiving a reflected transmit signal; said second MMIC chip comprising a low noise receiver amplifier connected to said second waveguide antenna system, said low noise receiver amplifier including; means for mounting said transmitter module and said receiver module; and means for coupling said transmitter VCO frequency signal generated by said first MMIC chip to said second MMIC chip by electromagnetic radiation.

5,481,269

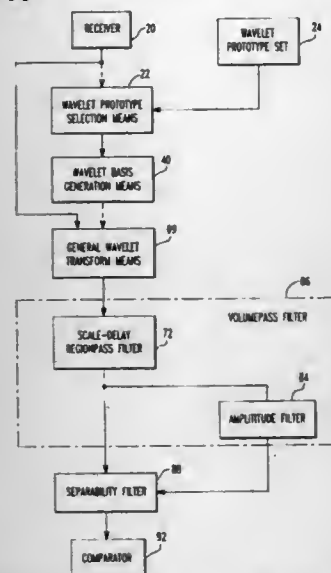
## GENERAL FRAME WAVELET CLASSIFIER

Scott A. Imhoff, Anne Arundel County; Martin G. Woolfson, Baltimore County; Gloria A. Bendor, Howard County; Guy W. Cheesman, III; James R. Brinsley, both of Anne Arundel County, and Martin M. Morici, Baltimore County, all of Md., assignors to Westinghouse Electric Corp., Baltimore, Md.

Filed May 27, 1994, Ser. No. 250,226  
Int. Cl.<sup>6</sup> G01S 13/00

U.S. Cl. 342-90

32 Claims



1. A classifier for recognizing features of a target in a received signal, comprising:

means for selecting a prototype wavelet corresponding in amplitude and phase per unit of time to a portion of said received signal;

means for resolving said received signal onto a basis of wavelet functions in a wavelet domain by calculating inner product transform coefficients between said received signal and each of said wavelet functions, said wavelet functions corresponding to variations in scale and delay for said prototype wavelet, said variations in scale and delay exceeding a frame condition for said prototype wavelet and said basis, said frame condition enabling an inverse wavelet transform of said calculated inner product transform coefficients to converge on said received signal;

a regionpass filter for identifying a target region of said basis and for passing said inner product transform coefficients within said target region, said target region including said target features in the received signal;

a separability filter coupled to said regionpass filter for passing select inner product transform coefficients in said target region, said select inner product transform coefficients being a scale band within said target region and having a separability between known targets exceeding the separability in other

scale bands within said target region, a scale band defined by a set of inner product transform coefficients having a common scale variable; and a comparator coupled to said separability filter for comparing said select inner product transform coefficients to an exemplar, said comparison indicating a recognition of said features of the target.

5,481,270

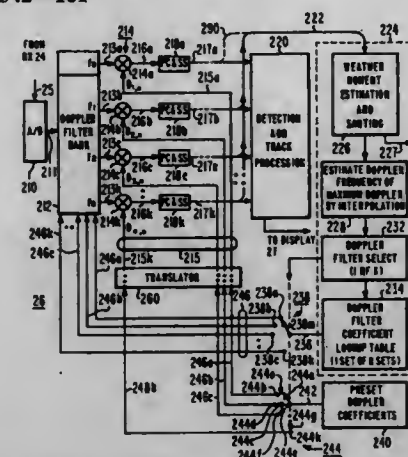
## RADAR WITH ADAPTIVE RANGE SIDELOBE SUPPRESSION

Harry Urkowitz, Philadelphia; Nicholas J. Bucci, Upper Darby, both of Pa., and Jerome E. Freedman, Margate, N.J., assignors to Martin Marietta Corporation, Moorestown, N.J.

Filed Mar. 4, 1994, Ser. No. 205,471  
Int. Cl.<sup>6</sup> G01S 13/28

U.S. Cl. 342-101

3 Claims



1. A radar system, comprising:  
transmitting means for transmitting pulses of energy toward a target, for generating echo signals;  
receiving means for receiving said echo signals, for generating received signals;

a plurality of Doppler filters, each of which is cascaded with a multiplier for forming a like plurality of cascaded channels, each of said cascaded channels including a received signal input port, a signal output port, and a frequency control signal input port, said received signal input port of each of said cascaded channels being coupled to said receiving means for receiving said received signals therefrom, for, in each of said channels, narrowband filtering the signals passing there-through about a center frequency controllable in response to a frequency control signal, and for, if necessary, converting said signals passing therethrough to baseband, for thereby generating one of a plurality of Doppler filtered baseband signals at said output port of each of said cascaded channels, each of which Doppler filtered baseband signals is representative of a different range of target velocities;

signal processing means coupled to said signal output port of each said plurality of Doppler filters for receiving said Doppler filtered baseband signals therefrom, and for processing said Doppler filtered baseband signals for determining which range bin has the greatest amplitude attributable to echo signals, and for determining said amplitude, to thereby generate maximum reflectivity signals;

Doppler power spectrum determining means coupled to said signal processing means for receiving said maximum reflectivity signals therefrom, for generating an estimate of the power spectrum of said maximum reflectivity signals to determine a maximum-power frequency; and

control means coupled to said Doppler power spectrum determining means and to said plurality of cascaded channels, for generating and applying said frequency control signal to said frequency control input port of at least one of said cascaded channels, for controlling said cascaded channels such that at

least said one of said cascaded channels has its said center frequency at said maximum-power frequency.

5,481,271

## TWO-WAVE ANTENNA FOR TELEPHONES USED IN VEHICLES

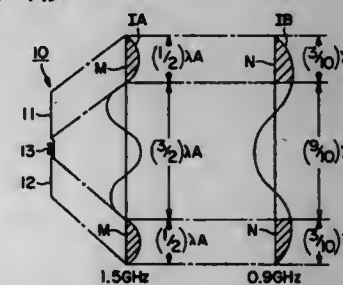
Xu Hai, and Yoshimi Egashira, both of Kanagawa, Japan, assignors to Harada Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1994, Ser. No. 218,097

Int. Cl.<sup>6</sup> H01Q 9/20

U.S. Cl. 343-749

1 Claim



1. A two-frequency band antenna for telephones used in vehicles comprising two radiating elements in which an end of each of said two radiating elements is respectively connected to one end of a single phase coil, and wherein effective radiating lengths of said two radiating elements are respectively  $\frac{1}{2} \lambda_1$  to  $\frac{3}{4} \lambda_1$  and an electrical length of said phase coil is  $\frac{3}{4} \lambda_1$  to  $\frac{1}{2} \lambda_1$  so that currents of same phase in two frequency bands comprising a first frequency band in the 1.5 GHz band and a second frequency band in the 0.9 GHz band are carried in said two radiating elements, said  $\lambda_1$  being a wavelength of said first frequency band.

5,481,272

## CIRCULARLY POLARIZED MICROCELL ANTENNA

George D. Yarusnas, Indian Mills, N.J., assignor to Radio Frequency Systems, Inc., Marlboro, N.J.

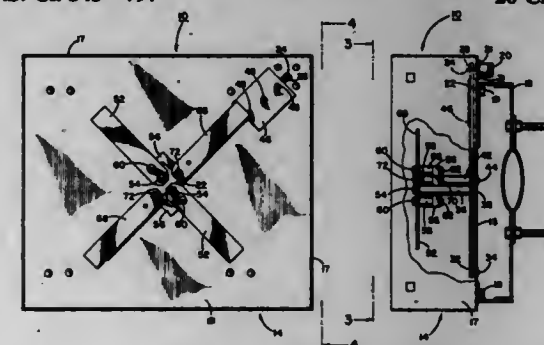
Continuation of Ser. No. 119,710, Sep. 10, 1993, abandoned.

This application Apr. 10, 1995, Ser. No. 420,439

Int. Cl.<sup>6</sup> H01Q 2/26

U.S. Cl. 343-797

20 Claims



1. A circularly polarized antenna (10) which is fed by a single feed-line for radiating circularly polarized electromagnetic energy therefrom, said antenna comprising:

an electrically conductive housing (12) having a base and a peripheral side wall extending upward therefrom for reflecting electromagnetic energy from therewithin;

an electrical connector (20) having an electrical conductor (24) surrounded by an electrically grounded shell, said shell being mounted to said housing (12) such that an electrical connection is made therebetween, said antenna being connected to the single feed-line by said electrical connector (20);

5,481,273

## TRANSMISSION CIRCUIT OF DISPLAY SIGNAL FOR LIQUID CRYSTAL DISPLAY AND TRANSMISSION METHOD THEREOF

Mitsuhiko Shigeta, Kyoto; Keisaku Nonomura, Nara, and Kazuyuki Kishimoto, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

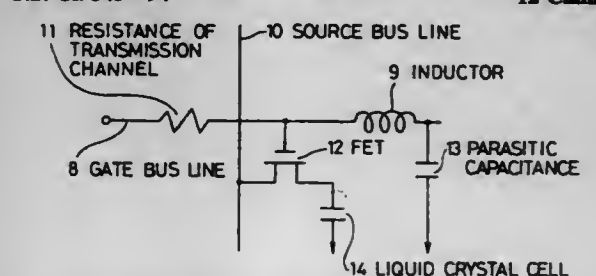
Filed Jul. 12, 1994, Ser. No. 273,932

Claims priority, application Japan, Jul. 13, 1993, 5-173162

Int. Cl.<sup>6</sup> G09G 3/36

U.S. Cl. 345-94

12 Claims



1. A transmission circuit for applying a display signal to a pixel of a liquid crystal display, which comprises

a transmission channel including a scanning line and a data signal line arranged in an intersecting matrix so that each intersection defines a pixel, and having

a switching element with inputs connected respectively to said scanning line and to said data signal line, and an output driving a cell of said display, said switching element having a capacitance;

wherein an inductor having a predetermined inductance value is arranged at a regular interval in the transmission channel,



thereby electrically separating each Nth pixel from an adjacent pixel, where N is an integer; and wherein said transmission circuit is driven by applying a voltage to the transmission channel and varying at least one of the capacitance and the inductance in a non-linear relation to the applied voltage while propagating the display signal either in the form of solitons or in the form of solitary waves.

5,481,274

## DISPLAY CONTROL DEVICE

Shuntaro Aratani, Machida, and Hiroshi Inoue, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 972,289, Nov. 5, 1992, abandoned.

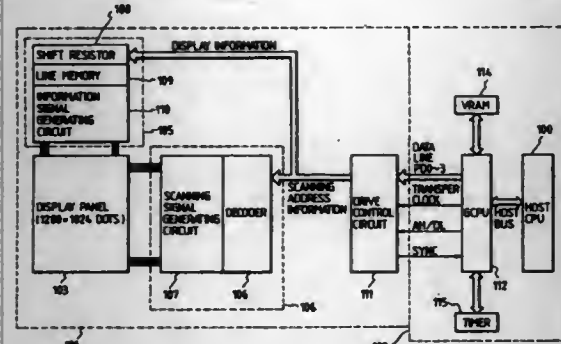
This application Mar. 21, 1995, Ser. No. 408,105

Claims priority, application Japan, Nov. 8, 1991, 3-319668

Int. Cl.<sup>6</sup> G09G 3/36

U.S. Cl. 345—98

7 Claims



1. A display method comprising the steps of: initiating a first partial rewriting on a display for displaying a first graphic event having a display priority; stopping the first partial rewriting remaining non-rewritten area on the display wherein the partial rewriting is not completed in response to a display instruction of a second graphic event having a display priority that is higher than the display priority of the first graphic event; performing the second partial rewriting on the display for displaying the second graphic event partially overlapping with the first graphic event on the display; and after completing the second partial rewriting, comparing an overlapping area between the first and second partial rewrites with the non-rewritten area and performing the partial rewrite of the non-rewritten area except for the overlapping area.

5,481,275

## RESOLUTION ENHANCEMENT FOR VIDEO DISPLAY USING MULTI-LINE INTERPOLATION

Robert J. Mical, Redwood City; David L. Needle, Alameda; Teju J. Khobchandani, Mountain View, and Stephen H. Landrum, San Leandro, all of Calif., assignors to The 3DO Company, Redwood City, Calif.

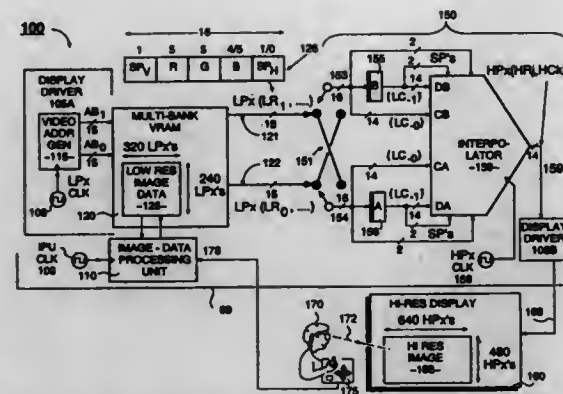
Filed Nov. 2, 1992, Ser. No. 970,287

Int. Cl.<sup>6</sup> G09G 1/06

U.S. Cl. 345—132

43 Claims

1. An enhanced resolution imaging system comprising: (a) a memory unit having a plurality of independently addressable storage banks for storing a plurality of low-resolution datawords respectively representing pixels of adjacent low-resolution image lines in memory locations of respective ones of the plural storage banks, the low-resolution image lines being aligned at least hypothetically one above the next so that their respective pixels define a plurality of low-resolution columns, with each column having at least four low-resolution pixels;



- (b) extracting means for extracting from the memory unit, in one or more extraction cycles, a group comprised of no more than N low-resolution pixel datawords, where N is an integer greater than one but less than the number of pixels in a low-resolution image line and where the extracted group includes low-resolution pixel datawords from at least two of said plural storage banks; and
- (c) interpolating means for interpolating the N low-resolution pixel datawords of the extracted group and producing therefrom an interpolated signal representing at least one high-resolution pixel.

5,481,276

## DEVICE INDEPENDENT INTERFACE FOR GRAPHICS DISPLAY DEVICES

Conwell J. Dickey, and James M. King, both of Ft. Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

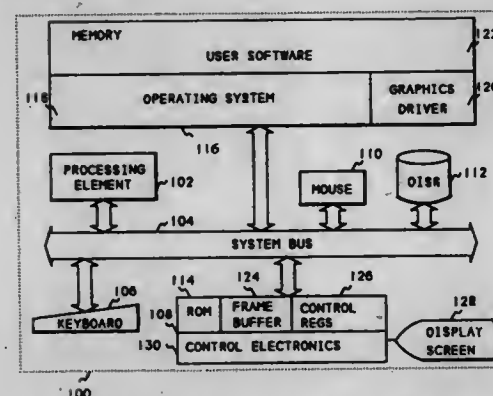
Continuation of Ser. No. 830,155, Feb. 3, 1992, abandoned.

This application Nov. 18, 1994, Ser. No. 342,401

Int. Cl.<sup>6</sup> G09G 5/00

U.S. Cl. 345—132

15 Claims



1. A method for displaying information on each of a plurality of display device types, said method comprising the steps of: (a) defining a standard programming interface for a set of programmed routines to display said information on said plurality of display device types; (b) defining a plurality of sets of programmed routines for displaying said information, one of said plurality of sets of programmed routines being defined for each one of said plurality of display device types, and wherein each of said plurality of sets of programmed routines incorporates said standard programming interface, and further defining a plurality of subsets of said sets of programmed routines, one subset for each of a plurality of computer processor types; (c) storing a selected one of said sets of programmed routines defined for a selected one of said plurality of display device types in a storage device contained within each device of said selected one of said display device types;

- (d) installing a selected device of said selected one of said display device types into a computer system;
- (e) selecting one of said subsets of said sets of programmed routines to match a computer processor type contained within said computer system; and
- (f) using said selected one of said subsets of programmed routines to display said information on said selected device.

5,481,277

## CHARACTER GENERATOR

Hidehiko Morinaga, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 547,849, Jul. 3, 1990, abandoned.

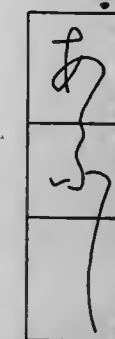
This application Nov. 2, 1992, Ser. No. 970,224

Claims priority, application Japan, Jul. 5, 1989, 1-171880

Int. Cl.<sup>6</sup> G09G 5/22

U.S. Cl. 345—143

19 Claims



1. A character generator comprising: storage means for storing a plurality of continuous-script character patterns for each character having a specified character code, the plurality of character patterns having different writing start and end points so as to continuously couple a character pattern to preceding and following character patterns when these characters are outputted; and searching means for searching the plurality of character patterns stored in said storage means for a most appropriate character pattern corresponding to a subject character code, wherein the most appropriate character pattern is determined by determining the writing end point thereof on the basis of the writing start point of a following character pattern such that the most appropriate character pattern is continuously coupled to the following character pattern.

5,481,278

## INFORMATION PROCESSING APPARATUS

Hiroyuki Shigematsu, Yamatokoriyama; Yutaka Nakamura, Soraku; Munenori Sakamoto, Yamatokoriyama; Hiroyuki Nagasawa; Hiroshi Nakao, both of Shiki; Yasuhiro Nakajima, Yao, and Masaaki Kurata, Nabari, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Oct. 15, 1993, Ser. No. 136,209

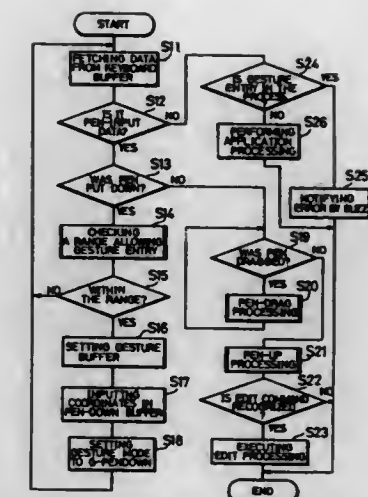
Claims priority, application Japan, Jan. 21, 1992, 4-283273; Jan. 21, 1992, 4-283276

Int. Cl.<sup>6</sup> G09G 3/02

U.S. Cl. 345—179

7 Claims

1. An information processing apparatus comprising: a screen; an input pen for inputting coordinates and drawing a line on said screen; position detecting means for detecting coordinates of a position on said screen where a pen point of said input pen makes contact with said screen; reference-stroke storing means for storing a plurality of predetermined reference strokes; reference-stroke selecting means for comparing a pen stroke made on a text on said screen by said input pen with the





a plurality of frame memories for storing a plurality of serial frame images of the subject;

address signal generating means for generating readout vertical address signals and readout horizontal address signals;

data setting means for setting data corresponding to a rate of readout of the plurality of serial frame images stored in the frame memories, capable of selectively either increasing or decreasing the rate of the readout of the serial frame images;

supply means for supplying periodic vertical address signals and horizontal address signals for reading out the serial frame images stored in the frame memories;

mode setting means for selectively setting an increase mode and a decrease mode;

first image synthesizing means for, when the increase mode is set by the mode setting means, reading out an  $N_1$  number of pixels of a first frame memory of the plurality of frame memories ( $N_1 < N$ ) and an  $N_2$  number of pixels of a second frame memory of the plurality of frame memories ( $N_1 < N$ ,  $N_1 > N_2$ ), and synthesizing the readout pixels ( $N_1$ ,  $N_2$ ) to produce an image to be displayed by use of the data setting means and the supply means;

second image synthesizing means for, when the decrease mode is set by the mode setting means, reading out an  $N$  number of pixels and an  $N_3$  number of pixels from said first frame memory, and synthesizing the readout pixels ( $N$ ,  $N_3$ ) to produce images to be displayed; and

display means for continuously selectively displaying the images to be displayed which are produced by the first and second image synthesizing means, wherein said first frame memory and said second frame memory are adjacent to each other.

5,481,280

## COLOR INK TRANSFER PRINTING

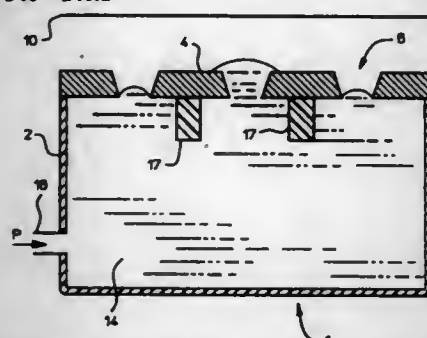
Si-Ty Lam, 3861 Kamp Dr., Pleasanton, Calif. 94566, and Young-Soo You, 486 Casita Way, Los Altos, Calif. 94022

Filed Nov. 30, 1992, Ser. No. 983,011

Int. Cl.<sup>6</sup> B41J 2/005

U.S. Cl. 346—140.1

19 Claims



1. A color ink transfer printing device, comprising:

first through fourth ink containers for retaining colored ink which is pressurized, each of said first through fourth containers retaining a different color ink, each of said first through fourth containers being respectively associated with and coupled to first through fourth ink transfer surfaces, each of said ink transfer surfaces having a plurality of perforations, an inner surface of said ink transfer surface contacts the colored ink held within said containers, and viscosity of the colored ink under ambient conditions prevents flow of the colored ink through the perforations of said ink transfer surfaces;

a viscosity control unit for inducing a change in the viscosity of colored ink near certain of the perforations thereby enabling a controlled amount of the colored ink near each of said certain

of the perforations to flow through said certain of the perforations onto an outer surface of said ink transfer surface corresponding thereto; and

an ink transfer unit for transferring the colored ink, which has flowed onto the outer surface of said ink transfer surfaces, to a printing media, the colored ink being transferred by contacting the outer surface of said ink transfer surface to the printing media or an intermediate surface to transfer the colored ink which has flowed onto the outer surface to the printing media,

wherein the ink which has flowed onto the outer surface sits or remains on the outer surface proximate to said certain of the perforations from which the ink flowed through until transferred.

5,481,281

## INK JET RECORDING APPARATUS AND METHOD CAPABLE OF PERFORMING HIGH-SPEED RECORDING

Naoji Otsuka, Kawasaki; Kentaro Yano; Kichiro Takahashi, both of Yokohama; Atsushi Arai, Kawasaki; Hitoshi Nishikori, Yokohama, and Osamu Iwasaki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 872,924, Apr. 23, 1992. This application

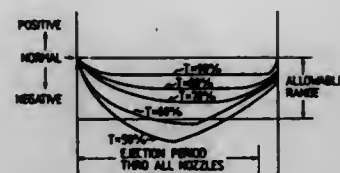
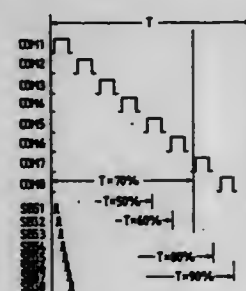
Oct. 7, 1993, Ser. No. 133,213

Claims priority, application Japan, Apr. 26, 1991, 3-097249; Mar. 31, 1992, 4-077411

Int. Cl.<sup>6</sup> B41J 2/01

U.S. Cl. 347—12

12 Claims



1. An ink jet recording apparatus comprising:

a recording head having a plurality of ejection orifices for ejecting an ink, and a common ink chamber for supplying the ink to said plurality of ejection orifices; and

driving means for causing said plurality of ejection orifices of said recording head to eject the ink,

wherein said driving means causes a number of the ejection orifices to eject an ink quantity at a same timing, the ink quantity being not more than 7% of an ink quantity to be ejected from all of said plurality of ejection orifices of said recording head, and sets an ink ejection period required for ejecting the ink from all of said plurality of ejection orifices to be not less than 70% of a driving period.

5,481,282

## SUCTION RECOVERY DEVICE AND INK JET RECORDING APPARATUS WITH THE DEVICE

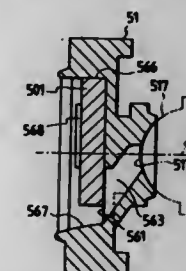
Kazuya Iwata, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 953,843, Sep. 30, 1992, abandoned, which is a division of Ser. No. 634,766, Dec. 27, 1990, Pat. No. 5,214,447. This application Jan. 28, 1994, Ser. No. 188,122

Claims priority, application Japan, Dec. 29, 1989, 1-344914 Int. Cl.<sup>6</sup> B41J 2/165

U.S. Cl. 347—30

30 Claims



1. A suction recovery device for recovering a recording head having a face having a discharge port for discharging ink onto a recording medium, said suction recovery device comprising:

a cap for covering the face of the recording head, said cap having an ink suction port interconnected with a suction mechanism for sucking ink, said ink suction port being disposed on an interior side of said cap, for facing the discharge port and displaced downwardly from a center position within said cap; and

an ink absorbing member disposed within said cap and for facing the discharge port, said ink absorbing member closing an upper side of said ink suction port, and maintaining a lower side thereof open.

5,481,283

## RECOVERY SYSTEM AND INK JET RECORDING APPARATUS PROVIDED WITH SAID RECOVERY SYSTEM

Fumihiko Watanabe, Yokohama; Akio Okubo, Tokyo; Atsushi Saito, and Yasuyuki Shinada, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 347,176, Nov. 22, 1994, abandoned, which is a continuation of Ser. No. 138,376, Oct. 19, 1993, abandoned, which is a continuation of Ser. No. 655,161, Feb. 13, 1991, abandoned. This application Mar. 24, 1995, Ser. No. 409,963

Claims priority, application Japan, Feb. 13, 1990, 2-31700; Feb. 13, 1990, 2-31707; Feb. 13, 1990, 2-31708; Feb. 13, 1990, 2-31716; Feb. 13, 1990, 2-31718; Feb. 13, 1990, 2-31720; Feb. 13, 1991, 3-19939

Int. Cl.<sup>6</sup> B41J 2/165

U.S. Cl. 347—33

26 Claims

1. An ink discharge recovery mechanism comprising:

support means for rotatably supporting a full-line ink jet recording head for rotation about an axis parallel to a longitudinal direction of an ink discharge port surface of said recording head, said discharge port surface having a plurality of discharge ports for discharging an ink to record across the width of a recording region of a recording medium, wherein said ink discharge port surface moves along a predetermined arc as said recording head is rotated; and

a plurality of wiping members, each having a width sufficient for wiping said discharge port surface, wherein each said wiping member has a different length so that successively longer wiping members wipe said discharge port surface as said discharge port surface moves along the predetermined arc, and wherein a contact force with which said wiping members wipe said discharge port surface varies within said discharge port surface.



5,481,284

## PRINTER HAVING LINE-TYPE INK JET RECORDING HEAD

Tsuyoshi Kitahara; Eiji Kumai; Hiromu Hirabayashi; Kenichi Kanbayashi, and Kohji Watanabe, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

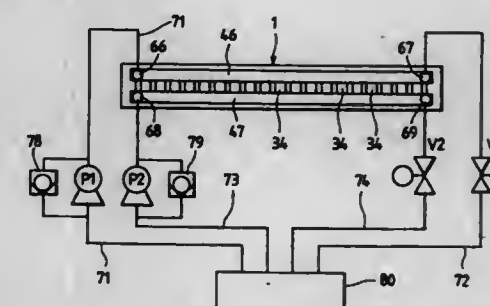
Filed Jun. 21, 1993, Ser. No. 78,652

Claims priority, application Japan, Jun. 23, 1992, 4-164951; Jun. 23, 1992, 4-164952; Sep. 24, 1992, 4-254885; Jan. 12, 1992, 4-273145; Jan. 13, 1992, 4-274508; Jan. 19, 1992, 4-280095; Mar. 29, 1993, 5-093672

Int. Cl.<sup>6</sup> B41J 2/155; 2/18; 2/19

U.S. Cl. 347—42

26 Claims



1. A printer having a line-type ink jet recording head, comprising:

a line head extending substantially horizontally in a recording paper width direction and having pressure producing chambers defined therein by substantially vertical side walls, at least one nozzle opening formed in each of said pressure producing chambers, an upper ink flow path and a lower ink flow path defined in said line head above and below said pressure producing chambers, respectively, said upper and said lower ink flow path being in fluid communication with each other through the pressure producing chambers and extending substantially horizontally, each said ink flow path having an inlet for replenishing ink and an outlet for discharging the ink on respective ends thereof, and a plurality of pressure producing elements coupled to said pressure producing chambers for applying varied pressures to the pressure producing chambers for jetting ink droplets;

a sealing member for sealing the nozzle openings by abutting on the nozzle openings when the recording head has been evacuated to a predetermined position;

an ink tank connected to said inlets and said outlets by pipes; and

ink stream producing means, associated with said pipes, for producing streams of ink flow, wherein the ink flows from said ink tank to at least said lower ink flow path and then to said upper ink flow path through the pressure producing chambers before returning to said tank.



5,481,285

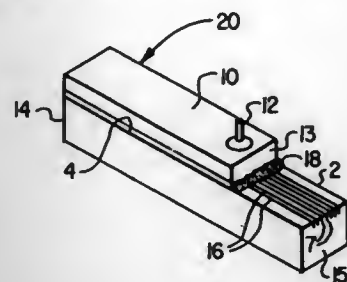
**INK JET PRINthead MANUFACTURED BY A FILM COATED PASSIVATION PROCESS**

John R. Pies, Dallas, and Donald J. Hayes, Plano, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex. Division of Ser. No. 947,830, Sep. 21, 1992, Pat. No. 5,334,415. This application Apr. 25, 1994, Ser. No. 232,695

Int. Cl.<sup>6</sup> B41J 2/045

U.S. Cl. 347-45

16 Claims



1. An ink jet printhead product including an elongated intermediate member having microgrooves formed in a top surface of said intermediate member along the length thereof and adhesively secured between an elongated base member and an injector top member adhesively secured to said top surface of said intermediate member, thereby covering said microgrooves, said ink jet printhead manufactured by a process comprising the steps of:

- placing the ink jet printhead on a rotation plate having a centrum for rotation;
- securing the ink jet printhead in position upon said rotation plate such that the microgrooves of the ink jet printhead are generally directed from said centrum radially outward;
- placing an insulating resin along the surfaces of the microgrooves; and
- spinning the ink jet printhead to cause said insulating resin to migrate along surfaces of the microgrooves, thereby coating the surfaces thereof.

5,481,286

**IMAGE FORMING APPARATUS HAVING STAGGERED APERTURE ELECTRODES THAT UNIFORMLY SUPPLY TONER TO FORM AN IMAGE**

Shigeru Kagayama, Owariasahi, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

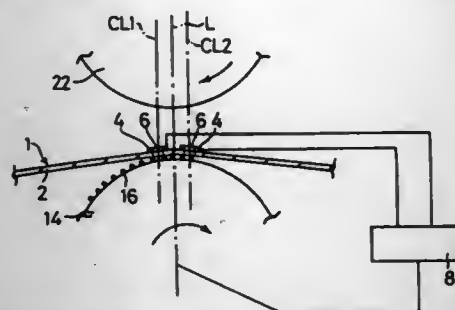
Filed Mar. 8, 1994, Ser. No. 207,210

Claims priority, application Japan, May 31, 1993, 5-128726

Int. Cl.<sup>6</sup> B41J 2/415

U.S. Cl. 347-55

19 Claims



1. An image forming apparatus comprising: carrier means for carrying and supplying charged toner particles and having a central toner particle transfer point; back electrode means for attracting the charged toner particles from said carrier means, said back electrode means facing and spaced from said carrier means so that an image receiving member can be positioned between said carrier means and said back electrode means to receive charged toner particles and form an image, said back electrode means having a

central toner particle transfer point aligned with said central toner particle transfer point of said carrier means; and toner flow control means for controlling a flow of charged toner particles from said carrier means to said back electrode means disposed between said back electrode means and said carrier means and confronting and contacting said carrier means, said toner flow control means comprising a plurality of arrays of control units, each array including a plurality of aligned openings disposed at predetermined intervals extending in a direction substantially perpendicular to a feeding direction of the image receiving member and a control electrode provided around each opening.

wherein each array is equally spaced from a reference line extending between said central toner particle transfer points of said carrier means and said back electrode means, and wherein said toner flow control means is pressed against said carrier means so that right and left sides of said toner flow control means with respect to the reference line are inclined at a same angle from the feeding direction.

5,481,287

**LIQUID JET RECORDING HEAD HAVING A PLURALITY OF HEATING ELEMENTS AND LIQUID JET RECORDING APPARATUS HAVING THE SAME**

Masayoshi Tachihara, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 45,310, Apr. 12, 1993, abandoned,

which is a continuation of Ser. No. 742,549, Aug. 8, 1991,

abandoned, which is a continuation of Ser. No. 434,576, Nov.

13, 1989, abandoned, which is a continuation of Ser. No.

137,337, Dec. 23, 1987, abandoned. This application Dec. 14,

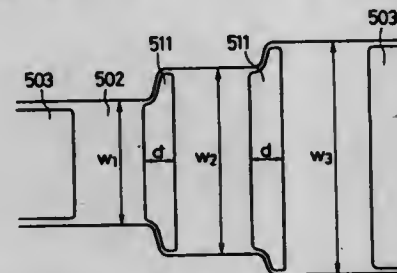
1994, Ser. No. 355,812

Claims priority, application Japan, Dec. 25, 1986, 61-307931

Int. Cl.<sup>6</sup> B41J 2/05

U.S. Cl. 347-62

14 Claims



1. A liquid jet recording head in which a plurality of recording elements are integrated, each of said recording elements comprising:

- a discharge opening through which a liquid is discharged;
- a liquid path communicating with said discharge opening;
- a plurality of heat generating elements disposed in said liquid path for heating said liquid to form a gas bubble, said heat generating elements being disposed at intervals, each said heat generating element having a width which is constant, said widths of successive said heat generating elements being mutually different;

at least one connecting member, each said connecting member being disposed between successive said heat generating elements within the intervals so as to connect electrically and in series said successive heat generating elements, each of said connecting members being dimensioned so that a width of each said connecting member varies monotonically from approximately said width of one adjacent said heat generating element to approximately said width of said other adjacent heat generating element, each said connecting member having a lower electrical resistance than that of both said adjacent heat generating elements; and

a pair of electrodes for allowing supply of an adjustable drive signal level from a drive source to both ends of said plurality of heat generating elements connected electrically and in series, wherein the gas bubble is formed with a predetermined number of said heat generating elements to control the amount of liquid discharged from the discharge opening by

changing the drive signal level supplied to said heat generating elements, so that one liquid droplet of a predetermined discharge amount is discharged from said discharge opening per one supply of the drive signal to said heat generating elements.

5,481,288

**MODULATION SIGNAL AMPLITUDE ADJUSTMENT FOR AN INK JET PRINTER**

Michael R. Keeling, and Hillar Weinberg, both of Cambridge, England, assignors to Linx Printing Technologies PLC, England

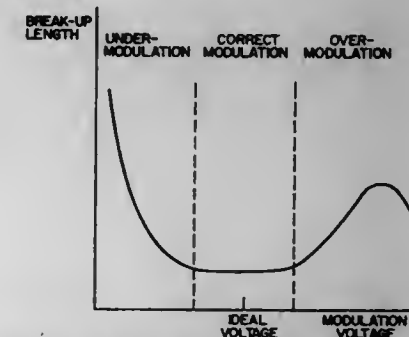
Division of Ser. No. 469,496, Apr. 16, 1990, abandoned. This application May 6, 1992, Ser. No. 864,850

Claims priority, application United Kingdom, Jan. 30, 1987, 8725465

Int. Cl.<sup>6</sup> B41J 2/115

U.S. Cl. 347-80

12 Claims



1. A method of adjusting the operating amplitude of a modulation signal which influences the separation of drops from an ink jet of an ink jet printer, the method comprising:

- a) determining the phase relationship between the modulation signal and the instants when successive said drops separate from the ink jet for a plurality of amplitudes of said modulation signal;
- b) identifying the amplitude of the modulation signal at a predetermined characteristic point in the function of said phase relationship with said amplitude from the magnitude of the change of said phase relationship with the change of said amplitude; and
- c) selecting the operating amplitude for the modulation signal in accordance with said amplitude identified in said identifying step.

5,481,289

**INK SUPPLY MECHANISM, INK JET CARTRIDGE PROVIDED WITH SUCH A MECHANISM, AND INK JET RECORDING APPARATUS PROVIDED WITH SUCH A MECHANISM**

Teruo Arashima, Kawasaki; Hiroshi Sugitani, Machida; Kazuaki Masuda, Kawasaki; Masami Ikeda, Yokohama; Masami Kasamoto, Ayase; Seiji Suzuki, Kawasaki; Hiroyuki Ishinaga, Tokyo; Jun Kawai, Yokohama; and Yuji Kamiyama, Fujisawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1993, Ser. No. 128,663

Claims priority, application Japan, Jan. 2, 1992, 4-289673

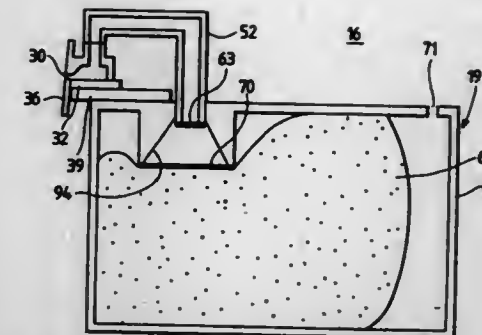
Int. Cl.<sup>6</sup> B41J 2/20

U.S. Cl. 347-93

29 Claims

1. An ink supply mechanism for supplying ink from an ink reservoir portion for storing ink to an ink jet recording portion having an ink discharging port for discharging ink, said mechanism comprising:

- an ink outlet section provided in said ink reservoir portion, said ink outlet section having an ink leading port for supplying ink to said ink jet recording portion;



a first filter member provided in said ink outlet section, within said ink leading port;

an ink supply member for communicating said ink jet recording portion with said ink outlet section for supplying ink from said ink reservoir portion to said ink jet recording portion; and a second filter member provided at an end of said ink supply member adjacent said ink reservoir portion and between the ink discharging port and said first filter member, said second filter member being provided in said ink leading port and creating a capillary force greater than a negative pressure in said ink reservoir portion, wherein an effective area of said first filter member is larger than an effective area of said second filter member and a volume between said discharging port and said second filter member is no less than or substantially equal to a volume between said first filter member and said second filter member.

5,481,290

**RECORDING APPARATUS**

Fumihiko Watanabe, Yokohama; Akio Okubo, Tokyo; Atsushi Saito, and Yasuyuki Shinada, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 655,162, Feb. 13, 1991, abandoned.

This application Jul. 26, 1993, Ser. No. 96,841

Claims priority, application Japan, Feb. 13, 1990, 2-31699;

Feb. 13, 1990, 2-31717; Feb. 13, 1991, 3-019939

Int. Cl.<sup>6</sup> B41J 2/01; 11/20

U.S. Cl. 347-104

8 Claims

1. A recording apparatus comprising:

- a drive roller member for conveying a recording medium;
- a recording head supporting member for supporting a recording head member for recording on the recording medium conveyed by said drive roller member;
- a follower roller member provided with a roller portion, disposed opposite to said drive roller member, for supporting the recording medium at a position opposite to said recording head member when recording and a roller bearing portion, disposed opposite to said recording head member, for supporting said roller portion; and
- a press member disposed adjacent to said follower roller member for pressing against said roller bearing portion so that said roller portion presses said drive roller member and said roller bearing portion presses said recording head member to position said follower roller member to said drive roller member and said recording head member.











5,481,304

# **APPARATUS FOR ZOOMING A DIGITAL VIDEO SIGNAL OF A PREDETERMINED COLOR ORDER WHICH IS DERIVED FROM A CHARGE-COUPLED DEVICE**

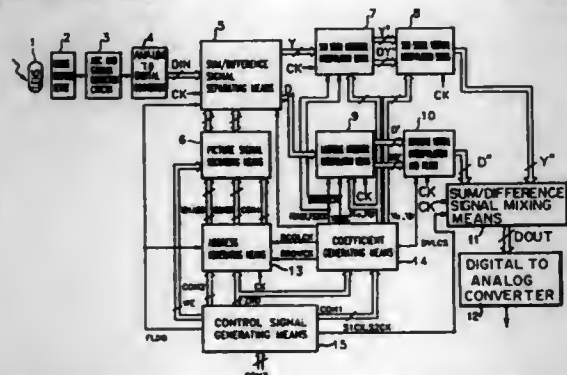
Sung-wook Park, Incheon, and Joon-ki Park, Seoul, both of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Continuation-in-part of Ser. No. 127,065, Sep. 27, 1993, abandoned. This application Dec. 27, 1994, Ser. No. 363,988  
Claims priority, application Rep. of Korea, Sep. 25, 1992, 92-17558

Int. Cl.<sup>6</sup> H04N 9/04; 5/14

U.S. Cl. 348—240

15 Claims



1. A digital zooming system for zooming a CCD video signal comprising:

recording means for recording a first charge-coupled device format digital video signal representing a color array converted into digital form and having a predetermined color order;

sum/difference signal separating means for receiving said first charge-coupled device format digital video signal and for obtaining a sum value and a difference value of two neighboring pixels among a plurality of pixels which establish said predetermined color array;

interpolation calculating means comprising:

sum-value interpolation calculating means for calculating a linear horizontal interpolation and a linear vertical interpolation with respect to said sum value according to a zooming factor; and

difference-value interpolation calculating means for calculating a linear horizontal interpolation and a nearest-neighbor vertical interpolation with respect to said difference value according to said zooming factor;

sum/difference signal mixing means for receiving resulting signals from said sum-value interpolation calculating means and said difference-value interpolation calculating means, and for producing a second charge-coupled device format digital video signal;

digital-to-analog converting means for converting said second charge-coupled device format digital video signal from said sum/difference signal mixing means into an analog television signal form having a color array in said predetermined order;

address generating means for producing a read-address signal for reading and a write-address signal for recording data in said recording means; and

5,481,305

Patent Not Issued For This Number

5,481,306

# **DISPLAY CIRCUIT FOR DISPLAYING AN HDTV SIGNAL AS TWELVE NTSC SIGNALS AND FOR DISPLAYING AN INDEPENDENT NTSC SIGNAL**

Hitoshi Senso, Yoshio Arai, and Masao Fukuda, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

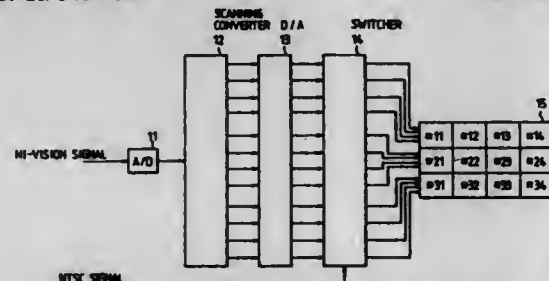
Continuation of Ser. No. 879,317, May 7, 1992, abandoned, which is a division of Ser. No. 725,100, Jul. 3, 1991, abandoned, which is a division of Ser. No. 440,169, Nov. 22, 1989, Pat. No. 5,111,303. This application Sep. 23, 1993, Ser. No. 125,139

Claims priority, application Japan, Feb. 27, 1989, 1-43171; Feb. 27, 1989, 1-43173

Int. Cl.<sup>6</sup> H04N 5/66

U.S. Cl. 348—383

10 Claims



1. A method for selectively displaying a high definition television system picture using a picture display system comprising a plurality of ordinary television receivers and a switch separate from said receivers, comprising the steps of:

A-D converting a high definition television system signal to provide A-D converted signals;

dividing said A-D converted signals into a plurality of video signals according to an existing ordinary television system;

D/A converting said plurality of video signals to provide D/A converted video signals;

displaying a portion of said high definition television system picture on at least one of said plurality of existing ordinary television receivers comprising a portion of a display area in accordance with at least one of said D/A converted video signals; and

controlling said switch of said picture display system to selectively display another portion of said high definition television system picture, in accordance with said D/A converted video signal, and at least one ordinary television system picture, different from said another portion of said high definition television system picture, on a different at least one of said plurality of existing ordinary television receivers comprising another portion of said display area.

5,481,307

# **METHOD AND APPARATUS FOR COMPRESSING AND DECOMPRESSING A SEQUENCE OF DIGITAL VIDEO IMAGES USING SYNC FRAMES**

Judith Goldstein, Browns Mills, N.J., and Michael Keith, Holland, Pa., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 857,605, Apr. 1, 1992, abandoned.

This application Oct. 26, 1994, Ser. No. 329,692

Int. Cl.<sup>6</sup> H04N 7/137; 7/133

U.S. Cl. 348—384

12 Claims

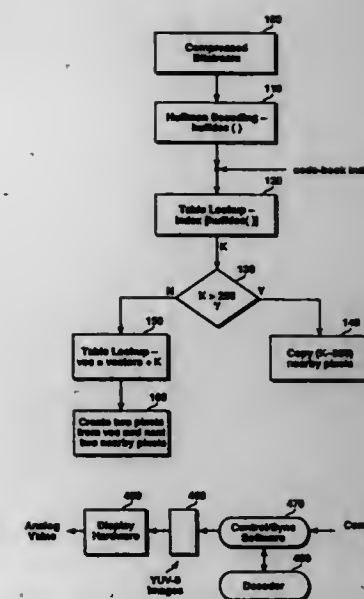
11. A method for decompressing a bitstream representative of a sequence of compressed digital video images, said sequence of compressed digital video images having a desired frame decomposition rate of F frames per second, comprising the steps of:

(A) selecting a frame from said bitstream for decoding;

(B) determining whether said selected frame is a sync frame;

(C) if said selected frame is said sync frame, copying a previously decoded frame into a current image bitmap;

wherein said at least one sync frame causes a video display system to continue displaying said previously decoded frame for a time period equivalent to at least 1/F seconds;



further wherein said bitstream is formed by a method for forming a bitstream, comprising the steps of:

- (1) determining a first number representing the actual number of frames already in said bitstream;
- (2) comparing said first number to a second number, wherein said second number represents a desired number of frames in said bitstream; and
- (3) if said second number exceeds said first number, inserting at least one sync frame into said bitstream.

5,481,308

# **METHOD AND APPARATUS FOR SYNTHESIZING SUBBAND VIDEO IMAGES**

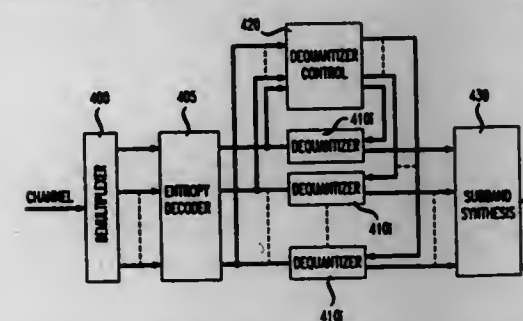
John Hartung, Warren, N.J.; Arnaud E. Jacquin, New York, N.Y.; Thomas A. Michel, Watchung, and Christine I. Podilchuk, Bridgewater, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Continuation of Ser. No. 179,858, Jan. 11, 1994, abandoned, which is a division of Ser. No. 92,768, Jul. 16, 1993, Pat. No. 5,309,232, which is a continuation of Ser. No. 832,256, Feb. 7, 1992, abandoned. This application Mar. 15, 1995, Ser. No. 405,426

Int. Cl.<sup>6</sup> H04N 7/24

U.S. Cl. 348—398

2 Claims



1. A method of synthesizing an image based on a plurality of coded sub-band image signals corresponding to a plurality of sub-bands into which an original image signal has been subdivided, the method comprising the steps of:

decoding a coded portion of a given sub-band image signal to form one or more decoded portions, said coded portion indicated by coded portion indicating signals received from a communication channel wherein the given sub-band image signal is an image signal corresponding to a given one of the plurality of coded image sub-band signals;

for a portion of given the sub-band image signal not coded, adopting a corresponding portion of a previously decoded sub-band image to form one or more adopted portions, said adopted portions identified by adopted portion identifying signals received from said communication channel;

zeroing a portion of the given sub-band image signal not decoded and not adopted to form one or more zeroed portions, said zeroed portions identified by zeroed portion identifying signals received from said communication channel;

for each of said plurality of coded sub-band image signals, forming a generated sub-band image, where at least one the generated sub-band images is based on a combination of said one or more decoded portions, said one or more adopted portions and said one or more zeroed portions; and

synthesizing an image based on the plurality of generated sub-band images.

5,481,309

# **VIDEO SIGNAL BIT RATE REDUCTION APPARATUS HAVING ADAPTIVE QUANTIZATION**

Tatsuro Juri, Osaka, and Masakazu Nishino, Kashiwara, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

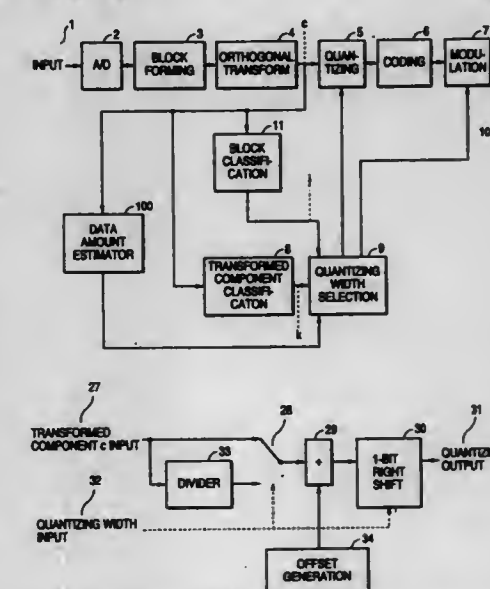
Filed Jun. 11, 1993, Ser. No. 74,484

Claims priority, application Japan, Jun. 15, 1992, 4-154650

Int. Cl.<sup>6</sup> H04N 7/30

U.S. Cl. 348—405

10 Claims



1. A bit rate reduction apparatus comprising:

block forming means for dividing input samples of a video signal into blocks, wherein each of said blocks is composed of a specific number of the input samples;

transforming means for transforming the input samples in each of said blocks to obtain transformed components in each of said blocks;

transformed component classifying means for classifying the transformed components in each of said blocks into k sets of classes, where k is an integer larger than 1, according to a visual importance of each of the transformed components and for outputting a classification signal indicating a class of each of said transformed components;

quantizing width selecting means having m kinds of quantizing widths where m is an integer larger than 1, which are assigned to n quantizing groups, where n is an integer larger than 1, each of said n quantizing groups being composed of k sets of quantizing widths assigned to correspond to said k sets of classes such that a one of said quantizing widths assigned to a class of smaller visual importance becomes relatively larger than a one of said quantizing widths assigned to a class of







5,481,316

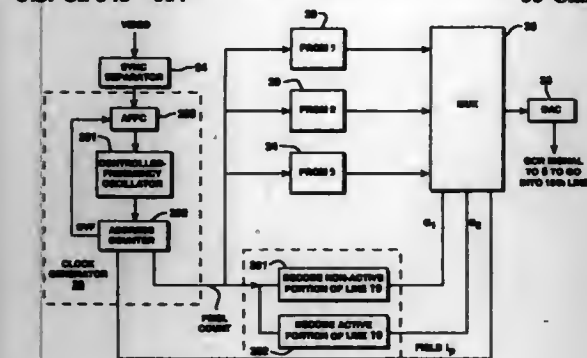
**SYSTEM, APPARATUS AND METHOD FOR CANCELING TELEVISION GHOST SIGNALS**

Chandrakant B. Patel, Hopewell, N.J., assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea  
Continuation-in-part of Ser. No. 623,563, Dec. 7, 1990, abandoned, which is a continuation-in-part of Ser. No. 609,522, Nov. 5, 1990, abandoned. This application Jul. 30, 1992, Ser. No. 921,686

Int. Cl.<sup>6</sup> H04N 5/21

U.S. Cl. 348-614

55 Claims



1. A reference signal signal generating circuit for generating a ghost canceling reference signal for insertion into a composite video signal, said composite video signal being descriptive of scanning of image frames horizontal scan line by horizontal scan line in accordance with horizontal and vertical synchronization signals within said composite video signal, said ghost canceling reference signal being of a type extending over the period of each said horizontal scan line and being generated during prescribed horizontal scan lines of said composite video signal occurring in respective vertical blanking intervals of said composite video signal, comprising:

- means for separating said synchronization signals from said composite video signal;
- means for generating a prescribed plural number of clock signals over the period of each said horizontal scan line, in response to said separated synchronization signals;
- means for generating a plurality of gating pulses during at least one prescribed scan line in each said image frame, in dependence upon said synchronization signals and clock signals;
- a plurality of addressable memory means storing components of a ghost cancelation reference signal without change during the course of a succession of said image frames, for reading responsive to address signals during said one prescribed scan line in each said image frame;
- means for generating the address signals for said plurality of addressable memory means by counting said clock signals that occur during said one prescribed scan line in each said image frame;
- a multiplexer for combining said components under control of said gating pulses, thereby to generate digital representations of said ghost cancelation reference signal;
- a digital-to-analog converter for converting said digital representations of said ghost cancelation reference signal to analog form, thereby providing said ghost cancelation reference signal; and
- superposition circuitry for inserting said ghost cancelation reference signal into said one prescribed scan line in each said image frame.

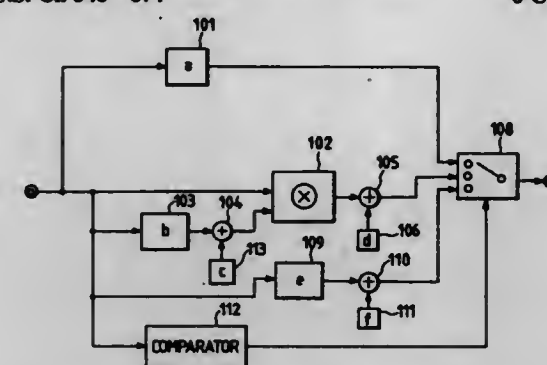
5,481,317

**GAMMA CORRECTION CIRCUIT WHICH SELECTS ONE OF A PLURALITY OF GAMMA CORRECTED SIGNALS AS AN OUTPUT SIGNAL BASED ON THE LEVEL OF AN INPUT SIGNAL**

Tetsuo Hieda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 3,482, Jan. 12, 1993, abandoned.  
This application Sep. 9, 1994, Ser. No. 302,943  
Claims priority, application Japan, Jan. 14, 1992, 4-023313  
Int. Cl.<sup>6</sup> H04N 5/202; 9/69

U.S. Cl. 348-674

6 Claims



1. A gamma correction apparatus, comprising:
  - (a) a plurality of operation means for forming a plurality of functional signals for together providing a gamma correction conversion of an entire range of levels of an input signal, each of said operation means at least multiplying the input signal by a respective coefficient to form one of the plurality of functional signals; and
  - (b) selecting means for selecting one of the plurality of functional signals, depending on a variation of the level of the input signal to form a combined gamma curve by combining said plurality of functional signals.

5,481,318

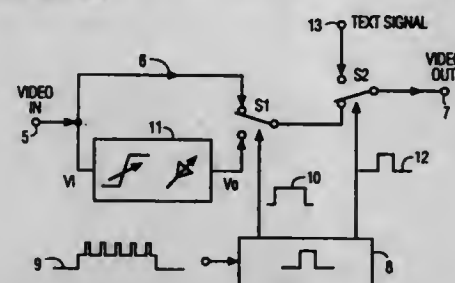
**TELEVISION RECEIVER WITH ADDITIONAL DISPLAY OF CHARACTERS**

Howard P. Flowers, Enfield, Great Britain, assignor to Ferguson Limited, United Kingdom  
Continuation of Ser. No. 111,229, Aug. 24, 1993, abandoned, which is a continuation of Ser. No. 669,067, Mar. 12, 1991, abandoned. This application Nov. 23, 1994, Ser. No. 344,796  
Claims priority, application United Kingdom, Mar. 27, 1990, 9006776

Int. Cl.<sup>6</sup> H04N 5/262

U.S. Cl. 348-686

8 Claims



1. A television receiver, comprising:
  - means for processing video signals, said video signal processing means developing one of a first video signal exhibiting a first substantially linear contrast range, and a second video signal exhibiting a second substantially linear contrast range, in response to a control signal, said second contrast range being reduced with respect to said first contrast range;
  - a display screen including a box on said display screen, wherein a video image is displayed outside and inside said box;

control means for generating said control signal for causing said video signal processing means to develop said first video signal for display of said video image outside said box, and to develop said second video signal for display of said video image within said box; and

means for producing a combined video signal, said combined video signal comprising a text signal representing characters for display and said second video signal;

said characters exhibiting a contrast range which is not reduced, in order to produce a display having easily viewable characters and a background of active video.

5,481,319

**MOTION DETECTION METHOD AND APPARATUS**  
Natalie L. Kershaw, Glebe; William C. Naylor, Jr., Mount Kuring-gai; Mark Pulver, Enmore; and David R. Brown, East Roseville, all of, Australia, assignors to Canon Inc., Tokyo, Japan

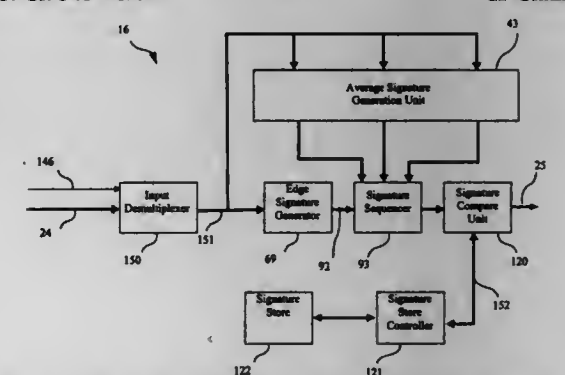
Continuation of Ser. No. 177,310, Jan. 4, 1994, abandoned.

This application Apr. 11, 1995, Ser. No. 420,716

Claims priority, application Australia, Jan. 11, 1993, PL6760  
Int. Cl.<sup>6</sup> H04N 7/18

U.S. Cl. 348-699

11 Claims



10. A method for detecting motion between a plurality of images, each of which comprises a plurality of lines, each line comprising a plurality of pixels, said method comprising the steps of:

- extracting an average value from a plurality of pixels in a first region;
- extracting an edge value from a plurality of pixels in a second region; and
- detecting the motion of successively input images from said average value and a corresponding average value from a previous image and said edge value and a corresponding edge value from a previous image.

5,481,320

**ELECTRO-OPTICAL APPARATUS UTILIZING AT LEAST THREE ELECTRO-OPTICAL MODULATING DEVICES TO PROVIDE A SYNTHESIZED COLOR IMAGE AND METHOD OF DRIVING SAME**

Toshimitsu Konuma, Kanagawa, and Akira Mase, Aichi, both of, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Filed Jul. 13, 1992, Ser. No. 912,335

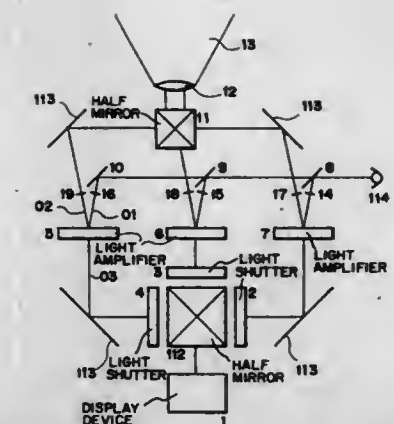
Claims priority, application Japan, Jul. 12, 1991, 3-198941; Jul. 12, 1991, 3-198942

Int. Cl.<sup>6</sup> H04N 9/31; 5/74

U.S. Cl. 348-751

8 Claims

1. An electro-optical device comprising:
  - at least three electro-optical devices, each of said three electro-optical devices comprising a transparent conductive film provided on a first substrate, a photoconductor provided on said transparent conductive film, a dielectric film provided on said



photoconductor and capable of intercepting a light, a second substrate provided with a transparent conductive film and orientation control means thereon, and an electro-optical modulating layer provided between said first substrate and said second substrate;

means capable of emitting an image light;

means for distributing said image light into at least three light components;

at least three optical shutters capable of transmitting and intercepting said at least three light components, respectively, said at least three light components transmitted by said at least three optical shutters being incident on the respective first substrates of said at least three electro-optical devices, respectively;

a light source;

at least three filters for separating the light emitted from said light source into at least three different color light components respectively; and

means for synthesizing at least three light patterns reflected from said at least three electro-optical devices, wherein said at least three different color light components are incident on the second substrates of said at least three electro-optical devices and reflected from said at least three electro-optical devices to produce said at least three light patterns.

5,481,321

**STEREOSCOPIC MOTION PICTURE PROJECTION SYSTEM**

Lenny Lipton, Greenbrae, Calif., assignor to StereoGraphics Corp., San Rafael, Calif.

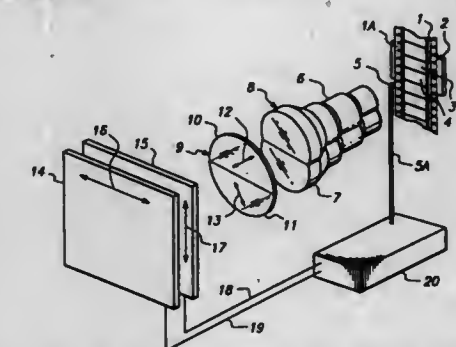
Continuation of Ser. No. 647,579, Jan. 29, 1991, abandoned.

This application Jul. 17, 1992, Ser. No. 917,517

Int. Cl.<sup>6</sup> G03B 35/00

U.S. Cl. 352-57

9 Claims



1. A system for projecting stereoscopic images from motion picture film onto a screen, wherein the film has a symmetrical above-and-below format in which left image subframes alternate with right image subframes, including:
  - a polarization control means for controlling a polarization characteristic of light which propagates simultaneously through a



left image subframe and a right image subframe and thereafter simultaneously illuminates the screen, wherein the polarization control means includes an electro-optical light modulation means whose optical state depends on an externally generated driving voltage;

a sensor positioned for detecting the presence or absence of index marks on the film, wherein the sensor generates a sensor signal indicative of the presence or absence of said index marks; and

a means for generating the driving voltage in response to the sensor signal and supplying the driving voltage to the electro-optical light modulation means, wherein the driving voltage maintains the electro-optical light modulation means in an optical state for projecting a stereoscopic image and preventing projection of a pseudostereoscopic image.

5,481,322

### CAMERA WITH MAGNETIC HEAD FOR RECORDING INFORMATION ON FILM

Itutomu Wakabayashi, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

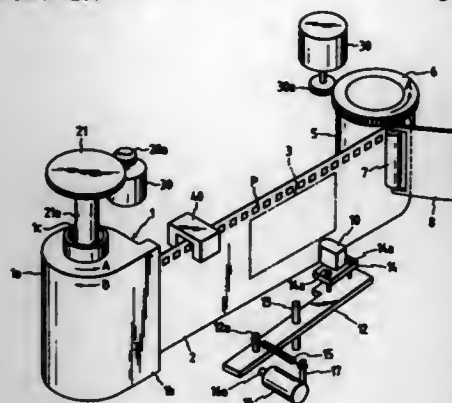
Continuation of Ser. No. 117,660, Sep. 19, 1993, abandoned, which is a continuation of Ser. No. 745,288, Aug. 19, 1991, abandoned. This application Mar. 14, 1994, Ser. No. 209,370

Claims priority, application Japan, Aug. 17, 1990, 2-217543

Int. Cl. G03B 17/24

U.S. Cl. 354-105

34 Claims



1. A camera comprising:

recording means having a member movable between a first position for magnetically recording predetermined information in a magnetic recording area on a film and a second position for disabling the recording;

a half-stroke depression switch which is switched on by partial depression of a release button to a first stage and which is switched off by releasing the depression of the release button; a release switch which is switched on by depression of the release button to a second stage beyond the first stage to perform an exposure operation;

time measuring means for measuring time in response to the switched-on state of said half-stroke depression switch;

moving means for moving said member of said recording means to said first position in response to a supply of electric power and for moving said member to said second position when the supply of the electric power is inhibited; and

control means responsive to the switched-on state of said half-stroke depression switch to cause electric power to be supplied to said moving means,

said control means holding the supply of electric power supply until said time measuring means has completed measuring a predetermined time, regardless of whether said half-stroke depression switch has been switched off, and terminating the supply of electric power after completion of measuring the predetermined time by said time measuring means.

### 5,481,323 CAMERA USING FILM WITH MAGNETIC STORAGE SECTION

Akira Egawa, Kawasaki, and Chikara Aoshima, Zama, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

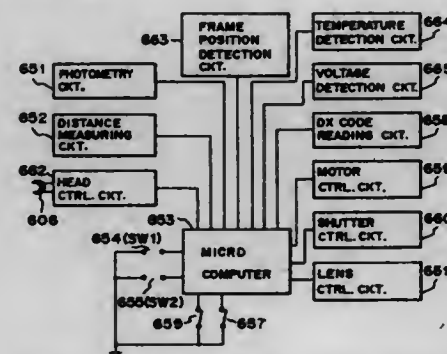
Continuation of Ser. No. 757,074, Sep. 9, 1991, abandoned, which is a continuation-in-part of Ser. No. 736,569, Jul. 26, 1991, abandoned. This application Apr. 25, 1994, Ser. No. 231,784

Claims priority, application Japan, Jul. 27, 1990, 2-200572; Sep. 7, 1990, 2-235589; Mar. 29, 1991, 3-089128; Mar. 29, 1991, 3-089129

Int. Cl. G03B 17/24

U.S. Cl. 354-106

33 Claims



1. A camera using a film provided with a magnetic storage section, said camera comprising:

(A) feed means for feeding the film;

(B) working means for performing at least one of (i) writing data to the magnetic storage section of the film, and (ii) reading data from the magnetic storage section of the film, during feeding of the film by said feed means; and

(C) control means for enabling said working means to operate after a feed speed of the film has stabilized, said control means comprising decision means for deciding that the feed speed of the film has stabilized based on a change of the feed speed of the film, said decision means deciding that the feed speed has stabilized when a large shift in the feed speed is detected.

5,481,324  
CAMERA

Jiro Sekine, 886-47, Onza Shimomakuri, Koshigaya-shi, Saitama-ken, 343, Japan

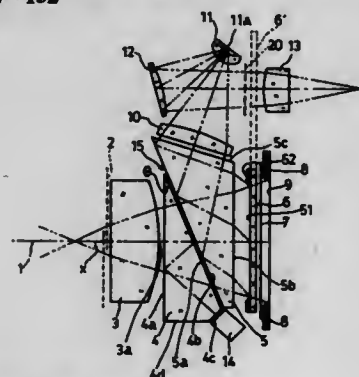
Filed Apr. 5, 1994, Ser. No. 223,427

Claims priority, application Japan, Apr. 13, 1993, 5-085040

Int. Cl. G03B 19/12; 13/08; 7/099

U.S. Cl. 354-152

19 Claims



1. A camera comprising:

a photographing lens;

a photosensitive surface;

a prism body including a first prism and a second prism which are arranged between said photographing lens and said photosensitive surface and in order from said photographing lens, and a low refractive index layer sandwiched between said first prism and said second prism, said low refractive index layer spreading slantingly with respect to the photographing system optical axis extending from photographing lens to said photosensitive surface, said a low refractive index layer having a refractive index lower than that of said second prism;

a viewfinder optical system; and

a reflective optical system arranged so as to reciprocate freely between a reflective position between said prism body and said photosensitive surface and a photographing position withdrawn from said reflective position, said reflective optical system for irradiating a light to said second prism, whereby when said reflective optical system is at said reflective position, said reflective optical system reflects a light advancing from said prism body toward said photosensitive surface, and reflects said advancing light at an interface of said second prism in contact with said low refractive index layer, so that said reflected light enters said viewfinder optical system via an adjacent surface arranged near to said viewfinder optical system.

5,481,325

### MECHANISM FOR LOCKING CARTRIDGE COMPARTMENT COVER OF CAMERA

Shigeru Wada, Kishiwada; Akira Funahashi, Sakai, both of, Japan, and Michihiro Iwata, Ridgewood, N.J., assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 224,656, Apr. 6, 1994, abandoned.

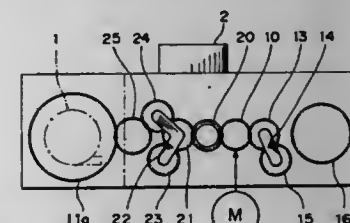
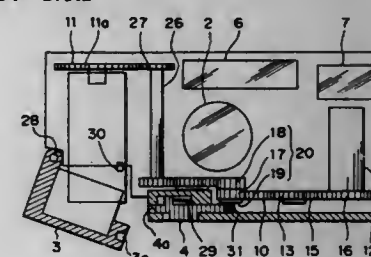
This application Jan. 31, 1995, Ser. No. 380,936

Claims priority, application Japan, Apr. 7, 1993, 5-080461; Apr. 7, 1993, 5-080513; Jun. 10, 1993, 5-138307; Jun. 16, 1993, 5-145193; Jun. 16, 1993, 5-145194; Jun. 18, 1993, 5-147380

Int. Cl. G03B 1/18

U.S. Cl. 354-173.1

35 Claims



1. A mechanism for locking a cover for opening/closing a cartridge compartment in which a film cartridge is accommodated comprising:

a lock mechanism selectively having a locking state that the cover is prevented from being opened and an unlocking state that the cover can be opened;

a film feeding mechanism which feeds a film in and out the film cartridge;

a drive mechanism which drives the film feeding mechanism; and

an actuating mechanism, driven by the driving mechanism, which switches the lock mechanism between the locking state and the unlocking state.

5,481,326

### CAMERA DATA COMMUNICATION DEVICE

Selichi Yasukawa, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

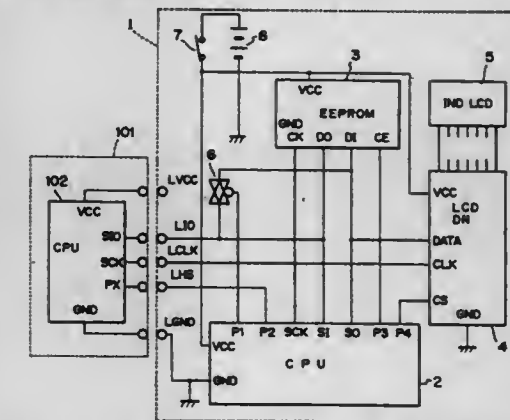
Continuation of Ser. No. 273,601, Jul. 12, 1994, abandoned, which is a continuation of Ser. No. 151,768, Nov. 15, 1993, abandoned, which is a continuation of Ser. No. 745,194, Aug. 15, 1991, abandoned. This application May 16, 1995, Ser. No. 442,148

Claims priority, application Japan, Aug. 29, 1990, 2-225240

Int. Cl. G03B 17/00

U.S. Cl. 354-286

47 Claims



1. A camera data communication system for performing data communication operations (a) between a detachable external accessory and a camera body through a data communication line, and for performing data communication operations (b) between a camera data communication device and a circuit unit in the camera body through the data communication line, comprising:

voltage level detecting means for generating a malfunction signal indicating a malfunction when the voltage level of the data communication line is abnormal, before a data communication operation (b) between said data communication device and said circuit unit through said data communication line is started; and

control means for inhibiting data communication operations (a) and (b) through said data communication line in response to said malfunction signal.

5,481,327

### FILM DRYING APPARATUS WITH UNIFORM FLOW AIR TUBES

Lee F. Frank, Rochester, and David K. Bischoff, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 16, 1995, Ser. No. 389,528

Int. Cl. G03D 3/02

U.S. Cl. 354-300

6 Claims

1. A film processing system comprising:

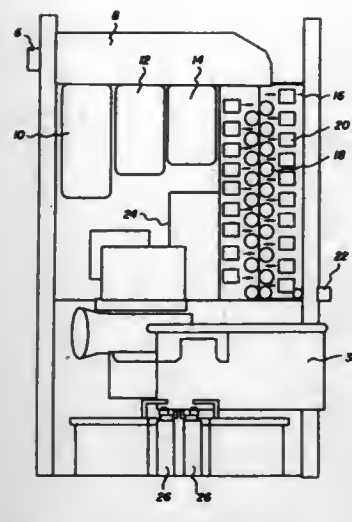
a plurality of processing tanks; a film drying apparatus; and means for transporting a photosensitive film through the processing tanks and into the film drying apparatus;

wherein the film drying apparatus includes:

an air manifold including a manifold air inlet and a plurality of manifold output ports; and a plurality of air tubes that correspond to the plurality of manifold output ports coupled to the air manifold;

wherein each of the air tubes includes a tapered main tube body including an open air inlet end and a closed end opposite the open air inlet end, an air discharge port including an air exhaust slot, and an air diffuser located between the main tube body and the air discharge port, wherein the air diffuser includes a plurality of air flow apertures that are located at a position offset from the air exhaust slot of the air discharge port.





5,481,328

# **APPARATUS FOR PROCESSING PHOTOGRAPHIC SHEET MATERIAL**

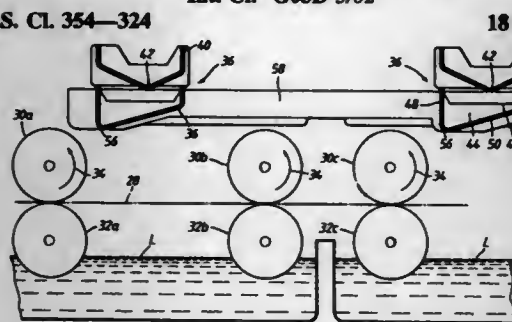
Bart P. Verhoest, Koutich, and Jan Claes, Helst Op Den Berg, both of, Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

Filed Sep. 9, 1994, Ser. No. 303,670

Int. Cl.<sup>6</sup> G03D 3/02

U.S. Cl. 354—324

18 Claims



1. An apparatus for processing photographic sheet material, comprising a pair of processing rollers, means for feeding sheet material to be processed between said processing rollers, and processing liquid distribution means for supplying processing liquid to said sheet, said processing liquid distribution means comprising an open-topped distributor channel and means for feeding processing liquid to said distributor channel along the length thereof, said distributor channel being formed with a plurality of apertures through which processing liquid passes to said sheet and overflow means associated with said distributor channel to maintain a constant liquid head therein.

5,481,329

# **FOCUS CONDITION DETECTING DEVICE**

Shigeyuki Uchiyama, Tokyo; Yosuke Kusaka, Yokohama, and Syozo Yamano, Tokyo, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 114,182, Sep. 1, 1993, abandoned.

This application Jan. 23, 1995, Ser. No. 373,832

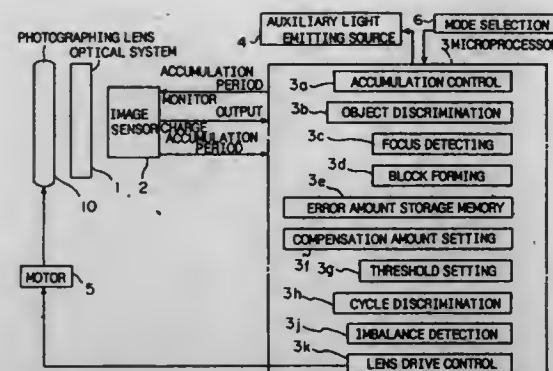
Claims priority, application Japan, Sep. 4, 1992, 4-236946

Int. Cl.<sup>6</sup> G03B 13/36

U.S. Cl. 354—402

9 Claims

1. A focus condition detecting device comprising: an image sensor that includes a plurality of photoelectric elements and outputs a signal in proportion to the intensity of incoming object light; an optical system that directs said object light in a photographic field having passed a photographing lens to said image sensor;



pattern judgment means for judging whether an object pattern is a specific pattern including a fine pattern and/or a low contrast pattern on the basis of the output signal from said image sensor; and

operation means or calculating the focus condition of the photographing lens on the basis of the data obtained through a first filtering of the output signal when said object pattern is judged by said pattern judgment means to be a specific pattern, or through a second filtering of the output signal when said object pattern is judged by said pattern judgment means not to be a specific pattern.

5,481,330

# **PANORAMIC PHOTOGRAPH PROCESSING SYSTEM**

Masafumi Yamasaki, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

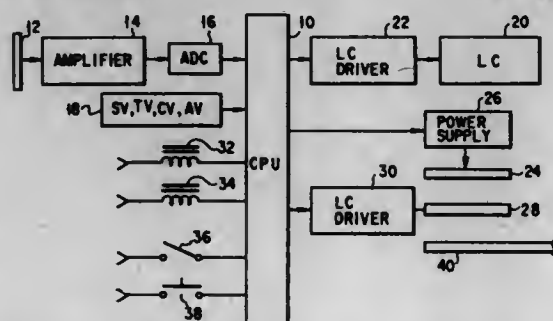
Filed Mar. 7, 1994, Ser. No. 206,796

Claims priority, application Japan, Mar. 8, 1993, 5-046377

Int. Cl.<sup>6</sup> G03B 17/24; 27/52; H04N 1/21; 1/387

U.S. Cl. 354—412

38 Claims



1. A camera capable of taking a panoramic photograph, comprising:

a photometer for measuring a brightness of an object to be photographed; a film sensitivity input device for inputting film sensitivity information of a photographic film; an exposure control device for controlling an amount of exposure to said film; a panorama mode switch for selecting a panorama-mode for rolling consecutive frames under a same exposure condition; an information recording device for recording information on said film; and a microcomputer, connected to said photometer, said film sensitivity input device, said panorama-mode switch and said information recording device, for calculating an exposure control value based on said brightness of said object measured by said photometer and said film sensitivity information input by said film sensitivity input device, controlling said exposure control device based on said exposure control value, and, with said panorama-mode selected by said panorama-mode switch, controlling said exposure control device so as to take consecutive photographs from a point of setting said panorama-mode to a point of releasing said panorama-mode under a

same exposure and causing said information recording device to record setting of said panorama-mode on said film, whereby information of said panorama-mode is indicated to an external printing equipment.

5,481,331

# **CONTROL SYSTEM FOR CAMERA WITH MULTIPLE OPTO-SENSORS**

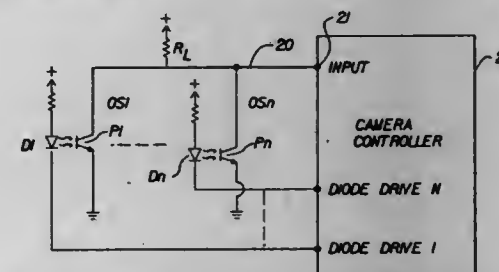
J. David Cocco, Pittsford, and Clay A. Dunsmore, Batavia, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 21, 1994, Ser. No. 230,589

Int. Cl.<sup>6</sup> G03B 7/00; 7/091

U.S. Cl. 354—412

6 Claims



1. A control system for a camera for controlling input of signals from a plurality of opto-sensors to a camera controller comprising: an opto-sensor bus connector coupling each of the opto-sensors to a common input terminal of said controller; an effective output load impedance coupled in common to said plurality of opto-sensors and to said bus connector; and activating means for selectively activating said opto-sensors to provide selected ones of said opto-sensor signals appearing across said output load effective impedance to said controller input terminal by way of said bus connector.

5,481,332

# **PROJECTION EXPOSURE METHOD AND APPARATUS FOR IMPROVED IMAGE TRANSFER FROM PHOTOMASK HAVING PERIODIC AND NON-PERIODIC PATTERNS**

Naomasa Shiraiishi, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 208,041, Mar. 9, 1984, abandoned, which is a continuation of Ser. No. 24,300, Mar. 1, 1993, abandoned. This application Dec. 29, 1994, Ser. No. 366,388

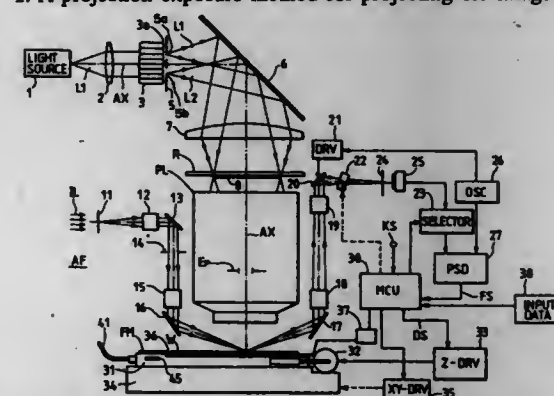
Claims priority, application Japan, Mar. 6, 1992, 4-049440

Int. Cl.<sup>6</sup> G03B 27/42

U.S. Cl. 355—53

58 Claims

1. A projection exposure method for projecting the image of a



photomask bearing first and second patterns arranged according to mutually different modes of arrangement onto a photosensitive

substrate by means of a projection optical system thereby exposing said photosensitive substrate to said image, comprising steps of:

illuminating said photomask so as to form, through said projection optical system, a projected image of a first depth of focus corresponding to said first pattern and a projected image of a second depth of focus corresponding to said second pattern, wherein said first depth of focus is larger than said second depth of focus; and matching a surface area, in which said second pattern is projected, of said photosensitive substrate with the best focal plane of said projection optical system.

5,481,333

# **LATCHABLE VACUUM BLANKET FRAME ASSEMBLY**

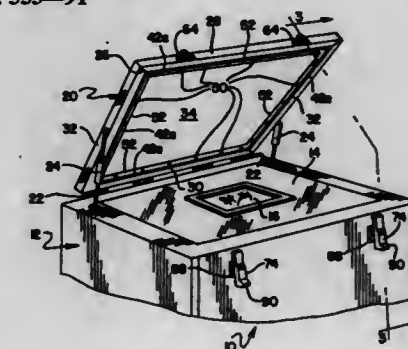
Charles J. Leonhart, Schaumburg, Ill., assignor to nuArc Company, Inc., Niles, Ill.

Filed Apr. 22, 1994, Ser. No. 231,621

Int. Cl.<sup>6</sup> G03B 27/20

U.S. Cl. 355—91

20 Claims



1. Apparatus for exposing a photosensitive material to light passed through an image forming workpiece to reproduce the image, comprising:

a transparent panel for supporting said material and workpiece while passing light to form said image; and a vacuum frame assembly movable between an open position and a closed position relative to said panel including a flexible vacuum blanket for pressing said material and workpiece together toward said panel; said vacuum frame assembly including a rigid hollow frame member secured to said flexible vacuum blanket, means for drawing a vacuum in said hollow frame member, said frame member including a first port for evacuating air between said flexible vacuum blanket and said panel and a second port; and latch means movable between an unlatched position and a latched position for mechanically securing said frame assembly in said closed position and including closure means for closing said second port when said latch means is in said latched position and opening said second port in said unlatched position to permit outside air to enter said hollow frame member.



5,481,334

# IMAGE PROCESSING APPARATUS HAVING MEANS FOR DETECTING NON-VISIBLE LIGHT, AND IMAGE PROCESSING METHOD THEREFOR

Shinobu Arimoto, Yokohama; Katsuchi Shimizu, Kawasaki; Yutaka Komiya, Tokyo; Kazuo Yoshinaga, Machida; Toshio Hayashi, Kawasaki; Takehiko Nakai, Tokyo; Tsutomu Utagawa, Yokohama; Tetsuya Nagase, Kawasaki, and Nobuatsu Sasanuma, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

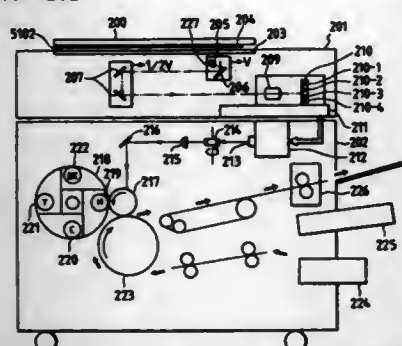
Filed Oct. 21, 1993, Ser. No. 139,174

Claims priority, application Japan, Jan. 23, 1992, 4-286350

Int. Cl.<sup>6</sup> G03G 21/04

U.S. Cl. 355—201

22 Claims



1. An image processing apparatus for controlling output of visible component data corresponding to an original in accordance with infrared reflected light detected from the original, comprising: detecting means for detecting the presence or absence of a pattern formed on the original on the basis of the infrared reflected light; and control means for determining that the original is a specified original in accordance with the result of the detection by said detecting means, and for controlling the visible component data output in accordance with the determination.

5,481,335

# IMAGE FORMING APPARATUS HAVING ERROR DETECTION WITH AUTOMATIC ERROR DISPLAY

Katsushi Furuichi, Yokohama; Yoshikazu Yokomizo, Kawagoe; Toshio Honma, Tokyo, and Katsumi Murakami, Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 887,139, May 22, 1992, abandoned, which is a continuation of Ser. No. 515,667, Apr. 26, 1990,

Pat. No. 5,164,770, which is a continuation of Ser. No. 219,851, Jul. 14, 1988, abandoned, which is a continuation of Ser. No. 850,706, Apr. 11, 1986, abandoned, which is a division of Ser. No. 627,563, Jul. 3, 1984, abandoned, which is a continuation of Ser. No. 100,236, Dec. 4, 1979, Pat. No. 4,477,178. This application May 10, 1994, Ser. No. 240,500

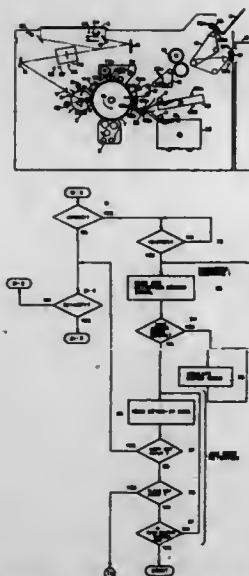
Claims priority, application Japan, Dec. 8, 1978, 53-151775; Dec. 10, 1978, 53-152818; Dec. 29, 1978, 53-165093; Dec. 29, 1978, 53-165095

Int. Cl.<sup>6</sup> G03G 15/00; 21/00

U.S. Cl. 355—206

11 Claims

1. An image forming apparatus comprising: process input means for setting plural kinds of data for image formation; process means for forming an image on a recording medium on the basis of data set by said process input means; plural detection means each for detecting an error state in said apparatus; memory means provided with memory areas corresponding to a respective detection means; common display means capable of displaying detection results by said plural detection means; and control means for receiving the detection outputs from said plural detection means, for producing signals indicating error



- states in said apparatus on the basis of the detection results by said detection means, and for supplying the signals to said common display means;
- said control means comprising designating means for designating each of said plural detection means, storage means for storing a detection result by the designated detection means in the memory area of said memory means corresponding to said designated detection means, reading means for reading the detection results stored in the memory areas of said memory means corresponding to said respective detection means, and display control means for controlling said reading means in such a manner that if the read detection result does not indicate an error state in said apparatus, said reading means automatically reads a next memory area successively, and if the read detection result indicates an error state in said apparatus, said common display means displays an error indication in accordance with a type of error state for a predetermined period and said reading means reads a next memory area, wherein said display control means controls said common display means to perform the steps of automatically and successively displaying the error states detected by said plural detection means at predetermined time intervals, and wherein said control means controls said common display means to repeatedly execute the step of successively displaying detected error states.

5,481,336

# IMAGE RECORDING APPARATUS WITH MULTIPLE FEED DETECTION AND PAPER FEED CONTROL

Tatsuto Tachibana, Kawasaki; Izumi Narita, Koganei; Akihisa Kusano; Yuzo Seino, both of Kawasaki, and Kaoru Sato, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 30, 1992, Ser. No. 921,643

Claims priority, application Japan, Aug. 1, 1991, 3-193185

Int. Cl.<sup>6</sup> G03G 21/00

U.S. Cl. 355—207

11 Claims

1. An image forming apparatus comprising: recording means for recording an image on a recording medium; a first loading unit for loading a recording medium; a second loading unit for loading a recording medium; first feeding means for feeding a recording medium from said first loading unit; second feeding means for feeding a recording medium fed by said first feeding means to said recording means, and for feeding a recording medium from said second loading unit to said recording means, and for separating multiply fed recording mediums; first detecting means for detecting a multiple feed state; and

5,481,338

# IMAGE FORMING APPARATUS FOR FORMING AN IMAGE ON AN IMAGE RECEIVING MEDIUM CARRIED BY A CONVEYOR BELT

Tuyoshi Todome, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

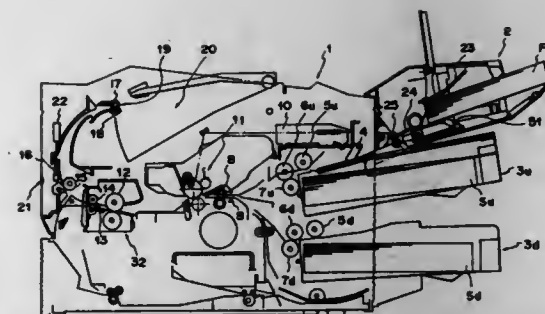
Filed Mar. 4, 1994, Ser. No. 205,851

Claims priority, application Japan, Mar. 5, 1993, 5-045014; Mar. 25, 1993, 5-066304; Mar. 25, 1993, 5-067097

Int. Cl.<sup>6</sup> G03G 5/00

U.S. Cl. 355—212

5 Claims



- discriminating means for discriminating whether a next sequential image is to be recorded on either recording medium fed from said first or second loading unit when the multiple feed state is detected,
- wherein said recording means records the next sequential image on a remaining sheet of the multiply fed recording mediums whenever the next sequential image is discriminated to be recorded on the recording medium fed from said first loading unit; and
- wherein said apparatus discharges a remaining sheet of the multiply fed recording mediums without said recording means recording an image thereon whenever the next sequential image is discriminated to be recorded on the recording medium fed from said second loading unit.

5,481,337

# METHOD AND APPARATUS FOR CORRECTING IMAGE FORMATION IN ACCORDANCE WITH A POTENTIAL MEASUREMENT AND A DENSITY MEASUREMENT SELECTED ALONG AN AXIAL DIRECTION OF A PHOTORESENSITIVE DRUM

Hiroaki Tsuchiya; Tetsuhiro Shibayama, both of Yokohama; Toru Katsumi, Kawasaki, and Yuji Kamiya, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

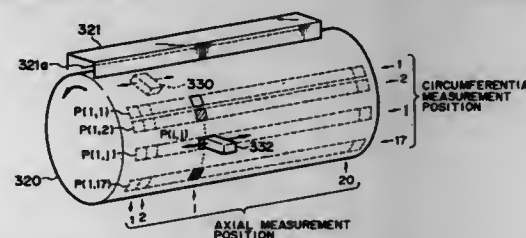
Filed May 12, 1992, Ser. No. 881,882

Claims priority, application Japan, May 13, 1991, 3-107170; Aug. 2, 1991, 3-216540; Aug. 29, 1991, 3-244417; Jan. 15, 1991, 3-295140; Jan. 15, 1991, 3-295141

Int. Cl.<sup>6</sup> G03G 21/00

U.S. Cl. 355—208

23 Claims



13. An image forming apparatus comprising: a photosensitive member; plural process means for forming an image on said photosensitive member; means for generating an electrical signal representing the image to be formed on said photosensitive member; detection means for detecting an image forming ability of plural levels of test patches disposed in an axial direction perpendicular to a rotating direction of said photosensitive member; and correction means for correcting said electrical signal based on a distribution of the detected image forming ability within the plural levels of the test patches disposed in said axial direction.

5,481,339

# AIR CONDITIONING DEVICE FOR A PRINTER

Etienne M. De Cock; Lucien A. De Schampelaere, both of Edegem; Johan D. G. Elsermans, Antwerpen, and Ludo Verluyten, Holsbeek, all of, Belgium, assignors to Xelkon NV, Mortsel, Belgium

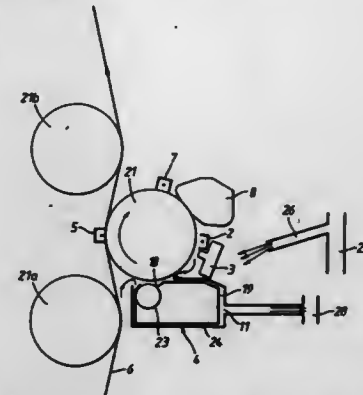
Filed Jun. 8, 1994, Ser. No. 257,048

Claims priority, application European Pat. Off., Jun. 18, 1993, 93304775

Int. Cl.<sup>6</sup> G03G 21/20

U.S. Cl. 355—215

20 Claims



1. An electrostatographic printer for forming an image onto a moving receptor element, which printer comprises:



- (i) a plurality of toner image-producing electrostatographic stations;
- (ii) means for conveying the moving receptor element past said image-producing stations, each of said image producing stations having rotatable endless surface means onto which a toner image can be formed, a development station for forming a toner image on said rotatable endless surface means and means for transferring said toner image on said rotatable endless surface means onto said moving receptor element; and
- (iii) an air-conditioning device comprising means for adjusting the temperature and humidity of air to produce conditioned air, and means for introducing a stream of said conditioned air into the environment of said image-producing stations, wherein air leaving the environment of said image-producing stations is recycled to, and reconditioned by, said air-conditioning device.

5,481,340

## IMAGE FORMING APPARATUS

Yoshinori Nagao, Yokohama; Koji Amemiya, Tokyo; Masami Izumizaki, and Nobuatsu Sasanuma, both of Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

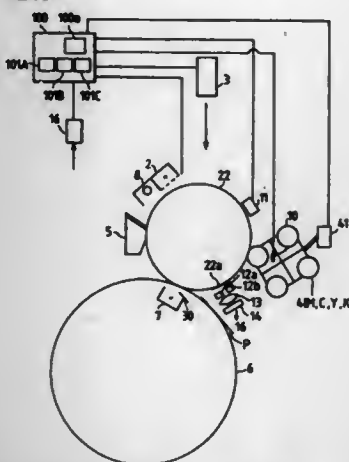
Filed Jun. 29, 1994, Ser. No. 267,719

Claims priority, application Japan, Jun. 30, 1993, 5-183274

Int. Cl.<sup>6</sup> G03G 21/00

U.S. Cl. 355-246

27 Claims



1. An image forming apparatus comprising:
- image forming means for forming an image onto a recording medium;
- generating means for generating pattern data to form an image of a stripe pattern of a predetermined interval by said image forming means;
- reading means for reading said stripe pattern image which is formed by the image forming means in accordance with the pattern data which is generated from said generating means;
- memory means for storing the stripe pattern image read by said reading means;
- detecting means for detecting the interval of the stripes of said stripe pattern stored in said memory means; and
- control means for controlling said image forming means on the basis of the interval of the stripes detected by said detecting means.

5,481,341  
ROLLER FOR CONTROLLING APPLICATION OF  
CARRIER LIQUID

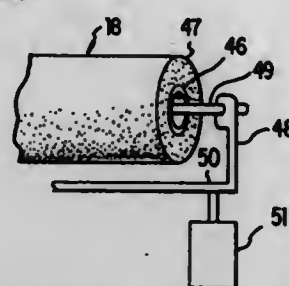
Donald S. Sypula, Penfield; Santokh S. Badesha, Pittsford; Shu Chang, Webster; John F. Knapp, Fairport; Robert E. Trott, Webster, all of N.Y.; Stephen T. Chal, Rancho Palo Verdes, Calif.; Henry R. Till, East Rochester, and Joseph Mammino, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 18, 1993, Ser. No. 107,876

Int. Cl.<sup>6</sup> G03G 15/10

U.S. Cl. 355-256

51 Claims



1. A roller for controlling an application of carrier liquid to an image bearing member in an electrostatographic reproduction apparatus, comprising a rigid porous electroconductive supportive core, a conformable microporous covering provided around said core, and a pressure controller located to provide a positive or negative pressure within said porous core and across a cross-section of said core and covering.

5,481,342

PREVENTION OF EXCESS LIQUID TONER  
CONTAMINATION IN THE FORMATION OF  
ELECTROPHOTOGRAPHIC IMAGES

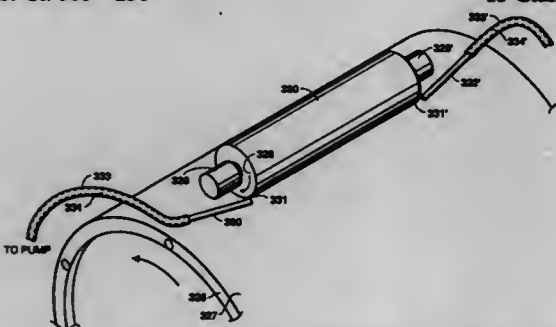
David J. Arcaro, and John L. Hettinger, both of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 26, 1994, Ser. No. 296,398

Int. Cl.<sup>6</sup> G03G 15/11

U.S. Cl. 355-256

13 Claims



1. In a liquid toner hard copy machine, including a moving photoconductor means, means for applying toner to develop a latent image on said photoconductor means, and means for removing excess toner from said photoconductor means, a device for preventing the formation of image edge effects comprising:
- pumping means for pressurizing a gas;
- means, connected to said pumping means, for converting said pressurized gas into at least two concentrated streams, including a means for directing each said concentrated stream at each interface nip edge of said photoconductor means with said means for removing excess toner.

5,481,343  
ELECTROPHOTOGRAPHIC PRINTING SYSTEM  
HAVING A MOISTURELESS ELECTROPHOTOGRAPHIC  
DEVELOPMENT CARTRIDGE

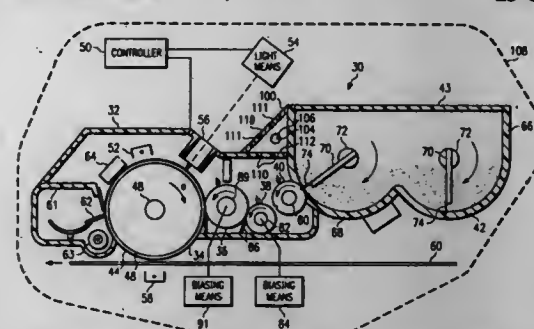
Gopal C. Bhagat, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 641,702, Jan. 22, 1991, Pat. No. 5,179,414. This application Jan. 8, 1993, Ser. No. 2,771. The portion of the term of this patent subsequent to Jan. 12, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> G03G 15/06

U.S. Cl. 355-259

23 Claims





5,481,346

**IMAGE FORMING APPARATUS CAPABLE OF ADJUSTING FIXING CONDITIONS**

Yukihiro Ohzeki, Tokyo, and Yasushi Sato, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 913,386, Jul. 15, 1992, abandoned.

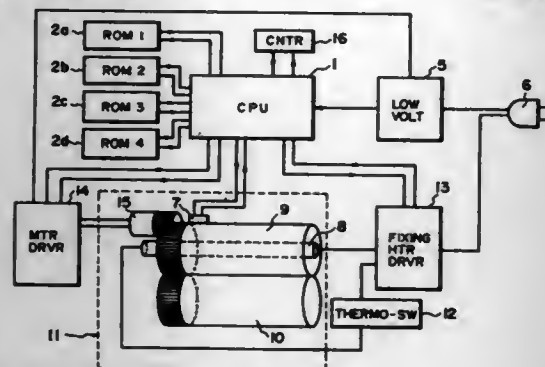
This application Apr. 22, 1994, Ser. No. 232,350

Claims priority, application Japan, Jul. 17, 1991, 3-176797

Int. Cl.<sup>6</sup> G03G 15/20

U.S. Cl. 355—285

17 Claims



1. An image forming apparatus, comprising:  
means for forming an unfixed image on a recording material;  
fixing means for thermally fixing the unfixed image on the recording material, wherein said fixing means comprises a heater and a temperature detecting element to detect the temperature of the heater; and  
setting means for setting a fixing condition of said fixing means, wherein said setting means comprises a counter for counting the number of image forming operations and reset means for resetting the count value in the counter, and  
wherein said setting means determines the fixing condition based on the counted number of image forming operations and an output of said temperature detecting element.

5,481,347

**REMOVABLE ROLLERS IN AN IMAGE FIXING DEVICE**

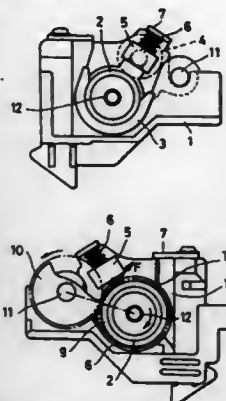
Nobukazu Adachi, Tokyo, and Yutaka Kikuchi, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 92,939, Jul. 19, 1993, abandoned, which is a continuation of Ser. No. 899,127, Jun. 18, 1992, abandoned, which is a continuation of Ser. No. 583,244, Sep. 17, 1990, abandoned. This application May 23, 1995, Ser. No. 447,836

Claims priority, application Japan, Sep. 16, 1989, 1-238392

Int. Cl.<sup>6</sup> G03G 15/20

U.S. Cl. 355—285

32 Claims



1. An image fixing device comprising:  
a fixing roller;  
a drive gear provided on one end of said fixing roller;

a first bearing rotatably supporting a first end of said fixing roller adjacent said drive gear;  
a second bearing rotatably supporting a second end of said fixing roller opposite to said drive gear; and  
a frame supporting said fixing roller through bearings;  
said fixing roller being adapted to be inserted into said frame by being moved in a direction perpendicular to the axis hereof;  
said first bearing holding the entire circumference of said first end of said fixing roller, while said second bearing supports only part of the circumference of said second end of said fixing roller.

5,481,348

**DISCHARGE DEVICE FOR USE IN AN IMAGE FORMING APPARATUS CAPABLE OF CORRECTING A WARP ON COPY ITEMS PASSED THROUGH FIXING ROLLERS**

Takashi Mihara; Kazumi Shirasaka; Kenji Oda; Akinobu Nakahata; Masahiro Shimohara, and Wataru Sasaki, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

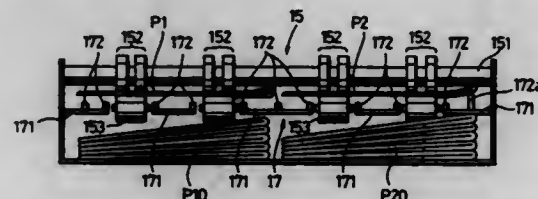
Filed Oct. 1, 1993, Ser. No. 130,222

Claims priority, application Japan, Jan. 6, 1992, 4-267478

Int. Cl.<sup>6</sup> G03G 15/00

U.S. Cl. 335—290

8 Claims



1. A discharge device for use in an image forming apparatus including a fixing portion having a heating roller in the shape of a hyperboloid for fixing an image formed on an item and a stacking portion for stacking the item, the discharge device comprising:  
discharge means provided between the fixing portion and the stacking portion and adapted for discharging the item to the stacking portion; and  
non-rotative preventing means juxtaposed to said discharge means and below the item being to be discharged, said non-rotative preventing means having a fixed upright portion extending above the level of the item being discharged and adapted for preventing the discharging item from warping downward.

5,481,349

**ELECTROPHOTOGRAPHIC IMAGE FIXING DEVICE AVOIDING OFFSET IN THE IMAGE BY MEANS OF DIFFERENTIAL ROLLER SPEED**

Toshiya Satoh, Hitachi; Akiko Oikawa, Nakaminato; Katsuyoshi Onose; Keijiro Yagi, both of Hitachi, and Tomoji Kitagishi, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 10, 1993, Ser. No. 164,799

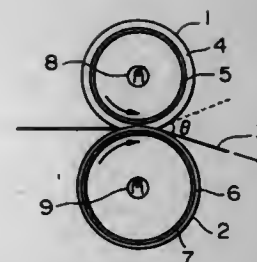
Claims priority, application Japan, Dec. 11, 1992, 4-331597

Int. Cl.<sup>6</sup> G03G 15/20

U.S. Cl. 355—290

5 Claims

1. An electrophotographic image fixing device comprising:  
a heating roller, including a mandrel, and an elastic layer of 40°-60° in hardness, measured by a spring type hardness meter of JIS K6301 type, provided on the mandrel;  
a pressure roller arranged in contact with the heating roller and having a surface layer with a hardness equal to or higher than the hardness of the elastic layer of the heating roller; and  
heating means for heating and fusion-depositing a toner image onto a toner substrate passing through the nip portion between



the heating roller and the pressure roller and having the toner image formed thereon; first drive means for rotating the heating roller such that the surface of the heating roller moves at a first linear speed; and second drive means for rotating the pressure roller such that the surface of the pressure roller moves at a second linear speed 1.005-1.05 times the first linear speed.

5,481,350

**HEAT ROLLER FIXING DEVICE DIVIDED INTO FIRST AND SECOND FRAMES AND WITH POSITIONING MEMBERS OF THE FIRST FRAME**

Motokazu Yasui, Yokohama, and Yasuhisa Kato, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

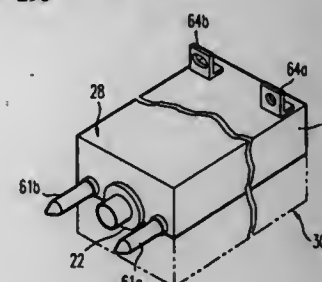
Filed Feb. 2, 1994, Ser. No. 190,495

Claims priority, application Japan, Apr. 12, 1993, 5-084221; Apr. 12, 1993, 5-084222

Int. Cl.<sup>6</sup> G03G 15/20

U.S. Cl. 355—290

3 Claims



1. A heat roller fixing device in a recording device having a main body, said heat roller fixing device comprising:  
a first unit including a heated fixing roller and a frame rotatably supporting the fixing roller;  
a second unit mounted to said first unit and including a pressing roller and a frame rotatably supporting the pressing roller; and  
at least one positioning member provided only on said first unit and engageable with the main body for positioning the fixing device on the main body,  
wherein the strength against bending of said first unit is greater than that of said second unit.

5,481,351

**ELECTROPHOTOGRAPHIC RECORDING APPARATUS HAVING IMPROVED RESIDUAL TONER CLEANING FUNCTION**

Katsuya Kawai; Masayasu Anzai; Toshimitsu Harada, and Shinichi Nishino, all of Ibaraki, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1994, Ser. No. 214,220

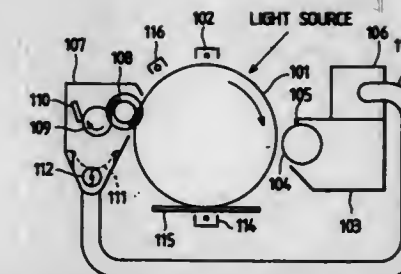
Claims priority, application Japan, Mar. 18, 1993, 5-058739; Apr. 19, 1993, 5-091340

Int. Cl.<sup>6</sup> G03G 21/00

U.S. Cl. 355—298

6 Claims

5. A developing apparatus, comprising:  
a photoreceptor for forming a toner image on a surface thereof;



cleaner means for removing and collecting residual toner on said photoreceptor;  
a toner transport pipe;  
developing means including a toner hopper which is coupled with said cleaner means through said toner transport pipe;  
a foreign material collector for collecting foreign material and disposed at a predetermined location in a residual toner collecting path ranging through said cleaner means, said toner transport pipe, and said toner hopper, said foreign material collector being meshed and having openings larger than a size of the foreign material; and  
means for vibrating said foreign material collector.

5,481,352

**IMAGE FORMING APPARATUS USING A CONTINUOUS PAPER SUPPLY**

Yoshikazu Yamamoto, and Akio Itabashi, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

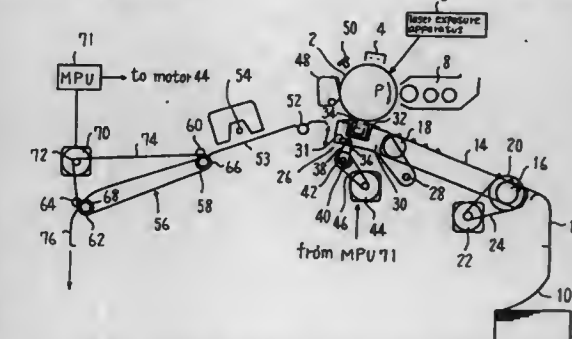
Filed Mar. 17, 1994, Ser. No. 214,314

Claims priority, application Japan, Mar. 19, 1993, 5-060001; Mar. 1, 1994, 6-031325

Int. Cl.<sup>6</sup> G03G 15/00

U.S. Cl. 355—308

60 Claims



1. An image forming apparatus which forms images on paper of a continuous paper supply, comprising:  
a toner carrying member having a surface carrying a toner image and driven so as to define a first surface velocity and an associated first direction of movement;  
transfer guide means for selectively moving the continuous paper to a first position at which the continuous paper is in contact with said toner image carrying surface and is fed at a surface velocity and associated direction of movement respectively corresponding to the first surface velocity and associated first direction of movement of the toner image carrying surface, for transfer thereto of the toner image from the image carrying surface and to a second position at which the continuous paper is separated from said toner image carrying surface;  
roller means, provided at a downstream side of said transfer guide means relative to the direction of movement of the paper and rotatable at selectable, different rates defining corresponding and selectable, different feed velocities, for engaging a portion of and thereby feeding the paper; and  
control means for controlling the rate of rotation of said roller means, at the first position thereof, to a first rotation rate so



that the corresponding first feed velocity of said roller means is faster than the surface velocity of said toner carrying surface and, during moving of the paper by said transfer guide means to the second position, to a second rotation rate and corresponding second feed velocity which are greater, respectively, than the first rotation rate and first feed velocity.

5,481,353

# APPARATUS FOR PRODUCING VARIABLE FEATURE PRESENTATION SETS

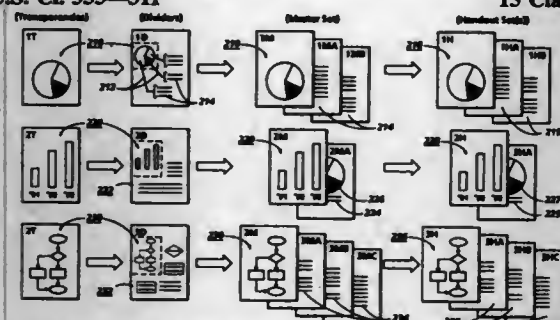
Derrek C. Hicks, West Henrietta; Keith G. Bunker, Hilton, and Riley L. Wardrip, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 31, 1994, Ser. No. 332,314

Int. Cl. G03G 21/00

U.S. Cl. 355—311

15 Claims



1. An apparatus for producing sorted document sets, comprising: generating means for producing a set of presentation documents including a primary image area thereon; input means for producing a set of supporting documents including an edited image area thereon; and output means for sorting and displaying the set of presentation documents from said generating means and the set of supporting documents from said input means.

5,481,354

# IMAGE FORMING APPARATUS

Akio Nakajima, Toyokawa, Japan, assignor to Minolta Co., Ltd., Osaka, Japan

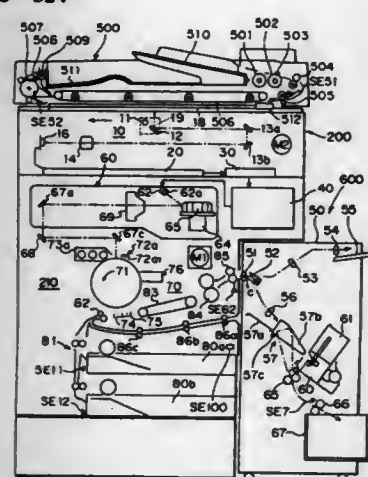
Filed Dec. 19, 1994, Ser. No. 358,511

Claims priority, application Japan, Mar. 4, 1994, 6-035036

Int. Cl. G03G 21/00

U.S. Cl. 355—324

10 Claims



1. An image forming apparatus comprising: an image sensor for detecting an image of a line in a document along a first direction or along a second direction reverse to the first direction;

a scan system which can shift a line detected by said image sensor along a third direction perpendicular to the first direction when said image sensor detects the line of the document along the first direction or along a fourth direction reverse to the third direction;

an image forming means for forming an image on a sheet of paper according to the image detected by said image sensor; a stapler for stapling a plurality of papers received from said image forming means, which stapler stacking the papers so as to have an appropriate staple position when images of documents are detected by said image sensor along the first direction;

a staple mode selection means for selecting staple mode using said stapler or non-staple mode not using said stapler; and a control means for making said image sensor read a document image along the first line and for making said scan system move along the third direction when said staple mode selection means selects the staple mode.

5,481,355

# FLYING SPHERICAL BODY MEASURING APPARATUS

Kenzaburo Iijima; Katsufumi Kondo; Katsuhiko Masuda; Kouji Yataka, and Yasuyuki Chujo, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

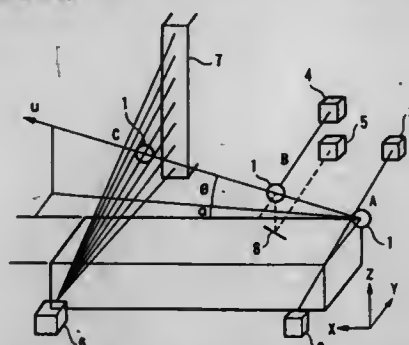
Filed Aug. 5, 1993, Ser. No. 102,345

Claims priority, application Japan, Aug. 6, 1992, 4-210504; Jan. 8, 1993, 5-002127

Int. Cl. G01P 3/36; G01B 11/12; A63B 69/36

U.S. Cl. 356—28

3 Claims



1. A flying spherical body measuring apparatus comprising: a detecting means for detecting the start of motion of a flying spherical body from a predetermined initial flight point; a surface velocity sensor, arranged in a forward direction of said flying spherical body, with respect to said initial flight point, for optically measuring a surface velocity of said flying spherical body; a multi-beam illuminating portion for emitting a plurality of light beams along a plane in a manner such that at least two of said plurality of light beams intersect said flying spherical body while in flight, said multi-beam illuminating portion being arranged in a forward direction of said flying spherical body with respect to said surface velocity sensor; a multi-beam light receiving portion for receiving respectively a plurality of light beams emitted from said multi-beam illuminating portion; and an arithmetic processing means for timing periods from the start of motion of the spherical body to intersections of the spherical body with at least two of said plurality of light beams and for calculating amounts of rotation of said flying spherical body with respect to predetermined directions based on the surface velocity measured by said surface velocity sensor, and amounts of an angle of elevation, a horizontal angle and velocity of said flying spherical body based on said periods; said surface velocity sensor comprising: a side portion surface velocity sensor for detecting the surface velocity of a side portion of said flying spherical body by

means of emitting a light beam at said side portion of said flying spherical body and then detecting the reflected light of said light beam; and

a lower portion surface velocity sensor for detecting the surface velocity of a lower portion of said flying spherical body by means of emitting a light beam at said lower portion of said flying spherical body and then detecting the reflected light of said light beam.

5,481,356

# APPARATUS AND METHOD FOR NONDESTRUCTIVE TESTING USING ADDITIVE-SUBTRACTIVE PHASE-MODULATED INTERFEROMETRY

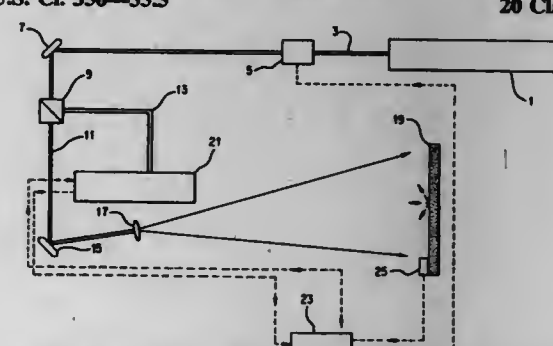
Bruno F. Pouet, Evanston; Tom C. Chatters, Chicago, and Sridhar Krishnaswamy, Evanston, all of Ill., assignors to Northwestern University, Evanston, Ill.

Filed Apr. 25, 1994, Ser. No. 231,936

Int. Cl. G01B 9/02

U.S. Cl. 356—35.5

20 Claims



1. A method of nondestructively analyzing a test object, the method comprising the steps of:

- applying a time-varying level of stress to the object,
- obtaining two images of the object on a video camera, the video camera producing video frames, each frame corresponding to an interval of time, wherein the images are obtained at two distinct levels of stress, and adding the images together to produce a composite image, the adding being performed in an analog manner, during an interval of time associated with a same video frame,
- repeating step (b) wherein the images are obtained with light that has been shifted in phase, and
- deriving a second-order composite image by subtracting the composite image obtained in step (b) from the composite image obtained in step (c), wherein the second-order composite image contains graphical information on the structural integrity of the object.

5,481,357

# APPARATUS AND METHOD FOR HIGH-EFFICIENCY, IN-SITU PARTICLE DETECTION

Aziz M. Ahsan, Hopewell Junction, N.Y.; Kianoush Beyzavi, Cary, N.C., and Nagaraja P. Rao, Minneapolis, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

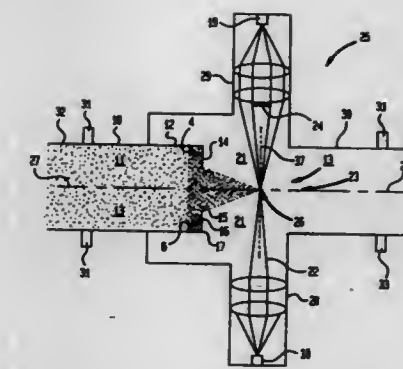
Filed Mar. 3, 1994, Ser. No. 201,732

Int. Cl. G01N 21/00

U.S. Cl. 356—338

44 Claims

1. An apparatus for detecting particles flowing through a single fluid conduit comprising, a nozzle having at least one internal focusing means secured to said single fluid conduit for aerodynamically focusing said particles into a focal region, at least one means for illuminating said focal region with at least one narrow beam of light, and at least one means for detecting light scattered by said particles illuminated by said light beam.



5,481,358

# COIL MOUNTING ARRANGEMENT FOR FIBER OPTIC GYROSCOPE USING A GEL LOADED WITH PARTICLES

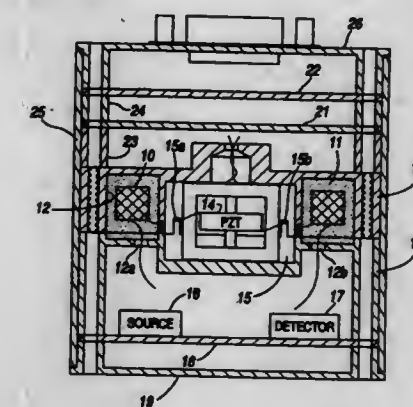
Richard B. Dyott, Oak Lawn; Eric L. Brooker, Hinsdale; Sidney M. Bennett, Chicago, and John D. Myhre, Western Springs, all of Ill., assignors to Andrew Corporation, Orland Park, Ill.

Continuation-in-part of Ser. No. 174,184, Dec. 27, 1993. This application Apr. 21, 1994, Ser. No. 230,763

Int. Cl. G01C 19/64

U.S. Cl. 356—350

32 Claims



28. A fiber optic gyroscope having a sensing coil of optical fiber submerged in a gel that surrounds and supports the sensing coil and a rigid housing containing said gel with said sensing coil submerged therein, the walls of the rigid housing being spaced away from the coil with the intervening space between said sensing coil and the innermost housing walls being filled with said gel, said gel being loaded with particles to reduce stresses from acting on said sensing coil by adjusting a spring mass of a combination including said gel and said sensing coil to produce a desired resonant frequency for said combination.

5,481,359

# MULTI-ETALON VISAR INTERFEROMETER HAVING AN INTERFEROMETER FRAME OF HIGH STIFFNESS WITH A LINEAR ELONGATED SLIDE BAR

Lynn M. Barker, 13229 Circulo Largo N.E., Albuquerque, N.M. 87112

Filed Aug. 23, 1994, Ser. No. 294,546

Int. Cl. G01B 9/02

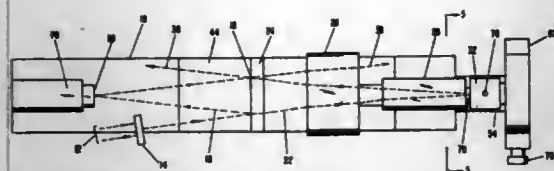
U.S. Cl. 356—352

18 Claims

1. An improved multi-etalon VISAR interferometer, comprising traditional multi-etalon VISAR interferometer components, said traditional multi-etalon VISAR interferometer components comprising

- a first beamsplitter means,
- a second beamsplitter means,





two separate interferometer light paths, multiple precision glass plates, said glass plates being referred to as delay etalons, and fixed optical components and movable optical components; said first beamsplitter means acting to split an incident light beam to travel through said two separate interferometer light paths before being recombined by said second beamsplitter means to form interference fringes, said two separate interferometer light paths being referred to respectively as the reference leg and the delay leg, with the lengths of said two separate interferometer light paths being referred to respectively as the reference leg length and the delay leg length, said delay leg length being longer than said reference leg length for introducing a delay in the portion of said incident light beam which traverses said delay leg before recombination; said delay leg being designed to accept various combinations of said delay etalons disposed in said delay leg of said VISAR interferometer, said VISAR interferometer having the characteristic that best fringe resolution can be obtained only at a precise optimum delay leg length as compared to said reference leg length, said optimum delay leg length being dependent on the thicknesses and indices of refraction of those said delay etalons which comprise the particular combination of said delay etalons which are disposed in said delay leg; said movable optical components being those which are designed to move with respect to said fixed optical components in order to achieve said optimum delay leg length for any said particular combination of said delay etalons which are disposed in said delay leg; wherein the improvement in said improved multi-etalon VISAR interferometer comprises a fringe alignment preservation means comprising

- a. an interferometer frame of high stiffness, to which said fixed optical components of said VISAR interferometer are securely attached;
- b. a linear elongated slide bar to which said movable optical components of said VISAR interferometer are securely attached;
- c. a linear elongated slide bar track means integral with said interferometer frame, which guides said slide bar in its longitudinal direction for allowing changes to be made in said delay leg length of said VISAR interferometer, said slide bar and said slide bar track means together serving to preserve, to a high degree of precision, the angular orientation of said movable optical components when said slide bar is longitudinally moved in said slide bar track means to change said delay leg length; and
- d. attachment means for attaching said slide bar at various positions in said slide bar track means for allowing adjustment of said delay leg length.

said interferometer frame, said slide bar, said slide bar track means, and said attachment means all being of such stiffness, design, and precision as to preserve said VISAR interferometer's fringe alignment to the extent that visible fringes are still present after said VISAR interferometer's delay leg length is changed from one said optimum delay leg length, corresponding to a certain combination of said delay etalons, to a new said optimum delay leg length, corresponding to a new combination of said delay etalons.

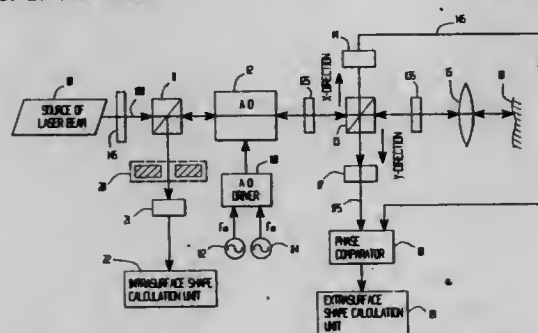
5,481,360  
OPTICAL DEVICE FOR MEASURING SURFACE SHAPE  
Hiroo Fujita, Sayama, Japan, assignor to Citizen Watch Co.,  
Ltd., Tokyo, Japan

Filed Jun. 18, 1993, Ser. No. 77,738  
Claims priority, application Japan, Jun. 19, 1992, 4-184777;  
Jul. 28, 1992, 4-219641

Int. CL<sup>6</sup> G01B 11/00;9/02

U.S. Cl. 356—360

#### 4 Claims



1. An optical device for measuring both the extrasurface shape and intrasurface shape of a sample, comprising:
- a) an acousto-optical element;
  - b) a laser beam source for emitting a laser beam incident upon the acousto-optical element;
- means for driving the acousto-optical element to convert the incident laser beam into at least two beams of different frequencies directed along a path to the sample;
- a) a first beam splitter positioned in the path of the at least two laser beams between the acousto-optical element and the sample for splitting the at least two laser beams directed toward the sample and for splitting light reflected by the sample into first and second reflected split beams of light;
- first light receiving means responsive to the at least two laser beams split by the first beam splitter for forming a reference beat signal;
- second light receiving means responsive to the first reflected split beam of light for forming a light beat signal;
- a) a second beam splitter positioned to reflect a portion of the second reflected split beam of light from the first beam splitter;
  - a) a third light receiving means for detecting light intensity of the portion of the second reflected split beam from the second beam splitter to form a reflected light intensity signal;
  - a) a phase comparator coupled to the first and second light receiving means for comparing the phase of the reference beat signal with the phase of the light beat signal;
  - a) an extrasurface shape calculator means coupled to the phase comparator for calculating the extrasurface shape of the sample in the direction of the height of the surface; and
  - a) an intrasurface shape calculator means coupled to the third light receiving means for calculating the intrasurface shape of the sample in accordance with a change in the intensity of the reflected light intensity signal.

5,481,361  
METHOD OF AND DEVICE FOR MEASURING  
POSITION COORDINATES

**Naoto Yumiki, Hirakata, and Hironori Honsho, Neyagawa,**  
both of, Japan, assignors to Matsushita Electric Industrial  
Co., Ltd., Osaka, Japan

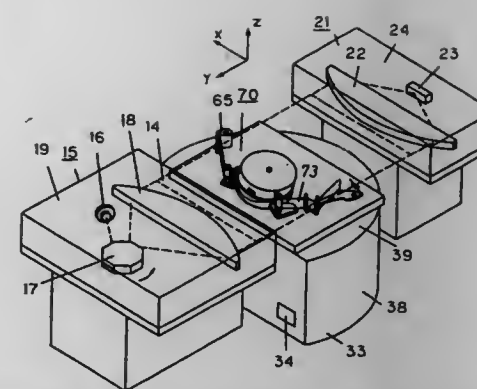
Claims priority, application Japan, May 19, 1993, 5-116981;  
Jul. 3, 1993, 5-189976

Int. Cl.<sup>6</sup> G01B 11/10

U.S. Cl. 356—375

## 10 Claims

1. A position coordinate measurement method comprising the steps of:  
placing a plurality of objects to be measured on a plane;



irradiating a laser beam on said plurality of objects from a plurality of different directions, said laser beam having a predetermined diameter and scanning parallel to said plane; computing a plurality of different projected position coordinates of each said plurality of objects from two tangent points of a cross section which is generated when said object is cut with said laser beam; and

computing two-dimensional position coordinates of said plurality of objects from said different projected position coordinates and an angular difference between said different directions, and computing relative distances between each of said plurality of objects.

5,481,362  
APPARATUS FOR PROJECTING A MASK PATTERN ON  
A SUBSTRATE

**Marinus A. Van Den Brink; Henk F. D. Linders, and Stefan Wittekoek, all of Veldhoven, Netherlands, assigns to ASM Lithography, Veldhoven, Netherlands**

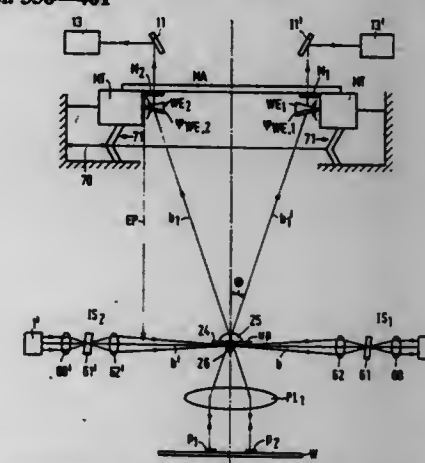
Continuation of Ser. No. 676,926, Mar. 28, 1991, abandoned.

**This application May 6, 1993, Ser. No. 57,437**

Claims priority, application Netherlands, Jul. 16, 1990  
9001611

Int. Cl.<sup>6</sup> G01B 11/00

## 28 Claims



1. An apparatus for projecting a mask pattern onto a substrate comprising:
  - (a) illumination means for supplying a projection radiation beam,
  - (b) at least one mask holder and at least one substrate holder,
  - (c) first means for aligning a mask on said mask holder with respect to a substrate on said substrate holder, said first means including
    - (i) radiation source means for supplying an alignment beam,
    - (ii) projection lens means for projecting said radiation beam, and

5,481,363  
POSITIONAL DEVIATION DETECTING METHOD

Masakazu Matsugu, Tokyo; Kenji Saitoh, Yokohama; Jun Hatori, Zama, and Sakae Houryu, Hachioji, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 693,708, Apr. 30, 1991, abandoned.

This application May 13, 1994, Ser. No. 242,066

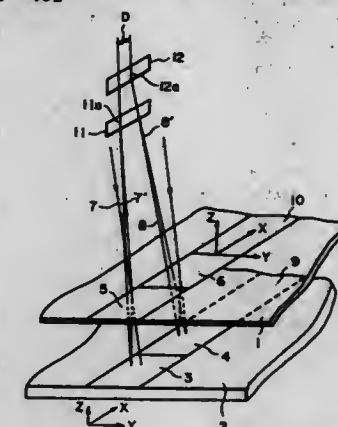
Claims priority, application Japan, May 1, 1990, 2-115445:

Jan. 11, 1990, 2-272926; Jan. 11, 1990, 2-272927; Jan. 11, 1990, 2-272928; Jan. 11, 1990, 2-272929

Int. Cl.<sup>6</sup> G01B 11/00

U.S. Cl. 356-401

29 Chalmers



1. A method of detecting a relative positional deviation of a first object having a first grating mark with an optical power and a second object having a second grating mark with an optical power, wherein a projected radiation beam is diffracted by the first and second grating marks in sequence and, on the basis of a position of convergence on a light receiving surface of plural diffraction beams produced by the diffraction through the first and second grating marks and including a signal beam having been diffracted at a predetermined order by each of the first and second grating marks, the relative positional deviation is determined, said method comprising the steps of:

providing the signal beam by a predetermined diffraction beam, which is diffracted at an  $l$ -th order by the first grating mark, diffracted at an  $m$ -th order by the second grating mark and diffracted at an  $n$ -th order by the first grating mark, and providing the predetermined diffraction beam by a beam diffracted at an  $l'$ -th order by the first grating mark, diffracted at an  $m'$ -th order by the second grating mark and diffracted at an  $n'$ -th order by the first grating mark, wherein  $n$  and  $l$  are equal to zero and 1 and  $n'$  have positive signs and  $m$  and  $m'$



have negative signs, or wherein  $n$  and  $l'$  are equal to zero and  $l$  and  $n'$  have negative signs and  $m$  and  $m'$  have positive signs; defining a detection zone on the light receiving surface; converging the signal beam upon the detection zone, the signal beam displacing on the detection zone in a particular direction in response to a relative positional deviation of the first and second objects; and setting the conditions of the first and second grating marks to substantially prevent the predetermined diffraction beam from being converged upon the detection zone, the predetermined diffraction beam also displacing in the particular direction in response to a relative positional deviation of the first and second objects.

5,481,364

# APPARATUS FOR ADAPTIVELY GENERATING A DECODER TABLE FOR VARIABLE-LENGTH CODES USING A STORED CODING TABLE

Kenji Ito, Asaka, Japan, assignor to Fuji Photo Co., Ltd., Minami-Ashigara, Japan

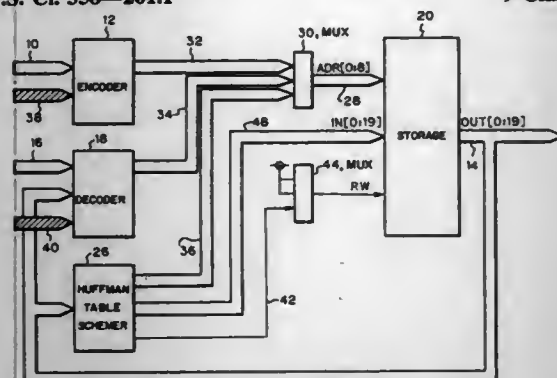
Filed Nov. 10, 1993, Ser. No. 149,907

Claims priority, application Japan, Nov. 10, 1992, 4-299579

Int. Cl.<sup>6</sup> H04N 1/41; 1/419; H03M 1/40; 1/42

U.S. Cl. 358—261.1

9 Claims



1. An apparatus for expanding variable-length codes comprising: decoder means for receiving compressed data, which is quantized data compressed on the basis of coding table data, and for expanding the compressed data on the basis of decoding table data for variable-length codes in response to the compressed data to produce symbol data associated with the compressed data;

storage means for rewritably storing therein the decoding table data for variable-length codes; and

table scheming means for sequentially generating the decoding table data from the coding table data in accordance with a specified procedure so as to be stored in said storage means, wherein said decoder means accesses the decoding table data stored in said storage means to expand the compressed data.

5,481,365

# IMAGE RECORDING APPARATUS HAVING A MEMORY FOR STORING IMAGES

Shinobu Arimoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 10, 1993, Ser. No. 16,105

Claims priority, application Japan, Feb. 13, 1992, 4-026827

Int. Cl.<sup>6</sup> H04N 1/21; 1/23; 1/46

U.S. Cl. 358—296

15 Claims

1. An image recording apparatus comprising: reading means for reading an original image and for outputting an image signal corresponding to the original image; storage means for storing the image signal output from said reading means;

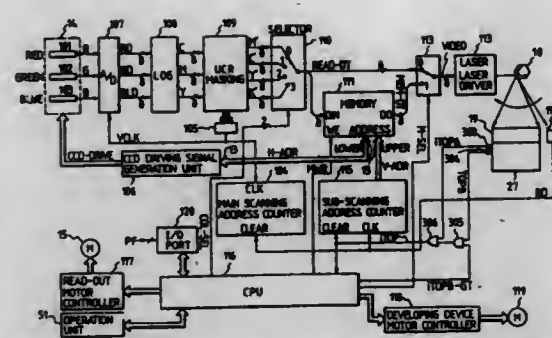


image forming means for forming an image on a recording medium based on one of the image signal output from said reading means and the image signal stored in said storage means;

a transfer medium holding member for holding a first transfer medium and a second transfer medium for transferring images formed on said recording medium onto said first transfer medium and said second transfer medium; and

control means for controlling said reading means and said storage means so that an image to be transferred onto said first transfer medium held on said transfer medium holding member is formed based on the image signal output from said reading means, and an image to be transferred onto said second transfer medium held on said transfer medium holding member is formed based on the image signal stored in said storage means.

5,481,366

# METHOD OF AND APPARATUS FOR PRODUCING A UNIT PATTERN ON A PRINTING CYLINDER FOR PRINTING AN ENDLESS PATTERN

Takashi Sakamoto, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan

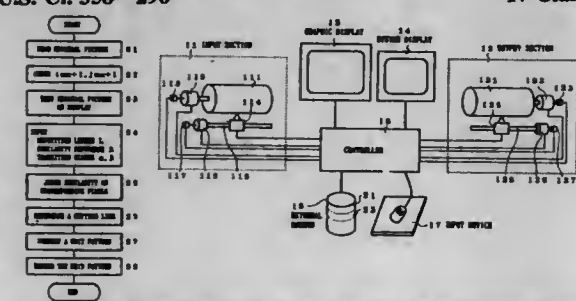
Filed Sep. 14, 1993, Ser. No. 122,050

Claims priority, application Japan, Sep. 14, 1992, 4-271013; Jul. 19, 1993, 5-200421

Int. Cl.<sup>6</sup> H04N 1/21

U.S. Cl. 358—296

17 Claims



1. A method of producing a unit pattern on a printing cylinder for printing an endless pattern on a printing medium by repeatedly printing said unit pattern, said unit pattern having a repetition length in a primary scanning direction, said method comprising the steps of:

storing pixel signals expressing pixels of an original picture in memory means, said pixels of said original picture being arranged in said primary scanning direction and a secondary scanning direction orthogonal thereto;

distinguishing said pixel signals stored in said memory means into first pixel signals and second pixel signals by comparing said pixel signals with respective their corresponding pixel signals distant therefrom by said repetition length in said primary scanning direction, said first pixel signals being approximate to said corresponding pixel signals, and said second pixel signals being much different from the same;

producing a cutting line extending across said original picture in said secondary scanning direction, said cutting line passing

through said pixels of said original picture expressed by said first pixel signals as much as possible;

extracting pattern pixel signals from said pixel signals stored in said memory means, said pattern pixel signals existing between said cutting line and an imaginary line distant therefrom by said repetition length in said primary scanning direction;

smoothing said pattern pixel signals close to said cutting line and said imaginary line in said primary scanning direction, thereby producing unit pattern signals expressing said unit pattern; and

recording said unit pattern on said printing cylinder on the basis of said unit pattern signals.

5,481,367

# PRINTING APPARATUS CAPABLE OF CHANGING PRINT FORMAT

Yoshinori Yokoe, and Yuji Hattori, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

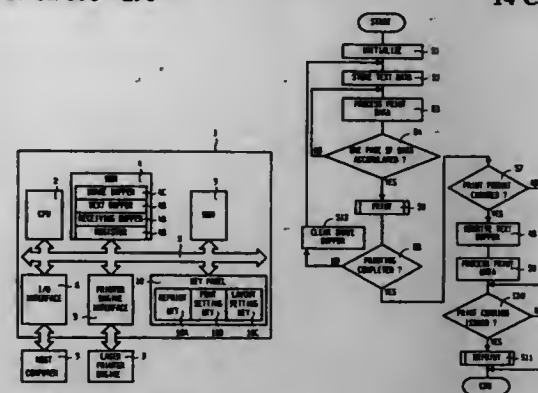
Filed Feb. 2, 1994, Ser. No. 190,489

Claims priority, application Japan, Mar. 30, 1993, 5-071586

Int. Cl.<sup>6</sup> G03G 15/36

U.S. Cl. 358—296

14 Claims



1. A printing apparatus, comprising:

a memory for storing at least one printout page of print data fed from an external device;

printing means for printing at least a first printing of the print data stored in said memory;

print format setting means for setting a print format in which the print data stored in said memory is printed;

print control means for reading the print data from said memory for printing by said printing means; and

print data converting means for modifying the print data to a changed print format if the print format for the print data stored in said memory is changed by said print format setting means, wherein said printing means subsequently prints the modified print data as a second printing such that information content of the first printing and the second printing are identical but a presentation is changed.

5,481,368

# FREQUENCY DEMODULATING APPARATUS WITH INVERSION COMPENSATION

Hidetoshi Ozaki, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 899,982, Jun. 17, 1992, abandoned.

This application Jan. 7, 1994, Ser. No. 178,597

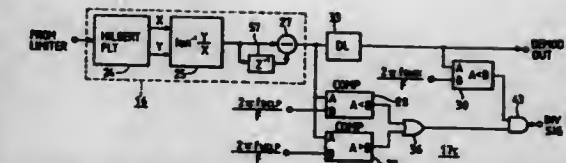
Claims priority, application Japan, Jun. 21, 1991, 3-177457

Int. Cl.<sup>6</sup> H04N 5/94; 5/91; 5/213

U.S. Cl. 358—336

9 Claims

6. An information reproduction apparatus for reproducing a frequency modulated signal, said information reproduction apparatus having demodulation means for demodulating said frequency



modulated signal and outputting a demodulated frequency modulated signal having a magnitude, and deemphasis means for deemphasis of the demodulated frequency modulated signal, comprising:

(a) detection means for detecting an inversion of levels of said demodulated frequency modulated signal to produce an inversion detection signal, said inversion being such that said demodulated signal does not correspond to said frequency modulated signal when said frequency modulated signal represents an image of an edge portion, said detection means having:

first comparing means for detecting whether or not said magnitude of said demodulated signal is less than a first predetermined magnitude corresponding to a dark clip level; delay means for delaying said demodulated signal for a predetermined interval;

second comparing means for detecting whether or not a magnitude of said delayed demodulated signal is less than a second predetermined magnitude corresponding to a black tone, said second predetermined magnitude being different from said first predetermined magnitude; and

logic means for producing said inversion detection signal when said magnitude of said delayed demodulated signal is less than said second predetermined magnitude and when said magnitude of said demodulated signal is less than said first predetermined magnitude; and

(b) compensation means for compensating said demodulated signal, said compensation means having switch means responsive to said inversion detection signal by outputting as a compensated demodulated signal one of said demodulated frequency modulated signal or a predetermined level corresponding to a white clip level, the compensated demodulated signal being supplied to said deemphasis means.

5,481,369

# CROSSTALK DETECTOR FOR OPTICALLY READ SIGNALS

Toru Akiyama, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Division of Ser. No. 46,932, Apr. 13, 1993, Pat. No. 5,321,519,

which is a continuation of Ser. No. 805,539, Dec. 11, 1991,

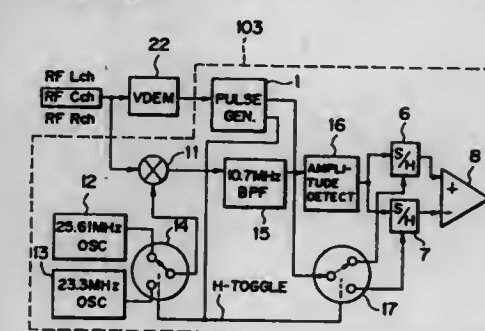
abandoned. This application Feb. 17, 1994, Ser. No. 197,611

Claims priority, application Japan, Dec. 18, 1990, 2-403098

Int. Cl.<sup>6</sup> H04N 5/76; 5/911

U.S. Cl. 358—340

6 Claims



1. A crosstalk quantity detector for detecting a quantity of crosstalk of signals on the basis of recording signals optically read from a plurality of parallel and spiral tracks formed on an information recording medium, said recording signals including crosstalk detection signals different from each other and recorded



at positions in alignment with each other in the perpendicular direction with respect to the adjacent tracks, said detector comprising:

- a demodulation circuit for receiving an RF signal and producing a demodulated video signal;
- a signal period detection circuit for detecting a crosstalk detection signal period from the demodulated video signal supplied from the demodulation circuit;
- a control signal generation circuit for generating a control signal inverting at every horizontal synchronizing periods for the demodulated video signal;
- a first oscillator for generating a first signal having a first frequency;
- a second oscillator for generating a second signal having a second frequency;
- a first changeover circuit for selecting one of the first and second signals in accordance with the control signal;
- a signal detection circuit for receiving the RF signal and one of the first and second signals selected by the first changeover circuit and extracting a detected signal of a predetermined center frequency;
- an amplitude detector for detecting an amplitude level of the detected signal; and
- a calculation circuit for comparing the amplitude levels of the detected signal in accordance with the control signal and outputting the compared result as a quantity of crosstalk of the read signals.

5,481,370

APPARATUS FOR DISCRIMINATING AUDIO SIGNALS  
Soon-tae Kim, Gumi, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

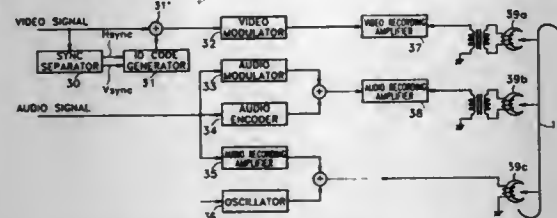
Filed Aug. 9, 1993, Ser. No. 103,240

Claims priority, application Rep. of Korea, Aug. 7, 1992, 1992-14196

Int. Cl.<sup>6</sup> H04N 5/92

U.S. Cl. 358-341

6 Claims



1. An audio signal discrimination apparatus for use in a recording and reproducing apparatus for recording and reproducing a video and an audio signal using a magnetic tape as a recording medium, said audio signal discrimination apparatus comprising:

- a sync separator for separating a horizontal sync signal and a vertical sync signal from the video signal;
- an identification code insertion circuit for receiving the separated horizontal and vertical sync signals so as to insert an identification code for discriminating a processing mode of the audio signal into a predetermined region of the video signal when recording; and
- an identification code detection circuit for detecting the identification code inserted into the predetermined region of the video signal so as to determine the processing mode of the audio signal when reproducing,

wherein said identification code insertion circuit comprises a counter for counting the horizontal and vertical sync signals output from said sync signal separator and setting a position where said identification code is inserted, and logic means for logically combining the output of said counter and said horizontal sync signal and generating said identification code for said recording medium.

5,481,371  
IMAGE READING DEVICE HAVING VARIABLE  
INTERNAL SYNCHRONIZATION SETTING CONTROL  
Kouichi Kamon, Yokohama, and Hiroyuki Kawamoto,  
Kawasaki, both of Japan, assignors to Ricoh Company,  
Ltd., Tokyo, Japan

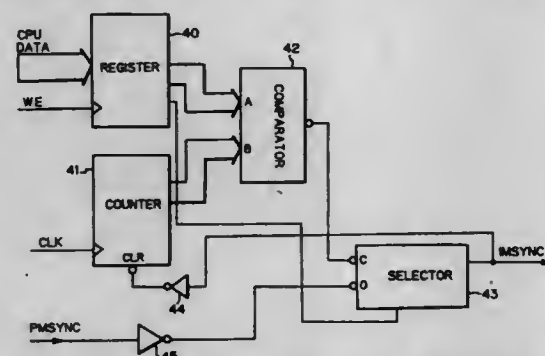
Filed Feb. 26, 1993, Ser. No. 22,910

Claims priority, application Japan, Feb. 28, 1992, 4-043164

Int. Cl.<sup>6</sup> H04N 1/36

U.S. Cl. 358-410

3 Claims



1. An image reading device, comprising: photoelectric transducer means for scanning an image to read said image line by line and converting resulting optical data to an electric signal; drive means for driving said photoelectric transducer means in response to a synchronizing signal; a clock for outputting clock pulses at a predetermined frequency; a counter for receiving said clock pulses at an input thereof and for outputting an internal period signal; a CPU for generating a select signal and a constant value signal and for outputting said select signal and said constant value signal to a register, said register outputting said constant value signal and said select signal; a comparator for receiving, as first and second inputs, the internal period signal output by said counter and said constant value signal output from said register, respectively, and for outputting an internal synchronization signal; a selector for outputting, as said synchronizing signal, and in accordance with said select signal, either said internal synchronization signal or an external synchronization signal output from an external device.

5,481,372

AREA CONTROL SYSTEM FOR IMAGE PROCESSING  
APPARATUS

Katuyuki Kouno; Kazuman Taniuchi, and Hiroshi Sekine, all  
of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd.,  
Tokyo, Japan

Continuation of Ser. No. 879,359, May 7, 1992, abandoned.

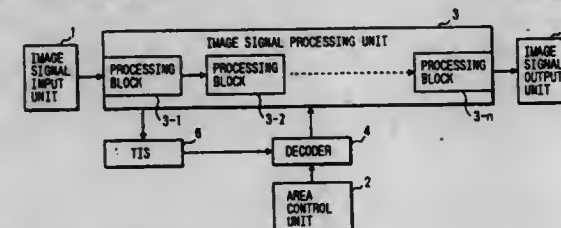
This application Dec. 9, 1994, Ser. No. 355,221

Claims priority, application Japan, May 14, 1991, 3-107973

Int. Cl.<sup>6</sup> H04N 1/415

U.S. Cl. 358-433

10 Claims



1. In an image processing apparatus having input means for inputting image signals, an area control system for generating, for each of one or more specified areas, parameter control signals according to a document type and a processing mode of said each

specified area, and processing means with a plurality of processing blocks for processing image signals according to parameters in the processing blocks, said parameters in said processing blocks being set by said parameter control signals, said area control system comprising:

- area control signal generation means for generating area control signals each indicative of the document type and the processing mode of a respective said each specified area, said area control signals being supplied to said processing blocks as first parameter control signals to switch first parameters in said processing blocks; and

decode means for generating second parameter control signals to switch second parameters in said processing blocks of said processing means in response to said area control signals for said each specified area and providing said second parameter control signals to said processing blocks.

5,481,373

FACSIMILE APPARATUS AND TELEPHONE TERMINAL  
APPARATUS HAVING VOICE AND IMAGE  
COMMUNICATION FUNCTIONS

Yoshinori Ikeguchi, and Hiroshi Murata, both of Fukuoka,  
Japan, assignors to Matsushita Electric Industrial Co., Ltd.,  
Japan

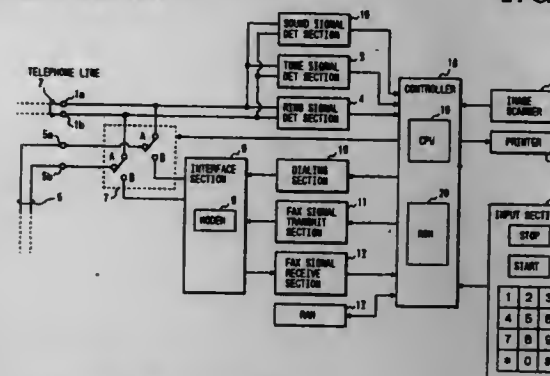
Filed Feb. 3, 1994, Ser. No. 191,119

Claims priority, application Japan, Feb. 8, 1993, 5-019808

Int. Cl.<sup>6</sup> H04N 1/32; 1/327

U.S. Cl. 358-434

24 Claims



1. A facsimile apparatus comprising: facsimile communication means for performing a facsimile communication; means for connecting an external telephone unit; line switch means having a first state where a telephone line is connected to said external telephone unit and a second state where the telephone line is connected to said facsimile communication means; voice sound detecting means for detecting a sound signal sent through said telephone line; first control means for switching said line switch means from said first state to said second state so as to start said facsimile communication when no sound signal is detected over a predetermined time period by said sound detecting means; code detecting means for detecting a code based on a signal sent through said telephone line; and second control means for holding said first control means inoperative when said code detecting means detects a predetermined code based on said signal sent through the telephone line.

5,481,374

IMAGE RECORDING APPARATUS

Shunichi Tachibana, Urayasu, and Hitoshi Saito, Yokohama,  
both of Japan, assignors to Canon Kabushiki Kaisha,  
Tokyo, Japan

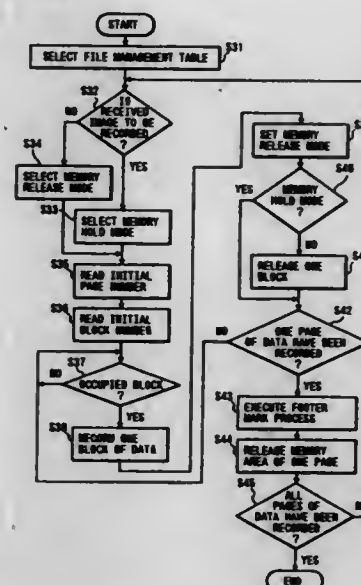
Filed Jul. 28, 1993, Ser. No. 97,900

Claims priority, application Japan, Jul. 28, 1992, 4-201158;  
Jul. 9, 1993, 5-170028

Int. Cl.<sup>6</sup> H04N 1/40

U.S. Cl. 358-444

24 Claims





5,481,375

## JOINT-PORTION PROCESSING DEVICE FOR IMAGE DATA IN AN IMAGE-FORMING APPARATUS

Koichi Eto, Yamatokoriyama; Masao Miyaza, Osaka; Kazuyuki Ohnishi, Yamatokoriyama, and Akira Tamagaki, Kyoto, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

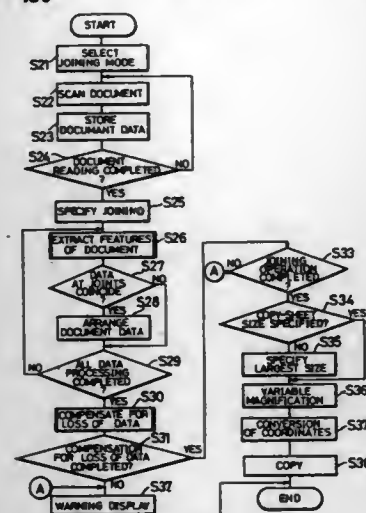
Filed Oct. 6, 1993, Ser. No. 132,274

Claims priority, application Japan, Jan. 8, 1992, 4-270269; Jan. 12, 1992, 4-273039; Jan. 12, 1992, 4-273050; Nov. 27, 1992, 4-318975; Jan. 26, 1993, 5-010807; Mar. 25, 1993, 5-066889; Apr. 19, 1993, 5-091562; Jun. 16, 1993, 5-145240

Int. Cl.<sup>6</sup> H04N 1/387

U.S. Cl. 358—450

10 Claims



1. An image processing apparatus comprising: input means for reading an image of an original document; storage means for storing a plurality of partial images as partial document data upon the image being read by the input means in a divided manner, each of the plurality of partial images being individually stored as partial document data; and joint-portion processing means for recognizing corresponding areas between the partial document data stored in the storage means, and for joining the partial document data in accordance with the recognized corresponding areas, said joint-portion processing means including a combination-processing section for discriminating a data-loss area of the image, upon data loss occurring during image reading by the input means, in accordance with a positional relationship between the partial document data and for creating compensating data which compensates for lost data in the data-loss area in accordance with images at edges of the partial document data that are to be joined together.

5,481,376

## METHOD AND APPARATUS FOR IMPROVING IMAGE QUALITY

Sumihiko Kawashima, Ohtsu, Japan, assignor to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Jun. 23, 1994, Ser. No. 264,460

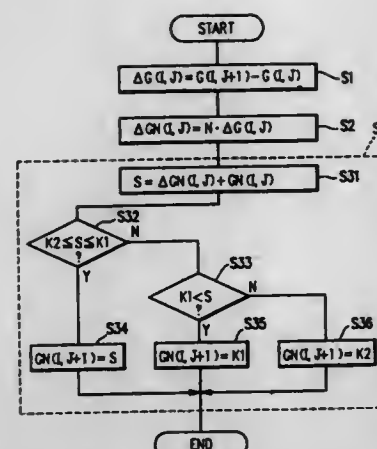
Claims priority, application Japan, Jun. 23, 1993, 5-152072

Int. Cl.<sup>6</sup> H04N 1/40

U.S. Cl. 358—455

10 Claims

1. A method for improving the quality of an image including a plurality of pixels by enhancing the contrast of the image, comprising the steps of: outputting from an electrical imaging device a first electrical signal having image information therein, the image information including pixel and gray-scale level information; receiving the electrical signal from the electrical imaging device; selecting a first pixel and a first gray-scale level at the first pixel from the image information;



selecting a second pixel and a second gray-scale level at the second pixel from the image information; subtracting the gray-scale level of the image at the first pixel from the gray-scale level of the image at the second pixel, so as to produce a difference  $\Delta G$ ; multiplying the differences  $\Delta G$  by  $N$ , so as to produce a value  $\Delta GN$  which is  $N$  times as large as the difference  $\Delta G$ ,  $N$  being larger than 1; determining a gray-scale level of an image with enhanced contrast at the second pixel depending on the gray-scale level of the image with enhanced contrast at the first pixel and the value  $\Delta GN$ , wherein the determining step comprises the steps of: determining a sum of the gray-scale level of the image with enhanced contrast at the first pixel and the value  $\Delta GN$  as the gray-scale level of the image with enhanced contrast at the second pixel, when the sum is in the range from a first predetermined value  $K1$  to a second predetermined value  $K2$ , the first predetermined value  $K1$  being larger than the second predetermined value  $K2$ ; determining the first predetermined value  $K1$  as the gray-scale level of the image with enhanced contrast at the second pixel, when the sum is larger than the first predetermined value  $K1$ ; and determining the second predetermined value  $K2$  as the gray-scale level of the image with enhanced contrast at the second pixel, when the sum is smaller than the second predetermined value  $K2$ ; and displaying a second signal having the enhanced contrast image information therein.

5,481,377

## IMAGE PROCESSING WITH ANTI-FORGERY FUNCTION

Yutaka Udagawa, Machida; Masahiro Funada, Yokohama; Ken-ich Ohta, Kawasaki; Yoichi Takaragi, Yokohama; Toshiyuki Kitamura, Kawasaki, and Eiichi Ohta, Fujisawa, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 858,500, Mar. 27, 1992, Pat. No.

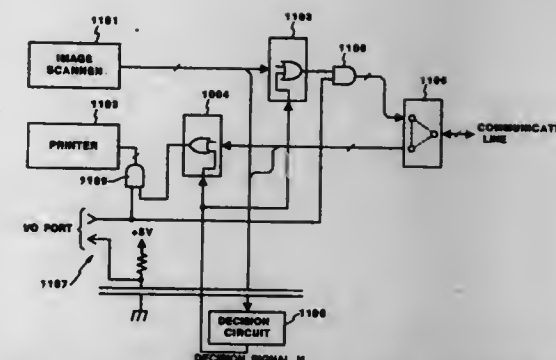
5,363,202. This application Jun. 24, 1994, Ser. No. 266,270 Claims priority, application Japan, Mar. 29, 1991, 3-066901; Jul. 1, 1991, 3-160379; Jul. 1, 1991, 3-160381; Sep. 30, 1991, 3-252218; Feb. 28, 1992, 4-043896

Int. Cl.<sup>6</sup> H04N 1/00; 1/44; 1/46

U.S. Cl. 358—501

9 Claims

1. An image discriminating apparatus which is independently arranged from an image processing apparatus for processing input image information and outputting the processed information, for discriminating a predetermined image by using image data corresponding to the input image information, and generating a discrimination signal, said image discriminating apparatus comprising:



connecting means for connecting the image discriminating apparatus to the image processing apparatus; and discriminating means for discriminating whether or not an image represented by the image data is the predetermined image, and generating the discrimination signal, wherein said connecting means comprises an electrical signal line through which the image data is input from the image processing apparatus, and the discrimination signal is output to the image processing apparatus.

5,481,378

## IMAGE FORMING APPARATUS WITH AN UNAPPROVED COPY PREVENTING MEANS

Masaaki Sugano; Yoshio Yamazaki; Masaaki Ikeda, and Tadashi Izawa, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Division of Ser. No. 265,650, Jun. 24, 1994, Pat. No.

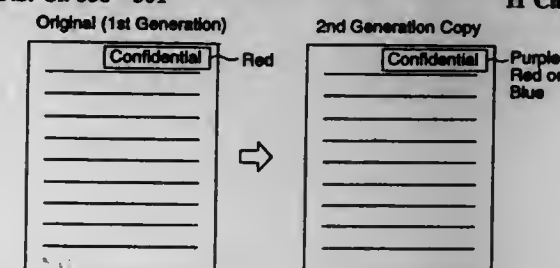
5,440,409. This application Apr. 10, 1995, Ser. No. 419,416

Claims priority, application Japan, Jul. 1, 1993, 5-163581

Int. Cl.<sup>6</sup> H04N 1/23; 1/44; 1/50

U.S. Cl. 358—501

11 Claims



1. An image forming apparatus with an unapproved copy preventing means, comprising: document supporting means for supporting an original document; irradiating means for irradiating said original document with a light beam; detecting means for detecting a reflection light from said original document which is irradiated with said light beam, and for generating detection signals according to the detection of said reflection light; converting means for converting said detection signals to digital image signals; first determining means for determining whether said original document is a first generation document according to said digital image signals; second determining means for determining whether said original document is a second generation copy of said first generation document according to said digital image signals; control means for preventing a copying operation of said image forming apparatus when said first and second determining means determines that said document is one of said first generation document and said second generation copy of said first generation document; image forming means for forming an image of said document on a recording sheet with a plurality of color developers; and

wherein said control means includes means for controlling said image forming means so that said image forming means forms an indication character with at least one of said plurality of color developers except a black color developer when said first determining means determines that said document is said first generation document.

5. An image forming apparatus with an unapproved copy preventing means, comprising: document supporting means for supporting an original document; an irradiating means for irradiating said original document with a light beam; detecting means for detecting a reflection light from said original document which is irradiated with said light beam, and for generating detection signals according to the detection of said reflection light; converting means for converting said detection signals to digital image signals; memory means for storing a dot image data of a specific mark, which specific mark indicates that said document prohibits an unapproved copy, according to said digital image signals; determining means for determining whether said original document is one of a first generation document and a second generation copy of said first generation document, according to said dot image data stored in said memory means; control means for preventing a copying operation of said image forming apparatus when said determining means determines that said document is one of the first generation document and a second generation copy of said first generation document; an image forming means for forming an image of said document on a recording sheet with a plurality of color developers; and wherein said control means includes means for controlling said image forming means so that said image forming means forms said specific mark with a color developer which is different from an original color of said specific mark, marked on said first generation document, when said determining means determines that said document is said first generation document.

6. An image forming apparatus with an unapproved copy preventing means, comprising: document supporting means for supporting an original document; irradiating means for irradiating said original document with a light beam; detecting means for detecting a reflection light from said original document which is irradiated with said light beam, and for generating detection signals according to the detection of said reflection light; converting means for converting said detection signals to digital image signals; image forming means for forming an image of said document on a recording sheet with a plurality of color developers; first judging means for determining whether said original document is a first generation document according to said digital image signals; control means for forming a predetermined indication on the recording sheet by said image forming means when said first judging means determines that the original document supported by said document supporting means is the first generation document; second judging means for determining whether said original document is a second generation copy of said first generation document according to said predetermined indication; and wherein said control means includes means for preventing a copying operation of said image forming means when said second judging means determines that said original document supported by said document supporting means is the second generation copy.



5,481,379

## METHOD FOR PREPARING POLYCHROMATIC PRINTING PLATES

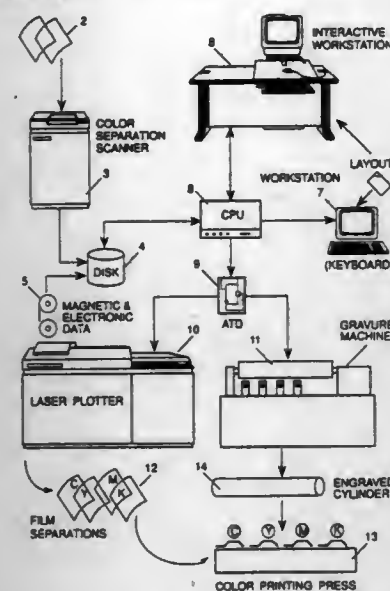
Hanan Yosefi, Rishon LeZion, Israel, assignor to Scitex Corporation Ltd., Herzlia Bet, Israel

Continuation of Ser. No. 215,546, Mar. 22, 1994, Pat. No. 5,420,702, which is a continuation of Ser. No. 843,338, Feb. 28, 1992, Pat. No. 5,323,248, which is a continuation of Ser. No. 545,805, Jun. 29, 1990, Pat. No. 5,113,249. This application May 10, 1995, Ser. No. 435,431

Claims priority, application Israel, Mar. 2, 1990, 93607 Int. Cl.<sup>6</sup> H04N 1/50; 1/56

U.S. Cl. 358—501

6 Claims



4. Apparatus for processing a file of recorded color separation values of color elements for use in preparing polychromatic printing plates in order to reduce or eliminate defects caused by misregistration in printing, comprising:

means for identifying color pairs where there is a change in color between adjacent color areas in at least one color separation; and

means for generating a frame when one color of the pair is of the semi-tint type and the other is of the tint type, at least two separations differ significantly in opposite directions, and an overlap transparent instruction was made,

said frame is generated towards the semi-tint and the frame color is the highest percentage in each separation, corresponding darker separations from the lighter area being reduced by the differences in percentage in the same separation between the lighter and darker areas multiplied by a factor.

5. Apparatus for processing a file of recorded color separation values of color elements for use in preparing polychromatic printing plates in order to reduce or eliminate effects caused by misregistration in printing, comprising:

means for identifying color pairs where there is a change in color between adjacent color areas in at least one color separation; and

means for generating a frame when both colors of the pair are of the tint or semi-tint type, at least two separations differ significantly in opposite directions, the common luminance is less than a predefined parameter, and the difference between the darkness of the color areas of the two colors is less than a defined parameter,

one-half the frame is generated towards one color and the other half frame is generated towards the other color and the frame color is the highest percentage in each separation, corresponding darker separations from the lighter area being reduced by the difference in percentage in the corresponding separation between the lighter and darker areas multiplied by a factor.

6. Apparatus for processing a file of recorded color separation values of color elements for use in preparing polychromatic print-

ing plates in order to reduce or eliminate defects caused by misregistration in printing, comprising the steps of:

means for identifying color pairs where there is a change in color between adjacent color areas in at least one color separation; and

means for generating a frame when both colors of the pair are either of the tint or the semi-tint type, and at least two separations differ significantly in opposite directions, the common luminance is less than a predefined parameter, and the difference between the darkness of the color areas is more than a defined parameter,

said frame is generated towards the darker color and the frame color is the highest percentage in each separation, corresponding darker adjacent separations from the lighter area being reduced by the difference in percentage in the corresponding separation between the lighter and darker areas multiplied by a factor.

5,481,380

## METHOD AND APPARATUS FOR CALIBRATION OF COLOR VALUES

Günter Bestmann, Altenholz, Germany, assignor to Linotype-Hell AG, Eschborn, Germany

Continuation of Ser. No. 43,271, Apr. 6, 1993, abandoned.

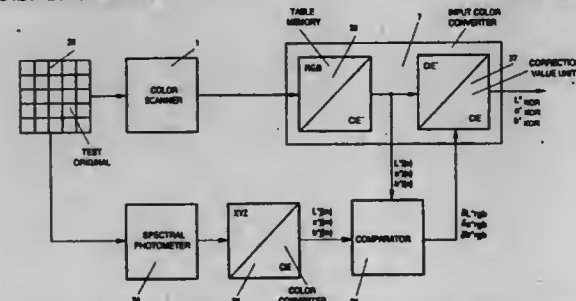
This application Jun. 17, 1994, Ser. No. 261,884

Claims priority, application Germany, Apr. 6, 1992, 42 11 453.5; Feb. 25, 1993, 43 05 693.8

Int. Cl.<sup>6</sup> H04N 1/46

U.S. Cl. 358—504

25 Claims



1. A method for calibrated conversion of color values of a first color space obtained by scanning a color original into color values of a second color space in apparatus for conducting color corrections of the color original in the second color space, comprising the steps of:

for acquiring color values R, G, B of the first color space, opto-electronically scanning with an input apparatus a test original containing a plurality of defined test colors, the test original respectively comprising same material properties as the color original to be later scanned with the input apparatus after calibration with the test original has been completed;

approximately calculating functionally corresponding color values  $L^*(s)$ ,  $a^*(s)$ ,  $b^*(s)$  of the second color space independent of the first color space from color values R, G, B of the first color space taking spectral and electrical properties of the input apparatus into consideration, the approximate functionally corresponding color values being calculated in the form of a conversion table and stored;

colorimetrically measuring for a given light type said test colors of said test original to create standard test color values X, Y, Z of the first color space and converting the standard color values X, Y, Z into colorimetrically exact color values  $L^*(m)$ ,  $a^*(m)$ ,  $b^*(m)$  of the second color space;

comparing said color values  $L^*(s)$ ,  $a^*(s)$ ,  $b^*(s)$  to said color values  $L^*(m)$ ,  $a^*(m)$ ,  $b^*(m)$ ;

calculating correction color values  $\delta L^*_{rsb}$ ,  $\delta a^*_{rsb}$ ,  $\delta b^*_{rsb}$  for the stored color values  $L^*(s)$ ,  $a^*(s)$ ,  $b^*(s)$  from color difference values acquired by comparison of the color values  $L^*(s)$ ,  $a^*(s)$ ,  $b^*(s)$  and  $L^*(m)$ ,  $a^*(m)$ ,  $b^*(m)$  so as to complete calibration; and

scanning said color original with said input apparatus to create color values in the first color space, utilizing said correction color values  $\delta L^*_{rsb}$ ,  $\delta a^*_{rsb}$ ,  $\delta b^*_{rsb}$  during a conversion of the color original color values in the first color space to color original color values in the second color space in the form of corrected values  $L^*_{kor}$ ,  $a^*_{kor}$ ,  $b^*_{kor}$ , then making said color corrections in the second color space using said corrected values  $L^*_{kor}$ ,  $a^*_{kor}$ ,  $b^*_{kor}$ , and then converting resulting color values into an output device color space and displaying a corrected color image.

5,481,381

## COLOR IMAGE READING APPARATUS

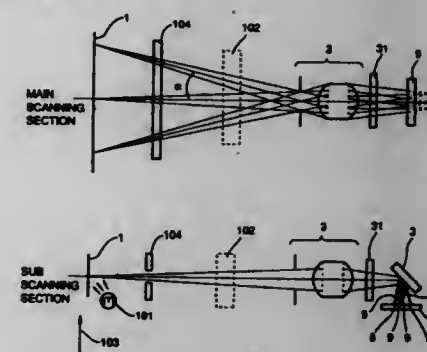
Makoto Fujimoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 979,051, Nov. 19, 1992, abandoned. This application Apr. 26, 1995, Ser. No. 430,147

Claims priority, application Japan, Nov. 20, 1991, 3-332532 Int. Cl.<sup>6</sup> H04N 1/48; 1/04; G02B 5/18; 5/20

U.S. Cl. 358—505

22 Claims



1. A color image reading apparatus comprising:  
a plurality of line sensors comprising a plurality of one-dimensional sensor arrays disposed on a single substrate;  
a projection optical system for projecting an image of a subject on said sensors;  
a blazed diffraction grating disposed in an optical path between said projection optical system and said sensors to separate light from said subject into a plurality of color light components; and  
wavelength selection means disposed in an optical path between said subject and said sensors to permit only a beam of light within a specific wavelength range to pass therethrough, said wavelength selection means preventing color blur, caused by off axis light from said subject, from being diffracted by said blazed diffraction grating so as to enter said sensors.

5,481,382

## METHOD OF TRANSMITTING AND RECEIVING IMAGE DATA AND APPARATUS WHICH IS USED IN SUCH A METHOD

Kazuyoshi Takahashi, Kawasaki, and Yasuhiro Yamada, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 956,478, Oct. 2, 1992, abandoned, which is a continuation of Ser. No. 614,501, Nov. 16, 1990, abandoned. This application Aug. 4, 1994, Ser. No. 285,522

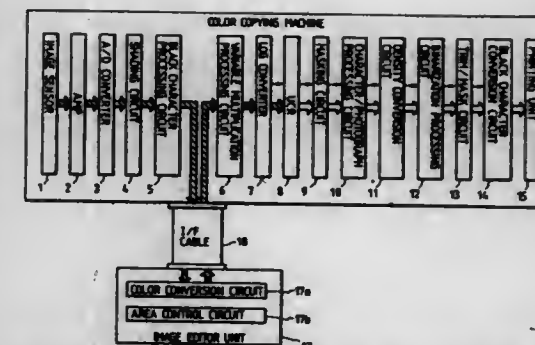
Claims priority, application Japan, Nov. 28, 1989, 1-310001 Int. Cl.<sup>6</sup> G03F 3/08

U.S. Cl. 358—529

30 Claims

1. A method of transmitting and receiving image data comprising pixel data for a plurality of color components, said method comprising the steps of:

producing image control data which is used on a receiving side for controlling the received image data;



providing the image control data and first pixel data for a plurality of color components, wherein said plurality of color components comprises n color components, wherein n is a positive integer; and

receiving the first pixel data for the n color components and producing, on the basis of the image control data and the first pixel data, second pixel data for a plurality of color components, wherein said plurality of color components comprises (n+m) color components, wherein m is a positive integer,

wherein, in the providing step, the n color components for the first pixel data are provided in a period of time corresponding to a period of time when n of the (n+m) color components of the second pixel data are produced, and wherein the image control data are provided in a period of time corresponding to a period of time when m of the (n+m) color components of the second pixel data are produced.

5,481,383

## COLOR IMAGE READER

Hideki Morishima, Tokyo, and Naomoto Taniguchi, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

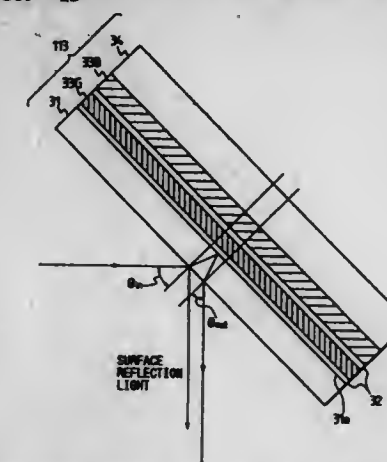
Filed Nov. 12, 1993, Ser. No. 150,803

Claims priority, application Japan, Nov. 13, 1992, 4-328836

Int. Cl.<sup>6</sup> G02B 5/28; 5/32; G03H 1/26; G01J 3/50

U.S. Cl. 359—15

16 Claims



1. A color image reading apparatus comprising:  
a multiple-line sensor in which a plurality of one-dimensional sensor arrays are arranged on a single substrate;  
a projection optical system for projecting a subject on said sensor; and  
color separation means disposed in an optical path between said projection optical system and said sensor, for color-separating light from said subject into a plurality of color beams, said color separation means comprising a volume hologram and an optical interference film.







5,481,390

## OPTICAL AMPLIFIER REPEATER

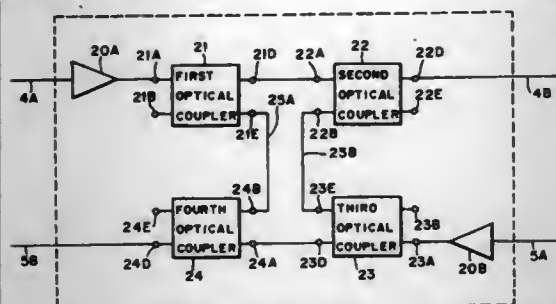
Takao Naito, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Feb. 7, 1995, Ser. No. 385,146

Claims priority, application Japan, Feb. 25, 1994, 6-028414  
Int. Cl.<sup>6</sup> H04B 10/02; 3/00

U.S. Cl. 359-174

31 Claims



1. An optical amplifier repeater for amplifying signal light transmitted along an ascending line and a descending line, comprising:

- first optical amplification means for amplifying signal light transmitted along said ascending line;
- second optical amplification means for amplifying signal light transmitted along said descending line;
- first optical coupler means having a first-first input port, a first-first output port and a first-second output port, an input side of said ascending line being connected to said first-first input port by way of said first optical amplification means;
- second optical coupler means having a second-first input port, a second-second input port and a second-first output port, said first-first output port being connected to said second-first input port, an output side of said ascending line being connected to said second-second input port;
- third optical coupler means having a third-first input port, a third-first output port and a third-second output port, an input side of said descending line being connected to said third-first input port by way of said second optical amplification means, said second-second input port being connected to said third-second output port; and
- fourth optical coupler means having a fourth-first input port, a fourth-second input port and a fourth-first output port, said third-first output port being connected to said fourth-first input port, said first-second output port being connected to said fourth-second input port, an output side of said descending line being connected to said fourth-first output port.

5,481,391

## OPTICAL FIBER SYSTEM AND METHOD FOR OVERCOMING THE EFFECTS OF POLARIZATION GAIN ANISOTROPY IN A FIBER AMPLIFIER

Clinton R. Giles, Middletown, N.J., assignor to AT&amp;T Corp., Murray Hill, N.J.

Filed Feb. 17, 1994, Ser. No. 198,011

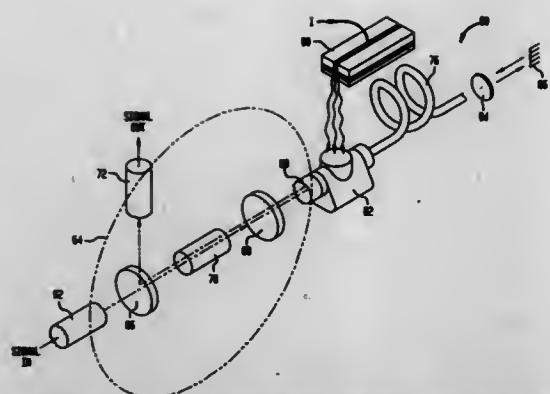
Int. Cl.<sup>6</sup> H04B 10/16; 10/02; H01S 3/00

U.S. Cl. 359-179

29 Claims

1. An optical fiber system comprising An optical fiber having at least one rare-earth doped fiber portion for amplifying a light signal,

- means for passing a light signal through the doped fiber portion in a first incident polarized state,
- means for generating a pump signal at a pump wavelength into the doped fiber portion for exciting any rare-earth dopants,
- means for reflecting the light signal back through the doped fiber portion in its orthogonal polarized state so as to overcome the effects of polarization gain anisotropy, and
- wherein the amplified spontaneous emission generated by the rare-earth doped fiber portion when in its saturated state is greater in its polarization state orthogonal to the incident light



signal as the light signal passes through said doped fiber portion, and wherein said amplified spontaneous emission is reflected back through the doped fiber portion in a polarization state perpendicular to its original state.

5,481,392

## AXIAL MIRROR SCANNER SYSTEM AND METHOD

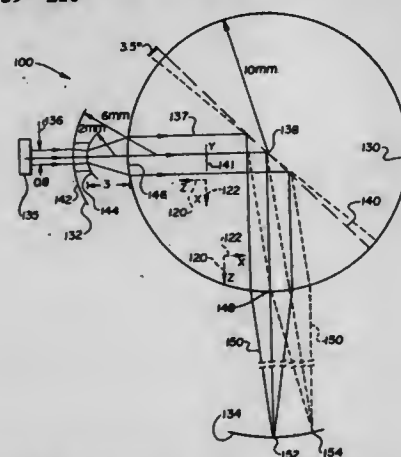
Lewis S. Damer, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 21, 1993, Ser. No. 170,590

Int. Cl.<sup>6</sup> G02B 26/08

U.S. Cl. 359-210

21 Claims



1. A rotating optical mirror scanner comprising:
  - at least one source of radiant energy;
  - input imaging means for pro-focusing the radiant energy into at least one input beam;
  - rotating mirror means for reflectively changing the direction of the input beam, the mirror means comprising a cylinder comprising material optically transparent to the input beam, and a mirrored surface located so that a plane of the mirrored surface divides the cylinder along the axis of rotation; and
  - output imaging means comprising a lens integrally formed as an outer surface of the cylinder material for focusing at least one reflected input beam into at least one out-put scanning beam.

5,481,393

## PUPIL MODULATION OPTICAL SYSTEM

Shingo Kashima, and Shinichi Hayashi, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1993, Ser. No. 149,335

Claims priority, application Japan, Nov. 9, 1992, 4-298551  
Int. Cl.<sup>6</sup> G02B 26/02; 5/22

U.S. Cl. 359-227

4 Claims

1. An optical system having a plurality of pupils, said optical system comprising:

5,481,395

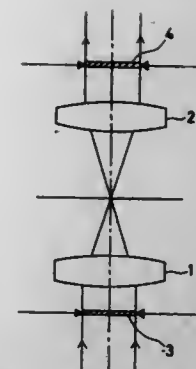
## PRISMATIC VARIABLE REFLECTANCE MIRRORS

Harlan J. Byker, Holland, Mich., assignor to Gentex Corporation, Zeeland, Mich.

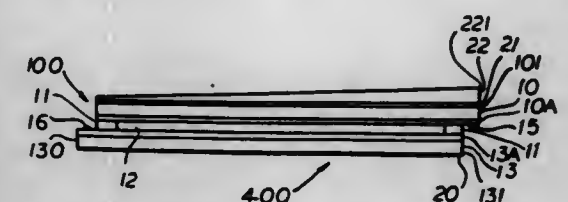
Division of Ser. No. 13,162, Feb. 1, 1993, Pat. No. 5,290,930, which is a continuation of Ser. No. 760,877, Sep. 16, 1991, abandoned, which is a division of Ser. No. 422,601, Oct. 17, 1989, abandoned, which is a division of Ser. No. 846,354, Mar. 31, 1986, Pat. No. 4,902,108. This application Dec. 28, 1993, Ser. No. 174,209  
Int. Cl.<sup>6</sup> G02F 1/153

U.S. Cl. 359-272

7 Claims



- a first filter means for controlling intensity distributions without effecting phase modulation of light at one of a plurality of positions for said pupils;
- a second filter means for controlling intensity distributions without effecting phase modulation of light at another of said plurality of positions for pupils;
- wherein said first and second filter means further perform pupil modulation at said one and another positions of said plurality of positions for said pupils of the optical system.



1. A variable reflectance mirror which comprises a device of reversibly variable transmittance, a planar front surface, and a planar reflecting means,
  - (A) said device comprising
    - (i) a medium of transmittance which is reversibly varied by electro-optic means, and
    - (ii) two planar, parallel, spaced-apart surfaces, between which the medium of reversibly variable transmittance is held and through which light passes prior to and after reflecting from said reflecting means; with
  - (B) the angle between the plane of said front surface and the plane of said reflecting means being 1° to 5°.

5,481,394

## VARIABLE-APEX PRISM CONTROLLER

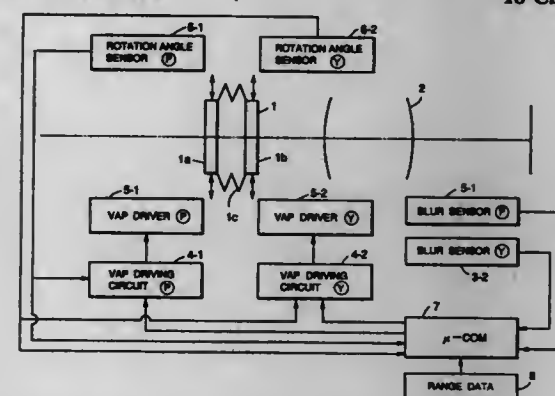
Kenichi Kimura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1993, Ser. No. 112,319

Claims priority, application Japan, Aug. 31, 1992, 4-255472  
Int. Cl.<sup>6</sup> G02B 27/64

U.S. Cl. 359-234

18 Claims



1. A variable-apex prism controller comprising:
  - a pair of transparent optical members;
  - driving means for driving said optical members around corresponding different rotation axes so as to change a direction of a light flux propagating through said optical members; and
  - controlling means for controlling said driving means in such a way that the maximum light modification amount with respect to said rotation axes is substantially the same as the maximum light modification amount with respect to any direction different from direction of said rotation axes.

5,481,396

## THIN FILM ACTUATED MIRROR ARRAY

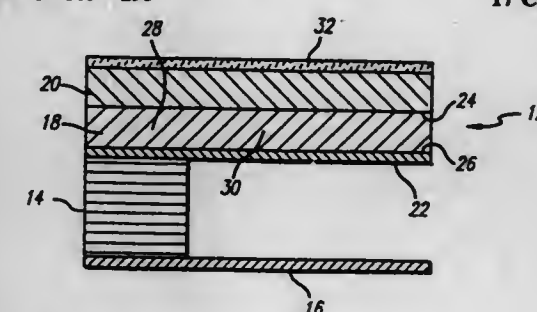
Jeong B. Ji, Seoul, Rep. of Korea, and Gregory Um, Torrance, Calif., assignors to Aura Systems, Inc., El Segundo, Calif.

Filed Feb. 23, 1994, Ser. No. 200,861

Int. Cl.<sup>6</sup> G02B 26/00

U.S. Cl. 359-295

17 Claims



1. A thin film actuated mirror comprising:
  - a pedestal;
  - at least one piezoelectric structure cantilevered from said pedestal, said piezoelectric structure further comprising a piezoelectric material layer having two opposing surfaces, and two metal electrodes, each of said electrodes being mounted on a respective one of said opposing surfaces of said piezoelectric material, wherein an electrical signal applied across said piezoelectric material between said electrodes causes deformation of said piezoelectric material layer; and
  - a mirror surface, said mirror surface being interconnected to said piezoelectric structure such that said mirror surface deforms in response to the deformation of said piezoelectric material layer.



5,481,397

## QUANTUM WELL STRUCTURES

Michael G. Burt, Woodbridge, England, assignor to British Telecommunications, London, England  
PCT No. PCT/GB90/01365, § 371 Date Feb. 26, 1992, § 102(e) Date Feb. 26, 1992, PCT Pub. No. WO91/03758, PCT Pub. Date Mar. 21, 1991

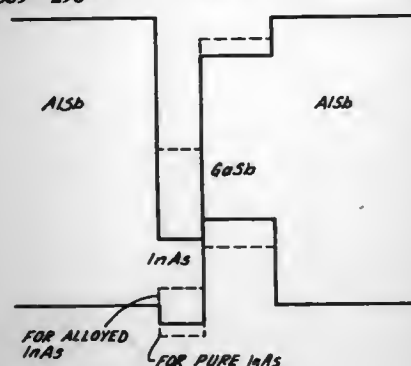
PCT Filed Sep. 4, 1990, Ser. No. 836,002

Claims priority, application United Kingdom, Sep. 4, 1989, 8919933; Sep. 5, 1989, 8919989

Int. Cl.<sup>6</sup> G02F 1/36; 1/015

U.S. Cl. 359—298

32 Claims



1. A quantum well structure comprising: first and second electrodes for application of an electric field normal to layers of the well, a quantum confinement region being formed without regions of graded compositional change, and having a conduction band profile tending to push electrons in the region to one side of the region and a valence band profile tending to push the holes in the region towards the opposite side of the region, and wherein electron-hole pairs with a dipole moment are produced by optical excitation of the structure.

5,481,398

## TEMPERATURE STABILIZATION MEANS FOR IMAGING OUTPUT RECORDER

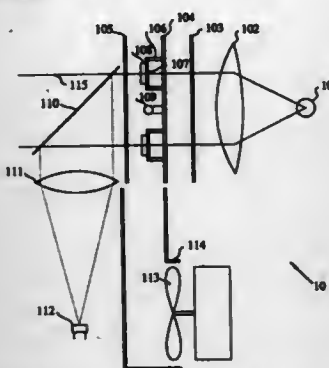
David J. Schoon, Mendota Heights, Minn., assignor to Schoonscan, Inc., Mendota Heights, Minn.

Filed Jan. 13, 1994, Ser. No. 181,573

Int. Cl.<sup>6</sup> G02F 1/00

U.S. Cl. 359—323

21 Claims



1. An imaging apparatus for applying at least one light beam to a photosensitive media comprising:
  - (a) a light source for providing light for use in imaging the photosensitive media;
  - (b) modulating means for modulating light from the light source and outputting the light beam; and
  - (c) temperature stabilization means for reducing response variations of the modulating means including:
    - (i) temperature sensing means for sensing the temperature of the modulating means and providing an output signal rep-

representative thereof, the temperature sensing means including a photosensor operatively configured to receive light output from the modulating means; whereby the output signal is representative of the intensity of light output from the modulating means;

- (ii) cooling means for cooling the modulating means; and
- (iii) control means for actuating the cooling means responsive to a temperature signal to maintain the modulating means at a substantially constant temperature, the control means including means for actuating the modulating means to output the light beam at two intensity levels, and means for generating the temperature signal, wherein the temperature signal is representative of the ratio of the output signals of the photosensor at the two intensity levels of the light beam.

5,481,399

## IN-LINE TWO-STAGE ERBIUM DOPED FIBER AMPLIFIER SYSTEM WITH IN-BAND TELEMETRY CHANNEL

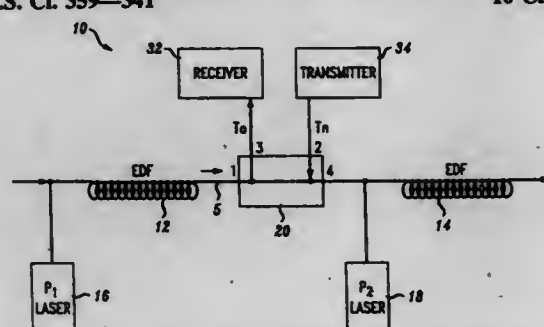
Jonathan A. Nagel, Freehold, and Samia M. Bahsoun, Bradley Beach, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Continuation of Ser. No. 142,754, Oct. 25, 1993, Pat. No. 5,394,265. This application Jan. 3, 1995, Ser. No. 368,509

Int. Cl.<sup>6</sup> H01S 3/17; 3/06; H04B 10/00

U.S. Cl. 359—341

10 Claims



1. A two-stage doped fiber amplifier system for use in optical fiber communication systems including an optical fiber for carrying a signal comprising a data signal and a first telemetry signal having a predetermined carrier wavelength, said doped fiber amplifier system comprising:

- a first doped fiber amplifier for disposal in-line with the optical fiber for amplifying the signal and having an input and an output, said first amplifier operatively generating an inherent spontaneous emission noise signal having a noise peak occurring at said predetermined carrier wavelength;
- a filter disposed at the output of said first amplifier for filtering out said predetermined carrier wavelength so as to remove from the signal the first telemetry signal and at least said noise peak of the spontaneous emission noise signal while passing the data signal through the filter;

means for adding a second telemetry signal having said predetermined carrier wavelength to the passed-through data signal for forming a second signal to be carried by said optical fiber; a second doped fiber amplifier for disposal in-line with the optical fiber carrying the second signal for amplifying the second signal and having an input and an output; and means for supplying optical power to said first and second amplifiers.

5,481,400

## SURVIVABLE WINDOW GRIDS

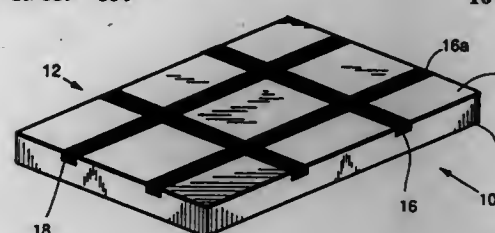
Michael R. Borden, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 9, 1993, Ser. No. 149,438

Int. Cl.<sup>6</sup> G02B 5/20

U.S. Cl. 359—350

16 Claims



1. An IR-transmitting window having a conductive grid for providing shielding against electromagnetic interference, said IR-transmitting window being formed of a material selected from the group consisting of zinc sulfide, zinc selenide, sapphire, magnesium fluoride, and combinations thereof and having an exterior surface and said exterior surface having a top surface, said conductive grid being formed within said material at said exterior surface and said conductive grid having a top surface that is coplanar with said top surface of said exterior surface of said IR-transmitting window.

5,481,401

## ULTRAVIOLET MICROSCOPE

Nobuhiro Kita; Shingo Kashima, and Kazuo Shimizu, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 882,280, May 13, 1992, abandoned.

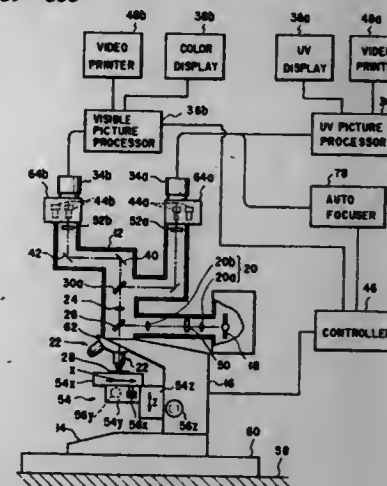
This application Aug. 15, 1994, Ser. No. 290,172

Claims priority, application Japan, May 16, 1991, 3-111894; May 7, 1992, 4-114922

Int. Cl.<sup>6</sup> G02B 5/30

U.S. Cl. 359—353

19 Claims



1. An ultraviolet microscope comprising: a stage for holding a specimen to be examined; light source means for emitting light having a wavelength range from a visible range to a near-ultraviolet range; an optical lens system including an illumination lens system for illuminating the specimen held on said stage with light emitted from said light source means and an image forming lens system having an objective lens system for focusing an enlarged optical image of the specimen by light from the specimen, at least said illumination lens system and said objective lens system being made of an optical material which can transmit light having at least a wavelength range from the visible range to the near ultraviolet range and which can

correct a chromatic aberration of an image position and a chromatic aberration of a magnification with respect to the light having the wavelength range; first observing means for observing at least an ultraviolet image of the specimen; second observing means for observing at least a visible image of the specimen; and wherein the image forming lens system has a plurality of said objective lens systems and a plurality of enlargement lens systems, and further comprising controller means for determining and selecting a combination of said objective lens systems and said enlargement lens systems having a highest numerical aperture from among a plurality of combinations having the same total magnification.

5,481,402

## TUNABLE OPTICAL FILTER

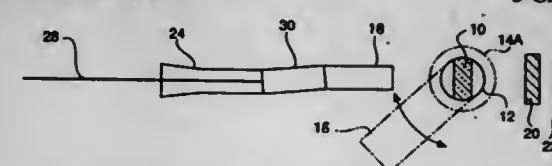
Yihao Cheng, Kanata; Timothy P. Cutts, Ottawa; Gary S. Duck, Nepean, and Carey M. Garrett, Kanata, all of, Canada, assignors to JDS Fitel Inc., Nepean, Canada

Filed Feb. 22, 1994, Ser. No. 199,793

Int. Cl.<sup>6</sup> G02B 5/28; 5/30; G02F 1/21

U.S. Cl. 359—498

3 Claims



1. An optical filter comprising a filter element mounted in an optical path for pivoting about a pivot axis extending transversely to said path, a quarter-wave plate mounted in the optical path and having mutually orthogonal fast and slow axes extending obliquely to the pivot axis, input means for directing a light beam to be filtered through the filter element in a first direction with a first polarization state, returning means for returning the light beam through the filter element a second time in an opposite direction, and output means for receiving the light beam following passage of the light beam through the filter element the second time.

5,481,403

## DRY SILVER PHOTOGRAPHIC IMAGING DEVICE AND METHOD

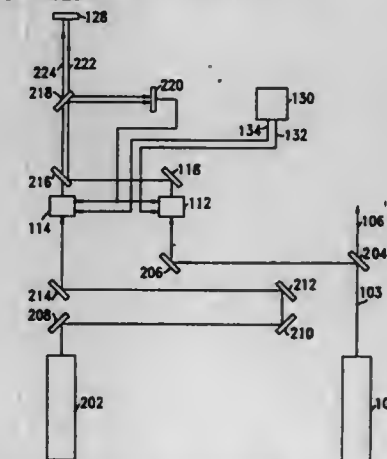
Max K. Muir, Payson, Ariz., assignor to Volt Information Sciences, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 72,199, Jun. 3, 1993, abandoned. This application Nov. 8, 1993, Ser. No. 148,726

Int. Cl.<sup>6</sup> G02B 27/10; 27/14

U.S. Cl. 359—618

14 Claims



1. A photographic imager comprising:



a first laser for generating a first laser beam having a first polarization;  
 a second laser for generating a second laser beam having a second polarization different from the first polarization; and  
 a beam combiner for receiving the first and second laser beams, the beam combiner reflecting the first laser beam and transmitting the second laser beam such that the reflected first laser beam is substantially separated from the transmitted second laser beam, the beam combiner directing the reflected first laser beam and the transmitted second laser beam toward a photographic media to sensitize at least one portion of the photographic media.

5,481,404

## ZOOM LENS HAVING SUPER WIDE ANGLE

Shuichi Kikuchi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

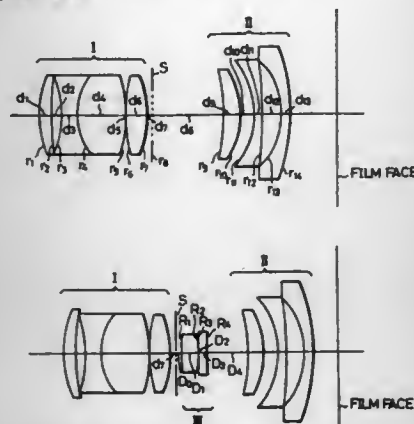
Filed Dec. 1, 1993, Ser. No. 159,574

Claims priority, application Japan, Dec. 17, 1992, 4-337561

Int. Cl.<sup>6</sup> G02B 15/02

U.S. Cl. 359—674

7 Claims



1. A zoom lens having a super wide angle comprising:  
 a first lens group having positive refracting power and arranged on an object side of said zoom lens;  
 a second lens group having negative refracting power and arranged on an image side of said zoom lens; and  
 a converter lens having positive refracting power and detachably attached between said first and second lens groups,  
 a focal length of said zoom lens being changed by changing a distance between said first and second lens groups, said distance being set to be wide on a wide angle side in a zooming region and to be narrow on a telephoto side in said zooming region,  
 said focal length of said zoom lens at the super wide angle being set to be shorter than that at a wide angle end in the zooming region, by mounting said converter lens on the wide angle side without changing said distance between said first and second lens groups on the wide angle side, and  
 a diaphragm of said zoom lens being stopped down in connection with said mounting of said converter lens in a super wide angle state.

5,481,405

## STEPLESS MICROGRAPHIC ZOOM LENS HAVING LARGE MAGNIFICATION RATIO

John J. Simbal, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

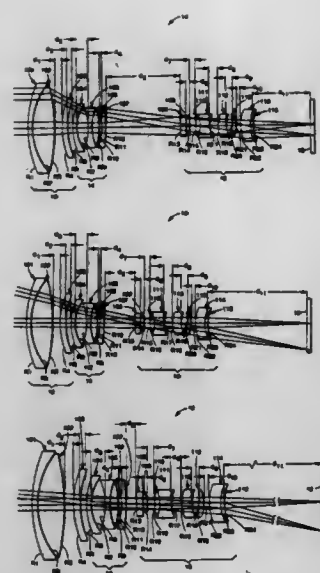
Filed Nov. 30, 1993, Ser. No. 160,420

Int. Cl.<sup>6</sup> G02B 15/14

U.S. Cl. 359—689

5 Claims

1. A micrographic stepless zoom lens, comprising, in succession from a side opposite from the side of incident light:



a first group comprising:

a first cemented doublet including a first meniscus lens element, convex toward said side opposite from the side of incident light, and a first biconvex lens element; and  
 a second meniscus lens element, convex toward said side opposite from the side of incident light, air spaced from said first cemented doublet; a second group comprising:  
 a third meniscus lens element, convex toward said side opposite from the side of incident light;  
 a second cemented doublet including a first biconcave lens element and a second biconvex lens element; and  
 a fourth meniscus lens element, concave toward said side opposite from the side of incident light, air spaced from said second cemented doublet; and

a third group comprising:

a third biconvex lens element;  
 a third cemented doublet including a fourth biconvex lens element and a second biconcave lens element, air spaced from said third biconvex lens element;  
 a fifth meniscus lens element, convex toward said side opposite from the side of incident light, air spaced from said third cemented doublet;  
 a sixth meniscus lens element, concave toward said side opposite from the side of incident light, air spaced from said fifth meniscus lens element; and  
 a fourth cemented doublet including a seventh meniscus lens element, convex toward said side opposite from the side of incident light, and an eighth meniscus lens element, convex toward said side opposite from the side of incident light, air spaced from said sixth meniscus lens element.

5,481,406

## MECHANISM FOR WATERPROOFING OPERATION MEMBER OF INTERCHANGEABLE LENS BARREL

Satoshi Yamazaki, Tokyo; Toru Takayama, Kawasaki; Kunihiro Fukino, Fujisawa; Yoshiro Kodaka, Kawasaki, and Hitoshi Imanari, Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Oct. 15, 1993, Ser. No. 136,256

Claims priority, application Japan, Nov. 13, 1992, 4-084683

U

Int. Cl.<sup>6</sup> G03B 17/08

U.S. Cl. 359—694

8 Claims

1. A switching mechanism of an interchangeable lens barrel, comprising:

an operation member rotatably set around a periphery of the interchangeable lens barrel, said operation member having a knurled part around a periphery of the operation member; and

5,481,408

## METHOD OF MANUFACTURING AN ILLUMINATING REFLECTION MIRROR

Mizuho Shimada, Yokohama, Japan, assignor to Equestrian Co., Ltd., Tokyo, Japan

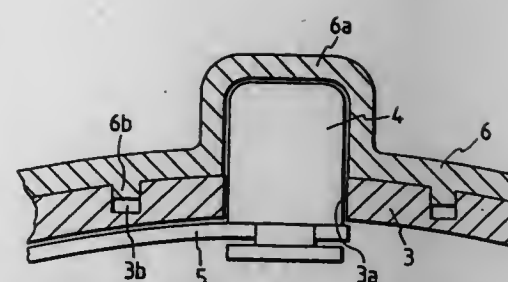
Continuation of Ser. No. 924,983, Aug. 5, 1992, abandoned.

This application Mar. 7, 1994, Ser. No. 206,229

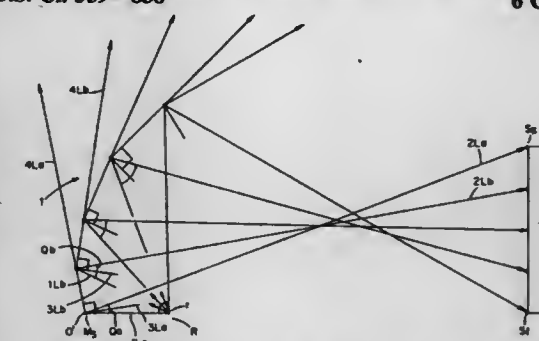
Int. Cl.<sup>6</sup> G02B 5/08; 5/10

U.S. Cl. 359—838

6 Claims



a button which engages with said operation member such that the button penetrates said operation member and protrudes outward from said operation member, the button functioning to fix the operation member to a predetermined rotation position and to release the operation member from the fixed rotation position, wherein said knurled part comprises an elastic material, said knurled part having a protruding portion integrally formed therewith to cover said button, and said operation member having a fitting groove on a periphery of said operation member to prevent the knurled part from being displaced in a direction of an optical axis of the interchangeable lens barrel.



1. A method of designing an illuminating reflection mirror having a reflective surface, the shape of which reflective surface corresponds to a desired illumination intensity pattern to be projected by said mirror on an illumination object, said method comprising the steps of:

- providing an illumination object;
- defining a plurality of illumination points which correspond to said desired illumination intensity pattern on said illumination object wherein a greater density of illumination points corresponds to a greater illumination intensity to be applied to said illumination object;
- locating a light source (R) at a given distance from said illumination object (S);
- selecting an initial one of said plurality of illumination points (Ss) on said illumination object (S) and a curvature starting point (Ms) on a remote side of said light source (R) and drawing a straight line (1La) to produce an imaginary incident ray from said light source (R) to said curvature starting point (Ms) and a straight line (2La) to produce a reflected ray from said curvature starting point (Ms) to said initial illumination point (Ss) to define an angle (Qa) between said straight line (1La) and said straight line (2La);
- drawing a straight line (3La) to produce an incident normal by bisecting said angle (Qa) equally into two angles;
- drawing a tangential line (4La) extending through said curvature starting point (Ms) perpendicularly to said straight line (3La) to produce an imaginary reflected light emitted from the light source (R) that is reflected at said curvature starting point (Ms) toward said initial illumination point (Ss) by reflection, said straight line (3La) producing an incident normal;
- selecting an adjacent one of said plurality of illumination points on said illumination object;
- locating a subsequent straight line (1Lb) from said light source extending at an angle from the preceding imaginary incident ray to produce a subsequent imaginary incident ray and to locate a subsequent curvature point on said tangential line (4La) while simultaneously drawing a straight line (2Lb) from said subsequent illumination point by reflection such that a subsequent angle (Qb) is defined between said subsequent straight line (1Lb) and said straight line (2Lb);
- drawing a straight line (3Lb) to produce a subsequent incident normal by bisecting said subsequent angle (Qb) equally into two angles;
- drawing a subsequent tangential line (4Lb) extending through said subsequent curvature point perpendicularly to said straight line (3Lb); and
- repeating the steps g) through j) to produce a series of curvature points which represent a reflective mirror surface.

5,481,407

## APPARATUS AND PROCESS FOR USING FRESNEL ZONE PLATE ARRAY FOR PROCESSING MATERIALS

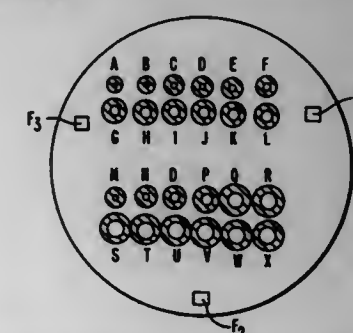
Adlai H. Smith, San Diego; Robert O. Hunter, Jr., Rancho Santa Fe, and Bruce B. McArthur, San Diego, all of Calif., assignors to Litel Instruments, San Diego, Calif.

Filed Sep. 14, 1993, Ser. No. 121,060

Int. Cl.<sup>6</sup> G02B 3/08; B23K 26/00

U.S. Cl. 359—742

31 Claims



1. Apparatus for processing a work piece with images produced by a Fresnel zone plate array having holographic images in a plurality of discrete subapertures on the Fresnel zone plate array, the apparatus including passing coherent light through the Fresnel zone plate array at selected subapertures to process the work piece comprising:

- an optical frame for supporting in optically stable manner a plurality of optical elements defining an optical path on the frame;
- a coherent light source for communicating coherent light to the optical path mounted on the frame;
- a Fresnel zone plate array mounted to the frame having a plurality of discrete subapertures, with each said subaperture containing image information for the coherent light at a preselected distance from the subaperture on the Fresnel zone plate array;
- means for addressing the coherent light from the optical path to less than all of the discrete subapertures on the Fresnel zone plate array to produce from at least one of the subapertures an image;
- a work piece;
- means for mounting and moving the work piece relative to the image for producing the image on the work piece at arbitrarily selected locations.



5,481,409

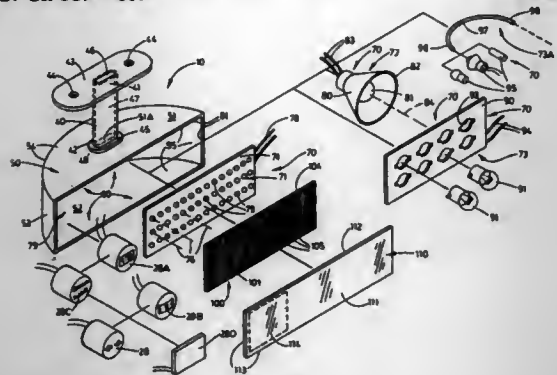
## MIRROR ASSEMBLY

John K. Roberts, Sheboygan, Wis., assignor to K. W. Muth Company, Inc., Sheboygan, Wis.  
Division of Ser. No. 694,884, May 2, 1991, Pat. No. 5,207,492, which is a continuation-in-part of Ser. No. 482,254, May 20, 1990, Pat. No. 5,014,167. This application Apr. 15, 1993, Ser. No. 48,202

Int. Cl.<sup>6</sup> G02B 5/08; 5/26; 27/14; G01J 1/32

U.S. Cl. 359—839

5 Claims



1. A mirror assembly comprising:  
an enclosure having an aperture;  
a dichroic mirror borne by the enclosure and substantially occluding the aperture and wherein the dichroic mirror is operable to selectively pass a predetermined narrow band of electromagnetic radiation which does not exceed 150 nanometers in width, and reflect a broad spectral band of visible light; and  
means borne by the enclosure for receiving electromagnetic radiation in the predetermined narrow spectral band of electromagnetic radiation passed by the dichroic mirror, and wherein the preponderance of the electromagnetic radiation detected by the receiving means lies within the same 150 nanometer wide band of electromagnetic radiation which is passed by the dichroic mirror, and wherein the dichroic mirror further has a luminous reflectance of greater than 50% while simultaneous passing at least 60% of the predetermined narrow band of electromagnetic radiation.

5,481,410

# MAGNETOOPTICAL RECORDING MEDIUM ALLOWING OVERWRITING WITH TWO OR MORE MAGNETIC LAYERS AND RECORDING METHOD UTILIZING THE SAME

Yoshi Osato, Yokohama; Hisaaki Kawade, Atsugi; Eiichi Fujii, Yokohama; Nobuhiro Kasama, Yokohama, and Tadashi Kobayashi, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 237,420, May 3, 1994, abandoned, which is a continuation of Ser. No. 841,015, Feb. 25, 1992, abandoned, which is a division of Ser. No. 475,941, Jan. 30, 1990, Pat. No. 5,132,945, which is a continuation of Ser. No. 71,190, Jul. 8, 1987, abandoned. This application Sep. 30, 1994, Ser. No. 312,930

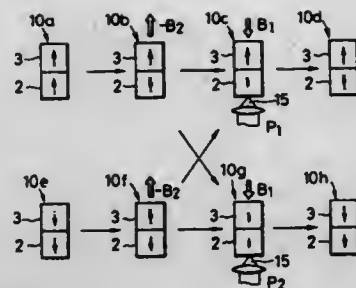
Claims priority, application Japan, Jul. 8, 1986, 61-158787; Aug. 16, 1986, 61-191202; Nov. 5, 1986, 61-262034; Nov. 25, 1986, 61-278566; Nov. 25, 1986, 61-278567; Feb. 2, 1987, 62-20384; Feb. 3, 1987, 62-21675; Feb. 4, 1987, 62-23993; Feb. 6, 1987, 62-24706; Feb. 6, 1987, 62-24707; Feb. 10, 1987, 62-27082; Feb. 10, 1987, 62-27083; Feb. 23, 1987, 62-37736; Mar. 10, 1987, 62-52897; Mar. 26, 1987, 62-70273; Mar. 26, 1987, 62-70274; Mar. 26, 1987, 62-70278; Mar. 26, 1987, 62-70279; Mar. 26, 1987, 62-72559; Jun. 18, 1987, 62-153108

Int. Cl.<sup>6</sup> G11B 13/04

U.S. Cl. 360—13

30 Claims

1. A magneto-optical recording medium comprising:  
a transparent substrate;



- a first magnetic layer;
  - a second magnetic layer exchange-coupled to said first magnetic layer, said second magnetic layer having a higher Curie point and a lower coercive force at room temperature than those of said first magnetic layer; and
  - a third magnetic layer located between said first magnetic layer and said second magnetic layer;
- wherein a following relationship is satisfied:

$$H_1 > H_2 > H_3$$

- wherein  $H_1$ ,  $H_2$  and  $H_3$  are respectively coercive forces at room temperature of said first, second and third magnetic layers; and  
wherein said first magnetic layer is located closer than said second and third magnetic layers to said transparent substrate...and said third magnetic layer is located closer than said second magnetic layer to said transparent substrate.

5,481,411

# TAPE DUBBING AND DIVIDED MASTER TAPE PRODUCING SYSTEM

Yoichi Nakatani, Mito, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

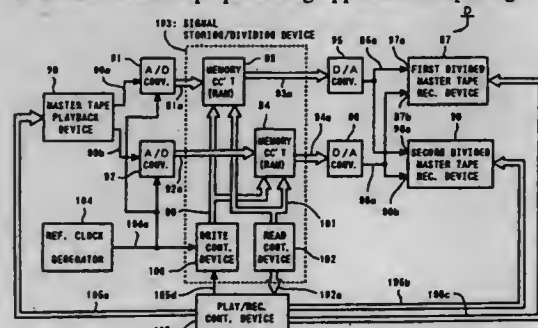
Continuation of Ser. No. 116,948, Sep. 3, 1993, abandoned, which is a continuation of Ser. No. 930,819, Aug. 14, 1992, abandoned. This application Feb. 28, 1995, Ser. No. 396,454

Int. Cl.<sup>6</sup> H04N 5/782

U.S. Cl. 358—311

11 Claims

1. A divided master tape producing apparatus comprising:



- an original master tape playback device for playing back an original master tape recorded with an original master signal having an original signal sequence;
- signal dividing means for dividing said original master signal time-divisionally into predetermined signal segments of equal length, each of said predetermined signal segments having a preselected time code and being one of a group consisting of one video field, one video frame, one color frame and two video frames forming an N number of divided master signals by assigning said predetermined signal segments sequentially and cyclically between said N number of divided master signals based on said time code where N is greater than 1, said signal dividing means comprising means for storing contents of said original master signal reproduced from said original master tape playback device and controlling means

for controlling said storing means so as to produce said N number of divided master signals being outputted from said storing means; and

N number of master signal recording devices for recording said N number of divided master signals respectively on N number of master tapes, said controlling means causing said N number of master signal recording devices to drive intermittently said N number of master tapes to be recorded, so that each of said N number of divided master signals becomes continuous without time interruption on said N number of tapes.

5,481,412

# VIDEO SIGNAL DIGITAL RECORDING/REPRODUCING APPARATUS

Tatsushi Bannai, Sakai; Hideaki Shibata, Osaka; Masamitsu Ohtsu, Moriguchi, and Hiroshi Okamoto, Nara, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 736,058, Jul. 26, 1991, Pat. No. 5,383,063. This application Apr. 28, 1994, Ser. No. 234,379

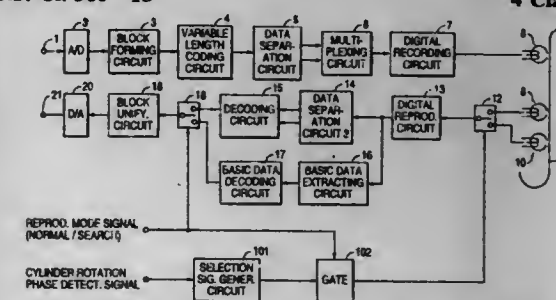
Claims priority, application Japan, Jul. 30, 1990, 2-202122

The portion of the term of this patent subsequent to Jan. 17, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> G11B 5/02

U.S. Cl. 360—18

4 Claims



1. A video signal digital recording/reproducing apparatus comprising:

- a block forming circuit, said circuit dividing an input video signal into a plurality of blocks each composed of a plurality of picture elements;
- an encoder, said encoder subjecting each of said plurality of blocks to a bit rate reduction encoding processing including a variable length coding processing to obtain a plurality of blocks of coded data, each block of said plurality of blocks of coded data being composed of basic data which represents rough basis construction of an image of said block and which comprises data of a fixed data length and additional data which represents details of the image of said block and which comprises data of a variable data length;
- a data separating circuit, said circuit extracting and separating, from said plurality of blocks of coded data, all of said basic data to obtain a collection of said basic data and for extracting and separating, from said plurality of blocks of coded data, all of said additional data to obtain a collection of said additional data; and
- a recorder, said recorder recording said collection of said basic data and said collection of said additional data on a recording medium such that an entire area of the recording medium is divided into a first continuous region in which only said collection of said basic data is continuously and collectively recorded and a second continuous region in which only said collection of said additional data is continuously and collectively recorded.

5,481,413

# MAGNETIC RECORDING AND REPRODUCING APPARATUS FOR A HELICAL-SCAN SYSTEM ADAPTED FOR REPRODUCTION OF DATA IN A REVERSE SEQUENTIAL ORDER FROM RECORDING OF DATA

Hideaki Kawada, and Toshiaki Wakita, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 143,478, Oct. 26, 1993, abandoned.

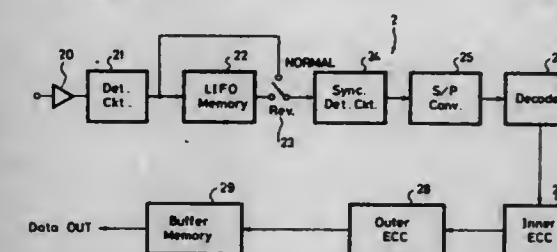
This application May 8, 1995, Ser. No. 436,833

Claims priority, application Japan, Jan. 27, 1992, 4-289078; Nov. 20, 1992, 4-335261

Int. Cl.<sup>6</sup> G11B 5/09

U.S. Cl. 360—53

9 Claims



1. A data recording and reproducing apparatus comprising:  
tape transporting means for transporting a tape recording medium in a first direction in a recording mode and in a second direction opposite the first direction in a reproducing mode;

a rotary drum rotating in a predetermined direction in the recording mode for recording a data signal on said tape recording medium in a plurality of tracks in a slant direction with respect to a longitudinal direction of the magnetic tape and said rotary drum rotating in a direction opposite the predetermined direction in the reproducing mode for reproducing the data signal from said tape recording medium to produce a reproduced data signal;

data receiving means for receiving a transmitted data signal having a sequential order opposite a sequential order of an original data signal prior to transmission;

synchronizing signal adding means receiving the transmitted data signal from said data receiving means for adding a synchronizing signal to every first data length of the data signal to be recorded;

first data inverting means for inverting a sequential order of said reproduced data signal at every second data length corresponding to a length of said track;

synchronizing signal detection means for detecting synchronizing signals from an output of said first data inverting means; and

second data inverting means for inverting a sequential order of an output signal of said synchronizing signal detection means at every data length corresponding to a data length of the data signal between adjoining two synchronizing signals so as to produce a data signal having a sequential order the same as the sequential order of the original data signal.



5,481,414

**MAGNETIC RECORDING AND REPRODUCING APPARATUS INCLUDING A TRACK SCANNING DEVICE FOR CAUSING A SINGLE MAGNETIC HEAD TO SCAN AT LEAST TWO TRACKS DURING A PERIOD OF TIME CORRESPONDING TO ONE CYCLE OF INFORMATION TO BE CONTINUOUSLY RECORDED ON A MAGNETIC TAPE**

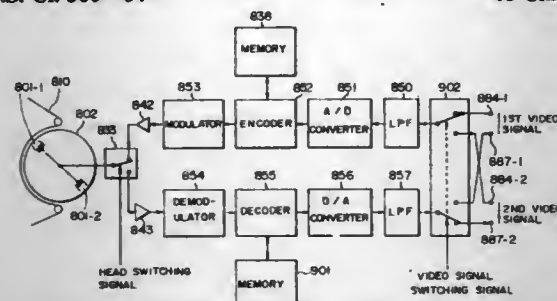
Yukari Takada; Ken Onishi, and Kimitoshi Hongo, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 113,319, Aug. 30, 1993, abandoned, which is a continuation of Ser. No. 592,038, Oct. 3, 1990, abandoned. This application Sep. 19, 1994, Ser. No. 308,630 Claims priority, application Japan, Jan. 4, 1989, 1-260810; Jan. 30, 1989, 1-283346; Nov. 6, 1989, 1-289015; Nov. 24, 1989, 1-305120; Dec. 4, 1989, 1-315858; Dec. 4, 1989, 1-315859; Dec. 16, 1989, 1-326246; Dec. 22, 1989, 1-333906

Int. Cl.<sup>6</sup> G11B 15/14; H04N 5/78

U.S. Cl. 360-64

41 Claims



1. A magnetic recording and reproducing apparatus comprising: a rotary drum having an outer periphery which is frictionally engageable with a magnetic tape such that an axis of rotation of said rotary drum is disposed at a predetermined angle with respect to a moving direction of the magnetic tape; a plurality of magnetic heads disposed on the outer periphery of said rotary drum for performing scanning on the magnetic tape so as to record a track of data having a predetermined width on the magnetic tape during recording and to reproduce the data from the magnetic tape during reproducing; and track scanning means for causing a single one of the plurality of magnetic heads to record one channel of information and another single one of the magnetic heads to reproduce another channel of information different from the one channel, during a period of time corresponding to one cycle of information to nearly simultaneously record and reproduce two different channels of information, the one channel being only recorded and the another channel being only reproduced for a plurality of consecutive periods of time.

5,481,415

**RECORDING/REPRODUCING APPARATUS THAT HANDLES BOTH DIGITAL AND ANALOG DATA AND DISTINGUISHES BETWEEN THE TWO**

Masaki Oguro, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 25, 1993, Ser. No. 142,813

Claims priority, application Japan, Jan. 26, 1992, 4-287875; Apr. 22, 1993, 5-096238

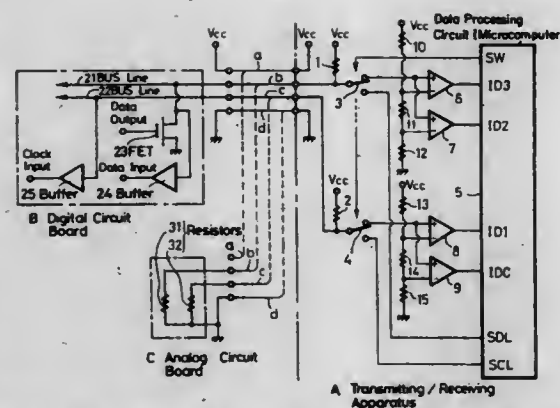
The portion of the term of this patent subsequent to Jul. 18, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> G11B 15/07

U.S. Cl. 360-69

8 Claims

1. In a data recording and/or reproducing apparatus a device for discriminating which of a digital signal source or an analog signal source is connected thereto through a plurality of contacts formed on a recording medium cassette containing the digital signal source or the analog signal source, the device comprising:



- means for applying a voltage to selected contacts of said plurality of contacts via respective resistors having predetermined values; switching means having inputs connected to said plurality of contacts; potential discriminating means connected to said plurality of contacts through said switching means for discriminating potentials developed at said contacts and producing a discriminating signal; and data processing means connected to said plurality of contacts through said switching means, wherein said discriminating signal from said potential discriminating means identifies said signal source as digital or analog.

5,481,416

**SEARCH METHOD AND CIRCUIT UTILIZING AN AUDIO SIGNAL**

Byong-Lyul Seo, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Continuation of Ser. No. 942,229, Sep. 9, 1992, abandoned.

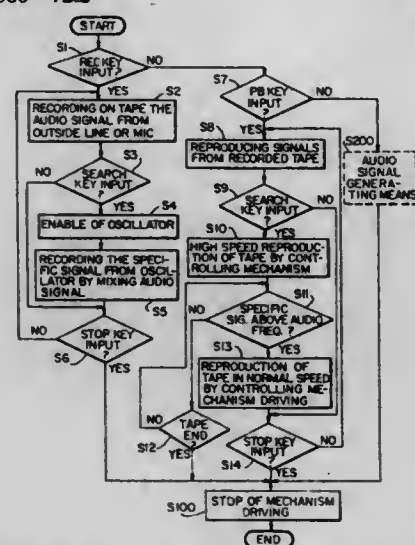
This application Oct. 18, 1994, Ser. No. 324,530

Claims priority, application Rep. of Korea, Sep. 9, 1991, 91-15880

Int. Cl.<sup>6</sup> G11B 15/18

U.S. Cl. 360-72.2

13 Claims



1. A search method for finding a desired location on a recording medium, comprising the steps of: generating a flag in accordance with an input of a search command by a user for marking the desired location; recording the flag on an audio track of the recording medium at substantially the desired location; and detecting the flag during a high speed playback of the medium in accordance with a further search command entered during playback.

5,481,417

**TAPE TENSION CONTROL FOR A MAGNETIC RECORDING AND REPRODUCING APPARATUS THAT ADJUSTS SPACING ERROR BASED ON THE REPRODUCED SIGNAL ENVELOPE**

Eiji Yokoyama, and Masato Nagasawa, both of Kyoto, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Kyoto, Japan

Division of Ser. No. 882,016, May 13, 1992, Pat. No.

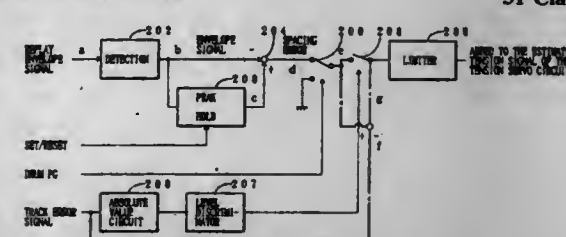
5,395,066. This application May 26, 1994, Ser. No. 249,745

Claims priority, application Japan, May 13, 1991, 3-107581; May 24, 1991, 3-120514

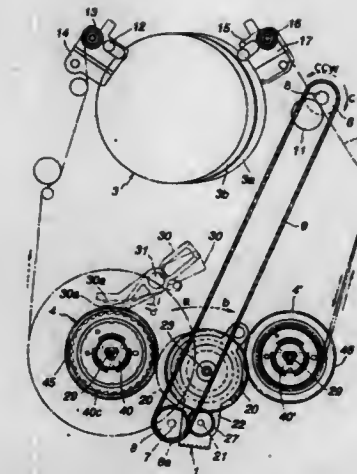
Int. Cl.<sup>6</sup> G11B 15/43

U.S. Cl. 360-73.08

31 Claims



1. A recording/reproducing apparatus comprising: supply reel drive means for driving a supply reel; tape tension control means for changing a tension of a magnetic tape path between said supply reel and a head cylinder on which a rotary head is mounted, said tape tension control means having a pair of supply side stationary pins located along the magnetic tape path for guiding the magnetic tape, a supply side movable pin, mounted along a plane located between said pair of supply side stationary pins, for guiding the magnetic tape and creating a supply side loop in the magnetic tape path, and actuator means for driving said supply side movable pin in a direction along the plane to change a distance in which said supply side movable pin is located from an axis between said pair of supply side stationary pins; tension detecting means for estimating tape tension and for outputting a control signal to said tape tension control means, said tape tension control means controlling the tension of the magnetic tape path in accordance with the control signal; and spacing detecting means, coupled to said tape tension control means, for detecting a spacing error between said rotary head and the magnetic tape based on an envelope of a signal reproduced by said rotary head and for generating a spacing error signal indicative of the detected spacing error, said tape tension control means changing a tension of the magnetic tape path in accordance with the spacing error signal.



5,481,419

**CASSETTE HOLDER MOVING MECHANISMS**  
Takeshi Fujishiro, Asaka, Japan, assignor to Fujii Photo Film Co., Ltd., Kanagawa, Japan

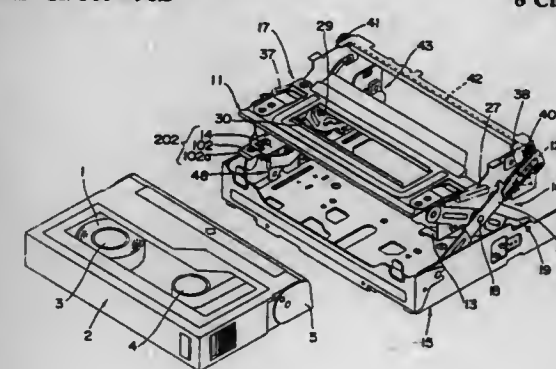
Filed Oct. 27, 1993, Ser. No. 141,884

Claims priority, application Japan, Jan. 28, 1992, 4-290070; Dec. 7, 1992, 4-326613

Int. Cl.<sup>6</sup> G11B 5/008; 5/027

U.S. Cl. 360-96.5

8 Claims



5,481,418

**TAPE LOADING APPARATUS INCLUDING GEAR MECHANISM FOR CONTROLLING ROTATION OF TAPE REELS**

Masahiro Maikuma, Kanagawa, and Tomoyasu Takaoka, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 3, 1994, Ser. No. 190,897

Claims priority, application Japan, Feb. 9, 1993, 5-020438

Int. Cl.<sup>6</sup> G11B 15/43; 5/027

U.S. Cl. 360-85

16 Claims

1. A tape loading apparatus having a rotatable head drum for one of reading data from and writing data to a length of a tape which is wound between a supply reel and a take-up reel, comprising: a base plate;

- a supply reel table mounted on said base plate supporting said supply reel around which said tape is wound;
- a take-up reel table mounted on said base plate supporting said take-up reel around which said tape is wound such that said tape extends between said supply reel and said take-up reel;



1. A magnetic recording and reproduction apparatus having a main unit with a base chassis, and a cassette holder defining front, rear, and opposite sides and adapted to hold a box-type cassette case having a wound magnetic tape, comprising:

a slide chassis slidably provided in said main unit for holding said cassette holder in a manner such that said cassette holder is capable of being vertically moved between an ascending position and a descending position, wherein an orientation of said cassette holder in said ascending position is substantially parallel to an orientation of said cassette holder in said descending position;

a first moving mechanism and a second moving mechanism which are operatively connected between said cassette holder and said slide chassis and are disposed at respective opposite sides of said cassette holder, wherein said first moving mechanism and said second moving mechanism guide said cassette holder between said ascending position and said descending position;

connecting means for synchronizingly connecting said first and second moving mechanisms, wherein said connecting means ensures that said cassette holder remains substantially parallel to said slide chassis;

holding means for preventing said first moving mechanism from moving said cassette holder to said ascending position when said cassette holder is in said descending position; and

acceleration means for accelerating a vertical movement of said second moving mechanism relative to a vertical movement of said first moving mechanism, wherein said acceleration means reduces an unstabilizing force generated by said holding means.

5,481,420

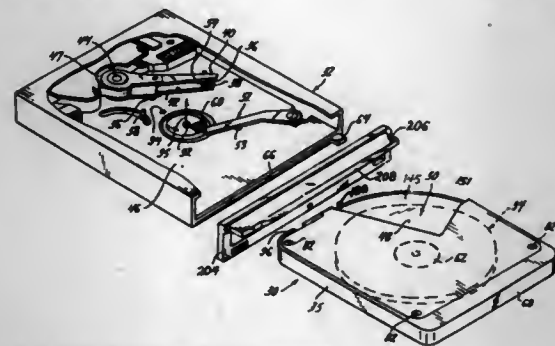
# DATA STORAGE DEVICE WITH REMOVABLE CARTRIDGE HAVING SHUTTER UNLOCKING AND DISK UNRESTRAINING ARRANGEMENTS

Joseph C. Cardona, 2395 W. Hedding St., San Jose, Calif. 95128, and Michael C. McGrath, 3126 Malvasia Ct., Pleasanton, Calif. 94566

Filed Nov. 9, 1992, Ser. No. 973,945  
Int. Cl.<sup>6</sup> G11B 17/02; 23/03

U.S. Cl. 360—99.06

29 Claims



1. A data storage device including:

a removable disk cartridge having:

a disk for data storage having:

an axis of rotation;

a housing surrounding said disk, said housing having:

a window therein to allow access to said disk;

a shutter attached to said housing for rotation generally about said axis of rotation, said shutter having:

an open position allowing access to said disk;

a closed position closing said window;

an arcuate outer peripheral edge portion;

first and second side walls on opposite sides of said arcuate outer peripheral edge portion; and

an abutment surface positioned across said arcuate outer peripheral edge portion; and

lock means for releasably retaining said shutter in said closed position, and

a disk drive for removably retaining said removable disk cartridge, said disk drive including:

an opening for insertion and removal of said removable disk cartridge therein;

a pivoting arm near said opening, said pivoting arm including:

an outer end having:

a finger positioned and shaped for engagement with said lock means to unlock said lock means as said removable disk cartridge is being inserted in said disk drive; and

an abutment lever shaped and positioned for engagement with said abutment surface as said finger is unlocking said lock means to move said shutter to said open position as said cartridge is further inserted in said disk drive.

a disk drive for removably retaining said removable disk cartridge, said disk drive including:

an opening for insertion and removal of said removable disk cartridge therein;

a pivoting arm near said opening, said pivoting arm including:

an outer end having:

a finger positioned and shaped for engagement with said lock means to unlock said lock means as said removable disk cartridge is being inserted in said disk drive; and

an abutment lever shaped and positioned for engagement with said abutment surface as said finger is unlocking said lock means to move said shutter to said open position as said cartridge is further inserted in said disk drive.

as said cartridge is further inserted in said disk drive.

5,481,421

# MAGNETIC DISK DRIVER CAPABLE OF DECREASING INGRESS OF NOISE IN A MAIN SURFACE OF A MAIN FRAME

Makoto Konno; Hisateru Komatsu, and Takashi Watanabe, all of Tendou, Japan, assignors to Mitsumi Electric Co., Ltd., Tokyo, Japan

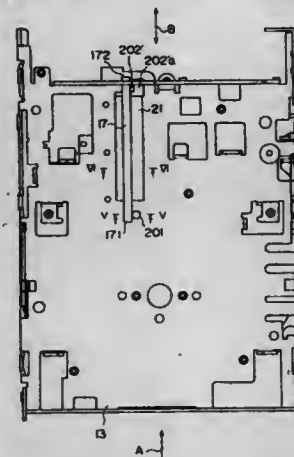
Filed Sep. 27, 1994, Ser. No. 313,332

Claims priority, application Japan, Feb. 8, 1994, 69-014353

Int. Cl.<sup>6</sup> G11B 5/55

U.S. Cl. 360—106

3 Claims



1. A magnetic disk driver for driving a magnetic disk inserted thereinto, comprising:

a main frame, having a main surface and a side wall, wherein said magnetic disk is mounted over said main frame;

a magnetic head for reading/writing data from/to said magnetic disk;

a head carriage, disposed over the main surface of said main frame and being apart from said main frame, for holding said magnetic head movably along a predetermined radial direction to said magnetic disk, said head carriage comprising a head carriage body and a supporting frame for supporting said head carriage body;

driving means, fixed on the side wall of said main frame and having a driving shaft extending in parallel with the predetermined radial direction, for moving said head carriage along the predetermined radial direction;

a guide bar having two ends, said guide bar being opposed to the driving shaft with said head carriage inserted between said guide bar and the driving shaft, said guide bar extending in parallel with the predetermined radial direction, and said guide bar having both ends thereof mounted on the main surface of said main frame, for guiding said head carriage along the predetermined radial direction by sliding the supporting frame of said head carriage;

a guide bar clamp, fixed on the main surface of said main frame, for clamping said guide bar on the main surface of said main frame; and

a pair of locating members for locating said both ends of said guide bar to mount said guide bar on the main surface of said

main frame in cooperation with said guide bar clamp, one of said locating members being disposed close to said magnetic disk and including a projecting portion which projects on the main surface of said main frame, the projecting portion being a protection squeezed out of said main frame by half blanking so as to form an inverted U-shaped projection which forms a continuous, uninterrupted surface with the surface of the frame, thereby creating a frame without any openings therein around the area of the projection so as to prevent dirt and noise from passing into the disk driver via the frame.

5,481,423

# DISC CARTRIDGE LOADING APPARATUS

Yoshitaka Aoki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

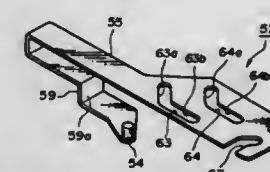
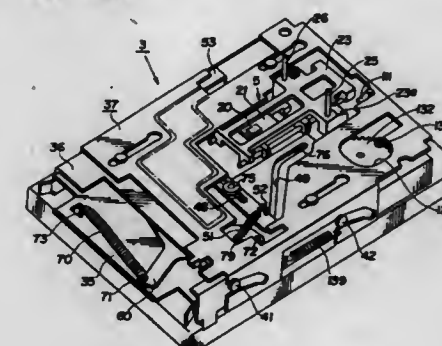
Filed Feb. 11, 1993, Ser. No. 16,606

Claims priority, application Japan, Feb. 17, 1992, 4-061526

Int. Cl.<sup>6</sup> G11B 17/04; 33/02

U.S. Cl. 360—99.06

2 Claims



5,481,422

# MAGNETIC HEAD WITH METALLIC MAGNETIC FILM AND PROTECTIVE FILM MEANS

Hiroshi Okayama, Kumamoto, and Kazuhiro Ishibashi, Fukuoka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

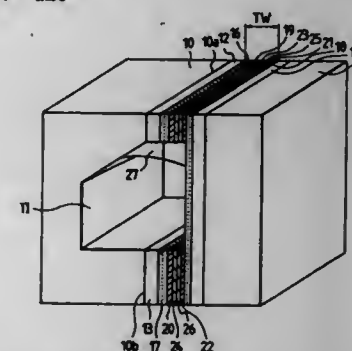
Filed Jul. 21, 1993, Ser. No. 89,524

Claims priority, application Japan, Jul. 24, 1992, 4-198113

Int. Cl.<sup>6</sup> G11B 5/127

U.S. Cl. 360—120

19 Claims



7. A magnetic head comprising:

first and second core halves made of a ferrite, said first core half having a winding channel so as to form a C-shaped configuration and said second core half having an I-shaped configuration, said first and second core halves defining at least one magnetic gap therebetween upon being abutted against each other;

first and second metallic magnetic films at least one of which is made of metallic magnetic material including nitrogen, said first and second metallic magnetic films being in contact with surfaces of said first and second core halves which respectively face said magnetic gap;

first and second protective film means in contact with said first and second metallic magnetic films to prevent said nitrogen of said at least one metallic magnetic film from being discharged;

at least one non-magnetic spacer film in contact with at least one of said first and second protective films so that, when said first and second core halves are abutted against each other, said first and second metallic magnetic films are opposed to each other with said first and second protective films and said non-magnetic film being interposed therebetween; and

a bonding glass provided in said winding channel of said first core half for connecting said abutting first and second core halves, said bonding glass remaining free from bubbles due to said protective film means being located between said metallic magnetic films and said bonding glass.

5,481,424

# RECORDING HEAD APPARATUS FOR A TAPE PLAYER

Shuji Koseki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 59,679, May 12, 1993, abandoned.

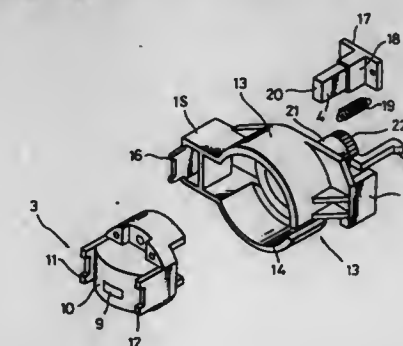
This application Aug. 30, 1994, Ser. No. 298,373

Claims priority, application Japan, May 20, 1992, 4-152795

Int. Cl.<sup>6</sup> G11B 5/55; 5/54

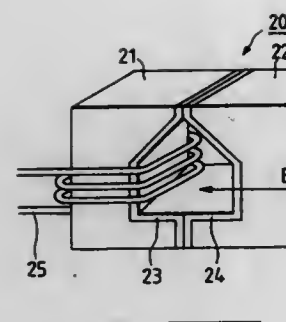
U.S. Cl. 360—106

5 Claims





1. A recording and reproducing apparatus comprising:  
 positive and reverse switching means for switching a travel direction of a tape so that said tape is transported at a constant speed in a positive direction or in a reverse direction;  
 a recording and reproducing head;  
 an erase head having a restricting plate at an end thereof opposite a tape contact surface of said erase head;  
 a head slider slidable between a recordable or reproducible first position at which said recording and reproducing head and said erase head are brought in contact with said tape and a second position at which said recording and reproducing head and said erase head are moved away from said tape in a ganged relation with a switching operation of said positive and reverse switching means;  
 a head supporting member supported on said head slider and including a first head holder and a second head holder for fixedly supporting said recording and reproducing head and for slidably supporting said erase head for motion along a straight line relative to said head supporting member, respectively, so that a tape contact surface of said recording and reproducing head and said tape contact surface of said erase head are projected from said head supporting member;  
 reverse means for reversing said head supporting member in a ganged relation with the switching operation of said positive and reverse switching means under a condition that said tape contact surfaces of said recording and reproducing head and said erase head are spaced from said tape in an opposing fashion so that said recording and reproducing head and said erase head are reversed at two positions corresponding to positions at which said tape is transported at a constant speed in the positive direction and in the reverse direction;  
 a record button for setting a recording operation mode;  
 a record lever attached to said record button; and  
 a recording operation slide member arranged to be moved by said record lever for movement independent of said head slider and slidable only upon engagement with said record lever and including a pair of engagement members erected on said recording operation slide member, wherein one of said pair of engagement members erected on said recording operation slide member is in contact with said restricting plate of said erase head in a reproducing operation mode to hold said tape contact surface of said erase head away from said tape while said recording and reproducing head is in contact with said tape, and said one of said pair of engagement members is moved out of contact with said restricting plate of said erase head in a recording operation mode when a user depresses said record button to cause said record lever to move said recording operation slide member to thereby disengage said one of said pair of engagement members from said restricting plate of said erase head.



5,481,426

# CASSETTE WITH RECORDING MEDIUM, IN PARTICULAR MAGNETIC TAPE CASSETTE

Klaus Schoettle, Heidelberg; Juergen Dreyer; Bozidar Pavelka, both of Willstaett, and Kurt Schmidts, Schwanau, all of, Germany, assignors to BASF Magnetics GmbH, Mannheim, Germany

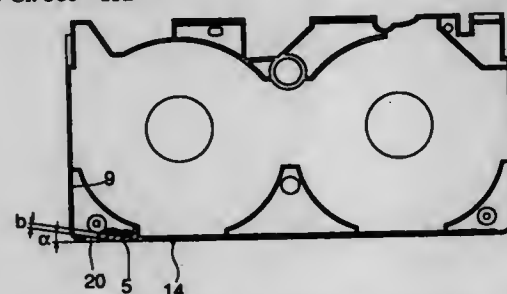
Division of Ser. No. 928,606, Aug. 13, 1992, abandoned. This application May 24, 1994, Ser. No. 248,551

Claims priority, application Germany, Aug. 16, 1991, 91 10 112 U

Int. Cl.<sup>6</sup> G11B 23/02

U.S. Cl. 360—132

17 Claims



1. In a magnetic tape cassette comprising a housing with top, bottom, front, rear and side walls, wherein at least one of said front, rear or side walls has at least one opening therein, which opening, when uncovered, provides a cavity in the housing such that when the opening is uncovered, recording and/or erasure is inhibited, and when said opening is covered, recording and/or erasure is uninhibited;  
 the improvement wherein the housing is provided with an inner wall section, which inner wall section forms an angle to the wall having the opening;  
 and wherein a displaceable identification part for covering and uncovering said opening is provided within the housing, said identification part having a length and height sufficient to cover said opening when in the covering position,  
 said identification part comprising a hook part and a front part, said front part is beveled in the direction for displacement of the identification part adapted to uncovering the opening, wherein said hook part has a hook gap which hooks over the back of said inner wall section for the identification part to slide along said inner wall section as it is displaced, said front part providing for guidance of the identification part on the inner surface of the portion of the wall having the opening; whereby the identification part is displaceable into the housing, sliding along the inner wall section on a path oblique to the wall in which the thereby-uncovered opening is located.

5,481,425

# MAGNETIC HEAD FOR A HARD DISK DEVICE HAVING A NON-MAGNETIC TRAILING CORE

Hiroshi Sempel, and Masashi Sato, both of Yamagata, Japan, assignors to Mitsumi Electric Co., Ltd., Tokyo, Japan

Filed Jul. 26, 1994, Ser. No. 280,822

Claims priority, application Japan, Sep. 27, 1993, 5-056748 U; Sep. 27, 1993, 5-056749 U

Int. Cl.<sup>6</sup> G11B 5/147

U.S. Cl. 360—126

20 Claims

1. A magnetic head comprising:  
 a leading core;  
 a trailing core having a magnetic circuit winding, said trailing core comprising non-magnetic monocrystal ferrite; and  
 magnetic metal films formed in magnetic path forming regions of said leading core and said trailing core.

5,481,427

# MODE SELECTOR MECHANISM FOR CASSETTE TAPE RECORDER INCLUDING IMPROVED CAM GEAR AND DRIVE SELECTING MECHANISM

Jun Ishikawa; Michio Kawashima, both of Tokyo, and Kazuhiro Itoh, Saitama, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

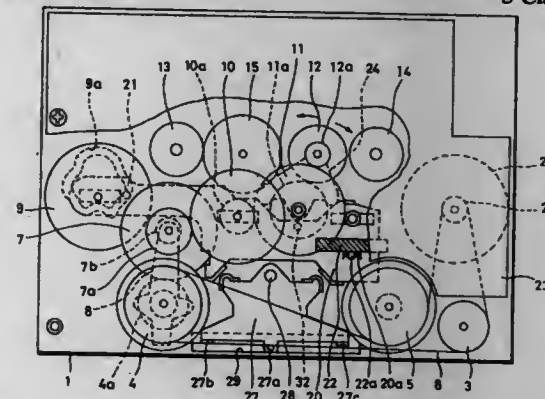
Filed Jan. 27, 1994, Ser. No. 187,057

Claims priority, application Japan, Jan. 29, 1993, 5-014172

Int. Cl.<sup>6</sup> G11B 15/02; 15/44

U.S. Cl. 360—137

8 Claims



8. A mode selector mechanism for use in a recording and/or reproducing apparatus, comprising:  
 a chassis;  
 a tape transport assembly switchable between settings corresponding to a plurality of operating modes and operable in a selected one of said plurality of operating modes of said apparatus including at least a forward playback mode, a fast-forward mode, and a rewinding mode, said tape transport assembly comprising  
 a transmission gear mounted on said chassis;  
 a speed change gear mounted on said chassis and engageable with said transmission gear; and  
 a first movable gear swingably mounted on said chassis for engagement with said speed change gear and one of a take-up reel and a supply reel;  
 a mode selector lever stoppable in a position corresponding to the selected one of the operating modes;  
 a cam gear for moving said mode selector lever in a first direction to the position corresponding to the selected one of the operating modes;  
 an operating mechanism angularly movable in response to movement of said mode selector lever for switching between the operating modes of said tape transport assembly of said apparatus depending on the selected one of the operating modes, and preventing said mode selector lever from moving in a second direction perpendicular to said first direction in which said mode selector lever moves;  
 a motor for producing drive forces to be supplied to said tape transport assembly and to said cam gear; and  
 a drive selecting mechanism for supplying the drive forces from said motor to said cam gear when said motor rotates in a first rotary direction and to said tape transport assembly when said motor rotates in a second rotary direction, said selecting mechanism comprising  
 a flywheel mounted on said chassis;  
 a belt connecting said motor and said flywheel;  
 a flywheel gear mounted on said flywheel; and  
 a second movable gear swingably mounted on said chassis for engagement with said flywheel gear and one of said cam gear and said transmission gear of said tape transport assembly, wherein said second movable gear engages said cam gear in response to a rotation of said motor in said first rotary direction when one of the operating modes is selected, thereby to move said mode selector lever to the position corresponding to the selected one of the operating modes to cause said operating mechanism to select the selected one of the operating modes, and subsequently said second movable gear engages said transmission gear of said

tape transport assembly to supply the drive forces to the tape transport assembly in response to rotation of said motor in said second rotary direction after the selected one of the operating modes has been selected.

5,481,428

# PROCESS FOR MANUFACTURING MULTILAYER CAPACITORS

Robert J. Lauf, Oak Ridge; Cressle E. Holcombe, Knoxville, and Norman L. Dykes, Oak Ridge, all of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Jun. 18, 1992, Ser. No. 900,886

Int. Cl.<sup>6</sup> H01G 4/008

U.S. Cl. 361—305

21 Claims



1. A method for manufacturing a multilayer electrical component comprising the steps of:  
 providing at least one layer of a particulate metal electrode in a first organic binder;  
 providing at least a second layer of a particulate ceramic dielectric in a second organic binder adjacent said layer of particulate metal electrode;  
 alternating said first and said second layers to produce a multilayer lamination;  
 heating said lamination to remove said organic binders from said lamination;  
 packing said lamination in a refractory insulating material; sintering said particulate metal layer and said particulate ceramic dielectric in said lamination by directly heating with microwave radiation;  
 and  
 attaching leads to said metal electrodes of said lamination.

5,481,429

# DISTRIBUTION OF COOLING AIR IN SWITCHGEAR CUBICLES

Stig Eriksson; Lars-Ove Mogren, and Bertil Moritz, all of Västerås, Sweden, assignors to ASEA Brown Boveri AB, Västerås, Sweden

Continuation of Ser. No. 117,039, Sep. 7, 1993, abandoned.

This application Jan. 10, 1995, Ser. No. 370,822

Claims priority, application Sweden, Mar. 18, 1991, 9100806

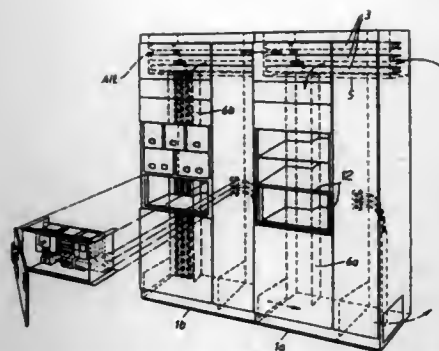
Int. Cl.<sup>6</sup> H02B 1/00

U.S. Cl. 361—678

5 Claims

1. The combination of a plurality of switchgear cubicles, air conditioning means for providing cooling gas to said cubicles, and busbar means for supplying electrical power to said cubicles; said plurality of cubicles being arranged in contacting side-by-side relationship, each cubicle containing electrical equipment, a horizontal busbar box to define a horizontal channel therein, and a vertical busbar box to define a vertical channel therein which communicates between said horizontal channel and said electrical equipment therein, said horizontal channels of said cubicles being in communication with one another; and said busbar means including a horizontal busbar portion which extends along said horizontal channels of said cubicles and a plurality of vertical busbar portions which extend from said horizontal busbar portion along said vertical channels of said respective cubicles to connect with the respec-





5,481,430

# PORTABLE COMPUTER HAVING KEYBOARD AND COORDINATE INPUT TABLET HINGEDLY CONNECTED TO A MAIN BODY CASE THROUGH A GROOVE

Shigenori Miyagawa, Tokyo; Koichi Kobayashi, Hanno; Shimpei Kunii, Tokyo; Shizuo Kamio, Tokyo; Hiroyuki Sakamoto, Tokyo; Fumitaka Sato, Tokyo, and Ryoichi Ishiura, Matsudo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

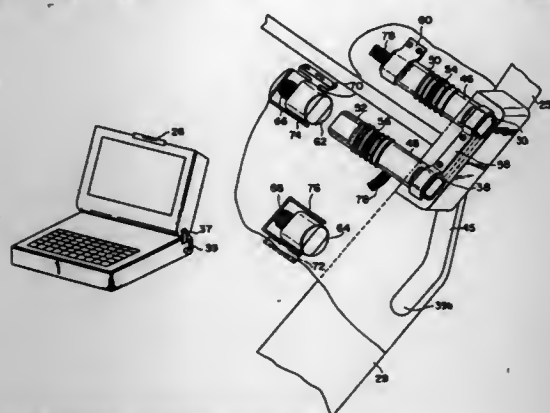
Continuation of Ser. No. 255,885, Jun. 7, 1994, abandoned, which is a continuation of Ser. No. 16,304, Feb. 11, 1993, abandoned, which is a division of Ser. No. 692,250, Apr. 26, 1991, abandoned. This application Dec. 22, 1994, Ser. No. 361,885

Claims priority, application Japan, Apr. 27, 1990, 2-112775; Nov. 21, 1990, 2-318403; Nov. 21, 1990, 2-318413; Nov. 21, 1990, 2-318414

Int. Cl.<sup>6</sup> G06F 1/16; H05K 7/16

U.S. Cl. 361-681

7 Claims



1. A portable computer comprising:
  - a keyboard for inputting data;
  - a main body case encasing said keyboard;
  - an integrated display/input device, said integrated display/input device having a display device for displaying data and a tablet for inputting coordinate data with said tablet overlaying a display surface of said display device;
  - a cover encasing said integrated display/input device;
  - a hinge for pivotally coupling said main body case and said cover from a state wherein said main body case and said cover overlap each other so that said keyboard and said integrated display/input device face each other to a state wherein said main body case and said cover overlap each other so that back surfaces thereof face each other; and
  - a hinge groove arranged along an outer periphery of said main body case, whereby said hinge moves in position while being guided by said hinge groove.

5,481,431

# SYSTEM HAVING U-SHAPED ACTUATOR AND HANDLE WITH CAM SURFACES FOR MOUNTING COMPUTER HARD DRIVE OR THE LIKE

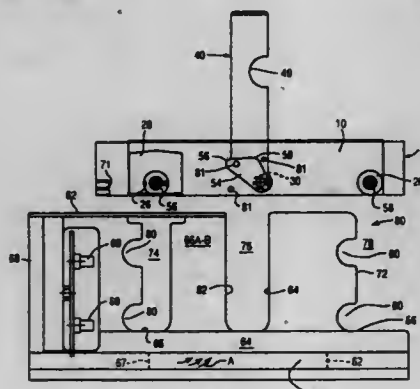
Hassan Siahpolo, Campbell, Calif.; Robert S. Antonuccio, Burlington; James M. Carney, Pepperel, both of Mass.; Daniel F. Hoornaert, Mountain View, Calif., and Joseph M. Spano, North Reading, Mass., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Jan. 28, 1994, Ser. No. 187,991

Int. Cl.<sup>6</sup> G06F 1/16; H05K 7/10; H01R 13/62

U.S. Cl. 361-685

40 Claims



1. A system for a computer comprising:
  - an element insertable in said system,
  - a crib device having a fastening facility for allowing the element to be secured to said crib device to prevent relative movement therebetween,
  - said crib device having a length corresponding generally to the length of the element and having opposed ends,
  - an actuator connected to said fastening facility in a manner to allow said actuator to move from a carrying position to another position to thereby create movement of said crib device and the secured element,
  - said actuator having an inverted U shaped handle mounted between said opposed ends,
  - said actuator having a first cooperative part of a mechanical mechanism for effecting said movement;
  - a chassis having a connecting portion to allow said crib device and the secured element to be connected to said chassis, and
  - said chassis having a second cooperative part of said mechanical mechanism operative with said first part for effecting said movement of said crib device.
36. A system for a computer comprising:
  - an element insertable in said system,
  - a crib device having a fastening facility for allowing the element to be secured to said crib device to prevent relative movement therebetween,
  - an actuator connected to said fastening facility in a manner to allow said actuator to move from a carrying position to another position to thereby create movement of said crib device and the secured element,
  - said actuator comprising a rotatable segment of a disk having two distinct cam surfaces constructed and arranged to contact said system to effect said movement of said crib device and the secured element, and
  - a chassis having a connecting portion to allow said crib device to be connected to said chassis.

5,481,432

# ELECTRONIC DEVICE HAVING CONNECTOR WITH ROWS OF TERMINALS DIVIDED BY RIBS AND GROUND OR POWER TERMINAL ADJACENT RIBS

Katsumi Tsukada; Norio Nakamura; Minoru Nimura; Hiroyuki Suemori; Tomio Kamihata, and Mutsuaki Yamazaki, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

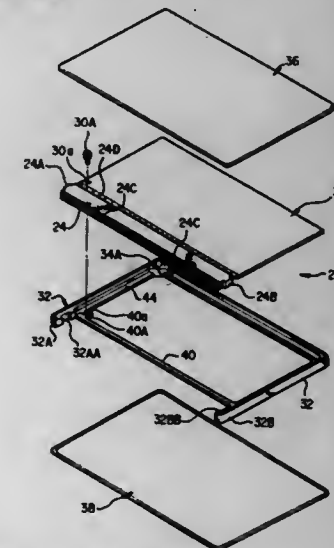
Filed Nov. 12, 1993, Ser. No. 151,214

Claims priority, application Japan, Nov. 13, 1992, 4-304060; Nov. 13, 1992, 4-304062; Nov. 13, 1992, 4-304063; Nov. 13, 1992, 4-304064; Feb. 19, 1993, 5-054843; Jun. 15, 1993, 5-169695; Nov. 8, 1993, 5-278643

Int. Cl.<sup>6</sup> G06F 1/16; H05K 7/10; H01R 13/64

U.S. Cl. 361-686

15 Claims



1. An electronic device comprising:
  - a flat, card-like casing encasing computer system component elements including: a CPU, memories, peripheral equipment control ICs, a control bus electrically coupled to said CPU and including at least part of an address bus and a data bus over which said CPU transmits information, and an IO bus electrically coupled to said peripheral equipment control ICs and over which said peripheral equipment control ICs transfer signals to and from external peripheral equipment; and
  - a connector formed on one side of said casing, said connector being electrically coupled to said control bus and to said IO bus, said connector having connection terminals arranged in a plurality of rows and having ribs that divide the rows of connection terminals into two or more sections in a longitudinal direction of said connector, wherein ones of said connection terminals located adjacent to said ribs are attached to at least one of ground lines and power lines.

5,481,433

# HEAT DISSIPATION FROM HIGH POWER SEMICONDUCTORS IN AN ELECTRICAL VEHICLE

James C. Carter, Clarkston, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

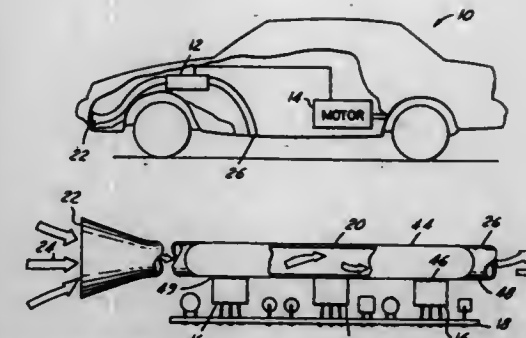
Filed Jul. 1, 1994, Ser. No. 266,348

Int. Cl.<sup>6</sup> H05K 7/20

U.S. Cl. 361-690

8 Claims

1. An electric powered vehicle comprising:
  - an electric motor that provides a motive force for propelling the vehicle along a surface;
  - a plurality of high powered semiconductors for controlling said electric motor;
  - heat exchanger device for cooling said high powered semiconductors including a generally box-like container having a top surface and a bottom surface;



- a generally funnel-shaped air intake that carries moving air due to movement of the vehicle and has one end coupled to one end of said box-like container;
- an air exhaust opening at an opposite end of said box-like container;
- at least one convoluted fin situated in said box-like container having a large surface area in intimate contact with said top surface and said bottom surface of said container, said at least one convoluted fin being arranged in a configuration that provides an air flow passage between said air intake and said air exhaust opening; and
- wherein at least one of said bottom and top surfaces is coupled to said high powered semiconductors.

5,481,434

# MEMORY CARD AND FRAME FOR ASSEMBLY THEREFOR

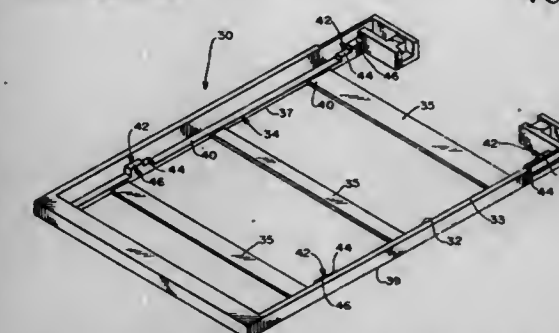
Emanuel G. Banakis, Naperville; Donald J. Brinkman, Woodridge; Kenneth F. Janota, Lisle, and Harold K. Lang, Fox River Grove, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Oct. 4, 1993, Ser. No. 131,797

Int. Cl.<sup>6</sup> H05K 1/14; S02/7/14

U.S. Cl. 361-756

4 Claims



1. An adaptable memory card frame for supporting only one of a plurality of generally uniformly dimensioned circuit substrates in an opening thereof, comprising:
    - a set of first support means defined by a first set of shelves integrally formed on the frame at a periphery of the opening and on opposite sides thereof for supporting a first one of the plurality of circuit substrates a first vertical distance from one of a top and bottom surface of the frame,
    - a set of second support means defined by a second set of shelves integrally formed on the frame at the periphery of the opening and on opposite sides thereof for supporting a second one of the plurality of the circuit substrates a second vertical distance from the surface,
- wherein the first one of the plurality of circuit substrates includes a first peripheral edge area having cutouts with a first configuration corresponding to the first set of shelves which allow only the first circuit substrate to be supported on the first set of shelves at said first vertical distance from the surface of the frame, and the second one of the plurality of circuit substrates includes a second peripheral edge area hav-



ing cutouts with a second configuration corresponding to the second set of shelves which allow only the second circuit substrate to be supported on the second set of shelves at said second vertical distance from the surface of the frame, whereby the frame accepts only one of the first circuit substrate and the second circuit substrate at a given time for a given memory card assembly.

5,481,435

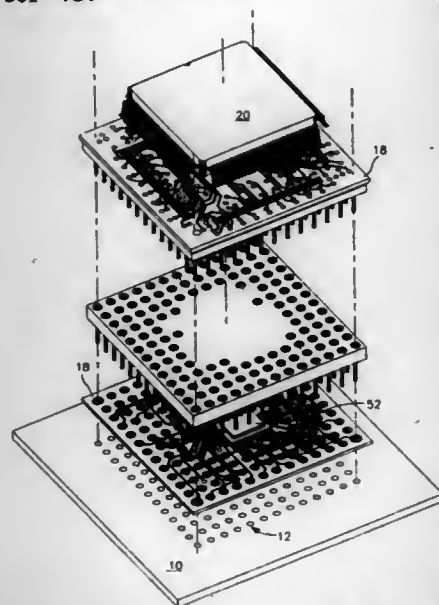
**ADAPTOR ASSEMBLY FOR ADDING FUNCTIONALITY TO A PIN GRID RECEPTACLE ON A CIRCUIT BOARD**  
William E. Werther, Wood Ranch, Calif., assignor to Interconnect Systems, Inc., Simi Valley, Calif.

Division of Ser. No. 998,476, Dec. 30, 1992. This application Jul. 22, 1994, Ser. No. 278,807

Int. Cl.<sup>6</sup> H05K 1/11

U.S. Cl. 361-784

23 Claims



1. A multi-level electrical assembly for coupling at least one integrated circuit having a plurality of electrically conductive leads to receptacles of a circuit board comprising:

- (a) a pin carrier of electrically insulating material, having a top surface and a bottom surface;
- (b) an interconnect board that:
  - (i) comprises a flat, electrically insulating substrate with conducting material at select locations,
  - (ii) is pierced by a plurality of holes,
  - (iii) is disposed generally parallel to the pin carrier and adjacent to the bottom surface of the pin carrier, and
  - (iv) has on one of its surfaces an electrically conductive receiving area configured to receive at least one electrical component;
- (c) a plurality of electrically conductive members:
  - (i) held by the pin carrier parallel to each other, perpendicular with the pin carrier, and in relative positions predetermined so as to align with the receptacles of the circuit board and the holes of the interconnect board,
  - (ii) each comprising a socket receptacle having a top end adjacent to the top surface of the pin carrier and a bottom end, and a pin connected to the bottom end, and
  - (iii) arranged so that the socket receptacles are configured to receive an integrated circuit; and
- (d) a plurality of electrical junctions between sides of at least one of the pins and electrically conductive material in the aligned hole that is electrically coupled to the conducting material of the interconnect board;
- (e) whereby a plurality of electrically conductive pathways are formed by the conducting material of the interconnect board,

the electrical junctions, and the members, at least one of which pathways extends to the receiving area of the interconnect board.

5,481,436

**MULTI-LEVEL ASSEMBLIES AND METHODS FOR INTERCONNECTING INTEGRATED CIRCUITS**

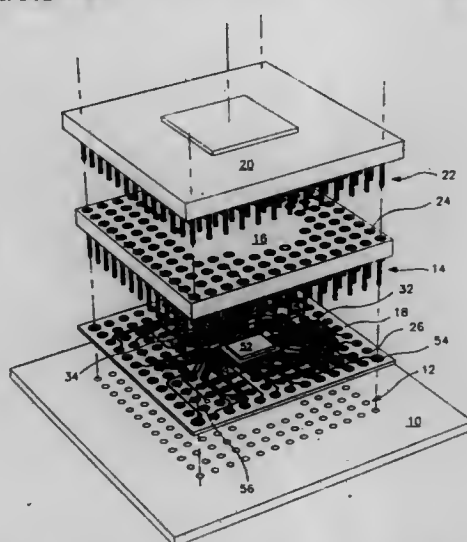
William E. Werther, Wood Ranch, Calif., assignor to Interconnect Systems, Inc., Simi Valley, Calif.

Continuation-in-part of Ser. No. 998,476, Dec. 30, 1992. This application Oct. 18, 1994, Ser. No. 330,746

Int. Cl.<sup>6</sup> H05K 1/11

U.S. Cl. 361-784

29 Claims



1. A multi-level electrical assembly for coupling at least one integrated circuit having a plurality of electrically conductive leads to at least one attachment area of a circuit board comprising:

- (a) an electrically insulating pin holder having a plurality of electrically conductive receiving devices configured to receive leads of an integrated circuit;
- (b) a plurality of electrically conductive pins held by the pin holder parallel to each other, perpendicular with the pin holder, and in a pattern predetermined so as to align with receptacles of a circuit board, each of which pins is attached to a receiving device;
- (c) an interconnect board disposed generally parallel to the pin holder, including an electrically insulating substrate having a top surface, a flat bottom surface, and at least one buried intermediate surface and having an array of holes arranged in the same predetermined pattern, which interconnect board is removable from the pins when the pins are not attached to the receptacles;
- (d) an electrical component mounted on the interconnect board;
- (e) a metallized surface formed on one of the surfaces of the substrate that is nearly completely covered with a layer of metal;
- (f) wherein surfaces inside selected of the holes are covered with metal so as to form electrical contacts with pins extending through those selected holes;
- (g) wherein a subset of the in-hole electrical contacts are electrically connected to the metallized surface; and
- (h) a plurality of electrically conductive pathways, at least in part passing through the metallized surface, at least some of which pathways electrically couple the electrical component to at least some of the receiving devices.

5,481,437

**APPARATUS ASSEMBLY OF AN ELECTROTECHNICAL APPARATUS**

Werner Neumann, Owning, Germany, assignor to Bodensee-werk Gerätetechnik GmbH, Überlingen, Germany

PCT No. PCT/EP92/02266, § 371 Date Apr. 4, 1994, § 102(e) Date Apr. 4, 1994, PCT Pub. No. WO93/07737, PCT Pub. Date Apr. 15, 1993

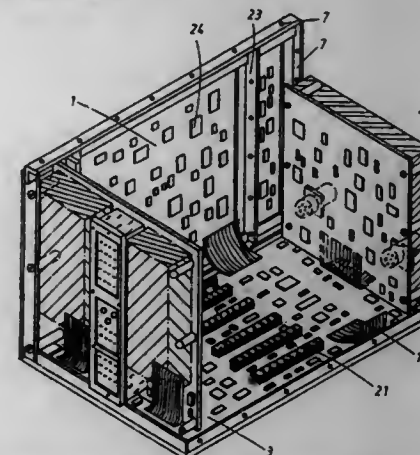
PCT Filed Sep. 30, 1992, Ser. No. 211,413

Claims priority, application Germany, Jan. 4, 1991; 41 32 994.5

Int. Cl.<sup>6</sup> H05K 7/14

U.S. Cl. 361-796

21 Claims



1. An electrotechnical apparatus assembly comprising a housing having plural walls, housing plates having first and second opposite surfaces forming said walls, at least portions of said housing plates being of synthetic plastic material, each housing plate having a continuous metal coated area on the first surface, said metal coated areas of interconnected walls being electrically conductive, at least one of said housing plates being printed circuit boards, wherein components of the printed circuit board are on the second surface, plural metal plates being in electrical conductive connection with the metal coated surface areas of said housing plates.

5,481,438

**TRAY FOR SEMICONDUCTOR DEVICES**

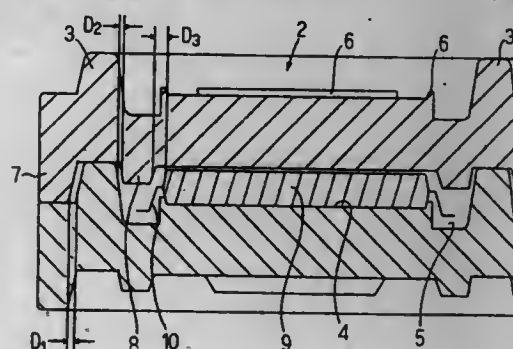
Hisashi Nemoto, Tokyo, Japan, assignor to Shinon Denki-isangyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1994, Ser. No. 301,239

Int. Cl.<sup>6</sup> H05K 7/02

U.S. Cl. 361-810

7 Claims



1. A tray for semiconductor devices on which another tray is mountable, said another tray having a same structure as said tray, said tray comprising:

- an upper face, an undersurface and an outer periphery;
- an outer peripheral frame extending upward from said upper face, said outer peripheral frame having an outer wall and defining a space;

longitudinal partition portions and crosswise partition portions formed in said space, for defining a plurality of substantially rectangular pockets, each pocket having a central portion and an inner wall;

an edge frame extending downward from said undersurface at said outer periphery, and said edge frame being formed so as to fit on said outer wall of said outer peripheral frame of said another tray which is disposed below said tray;

a base projectingly formed in said central portion of each of said pockets, for supporting an undersurface of a semiconductor device;

downward extending ribs formed on said undersurface of said tray, each of said downward extending ribs having an outer wall and an inner wall surrounding an upper portion of said semiconductor device housed in the corresponding pocket of said another tray which is disposed below said tray and fitted on said inner wall of said another tray disposed below said tray; and

said outer peripheral frame and said edge frame defining therebetween a first horizontal space  $D_1$ , and said outer wall of said downward extending rib and said inner wall of said pocket defining therebetween a second horizontal space  $D_2$ , wherein  $D_1 > D_2$ .

5,481,439

**AUTOMATIC LIGHTING EQUIPMENT AND AUTOMATIC LIGHTING SYSTEM USING SAID EQUIPMENT**

Teruki Goto, Saitama, Japan, assignor to Kabushiki Kaisha S & T Studio, Tokyo, Japan

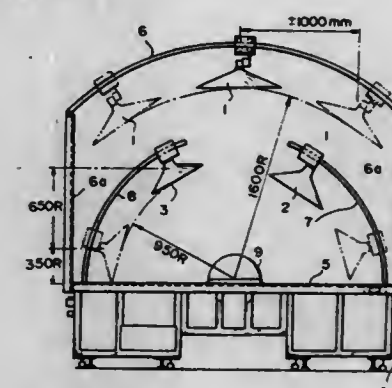
Filed May 3, 1994, Ser. No. 237,507

Claims priority, application Japan, May 19, 1993, 5-116898; Dec. 27, 1993, 5-330929

Int. Cl.<sup>6</sup> G03B 15/02

U.S. Cl. 362-5

7 Claims



1. An automatic lighting system comprising:

- a frame having a top surface;
- a top lighting fixture;
- a circular arc-shaped guide rail, terminal ends of which are movably mounted on said frame at opposed sides thereof to permit lateral motion of said circular arc-shaped guide rail along said top surface;
- said top lighting fixture being slidably and swivelably mounted to said circular arc-shaped guide rail;
- a pair of circular arc-shaped holding fixtures each being movably mounted at a one end thereof to said frame at said opposed sides to permit motion along arcs of travel on said top surface where said arcs of travel have centers thereof substantially in common with a center of said top surface, each of said pair of circular arc-shaped holding fixtures being oriented with arc centers thereof approximately in common with said center of said frame; and
- lower lighting fixtures slidably mounted to said circular arc-shaped holding fixtures.

6. An automatic lighting system for lighting a subject area, comprising:



a plurality of lighting means;  
 support means for supporting said plurality of lighting means proximate said subject area;  
 means for movably mounting said plurality of lighting means to said support means;  
 said means for movably mounting including means for permitting range of motion of lighting means relative to a fixed reference location in said subject area operable to allow selective orientation of said light means, each of said light means being locatable at a selected one of a plurality of discrete spacial coordinates remote from said fixed reference location; and  
 a hemispherical sensor removably positionable within said subject area and including a plurality of photodiodes arranged on a surface thereof for measuring a distribution of intensity of light incident thereon from said plurality of lighting means and varied by said means for movably mounting said plurality of lighting means.

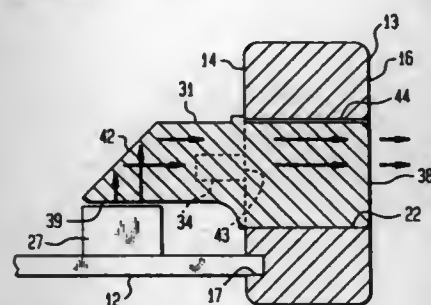
5,481,440

## CIRCUIT PACK WITH LIGHT PIPES

Michael L. Oldham, Boulder, and Gerald L. Buxton, Thornton, both of Colo., assignors to AT&T Corp., Murray Hill, N.J.  
 Filed Dec. 27, 1993, Ser. No. 173,594  
 Int. Cl.<sup>6</sup> F21V 8/00

U.S. Cl. 362—32

12 Claims



1. A circuit pack comprising:  
 a face plate member having at least one aperture therein,  
 a planar printed circuit board having at least one light emitting device thereon corresponding to said one aperture of said face plate member and said light emitting device adapted to emit light at an angle to a plane of said circuit board, said circuit board being mounted at one end thereof to said face plate member at an angle thereto;  
 means for redirecting the light emitted by said device into said corresponding one aperture in said face plate member, said means comprising a light pipe member overlying said device and mounted in said corresponding aperture, said light pipe member having means therein for reflecting the light emitted from said one device at an angle to the direction of light emission into said corresponding one aperture in said face plate member;  
 said light pipe member having a first end region in said corresponding one aperture in said face plate member and a second end region having a flat surface thereon overlying a light emitting surface of said device; and  
 means on said first end region of said light pipe member for affixing said member in said corresponding one aperture.

5,481,441

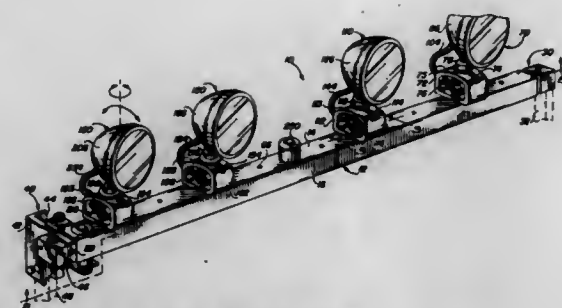
## ADJUSTABLE LIGHT BAR APPARATUS

Daniel W. Stevens, 2901 W. Belmont, Phoenix, Ariz. 85051  
 Filed Sep. 20, 1993, Ser. No. 112,964  
 Int. Cl.<sup>6</sup> B60Q 1/00

U.S. Cl. 362—35

10 Claims

1. Adjustable light bar apparatus for a vehicle comprising in combination:



light fixture means for providing light;  
 bracket means for supporting the light fixture means;  
 light bar housing means secured to the bracket means for supporting the bracket means and pivotable for pivoting the light fixture means; and  
 means for pivoting the light bar housing means, including  
 a motor secured to the light bar housing means,  
 a threaded shaft secured to the light bar housing means and rotatably coupled to the motor,  
 a nut movable on the threaded shaft in response to the rotation of the threaded shaft,  
 a block secured to the vehicle, and  
 a link having a first end secured to the nut and a second end secured to the block and pivotable relative to both the block and the nut whereby movement of the nut on the threaded shaft causes pivoting of the threaded shaft and the light bar housing means.

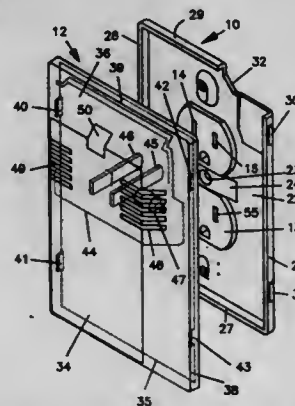
5,481,442

## NIGHT LIGHT COVER PLATE ASSEMBLY FOR ELECTRIC WALL OUTLET

Robert G. Dickie, Newmarket; Larry W. Gatien, Burlington, and Suzanne J. Wiltshire, Brantford, all of, Canada, assignors to Paige Innovations Inc., King City, Canada  
 Filed May 16, 1994, Ser. No. 243,014  
 Int. Cl.<sup>6</sup> F21V 33/00

U.S. Cl. 362—95

9 Claims



1. A night light for a standard duplex socket electric wall outlet having two separate sockets, said night light comprising  
 a night light assembly including an electric bulb and a pair of power blades,  
 a cover plate for covering said wall outlet,  
 said night light assembly being integral with said cover plate and mounted in a first portion of the interior of said cover plate such that said power blades engage one socket of said two separate sockets of said duplex socket outlet without interfering with the insertion of an electric plug into the other socket of said outlet,  
 means for latching said cover plate to said wall outlet, and  
 means for accepting a low profile plug inserted into said other outlet of said standard duplex outlet under a second portion of the interior of said cover plate.

5,481,443

## IN-GROUND DIRECTIONAL LIGHT FIXTURE

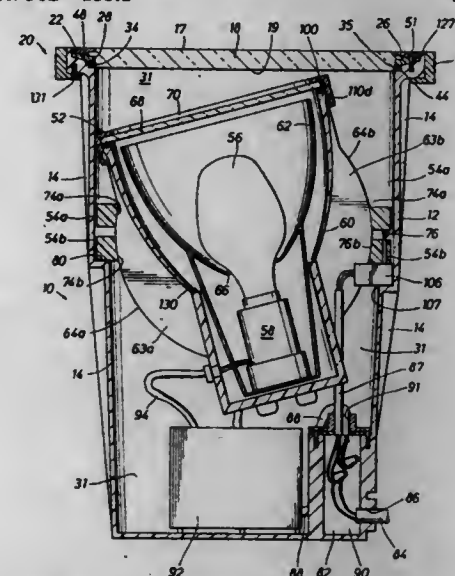
Lee F. Wagner, San Marcos, and William A. Schulte, San Antonio, both of Tex., assignors to The Genlyte Group, Inc., Secaucus, N.J.

Filed May 19, 1993, Ser. No. 63,526

Int. Cl.<sup>6</sup> E01F 9/00

U.S. Cl. 362—153.1

16 Claims



1. A light fixture, comprising:  
 an in-ground housing having an interior and an opening;  
 an assembly gimbaled in the housing interior, the assembly including:  
 a body having an interior, an opening, an arcuate outer surface; and  
 a lamp mounted in the body interior;  
 means for gimballing the assembly mounted within the housing interior to provide rotation about a plurality of axes and including a pair of retaining members having arcuately complementary surfaces that mate to the arcuate outer surface of the body to suspend the assembly within the housing; and  
 means for providing electrical power to the lamp.

5,481,444

## MINIATURE LIGHT HOLDER

Thomas J. Schultz, W1633 Aerotech Dr., Appleton, Wis. 54915  
 Filed Feb. 16, 1994, Ser. No. 197,144  
 Int. Cl.<sup>6</sup> F21P 1/02

U.S. Cl. 362—249

4 Claims



1. A holder for a miniature light including a light socket and a bulb removably inserted into said light socket, said holder comprising:

A. a receptacle having a base and a generally tubular body extending upwardly from said base, said body having a minimum inside diameter which is significantly larger than a maximum outside diameter of said light socket, thereby per-

mitting relatively loose insertion of said light socket into and removal of said light socket from said receptacle, wherein said body of said receptacle has upwardly extending axial slots formed therein for the passage of an electrical cord therethrough, and wherein said slots have upper ends which flare outwardly; and

B. a clip, extending downwardly from said base of said receptacle, for attaching said holder to a support, said clip being formed from a unitary plate member having a slot formed therein to define a pair of opposed jaws, wherein said clip and said receptacle are formed as a unitary injection molded element.

5,481,445

## TRANSFLECTION REFLECTOR HAVING CONTROLLED REFLECTED AND TRANSMITTED LIGHT DISTRIBUTION

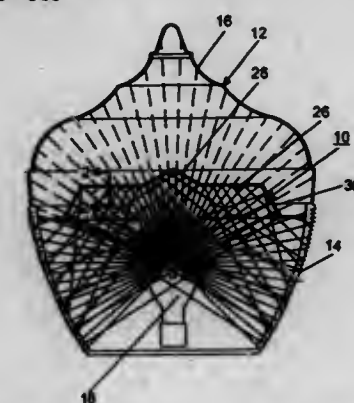
Ronald L. Stizema, Ellsworth; Dale A. Troppman, Charlevoix, and Gregg A. Motter, Midland, all of Mich., assignors to Lexalite International Corp., Charlevoix, and Dow Chemical Company, Midland, both of Mich.

Filed Feb. 15, 1994, Ser. No. 196,303

Int. Cl.<sup>6</sup> F21V 7/22

U.S. Cl. 362—308

4 Claims



1. In combination, a transflection reflector and an ornamental roadway luminaire including an upper body and a lower body, said ornamental roadway luminaire including a refractor for said lower body and an acorn-shaped top for said upper body and a light source generally centrally disposed within said lower body refractor, said transflection reflector comprising:

a transflection reflector body for simultaneously reflecting and transmitting light rays, said body being formed by a plurality of layers of a polymeric reflective material with adjacent layers having a different index of refraction and having reflected rays at each interface between adjacent ones of said multiple layers; and

said transflection reflector body being selectively positioned above the light source and below said acorn-shaped top, said transflection reflector body having a substantially flat upper section for reflecting light rays downwardly into a lower  $\frac{2}{3}$  portion of said lower body refractor and an upper peaked section disposed above the light source for reflecting light rays downwardly into a lower  $\frac{1}{3}$  portion of said lower body refractor.



5,481,446

## INDUCTOR CURRENT-SENSING CIRCUITRY

Graham J. A. Timmins, Hove, England, assignor to The BOC Group plc, Windlesham, United Kingdom

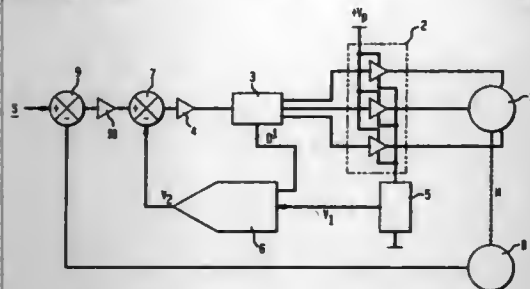
Filed Sep. 29, 1992, Ser. No. 953,033

Claims priority, application United Kingdom, Jan. 3, 1991, 9121014

Int. Cl.<sup>6</sup> H02M 1/12

U.S. Cl. 363—41

2 Claims



1. A pulse width modulated system for driving an inductive load which comprises:

- means for supplying a switched current to the load;
- a pulse width modulation controller controlling the switched current supply means and having means for determining a duty cycle of the switched current and for generating a duty cycle signal referable to said duty cycle;
- means connected to said switched current supply means for determining the amplitude of the switched current and for generating a switched current signal referable to the amplitude of said switched current; and
- a multiplier device having means responsive to the switched current signal and the duty cycle signal for generating a load current signal referable to load current; and
- a current control loop having a current error summing junction responsive to said load current signal and a current demand signal for generating an error signal and a current error amplifier interposed between said pulse width modulation controller and said current error summing junction for introducing an amplified error signal to said pulse width modulation controller.

5,481,447

## SWITCHED CAPACITANCE VOLTAGE MULTIPLIER WITH COMMUTATION

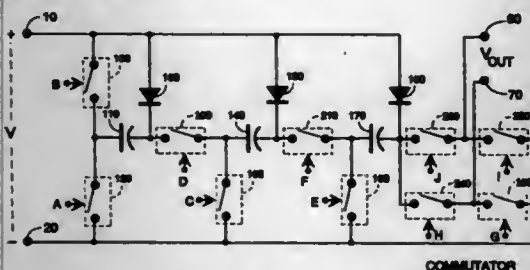
Hubertus A. Caris, Enschede, and Paulus J. M. Dost, Almelo, both of, Netherlands, assignors to Fluke Corporation, Everett, Wash.

Filed Apr. 27, 1995, Ser. No. 431,331

Int. Cl.<sup>6</sup> H02M 7/42

U.S. Cl. 363—60

5 Claims



1. A d.c. to a.c. voltage multiplier circuit comprising:
- (a) a series network comprising a plurality of capacitors, each of said capacitors having a sufficient amount of capacitance to substantially maintain a charge voltage over a period of an a.c. output waveform;
  - (b) a plurality of switches for selectively coupling said each of said capacitors to a d.c. input voltage for a selected charging time at least once during said period wherein said series

network produces a sequentially increasing voltage followed by a sequentially decreasing voltage during one half of said period to form a waveform half;

- (c) a pair of output terminals; and
- (d) a commutator circuit interposed between said pair of output terminals and said series network, said commutator circuit selectively coupling said output terminals to receive said waveform half in a positive polarity followed by a negative polarity to form said a.c. output waveform at said pair of output terminals.

5,481,448

## MULTILEVEL INVERTER HAVING VOLTAGE DIVIDING CAPACITORS DISTRIBUTED ACROSS MULTIPLE ARMS

Kiyoshi Nakata, Nishibaraki; Kiyoshi Nakamura, Katsuta; Tokunosuke Tanamachi, Katsuta; Yoshio Tsutsui, Katsuta, and Mutsuhiro Terunuma, Mito, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

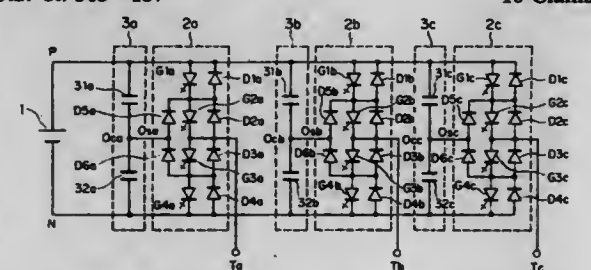
Continuation of Ser. No. 44,493, Apr. 9, 1993, abandoned, which is a continuation of Ser. No. 760,069, Sep. 13, 1991, abandoned. This application Oct. 25, 1994, Ser. No. 329,374

Claims priority, application Japan, Sep. 14, 1990, 2-242370

Int. Cl.<sup>6</sup> H02M 7/521

U.S. Cl. 363—137

16 Claims



1. A power converter for generating an a.c. output voltage having at least three potential levels from a d.c. voltage source, the power converter comprising:

- at least two capacitor sets each including at least two voltage dividing capacitors, two end points and at least one serial connection point connecting said voltage dividing capacitors, connected in series for dividing an input voltage from the d.c. voltage source into a divided d.c. voltage, said end points being connected with output terminals of the d.c. voltage source, respectively; and
  - at least two switching arms for deriving the a.c. output voltages from the divided d.c. voltages, each of the switching arms having an intermediate input terminal receiving said divided d.c. voltage, switching devices controlling the a.c. output voltage, and an output terminal providing said a.c. output of each phase,
- wherein each of the capacitor sets is disposed correspondingly to each switching arm, and the at least one serial connection point of each capacitor set is connected to the intermediate input terminal of the corresponding switching arm; and pulsating component reducing means including the at least one serial connection point of each of the capacitor sets being connected to the at least one serial connection point of the other capacitor sets which has a substantially same potential, respectively so as to provide a capacitor voltage with a restricted pulsating component and reduced harmonic components in the a.c. output voltage.

5,481,449

## EFFICIENT, HIGH POWER DENSITY, HIGH POWER FACTOR CONVERTER FOR VERY LOW DC VOLTAGE APPLICATIONS

Mustansir H. Kheraluwala, Schenectady, and Robert L. Stelgerwald, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

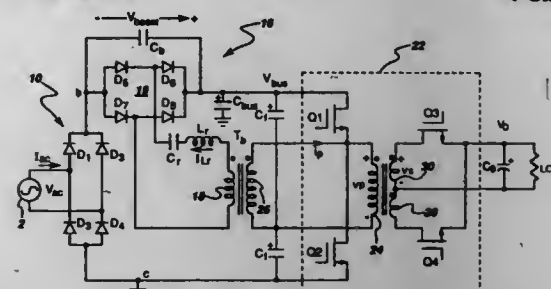
Continuation of Ser. No. 215,149, Mar. 21, 1994, abandoned.

This application Jan. 3, 1995, Ser. No. 367,906

Int. Cl.<sup>6</sup> H02M 3/335

U.S. Cl. 363—17

4 Claims



1. A high power factor power supply, comprising:
- an ac rectifier for providing a rectified ac voltage when coupled to an ac power line;
  - a power converter comprising a single boost converter and a dual active bridge converter, said boost converter coupled in series between said ac rectifier and a dc bus voltage, said boost converter comprising a resonant circuit including a combination of a boost transformer, a resonant inductance and a resonant capacitance, said dual active bridge converter comprising a primary-side bridge connection of switching devices and a secondary-side bridge connection of switching devices, said primary-side connection of switching devices and said secondary-side connection of switching devices being coupled by an output transformer, said primary-side switching devices driving both the primary side of said dual active bridge converter and said resonant boost converter; and
  - a control system for controlling said primary-side and secondary-side switching devices to provide a frequency modulated output voltage for driving said boost converter, said control system controlling a power supply output voltage by providing a phase shift between square-wave voltages respectively produced by said primary-side and secondary side connections of switching devices, such that control of said power supply output voltage and efficient synchronous rectification are achieved simultaneously without discrete timing control.

5,481,450

## SWITCHING POWER SUPPLY SYSTEM FOR PRIMARY AND SECONDARY LOADS WITH LESS SWITCHING LOSS

Myung-Jun Lee, Seoul, Rep. of Korea, and Mitsuo Ueki, Kawagoe, Japan, assignors to Sanken Electric Co., Ltd., Saitama, Japan

Filed Apr. 26, 1994, Ser. No. 233,136

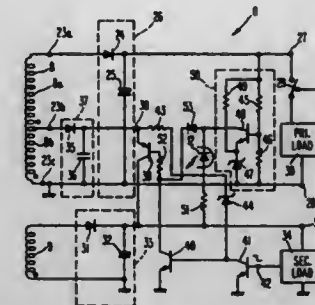
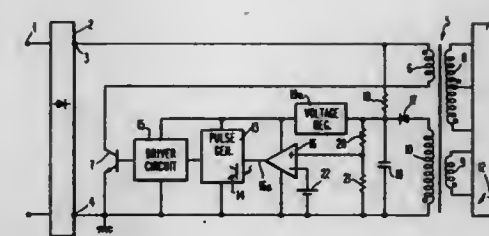
Claims priority, application Japan, Apr. 27, 1993, 5-27814 U

Int. Cl.<sup>6</sup> H02M 3/335; H04N 5/63; H02J 3/00

U.S. Cl. 363—21

11 Claims

1. A switching power supply system for a primary and a secondary load, the primary load being greater in power requirement than the secondary load, comprising:
- (a) a direct current power supply;
  - (b) a transformer having a primary winding connected across the direct current power supply;
  - (c) a switching element connected in series with the primary winding of the transformer;
  - (d) secondary winding means of the transformer electromagnetically coupled to the primary winding thereof, the secondary winding means having first output means for providing a first



- supply voltage, and second output means for providing a second supply voltage, the first supply voltage being greater than the second supply voltage;
- (e) a first rectifying and smoothing circuit connected to the first output means of the secondary winding means of the transformer, the primary load being to be connected to the first rectifying and smoothing circuit;
  - (f) a second rectifying and smoothing circuit connected to the second output means of the secondary winding means of the transformer, the secondary load being to be connected to the second rectifying and smoothing circuit;
  - (g) load state signal means for providing a load state signal indicative of whether the primary load is being powered or unpowered while the secondary load is held powered; and
  - (h) pulse generator means connected between the switching element and the load state signal means for generating a train of pulses at a first periodic rate for opening and closing the switching element when the primary load is being powered, and at a second periodic rate, less than the first periodic rate, for opening and closing the switching element when the primary load is not being powered;
  - (i) whereby, when the primary load is not being powered, the secondary load can be powered with less switching loss than if the switching element is opened and closed with the same frequency as when the primary load is being powered.

5,481,451

## AC-TO-AC POWER INVERTER APPARATUS FUNCTIONING WITHOUT SMOOTHING CAPACITOR, AND CONTROL METHOD THEREOF

Naruto Kuwahara, Tokyo, Japan, assignor to Arrex Electronics Corporation, Tokyo, Japan

Filed Oct. 29, 1993, Ser. No. 145,907

Claims priority, application Japan, Jan. 30, 1992, 4-332126; Jan. 30, 1992, 4-332127

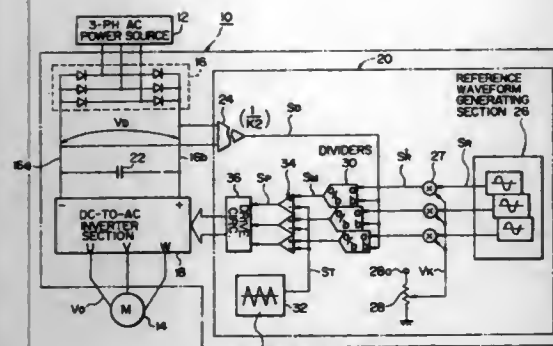
Int. Cl.<sup>6</sup> H02M 5/45; H02P 5/34

U.S. Cl. 363—37

13 Claims

1. An AC power inverter apparatus for converting an input AC voltage supplied from an AC power source to an output AC voltage, comprising:
- AC-to-DC converter means for converting said input AC voltage to a DC voltage having AC ripple components;
  - amplitude detection means (24) for deriving an amplitude detection signal, said amplitude detection signal varying in accordance with changes in amplitude of said DC voltage;
  - reference waveform generating means (26) for generating a reference waveform signal from a reference waveform, said reference waveform signal varying in accordance with changes in amplitude of the reference waveform;





operational means (30) for operating on said reference waveform signal and said amplitude detection signal to obtain a ratio signal, said ratio signal varying in amplitude in accordance with a ratio of said amplitude of the reference waveform to said amplitude of the DC voltage;

pulse width modulation signal generating means (32, 34) for operating on said ratio signal to generate a pulse width modulation signal, said pulse width modulation signal varying in duty factor in accordance with changes in said amplitude of the ratio signal; and

a DC-to-AC inverter circuit, controlled by said pulse width modulation signal for converting said DC voltage to said output AC voltage;

said DC-to-AC inverter circuit being controlled by said pulse width modulation signal such as to compensate the amplitude of said output AC voltage for changes in said DC voltage amplitude, to thereby compensate against said ripple components.

5,481,452

## PROGRAMMABLE SWITCHING UNIT

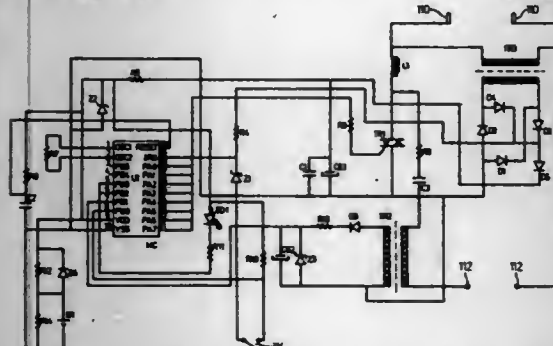
Robert G. R. Simmons, Apt. 205, 350 The West Mall, Etobicoke, Ontario, Canada

Continuation-in-part of Ser. No. 687,743, Apr. 19, 1991, abandoned. This application Jul. 27, 1992, Ser. No. 919,241

Int. Cl. H01H 43/04

U.S. Cl. 364-141

10 Claims



1. A programmable switching unit for controlling electrically power devices, comprising:  
a microcontroller and memory associated therewith;  
means associated with the microcontroller for sensing ON and OFF transitions of a controlled device;  
user operated control switch means;  
means associated with the microcontroller for sensing alternative conditions of the control switch means;  
electrical switching means in series with the controlled device and controlled by the microcontroller;  
a timer implemented by the microcontroller and having a cycle period of predetermined duration; and  
the microcontroller including a control program having a first control program routine executed when the microcontroller senses a first condition set by said control switch means, and

a second control program routine executed when it senses other conditions set by said control switch means, said second control program routine causing the microcontroller to continuously update at least one table, formed in said memory, of time slots within a cycle period, within which ON and OFF transitions of said controlled device occur over a plurality of cycle periods, and said first control program routine causing the microcontroller to review said at least one table in advance of each time slot within a period for events which occurred within that time slot in any of said plurality of cycle periods, determining according to the events detected and according to logic determined by said first control program routine whether a transition should occur during that time slot, and controlling said controlled switching device during that time slot to apply at a time during the time slot and transition which the routine has determined should occur.

5,481,453

## DUAL LOOP PID CONFIGURATION

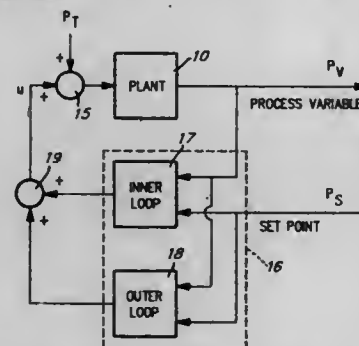
Romano M. Desantis, Montréal, Canada, assignor to Corporation De L'École Polytechnique, Montréal, Canada

Filed Aug. 25, 1994, Ser. No. 296,111

Int. Cl. G05B 13/02

U.S. Cl. 364-162

20 Claims



7. A proportional-integral-derivative controller for controlling a process in relation to a process variable signal representative of a variable of the process to be controlled, a derivative signal representative of the derivative of said process variable, and a setpoint signal representative of a desired value for said process variable, said proportional-integral-derivative controller comprising:

- means for producing a difference signal representative of a difference between said process variable signal and said setpoint signal;
- an inner loop comprising amplifying means for applying respective adjustable gains to at least two of said difference, derivative and setpoint signals to thereby produce at least two corresponding amplified signals;
- an outer loop comprising:  
means for integrating said difference signal to produce an integral signal; and  
amplifying means for applying an adjustable gain to said integral signal to produce an outer-loop output signal; and
- means for combining i) said at least two amplified signals and ii) said outer-loop output signal into a process control signal applied to said process in view of controlling said process;

wherein adjustment of the gains of the inner loop affects input/output characteristics of the controller and adjustment of the gain of the outer loop influences the sensitivity of said controller to perturbations.

5,481,454

## SIGN LANGUAGE/WORD TRANSLATION SYSTEM

Kiyoshi Inoue, Tokyo, Japan; Masahiro Abe, Dublin, Ireland, and Hirohiko Sagawa, Kokubunji, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

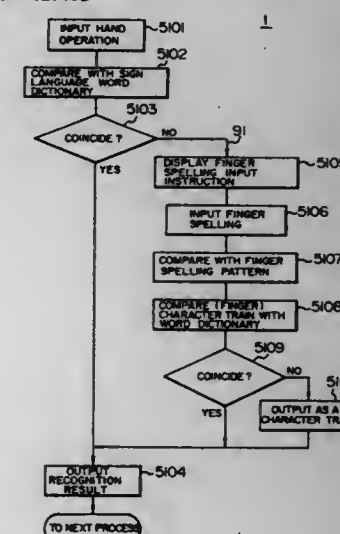
Filed Oct. 27, 1993, Ser. No. 141,646

Claims priority, application Japan, Jan. 29, 1992, 4-291105

Int. Cl. G06F 15/38; G06G 7/60; H03K 17/94; H03M 11/00

U.S. Cl. 364-419.03

12 Claims



7. An automated machine-implemented sign language/word translation method for translating a sign language motion into a verbal language representation thereof, comprising the steps of:

- converting a sign language hand operation into an electrical signal representative thereof;
- storing words corresponding to sign language hand operations in a sign language word dictionary memory;
- pattern matching contents of said sign language word dictionary memory to recognize a word corresponding to a hand operation electrical signal generated by said step of converting a sign language hand operation into an electrical signal;
- converting a sign language finger operation into a finger operation electrical signal when the word corresponding to the hand operation electrical signal is not found in the step of pattern matching contents of the sign language word dictionary memory;

storing characters corresponding to sign language finger operations in a manual alphabet pattern dictionary memory; pattern matching contents of said manual alphabet pattern dictionary memory to recognize a character corresponding to each finger operation electrical signal generated by said step of converting a sign language finger operation into a finger operation electrical signal;

storing words corresponding to trains of said characters of said manual alphabet pattern dictionary memory in a character word dictionary memory; and pattern matching contents of said character word dictionary memory to recognize a word based on a train of characters determined by said step of pattern matching contents of said manual alphabet pattern dictionary memory.

5,481,455

## SYSTEM FOR DETECTING HYDROPLANING OF VEHICLE

Toru Iwata, and Sota Yasuda, both of Kanagawa, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 14, 1992, Ser. No. 960,647

Claims priority, application Japan, Jan. 17, 1991, 3-269565;

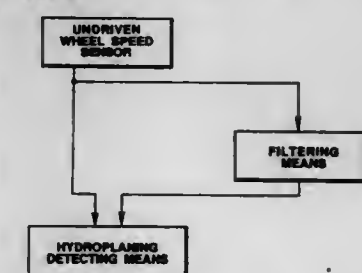
Jan. 17, 1991, 3-269586; Jan. 17, 1991, 3-269592; Jan. 17, 1991,

3-269596; Dec. 25, 1991, 3-342966; Dec. 27, 1991, 3-346635

Int. Cl. B60T 8/32

U.S. Cl. 364-424.01

21 Claims



1. A hydroplaning condition detecting system for a vehicle comprising:

an undriven wheel speed sensor for sensing rotation of an undriven wheel of the vehicle and producing an undriven wheel speed signal representing a sensed undriven wheel speed;

a filtering means for generating a signal representing a filtered undriven wheel speed by subjecting said undriven wheel speed signal to an action of a low-pass filter with a predetermined cutoff frequency; and

a condition detecting means for determining a difference resulting from subtraction from said filtered undriven wheel speed of said sensed undriven wheel speed, and generating a hydroplaning detection signal indicative of occurrence of a hydroplaning condition when said difference is equal to or greater than a predetermined value.

5,481,456

## ELECTRONIC CONTROL SYSTEM HAVING MASTER/SLAVE CPUS FOR A MOTOR VEHICLE

Akira Ogura, Musashino, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 765,684, Sep. 26, 1991, abandoned.

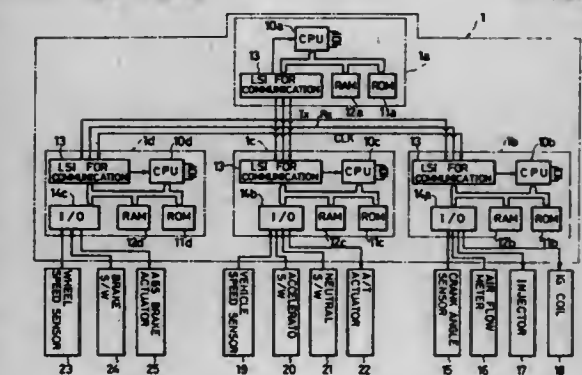
This application Dec. 28, 1994, Ser. No. 365,328

Claims priority, application Japan, Sep. 4, 1990, 4-236873

Int. Cl. H04L 27/00

U.S. Cl. 364-424.01

13 Claims



1. An electronic control system for a motor vehicle having, a plurality of parameter detecting means for sensing operating conditions of said motor vehicle and for generating an operating condition signal, and a plurality of actuating means for controlling said motor vehicle, the system comprising:



a plurality of slave control means responsive to said operating signals for controlling said actuating means and for producing a control signal;

master control means connected to each slave control means through a common serial bus for providing a respective control signal requesting said control signal to each of said slave control means for controlling of said actuating means;

said slave control means converts a requested control signal into a serial data signal and transmits said serial data to said master control means during a reception of said respective control signal;

said master control means integrally calculates an operating condition of the vehicle from said serial data signal and produces said respective control signal based on said operating condition of the vehicle so as to minimize transmission volume of said signals between said master and slave control means and to effectively control said motor vehicle; and said slave control means comprising an ABS controller, an automatic transmission controller and an engine controller.

5,481,457

## VEHICLE STEERING SYSTEM

Yorihisa Yamamoto; Yutaka Nishi; Takashi Nishimori, and Hiroyuki Tokunaga, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

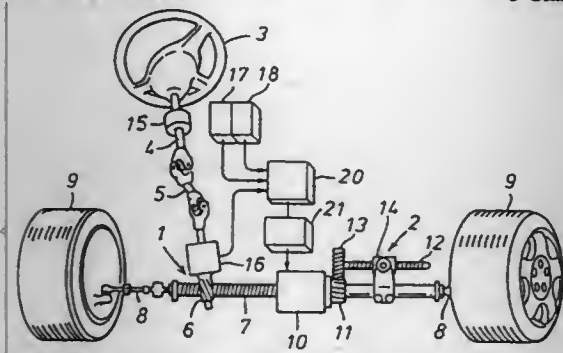
Filed Mar. 25, 1994, Ser. No. 218,116

Claims priority, application Japan, Jun. 4, 1993, 5-158080

Int. Cl.<sup>6</sup> B62D 5/04

U.S. Cl. 364—424.05

8 Claims



1. A vehicle steering system, comprising:  
manual steering means including a steering wheel for manually steering steerable wheels of a vehicle;  
power means for applying a steering torque to said steerable wheels; and

control means for controlling said steering torque produced by said power means according to a value indicating a lateral dynamic behavior of said vehicle so as to control said lateral dynamic behavior of said vehicle against external disturbances;

said lateral dynamic behavior including at least one of a yaw rate and a lateral acceleration of said vehicle, and said steering torque being given by a mathematical function including a sum of a first term consisting of a product of said value indicating a lateral dynamic behavior of said vehicle and a first coefficient, and a second term consisting of a product of an angular speed of said steering wheel and a second coefficient.

# 5,481,458 CASTER ANGLE CONTROL APPARATUS AND METHOD FOR SUSPENSION

Mitsuhiko Harara; Yoshiki Miichi, both of Okazaki; Tsuyoshi Takeo, Nagoya, and Tadao Tanaka, Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

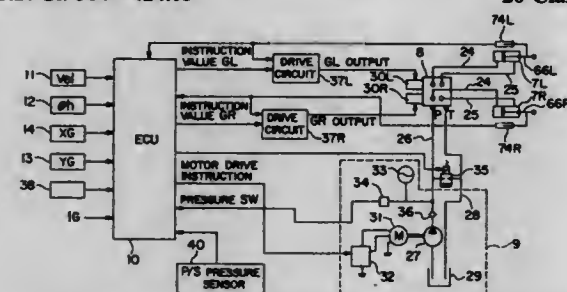
Filed Jun. 15, 1994, Ser. No. 260,976

Claims priority, application Japan, Jun. 16, 1993, 5-144659

Int. Cl.<sup>6</sup> G01B 5/24; B60G 17/015

U.S. Cl. 364—424.05

20 Claims



1. A caster angle control apparatus for a suspension of a vehicle comprising:

an actuator mounted to the suspension for varying a caster angle of vehicle wheels;

operation energy supply means for supplying an operation energy of said actuator;

actuator drive means disposed between said actuator and said operation energy supply means for setting a supply amount of the operation energy;

vehicle speed detection means, operatively connected to the control means, for detecting a vehicle speed;

control means, operatively connected to the vehicle speed detection means, for calculating a target caster angle, increased relative to an increase in the vehicle speed detected by said vehicle speed detection means, and for outputting a signal to said actuator drive means to control the operation of said actuator in accordance with the calculated target caster-angle; steering angular velocity detection means, operatively connected to the control means, for detecting a steering angular velocity; and

road surface frictional coefficient detection means, operatively connected to the control means, for detecting a frictional coefficient of the road surface,

said control means calculating a steering angular velocity correction amount according to a predetermined coefficient, predetermined based upon the detected vehicle speed, the road surface frictional coefficient detected by said road surface frictional coefficient detection means and the steering angular velocity detected by said steering angular velocity detection means, the control means calculating and subsequently adjusting the calculated target caster angle, according to the calculated steering angular velocity correction amount.

5,481,459

# CONTROL SYSTEM FOR AN ACTIVE SUSPENSION SYSTEM IN A MOTOR VEHICLE AND METHOD FOR CONTROLLING MOTOR VEHICLE HANDLING AROUND CURVES

Jörg Büngeler, Rheinberg, Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Oct. 31, 1994, Ser. No. 331,894

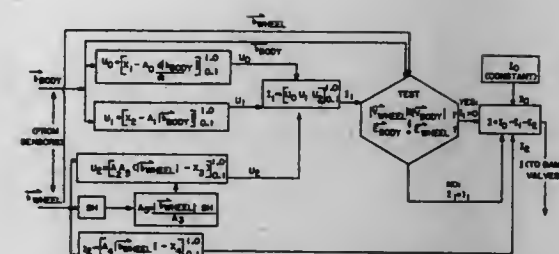
Claims priority, application Germany, Nov. 5, 1993, 43 37 772.6

Int. Cl.<sup>6</sup> B60G 17/00

U.S. Cl. 364—424.05

15 Claims

1. A suspension system assembly comprising:  
at least one shock absorber, said at least one shock absorber comprising:



a sealed cylinder defining a chamber therein, said cylinder containing a damping fluid; said cylinder having a first end and a second end;

a piston rod sealingly projecting into said cylinder and being axially displaceable with respect to said cylinder;

said first end of said cylinder being disposed at said piston rod;

a piston being attached to said piston rod, said piston being slidably disposed within said cylinder to sealingly divide said chamber into first and second chambers;

means for permitting flow of damping fluid between said first and second chambers;

said cylinder having an inner wall disposed towards said piston rod and an outer wall disposed radially away from said piston rod;

a central longitudinal axis defined through said sealed cylinder, the central longitudinal axis defining a longitudinal direction of said shock absorber;

means for the recognition of cornering for a vehicle with an active hydraulic system;

said means for the recognition of cornering for a vehicle with an active hydraulic system comprising a supply pump for the hydraulic system, a plurality of actuators, a number of valves for control of the actuators and a measuring device for determination of vehicle movement parameters;

said means for the recognition of cornering for a vehicle with an active hydraulic system further comprising:

means for measuring a vehicle acceleration signal "a";

means for providing an acceleration threshold value "a<sub>th</sub>";

means for comparing said vehicle acceleration signal "a" to said acceleration threshold value "a<sub>th</sub>";

means for measuring a vehicle velocity signal "v";

means for providing a lower vehicle velocity threshold value "v<sub>l</sub>";

means for comparing said vehicle velocity signal "v" to a lower vehicle velocity threshold value "v<sub>l</sub>";

means for providing an upper vehicle velocity threshold value "v<sub>u</sub>";

means for comparing said vehicle velocity signal "v" to said upper vehicle velocity threshold value "v<sub>u</sub>";

means for providing a steering angle threshold value "s<sub>th</sub>";

means for detecting a steering movement as a steering angle; said means for detecting a steering movement as a steering angle comprising means for detecting said steering angle below and above said steering angle threshold value "s<sub>th</sub>";

means for actuating power to the suspension system;

said means for actuating power to the suspension system comprising means for providing a signal to said valves for control of the actuators;

said means for providing a signal to said valves for control of the actuators comprising means for providing a signal to said valves at a vehicle velocity in the vehicle velocity range between the vehicle velocity threshold values "v<sub>l</sub>" and "v<sub>u</sub>";

said means for providing a signal to said valves at a vehicle velocity in the vehicle velocity range between the vehicle velocity threshold values "v<sub>l</sub>" and "v<sub>u</sub>" comprising means for providing a signal to said valves only if the actual measured acceleration "a" increases above the acceleration threshold value "a<sub>th</sub>" at the same time as the vehicle velocity is in the vehicle velocity range between the vehicle velocity threshold values "v<sub>l</sub>" and "v<sub>u</sub>";

a spring for applying a substantially longitudinally directed force with said shock absorber;  
said spring being operatively connected to apply the force to said shock absorber.

5,481,460

## CONTROLLER FOR ELECTRIC VEHICLE

Ryoso Masaki; Shigeki Morinaga; Kazuo Tahara, all of Hitachi; Hirohisa Yamamura, Hitachi; Kenzo Kajiwara, Hitachi; Hiroyuki Yamada, Katsuta; Nobuo Inoue, Mito, and Toshio Suzuki, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Automotive Engineering Co., Ltd., Ibaraki, both of Japan

PCT No. PCT/JP91/01326, § 371 Date Jun. 3, 1992, § 102(e) Date Jun. 3, 1992, PCT Pub. No. WO92/05974, PCT Pub. Date Apr. 16, 1992

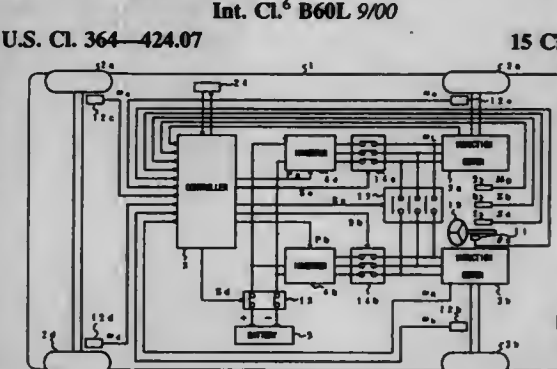
PCT Filed Oct. 2, 1991, Ser. No. 867,232

Claims priority, application Japan, Jan. 3, 1990, 2-263919; Jan. 12, 1990, 2-272269

Int. Cl.<sup>6</sup> B60L 9/00

U.S. Cl. 364—424.07

15 Claims



1. A controller for an electric vehicle having a right-hand side motor for driving a right-hand wheel, a right-hand side current supply means for supplying driving current to said right-hand side motor, a left-hand side motor for driving a left-hand side wheel, a left-hand side current supply means for supplying driving current to said left-hand side motor, and control means for controlling said right-hand side current supply means and said left-hand side current supply means, wherein said control means comprises:

means for detecting an abnormality in the operation of said right-hand side current supply means and left-hand side current supply means;

means for controlling a current supply means, which has been detected to be abnormal, so that driving current is not supplied to said motor driven by the abnormal current supply means, when one of said current supply means is detected as being abnormal;

switching means for connecting the outputs of said right-hand side current supply means and left-hand side current supply means; and

means for activating said switching means to connect the output of a normal operating current supply means to the motor driven by an abnormally operating current supply means in response to detection of abnormal operation of one of said current supply means by said detecting means.



5,481,461

# **AUTOMOTIVE VEHICLE ENGINE WITH CYLINDER SUSPENDING MECHANISM FOR SWITCHING BETWEEN A PARTIAL-CYLINDER NON-WORKING MODE AND AN ALL-CYLINDER WORKING MODE DEPENDING ON RUNNING CONDITIONS OF THE ENGINE**

Katsuhiko Miyamoto; Kazumasa Iida; Mitsuru Kishimoto, and Kiyotaka Hosono, all of Kyoto, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan  
PCT No. PCT/JP92/01717, § 371 Date Aug. 18, 1993, § 102(e) Date Aug. 18, 1993, PCT Pub. No. WO93/13311, PCT Pub. Date Jul. 8, 1993

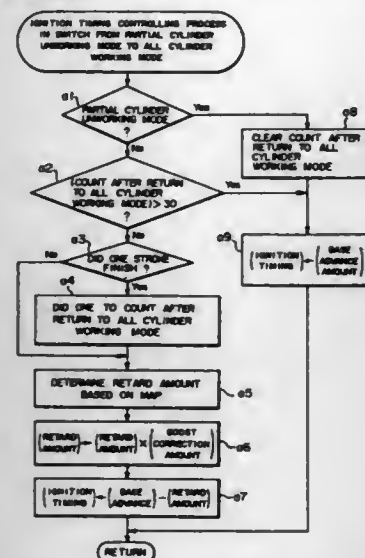
PCT Filed Dec. 25, 1992, Ser. No. 104,041

Claims priority, application Japan, Dec. 26, 1991, 3-344748; Dec. 27, 1991, 3-346709; Dec. 25, 1992, 4-346105

Int. Cl.<sup>6</sup> F02D 17/02

U.S. Cl. 364-431.01

8 Claims



1. An automotive vehicle engine provided with a cylinder suspending mechanism for suspending the working of a partial number of cylinders in response to running conditions of the engine, comprising:

- a revolution sensor for detecting a revolution speed of said engine;
  - a boost pressure sensor for producing data of a boost pressure of said engine;
  - an ignition driving apparatus for causing said engine to run in such a manner that electric sparks are produced in said engine at respective target ignition timings; and
  - a controlling apparatus for controlling said cylinder suspending mechanism and said ignition driving apparatus,
- wherein said controlling apparatus has a running mode map for determining an all cylinder working mode and a partial cylinder non-working mode on the basis of said revolution speed and said data of said boost pressure of said engine and an ignition retard map for determining a retard amount used during a calculation of said target ignition timings in such a manner that said retard amount decreases with a predetermined lapse of time, said controlling apparatus controlling said ignition driving apparatus in such a manner that electric sparks are produced in said engine at said respective target ignition timings calculated on the basis of said retard amount decreased with the lapse of time and a standard ignition timing when a stroke number counted after determination of a switching operation from said partial cylinder non-working mode to said all cylinder working mode is within a predetermined range.

5,481,462

# **APPARATUS FOR DETERMINING AN ALTITUDE CONDITION OF AN AUTOMOTIVE VEHICLE**

Toshinari Nagai, Shizuoka, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

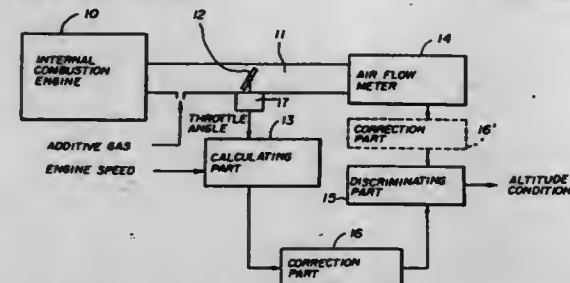
Filed Oct. 6, 1993, Ser. No. 132,317

Claims priority, application Japan, Jan. 15, 1992, 4-277527; Nov. 13, 1992, 4-304017; Nov. 13, 1992, 4-304018; Nov. 13, 1992, 4-304019

Int. Cl.<sup>6</sup> G06F 19/00; G06G 7/70

U.S. Cl. 364-431.03

12 Claims



1. An apparatus for determining an altitude condition of an automotive vehicle, said apparatus comprising: an internal combustion engine having a throttle valve arranged in an intake passage and an air flow meter arranged at an inlet portion of the intake passage; calculating means for determining a reference air flow rate based on a throttle angle sensed from said throttle valve and an engine speed sensed from said engine; correction means for detecting an operating condition of the engine under which additive gas is supplied to the intake passage downstream of the throttle valve, and for changing said reference air flow rate determined by said calculating means to a second reference air flow rate according to said operating condition only when said operating condition of the engine is detected; and discriminating means coupled to said correction means for comparing an intake air flow rate sensed by said air flow meter with a reference air flow rate supplied from said correction means, and for determining an altitude condition of the automotive vehicle based on the result of said comparison, wherein said correction means includes detecting means for detecting whether additive gas is supplied to said intake passage and operation of said internal combustion engine is adjusted to compensate for the determined altitude condition.

5,481,463

# **PAY-PER-USE ACCESS TO MULTIPLE ELECTRONIC TEST CAPABILITIES**

Amanda L. Constant; David W. Webb; Katherine Z. Withers-Milkos; Kay C. Lannen, all of Fort Collins; Ted T. Turner, Loveland, all of Colo., and Amos H.-K. Leong, Singapore, Singapore, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 132,987, Oct. 7, 1993, Pat. No. 5,412,575. This application Feb. 15, 1995, Ser. No. 388,765  
Int. Cl.<sup>6</sup> G07B 15/00

U.S. Cl. 364-464.01

23 Claims

1. A system for testing an electronic circuit, comprising: (a) a circuit test platform having multiple electronic test capabilities; and (b) a pay-per-use module, coupled to said circuit test platform, for monitoring use of said multiple electronic test capabilities of said circuit test platform, and for debiting a number of usage credits from a usage credit pool based on said use of said multiple electronic test capabilities.

5,481,465

# **METHOD OF AND SYSTEM FOR PRODUCING SOLID MODELS**

Kazuo Itoh; Kazuhiko Narita; Shuichi Kitazawa; Masanori Tokoi; Ayumi Nakajima, and Hiroshi Sekine, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan

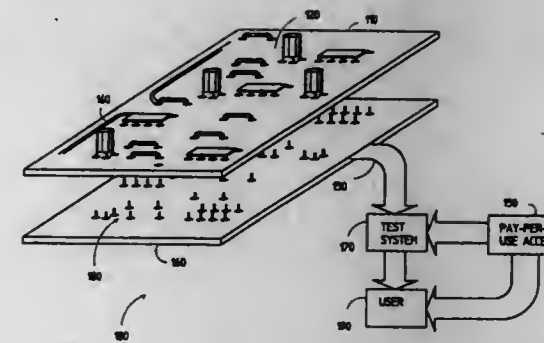
Filed Dec. 6, 1993, Ser. No. 161,598

Claims priority, application Japan, Dec. 9, 1992, 4-329593; Dec. 9, 1992, 4-329624; Aug. 2, 1993, 5-191402

Int. Cl.<sup>6</sup> G06F 15/60

U.S. Cl. 364-468

10 Claims



5,481,464

# **SYSTEM FOR COLLECTING AND SHIPPING ITEMS**

Gary W. Ramsden, Eau Claire, Wis., assignor to U-Ship, Inc., Edina, Minn.

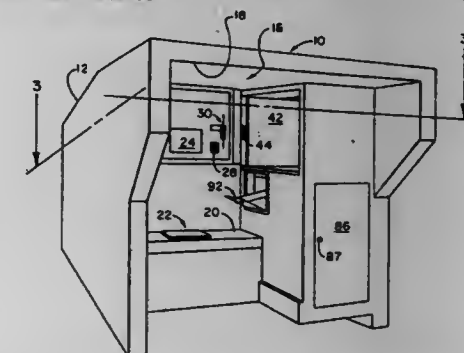
Continuation-in-part of Ser. No. 903,342, Jun. 24, 1992, Pat. No. 5,340,948, which is a continuation-in-part of Ser. No. 683,243, Apr. 10, 1991, Pat. No. 5,233,532. This application Feb. 18, 1994, Ser. No. 198,872

The portion of the term of this patent subsequent to Aug. 3, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> G07B 17/00

U.S. Cl. 364-464.03

34 Claims





supplying data defining said surface model as input data to a numerically controlled machine tool for fabricating a press mold conforming to said surface model.

5,481,466

# MEAT SLICING MACHINE AND METHOD OF USE THEREOF

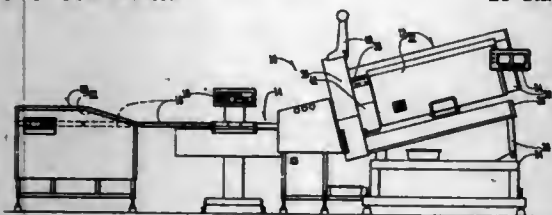
Joseph Carey, Dublin, Ireland, assignor to Townsend Engineering Company, Des Moines, Iowa

Filed Jan. 31, 1994, Ser. No. 189,593

Claims priority, application Ireland, Apr. 23, 1992, 921303  
Int. Cl.<sup>6</sup> G06F 19/00; B26D 5/20

U.S. Cl. 364—474.09

28 Claims



- The method of slicing a plurality of drafts from an elongated slab of meat product, comprising:  
laying a slab of product to be sliced on a supporting surface located upstream from a slicing blade wherein said slab has forward and rearward ends, opposite sides, and upper and lower surfaces,  
weighing said slab and measuring the length thereof while said slab is on said supporting surface,  
comparing the weight and length of said slab with historical data of known historical slabs having similar weights, lengths and density factors, and selecting an operational density factor from said historical data based upon historical slabs having weights and lengths similar to that of said slab,  
selecting a predetermined draft weight,  
selecting a predetermined number of slices for each draft to be sliced,  
calculating the volume of a first draft of said slab having said predetermined draft weight, and  
slicing said first draft into said predetermined number of slices of equal thickness.

5,481,467

# CONTROLLING THE OPERATION OF A TOOL ALONG A PREDETERMINED PATH

James A. Smith, Gilmorton; Alfred R. Corbett, Birstall, and Graham N. Totton, Leicester, all of, England, assignors to British United Shoe Machinery Ltd., Leicester, England

Continuation of Ser. No. 873,296, Apr. 23, 1992, abandoned.

This application May 5, 1994, Ser. No. 238,577

Claims priority, application United Kingdom, May 1, 1991, 9109422; May 9, 1991, 9110061

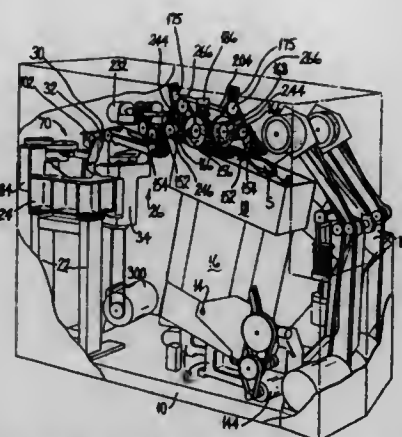
Int. Cl.<sup>6</sup> G05B 19/18

U.S. Cl. 364—474.28

14 Claims

- A method of controlling the progressive operation of a tool of a shoe machine on a selected portion of a shoe, wherein the tool is caused to follow a predetermined path in relation to a selected portion of the shoe and, as the tool thus operates progressively on said selected portion at least one parameter relating to the operation of the tool other than in respect of its position can be varied, said method comprising:

defining a plurality of selected points, said points together providing a predetermined operating path of the tool, each such point being defined by its coordinate axis values;  
establishing and pre-setting a limited number of values for each of said at least one parameter for each of said points, each such value being provided with an identification, one of said values being thus selectable for each point by selecting its identification;



- selecting a value for said at least one parameter for each point defined as aforesaid, wherein a limited number of values is pre-set for the at least one parameter;  
storing the coordinate axis values and the selected identification for subsequent recall, the said values and identifications for all the defined points constituting a programmed instruction; and  
implementing said programmed instruction to cause the tool to operate progressively along its path and to vary said at least one parameter during such progressive operation.

5,481,468

# METHOD AND APPARATUS FOR STORING AN INCREASING NUMBER OF SEQUENTIAL REAL-TIME SAMPLES IN A FIXED AMOUNT OF MEMORY

Alexander McEachern, Oakland, Calif., assignor to Basic Measuring Instruments, Inc., San Jose, Calif.

Filed Aug. 4, 1992, Ser. No. 925,570

Int. Cl.<sup>6</sup> G01R 1/00

U.S. Cl. 364—481

4 Claims

Voltage Sample Memory			
Min.	Max.	Average	
102.5	115.8	114.6	Storage pointer 110
103.2	115.2	117.3	
104.7	113.7	120.6	
104.7	114.7	118.2	
112.2	114.6	113.2	
110.3	113.6	112.4	
112.2	115.9	113.0	
0.0	108.6	92.2	

(before compression)

Voltage Sample Memory			
Min.	Max.	Average	
102.5	117.3	115.7	Storage pointer 110
113.7	120.6	116.6	
110.3	114.6	112.8	
0.0	115.9	102.6	
empty	empty	empty	
empty	empty	empty	
empty	empty	empty	
empty	empty	empty	
empty	empty	empty	
empty	empty	empty	

(after compression)

- An apparatus for periodically measuring a real-time power-line parameter, forming an electronic signal from each of the periodic measurements, and storing the measurements in a finite digital memory comprising:

- means for triggering a real-time power-line measurement at a predetermined time interval one measurement per time interval forming a stream of measurements, the real-time power line measurements including a plurality of related values;
- means for maintaining a statistical composite of the power line measurements;
- means for storing the statistical composite into a sequentially next one of a finite number of digital memory locations once every N measurements, where N is an integer number;

- means for determining when each of the digital memory locations contains one of the statistical composites;
- means for combining m of the stored statistical composites into one of the finite digital memory locations so that only 1/m of the finite digital memory locations contain information, where m is an integer number;
- means for increasing the predetermined time interval by a factor of m; and
- means for storing the statistical composite into a sequentially next one of the finite number of digital memory locations once every Nxm measurements.

5,481,469

# AUTOMATIC POWER VECTOR GENERATION FOR SEQUENTIAL CIRCUITS

Daniel R. Brasen, Grenoble Cedex, and Christophe Gauthron, La Colle sur Loup, both of, France, assignors to VLSI Technology, Inc., San Jose, Calif.

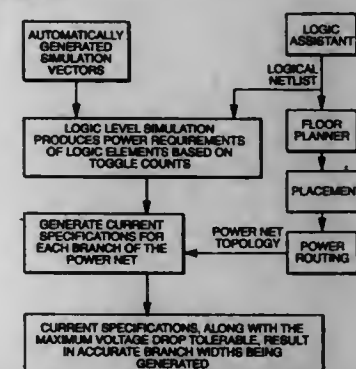
Continuation of Ser. No. 120,627, Sep. 13, 1993, abandoned.

This application Apr. 28, 1995, Ser. No. 430,245

Int. Cl.<sup>6</sup> G06F 15/60

U.S. Cl. 364—483

1 Claim



- A method of automatically generating a worst-case power-consumption logic vector pair for a sequential circuit, the sequential circuit comprising a combinatorial logic circuit and a logic feedback circuit, the method comprising the steps of:  
determining with respect to the combinatorial logic circuit the worst-case power-consumption logic vector pair, the second-worst-case power-consumption logic vector pair up to the Nth-worst-case power-consumption logic vector pair, each logic vector pair having a present state portion and a next state portion;

determining with respect to the logic vector pairs:  
whether the present state portion of the second logic vector in the logic vector pair is consistent with the next state portion of the first logic vector of the logic vector pair, signifying that the second logic vector can be produced from the first logic vector; and

a setup vector sequence, for the first logic vector, of one or more logic vectors that when applied to the sequential circuit causes the present state portion of the first logic vector to be produced, if such a setup vector sequence can be found;

until for a particular worst-case power-consumption logic vector pair the second logic vector can be produced from the first logic vector, and a setup sequence for the first logic vector has been found, the particular logic vector pair being the worst-case power-consumption logic vector pair for the sequential circuit;

determining from the worst-case power-consumption logic vector pair for the sequential circuit the worst-case power consumption of the sequential circuit; and  
sizing a power bus of the sequential circuit in accordance with said worst-case power consumption of the sequential circuit.

5,481,470

# BOOLEAN LAYER COMPARISON SLICE

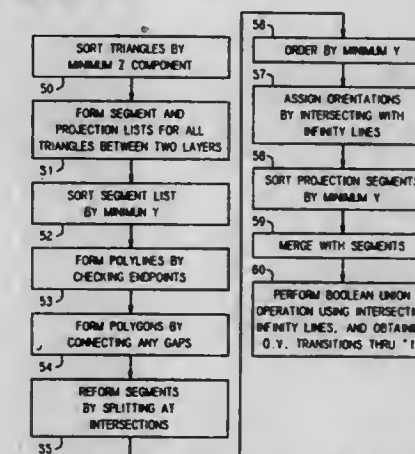
David E. Snead, Canyon Country; Dennis R. Smalley, Baldwin Park; Adam L. Cohen, Los Angeles; Joseph W. Allison, Valencia; Thomas J. Vorgitch, Simi Valley, and Thomas P. Chen, Saugus, all of Calif., assignors to 3D Systems, Inc., Valencia, Calif.

Continuation of Ser. No. 606,191, Oct. 30, 1990, Pat. No. 5,321,622, which is a continuation-in-part of Ser. No. 331,644, Mar. 31, 1989, Pat. No. 5,184,307, which is a continuation of Ser. No. 269,801, Nov. 8, 1988, abandoned, which is a continuation-in-part of Ser. No. 182,830, Apr. 18, 1988, Pat. No. 5,059,359. This application Jun. 13, 1994, Ser. No. 259,333

Int. Cl.<sup>6</sup> G06F 17/50; 19/00

U.S. Cl. 364—468

27 Claims



- A method for forming a plurality of layer representations of layers of a three-dimensional object from layer boundary representations of those layers, for use in forming the object on a layer-by-layer basis, comprising the following steps:

supplying a layer boundary representation of a first layer spaced below a second layer;  
supplying a layer boundary representation of the second layer;  
forming a modified boundary representation for a first selected one of the first and second layers comprising forming a Boolean difference between the layer boundary representation of the first selected one and the layer boundary representation of a second selected one of the first and second layers different from the first selected one;  
using the modified boundary representation in forming the layer representation of the first selected one; and  
supplying the layer representation for forming the object on a layer-by-layer basis.

5,481,471

# MIXED SIGNAL INTEGRATED CIRCUIT ARCHITECTURE AND TEST METHODOLOGY

Mark B. Naglestad, Mission Viejo; Frank J. Bohac, Jr., Laguna Hills; James M. Aralis, Mission Viejo; Bert S. Moriwaki, Laguna Niguel; Frank J. Calabretta, Costa Mesa, and Bruce L. Troutman, Aliso Viejo, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 18, 1992, Ser. No. 993,268

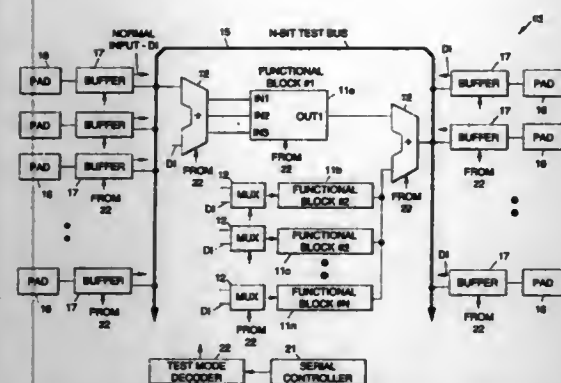
Int. Cl.<sup>6</sup> G06F 11/26

U.S. Cl. 364—489

6 Claims

- A mixed-signal integrated circuit architecture that permits normal operation and test mode operation, and that comprising:  
a plurality of mixed-signal integrated circuits, each having predetermined inputs and outputs;  
a plurality of signal pads adapted couple signals into and out of each of the plurality of mixed-signal integrated circuits;  
a bidirectional digital/analog test bus that is selectively coupleable between the plurality of signal pads and the inputs and outputs of the plurality of mixed-signal integrated circuits;





a plurality of configurable buffers individually coupled to the plurality of signal pads and the bidirectional digital/analog test bus, that are adapted to selectively couple input and output signals between predetermined sets of signal pads and corresponding ones of the plurality of mixed-signal integrated circuits to provide for normal operation thereof, and that are adapted to selectively couple test signals between different selectable sets of the signal pads and selected ones of the plurality of mixed-signal integrated circuits by way of the bidirectional digital/analog test bus to provide for test mode operation thereof; and

controller means coupled to the plurality of configurable buffers that are adapted to selectively configure the plurality of configurable buffers to provide normal operation and test mode operation of the plurality of mixed-signal integrated circuits; and wherein the controller means and the plurality of configurable buffers are adapted to selectively reconfigure the function of each of the signal pads to permit the test mode operation of the plurality of mixed-signal integrated circuits.

5,481,472

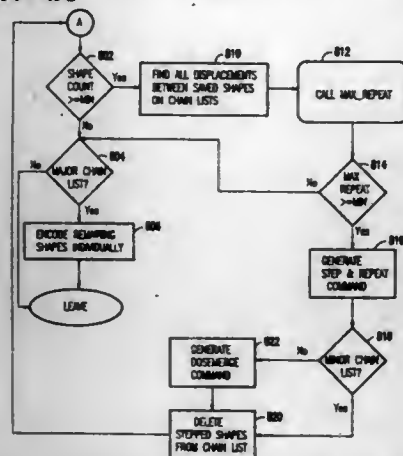
# METHOD AND APPARATUS FOR AUTOMATICALLY RECOGNIZING REPEATED SHAPES FOR DATA COMPACTION

Virginia M. Chung, Pleasant Valley, and James E. Stuart, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 18, 1993, Ser. No. 62,629  
Int. Cl.<sup>6</sup> G06F 15/60

U.S. Cl. 364-491

19 Claims



1. A method of generating descriptions of step-and-repeat operations for compaction of data having at least an address and at least first, second and third parameters and containing repeated patterns comprising the steps of

forming a list of portions of said data having at least one common first parameter,  
forming an ordered list from said portions of said data in accordance with said second and third parameters of said data,

determining displacements between members of said ordered list from values of said third parameter of said data,  
incrementing an address of a member of said ordered list by at least one said displacement to obtain a further address,

detecting if a member of said ordered list has said further address, and

if a member of said ordered list has said further address, incrementing a step count and repeating said incrementing step from said further address and said detecting step, and

if a member of said ordered list is not found, removing said member of said ordered list which has been incremented by said incrementing step and all members of said ordered list which have been detected by said detecting step from said ordered list and forming a coded description of said members of said ordered list which have been removed by said removing step using at least said second parameter and said step count.

5,481,473

# SYSTEM AND METHOD FOR BUILDING INTERCONNECTIONS IN A HIERARCHICAL CIRCUIT DESIGN

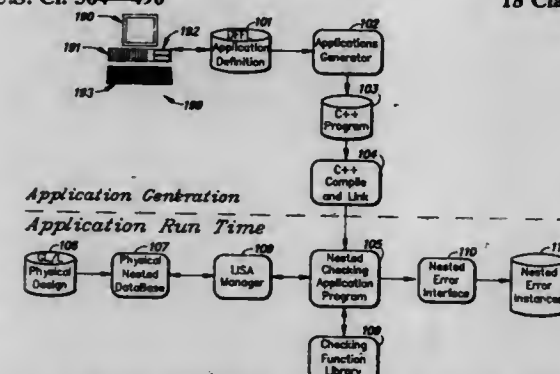
Young O. Kim, San Jose, Calif.; Phillip J. Russell, Alresford, United Kingdom, and Glenwood S. Weinert, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 19, 1993, Ser. No. 19,970

Int. Cl.<sup>6</sup> H01L 21/70

U.S. Cl. 364-490

18 Claims



1. A computer-implemented method for creating in computer memory a representation of interconnections between very large scale integrated (VLSI) circuit design components of a hierarchical circuit design, comprising the steps of:

storing in the computer memory a VLSI circuit design component identifying a leaf design entity from the hierarchical circuit design;

storing in the computer memory a set of placements in the design where the VLSI circuit design component appears, the placements representing a subset of instances of the leaf design entity;

associating with the VLSI circuit design component and the placements a set of links, the links connecting various ones of the placements to one another to further denote placement of the VLSI circuit design component within the hierarchical circuit design;

storing the set of links in the computer memory;

computing interconnections denoting where placements of instances of VLSI circuit design components are interconnected; and

storing the interconnections in the computer memory.

5,481,474

# DOUBLE-SIDED PLACEMENT OF COMPONENTS ON PRINTED CIRCUIT BOARD

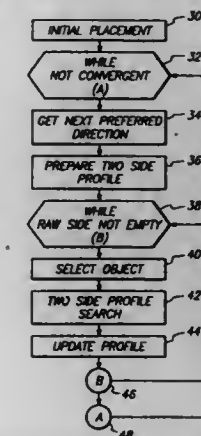
Tsu-chang Lee, San Jose, Calif., assignor to Cadence Design Systems, Inc., San Jose, Calif.

Filed Jul. 22, 1993, Ser. No. 96,604

Int. Cl.<sup>6</sup> H05K 13/04

U.S. Cl. 364-491

20 Claims



17. A simulation method for placing components on both sides of a printed circuit board (PCB), the simulation method comprising the steps of:

placing a plurality of components in a raw portion of the PCB; evaluating a selected component placed in the raw portion for re-placement in a first refined portion of the first side of the PCB or in a second refined portion of a second side of the PCB;

re-placing the selected component in the first or second refined portion according to the evaluation; and repeating the evaluating and re-placing steps until each component placed in the raw portion has been evaluated.

5,481,475

# METHOD OF SEMICONDUCTOR DEVICE REPRESENTATION FOR FAST AND INEXPENSIVE SIMULATIONS OF SEMICONDUCTOR DEVICE MANUFACTURING PROCESSES

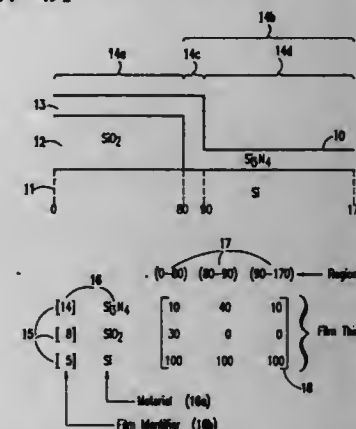
Ralph W. Young, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 10, 1993, Ser. No. 166,181

Int. Cl.<sup>6</sup> H01F 41/14

U.S. Cl. 364-491

12 Claims



1. A computer implemented method for simulations of semiconductor device manufacturing processes, said method comprising the steps of:

defining a dynamic data structure used in the design and manufacture of a semiconductor device, said dynamic data structure comprising a multiplicity of rows representing film layers comprising a structure of said device at any point in a simu-

lation of a semiconductor device manufacturing process, each of said rows being associated with additional information identifying said film, and a multiplicity of columns representing vertical regions within the structure of said device, each said column being associated with additional information giving horizontal dimensions of said vertical regions;

forming a matrix of cells in computer memory corresponding to a one-for-one mapping of said rows against said columns, each of said cells having a primary value and one or more associated values, said primary value being a thickness of a film layer in a vertical region; and

using the matrix of cells in the computer memory, performing a computer simulation of a semiconductor device manufacturing process in which said matrix is regenerated during simulation to reflect evolution of a region structure with each step in the semiconductor device manufacturing process, said computer simulation corresponding to successive process steps in the development of the structure of said semiconductor device, wherein the number of said rows and said columns at any step are minimized.

5,481,476

# APPARATUS FOR INTERACTIVE SELF-MODELING MIXTURE ANALYSIS

Willem Windig, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

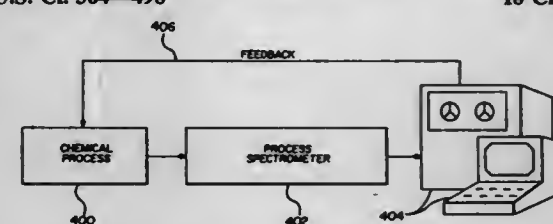
Continuation of Ser. No. 532,601, Jun. 4, 1990, abandoned.

This application Jan. 27, 1995, Ser. No. 379,829

Int. Cl.<sup>6</sup> G06F 159/00

U.S. Cl. 364-498

18 Claims



1. Apparatus for controlling a process wherein starting material undergoes a reaction over a period of time to produce reaction products, said apparatus comprising:

a) process spectrometer means operatively associated with said process for providing spectrographic data from said process;

b) programmed computer means operatively connected to said process spectrometer means for analyzing said spectrographic data to determine pure variables relating to the reaction products and for comparing the determined pure variables to predetermined pure variables; and

c) control means operatively associated with said process and operatively connected to said computer means for controlling the process in a manner determined by the result of the comparison.

5,481,477

Patent Not Issued For This Number

5,481,478

# BROADCAST SYSTEM FOR A FACILITY

Herman D. Palmieri, 1532 Eben St., Pittsburgh, Pa. 15226, and Martin Tutwerk, 801 Summitt St., McKeesport, Pa. 15132

Filed Jun. 3, 1994, Ser. No. 253,685

Int. Cl.<sup>6</sup> H04H 5/00; 1/00

U.S. Cl. 364-514 R

30 Claims

1. A broadcast system for a facility, said system including:



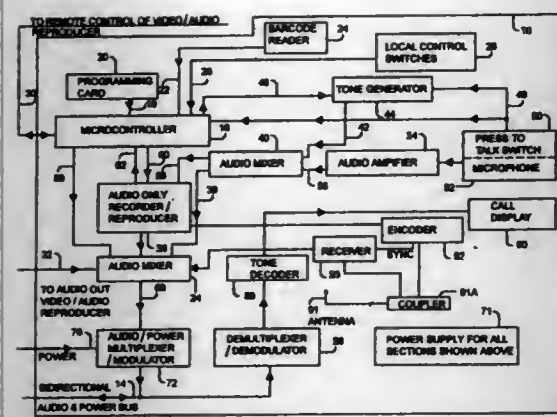


FIGURE 1

means for producing each of a plurality of broadcast signals including a program signal, a supervisory program signal and a supervisory alert signal;  
a supervision controller for said broadcast signals;  
power supply means having output terminals on which there appears a desired power supply for monitoring stations;  
means for combining said program signals with said power supply to form an output signal suitable for broadcast within said facility;  
bus means for distributing said output signal in said facility to each of a plurality of monitor stations; and  
said plurality of monitoring stations each including:

- means connected to said bus means to recover broadcast signals and form a resident power supply for that monitor station only from said output signal,
- a monitor coupled to a resident amplifier and powered by said resident power supply for responding to any of said plurality of recovered broadcast signals,
- a resident controller for controlling said resident amplifier when receiving a program signal supplied to said monitor, and
- a resident executive controller for overriding said resident controller and applying said supervisory alert signal and supervisory program signal to said resident amplifier.

5,481,479

#### NONLINEAR SCANNING TO OPTIMIZE SECTOR SCAN ELECTRO-OPTIC RECONNAISSANCE SYSTEM PERFORMANCE

Ralph H. Wight, Northport, and Gregory J. Wolfe, Port Jefferson Station, both of N.Y., assignors to Loral Fairchild Corp., Syosset, N.Y.

Filed Dec. 10, 1992, Ser. No. 988,837

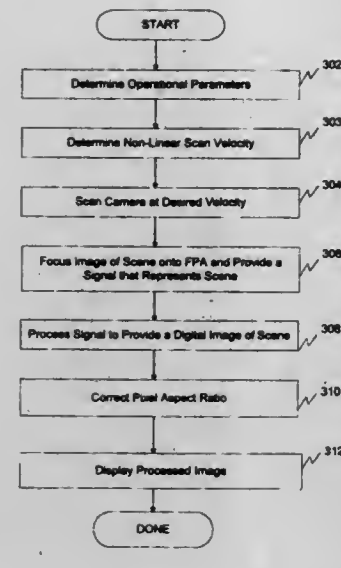
Int. Cl.<sup>6</sup> G02B 15/16; G01C 11/02

U.S. Cl. 364-525

30 Claims

28. A system for performing sector scan reconnaissance of a scene, comprising:

- focusing means for focusing a portion of the scene onto a detector, wherein said portion of the scene is defined by a projection of said detector;
- determining means for determining a non-linear scan velocity and;
- scanning means for scanning said projection across the scene at said determined-non-linear scan velocity.



5,481,480

#### PROCESS CONTROL FOR PHOTOGRAPHIC PROCESSING APPARATUS

Andrew Green, and Arthur E. Saunders, both of Middlesex, England, assignors to Eastman Kodak Company, Rochester, N.Y.

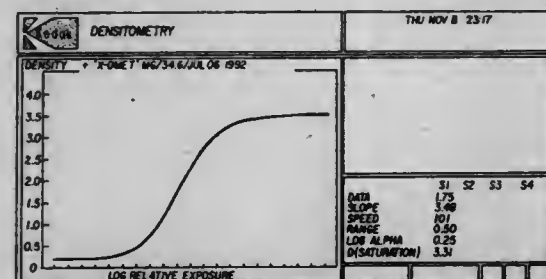
Filed Oct. 27, 1993, Ser. No. 144,167

Claims priority, application United Kingdom, Nov. 28, 1992, 9224962

Int. Cl.<sup>6</sup> G03C 5/00

U.S. Cl. 364-525

1 Claim



1. A method of controlling photographic processing apparatus to process a given photographic material comprising the steps of: producing a control strip of said given photographic material by exposing the control strip to a step wedge; processing the exposed control strip in the processing apparatus to be exposed; measuring the density values of the processed control strip; determining a characteristic curve of the given photographic material, said curve defined by

$$D = D_s / [1 + ((E/E_i)^p / \alpha)]^\alpha$$

where

E is the exposure,

D is the density at exposure E,

E<sub>i</sub> is the exposure at the point of inflexion of the curve,D<sub>s</sub> is the density at saturation.

α is a constant related to the asymmetry of the characteristic curve, and

β is a constant related to the slope of the curve at the inflexion point

by plotting the densities measured in said measuring step in relation to the exposures applied to said control strip in said producing step;

determining from said characteristic curve at least the slope, speed, latitude and D<sub>s</sub> parameters of said given photographic material; and  
controlling said photographic processing of said given photographic material by said photographic processing apparatus as a function of said slope, speed, latitude and D<sub>s</sub> parameters of said given photographic material.

5,481,481

#### AUTOMATED DIAGNOSTIC SYSTEM HAVING TEMPORALLY COORDINATED WIRELESS SENSORS

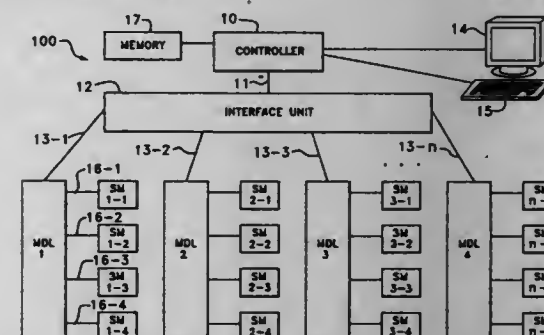
Donald J. Frey, and Michael J. Holtz, both of Boulder, Colo., assignors to Architectural Ennergy Corporation, Boulder, Colo.

Filed Nov. 23, 1992, Ser. No. 979,825

Int. Cl.<sup>6</sup> G01F 1/56

U.S. Cl. 364-551.01

62 Claims



1. A maintenance apparatus for analyzing a system under test, which system under test has a plurality of operationally interdependent components, at least one of which is spatially disjunct from the remainder of said components, comprising:

control means;

a plurality of data collecting means, each said data collecting means being installable in said operationally interdependent components for measuring predefined parameters at said operationally interdependent components, absent direct connection to said control means while said data collection means are installed in said operationally interdependent components, each of which data collecting means comprises:

means for determining a value for at least one predetermined parameter at each of a plurality of points in time,  
means for storing a plurality of sets of data, each said set of data being indicative of each said determined value of each said predetermined parameter at a one of said plurality of points in time,

means for temporally enabling said determining means simultaneously with said determining means located in others of said data collecting means independent of said control means,  
means for transmitting a plurality of said sets of said collected data to said control means;

wherein said control means comprises:

means for storing each said set of collected data received from said plurality of data collecting means, and  
means for analyzing said system under test using said stored sets of data to identify performance problems in said system under test.

5,481,482

#### PRESSURE INFORMATION PROCESSING SYSTEM SUITABLE FOR USE IN A VACUUM UNIT

Shigekazu Nagai; Shigeru Sugano; Mitsuhiro Saito; Takashi Takebayashi; Hiroshi Matsushima, and Yoshiharu Ito, all of Ibaraki, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 941,259, Sep. 4, 1992, abandoned.

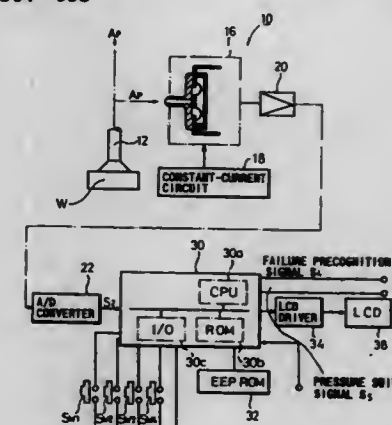
This application Aug. 22, 1994, Ser. No. 293,601

Claims priority, application Japan, Sep. 5, 1991, 3-226195

Int. Cl.<sup>6</sup> G01L 27/00; 13/00

U.S. Cl. 364-558

8 Claims



1. A system for processing pressure information for a vacuum unit operable on a workpiece, comprising:

- a vacuum generator for generating a vacuum;
- a vacuum generator detecting means for detecting a vacuum generator vacuum level of vacuum generated by said vacuum generator;
- an interface component which interfaces said vacuum generator with the workpiece;
- interface component detecting means for detecting an interface component vacuum level of vacuum in said interface component;
- determining means for determining whether a predetermined critical value has been met, wherein said interface component vacuum level is compared with said predetermined critical value, said predetermined critical value thereafter being adjusted as a function of said vacuum generator vacuum level to provide an adjusted predetermined critical value.

5,481,483

#### NON-CONTACT METHOD OF OBTAINING DIMENSIONAL INFORMATION ABOUT AN OBJECT FOR COMPARING SIMILAR OBJECTS

Samuel E. Ebenstein, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 980,419, Nov. 23, 1992, Pat. No.

5,384,717. This application Jan. 18, 1995, Ser. No. 374,351

Int. Cl.<sup>6</sup> G06K 9/46

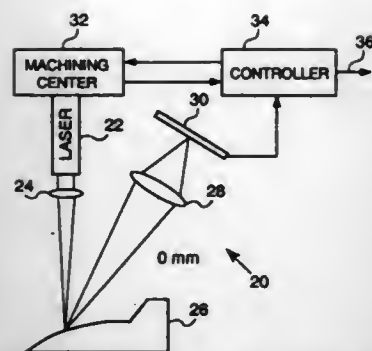
U.S. Cl. 364-561

2 Claims

1. A method for comparing similar objects located at a vision station, the method comprising the steps of:

- generating reference data relating to a surface of an object to be scanned, the surface including at least one reference feature of the object, the at least one reference feature having a boundary;
- scanning a beam of controlled light at the surface of the object located at the vision station based on the reference data to generate reflected light signals;
- imaging the reflected light signals to a measuring area of a photodetector means to produce corresponding electrical signals;
- computing scan data based on the electrical signals, the scan data providing height values of the surface of the object;





- (e) determining at least a portion of the boundary of the at least one reference feature based on the height values of the scan data to obtain boundary data;
- (f) computing dimensional information associated with the at least one reference feature of the object based on the boundary data, wherein the at least one reference feature has a curved area defined by a radius and a center and wherein the dimensional information includes a value for the radius and coordinates of the center and wherein the step of computing the dimensional information includes the steps of estimating the coordinates of the center and the radius from the boundary data and correcting the estimated radius to obtain the value of the radius;
- (g) repeating steps (a) through (f) for each other object at the vision station to determine the dimensional information for each other object; and
- (h) utilizing the dimensional information for each of the objects to compare the scan data for each of the objects to detect differences between the objects.

5,481,484

### MIXED MODE SIMULATION METHOD AND SIMULATOR

Munehiro Ogawa, deceased, late of Kumamoto, Japan; Masato Iwabuchi, Akishima, Japan; Hitoshi Sugihara, Koganei, Japan; Saburo Hojo, Takasaki, Japan; Masami Kinoshita, Hidaka, Japan; Osamu Yamashiro, Tokorozawa, Japan; Goichi Yokomizo, Tokyo, Japan, and Mikako Miyama, Hachioji, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

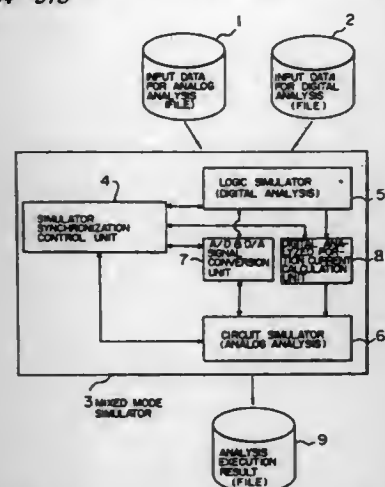
Filed Sep. 28, 1992, Ser. No. 953,533

Claims priority, application Japan, Jan. 9, 1991, 3-290597; Feb. 5, 1992, 4-054215

Int. Cl.<sup>6</sup> G06J 1/00

U.S. Cl. 364-578

17 Claims



1. A mixed mode simulation method for mixedly executing logic simulation and circuit simulation so as to enable verification to be made for a noise current influence which is exerted to an analog

analyzed circuit portion realized by circuit simulation caused by a digital analyzed circuit portion realized by logic simulation, said method comprising:

a first step of determining an analog component in a generated output due to an operating state of the digital analyzed circuit portion which is subjected to said logic simulation in synchronism with a logic operation of the digital analyzed circuit portion realized by said logic simulation, said analog component comprising an equivalent circuit for noise current calculation which is modeled for applying said analog analyzed circuit portion with a noise current generated in accordance with an operating state of said digital analyzed circuit portion; and

the second step of forming the analog component determined by said first step with an equivalent circuit including a current source component to realize said analog component, and adding said equivalent circuit to said analog analyzed circuit portion subjected to said circuit simulation to execute said circuit simulation.

5,481,485

### EFFECTIVE CHANNEL LENGTH SIMULATION USING A SINGLE SAMPLE TRANSISTOR

Kiyoshi Takeuchi, Tokyo, Japan, assignor to NEC Corporation, Japan

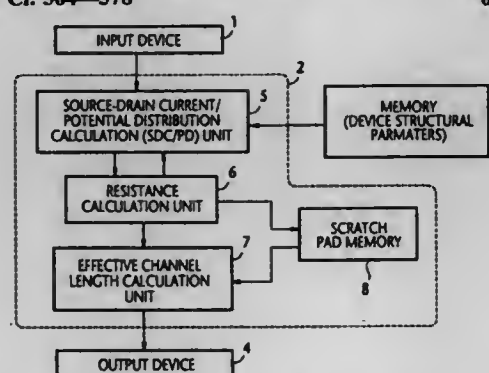
Division of Ser. No. 99,062, Jul. 29, 1993, abandoned. This application May 22, 1995, Ser. No. 445,578

Claims priority, application Japan, Jul. 30, 1992, 4-203668

Int. Cl.<sup>6</sup> G06F 17/00

U.S. Cl. 364-578

6 Claims



1. A method for manufacturing a field effect transistor having a desired effective channel length, the method comprising the steps of:

- (a) selecting a single sample transistor;
- (b) measuring the sample transistor in terms of manufacturing process parameters to provide structural data;
- (c) converting the structural data into an effective channel length by:
- (c1) determining a plurality of source-drain current values and a plurality of potential distributions corresponding to a plurality of successive sets of voltage parameters, wherein one of the voltage parameters of each of the sets differs from a corresponding voltage parameter of adjacent sets;
- (c2) determining channel resistivity values corresponding to said plurality of source-drain current values and said plurality of potential distribution, and determining source-drain resistance values corresponding to
- a plurality of drain-source voltages and source-drain currents; and
- (c3) finding an effective channel length based upon said channel resistivity values and said source-drain resistance values;
- (d) comparing the effective channel length with the desired effective channel length;
- (e) adjusting the manufacturing process parameters; and

- (f) repeating steps (a) through (e) until the effective channel length found by said measuring and the desired effective channel length differ by, at most, a predetermined allowable error.

5,481,486

### LOOK UP TABLE IMPLEMENTATION OF FAST CARRY ARITHMETIC AND EXCLUSIVE-OR OPERATIONS

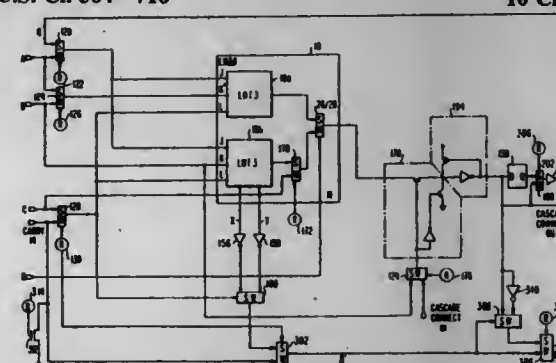
Richard G. Cliff, Milpitas, and L. Todd Cope, San Jose, both of Calif., assignors to Altera Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 880,752, May 8, 1992, Pat. No. 5,274,581. This application Dec. 13, 1993, Ser. No. 166,300

Int. Cl.<sup>6</sup> G06F 7/50

U.S. Cl. 364-716

10 Claims



1. Programmable logic array apparatus comprising:

a plurality of logic modules, each of which has a plurality of inputs and an output, and each of which is programmable to provide to said output an output signal, and each logic module having means to store an individual program for programming said module, the output signal being any of a plurality of logical functions of said inputs, a first of said logic modules including means for selectively receiving the output signal of a second of said logic modules, wherein a first of said plurality of inputs of said first of said logic modules provides an output signal of said second of said logic modules to said means for selectively receiving, and wherein said first logic module is programmable to provide a modified output signal to said output of said first logic module, said modified output signal being an EXCLUSIVE OR function of the unmodified output signal of said first logic module and said output signal of said second logic module.

5,481,487

### TRANSPOSE MEMORY FOR DCT/IDCT CIRCUIT

Yi-Feng Jang, Keelung; Jinn-Nan Kao, and Po-Chuan Huang, both of Hsinchu, all of Taiwan, Prov. of China, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan, Prov. of China

Filed Jan. 28, 1994, Ser. No. 189,446

Int. Cl.<sup>6</sup> G06F 15/332

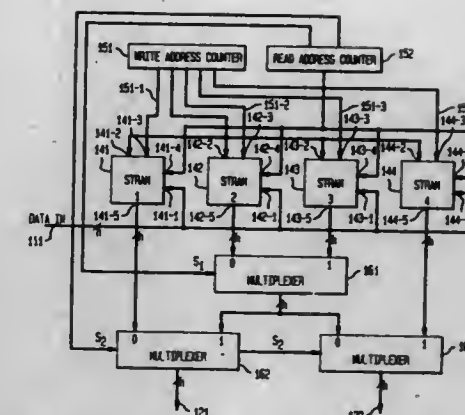
U.S. Cl. 364-725

15 Claims

1. A transpose memory for receiving elements of a matrix according to a first sequence order and for outputting elements to a first or second type of transform circuit according to a second sequence order comprising:

four dual port memories, which memories each have a storage cell for storing an element of one fourth of said elements of said matrix;

a first counter for writing each received matrix element, according to a first write counter order, in a particular storage cell of a first particular memory of said dual port memories which first particular memory corresponds to the matrix quadrant of said element, for said first type of transform circuit, and for writing each received matrix element, according to a second



write counter order, in a particular storage cell of a second particular memory of said dual port memories which second particular memory corresponds to the matrix row and column evenness or oddness of said element, for said second type of transform circuit, and

a second counter for simultaneously reading-out pairs of elements from particular storage cells of said memories according to said second sequence order.

5,481,488

### BLOCK FLOATING POINT MECHANISM FOR FAST FOURIER TRANSFORM PROCESSOR

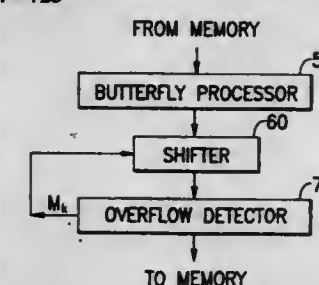
Wenzhe Luo, and Jiasheng Xu, both of Beijing, China, assignors to United Microelectronics Corporation, Taiwan, Prov. of China

Filed Oct. 21, 1994, Ser. No. 328,713

Int. Cl.<sup>6</sup> G06F 17/14; 15/00; 7/38

U.S. Cl. 364-725

1 Claim



1. A block floating point mechanism for an FFT processor which is used to perform a plurality of stages of butterfly computations and has a memory therein, comprising:

a pipelined butterfly processor receiving source data to be computed from said memory, performing butterfly computations, and outputting resultant data;

a shifter coupled to said pipelined butterfly processor to receive the resultant data for shifting the resultant data by the largest overflow bit number occurring in the previous stage of butterfly computations; and

an overflow detector coupled to said shifter to receive the shifted resultant data for detecting the largest overflow bit number occurring in this stage of butterfly computations, and for sending the detected largest overflow bit number to said shifter, the shifted resultant data being sent to said memory by said overflow detector to act as the source data for the butterfly computations of the next stage.







a predetermined higher value to a predetermined lower value so as to compensate for an increased erase time caused by the lowering of the magnitude of the negative constant voltage, whereby an improved threshold voltage  $V_T$  distribution after erase is obtained without sacrificing any reduction in the erase speed.

5,481,495

# CELLS AND READ-CIRCUITS FOR HIGH-PERFORMANCE REGISTER FILES

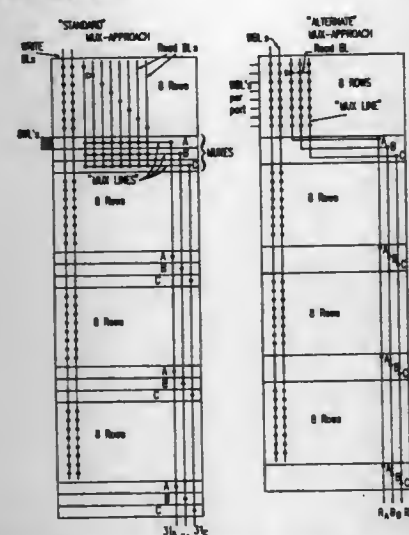
Walter H. Henkels, Putnam County; Wei Hwang, and Terry I. Chappell, both of Westchester County, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 11, 1994, Ser. No. 226,161

Int. Cl.<sup>6</sup> G11C 7/00

U.S. Cl. 365—189.02

8 Claims



1. A multi-port register file employing single-ended reading and writing, comprising:

- a plurality of read-ports and a plurality of write-ports;
- an assembly of blocks, each block consisting of a sub-array of multi-port register file cells and associated multiplexing circuits;
- write bit lines extending a full height of the register file with no partitioning along the write bit lines; and
- for a given read-port, outputs of all multiplexing circuits from all the blocks being dot-ORed together onto a single global output line for an entire, full register file.

5,481,496

# SEMICONDUCTOR MEMORY DEVICE AND METHOD OF DATA TRANSFER THEREFOR

Toshifumi Kobayashi; Yoshikazu Morooka; Michihiro Yamada, and Takeshi Hamamoto, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 799,728, Nov. 22, 1991, which is a continuation of Ser. No. 574,162, Aug. 29, 1990, which is a division of Ser. No. 353,564, May 18, 1989. This application May 2, 1994, Ser. No. 236,004

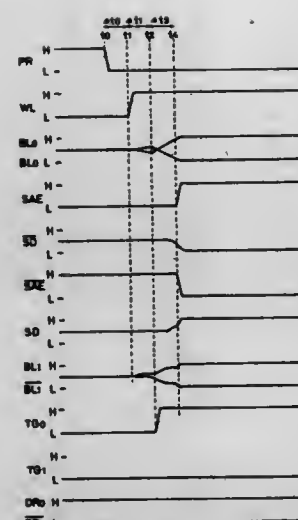
Claims priority, application Japan, Jun. 27, 1988, 63-159806; Jun. 27, 1988, 63-159807

Int. Cl.<sup>6</sup> G11C 7/00; 8/00

U.S. Cl. 365—189.05

8 Claims

1. A method of performing a read refresh operation and performing a partial data transfer from a data register to a memory cell array in a semiconductor memory device including



a memory cell array including a plurality of word lines, a plurality of sets of bit line pairs arranged orthogonally intersecting with the word lines, and a plurality of memory cells arranged at the intersection of the word lines and the bit lines, including first memory cells undergoing data transfer and second memory cells not undergoing data transfer,

a plurality of precharging circuits for precharging each of said bit line pairs,

a plurality of sense amplifiers for amplifying potential difference appearing in each of said bit line pairs,

a shared sense amplifier activating signal line shared by first sense amplifiers for said first memory cells and second sense amplifiers for said second memory cells;

a plurality of data registers provided for each of said bit line pairs, and

a plurality of gate means responsive to a transfer signal for selectively connecting said bit line pairs to said data registers, the method comprising:

a first step of precharging said bit line pairs by said precharging circuits;

a second step of selecting first memory cells in said memory cell array for reading data stored in said first memory cells to predetermined ones of said bit line pairs connected thereto after the end of said first step, said second step including applying a signal to a predetermined one of said word lines;

a third step of preventing a signal on said shared sense amplifier activating signal line from causing a second sense amplifier to corrupt data in one of said second memory cells by selectively connecting selected ones of said bit line pairs to said data register by said gate means only after a first predetermined time period after the start of said second step; and

a fourth step of applying a sense amplifier starting signal for activating both said first sense amplifiers for said first memory cells selected to undergo data transfer and said second sense amplifiers for said second memory cells not selected to undergo data transfer, at a second predetermined time period after the start of said third step,

wherein said third step comprises selecting said first predetermined time period to be at least as long as a time for providing full reading of data stored in said first memory cells to said predetermined one of said bit line pairs and to be at least as long as a time for refreshing data in said second memory cells not selected to undergo data transfer and

said fourth step comprising selecting said second predetermined time period to be at least as long as a time required for full reading of data from the data register.

5,481,497

# SEMICONDUCTOR MEMORY DEVICE PROVIDING EXTERNAL OUTPUT DATA SIGNAL IN ACCORDANCE WITH STATES OF TRUE AND COMPLEMENTARY READ BUSES

Tadaaki Yamauchi; Hiroshi Miyamoto; Yoshikazu Morooka; Kiyohiro Furutani, and Makiko Aoki, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

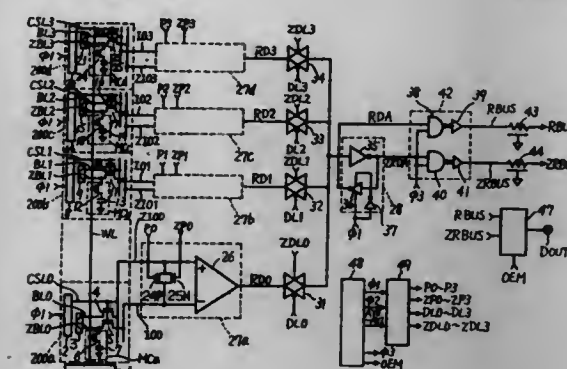
Filed Sep. 12, 1994, Ser. No. 304,749

Claims priority, application Japan, Sep. 13, 1993, 5-227449; May 20, 1994, 6-106882

Int. Cl.<sup>6</sup> G11C 7/00

U.S. Cl. 365—189.05

17 Claims



1. A semiconductor memory device comprising:

a memory cell array including a plurality of word lines, a plurality of bit line pairs crossing said plurality of word lines, and a plurality of memory cells connected to said word lines and said bit line pairs;

a plurality of I/O line pairs connected to said plurality of bit line pairs via switching means;

a plurality of differential amplifier means provided correspondingly to said plurality of I/O line pairs, said differential amplifier means being selectively operated to amplify a potential difference of the corresponding I/O line pair and output the same to a data line pair, said data line pair having first and second data lines for complementarily transmitting the output signal of said selected differential amplifier means;

first drive means for receiving said output signal of said selected differential amplifier means and transmitting a signal having the same phase as said received output signal to said first data line in response to said received output signal;

second drive means for receiving a signal having a phase opposite to that of said output signal of said selected differential amplifier means and transmitting a signal, which has the phase opposite to that of said output signal, to said second data line in response to said signal having said opposite phase;

output buffer means for receiving signals from said first and second data line, providing an output signal to an output pad and being controlled to attain one of a high impedance state and a signal output state in response to the potentials of said signals received from said first and second data lines; and

control means for controlling said first and second drive means such that potentials of said first and second data lines attain levels which set said output buffer means to said high impedance state prior to the operation of said selected differential amplifier means, wherein

said plurality of differential amplifier means are positioned close to the memory cell array as compared with the output buffer means which is positioned close to the output pad.

5,481,498

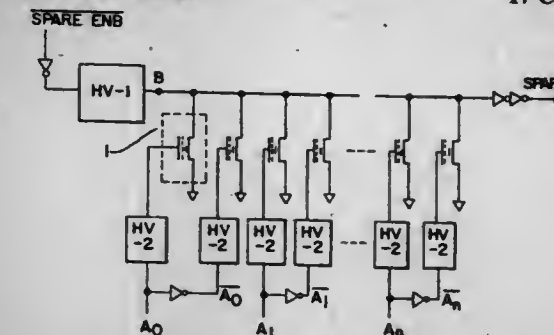
# REDUNDANCY CIRCUIT FOR SEMICONDUCTOR MEMORY DEVICE

Seok Woo Han, Kyungki-do, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Cheongju, Rep. of Korea  
Division of Ser. No. 911,611, Jul. 10, 1992, Pat. No. 5,355,338.  
This application Oct. 11, 1994, Ser. No. 320,341  
Claims priority, application Rep. of Korea, Jul. 11, 1991, 91-12072

Int. Cl.<sup>6</sup> G11C 7/00; 29/00

U.S. Cl. 365—185.09

17 Claims



1. A redundancy circuit for generating a spare signal in a memory device having memory cells and spare memory cells, wherein some of the memory cells may be defective and wherein in response to the spare signal one or more spare memory cells are addressed in the memory device, comprising:

address lines for receiving addresses corresponding to the memory cells in the memory device, wherein one or more addresses correspond to defective memory cells;

a reference line for generating the spare signal;

a reference voltage circuit coupled to the reference line for supplying a first programming voltage and a spare signal voltage to the reference line;

at least a pair of programmable transistors having an initially unprogrammed state and each having a gate, a source and a drain, the drains and sources of the transistors being coupled to the reference line and ground potential, respectively;

high voltage driving circuits coupled to the gates of the transistors and to one or more address lines, wherein the transistors are programmed in response to the first programming voltage supplied by the reference voltage circuit and a second programming voltage supplied by the high voltage driving circuits, wherein the redundancy circuit produces the spare signal on the reference line in response to an address corresponding to a defective memory cell.

5,481,499

# INTEGRATED MATRIX MEMORY, COMPRISING A CIRCUIT ARRANGEMENT FOR TESTING THE ADDRESSING

Peter Meyer, Gudow, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 324,453, Oct. 17, 1994, which is a continuation of Ser. No. 93,220, Jul. 16, 1993. This application Mar. 16, 1995, Ser. No. 405,566

Claims priority, application Germany, Jul. 17, 1992, 42 23 532.4

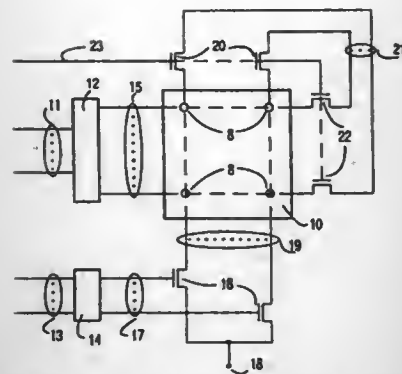
Int. Cl.<sup>6</sup> G11C 29/00

U.S. Cl. 365—201

16 Claims

1. An integrated matrix memory comprising a circuit arrangement for testing the addressing of a matrix, comprising storage elements which are arranged at intersections of row conductors and column conductors, the addressing taking place by way of a multibit address, via a decoder which comprises at least one row decoder and one column decoder, each of which is arranged to receive and decode a different part of the address bits and to drive





each time a different row conductor or to select at least one column conductor, via selection switches, for connection to at least one output terminal, characterized in that the memory comprises a test bus and in that at the side of the matrix which is remote from the row decoder each row conductor can be coupled to a different conductor of the test bus and that at the side of the matrix which is remote from the selection switches each column conductor can be coupled to a different conductor of the test bus.

5,481,500

#### PRECHARGED BIT DECODER AND SENSE AMPLIFIER WITH INTEGRATED LATCH USABLE IN PIPELINED MEMORIES

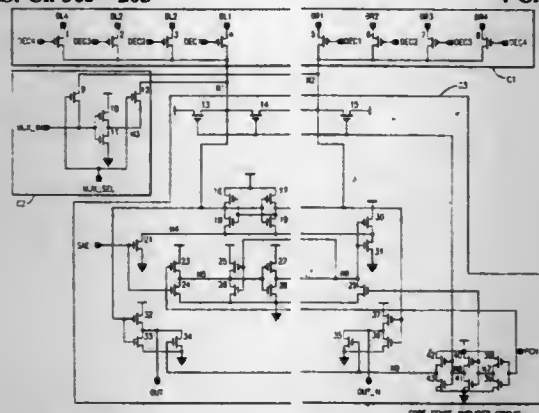
William R. Reohr, Pleasantville; Yuen H. Chan, Poughkeepsie, and Pong-Fel Lu, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 22, 1994, Ser. No. 279,366

Int. Cl.<sup>6</sup> G11C 13/00

U.S. Cl. 365—203

4 Claims



1. A precharged sense amplifier arrangement including a bistable differential amplifier, means for enabling sensing of a differential voltage by said bistable differential amplifier, said means for enabling sensing including a means for causing latching of outputs of said differential amplifier, and means for precharging at least said means for enabling sensing and inputs of said differential amplifier in sequence, said means for precharging including means for resetting said means for causing latching of outputs of said differential amplifier.

5,481,501

#### METHOD FOR SIMULATING CROSSWELL SEISMIC DATA

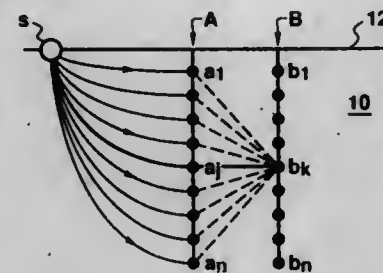
Samuel N. Blakeslee, and Sen-Tsuen Chen, both of Sugar Land, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Feb. 19, 1993, Ser. No. 19,501

Int. Cl.<sup>6</sup> G01V 1/28; 1/36

U.S. Cl. 367—57

33 Claims



1. A method for simulating crosswell seismic data for the subterranean region between a first well and a second well, said method comprising the steps of:
  - (a) locating at least one seismic source on the surface of the earth substantially in line with, but not between, said first well and said second well, said seismic source being closer to said first well than to said second well;
  - (b) locating a plurality of vertically spaced apart seismic receivers in said first well;
  - (c) locating at least one seismic receiver in said second well;
  - (d) activating said seismic source to generate a seismic signal;
  - (e) recording the actual arrival time of said seismic signal at each of said first well and second well seismic receivers;
  - (f) assuming a seismic velocity field for the subterranean region between said first well and said second well;
  - (g) for each second well seismic receiver, calculating a plurality of estimates of the seismic signal travel time from said seismic source to said second well seismic receiver, each of said estimates being the sum of
    - (1) the actual travel time of said seismic signal from said seismic source to a selected first well seismic receiver, and
    - (2) the theoretical travel time of said seismic signal from said selected first well seismic receiver to said second well seismic receiver based on said assumed velocity field;
  - (h) for each second well seismic receiver, selecting the shortest of said plurality of estimates of the seismic signal travel time;
  - (i) comparing said selected estimate of the seismic signal travel time with said actual arrival time of said seismic signal at said second well seismic receiver; and
  - (j) if said selected estimate of the seismic signal travel time and said actual arrival time are not approximately equal for all second well seismic receivers, revising said assumed velocity field and repeating steps (g) through (j) until said selected estimate of the seismic signal travel time and said actual arrival time are approximately equal for all second well seismic receivers.

5,481,502

#### SYSTEM OF ACQUISITION AND CENTRALIZATION OF DATA OBTAINED THROUGH A PERMANENT PLANT FOR EXPLORING A GEOLOGIC FORMATION

Jacques Cretin, Le Chesnay; Jean-François Therod, Neuilly s/Seine, and Jean Laurent, Orgeval, all of France, assignors to Institut Français de Pétrole, Rueil Malmaison, France

Filed Apr. 1, 1993, Ser. No. 40,453

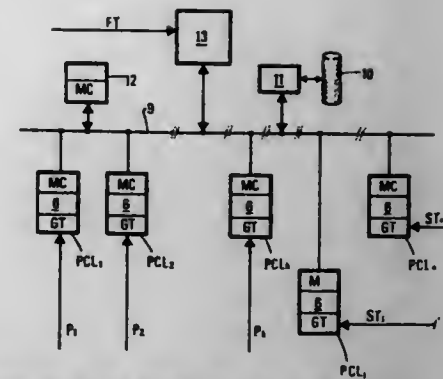
Claims priority, application France, Apr. 1, 1992, 92 04052

Int. Cl.<sup>6</sup> G01V 1/40

U.S. Cl. 367—77

15 Claims

1. A system for centrally collecting data obtained during exploration of a geological formation comprising:



- at least one local station provided with a set communication procedure to control exchange of information with a monitoring device coupled with the geological formation via a local transmission link;
- a communication network provided with a set communication procedure different than the set communication procedure of the at least one local station;
- a server set associated with a system memory for controlling communications with the at least one local station via the communication network; and
- an interface for transferring command and data signals between the at least one local station and the communication network.

5,481,503

#### APPARATUS FOR AND METHOD OF ADAPTIVELY PROCESSING SONAR DATA

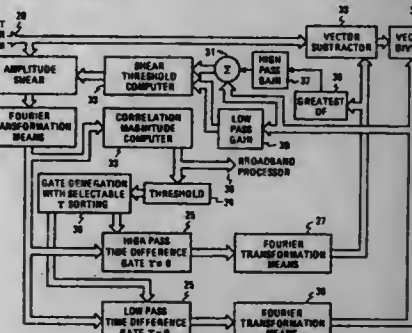
John P. Kuhn, Liverpool, and Thomas S. Heath, Syracuse, both of N.Y., assignors to Martin Marietta Corporation, Syracuse, N.Y.

Filed Dec. 12, 1984, Ser. No. 680,953

Int. Cl.<sup>6</sup> G06F 15/336; G01R 23/16; G81C 27/00

U.S. Cl. 367—100

11 Claims



1. An adaptive normalization processor of a sonar power spectrum for improving the detectability of discrete spectral line data for target detection and classification in a background of broadband noise containing both relatively broad and narrow (with respect to the center frequency of the spectral band) interference ripples due to the reception of broadband signals via multipath propagation, said processor comprising:
  - A. an input port for connection to a source of sonar spectral data in a periodically scanned power spectrum format containing both said spectral line data and said broadband background;
  - B. means to perform a real to complex Fourier transformation of said sonar data in said power spectrum format to form a complex autocorrelation function whose magnitude contains peak(s) at time differences in said scan corresponding to the inverse of the period of the interference ripples in the broadband spectral data;
  - C. means to compute the magnitudes of said complex autocorrelation function to form a correlation magnitude function;
  - D. means responsive to said correlation magnitude function to select values of said complex autocorrelation function over time difference interval(s) containing said high amplitude

peak(s) while maintaining zero values for all other time difference in said scan to form a gated complex autocorrelation function from which only the broadband spectrum is derived;

- E. means to perform the inverse complex to real Fourier transformation of said gated complex autocorrelation function to obtain an estimate of said broadband data in a power spectrum format;
- F. means to perform a vector division of said input sonar data for each scan by said broadband data estimate computed from said scan to normalize said spectral line data in relation to said background for improved detectability; and
- G. an output port for application of said normalized electrical sonar data to a visual display.

5,481,504

#### METHOD AND DEVICE FOR DETERMINING TARGET SPEED AND DISTANCE WITH FREQUENCY MODULATED PULSES

Karlhans Rosenbach, Bonn, and Jochen Ziegenbein, Rheinbach, both of Germany, assignors to Atlas Elektronik GmbH, Bremen, Germany

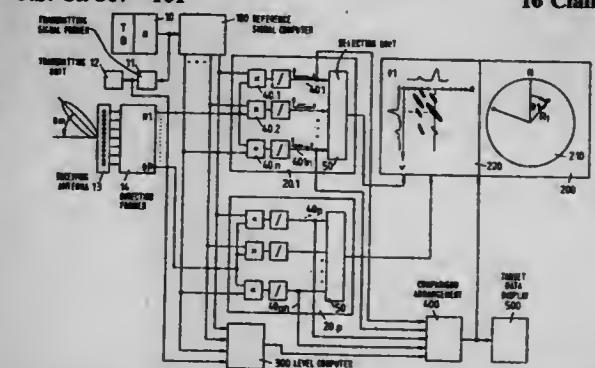
Filed May 9, 1994, Ser. No. 240,069

Claims priority, application Germany, May 21, 1993, 43 17 038.2

Int. Cl.<sup>6</sup> G01S 15/10

U.S. Cl. 367—101

16 Claims



1. A method for determining target speed and distance, comprising:
  - a. transmitting and receiving a signal with continuous frequency-modulated waves within a pre-determinable pulse length T, wherein a transmitted frequency f of the signal is selected to be rising or falling over a time t during the pulse length T within a pre-selectable bandwidth B in accordance with a pre-selectable irrational function having the form

$$f = f_m - \frac{B}{2} + B \left( \frac{t}{T} \right)^\alpha$$

wherein  $f_m$  is a center frequency,  $\alpha$  is an exponent that has a constant value during the pulse length T and is selected to be larger than 0 and smaller than 1, so that the transmitted frequency rises from a lower frequency  $f_m - B/2$  at time  $t=0$  and to a higher frequency  $f_m + B/2$  at time  $t=T$ ; and forming an ambiguity function from the received signal and evaluating the ambiguity function for determining speed and distance.







first light-emitting means provided on said optical head for applying light to said optical storage medium;  
a one-dimensional optical position detector having a photo-sensitive surface disposed along a path of movement of said positioner for outputting a position signal corresponding to a light spot on said photo-sensitive surface;  
second light-emitting means, independent from said first light emitting means, provided either on said optical head or on said positioner for applying light to said one-dimensional optical position detector; and  
control means for controlling a movement of said positioner on the basis of said output of said one-dimensional optical position detector.

5,481,511

# ADDRESS TABLE EDITING SYSTEM FOR VOICE DATA RECORDED IN AN OPTICAL DISK

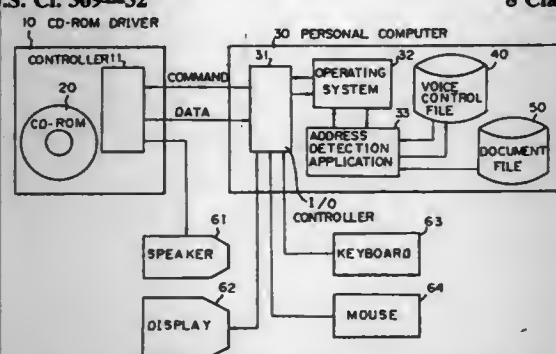
Tomokatsu Yanagida, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 338,819, Nov. 10, 1994, abandoned, which is a continuation of Ser. No. 164,850, Dec. 9, 1993, abandoned, which is a continuation of Ser. No. 426,756, Oct. 26, 1989, abandoned. This application May 1, 1995, Ser. No. 431,956

Claims priority, application Japan, Jan. 26, 1988, 63-270294  
Int. Cl.<sup>6</sup> G11B 17/22; 27/02

U.S. Cl. 369—32

8 Claims



1. An address table editing system for identifying portions of a voice file containing voice data recorded on an optical disk, for setting up a start address and an end address for each of the portions identified in the voice file, and for editing an address table of the portions of the voice file, comprising:

- playback means for replaying the voice data of the voice file recorded on the optical disk;
- detection means for detecting a clock time indicating at least one of a start address and an end address identifying one of the portions of the voice file during replaying by said playback means;
- input means operated by an operator for setting up the start address and the end address when said operator hears the one of the portions of the voice file replayed by said playback means; and
- storage means for storing the start address and the end address, identifying the one portion of the voice file, in the address table based on the address detected by said detection means when said input means is operated.

## 5,481,512 SEPARABLE MAGAZINE FOR ACCOMMODATING DISCS AND A DISC PLAYER

Shouji Morioka; Hiroshi Matsugase, both of Gunma; Katsutake Togawa, and Mitsuru Nakagawa, both of Maebashi, all of, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jun. 29, 1993, Ser. No. 85,320

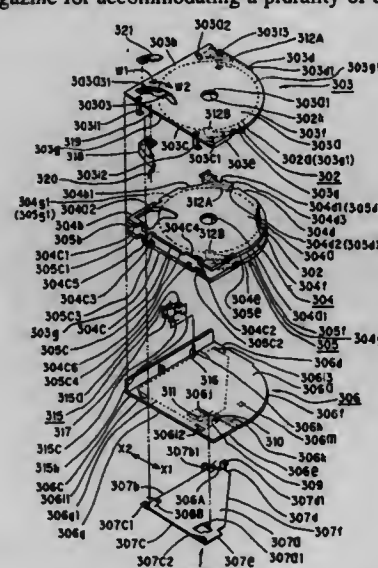
Claims priority, application Japan, Jun. 30, 1992, 4-195960; Jan. 29, 1993, 5-034898

Int. Cl.<sup>6</sup> G11B 17/22; 17/04

U.S. Cl. 369—36

3 Claims

2. A magazine for accommodating a plurality of discs each held





a lifter disposed at said rear end of said right and left tray stockers for transporting a recording medium in a vertical direction;

a tray extracting mechanism provided on said lifter for extracting two trays from said right and left tray stockers, said tray extracting mechanism including two disk clampers, and a slider slidable in a frontward and rearward direction of said right and left tray stockers, said slider having an engaging means for simultaneously engaging with two trays disposed at a same height in each of said right and left tray stockers when said slider is extended frontwardly toward said right and left tray stockers;

record/reproduce means disposed below said lifter and shiftable to a position right below a selected recording medium for receiving and placing the selected recording medium in position for recording/reproducing;

a shift mechanism defined by a rack and a partially geared pinion for shifting said record/reproduce means, said rack being formed on said record/reproduce means, said partially geared pinion being formed thereon with a geared portion, said geared portion meshing with said rack so as to drive said rack in response to a rotation of said partially geared pinion, and a non-geared portion, said non-geared portion disengaging said rack from said partially geared pinion; and

a lock mechanism integrally shifting together with said partially geared pinion, said lock mechanism engaging with said record/reproduce means when said rack is disengaged from said partially geared pinion.

5,481,515

## OPTICAL INFORMATION STORAGE MEDIUM CONTROL APPARATUS

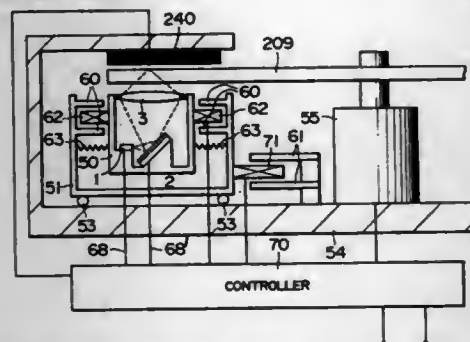
Hidehiko Kando, Matsudo; Mamoru Kainuma, Ibaraki; Masaru Muranishi, Ibaraki, and Katsuhiko Kimura, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 69,511, Jun. 1, 1993, Pat. No. 5,404,009. This application Nov. 23, 1993, Ser. No. 156,440  
Claims priority, application Japan, Jun. 2, 1992, 4-141311; Nov. 25, 1992, 4-314937; Jan. 19, 1993, 5-006636

Int. Cl.<sup>6</sup> G11B 7/135

U.S. Cl. 369-44.12

27 Claims



1. An optical information storage medium control apparatus comprising:

an optical information storage medium;

a storage medium driver provided on a frame for driving the medium;

an optical pickup device including a laser source for emitting linearly polarized light; an objective lens for focusing source light emitted from said laser source on the medium; a photodetector receiving signal light reflected from the medium, for converting the signal light into an electric signal, said photodetector including at least a photosensor, a planar optical waveguide formed on said photosensor for propagating the signal light therethrough, a diffraction grating for diffracting the signal light propagating through said waveguide, and an incidence coupler provided on said waveguide, for reflecting the source light from said laser source and receiving the signal

light obtained through said objective lens from the medium; wherein said laser source and said photodetector are arranged such that an angle between an incidence plane of the source light to a surface of said planar optical waveguide and a polarization plane of the source light determined by both an optical axis and an electric field vector of the source light is in a range of 5 to 85 degrees;

an optical pickup driver for moving said optical pickup device so as to move the source light focused on the medium through the objective lens in a direction transverse to tracks of the medium; and

a controller for controlling respective operations of said storage medium driver, optical pickup driver and pickup device.

5,481,516

## OPTICAL DISK PICKUP DEVICE INCLUDING WAVEGUIDE WITH SEPARATE INTEGRATED GRATING COUPLERS FOR LASER OUTPUT, FOCUS, AND TRACKING ERROR SIGNALS

Eun J. Kim, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

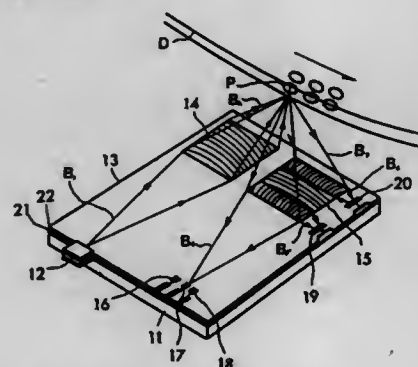
Filed Feb. 3, 1994, Ser. No. 191,182

Claims priority, application Rep. of Korea, Feb. 3, 1993, 1993-1432

Int. Cl.<sup>6</sup> G11B 7/00

U.S. Cl. 369-44.12

3 Claims



1. An optical disk pickup device, comprising:

a semiconductor laser for emitting a laser beam;

an optical waveguide for propagating said laser beam;

an output grating coupler for focusing said propagated beam through said optical waveguide onto one point of an optical disk;

an input grating coupler for coupling a beam reflected and diffracted from said optical disk into said optical waveguide, wherein said input grating coupler includes a focus error signal detection part and two tracking error signal detection parts disposed at the outside thereof;

photodiodes for detecting a focused beam from said input grating coupler;

wherein

said photodiodes comprise a 3-piece-divided photodiode for detecting readout signals and focus error signals, and a 2-piece divided photodiode for detecting tracking error signals;

said optical waveguide, said output grating coupler, said input grating coupler, and said photodiodes are integrated on the surface of a slab substrate; and

the grating pattern of said output grating coupler is expressed as the following equation

$$N\sqrt{(x+c)^2 + (y+r_1)^2} - \sqrt{x^2 + y^2 + f^2} = m\lambda + N\sqrt{c^2 + r_1^2} - f$$

where:

N represents the refractive index of the optical waveguide;

x represents the abscissa of a coordinate system;

y represents the ordinate of a coordinate system;

c represents the distance of an output grating coupler and an input grating coupler from the y axis;

r<sub>1</sub> is the distance between semiconductor laser and the output grating coupler;

f represents the distance between an optical disk D and the optical pickup device;

m represents an integer; and

λ represents the wavelength of the laser beam.

5,481,517

## TRACK JUMP CONTROL MEANS FOR A DISK APPARATUS

Kyosuke Yoshimoto; Yoshiki Nakajima; Kimiyuki Koyanagi; Osamu Ito, all of Amagasaki; Akira Mashimo, Tokorozawa; Hiroyuki Onda, Hoya; Yutaka Kobayashi, Musashino, and Koji Yamana, Setagaya, all of Japan, assignors to Mitsubishi Electric Corporation, and Teac Corporation, Japan

Continuation of Ser. No. 788,554, Nov. 6, 1991, abandoned.

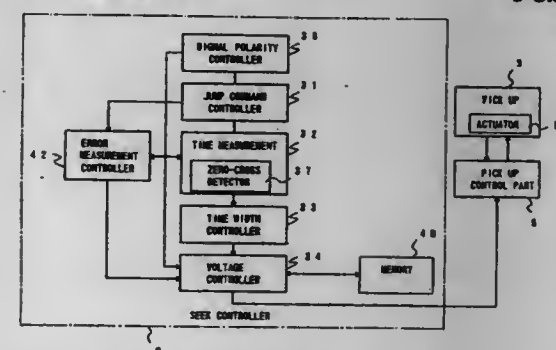
This application Jul. 16, 1993, Ser. No. 93,440

Claims priority, application Japan, Nov. 9, 1990, 2-305784

Int. Cl.<sup>6</sup> G11B 7/00

U.S. Cl. 369-44.28

8 Claims



8. A disk drive apparatus comprising:

a pickup means for tracing a track on a disk, said pickup means performing a track jump in which said pickup moves from one track to an adjacent track, said track jump comprising a track jump operation during which a jumping voltage is applied to said pickup means and a braking operation during which a braking voltage is applied to said pickup means;

rotation control means for rotating the disk;

signal processing means for controlling the focus and tracking of said pickup means;

moving time measurement means, said moving time measurement means comprising means for establishing a fixed time period for carrying out a track jump operation, said moving time measurement means further comprising means for measuring the moving time between a time when said pickup means begins a track jump from a given track and a time when it has moved to a border of an adjacent track;

position detecting means for detecting a position of said pickup means when a braking operation has ended;

jumping voltage value setting means for determining, on the basis of a comparison of the fixed time period and the moving time, a value of a jumping voltage that will move said pickup means from the given track to the adjacent track in a moving time corresponding to the fixed time period so that the moving time becomes similarly fixed;

braking voltage value setting means for determining, on the basis of the measurement results of the position detecting means, a value of a braking voltage that, when applied for a fixed period of time, will halt movement of said pickup means at a desired tracking error amount level;

5,481,518

## MULTICHANNEL DIGITAL-SIGNAL REPRODUCING APPARATUS FOR SWITCHING ACCESS TIMING RELATIVE TO REPRODUCING TIMING

Motokazu Kashida, Musashino; Hidenori Hoshi, Yokohama; Kenichi Nagasawa, Kawasaki, and Shinichi Yamashita, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 27,583, Mar. 5, 1993, abandoned,

which is a continuation of Ser. No. 369,690, Jun. 21, 1989,

abandoned. This application Sep. 16, 1994, Ser. No. 307,047

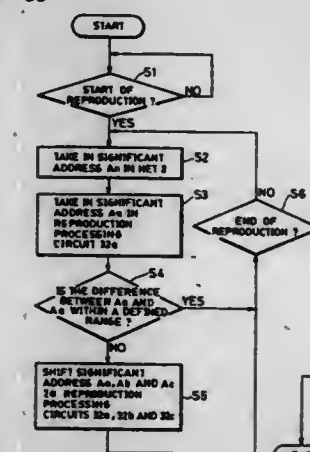
Claims priority, application Japan, Jun. 28, 1988, 63-159926;

Sep. 14, 1988, 63-230921

Int. Cl.<sup>6</sup> G11B 20/10

U.S. Cl. 369-53

5 Claims



1. An apparatus for reproducing digital information from a recording medium having a plurality of a parallel tracks and digital information recorded thereon as n-channel, n being greater than or equal to 2, digital signals, said apparatus comprising:

n reproducing heads for reproducing the n-channel digital signals;

storage means for storing digital information within the digital signals which said n reproducing heads reproduce;

access means for accessing said storage means in order to perform a predetermined processing of the digital information stored in said storage means;

comparison means for comparing write addresses of said digital information reproduced by said n reproducing heads in said storage means with access addresses to said storage means by said access means; and

address shift means for shifting the write addresses of said digital information reproduced by said n reproducing heads in said storage means in accordance with an output of said comparison means, said address shift means shifting the write addresses in said storage means corresponding to one unit of digital information for n tracks.



5,481,519

# METHOD FOR RECORDING, REPRODUCING AND MANAGING FILE DATA ON A RECORDING MEDIUM

Hideki Hosoya, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 770,337, Oct. 3, 1991, abandoned.

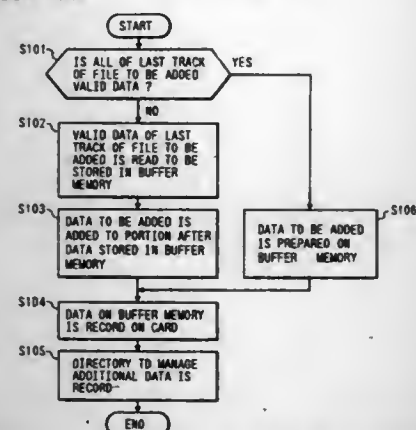
This application Feb. 8, 1994, Ser. No. 193,619

Claims priority, application Japan, Jan. 3, 1990, 2-263774

Int. Cl.<sup>6</sup> G11B 7/00

U.S. Cl. 369—58

5 Claims



1. A method of recording file data on a non-rewritable recording medium and reproducing the file data recorded on the recording medium, the recording medium having a directory region, on which a directory for managing the file data is recorded, and a file data region, on which the file data is recorded, said method comprising the steps of:

recording file data on the file data region such that the file data is sequentially recorded every recording unit, each recording unit having a predetermined data capacity and being arranged on the file data region;

recording a directory for managing the recorded file data on the directory region;

detecting, when new file data is to be added into the recorded file data on the file data region to form a series of file data, whether there is a recording unit in which an amount of data recorded thereon during said file data recording step is smaller than the predetermined data capacity;

reproducing file data of the recording unit in which the amount of the recorded file data thereof is smaller than the predetermined capacity, detected in said detecting step, and storing the file data of the detected recording unit;

recording additional file data by adding the new file data to the file data stored at said reproducing step such that the additional file data is sequentially recorded on respective different recording units in the file data region;

recording an additional directory for managing the additional file data on the directory region; and

reproducing the file data and the additional file data both recorded on the file data region without reproducing the recording unit detected in said detecting step, when a series of data files comprising the file data and the additional file data is to be reproduced by use of the directory and the additional directory.

5,481,520

# DISK PLAYER DOOR ASSEMBLY

Koichi Tokoro, Ueda, Japan, assignor to Shinano Kenshi Kabushiki Kaisha, Nagano, Japan

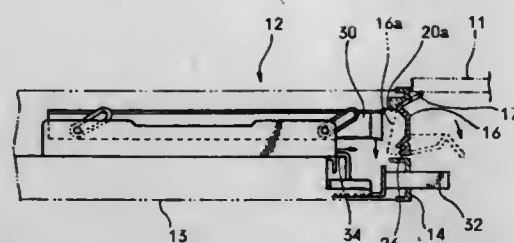
Filed Jan. 6, 1994, Ser. No. 178,404

Int. Cl.<sup>6</sup> G11B 33/02

U.S. Cl. 369—77.2

2 Claims

1. A disk player, comprising:  
a casing having an opening section, through which a disk cartridge is inserted and taken out, in a front face;



a door member being pivotally attached to said casing, said door member rotatable outside of said casing between a first position, at which said door member closes the opening section of said casing, and a second position, at which said door member opens the opening section of said casing, wherein a lower section of said door member is pivotally attached to a lower section of the opening section of said casing;

means for biasing said door member toward the first position; at least one rib disposed on a rear face of said door member; and an ejecting mechanism for moving the disk cartridge from a set position toward the door member such that when said ejecting mechanism is actuated a disk cartridge pushes said at least one rib so that the door member is opened outward and the disk cartridge can be removed from the casing;

said door member including an extended section which is extended upward and outward from an upper edge of said door member, wherein the door member is movable to open the opening section of the casing by engaging a front end of a disk cartridge with the extended section of the door member, and by pushing the extended section downward with the disk cartridge, such that the door member is opened, the disk cartridge is inserted, and the door member is closed.

5,481,521

# INFORMATION RECORDING AND REPRODUCING APPARATUS UTILIZING A TUNNELING CURRENT OR INTERATOMIC FORCES

Teruyoshi Washizawa, Atsugi, and Kunihiro Sakai, Isehara, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

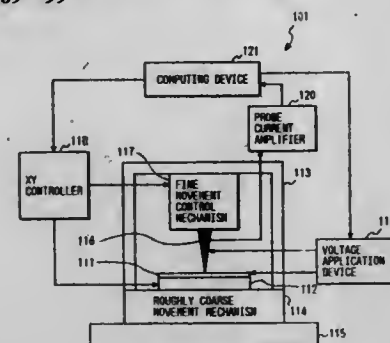
Filed Aug. 31, 1994, Ser. No. 297,911

Claims priority, application Japan, Sep. 1, 1993, 5-217393; Sep. 21, 1993, 5-234581

Int. Cl.<sup>6</sup> G11B 7/00

U.S. Cl. 369—99

2 Claims



1. An information recording and reproducing apparatus for reproducing a recording bit recorded on a surface of a recording medium by two-dimensionally scanning the surface of the recording medium with a probe, comprising:

first detecting means for detecting first data indicative of the state of the surface of the recording medium utilizing a

tunneling current or an interatomic force between the probe and the recording medium after recording of the recording bit and after scanning the surface of the recording medium;  
second detecting means for detecting second data indicative of the state of the surface of the recording medium before recording of the recording bit or in a region not containing the recording bit and for predicting predicted data indicative of the surface of the recording medium on which the recording bit is not present by using predetermined predictive parameters; and  
means for reproducing the recording bit recorded on the recording medium on the basis of the difference between the first data and the predicted data.

5,481,522

# RECORDING/REPRODUCING METHOD AND APPARATUS USING PROBE

Takahiro Oguchi, Yamato, and Kunihiro Sakai, Isehara, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

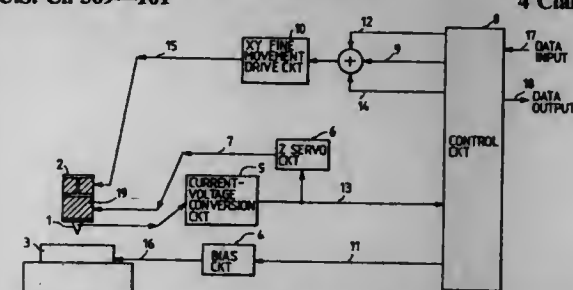
Filed Aug. 16, 1994, Ser. No. 291,676

Claims priority, application Japan, Aug. 26, 1993, 5-211779

Int. Cl.<sup>6</sup> G11B 7/00

U.S. Cl. 369—101

4 Claims



4. A recording and reproducing apparatus for writing information in the form of bits by physical interaction between a probe and a recording medium opposed to said probe, comprising:

recording means for recording information by shifting a forming position of a bit by a predetermined shift amount in a horizontal direction of said recording medium in accordance with information; and

reproducing means for reproducing said information, based on the shift amount of said recorded bit in the horizontal direction of said recording medium.

5,481,523

# GANTRY FOR POSITIONING A READ/WRITE HEAD OF A HOLOGRAPHIC INFORMATION STORAGE SYSTEM

Duane S. Dewald, Austin, Tex., assignor to Tamarack Storage Devices, Austin, Tex.

Filed Dec. 23, 1993, Ser. No. 173,368

Int. Cl.<sup>6</sup> G11B 7/00

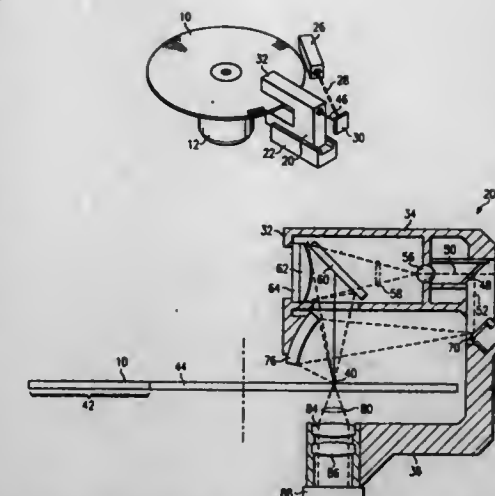
U.S. Cl. 369—103

20 Claims

1. A holographic information storage system for positioning data and reference beams onto a holographic storage media, comprising:

a gantry moveable relative to the surface of the holographic storage media;

Read/Write optics disposed within said gantry, said Read/Write optics operable to redirect a light beam onto the surface of the holographic storage media as a data beam and a reference beam during a record operation, and a reference beam only during a playback operation, said Read/Write optics during a playback operation operable to detect a reconstructed image with an associated detector;



a gantry positioning device for positioning said Read/Write optics over the holographic storage media at a select location and along a select path over the surface of the holographic storage media;

a laser for generating said light beam, said light beam being a coherent light beam, said laser fixed relative to said gantry; and

light beam directing optics for directing said light beam from said laser along said select path such that said light beam enters said gantry at substantially the same angle and location for all points along said path.

5,481,524

# DIFFRACTION ELEMENT AND OPTICAL PICK-UP ASSEMBLY

Akira Ueno, Katano; Hideyuki Nakanishi, Kyoto; Hideo Nagai, Takatsuki, and Akio Yoshikawa, Ibaraki, all of Japan, assignors to Matsushita Electronics Company, Osaka, Japan

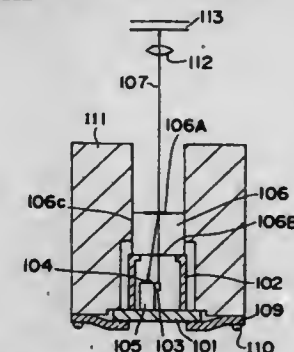
Filed Jan. 29, 1993, Ser. No. 11,311

Claims priority, application Japan, Jul. 27, 1992, 4-199418

Int. Cl.<sup>6</sup> G11B 7/135

U.S. Cl. 369—112

9 Claims



1. A diffraction element comprising:

a light splitting means for dividing a beam of light propagating in a predetermined direction along an optical path and incident thereon into a principal light beam and at least two auxiliary light beams;

a light separating means for displacing the light propagating along the optical path and incident thereon from the optical path;

a one-piece block of material transparent to the light, said one-piece block having a main body including opposite portions in which said light splitting means and said light separating means are formed in alignment with one another along an optical axis coincident with the optical path, and at least one projection extending from the main body, said at least one projection including a peripheral wall, at least portions of the surface of the peripheral wall being coincident with a circle



coaxial with the optical axis along which the light splitting means and light separating means are aligned such that the peripheral wall will slide along and guide the diffraction element when rotated against a cylindrical surface of a diameter substantially the same as that of the circle.

5,481,525

**PULSE TRAIN CONDITION/HEAT SHUT OFF CONDITION DETERMINATION METHOD AND APPARATUS FOR OPTICAL RECORDING, AND OPTICAL RECORDING METHOD AND APPARATUS**

Jun Salto, Tokyo, and Shinichi Kurita, Yokohama, Japan, assignors to Nikon Corporation, Tokyo, Japan

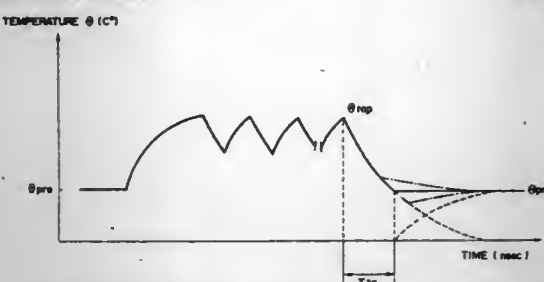
Filed Oct. 19, 1993, Ser. No. 137,984

Claims priority, application Japan, Jan. 21, 1992, 4-282105; Jan. 21, 1992, 4-282106; Sep. 20, 1993, 5-232634

Int. Cl.<sup>6</sup> G11B 7/125

U.S. Cl. 369-116

4 Claims



1. In an optical recording method in which an intensity of a laser beam to be radiated onto an optical recording medium is raised from an intensity  $P_{pre}$  for maintaining a pre-heat state, in which a temperature of the medium surface becomes a predetermined temperature, to an intensity  $P_{w1}$  higher than  $P_{pre}$ , after  $P_{w1}$  is maintained for a time  $T_{w1}$ , the intensity is reduced to an intensity  $P_{LT}$  lower than  $P_{w1}$ , and thereafter, the laser beam is intensity-modulated between  $P_{LT}$  and an intensity  $P_{w2}$  higher than  $P_{LT}$ ,  $P_{w2}$  being maintained for a time  $T_{w2}$ , so as to form a mark on said optical recording medium,

the improvement characterized in that by controlling at least one of  $P_{w2}$ ,  $P_{LT}$ , and  $T_{w2}$ , a medium temperature, after an elapse of  $T_{w1}$ , at a peak temperature position or a spot center position of the laser beam radiated onto the medium surface, becomes equal to a medium temperature after an elapse of  $T_{w2}$ .

5,481,526

**TRACKING ADJUSTMENT USING THE SUM OF THE MAXIMUM AND MINIMUM TRACKING ERROR SIGNALS OR THE MEAN VALUE OF THE SUM**

Nagata Shizuo; Suzuki Yasuhiro; Tabata Tutomu, and Takahashi Masahiro, all of Tokyo, Japan, assignors to Oki Electric Industrial Co., Ltd., Tokyo, Japan

Division of Ser. No. 112,655, Aug. 27, 1993, Pat. No.

5,351,224, which is a continuation of Ser. No. 665,231, Mar. 6, 1991, abandoned. This application Jun. 28, 1994, Ser. No. 266,719

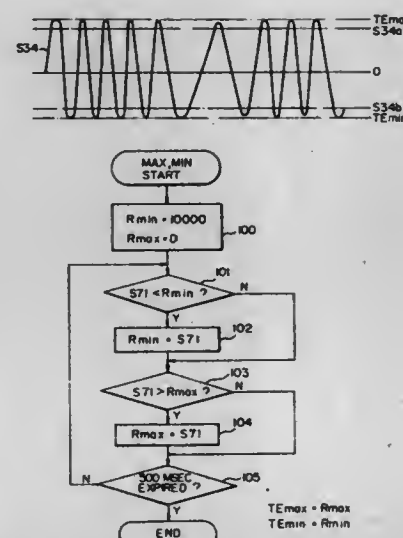
Claims priority, application Japan, Mar. 8, 1990, 2-57068; Mar. 8, 1990, 2-57069; Mar. 9, 1990, 2-59482

Int. Cl.<sup>6</sup> G11B 7/00; 7/09

U.S. Cl. 369-124

5 Claims

1. A tracking offset adjusting device comprising: an optical pickup, said optical pickup emitting a light beam onto a recording medium and outputting, in response to a reflection from said medium, a first and a second signal for controlling a focusing servo and a tracking servo, respectively; a signal generator, said signal generator generating a focus error signal and a tracking error signal in response to said first signal and said second signal, respectively;



a driver, responsive to said signal generator, for outputting a first and a second drive current assigned to focusing and tracking, respectively; an actuator, said actuator moving said optical pickup in a focusing direction and a tracking direction by said first drive current and said second drive current, respectively; and an adjuster, said adjuster detecting the maximum and the minimum of said tracking error signal at the beginning of focusing servo and adjusting an offset of said second signal on the basis of a sum of the maximum and the minimum of said tracking error signal.

5,481,527

**INFORMATION PROCESSING APPARATUS WITH FERROELECTRIC REWRITABLE RECORDING MEDIUM**

Yuji Kasanuki, Isehara; Haruki Kawada, Yokohama, and Yoshihiro Yanagisawa, Isehara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

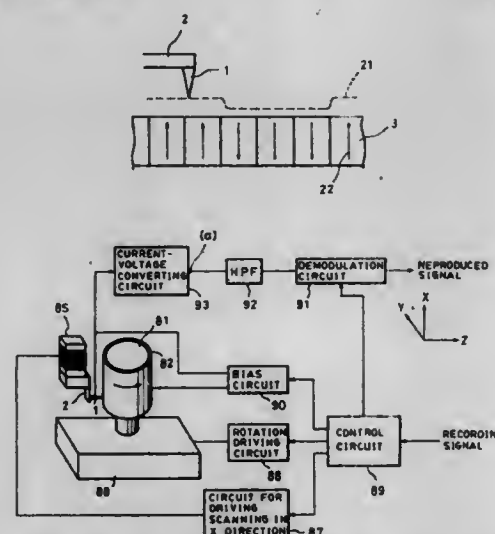
Filed Mar. 10, 1993, Ser. No. 29,057

Claims priority, application Japan, Mar. 31, 1992, 4-103797

Int. Cl.<sup>6</sup> G11B 9/00; G11C 11/22

U.S. Cl. 369-126

13 Claims



1. An information processing apparatus which reproduces information by detecting a force acting between an information reading probe and a surface of a recording medium, comprising: means for applying a voltage between the probe and the recording medium; and

displacement detecting means for detecting the force acting between the recording medium and the probe, wherein said recording medium includes a substrate electrode and a ferroelectric material layer provided thereon and said force is an electrostatic force.

5,481,528

**INFORMATION PROCESSOR AND METHOD USING THE INFORMATION PROCESSOR**

Ken Eguchi, Yokohama; Osamu Takamatsu, Atsugi, and Etsuro Kishi, Sagami-hara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1993, Ser. No. 124,002

Claims priority, application Japan, Sep. 25, 1992, 4-279300; Jul. 27, 1993, 5-203708

Int. Cl.<sup>6</sup> G11B 9/00

U.S. Cl. 369-126

28 Claims



1. An information processor for use with a recording medium that has a recording layer, said information processor comprising: a substrate electrode in the recording medium, on which the recording layer is formed, the recording layer having a maximum difference in surface level of a  $1 \times 1 \mu\text{m}$  surface region of 1 nm or less;

at least one probe electrode disposed near the recording medium and having a tip, the tip of said at least one probe electrode having a radius of curvature in the range of 0.1  $\mu\text{m}$  or greater; at least one of (i) a circuit for applying an information recording pulse voltage between said at least one probe electrode and the recording medium to effect information recording on the recording medium, and (ii) a circuit for applying an information reproducing bias voltage between said at least one probe electrode and the recording medium to effect information reproducing from the recording medium; and means for controlling the distance between a surface of the recording medium and the tip of said at least one probe electrode.

5,481,529

**SCANNING PROBE MICROSCOPE FOR OBSERVING A SAMPLE SURFACE WHILE APPLYING AN AC BIAS VOLTAGE BETWEEN THE SAMPLE AND A PROBE**

Kiyoshi Takimoto, Isehara; Hisaaki Kawade, Yokohama; Etsuro Kishi, Sagami-hara, and Koji Yano, Zama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1994, Ser. No. 195,196

Claims priority, application Japan, Feb. 17, 1993, 5-027903; Jan. 28, 1994, 6-008524

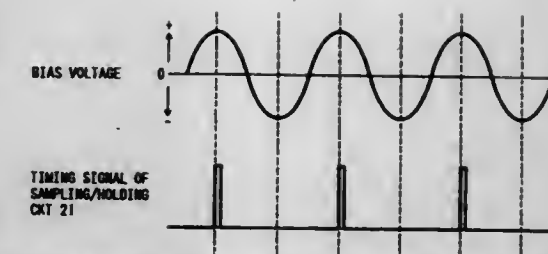
Int. Cl.<sup>6</sup> G11B 9/00; H01J 37/285

U.S. Cl. 369-126

8 Claims

1. A scanning probe microscope for observing a surface of a sample while applying a voltage between a probe and the sample, including:

a probe; scanning means for causing said sample and said probe to scan relative to each other; means for applying an AC bias voltage between said sample and said probe when the relative scanning between said probe and said sample is effected by said scanning means; and



means for detecting an electric current flowing between said sample and said probe at a predetermined phase point of said AC bias voltage; the surface of said sample being observed on the basis of said detected electric current.

5,481,530

**HIGH DENSITY OPTICAL RECORDING METHOD AND RECORDING MEDIUM**

Chiga Ueda, Tokyo; Hidemi Yoshida, Atsugi, and Masaaki Mizuno, Yokohama, all of Japan, assignors to Mitsubishi Chemical Corporation, Japan

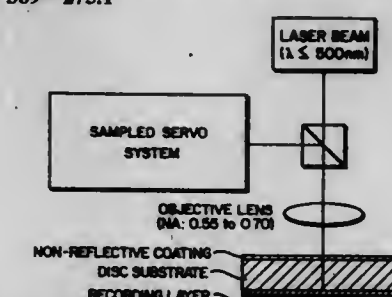
Filed Oct. 18, 1993, Ser. No. 136,677

Claims priority, application Japan, Jan. 20, 1992, 4-281967

Int. Cl.<sup>6</sup> G11B 7/24

U.S. Cl. 369-275.1

15 Claims



1. An optical recording method of conducting recording/reading out for information by irradiating a laser beam at a wavelength of not more than 500 nm onto a recording layer of an optical disc comprising a disc substrate and a recording layer, and having a track pitch of not less than 0.4  $\mu\text{m}$  and less than 0.9  $\mu\text{m}$ , a recording area for information recording on the disc substrate being a flat area not having a guide groove for each track, and the disc substrate having an in-plane birefringence of not more than  $20 \times 10^{-6}$  and a vertical birefringence of not more than  $300 \times 10^{-6}$ .

the laser beam being incident from a disc substrate side of the optical disc using an objective lens having numerical aperture of 0.55 to 0.70.

5,481,531

**OPTICAL DISK APPARATUS FOR RECORDING/ERASING INFORMATION IN THE M-CAV FORMAT BY USING GAIN SWITCHING TO INCREASE THE SPEED OF THE MASTER CLOCK**

Mikio Yamamuro, Zushi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 22, 1994, Ser. No. 310,485

Claims priority, application Japan, Sep. 24, 1993, 5-238438

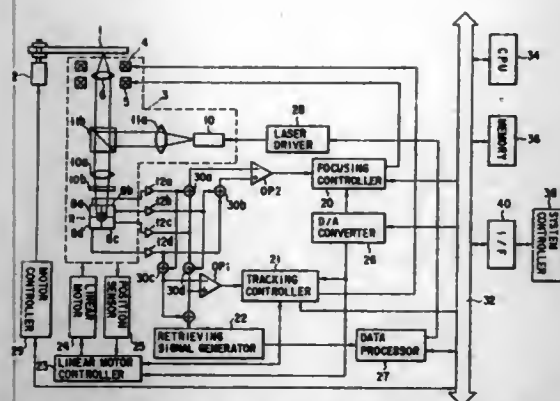
Int. Cl.<sup>6</sup> G11B 7/13

U.S. Cl. 369-275.3

7 Claims

1. An optical disk apparatus for recording data onto an optical disk having a plurality of substantially concentric tracks which are divided into a plurality of zones arranged in a radial direction of the disk, each zone being divided into the same number of sector





regions each used as a unit area and each sector region having a different assigned frequency at which its data are read, said apparatus comprising:

- data-generating means for generating data to be recorded;
- beam-generating means for generating a light beam;
- drive means for rotating an optical disk at a constant speed;
- beam-focusing means for focusing the light beam onto a track of the optical disk, detecting the light beam reflected from the track, and reproducing signals from the light beam reflected from the track;
- signal-detecting means for detecting a data clock signal from the signals reproduced;
- position-detecting means for detecting a start position of a sector region of the optical disk from the signals reproduced, generating a sector-start signal, and, in response to the sector-start signal, demodulating data obtained from the signals reproduced using the data clock signal;
- zone-switching detecting means for detecting, from the data reproduced, that the optical disk apparatus currently reading a first zone of the plurality of zones of the optical disk has been switched to begin reading a second zone of the plurality of zones of the optical disk, thereby generating a zone-switching signal, and generating a frequency-setting signal representing a frequency assigned to the second zone;
- a reference clock source for providing a reference clock signal;
- a phase-locked loop circuit for setting a frequency in accordance with the frequency-setting signal, generating a master clock signal having a frequency set by the reference clock signal input, and switching a gain of the phase-locked loop circuit to acquire a new response characteristic for the phase-locked loop circuit;
- gain-switching means for switching the gain of said phase-locked loop circuit in response to the zone-switching signal and the sector-start signal, thereby generating the master clock signal having the frequency set by said phase-locked loop circuit; and
- data-modulating means for modulating data into record signals by using the master clock signal generated by said phase-locked loop circuit, modulating the light beam generated by said beam-generating means by using the record signals, and applying the light beam onto the optical disk to write the data into the sector region of the optical disk.

5,481,532

#### MOBILE TELECOMMUNICATIONS DEVICE AND SERVICE

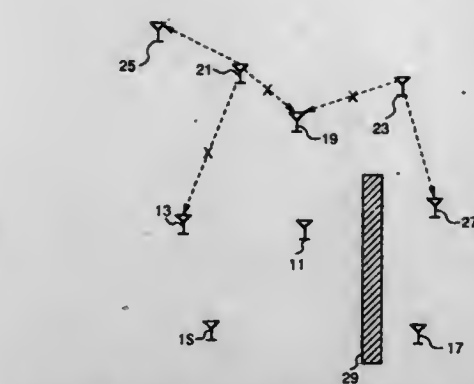
Amer A. Hassan, Cary, N.C.; John E. Hershey, Ballston Lake, N.Y.; Howard L. Lester, Alplaus, N.Y., and Charles M. Puckette, Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 29, 1994, Ser. No. 267,347  
Int. Cl.<sup>6</sup> H04J 3/26

U.S. Cl. 370-16

4 Claims

1. A method of transmitting information over a mobile and fixed radio network having a plurality of transceivers, each with a unique internal ID number, comprising the steps of:



- a) obtaining message information desired to be transmitted;
- b) determining a destination identification number (ID) for a destination transceiver desired to receive information packet;
- c) creating a message packet having a message ID, the destination ID, the message information, and error detection bits;
- d) broadcasting the message packet from an initiating transceiver to transceivers within range;
- e) for each transceiver receiving the broadcast:
  1. checking the error detection bits for errors in the received message packet, and sending an acknowledgment signal if received with no errors;
  2. identifying if the message is a valid message packet, a valid message packet being one which was received without errors, has not expired and has a message ID which does not match stored message IDs;
  3. comparing the destination ID to the internal ID of the transceiver receiving the broadcast;
  4. storing and utilizing valid message packets which have destination IDs which match the internal ID of the transceiver receiving the broadcast, and
  5. re-broadcasting the valid message packets to other transceivers within range.

5,481,533

#### HYBRID INTRA-CELL TDMA/INTER-CELL CDMA FOR WIRELESS NETWORKS

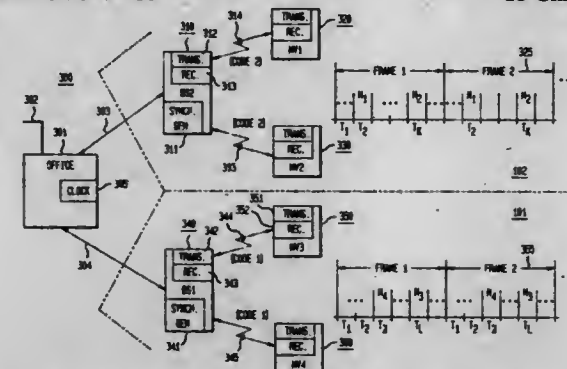
Michael L. Honig, Bloomfield, and Upamanyu Madhow, Morristown, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed May 12, 1994, Ser. No. 241,928

Int. Cl.<sup>6</sup> H04B 7/20; H04J 13/04; H04L 27/30

U.S. Cl. 370-18

18 Claims



1. A method for communicating in a cellular communication network composed of a plurality of base stations homing on a central switching office, each of the base stations serving a plurality of mobile units, the method comprising the steps of:
  - generating TDMA time slots in each of the base stations and the mobile units,
  - synchronizing the TDMA time slots generated in the base stations and the mobile units by propagating a synch signal from the office to each of the base stations and, in turn, to the corresponding mobile units,

assigning a CDMA code from a set of CDMA codes to each cell, assigning each of the mobile units to one of the TDMA time slots,

for downlink communication from an uplink base station to a downlink mobile unit,

sending an outgoing information signal from the office to the uplink base station,

converting the outgoing information signal in the uplink base station to an outgoing CDMA coded signal corresponding to the CDMA code assigned to the cell containing the uplink base station, and

propagating the outgoing CDMA coded signal to the downlink mobile unit in the TDMA time slot assigned to the downlink mobile unit,

for uplink communication from a downlink mobile unit to an uplink base station,

converting an incoming information signal in the downlink mobile unit to an incoming CDMA coded signal corresponding to the CDMA code assigned to the cell containing the uplink base station,

propagating the incoming CDMA coded signal to the uplink base station in the TDMA time slot assigned to the downlink mobile unit, and

converting the incoming CDMA coded signal in the uplink base station to an incoming information signal for transmission to the office.

5,481,534

#### DATA PACKET SWITCH APPARATUS AND METHOD WITH ENHANCED CHARGE ASSESSMENT CAPABILITY

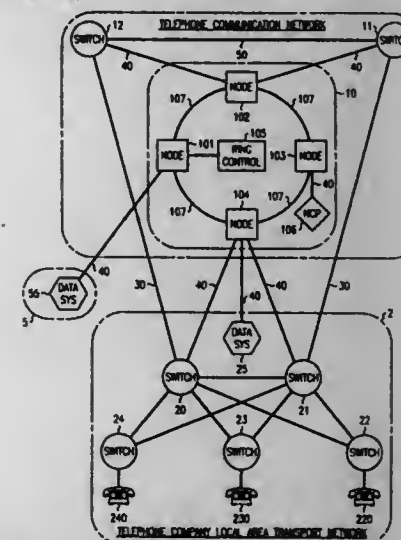
Shawn A. Beachy, Gahanna; William W. Kean, Pataskala; DeCarla J. Morgan, Reynoldsburg, and Ani A. Okafor, Columbus, all of Ohio, assignors to AT&T Corp., Murray Hill, N.J.

Filed Sep. 27, 1991, Ser. No. 766,871

Int. Cl.<sup>6</sup> H04L 19/56

U.S. Cl. 370-60

16 Claims



10. A method of operating apparatus for implementing transport and enhanced services for telephone local access transport area data systems and switching systems connected by data links with nodes of the apparatus comprising steps of:

- receiving data packets at the nodes from at least one of originating data systems and switching systems and recording requests therein for transport of data packets to a destination system and an enhanced service of a switching system for interconnection information required to control the switching systems to interconnect calling and called parties in accordance with the requests, and
- assessing charges at the node for use of the apparatus based on received data packets in accordance with transport and

enhanced service requests and identify of said at least one, and accumulating a total of said charges at a central processor incurred by said at least one to be billed to the telephone local access transport area for data packet use of the apparatus, transporting ones of the data packets to the destination system and generating other data packets identifying interconnection information required to control telephone local access transport area switching systems to interconnect the calling and called parties in accordance with the requests and transmitting the generated data packets over the data links to the telephone local access transport area switching systems.

5,481,535

#### DATAGRAM MESSAGE COMMUNICATION SERVICE EMPLOYING A HYBRID NETWORK

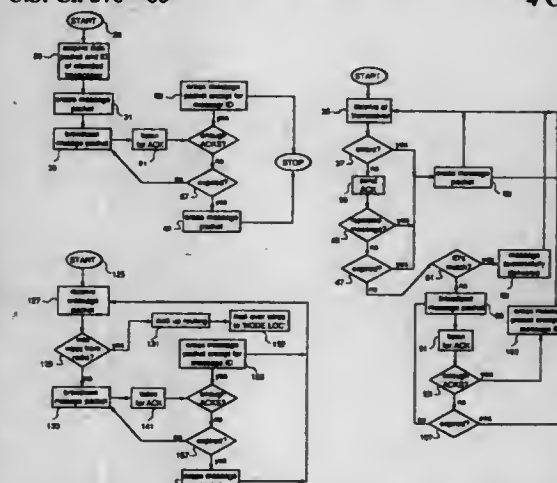
John E. Hershey, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 29, 1994, Ser. No. 267,348

Int. Cl.<sup>6</sup> H04L 12/56

U.S. Cl. 370-60

4 Claims



1. A method of transmitting information over a hybrid network having a plurality of transceivers, bridge transceivers and a wired network with wired nodes, each with a unique internal ID number, comprising the steps of:

- a) obtaining message information desired to be transmitted;
- b) determining a destination identification number (ID) for a destination unit intended to receive information packet;
- c) looking up a NODE LOC code from a predetermined list of wired nodes identifying a wired node closest to the intended destination unit;
- d) creating a message packet having a message ID, the destination ID, the NODE LOC and the message information;
- e) providing the message packet to a bridge transceiver connected to the wired network;
- f) the bridge transceiver looking up the NODE LOC and routing the message packet to the node identified by NODE LOC through the wired network;
- g) the node at NODE LOC checking the destination ID with its own ID and if the IDs match, the message packet has been successfully transmitted to its intended destination unit, if the IDs do not match, broadcasting the message packet by radio signal to recipient transceivers;
- h) for each recipient transceiver receiving the broadcast:
  1. checking for errors in the received message packet, and sending an acknowledgment signal if received with no errors;
  2. identifying if the message is a valid message packet, a valid message packet being one which was received without errors, has not expired and has a message ID which does not match stored message IDs;
  3. comparing the destination ID to the internal ID of the recipient transceiver,



4. storing and utilizing valid message packets for which the destination ID matches the internal ID of the recipient transceiver, and
5. re-broadcasting the valid message packets to other recipient transceivers if the destination ID does not match the internal ID of the recipient transceiver.

5,481,536

# METHOD FOR RESTORING A PRESCRIBED SEQUENCE FOR UNORDERED CELL STREAMS IN ATM SWITCHING TECHNOLOGY

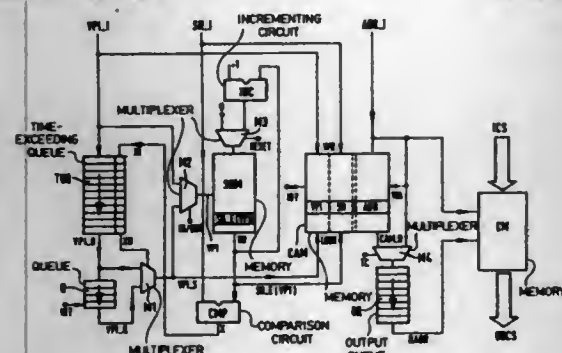
Michael Reisch, Kempton, and Klaus Ziemann, Germaring, both of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 9, 1994, Ser. No. 303,837

Claims priority, application Germany, Jan. 29, 1993, 43 37 095.0

Int. Cl.<sup>6</sup> H04J 3/26

U.S. Cl. 370-60.1



1. A method for restoring a prescribed sequence for unordered cell streams in asynchronous transfer mode (ATM) switching technology, comprising the steps of:

a first step for supplying a generally unordered cell stream to a cell memory and intermediately storing respectively one cell of said cell stream in a memory area of the cell memory addressed by an input address, the memory area being a content addressable memory;

a second step for reading a sequence number that is expected for a connection having a path identifier of the respective cell, from a sequence number memory, and checking said sequence number to determine if a magnitude of a difference between an expected sequence number and said sequence number of the respective cell is greater than a prescribed range value;

a third step for effecting an indication of a range transgression error, an elimination of the cell, and an entry of a set marking bit into a time-exceeding queue, when said magnitude is greater than the prescribed range value;

a fourth step for entering the input address into the content addressable memory, entering a path identifier of the respective cell into the content addressable memory and into the time-exceeding queue, entering the sequence number of the respective cell into the content addressable memory, and entering a marking bit that is not set into the time-exceeding queue if the range value is not transgressed;

a fifth step for reading a path identifier and an appertaining marking bit from a top of the time-exceeding queue and determining if the marking bit is set;

a sixth step for setting a current path identifier used for addressing the sequence number memory equal to the path identifier from the time-exceeding queue if the marking bit is not set, or alternatively, beginning a new cell cycle if a further queue is empty or, if the further queue is not empty and the marking bit is set, setting the current path identifier equal to a path identifier that is at a top of the additional queue;

a seventh step for seeking an entry in the content addressable memory which has the current path identifier and the appertaining expected sequence number from the sequence number memory, and generating a hit signal when said entry is

present; an eighth step for indicating a cell loss error, incrementing the respective expected sequence number in the sequence number memory by one and entering the current path identifier into the further queue when the hit signal indicates no hit;

a ninth step for reading out an address from the sought entry in the content addressable memory into an output queue if a hit signal is present, and incrementing the respective expected sequence number in the sequence number memory by one; and

a tenth step for reading out a read address from the output queue and addressing a cell of the cell memory to be read out with said read address and, subsequently, starting a new cell cycle if necessary.

5,481,537

# TRANSMISSION SIGNALLING TECHNIQUE FOR A RESERVATION REQUEST

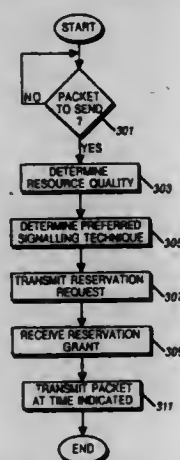
Kenneth J. Crisler, 2116 Kentucky Ct., Wheaton, Ill. 60187, and Michael L. Needham, 354 W. Hellen Rd., Palatine, Ill. 60067

Filed Mar. 31, 1994, Ser. No. 221,138

Int. Cl.<sup>6</sup> H04B 7/204

U.S. Cl. 370-84

15 Claims



6. A method comprising the steps of: receiving a reservation request for allocation of a communication resource; determining from the reservation request a preferred signalling technique; transmitting a reservation grant according to the preferred signalling technique.

5,481,538

# FRAME REMOVAL MECHANISM FOR TOKEN RING NETWORKS USING ONE OR MORE START STRIP DELIMITER FRAMES OR CIRCULATION TIME INTERVAL

Henry S. Yang, Andover; K. K. Ramakrishnan, Maynard, and Barry Spinney, Wayland, all of Mass., assignors to Digital Equipment Corp., Maynard, Mass.

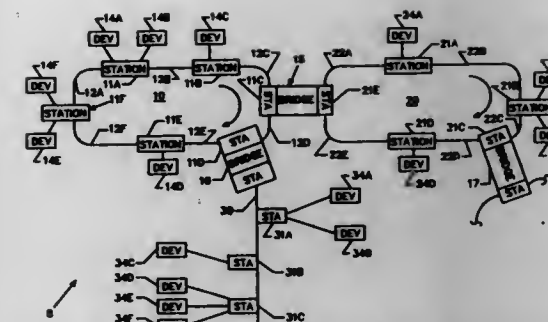
Continuation of Ser. No. 546,618, Jun. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 483,296, Feb. 20, 1990, abandoned, which is a continuation of Ser. No. 231,773, Aug. 8, 1988, abandoned. This application Apr. 9, 1992, Ser. No. 866,958

Int. Cl.<sup>6</sup> H04L 12/46

U.S. Cl. 370-85.5

53 Claims

1. A station for connection to a computer network, comprising: transmitting means for transmitting onto the network a number of information frames, preceded by a start strip delimiter frame and followed by an end strip delimiter frame;



receiving means for receiving frames and other information from the network, and processing the received frames, including frame stripping means for stripping from the network information frames received during a time period that begins no later than when the transmitting means begins transmitting the start strip delimiter frame;

stripping termination means, for detecting the occurrence of any of a number of preselected conditions intended to terminate operation of the frame stripping means;

frame counting means, for recording the number of frames transmitted by the transmitting means and the number of frames received and stripped by the frame stripping means, wherein one of the conditions terminating stripping is that the number of frames transmitted is equal to the number of frames received and stripped; and

means for disabling the frame counting means from counting stripped frames, wherein the stripped frames are not counted until after receipt of the start strip delimiter frame, whereby any extraneous frames received prior to the start strip delimiter frame will be stripped but not counted as stripped, and the existence of any such extraneous frames does not adversely affect network performance.

5,481,539

# DATAGRAM COMMUNICATION SERVICE OVER A CELLULAR TELEPHONE NETWORK

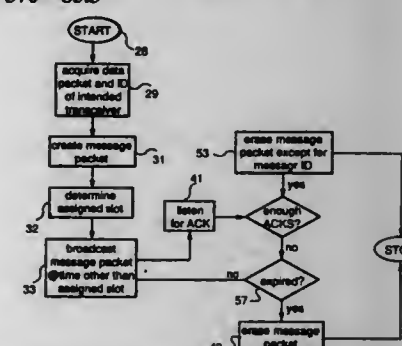
John E. Hershey, Ballston Lake, N.Y., and Amer A. Hassan, Cary, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 29, 1994, Ser. No. 267,328

Int. Cl.<sup>6</sup> H04B 7/212; 7/26

U.S. Cl. 370-85.3

3 Claims



1. A method of transmitting message information from an initiating unit to a destination unit over a time division multiple access (TDMA) mobile radio network having a plurality of mobile units, each with a unique internal identification (ID) number, comprising the steps of: a) determining a destination unit identification number (ID) for said destination unit desired to receive information packet;

b) creating a message packet having a message ID, the destination unit ID, and said message information;

c) determining a time slot assigned to said initiating unit;

d) broadcasting the message packet to recipient mobile units in a non-interfering fashion at a time period other than that assigned to said initiating unit;

e) for each recipient mobile unit receiving the broadcast:

1. checking for errors in the received message packet, and transmitting an acknowledgment signal if received with no errors,

2. identifying if the message is a valid message packet, a valid message packet being one which was received without errors, has not expired and is has an message ID which does not match stored message IDs,

3. comparing the destination unit ID to the internal ID of the recipient mobile unit for the message if it is a valid message packet,

4. storing and utilizing valid message packets which the destination unit ID matches the internal ID of the recipient mobile unit,

5. determining a time slot assigned to this recipient mobile unit if the message is a valid message packet, and

6. re-broadcasting the message packet to other recipient mobile units in a non-interfering fashion at a time period other than that assigned to this recipient mobile unit if the message is a valid message packet.

5,481,540

# FDDI BRIDGE FRAME LEARNING AND FILTERING APPARATUS AND METHOD

Gang Huang, Middletown, N.J., assignor to AT&T Corp., Murray Hill, N.J.

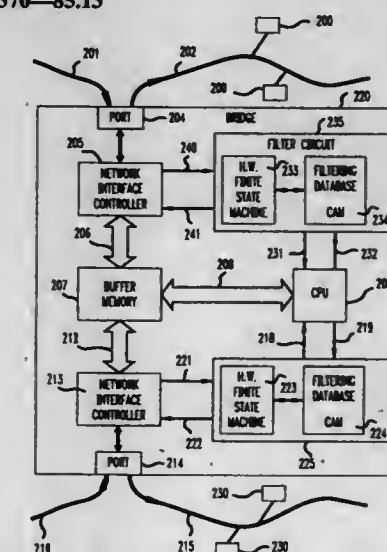
Continuation of Ser. No. 572,738, Aug. 24, 1990, abandoned.

This application Nov. 10, 1994, Ser. No. 336,887

Int. Cl.<sup>6</sup> H04J 3/02; H04L 12/28

U.S. Cl. 370-85.13

25 Claims



1. Apparatus for filtering messages on a first data network interconnecting a first plurality of stations, to identify those messages intended for stations on a second data network, each of said messages including a source address (SA) and a destination address (DA), said apparatus comprising

means including a content addressable memory (CAM) for storing the SA's for stations on said first data network;

means including a finite state machine for comparing the DA of each message with said stored SA's by applying each DA to an input of said CAM; and

means for generating a "no-match" signal in said CAM to identify messages having DA's that are different from any stored SA.



5,481,541

# METHOD OF OPERATION OF REMOTE DATA/CONTROL APPARATUS WITH CONTROLLED RESPONSE TIMING

Oded Gareh; Haim Geller, both of Tel Aviv, and Yitzhak Cohen, Yahud, all of, Israel, assignors to Motorola, Inc., Schaumburg, Ill.

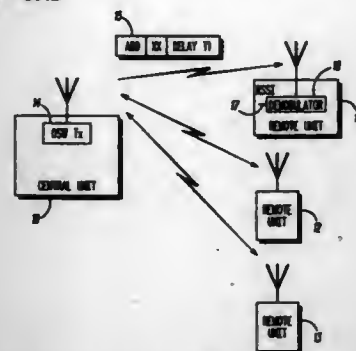
Filed Aug. 13, 1992, Ser. No. 929,321

Claims priority, application United Kingdom, Sep. 7, 1991, 9119186

Int. Cl.<sup>6</sup> H04L 12/413

U.S. Cl. 370—85.2

4 Claims



2. A method of operation of remote data/control apparatus comprising a first unit, a second unit arranged to exchange messages with the first unit over a communication channel, and a third unit arranged to exchange messages with the first unit over the communication channel, the method comprising the steps of:

- at the first unit:
  - selecting a time delay;
  - communicating to the second unit a value representing said time delay;
  - requesting a response from the second unit;
  - at the second unit:
    - monitoring the channel;
    - determining when the channel becomes free;
    - responsive to the channel becoming free at a first determined time, waiting said time delay from said first determined time;
    - responsive to the channel not being free after said time delay, determining when the channel again becomes free at a second determined time;
    - responsive to the channel becoming free at said second determined time, waiting said time delay from said second determined time; and
    - transmitting a response to the first unit delayed by said time delay after said second determined time;
  - whereby the value representing the time delay transmitted by the first unit controls timing of response from the second unit when the second unit contends for access to the channel.

5,481,542

# INTERACTIVE INFORMATION SERVICES CONTROL SYSTEM

Gary L. Logston, Tucker; Anthony J. Wasilewski, Alpharetta; Timothy H. Addington, Roswell, and William E. Wall, Jr., Atlanta, all of Ga., assignors to Scientific-Atlanta, Inc., Norcross, Ga.

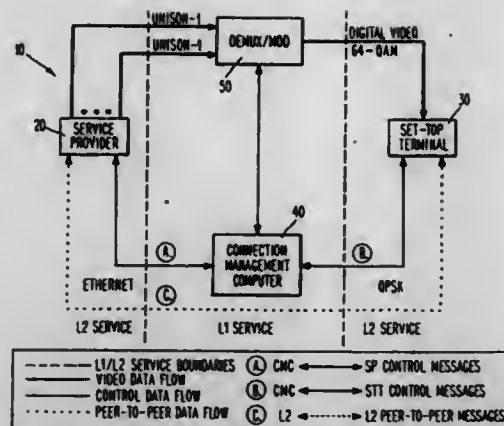
Filed Nov. 10, 1993, Ser. No. 149,929

Int. Cl.<sup>6</sup> H04N 7/173

U.S. Cl. 370—94.2

64 Claims

25. A method of providing at least one of a video, audio, and information data service from a data service provider (SP) to a customer's set top terminal (STT), comprising the step of: providing said data service from said SP to said STT via a first communications path; said STT providing presentation control commands and data to said SP via a second communications path from said STT to said SP, said first and second communications paths including a common communications link connecting at least said STT



to a headend, and said presentation control commands initiating and controlling presentation of said data service from said SP to said STT; and said SP varying, on a real-time basis, its presentation of said data service to said STT via said common communications link in response to said presentation control commands and data received from said STT via said common communications link.

5,481,543

# RATIONAL INPUT BUFFER ARRANGEMENTS FOR AUXILIARY INFORMATION IN VIDEO AND AUDIO SIGNAL PROCESSING SYSTEMS

Markus H. Veltman, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 32,341, Mar. 16, 1993, Pat.

No. 5,396,497. This application Jun. 10, 1994, Ser. No.

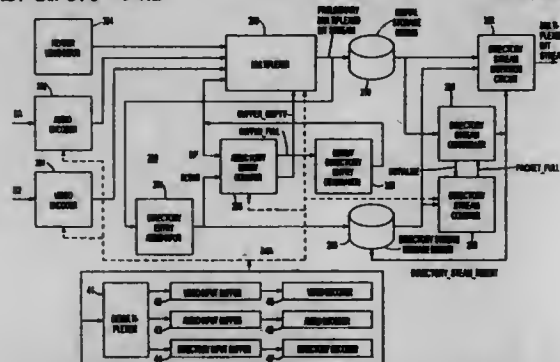
258,248

Claims priority, application Japan, Jun. 10, 1993, 5-138109

Int. Cl.<sup>6</sup> H04J 3/00; H04N 7/08

U.S. Cl. 370—94.1

31 Claims



1. A method of generating a bit stream by multiplexing non-compressed auxiliary information with an information stream, the information stream being obtained by compressing fixed-size units of an information signal with a varying compression ratio to provide varying-sized units of the information stream, the auxiliary information being for use in subsequently processing the information stream, the auxiliary information being composed of auxiliary information units, each of the auxiliary information units corresponding to one of the units of the information signal, the method comprising steps of:

- dividing the information stream in time into information stream portions;
- dividing the non-compressed auxiliary information in time into auxiliary information portions;
- interleaving the information stream portions and the auxiliary information portions to provide the bit stream; and
- controlling the information stream dividing, auxiliary information dividing, and interleaving steps by emulating decoding of the bit stream by a hypothetical system target decoder includ-

ing demultiplexer means for demultiplexing the bit stream, a serial arrangement of an information stream buffer and an information stream decoder, and a serial arrangement of an auxiliary information buffer and an auxiliary information processor, each serial arrangement being connected to the demultiplexer means, the information stream dividing, auxiliary information dividing, and interleaving steps being controlled such that the information stream buffer and the auxiliary information buffer neither overflow nor underflow.

5,481,544

# MULTI-CHANNEL BROADBAND ADAPTATION PROCESSING

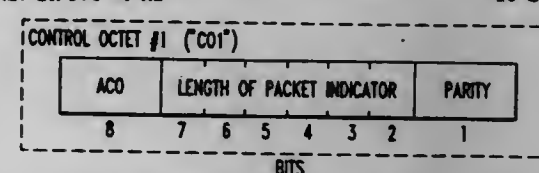
John H. Baldwin, Morristown; Bharat T. Doshi, Holmdel, and Subrahmanyam Dravida, Somerset, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Oct. 17, 1994, Ser. No. 323,997

Int. Cl.<sup>6</sup> H04J 3/12; 3/26

U.S. Cl. 370—94.1

10 Claims



1. A method for multiplexing a first user packet comprising M octets and a second user packet comprising N octets that are associated with different channels into a cell information field, said method comprising:

building a first basic control octet which comprises:

- (1) an additional control bit that indicates if a first supplemental control octet accompanies said first basic control octet,
- (2) a length indicator based on M;

building a second basic control octet which comprises:

- (1) an additional control bit that indicates if a second supplemental control octet accompanies said second basic control octet,
- (2) a length indicator based on N;

packing said first basic control octet, said first user packet, said second basic control octet and said second user packet into said information field.

5,481,545

# CONVENTIONAL NETWORK INTERFACE FOR MULTISITE RF TRUNKING SYSTEM

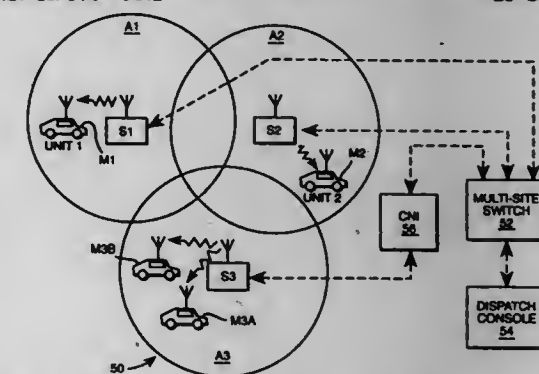
Samuel Maedjaja, and Houston H. Hughes, III, both of Lynchburg, Va., assignors to Ericsson Inc., Research Triangle Park, N.C.

Filed Aug. 26, 1991, Ser. No. 749,534

Int. Cl.<sup>6</sup> H04J 3/16

U.S. Cl. 370—95.1

23 Claims



23. A method of communicating over the air with first and second radio transceivers comprising the following steps:

(a) establishing a correspondence between a first radio transceiver and a second radio transceiver; and

(b) calling both said first radio transceiver and said second radio transceiver whenever a call is to be initiated to either of said first and second radio transceivers, including the steps of:

(1) transmitting trunking control signals to said first radio transceiver to cause said first radio transceiver to move to and begin operating on a trunked radio communications channel,

(2) transmitting receiver enabling signals to said second radio transceiver over a non-trunked radio communications channel to cause said second radio transceiver to begin actively receiving radio signals on said non-trunked radio communications channel, and

(3) transmitting common signals to said first radio transceiver over said trunked radio communications channel and to said second radio transceiver over said non-trunked radio communications channel.

5,481,546

# INTERACTIVE NATIONWIDE DATA SERVICE COMMUNICATION SYSTEM FOR STATIONARY AND MOBILE BATTERY OPERATED SUBSCRIBER UNITS

Gilbert M. Dinkins, Herndon, Va., assignor to Eon Corporation, Reston, Va.

Continuation of Ser. No. 966,414, Oct. 26, 1992, Pat. No.

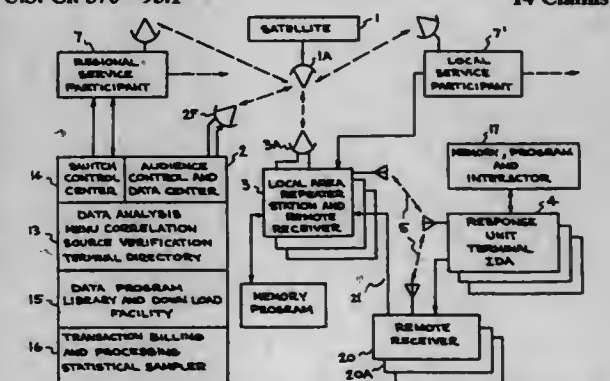
5,388,101. This application May 10, 1994, Ser. No. 240,147

The portion of the term of this patent subsequent to Feb. 7, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> H04N 7/173; H04B 7/24; H04L 12/18

U.S. Cl. 370—95.1

14 Claims



1. A base station configuration in a two-way communication interactive video network having network hub switching center means for routing communications from and to a plurality of subscriber units comprising:

subscriber units dispersed at various locations within a predetermined base station geographic area,

local base station repeater cell means for communicating with identified individual subscriber units within a local base station geographic area associated with said local base station repeater cell means, said local base station repeater cell means further comprising:

base station data processing and transmission means for transmitting to a set of said local subscriber units contained within said local base station geographic area associated with said local base station repeater cell means and receiving from a subset of said local set of subscriber units multiplexed synchronously related digital data messages of variable lengths for point-to-point communication between said local base station repeater cell means and said subset of said local subscriber units,

reception means for receiving and processing data messages from said set of local subscriber units comprising a local remote receiver disposed within one of a plurality of cell subdivision site partitioned from said local base station geographic area associated with said local base station repeater cell means, said plurality of cell subdivision sites dispersed











parison of the counter count value on the counter output signal lines with the predetermined set point value, wherein the counter output signal lines are connected to the comparator such that the internal count value of the counter is presented to the comparator in other than an integer ascending order between the two predetermined numbers; and  
d. wherein the pulse width-to-analog converter comprises means for converting the comparator output signal to an analog value.

5,481,561

### FULLY MESHEDED CDMA NETWORK FOR PERSONAL COMMUNICATIONS TERMINALS

Russell J. Fang, Potomac, Md., assignor to Comsat Corporation, Bethesda, Md.

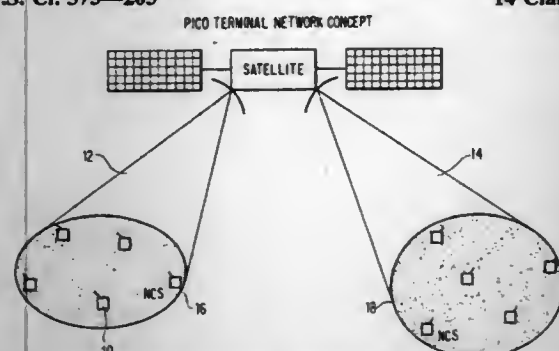
Continuation of Ser. No. 706,830, May 29, 1991, abandoned.

This application Oct. 26, 1993, Ser. No. 141,721

Int. Cl.<sup>6</sup> H04J 13/02; H04B 1/69; 1/707

U.S. Cl. 375-205

14 Claims



1. A communications system, comprising a plurality of terminals communicating with one another in a code division multiple access (CDMA) manner over a communications medium, said system including a modulator at each of said terminals for modulating signals being transmitted to another terminal in accordance with a PN code associated with communications between said each terminal and said another terminal, and a demodulator at said another terminal for demodulating received signals in accordance with said PN code, said system further comprising reference means at at least one of said plural terminals for transmitting a pilot tone to others of said terminals for controlling at least one parameter at said other terminals, and means at said other terminals for receiving said pilot tone and controlling said at least one parameter in accordance with said pilot tone, said system further comprising means for automatically periodically changing said PN codes associated with said terminals.

5,481,562

### MULTI-MODE MODEM AND DATA TRANSMISSION METHOD

Gregory Pearson, Granada Hills, Calif.; Nathan R. Melhorn, Framingham, Mass.; Michael F. Onarato, Acton, Mass., and Craig A. Richards, Wrentham, Mass., assignors to Microcom Systems, Inc., Granada Hills, Calif.

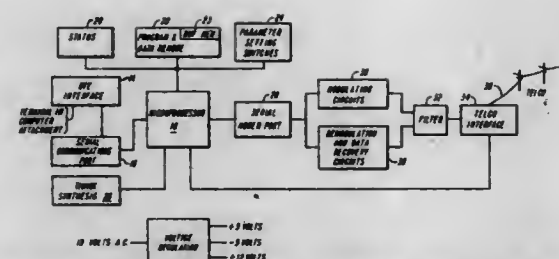
Division of Ser. No. 431,595, Nov. 3, 1989, abandoned. This application Apr. 1, 1991, Ser. No. 678,755

Int. Cl.<sup>6</sup> H04B 1/38; H04L 7/00

U.S. Cl. 375-222

4 Claims

3. A multi-mode modem for connecting between a unit of data terminal equipment and a communications medium to facilitate data telecommunications, said multi-mode modem operating as a receiving modem for receiving data transmitted across said communications medium from a second modem operating as an initiating modem, said multi-mode modem being capable of operating in a special mode or a normal mode, said multi-mode modem providing for (A) when operating in said special mode: (1) the optimized transmission of data by pacing the flow of data between



said multi-mode modem and said initiating modem, (2) the detection of errors in a transmitted data stream from said initiating modem to said multi-mode modem and (3) the automatic re-transmission of said transmitted data stream by said initiating modem when an error is detected, and (B) when operating in said normal mode the direct, non-optimized transmission of data from said initiating modem to said multi-mode modem in order to provide for the simple transmission of data without any error detection analysis of the data stream or associated automatic re-transmission of said data stream when an error is detected, said multi-mode modem comprising:

- means for receiving a transmitted stream of data characters from said initiating modem;
- detection means for detecting at least one special mode indicating character or a normal mode indicating character in said received stream of data characters;
- first timing means cooperative with said detection means, for allotting an initial first time period during which said detection means may detect in said received stream of data characters a special mode link request having a sequence of special mode indicating characters;
- second timing means, cooperative with said detection means, for providing a second time period if a portion of a special mode link request is detected by said detection means during said first time period, the second time period being for detecting additional special mode indicating characters in said received stream of data characters until a complete special mode link request is detected, or until said normal mode indicating character is detected;
- means for causing said multi-mode modem to operate in said special mode upon detecting said complete special mode link request; and
- means for causing said multi-mode modem to operate in said normal mode upon detecting said normal mode indicating character or upon the expiration of said initial and extended time period.

5,481,563

### JITTER MEASUREMENT USING A STATISTICALLY LOCKED LOOP

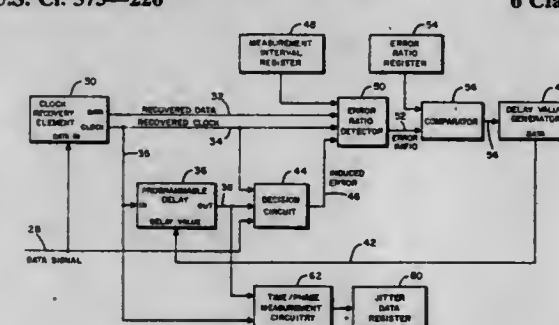
John D. Hamre, Plymouth, Minn., assignor to Network Systems Corporation, Minneapolis, Minn.

Filed Mar. 14, 1994, Ser. No. 212,216

Int. Cl.<sup>6</sup> H04L 7/00; H04B 3/46

U.S. Cl. 375-226

6 Claims



1. An apparatus for determining the jitter profile of a serial data link employing a self-clocking data signal, said apparatus comprising:

clock recovery means coupled to receive the self-clocking data signal for generating a recovered clock signal and a recovered data signal in response to said self-clocking data signal, said recovered clock signal establishing a first time to sample said self-clocking data signal;

programmable delay means coupled to receive the recovered clock signal for establishing a second time to sample said self-clocking data signal, the interval between said first and said second sampling times being a function of a delay value signal input to said programmable delay means;

first circuit means operatively connected to an output of the clock recovery means and the programmable delay means for producing an induced error signal at an output indicative of a difference of results when sampling said self-clocking data signal at said first sampling time and then at said second sampling time;

second circuit means coupled to the output of the first circuit means for producing an error ratio signal indicative of the number of said induced error signals occurring within a predetermined measurement interval;

third circuit means including means for comparing said error ratio to a predetermined error ratio reference signal, the third circuit means producing said delay value signal in response to a difference between said error ratio signal and said predetermined error ratio reference signal; and

said apparatus operating iteratively in a closed-loop manner to control said delay value signal such that said error ratio signal substantially corresponds to said predetermined error ratio reference signal.

5,481,564

### RECEIVED DATA ADJUSTING DEVICE

Mitsuo Kakushi, Yokohama; Yutaka Awata, Kawasaki; Norio Ueno; Seiji Miyoshi, both of Yokohama; Norio Murakami, Kawasaki, and Atsushi Manabe, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

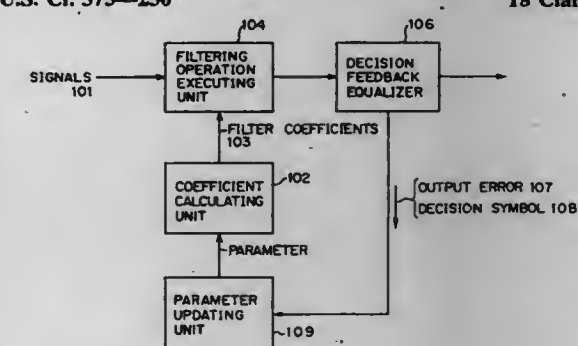
Filed Jul. 22, 1991, Ser. No. 733,983

Claims priority, application Japan, Jul. 20, 1990, 2-190683; Jul. 20, 1990, 2-190690; Jan. 9, 1990, 2-269355

Int. Cl.<sup>6</sup> H03H 7/30

U.S. Cl. 375-230

18 Claims



1. A digital adaptive equalizer for equalizing input signals through digital filtering operations by changing filtering coefficients based on a predetermined parameter characterizing the digital filtering operations, comprising:

- parameter means for supplying the predetermined parameter indicative of equalization required for the input signals;
- coefficient calculating means for calculating the filtering coefficients by using the predetermined parameter as an input to functions corresponding to the filtering coefficients; and
- filtering operation executing means for executing the digital filtering operations on the input signals based on the filtering coefficients to produce filtered signals.

5,481,565

### METHOD AND APPARATUS FOR CHANNEL EQUALIZATION

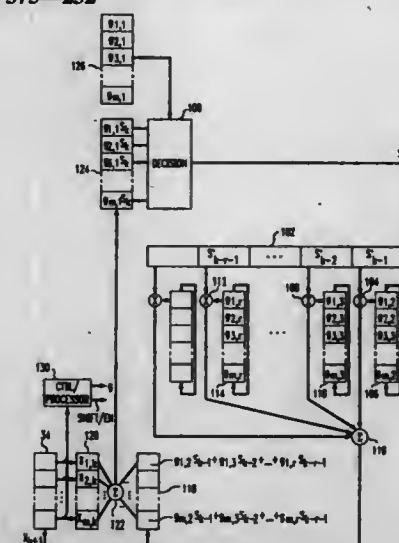
Debajyoti Pal, Middletown, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Oct. 18, 1993, Ser. No. 139,600

Int. Cl.<sup>6</sup> H03H 7/30

U.S. Cl. 375-232

9 Claims



1. A method for identifying symbols represented by a received signal from a communication channel comprising:

- sampling said received signal beginning at a first time to produce a first plurality of initial samples of a first symbol;
- sampling said received signal beginning at a second time to produce a second plurality of initial samples of a second symbol, said second time being one symbol period after said first time;
- using said first and second plurality of initial samples to produce a time averaged auto-correlation matrix;
- performing a singular value decomposition of said time averaged auto-correlation matrix to produce a diagonal matrix;
- determining a value  $r$  by comparing values along a diagonal of said diagonal matrix to identify a location along said diagonal where a ratio of adjacent values crosses a predetermined threshold;
- identifying a symbol represented by said received signal using a third plurality of samples of said received signal and a plurality of consecutive prior symbols, said plurality of prior symbols having at least  $r-1$  prior symbols, and said third plurality of samples having at least two samples being less than one symbol period apart.

5,481,566

### METHOD AND APPARATUS TO INCREASE EFFICIENCY OF SYSTEMATIC CODES

Anthony G. Kulesa, Martinsville, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Dec. 29, 1993, Ser. No. 175,008

Int. Cl.<sup>6</sup> H04L 27/00

U.S. Cl. 375-259

12 Claims

9. A digital data transmission system comprising

- encoding means for implementing a predefined systematic coding algorithm to encode blocks of information bits into codewords prior to transmission, wherein each of said codewords comprises an information word having a fixed number of information bits  $k$  concatenated with a checkword having a fixed number of check bits  $r$  thereby forming a codeword having a fixed number of bits  $n$  such that  $n=k+r$ ;
- means to truncate one check bit  $R(\text{lost})$  from said checkword to form a modified checkword having  $r-1$  check bits;











5,481,579

## LATCHING AND LIFTING MECHANISM FOR A NUCLEAR REACTOR FUEL BUNDLE

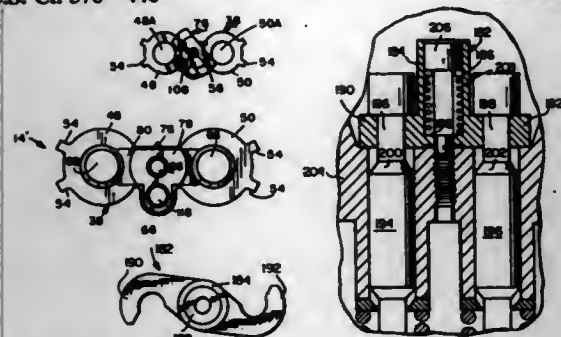
Eric B. Johansson, and Harold B. King, both of Wrightsville Beach, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 30, 1995, Ser. No. 380,587

Int. Cl.<sup>6</sup> G21C 3/33

U.S. Cl. 376-446

20 Claims



1. In a fuel bundle assembly for a nuclear reactor wherein a plurality of fuel rods and at least one water rod extend between an upper tie plate and a lower tie plate, the improvement comprising: an upper end plug secured to the at least one water rod and having a recessed portion defined by upper and lower shoulders; and a latching mechanism for securing the at least one water rod to the upper tie plate comprising a latch bar mounted on an upper surface of the upper tie plate and rotatable into and out of said recess portion in said end plug when said end plug extends above said upper surface of said tie plate upon installation of said upper tie plate on the fuel bundle assembly.

5,481,580

## METHOD AND APPARATUS FOR TESTING LONG COUNTERS

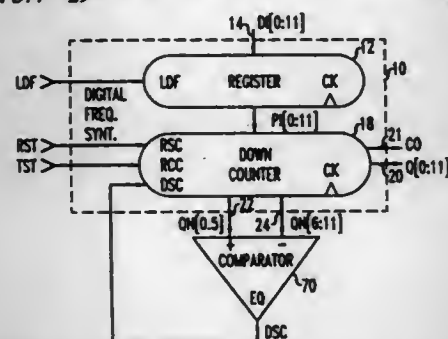
Mirosław Guzinski, Lawrenceville, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Jan. 26, 1995, Ser. No. 378,435

Int. Cl.<sup>6</sup> H03K 21/40

U.S. Cl. 377-29

6 Claims



1. A method for testing a n-bit counter (where n is an integer  $\geq 1$ ) that provides an n-bit count that runs between zero and an initial count value  $\leq 2^n - 1$ , and the counter being reconfigurable to provide first and second half-counts that are equal to each other when the counter is operating properly, the method comprising the steps of:
  - (a) resetting the counter and thereafter loading the counter with the initial count value;
  - (b) reconfiguring the counter to generate the first and second half-counts;
  - (c) comparing the first half-count to the second half-count and successively clocking the counter to change the first and second counts;
  - (d) inhibiting the counter from counting if a successive half-count is unequal to the other half-count; and
  - (e) checking whether the counter has completed counting.

5,481,581

## PROGRAMMABLE BINARY/INTERLEAVE SEQUENCE COUNTER

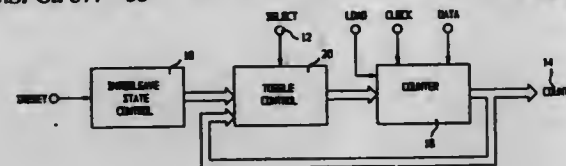
Oscar F. Jonas, Jr., Colorado Springs, Colo., assignor to United Memories, Inc., Colorado Springs, Colo., and Nippon Steel Semiconductor Corp., Chiba, Japan

Filed May 19, 1995, Ser. No. 445,058

Int. Cl.<sup>6</sup> H03K 21/02

U.S. Cl. 377-55

21 Claims



1. A counter circuit for sequential address generation comprising:
  - a mode select input;
  - a toggle control circuit responsively coupled to said mode select input;
  - an interleave state control circuit coupled to said toggle control circuit;
  - a first counter responsively coupled to said toggle control circuit and providing a sequence of count values in a progression corresponding to a select signal applied to said mode select input;
  - wherein said toggle control circuit includes logic circuits and provides control signals to said counter based on the select signal;
  - wherein said interleave control circuit includes a second counter;
  - wherein said toggle control circuit is coupled to receive a lower order count signal for use in generating a binary sequence;
  - wherein said interleave state control circuit provides interleave control signals; and
  - wherein said toggle control circuit selectively provides a signal corresponding to the lower order count signal or to the interleave control signal for use by the first counter.

5,481,582

## RAPIDLY RESETTABLE COUNTING DEVICE

Achim Ibenhal, Elmshorn, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 203,167, Feb. 28, 1994, abandoned.

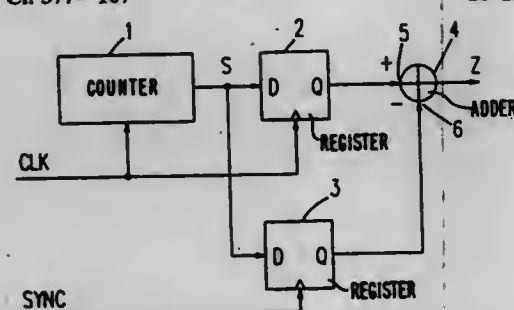
This application May 8, 1995, Ser. No. 437,247

Claims priority, application Germany, Apr. 17, 1993, 43 12 561.1

Int. Cl.<sup>6</sup> H03K 21/38

U.S. Cl. 377-107

16 Claims



1. A rapidly resettable counting device, comprising:
  - a counter for counting clock pulses in a clock signal, said counter outputting an updated sum of the clock pulses counted upon the occurrence of each clock pulse;
  - a first register clocked by said clock signal for storing the updated sum from said counter corresponding to the next previous clock pulse upon the occurrence of each clock pulse;

- a second register clocked by a recurrent reset signal for storing the updated sum from said counter corresponding to the next previous clock pulse occurring prior to said reset signal, the updated sum remaining stored in said second register until the occurrence of a subsequent reset signal; and
- a subtraction device clocked by said clock signal for subtracting the sum in the second register from the sum in the first register upon the occurrence of each clock pulse, the result of said subtraction being the output of said counting device, whereby (i) on the next clock pulse after a reset signal the sum in the second register and the sum in the first register are equal and (ii) the output of said clocking device is reset in one clock signal without resetting of said counter.

5,481,583

## HIGHER ORDER PREINTERPOLATOR FOR BACKPROJECTION

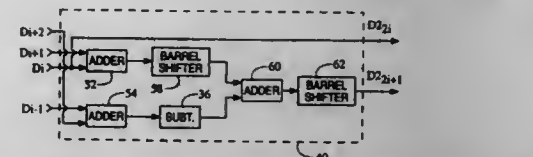
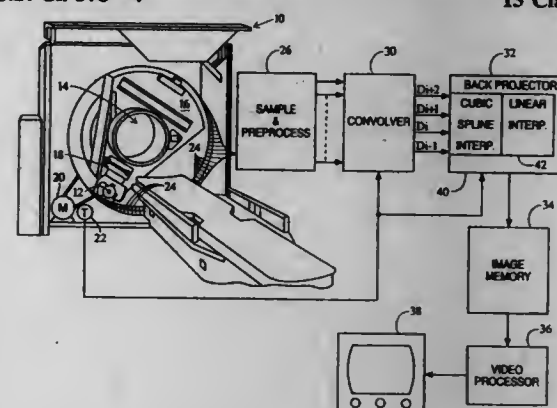
Dominic J. Heuscher, Anrora, Ohio, assignor to Picker International, Inc., Highland Hts., Ohio

Filed Aug. 24, 1994, Ser. No. 295,990

Int. Cl.<sup>6</sup> A61B 6/03; G01N 23/083; G06F 7/38

U.S. Cl. 378-4

15 Claims



1. In a CT scanner which includes a radiation source which generates a beam of radiation, a multiplicity of radiation detectors which receive radiation from the source that has traversed an examination region and converts the received radiation into electronic data, a convolver which convolves lines of the electronic data from the detectors, and a backprojector which backprojects convolved lines of data into an image memory, the improvement comprising:
  - a high order preinterpolator incorporated in the backprojector.

6. A CT scanner comprising:
  - an x-ray source;
  - a multiplicity of detectors positioned to detect radiation from the x-ray source which has traversed a portion of a subject in an examination region;
  - a convolver connected with the detectors;
  - a preinterpolator which performs a parametric cubic spline interpolation, the preinterpolator being connected with the convolver;
  - a backprojector connected with the preinterpolator; and,
  - an image memory connected with the backprojector to receive and store reconstructed images.
10. A parametric cubic-spline preinterpolator comprising:
  - a first adder which adds each received data line with an adjacent data line;
  - a second adder which adds a pair of next most adjacent data lines;

5,481,584

## DEVICE FOR MATERIAL SEPARATION USING NONDESTRUCTIVE INSPECTION IMAGING

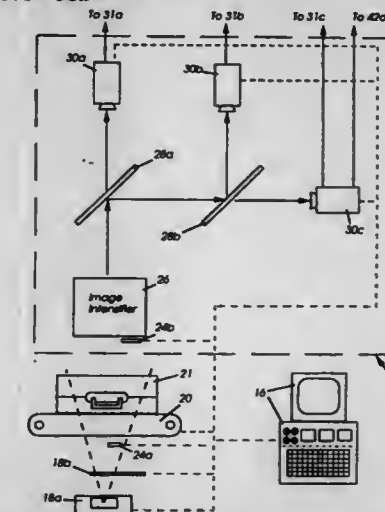
Jihong Tang, 14 Bayport, Irvine, Calif. 92714, and Yao-Jin Qian, 16401 Santa Anita La., Huntington Beach, Calif. 92649

Filed Nov. 23, 1994, Ser. No. 344,171

Int. Cl.<sup>6</sup> G01N 23/06

U.S. Cl. 378-98.9

43 Claims



1. An x-ray inspection system for separating material-specific images generated by transmitting x-rays through an ensemble of unknown materials, comprising:
  - generating means for generating and emitting N different x-ray energy distributions, each energy distribution being labelled by  $E_k$  and having an x-ray intensity  $I_0(E_k)$ , where k ranges from 1 to N, and where N is an integer greater than 1;
  - a device storing an N by N matrix  $\mu^{-1}$ , where  $\mu^{-1}$  is an inversion of a matrix  $\mu^*$ , and where each matrix element  $\mu_{jk}$  for the matrix  $\mu$  is defined as the linear attenuation coefficient of a certain material group j (of N material groups) at the x-ray energy  $E_k$ , the N material groups being generated from sorting the ensemble of unknown materials into N possible groups of materials according to the closeness of linear attenuation coefficients or equivalent characteristics of materials at different incident x-ray energy distributions prior to inspection, wherein at least two  $\mu^{-1}$  matrices are stored in the device and each  $\mu^{-1}$  matrix corresponds to a different set of N material groups;
  - reshaping means for reshaping the N different x-ray energy distributions emitted from the generating means;
  - first detecting means for detecting the x-ray intensities  $I_0(E_k)$  at each of the reshaped N x-ray energy distributions labelled  $E_k$ , the detecting occurring before transmission of the reshaped N x-ray energy distributions through the ensemble of unknown materials, the first detecting means outputting a first signal corresponding to the detection by the first detecting means;
  - second detecting means for detecting a portion of the reshaped N x-ray energy distributions labelled  $E_k$  that have passed through the ensemble of unknown materials, the second detecting means outputting a second signal corresponding to the detection by the second detecting means;
  - first converting means for receiving the first signal from the first detecting means and for converting the first signal into first image information;



second converting means for receiving the second signal from the second detecting means and for converting the second signal into second image information;  
 logarithmic means for logarithmically processing the first and second image information;  
 switching means for dynamically switching from one  $\mu^{-1}$  matrix for one set of N material groups to another  $\mu^{-1}$  for another set of N material groups during the inspection, wherein the switching is for the purpose of finding an appropriate set of N material groups that best represents the actual material groups existing in the ensemble under inspection;  
 image-generating means for generating material-specific images for the N groups of materials, using the logarithmically processed first and second image information and the  $\mu^{-1}$  matrix; and  
 processing means for processing and displaying the material-specific images.

5,481,585

## ROTARY CATHODE X-RAY TUBE EQUIPMENT

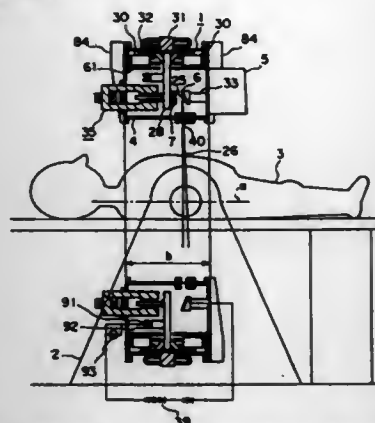
Yutaro Kimura; Tetsuhiko Ikeshima; Hiromichi Tonami, all of Kyoto; Ikuro Konishi, Nara; Hiroshi Horikawa, Kyoto; Akihiro Daikoku, Hyogo; Shigekazu Sakabe, Hyogo; Masao Inoue, Hyogo, and Akinori Yamasaki, Hyogo, all of Japan, assignors to Shimadzu Corporation, Kyoto, and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of Japan

Continuation of Ser. No. 79,913, Jun. 23, 1993. This application May 3, 1995, Ser. No. 434,171

Claims priority, application Japan, Sep. 18, 1992, 4-249255 Int. Cl.<sup>6</sup> H01J 35/04

U.S. Cl. 378—134

7 Claims



1. A rotary cathode X-ray tube equipment comprising:  
 a ring-shaped hollow vacuum vessel;  
 a ring-shaped anode target fixed within said vacuum vessel;  
 a ring-shaped rotary member rotatably disposed in an opposed relation to said anode target within said vacuum vessel;  
 at least one cathode portion attached to said rotary member on the side opposed to said anode target;  
 an X-ray radiation window for passing X-rays generated at the anode target through the window, said X-ray radiation window being mounted to an inner ring of said vacuum vessel;  
 a rotary driving mechanism for rotationally driving said rotary member, said rotary driving mechanism comprising a rotor;  
 a magnetic levitation mechanism having a magnet for magnetic levitation which is fixed to said vacuum vessel; and  
 an object to be attracted which is fixed to said rotary member wherein said object to be attracted is fixed in position between said rotary member and said rotor of said rotary driving mechanism and integral with a portion of said rotor for reinforcing said rotary member.

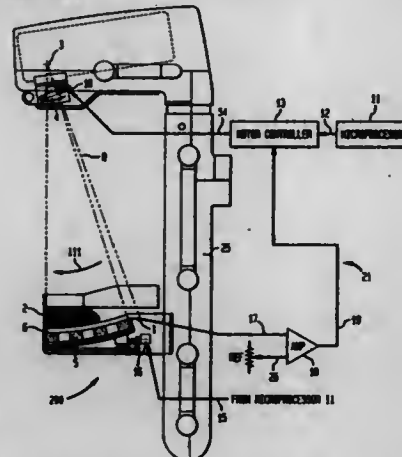
5,481,586  
AUTOMATIC POSITION CONTROL SYSTEM FOR X-RAY MACHINES

Robert P. Coe, Dix Hills, N.Y., assignor to Bennett X-Ray Technologies, Copiague, N.Y.

Division of Ser. No. 286,484, Aug. 4, 1994. This application Feb. 7, 1995, Ser. No. 385,099 Int. Cl.<sup>6</sup> G21K 5/10

U.S. Cl. 378—146

13 Claims



1. An automatic position control system for use in an x-ray machine, comprising  
 an x-ray source including a beam limiting device which produces a narrow x-ray beam,  
 a sensor which senses the position of said narrow x-ray beam,  
 a mechanical sweep system which moves said narrow beam and said sensor in the same direction,  
 a feedback control circuit which receives a signal from said sensor and a reference signal and generates an error signal, said error signal being inputted to said mechanical sweep system to adjust the position of said narrow x-ray beam, such that said narrow x-ray beam is centered on said sensor.

5,481,587

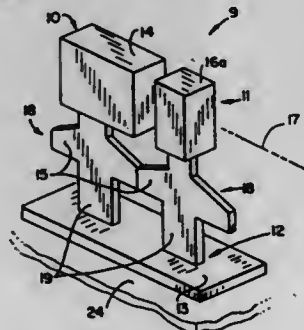
## RADIOGRAPHIC PHANTOM FOR VERTEBRAL MORPHOMETRY

Richard B. Mazess, Madison, Wis., assignor to Lunar Corporation, Madison, Wis.

Filed May 9, 1994, Ser. No. 239,664 Int. Cl.<sup>6</sup> G01D 18/00

U.S. Cl. 378—207

18 Claims



18. A method of employing an x-ray phantom having a first vertebral model formed of a material having a first predetermined bone density value and sized to substantially resemble a human vertebra and a second vertebral model affixed with respect to the first vertebral model and formed of a material having a second predetermined bone density value and sized to substantially resemble a human vertebra with a clinically recognized vertebral deformity, the method comprising the steps of:  
 establishing the classification of the first and second vertebral models as evidencing or not evidencing osteoporosis based on

direct physical measurement of the dimensions of the vertebral models and their bone density values;  
 positioning the x-ray phantom with respect to an imaging densitometer;  
 obtaining a radiographic image of the x-ray phantom so positioned, the image indicating dimensions and measured bone density of the first and second vertebral models;  
 analyzing the image to classify the first and second vertebral bodies as evidencing or not evidencing osteoporosis based on a morphometric analyses of the radiographic image and the obtained bone density values; and  
 comparing the classification from the image with the classification by direct physical measurement of the first and second vertebral models to evaluate the analyses of the image.

5,481,588

## TEST ARRANGEMENTS FOR RADIO TELEPHONE SYSTEMS

Hansueli Rickli, Uerkliweg, and Daniel Wetter, Burenweg, both of Switzerland, assignors to Alcatel N.V., Rijswijk, Netherlands

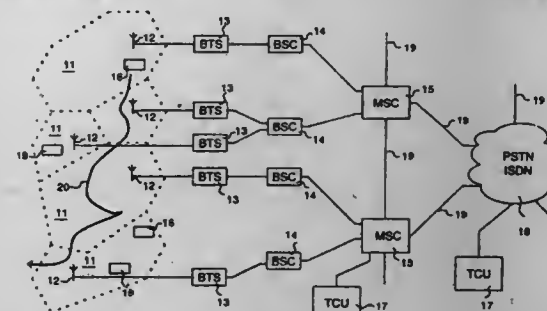
Filed Apr. 5, 1994, Ser. No. 223,158

Claims priority, application Switzerland, Apr. 6, 1993, 1055/93

Int. Cl.<sup>6</sup> H04M 1/24; 11/00

U.S. Cl. 379—32

28 Claims



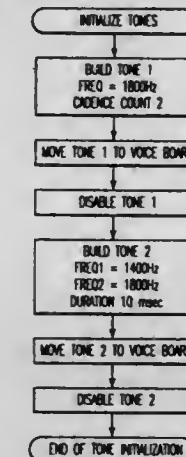
1. Method to ascertain the quality of service in a mobile radio installation with at least one base transceiver station and a plurality of mobile subscriber sets, comprising the steps of:  
 storing programmed instructions for initiating calls in at least one test mobile remote unit having means for measuring position and clock time data;  
 initiating calls between said at least one test mobile remote unit (16) at selected time or position intervals and a test control unit (17) or between plural test mobile remote units (16) controlled by said programmed instructions,  
 storing call identification and call connection parameters as well as position and clock time data in both the test mobile remote unit and the test control unit, and  
 transferring the stored data in the at least one test mobile remote unit to the test control unit (17) for statistical evaluation and display;  
 and wherein said step of initiating calls between said at least one test mobile remote unit and the test control unit includes at least one call initiated on the basis of a measured position as compared to at least one preselected position stored within the test mobile remote unit (16).

5,481,589  
DETECTION OF TDD SIGNALS IN AN AUTOMATED TELEPHONE SYSTEM

Georg E. Morduch, Alexandria, Va., assignor to Microlog Corporation, Germantown, Md.  
 Continuation-in-part of Ser. No. 790,257, Nov. 12, 1991, Pat. No. 5,388,146. This application Oct. 17, 1994, Ser. No. 324,394 Int. Cl.<sup>6</sup> H04M 11/00

U.S. Cl. 379—97

24 Claims



1. A method for using a digital signal processor to allow an automated telephone system to recognize the presence of a transmission from a telecommunications device for the deaf, comprising defining a tone having frequency and duration characteristics similar to the frequency and duration characteristics of a Baudot character, enabling said digital signal processor to recognize said tone, and initiating an action by said automated telephone system in response to the recognition of said tone by said digital signal processor.

5,481,590

## SELECTION OF A COMMUNICATION TERMINAL FOR RECEIVING AN INCOMING CALL

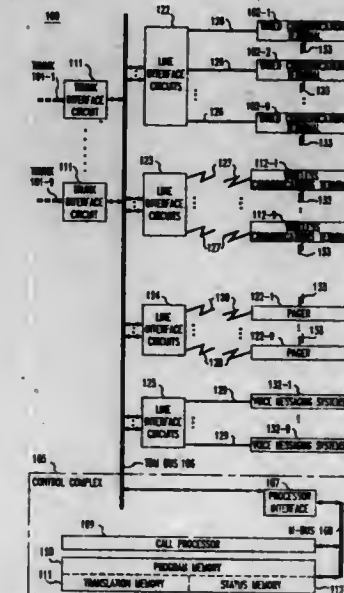
Gary J. Grimes, Birmingham, Ala., assignor to AT&T Corp., Murray Hill, N.J.

Filed Oct. 26, 1994, Ser. No. 329,392

Int. Cl.<sup>6</sup> H04Q 7/38

U.S. Cl. 379—57

24 Claims



1. An apparatus for allowing a user of a pager to control the termination of incoming telephone calls that are intended for the user, comprising:

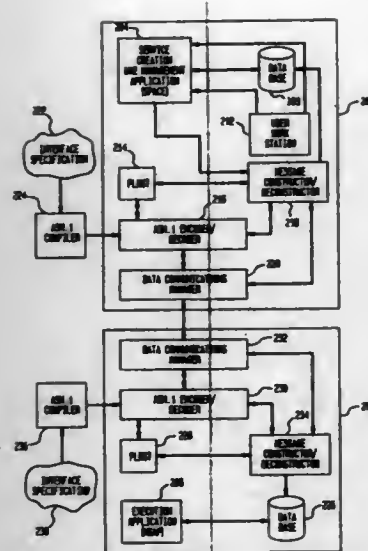












decoding, in accordance with the interface specification, each of said machine independent data transfer syntax form of the call processing record received in the receiving step to generate a plurality of service procedures;  
storing the plurality of service procedures in the memory;  
detecting a telephone call;  
selecting one of the plurality of service procedures stored in the memory according to a telephone number corresponding to the telephone call; and  
executing the selected service procedure to control the switching network.

5,481,602

### METHOD AND APPARATUS FOR ALTERNATE DESTINATION ROUTING FOR SWITCHING EGRESS CUSTOMERS

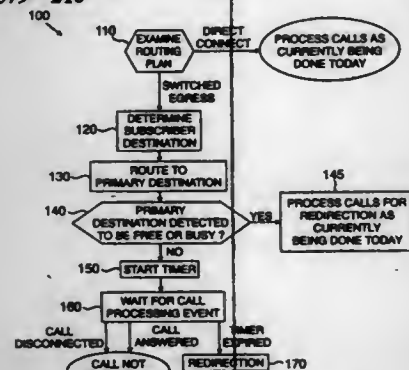
Richard W. Griffiths, Red Bank, N.J.; Rose A. Krlcich; William G. Kuchenbecker, both of Naperville, Ill., and Bryan M. Richardson, Westminster, Colo., assignors to AT&T Corp., Murray Hill, N.J.

Filed Dec. 27, 1994, Ser. No. 364,361

Int. Cl.<sup>6</sup> H04M 3/54

U.S. Cl. 379-210

26 Claims



1. A method for redirecting a telephone call from a busy primary destination to a secondary destination of a switched egress alternative destination redirection (ADR) customer when either a busy or free indication is not provided, comprising the steps of:  
determining the primary and secondary destination subscribed to by the ADR customer;  
providing signalling information to a local switch for routing the call to the primary destination;  
starting a timer for timing a predetermined interval if the local switch does not provide either the busy or the free indication associated with the primary destination; and,

redirecting the call to the secondary destination if the timer times the predetermined interval before the call is disconnected or before the call is answered at the primary destination.

5,481,603

### INTELLIGENT CALL PROCESSING BASED UPON COMPLETE IDENTIFICATION OF CALLING STATION

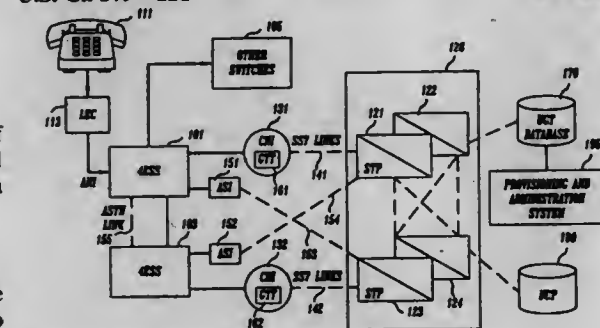
Franklin Gutierrez, Red Bank; Robert Y. Peters, Jr., Middletown; Aruna Thirunagari, Matawan, and Joel K. Young, Middletown, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Sep. 28, 1993, Ser. No. 127,864

Int. Cl.<sup>6</sup> H04M 3/42

U.S. Cl. 379-221

20 Claims



11. A telephone network arrangement including:  
a global title translation (GTT) database;  
a network switch;  
means in said network switch arranged, in response to receipt of a call that requires intelligent call processing, to route a first query fully identifying the calling station from which said call was originated, to said GTT database;  
means in said GTT database for storing information identifying a particular network control point (NCP) in the telecommunications network that contains a call processing record for completing said received call and for providing said information to said network switch in response to said first query;  
a centralized universal global translation (UGT) database;  
means in said network switch arranged to route a second query to said UGT database if said GTT database does not respond to said first query; and  
means in said UGT database for storing information identifying a particular NCP in the telecommunications network that contains a call processing record for completing said received call and for providing said information to said network switch in response to said second query.

5,481,604

### TELECOMMUNICATION NETWORK AND SEARCHING ARRANGEMENT FOR FINDING THE PATH OF LEAST COST

Joel Minot, Charenton, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 15, 1994, Ser. No. 214,880

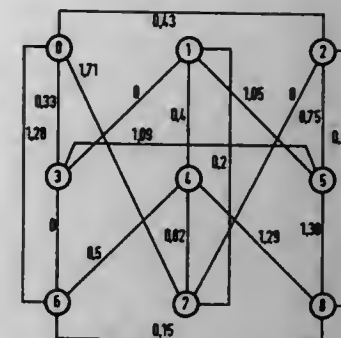
Claims priority, application France, Mar. 17, 1993, 93 03086

Int. Cl.<sup>6</sup> H04M 15/32

U.S. Cl. 379-221

18 Claims

3. A telecommunication network comprising nodes interconnected by communication links, and a decentralized arrangement for finding the path of least cost for transmission between two nodes based on an adaptive search, wherein each path includes at least one of said links, and each node comprises means for storing cost data for each of said links, characterized in that:  
each of the nodes comprises a cellular automaton formed by a respective plurality of cells interconnected by simulated links, the cells and simulated links being respectively arranged to



represent the nodes and communication links, all the simulated links connected to a particular cell being defined as simulated neighbor links extending to neighbor cells,  
each of the nodes comprises means, associated with each of the cells in that node, for calculating the cost of respective paths to each of the other cells in that node, a plurality of the paths being formed by respective pluralities of simulated links serially connected through respective cells,  
each said neighbor cell comprises means for transmitting to said particular cell cost data for paths from that neighbor cell to other cells in that node,  
to determine the path of at least cost from a node i to a node j, the cell i corresponding to node i receives, from each neighbor cell k, the cost data for the lowest cost path from cell k to cell j which is most recently calculated in said cell k, and identification of said lowest cost path from cell k to cell j,  
cell i comprises means for selecting, from the respective sums of the cost from cell i to each respective neighbor cell k plus the cost data to cell j respectively received from each of the neighbor cells, the lowest cost data and corresponding path from cell i to cell j, and for storing the selected lowest cost data and path, and  
cell i comprises means for subsequently transmitting, to each of its neighbor cells, the stored lowest cost data and corresponding path from cell i to cell j.

5,481,605

### PRIVATE BRANCH EXCHANGE CAPABLE OF ANALYZING INFORMATION RECEIVED FROM ISDN

Shigeki Sakurai, Yokohama, and Sholchi Takashima, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 797,968, Nov. 26, 1991, abandoned.

This application Jul. 2, 1993, Ser. No. 85,147

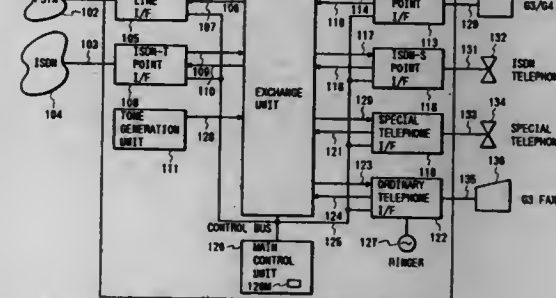
Claims priority, application Japan, Nov. 27, 1990, 2-326229;

Nov. 27, 1990, 2-326230; Nov. 27, 1990, 2-326231

Int. Cl.<sup>6</sup> H04M 3/00; H04M 7/00; H04J 3/12

U.S. Cl. 379-243

37 Claims



1. A private branch exchange comprising:  
detecting means for detecting a call reception from an analog external line;  
a digital interface for connecting a digital terminal capable of performing a digital procedure for an ISDN; and

judging means for judging whether the digital terminal connected to said digital interface is capable of performing an analog procedure for an analog line,  
wherein if said judging means decides that the digital terminal is capable of performing the analog procedure for the analog line when the call reception is detected by said detecting means, said digital interface transmits a set-up message corresponding to the digital procedure for the ISDN to the digital terminal.

5,481,606

### OPTO-COUPLING DEVICE BETWEEN A MODEM AND A TELEPHONE LINE

Dominique Andrieu, Golfe-Juan, and Innocenzo Francione, Antibes, both of France, assignors to Rockwell International Corporation, Seal Beach, Calif.

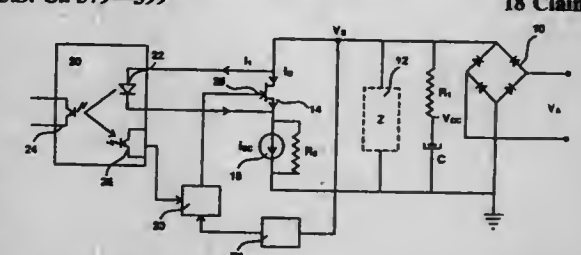
Filed Mar. 15, 1994, Ser. No. 213,353

Claims priority, application France, Apr. 9, 1993, 93 04481

Int. Cl.<sup>6</sup> H04M 1/00

U.S. Cl. 379-399

18 Claims



1. A coupling system between:

- (a) an input circuit for an analog telephone line voltage signal ( $V_a$ ), said signal having a DC component, and
  - (b) an analog signal processing apparatus comprising a modem, said coupling system comprising an opto-coupling device (20) having an input and an output, said input of the opto-coupling device having an input impedance, and said output of the opto-coupling device having an output impedance,
- (1) the input of the opto-coupling device being connected to said input circuit for analog signal, and
  - (2) the output of the opto-coupling device being connected to said signal processing apparatus,

wherein:

- (c) said coupling system comprises a circuit of high impedance relative to an input impedance of said analog signal processing apparatus, said high impedance circuit comprising a voltage-to-current conversion circuit (14) wherein:
- (1) a current (10) having variations (11) flows through said conversion circuit, said variations being induced by variations of voltage ( $V_b$ ) of said analog signal,
  - (2) said conversion circuit is in series with a constant current source (16), said current source (16) comprises a field effect transistor with high impedance ( $R_2$ ), said conversion circuit having a field effect transistor having a gate (28) which is fed by the DC component of said analog signal, and
  - (3) said conversion circuit is connected to said analog signal circuit, and
- (d) inputs of said opto-coupling device are in parallel with said voltage-to-current conversion circuit, whereby the current variations (11) at the input of said opto-coupling device, being equal in, absolute value to the variations of current in said voltage-to-current conversion circuit, are proportional to the variations of the voltage of the analog telephone line signal on said input circuit.







encrypting the challenge code at the second electronic device at the subscriber site to produce a user-encrypted code; transmitting by the second electronic device the user-encrypted code to the first electronic device and transmitting by the first electronic device the user-encrypted code to the host; and comparing at the host the user-encrypted code to the host-encrypted code and, if a match is found, permitting the user to access the host.

5,481,612

# PROCESS FOR THE AUTHENTICATION OF A DATA PROCESSING SYSTEM BY ANOTHER DATA PROCESSING SYSTEM

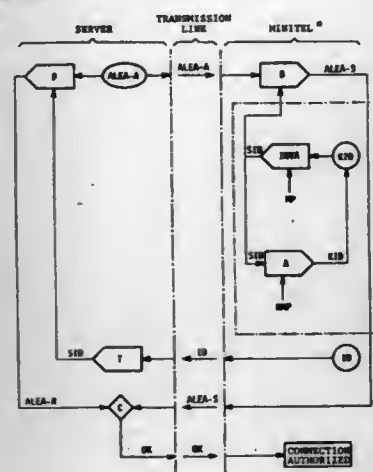
Mireille Campana, Clamart; François Allegre, Bicetre; David Arditti, Clamart, and Jean Millot, Issy-Les-Moulineaux, all of, France, assignors to France Telecom Etablissement Autonome de Droit Public, France

Filed Dec. 15, 1993, Ser. No. 167,502

Claims priority, application France, Dec. 15, 1992, 92 15099  
Int. Cl.<sup>6</sup> H04L 9/30

U.S. Cl. 380—25

4 Claims



1. A process for authentication of a first data processing system by a second data processing system, and comprising, supplying an identity code (ID) from said first system to said second system to permit said second system to check said identity code for agreement, supplying a random number (ALEA-A) from said second system to said first system if said agreement is found whereby to permit said first system to encode said random number using a signature algorithm (B) using a secret key (SID) whereby to generate a first signed random number (ALEA-S), and supplying said first signed random number from said first system to said second system to permit said second system to apply a signature checking algorithm (T,B,C) to said first signed random number; and wherein, the first system includes a data processing terminal including a memory for being programmed and for storing data, said identity code and an encrypted secret key (KID) are stored in said memory, and the secret key used for the signature of the random number is determined with aid of a decrypting algorithm (INVA) using the encrypted secret key (KID) and a password (MP) supplied by a user to the terminal.

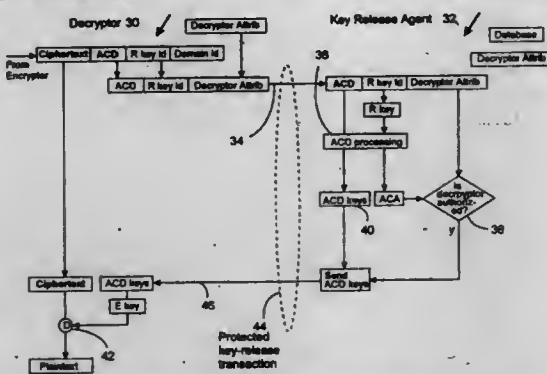
## 5,481,613 COMPUTER NETWORK CRYPTOGRAPHIC KEY DISTRIBUTION SYSTEM

Warwick S. Ford, and Michael J. Wiener, both of Nepean, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 15, 1994, Ser. No. 227,871  
Int. Cl.<sup>6</sup> H04L 9/30

U.S. Cl. 380—30

19 Claims



1. A method of publicly distributing a message encryption key through a computer network which includes an encryptor, a decryptor and a key release agent, comprising steps of: the encryptor distributing an identifier associated with a key-release public-private key pair and distributing therewith an access controlled decryption block, the latter of which has been created using the key-release public key and contains key data related to the message encryption key and a statement of access control criteria with respect to the decryptor; the decryptor sending to the key release agent the identifier and the access controlled decryption block in a locally protected transaction, said identifier indicating a key release private key corresponding to the key-release public key; and the key release agent recovering the message encryption key from the access controlled decryption block by using the key release private key and the key data in the access controlled decryption block, and sending to the decryptor the message encryption key if the decryptor is authorized to decrypt a message which is encrypted under the message encryption key.

5,481,614

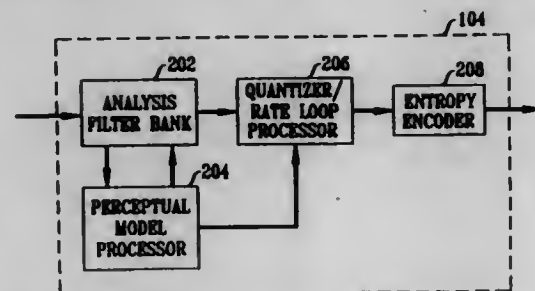
## METHOD AND APPARATUS FOR CODING AUDIO SIGNALS BASED ON PERCEPTUAL MODEL

James D. Johnston, Warren, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Continuation of Ser. No. 844,804, Mar. 2, 1992. This application Sep. 1, 1993, Ser. No. 115,500  
Int. Cl.<sup>6</sup> H04H 5/00

U.S. Cl. 381—2

7 Claims



1. A method for coding an input set of stereophonic audio signals comprising a left channel signal and a right channel signal, the method comprising:

(a) filtering the right channel signal and the left channel signal to obtain a first set of signals and a second set of signals, the first

set of signals representing the frequency content of the right channel and the second set of signals representing the frequency content of the left channel;

- generating a third set of signals representing the frequency content of a sum of the right channel signal and the left channel signal;
- generating a fourth set of signals representing the frequency content of a difference between the right channel signal and the left channel signal;
- based on the first set of signals, generating a first perceptual threshold for the first set of signals;
- based on the second set of signals, generating a second perceptual threshold for the second set of signals;
- based on the third set of signals, the fourth set of signals, the first perceptual threshold, and the second perceptual threshold, generating a third perceptual threshold for the third set of signals;
- based on the third set of signals, the fourth set of signals, the first perceptual threshold, and the second perceptual threshold, generating a fourth perceptual threshold for the fourth set of signals; and
- generating a signal based upon either:
  - the first set of signals, the second set of signals, and their respective perceptual thresholds; or
  - the third set of signals, the fourth set of signals, and their respective perceptual thresholds.

5,481,615

## AUDIO REPRODUCTION SYSTEM

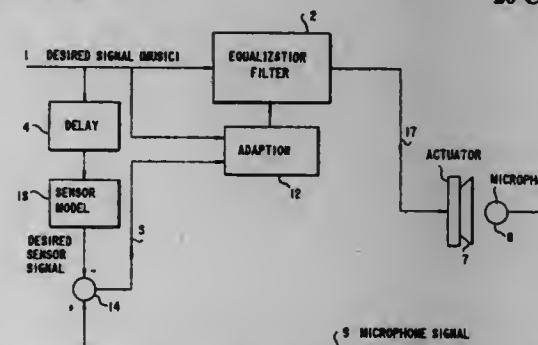
Graham P. Eatwell, Cambridge, and Andrew Langley, Herts, both of, United Kingdom, assignors to Noise Cancellation Technologies, Inc., Linthicum, Md.

Filed Apr. 1, 1993, Ser. No. 41,382

Int. Cl.<sup>6</sup> G10K 11/16; H03G 5/00

U.S. Cl. 381—71

20 Claims



1. A self-equalizing audio headset system, said system comprising input means for receiving a desired signal, sensor means adapted to provide a sensing signal related to the sound at the listener's ear, equalization filter means adapted to respond to said desired signal and produce a modified signal, acoustic actuator means adapted to respond to a drive signal derived from said modified signal, weighting filter means adapted to provide a model of the response of said sensor means, and delay means, said system characterized in that said equalization filter means is continuously adapted to maintain said sensing signal close to a desired sensor signal obtained by passing said desired signal through said weighting filter means and said delay means, said desired sensor signal thereby corresponding to a delayed and filtered version of said desired signal enabling the system to produce the desired sound at the listener's ear.

5,481,616

## PLUG-IN SOUND ACCESSORY FOR PORTABLE COMPUTERS

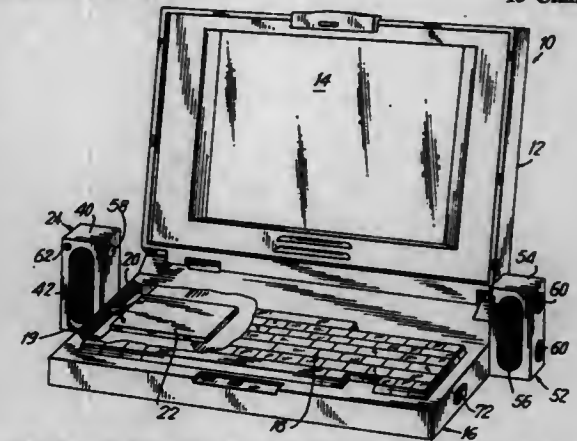
Tommyca Freadman, New York, N.Y., assignor to Sparkomatic Corporation, Milford, Pa.

Filed Nov. 8, 1993, Ser. No. 148,597

Int. Cl.<sup>6</sup> H04B 1/00

U.S. Cl. 381—90

13 Claims



10. A sound accessory for a portable computer having an accessory card insertion slot adapted for receiving cards providing additional functions for the computer, said sound accessory comprising:

- a sound accessory card insertable into the slot;
- master speaker means mounted to the card so as to move with the card during insertion of the card;
- driver means on at least one of the card and the master speaker means, for processing audio digital signals generated by the computer into master drive signals for driving the master speaker means to radiate sound therefrom;
- microphone means on the master speaker means for converting sound waves into microphone digital signals for input into the computer; and
- telephone interface means on the card operatively connecting the microphone means and the driver means for converting the sound accessory to a speakerphone.

5,481,617

## LOUDSPEAKER ARRANGEMENT WITH FREQUENCY DEPENDENT AMPLITUDE REGULATION

Egon Bjerre, Struer, Denmark, assignor to Bang & Olufsen A/S, Struer, Denmark

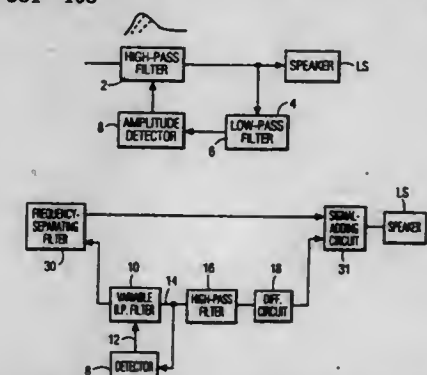
PCT No. PCT/EP93/00941, § 371 Date Dec. 7, 1993, § 102(e) Date Dec. 7, 1993, PCT Pub. No. WO93/18626, PCT Pub. Date Sep. 16, 1993

PCT Filed Mar. 1, 1993, Ser. No. 137,138

Claims priority, application Denmark, Mar. 2, 1992, 269-92  
Int. Cl.<sup>6</sup> H04R 25/00

U.S. Cl. 381—108

6 Claims



1. In a speaker-driving circuit arrangement having a signal input for receiving a variable amplitude input signal and means electi-



cally coupled to said input for boosting the amplitude of said input signal for a predetermined band of frequencies, the improvement comprising:

- a variable band-pass filter having a first input electrically coupled to the signal input, a second input and an output, said filter being adapted to pass at least the predetermined band of frequencies and to effectively decrease the magnitude of the boost, especially in a selected portion of said band, in response to a control signal indicating that an output signal of said filter will cause overloading of the speaker;
- an amplitude detector having an input electrically coupled to the output of the band-pass filter and having an output electrically coupled to the second input of said band-pass filter, said amplitude detector being adapted to produce said control signal responsive to the amplitude of the output signal of said band-pass filter; and
- a differentiating circuit having an input electrically coupled to the output of the band-pass filter and having an output for electrical coupling to the speaker, said differentiating circuit being adapted to compensate for any decrease of signal magnitude, in at least a portion of said band lying outside of the selected portion, which is effected by the variable band-pass filter.

5,481,618

### INTERCONNECTION OF A SPEAKER USING MAGNETIC COUPLING

Danny E. Ross, Plantation; David E. Reiff, Ft. Lauderdale, and John F. Murray, Sunrise, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

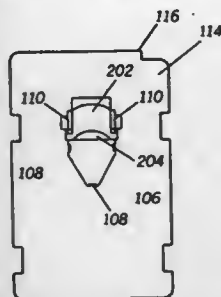
Continuation of Ser. No. 99,797, Jul. 30, 1993, abandoned.

This application Nov. 28, 1994, Ser. No. 346,312

Int. Cl.<sup>6</sup> H04R 25/00

U.S. Cl. 381-205

18 Claims



1. An electrical interconnecting system for a speaker, comprising:

- a speaker having a magnet and an electrical terminal;
- a printed circuit board having a contact corresponding to the electrical terminal, and having a magnetically susceptible portion; and

the speaker physically and electrically connected to the printed circuit board by means of magnetic attraction between the magnet and the magnetically susceptible portion, to simultaneously mate the contact to the electrical terminal and attach the speaker to the printed circuit board.

5,481,619

### INSPECTION METHOD USING TEMPLATES IMAGES, UNIQUE HISTOGRAM ANALYSIS, AND MULTIPLE GRAY LEVELS CORRELATED TO ADDRESSES OF TEMPLATE IMAGES

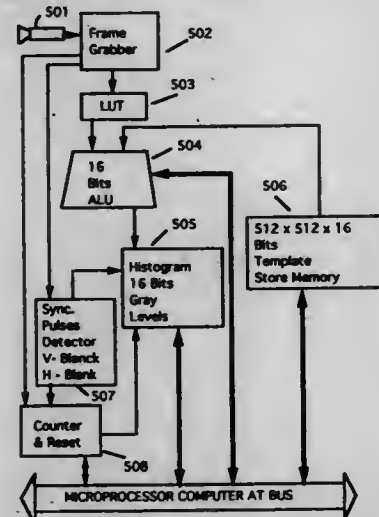
Nira Schwartz; Arie Shahar, and Richard Woods, all of 2800 Plaza Del Amo #187, Torrance, Calif. 90503

Filed Jul. 7, 1992, Ser. No. 910,721

Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382-141

18 Claims



1. A method for inspecting products that move on a production line for defects, marks, and dimensional accuracy with the use of a sensor and a processing unit having a memory, comprising:

- providing and saving in said memory a plurality of computer-generated artificial template images, each of said plurality of computer-generated artificial template images having a plurality of predetermined coordinates and addresses mapped within said memory, said plurality of computer-generated artificial template images together defining a full template image;
- assigning a plurality of predetermined gray levels to each of said plurality of computer-generated artificial template images;
- creating a respective plurality of histogram vectors of said plurality of computer-generated artificial template images, each of said histogram vectors having values which are correlated to said coordinates and addresses mapped within said memory;
- creating a product image by sensing one of said products with said sensor, said product image comprising a multiplicity of pixels with intensity levels expressed as a plurality of respective gray levels;
- modifying said product image to produce a modified product image by converting said plurality of gray levels of said product image to a plurality of modified gray levels;
- creating a plurality of additional gray levels by mathematically combining said plurality of modified gray levels with said plurality of predetermined gray levels so that said plurality of additional gray levels are different from said plurality of modified gray levels or said plurality of predetermined gray levels; and
- analyzing said plurality of computer-generated artificial template images, said modified product image, and said plurality of additional gray levels for product inspection.

5,481,620

### ADAPTIVE VISION SYSTEM

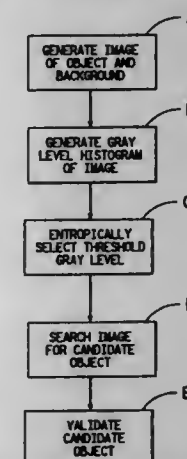
Akhileswar G. Valdyanathan, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 27, 1991, Ser. No. 767,339

Int. Cl.<sup>6</sup> G06K 9/30; 9/20

U.S. Cl. 382-169

64 Claims



1. A method of identifying at least one valid object having at least one predetermined attribute value in a background, comprising the steps of:

- generating an image of the object and the background;
- generating a gray level histogram of the image, the gray level histogram having an entropy function;
- entropically selecting a threshold gray level such that the entropy function of the histogram is maximized;
- searching the image using the entropically selected threshold gray level for at least one candidate object, wherein the candidate object has at least one candidate object attribute value;
- validating the candidate object having the valid object predetermined attribute value to identify [the] a valid object;
- subdividing the gray level histogram into an upper histogram and a lower histogram using the entropic threshold gray level as defined by step (c) as an upper delimiter and a lower delimiter; and
- recursively repeating steps (c)-(f) for each of the upper and lower histograms, wherein the repetition of step (c) selects a next successive entropic threshold gray level, thereby recursively partitioning the gray level histogram until a predetermined minimum number of new valid objects is identified.

5,481,621

### DEVICE & METHOD FOR RECOGNIZING AN IMAGE BASED ON A FEATURE INDICATING A RELATIVE POSITIONAL RELATIONSHIP BETWEEN PATTERNS

Yasunori Kuratomi, Sulta, and Hisahito Ogawa, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 25, 1993, Ser. No. 66,878

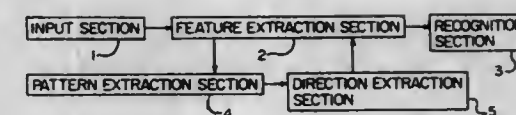
Claims priority, application Japan, May 28, 1992, 4-136585

Int. Cl.<sup>6</sup> G06K 9/52

U.S. Cl. 382-204

16 Claims

1. An image recognition device, comprising:
- input means for inputting an image;
  - pattern extraction means for extracting a first group of first patterns and a second group of second patterns from said input image, each of said first patterns and said second patterns consisting of a plurality of points;
  - first feature extraction means for extracting, with respect to each point on each second pattern included in said second group, a corresponding first feature indicating the number of points of at least one first pattern included in said first group which are positioned in a specified range of direction, said specified range of direction being one of a plurality of ranges of



direction, and wherein said corresponding first features are extracted for each of said plurality of ranges of direction; second feature extraction means, including summing means, for extracting second features, wherein each second feature is obtained by way of said summing means summing up each of said first features extracted in relation to a corresponding one of said plurality of ranges of direction for all points of said second patterns included in the second group; and recognition means for recognizing said input image based on said second features.

5,481,622

### EYE TRACKING APPARATUS AND METHOD EMPLOYING GRAYSCALE THRESHOLD VALUES

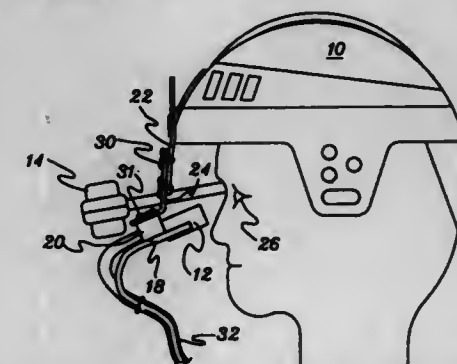
Lester A. Gerhardt, Clifton Park, N.Y., and Ross M. Sabolcik, Austin, Tex., assignors to Rensselaer Polytechnic Institute, Troy, N.Y.

Filed Mar. 1, 1994, Ser. No. 204,008

Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382-103

35 Claims



1. A system for determining a point of regard, said system comprising:

- camera means for acquiring a video image of a first vision means, said first vision means comprising a pupil, a position of said pupil corresponding to said point of regard, and said video image comprising a pupil image;
- frame grabber means, coupled to said camera means, for accepting video data corresponding to said video image from said camera means and converting said video data to digital pixel data of a given dynamic range so as to provide said digital pixel data as a grayscale mapping of the video image;
- computer means, coupled to said frame grabber means, for processing said digital pixel data to substantially determine the position of said pupil wherein said computer means includes:
- memory means for providing an expected area value for the area of said pupil within said video image;
- means for determining a grayscale threshold value in accordance with said expected area value and grayscale distribution of said digital pixel data;
- means for segregating said digital pixel data into two separate binary groups as first and second groups using said grayscale threshold value as a discriminator; and
- means for substantially determining the position of said pupil in accordance with the segregated data;



feedback means, coupled to said computer means, for accepting data corresponding to the determined position of said pupil from said computer means and feeding back to said first vision means feedback information representative of the determined position; and  
support means, connected to said camera means and said feedback means, for fixing the relative physical positions of said camera means and said feedback means.

5,481,623

# APPARATUS FOR DETERMINING AN IMAGE POSITION ON IMAGING MEDIA

Shoji Hara, Kanagawa, Japan, assignor to Fujl Photo Film Co., Ltd., Kanagawa, Japan

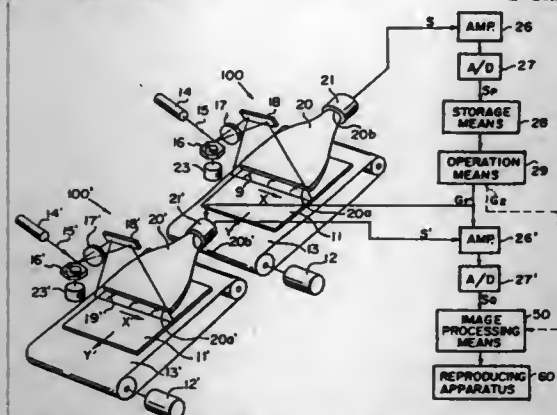
Filed Apr. 18, 1991, Ser. No. 687,263

Claims priority, application Japan, Apr. 19, 1990, 2-103393; Apr. 26, 1990, 2-111147; Apr. 27, 1990, 2-114610; Jun. 21, 1990, 2-163140

Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382-128

2 Claims



1. An apparatus for determining a mammary image position, comprising:

- i) a prospective object image region finding means comprising: means for obtaining an image signal made up of a series of image signal components representing a radiation image of an object, which radiation image has been recorded on a recording medium and is composed of:
  - a) a single object image region or a plurality of object image regions, in each of which a mammary pattern has been recorded such that it may project in an approximately semicircular shape from an edge of said recording medium toward the middle of said recording medium, said mammary pattern having been recorded by irradiating radiation, which has passed through a mammary, to said recording medium,
  - b) a background region, which surrounds the approximately semicircular edge of each said object image region, and upon which the radiation impinged directly without passing through the object, and
  - c) a scattered radiation image region, which is adjacent to said background region, and upon which scattered radiation impinged,
- ii) means for detecting a change in said image signal at the approximately semicircular edge of each said object image region on the basis of said image signal, and thereby finding a single prospective object image region or a plurality of prospective object image regions, and
- iii) a position determining means for judging the correctness or incorrectness of each said prospective object image region on the basis of a mean-level value of the values of the image signal components corresponding to each said prospective object image region, and thereby determining the position of each said object image region in said radiation image.

## 5,481,624 MASK INSPECTING METHOD AND MASK DETECTOR

Kazuya Kamon, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

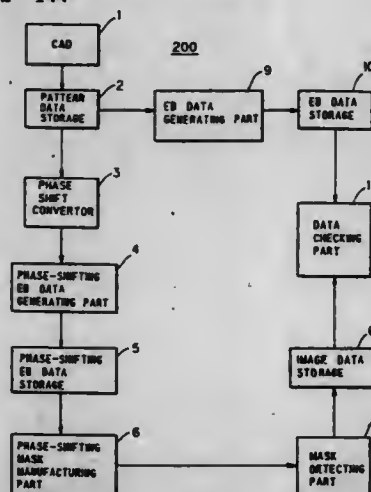
Filed Apr. 13, 1993, Ser. No. 45,471

Claims priority, application Japan, Apr. 27, 1992, 4-107683

Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382-144

7 Claims



4. A mask detector having a minimum resolving power R1, comprising:

- a light source for projecting single-wavelength light;
- a first optical system for introducing said light projected from said light source onto a mask surface of a phase-shifting mask;
- a second optical system for forming an optical image of said light which passes through said phase-shifting mask; and
- an imaging means for imaging said optical image of said phase-shifting mask to obtain image data; and wherein said mask detector is set to satisfy the following relations,

$$\lambda_1 = \lambda$$

$$\sigma_1 = \sigma$$

$$m_1 A_1 = m A$$

$$m_1 > m$$

where A1 and m1 represent a numerical aperture and a magnification of said mask detector,  $\lambda_1$  and  $\delta_1$  represent a wavelength and a coherence of said light projected from said light source respectively, while A and m represent a numerical aperture and a magnification of an exposure device having a minimum resolving power R and used in a process of manufacturing a semiconductor device using said phase-shifting mask,  $\lambda$  and  $\delta$  represent a wavelength and coherence of light used therein; and

$$R_1 = (m_1/m) \cdot R$$

5,481,625

## HANDWRITTEN CHARACTER RECOGNITION DEVICE

Toshio Suzuki, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 46,562, Apr. 12, 1993, abandoned.

This application Dec. 5, 1994, Ser. No. 349,387

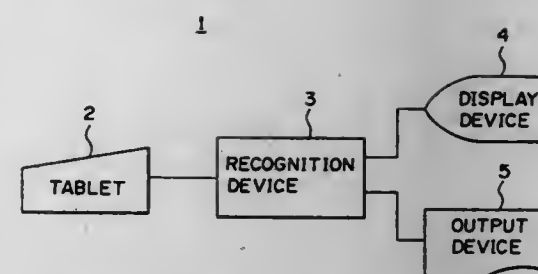
Claims priority, application Japan, Apr. 15, 1992, 4-095571

Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382-187

8 Claims

1. A handwritten character recognition device comprising: an input unit for receiving thereon one or more handwritten strokes forming a character;
- stroke extracting means for analyzing said handwriting in an X-axis direction and in a Y-axis direction, and extracting an



X-axis direction input stroke and a Y-axis direction input stroke, said Y-axis direction being perpendicular to said X-axis direction;

symbolizing means for converting each point and each direction change of said X-axis direction input stroke into an X-axis direction symbol string and for converting each point and each direction change of said Y-axis direction input stroke into a Y-axis direction symbol string, each of said symbol strings including one or a plurality of symbols which are representative of each point and each direction change of said one or more handwritten strokes;

first storage means for storing X-axis direction basic symbol strings each including one or a plurality of symbols corresponding to X-axis direction basic symbol strokes of reference characters, and Y-axis direction basic symbol strings each including one or a plurality of symbols corresponding to Y-axis direction basic symbol strokes of the reference characters;

means for obtaining correlation coefficients between each of said X- and Y-axis direction symbol strings and said basic symbol strings;

second storage means for storing said correlation coefficients between each of said X- and Y-axis direction symbol strings and said basic symbol strings;

degree-of-match calculating means for calculating, by referring to the first storage means and the second storage means, X-axis correlation coefficients between the symbols forming the X-axis direction symbol string and the symbols forming the Y-axis direction symbol string and the symbols forming the Y-axis direction basic symbol stroke, and for producing X-axis degrees-of-match on the basis of said X-axis correlation coefficients and Y-axis degrees-of-match on the basis of said Y-axis correlation coefficients; and

recognizing means for recognizing said character inputted to said input means on the basis of said X-axis degree-of-match and Y-axis degree-of-match.

5,481,626

## NUMERICAL EXPRESSION RECOGNIZING APPARATUS

Kazuhiro Matsubayashi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 959,470, Oct. 9, 1992, abandoned, which is a continuation of Ser. No. 865,686, Apr. 8, 1992, abandoned, which is a continuation of Ser. No. 226,820, Aug. 1, 1988, abandoned. This application Jun. 23, 1994, Ser. No. 264,752

Claims priority, application Japan, Aug. 5, 1987, 62-194311

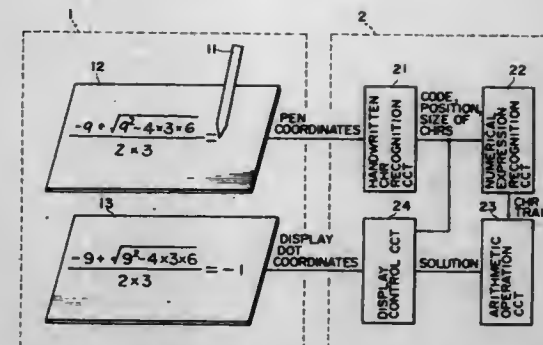
Int. Cl.<sup>6</sup> G06K 3/00

U.S. Cl. 382-189

26 Claims

10. A numerical expression recognizing method using a pattern of a character stored in a dictionary and identification information stored in the dictionary indicating whether the stored pattern is that of a size-determine character or a size-undetermined character, comprising the steps of:

- inputting a numerical expression consisting of characters including numerals and signs;
- recognizing the characters including the numerals and signs input in said inputting step,



wherein said recognizing step comprises the step of recognizing whether a character input in said inputting step represents an exponent on the basis of the size of the input character; discriminating whether each character recognized in said recognizing step is a size-determined character or a size-undetermined character on the basis of the identification information stored in the dictionary, wherein the discrimination is made using a table in which it is previously set whether each character is a size-determined character or a size-undetermined character; and

comparing the coordinates of the character discriminated as a size-undetermined character in said discriminating step and other characters.

5,481,627

## METHOD FOR RECTIFYING CHANNEL ERRORS IN A TRANSMITTED IMAGE SIGNAL ENCODED BY CLASSIFIED VECTOR QUANTIZATION

Jong-Rak Kim, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

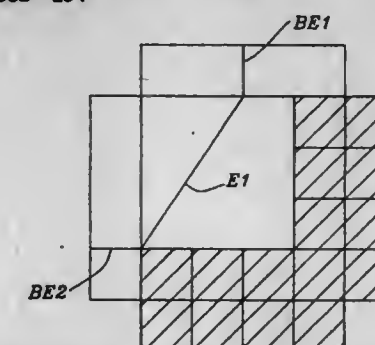
Filed Aug. 31, 1994, Ser. No. 299,179

Claims priority, application Rep. of Korea, Aug. 31, 1993, 1993-17192

Int. Cl.<sup>6</sup> G06K 9/40

U.S. Cl. 382-254

2 Claims



1. A method, for use in an image signal decoding system, for concealing class errors in an image signal transmitted in a compressed form by using a classified vector quantization method, wherein the image signal is divided into a multiplicity of blocks, each of said blocks being classified into one of a plurality of classes based on an edge pattern of said each block and said classes including a non-edge class which corresponds to a block having no edge pattern therein and a texture class which corresponds to a block having more than one edge patterns therein, said method comprising the steps of:

- detecting a block containing a class error;
- detecting boundary edges at each of four groups of neighboring pixels to the class error containing block, wherein each group of the neighboring pixels is located at a boundary of the class error containing block and included in one of four contiguous blocks to the class error containing block, pixel values of the neighboring pixels being considered to be correct;



determining the non-edge class as a class of the class error containing block is less than two boundary edges are detected and the texture class, if more than two boundary edges are detected;

obtaining an edge pattern in the class error containing block by connecting the detected boundary edges if two boundary edges are detected;

determining the class for the class error containing block by selecting the most similar edge pattern to the obtained edge one, wherein said class is one of said plurality of classes; and repeating the above steps until classes all the blocks containing class errors are determined.

5,481,628

# METHOD AND APPARATUS FOR SPATIALLY VARIANT FILTERING

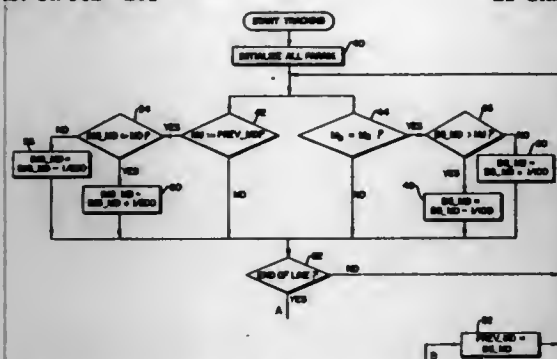
Mohsen Ghaderi, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 757,091, Sep. 10, 1991, abandoned. This application Mar. 9, 1993, Ser. No. 28,474

Int. Cl. G06K 9/40

U.S. Cl. 382-261

21 Claims



1. A method of processing an input digital image containing an array of input pixels having associated digital input signals which are to be processed to produce digital output signals representative of the values of output pixels of an enhanced output digital image, said method comprising the steps of:

- providing an adaptive spatial filter mechanism which selectively performs spatial high pass filtering of successive portions of an input digital signal associated with a respective input pixel of an input digital image in accordance with a first prescribed relationship between a variation in spatial activity content within an image window containing said input pixel and an adjustable threshold level;
- applying a digital input signal to the adaptive filter mechanism provided in step (a), so as to produce a digital output signal associated with a respective output pixel of said output digital image; and wherein

said adaptive spatial filter mechanism is operative to selectively adjust said adjustable threshold level to a new threshold level for each of said successive portions of said input digital image in accordance with the contents of a respective portion of said digital input image being processed, and wherein, for each successive portion of said input digital image to be processed, said adaptive spatial filter mechanism is operative to generate a respective prospective threshold level in accordance with the contents of said each successive portion of said digital input image being processed, and wherein, for a respective one of said successive portions of said input digital image, said adaptive spatial filter mechanism is operative to selectively employ either its prospective threshold level or the previous threshold level as said adjustable threshold level in dependence upon a prescribed difference in contents of said respective one of said successive portions of said image and another of said successive portions of said image.

5,481,629

# HYBRID OPTICAL IC WITH OPTICAL AXES AT DIFFERENT LEVELS

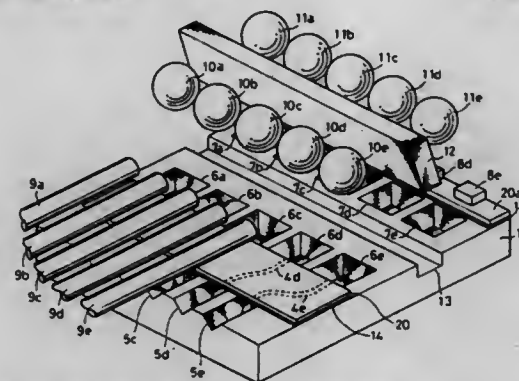
Haruhiko Tabuchi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 31, 1994, Ser. No. 251,284

Claims priority, application Japan, Aug. 31, 1993, 5-216632 Int. Cl. G02B 6/22

U.S. Cl. 385-14

29 Claims



28. An integrated optical device comprising:

- a silicon substrate having a main surface;
- a planar optical waveguide which is formed on a first portion of the main surface of said silicon substrate, and has a plurality of light guiding core regions, each of a first, high refractive index, a cladding layer of a second, lower index surrounding the core regions and having a flat top surface, said plurality of light guiding core regions having light input/output ports at first and second opposite sides thereof disposed at first and second, different constant pitches, respectively;

- a bonding pedestal which is formed on a second portion of said silicon substrate, different from the first portion thereof, and has a flat top surface, the respective heights of said top flat surfaces of said bonding pedestal and said planar optical waveguide, measured from the surface of said silicon substrate, being the same;

- a plurality of edge input/output type optical semiconductor devices bonded on said top surface of said bonding pedestal and mounted in a line with the same pitch as that of said light input/output ports of said planar waveguide facing the plurality of edge input/output type optical semiconductor devices, said edge input/output type optical semiconductor devices being mounted on optical axes extending from said light input/output ports of said light guiding core regions so that said edge input/output type optical semiconductor devices align with said light input/output ports of said light guiding core regions respectively, respective heights of optical axes of said edge input/output type optical semiconductor devices being the same, and respective heights of optical axes of said light guiding core regions being the same, and respective heights of said optical axes of said edge input/output type optical semiconductor devices and said light guiding core regions being different;

means for changing a level of an optical axis, thereby for optically coupling said light guiding core regions of said planar optical waveguide and said optical semiconductor devices, by changing the respective heights of optical axes, relative to the surface of said silicon substrate, at each said edge input/output type optical semiconductor device and said light guiding core regions of said planar optical waveguide; and

- a plurality of V grooves having a V-shaped cross-section for position-aligning optical fibers, formed on the surface of said silicon substrate along optical axes extending in one direction from other input/output ports of said planar optical waveguide respectively, said V grooves being arranged at a constant pitch which is smaller than that of said edge input/output semiconductor devices; and

optical fibers which are fitted in, and fixed to, said V grooves to provide position alignment between said optical fibers and

said light guiding core regions of said planar optical waveguide, respectively.

5,481,630

# OPTICALLY ENCODED PHASE MATCHED SECOND HARMONIC GENERATION, SELF FREQUENCY DOUBLING LASER MATERIAL, AND OPTICAL SWITCH USING SEMICONDUCTOR MICROCRYSTALLITE DOPED GLASSES

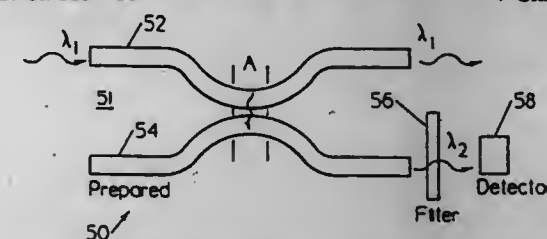
Nabil M. Lawandy, Providence, R.I., assignor to Intellectual Property Development Associates of Connecticut, Inc., Trumbull, Conn.

Division of Ser. No. 90,818, Jul. 13, 1993, Pat. No. 5,383,038, which is a division of Ser. No. 778,593, Oct. 17, 1991, Pat. No. 5,253,258. This application Dec. 6, 1994, Ser. No. 350,407

Int. Cl. G02B 6/26; G02F 1/35

U.S. Cl. 385-16

7 Claims



1. An optical switching device comprising a glass substrate having semiconductor microcrystallites embedded within, said glass substrate including a first waveguide and a second waveguide formed within a surface thereof and spaced apart along at least a portion of a length thereof such that radiation having a wavelength of  $\lambda_1$  propagating in said first waveguide couples into said second waveguide when the intensity of the radiation is greater than a critical intensity, said second waveguide receiving the coupled radiation and converting same to a wavelength  $\lambda_2$ , wherein  $\lambda_2$  is one half of  $\lambda_1$ .

5,481,631

# OPTICAL SWITCHING APPARATUS WITH RETROREFLECTOR

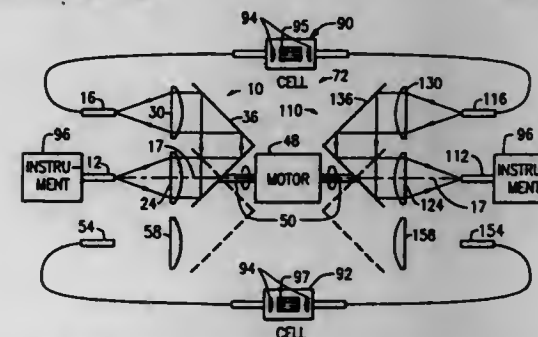
Jerry E. Cahill, Trumbull, and David H. Tracy, Norwalk, both of Conn., assignors to The Perkin-Elmer Corp., Norwalk, Conn.

Filed Feb. 25, 1994, Ser. No. 201,848

Int. Cl. G02B 6/26

U.S. Cl. 385-18

2 Claims



1. An optical switching apparatus which comprises a first combination of optics comprising: transmission means for transmitting radiation, comprising primary transmission means terminating in a primary window facing in a predetermined direction along a primary axis, and secondary transmission means terminating in a secondary window facing in the predetermined direction along a secondary axis, the secondary axis being parallel to and having a lateral spacing from the primary axis;

a pair of lenses communicative of radiation with the transmission means, consisting of a primary lens and a secondary lens, the primary lens having an axis coinciding with the primary axis and a focal point positioned on the primary axis at the primary window, and the secondary lens having an axis coinciding with the secondary axis and a secondary focal point positioned on the secondary axis at the secondary window;

a retroreflector spaced from the lenses oppositely from each window, the retroreflector having an optical axis aligned parallel to the primary axis; and positioning means for selectively rotating the retroreflector about the primary axis to each of a plurality of selected positions including a transmitting position with the optical axis positioned midway between the primary axis and the secondary axis in a plane thereof, such that radiation can be transmitted between the primary transmission means and the secondary transmission means by the retroreflector via the lenses, and a further position with the optical axis displaced away from the plane such that substantially no radiation can pass between the primary transmission means and the secondary transmission means; wherein:

the transmission means further comprises one or more additional secondary transmission means for transmitting radiation, each such additional means terminating in an associated window facing in the predetermined direction along an associated axis, each associated axis being parallel to and having a lateral spacing from the primary axis radially equal to the lateral spacing of the secondary axis from the primary axis, the secondary axis and the associated axes being arranged arcuately about the primary axis;

the apparatus further comprises an additional secondary lens associated with each additional transmission means, each additional lens having an axis coinciding with the associated axis and a focal point positioned on the associated axis at the associated window, so that the plurality of selected positions of the retroreflector includes, for each additional transmission means, an additional transmitting position with the optical axis positioned midway between the primary axis and the associated axis in a plane thereof, such that radiation can be transmitted between the primary transmission means and the additional transmission means by the retroreflector via the primary lens and the additional lens, whereby selected rotation of the retroreflector about the primary axis provides switching for transmission of radiation between the primary transmission means and any selected secondary transmission means; and the apparatus further comprises a second combination of optics, the first combination and the second combination are arranged in mirror image and facing oppositely from each other, the second combination comprising a second retroreflector, second primary transmission means for transmitting radiation and a plurality of second secondary transmission means for transmitting radiation, the second primary transmission means being aligned axially with the primary transmission means of the first combination, each secondary transmission means of the second combination being aligned axially with a counterpart secondary transmission means of the first combination, and the positioning means being connected to rotate the second retroreflector about the primary axis whereby mutual rotation of the retroreflectors provides coordinated switching of the first combination and the second combination.



5,481,632

## OPTICAL WAVEGUIDE MODULE AND METHOD OF MANUFACTURING THE SAME

Shigeru Hirai, Kazunori Kurima, Masahide Saito, Dai Yui, Tomoyuki Hattori, and Hiroshi Suganuma, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

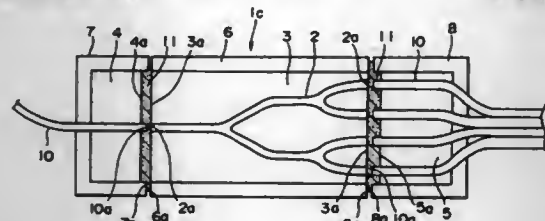
Filed May 25, 1994, Ser. No. 248,885

Claims priority, application Japan, May 26, 1993, 5-123947; Jun. 25, 1993, 5-155360; Nov. 16, 1993, 5-286825

Int. Cl.<sup>6</sup> G02B 6/30

U.S. Cl. 385-49

54 Claims



7. An optical waveguide module comprising:  
 an optical waveguide holder;  
 an optical waveguide substrate mounted in said optical waveguide holder;  
 an optical waveguide formed in said optical waveguide substrate and having end faces exposed from said optical waveguide substrate;  
 an optical fiber holder;  
 an optical fiber connector mounted in said optical fiber holder; and  
 an optical fiber supported by said optical fiber connector and having end faces exposed from said optical fiber connector;  
 wherein respective end faces of said optical waveguide holder and said optical fiber holder contact each other with said optical waveguide and said optical fiber in alignment, wherein an end face of said optical waveguide substrate is bonded to an end face of said optical fiber connector while an end face of said optical waveguide is spaced from an end face of said optical fiber;  
 wherein a light-transmitting hardening matching agent fills a space defined by said end faces of said optical waveguide and said optical fiber;  
 wherein an interval between said end faces of said optical waveguide and said optical fiber in said space has an upper limit value corresponding to an allowable threshold value for transmission loss by said hardening matching agent between said optical waveguide and said optical fiber, and a lower limit value based on an allowable value for a peeling frequency of said hardening matching agent by a thermal stress between said optical waveguide holder and said optical fiber holder and between said optical waveguide substrate and said optical fiber connector.

5,481,633

## METHOD AND OPTICAL DEVICE PRODUCED OF OPTICAL POLYMER COMPONENTS HAVING INTEGRATED VERTICAL COUPLING STRUCTURES

Klaus-Michael Mayer, Gerlingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE93/01128, § 371 Date Aug. 1, 1994, § 102(e) Date Aug. 1, 1994, PCT Pub. No. WO94/12903, PCT Pub. Date Jun. 9, 1994

PCT Filed Nov. 27, 1993, Ser. No. 256,972

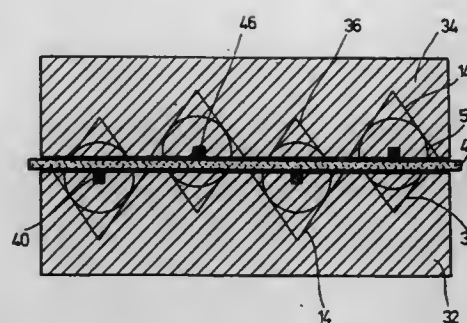
Claims priority, application Germany, Dec. 1, 1992, 42 40 266.2

Int. Cl.<sup>6</sup> G02B 6/12; B29D 11/00

U.S. Cl. 385-49

17 Claims

1. A method of producing optical polymer components having integrated vertical coupling structures, wherein the optical polymer components have regions for receiving light waveguides and fiber



guide structures, preferably configured as V-shaped positioning trenches, for receiving optical fiber structures to be coupled to the light waveguides, and the polymer components comprise a polymer substrate and a polymer lid plate, said method comprising: forming at least one structure for receiving a light waveguide, and at least two fiber guide structures and at least two adjusting structures on the substrate plate and on the lid plate such that both the substrate plate and the lid plate possess respective fiber guide structures which are located opposite the adjusting structures in the lid plate and substrate plate respectively after assembly, and the respective light waveguide structures of the substrate plate and of the lid plate which connect the fiber guide structures extend parallel to each other in at least one region such that the optical fields in the respective light waveguides can be coupled with one another.

5,481,634

## CONNECTOR FOR OPTICAL FIBER

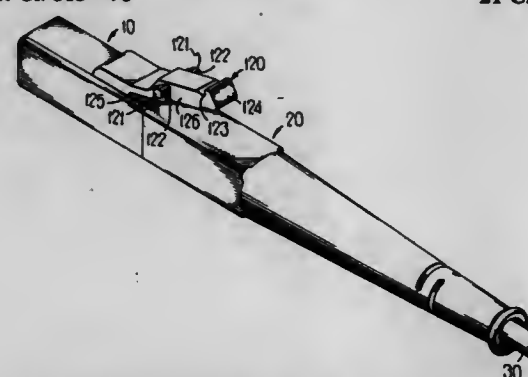
Jerry M. Anderson, Austell; Norman R. Lampert, Norcross, and Robert W. Mock, Jr., Lawrenceville, all of Ga., assignors to AT&T Corp., Murray Hill, N.J.

Filed Jun. 24, 1994, Ser. No. 265,291

Int. Cl.<sup>6</sup> G02B 6/36

U.S. Cl. 385-76

21 Claims



1. A connector for terminating an optical fiber comprising:  
 a fiber-holding structure having an end face in which an associated fiber is to terminate the holding structure including an axial passageway which terminates in the end face and which is adapted to receive an end portion of the associated fiber;  
 a housing having internal surfaces that define a cavity and surround the fiber-holding structure, the housing including a first opening for receiving an optical fiber and a second opening for enabling the end face of the holding structure to protrude therethrough, said openings extending into the cavity and being positioned at opposite ends of the housing; and  
 a manually operated latch for securing the housing to an associated receptacle to preclude unintended decoupling therebetween, the latch being positioned on a single side surface of the housing and movable in a direction which is perpendicular to the axial passageway, said latch comprising a cantilever beam having its fixed end positioned toward the second opening of the housing.

5,481,635

## COMPOSITE DISTRIBUTION CABLE

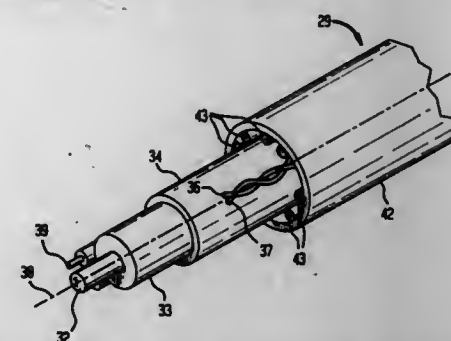
Candido J. Arroyo, Lithuania; David S. Hancock, Roswell, and Richard L. Knight, Cumming, all of Ga., assignors to AT&T Corp., Murray Hill, N.J.

Filed Oct. 28, 1994, Ser. No. 330,499

Int. Cl.<sup>6</sup> G02B 6/44

U.S. Cl. 385-103

6 Claims



1. A composite cable for the transmission of electrical signals comprising:  
 a longitudinally extending core member having a metallic conductor member for transmitting broadband signals encased within an insulating member, said core member having an outer surface and a longitudinal axis;  
 first and second insulated electrical power conducting members disposed substantially adjacent each other and extending longitudinally along said outer surface;  
 a twisted pair of individually insulated narrow band signal conductors disposed adjacent the outer surface of said core member on the other side of the axis thereof from said power conducting members and extending longitudinally therealong;  
 a jacket of insulating material surrounding said core member, said power conducting members and said twisted pair, said jacket being spaced from said core member;  
 means for preventing the flow of water into and through at least a portion of the space between said core member and said jacket, said means comprising one or more discrete superabsorbent members located in the space between said core member and said jacket and extending along the length of said cable;  
 a first metallic sheath member surrounding said insulating member in contact therewith said cable further comprising a second metallic sheath member surrounding said core member and spaced therefrom, said power conducting members, said twisted pair, and said superabsorbent members being situated in the space between said first and second metallic sheath members.

5,481,636

## WAVELENGTH CONVERSION ELEMENT

Hiroaki Fukuda, Yokohama; Hiroyoshi Funato, Chigasaki, and Shigeyoshi Misawa, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 876,042, Apr. 30, 1992, Pat. No. 5,333,231.

This application Apr. 20, 1994, Ser. No. 230,243

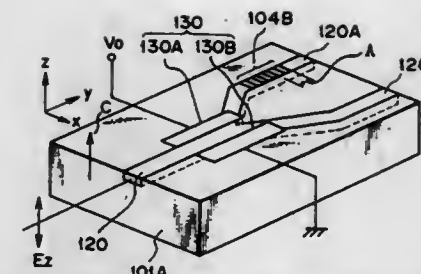
Claims priority, application Japan, May 2, 1991, 3-100836; May 20, 1991, 3-114805; May 2, 1991, 3-130592; May 9, 1991, 3-133616; May 17, 1991, 3-113265; Jan. 28, 1991, 3-281522; Jan. 24, 1992, 4-34250

Int. Cl.<sup>6</sup> G02B 6/10; H01S 3/10

U.S. Cl. 385-122

14 Claims

1. A wavelength conversion element comprising:  
 a substrate of non-linear optical medium;  
 a three-dimensional waveguide formed in the substrate and having a y-shape divided into two branches at an output side thereof;  
 a potential difference application means formed in a branch portion of the waveguide on the substrate for selecting a



branch of the waveguide by changing a phase of a fundamental wave guided through the waveguide before a branch point; and  
 a shorter wavelength harmonic generation means formed in the waveguide for generating a shorter wavelength harmonic from the fundamental wave introduced into the waveguide.

5,481,637

## HOLLOW LIGHT GUIDE FOR DIFFUSE LIGHT

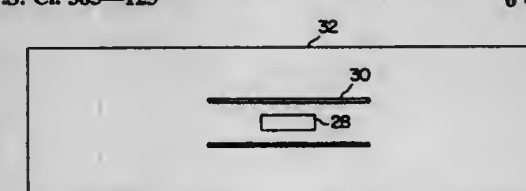
Lorne A. Whitehead, Vancouver, Canada, assignor to The University of British Columbia, Vancouver, Canada

Filed Nov. 2, 1994, Ser. No. 333,340

Int. Cl.<sup>6</sup> G02B 6/20; F21V 7/04

U.S. Cl. 385-125

6 Claims



1. A light guide containing a light source, said light guide comprising:  
 (a) an outer prism light guide formed of prism light guide wall material, having uniform shape in cross-sections perpendicular to a first octature symmetry direction, and having an optical centre line parallel to said first octature symmetry direction, wherein:  
 (i) surfaces of said light guide wall material are substantially in octature relative to said first octature symmetry direction;  
 (ii) a surface normal vector at any point on any internal surface of said material is either substantially parallel or substantially perpendicular to a first notional line extending from said point through and perpendicular to said optical centre line;  
 (b) a cover positioned within said guide, around said light source, in cylindrical symmetry about said optical centre line, to intercept a substantial portion of light emitted by said source, said cover being formed of prism light guide wall material wherein:  
 (i) surfaces of said cover wall material are substantially in octature at any point on said cover relative to a second, spatially variable octature symmetry direction, which, at said point, is:  
 (A) perpendicular to said first octature symmetry direction; and  
 (B) perpendicular to a second notional line extending from said point on said cover through and perpendicular to said optical centre line;  
 (ii) a surface normal vector at any point on any outer surface of said cover is either substantially parallel or substantially perpendicular to said first octature symmetry direction; and,  
 (iii) said cover is confined to a region sufficiently close to said optical centre line to substantially prevent propagation of light rays incident on an inside surface of said cover to and through said light guide wall material.



5,481,638

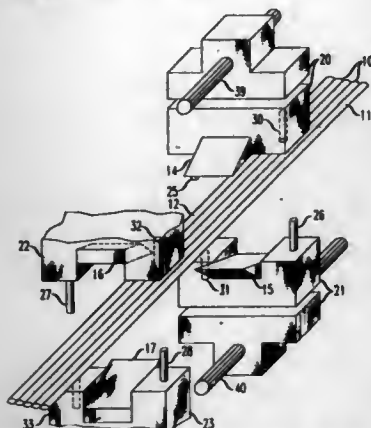
# TECHNIQUES FOR STRIPPING OPTICAL FIBER ENCAPSULANTS

Richard A. Roll, West Trenton, and Muhammed A. Shahid, Ewing Township, Mercer County, N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Jul. 5, 1994, Ser. No. 270,336  
Int. Cl.<sup>6</sup> H02G 1/12

U.S. Cl. 385—134

25 Claims



16. A method for removing encapsulant portions of arrays of optical fibers comprising the steps of:

slideably mounting first and third members on a first rod extending across a first opening of a first enclosure having a first duct;

slideably mounting second and fourth members on a second rod extending across a second opening of a second enclosure having a second duct;

the first, second, third and fourth members respectively having mounted thereon first, second, third and fourth knife edges; softening part of the plastic encapsulant of an array of parallel optical fibers;

positioning that part of the optical fibers covered by the soft part of the encapsulant between the first and second enclosures, facing the first, second, third and fourth knife edges, and parallel to the first and second rods;

causing the first, second, third and fourth knife edges to penetrate the softened portion of the encapsulant;

said causing step comprising clamping together the first and second enclosures such that the first and second openings combine to form a cavity;

stripping at least part of the softened encapsulant from said optical fibers comprising the step of moving at least the first and second knife edges with respect to the optical fibers;

the moving step comprising sliding the first and second members in the same direction along the first and second rods; and flushing the softened encapsulant comprising directing fluid through the first duct, the cavity and the second duct.

5,481,639

# COMPACT CLOSURE FOR OPTICAL FIBER CABLE

Gary S. Cobb, Norcross; Wesley W. Jones, Lawrenceville, and John F. Malluck, Marietta, all of Ga., assignors to AT&T Corp., Murray Hill, N.J.

Filed Oct. 28, 1994, Ser. No. 330,417  
Int. Cl.<sup>6</sup> G02B 6/00; 6/36

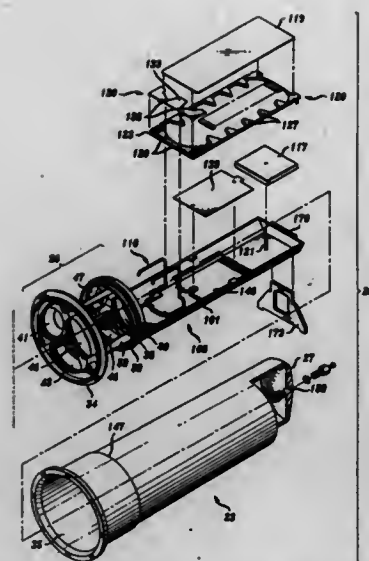
U.S. Cl. 385—135

12 Claims

1. A compact closure for cables containing optical fiber, said closure comprising a cable termination assembly surrounded by a protective cover, the cable termination assembly comprising:

a support frame;

a plurality of fiber connection trays mounted on the support frame for storing loops of optical fiber therein, each tray being adapted to hold at least one optical fiber connecting arrange-



ment, and each tray including a pair of spaced-apart openings outside the loop of optical fiber through on side of the tray; and

a pair of spaced-apart parallel rods attached to the support frame and extending upwardly therefrom through the openings in each tray, said openings being slideably joined to the pair of parallel rods.

5,481,640

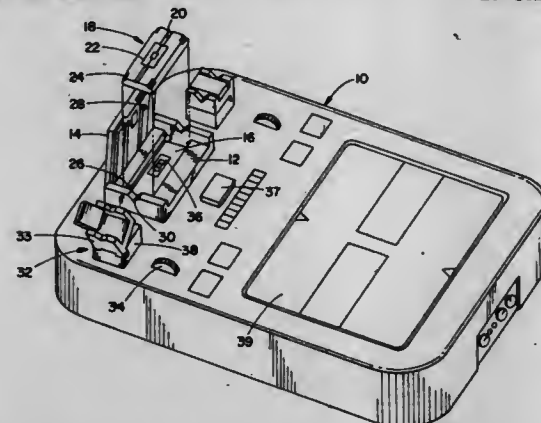
# TOOL FOR FUSING OPTICAL FIBERS

Murray R. Harman, Gloucester; James D. Marshall, Stittsville, and Gordon A. Clark, Nepean, all of, Canada, assignors to Fiberline Division of Preformed Line Products (Canada) Ltd., Nepean, Canada

Continuation of Ser. No. 266,205, Jun. 27, 1994. This application Aug. 11, 1994, Ser. No. 289,291  
Int. Cl.<sup>6</sup> G02B 6/255

U.S. Cl. 385—147

25 Claims



17. A system for heat fusing optical fibers comprising: an electrode block holder having an integral electrode and a first electrical contact connected to the integral electrode; a housing adapted on a first portion for receiving the electrode block holder; a latch for releasably securing the electrode block holder to the first portion of the housing; and, a second electrical contact disposed on the housing in said first portion, the second electrical contact being adapted to engage said first electrical contact for communicating electrical energy from the housing to the electrode block holder.

5,481,641

# MOTOR CONTROL APPARATUS

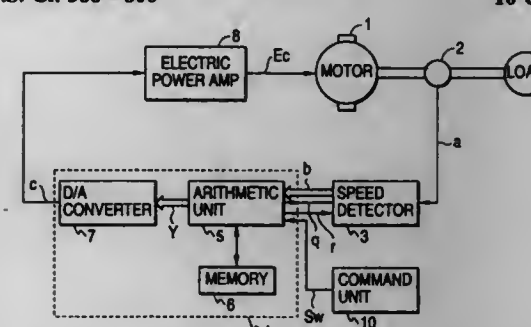
Akihiko Nakamura, Osaka; Yoshio Sakakibara, Neyagawa; Makoto Gotou, Nishinomiya, and Kazuhiko Kobayashi, Moriguchi, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 7, 1993, Ser. No. 87,046

Claims priority, application Japan, Jul. 8, 1992, 4-180847  
Int. Cl.<sup>6</sup> H02P 5/00

U.S. Cl. 388—300

10 Claims



1. A control apparatus for controlling a motor comprising: a command means for generating a command signal including a running command signal and a stopping command signal; a rotation sensor means for generating an AC signal having a period corresponding to a rotational speed of said motor; a speed detection means for detecting the rotational speed of said motor from the AC signal generated by said rotation sensor means and for outputting a detected signal indicating the detected rotational speed and another detected signal; a compensation means for generating a control signal for controlling said motor; and a driver means for driving said motor in response to the control signal generated by said compensation means; said compensation means comprising: a stopping signal generating means for generating a signal to stop said motor when the command signal from said command means is the stopping command signal; a time measuring means for generating a detection timing signal at predetermined time intervals until the another detected signal from said speed detection means becomes a predetermined level after the command signal from said command means has been switched from the stopping command signal to the running command signal; a control signal renewal means for changing said control signal by a predetermined amount in response to the detection timing signal from said time measuring means to renew said control signal in a step-by-step manner when said time measuring means is generating the detection timing signal, and a control signal generating means operable when the detected signal from said speed detection means is inputted thereto for generating said control signal in response to the detected signal from said speed detection means, said control signal generating means using an output of said control signal renewal means as an initial value of said control signal.

5,481,642

# CONSTRAINED-STOCHASTIC-EXCITATION CODING

Yair Shoham, Berkeley Heights, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Continuation of Ser. No. 402,006, Sep. 1, 1989, abandoned.  
This application Aug. 8, 1994, Ser. No. 287,636

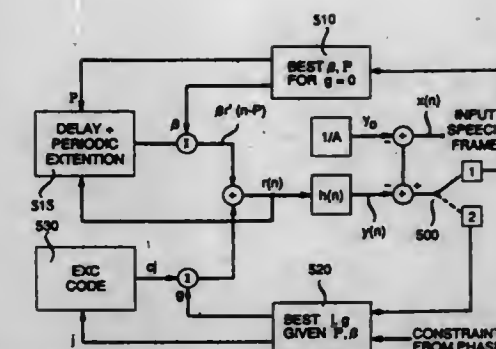
Int. Cl.<sup>6</sup> G10L 9/00

U.S. Cl. 395—228

8 Claims

1. In a communication system, a method for encoding an input signal to form a set of output signals, said method comprising the steps of:

transducing an acoustic signal to generate said input signal;





compression of said one main signal component in response to a first masking control signal and to produce the resulting compressed one main signal component at its output;

first masking control signal generator means for generating said first masking control signal for the first data compression means and for further generating a first data expansion instruction signal applicable to said compressed one main signal component, both generated signals being generated from said one main signal component at the input of the first data compression means;

data expansion means having an input and an output, the input being coupled to the first data compression means to receive data therefrom, said data expansion means being adapted to carry out a data expansion of the data received from the first data compression means so as to derive at said output a replica of said one main signal component;

matrixing means having a first input coupled to the other of said input terminals to receive the other of said first and second main signal components, and a second input coupled to the output of said data expansion means to receive the replica of said one main signal component, the matrixing means being adapted to combine the signals received at its first and second inputs and produce a resulting combined signal at an output thereof;

second data compression means having an input and an output, the input being coupled to the output of said matrixing means to receive said combined signal, the second compression means being adapted to carry out a data compression of said combined signal in response to a second masking control signal and to produce the resulting compressed combined signal at its output;

second masking control signal generator means for generating said second masking control signal for the second data compression means and for further generating a second data expansion instruction signal, both generated signals from said second masking control signal generator means being generated from said other main signal component at the first input of said matrixing means, the second data expansion instruction signal being applicable to said compressed combined signal produced at the output of said second data compression means; and

means for combining the output signals of the first and second data compression means and said first and second data expansion instruction signals so as to form a composite signal for transmission by said transmitter.

5,481,644

### NEURAL NETWORK SPEECH RECOGNITION APPARATUS RECOGNIZING THE FREQUENCY OF SUCCESSIVELY INPUT IDENTICAL SPEECH DATA SEQUENCES

Mitsuhiko Inazumi, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Aug. 6, 1993, Ser. No. 102,859

Claims priority, application Japan, Aug. 6, 1992, 4-210422; Aug. 5, 1993, 5-213363

Int. Cl.<sup>6</sup> G10L 9/00

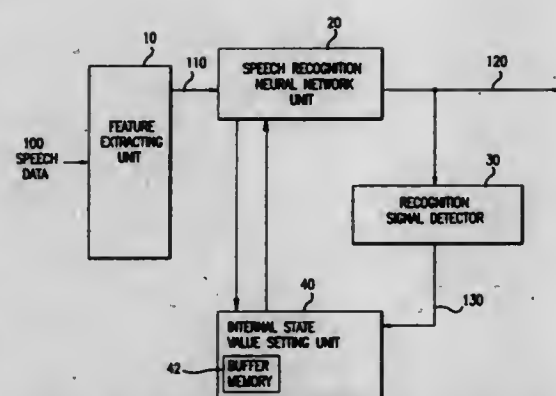
U.S. Cl. 395—2.41

55 Claims

1. A speech recognition apparatus which recognizes a continuous input speech data sequence, the speech recognition apparatus recognizing the frequency of successively input identical input speech data sequences, comprising:

feature extracting means for extracting a sequence of feature vectors from the continuous input speech data sequence by segmenting the continuous input speech data sequence into a sequence of frames and converting each frame of the sequence of frames of the continuous input speech data sequence into the sequence of feature vectors;

speech recognition single-layered neural network means coupled to the feature extracting means for recognizing the sequence of feature vectors of the input speech data sequence input from the feature extracting means based on at least one



learned predetermined input speech data sequence and for generating a speech recognition signal when the continuous input speech data sequence matches the at least one learned predetermined input speech data sequence;

recognition signal detection means coupled to the speech recognition neural network means for detecting the speech recognition signal generated by said speech recognition neural network means and for generating a reset instruction signal; and

internal state value setting means coupled to the speech recognition neural network means and the recognition signal detection means for setting an internal state value of the speech recognition neural network means by storing an initial value of the internal state value of said speech recognition neural network means and setting the internal state value of said speech recognition neural network means to the initial value based on the reset instruction signal generated by the recognition signal detection means, wherein the initial value is one of a plurality of internal state values.

5,481,645

### PORTABLE COMPUTER WITH VERBAL ANNOTATIONS

Gian L. Bertino, Ivrea, and Sergio Rainero, Turin, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Turin, Italy

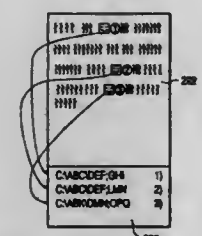
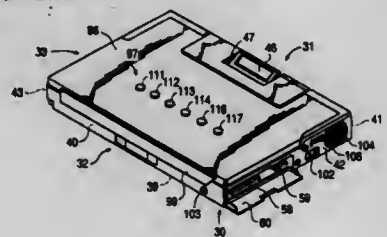
Filed May 14, 1993, Ser. No. 60,830

Claims priority, application Italy, May 14, 1992, TO92A0415

Int. Cl.<sup>6</sup> G10L 9/00

U.S. Cl. 395—2.79

9 Claims



1. A portable computer comprising:

an electronic unit able to assume a text processing condition for processing text in accordance with a commercial text processing program, and a voice management condition for storing and reproducing verbal inserts;

an input unit connected to said electronic unit;

an input unit buffer for storing data corresponding to characters and/or graphic symbols digitized by said input unit;

a visual display screen controlled by said electronic unit for visually displaying said text;

a voice section connected to said electronic unit for generating digital voice signals which define said verbal inserts;

an external memory linked with said electronic unit for storing said digital voice signals;

a base body to carry said electronic unit, having an upper surface to support said input unit;

a cover of said base body for carrying said visual display screen, said cover being movable between a closed position, in which said cover protects both said input unit and said screen, and an open position in which said cover allows access to said input unit and visibility of said screen;

preset keys for said voice section which are supported by said cover and are accessible when said cover is both in said open position and in said closed position, said preset keys controlling said electronic unit in said voice management condition;

voice management access command means activatable for placing said electronic unit in said voice management condition, starting from said text processing condition; and

annotation means activatable for returning said electronic unit to said text processing condition, starting from said voice management condition, and for inserting in a text processed during said text processing condition a linkage track including an alphanumeric character string indicative of a linking between said text and a corresponding linked verbal insert of said verbal alphanumeric character string being inserted in said text in a position identified by a cursor on said visual display screen and equal to the position where said cursor was placed when said voice management command access means were activated;

wherein said annotation means generate said alphanumeric character string to represent an address of said linked verbal insert, and store buffer data in said input unit for identifying said alphanumeric character string, said alphanumeric character string being processed in said text by said commercial text processing program in the same way that said alphanumeric character string is digitized by said input unit; and

wherein switching means are movable between an enabling position for enabling said preset keys and a disabling position for disabling said preset keys, said switching means preventing an unintentional activation of said preset keys.

5,481,646

### NEURON UNIT AND NEURON UNIT NETWORK

Toshiyuki Furuta, Hiroyuki Horiguchi, and Hirotohi Eguchi, all of Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 971,476, Nov. 4, 1992, abandoned,

which is a continuation of Ser. No. 856,645, Mar. 24, 1992,

Pat. No. 5,185,851, which is a division of Ser. No. 550,404,

Jul. 10, 1990, Pat. No. 5,131,073. This application Apr. 22,

1994, Ser. No. 232,355

Claims priority, application Japan, Jul. 12, 1989, 1-179629;

Mar. 12, 1990, 2-60739; Mar. 16, 1990, 2-67937

The portion of the term of this patent subsequent to Jul. 14, 2009, has been disclaimed.

Int. Cl.<sup>6</sup> G06F 15/18

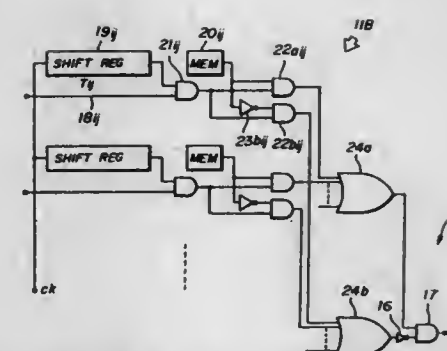
U.S. Cl. 395—27

5 Claims

1. A neuron unit for processing a plurality of binary input signals and for outputting a neuron output signal which is indicative of a result of the processing, said neuron unit comprising:

a plurality of first gate means for carrying out respective synchronous logical operations on a binary input signal using a synchronizing clock signal, the carrying out of the respective synchronous logical operations using weighting coefficients which are each represented by a pulse density which is defined by at least one of first and second values which are arranged at random:

i) a number of the first values corresponding to a high binary signal level; and



ii) a number of the second values corresponding to a low binary signal level;

within a predetermined time;

b) a second gate means, coupled to said first gate means, for carrying out a logical operation on an excitatory output signal of each of said first gate means;

c) a third gate means, coupled to said first gate means, for carrying out a logic operation on an inhibitory output signal for each of said first gate means; and

d) a fourth gate means, coupled to said second and third gate means, for synthesizing output signals of said second and third gate means and for outputting the neuron output signal.

5,481,647

### USER ADAPTABLE EXPERT SYSTEM

Bill E. Brody, Dallas; Steven B. Cudd, Richardson, and Ronald M. Rose, Carrollton, all of Tex., assignors to Raff Enterprises, Inc., Dallas, Tex.

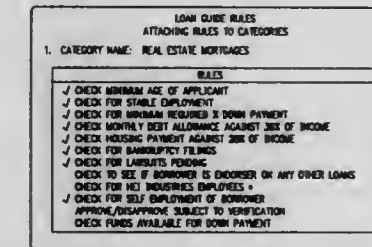
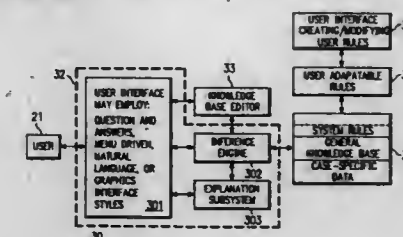
Continuation of Ser. No. 673,955, Mar. 22, 1991, abandoned.

This application Sep. 21, 1993, Ser. No. 125,034

Int. Cl.<sup>6</sup> G06F 15/18

U.S. Cl. 395—51

15 Claims



1. An expert system for use as a decision support system, said system comprising:

a general knowledge base including a set of system rules;

a first data base of case specific data including industry specific data for arriving at a decision;

an interface for receiving a plurality of externally stored user-defined rules and selectively changing by said user ones of said user-defined rules at any time, wherein said plurality of user-defined rules comprise logical expressions stored as a string of pseudovariables in an interpretive language;

means for specifying, by presenting to said user a table of said plurality of user-defined rules and marking by said user a subset of said plurality of user-defined rules, which of the plurality of user-defined rules to apply for arriving at said decision; and











input memory means for receiving box data representing the vertices that define the set of K axial boxes and for storing the data;

control means for retrieving the box data from the input memory means and computing a set of linear inequalities that are functions of  $R=(r_1, r_2, r_3)$  and  $S=(s_1, s_2, s_3)$  and are defined by a set of line conditions comprising

- (1) for all the K boxes and for every digital box data vertex value that is an element of the partition subset  $I_0$ , the maximum value of a box vertex value  $a_i$  is less than or equal to the minimum value of a box vertex value  $b_i$  for each box K;
- (2) for every i that is an element of the partition subset  $I_1$ , all box data vertex values  $x_i$  is greater than zero and for every i that is an element of the partition subset  $I_2$ , the  $x_i$  is less than zero;
- (3) for all i and j that are elements of the partition subset  $I_3$  and for all the boxes K, the difference of the product  $a_i x_i$  and a box data vertex value  $y_i$  is less than or equal to the difference of  $b_i x_i$  and  $y_i$ ;
- (4) for all i and j that are elements of the partition subset  $I_4$  and for all the K boxes, the difference of the product  $a_i x_i$  and a box data vertex value  $y_i$  is greater than or equal to the difference of  $b_i x_i$  and  $y_i$ ;
- (5) for every i that is an element of the partition subset  $I_5$  and for every j that is an element of the partition subset  $I_6$  and for all of the K boxes, the difference of the product  $b_i x_i$  and the box data vertex value  $y_i$  is greater than or equal to the difference of  $b_i x_i$  and  $y_i$  and also the difference of the product  $a_i x_i$  and the box data vertex value  $y_i$  is greater than or equal to the difference of  $a_i x_i$  and  $y_i$ ;

such that the linear inequalities must be true if a transversal line specified by R and S exists for the set of axial boxes; solver means for solving the set of linear inequalities and determining the transversal line solution, if one exists, specified by R and S; and an output display that provides a two-dimensional representation of the line determined by the solver means and defined by R and S.

5,481,659

# METHOD FOR GENERATING FREE-FORM SURFACE DATA

Shiro Nosaka, Kanagawa, and Tetsuzo Kuragano, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan  
PCT No. PCT/JP91/00045, § 371 Date Oct. 8, 1991, § 102(e) Date Oct. 8, 1991, PCT Pub. No. WO91/10965, PCT Pub. Date Jul. 25, 1991

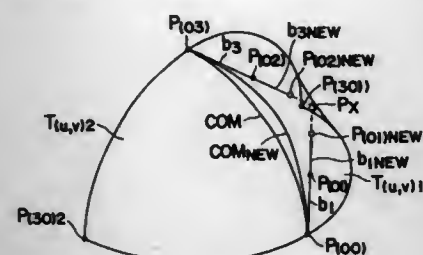
PCT Filed Jan. 18, 1991, Ser. No. 761,957

Claims priority, application Japan, Jan. 21, 1990, 2-010870; Feb. 26, 1990, 2-044843

Int. Cl.<sup>6</sup> G06T 17/20

U.S. Cl. 395—123

3 Claims



2. A free-form surface data generating method for creating a free-form surface by forming trilateral patches expressed by pre-determined vector functions over a multiplicity of frame spaces encircled by boundary curves by frame processing, comprising the steps of:

inputting frame space data representing the frame spaces; forming first and second trilateral patches over the frame spaces and connected by a common boundary; and changing the connection of said first and second trilateral patches so that a first tangent vector along said common boundary and second and third tangent vectors invariably exist on a same plane at an arbitrary point on said common boundary, where said second and third tangent vectors are directed to said first and second trilateral patches across said common boundary; whereby said first and second trilateral patches are connected smoothly; and displaying said first and second trilateral patches on a display unit.

5,481,660

# IMAGE CONVERTING APPARATUS

Masafumi Kurashige, Shinichi Fukushima, and Ayumi Nakao, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

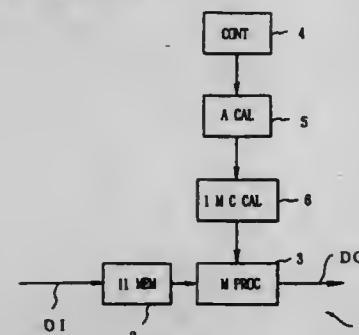
Filed Apr. 6, 1993, Ser. No. 43,543

Claims priority, application Japan, Apr. 11, 1992, 4-118402

Int. Cl.<sup>6</sup> G06T 3/00

U.S. Cl. 395—125

13 Claims



1. An image transforming apparatus for transforming an input image into an output image by mapping the input image onto a shape which includes a wave having a center point and a direction of propagation extending therefrom, comprising: means for generating offset values varying cyclically with increasing distance along said shape in said direction of propagation from said center point; means for defining an attenuation standard position representing a location of minimum attenuation of said wave; means for defining an attenuation range value corresponding to a rate at which the wave attenuates with increasing distance along said direction of propagation from said attenuation standard position; means for generating an attenuation factor as a function of a distance along said direction of propagation from said attenuation standard position and of said attenuation range value for weighting said offset values to form respective weighted offset values; means for generating transform address data representing said shape by adding the weighted offset values to address data representing respective locations on the input image; and means for forming the output image by mapping said input image onto said shape as a function of said input image data and said transform address data.

5,481,661

# METHOD AND APPARATUS FOR CONVERTING ATTRIBUTE OF DISPLAY DATA INTO CODE

Hironobu Kobayashi, Oome, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

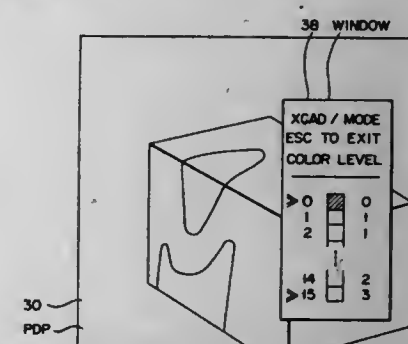
Continuation of Ser. No. 908,897, Jul. 8, 1992, abandoned, which is a continuation of Ser. No. 731,381, Jul. 16, 1991, abandoned, which is a continuation of Ser. No. 330,443, Mar. 30, 1989, abandoned. This application Nov. 17, 1994, Ser. No. 344,685

Claims priority, application Japan, Mar. 30, 1988, 63-74534

Int. Cl.<sup>6</sup> G06T 5/00

U.S. Cl. 395—131

20 Claims



1. A display apparatus for displaying information on a display of a type capable of displaying only a certain number of gradations, comprising:

display data storing means for storing display data to be displayed, the display data including color codes indicative of a display color;

converting means for converting the color codes of the stored display data into converted gradation codes using a prestored table, each gradation code being indicative of one of the gradations and a number of possible gradation codes being less than a number of possible color codes;

means for driving the display to produce a window display, while an application program is being executed, the window display having separate columns, wherein one column indicates an entry representing an attribute of displayed display data and another column indicates a corresponding gradation code;

selecting means for selecting a selected gradation code from the converted gradation codes window-displayed on the display; and

changing means for receiving a command to change the selected gradation code into another gradation code and for changing the selected gradation code into the another gradation code, said driving means subsequently displaying the display data including the another gradation code.

5,481,662

# METHOD OF AND APPARATUS FOR MODIFYING BASE SEPARATION FIGURE

Satoshi Kouyama, and Yasushi Ohshima, both of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Sep. 27, 1994, Ser. No. 312,736

Claims priority, application Japan, Jan. 8, 1993, 5-277797

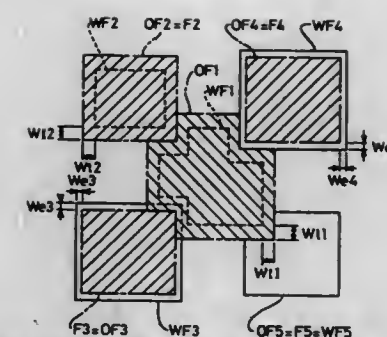
Int. Cl.<sup>6</sup> G06T 3/00

U.S. Cl. 395—135

12 Claims

1. A method of modifying a base separation figure to be painted with a specific base color ink, said method comprising the steps of:

- (a) providing original figure data representing a plurality of original figures close to each other and base separation figure data representing a plurality of base separation figures corresponding to said plurality of original figures, each base separation figure representing an area laid under the corresponding



original figure, at least one of said plurality of base separation figures being produced by contracting a corresponding original figure;

- (b) selecting an original figure to which a corresponding base separation figure was produced by contracting said original figure, and determining said selected original figure as an objective figure;
- (c) extracting one of said plurality of original figures which is close to said objective figure, and determining said extracted original figure as a target contiguous figure to be processed;
- (d) when an outline of said target contiguous figure is in contact with an outline of said objective figure, producing a first intermediate figure by obtaining a logical sum of said objective figure and said target contiguous figure, producing a second intermediate figure by contracting said first intermediate figure by a predetermined width, producing a third intermediate figure by obtaining a logical product of said second intermediate figure and said objective figure, and producing a fourth intermediate figure by obtaining a logical sum of said third intermediate figure and a base separation figure corresponding to said objective figure; and
- (e) repeating said steps (c) and (d) to produce a plurality of fourth intermediate figures respectively corresponding to original figures close to said objective figure, and obtaining a logical sum of said plurality of fourth intermediate figures to produce a modified base separation figure corresponding to said objective figure.

5,481,663

# WORD PROCESSORS FOR PERFORMING AN AUTOMATIC LAYOUT PROCESS

Teruyuki Satake, Higashimurayama, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 15, 1993, Ser. No. 47,964

Claims priority, application Japan, Apr. 22, 1992, 4-127921

Int. Cl.<sup>6</sup> G06F 17/24

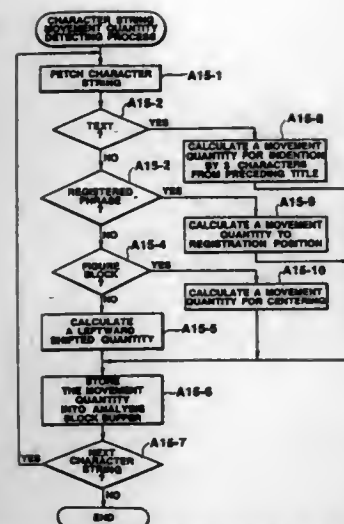
U.S. Cl. 395—146

1 Claim

1. A word processor for performing an automatic layout process to determine a new layout of a document, the document including plural character strings and figures, the character strings being a series of plural characters and a category of the character string being determined depending on a position where the character string is originally disposed, comprising:

- a) document storage means for storing a document, the document including plural character strings and at least a figure, and for storing position data of the character strings and the figure, the position data representing a position in a layout of the document at which position the character string or the figure is disposed;
- b) layout rule storage means for storing a layout rule specifying a position in a new layout of a document at which position a character string is to be disposed depending on the category of the character string;
- c) character string moving means for judging a category of each of the character strings of the document stored in said document storage means and for moving the character string to the position specified by the character string's category as determined by the layout rules stored in said layout rule storage means;





- d) determining means for judging whether the figure included in the document stored in said document storage means has position data identical to the original position data of any of the character strings moved by said character string moving means; and
- e) figure moving means for, when said determining means determines that the figure has the position data identical to the original position data of the character string moved by said character string moving means, moving the figure to the position in the new layout of the document, to which position the character string has been moved by said character string moving means.

5,481,664

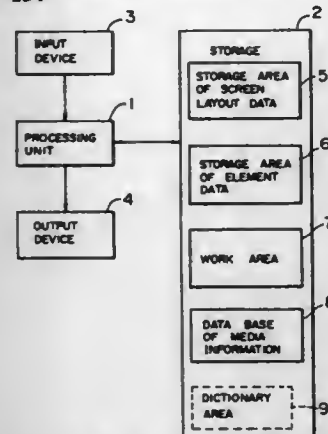
## METHOD OF CONTROLLING INFORMATION IN MULTIMEDIA SYSTEM

Masaaki Hiroya, Yokohama; Masayuki Saito, and Hiroyuki Takagi, both of Atsugi, all of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Keiyo Engineering Co., Ltd., Chiba, both of Japan

Filed Jan. 19, 1993, Ser. No. 5,273

Claims priority, application Japan, Jan. 30, 1992, 4-014753  
Int. Cl.<sup>6</sup> G06T 1/00

U.S. Cl. 395-154



1. A method of controlling information in a multimedia system including a processing unit, a storage, a display, and an input device, the system executing the steps of:

- storing, in a first area of said storage, for each of a plurality of screen layout areas simultaneously used by the processing unit, screen layout data including an identifier of each of a plurality of media information elements used in the screen layout area;
- storing element data of said media information elements used in the plural screen layout areas in a second area of said storage,

said element data being constituted with data representing a media information element and a reference number denoting a number of screen layout areas referencing the media information element corresponding to said each element data;

adding in the first area of said storage, in response to a command requesting a copy of a media information element inputted via the input device, an identifier of the media information element to be copied to screen layout data associated with a destination screen layout area, and incrementing, in the second area of said storage, a reference number of the element data corresponding to the media information to be copied;

in response to a command inputted via the input device to change one of same media information elements simultaneously used, copying element data associated with a media information element to be changed in the second area of said storage so as to use copied element data as element data of the media information element to be changed;

decrementing, in the second area of said storage, a reference number in element data associated with a media information element as a change source;

changing, in the first area of said storage, an identifier of the media information element to be changed in a screen layout data associated with a screen layout as an object of change to have a new identifier;

initializing, in the second area of said storage, a reference number as "one" in element data associated with the media information element as the change object;

changing the media information as the change object; and

presenting, for each of the plural screen layout areas, the media information elements related thereto according to data stored in the storage.

5,481,665

## USER INTERFACE DEVICE FOR CREATING AN ENVIRONMENT OF MOVING PARTS WITH SELECTED FUNCTIONS

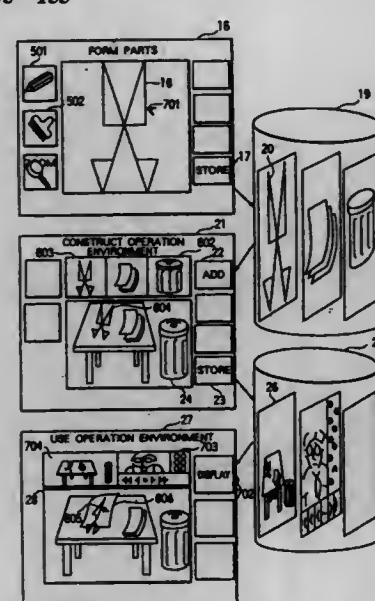
Kazuhisa Okada; Kazumi Matsuura, and Nobuo Asahi, all of Kamakura, Japan, assignors to Institute for Personalized Information Environment, Tokyo, Japan

Filed Jul. 14, 1992, Ser. No. 913,304

Claims priority, application Japan, Jul. 15, 1991, 3-173842  
Int. Cl.<sup>6</sup> G06F 17/00

27 Claims

U.S. Cl. 395-155



5. A visual interface device for generating a visual system on a computer having an input device and a display, the device comprising:

12 Claims

part forming means for forming a plurality of graphics, each graphic having graphic information entered through the input device of the computer;

operational environment constructing means for constructing an operational environment that includes the formed plurality of graphics, the operational environment constructing means including relational information forming means for forming relational information defining a part-to-part relationship between the first graphic and the second graphic and a part-to-environment relationship between the first graphic and the operational environment, the relational information including semantic information that defines semantic attributes of the first graphic and the second graphic, and movement information that defines movement attributes of the first graphic and the second graphic; and

operational environment using means for displaying an operation of the operational environment on the display of the computer, wherein the operation includes a first graphic performing a function so that the first graphic displays a movement relative to a second graphic, wherein the operational environment using means includes operational history storing means for storing a history of functions performed by the graphics in the operational environment.

5,481,666

## OBJECT-ORIENTED NAVIGATION SYSTEM

Frank T. Nguyen, Campbell; David R. Anderson, Cupertino, and Timothy J. O. Catlin, Belmont, all of Calif., assignors to Taligent, Inc., Cupertino, Calif.

Filed Aug. 25, 1993, Ser. No. 112,821

Int. Cl.<sup>6</sup> G06F 15/00

U.S. Cl. 395-159



1. A method for navigating between a first and a second document object in a computer system having a processor, a storage attached to and under the control of the processor, a display attached to and under the control of the processor, the first and second document objects each consisting of a container object having therein a plurality of model objects each with a model object interface the method comprising the steps of:

- loading the first document object into the storage and presenting the first document object on the display;
- creating a first selection object associated with the first document object in the storage, the first selection object identifying a selected portion of one of the plurality of model objects;
- creating a reference object having a model object interface;
- inserting a reference to the first selection object into the reference object;
- loading a second document object into the storage and presenting the second document object on the display;
- placing the reference object associated with the first selection object in the second document object as a model object; and
- navigating via the reference object in the second document object to the selected portion of the one of the plurality of model objects in the first document object.

5,481,667

## METHOD AND SYSTEM FOR INSTRUCTING A USER OF A COMPUTER SYSTEM HOW TO PERFORM APPLICATION PROGRAM TASKS

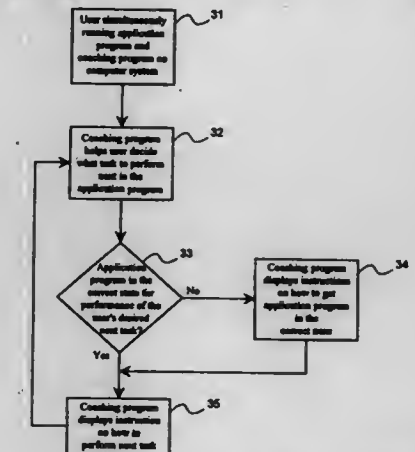
Cynthia L. Bleniek, Bellevue; Ross A. Hunter, Woodinville; Timothy P. McKee, Seattle, and David H. Schroeder, Redmond, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Feb. 13, 1992, Ser. No. 835,213

Int. Cl.<sup>6</sup> G06F 17/30

U.S. Cl. 395-161

33 Claims



1. A method of coaching a user of a computer system running an application program, where the user manipulates the user's own data by performing various application program tasks, and where the computer system includes a display screen, the method comprising the steps of:

- providing a coaching program to be run on the computer system while the application program is running;
- activating the coaching program while the application program is running;
- under control of the coaching program, determining a next task the user wishes to perform in the application program;
- simultaneously displaying on the display screen application program instructions generated by the coaching program for performance of the next task and a user interface display generated by the application program, the user interface display having a working portion used by the user to perform the next task, with the application program instructions overlaying the user interface display without blocking the working portion of the user interface display and without interrupting the operation of the application program; and
- performing the next task in the application program by using the working portion of the user interface display while continuing to display the application program instructions so that the application program instructions displayed on the display screen during performance of the next task are readable to the user.

5,481,668

## SYSTEM FOR DESIGNING INFORMATION CONTROL NETWORKS FOR MODELING ALL KINDS OF PROCESSES

Michel Marcus, Vitry, France, assignor to Bull S.A., Paris, France

Filed Jun. 8, 1993, Ser. No. 73,070

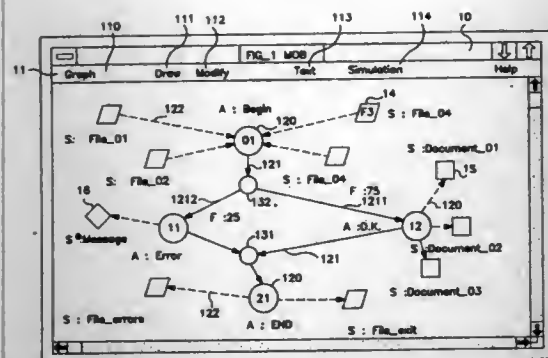
Claims priority, application France, Jun. 9, 1992, 92 06932  
Int. Cl.<sup>6</sup> G06F 3/14

U.S. Cl. 395-161

22 Claims

1. A system for designing information control networks for modeling a process, including means for defining a set of independent procedures, said independent procedures comprising objects, including activities to be performed, AND-SOURCE or OR-SOURCE jumps, or AND-WELL or OR-WELL jumps, which together define the process to be modeled, means for representing





each object as a different graphical symbol, means for assigning textual attributes and other information to the graphical symbols, means for representing the information as receptacles indicating a file, document or message, each receptacle having a different shade based on the information contained therein, means for defining logical links between the objects, and for defining logical links between the objects and the other information to define a process model in the form of a graph, said graph connecting activities by arrows drawn in a solid line, either directly or by way of a jump, wherein activities are also connected by dashed arrows to the information, and means for interactively manipulating the objects, attributes, information and links on a graphical screen of the information processing device.

5,481,669

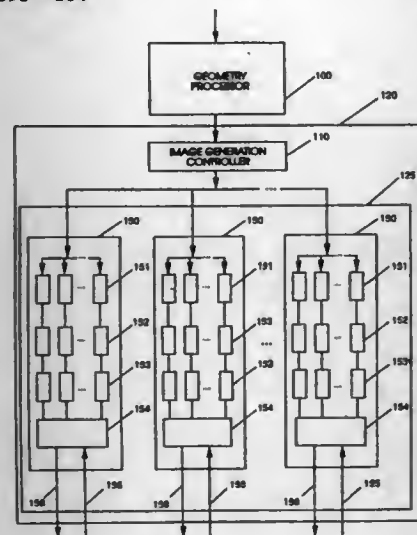
### ARCHITECTURE AND APPARATUS FOR IMAGE GENERATION UTILIZING ENHANCED MEMORY DEVICES

John W. Poulton; Steven E. Molnar, and John G. Eyles, all of Chapel Hill, N.C., assignors to The University of North Carolina at Chapel Hill, Chapel Hill, N.C.

Continuation of Ser. No. 975,821, Nov. 13, 1992, Pat. No. 5,388,206. This application Feb. 6, 1995, Ser. No. 383,969  
Int. Cl. G06F 12/00

U.S. Cl. 395—164

15 Claims



1. An image generation system, comprising:

- primitive processing means for generating primitive screen data; and,
- a plurality of rasterizers associated with said primitive processing means for computing pixel values from said primitive screen data, each of said rasterizers comprising an enhanced memory device, said enhanced memory device corresponding to a selected set of screen coordinates,
  - said enhanced memory device having for each of said selected screen coordinates,

internal processing means for computing pixel values to provide a computed pixel value, storage means associated with each of said internal processing means for storing data, and, compositor buffer associated with each of said internal processing means for storing said computed pixel value, and

- said enhanced memory device further having, input means for receiving computed pixel values from a different one of said plurality of rasterizers, compositor means for compositing said stored computed pixel value and the pixel value received by said input means to determine a composited pixel value, output means operably associated with said compositor means for outputting said composited pixel value; and
- at least one of said plurality of rasterizers further comprising external memory means operably associated with said enhanced memory device for storing imaging information.

5,481,670

### METHOD AND APPARATUS FOR BACKUP IN A MULTI-MEMORY DEVICE

Toyohito Hatashita; Motoharu Taura; Toshihiko Shimizu, and Hiroshi Umeoka, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

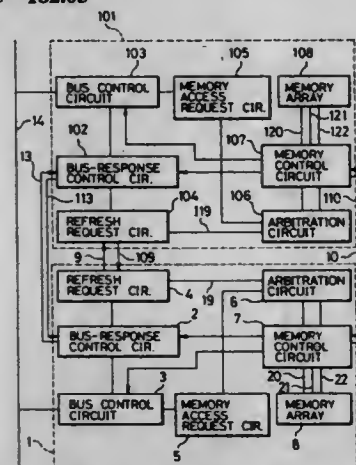
Filed Jul. 28, 1993, Ser. No. 98,806

Claims priority, application Japan, Jan. 14, 1992, 4-275739

Int. Cl. G11C 29/00

U.S. Cl. 395—182.05

13 Claims



9. A multi-memory apparatus which includes plural identical memory units each of which operates in either a master mode, wherein said memory unit functions as a master memory, or a backup mode, wherein said memory unit functions as a backup memory, connected to a system bus, each said memory unit comprising:

- a refresh request means for issuing a memory-refresh request, the refresh request means coupled a bus clock on said system bus and coupled to a trigger from said master memory, and the refresh request means is responsive to said bus clock on said system bus while said memory unit is in said master mode, and responsive to said trigger from said master memory while said memory unit is in said backup mode;
- a bus control means having a mode input for responding to said system bus while said memory unit is in said master mode, and the bus control means further for prohibiting a response to said system bus while said memory unit is in said backup mode;
- a bus-response control means for detecting an error in said master memory, and the bus response control means for indicating in the mode input of the bus control means that said memory unit is in one of said master mode or said backup mode when the error in said master memory had been detected; and

(D) a copy-status register operative when said memory is in said backup mode, after connecting said memory unit to said system bus, for copying data from said master memory at specific addresses, and for preventing said memory unit from being used as said backup memory until completion of said copying data.

5,481,671

### MEMORY TESTING DEVICE FOR MULTI-PORTED DRAMS

Kenichi Fujisaki, Gyoda, Japan, assignor to Advantest Corporation, Tokyo, Japan

PCT No. PCT/JP93/00118, § 371 Date Dec. 30, 1993, § 102(e) Date Dec. 30, 1993, PCT Pub. No. WO93/15462, PCT Pub. Date Aug. 5, 1993

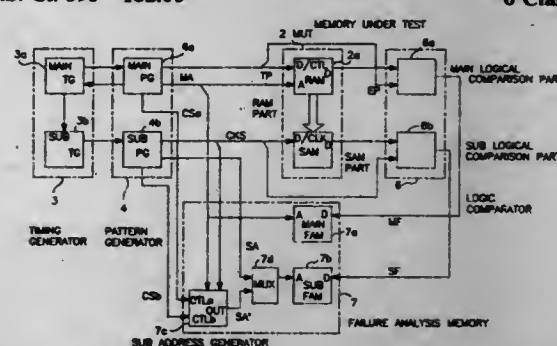
PCT Filed Feb. 2, 1993, Ser. No. 122,490

Claims priority, application Japan, Feb. 3, 1992, 4-017758

Int. Cl. G11C 29/00; 7/00

U.S. Cl. 395—182.06

6 Claims



1. A memory testing device for testing a memory device having a random access memory (RAM) part and a serial or sequential access memory (SAM) part, comprising:

- timing generator means for generating and providing a timing signal;
- a main pattern generating part, receiving said timing signal from said timing generator means, for applying a test pattern, a control signal and a main address signal to the RAM part of the memory device under test and outputting an expected pattern;
- a sub pattern generating part, receiving said timing signal from said timing generator means, for applying a test pattern and a clock signal to the SAM part of the memory device under test and outputting an expected pattern;
- the SAM part having data corresponding to said main address signal transferred from the RAM part and stored therein;
- a main logical comparison part, receiving the test pattern read out of the RAM part and the expected pattern supplied from said main pattern generating part, for comparing both the test pattern and the expected pattern with each other and generating a main failure signal when a disagreement between both the test pattern and the expected pattern is detected by said main logical comparison part;
- a sub logical comparison part, receiving the test pattern read out of the SAM part and the expected pattern output from said sub pattern generating part, for comparing both the test pattern and the expected pattern with each other and generating a sub failure signal when a disagreement between both the test pattern and the expected pattern is detected by said sub logical comparison part;
- a failure analysis memory comprising:
- a main failure analysis memory having the same storage capacity as that of the RAM part; and
  - a sub failure analysis memory having the same storage capacity as that of the SAM part, said main failure signal output from said main logical comparison part being written into said main failure analysis memory, said sub failure signal output from said sub logical comparison part being written into said sub failure analysis memory; and

5,481,672

### DETECTING REWRITING OF STORED DATA, USING CODES BASED ON PASSWORD AND THE STORED DATA

Yasuhiro Okuno, Kawasaki; Tadashi Yamakawa, Yokohama; Masaaki Nagashima, Kawasaki, and Takayuki Sasaki, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

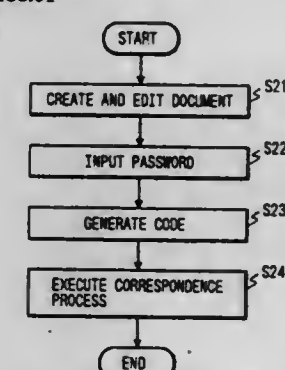
Filed Feb. 27, 1992, Ser. No. 842,514

Claims priority, application Japan, Feb. 27, 1991, 3-032896; Feb. 27, 1991, 3-032911; Feb. 27, 1991, 3-032912; Feb. 27, 1991, 3-032913

Int. Cl. G06F 11/00

U.S. Cl. 395—188.01

27 Claims



1. A method for determining whether or not a rewrite of stored data has been made, comprising the steps of:

- (A) in storing newly prepared data: inputting a password;



generating a first code by converting the input password and the newly prepared data in a predetermined procedure; and storing the newly prepared data and the first code in correspondence thereto; and

(B) in reading out the stored data:

inputting the password;  
generating a second code by converting the input password and the read out data in said predetermined procedure;  
comparing the generated second code and said first code; and determining that the rewrite of the newly prepared data has been made subsequent to storage in correspondence to the first code if the comparison result is unmatched.

5,481,673

### METHOD FOR CLUSTER ROUTING IN DIRECT LINK USING TWO ASSOCIATED ROUTING TABLES AT NODE OR SIGNALING TRANSFER POINT

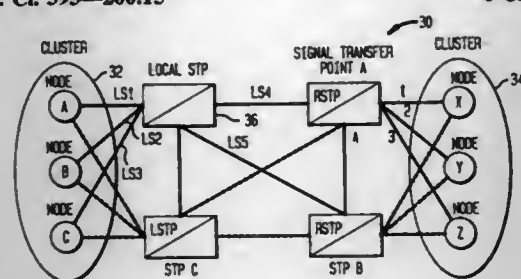
Steven M. Michelson, Freehold, N.J., assignor to Bell Communications Research Inc., Livingston, N.J.

Filed Aug. 20, 1993, Ser. No. 110,147

Int. Cl.<sup>6</sup> H04J 3/16; 3/24; G06F 13/00

U.S. Cl. 395—200.15

6 Claims



1. A method for routing messages through a communication system to an end member in a cluster of members from a remote node through a pair of intermediate nodes, wherein one of said members in said cluster can be reached from said remote node by a direct link utilizing member routing or by intermediate links through at least one other of said intermediate nodes utilizing cluster routing, the method comprising

maintaining at said remote node a first routing table including cluster routing entries identifying cluster routes for said cluster including said end member,

maintaining at said remote node a second routing table including member routing entries identifying member routes for the members of said cluster, said first and second tables being associated with each other,

receiving at said remote node a cluster network management message including status information as to the status of said cluster and identifying cluster routes affected by the message, marking the cluster routing entries in said first routing table associated with the affected cluster routes with said status information,

marking the associated member routing entries with said status information, so as to ensure consistency of route status information between the cluster and the member routing entries, and

sending messages from said remote node to said end member through said direct link utilizing member routing entries in said second routing table and from said remote node to other end members in said cluster through said intermediate links utilizing cluster routing entries in said first routing table.

5,481,674

### METHOD AND APPARATUS MAPPING THE PHYSICAL TOPOLOGY OF EDDI NETWORKS

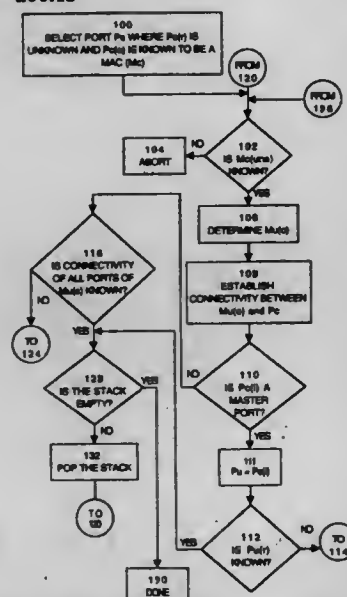
Manohar R. Mahavadi, 34512 Willbridge Ter., Fremont, Calif. 94555

Filed Jun. 20, 1994, Ser. No. 262,150

Int. Cl.<sup>6</sup> G06F 13/00

U.S. Cl. 395—200.11

17 Claims



1. A computer-implemented method for generating a physical topology map of a network, the method comprising the computer-implemented steps of:

a) selecting a first selected port on a station in said network as a currently selected port, said first selected port having an input entity and an output entity, said first selected port having an initially unknown external connectivity, wherein said output entity of said first selected port is known to be a first selected medium access controller;

b) selecting said first selected medium access controller as a currently selected medium access controller;

c) selecting a first upstream medium access controller as a currently selected upstream medium access controller, said first upstream medium access controller being an upstream neighbor medium access controller of said currently selected medium access controller, said currently selected upstream medium access controller having an input entity and an output entity, said currently selected upstream medium access controller being disposed within a station which includes one or more ports, each port of said one or more ports having an external connectivity;

d) selecting a first upstream port as a currently selected upstream port, said first upstream port being said output entity of said currently selected upstream medium access controller;

e) generating connection data which indicates that said currently selected upstream port is externally connected to said currently selected port;

f) determining whether said input entity of said currently selected port is a master port;

g) if said input entity of said currently selected port is not a master port, then determining whether said external connectivity of each port of said one or more ports is known;

h) if said input entity of said currently selected port is not a master port and if said external connectivity of each port of said one or more ports is not known, then performing the steps of:

h1) selecting said currently selected upstream medium access controller as said currently selected medium access controller;

h2) selecting said input entity of said currently selected upstream medium access controller as said currently selected port;

h3) selecting a second upstream medium access controller as said currently selected upstream medium access controller, said second upstream medium access controller being an upstream neighbor medium access controller of said currently selected medium access controller, said currently selected upstream medium access controller having an input entity and an output entity;

h4) selecting a second upstream port as said currently selected upstream port, said second upstream port being said output entity of said currently selected upstream medium access controller; and

h5) generating connection data which indicates that said currently selected upstream port is externally connected to said currently selected port.

5,481,675

### ARRANGEMENT FOR THE DECENTRALIZED CONTROL OF ACCESS TO A BUS BY UNITS CONNECTED TO THE BUS

Winfried Glaeser, Markt Schwaben; Rudolf Holzner, Altdorf, and Guenter Watzlawik, Taufkirchen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

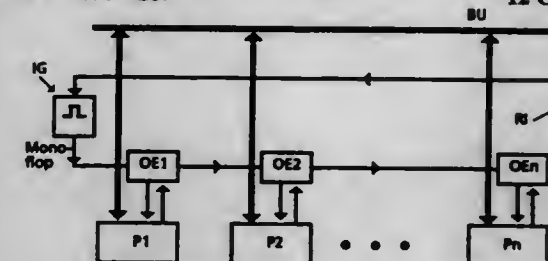
Filed Jul. 7, 1994, Ser. No. 271,715

Claims priority, application Germany, Jul. 9, 1993, 43 23 019.9

Int. Cl.<sup>6</sup> G06F 13/36

U.S. Cl. 395—287

12 Claims



1. A control system for controlling access to a bus by a bus accessing unit coupled to the bus, comprising:

a unidirectional ring circuit;

a monoflop function element coupled in-line in the ring circuit and configured to generate a pulse of duration  $T > 0$  downstream of the monoflop function element whenever a transition from a logic signal of a first type to a logic signal of a second type is detected by the monoflop function unit immediately upstream of the monoflop function unit; and

a coupling unit coupled in-line in the ring circuit and coupled to the bus accessing unit, the coupling unit having a first input coupled to the ring circuit and a second input coupled to the bus accessing unit, the coupling unit effecting a logical OR operation on any signal appearing immediately upstream of the coupling unit in the ring circuit and an access request logic signal of the first type issued by the bus accessing unit, the coupling unit awarding access to the bus to the accessing unit whenever it receives a transition from a logic signal of the first type to a logic signal of the second type at its first input, the coupling unit generating as an output the result of the logic OR operation on the ring circuit downstream of the coupling unit, the logic OR operation generating a logic signal of the first type while a logic signal of the first type is an input to thereto.

5,481,675

### ASYNCHRONOUS SERIAL COMMUNICATION SYSTEM FOR DELAYING WITH SOFTWARE DWELL TIME A RECEIVING COMPUTER'S ACKNOWLEDGEMENT IN ORDER FOR THE TRANSMITTING COMPUTER TO SEE THE ACKNOWLEDGEMENT

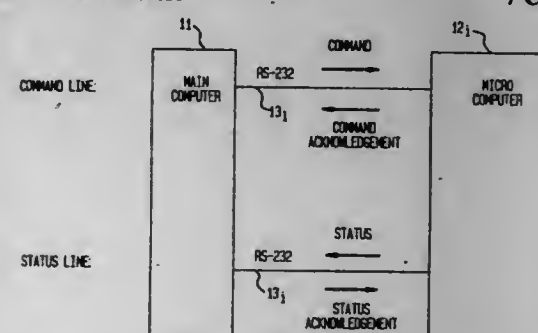
Chris T. Kapogiannis, Poughkeepsie, and John F. Harmuth, Pleasant Valley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 12, 1992, Ser. No. 881,593

Int. Cl.<sup>6</sup> G06F 13/00; 13/14

U.S. Cl. 395—200.13

7 Claims



1. A method of asynchronous full-duplex communications between two or more computers connected via separate serial communications links comprising the steps of:

measuring relative READ/WRITE cycle times for each of said computers by transmitting over a serial channel from a first computer to a second computer a data string and responding by the second computer with an acknowledgement over said serial channel and determining whether the first computer sees the acknowledgement and repeating the process by transmitting a data string from the second computer to the first computer over said serial channel and responding by the first computer with an acknowledgement over said serial channel; and

adding a delay in the form of a software dwell time in a time period between receiving a data string and responding with an acknowledgement as necessary to allow said computers to see the acknowledgements from computers to which data strings were transmitted over said serial channel.

5,481,677

### DATA TRANSFER SYSTEM IN WHICH DATA IS TRANSFERRED TO OR FROM A DATA MEMORY DURING AN INSTRUCTION FETCH CYCLE

Yoshihide Kai, Tokyo; Hiroya Tanigawa, Yokosuka, and Toshiko Wakahara, Yokohama, all of Japan, assignors to Oki Electric Industry Co., Ltd., and Nippon Telegraph And Telephone Corporation, both of Tokyo, Japan

Continuation of Ser. No. 555,349, Jul. 18, 1990. This application Sep. 3, 1992, Ser. No. 939,044

Claims priority, application Japan, Jul. 20, 1989, 1-185936; Jul. 20, 1989, 1-185937

Int. Cl.<sup>6</sup> G06F 13/00

U.S. Cl. 395—280

16 Claims

1. A data transfer system, comprising:

an address bus means, having a first part and a second part, for transferring address information;

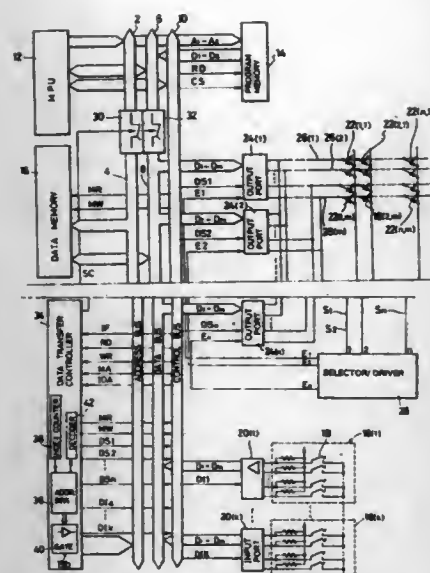
a data bus means, having a first part and a second part, for transferring data;

a control bus means for transferring control signals;

a von-Neumann-type microprocessor connected to said first part of said address bus means, said first part of said data bus means, and said control bus means;

a program memory means, connected to said first part of said address bus means, said first part of said data bus means, and





said control bus means, for storing instructions to be executed by said microprocessor during instruction cycles;

a data memory means, connected to said second part of said address bus means, said second part of said data bus means, and said control bus means, for storing data;

at least one I/O device connected to said second part of said data bus means and said control bus means;

an address bus switch means for disconnecting said first part of said address bus means from said second part of said address bus means when said microprocessor is fetching an instruction from said program memory means, and connecting said first part of said address bus means to said second part of said address bus means at other times in each instruction cycle;

a data bus switch means for disconnecting said first part of said data bus means from said second part of said data bus means when said microprocessor is fetching an instruction from said program memory means, and connecting said first part of said data bus means to said second part of said data bus means at said other times; and

data transfer controller means, connected to said second part of said address bus means and said control bus means, for generating addresses and control signals to perform direct transfers of data between said data memory means and said at least one I/O device via said second part of said data bus means while said microprocessor is fetching instructions from said program memory means.

5,481,678

#### DATA PROCESSOR INCLUDING SELECTION MECHANISM FOR COUPLING INTERNAL AND EXTERNAL REQUEST SIGNALS TO INTERRUPT AND DMA CONTROLLERS

Hiroyuki Kondo; Yuichi Nakao, and Kazumi Koyama, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 499,876, Mar. 27, 1990, abandoned.

This application Jul. 12, 1993, Ser. No. 92,021

Claims priority, application Japan, Mar. 30, 1989, 1-83185; Jan. 23, 1989, 1-275433

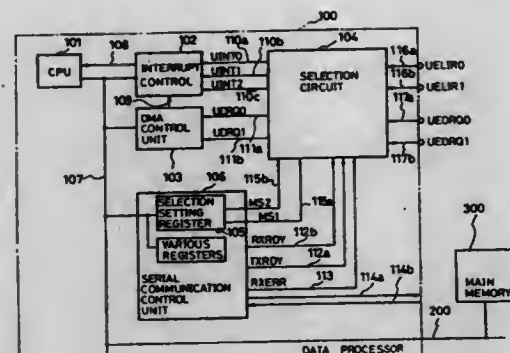
Int. Cl.<sup>6</sup> G06F 13/00

U.S. Cl. 395—280

10 Claims

8. A single integrated circuit data processor for communicating data with a main memory having a first portion for storing data for transmission by the single integrated circuit data processor and a second portion for storing data received by the single integrated circuit data processor, the single integrated circuit data processor comprising:

a data bus connected to said main memory;



a central processing unit coupled to said data bus, said central processing unit for issuing instructions and for processing data over said data bus, said central processing unit responsive to an interrupt request received at an interrupt signal line;

a serial communication control unit, coupled to said central processing unit by said data bus, for independently controlling both a serial transmission and a serial reception of data to an external transmission port and from an external reception port, respectively, and for selectively asserting any of a reception ready signal on a reception ready signal line, a transmission ready signal on a transmission ready signal line or a reception error signal on a reception error signal line responsive to a status of said serial transmission and said serial reception;

an interrupt control unit, coupled to said interrupt signal line of said central processing unit and to said data bus for asserting said interrupt request on said interrupt signal line responsive to receipt of a signal at any of one or more interrupt request lines;

a direct memory access (DMA) control unit, coupled to said data bus, for controlling direct memory access, relative to the main memory, responsive to receipt of a signal at any of one or more DMA transfer request lines;

a selection setting register, coupled to said central processing unit by said data bus and responsive to an instruction from said central processing unit, for providing a mode selecting signal on a mode selecting signal line to select a connection mode, said mode selecting signal being generated responsive to said instruction; and

a selection circuit, coupled to said mode selecting signal line, to said interrupt signal line, to said DMA control unit, to said signal lines of said serial communication control unit, to one or more external interrupt request lines and to one or more external DMA request lines, said selection circuit responsive to said mode selecting signal, for setting the connection mode by configuring itself to couple said reception ready signal, said transmission ready signal, and said reception error signal to selected ones of said ones of said one or more interrupt request lines and said one or more DMA transfer request lines to selected ones of said external interrupt request lines and said external DMA request lines.

5,481,679

#### DATA PROCESSING APPARATUS HAVING BUS SWITCHES FOR SELECTIVELY CONNECTING BUSES TO IMPROVE DATA THROUGHPUT

Nobuo Higaki, Osaka, and Toshimichi Matsuzaki, Minou, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 15, 1993, Ser. No. 121,799

Claims priority, application Japan, Sep. 16, 1992, 4-246659

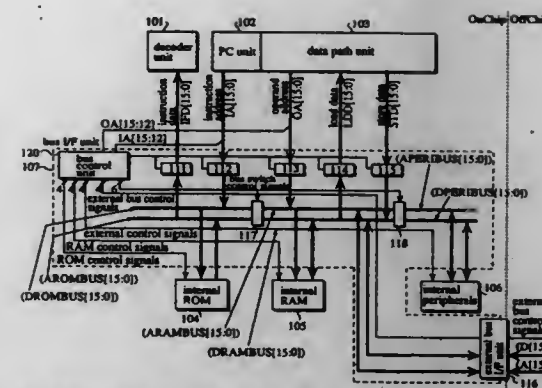
Int. Cl.<sup>6</sup> G06F 13/00; 13/42

U.S. Cl. 395—308

34 Claims

34. A data processing apparatus, comprising:

an instruction storage unit for storing instructions;



an instruction preparation unit for preparing instructions for execution;

a first bus operatively connecting the instruction storage unit to the instruction preparation unit;

an instruction execution unit for executing instructions;

a data storage unit for storing data;

a second bus operatively connecting the instruction execution unit to the data storage unit;

means for providing a communication path between the first bus and the second bus, the communication path being provided to transmit information between the first bus and the second bus when either the instruction execution unit needs to access the instruction storage unit or the instruction preparation unit needs to access the data storage unit; and

means for controlling the communication path of the first bus and second bus so that the first and second bus are connected when either the instruction execution unit accesses said instruction storage unit or the instruction preparation unit accesses said data storage unit and disconnected when either the instruction preparation unit accesses said instruction storage unit or when said instruction execution unit accesses said data storage unit.

5,481,681

#### DATA TRANSFER OPERATIONS BETWEEN TWO ASYNCHRONOUS BUSES

Paul S. Gallo, Watertown; R. W. Benjamin Goodman, Hopkinton; Lawrence L. Krantz, Marlborough; Kathleen A. McLoughlin, Hopkinton, and Eric M. Wagner, E. Douglas, all of Mass., assignors to Data General Corporation, Westboro, Mass.

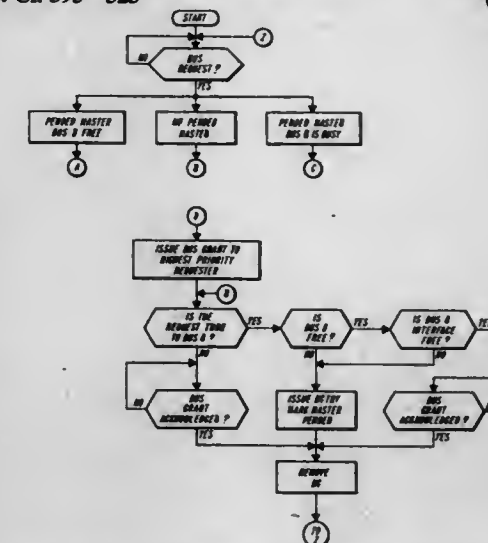
Continuation of Ser. No. 315,430, Feb. 24, 1989, abandoned.

This application May 19, 1995, Ser. No. 445,408

Int. Cl.<sup>6</sup> G06F 13/14

U.S. Cl. 395—325

6 Claims



5,481,680

#### DYNAMICALLY PROGRAMMABLE BUS ARBITER WITH PROVISIONS FOR HISTORICAL FEEDBACK AND ERROR DETECTION AND CORRECTION

Mikael L. Larson, St Charles, and Wayne R. Wilcox, Naperville, both of Ill., assignors to AT&T Corp., Murray Hill, N.J.

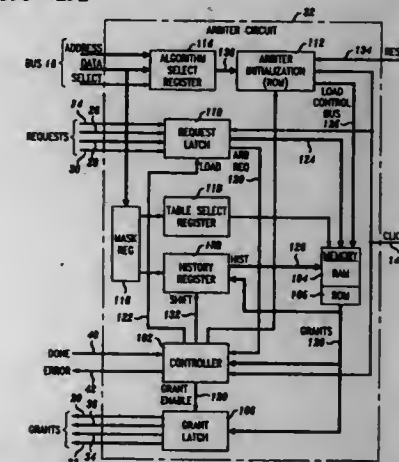
Continuation of Ser. No. 63,380, May 17, 1993, abandoned.

This application Apr. 14, 1995, Ser. No. 425,317

Int. Cl.<sup>6</sup> G06F 13/18; 3/04

U.S. Cl. 395—292

21 Claims



1. A system for providing arbitration of allocation requests from a plurality of requesters based on the history of a plurality of prior grants of requests by such requesters, said system comprising:

input means for receiving requests from said plurality of requesters;

1. In a data processing system requiring data transfers between two independently, asynchronously operating buses which are interconnected via an interface unit wherein one bus operates at a higher speed and the other bus operates at a lower speed, a method for controlling inter-bus data transfers comprising the steps of:

determining when a requesting device on the high speed bus has tenure on the higher speed bus and requests access to permit data transfers to or from the lower speed bus;

determining the busy status of the lower speed bus;

placing the requesting device in a pending status when the lower speed bus is busy and removing the tenure of the requesting device from the higher speed bus; and

providing access by the higher speed bus to the lower speed bus via said interface unit when the lower speed bus is not busy.











then, casting out said cast out page from said first one of said sets;  
 establishing first and second addressing procedures for accessing said sets;  
 selecting said first procedure for primarily sequential page accessing and selecting said second procedure for randomly accessing said sets;  
 maintaining an indication of the access procedure last used in accessing the page in all of said sets in said cache;  
 in third identifying step, determining from said maintained indication which of said cache accessing procedures was used to access a page of data in said cache;  
 if said second cache accessing procedure was last used to access a page of data in said cache, then second identifying a second one of said sets that is storing pages of data that contains pages of data to be candidates to be cast out of said cache;  
 determining which of said pages of data is a least recent used page of said second one of said sets, then selecting said least recent used page in said second set to be said cast out page;  
 if said first addressing procedure was least used, then performing said first examining step;  
 in said first accessing procedure using a hash table to address pages in the cache;  
 in said second accessing procedure using a directory tree to address pages in the cache;  
 attempting to store a new data page into the cache, detecting that the cache is full of data;  
 then in response to detecting said cache is full of data, indicating a page fault;  
 in response to indicating a page fault, performing said first identifying step that identifies a page of data to be cast out, then performing said first examining step and said casting out step;  
 then storing said new page of data in said cache;  
 in said attempting to store step, generating an address of a predetermined one of said addressable continuation chains in said backing store storing said new page for addressing said predetermined one of said addressable continuation chains;  
 examining predetermined ones of said sets in the cache for identifying a predetermined one of said examined sets to receive and store said new page of data;  
 then identifying said predetermined one of said examine sets to be said first one of said sets for casting out a last stored page from said first one of said sets and then storing the new page in said first one of said sets;  
 otherwise, identifying said least recent accessed set to be said second set, then establishing a new set in said cache for receiving and storing said new page of data.

5,481,692

## COMPUTING SYSTEM FOR DATA PROCESSING APPARATUS

Tadamitsu Ryu, Yokohama; Toshio Takahara, Kawasaki; Shingo Hiroso, Tokyo, and Tohru Matsumoto, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan  
 Continuation of Ser. No. 596,332, Oct. 12, 1990, abandoned.

This application Nov. 12, 1993, Ser. No. 151,044

Claims priority, application Japan, Jan. 12, 1989, 1-265570  
Int. Cl.<sup>6</sup> G06F 12/00

U.S. Cl. 395—700

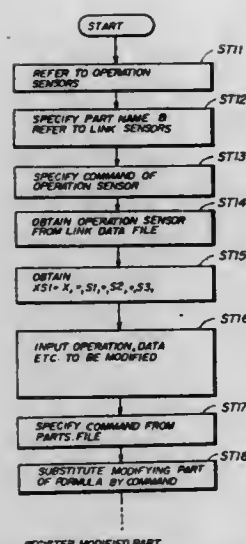
9 Claims

1. A computing system, using a computer, for a data processing apparatus which performs data processing using a formula, said computing system comprising:

a storage device, including:

a link data file prestoring a plurality of formulas which are described by command names assigned to data elements and operation symbols which define operation contents between the command names;

an actual data file managing actual data corresponding to the command names in the formulas stored by said link data file; and



a computing file managing computing processes for computing the operation contents of the operation symbols in the formulas managed by said link data file;  
 processing means coupled to and for processing said link data file, said actual data file and said computing file, and including:  
 first means for specifying a requested formula to be computed by referring to said link data file in response to a computation request;  
 second means for reading from said actual data file the actual data corresponding to the command names in the specified formula and reading from said computing file the computing processes corresponding to the operation symbols in the specified formula; and  
 third means for performing the computing processes read from said computing file using the actual data read from said actual data file; and  
 a parts file, operatively connected to said processing means, for managing first attribute information of the formulas stored in said link data file and second attribute information of the actual data stored in said actual data file using predetermined names respectively assigned to the first and second attribute information for user identification, said first attribute information including the command names stored in said link data file, said second attribute information including the command names stored in said actual data file.

5,481,693

## SHARED REGISTER ARCHITECTURE FOR A DUAL-INSTRUCTION-SET CPU

James S. Blomgren, and David E. Richter, both of San Jose, Calif., assignors to Exponential Technology, Inc., San Jose, Calif.

Filed Jul. 20, 1994, Ser. No. 277,962

Int. Cl.<sup>6</sup> G06F 9/30

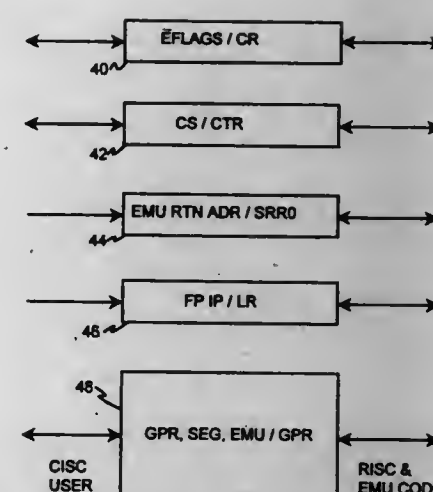
U.S. Cl. 395—375

7 Claims

1. A shared register system for a dual-instruction-set processor, the shared register system comprising:

a shared register for storing information to be transferred between a first program comprised of instructions from a first instruction set and a second program comprised of instructions from a second instruction set, the first instruction set having a first encoding of operations to opcodes, the second instruction set having a second encoding of operations to opcodes, the first encoding of operations to opcodes being substantially independent from the second encoding of operations to opcodes;

first means, coupled to the shared register, for accessing the shared register from the first instruction set, the first means writing information into the shared register responsive to a first subset of instructions from the first instruction set; and



second means, coupled to the shared register, for accessing the shared register from the second instruction set, the second means reading information from the shared register responsive to a second subset of instructions from the second instruction set, wherein each instruction in the first subset of instructions from the first instruction set comprises a first opcode field indicating the operation encoded and a destination field specifying the shared register, and wherein each instruction in the second subset of instructions from the second instruction set comprises a second opcode field indicating the operation encoded and a source field specifying the shared register;  
 wherein the first subset of instructions have first opcode fields with encodings for integer operations, arithmetic-logic-unit (ALU) operations, and register-to-register move operations and wherein the second subset of instructions have second opcode fields with encodings for integer operations, arithmetic-logic-unit (ALU) operations, and register-to-register move operations;  
 wherein the shared register is in a plurality of general-purpose registers in the dual-instruction-set processor, the source field and the destination field selecting any one register in the plurality of general-purpose registers, the one register selected being the shared register for transferring information between the first program and the second program;  
 wherein the first means for accessing the shared register from the first instruction set includes means for reading and means for writing information into the shared register;  
 and wherein the second instruction set is a reduced instruction set computer (RISC) instruction set and the first instruction set is a complex instruction set computer (CISC) instruction set, whereby information is transferred from the first program to the second program using the shared register.

5,481,694

## HIGH PERFORMANCE MULTIPLE-UNIT ELECTRONIC DATA STORAGE SYSTEM WITH CHECKPOINT LOGS FOR RAPID FAILURE RECOVERY

Chia-Chiang Chao, Sunnyvale; Robert M. English, Palo Alto; David M. Jacobson, Santa Clara; Alexander A. Stepanov, and Andrew J. Wilkes, both of Palo Alto, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 767,109, Sep. 26, 1991, Pat. No. 5,345,575. This application Apr. 24, 1992, Ser. No.

873,928

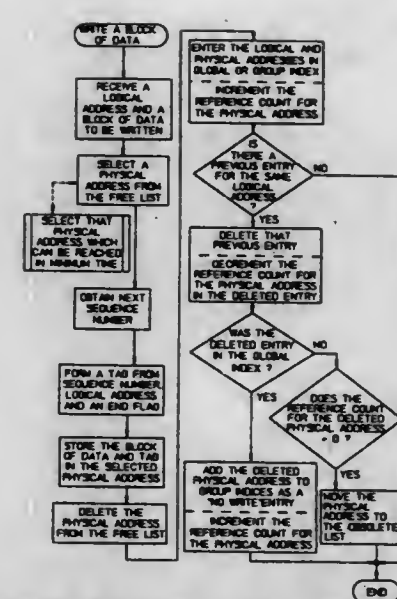
Int. Cl.<sup>6</sup> G06F 13/00

U.S. Cl. 395—439

15 Claims

1. An electronic data storage system comprising a memory; a plurality of storage units each having a plurality of segments for storing blocks of data, each segment identified by a physical address; and a controller in communication with the memory and the storage units, the controller operative:

to maintain in the memory an index containing entries each having a logical address and a corresponding physical



address, an obsolete list containing physical addresses of segments that contain obsolete data, and a free list containing physical addresses of segments that are available to receive data for storage, and

in response to a write command that provides a preselected logical address and an associated block of data for storage, to (a) select a physical address from the free list according to a predefined criterion, (b) obtain a next sequence number from a set of sequential numbers, (c) append to the block a tag that includes the sequence number, the preselected logical address, and an end flag, (d) store the block and its tag in the segment of the selected physical address, (e) delete the selected physical address from the free list, (f) enter the preselected logical address and the selected physical address in the index, (g) delete any previous index entry that contains a logical address which is the same as the preselected logical address, and (h) list the physical address from any such deleted entry in the obsolete list.

5,481,695

## SYSTEM AND METHOD FOR ESTIMATING CROSSTALK BETWEEN SIGNAL LINES IN A CIRCUIT

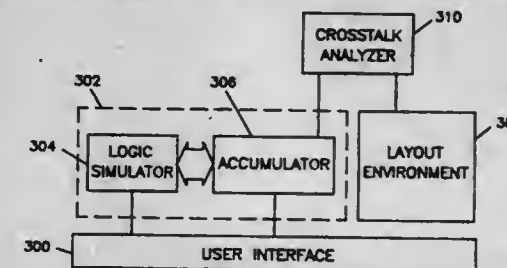
Stephen R. Purks, Bedford, Mass., assignor to Cadence Design Systems, Inc., San Jose, Calif.

Filed Oct. 26, 1993, Ser. No. 142,782

Int. Cl.<sup>6</sup> G06F 17/50

U.S. Cl. 395—500

11 Claims



1. A computer aided design (CAD) system capable of performing improved crosstalk analysis on a plurality of signal nets in a circuit, said CAD system comprising:

a user interface for entering (i) a circuit schematic information file representing circuit elements and interconnections therebetween, and (ii) a simulation control file comprising user-defined circuit function stimuli and crosstalk-specific commands;

a circuit simulation module coupled to said user interface, said circuit simulation module for simulating functionality of the







(e) security constraints which are rules that assign security levels to the data;  
users cleared to the different security levels for querying the multilevel database; and  
a multilevel logic programming system for accessing the multilevel knowledge base for processing queries and for processing the integrity and security constraints,  
whereby the multilevel database management system (1) makes deductions and gives complete answers to queries and (2) prevent certain unauthorized inferences.

5,481,701

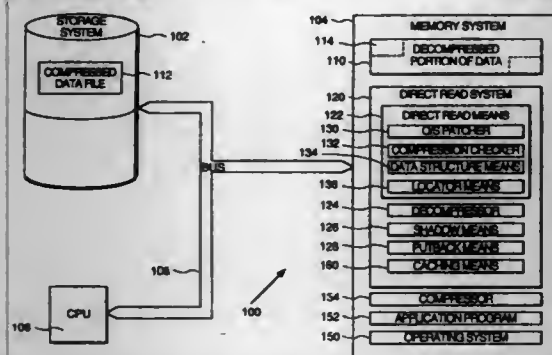
### METHOD AND APPARATUS FOR PERFORMING DIRECT READ OF COMPRESSED DATA FILE

Lloyd L. Chambers, IV, Menlo Park, Calif., assignor to Salient Software, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 759,226, Sep. 13, 1991, Pat. No. 5,155,484. This application Feb. 25, 1992, Ser. No. 840,869

Int. Cl.<sup>6</sup> G06F 17/30; 5/00  
U.S. Cl. 395—600

33 Claims



30. A compressed data accessing device for providing access to a non-compressed version of target data held in a subportion of a compressed data file, the compressed data file being composed of a series of compressed data blocks each having beginning and end locations that vary as a function of compression efficiency for the data held in the corresponding non-compressed version of the block and as a function of compression efficiency for the data held in the corresponding non-compressed versions of preceding blocks, if any, said accessing device comprising:

request receiving means for receiving access requests that each identify the target data in terms of where the non-compressed version of the target data resides within a non-compressed version of the compressed data file;

subportion identifying means, responsive to access requests received by the request receiving means, for identifying a first subportion of the compressed data file containing compressed data corresponding to the identified target data and distinguishing the first subportion from a second subportion not containing data corresponding to the identified target data;

fetching means, responsive to the subportion identifying means, for fetching the first subportion of the compressed data file after the first subportion is identified by said subportion identifying means; and

decompressing means, operatively coupled to the fetching means, for decompressing the fetched first subportion of the compressed data file.

### 5,481,702 ALLOCATION OPTIMIZATION WITH DIFFERENT BLOCK-SIZED ALLOCATION MAPS

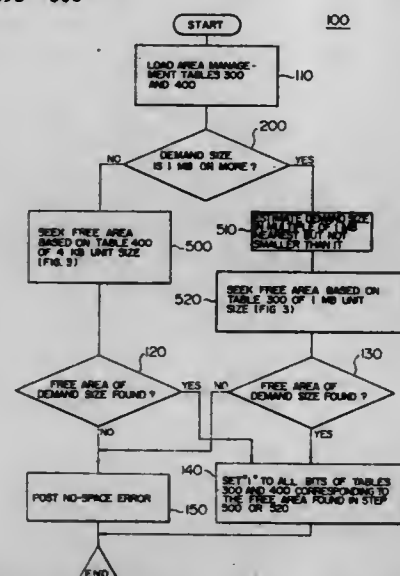
Kikuo Takahashi, Hachioji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 7, 1992, Ser. No. 925,654

Claims priority, application Japan, Aug. 8, 1991, 3-199085  
Int. Cl.<sup>6</sup> G06F 12/02; 17/30

U.S. Cl. 395—600

13 Claims



10. A computer-implemented method of searching for a non-allocated portion of a storage device area, said method comprising the steps of:

- storing a plurality of allocation information for plural unit areas, each of said plurality of allocation information indicating each of a plurality of respective division sizes;
- selecting one of the respective division sizes in response to a search request for a non-allocated area of a variable size, the selected division size being one which is the largest amongst the respective division sizes without exceeding the variable non-allocated area size corresponding to the search request;
- searching said plurality of allocation information for a required amount of non-allocated unit areas of the selected division size so as to approach, but not exceed, the variable non-allocated area size corresponding to the search request; and
- searching said plurality of allocation information for a required amount of non-allocated unit areas corresponding to division sizes smaller than the selected division size to satisfy the difference between the searched non-allocated unit areas of the selected division size and the variable non-allocated area size corresponding to the search request.

5,481,703

### DATABASE RESTRUCTURING SYSTEM FOR DETECTING FUNCTIONALLY DEPENDENT RELATIONS AND CONVERTING THEM INTO THIRD NORMAL FORM

Nobuhiro Kato, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

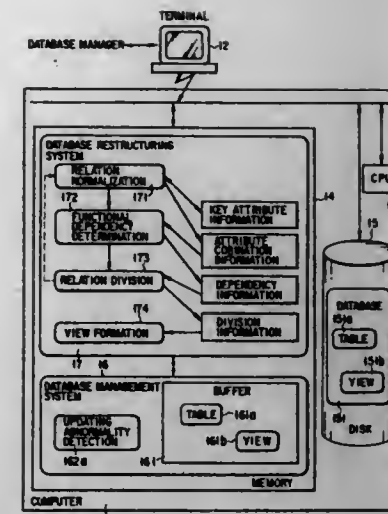
Filed Sep. 29, 1993, Ser. No. 128,198

Claims priority, application Japan, Sep. 30, 1992, 4-261334  
Int. Cl.<sup>6</sup> G06F 15/00; 7/04

U.S. Cl. 395—600

32 Claims

9. A relational database restructuring system, having at least one relation, each said relation having a plurality of tuples, a set of attributes, a set of candidate keys and a set of non-key attributes, wherein each said tuple is managed as a two-dimensional relation for each said attribute and wherein each said relation has a candi-



date key serving as a set of attributes which can uniquely identify one of said tuples, comprising:

first determination means for checking, with reference to values of tuples which are present in said relations, whether a first set of attributes is functionally dependent on a second set of attributes;

division means for dividing a first relation into a second and a third relation by a projecting operation for a designated attribute set;

second determination means for determining, from attribute sets A and B which are included in a relation and are mutually primary, whether said attribute sets A and B satisfy at least one of a first condition and a second condition, said first condition being that said attribute set A is a proper subset of said set of candidate keys and said attribute set B is a subset of a non-key attribute set serving as a subset of said set of candidate keys said second condition being that both the attribute sets A and B are proper subsets of said non-key attribute set; and

means for checking whether said attribute set B is functionally dependent on said attribute set A once said second determination means has determined that said attribute sets A and B satisfy at least one of said first condition and said second condition, and dividing said relation including said attribute sets A and B, when said attribute set A is functionally dependent on attribute set B, into a relation formed by a projection to a subset of the attribute set B and, a relation formed by a projection to a union between said attribute sets A and B.

5,481,704

### INDEXING/COMPRESSION SCHEME FOR SUPPORTING GRAPHICS AND DATA SELECTION

Russell A. Pellicano, North Bayshore, N.Y., assignor to Computer Concepts Corp., Bohemia, N.Y.

Continuation of Ser. No. 766,860, Sep. 27, 1991, Pat. No. 5,301,315. This application Mar. 10, 1994, Ser. No. 209,385

Int. Cl.<sup>6</sup> G06F 17/30

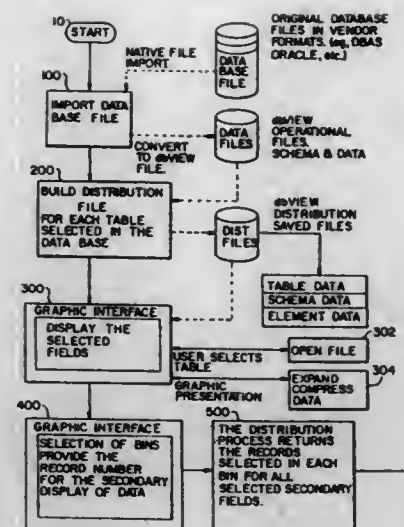
U.S. Cl. 395—600

10 Claims

1. An interactive method for selecting and displaying data and information about said data in a selected data structure, said selected data structure having a particular file structure associated therewith and comprising at least a plurality of data records, and a plurality of data fields having data therein, said method comprising the steps of:

(a) accessing said selected data structure resident on a host system and reading the data therein to determine selected parameters of the distribution of said data;

(b) building a plurality of distribution matrices from data contained within said selected data structure with each matrix having at least one data summary associated therewith; and



(c) interactively generating at least one display from said plurality of distribution matrices for said selected data structure to provide a graphical representation of the distribution of data contained within said selected data structure.

5,481,705

### METHOD FOR EXECUTING A PROGRAM WITH BRANCH-TO MODIFYING INSTRUCTIONS

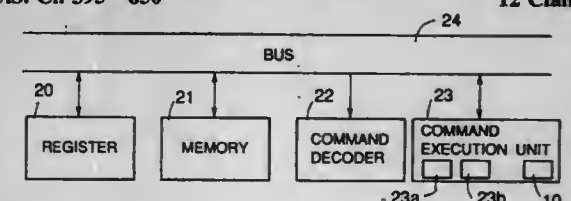
Hitoshi Watanabe, Yokohama; Tsuneaki Kadosawa, Kanagawa; Takashi Nakamura, Hiratsuka; Eiji Koga, Hadano, and Satoshi Asada, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1993, Ser. No. 82,858

Claims priority, application Japan, Jun. 29, 1992, 4-192838  
Int. Cl.<sup>6</sup> G06F 9/32

U.S. Cl. 395—650

12 Claims



1. A method for executing a program by a processor including a plurality of program steps to be executed, comprising the steps of: registering information of at least one of the program steps to be executed in an order of execution in a queue; searching information of program steps in the queue in response to an instruction for modifying a branch-to direction from a first direction to a second direction and retrieving information of the program step in the queue which is in the first direction; erasing the retrieved program step information from the queue; registering program step information of a program step which is in the second direction at the position of the erased program step in the queue; sequentially reading the program step information registered in the queue in the order of registration; and executing program steps corresponding to the read program step information.



5,481,706

## SYSTEM AND METHOD FOR CREATING THREAD-SAFE SHARED LIBRARIES

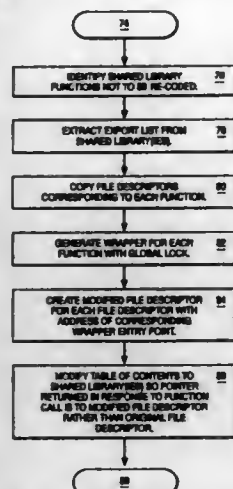
Jeffrey S. Peek, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 1, 1993, Ser. No. 143,586

Int. Cl.<sup>6</sup> G06F 13/00;15/16

U.S. Cl. 395—650

6 Claims



1. A method for use in a multithread computer system employing a pre-existing shared library having a pre-existing function descriptor, a pointer to said function descriptor and a corresponding at least one function which is not multithread-safe when used in said system having a corresponding underlying call associated therewith exported from said library to render said shared library multithread-safe when used in said system, comprising:

- creating a wrapper for said function comprised of program code extending around instantiation of said underlying call said wrapper being responsive to a call corresponding to said underlying call, said creating including the steps of storing said pre-existing function descriptor therewithin, and creating a lock to said function; and
- rebinding said pre-existing shared library with said wrapper including the steps of creating a modified function descriptor including creating a pointer to said wrapper and creating a copy of said function descriptor with said pointer to said wrapper in said modified function descriptor being substituted for said pointer to said function in said function descriptor during said rebinding; and
- substituting a pointer to said modified pointer descriptor for said pointer to said function descriptor.

5,481,707

## DEDICATED PROCESSOR FOR TASK I/O AND MEMORY MANAGEMENT

Philip A. Murphy, Jr., King of Prussia; Wayne A. Genetti, Phoenixville; Gunnar K. Gunnarsson, West Chester; Edward J. Pullin, Norwood; Steven A. Thompson, Coatesville; Robert H. Tickner, Jeffersonville, and Gary C-F Wu, Audubon, all of Pa., assignors to Unisys Corporation, Blue Bell, Pa.

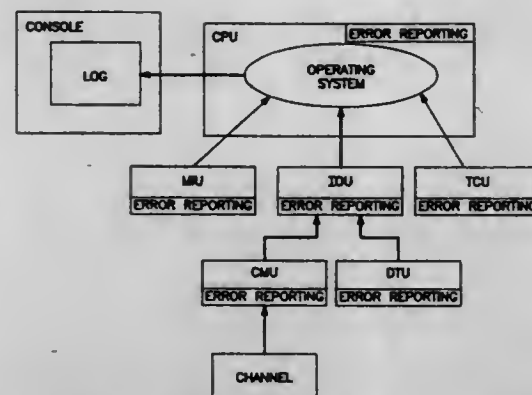
Continuation of Ser. No. 187,796, Jan. 26, 1994, abandoned, which is a continuation of Ser. No. 698,588, May 19, 1991, abandoned. This application Apr. 11, 1995, Ser. No. 420,329

Int. Cl.<sup>6</sup> G06F 3/00;12/06;13/20;15/16

U.S. Cl. 395—650

16 Claims

1. An input/output (I/O) system including a plurality of processors, a plurality of I/O devices and a memory, said memory including a plurality of memory buffers, wherein said I/O system performs a) data transfer between said plurality of I/O devices and the memory, b) data transfer within the memory and c) task



scheduling and I/O requests handling for I/O operations executed on said plurality of I/O devices, said I/O system comprising: memory interface means

- a) for transferring a continuous block of a plurality of data values between the memory and the I/O system; and
- b) responsive to a control signal for
  - i) receiving said continuous block of said plurality of data values from said memory beginning at a starting address in said memory,
  - ii) modifying only selected data values of said continuous block of said plurality of data values received from said memory to create a continuous block of a further plurality of data values, and
  - iii) replacing, beginning at said starting address, said continuous block of said plurality of data values in said memory with said continuous block of said further plurality of data values;

I/O unit (IOU) means for queuing said I/O requests for said I/O operations as said I/O requests are received, selecting one of a plurality of paths within said I/O system for each of said I/O operations, collecting statistics on operation of said plurality of I/O devices and maintaining a list of said plurality of I/O devices;

data transfer unit (DTU) means for moving data among said plurality of memory buffers responsive to commands from said I/O unit means;

task control unit (TCU) means for maintaining the status of tasks on the system and for signalling each one of said plurality of processors to execute a respective one of said tasks which is in an executable state; and

channel manager unit (CMU) means for receiving data from channels associated with said plurality of I/O devices and for transferring said data to said memory interface means.

5,481,708

## SYSTEM AND METHODS FOR OPTIMIZING OBJECT-ORIENTED COMPILATIONS

Peter Kukol, Aptos, Calif., assignor to Borland International, Inc., Scotts Valley, Calif.

Filed Jun. 5, 1992, Ser. No. 894,706

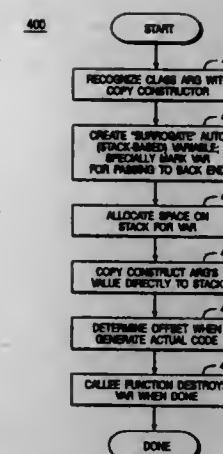
Int. Cl.<sup>6</sup> G06F 11/00;13/00

U.S. Cl. 395—700

13 Claims

1. In a system for generating code executable by a computer from object-oriented source listings, said source listings including definitions of classes of objects having data members and functions operative on said data members, the computer including a memory stack for creating automatic variables, a method for passing classes of objects by value to a function, the method comprising:

- (a) identifying by the system a class argument being passed by value as a parameter to a particular function, said class argument comprising an object to be instantiated from a particular class;
- (b) creating a surrogate variable for the class argument by allocating space on the memory stack for storing said value; and



(c) determining an address of said surrogate variable on the memory stack when code referencing said class argument is generated.

5,481,709

## METHOD AND APPARATUS FOR PROVIDING A MODULAR ABIOS DEVICE SUPPORT LAYER IN A COMPUTER SYSTEM

Richard Bealkowski, Delray Beach; David E. Blaschke, Boynton Beach; Mary M. Bolt, Delray Beach; Douglas R. Geisler, Boca Raton; Robert G. Hillis, Boca Raton, and Frank J. Schroeder, Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

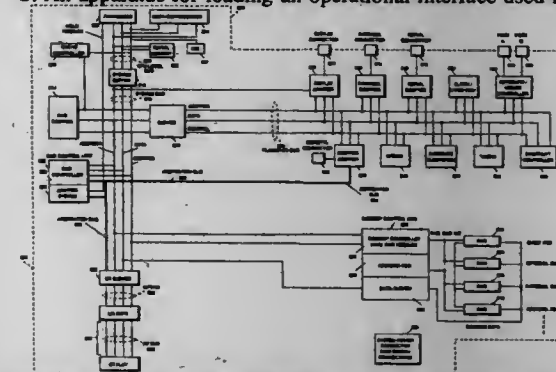
Filed Jun. 22, 1992, Ser. No. 902,330

Int. Cl.<sup>6</sup> G06F 9/44;9/445

U.S. Cl. 395—700

8 Claims

5. An apparatus for loading an operational interface used in the



operation of a personal computer system containing a system processor, a non-volatile memory, a volatile memory, and a direct access storage device; said operational interface comprising discretely separate first and second portions having different memory addressing capabilities; said first portion including first information stored in said non-volatile memory that is used by said system processor for completing a preliminary initialization of said system, and second information required by said system processor to initialize said computer system for using said second portion; said second portion comprising plural modules having different functions; both said first and second portions being useful for enabling said system processor to perform applications defined by application programs; said direct access storage device storing said plurality of modules contained in said second portion of the operational interface; said apparatus comprising:

- means formed by said system processor, utilizing said first information, for performing said preliminary initialization of said system and storing said second information in a predetermined part of said volatile memory;
- means formed by said system processor utilizing said second information, at completion of said preliminary initialization, for loading said modules of said second portion one at a time into said volatile memory and for determining in respect to

each loaded module whether the computer system thereafter will require access to the respective loaded module; and said last mentioned means acting in response to each said determination to allow for the respective loaded module to be discarded if access thereto is not required and retained if access thereto is required, whereby only said loaded modules to which access is required are retained in said volatile memory.

5,481,710

## METHOD OF AND SYSTEM FOR PROVIDING APPLICATION PROGRAMS WITH AN UNDO/REDO FUNCTION

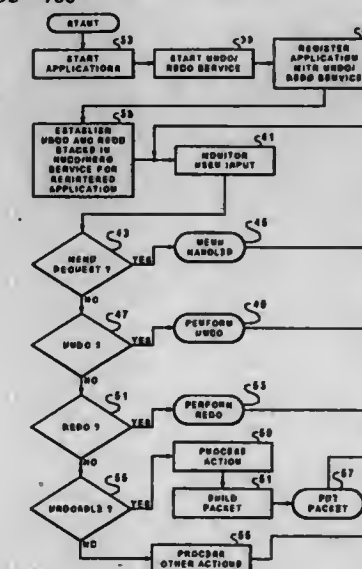
Patrick J. Keane, Grapevine, and Kathy P. Mitchell, Trophy Club, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 16, 1992, Ser. No. 947,677

Int. Cl.<sup>6</sup> G06F 9/06

U.S. Cl. 395—700

11 Claims



1. A method of providing application programs in a computer system with an undo/redo function, which comprises the computer implemented steps of:

- establishing an undo/redo service in said computer system;
- establishing an undo data structure and a redo data structure in said undo/redo service;
- registering a selected application program among a plurality of application programs within said computer system with said undo/redo service;
- giving a packet to said undo/redo service whenever said selected application program processes an action on an object that can be undone, said packet including the identity of the object acted upon by said action, instructions that, when applied to the object of the packet, will cause the action to be undone, and a text string for a menu choice for said action; and
- placing said packet in said undo data structure.

5,481,711

## PROGRAM EDITING SYSTEM

Yoshikazu Sotani, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 7, 1993, Ser. No. 1,663

Claims priority, application Japan, Jan. 17, 1992, 4-26117

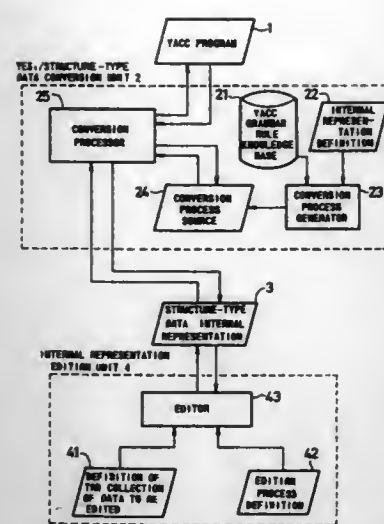
Int. Cl.<sup>6</sup> G06F 17/00

U.S. Cl. 395—700

6 Claims

1. A system for editing a first text data program written in a programming language having a plurality of grammar rules, said system comprising:





first storage means for storing said plurality of grammar rules; second storage means for storing an internal representation definition defining a designated tree structure; conversion code generating means for generating a conversion code based on said plurality of grammar rules and on said internal representation definition, said conversion code including

a directional conversion code for converting said first text data program to a first structure-type data internal representation program having said designated tree structure; and a reverse-directional conversion code for converting a second structure-type data internal representation program to a second text data program;

third storage means for storing said first and second structure-type data internal representation programs;

editing means for editing said first structure-type data internal representation program stored in said third storage means to produce said second structure-type data internal representation program; and

execution control means for executing said directional conversion code when said first text data program is provided to said execution control means, and for executing said reverse-directional conversion code when said second structure-type data internal representation program has been provided to said execution control means.

5,481,712

#### METHOD AND APPARATUS FOR INTERACTIVELY GENERATING A COMPUTER PROGRAM FOR MACHINE VISION ANALYSIS OF AN OBJECT

William M. Silver, Medfield; Samuel Druker, Brookline, both of Mass.; Philip Romanik, West Haven, Conn., and Carroll Arbogast, Needham, Mass., assignors to Cognex Corporation, Natick, Mass.

Filed Apr. 6, 1993, Ser. No. 43,295  
Int. Cl.<sup>6</sup> G06F 9/44

U.S. Cl. 395—700

34 Claims

1. A digital processing system for interactively generating a computer program, said system comprising

A. program storage means for storing a program signal representative of a syntactically correct computer program being generated,

B. display means, coupled to said program storage means, for displaying at least a portion of said computer program being generated,

C. positioning means coupled to said display means for demarking a location of interest within said computer program being generated, and for generating a position signal representative of that location,

D. menu means, coupled to said program storage means and to said positioning means, for responding to said position signal

5,481,713

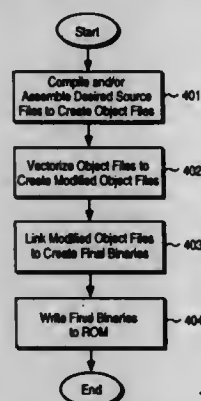
#### METHOD AND APPARATUS FOR PATCHING CODE RESIDING ON A READ ONLY MEMORY DEVICE

Russ Wetmore, Santa Clara; Philip Nguyen, Santa Cruz, and Ricardo Batista, Santa Clara, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

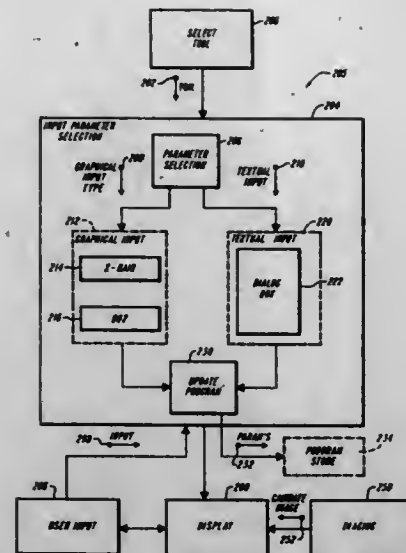
Filed May 6, 1993, Ser. No. 58,877  
Int. Cl.<sup>6</sup> G06F 9/44

U.S. Cl. 395—700

18 Claims



1. A method for applying patches to code residing on a Read Only Memory (ROM) device, said code having a plurality of functions, each of said plurality of functions having a plurality of routines, wherein each routine is accessed through a vector table entry in a Random Access Memory (RAM) device, said code corresponding to one of a plurality of ROM release levels, said method comprising the steps of:



and said program signal for graphically displaying one or more syntactically correct modifications of said computer program being generated at said location of interest, said menu means including

selection means for inputting an operator selection corresponding to at least one of said syntactically correct modifications, and for generating a selection signal representative of that operator selection, and

E. update means, coupled to said selection means, said program storage means, and said positioning means, for responding to said selection signal, said position signal and said program signal, for generating and storing in said program storage means an updated program signal representative of said computer program being generated as modified in accord with said at least one syntactically correct modification corresponding to said operator selection.

- generating a plurality of patch resources, said plurality of patch resources including a patch resource for each of said plurality of ROM release levels, each of said patch resources having a plurality of patch resource entries, each of said patch resource entries including a new routine;
- identifying the ROM release level for said ROM device to be patched;
- retrieving from said plurality of patch resources a selected patch resource, said selected patch resource corresponding to said identified ROM release level; for each patch resource entry in said selected patch resource
- if said new routine is a routine for replacing an existing routine of said plurality of routines, then
  - identifying an existing vector table entry in said RAM device, said existing vector table entry being the vector table entry for said existing routine, and
  - updating said existing vector table entry to cause said existing vector table entry to refer to said new routine;
- if said new routine is a routine for adding functionality to an existing function of said plurality of functions, then
  - identifying an existing vector table in said RAM device, said existing vector table being a vector table corresponding to said existing function, and
  - adding a new vector table entry to said existing vector table, wherein said new vector table entry includes a reference to said new routine; and
- if said new routine is a routine for adding a new function to supplement said plurality of functions, then
  - creating a new vector table in said RAM device, said new vector table including a reference to said new routine.

5,481,714

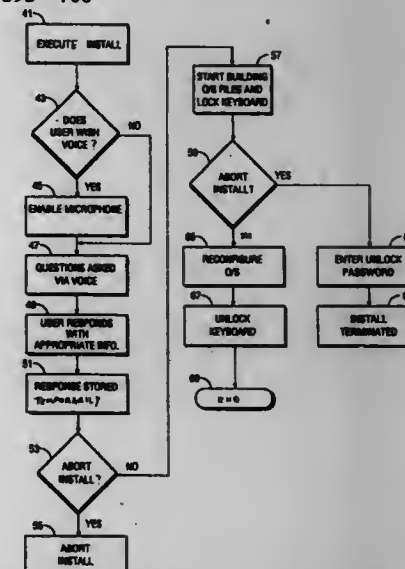
#### METHOD AND SYSTEM FOR INSTALLING AN OPERATING SYSTEM ON A DATA PROCESSING SYSTEM WITH ABORT CAPABILITY AND VOICE INPUT FEATURE

Darryl Pipkin, Colleyville; Eddie Rogers, Carrollton; Linda Jones-Scott, and Keith T. Scott, both of Keller, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 18, 1993, Ser. No. 138,328  
Int. Cl.<sup>6</sup> G06F 9/445

U.S. Cl. 395—700

16 Claims



1. A computer implemented method for installing a new operating system on a data processing system, said data processing system having an old operating system located thereon, comprising the steps of:

- building files of said new operating system in said data processing system without damaging said old operating system;
- determining if the installation of said new operating system is either to continue or is to be aborted;
- if the installation of said new operating system is to be aborted, then deleting said files of said new operating system and utilizing said old operating system in subsequent operations of said data processing system; and
- if the installation of said new operating system is to continue, then permanently storing said files of said new operating system on said data processing system.

5,481,715

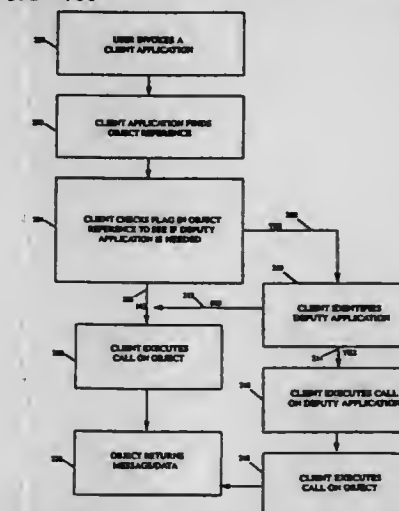
#### METHOD AND APPARATUS FOR DELEGATED COMMUNICATIONS IN A COMPUTER SYSTEM USING TRUSTED DEPUTIES

Graham Hamilton, and Robert B. Hagmann, both of Palo Alto, Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Dec. 15, 1993, Ser. No. 167,496  
Int. Cl.<sup>6</sup> G06F 13/00

U.S. Cl. 395—700

28 Claims



1. In a distributed computer system, a method for a user to communicate safely with an untrusted server, by delegating a trusted deputy application to act in behalf of said user, said method performed by instructions in a central processor of a computer in said distributed system, said method comprising the steps of:

identifying a deputy application in a computer in said distributed computer system, said deputy application being recommended by said untrusted server to a client application, said client application checking a series of places on said client application's computer which contain indications of deputy applications to be trusted and if said recommended deputy application is recognized as trustworthy designating said recommended deputy application as a trusted deputy application to act on behalf of said client application;

executing a call on one or more target programs by invoking said call on said trusted deputy application, said call being initiated by said client application;

passing said invoked call to one or more servers which contain implementations of said one or more target programs, by said deputy application; and

accepting said invoked call by said one or more servers which contain implementations of said one or more target programs by recognizing that said trusted deputy is acting for said client application regardless of which computer in said distributed computer system said trusted deputy application resides on.







5,481,721

# METHOD FOR PROVIDING AUTOMATIC AND DYNAMIC TRANSLATION OF OBJECT ORIENTED PROGRAMMING LANGUAGE-BASED MESSAGE PASSING INTO OPERATION SYSTEM MESSAGE PASSING USING PROXY OBJECTS

Bertrand Serlet; Lee Boynton, both of Palo Alto, and Avadis Tevanian, Mountain View, all of Calif., assignors to NeXT Computer, Inc., Redwood City, Calif.

Continuation of Ser. No. 731,636, Jul. 17, 1991, abandoned.

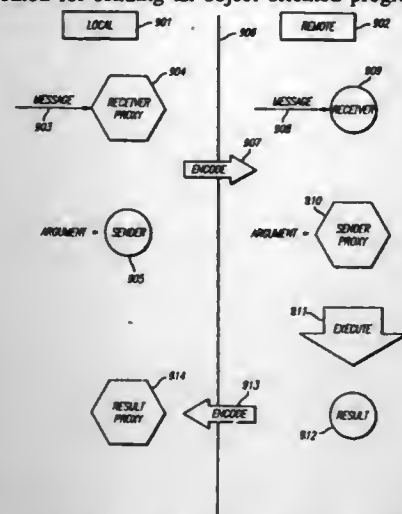
This application Oct. 31, 1994, Ser. No. 332,486

Int. Cl.<sup>6</sup> G06F 9/44

U.S. Cl. 395-700

24 Claims

1. A method for sending an object oriented programming lan-



guage based message having dynamic binding from a first object in a first process to a second object in a second process, said method comprising the steps of:

- transmitting, using a first processing means, said object oriented programming language based message to a first proxy in said first process;
- using said first proxy and said first processing means, encoding said object oriented programming language based message into an operating system based message at run time;
- transmitting said operating system based message to said second process in said second processing means at run time;
- decoding, using a second process, said operating system based message into a language based message;
- transmitting, using said second processing means, said object oriented programming language based message to said second object in said second process;
- executing said object oriented programming language based message by said second object in said second process.

5,481,722

# METHOD AND APPARATUS FOR MERGING CHANGE CONTROL DELTA STRUCTURE FILES OF A SOURCE MODULE FROM A PARENT AND A CHILD DEVELOPMENT ENVIRONMENT

Glenn Skinner, Mountain View, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

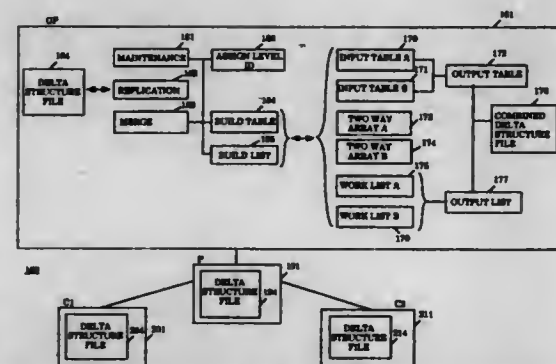
Continuation of Ser. No. 84,078, Jun. 28, 1993, abandoned, which is a continuation of Ser. No. 746,957, Aug. 19, 1991, abandoned. This application Nov. 14, 1994, Ser. No. 338,883

Int. Cl.<sup>6</sup> G06F 15/16; 7/22; 13/00

U.S. Cl. 395-700

17 Claims

1. In a computer system comprising a parent and a child development environment, said parent and child environments having a first and a second delta hierarchy representing a source module and changes to said source module individually known to said parent and child environments respectively, a method for merging said first and second delta hierarchies together that preserves all delta relationships of said changes individually known to said parent and



child environments without the need for computer assisted tracking, said method comprising the steps of:

- (a) storing deltas in a first and a second list of deltas and storing descriptive entries corresponding to said deltas in a first and second table of descriptive entries of said first and second delta hierarchies;
- (b) initializing a first and a second work list and a first and a second work table to equal said first and second list of deltas and first and said second table of descriptive entries of said first and second delta hierarchies respectively, said first and second lists of deltas being chronologically identified within a first and a second development environments in identical manners, and said first and second table of descriptive entries being time ordered and correspondingly describing said first and second lists of deltas respectively;
- (c) initializing an output table, an output list, a first and a second two way associative array corresponding to said first and second work tables to empty, for sequentially receiving modified non-duplicate descriptive entries of said first and second work tables, modified non-duplicate deltas of said first and second lists of deltas, and cross reference entries cross referencing descriptive entries of said first and second work tables and said output table to each other;
- (d) retrieving descriptive entries and their corresponding deltas from said first and second work tables and said first and second work lists, outputting a two way cross reference entry to the corresponding one of said first and second two way associative arrays for each descriptive entry which has been retrieved, as the descriptive entry and its corresponding delta are retrieved, cross referencing said descriptive entry which has been retrieved to the next descriptive entry of said output table, said step of retrieving being performed one descriptive entry and its corresponding delta at a time, in a predetermined least recent entry manner, until all descriptive entries and their corresponding deltas have been retrieved from said first and second work tables and said first and second work lists;
- (e) discarding each descriptive entry which has been retrieved and its corresponding delta, as its two way cross reference entry is output, if the descriptive entry which has been retrieved is a duplicate of a second descriptive entry which has been retrieved in the other work table;
- (f) modifying each said descriptive entry which has been retrieved and its corresponding delta not discarded, after its discard or not discard determination is made, outputting each of said descriptive entries which have been retrieved and modified and its corresponding modified delta into said output table and said output list respectively, as the modifications are made, said step of modifying being performed in accordance to whether a new branch is to be created in the merged hierarchy for the corresponding delta of the descriptive entry which has been retrieved and not discarded, and the number of descriptive entries which have been retrieved having been output to the output table so far, and furthermore utilizing said cross reference entries.

5,481,723

# SYSTEM AND METHOD FOR CONTROLLING EXECUTION OF NESTED LOOPS IN PARALLEL IN A COMPUTER INCLUDING MULTIPLE PROCESSORS, AND COMPILER FOR GENERATING CODE THEREFORE

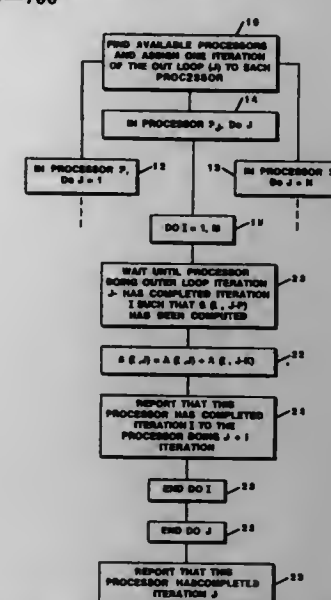
Kevin W. Harris, Nashua, and William B. Noyce, Hollis, both of N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 555,660, Jul. 18, 1990, abandoned, which is a continuation of Ser. No. 226,257, Jul. 29, 1988, abandoned. This application Feb. 27, 1995, Ser. No. 395,275

Int. Cl.<sup>6</sup> G06F 9/45

U.S. Cl. 395-700

25 Claims



1. A method of compiling a nested loop program structure including an outer loop structure to be processed by a plurality of processors operating in parallel, each of said processors assigned to process a selected one of a plurality of outer loop iterations, and further including an inner loop structure to be processed in a plurality of inner loop iterations, the inner loop iterations corresponding to each said outer loop iteration being processed in series by the processor assigned to process the corresponding outer loop iteration, wherein at least one of the inner loop iterations is dependent upon a computation of another of the inner loop iterations in a preceding iteration of the outer loop iterations, the method comprising the steps, performed in a data processing system, of:

- A) extracting the outer loop structure from the nested loop structure;
- B) extracting the inner loop structure from the nested loop structure;
- C) generating a plurality of control structures each for enabling a corresponding one of said processors to perform a current outer loop iteration of the outer loop iterations and at least a current inner loop iteration of the inner loop iterations, each said control structure comprising a progress counter providing a count representing a number of inner loop iterations performed by the processor corresponding to said counter, said control structures enabling a current processor of the plurality of processors to perform the substeps of:
  - i) waiting until a previous processor of the plurality of processors, performing a previous outer loop iteration that precedes the current outer loop iteration being performed by the current processor, generates a waiting report value indicating that the previous processor has completed performance of an inner loop iteration upon which the current inner loop iteration being performed by the current processor depends;
  - ii) after the waiting step, performing the current inner loop iteration as defined by the inner loop structure; and

iii) after the performing step, generating a next report value to indicate to a next processor of the plurality of processors that the current inner loop iteration has been completed by the current processor;

D) wherein the waiting report value and the next report value are generated in response to the counts of the counters corresponding respectively to the previous processor and to the current processor.

5,481,724

# PEER TO PEER COMPUTER-INTERRUPT HANDLING

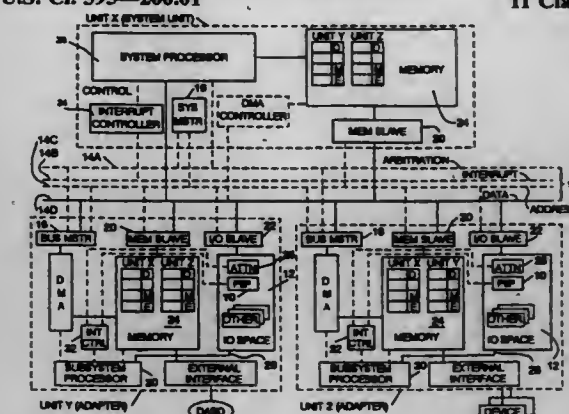
Arthur J. Heimsoth, Coral Springs; Ernest N. Mandese, Boynton Beach; Joseph P. McGovern, Boca Raton, and Richard N. Mendelson, Highland Beach, all of Fla., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Apr. 6, 1993, Ser. No. 43,331

Int. Cl.<sup>6</sup> G06F 13/00

U.S. Cl. 395-200.01

11 Claims



1. In a data processing system having multiple processing units, apparatus for handling logical and other interrupts from a first processing unit as a sending unit to a second processing unit as a receiving unit, wherein any one of said multiple processing units may function as a sending unit, and wherein any one of said multiple processing units may function as a receiving unit, said apparatus comprising:

- means in the sending unit for sending a coded logical interrupt to the receiving unit for processing at the receiving unit, said coded logical interrupt being coded to indicate an interrupt request and including source identification information identifying the sending unit that requests an interrupt of the receiving unit;
- means in the receiving unit for receiving said coded logical interrupts and other interrupts;
- interrupt storage means in the receiving unit for storing a plurality of coded logical interrupts received by said receiving means from a plurality of sending units;
- means for providing an interrupt request when at least one coded logical interrupt is stored in said interrupt storage means or when an other interrupt is received by said receiving means;
- processing means in the receiving unit in response to the interrupt request for reading all of the coded logical interrupts in said interrupt storage means during said processing means's next interrupt processing operation and for processing each such read coded logical interrupt to identify the sending unit for each such read logical interrupt;
- said interrupt storage means having a unique storage location assigned to each sending unit whereby said storage means stores each coded logical interrupt that is received in a storage location that is uniquely indicative of the identity of the sending unit sending the received coded logical interrupt; and
- said processing means including means identifying the sending unit for each coded logical interrupt from the unique storage location of the coded logical interrupt in said interrupt storage means.







5,481,729

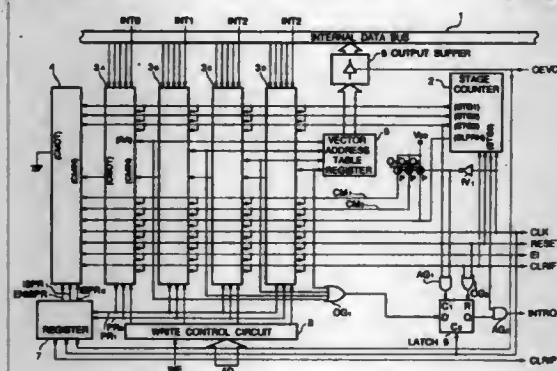
**INTERRUPT CONTROLLER THAT REDUCES THE NUMBER OF SCANS NEEDED TO IDENTIFY PRIORITY**  
Tadashi Shibuya, Yukihiro Nishiguchi, Tomikazu Suzuki, and Yasufumi Takamine, all of Kanagawa, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 789,168, Nov. 4, 1991, abandoned.  
This application Aug. 23, 1993, Ser. No. 110,495  
Claims priority, application Japan, Nov. 2, 1990, 2-297475;  
Dec. 18, 1990, 2-411472; Dec. 18, 1990, 2-411473; Jan. 9, 1991, 3-012911

Int. Cl. G06F 9/46

U.S. Cl. 395-737

6 Claims



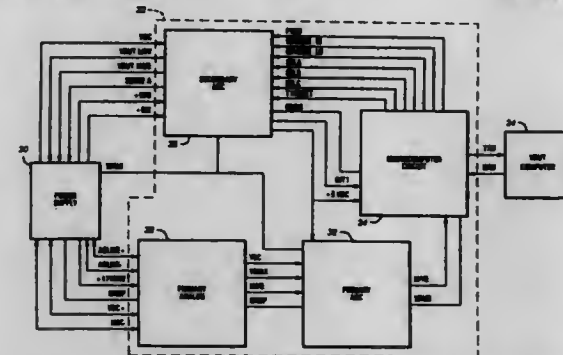
1. An interrupt controller comprising:
  - a plurality of n-bit priority registers for designating 2<sup>n</sup> priority levels to a plurality of interrupt request signals, where n is an integer not less than 2;
  - stage counter means for sequentially and repeatedly generating timing signals for scanning the priority levels of the interrupt request signals designated by said n-bit priority registers;
  - priority-level-under-execution register means for storing the content of the priority register designating the priority level of the interrupt request signal corresponding to an interrupt processing currently under execution;
  - interrupt request signal controlling means for comparing the content of the priority-level-under-execution register with contents of said n-bit priority registers designating the priority levels of the interrupt request signals being generated including the priority register designating the priority level of the interrupt request signal corresponding to the interrupt processing currently under execution;
  - said interrupt request signal controlling means operating in synchronism with the first n of said n+1 timing signals in an order of a highest place bit to a lowest place bit of said n-bit priority registers;
  - said interrupt request signal controlling means further operating to detect an interrupt request signal having a highest priority bit from the interrupt request signals being generated, the interrupt request signal controlling means also operating in such a manner that when a plurality of interrupt request signals having the highest priority bit are detected, the interrupt request signal controlling means selects one interrupt request signal, in accordance with a predetermined order of interrupt request signals, in synchronism with a timing signal following said first n of said n+1 timing signals generated by said stage counter means; and
  - output means for generating an interrupt processing request signal to a central processing unit when the interrupt request signal controlling means detects an interrupt request signal having a highest priority level.

5,481,730

**MONITORING AND CONTROL OF POWER SUPPLY FUNCTIONS USING A MICROCONTROLLER**  
Alan E. Brown, and David S. Lin, both of Houston, Tex., assignors to Compaq Computer Corp., Houston, Tex.  
Filed Jan. 24, 1992, Ser. No. 825,399  
Int. Cl. G06F 1/00; 1/02

U.S. Cl. 395-750

29 Claims



1. A system for monitoring power supply parameters, the system comprising:
  - a power supply receiving an input voltage and current and providing an output voltage and current;
  - means connected to said power supply for developing analog signals representative of said input voltage and current and output voltage and current;
  - means connected to said means for developing analog signals for converting said analog signals to digital values;
  - a microcontroller connected to said analog to digital converting means for calculating voltage and current values from said digital values, said microcontroller including a serial port;
  - a host computer system having a serial port, said host computer system serial port connected to said microcontroller serial port to allow communication between said microcontroller and said host computer system, said host computer system including means for requesting voltage and current values from said microcontroller; and
  - wherein said microcontroller includes means responsive to said host computer system requests for providing voltage and current values to said host computer system.

5,481,731

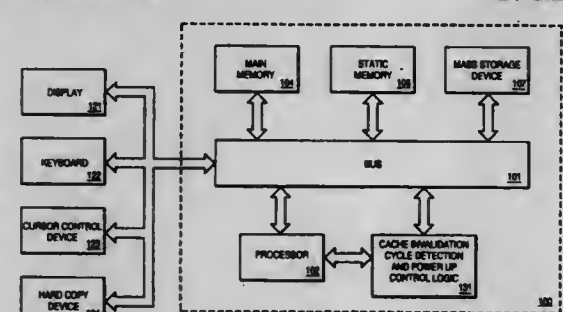
**METHOD AND APPARATUS FOR INVALIDATING A CACHE WHILE IN A LOW POWER STATE**  
James W. Conary, Aloha, and Robert R. Beutler, Lake Oswego, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 778,575, Oct. 17, 1991, abandoned. This application Mar. 24, 1993, Ser. No. 36,470

Int. Cl. G06F 1/32

U.S. Cl. 395-750

24 Claims



21. An integrated circuit comprising:
  - a cache memory for storing data duplicated in a main memory;
  - a first logic circuit placing said integrated circuit in a reduced power consumption state; and

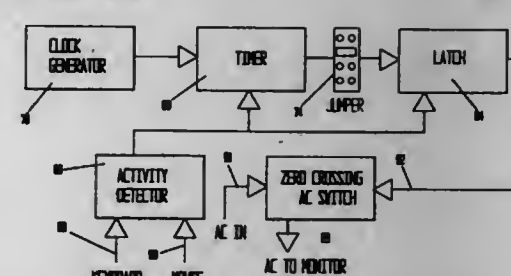
a second logic circuit temporarily powering up said integrated circuit out of said reduced power consumption state to run an invalidation cycle in said cache memory for maintaining cache coherence with the main memory, the second logic circuit restoring the integrated circuit to the reduced power consumption state after running the invalidation cycle.

5,481,732

**CRT MONITOR POWER CONTROL UNIT**  
Horyeh D. Shahbazi, 1 Driftwood, Irvine, Calif. 92714  
Filed Dec. 14, 1993, Ser. No. 166,043  
Int. Cl. G06F 1/32; 3/14

U.S. Cl. 395-750

18 Claims



1. In a computer system having a base unit containing a central processing unit, a graphical interface having a graphics port, a plurality of I/O ports and an electrical power supply, and at least one user input peripheral unit in an input circuit to one of said I/O ports and a non-captive CRT monitor in circuit to said graphics port and having an independent electrical power supply, wherein the improvement consists of:
  - a. normally closed electrical switch means in said independent electrical power supply to, and external of, said CRT monitor;
  - b. timing means including clock means to generate a clock signal of counts of predetermined frequency, and counter means to produce a pulsed signal upon receipt of a pre-selected number of clock signal counts also external of said CRT monitor;
  - c. latch means also external of said CRT monitor and in circuit to apply an interrupt signal to said electrical switch means to open said switch means and interrupt said electrical power supply to said monitor, and first circuit means from said counter means to apply said pulsed signal to said latch means and generate said interrupt signal;
  - d. user activity detection means external of said CRT monitor, in said input circuit of said user input peripheral unit to generate an activity signal upon detection of an input signal from said peripheral unit; and
  - e. second circuit means external of said CRT monitor from said user activity detection means to apply said activity signal to reset said counter means and to apply said activity signal to clear said latch means.

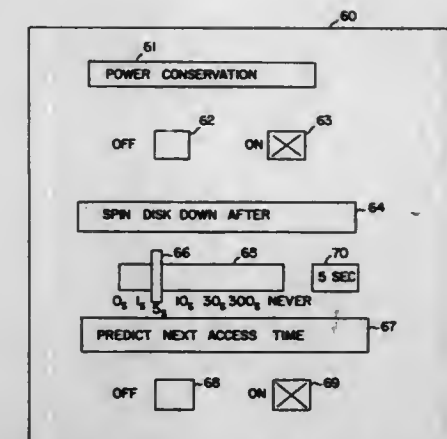
5,481,733

**METHOD FOR MANAGING THE POWER DISTRIBUTED TO A DISK DRIVE IN A LAPTOP COMPUTER**  
Frederick Douglass, Somerset, N.J.; Brian D. Marsh, New York, N.Y., and Parameshwaran Krishnan, Durham, N.C., assignors to Panasonic Technologies, Inc., Princeton, N.J.  
Filed Jun. 15, 1994, Ser. No. 260,104  
Int. Cl. G06F 1/32

U.S. Cl. 395-750

12 Claims

1. A power conservation method for a computer apparatus that includes a memory and that contains a spinnable disk that exhibits intermittent periods of activity separated by periods of inactivity wherein said computer apparatus is in a high power consumption state or a low power consumption state lower than said high power consumption state and wherein periods of disk activity always take place when said computer apparatus is in said high power consumption state.



sumption state and periods of disk inactivity take place when said computer apparatus is in either said high power consumption state or said low power consumption state, the method including the steps of:

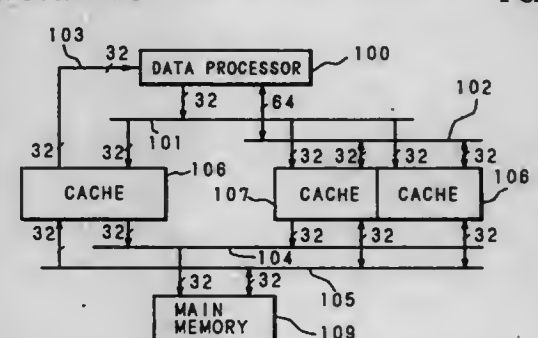
- quantizing predetermined periods of disk inactivity into a plurality of states, each said state representing a distinct range of time;
- storing in a table in said memory counts of a number of transitions between each pair of states while said apparatus has been in operation for a given period of time;
- predicting a time period of disk inactivity based upon a historical review of the previously stored counts for each pair of states;
- determining that said disk is in said predicted time period of disk inactivity; and
- placing the computer apparatus in said low power consumption state if power expenditure by said computer apparatus in said high power consumption state during the predicted time period of disk inactivity is determined to be greater than power expenditure by said computer apparatus between two periods of disk activity with an intervening one of said periods of disk inactivity.

5,481,734

**DATA PROCESSOR HAVING 2N BITS WIDTH DATA BUS FOR CONTEXT SWITCHING FUNCTION**  
Toyohiko Yoshida, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan  
Filed Dec. 13, 1990, Ser. No. 627,066  
Claims priority, application Japan, Dec. 16, 1989, 1-326254  
Int. Cl. G06F 9/00; 9/30; 13/00; 13/40

U.S. Cl. 395-775

1 Claim



1. An n-bit data processor including plural internal n-bit data buses comprising:
  - an instruction decoding unit, having an output port, which decodes instructions;
  - a control unit, coupled to the output port of said instruction decoding unit and having an output port, which generates control signals to control the execution of the instructions according to the output of said instruction decoding unit;



first and second n-bit registers coupled respectively to first and second n-bit internal data buses;

a 2n-bit internal data bus;

a 2n-bit interface data register, having first and second internal n-bit I/O ports coupled, respectively, to said first and second n-bit internal data buses, a 2n-bit interface I/O port coupled to said 2n-bit internal data bus, and an input port coupled to the output port of said control unit to receive said control signals for storing either a single n-bit word transferred between said first n-bit register and said 2n-bit interface data register or storing a pair of n-bit words simultaneously transferred between said first and second n-bit registers and said 2n-bit interface data register and for simultaneously transferring either a single n-bit word or a pair of n-bit words through said 2n-bit interface I/O port as determined by the control signals resulting from the decoding of selected instructions;

an address register which holds an operand address of an instruction;

a memory, having a 2n-bit data transfer port coupled to said 2n-bit internal data bus, for storing data; and

a memory access unit, coupled to said address register, said memory, and to said 2n-bit interface I/O port, which accesses said memory according to the address value held in said address register, and transfers a 2n-bit word from successive memory locations in said memory to said 2n-bit interface I/O port or to successive memory locations in said memory from said 2n-bit interface I/O port.

5,481,735

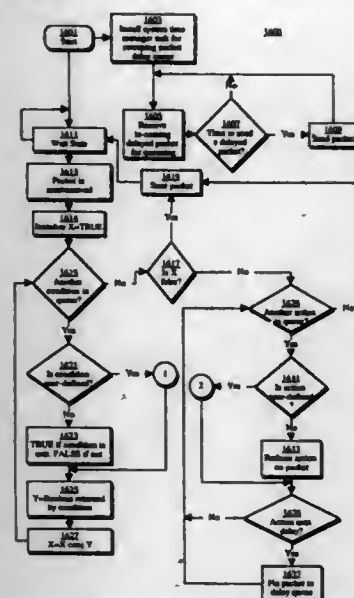
# METHOD FOR MODIFYING PACKETS THAT MEET A PARTICULAR CRITERIA AS THE PACKETS PASS BETWEEN TWO LAYERS IN A NETWORK

Craig Mortensen, Sunnyvale; Logan Roots, Redwood City, and Klaus Strelau, Saratoga, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Dec. 28, 1992, Ser. No. 999,281.  
Int. Cl.<sup>6</sup> G06F 13/14; H04L 12/00; 12/28

U.S. Cl. 395—200.1

17 Claims



1. A method for selectively modifying packets or the transmission of packets transmitted between a first layer in the ISO/OSI model in a network system and a second layer in the ISO/OSI model in a network system, the first layer in the ISO/OSI model being different from and adjacent to the second layer in the ISO/OSI model, the network system including a first process for translating packets from said first layer in the ISO/OSI model to said second layer in the ISO/OSI model, the packet having a plurality of properties including a packet size, a packet offset and a plurality of packet traits, the method comprising the steps of:

A) receiving from a user a set of user-specified conditions and a user-specified operation associated with a set of user-specified conditions by:

- A1) generating a first display of a first plurality of user interface controls for specifying said set of user-specified conditions;
- A2) receiving through user interaction with said first plurality of user interface controls user input that specifies said set of user-specified conditions, wherein each of said user-specified conditions designates an arithmetic relationship between a property of packets and a specified value;
- A3) generating a second display of a second plurality of user interface controls for specifying said user-specified operation associated with said set of user-specified conditions;
- A4) receiving through user interaction with said second plurality of user interface controls user input that specifies said user-specified operation, said user-specified operation being an operation that either modifies the packet or modifies transmission of the packet;

B) causing a second process to execute when an attempt is made to transmit a packet from said first layer in the ISO/OSI model to said second layer in the ISO/OSI model, said second process performing the steps of:

- B1) inspecting said packet to determine whether the packet satisfies said set of user-specified conditions;
- B2) if said packet satisfies said set of user-specified conditions, then performing a user-specified operation on said packet; and

C) invoking said first process after executing said second process.

5,481,736

# COMPUTER PROCESSING ELEMENT HAVING FIRST AND SECOND FUNCTIONAL UNITS ACCESSING SHARED MEMORY OUTPUT PORT ON PRIORITIZED BASIS

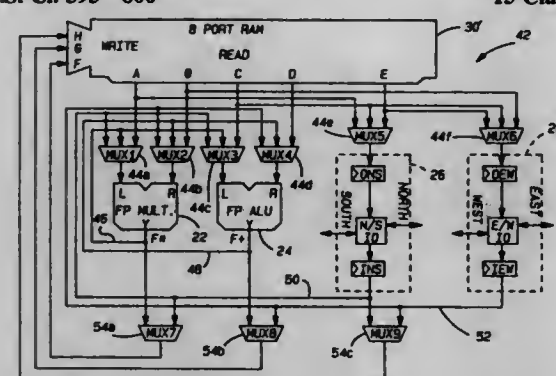
David A. Schwartz, Moorpark, and James J. Radigan, Sunnyvale, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 17, 1993, Ser. No. 18,683

Int. Cl.<sup>6</sup> G06F 9/30

U.S. Cl. 395—800

15 Claims



1. A processing element for a computer system, said processing element comprising:

memory means having a limited number of input ports and a limited number of output ports, the memory means having at least two input ports and at least two output ports; at least first and second functional unit means,

said first functional unit means, having M inputs, for performing a first function on data applied to at least one input thereof and for generating a result at its output, and

said second functional unit means, having N inputs, for performing a second function on data applied to at least one input thereof and generating a result at its output;

multiplexer means for connecting a single memory output port to inputs of both the first and second functional units to permit sharing therebetween; and

data path means for forwarding the output result of the first functional unit to an input of the second functional unit while bypassing the memory means,

wherein, said memory means having less than M+N output ports, where M and N are integers, wherein the functional units are prioritized to thereby give the one functional unit having priority access to the single memory output port in the event that the functional units attempt to concurrently execute instructions calling for access to the single memory output port.

5,481,737

# IMAGE DATA QUANTIZING CIRCUIT WITH A MEMORY FOR STORING UNQUANTIZED AND QUANTIZED IMAGE DATA

Akira Ito, and Teruo Ishihara, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 528,842, May 25, 1990, abandoned.

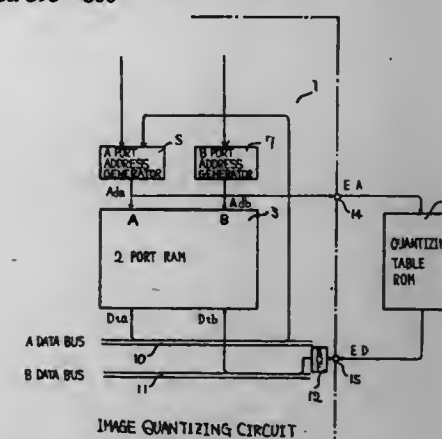
This application Mar. 12, 1993, Ser. No. 32,203

Claims priority, application Japan, May 30, 1989, 1-136513; May 30, 1989, 1-136515

Int. Cl.<sup>6</sup> G06T 1/60

U.S. Cl. 395—800

7 Claims



1. An image quantizing system, comprising:

an image quantizing circuit, comprising:

an address generator generating first and second addresses; and

an internal memory, connected to said address generator, storing pixel data to be quantized in a first portion, outputting from said first portion said unquantized pixel data responsive to said first address and storing in a second portion differentially quantized pixel data responsive to the second address; and

an external memory, connected to said internal memory, storing said differentially quantized pixel data corresponding to said unquantized pixel data and outputting said differentially quantized pixel data to said internal memory means responsive to said unquantized pixel data being used as a memory address and provided by said internal memory means.

5,481,738

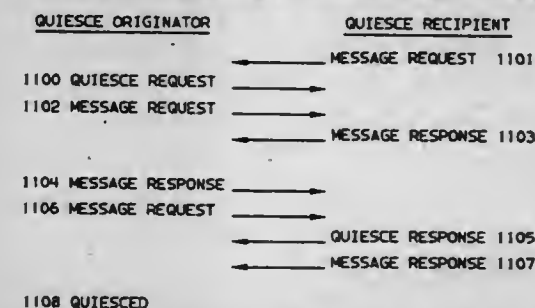
# APPARATUS AND METHOD FOR COMMUNICATING A QUIESCE AND UNQUIESCE STATE BETWEEN ELEMENTS OF A DATA PROCESSING COMPLEX

Nell G. Bartow, Sangerties; Steven N. Goss, Lake Katrine, and Douglas W. Westcott, Rhinebeck, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.  
Continuation-in-part of Ser. No. 839,657, Feb. 20, 1992, Pat. No. 5,357,608, Ser. No. 839,986, Feb. 20, 1992, Pat. No. 5,267,240, and Ser. No. 839,652, Feb. 20, 1992, Pat. No. 5,412,803. This application Jun. 1, 1993, Ser. No. 71,154  
Int. Cl.<sup>6</sup> G06F 13/00; H04J 3/02

U.S. Cl. 395—800

12 Claims

1. A method of reconfiguring an operational link between a first



element interconnected with a second element of a data processing complex, each of said elements containing at least one channel for interfacing with other elements, said method comprising:

initiating from a quiesce operator, which has become a master after a quiesce, a desired reconfiguration sequence, which reconfiguration sequence includes the steps of:

determining operational connectivity between a channel of said first element and a channel of said second element for every conductor interconnecting said elements;

acquiring a node descriptor on each operational conductor connected to said, said node descriptors uniquely describing a channel to which said conductor is connected;

sending an operational-transceiver request on an operational conductor connected to an originator channel, said request containing a node descriptor which uniquely describes said originator channel and said originator transceiver;

receiving said operational-transceiver request on a receiving set of transceivers in a recipient channel; and

responding to said operational-transceiver request on each of said transceivers in said receiving set with an operational-transceiver response, said response containing a node descriptor which uniquely describes said recipient channel and said receiving transceiver;

marking as configured in a configured-conductor table, each conductor connected to each of said channels if said acquired node descriptor matches a node descriptor uniquely describing said interconnected channel;

generating an intended-operational-link, said intended-operational-link being one of a plurality of allowed-operational-links, said allowed-operational-links being sets of conductors which are allowed to form an operational link; comparing each conductor in said intended-operational-link to said configured-conductor table;

repeating said generation and comparison steps if one of said conductors in said intended-operational-link is not marked as configured in said configured-conductor table;

verifying said intended-operational-link if each of said conductors in said intended-operational-link is marked as configured in said configured-conductor table, said verification ensuring that said intended-operational-link can form an operational link between said channels; and

establishing said operational link from said intended-operational-link if said intended-operational-link is verified.

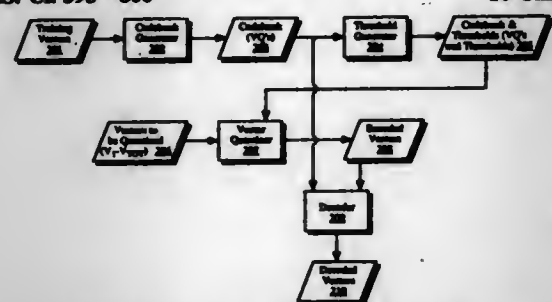


**5,481,739**  
**VECTOR QUANTIZATION USING THRESHOLDS**  
 Erik Staats, Felton, Calif., assignor to Apple Computer, Inc.,  
 Cupertino, Calif.

Filed Jun. 23, 1993, Ser. No. 82,022  
 Int. Cl.<sup>6</sup> G06F 7/60

U.S. Cl. 395—800

10 Claims



**10. An apparatus for vector quantization comprising:**

- a vector quantization codebook generator for generating a representative set of  $n$  quantized vectors operative upon receiving a set of training vectors;
- a threshold generator operative for generating a threshold (Threshold <sub>$i$</sub> ) for each  $i$  quantized vector ( $VQ_i$ ) of said  $n$  quantized vectors, said  $i$  threshold comprising half a distance between said  $i$  quantized vector and a  $k$  quantized vector ( $VQ_k$ ) of said  $n$  quantized vectors, wherein  $i < k \leq n$ , and said  $k$  quantized vector is the closest quantized vector to said  $i$  quantized vector of a set of quantized vectors having an index  $k$  wherein  $i < k \leq n$ ; and
- an encoder for encoding a set of input vectors ( $V_1 - V_{TOT}$ ) using said  $n$  quantized vectors and said threshold for said each of said  $n$  quantized vectors.

**5,481,740**

**METHOD AND APPARATUS FOR PROVIDING  
 AUTOPROBE FEATURES IN A GRAPHICAL DATA  
 FLOW DIAGRAM**

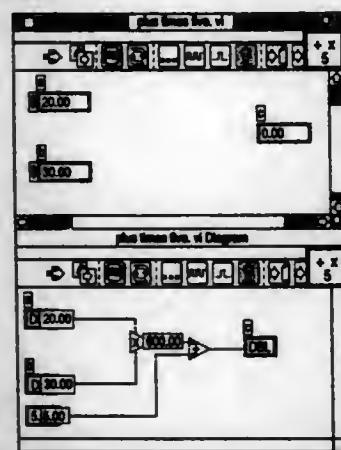
Jeffrey L. Kodosky, Travis County, Tex., assignor to National  
 Instruments Corporation, Austin, Tex.

Continuation-in-part of Ser. No. 979,416, Nov. 19, 1992, Pat.  
 No. 5,291,587, which is a continuation of Ser. No. 376,257,  
 Jul. 6, 1989, which is a continuation of Ser. No. 851,659, Apr.  
 11, 1986, abandoned. This application Sep. 22, 1993, Ser. No.  
 125,460

Int. Cl.<sup>6</sup> G06F 9/455

U.S. Cl. 395—800

3 Claims



1. A method for improved debugging of a data flow diagram in a computer system including a video screen and means for creating a graphical data flow diagram, wherein the data flow diagram comprises a plurality of interconnected function icons, wherein the plurality of interconnected function icons include a first function

icon including at least one input and at least one output, a first wire connected to the at least one input of the first function icon to provide data to the first function icon, a second function icon including at least one input and at least one output, and a second wire connected to the at least one output of the first function icon and also connected to the at least one input of the second function icon to provide data from the first function icon to the second function icon, the method comprising the computer-implemented steps of:

- receiving a request to enable an autoprobe feature to display data associated with or produced by icons in said data flow diagram;
- beginning execution of said data flow diagram after said step of receiving said request to enable said autoprobe feature;
- displaying on the screen one or more bubbles propagating on said first wire after said step of executing;
- the first function icon executing after said step of beginning execution of said data flow diagram and after said step of displaying on the screen one or more bubbles propagating on said first wire, wherein the first function icon generates first data;
- automatically displaying on the screen the first data output from the first function icon proximate to the first function icon after the first function icon executes, wherein said step of displaying on the screen the first data output from the first function icon is performed in response to said autoprobe feature being enabled;
- displaying on the screen one or more bubbles propagating on said second wire after said step of displaying on the screen the first data output from the first function icon;
- the second function icon executing after the first function icon executes and after said step of displaying on the screen the one or more bubbles propagating on said second wire, wherein the second function icon generates second data;
- automatically displaying on the screen the second data output from the second function icon proximate to the second function icon after the second function icon executes, wherein said step of displaying on the screen the second data output from the second function icon is performed in response to said autoprobe feature being enabled.

**5,481,741**

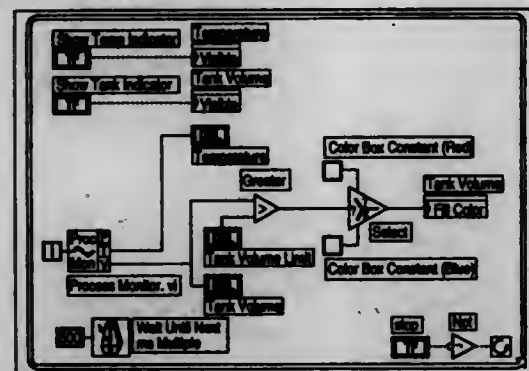
**METHOD AND APPARATUS FOR PROVIDING  
 ATTRIBUTE NODES IN A GRAPHICAL DATA FLOW  
 ENVIRONMENT**

Greg McKaskle, and Jeffrey L. Kodosky, both of Austin, Tex.,  
 assignors to National Instruments Corporation, Austin, Tex.  
 Continuation-in-part of Ser. No. 979,416, Nov. 19, 1992, Pat.  
 No. 5,291,587, which is a continuation of Ser. No. 376,257,  
 Jul. 6, 1989, abandoned, which is a continuation of Ser. No.  
 851,659, Apr. 14, 1986, Pat. No. 4,901,221. This application  
 Sep. 22, 1993, Ser. No. 126,163

Int. Cl.<sup>6</sup> G06F 9/60

U.S. Cl. 395—800

33 Claims



1. A computer implemented method for programmatically affecting an attribute of a control in a data flow program in a computer system including a video screen, means for creating a graphical

data flow diagram, and means for creating a panel associated with said data flow diagram for displaying data input to and output from said data flow diagram, the method comprising the computer implemented steps of:

- displaying on the screen a first panel;
- displaying on the screen a first control which displays data, wherein said first control is comprised in said first panel;
- displaying on the screen a first function icon that references a function icon control means for controlling a first function;
- displaying on the screen an attribute node icon associated with said first control, wherein the attribute node icon references an attribute control means for programmatically affecting an attribute of said first control;
- assembling on the screen a data flow diagram including the first function icon and the attribute node icon, wherein the first function icon is connected to the attribute node icon and wherein the function icon control means provides data to the attribute control means during execution of the data flow diagram, wherein said first panel is associated with said data flow diagram and wherein said first control in said first panel displays input or output data from said data flow diagram;
- executing the data flow diagram;
- the function icon control means writing a value to the attribute control means to affect said attribute of said first control during said step of executing; and
- changing said attribute of said first control after said step of the function icon control means writing said value to the attribute control means to affect said attribute of said first control.

**5,481,742**

**PRINTER CONTROL APPARATUS FOR REMOTELY  
 MODIFYING LOCAL PRINTER BY CONFIGURATION  
 SIGNALS FROM REMOTE HOST TO PRODUCE  
 CUSTOMIZED PRINTING CONTROL CODES**

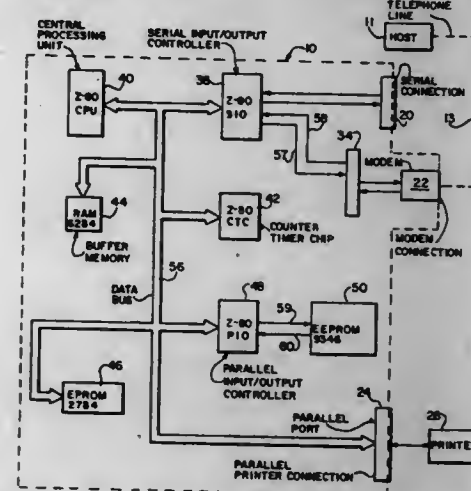
Michael E. Worley, Beavercreek, and James M. Armstrong,  
 Enon, both of Ohio, assignors to Reed Elsevier Inc., Newton,  
 Mass.

Continuation of Ser. No. 519,601, May 4, 1990, abandoned.  
 This application Sep. 27, 1993, Ser. No. 126,713

Int. Cl.<sup>6</sup> G06F 3/12; 9/06

U.S. Cl. 395—800

12 Claims



1. Printing control apparatus connected between a remote host data source and a local printer, the printing control apparatus comprising:

- communication means for receiving configuration signals and data signals of a first protocol from the host data source, said data signals including text identifying codes and generic printer control codes;
- converter means, connected to said communication means for accepting said configuration signals and said data signals, converting said text identifying codes of said first protocol to text identifying codes of a second protocol, and modifying

said generic printer control codes to produce customized printing control codes for controlling the operation of the local printer;

memory means, interconnected to said converter means, said memory means being programmable by said configuration signals from the remote host data source for controlling the manner in which said converter means modifies said generic printer control codes to produce said customized printing control codes, whereby the remote host data source programs the printing control apparatus to modify said generic printer control codes to produce said customized printing control codes; and

a local communication port connected to said converter means for transmitting said converted text identifying codes and said customized printer control codes to the local printer.

**5,481,743**

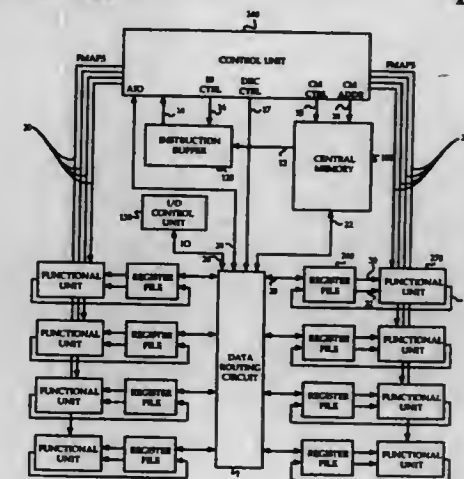
**MINIMAL INSTRUCTION SET COMPUTER  
 ARCHITECTURE AND MULTIPLE INSTRUCTION ISSUE  
 METHOD**

Michael A. Baxter, Sunnyvale, Calif., assignor to Apple Com-  
 puter, Inc., Cupertino, Calif.

Filed Sep. 30, 1993, Ser. No. 129,697  
 Int. Cl.<sup>6</sup> G06F 13/00; 15/76

U.S. Cl. 395—800

17 Claims



1. A computer system for issuing and executing multiple instructions using a minimal instruction set, the computer system comprising:

- a memory means for storing instructions and data, the memory means having an address input, a bi-directional data port, a control input, and a data output;
- an instruction buffer for storing multiple instructions for execution in parallel, the instruction buffer having an address input, a data output and a control input, the address input of the instruction buffer coupled to the data output of the memory means;
- a plurality of register files for storing data, each of the register files having a bi-directional port, a data input, a first data output and a second data output;
- a plurality of functional units for performing logical and arithmetic operations, each of the function units having a first data input, a second data input, a control input and an output, each of the functional units corresponding to a respective register file, and the first data input of each functional unit coupled to the first data output of its respective register file, the second data input of each functional unit coupled to the second data output of its respective register file, the output of each functional unit coupled to the data input of its respective register file;
- a data routing circuit for selectively transferring data between the memory means and the plurality of register files or between one of the plurality of register files and another



register file of the plurality of register files, in response to a routing control signal, the data routing circuit having a control input, a first bi-directional port coupled to the bi-directional data port of the memory means, a plurality of second bi-directional data ports, each of the second bi-directional data ports coupled to the bi-directional port of a respective register file; and

a control unit for controlling the memory means, the instruction buffer, the functional units and the register files, the control unit determining largest sequential number of instructions within the plurality of instructions received that can be issued in parallel and asserting control signals to execute the instructions in parallel, the control unit having: an input coupled to the data output of the instruction buffer for receiving a plurality of instructions to be executed in parallel, a memory control output coupled to the control input of the memory means, a memory address output coupled to the address input of the memory means, an instruction buffer control output coupled to the control input of the instruction buffer, a plurality of function control outputs each of the function control outputs connected to a respective control input of a functional unit, and a routing control output coupled to the control input of the data routing circuit to provide the routing control signal.

5,481,744

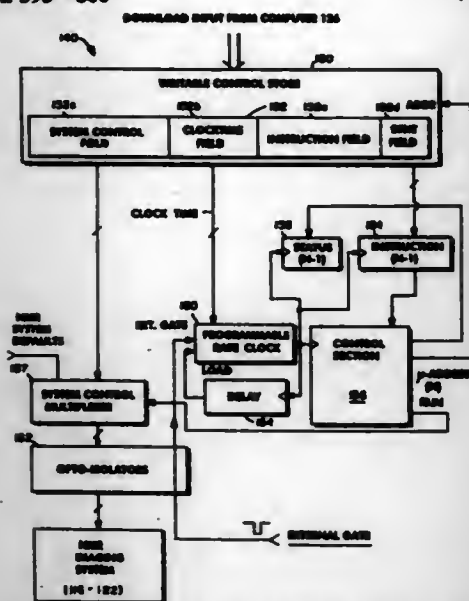
# MICROCODE SEQUENCER CHANGING STATES IN RESPONSE TO AN EXTERNAL GATING INPUT LEVEL CHANGE UPON THE OCCURRENCE OF A WAIT INSTRUCTION

John C. Hoenninger, III, Oakland, Calif., assignor to The Regents of the University of California, Oakland, Calif.  
Continuation of Ser. No. 551,798, Jul. 12, 1990, Pat. No. 5,291,610. This application Nov. 5, 1993, Ser. No. 147,552  
The portion of the term of this patent subsequent to Mar. 1, 2011, has been disclaimed.

Int. Cl. G06F 9/00

U.S. Cl. 395-800

7 Claims



1. A nuclear magnetic resonance imaging system comprising: at least one magnetic field source that applies a magnetic field to a body; an RF transmitter for applying RF excitation pulses to said body in response to a first control signal; an RF receiver that receives, under control of a second control signal, nuclear magnetic resonance responses generated by said body in response to said RF excitation pulses; imaging means connected to said RF receiving means for generating an image based on said received responses;

a sequencer for repetitively generating said first and second control signals in real time under control of a program specifying a time sequence of said RF excitation pulses and said response receptions, said program defining at least one WAIT command; and

an external gating circuit connected to said sequencer, said external gating circuit connected to receive an external gate signal, said external gating circuit including a testing circuit for testing said external gate signal to determine whether said signal is at a predetermined level, said external gating circuit disabling said WAIT command and allowing said sequencer to proceed in said repetitive generating of said first and second control signals when said testing circuit determines said signal is at said predetermined level, said external gating circuit controlling said sequencer to wait in response to the WAIT command until said external gate signal changes level when said testing circuit determines said external gate signal is at a level different from said predetermined level.

5,481,745

# HIGH SPEED DIVIDER FOR PERFORMING HEXADECIMAL DIVISION HAVING CONTROL CIRCUIT FOR GENERATING DIFFERENT DIVISION CYCLE SIGNALS TO CONTROL CIRCUIT IN PERFORMING SPECIFIC FUNCTIONS

Takashi Tatsuami, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

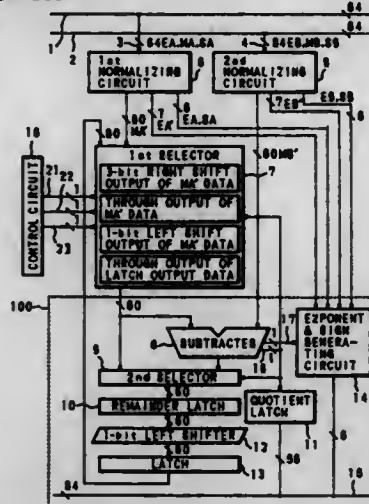
Filed Dec. 23, 1993, Ser. No. 172,337

Claims priority, application Japan, Dec. 25, 1992, 4-346440

Int. Cl. G06F 7/38; 7/52

U.S. Cl. 395-800

6 Claims



1. A divider, comprising: a control circuit for generating division cycle signals indicating a first cycle, a second cycle and at least a third cycle of a division respectively; a first normalizing circuit for inputting a dividend data being floating point data whose base is 16, and for normalizing the dividend data on a basis of the base of the dividend data; a second normalizing circuit for inputting a divisor data being floating point data whose base is 16, and for normalizing the divisor data on a basis of the base of the divisor data; a selector for inputting a first data and the division cycle signals generated by said control circuit, and for performing an operation on the first data corresponding to the division cycle signals and then outputting the operated on first data; and a dividing circuit for inputting a second data and a third data, for comparing the second and third data with each other, and for calculating a quotient data and a remainder data from the second and third data; wherein when the division cycle signals indicate the first cycle, said selector inputs a mantissa data of the dividend data from said first normalizing circuit as the first data to through-

output the first data as the second data which is to be inputted to said dividing circuit, and said dividing circuit inputs the data outputted from said selector as the second data and a mantissa data of the divisor data outputted from said second normalizing circuit as the third data, and compares the second and third data, wherein when the division cycle signals indicate the second cycle,

said selector, when a comparison result by said dividing circuit in said first cycle shows that the second data is larger than or equal to the third data, inputs the mantissa data of the dividend data from said first normalizing circuit as the first data to output the first data as the second data, which is to be inputted to said dividing circuit after shifting the first data to the right, and when the comparison result by said dividing circuit in said first cycle shows that the second data is smaller than the third data, inputs the mantissa data of the dividend data from said first normalizing circuit as the first data to output the first data as the second data which is to be inputted to said dividing circuit after shifting the first data to the left, and

said dividing circuit inputs the data outputted from said selector as the second data and the mantissa data of the divisor data outputted from said second normalizing circuit as the third data, respectively, compares the second and third data, calculates the quotient data and the remainder data from the second and third data, and outputs said quotient data and said remainder data, and

wherein when the division cycle signals indicate at least the third cycle,

said selector inputs the remainder data outputted from said dividing circuit as the first data to through-output the first data as the second data which is to be inputted to said dividing circuit, and

said dividing circuit inputs the remainder data outputted from said selector as the second data and mantissa data of divisor data outputted from said second normalizing circuit as the third data, respectively, compares the second and third data, calculates the quotient data and the remainder data and outputs said quotient data and said remainder data.

5,481,746

# VECTOR SHIFT FUNCTIONAL UNIT FOR SUCCESSFULLY SHIFTING OPERANDS STORED IN A VECTOR REGISTER BY CORRESPONDING SHIFT COUNTS STORED IN ANOTHER VECTOR REGISTER

Alan J. Schiffler, Chippewa Falls; Ram K. Gupta, and Christopher C. Hsiung, both of Eau Claire, all of Wis., assignors to Cray Research, Inc., Eagan, Minn.

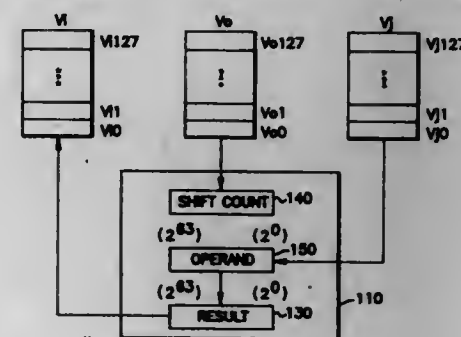
Continuation of Ser. No. 618,748, Nov. 27, 1990, abandoned.

This application Mar. 29, 1994, Ser. No. 218,997

Int. Cl. G06F 9/315; 9/302; 9/30

U.S. Cl. 395-800

8 Claims



1. A method of shifting individual operands within a vector register computer, comprising the steps of:

- (a) loading a first vector register with a plurality of individual operands including a first operand, a second operand, and a third operand;
- (b) loading a second vector register with a plurality of corresponding shift counts such that each of the shift counts corresponds to one of the individual operands in the first vector register, the plurality of corresponding shift counts including a first shift count, a second shift count, and a third shift count;
- (c) transferring the first operand and the first corresponding shift count into a vector shift functional unit;
- (d) shifting the first operand by an amount equal to the first corresponding shift count to produce a first corresponding shifted operand and, pipelined with shifting the first operand, transferring the second operand and the second corresponding shift count into the vector shift functional unit; and
- (e) storing the first corresponding shifted operand and, pipelined with storing the first corresponding shifted operand, shifting the second operand by an amount equal to the second corresponding shift count to produce a second corresponding shifted operand and transferring the third operand and the third corresponding shift count into the vector shift functional unit.

5,481,747

# SYNCHRONOUS METHOD AND APPARATUS FOR PROCESSORS

Masatsugu Kametani, Tsuchiura, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 759,529, Sep. 13, 1991, Pat. No. 5,361,369.

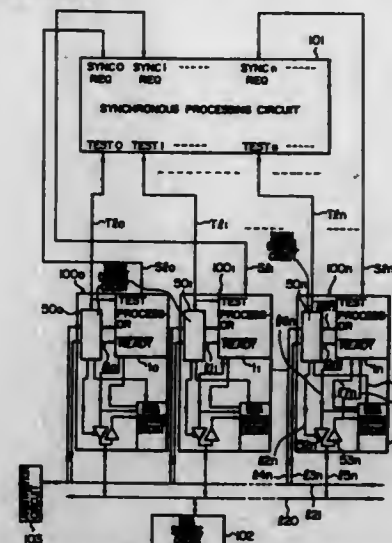
This application Jul. 29, 1994, Ser. No. 281,990

Claims priority, application Japan, Sep. 14, 1990, 2-245208

Int. Cl. G06F 9/00

U.S. Cl. 395-800

23 Claims



1. A synchronization system among processors, comprising: a plurality of processors; an information sharing system for holding information shared with said processors; means responsive to an instruction from a certain processor, for outputting a synchronization request signal for requesting synchronization of processors associated with said certain processor; and means for generating and outputting a synchronization completion signal when the synchronization request signals for all of said associated processors to be synchronized has been outputted, wherein there are provided a synchronization instruction having a function of generating from said certain processor an instruction for making said synchronization request signal outputting means generate said synchronization request sig-







storing the first and second partially-decoded instructions in the first and second storage slots, respectively, of a selected instruction cache entry, the instruction loader including means responsive to a non-core instruction received from the bus interface unit for,

- (a) in the event that the non-core instruction corresponds to a single core instruction that performs the same operation as the non-core instruction,
- (i) translating the non-core instruction to a decoded version of the single corresponding core instruction;
- (ii) storing the decoded single corresponding core instruction in the instruction cache; and
- (iii) providing the decoded single corresponding core instruction to a selected one of the first and second execution units for execution thereby;
- (b) in the event that the non-core instruction corresponds to a sequence of first and second core instructions that perform the same operation as the non-core instruction,
- (i) translating the non-core instruction into the sequence of the first and second decoded corresponding core instructions;
- (ii) storing the first and second decoded corresponding core instructions in the first and second storage slots, respectively, of a single instruction cache entry; and
- (iii) sequentially providing the first and second decoded corresponding core instructions to a selected one of the first and second execution units for execution thereby; and
- (c) in the event that the non-core instruction corresponds to a sequence of three or more core instructions,
- (i) providing the non-core instruction to an emulator connected to the instruction loader for generation by the emulator of said sequence of core instructions corresponding to the non-core instruction;
- (ii) storing a pointer corresponding to the first core instruction in said sequence of core instructions in the instruction cache; and
- (iii) providing said sequence of core instructions generated by the emulator to a selected one of the first and second execution units for execution thereby.

5,481,752

# METHOD OF EDITING MULTIMEDIA DATA INCLUDING GRAPHIC DISPLAY OF REPRODUCTION TIMES

Kisoko Suzuki, Neyagawa; Hidemasa Kitagawa, Toyonaka; Koichiro Endo, Osaka, and Yoshihiro Mori, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

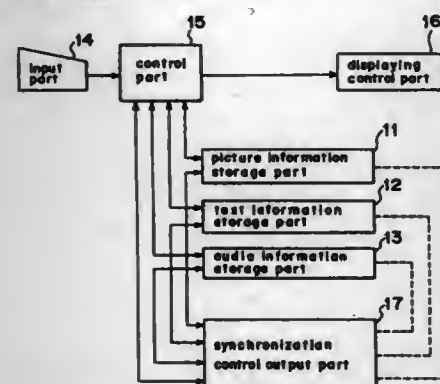
Division of Ser. No. 115,831, Sep. 3, 1993, Pat. No. 5,386,581, which is a continuation of Ser. No. 500,543, Mar. 28, 1990, abandoned. This application Nov. 7, 1994, Ser. No. 336,239

Claims priority, application Japan, Mar. 28, 1989, 1-77562; Jan. 13, 1989, 1-266483

Int. Cl.<sup>6</sup> G06F 3/00

U.S. Cl. 395—800

2 Claims



2. A method of editing multimedia data comprising the steps of (1) visually representing reproduction times of information data,

(2) visually displaying the designated location of said plurality of material and destination information, (3) confirming a designated location of the information data, (4) inserting the designated location of the information data, (5) deleting the designated location of the information data, and (6) confirming edition of the information data;

wherein said step (1) of visually representing reproduction times of information data further includes the steps of (a) calculating a reproduction time of each of a plurality of material information data stored in a data storage portion and a reproduction time of each of a plurality of destination information data corresponding to said material information data, and (b) displaying graphics arranged in parallel, using a display control portion, said graphics having their areas proportional to the calculated respective reproduction times, so as to visually represent the respective reproduction times indicative of the material information data and indicative of the corresponding destination information data;

wherein said step (2) of visually displaying the designated location of said plurality of material and destination information data includes the step of displaying a plurality of markers, using said display control portion, said markers indicative of a predetermined time address value in superposition on a location according to the time address value corresponding to said markers of the graphics representing said plurality of material and destination information data, thereby visually displaying the designated location of the plurality of material and destination information data;

wherein said step (3) of confirming the designated data location includes the steps of (a) designating an optional location of the graphics, using an input portion, said graphics corresponding to the plurality of material information data or the plurality of destination information data being displayed by said display control portion, or designating the markers being displayed in superposition on the graphics corresponding to the plurality of material or destination information data, where indication information data corresponding to the designated location including identification data for distinction of the designation information part on the designated location, address value of the designated location and indication of indicating reproduction of the designation information part on the designated location are transmitted to a control portion, (b) converting the address value included in the indication information data into a time address value represented in a unit of time basis using said control portion, said address value, which the time address value is transmitted to said display control portion, (c) digitally displaying the time address value using said display control portion, and (d) simultaneously reading-out the information data of a predetermined data amount, using said control portion, said information data of a predetermined data amount corresponding to the time address value of the corresponding plurality of material information data or the destination information data, from a data storage portion in accordance with the identification data for distinction included in the indication information data, which the read-out information data is transmitted to a synchronization control portion where the resultant information data is reproduced, thereby confirming the designated location of the information data;

wherein said step (4) of inserting the designated information data includes the steps of (a) designating an optional range of the plurality of material information data by directly designating the graphics corresponding to the plurality of material information data being displayed by said display control portion or by designating the markers displayed in superposition on the graphics corresponding to the plurality of material information data, and designating an optional location of the destination information data by directly designating the graphics corresponding to the destination information data which corresponds to the plurality of material information

data or by designating the markers displayed in superposition on the graphics corresponding to the destination information data, thereby supplying, to said control portion, construction information indicative of the identification data for distinction and the address value within the designated range of the designated material information data and arrangement information including the identification data for distinction of the designated destination information part, address value of the designated location thereof and insertion indication of inserting the destination information data part into the designated location, (b) reading-out the designated range of the designated material information part, using said control portion, from said data storage portion based on the construction information, (c) inserting the read-out designation range of the designated material information part into the designated location of the designated destination information part in said data storage portion, and (d) simultaneously displaying graphics, using said display control portion, said graphics having their areas corresponding to the increased amount of the information part due to the insertion of the designated destination information part, thereby executing the insertion of the information data;

wherein said step (5) of deleting the designated location of the information data includes the steps of (a) designating an optional range of the plurality of material or destination information data by directly designating the graphics corresponding to the plurality of material information data or the plurality of destination information data being displayed by said display control portion or by designating the markers displayed in superposition on the graphics corresponding to said plurality of material or destination information data, using the input portion, thereby transmitting to said control portion the arrangement information including the identification information for distinction of the designated information part, address value of the designated location and deletion indication of deleting the data part of the designated range, (b) deleting the designated range of the designation information part in said data storage portion on the basis of the construction information, and (c) simultaneously displaying graphics, in said display control portion, said graphics having their areas corresponding to the decreased data amount due to the deletion of the designated destination information part, thereby effecting the deletion of the information data; and

wherein said step (6) of confirmation edition of the information data includes the steps of (a) designating a location, using the input portion, said location corresponding to any same time address value of the graphics corresponding to the plurality of destination information data being displayed by said display control portion or designating one of the plurality of markers displayed in superposition on the graphics corresponding to the plurality of destination information data, whereby the address value of the designated location of the designated plurality of destination information data and indication information including indication of reproducing in synchronization the designated plurality of destination information data from the designated location are transmitted to said control portion, (b) converting the address value included in the designated designation information into a time address value corresponding to the designation location of the designated destination information part on the basis of the indication information using said control portion, and (c) reading out the respective information data contained in the designation location corresponding to the respective time address value corresponding to the designated designation information part from said data storage portion, which the read-out information is transmitted to said synchronization control portion where the

respective information data are reproduced in synchronization, thereby executing the confirmation of editing data.

5,481,753

# I/O DEVICE HAVING IDENTIFICATION REGISTER AND DATA REGISTER WHERE IDENTIFICATION REGISTER INDICATES OUTPUT FROM THE DATA REGISTER TO BE AN IDENTIFIER OR NORMAL DATA

Takashi Miyake, and Nobusuke Abe, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

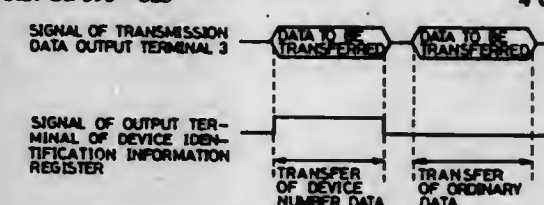
Filed Jun. 22, 1992, Ser. No. 902,118

Claims priority, application Japan, Jun. 24, 1991, 3-178720; Aug. 20, 1991, 3-232301

Int. Cl.<sup>6</sup> H01J 3/00

U.S. Cl. 395—823

4 Claims



1. An input/output device comprising: a first storage register for storing a plurality of data including normal data and device number data indicating a transmission destination to be transmitted in synchronization with a concurrently transmitted clock signal; a second storage register for storing an identification code having "1" which indicates that transmission data is the device number data of a serial input/output device and having "0" which indicates that the transmission data is normal; an output terminal, coupled to an output of said second storage register, for outputting said identification code; and a shifter, coupled to said first storage register, for accessing said device number data from said first storage register when said identification code output from said second storage register to said output terminal has "1" and serially outputting said device number data in synchronization with said clock signal, and for accessing said normal data from said first storage register when said identification code has "0" and serially outputting said normal data in synchronization with said clock signal.

5,481,754

# APPARATUS AND METHOD FOR BIOS INTERFACE TO FEATURES IN MULTIPLE ADAPTER CARDS IN ONE OPERATION USING REGISTERS WITH BITS DISTRIBUTED ACROSS THE ADAPTER CARDS

William J. Piazza, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 902,414, Jun. 19, 1992, abandoned, which is a continuation of Ser. No. 525,510, May 18, 1990, abandoned. This application May 2, 1994, Ser. No. 236,239

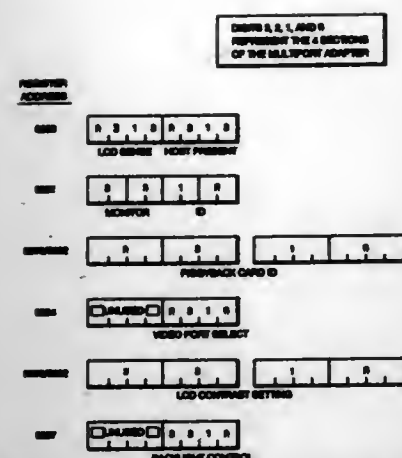
Int. Cl.<sup>6</sup> G06F 13/00; 12/00; 12/02

U.S. Cl. 395—823

14 Claims

1. An apparatus for separately controlling a plurality of separately addressable I/O devices in a system, and wherein each of said I/O devices has functions which are independently controllable with respect to other I/O devices; said apparatus comprising: a processor; a system bus, said bus operatively connected to said processor; a plurality of I/O devices; at least one adapter, each adapter operatively connected to said bus and to at least one I/O device, each of said adapters further comprising: switch selection means to indicate to said adapter the address associated with each I/O device connected thereto;





said adapters having a plurality of distributed registers, each associated with a different one of said functions, each one of said distributed registers associated with and distributed among all of said adapters and having a single system address for said distributed register for receiving information in a single BIOS call from a system bus relating to one of the functions of each I/O device, each of said distributed registers being comprised of at least one bit of information from each adapter and said at least one bit of information being operative to control one of said functions of each I/O device associated with said each adapter; and

means to use said information in said distributed register to control or communicate selectively with each of said I/O devices from said single system address and control one of the functions of each I/O device independently of other I/O devices from said single operation in said single BIOS call; and BIOS means to transfer information to said register to execute hardware related functions in said system; said BIOS means including a given address to address all of said I/O devices, and means to provide a call to each I/O device therewith;

means to store in said distributed register said call to each of said I/O devices individually and readable by all of said I/O devices; and whereby a single address serves to address each I/O device individually.

5,481,755

#### APPARATUS AND METHOD FOR ADDRESSING MULTIPLE ADAPTER CARDS IN ONE OPERATION BY DISTRIBUTING BITS OF REGISTERS ACROSS THE ADAPTER CARDS

Jeffrey D. Harper, Austin, Tex.; Paul W. Kalendra; William J. Piazza, both of Boca Raton, Fla.; Howard C. Tanner, and Anh Vinh, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

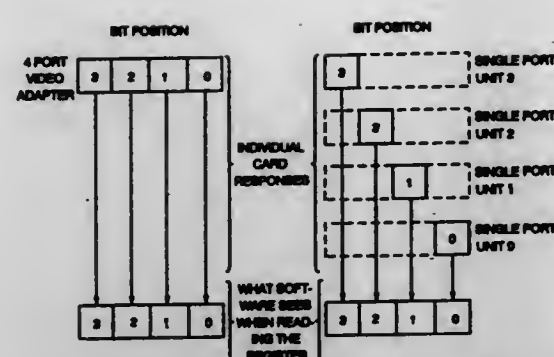
Continuation of Ser. No. 906,048, Jun. 26, 1992, abandoned, which is a continuation of Ser. No. 525,509, May 18, 1990, abandoned. This application May 2, 1994, Ser. No. 236,672

Int. Cl.<sup>6</sup> G06F 13/00; 12/00; 12/02

U.S. Cl. 395—823

50 Claims

1. An apparatus for separately controlling a plurality of separately addressable I/O devices in a system, and wherein each of said I/O devices has functions which are independently controllable with respect to other I/O devices; said apparatus comprising: at least one adapter interconnecting said system and each of said I/O devices, each adapter further comprising: switch selection means to indicate to each respective adapter the address associated with each I/O device connected thereto; a plurality of distributed registers, each associated with a different one of said functions, each one of said distributed registers associated with and distributed among all of said adapters and having a single system address for all of said adapters asso-



ciated with said distributed register for receiving information in a single operation from a system bus relating to one of the functions of each I/O device addressed by said single system address in said single operation, each of said distributed registers being comprised of at least one bit of information from each adapter and said at least one bit of information being operative to control one of said functions of each I/O device associated with said each adapter; and

means to use said information in said distributed register for said system from said single address to communicate selectively with each of said I/O devices from said single address and control one of the functions of each I/O device independently of other I/O devices in said single operation.

5,481,756

#### DMA CONTROLLER MAILING AUTO-INITIALIZE HALTING UNIT

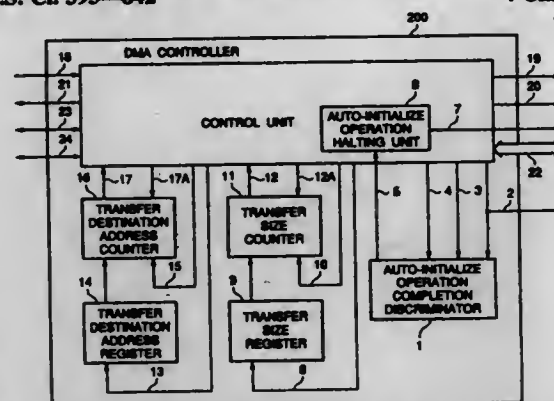
Naotaka Kanno, Kanagawa, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 15, 1992, Ser. No. 961,185

Claims priority, application Japan, Jan. 15, 1991, 3-266551  
Int. Cl.<sup>6</sup> G06F 13/28; 13/12

U.S. Cl. 395—842

4 Claims



1. A Direct Memory Access (DMA) controller comprising: a transfer size register written, before a first series of DMA transfer operations being executed are completed, with the number of DMA transfer operations to be performed in a second series of DMA transfer operations to be executed after said first series of DMA transfer operations are executed; a transfer destination address register written, before said first series of DMA transfer operations being executed are completed, with a transfer destination head address for said second series of DMA transfer operations to be executed after said first series of DMA transfer operations are executed; a control unit configured to start a DMA transfer for said second series of DMA transfer operations by using values of the number of DMA transfer operations and the transfer destination head address respectively written in said transfer size register and said transfer destination address register and to generate a transfer completion status signal, when the DMA transfer for said first series of DMA transfer operations has

been completed, said control unit being also configured to generate an auto-initialize halt operation setting signal indicating that an auto-initialize operation halting mode is set, and a register write confirmation status signal indicating that a new set value is written into either or both of said transfer size register and said transfer destination address register during execution of the DMA transfer for said first series of DMA transfer operations;

an auto-initialize operation completion discriminator, receiving said transfer completion status signal, said auto-initialize halt operation setting signal and said register write confirmation status signal, for generating a halt request signal when all of said transfer completion status signal, said auto-initialize halt operation setting signal and said register write confirmation status signal are active; and

an auto-initialize operation halting unit responding to said halt request signal so as to halt an auto-initialize operation and to generate a signal indicating that the auto-initialize operation has been halted.

5,481,757

#### CATV TERMINAL DEVICE IN TWO-WAY COMMUNICATION CATV SYSTEM

Yoshikazu Mihara, Kawanishi, and Yuji Yamamoto, Yawata, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Oct. 26, 1993, Ser. No. 141,335

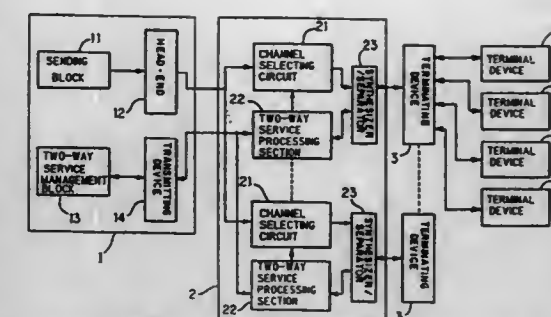
Claims priority, application Japan, Jan. 26, 1992, 4-287580;  
Jan. 29, 1992, 4-291578; Jan. 29, 1992, 4-291579; Jan. 29, 1992, 4-291580

Int. Cl.<sup>6</sup> H04H 1/00; H04N 7/14

U.S. Cl. 455—3.1

19 Claims

1. In a two-way communication CATV system having a CATV broadcasting station for transmitting a CATV broadcasting signal including frequency-division-multiplexed broadcasting signals corresponding to a plurality of channels; a plurality of CATV terminal devices respectively assigned different particular frequencies for transmitting channel



request signals for requesting channels desired out of said plurality of channels; and

a relay device for receiving the CATV broadcasting signal transmitted from said CATV broadcasting station as well as receiving the channel request signals transmitted from said CATV terminal devices, frequency-converting the broadcasting signal corresponding to the channel requested by the channel request signal transmitted from each of said CATV terminal devices out of the broadcasting signals corresponding to the plurality of channels included in said CATV broadcasting signal into a broadcasting signal having the particular frequency assigned to the corresponding CATV terminal device and transmitting the broadcasting signal to the corresponding CATV terminal device, each of the plurality of CATV terminal devices in the two-way communication CATV system comprising:

storing means for storing a recognition number;

frequency determining means for determining the frequency of the broadcasting signal transmitted from said relay device; and

recognition number setting means for determining the recognition number depending on the frequency determined by said frequency determining means and storing the determined recognition number in said storing means.



**DESIGN PATENT**

**GRANTED JAN. 2, 1996**

**ERRATA**

**For  
CLASS**

**See  
PATENT NO.**

D22-109 ..... D365,858



# DESIGNS

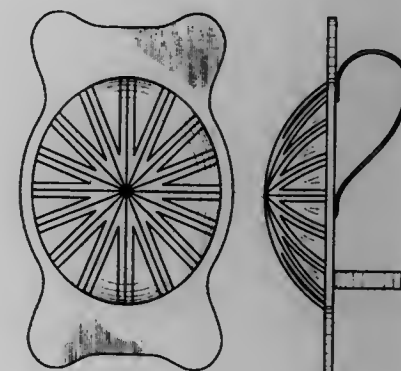
JANUARY 2, 1996

365,671

## SIMULATED TURTLE BACK COSTUME

Phyllis J. Eberman, 421 Elaine Dr., Pittsburgh, Pa. 15236  
Continuation of Ser. No. 3,619, Jan. 11, 1993, abandoned.  
This application Jun. 28, 1994, Ser. No. 25,251  
Term of patent 14 years

U.S. Cl. D2—741



365,673

## SLIP ON SNEAKER

Helene M. Bradway, 14 Orchard La., Colts Neck, N.J. 07722  
Filed Sep. 2, 1994, Ser. No. 27,953  
Term of patent 14 years

U.S. Cl. D2—908



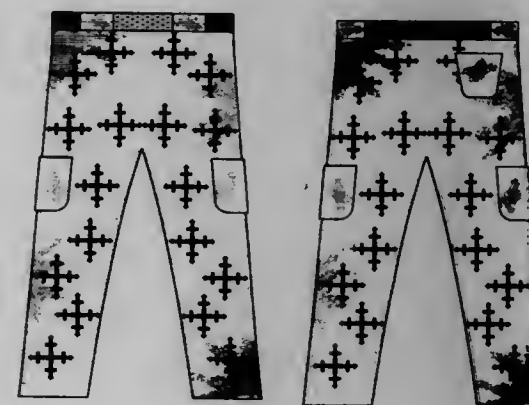
365,672

## TROUSERS

Michael W. Childress, 505 Jerome St., Hot Springs, Ark. 71913  
Continuation of Ser. No. 4,513, Feb. 8, 1993, abandoned. This  
application Apr. 21, 1994, Ser. No. 21,682

Term of patent 14 years

U.S. Cl. D2—742



365,674

## CHRISTIAN FOOTWEAR

Travona A. Coles, 6134 Surrey Square La. #202, Forestville,  
Md. 20747

Filed Dec. 14, 1993, Ser. No. 16,347

Term of patent 14 years

U.S. Cl. D2—980





365,675

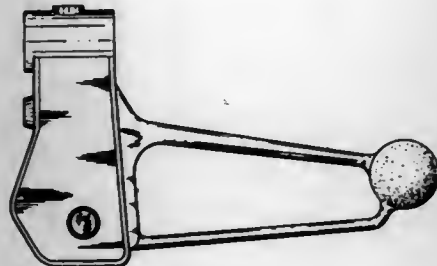
**BRAKE HANDLE FOR A WALKER**

Douglas D. Macmillan, Nepean, Canada, assignor to Dana Douglas Medical, Nepean, Canada

Filed Nov. 12, 1993, Ser. No. 15,239

Term of patent 14 years

U.S. Cl. D3—12



365,676

**RADIO PAGER HOLSTER**

William J. Scheid, Coral Springs, Fla., and Bee L. Khoo, Johor, Malaysia, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 25, 1994, Ser. No. 31,419

Term of patent 14 years

U.S. Cl. D3—218



365,677

**ANKLE WALLET**

Michael Dolsey, 863 W. 44th St., Norfolk, Va. 23508

Filed Jan. 7, 1994, Ser. No. 17,228

Term of patent 14 years

U.S. Cl. D3—226



365,678

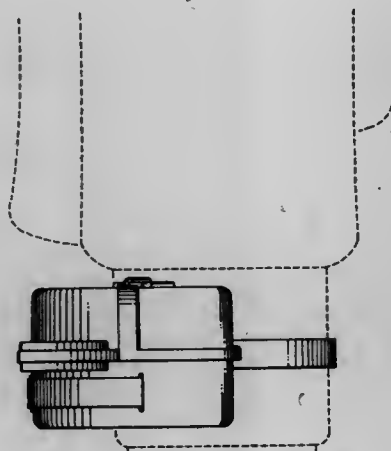
**GOLFBAG BEVERAGE CONTAINER**

Daniel H. Godfrey, Beaverton, and Darrin Dow, Portland, both of Oreg., assignors to Sports Coolers Unlimited, Inc., Beaverton, Oreg.

Filed Feb. 2, 1994, Ser. No. 18,194

Term of patent 14 years

U.S. Cl. D3—255



365,679

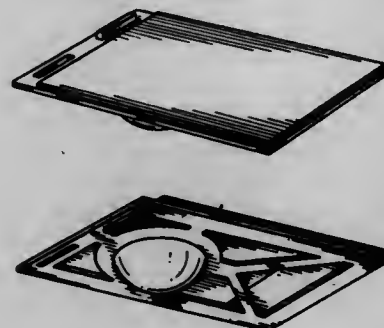
**CONTACT LENS PACKAGE**

Richard W. Abrams; Russell J. Crossman, both of Jacksonville, Fla., and John E. Studer, Morris Plains, N.J., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.

Filed Apr. 21, 1994, Ser. No. 21,570

Term of patent 14 years

U.S. Cl. D3—264



365,680

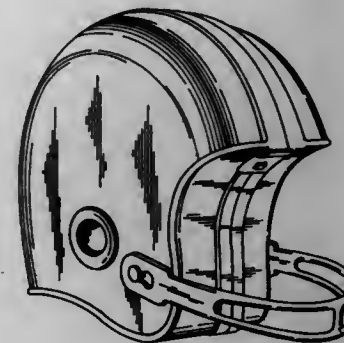
**CARRYING CASE**

Victor E. Steinfeld, III, 8627 Gavington Ct., Dublin, Ohio 43017

Filed Jul. 22, 1994, Ser. No. 26,237

Term of patent 14 years

U.S. Cl. D3—271



365,682

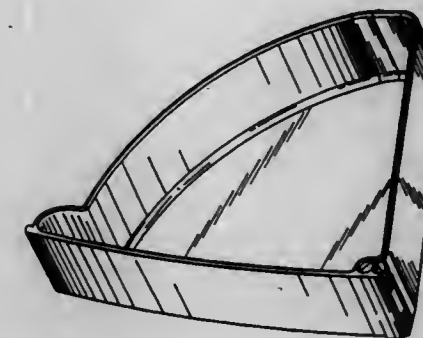
**STORAGE BIN CONTAINER**

Randall Calmeise, Oakwood Village, and John A. Vura, Wooster, both of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio

Filed Aug. 12, 1994, Ser. No. 27,055

Term of patent 14 years

U.S. Cl. D3—319



365,681

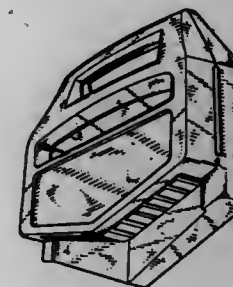
**TOOL HOLDER FOR WRENCHES**

Jessie Chow, No. 18, Hou Juan Road, Taichung, Taiwan, Prov. of China

Filed Feb. 1, 1994, Ser. No. 18,196

Term of patent 14 years

U.S. Cl. D3—315



365,683

**TOOTHBRUSH**

John C. Wan, 1600 S. Joyce St., Apt. B-701, Arlington, Va. 22202

Continuation of Ser. No. 20,572, Mar. 29, 1994, abandoned.

This application Mar. 20, 1995, Ser. No. 36,382

Term of patent 14 years

U.S. Cl. D4—104





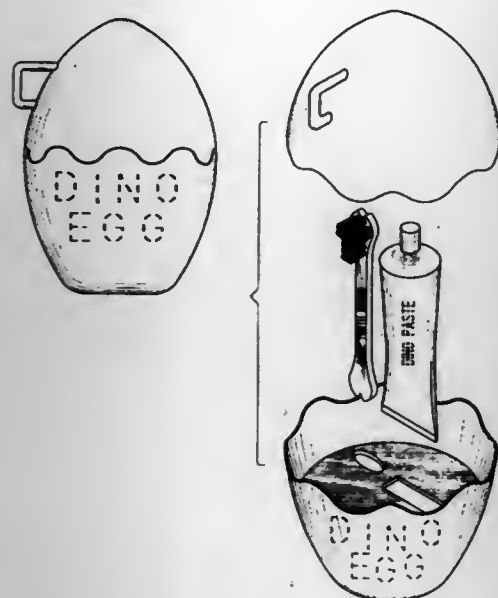
365,684

**COMBINED TOOTHBRUSH, TUBE OF TOOTHPASTE,  
AND CONTAINER THEREFOR**Rhonda G. Loomis, and Karen L. Tamminen, both of 706  
Kipling Street, Sarnia, Ontario, Canada

Filed Mar. 3, 1994, Ser. No. 19,496

Term of patent 14 years

U.S. Cl. D4—108



365,686

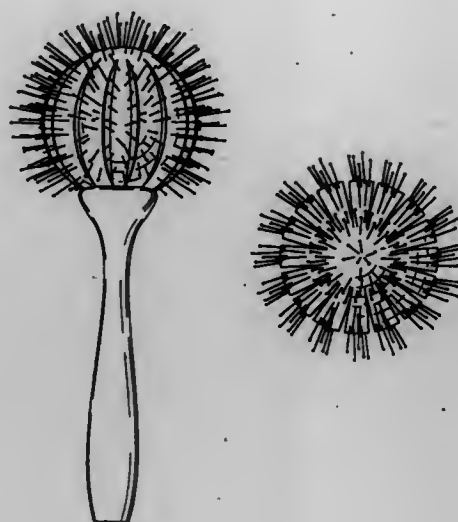
**VENTED HAIRBRUSH**

Sabrina S. Denebelm, 260 Avila St., San Francisco, Calif. 94111

Filed Aug. 17, 1994, Ser. No. 27,286

Term of patent 14 years

U.S. Cl. D4—128



365,685

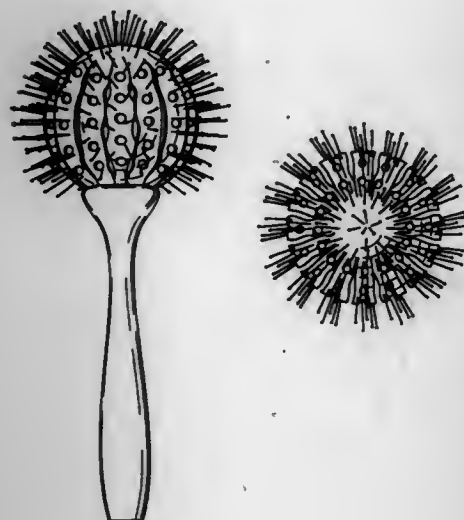
**VENTED HAIRBRUSH**

Sabrina S. Denebelm, 260 Avila St., San Francisco, Calif. 94123

Filed Jul. 15, 1994, Ser. No. 26,017

Term of patent 14 years

U.S. Cl. D4—128



365,687

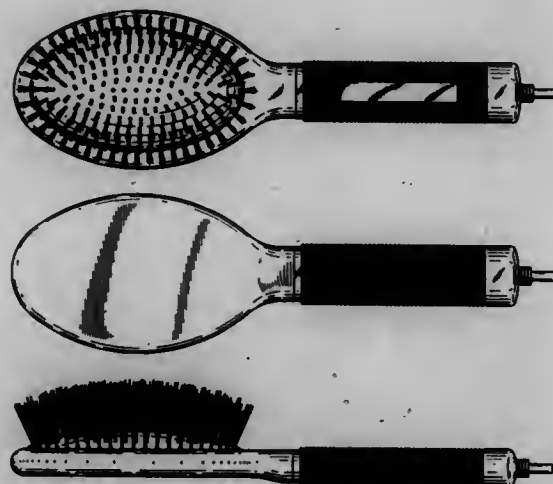
**HAIRBRUSH**

Kathy Gertma, Sausalito, and Christopher Davis, San Francisco, both of Calif., assignors to West Coast Beauty Supply Co., Benicia, Calif.

Filed Mar. 29, 1995, Ser. No. 36,865

Term of patent 14 years

U.S. Cl. D4—133



365,688

**MIRROR**

Sally S. Lewis, 8727 Melrose Ave., Los Angeles, Calif. 90069-5086

Filed Oct. 12, 1993, Ser. No. 14,029

Term of patent 14 years

U.S. Cl. D6—300



365,690

**GARMENT HANGER**

Sandra K. Charlet, Lenoir, N.C., assignor to Alba-Waldensian, Inc., Valdese, N.C.

Filed Jun. 9, 1994, Ser. No. 24,213

Term of patent 14 years

U.S. Cl. D6—315



365,689

**SUN BURST MIRROR FRAME**

Anthony Ramirez, 18251 Highway 88, Lockeford, Calif. 95237

Filed Sep. 19, 1994, Ser. No. 28,558

Term of patent 14 years

U.S. Cl. D6—309



365,691

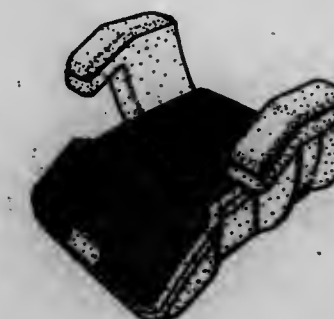
**CHILD'S BOOSTER CAR SEAT FOR VEHICLE LAP/  
SHOULDER BELT SYSTEMS**

Mark A. Sedlack, Cuyahoga Falls, Ohio, assignor to Century Products Company, Macedonia, Ohio

Filed Nov. 4, 1994, Ser. No. 32,300

Term of patent 14 years

U.S. Cl. D6—333



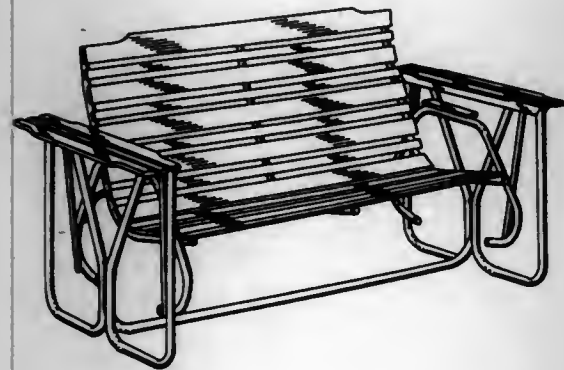


365,692  
GLIDER

Charles Pomeroy, and John T. Bycraft, both of South Bend, Ind., assignors to Jack-Post Corporation, Buchanan, Mich.  
Filed May 31, 1994, Ser. No. 23,716

Term of patent 14 years

U.S. Cl. D6—344



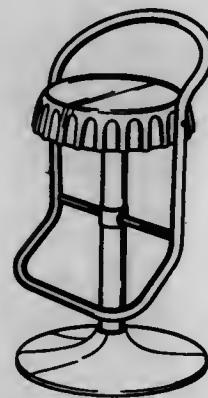
365,694  
BOTTLE CAP CHAIR

Henrik Linsberg, 33250 Sea Forest, P.O. Box 318, The Sea Ranch, Calif. 95497

Filed Jul. 28, 1994, Ser. No. 26,455

Term of patent 14 years

U.S. Cl. D6—360

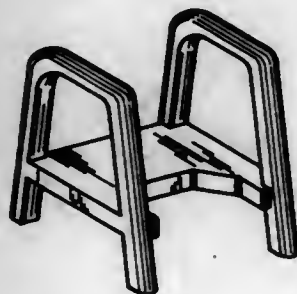


365,693  
POTTY STEP

Thomas J. Jones, 3007 Crone Rd., Borden, Ind. 47106  
Filed Jul. 5, 1994, Ser. No. 25,179

Term of patent 14 years

U.S. Cl. D6—349

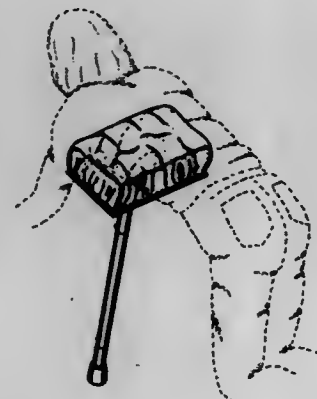


365,695  
SUPPORT FOR LEANING BODY  
Kenneth G. Sibbitt, Sr., 5404 Countess Ct., Lake Dallas, Tex. 75065

Filed Nov. 15, 1993, Ser. No. 15,315

Term of patent 14 years

U.S. Cl. D6—364



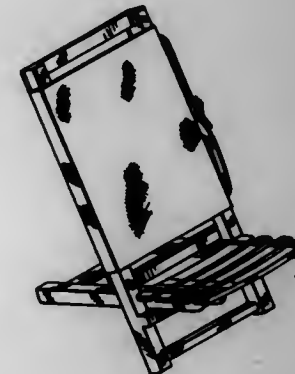
365,696  
TWO PIECE CHAIR

Vittorio Infanti, Matawan, N.J., assignor to Infanti Chair Manufacturing Corp., Staten Island, N.Y.

Filed Mar. 3, 1995, Ser. No. 35,628

Term of patent 14 years

U.S. Cl. D6—368



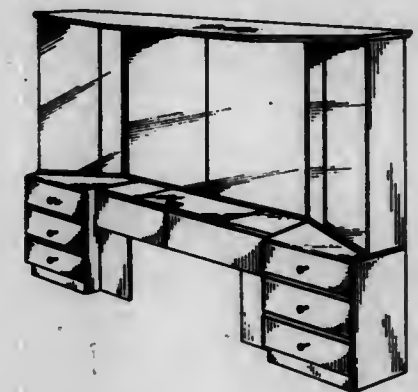
365,698  
COMBINED DUAL ARMOIRE, HEADBOARD, MIRROR  
AND BRIDGE

Jericho P. Pauer, Onalaska, and Darrin M. Swagel, Arcadia, both of Wis., assignors to Ashley Furniture Industries, Inc., Arcadia, Wis.

Filed Feb. 11, 1993, Ser. No. 4,677

Term of patent 14 years

U.S. Cl. D6—397



365,697  
SOFA

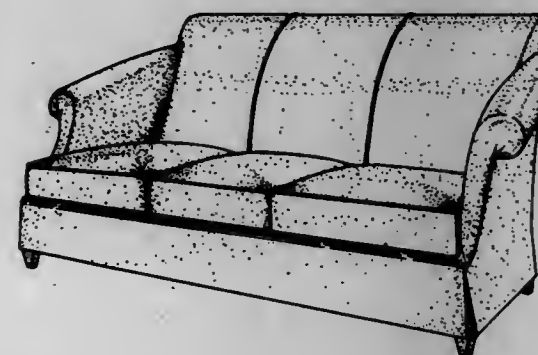
John Hutton, New York, N.Y., assignor to Donghia Furniture, New York, N.Y.

Filed Sep. 16, 1993, Ser. No. 13,048

The portion of the term of this patent subsequent to Jan. 31, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D6—381



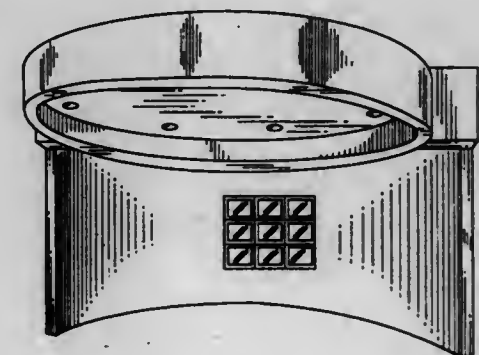
365,699  
DISPLAY

Paul R. Lechleiter, Powell, and Mark B. Artus, Beechwood, both of Ohio, assignors to Blockbuster Entertainment Corp., Ft. Lauderdale, Fla.

Filed Aug. 29, 1994, Ser. No. 27,751

Term of patent 14 years

U.S. Cl. D6—399





365,700

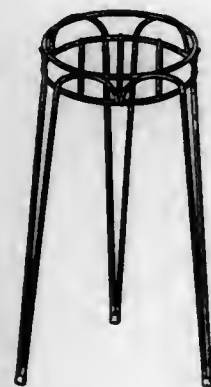
## WIRE PLANT STAND

Martin Lee, Yonkers, N.Y., assignor to American Track & Hardware Co., Inc., Monsey, N.Y.

Filed Feb. 14, 1994, Ser. No. 18,668

Term of patent 14 years

U.S. Cl. D6-403



365,702

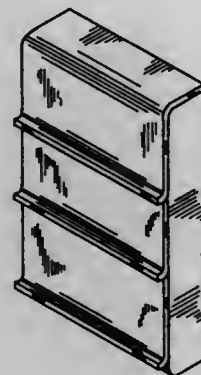
## CABINET FOR TOILETRIES

Larry Hall, 9646 S. Dobson Ave., Chicago, Ill. 60628

Filed May 3, 1994, Ser. No. 22,307

Term of patent 14 years

U.S. Cl. D6-445



365,701

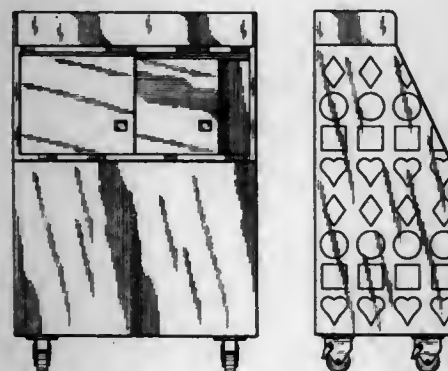
## TOY CHEST

Laurencia E. Keola, 606 Kaha St., Kailua, Hi. 96734

Filed Jul. 8, 1993, Ser. No. 10,396

Term of patent 14 years

U.S. Cl. D6-443



365,703

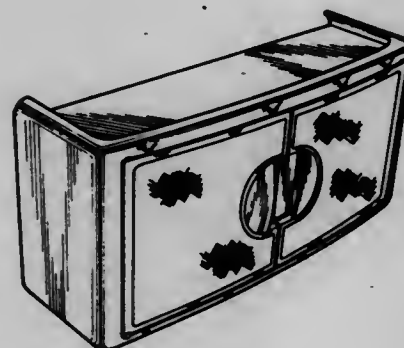
## CABINET

D. Scott Miller, Orlando, Fla., and John F. Travers, North Royalton, Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio

Filed Dec. 14, 1994, Ser. No. 32,178

Term of patent 14 years

U.S. Cl. D6-446



365,704

## DISPLAY RACK

Graham Brown, and Lyle London, both of Scottsdale, Ariz., assignors to Pure Art U.S.A. Inc., Scottsdale, Ariz.

Filed Nov. 3, 1993, Ser. No. 15,044

Term of patent 14 years

U.S. Cl. D6-467



365,706

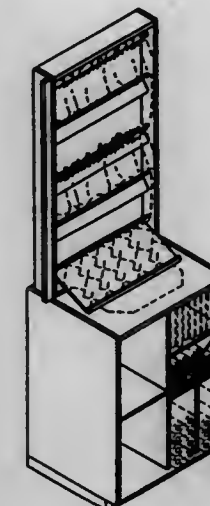
## WALLPAPER DISPLAY UNIT

Duncan F. Campbell, Inglewood, Canada, assignor to The Borden Company, Limited, Ontario, Canada

Filed Mar. 29, 1994, Ser. No. 20,543

Term of patent 14 years

U.S. Cl. D6-477



365,705

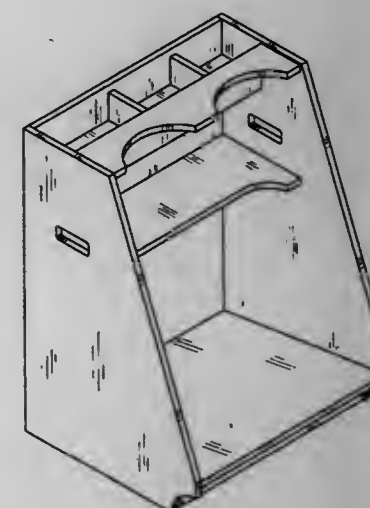
## GOLF BAG STAND

Robert E. Deeley, P.O. Box 467, Norwich, Vt. 05055

Filed Nov. 22, 1994, Ser. No. 31,331

Term of patent 14 years

U.S. Cl. D6-467



365,707

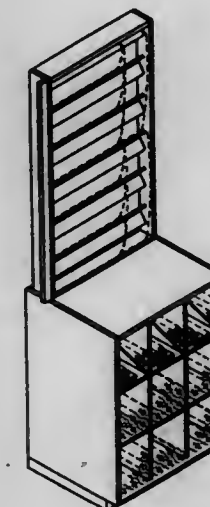
## WALLPAPER DISPLAY UNIT

Duncan F. Campbell, Inglewood, Canada, assignor to The Borden Company, Limited, Ontario, Canada

Filed Mar. 29, 1994, Ser. No. 20,599

Term of patent 14 years

U.S. Cl. D6-477





365,708

**BASE SUPPORT FOR A TABLE TOP**

Anthony Ramirez, P.O. Box 1458, Lockeford, Calif. 95237

Filed Sep. 14, 1994, Ser. No. 28,408

Term of patent 14 years

U.S. Cl. D6—497



365,710

**CAR SEAT SUN VISOR**

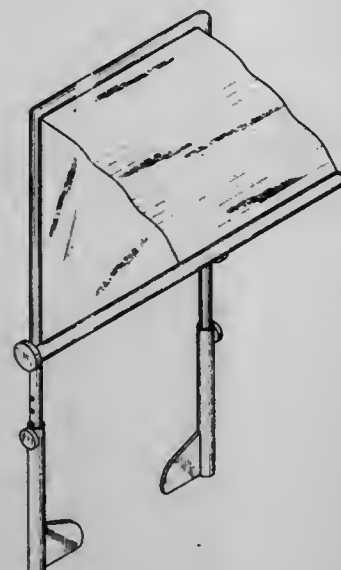
Dale V. Cunningham, 7885 Fairview Rd., Tillamook, Oreg.

97141

Filed May 16, 1994, Ser. No. 22,949

Term of patent 14 years

U.S. Cl. D6—491



365,709

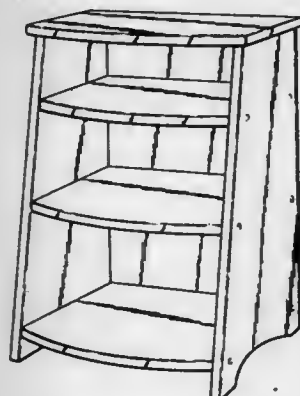
**END TABLE**

Steven Leveen; Lori G. Leveen, both of Boca Raton; Israel Pycher, Plantation; Chris Roncone, Lake Worth, and Laura McColskey, Palm Beach Gardens, all of Fla., assignors to Levenger Company, Delray Beach, Fla.

Filed Sep. 9, 1993, Ser. No. 12,764

Term of patent 14 years

U.S. Cl. D6—474



365,711

**BASE SUPPORT FOR A TABLE TOP**

Anthony Ramirez, P.O. Box 1458, Lockeford, Calif. 95237

Filed Sep. 14, 1994, Ser. No. 28,407

Term of patent 14 years

U.S. Cl. D6—497



365,712

**DESK TOP**

John H. Smith, Auckland, New Zealand, assignor to Criterion

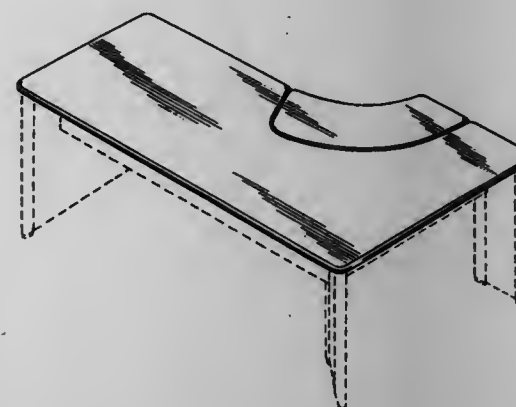
Manufacturing Limited, Auckland, New Zealand

Filed Jun. 15, 1993, Ser. No. 10,741

Claims priority, application Australia, Dec. 15, 1992, 363792

Term of patent 14 years

U.S. Cl. D6—511



365,714

**ELECTRIC RAZOR HOLDER**

Leon Masello, 115 Eisenhower Ave., E. Syracuse, N.Y. 13057

Filed Apr. 15, 1994, Ser. No. 21,376

Term of patent 14 years

U.S. Cl. D6—526



365,713

**PAPER TOWEL HOLDER**

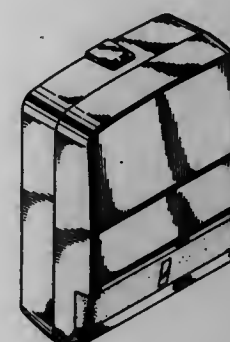
Cheng-Feng Chen, Taipei, Taiwan, Prov. of China, assignor to

Bobson Hygiene International, Inc., Taipei, Taiwan, Prov. of China

Filed Feb. 1, 1995, Ser. No. 34,301

Term of patent 14 years

U.S. Cl. D6—522



365,715

**LONG SPINED GUN RACK**

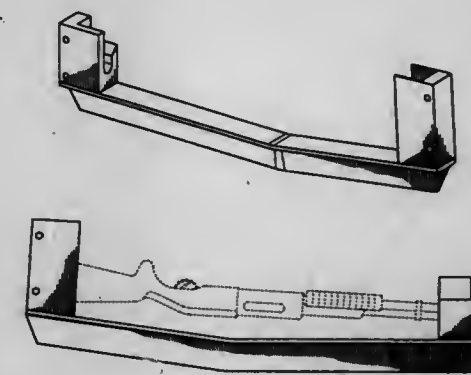
Dieter H. Zebbedies, 4175 Springcrest Dr., Brooklyn, Ohio

44144

Filed Nov. 28, 1994, Ser. No. 31,464

Term of patent 14 years

U.S. Cl. D6—552





365,716

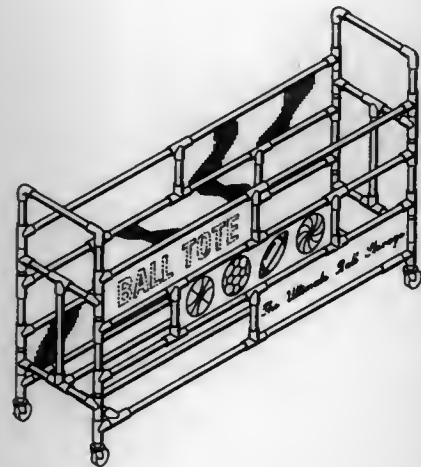
**PORTABLE MULTI-BALL STORAGE CONTAINER**

Alan P. Rose, Sr., 713 Jansen St., Cayce, S.C. 29033

Filed Nov. 25, 1994, Ser. No. 31,398

Term of patent 14 years

U.S. Cl. D6—552



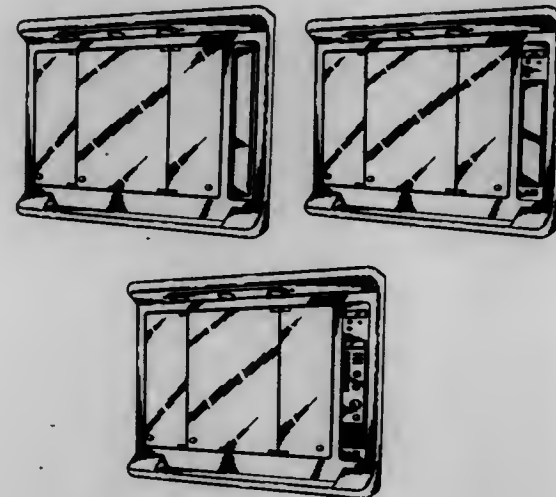
365,718

**MEDICINE CABINET**Andre Morin, Pointe-Claire, Canada, assignor to Maax Inc.,  
Sainte-Marie, Canada

Filed Feb. 16, 1995, Ser. No. 34,954

Term of patent 14 years

U.S. Cl. D6—561



365,717

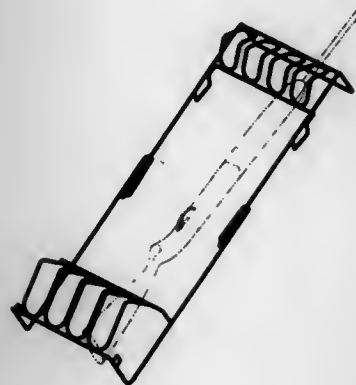
**PORTABLE GUN RACK**

John Cardenas, 339 W. Norman Ave., Arcadia, Calif. 91007

Filed Aug. 31, 1994, Ser. No. 27,889

Term of patent 14 years

U.S. Cl. D6—552



365,719

**HOLSTER FOR A STEERING WHEEL LOCKING CLUB**Lamonte E. Bryan, 2321 S. Magnolia, No. 5A, Ontario, Calif.  
91762

Filed Feb. 15, 1995, Ser. No. 34,935

Term of patent 14 years

U.S. Cl. D6—567



365,720

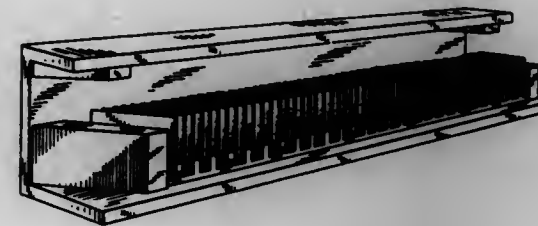
**STORAGE UNIT FOR COMPACT DISCS**

Gary Balchunas, P.O. Box 408, Middleville, N.Y. 13406-0408

Filed May 13, 1994, Ser. No. 22,869

Term of patent 14 years

U.S. Cl. D6—629



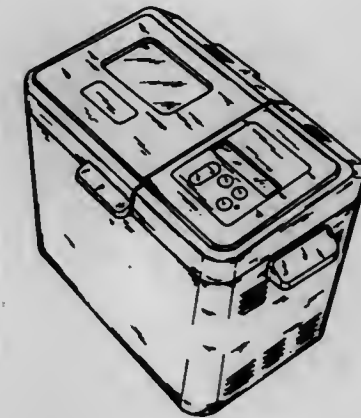
365,722

**BREAD MAKING APPLIANCE**Edward J. Duquaine, West Bend, Wis., and William C. Cesaroni, Glenview, Ill., assignors to The West Bend Company,  
West Bend, Ind.

Filed Sep. 7, 1993, Ser. No. 12,647

Term of patent 14 years

U.S. Cl. D7—350



365,721

**VACUUM FLASK**

Frank T. H. Huang, Suite 804, 8 Fl., No. 128, Sec. 3, Ming-Sheng E. Rd., Taipei, Taiwan, Prov. of China

Filed Oct. 19, 1994, Ser. No. 29,916

Term of patent 14 years

U.S. Cl. D7—317



365,723

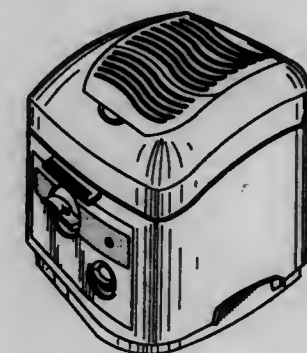
**ELECTRIC DEEP FAT FRYER**Dick Powell, London, Great Britain, assignor to SEB, Sclongey,  
France

Filed Aug. 5, 1993, Ser. No. 11,475

Claims priority, application France, Feb. 5, 1993, 93 0650

Term of patent 14 years

U.S. Cl. D7—354





365,724

**CHAFING DISH**

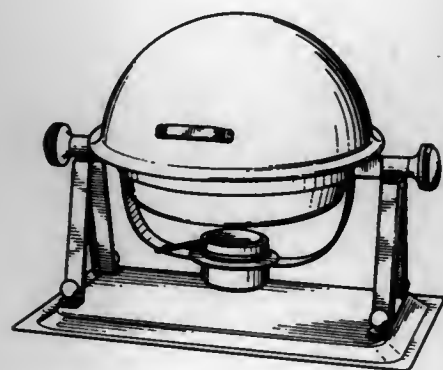
Henry T. Yu, Kowloon, Hong Kong, assignor to Sunnex Products Limited, Hong Kong

Filed Nov. 10, 1994, Ser. No. 30,883

Claims priority, application United Kingdom, May 20, 1994, 2039187

Term of patent 14 years

U.S. Cl. D7—355



365,725

**HANDLE FOR A KNIFE**

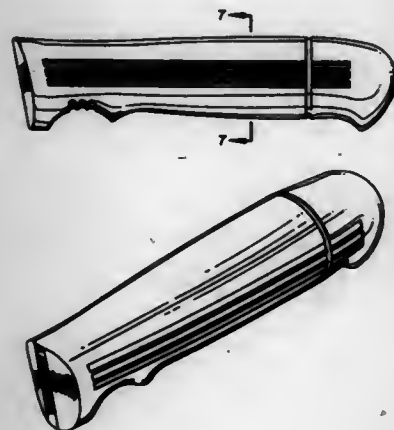
Katsumi Hasegawa, Sagamihara, Japan, assignor to Kai R &amp; D Center Co., Ltd., Gifu, Japan

Filed Apr. 29, 1994, Ser. No. 22,096

Claims priority, application Japan, Jan. 29, 1993, 5-32915

Term of patent 14 years

U.S. Cl. D7—401.2



365,726

**ELECTRONIC IGNITER**

Kun-Chung Hsu, Shin Chuang, Taiwan, Prov. of China, assignor to Chien Sheng Machine Industrial Co., Ltd., Taipei, Taiwan, Prov. of China

Filed Apr. 18, 1995, Ser. No. 37,628

Term of patent 14 years

U.S. Cl. D7—416



365,727

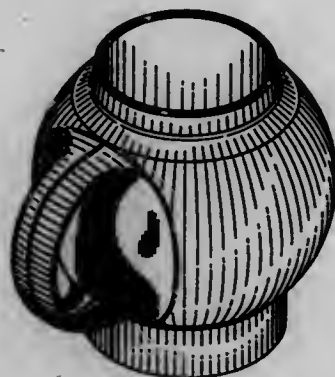
**BEVERAGE MUG**

Bret A. Adams, Upper Arlington; Paul P. Kolada, Bexley; Michael J. Painter, Columbus, and Sherry L. Jones, London, all of Ohio, assignors to Advanced Sports Concepts, Inc., Columbus, Ohio

Filed Aug. 17, 1994, Ser. No. 27,285

Term of patent 14 years

U.S. Cl. D7—536



365,728

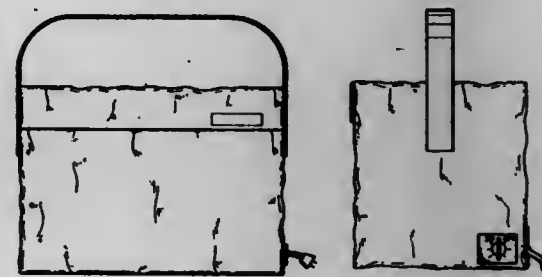
**INSULATED HEATING CONTAINER**

Linda L. Gilliland, 301 Hickory Dr., Longwood, Fla. 32779, and Mary R. Downs, 2206 Morriswood Ct., Franklin, Tenn. 37064

Filed Sep. 23, 1994, Ser. No. 30,018

Term of patent 14 years

U.S. Cl. D7—607



365,730

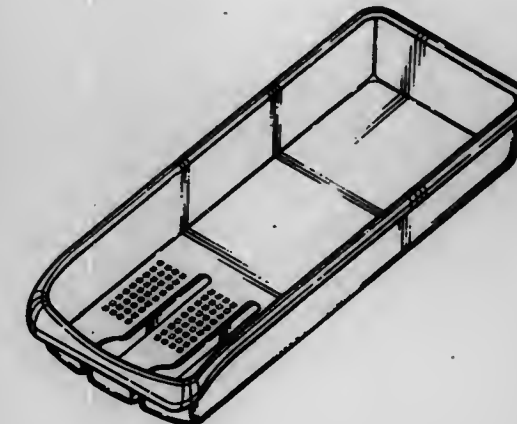
**UTENSIL TRAY**

Keith E. Brightbill, Wooster; Charles W. Craft, Apple Creek, and John W. Koenig, Cincinnati, all of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio

Filed Dec. 13, 1994, Ser. No. 32,163

Term of patent 14 years

U.S. Cl. D7—641



365,731

**SPOON**

Paul E. Gebhardt, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.

Filed Jul. 20, 1994, Ser. No. 26,150

Term of patent 14 years

U.S. Cl. D7—653



365,729

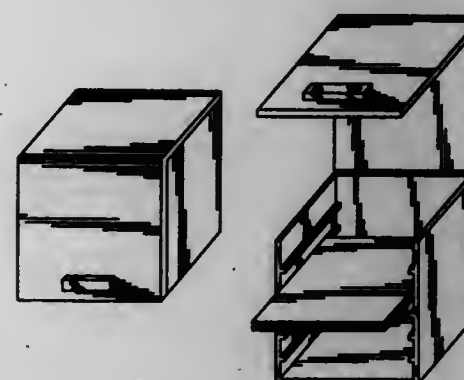
**STACKING CONTAINER FOR BAKED GOODS**

David R. Wold, 910 Schaller Dr., Maplewood, Minn. 55119

Filed Sep. 19, 1994, Ser. No. 28,659

Term of patent 14 years

U.S. Cl. D7—610





365,732

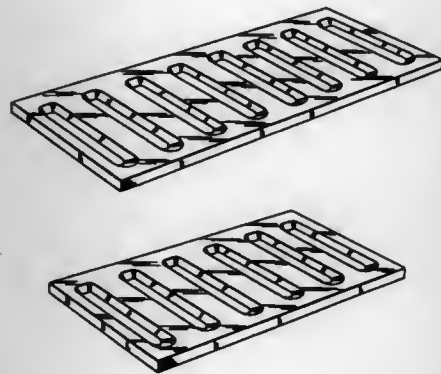
## WINE STORAGE SHELF

Elizabeth Kellen, 540 Paseo Miramar, Pacific Palisades, Calif. 90272; Gerald V. Casale, 2714 4th St., Santa Monica, Calif. 90405, and Konrad Kellen, 540 Paseo Miramar, Pacific Palisades, Calif. 90272

Filed Aug. 2, 1994, Ser. No. 26,653

Term of patent 14 years

U.S. Cl. D7—701



365,734

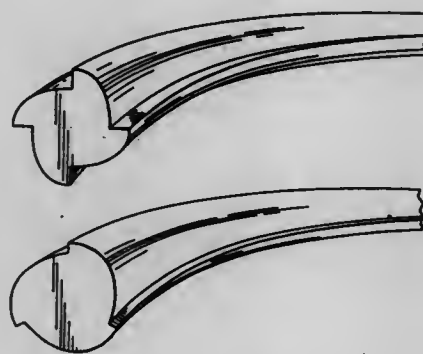
## CUTTING LINE FOR A ROTATING LINE TRIMMER

David B. Skinner, Columbia, S.C., assignor to Shakespeare Company, Columbia, S.C.

Division of Ser. No. 954,386, Sep. 30, 1993, Pat. No. Des. 358,53, which is a continuation-in-part of Ser. No. 834,520, Feb. 12, 1992. This application Oct. 6, 1994, Ser. No. 29,442

Term of patent 14 years

U.S. Cl. D8—8



365,733

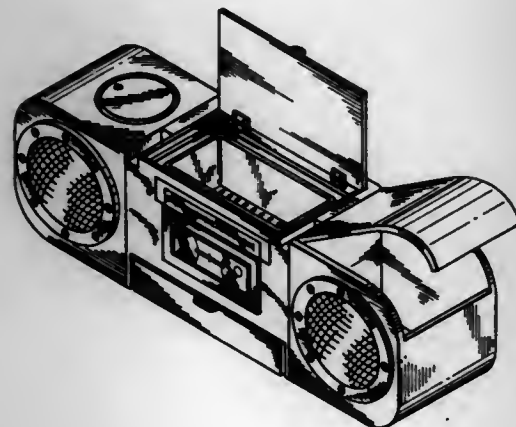
## LUNCH BOX

Darryle Freedland, 20110 NE. 23rd Ct., North Miami Beach, Fla. 33160

Filed Aug. 25, 1994, Ser. No. 27,596

Term of patent 14 years

U.S. Cl. D7—710



365,735

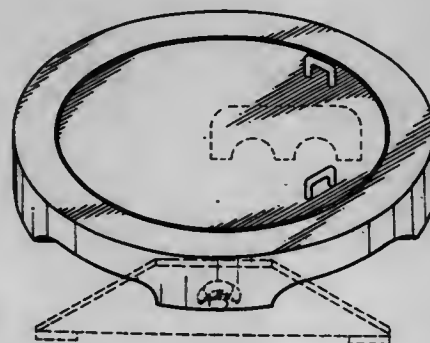
## BRAKE CALIPER TOOL

Cedric H. Fells, 1815 Garfield, Little Rock, Ark. 72204

Filed Mar. 24, 1994, Ser. No. 20,352

Term of patent 14 years

U.S. Cl. D8—14



365,736

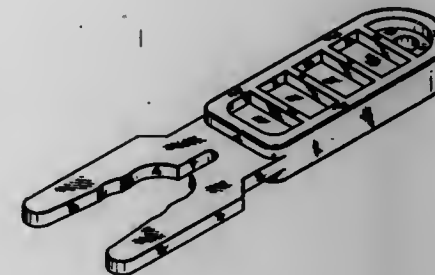
## BELLOWS RETRACTOR TOOL FOR FUEL PUMP NOZZLE

Joseph Rucereto, 33 Hillside Dr., North Haledon, N.J. 07508

Filed Nov. 3, 1994, Ser. No. 30,609

Term of patent 14 years

U.S. Cl. D8—14



365,738

## CORKSCREW

Ming-Hsiang Lee, No. 4, Lane 263, Sec. 2, Chien-Kong Rd., Tainan City, Taiwan, Prov. of China

Filed Dec. 9, 1994, Ser. No. 31,976

Claims priority, application Taiwan, Prov. of China, Nov. 11, 1994, 83309357

Term of patent 14 years

U.S. Cl. D8—42



365,737

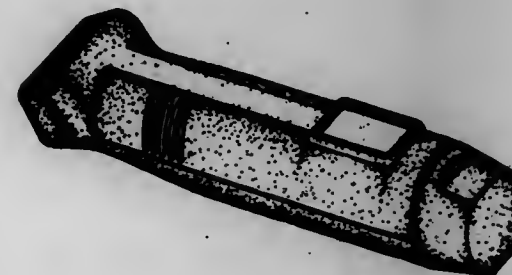
## ELECTRONIC SEALER

Shu H. Chou, and Heng G. Fang, both of Taipei Hsien, Taiwan, Prov. of China, assignors to Welcome Company, Ltd., Taipei Hsien, Taiwan, Prov. of China

Filed Sep. 16, 1994, Ser. No. 28,493

Term of patent 14 years

U.S. Cl. D8—30



365,739

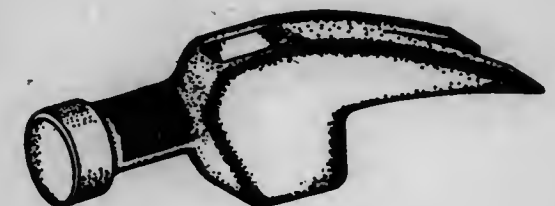
## COMBINED HAMMER HEAD AND WOOD FILE

Albert G. Weintraub, 41905 Humber Dr., Temecula, Calif. 92591

Filed Aug. 3, 1994, Ser. No. 26,691

Term of patent 14 years

U.S. Cl. D8—78





365,740

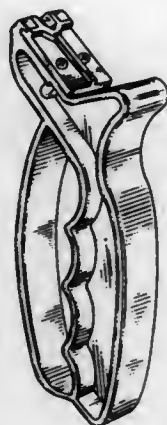
## KNIFE SHARPENER

Richard S. Smith, Hot Springs, Ark., assignor to Smith Abrasives, Inc., Hot Springs, Ark.

Filed Sep. 6, 1994, Ser. No. 28,066

Term of patent 14 years

U.S. Cl. D8—93



365,742

## KNOB

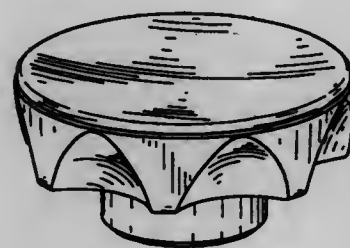
Giorgio Decursu, and Alberto Bertani, both of Milan, Italy, assignors to Elessa S.p.A., Milan, Italy

Filed Oct. 3, 1994, Ser. No. 29,285

Claims priority, application Hague Agreement, Apr. 5, 1994, DM/029 270

Term of patent 14 years

U.S. Cl. D8—312



365,741

## HANDLE

Giorgio Decursu, and Alberto Bertani, both of Milan, Italy, assignors to Elessa S.p.A., Milan, Italy

Filed Oct. 3, 1994, Ser. No. 29,281

Claims priority, application Hague Agreement, Apr. 5, 1994, DM/029270

Term of patent 14 years

U.S. Cl. D8—310



365,743

## KNOB

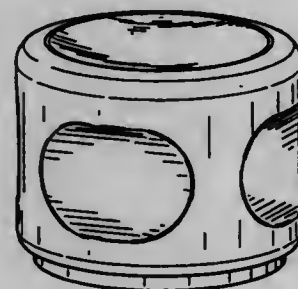
Giorgio Decursu, and Alberto Bertani, both of Milan, Italy, assignors to Elessa S.p.A., Milan, Italy

Filed Oct. 3, 1994, Ser. No. 29,287

Claims priority, application Hague Agreement, Apr. 5, 1994, DM/029 270

Term of patent 14 years

U.S. Cl. D8—312



365,744

## DOOR LATCH ASSEMBLY

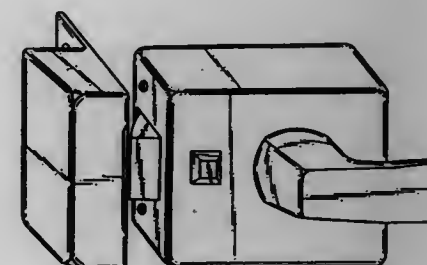
Kam S. Leung, Hong Kong, Hong Kong, assignor to Faith Hill Industrial Limited, Hong Kong

Filed Jun. 13, 1994, Ser. No. 24,303

Claims priority, application United Kingdom, Dec. 14, 1993, 2035829

Term of patent 14 years

U.S. Cl. D8—331



365,746

## COMBINED PROFILE SECTION AND SPRING NUT

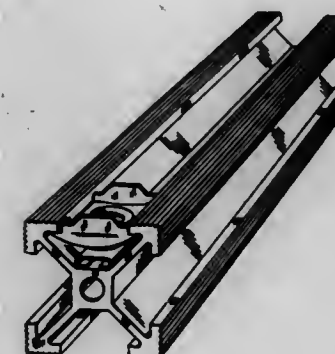
Josef Chudoba, Jarnlundsvagen 2, Johanneshov, Sweden, and Sven-Erik Kaufeldt, Bjornskogsgard 9, Vallingby, Sweden

Filed May 3, 1993, Ser. No. 7,786

Claims priority, application Sweden, Nov. 4, 1992, 92-2315

Term of patent 14 years

U.S. Cl. D8—349



365,747

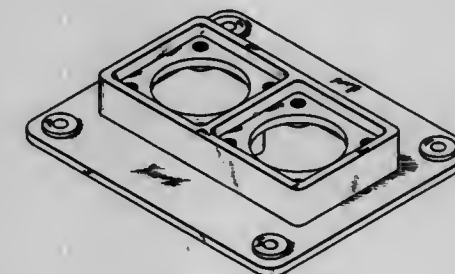
## TWO GANG JACK COVER

Frank A. Grande, Highland Beach, Fla., assignor to Hose-McCann Telephone Co., Inc., Deerfield Beach, Fla.

Filed Jul. 22, 1994, Ser. No. 26,254

Term of patent 14 years

U.S. Cl. D8—353



365,745

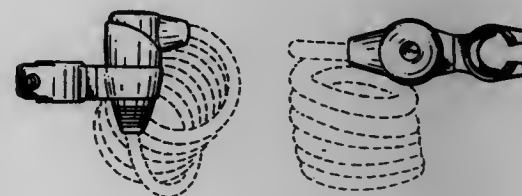
## BICYCLE LOCK

Fred Brendel, München, Germany, assignor to EASEC-Schloss-Production GmbH & Co. KG, Telgte, Germany

Filed Apr. 8, 1994, Ser. No. 21,105

Term of patent 14 years

U.S. Cl. D8—333





365,748

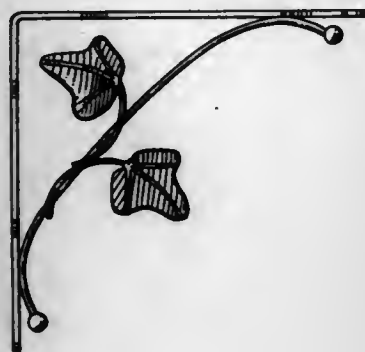
**SHELF BRACKET**

Fred Hollinger, Kings Park, N.Y., assignor to American Tack & Hardware Co., Inc., Monsey, N.Y.

Filed Oct. 13, 1994, Ser. No. 29,689

Term of patent 14 years

U.S. Cl. D8—381



365,750

**COMBINED CONTAINER AND CAP**

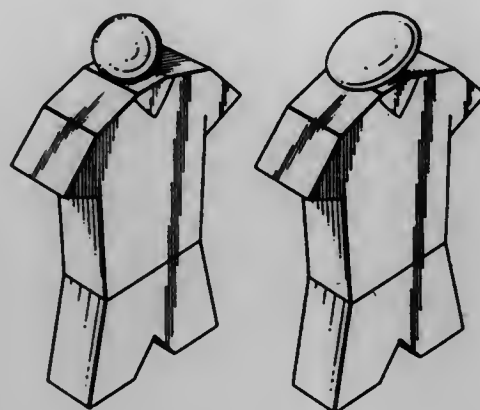
Dean Gouveia, and Wayne Allison, both of 125 Sutton Court Road, Plaistow, London E13 9NR, Great Britain

Filed Sep. 22, 1994, Ser. No. 28,772

Claims priority, application United Kingdom, May 11, 1994, 2838985

Term of patent 14 years

U.S. Cl. D9—311



365,751

**HEART-SHAPED TRIPLE BOTTLE SET**

Kuo S. Hou, No. 38, Alley 43, Lane 344, Chung Cheng S. Rd., Yang Kang Country, Tainan Hsien, Taiwan, Prov. of China

Filed Aug. 23, 1994, Ser. No. 27,585

Term of patent 14 years

U.S. Cl. D9—315

365,749

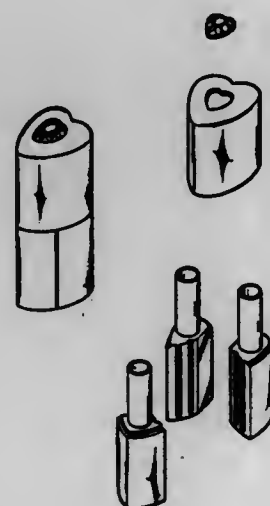
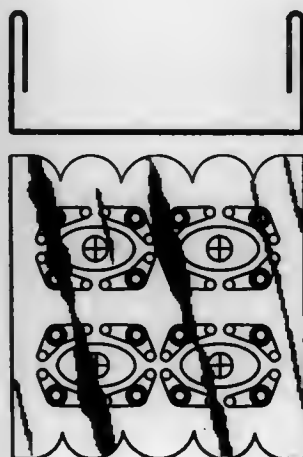
**METAL STUD CONNECTOR**

Michael A. Pacheco, 10 Pleasant Ln., Hampstead, N.H. 03841

Filed Mar. 1, 1993, Ser. No. 5,528

Term of patent 14 years

U.S. Cl. D8—382



365,752

**BOTTLE**

Therese Flanagan-Boos, Chicago; Anne Bucher, Palatine, both of Ill., and Melanie Stephens, Atlanta, Ga., assignors to Kraft Foods, Inc., Northfield, Ill.

Filed Oct. 17, 1994, Ser. No. 29,795

Term of patent 14 years

U.S. Cl. D9—335



365,754

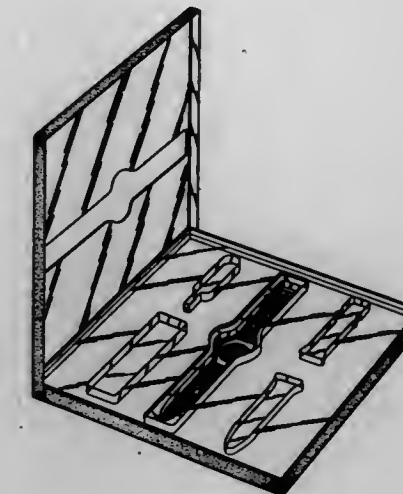
**WATCH CASE**

Stephane Plassier, Paris, France, assignor to Swatch S.A., Bienne, Switzerland

Filed Feb. 25, 1994, Ser. No. 19,242

Term of patent 14 years

U.S. Cl. D9—423



365,753

**PACKAGING CONTAINER**

Michael G. Sibbio, 5340 E. Main St., Mesa, Ariz. 85205

Filed Nov. 7, 1994, Ser. No. 30,728

Term of patent 14 years

U.S. Cl. D9—415



365,755

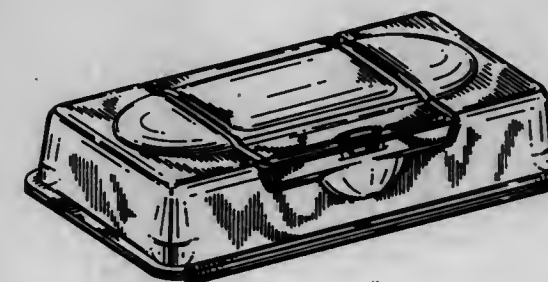
**DISPENSING CONTAINER**

Joseph S. Kanfer, Akron; Ronald F. Bell, Uniontown, both of Ohio; Rodney D. Borst, Oregon, Wis.; Thomas Kearnes, Richfield, Ohio, and Gregg S. Lewis, Middleton, Wis., assignors to GOJO Industries, Inc., Cuyahoga Falls, Ohio

Filed Nov. 25, 1994, Ser. No. 31,452

Term of patent 14 years

U.S. Cl. D9—423



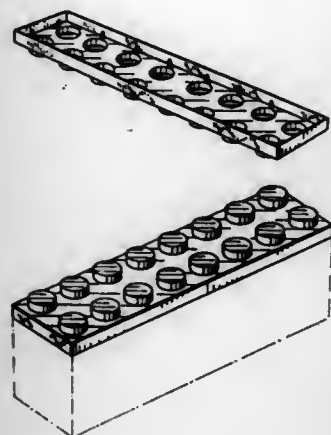


365,756

## LID FOR A CONTAINER

Janne H. Rank, Bredsten, and Søren X. Frøhm, Århus, both of Denmark, assignors to INTERLEGO AG, Baar, Switzerland  
Filed Sep. 22, 1993, Ser. No. 13,268  
Term of patent 14 years

U.S. Cl. D9—435



365,758

## CONTAINER

Krzysztof W. Zak, Northamptonshire, and David J. Wood, Plymouth, both of Great Britain, assignors to Unipath Limited, Hampshire, United Kingdom  
Filed Nov. 8, 1994, Ser. No. 38,129  
Claims priority, application United Kingdom, May 16, 1994, 2839069

Filed Nov. 8, 1994, Ser. No. 38,129

Claims priority, application United Kingdom, May 16, 1994, 2839069

Term of patent 14 years

U.S. Cl. D9—503



365,757

## TRANSLUCENT WATER BOTTLE

Donald R. Stenger, Roscoe, Ill., assignor to Johnson Enterprises, Inc., Rockford, Ill.  
Continuation-in-part of Ser. No. 784,914, Oct. 28, 1991, abandoned. This application Feb. 14, 1994, Ser. No. 18,666  
Term of patent 14 years

U.S. Cl. D9—502



365,759

## COMBINED BOTTLE AND CAP

Laura Otami, and Ken Hirst, both of New York, N.Y., assignors to Aramis, Inc., New York, N.Y.  
Filed Jan. 24, 1994, Ser. No. 17,845  
Term of patent 14 years

Filed Jan. 24, 1994, Ser. No. 17,845

Term of patent 14 years

U.S. Cl. D9—504



365,760

## COMBINED PERFUME BOTTLE AND CLOSURE

Khaled Chahed, 61, rue d'Anjou, 75008 Paris, France  
Filed Nov. 21, 1994, Ser. No. 31,555  
Claims priority, application France, May 19, 1994, 94-2927  
Term of patent 14 years

U.S. Cl. D9—520



365,761

## BOTTLE

Melvin Abler, Stamford, Conn.; Stuart M. Leslie, Brooklyn, and Frederick Mittleman, New York, both of N.Y., assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.  
Filed Feb. 9, 1995, Ser. No. 34,625  
Term of patent 14 years

Filed Feb. 9, 1995, Ser. No. 34,625

Term of patent 14 years

U.S. Cl. D9—542

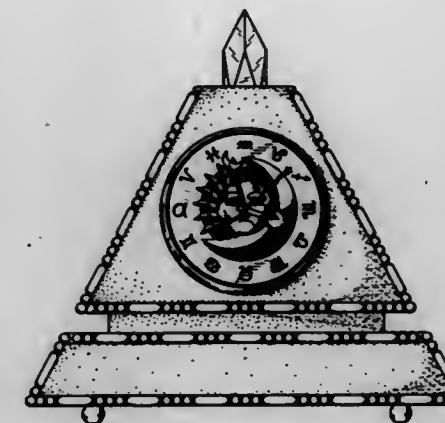


365,762

## TALKING CLOCK

Leonie Mateer, 10596 Matinal Cir., San Diego, Calif. 92127  
Filed Dec. 29, 1994, Ser. No. 32,840  
Term of patent 14 years

U.S. Cl. D10—6



365,763

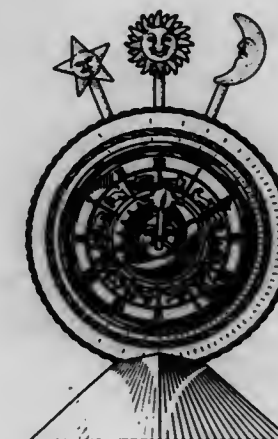
## TALKING CLOCK

Leonie Mateer, 10596 Matinal Cir., San Diego, Calif. 92127  
Filed Dec. 29, 1994, Ser. No. 32,830  
Term of patent 14 years

Filed Dec. 29, 1994, Ser. No. 32,830

Term of patent 14 years

U.S. Cl. D10—8





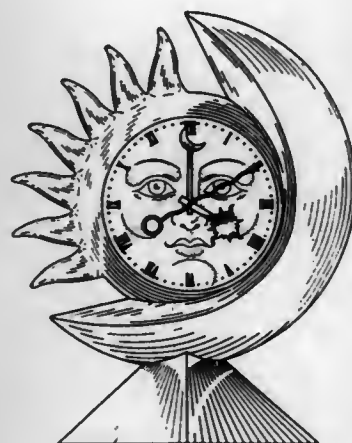
365,764

**TALKING CLOCK**

Leonie Mateer, 10596 Matinal Cir., San Diego, Calif. 92127  
Filed Dec. 29, 1994, Ser. No. 32,839

Term of patent 14 years

U.S. Cl. D10—8



365,766

**TABLE ALARM CLOCK**

Clifton W. Henley, Birmingham, Mich., assignor to Advance Watch Company, Inc., Southfield, Mich.

Filed Mar. 21, 1995, Ser. No. 36,487

Term of patent 14 years

U.S. Cl. D10—15



365,765

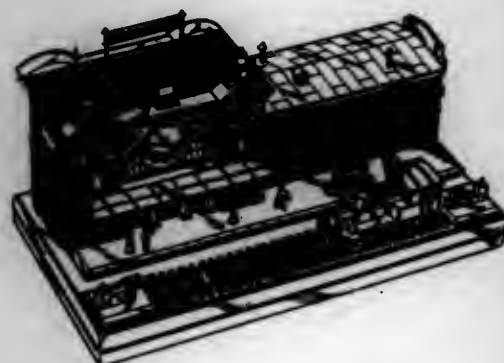
**TRAIN STATION CLOCK**

Pao-Yu Liu, No. 77, Lane 366, Pa-Tec Rd., Sec. 2, Taipei, Taiwan, Prov. of China

Filed Dec. 30, 1994, Ser. No. 32,869

Term of patent 14 years

U.S. Cl. D10—11



365,767

**COMBINED WATCH AND BRACELET**

Steven Hitter, Lengnau, Switzerland, assignor to Sportime Watches AG (Sportime Watches SA) (Sportime Watches Ltd.), Lengnau, Switzerland

Filed Aug. 26, 1993, Ser. No. 12,201

Claims priority, application Hague Agreement, Mar. 3, 1993, DMA/002073

The portion of the term of this patent subsequent to Aug. 30, 2008, has been disclaimed.

Term of patent 14 years

U.S. Cl. D10—32



365,768

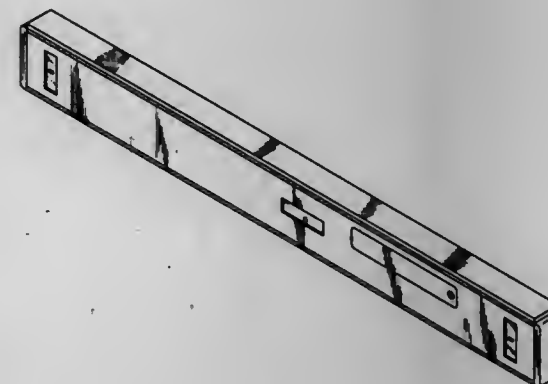
**LIGHT LEVEL WITH MAGNET**

Salvador C. Rodriguez, 1908 Tadcaster Rd., Baltimore, Md. 21228

Filed Apr. 3, 1995, Ser. No. 37,071

Term of patent 14 years

U.S. Cl. D10—69



365,770

**ERASEABLE MEMO PLATE AND PENCIL HOLDER FOR A CONVENTIONAL RETRACTABLE MEASURING TAPE CASING**

Charles F. Hines, P.O. Box 53, Doswell, Va. 23047

Filed Oct. 11, 1994, Ser. No. 29,594

Term of patent 14 years

U.S. Cl. D10—74



365,771

**WATER COMPUTER**

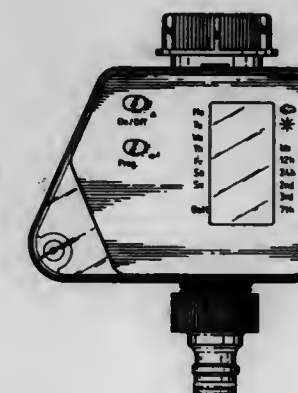
Franco Clivio, Erlenbach, Switzerland, assignor to Gardena Kress & Kastner GmbH, Germany

Filed Nov. 17, 1994, Ser. No. 31,103

Claims priority, application Germany, Jun. 28, 1994, 94 05 081.3

Term of patent 14 years

U.S. Cl. D10—96



365,769

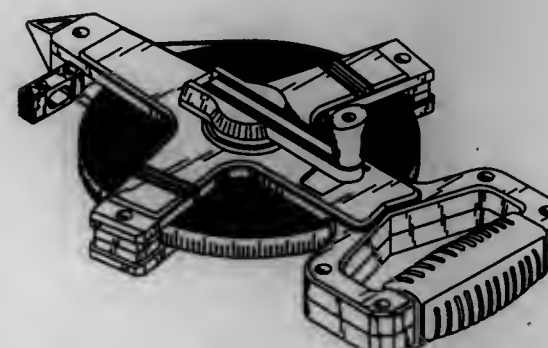
**MEASURING TAPE**

Dong H. Kang, Pusan, Rep. of Korea, assignor to Komelon Corporation Ltd., Rep. of Korea

Filed Mar. 1, 1995, Ser. No. 35,536

Term of patent 14 years

U.S. Cl. D10—72





365,772

## WATCH AND BRACELET DESIGN

Severin Wanderman, Irvine, Calif., assignor to Severin Montres AG (Severin Montres SA) (Severin Montres Ltd.), Lengnau, Switzerland

Filed Jan. 20, 1995, Ser. No. 33,809

Claims priority, application WIPO, Sep. 19, 1994, 002633

Term of patent 14 years

U.S. Cl. D10—32



365,774

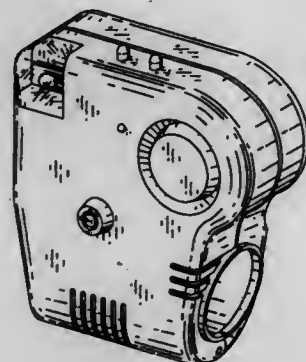
## STEERING WHEEL ALARM

David A. Collins, Hot Springs, Ark., and Victor S. P. Lee, Chino Hills, Calif., assignors to DHC Technologies of America Inc., Little Rock, Ark.

Filed Feb. 22, 1995, Ser. No. 35,171

Term of patent 14 years

U.S. Cl. D10—106



365,773

## VELOCITY INDICATOR EYE FOR ROULETTE WHEELS

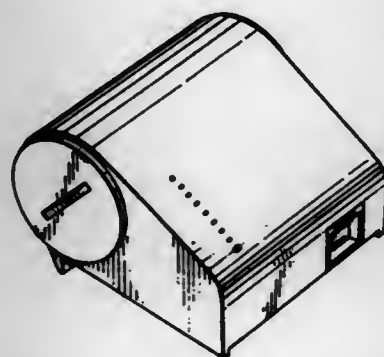
Paul Towers, 183 Garstang Road, Preston, PR2 4JQ, Lancashire, United Kingdom

Filed Oct. 26, 1994, Ser. No. 30,320

Claims priority, application United Kingdom, Apr. 26, 1994, 2038637

Term of patent 14 years

U.S. Cl. D10—106



365,775

## ELEVATOR PUSHBUTTON CONTROL PANEL

Hygh Raymond, Middlesex, United Kingdom, assignor to Kone Oy, Helsinki, Finland

Filed Mar. 10, 1994, Ser. No. 19,752

Claims priority, application Finland, Sep. 10, 1993, FI603/93

Term of patent 14 years

U.S. Cl. D10—106



365,776

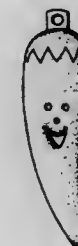
## BELL

Chung-Shyan Huang, No. 1-1, Chang Mar Street, Hsiu Shui Hsiang, Chang Hua Hsien, Taiwan, Prov. of China

Filed Oct. 14, 1994, Ser. No. 29,735

Term of patent 14 years

U.S. Cl. D10—116



365,778

## JEWELRY CHAIN

Luca Scortecchi, and Marco Stocchi, both of Castiglione Fibocchi, Italy, assignors to S.I.L.O. S.p.A. Societa', Castiglione Fibocchi (Arezzo), Italy

Filed Oct. 7, 1994, Ser. No. 29,511

Claims priority, application Hague Agreement, May 2, 1994, DMA/002503

Term of patent 14 years

U.S. Cl. D11—13



365,777

## JEWELRY CHAIN

Luca Scortecchi, and Marco Stocchi, both of Castiglione Fibocchi, Italy, assignors to S.I.L.O. S.p.A. Societa', Castiglione Fibocchi (Arezzo), Italy

Filed Oct. 7, 1994, Ser. No. 29,505

Claims priority, application Hague Agreement, May 2, 1994, DMA002503

Term of patent 14 years

U.S. Cl. D11—12



365,779

## EARRING POST

Carl Archambeault, 71 Alden St., Pawtucket, R.I. 02861

Filed Jan. 17, 1995, Ser. No. 33,629

Term of patent 14 years

U.S. Cl. D11—88





365,780

## CUT FOR A DIAMOND GEM

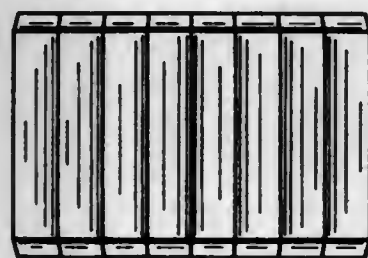
Gagi Kaplan, Tenafly, N.J., assignor to Merit Diamond Corporation, New York, N.Y.

Filed Oct. 18, 1994, Ser. No. 30,843

Claims priority, application Israel, Jun. 21, 1994, 22762

Term of patent 14 years

U.S. Cl. D11-90



365,782

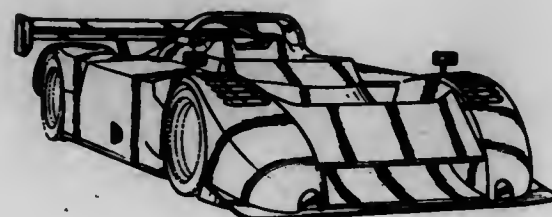
## AUTOMOBILE BODY

Adrian Reynard, Dillycend Halley; Nigel Stroud, Gagingwell, both of, England, and John E. Crain, Birmingham, Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Jan. 4, 1994, Ser. No. 17,028

Term of patent 14 years

U.S. Cl. D12-88



365,781

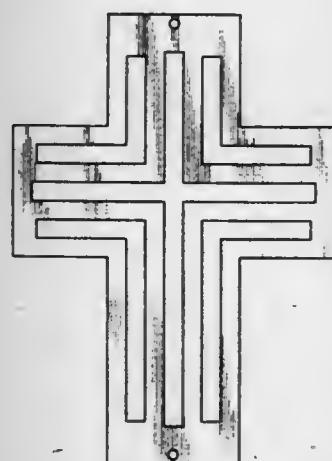
## CROSS

Charles M. Osborn, Box 11, Atlanta, Nebr. 68923

Filed Nov. 10, 1994, Ser. No. 30,887

Term of patent 14 years

U.S. Cl. D11-96



365,783

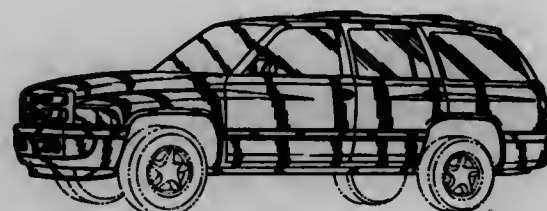
## VEHICLE BODY

John R. Starr, Woodhaven; Dennis Myles, and Trevor M. Creed, both of West Bloomfield, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Jun. 20, 1994, Ser. No. 24,655

Term of patent 14 years

U.S. Cl. D12-91



365,784

## COLLAPSIBLE INFANT STROLLER

Joel W. Wennerstrom, Akron, Ohio; Er-jui Chen, Kaoshiung, and Ling C. Chang, Chia yi, both of, Taiwan, Prov. of China, assignors to Century Products Company, Macedonia, Ohio

Filed Nov. 4, 1994, Ser. No. 30,709

Term of patent 14 years

U.S. Cl. D12-129



365,786

## SPORT WHEELCHAIR HAVING A T-FRAME

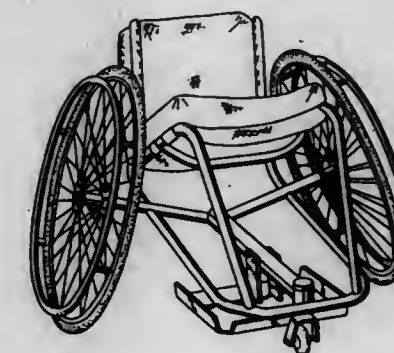
Christopher J. Peterson, Tierra Verde, Fla., assignor to Invacare Corporation, Elyria, Ohio

Continuation of Ser. No. 14,024, Oct. 12, 1993, abandoned, which is a continuation of Ser. No. 135,745, Oct. 12, 1993.

This application Mar. 8, 1995, Ser. No. 36,016

Term of patent 14 years

U.S. Cl. D12-131



365,785

## WALKER

James O. Sawyer, P.O. Box 1131, Garden Grove, Calif. 92642

Filed Dec. 20, 1994, Ser. No. 32,506

Term of patent 14 years

U.S. Cl. D12-130



365,787

## SPORT WHEELCHAIR HAVING A T-FRAME

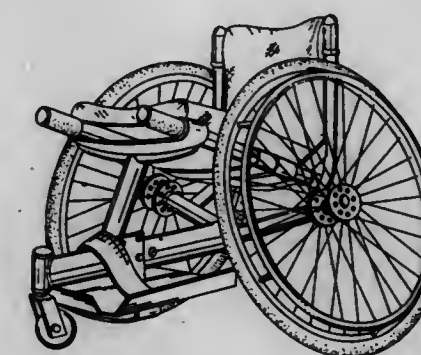
Christopher J. Peterson, and Mary C. Peterson, both of Tierra Verde, Fla., assignors to Invacare Corporation, Elyria, Ohio

Continuation of Ser. No. 14,031, Oct. 12, 1993, abandoned, which is a continuation of Ser. No. 135,745, Oct. 12, 1993.

This application Mar. 8, 1995, Ser. No. 35,883

Term of patent 14 years

U.S. Cl. D12-131





365,788

## SPORT WHEELCHAIR HAVING A T-FRAME

Christopher J. Peterson, Tierra Verde, Fla., assignor to Invacare Corporation, Elyria, Ohio

Continuation of Ser. No. 14,837, Oct. 12, 1993, abandoned, which is a continuation of Ser. No. 135,745, Oct. 12, 1993.

This application Mar. 8, 1995, Ser. No. 35,884

Term of patent 14 years

U.S. Cl. D12—131



365,790

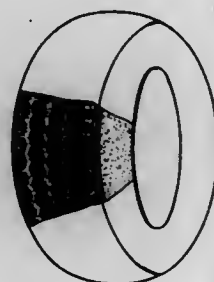
## TIRE

Jun-Hwa Chen, 215, Meel-Kong Road, Huang-Tr'O Village, Ta-Suen, Chang-Hua, Taiwan, Prov. of China

Filed Apr. 28, 1994, Ser. No. 23,578

Term of patent 14 years

U.S. Cl. D12—146



365,791

## TIRE TREAD

Stephanie C. Brown, Akron; Donald W. Gilliam, Uniontown, both of Ohio; Andy N. Hoang, Schaumburg, Ill.; Michael A. Kolowski, Mogadore; Frederick W. Miller, Akron; Anthony J. Scarpitti, Uniontown, and Keith C. Trares, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 21,350, Apr. 14, 1994, abandoned. This application Aug. 11, 1994, Ser. No. 26,881

Term of patent 14 years

U.S. Cl. D12—146

365,789

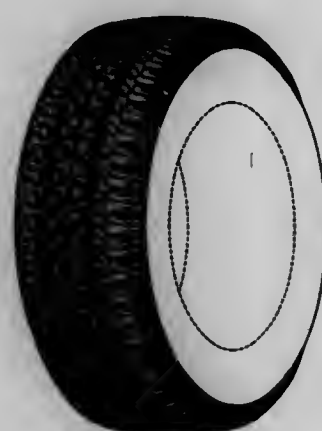
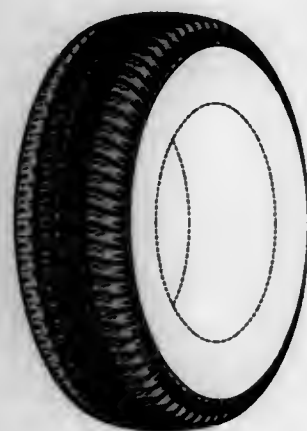
## TIRE TREAD

Timothy J. Lauen, Kent, and Timothy F. Robinson, North Canton, both of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Dec. 2, 1993, Ser. No. 16,822

Term of patent 14 years

U.S. Cl. D12—146



365,792

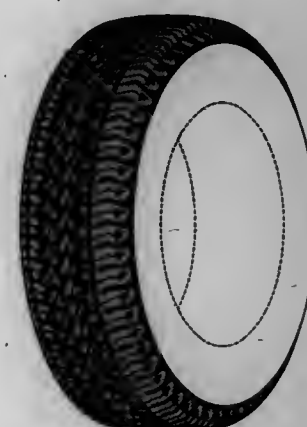
## TIRE TREAD

Donald W. Gilliam, Uniontown; Keith C. Trares; Stephanie C. Brown, both of Akron; Anthony J. Scarpitti, Uniontown; Michael A. Kolowski, Mogadore, and Frederick W. Miller, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 15, 1994, Ser. No. 32,324

Term of patent 14 years

U.S. Cl. D12—146



365,793

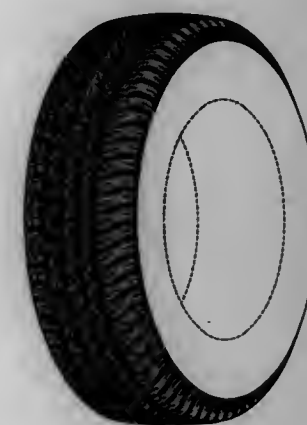
## TIRE TREAD

Anthony J. Scarpitti, Uniontown; Michael A. Kolowski, Mogadore; Frederick W. Miller, Akron; Donald W. Gilliam, Uniontown; Keith C. Trares, and Stephanie C. Brown, both of Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 2, 1994, Ser. No. 31,658

Term of patent 14 years

U.S. Cl. D12—146



365,794

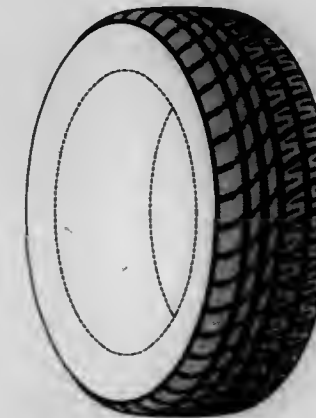
## TIRE TREAD

Michael J. Weber, Mogadore; Charles K. Schmalix, Canal Fulton; Nathan A. Gammon, Akron; Jeffrey J. McElfresh, Fairlawn, and Perry W. Bell, North Lawrence, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 26, 1994, Ser. No. 27,674

Term of patent 14 years

U.S. Cl. D12—147



365,795

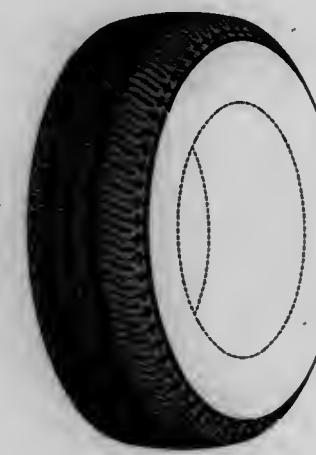
## TIRE TREAD

Anthony J. Scarpitti, Uniontown; Michael A. Kolowski, Mogadore; Frederick W. Miller, Akron; Donald W. Gilliam, Uniontown; Keith C. Trares, and Stephanie C. Brown, both of Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 15, 1994, Ser. No. 32,323

Term of patent 14 years

U.S. Cl. D12—147

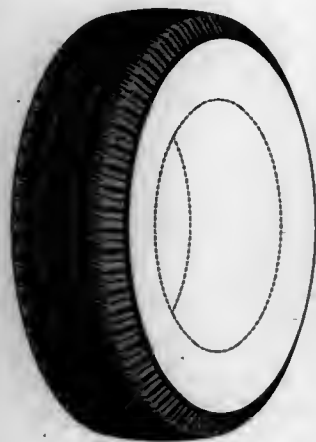




365,796  
TIRE TREAD

Anthony J. Scarpitti, Uniontown; Michael A. Kolowski, Mogadore; Frederick W. Miller, Akron; Donald W. Gilliam, Uniontown; Keith C. Trarez, and Stephanie C. Brown, both of Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio  
Filed Dec. 1, 1994, Ser. No. 31,608  
Term of patent 14 years

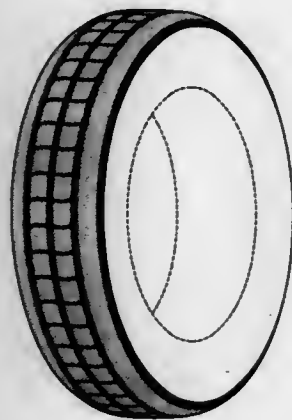
U.S. Cl. D12—147



365,797  
TIRE TREAD

Robert J. Hermann, Stow, and Daniel E. Schuster, North Royalton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio  
Filed Jan. 13, 1994, Ser. No. 17,442  
The portion of the term of this patent subsequent to Aug. 1, 2009, has been disclaimed.  
Term of patent 14 years

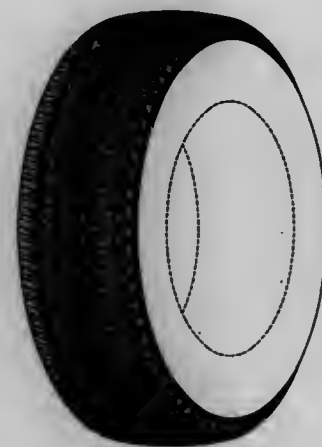
U.S. Cl. D12—147



365,798  
TIRE TREAD

Anthony J. Scarpitti, Uniontown; Michael A. Kolowski, Mogadore; Frederick W. Miller, Akron; Donald W. Gilliam, Uniontown; Keith C. Trarez, and Stephanie C. Brown, both of Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio  
Filed Dec. 15, 1994, Ser. No. 32,325  
Term of patent 14 years

U.S. Cl. D12—147



365,799  
COMBINED FIFTH WHEEL AND PLATE COVER

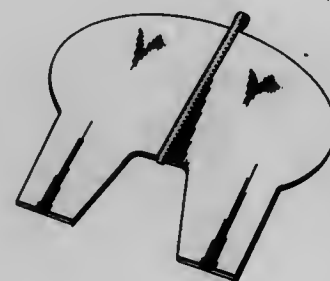
Gordon S. Murcheson, Nanaimo, Canada, assignor to Murcheson & Murcheson Contracting Ltd., Nanaimo, Canada

Filed Jul. 5, 1994, Ser. No. 25,181

Claims priority, application Canada, Jan. 11, 1994, 1994-0042

Term of patent 14 years

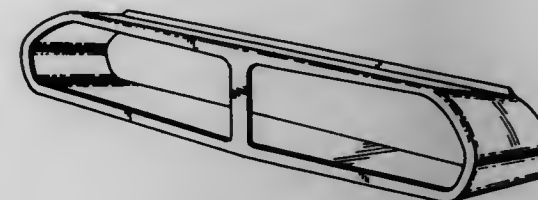
U.S. Cl. D12—161



365,800  
AIR DEFLECTOR FOR TRACTOR TRUCK RIGS

Charles Haley, P.O. Box 106, Sunrise Beach, Mo. 65079  
Filed May 31, 1994, Ser. No. 23,687  
Term of patent 14 years

U.S. Cl. D12—181



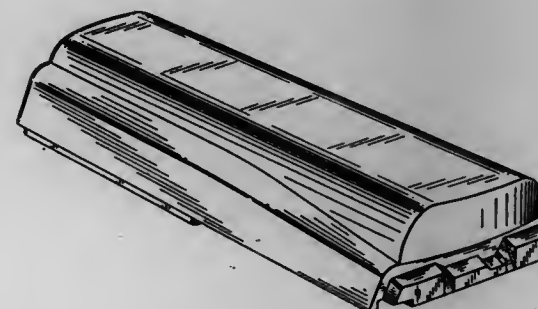
365,801  
BATTERY

Richard Lindahl, Malmö, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden  
Filed Mar. 18, 1994, Ser. No. 20,126

Claims priority, application Sweden, Sep. 24, 1993, 932118

Term of patent 14 years

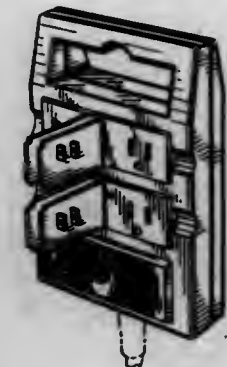
U.S. Cl. D13—103



365,803  
ELECTRICAL OUTLET BLOCK

George F. W. Boesel, Canton, Mass., and Mark W. Gels, Carmel, Ind., assignors to Woods Industries, Inc., Carmel, Ind.  
Filed Feb. 1, 1995, Ser. No. 34,312  
Term of patent 14 years

U.S. Cl. D13—142



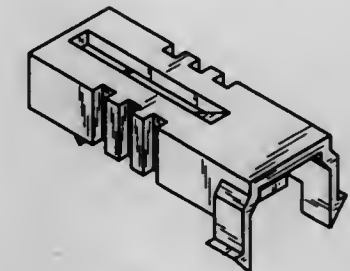
365,804  
THERMAL SWITCH COVER

Dale A. Klaus, Chesterfield, Mo., assignor to Dal Partnership, St. Louis, Mo.

Filed Nov. 10, 1994, Ser. No. 30,872

Term of patent 14 years

U.S. Cl. D13—178



365,802  
ELECTRICAL OUTLET STRIP

Phillip Fladung, Carmel, Ind., assignor to Woods Industries, Inc., Carmel, Ind.

Filed Jan. 17, 1995, Ser. No. 33,566

Term of patent 14 years

U.S. Cl. D13—142



365,805

Patent Not Issued For This Number



365,806

## PORTABLE LAPTOP COMPUTER

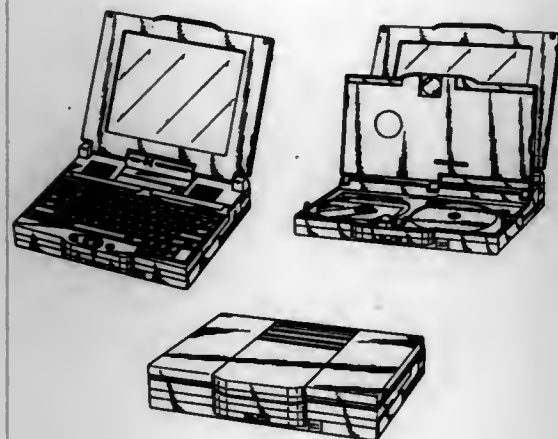
Takayuki Hayami; Masahiko Moriwaki, and Shinichi Sugihara, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 21, 1994, Ser. No. 30,066

Claims priority, application Japan, Jun. 21, 1994, 6-18360

Term of patent 14 years

U.S. Cl. D14-106



365,808

## VIDEO CIRCUIT BOARD HOUSING ASSOCIATED WITH A MULTI-MEDIA TERMINAL

Tor A. Alden, Bernardsville; Marc J. Beacken, Township of Randolph, Morris County; Robert L. Doran, Mt. Olive Township, Morris County; John E. Nordman, Randolph, and James G. Turner, Wharton, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Jul. 21, 1994, Ser. No. 26,211

Term of patent 14 years

U.S. Cl. D14-107



365,809

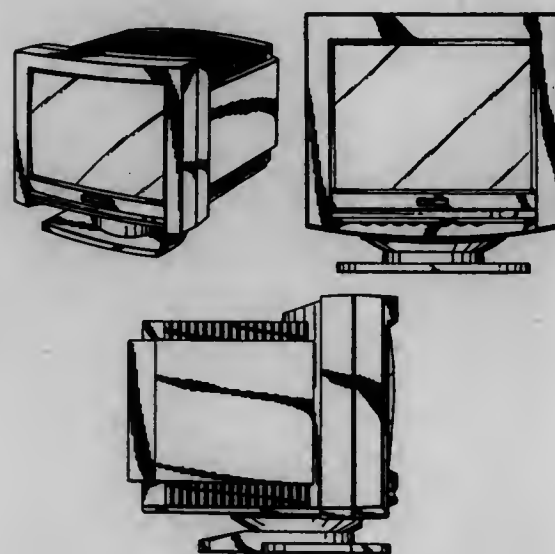
## MONITOR

Gad Shaanan, Montreal, Canada, assignor to Action Electronics Co., Ltd., Taiwan, Prov. of China

Filed Nov. 18, 1994, Ser. No. 31,126

Term of patent 14 years

U.S. Cl. D14-113



365,807

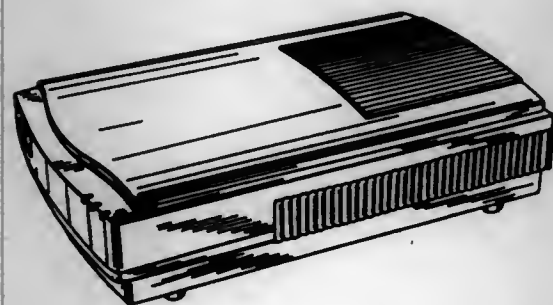
## VISUAL IMAGE SCANNER

Hsi-Chia Chen, Hsinchu, Taiwan, Prov. of China, assignor to Umax Data System Inc., Taiwan, Prov. of China

Filed Jun. 29, 1994, Ser. No. 25,304

Term of patent 14 years

U.S. Cl. D14-107



365,810

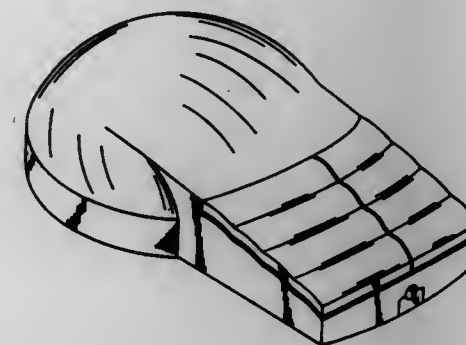
## COMPUTER MOUSE

Hartmut H. Esslinger, Los Gatos, Calif., assignor to Packard Bell Electronics, Inc., Westlake Village, Calif.

Filed Jun. 13, 1994, Ser. No. 24,325

Term of patent 14 years

U.S. Cl. D14-114



365,812

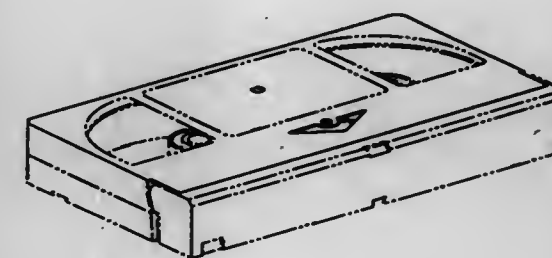
## FRONT PORTION OF A TOP SURFACE FOR A VIDEOCASSETTE

Gregory H. Johnson, Oakdale, Minn., and Mark J. Clesko, Hilliard, Ohio, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 5, 1994, Ser. No. 20,912

Term of patent 14 years

U.S. Cl. D14-121



365,813

Patent Not Issued For This Number

365,811

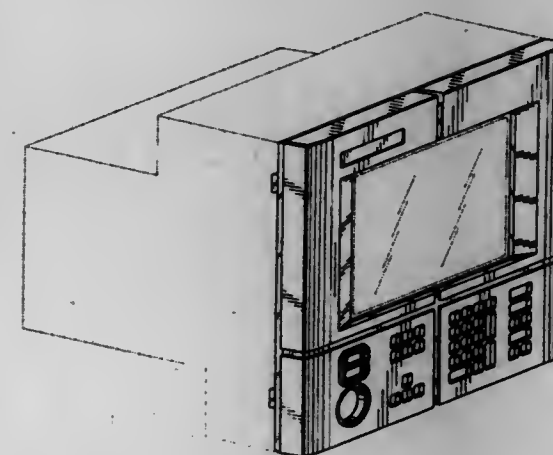
## BEZEL

James J. Kemp, Pleasant Plain, Ohio; Edgar B. Montague, and Mark D. Gildersleeve, both of Charlotte, N.C., assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Mar. 2, 1995, Ser. No. 35,569

Term of patent 14 years

U.S. Cl. D14-115



365,814

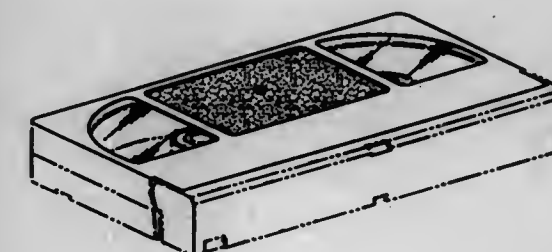
## WINDOW AND LABEL AREA OF A TOP SURFACE FOR A VIDEOCASSETTE

John A. Bailey, Woodbury; Glenn A. Bloomer, Maplewood; Gregory H. Johnson, Oakdale, all of Minn., and Donald J. Staufenberg, Dublin, Ohio, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 5, 1994, Ser. No. 20,922

Term of patent 14 years

U.S. Cl. D14-121





365,815

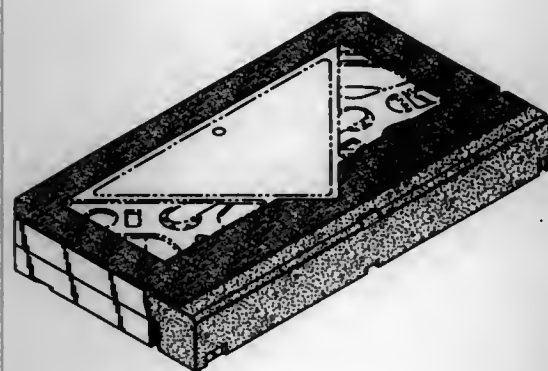
## VIDEOCASSETTE

Glenn A. Bloomer, Maplewood; Gregory H. Johnson, Oakdale, both of Minn.; Mark J. Ciesko, Hilliard, and Donald J. Staufenberg, Dublin, both of Ohio, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 5, 1994, Ser. No. 20,921

Term of patent 14 years

U.S. Cl. D14—121



365,817

## PORTABLE COMMUNICATION DEVICE HAVING A KEYPAD COVER

Nicholas Mischenko, Mount Prospect, and Terrance N. Taylor, Cary, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 31, 1994, Ser. No. 30,497

Term of patent 14 years

U.S. Cl. D14—138



365,818

## PORTABLE TELEPHONE

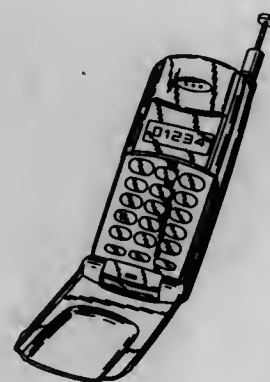
Toru Irie, Kawasaki, and Hiroshi Kubo, Sapporo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 15, 1995, Ser. No. 34,880

Claims priority, application Japan, Dec. 27, 1994, 6-39982

Term of patent 14 years

U.S. Cl. D14—138



365,816

## VIDEO TAPE RECORDER

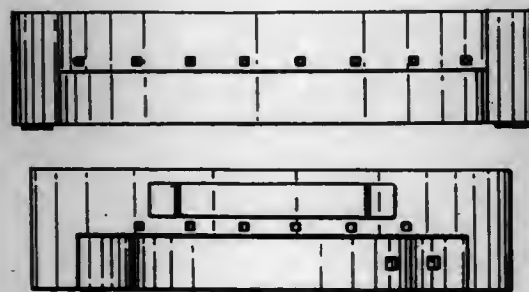
Philippe Starck, Paris, France, assignor to Thomson Consumer Electronics (Societe Anonyme), Courbevoie, France

Filed Mar. 11, 1994, Ser. No. 19,879

Claims priority, application France, Jan. 10, 1994, 94 0089

Term of patent 14 years

U.S. Cl. D14—135



365,819

## PORTABLE TELEPHONE

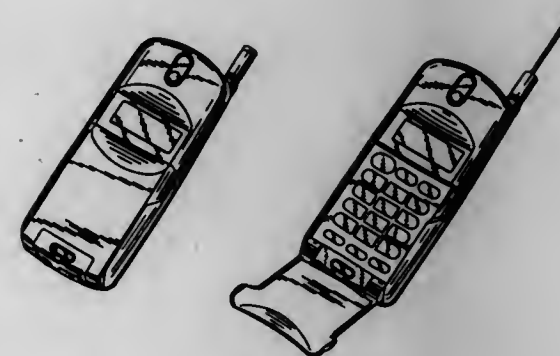
Makoto Sawaguchi; Toru Irie, both of Kawasaki, and Hiroaki Sakashita, Sapporo, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Feb. 15, 1995, Ser. No. 34,881

Claims priority, application Japan, Sep. 14, 1994, 6-27907

Term of patent 14 years

U.S. Cl. D14—138



365,821

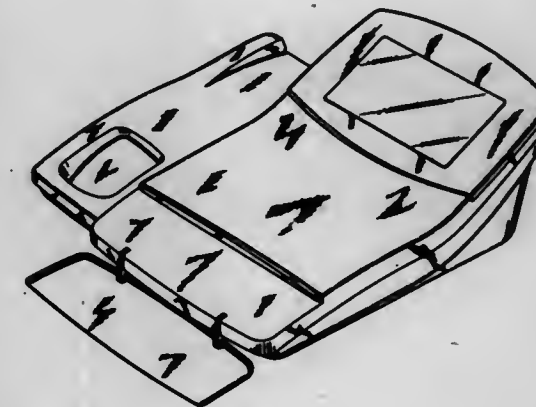
## PERSONAL INFORMATION CENTER TELEPHONE SET

Harold D. Bales, New Palestine, Ind.; Anthony D. Franks, New York, N.Y.; John A. Karpicke, Indianapolis, Ind.; David A. Reid, Greenwich, Conn.; Paul J. Straub, Jr., Mooresville, Ind., and Michael P. Zambelli, Livingston, N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Nov. 4, 1994, Ser. No. 30,704

Term of patent 14 years

U.S. Cl. D14—149



365,822

## FRONT PANEL FOR A COMBINED DIGITAL AUDIO DISC PLAYER, RADIO RECEIVER, AMPLIFIER TAPE RECORDER AND SPEAKERS

Masafumi Ito, Tokyo; Minoru Sube, Hachioji; Haruki Takita, Tokyo; Hiroyuki Watanabe, Hanno, and Yukio Ikura, Asaka, all of Japan, assignors to TEAC Corporation, Tokyo, Japan

Division of Ser. No. 753,692, Sep. 3, 1991, Pat. No. D. 343,393. This application Oct. 5, 1993, Ser. No. 13,899

Claims priority, application Japan, Mar. 5, 1991, 3-5910

Term of patent 14 years

U.S. Cl. D14—168

365,820

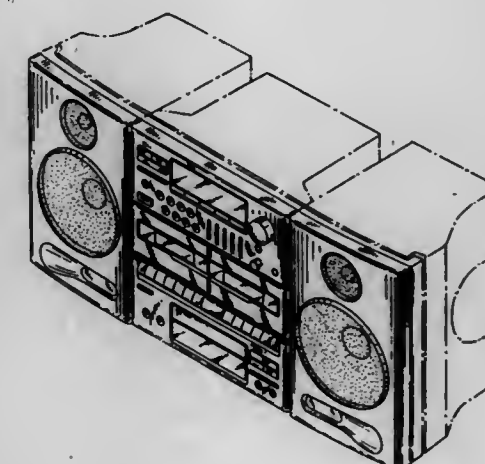
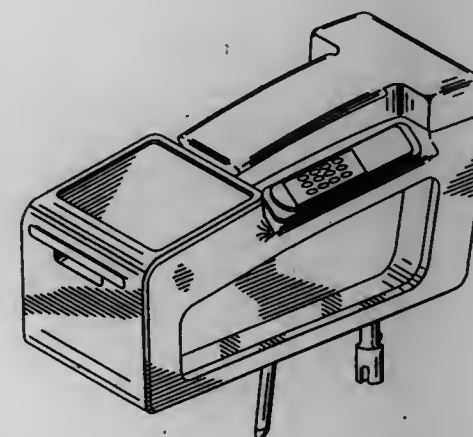
## TELEPHONE CONSOLE FOR AIRCRAFT SEATS

Paul R. Bentley, Gainesville, Tex., assignor to Weber Aircraft, Inc., Gainesville, Tex.

Filed Nov. 17, 1994, Ser. No. 31,104

Term of patent 14 years

U.S. Cl. D14—142





365,823

**COMBINED COMPACT DISC PLAYER, RADIO AND ALARM CLOCK**

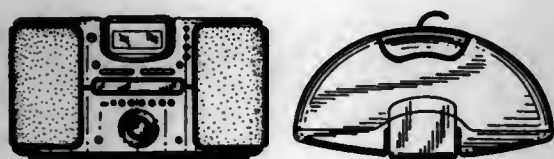
Alberto Borgonovo, Courbevoie, France, assignor to Thomson Consumer Electronics (Societe Anonyme), Courbevoie, France

Filed Sep. 30, 1994, Ser. No. 29,223

Claims priority, application France, Apr. 1, 1994, 94 1889

Term of patent 14 years

U.S. Cl. D14—168



365,825

**ACOUSTIC BAFFLE**

Leslie R. Abraham, Owatonna, Minn., assignor to Wenger Corporation, Owatonna, Minn.

Filed Sep. 13, 1994, Ser. No. 28,374

Term of patent 14 years

U.S. Cl. D14—299



365,824

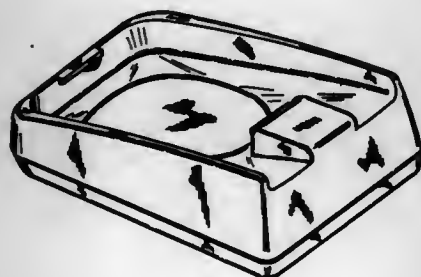
**CRADLE FOR A TELEPHONE HANDSET**

David C. Danielson, Litchfield, Conn.; Sonia M. Estevez-Alcolado, Holmdel, N.J.; Michael L. Moroze, New Egypt, N.J.; Daniel J. O'Donnell, Flanders, N.J.; Dharendra M. Patel, Jersey City, N.J.; Robert T. Saizan, Howell, N.J.; David C. Stowers, Nutley, N.J., and Susan L. Tuttle, East Windsor, N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Dec. 5, 1994, Ser. No. 31,719

Term of patent 14 years

U.S. Cl. D14—253



365,826

**TREAD ELEMENT FOR WHEEL OR ENDLESS TRACK**

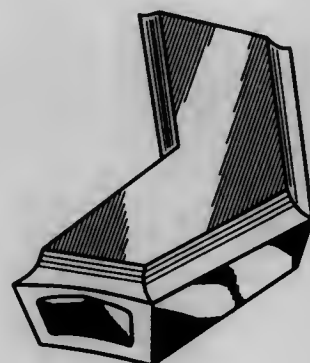
Graeme A. Chandler, Morley, Australia, assignor to AirBoss Limited, Kewdale, Australia

Filed Aug. 9, 1993, Ser. No. 11,579

Claims priority, application Australia, Feb. 11, 1993, 353/93

Term of patent 14 years

U.S. Cl. D15—28



365,827

**TREAD ELEMENT FOR WHEEL OR ENDLESS TRACK**

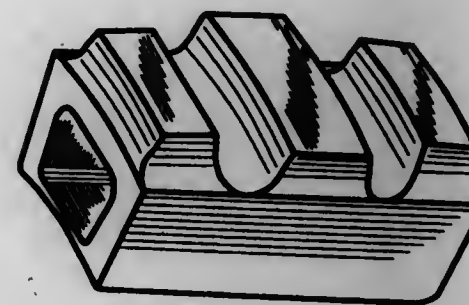
Graeme A. Chandler, Morley, Australia, assignor to AirBoss Limited, Kewdale, Australia

Filed Aug. 9, 1993, Ser. No. 11,612

Claims priority, application Australia, Feb. 11, 1993, 352/93

Term of patent 14 years

U.S. Cl. D15—28



365,829

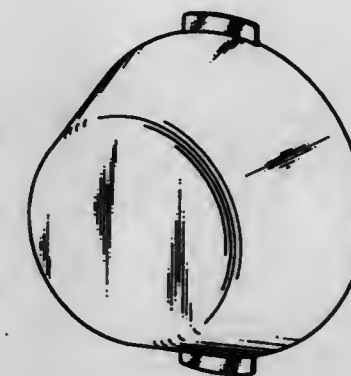
**END CAP FOR HOUSED BEARING UNITS**

Jeffrey A. Terrier, East Berlin, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Nov. 23, 1994, Ser. No. 31,300

Term of patent 14 years

U.S. Cl. D15—143



365,830

**FLUID DISPENSING MODULE FOR DISPENSING HEATED FLUIDS, SUCH AS HOT MELT ADHESIVES, SEALANTS, OR CAULKS**

Timothy M. Hubbard, Canton; Taiwo T. Ominiya, Stone Mountain; Paula E. Ruse, Norcross, and John T. Walsh, Duluth, all of Ga., assignors to Nordson Corporation, Westlake, Ohio

Continuation-in-part of Ser. No. 15,099, Nov. 8, 1993, Pat. No. D. 354,295. This application Oct. 31, 1994, Ser. No. 30,473

Term of patent 14 years

U.S. Cl. D15—144.2



365,828

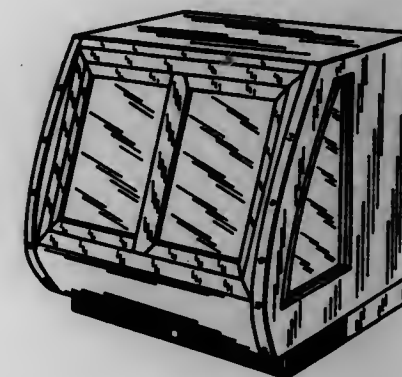
**REFRIGERATED DISPLAY CASE**

Edward L. Laceywell, Pontotoc, and Paul G. Thompson, Ecru, both of Minn., assignors to Master-Bilt Products, Pontotoc, Minn.

Filed Jul. 20, 1994, Ser. No. 26,143

Term of patent 14 years

U.S. Cl. D15—87





365,831

## BINOCULARS

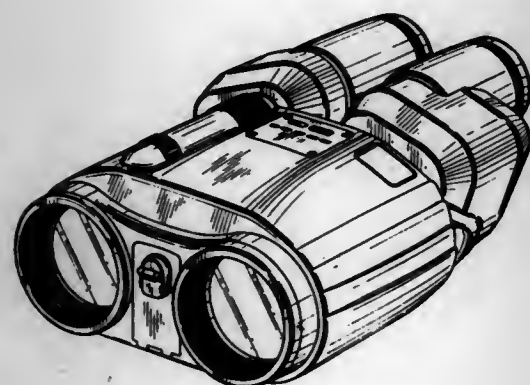
Kazuhiko Miyahara; Toshimi Izuka, and Hidefumi Notagashira, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1994, Ser. No. 17,641

Claims priority, application Japan, Jul. 22, 1993, 5-22450

Term of patent 14 years

U.S. Cl. D16-133



365,833

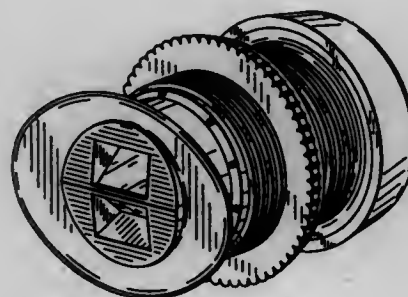
## DOOR VIEWER

Theodore Werner, Huntington Station, N.Y., assignor to United States Marketing Corporation, Huntington Station, N.Y.

Filed May 2, 1994, Ser. No. 22,155

Term of patent 14 years

U.S. Cl. D16-135



365,834

## HOUSING FOR A SURVEILLANCE CAMERA

Charles W. Dozier, 3207 Newfield Ct., Garland, Tex. 75044

Filed Jan. 6, 1995, Ser. No. 33,190

Term of patent 14 years

U.S. Cl. D16-203



365,832

## BINOCULARS

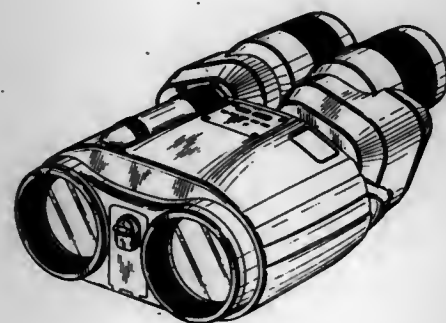
Kazuhiko Miyahara; Hidefumi Notagashira, and Toshimi Izuka, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1994, Ser. No. 17,936

Claims priority, application Japan, Jul. 28, 1993, 5-23159

Term of patent 14 years

U.S. Cl. D16-133



365,835

## CAMERA

Akira Nojima, Fussa; Ken Moro, Yokosuka; Nobuo Hashimoto, Kawasaki, and Shoko Ryuen, Ichikawa, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Oct. 12, 1994, Ser. No. 29,632

Term of patent 14 years

U.S. Cl. D16-209



365,837

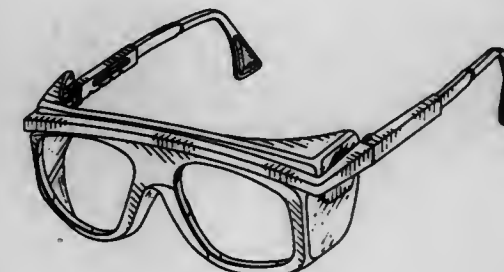
## SAFETY EYEGLASSES

Richard W. Canavan, East Woodstock, Conn., assignor to Uvex Safety, Inc., Smithfield, R.I.

Filed Feb. 1, 1994, Ser. No. 18,250

Term of patent 14 years

U.S. Cl. D16-325



365,836

## OVERHEAD PROJECTOR

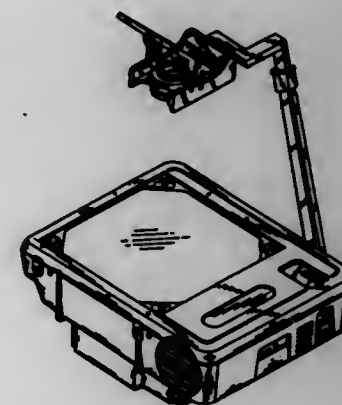
Fumio Hasegawa, Nisio, Japan, assignor to Elmo Co., Ltd., Nagoya, Japan

Filed Jun. 16, 1994, Ser. No. 24,596

Claims priority, application Japan, Dec. 17, 1993, D5-38370

Term of patent 14 years

U.S. Cl. D16-232



365,838

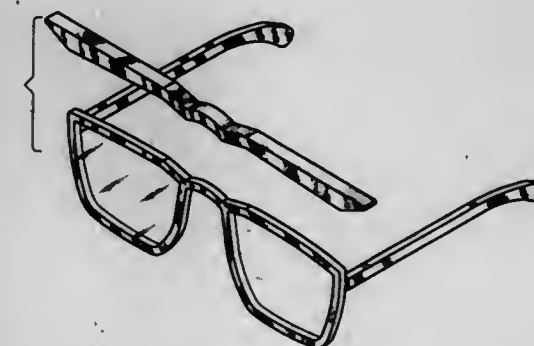
## STYLE CHANGABLE EYEWEAR

Yvonne E. Moore, 7836 S. Green St., Chicago, Ill. 60620

Filed Jan. 17, 1995, Ser. No. 33,585

Term of patent 14 years

U.S. Cl. D16-327





365,839

**ELECTRONIC CALCULATOR HAVING THE  
FUNCTIONS OF TELEPHONE BOOK, ADDRESS BOOK,  
CALENDAR, SCHEDULE BOOK AND MEMO BOOK**  
Yuuiti Kurabuti, Kasukabe, and Kenji Takahata, Hino, both  
of, Japan, assignors to Casio Computer Co., Ltd., Tokyo,  
Japan

Filed Oct. 3, 1994, Ser. No. 29,323  
Term of patent 14 years

U.S. Cl. D18—2



365,841

**ELECTRONIC CALCULATOR**

Kenji Takahata, Hino; Yuuiti Kurabuti, Kasukabe, and Yuichi  
Onumata, Hachiohji, all of, Japan, assignors to Casio Com-  
puter Co., Ltd., Tokyo, Japan

Filed Jun. 27, 1994, Ser. No. 25,061  
Term of patent 14 years

U.S. Cl. D18—7



365,840

**ELECTRONIC CALCULATOR HAVING THE  
FUNCTIONS OF TELEPHONE BOOK, ADDRESS BOOK,  
CALENDAR, SCHEDULE BOOK AND MEMO BOOK**  
Yuuiti Kurabuti, Kasukabe, and Atsushi Shigemura, Tokyo,  
both of, Japan, assignors to Casio Computer Co., Ltd.,  
Tokyo, Japan

Filed Nov. 1, 1994, Ser. No. 30,527  
Term of patent 14 years

U.S. Cl. D18—2



365,842

**ELECTRONIC CALCULATOR**

Hiroshi Nakatsuka, Kokubunji, and Toru Suzuki, Sagami-hara,  
both of, Japan, assignors to Casio Computer Co., Ltd.,  
Tokyo, Japan

Filed Dec. 19, 1994, Ser. No. 32,438  
Term of patent 14 years

U.S. Cl. D18—7



365,843

**ELECTRONIC CALCULATOR**

Tomoshige Komatsu, Tokyo, Japan, assignor to Casio Com-  
puter Co., Ltd., Tokyo, Japan

Filed Mar. 9, 1995, Ser. No. 35,913

Term of patent 14 years

U.S. Cl. D18—7



365,845

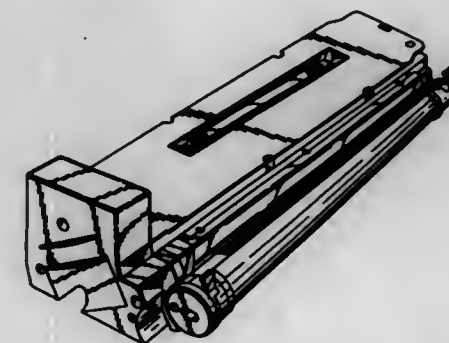
**PHOTOCONDUCTIVE UNIT FOR A REPROGRAPHIC  
APPARATUS**

Koichi Yasuda, Yao, and Hiroki Morishita, Nara, both of,  
Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Sep. 8, 1994, Ser. No. 28,602

Claims priority, application Japan, Mar. 11, 1994, 6-6393  
Term of patent 14 years

U.S. Cl. D18—43



365,844

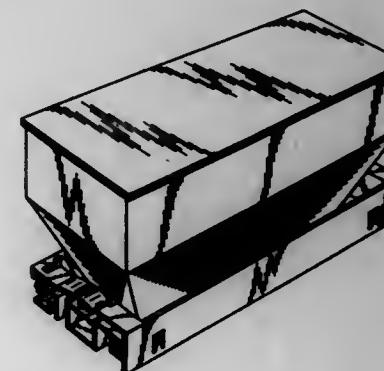
**DEVELOPER-SUPPLYING UNIT FOR AN IMAGE  
FORMING APPARATUS**

Toshinori Nishimura, and Hiromi Sakata, both of Suita, Japan,  
assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Mar. 25, 1993, Ser. No. 6,294

Claims priority, application Japan, Jan. 8, 1993, 5-296  
Term of patent 14 years

U.S. Cl. D18—43



365,846

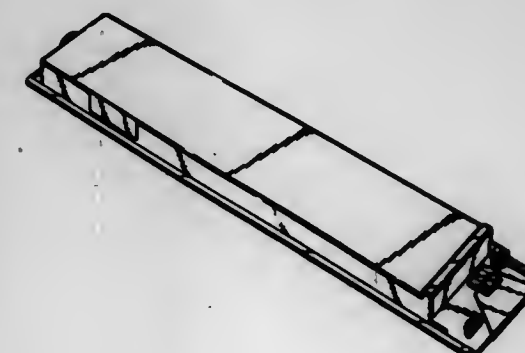
**TONER CARTRIDGE**

Ryoji Nishimura, Osaka, Japan, assignor to Mita Industrial  
Co., Ltd., Osaka, Japan

Filed Jul. 13, 1994, Ser. No. 25,841

Claims priority, application Japan, Mar. 11, 1994, 6-6391  
Term of patent 14 years

U.S. Cl. D18—43





365,847

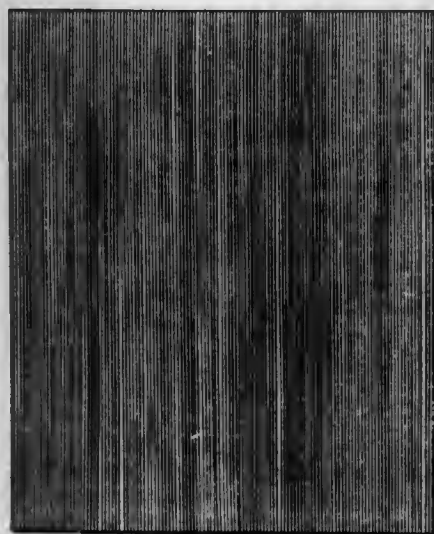
## SAFETY PAPER

Brenda Milne, Penfield, and Dave Young, Canandaigua, both of N.Y., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Apr. 21, 1994, Ser. No. 21,656

Term of patent 14 years

U.S. Cl. D19—5



365,849

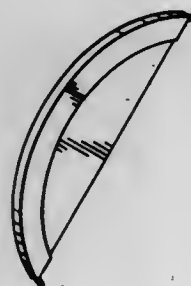
## WRITING INSTRUMENT

Joseph M. Greer, Jr., 3920 Wyandotte, Kansas City, Mo. 64111

Filed Jan. 17, 1995, Ser. No. 33,586

Term of patent 14 years

U.S. Cl. D19—36



365,850

## NOTEPAD HOLDER WITH REMOVABLE PEN

Dennis R. Romans, Rte. 1, Box 118, Ft. Calhoun, Nebr. 68023

Filed Feb. 15, 1995, Ser. No. 34,901

Term of patent 14 years

U.S. Cl. D19—36



365,848

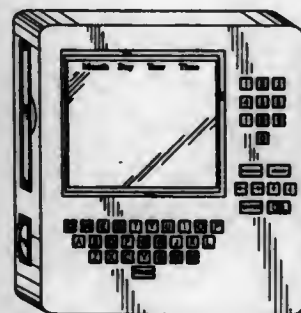
## ELECTRONIC CALENDAR

James W. Thomas, Gen. Del., Tuntutuliak, Ak. 99680

Filed Dec. 12, 1994, Ser. No. 31,989

Term of patent 14 years

U.S. Cl. D19—20



365,851

## WRITING INSTRUMENT CLIP

Michael P. Reynolds, Warwick, R.I., assignor to Colibri Corporation, Providence, R.I.

Filed Mar. 10, 1995, Ser. No. 35,988

Term of patent 14 years

U.S. Cl. D19—56



365,853

## PLATE FOR A GAMING TABLE

Georg Zadro, Baden, Austria, assignor to Casinos Austria Aktiengesellschaft, Vienna, Austria

Filed Jan. 17, 1994, Ser. No. 24,641

Claims priority, application Austria, Dec. 22, 1993, MU4007/93; Dec. 22, 1993, MU4008/93; Dec. 22, 1993, MU4009/93; Dec. 22, 1993, MU4010/93; Dec. 22, 1993, MU4011/93

Term of patent 14 years

U.S. Cl. D21—37



365,852

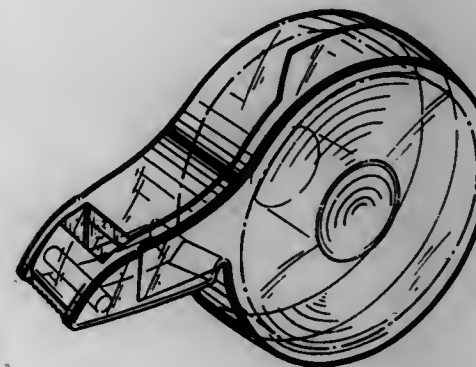
## TAPE DISPENSER

Tim Parsey, Palo Alto, Calif.; Scott W. Voorhees, Woodbridge, Va., and George Ireland, Devon, United Kingdom, assignors to Inventure Development Corporation, Woodbridge, Va.

Filed Sep. 1, 1994, Ser. No. 27,938

Term of patent 14 years

U.S. Cl. D19—69



365,854

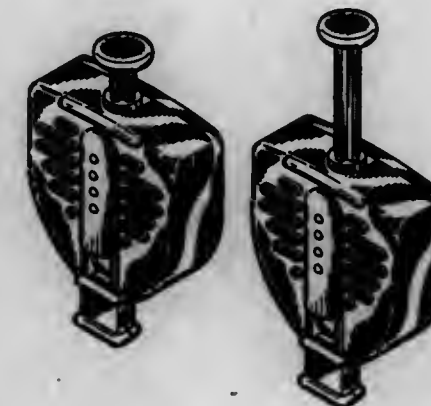
## SLIDE WHISTLE

John G. Mathews, Providence, R.I., assignor to SRL, Inc., Wilmington, Del.

Filed Jan. 27, 1995, Ser. No. 34,103

Term of patent 14 years

U.S. Cl. D21—64





365,855

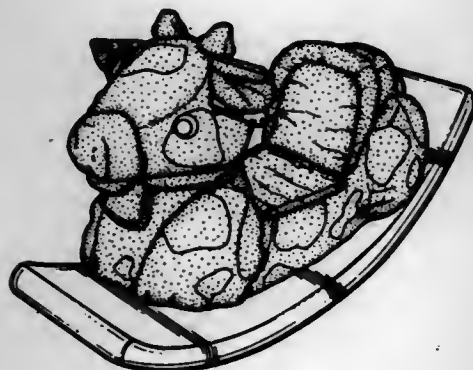
## ROCKING TOY

Lois E. Veraguth, Cleveland Heights, Ohio, assignor to The Little Tikes Company, Hudson, Ohio

Filed Feb. 7, 1995, Ser. No. 34,526

Term of patent 14 years

U.S. Cl. D21—68



365,857

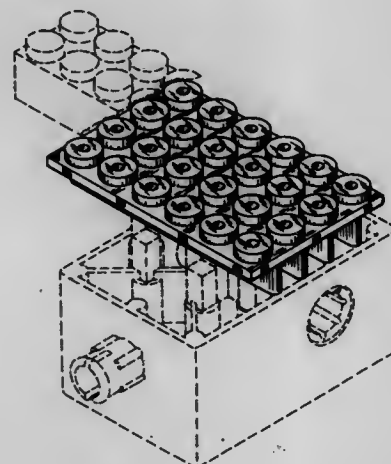
## TOY CONSTRUCTION BLOCK

Ronald L. Lyman, Folsom, Calif., assignor to Dart Industries Inc., Deerfield, Ill.

Filed Oct. 24, 1994, Ser. No. 30,220

Term of patent 14 years

U.S. Cl. D21—108



365,856

## DISPLAY PUZZLE

Domenico Rotella, Milano, Italy, assignor to Swatch AG (Swatch SA) (Swatch Ltd.), Bienne, Switzerland

Filed May 18, 1994, Ser. No. 23,092

Claims priority, application WIPO, Nov. 18, 1993, DM/027

897

Term of patent 14 years

U.S. Cl. D21—104



365,858

## SIGHT SCOPE

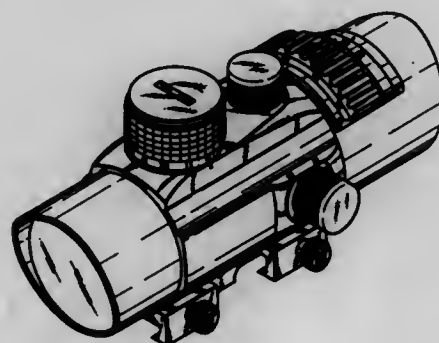
Saburo Tomita, Fujimi, Japan, assignor to Asia Optical Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1994, Ser. No. 32,781

Claims priority, application Japan, Jul. 14, 1994, 6-21039

Term of patent 14 years

U.S. Cl. D22—109



365,859

## MASK

Chung-Hing Choi, Hong Kong, Hong Kong, assignor to Hing Fat Toys Manufacturer Ltd., Hong Kong, Hong Kong

Filed Jan. 29, 1994, Ser. No. 25,318

Term of patent 14 years

U.S. Cl. D21—190



365,861

## EXERCISE STICK

William J. Moss, Jr., Matthews, and Sherrill D. Lowder, Sr., Concord, both of N.C., assignors to Moss-Lowder, Inc., Matthews, N.C.

Filed Feb. 18, 1994, Ser. No. 18,961

Term of patent 14 years

U.S. Cl. D21—191



365,860

## PHYSICAL EXERCISER

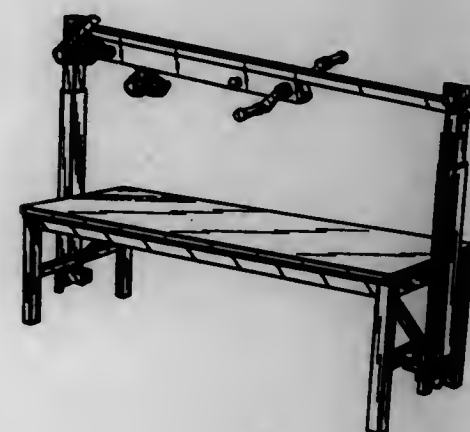
Urs Giger, Tugginerweg 3, CH-4503 Solothurn, Switzerland

Filed Oct. 24, 1994, Ser. No. 30,092

Claims priority, application WIPO, Apr. 25, 1994, DM 029 411

Term of patent 14 years

U.S. Cl. D21—191



365,862

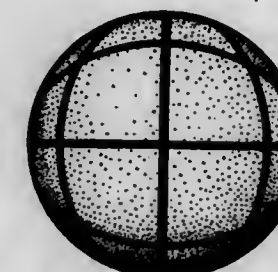
## BASKETBALL

Hideomi Shishido; Hisashi Ikemoto, and Emi Hirata, all of Hiroshima, Japan, assignors to Kabushiki Kaisha Molten, Hiroshima, Japan

Filed Dec. 13, 1994, Ser. No. 32,060

Term of patent 14 years

U.S. Cl. D21—204





365,863

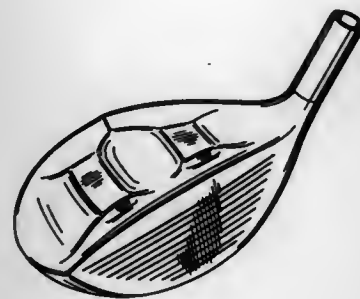
**GOLF CLUB HEAD**

Richard F. Mugica, Hacienda Heights; Richard D. Mugica, Anthony J. Antonious, 7738 Calle Facil, Sarasota, Fla. 34238  
Monterey Park, and Edward A. Mugica, Walnut, all of  
Calif., assignors to Solo Enterprise Corporation, City of  
Industry, Calif.

Filed Dec. 27, 1994, Ser. No. 32,716

Term of patent 14 years

U.S. Cl. D21—214



365,865

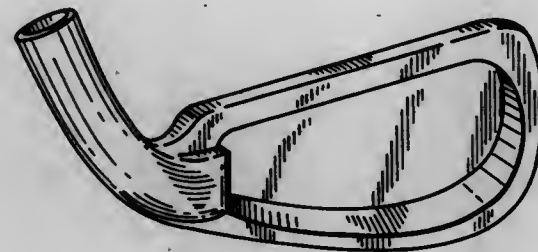
**IRON TYPE GOLF CLUB HEAD**

Richard F. Mugica, Hacienda Heights; Richard D. Mugica, Anthony J. Antonious, 7738 Calle Facil, Sarasota, Fla. 34238  
Monterey Park, and Edward A. Mugica, Walnut, all of  
Calif., assignors to Solo Enterprise Corporation, City of  
Industry, Calif.

Filed Jan. 25, 1994, Ser. No. 17,907

Term of patent 14 years

U.S. Cl. D21—220



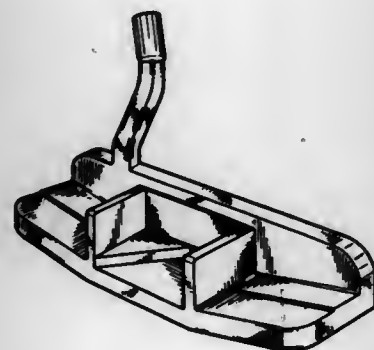
365,864

**GOLF PUTTER HEAD**

Ernst F. Sturm, 9612 Magnolia, Hillsboro, Mo. 63050  
Continuation-in-part of Ser. No. 16,203, Dec. 10, 1993. This  
application Jan. 3, 1995, Ser. No. 32,929

Term of patent 14 years

U.S. Cl. D21—219



365,866

**IN-LINE ROLLER-SKATE**

Sheng-Huan Cheng, No. 481-11, Chung-Cheng Rd., Lu-Chou  
Hsiang, Taipei Hsien, Taiwan, Prov. of China

Filed Jan. 25, 1995, Ser. No. 33,982

Term of patent 14 years

U.S. Cl. D21—226



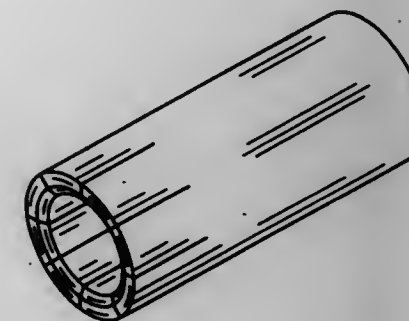
365,867

**MULTIPLE PROJECTILES SABBOT**

John M. Flanagan, 1525 Moon Ter., Medford, Oreg. 97504  
Filed Feb. 14, 1994, Ser. No. 18,649

Term of patent 14 years

U.S. Cl. D22—116



365,869

**FISHING LURE**

Augustus W. Merwin, 19 Lovers Ln., Wilton, Conn. 06897  
Filed Jun. 27, 1994, Ser. No. 25,116

Term of patent 14 years

U.S. Cl. D22—128



365,868

**BEE FLY SWATTER**

Sandy Cooper, New York, N.Y., assignor to Sun It Corp., Mt.  
Vernon, N.Y.

Filed Jun. 21, 1994, Ser. No. 24,804

Term of patent 14 years

U.S. Cl. D22—124



365,870

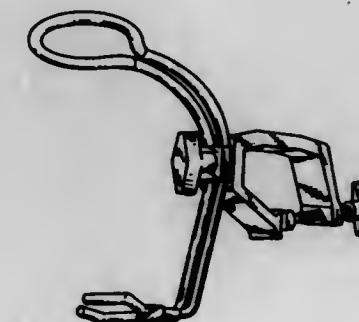
**ADJUSTABLE FISHING ROD HOLDER**

Timothy J. Miller, Ligonier, Ind., assignor to Universal Con-  
solidated Methods, Inc., Topeka, Ind.

Filed Sep. 9, 1994, Ser. No. 28,230

Term of patent 14 years

U.S. Cl. D22—147





365,871

## POND FILTER

James L. Anderson, 1105 Holly La., Burnsville, Minn. 55337

Filed Nov. 10, 1994, Ser. No. 30,853

Term of patent 14 years

U.S. Cl. D23—209



365,872

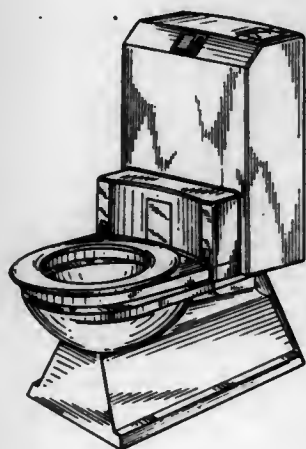
## WATER CLOSET

Werner Wilhelm, Oberrieden, and Olrich Lehmann, Birmensdorf, both of, Switzerland, assignors to Ows International AG, Barr, Switzerland

Division of Ser. No. 12,879, Sep. 13, 1993, Pat. No. Des. 358,201. This application Dec. 14, 1994, Ser. No. 32,188

Term of patent 14 years

U.S. Cl. D23—299



365,873

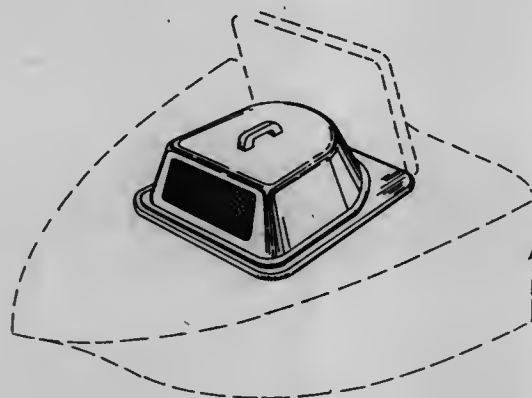
## COMBINED FAN HOUSING AND HATCH COVER

Paul D. Van Belle, Niles, Mich., assignor to Kool-O-Matic Corporation, Niles, Mich.

Filed Oct. 19, 1994, Ser. No. 29,927

Term of patent 14 years

U.S. Cl. D23—328



365,874

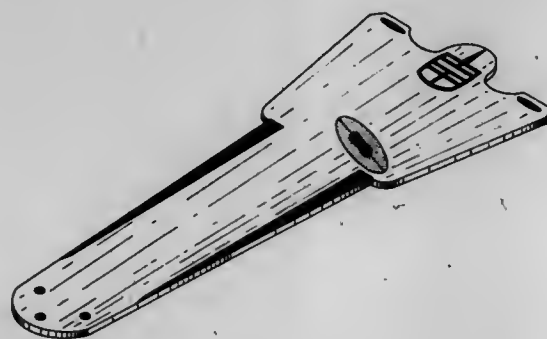
## CEILING FAN BLADE

Tung-Liang Kuo, 58, Ma Yuan West St., Taichung, Taiwan, Prov. of China

Filed Mar. 6, 1995, Ser. No. 35,704

Term of patent 14 years

U.S. Cl. D23—413



365,875

## EDIBLE COMPOSITION, PARTICULARLY A PHARMACEUTICAL TABLET

Daniel M. Bradbury, Bockingham; Anthony G. Hatton, W. Sussex, and Ronald A. Wilkinson, London, all of, England, assignors to SmithKline Beecham plc, United Kingdom

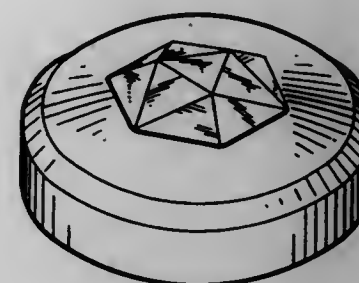
Continuation of Ser. No. 19,666, Mar. 8, 1994, abandoned.

This application Feb. 15, 1995, Ser. No. 36,452

Claims priority, application United Kingdom, Sep. 9, 1992, 2033685

Term of patent 14 years

U.S. Cl. D24—101



365,877

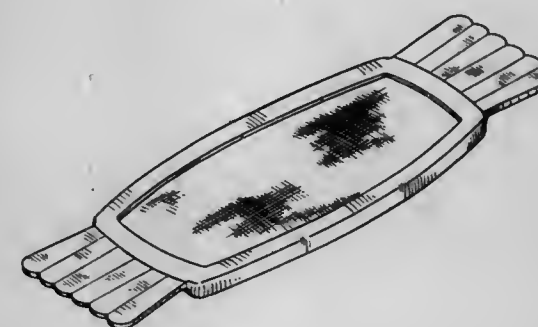
## SANITARY NAPKIN

Elisabeth Fraser, and Hal D. Shelton, both of 23715 W. Malibu Rd., #249, Malibu, Calif. 90265

Filed Apr. 10, 1995, Ser. No. 37,271

Term of patent 14 years

U.S. Cl. D24—125



365,876

## MEDICAMENT INHALER

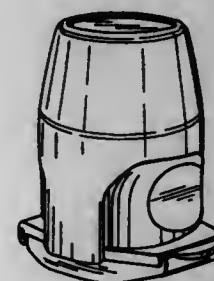
Brindra P. S. Chawla, 45 Boundary Road, West Bridgford (Nottinghamshire) NG2 7BZ, England

Filed Dec. 9, 1993, Ser. No. 16,154

Claims priority, application United Kingdom, Jun. 16, 1993, 2031774

Term of patent 14 years

U.S. Cl. D24—110



365,878

## THORACOSCOPIC ULTRA SHARP SCISSORS

Kenneth R. Blake, Brooklyn Park, Minn., assignor to Scanlan International, St. Paul, Minn.

Filed Apr. 22, 1994, Ser. No. 21,767

Term of patent 14 years

U.S. Cl. D24—148





365,879

**MEDICAL X-RAY CAMERA FOR TAKING AND DISPLAYING X-RAY PICTURES**

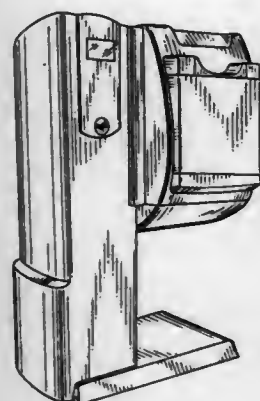
Katsumi Hirabayashi, and Masahiro Fukuda, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 4, 1994, Ser. No. 19,537

Claims priority, application Japan, Sep. 10, 1993, 5-27696

Term of patent 14 years

U.S. Cl. D24—158



365,881

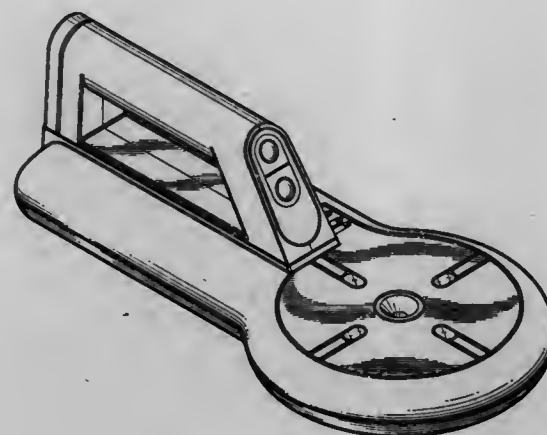
**TUBE PLACEMENT VERIFIER**

James L. Tiefenthal, Dublin; Donald J. Goldhardt, Grove City, both of Ohio, and James D. Morrow, Oak Park, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Aug. 18, 1994, Ser. No. 27,329

Term of patent 14 years

U.S. Cl. D24—186



365,880

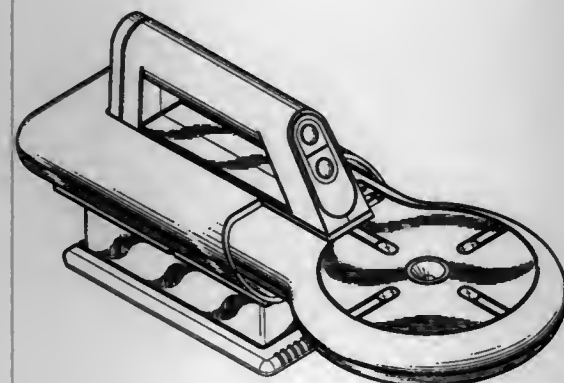
**TUBE PLACEMENT VERIFIER WITH BATTERY CHARGER**

James L. Tiefenthal, Dublin; Donald J. Goldhardt, Grove City, both of Ohio, and James D. Morrow, Oak Park, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Aug. 18, 1994, Ser. No. 27,328

Term of patent 14 years

U.S. Cl. D24—186



365,882

**STERILIZER FOR BABY BOTTLES**

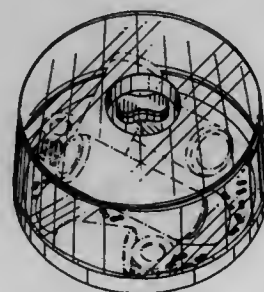
Jean P. Allegre, Saint-Etienne, France, assignor to Allegre Puericulture Hygiene S.A., France

Filed Jun. 16, 1994, Ser. No. 24,582

Claims priority, application France, Dec. 16, 1993, 936.692

Term of patent 14 years

U.S. Cl. D24—217



365,883

**SINGLE HUNG WINDOW**

John T. Forbis, Perrysburg, Ohio, and David J. Klimek, Wausau, Wis., assignors to Great Lakes Window Inc., Walbridge, Ohio

Filed May 10, 1994, Ser. No. 22,667

Term of patent 14 years

U.S. Cl. D25—52



365,885

**FLUORESCENT LAMP**

Masashi Sangen, Hyogo; Naoyuki Nakamura, Okayama, and Takeshi Matsumura, Osaka, all of, Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Jan. 3, 1995, Ser. No. 32,932

Claims priority, application Japan, Jul. 4, 1994, 6-19802; Jul. 4, 1994, 6-19806

Term of patent 14 years

U.S. Cl. D26—3



365,884

**CLOTH-COVERED CANOPY**

Ronald N. Dennis, Pretoria, South Africa, assignor to Autosshade Corporation Aktiengesellschaft, Triesenberg, Liechtenstein

Continuation-in-part of Ser. No. 486,178, Feb. 28, 1990, abandoned. This application Mar. 26, 1993, Ser. No. 6,360

Claims priority, application Australia, Aug. 31, 1989, 2804/89

Term of patent 14 years

U.S. Cl. D25—56



365,886

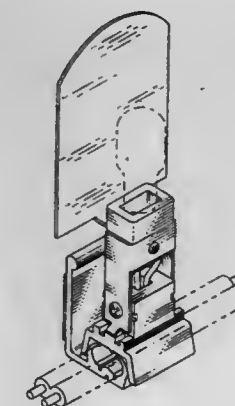
**LIGHT HOUSING**

Michael M. Strazhnik, Philadelphia, Pa., assignor to Sea Gull Lighting, Riverside, N.J.

Filed Jul. 1, 1994, Ser. No. 25,434

Term of patent 14 years

U.S. Cl. D26—60





365,887

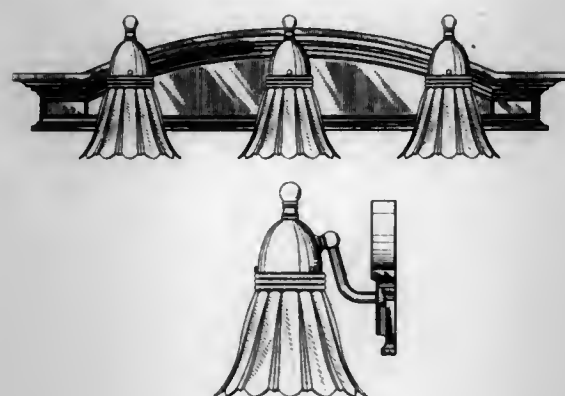
**WALL SUPPORTED LIGHTING FIXTURE**

Mark A. Pickett, Louisville, Ky., assignor to Thomas Industries, Inc., Louisville, Ky.

Filed Oct. 4, 1994, Ser. No. 29,372

Term of patent 14 years

U.S. Cl. D26—87



365,889

**CIGARETTE LIGHTER**

Jung J. Kim, Seoul, Rep. of Korea, assignor to Colibri Corporation, Providence, R.I.

Filed Sep. 29, 1994, Ser. No. 29,094

Term of patent 14 years

U.S. Cl. D27—147



365,890

**MOUSTACHE TRIMMER**

Martin Bone, Groningen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 13, 1994, Ser. No. 24,291

Claims priority, application WIPO, Dec. 28, 1993, DM/028 240

Term of patent 14 years

U.S. Cl. D28—53



365,888

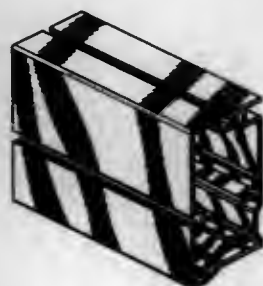
**EXTRUDED DOOR MOLDING**

David L. Ishmael, Van Meter, Iowa, assignor to EMCO Enterprises, Inc., Des Moines, Iowa

Filed Aug. 8, 1994, Ser. No. 26,820

Term of patent 14 years

U.S. Cl. D25—124



365,891

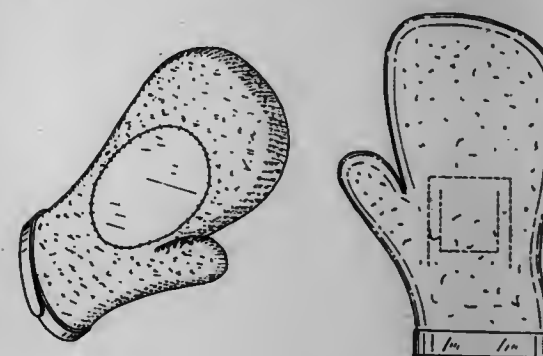
**BATHING MITT**

Grace Gargano, and Sabino A. Gargano, both of 1065 Lydia Dr., Franklin Square, N.Y. 11010

Filed Jul. 14, 1994, Ser. No. 25,860

Term of patent 14 years

U.S. Cl. D28—63



365,893

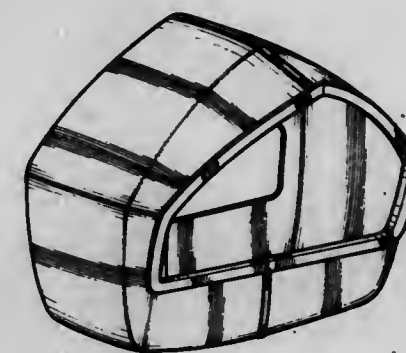
**WINDOW BIRD FEEDER**

Christopher S. Thorp, Wooster, Ohio, assignor to Rubbermaid Specialty Products Inc., Wooster, Ohio

Filed Aug. 1, 1994, Ser. No. 26,569

Term of patent 14 years

U.S. Cl. D30—124



365,892

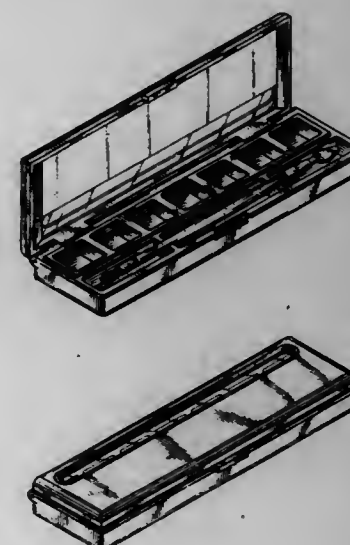
**COMBINED COSMETIC TRAY AND CASE**

Susan Markham, 3020 Cedar Height Dr., Colorado Springs, Colo. 80904

Filed Jul. 1, 1994, Ser. No. 25,432

Term of patent 14 years

U.S. Cl. D28—83



365,894

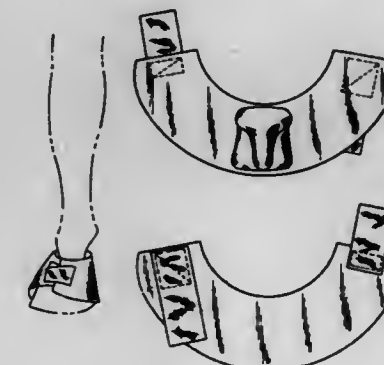
**HOOF PROTECTOR**

Brian Davis, W14302 Brookwood Ct., Ripon, Wis. 54971

Filed Jan. 12, 1994, Ser. No. 17,412

Term of patent 14 years

U.S. Cl. D30—146





365,895

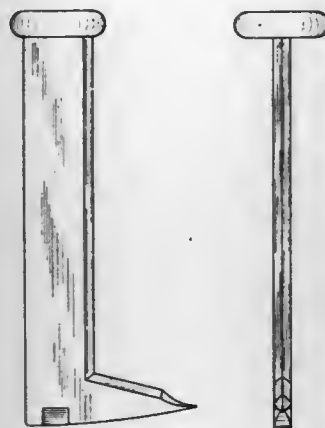
## TOOL FOR SHOEING HORSES

Kevin L. Graves, 2590 W. Eucalyptus Way, West Valley City, Utah 84119, and Robert C. Braithwaite, 4566 W. 5295 South, Kearns, Utah 84118

Filed Oct. 19, 1994, Ser. No. 29,905

Term of patent 14 years

U.S. Cl. D30—199



365,897

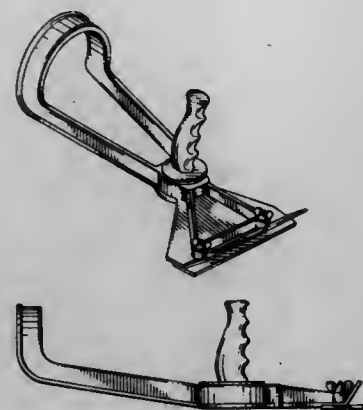
## GRILL SCRAPER

Camilo Pereira, 633 NE. 167th St., #701, North Miami Beach, Fla. 33162

Filed Dec. 8, 1994, Ser. No. 31,885

Term of patent 14 years

U.S. Cl. D32—46



365,896

## DUSTING GLOVE

Steven J. Zuege, 1621 Twin Sisters Dr., Longmont, Colo. 80501

Filed Mar. 13, 1995, Ser. No. 36,109

Term of patent 14 years

U.S. Cl. D32—40



365,898

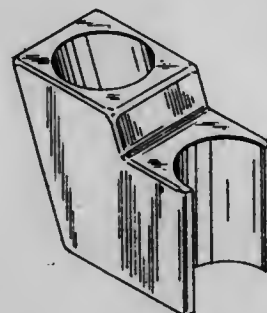
## BAIL TIP COVER

Kenneth A. Fomby, W. Hwy. 82, P.O. Box 636, Gainesville, Tex. 76241-0636

Filed Feb. 14, 1994, Ser. No. 18,736

Term of patent 14 years

U.S. Cl. D32—54



365,899

## STEAM IRON

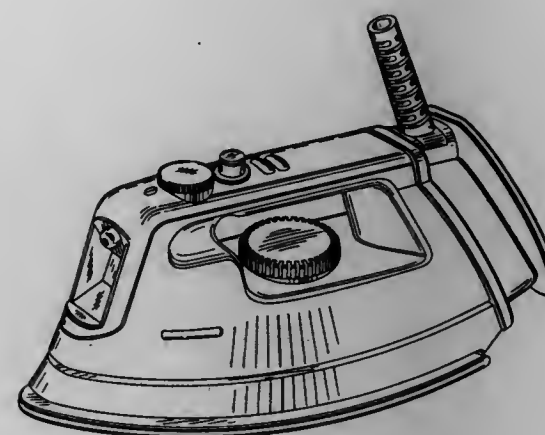
Choi L. Wai, Hong Kong, Hong Kong, assignor to Goodway Electrical Co. Ltd., Tokwawan, Hong Kong

Filed May 20, 1993, Ser. No. 8,615

Claims priority, application United Kingdom, Nov. 20, 1992, 2027249

Term of patent 14 years

U.S. Cl. D32—70



365,901

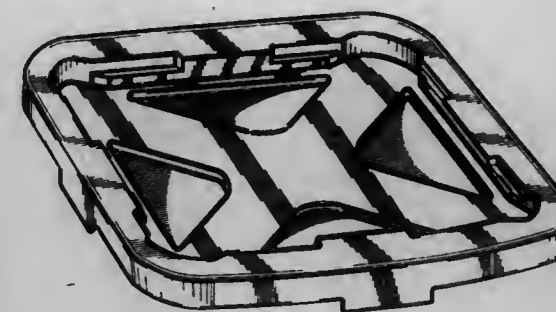
## REFUSE CONTAINER LID

John A. Kowalski, and Donald C. Presnell, both of Stephens City, Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.

Filed Nov. 14, 1994, Ser. No. 30,991

Term of patent 14 years

U.S. Cl. D34—11



365,902

## CART

Cheng-Hsien Tsai, No. 103, Da-Ming 1st Rd., Tien-Tzu Hsiang, Taichung Hsien, Taiwan, Prov. of China

Filed Feb. 13, 1995, Ser. No. 34,764

Term of patent 14 years

U.S. Cl. D34—12

365,900

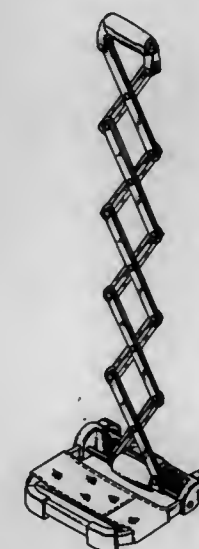
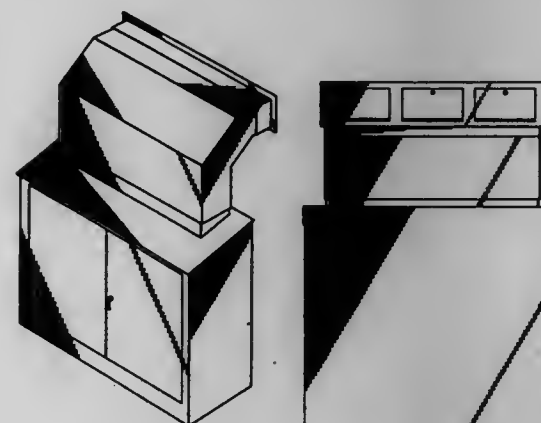
## HOME RECYCLING SYSTEM

Christian P. Kamm, Fairview Park, Ohio, assignor to Wilkin-son Company, Inc., Stow, Ohio

Filed Oct. 4, 1993, Ser. No. 13,850

Term of patent 14 years

U.S. Cl. D34—1





365,903

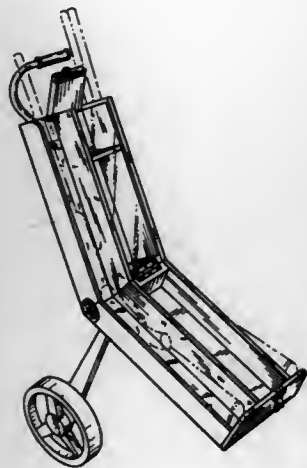
**GUN TRANSPORT CART**

Rick E. Boyle, 1431 Victoria Blvd., Rockledge, Fla. 32955, and  
James D. Bausman, 2922 Elder St., Titusville, Fla. 32796

Filed Apr. 24, 1995, Ser. No. 37,918

Term of patent 14 years

U.S. Cl. D34—15



365,905

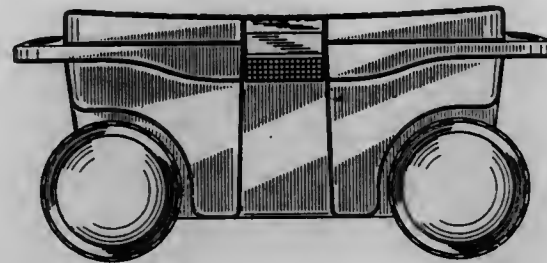
**STORAGE BOX WORK SEAT**

Zvi Yemini, Tel Aviv, Israel, assignor to Zag Ltd., Tel Aviv,  
Israel

Filed Nov. 28, 1994, Ser. No. 32,071

Term of patent 14 years

U.S. Cl. D34—19



365,904

**LUGGAGE CART**

Mark Adamson, Broken Arrow; Jack W. Hurst, and James F.  
Reinbold, both of Wagoner, all of Okla., assignors to UNR  
Industries, Inc., Chicago, Ill.

Filed Jan. 23, 1995, Ser. No. 33,889

Term of patent 14 years

U.S. Cl. D34—17



365,906

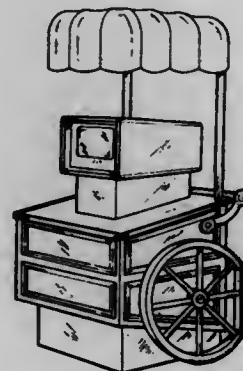
**ELECTRONIC FLOWER CART KIOSK**

Cleve L. Lee, Brantford, Canada, assignor to Anthem Sentech,  
Inc., Brantford, Canada

Filed Oct. 11, 1994, Ser. No. 29,560

Term of patent 14 years

U.S. Cl. D34—20



365,907

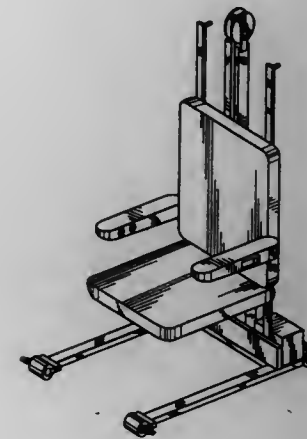
**PORTABLE LIFT**

Kenneth D. Mishler, 7342 40th Ave. S., Seattle, Wash. 98118

Filed Dec. 8, 1994, Ser. No. 31,927

Term of patent 14 years

U.S. Cl. D34—28



365,909

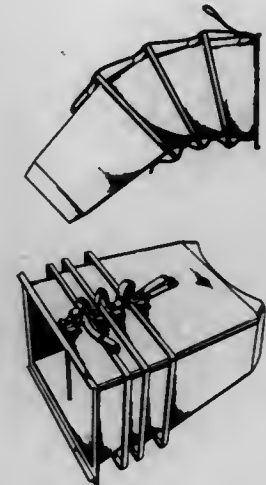
**TELESCOPIC GRAIN SPOUT**

James Spenceley, 2530-39 Street North, Lethbridge, Alberta,  
Canada

Filed Sep. 21, 1994, Ser. No. 28,584

Term of patent 14 years

U.S. Cl. D34—35



365,908

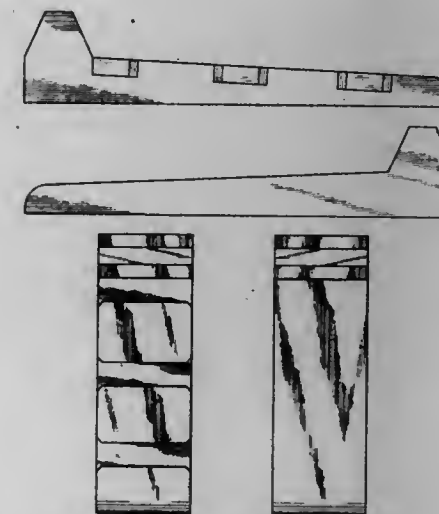
**SET OF RAMPS FOR MOUNTING VEHICLE TIRE CHAINS**

Douglas F. Pesznecker, Rte. 2, Box 3602, Lopez Island, Wash.  
98261

Filed Jun. 27, 1994, Ser. No. 25,097

Term of patent 14 years

U.S. Cl. D34—32



365,910

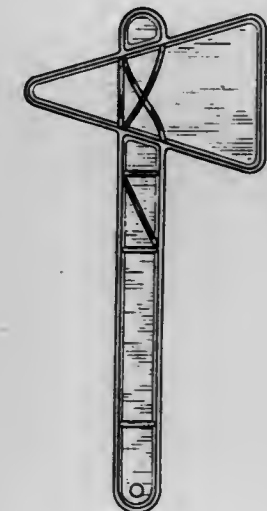
**TOMAHAWK MAILBOX FLAG**

Doile A. King, 2193 Fellowship Ct., Tucker, Ga. 30084

Filed May 13, 1993, Ser. No. 5,078

Term of patent 14 years

U.S. Cl. D99—43





# LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 2nd DAY OF JANUARY, 1996

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. Ahlstrom Corporation: *See—*  
Hiltunen, Matti; Lampenius, Harry; and Westertund, Kurt, 5,481,063, Cl. 588-205.000.  
Kuivalainen, Reijo, 5,480,624, Cl. 423-210.000.  
Sannholm, Krister, 5,480,512, Cl. 162-16.000.
- A. C. Nielsen Company: *See—*  
Thomas, William L.; and Lu, Daozheng, 5,481,294, Cl. 348-1.000.
- A.W.T. World Trade, Inc.: *See—*  
Motev, Phil; and Kitaygorodskiy, Simon, 5,480,133, Cl. 271-85.000.
- A/F Protein, Inc.: *See—*  
Hew, Choy L.; and Du, Shao J., 5,480,774, Cl. 435-6.000.
- Aalbers, Robert: *See—*  
Oeste, Franz D., 5,480,524, Cl. 204-158.200.
- Aaronson, Stuart A.: *See—*  
Kraus, Matthias H.; and Aaronson, Stuart A., 5,480,968, Cl. 530-326.000.
- Aastra Corporation: *See—*  
Shen, Francis N.; Shen, Anthony P.; Edwards, Eric C.; Schmid, Gerrard B.; and Kotzev, Grigor K., 5,481,594, Cl. 379-67.000.
- ABB Atom AB: *See—*  
Bäck, Anders; and Börtin, Stefan, 5,481,575, Cl. 376-254.000.
- ABB Environmental Services, Inc.: *See—*  
Sublette, Kerry L., 5,480,550, Cl. 210-611.000.
- ABB Henschel Waggon Union GmbH: *See—*  
Ahlborn, Günter; and Büdenbender, Herbert, 5,479,863, Cl. 105-199.500.
- ABB Industrial Systems, Inc.: *See—*  
Hellstrom, Ake A.; Koester, Karsten G.; Frisco, Thomas A.; and Throm, James E., Jr., 5,479,720, Cl. 33-501.020.  
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- Abbate, Robert J.: *See—*  
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- Abbott, Donald C.; Dainis, George A., III; and West, David W., to Texas Instruments Incorporated. Electrochemical etch system and method. 5,480,519, Cl. 204-129.350.
- Abbott Laboratories: *See—*  
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- Abbruzzese, Bonnie C.: *See—*  
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- Abe, Akira: *See—*  
Mitsumori, Kenichi; Kasama, Yasuhiko; Nakano, Akira; Abe, Akira; and Ohmi, Tadahiro, 5,480,563, Cl. 210-748.000.
- Abe, Keiko: *See—*  
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- Abe, Nobusuke: *See—*  
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- Aberle, Marshall L.: *See—*  
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- Abou-Gharbia, Magid A.: *See—*  
Failli, Amedeo A.; Bleyman, Oleg I.; Kao, Wenling; and Abou-Gharbia, Magid A., 5,480,988, Cl. 540-456.000.  
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- Abrokwah, Jonathan K.; Huang, Jenn-Hwa; and Ooms, William J., to Motorola, Inc. Method of making a III-V complementary heterostructure device with compatible non-gold ohmic contacts. 5,480,829, Cl. 437-57.000.
- Acevedo, Socrates: *See—*  
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- Achelpohl, Fritz; to Windmüller & Höscher. Device for separating perforated sections of a tubular web. 5,480,083, Cl. 225-100.000.
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McCarter, Walter K.; and Fischer, Jorgen T., 5,480,743, Cl. 429-96.000.
- Acuson Corporation: *See—*  
Cooper, Thomas G.; Adams, David V.; and Eaton, John W., 5,479,929, Cl. 128-662.030.  
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- Adamczyk, Andrew A., Jr.: *See—*  
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- Adams, Byron H. Golf club shaft with alignment system. 5,480,151, Cl. 273-163.00A.
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- Adams, David V.: *See—*  
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- Adams, Gerald E.: *See—*  
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- Adams, William T., Jr., to American Cast Iron Pipe Company. Ductile iron pipe joint employing a coupling and coupling therefor. 5,480,196, Cl. 285-369.000.
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- Addington, Timothy H.: *See—*  
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- Adir et Compagnie: *See—*  
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- Adolf Wurth GmbH & Co. KG: *See—*  
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- Advanced Cardiovascular Systems, Inc.: *See—*  
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- Advanced Micro Devices, Inc.: *See—*  
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Luedtke, Mark, 5,481,215, Cl. 327-218.000.
- Tang, Yuan; and Cleveland, Lee E., 5,481,494, Cl. 365-185.240.
- Advanced NMR Systems, Inc.: *See—*  
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- Advanced Surgical, Inc.: *See—*  
Cuschieri, Alfred; and Heaven, Malcom D., 5,480,410, Cl. 606-213.000.
- Advanced Technology Laboratories, Inc.: *See—*  
Gruner, George P.; and Doidge, John A., Jr., 5,479,930, Cl. 128-662.060.
- Advantest Corporation: *See—*  
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- Aeby, Johann: *See—*  
Mager, Herbert; Pasquier, Gilbert; Hoch, Dieter; and Aeby, Johann, 5,480,459, Cl. 8-408.000.
- Agency of Industrial Science & Technology: *See—*  
Sakai, Tetsuo; and Iwaki, Tsutomu, 5,480,741, Cl. 429-59.000.
- AGFA-Gevaert, N.V.: *See—*  
Dewanckele, Jean-Marie; Terrell, David; and Viaene, Kris, 5,480,770, Cl. 430-410.000.  
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- Aghajanian, Michael K.: *See—*  
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- Agur, Enno E.: See—  
Mahabadi, Hadi K.; Agur, Enno E.; McAneney, T. Brian; Kao, Sheau V.; Allison, Gerald R.; Hawkins, Michael S.; Hollenbaugh, William H., Jr.; Jacobs, Robert M.; and Chow, Che C., 5,480,756, Cl. 430-109.000.
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- Air Products and Chemicals, Inc.: See—  
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- Aire Solutions, Inc.: See—  
Borten, William H.; and Crews, L. Jeremy, 5,479,789, Cl. 62-324.100.
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- AlliedSignal Inc.: See—  
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- Zimmerman, Scott M.; Beeson, Karl W.; McFarland, Michael J.; Yardley, James T.; and Fern, Paul M., 5,481,385, Cl. 359-40.000.
- Allison, Gerald R.: See—  
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- Alpert, Donald B.; Avnon, Dror; Ben-Meir, Amos; and Talmudi, Ran, to National Semiconductor Corporation. Apparatus and method for storing partially-decoded instructions in the instruction cache of a CPU having multiple execution units. 5,481,751, Cl. 395-800.000.
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- Altera Corporation: See—  
Cliff, Richard G.; and Cope, L. Todd, 5,481,486, Cl. 364-716.000.
- Altieri, Paul A.; Eden, James; Gribnau, Michael C.; Hoogendijk, Leendert; Krijnen, Lambertus B.; Solarek, Daniel B.; and Swarthoff, Ton, to Lever Brothers, Division of Conopco, Inc. Adjuncts dissolved in molecular solid solutions. 5,480,575, Cl. 252-94.000.
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- Musselman, Lawrence L.; and Greene, Howard L., 5,480,587, Cl. 252-609.000.
- Patrick, Edward P.; and Pajerski, A. Victor, 5,481,084, Cl. 219-123.000.
- Alvarez, Robert J.; Bredezen, Scott E.; Wilson, James J.; Flim, Duane D.; Kniffen, Todd E.; and Schahner, Clinton O., to Mile High Equipment Company. Method of making an integrally formed, modular ice cuber having a stainless steel evaporator and a microcontroller. 5,479,707, Cl. 29-890.039.
- Ambi-Rad Limited: See—  
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- Amburgey, Terry L.: See—  
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- American Air Liquide Chicago Research Center: See—  
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- American Cast Iron Pipe Company: See—  
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- American Cyanamid Company: See—  
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- Epstein, Joseph W.; Birnberg, Gary H.; Dutia, Minu D.; Claus, Thomas H.; and Largis, Elwood E., 5,480,908, Cl. 514-465.000.

- Ziegler, Carl B., Jr.; Curran, William V.; and Feigelson, Gregg, 5,480,987, Cl. 540-200.000.
- American Home Products Corporation: See—  
Failli, Amedeo A.; Bleyman, Oleg I.; Kao, Wenling; and Abou-Gharbia, Magid A., 5,480,988, Cl. 540-456.000.
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- American Laundry Machinery, Inc.: See—  
McClain, David R.; and Shattuck, Ewart H., 5,480,485, Cl. 118-64.000.
- Amersham International PLC: See—  
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- Amiard, Vincent J.; Le Blanc, Francis D.; and Borghetti, Paul R., to Etat Francais as represented by the Delege General pour l'Armement. Harpoon heads and harpoons provided with such heads for the anchoring of helicopters to platforms. 5,480,108, Cl. 244-115.000.
- Amity Leather Products Company: See—  
Skaalen, Peter L., Jr.; Papez, Thomas W.; and Scheunemann, Roy A., 5,480,605, Cl. 264-234.000.
- Ammermann, Eberhard: See—  
Eicken, Karl; Goetz, Norbert; Harreus, Albrecht; Ammermann, Eberhard; Lorenz, Gisela; and Rang, Harald, 5,480,897, Cl. 514-365.000.
- Amoco Corporation: See—  
Richardson, Joel A.; Poppe, Wassily; Bolton, Benjamin A.; and Paschke, Edward E., 5,480,616, Cl. 422-134.000.
- Wolf, Fred R.; and Cuellar, Richard E., 5,480,805, Cl. 435-320.100.
- Amos, David J.: See—  
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- Amuti, Kofi S., to Du Pont de Nemours, E. I., and Company. 1,2,4-triazolo[1,2-a]pyridazine-1,3(2H)-dione herbicides for citrus, sugarcane, oil palm and the like. 5,480,856, Cl. 504-236.000.
- Analog Devices, Inc.: See—  
Core, Craig E., 5,480,831, Cl. 437-60.000.
- Anderson, David R.: See—  
Nguyen, Frank T.; Anderson, David R.; and Catlin, Timothy J. O., 5,481,666, Cl. 395-159.000.
- Anderson, Jan: See—  
Bergkvist, Lennart; Gustafsson, Sten; Lindblom, Kjell; Anderson, Jan; Ekholm, Rolf; and Höglund, Ronny, 5,480,546, Cl. 210-404.000.
- Anderson, Jerry M.; Lampert, Norman R.; and Mock, Robert W., Jr., to AT&T Corp. Connector for optical fiber. 5,481,634, Cl. 385-76.000.
- Anderson, Karl F.; and Parker, Allen R. System for improving measurement accuracy of transducer by measuring transducer temperature and resistance change using thermoelectric voltages. 5,481,199, Cl. 324-705.000.
- Anderson, Richard M., to Andersons, The. Apparatus and method for a breadmaking machine. 5,479,850, Cl. 99-357.000.
- Anderson, Thomas M.: See—  
Crow, Harry; Anderson, Thomas M.; Kelly, Scott; Atherton, Terry; and Schmidt, Larry, 5,479,957, Cl. 137-101.190.
- Anderson, William W.: See—  
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- Andersons, The: See—  
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- Ando, Eiiti: See—  
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- Ando, Hitoshi: See—  
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- Ando, Tadahiho: See—  
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- Andre, James R., to W. E. Hall Company. Method of fabricating a steel pipe with integrally formed liner. 5,480,505, Cl. 156-201.000.
- Andreas Stahl: See—  
Wieland, Dieter; Armbruster, Herbert; and Meyer, Gerhard, 5,480,009, Cl. 188-77.00W.
- Andresen, Mark E.; Neer, Jay H.; and Nelson, Richard J., to International Business Machines Corporation. Ribbon cable with terminal edge reinforcement. 5,481,069, Cl. 174-117.00F.
- Andrew Corporation: See—  
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- Andrews, Donald E., Jr.: See—  
Noggle, Gary C.; and Andrews, Donald E., Jr., 5,479,974, Cl. 152-333.100.
- Andrews, Edward A. Finger tip mustache shaving device with cover. 5,479,950, Cl. 132-215.000.
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- Angel, Jeffrey R., to Progressive Tool & Industries Co. Geometry station. 5,479,698, Cl. 29-701.000.
- Angerbauer, David G.; and Angerbauer, Rose H. Coupon organizer. 5,480,192, Cl. 281-31.000.
- Angerbauer, Rose H.: See—  
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- Angerer, John D.; Modi, Jashwant J.; and Szafranski, Robert C., to Aqualon Company. Process of preparing high solids low viscosity polysaccharides. 5,480,984, Cl. 536-88.000.
- Angevaere, Petrus A.: See—  
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- Anse, Hiroaki: See—  
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- Ansell, Graham P.: See—  
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- Anton Piller GmbH & Co. KG: See—  
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- Antonelli, Alexander A.: See—  
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- Antonuccio, Robert S.: See—  
Siahpolo, Hassan; Antonuccio, Robert S.; Carney, James M.; Hoornaert, Daniel F.; and Spano, Joseph M., 5,481,431, Cl. 361-685.000.
- Antoshkiw, William T.: See—  
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- Antus, Sandor: See—  
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- Anzai, Masayasu: See—  
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- Anzai, Shohji: See—  
Kageyama, Shuhei; Anzai, Shohji; Ueki, Tomiji; and Mitsuya, Yoshihide, 5,480,249, Cl. 401-60.000.
- Aoki, Makiko: See—  
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- Aoki, Osamu: See—  
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- Aoki, Yoshitaka, to Sony Corporation. Disc cartridge loading apparatus. 5,481,423, Cl. 360-99.060.
- Aoshima, Chikara: See—  
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- Aoya, Osamu, to Seiko Instruments Inc. Liquid crystal electro-optical device having columnar glass fibers and glass balls in the sealing portion. 5,481,388, Cl. 359-80.000.
- Apex Bioscience, Inc.: See—  
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- Apple Computer, Inc.: See—  
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- Mortensen, Craig; Roots, Logan; and Strelau, Klaus, 5,481,735, Cl. 395-200.100.
- Staats, Erik, 5,481,739, Cl. 395-800.000.
- Wetmore, Russ; Nguyen, Philip; and Batista, Ricardo, 5,481,713, Cl. 395-700.000.
- Appleton, Robert P., to Appleton, Robert Patrick. Mud check valves in drilling apparatus (wells). 5,479,988, Cl. 166-325.000.
- Appleton, Robert Patrick: See—  
Appleton, Robert P., 5,479,988, Cl. 166-325.000.
- Applied Magnetics Corporation: See—  
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- Applied Materials, Inc.: See—  
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- Appold, Brian M., to VLSI Technology, Inc. Adapter for quad flat pack failure-analysis socket. 5,481,203, Cl. 324-755.000.
- Aprica Kassai Kabushiki Kaisha: See—  
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Angerer, John D.; Modi, Jashwant J.; and Szafranski, Robert C., 5,480,984, Cl. 536-88.000.
- Arachnid, Inc.: See—  
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- Arai, Atsushi: See—  
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- Arai, Junichi, to Uchiyama Manufacturing Corp. Bearing sealing device. 5,480,235, Cl. 384-484.000.
- Arai, Kazuo: See—  
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- Arai, Kenjiro: See—  
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- Arai, Kunio; and Ajiri, Tadafumi, to Nissan Chemical Industries Ltd. Process for producing fine metal oxide particles. 5,480,630, Cl. 423-625.000.



- Arai, Soichi: See—  
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- Arai, Yoshio: See—  
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- Aralis, James M.: See—  
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- Arashima, Teruo; Sugitani, Hiroshi; Masuda, Kazuaki; Ikeda, Masami; Kasamoto, Masami; Suzuki, Seiji; Ishinaga, Hiroyuki; Kawai, Jun; and Kamiyama, Yuji, to Canon Kabushiki Kaisha. Ink supply mechanism, ink jet cartridge provided with such a mechanism, and ink jet recording apparatus provided with such a mechanism. 5,481,289, Cl. 347-93.000.
- Aratani, Shuntaro; and Inoue, Hiroshi, to Canon Kabushiki Kaisha. Display control device. 5,481,274, Cl. 345-98.000.
- Arbogast, Carroll: See—  
Silver, William M.; Druker, Samuel; Romanik, Philip; and Arbogast, Carroll, 5,481,712, Cl. 395-700.000.
- Arcaro, David J.; and Hettinger, John L., to Hewlett-Packard Company. Prevention of excess liquid toner contamination in the formation of electrophotographic images. 5,481,342, Cl. 355-256.000.
- Arch Development Corporation: See—  
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- Architectural Energy Corporation: See—  
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- ARCO Chemical Technology, L.P.: See—  
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- Arditti, David: See—  
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- Arduin, Joel: See—  
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Carsten, Bruce W.; and Davidson, Christopher D., 5,481,238, Cl. 336-214.000.
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- Arima, Yuusuke; Miyamoto, Shinichi; and Sahira, Kensho, to Mitsubishi Materials Corporation. Bioactive ceramic coated surgical implant. 5,480,438, Cl. 623-16.000.
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- Arisaka, Hiroshi, to Kel Corporation. Universal multilayer base board assembly for integrated circuits. 5,480,309, Cl. 439-43.000.
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- Bassett, James H., to Dawn Equipment Co. Wheels hub mount. 5,479,868, Cl. 111-139.000.
- Bassett, James H., to Dawn Equipment Company. Agricultural implement controller to compensate for soil hardness variation. 5,479,992, Cl. 172-4.000.
- Batchelor, Esther C.: See—  
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- Bateman, David E.: See—  
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- Bauer, Klaus-Peter: See—  
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- Bauer Systemtechnik AG: See—  
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- Baxter, Michael A., to Apple Computer, Inc. Minimal instruction set computer architecture and multiple instruction issue method. 5,481,743, Cl. 395-800.000.
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- Kraus, Helmut, 5,480,995, Cl. 546-250.000.
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- Becker, Wolfgang: See—  
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- Beckstead, Donal O.: See—  
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- Becton, Dickinson and Company: See—  
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- Beeson, Karl W.: See—  
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- Beissel, Dieter: See—  
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- Honig, Michael L.; and Madhoo, Upamanyu, 5,481,533, Cl. 370-18.000.
- Michelson, Steven M., 5,481,673, Cl. 395-200.150.
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- Bell, Eric L., to Eastman Kodak Company. Photographic emulsion containing transition metal complexes. 5,480,771, Cl. 430-567.000.
- Bell, Weldon K.; Huang, Tracy J.; Lago, Rudolph M.; Tsao, Ying-Yen P.; and Whitehurst, D. Duayne, to Mobil Oil Corporation. Alkylation with activated equilibrium FCC catalyst. 5,481,057, Cl. 585-722.000.
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- Belpont Company, Inc.: See—  
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- Bemurat, Marc F. Stimulation lead specially cardiac with auxiliary connection. 5,480,419, Cl. 607-115.000.
- Bendor, Giora A.: See—  
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- Benedini, Francesca: See—  
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- Ben-Haim, Shlomo, to Biosense, Inc. Apparatus for treating cardiac arrhythmias. 5,480,422, Cl. 607-122.000.
- Ben-Meir, Amos: See—  
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- Bennett, Sidney M.: See—  
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- Bennett X-Ray Technologies: See—  
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- Benton, Dudley J.: See—  
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- Berg, Michael: See—  
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- Bergmont, Albert, to National Semiconductor Corporation. Segment-erasable flash EPROM. 5,481,493, Cl. 365-185.180.
- Berger, J. Lee. Method and device for internal fixation of bone fractures. 5,480,400, Cl. 606-60.000.
- Bergkvist, Lennart; Gustafsson, Sten; Lindblom, Kjell; Anderson, Jan; Ekholm, Rolf; and Höglund, Ronny, to Kvaerner Pulpung Technologies Aktiebolag. Rotating screen drum with a stainless lining. 5,480,546, Cl. 210-404.000.
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- Bergman, Alan, to Sportsquip Limited. Adductor/abductor exercise device. 5,480,367, Cl. 482-122.000.
- Berlinghoff, Frank: See—  
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- Bernaques, Normand; and Sabourin, Ivan. Impact-absorbing barriers for highways. 5,480,255, Cl. 404-6.000.
- Berry, John F.: See—  
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- Bertagnoli, Rudolf, to MAN Ceramics GmbH. Fixedly adjustable intervertebral prosthesis. 5,480,442, Cl. 623-17.000.
- Bertino, Gian L.; and Rainero, Sergio, to Ing. C. Olivetti & C., S.p.A. Portable computer with verbal annotations. 5,481,645, Cl. 395-2.790.
- Bertolini, Giorgio: See—  
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- Bestmann, Günter, to Linotype-Hell AG. Method and apparatus for calibration of color values. 5,481,380, Cl. 358-504.000.
- Bethea, Bobby J. Knife sharpener. 5,480,345, Cl. 451-234.000.
- Betts, William L.; and Zuranski, Edward S., to AT&T Corp. Method and apparatus for automatically adapting the amount of warping in a system transmitting information through a non-linear channel. 5,481,567, Cl. 375-261.000.
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- Betzin, Klaus: See—  
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- Beutler, Robert R.: See—  
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- Bey, Roger, to Rotatrol AG. Butterfly type control valve. 5,480,123, Cl. 251-305.000.
- Reylin, Vladimir G.; Serce, Anthony D.; Showalter, Howard D. H.; Adams, Gerald E.; Fielden, Edward M.; Naylor, Matthew A.; and Stratford, Ian J., to Warner-Lambert Company. Process for preparing chiral [(2-bromoethyl)-amino]methyl-2-nitro-1H-imidazol-1-ethanol and related compounds. 5,481,000, Cl. 548-229.000.
- Beylis, Renato: See—  
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- Beyzavi, Kianoush: See—  
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- Bhagat, Gopal C., to Compaq Computer Corporation. Electrophotographic printing system having a moistureless electrophotographic development cartridge. 5,481,343, Cl. 355-259.000.
- Bhardwaj, Poonam: See—  
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- Bhat, Pervaje A.: See—  
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- Bickford, Harry R.; Coteus, Paul W.; and Matthew, Linda C., to International Business Machines Corporation. Process of multilayer conductor chip packaging. 5,480,841, Cl. 437-209.000.
- Bidan, Gérard: See—  
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- Bridgestone Corporation: See—  
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- Briggs, John E.: See—  
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- British Technology Group Ltd.: See—  
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- Morimoto, Yoshinari, 5,480,246, Cl. 400-615.200.
- Tanahashi, Naokazu, 5,480,248, Cl. 400-693.000.
- Yokoe, Yoshinori; and Hattori, Yuji, 5,481,367, Cl. 358-296.000.
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- Brown, Dale M., to General Electric Company. Combustion control for producing low NO<sub>x</sub> emissions through use of flame spectroscopy, 5,480,298, Cl. 431-79.000.
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- Bubniak, Józef: See—  
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- Buchanan, Charles M.: See—  
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- Bunton, Joe H., to March-Southwestern Corp. Mill sweep for pulverizers, 5,480,099, Cl. 241-119.000.
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- Burgess, Brian J.: See—  
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- Burkhart, Georg: See—  
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- Caddock Electronics, Inc.: See—  
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- Callas, Mike T. Sign holder, 5,480,116, Cl. 248-228.400.
- Callaway, Enoch, to University of California, Regents of the. Composition and method for treating nicotine craving in smoking cessation, 5,480,651, Cl. 424-464.000.
- Callaway Golf Company: See—  
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- Calsson, Staffan; and Persson, Torsten, to Autoliv Development AB. Gas generator arrangement, 5,480,618, Cl. 422-164.000.
- Cameron, Gordon M. Catalytic converter, 5,480,620, Cl. 422-171.000.
- Camp, Floyd E.: See—  
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- Campagnolo S.r.l.: See—  
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- Romano, Antonio, 5,479,776, Cl. 74-502.200.
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- Campana, Mireille; Allegre, François; Ardini, David; and Millot, Jean, to France Telecom Etablissement Autonome de Droit Public. Process for the authentication of a data processing system by another data processing system, 5,481,612, Cl. 380-25.000.
- Campbell, Edward I. Retractable electric plug, 5,480,314, Cl. 439-159.000.
- Canders, Wolf-Ruediger; Ueffing, Norbert; and Reuter, Klaus, to Anton Piller GmbH & Co. KG; and BOC AG. Power recovery plant, 5,481,145, Cl. 310-90.500.
- Canino, Sylvia J.: See—  
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- Canon Inc.: See—  
Kershaw, Natalie L.; Naylor, William C., Jr.; Pulver, Mark; and Brown, David R., 5,481,319, Cl. 348-699.000.
- Canon Kabushiki Kaisha: See—  
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- Arashima, Teruo; Sugitani, Hiroshi; Masuda, Kazuaki; Ikeda, Masami; Kasamoto, Masami; Suzuki, Seiji; Ishinaga, Hiroyuki; Kawai, Jun; and Kamiyama, Yuji, 5,481,289, Cl. 347-93.000.
- Aratani, Shuntaro; and Inoue, Hiroshi, 5,481,274, Cl. 345-98.000.
- Arimoto, Shinobu; Shimizu, Katsuchi; Komiya, Yutaka; Yoshinaga, Kazuo; Hayashi, Toshio; Nakai, Takehiko; Utagawa, Tsutomu; Nagase, Tetsuya; and Sasanuma, Nobuatsu, 5,481,334, Cl. 355-201.000.
- Arimoto, Shinobu, 5,481,365, Cl. 358-296.000.
- Egawa, Akira; and Aoshima, Chikara, 5,481,323, Cl. 354-106.000.
- Eguchi, Ken; Takamatsu, Osamu; and Kishi, Etsuro, 5,481,528, Cl. 369-126.000.
- Fujimoto, Makoto, 5,481,381, Cl. 358-505.000.
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- Furukawa, Hideaki; and Yamakawa, Tadashi, 5,480,131, Cl. 271-9.060.
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- Hieda, Teruo, 5,481,317, Cl. 348-674.000.
- Hosoya, Hideki, 5,481,519, Cl. 369-58.000.
- Inoue, Yuji, 5,480,494, Cl. 136-251.000.
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- Kashiwagi, Kenichi; and Matsumoto, Masami, 5,481,653, Cl. 395-100.000.
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- Kikkawa, Shoshi; Kanazawa, Manabu; and Tsukada, Isao, 5,480,243, Cl. 400-354.000.
- Kimura, Kenichi, 5,481,394, Cl. 359-234.000.
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- Kozuka, Hiraku; Sugawa, Shigetoshi; and Shimizu, Hisae, 5,481,124, Cl. 257-185.000.
- Matsubayashi, Kazuhiro, 5,481,626, Cl. 382-189.000.
- Matsugu, Masakazu; Saitoh, Kenji; Hattori, Jun; and Houryu, Sakae, 5,481,363, Cl. 356-401.000.
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- Nagao, Yoshinori; Amemiya, Koji; Izumizaki, Masami; and Sasanuma, Nobuatsu, 5,481,340, Cl. 355-246.000.
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- Sakurai, Shigeki; and Takashima, Shoichi, 5,481,605, Cl. 379-243.000.
- Sato, Hideaki, 5,481,249, Cl. 340-825.060.
- Tachibana, Shunichi; and Saito, Hitoshi, 5,481,374, Cl. 358-444.000.
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- Tachihara, Masayoshi, 5,481,287, Cl. 347-62.000.
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- Washizawa, Teruyoshi; and Sakai, Kunihiro, 5,481,521, Cl. 369-99.000.
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- Cant, Jonathan R.: See—
- Goodlad, John S.; Cant, Jonathan R.; and Harford, Stephen, 5,480,973, Cl. 530-386.000.
- Caradonna, John: See—
- Orr, Carl C.; Caradonna, John; Edmundson, Robert J.; and Jacks, Terry C., 5,480,632, Cl. 424-63.000.
- Carberry Corporation: See—
- Pordy, William T., 5,480,670, Cl. 426-580.000.
- CarboMedics, Inc.: See—
- Ogilvie, William F., 5,480,425, Cl. 623-2.000.
- Cardona, Joseph C.; and McGrath, Michael C. Data storage device with removable cartridge having shutter unlocking and disk unrestraining arrangements, 5,481,420, Cl. 360-99.060.
- Carey, Jay F., II; and Zamanzadeh, Mehrooz, to Louis Berkman Company, The. Hot dip terne coated roofing material, 5,480,731, Cl. 428-648.000.
- Carey, Joseph, to Townsend Engineering Company. Meat slicing machine and method of use thereof, 5,481,466, Cl. 364-474.090.
- Caris, Hubertus A.; and Dost, Paulus J. M., to Fluor Corporation. Switched capacitance voltage multiplier with commutation, 5,481,447, Cl. 363-60.000.
- Carisch, Claudia: See—
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- Carlberg, Stanley B. Joist cap, 5,479,750, Cl. 52-300.000.
- Carlisle, Daniel A.; and Maxwell, G. Patrick, to McGhan Medical Corporation. Shape-retaining shell for a fluid filled prosthesis, 5,480,430, Cl. 623-8.000.
- Carney, Francis J.; Carney, George F.; and Mitchell, Douglas G., to Motorola, Inc. Electrical interconnect and method for forming the same, 5,480,835, Cl. 437-189.000.
- Carney, George F.: See—
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- Carney, James M.: See—
- Siahpolo, Hassan; Antonuccio, Robert S.; Carney, James M.; Hoornaert, Daniel F.; and Spano, Joseph M., 5,481,431, Cl. 361-685.000.
- Carbolante, Francesco: See—
- Rohrbaugh, Mark E.; and Carbolante, Francesco, 5,481,167, Cl. 318-254.000.
- Carre, Jean-Yves: See—
- Maze, Gwendael; Poulain, Marcel; Carre, Jean-Yves; Soufiane, Abdelouhed; and Messaddeq, Younes, 5,480,845, Cl. 501-40.000.
- Carrier Corporation: See—
- Dobmeier, Thomas J.; Jomard, Thierry; and Penge, Dennis, 5,479,784, Cl. 62-117.000.
- Carroll, James E.; and Lambert, Ronald L., to Chrysler Corporation. Multiple stamping dies with cumulative stamping markers and method of stamping parts, 5,479,853, Cl. 101-32.000.
- Carsten, Bruce W.; and Davidson, Christopher D., to Argus Technologies Ltd. Compound inductors for use in switching regulators, 5,481,238, Cl. 336-214.000.
- Carter, James C., to Chrysler Corporation. Heat dissipation from high power semiconductor in an electrical vehicle, 5,481,433, Cl. 361-690.000.
- Carter, Steven B.; and McFerd, Thomas A., to Carter, Steven B. Air-conditioned booth with vending unit, 5,479,787, Cl. 62-231.000.
- Carter, William T., Jr.; Sawyer, Thomas F.; Benz, Mark G.; and Braaten, Mark E., to General Electric Company. Gas atomizer with reduced backflow, 5,480,097, Cl. 239-296.000.
- Cartmell, James V.; Sturtevant, Wayne R.; Wolf, Michael L.; and Allaire, Michael J., to New Dimensions in Medicine, Inc. Wound dressing having a roll configuration, 5,480,377, Cl. 602-48.000.
- Carton, Bruce M. Reversible scrub brush and scraper, 5,479,673, Cl. 15-111.000.
- Casas-Perez, Ivan A., to Biogiga AB. Feed additive which consists of whey and *Lactobacillus reuteri* and a method of delivering *Lactobacillus reuteri* to the gastrointestinal tract, 5,480,641, Cl. 424-93.450.
- Case Corporation: See—
- Mozingo, Robert E., 5,480,276, Cl. 414-685.000.
- Case Western Reserve University: See—
- Monnier, Vincent M.; and Sell, David R., 5,480,807, Cl. 436-86.000.
- Casey, Jon A.; Golland, David B.; Gupta, Dinesh; Herron, Lester W.; Humenik, James N.; Lombardi, Thomas E.; Knickerbocker, John U.; Sullivan, Robert J.; and Wylder, James R., to International Business Machines Corporation. Process for producing circuitized layers and multilayer ceramic sub-laminates and composites thereof, 5,480,503, Cl. 156-89.000.
- Cash, Glenn L.; Civanlar, Mehmet R.; Gaglianillo, Robert D.; and Swicker, Donald B., to AT&T Corp. Multipoint digital video communication system, 5,481,297, Cl. 348-13.000.
- Cash, Glenn L.; and Civanlar, Mehmet R., to AT&T Corp. Method of and apparatus for the transmission of high and low priority segments of a video bitstream over packet networks, 5,481,312, Cl. 348-466.000.
- Casio Computer Co., Ltd.: See—
- Kim, Hiroki, 5,481,264, Cl. 341-20.000.
- Kita, Kazunori, 5,481,506, Cl. 368-10.000.
- Satake, Teruyuki, 5,481,663, Cl. 395-146.000.
- Cassidy, Joseph P.; Meyer, James L.; and Meyer, David J. Automated tri-fold bed, 5,479,665, Cl. 5-613.000.
- Caterpillar Inc.: See—
- Brown, Richard L.; and Dust, Maurice J., 5,481,141, Cl. 307-106.000.
- Gibson, Dennis H.; Heffer, Gregory N.; Maley, Dale C.; and Shinogle, Ronald D., 5,479,901, Cl. 123-472.000.
- Hilbert, Mark J.; Parupalli, Prasad V.; and Rettig, Mark E., 5,480,364, Cl. 477-107.000.
- Marcott, Tony L.; Branch, Matthew G.; and Nippert, Andrew H., 5,481,187, Cl. 324-207.160.
- Cathaud, Muriel: See—
- Hascoet, Gérard; LaCoste, Francois; Cathaud, Muriel; Jacomino, Jean-Marie; Devonec, Marian; and Perrin, Paul, 5,480,417, Cl. 607-101.000.
- Cathignol, Dominique; Lavandier, Bernard; and Muchada, Ranul, to Institut National de la Sante et de la Recherche Medicale. Ultrasonic method and apparatus for flow measurement, 5,479,928, Cl. 128-662.060.
- Catlin, Timothy J. O.: See—
- Nguyen, Frank T.; Anderson, David R.; and Catlin, Timothy J. O., 5,481,666, Cl. 395-159.000.
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- Cauffiel, Ford B. Table with elongate support and base plate for use with seating apparatus, 5,479,865, Cl. 108-42.000.
- Cavé-Jansen, Johanna M. A. T.: See—
- Hendrikx, Remigius V.; and Cavé-Jansen, Johanna M. A. T., 5,479,682, Cl. 24-67.110.
- Caveza, Martin J., to Mattel, Inc. Toy for making simulated french fries from chewing gum sticks, 5,480,335, Cl. 446-75.000.
- Cazaux, Yvon; Coutures, Jean-Louis; Dautriche, Pierre; and Bouchariat, Gilles, to Thomson Composants Militaires et Spatiaux. Method of detecting electromagnet radiation in a large-sized pixel image detector having matrices of small-sized photomos pixel network, 5,481,301, Cl. 348-218.000.
- Central Glass Company, Ltd.: See—
- Takematsu, Tetsuo; Kume, Takashi; Yamaoka, Shoji; Komata, Takeo; Suzuki, Kiyoshi; Ikeda, Yukio; Kawamura, Matsue; Koda, Yumiko; and Mori, Kaoru, 5,481,022, Cl. 560-45.000.
- Centre National de la Recherche Scientifique: See—
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- Thal, Claude; Quirosa-Guillou, Catherine; Potier, Pierre; Renko, Dolor; Zanetta, Jean-Pierre; Portier, Marie-Madeleine; Sensenbrenner, Monique; Koenig, Janine; and Koenig, Herbert, 5,480,884, Cl. 514-275.000.
- Centrum Merchanzicji Gornictwa "Komag": See—
- Diederichs, Ryszard; Sznappa, Helmut; and Bubniak, Józef, 5,480,195, Cl. 285-184.000.
- Ceram-Eng Pty Ltd.: See—
- Derriman, Lindsay E.; and Cortese, Stephen M. A., 5,480,847, Cl. 501-128.000.
- Ceramtec, Inc.: See—
- Elangovan, Singaravelu; Khandkar, Ashok C.; and Hartvigsen, Joseph J., 5,480,738, Cl. 429-32.000.
- Nachlas, Jesse A.; Powers, Kelly B.; and McJunkin, James R., 5,479,700, Cl. 29-825.000.
- Cerberus Institute for Research and Development, Inc.: See—
- Forrester, David J., 5,479,736, Cl. 42-72.000.
- Cerestar Holding B.V.: See—
- de Troostembergh, Jean-Claude M. G.; Beck, Roland H. F.; and De Wannemaeker, Bénédicte L. T., 5,480,785, Cl. 435-104.000.

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- Chai, Stephen T.: See—
- Sypula, Donald S.; Badesha, Santokh S.; Chang, Shu; Knapp, John F.; Trott, Robert E.; Chai, Stephen T.; Till, Henry R.; and Mammino, Joseph, 5,481,341, Cl. 355-256.000.
- Challenge Printing Co., The: See—
- Gelsinger, Timothy L., 5,480,370, Cl. 493-475.000.
- Chambers, Lloyd L., IV, to Salient Software, Inc. Method and apparatus for performing direct read of compressed data file, 5,481,701, Cl. 395-600.000.
- Chambers, Richard D.; Greenhall, Martin P.; and Wright, Antony P., to Dow Corning Corporation. Telechelic telomers of chlorotrifluoroethylene, 5,481,046, Cl. 568-684.000.
- Chan, Yuen H.: See—
- Reohr, William R.; Chan, Yuen H.; and Lu, Pong-Fei, 5,481,500, Cl. 365-203.000.
- Chandler, Michael A.: See—
- Cope, Frederick O.; Richards, Ernest W.; Mazer, Terrence B.; Abbruzzese, Bonnie C.; Snowden, Gregory A.; and Chandler, Michael A., 5,480,872, Cl. 514-21.000.
- Chandra, Grish; and Michael, Keith W., to Dow Corning Corporation. Hermetic protection for integrated circuits, 5,481,135, Cl. 257-701.000.
- Chang, Chin-Shu. Quick release having an anti-theft device, 5,479,836, Cl. 74-551.100.
- Chang, Chuan-Ming: See—
- Jou, Ming-Jiunn; Chang, Chuan-Ming; Lee, Bing-Jye; and Lin, Jyh-Feng, 5,481,122, Cl. 257-9.000.
- Chang, Ming-Bing, to National Semiconductor Corporation. Method of fabricating source-coupling, split-gate, virtual ground flash EEPROM array, 5,480,821, Cl. 437-43.000.
- Chang, Paul; Wolaver, Dan H.; and Mitchell, J. Howell, Jr., to Tektronix, Inc. Phase modulator having individually placed edges, 5,481,230, Cl. 332-112.000.
- Chang, Qing: See—
- Mills, Andrew; and Chang, Qing, 5,480,611, Cl. 422-55.000.
- Chang, Shu: See—
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- Chao, Chia-Chiang; English, Robert M.; Jacobson, David M.; Stepanov, Alexander A.; and Wilkes, Andrew J., to Hewlett-Packard Company. High performance multiple-unit electronic data storage system with checkpoint logs for rapid failure recovery, 5,481,694, Cl. 395-439.000.
- Chapoy, Larry L.: See—
- Pozzoli, Massimo; Vita, Giandomenico; and Chapoy, Larry L., 5,480,721, Cl. 428-422.000.
- Chappell, Terry I.: See—
- Henkels, Walter H.; Hwang, Wei; and Chappell, Terry I., 5,481,495, Cl. 365-189.020.
- Charles Machine Works, Inc., The: See—
- Deken, Arthur D.; Franklin, James E.; and Sewell, Cody L., 5,479,728, Cl. 37-142.500.
- Chartier, Pascal: See—
- Kruger, Albert A.; and Chartier, Pascal, 5,480,917, Cl. 522-33.000.
- Chatters, Tom C.: See—
- Pouet, Bruno F.; Chatters, Tom C.; and Krishnaswamy, Sridhar, 5,481,356, Cl. 356-35.500.
- Chazelas, Jean: See—
- Bonniau, Philippe; Estang, Bernard; Perrier, Bernard; Chazelas, Jean; and Lecucllet, Jérôme, 5,479,828, Cl. 73-800.000.
- Checovich, William J.: See—
- Mosher, Deane F., Jr.; and Checovich, William J., 5,480,877, Cl. 514-134.000.
- Cheesman, Guy W., III: See—
- Imhoff, Scott A.; Woolfson, Martin G.; Bendor, Giora A.; Cheesman, Guy W., III; Brinsley, James R.; and Morici, Martin M., 5,481,269, Cl. 342-90.000.
- Cheffey, Dean C., to Hutchens Industries, Inc. Slider locking mechanism, 5,480,171, Cl. 280-149.200.
- Chemie Linz Gesellschaft m.b.H.: See—
- Müller, Martin; Stern, Gerhard; and Rössler, Markus, 5,481,035, Cl. 564-61.000.
- Chen, Chen-Long. Rotary internal combustion engine and compressor, 5,479,887, Cl. 123-203.000.
- Chen, Daniel T.: See—
- Blackwell, John A.; Chen, Daniel T.; Alband, Todd D.; and Perman, Craig A., 5,481,058, Cl. 585-833.000.
- Chen, Frank J.: See—
- Chung, Tze-Chiang; Chen, Frank J.; Stanat, Jon E.; and Kumar, Alok, 5,481,054, Cl. 585-459.000.
- Chen, Ling: See—
- Liao, Siu-han; and Chen, Ling, 5,480,830, Cl. 437-58.000.
- Chen, Michael. Electrical jack assembly for modular plugs, 5,480,326, Cl. 439-607.000.
- Chen, Ping; Cheng, Peter T. W.; Spergel, Steven H.; Barrish, Joel C.; Thottathil, John K.; Zahler, Robert; Polniaszek, Richard P.; and Wang, Xuebao, to Bristol-Myers Squibb Company. Process for preparing N-protected amino acid  $\alpha$ -halomethyl ketones and alcohols from N-protected amino acid esters, 5,481,011, Cl. 549-514.000.
- Chen, Sen-Tsuen: See—
- Blakeslee, Samuel N.; and Chen, Sen-Tsuen, 5,481,501, Cl. 367-57.000.
- Chen, Thomas P.: See—
- Snead, David E.; Smalley, Dennis R.; Cohen, Adam L.; Allison, Joseph W.; Vorgitch, Thomas J.; and Chen, Thomas P., 5,481,470, Cl. 364-468.000.
- Chen, Ting-Hsing, to Far Great Plastics Industrial Co., Ltd. Quick adjustable fastening means to adjust the position of a gaiter on a roller skate, 5,480,168, Cl. 280-11.220.
- Chen, Wen S. Multi-purpose tool for IC, 5,479,669, Cl. 7-107.000.
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- Claiborne, Christopher F.: See—  
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- Co.Ri.M. Me.: See—  
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- Coble, John E., to Environmental Blades, Inc. Rotary filament assembly and method. 5,479,763, Cl. 56-12,700.
- Cocca, J. David; and Dunsmore, Clay A., to Eastman Kodak Company. Control system for camera with multiple opto-sensors. 5,481,331, Cl. 354-412,000.
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- Coe, Robert P., to Bennett X-Ray Technologies. Automatic position control system for x-ray machines. 5,481,586, Cl. 378-146,000.
- Coffey, Lawrence G.; and Verity, Steve B. Power saving device for video screen. 5,481,299, Cl. 348-123,000.
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- Cohen, William W., to AT&T Corp. Biased learning system. 5,481,650, Cl. 395-77,000.
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- Collier, Susan J. Toothbrush holder. 5,480,038, Cl. 211-65,000.
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- Brown, Alan E.; and Lin, David S., 5,481,730, Cl. 395-750,000.
- Murphy, Richard D., 5,479,684, Cl. 29-25,350.
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- Consolidated Natural Gas Service Company, Inc.: See—  
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- Cooper, Charlotte L.: See—  
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- Cordis Corporation: See—  
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- Weier, Steven D., 5,479,938, Cl. 128-772,000.
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- Cornell, Daniel R.: See—  
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- Corzine, John E. Runaway halyard stop. 5,479,870, Cl. 114-102,000.
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- Costiner, Sorin: See—  
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- Cottam, Alan, to Profit Improvement and Engineering Limited. Belt filters. 5,480,544, Cl. 210-304,000.
- Cotter, Patrick J., to Diebolt International, Inc. Gas spring with threaded mount and method of producing the same. 5,480,128, Cl. 267-64,110.
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- Couladouros, Elias A.: See—  
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- Crow, Mary K.: See—  
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- Cunningham, James K. Thrust bearing for use in downhole drilling systems. 5,480,233, Cl. 384-308.000.
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- Cynamon, Sam. Multiple victim rescue device. 5,480,332, Cl. 441-80.000.
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Breuer, Hans-Jürgen; Cyron, Theodor; Maus, Wolfgang; Swars, Helmut; and Wieres, Ludwig, 5,480,621, Cl. 422-174.000.
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- Daewoo Electronics Co., Ltd.: See—  
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- Dai Nippon Printing Co., Ltd.: See—  
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- Daido Metal Company Ltd.: See—  
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- Daigger, Glen T.; Stephenson, Joseph P.; Nolasco, Daniel A.; Stafford, Dalton R.; and Kaupp, Douglas M., to CH2M Hill, Inc. Wastewater biological phosphorus removal process. 5,480,548, Cl. 210-605.000.
- Daichi Pharmaceutical Co., Ltd.: See—  
Kodama, Kazuhisa; Hirayama, Atsushi; and Masayasu, Hiroyuki, 5,480,888, Cl. 514-310.000.
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- Dainis, George A., III: See—  
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- Hirose, Haruomi, 5,479,831, Cl. 73-862.440.
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- Dames & Moore: See—  
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- Danna, Michael L. Wildlife hunting and observation blind constructed from a salvaged liquid storage tank. 5,479,738, Cl. 43-1.000.
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- Darrow, Robert D.: See—  
Dumoulin, Charles L.; and Darrow, Robert D., 5,479,925, Cl. 128-653.300.
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- Data General Corporation: See—  
Gallo, Paul S.; Goodman, R. W. Benjamin; Krantz, Lawrence L.; McLoughlin, Kathleen A.; and Wagner, Eric M., 5,481,681, Cl. 395-325.000.
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- Davies, Richard G.; and Thornton, Peter H., to Ford Motor Company. Automotive vehicle frame. 5,480,189, Cl. 280-797.000.
- Davis, Alvah B.: See—  
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- Davis, Warren F. Autodyne motion sensor. 5,481,266, Cl. 342-28.000.
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- Dawson, Craig R.: See—  
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- Day, Paul R.: See—  
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- Deadmond, Richard S.: See—  
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- Delaware Capital Formation, Inc.: See—  
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- Deljevic, Zeljko: See—  
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- Dell, Colin P.: See—  
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- della Bruna, Costantino: See—  
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- DeMarsh, Peter L.; and Crawford, William W., to Senior Engineering Company. Method of plugging a heat exchanger tube and plug therefor. 5,479,961, Cl. 138-97.000.
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- DeSantis, Francis J.: See—  
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- Desantis, Romano M., to Corporation de l'Ecole Polytechnique. Dual loop PID configuration. 5,481,453, Cl. 364-162.000.
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- Design Tool, Inc.: See—  
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- deSolms, S. Jane: See—  
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- Deutsch, Dennis: See—  
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- Deutsche Aerospace Airbus GmbH: See—  
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- Deutsche Aerospace Airbus GmbH: See—  
Fischer, Heinz; Mueller, Wolfgang; and Schmidt, Ruediger, 5,479,983, Cl. 165-22.000.
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Diamant Boart, Inc.: See—  
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Dimeff, John. Circuit for generating a current linearly proportional to displacement of a movable member. 5,481,201, Cl. 324-720.000.

Dinca, Milan; and Moisescu, Gheorghe V., to Master S.A. Rotary distributor fuel injection apparatus. 5,480,293, Cl. 417-462.000.

Dinkelmann, Friedrich: See—  
Bothner, Jakob; and Dinkelmann, Friedrich, 5,479,770, Cl. 57-303.000.

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Dirmeyer, Josef: See—  
Roth, Michael; Schneider, Karl; Liebich, Ernst; Dirmeyer, Josef; Wagner, Egbert; and Moerkerke, Peter, 5,480,328, Cl. 439-607.000.

Di Troia, Gary W., to Bumdy Corporation. Limiter indicator. 5,481,239, Cl. 337-206.000.

Dix, Gregory F.: See—  
Tomasiak, Mark J.; Dix, Gregory F.; and Moody, John F., 5,480,588, Cl. 261-72.100.

Dixon, Robert C.: See—  
Brubaker, Curtis M.; Wykes, Harry B.; Pierce, Harold D.; Dixon, Robert C.; and Post, Lawrence H., 5,481,257, Cl. 340-825.690.

Dobbin, Paul S.: See—  
Hider, Robert C.; Singh, Surinder; Tilbrook, Gary S.; and Dobbin, Paul S., 5,480,894, Cl. 514-348.000.

Dobbs, Suzanne W.: See—  
Sharma, Mahendra K.; Dobbs, Suzanne W.; and Hiller, John J., 5,480,920, Cl. 523-161.000.

Dobmeier, Thomas J.; Jomard, Thierry; and Penge, Dennis, to Carrier Corporation. Refrigerant distribution device. 5,479,784, Cl. 62-117.000.

Dobson, David R.: See—  
Brunavs, Michael; Dell, Colin P.; Dobson, David R.; Gallagher, Peter T.; Hicks, Terence A.; Owton, William M.; and Smith, Colin W., 5,480,873, Cl. 514-33.000.

Dockser, Kenneth A., to VLSI Technology, Inc. Floating-point processor with apparent-precision based selection of execution-precision. 5,481,686, Cl. 395-375.000.

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Nagane, Hiromichi; Dodge, Alexandre; Froger, Marie-Helene; Truffaut, Christophe; and Michel, Stéphane, 5,480,135, Cl. 271-176.000.

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Doi, Hiroyuki; Yasuda, Ken; Kashimura, Tetsuo; and Fukui, Yutaka, to Hitachi, Ltd. Gas turbine and gas turbine nozzle. 5,480,283, Cl. 415-199.500.

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Gruener, George P.; and Doidge, John A., Jr., 5,479,930, Cl. 128-662.060.

Doiron, Timothy J.; Dreon, Steven T.; and Priest, Mark D., to Ericsson Inc. Digital radio transceiver with encrypted key storage. 5,481,610, Cl. 380-21.000.

Dollar, Jenny L.: See—  
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Dollar, Travis; and Dollar, Jenny L. Poultry feed restraint. 5,479,891, Cl. 119-715.000.

Dombrowski, Edward J.; and Jones, Robert L., to Polaroid Corporation. Thermographic recording film including improved washcoat. 5,480,855, Cl. 503-207.000.

Doná, Giancarlo: See—  
Sala, Alberto; Barani, Roberto; Benedini, Francesca; Bertolini, Giorgio; Doná, Giancarlo; Gromo, Gianni; and Levi, Silvio, 5,480,882, Cl. 514-224.200.

Donald, James B.; Nuttall, Albert H.; and Wilson, James H., to United States of America, Navy. Tracking system and method. 5,481,505, Cl. 367-130.000.

Donelson, Michael E.: See—  
Fagerburg, David R.; and Donelson, Michael E., 5,480,926, Cl. 524-86.000.

Donovan, Daniel J.; McSherry, David D.; and Fredell, Dale L., to Ecolab Inc. Stable antimicrobial dialdehyde composition and methods of use. 5,480,643, Cl. 424-409.000.

Doppstadt, Werner. Mobile material processing machine with tandem axle. 5,480,098, Cl. 241-101.760.

Dorsch, Walter: See—  
Wagner, Hildebert; Dorsch, Walter; Stuppner, Hermann; and Antus, Sandor, 5,481,043, Cl. 568-309.000.

Dorst, Leendert: See—  
Rosar, Madeleine E.; Trovato, Karen I.; Dorst, Leendert; and Warmerdam, Thomas P. H., 5,481,111, Cl. 250-311.000.

Doshi, Bharat T.: See—  
Baldwin, John H.; Doshi, Bharat T.; and Dravida, Subrahmanyam, 5,481,544, Cl. 370-94.100.

Dost, Paulus J. M.: See—  
Caris, Hubertus A.; and Dost, Paulus J. M., 5,481,447, Cl. 363-60.000.

Dou, Xiaoming; and Uenoyama, Harumi, to Kyoto Daiichi Kagaku Co., Ltd. Apparatus and method for measuring concentrations of components with light scattering. 5,481,113, Cl. 250-341.100.

Dougald, Colin D.: See—  
McCombs, David E.; Dougald, Colin D.; and Rapp, Martin L., 5,480,538, Cl. 210-151.000.

Douglas, Homer; Aberle, Marshall L.; Parker, Phillip M.; Pinch, Daniel R.; and Schwartzkopf, Robert A., to Sassy, Inc. High chair apparatus for attachment to a table or the like. 5,480,211, Cl. 297-174.000.

Douglass, Karl J. Attachable container particularly suited for ambulatory aids. 5,480,079, Cl. 224-551.000.

Douglas, Frederick; Marsh, Brian D.; and Krishnan, Parameshwaran, to Panasonic Technologies, Inc. Method for managing the power distributed to a disk drive in a laptop computer. 5,481,733, Cl. 395-750.000.

Douta, Hisayo: See—  
Kawai, Katsuhiko; Douta, Hisayo; and Ikeda, Hiroshi, 5,479,897, Cl. 123-339.200.

Dow Chemical Company, The: See—  
Athey, Phillip S.; Wilson, David A.; and Crump, Druce K., 5,481,018, Cl. 558-442.000.

Kiefer, Garry E.; and Simon, Jaime, 5,480,990, Cl. 540-465.000.

Lopez, Leonardo C.; and Pelletier, Ronald R., 5,480,603, Cl. 264-131.000.

Pawloski, Chester E.; and Nader, Bassam S., 5,480,568, Cl. 252-46.700.

Sitzema, Ronald L.; Troppman, Dale A.; and Motter, Gregg A., 5,481,445, Cl. 362-308.000.

Dow Corning Corporation: See—  
Bank, Howard M.; and Decker, Gary T., 5,481,016, Cl. 556-479.000.

Chambers, Richard D.; Greenhall, Martin P.; and Wright, Antony P., 5,481,046, Cl. 568-684.000.

Chandra, Grish; and Michael, Keith W., 5,481,135, Cl. 257-701.000.

Duffee, Loren D.; and Schmidt, Randall G., 5,480,573, Cl. 252-78.300.

Gentle, Thomas M.; and Gomowicz, Gerald A., 5,480,930, Cl. 524-414.000.

Graiver, Daniel; Hough, Eric J.; and Lomas, Arnold W., 5,481,014, Cl. 556-401.000.

Liles, Donald T.; and Murray, David L., 5,480,919, Cl. 522-86.000.

Smith, Janet M., 5,480,637, Cl. 424-78.020.

Dow Corning France S.A.: See—  
Agnadisch, Louis M. J.; and Etienne, Alain, 5,480,653, Cl. 424-486.000.

Dow Corning Toray Silicone Co., Ltd.: See—  
Ishida, Koichi; Nakagawa, Teruyuki; and Watanabe, Takehiro, 5,480,597, Cl. 264-40.400.

Nomura, Toshihiko, 5,481,015, Cl. 556-405.000.

Dow Deutschland Inc.: See—  
Walter, Hilger A.; Hönen, Herwart; and Gallus, Heinz E., 5,479,818, Cl. 73-116.000.

Dowbrands L.P.: See—  
Bliss, Gary S., 5,479,762, Cl. 53-490.000.

DowElanco: See—  
Orvik, Jon A.; and Shiang, Dawn, 5,480,991, Cl. 544-263.000.

Dowell, George W., III: See—  
Coudon, Thomas W. L.; and Dowell, George W., III, 5,479,869, Cl. 114-26.000.

Downing, William J. Football with bladder protective panel. 5,480,144, Cl. 273-65.00A.

Dr. Fischer Aktiengesellschaft: See—  
Fischer, Gerhard; Warke, Ulrich; and König, Herbert, 5,480,373, Cl. 600-14.000.

Dr. Helbig GmbH & Co Orthopädische Produkte KG: See—  
Weber-Unger, Georg, 5,480,429, Cl. 623-7.000.

Draenert, Klaus. Prestressed surgical network. 5,480,437, Cl. 623-16.000.

Drägerwerk AG: See—  
Buchtal, Ralf, 5,479,919, Cl. 128-202.270.

Kummerfeld, Ryszard, 5,479,958, Cl. 137-357.000.

Drago, Joseph A.: See—  
Keating, Kent G.; and Drago, Joseph A., 5,479,972, Cl. 144-287.000.

Draucker, James B.; Hansen, Charles D., Jr.; Newsome, Reginald W.; and Pham, Xuan M., to Philip Morris Incorporated. Step-shaped innerframe for use with short cigarettes and hinged lid box. 5,480,025, Cl. 206-246.000.

Drauscke, Stefan: See—  
Birkholz, Michaela; Drauscke, Stefan; and Hörber, Gerhard, 5,480,610, Cl. 422-26.000.

Dravida, Subrahmanyam: See—  
Baldwin, John H.; Doshi, Bharat T.; and Dravida, Subrahmanyam, 5,481,544, Cl. 370-94.100.

Dreon, Steven T.: See—  
Schneuing, Ralf; and Janzen, Paul, 5,480,020, Cl. 198-465.400.

Doiron, Timothy J.; Dreon, Steven T.; and Priest, Mark D., 5,481,610, Cl. 380-21.000.

Dressel, Philip F.: See—  
Ellis, Larry D.; Dressel, Philip F.; and van Deutekom, Cornelis A., 5,480,661, Cl. 426-73.000.

Dreyer, Juergen: See—  
Schoettle, Klaus; Dreyer, Juergen; Pavelka, Bozidar; and Schmidts, Kurt, 5,481,426, Cl. 360-132.000.

Drouin, Jehan-Yves: See—  
Bru-Magniez, Nicole; Cordoliani, Jean-Francois; Thauvin, Gérard; and Drouin, Jehan-Yves, 5,480,652, Cl. 424-466.000.

Druker, Samuel: See—  
Silver, William M.; Druker, Samuel; Romanik, Philip; and Arbogast, Carroll, 5,481,712, Cl. 395-700.000.

Du Pont de Nemours, E. I., and Company: See—  
Alms, Gregory R.; and Samuels, Michael R., 5,481,033, Cl. 562-486.000.

Amuti, Kofi S., 5,480,856, Cl. 504-236.000.

Ayers, Timothy A.; and Rajanbabu, Thaliyl V., 5,481,006, Cl. 549-206.000.

Ballman, Albert A.; and Cheng, Lap K., 5,480,569, Cl. 252-62.900.

Frances, Arnold, 5,480,941, Cl. 525-178.000.

Frankosky, Michael S.; and Snyder, Adrian C., 5,480,710, Cl. 428-288.000.

Kirchner, Jack R., 5,481,027, Cl. 560-160.000.

Minor, Barbara H., 5,480,572, Cl. 252-67.000.

Petrov, Viacheslav A.; and Krespan, Carl G., 5,481,028, Cl. 560-184.000.

Rao, V. N. Mallikarjuna, 5,481,051, Cl. 570-176.000.

Vaidyanathan, Akhileswar G., 5,481,620, Cl. 382-169.000.

Du Pont Merck Pharmaceutical Company, The: See—  
Ciganek, Engelbert; Tam, Sang W.; and Wright, Ann S., 5,480,892, Cl. 514-323.000.

Du, Shao J.: See—  
Hew, Choy L.; and Du, Shao J., 5,480,774, Cl. 435-6.000.

Duback, Jeffrey E.; Vaughter, Eric D.; and Parker, A. Bruce, to Parker Medical Associates. Custom body protective pad with cure-retarding storage system. 5,480,376, Cl. 602-8.000.

Duck, Gary S.: See—  
Cheng, Yihao; Cutts, Timothy P.; Duck, Gary S.; and Garrett, Carey M., 5,481,402, Cl. 359-498.000.

Dudley, Randall W. Resilient exercise device wherein user's legs provide a counter force to exercise of user's arms. 5,480,369, Cl. 482-125.000.

Duecoffre, Volker; Flosbach, Carmen; Schubert, Walter; Krumme, Manfred; Stephan, Werner; and Sadowski, Fritz, to Herberts Gesellschaft mit beschränkter Haftung. Emulsifier-free coating agent, manufacture and use thereof. 5,480,936, Cl. 524-839.000.

Duke University: See—

Bonaventura, Joseph; DeAngelo, Joseph; and Kilbourn, Robert G., 5,480,866, Cl. 514-6.000.

Dullien, Vivian K., to Biex, Inc. Method for prediction of premature labor. 5,480,776, Cl. 435-7.900.

Dumoulin, Charles L.; and Darrow, Robert D., to General Electric Company. Magnetic resonance (MR) angiography in a low-field imaging magnet. 5,479,925, Cl. 128-653.300.

Duncan, Daron D.; and Duncan, Patricia R. Mannequin. 5,480,074, Cl. 223-66.000.

Duncan, Laurelee A.: See—  
Addor, Roger W.; Furch, Joseph A., III; and Duncan, Laurelee A., 5,480,902, Cl. 514-422.000.

Duncan, Patricia R.: See—  
Duncan, Daron D.; and Duncan, Patricia R., 5,480,074, Cl. 223-66.000.

Duncan, Samuel H.: See—  
Wade, Paul C.; Duncan, Samuel H.; and Smelser, Donald W., 5,481,555, Cl. 371-57.200.

Dunfield, John C.; Knoche, Steven C.; and Kloeppel, Klaus D., to Seagate Technology, Inc. Wire guide and adhesive retaining ring for disc drive spindle motor. 5,481,144, Cl. 310-71.000.

Dunne, Simon, to Ambi-Rad Limited. Space heating appliances. 5,479,912, Cl. 126-91.00A.

Dunsmore, Clay A.: See—  
Cocca, J. David; and Dunsmore, Clay A., 5,481,331, Cl. 354-412.000.

Dupoiron, François; Gagnepain, Jean-Christophe; and Verneau, Michel, to Creusot-Loire Industrie. Austenitic stainless steel with high resistance to corrosion by chloride and sulphuric media and uses. 5,480,609, Cl. 420-45.000.

Dupont-Mitsu Fluorochemicals Co., Ltd.: See—  
Urano, Tetsuo; Miyaji, Hiroshi; Ogura, Masatsune; Shimoda, Tetsuya; and Ishikawa, Kanaki, 5,480,584, Cl. 252-384.000.

Dupree, Paul L.: See—  
Ritter, Ann M.; Jackson, Melvin R.; Dupree, Paul L.; Wemple, Donald N., Jr.; and Hughes, John R., 5,480,468, Cl. 75-228.000.

Dupuis, Joël: See—  
Stubler, Jérôme; Ladret, Patrick; and Dupuis, Joël, 5,479,671, Cl. 14-22.000.

Durametallic Corporation: See—  
Cook, Thomas E., 5,479,718, Cl. 33-412.000.

Durfee, Loren D.; and Schmidt, Randall G., to Dow Corning Corporation. Electrotheological fluid compositions containing alkylmethylsiloxanes. 5,480,573, Cl. 252-78.300.

Dürkopp Adler Aktiengesellschaft: See—  
Schneuing, Ralf; and Janzen, Paul, 5,480,020, Cl. 198-465.400.

Dust, Maurice J.: See—  
Brown, Richard L.; and Dust, Maurice J., 5,481,141, Cl. 307-106.000.

Dutia, Minu D.: See—  
Epstein, Joseph W.; Birnberg, Gary H.; Dutia, Minu D.; Claus, Thomas H.; and Largis, Elwood E., 5,480,908, Cl. 514-465.000.

Duve, Hans, to Huls Aktiengesellschaft. Method for determining decomposable organic carbon compounds present in a gaseous phase. 5,480,806, Cl. 436-52.000.

Duwell, Ernest J.: See—  
Gaghardi, John J.; Chesley, Jason A.; Houck, Charles H.; Cosmano, Richard J.; and Duwell, Ernest J., 5,480,461, Cl. 51-295.000.

Dvorkis, Paul, to Symbol Technologies, Inc. Scanning arrangement for the implementation of omni-directional scanning patterns over indicia. 5,481,099, Cl. 235-462.000.

Dydyk, Michael; and Lindberg, Craig E., to Motorola, Inc. Lumped element four port coupler. 5,481,231, Cl. 333-112.000.

Dyett, Derek H., to Molins PLC. Cigarette making machine. 5,479,947, Cl. 131-37.000.

Dykes, Norman L.: See—  
Lauf, Robert J.; Holcombe, Cressie E.; and Dykes, Norman L., 5,481,428, Cl. 361-305.000.

Dynamic Optimization Technology Products, Inc.: See—  
Morshedi, A. M.; Stevenson, Thomas E.; and Scott, David E., 5,481,716, Cl. 395-700.000.

Dynamic Systems Inc.: See—  
Ferguson, Hugo S., 5,481,086, Cl. 219-385.000.

Dyott, Richard B.; Brooker, Eric L.; Bennett, Sidney M.; and Myhre, John D., to Andrew Corporation. Coil mounting arrangement for fiber optic gyroscope using a gel loaded with particles. 5,481,358, Cl. 356-350.000.

Dyuzhenko, Michael: See—  
Itsekson, Boris; Dyuzhenko, Michael; Itsekson, Vladimir; Itsekson, Alexander; and Tsigelman, Igor, 5,480,256, Cl. 404-72.000.

E & S Dispenser Company: See—  
Ellinger, Victor H., 5,480,061, Cl. 221-75.000.

Eade, Thomas J.: See—  
Bolash, John P.; Breswick, Curt P.; Eade, Thomas J.; Lane, David K.; Mayo, Randall D.; and Waldrop, David S., 5,480,240, Cl. 400-124.010.

Easterbrook, David; and Butorac, Michael, to Eastorac Corporation. Removable positive shut-off panel. 5,479,984, Cl. 165-96.000.

Eastman Chemical Company: See—  
Fagerburg, David R.; and Donelson, Michael E., 5,480,926, Cl. 524-86.000.

Sharma, Mahendra K.; Dobbs, Suzanne W.; and Hiller, John J., 5,480,920, Cl. 523-161.000.

White, Alan W.; Percy, Barry G.; Jones, Allan S.; Buchanan, Charles M.; and Gardner, Robert M., 5,480,962, Cl. 528-272.000.



## Eastman Kodak Company: See—

Bailey, David S.; and Mura, Albert J., Jr., 5,480,760, Cl. 430-203.000.  
 Bailey, David S.; and Mura, Albert J., Jr., 5,480,761, Cl. 430-203.000.  
 Bell, Eric L., 5,480,771, Cl. 430-567.000.  
 Cocca, J. David; and Dunsmore, Clay A., 5,481,331, Cl. 354-412.000.  
 Fitzgerald, John J.; and Ferrar, Wayne T., 5,480,724, Cl. 428-447.000.  
 Fitzgerald, John J.; Ferrar, Wayne T.; Binga, Tonya D.; and Fichtner, Michael W., 5,480,725, Cl. 428-447.000.  
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 Green, Andrew; and Saunders, Arthur E., 5,481,480, Cl. 364-525.000.  
 Jadwin, Thomas A.; Osterhoudt, Hans W.; Spence, John M.; and Tyagi, Dinesh, 5,480,757, Cl. 430-110.000.  
 Stewart, Wallace S.; Merz, Gary E.; and Marshall, Dale C., 5,480,501, Cl. 156-73.100.  
 Ueffinger, Gerhard; and Huettemeister, Franz, 5,480,769, Cl. 430-401.000.  
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## Eastorac Corporation: See—

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## Eaton Corporation: See—

Edelen, Stephen A.; Hussain, Syed F.; and Ong, Chiau-Chieh, 5,481,170, Cl. 318-650.000.

## Eaton, John W.: See—

Cooper, Thomas G.; Adams, David V.; and Eaton, John W., 5,479,929, Cl. 128-662.030.

Eatwell, Graham P.; and Langley, Andrew, to Noise Cancellation Technologies, Inc. Audio reproduction system, 5,481,615, Cl. 381-71.000.

## Ebara Corporation: See—

Nagai, Kazutoshi; Satake, Tooru; Hayashi, Hideaki; and Yasui, Takanari, 5,480,286, Cl. 417-48.000.

Ebenstein, Samuel E., to Ford Motor Company. Non-contact method of obtaining dimensional information about an object for comparing similar objects, 5,481,483, Cl. 364-561.000.

Echols, Joseph A.; Kimbrel, Jean D.; and Montz, Sandra L. Clamp for push-on couplings, 5,480,193, Cl. 285-45.000.

Eckstein, Eugene C.; and Block, Norman L., to University of Miami, The. Method and device for connecting biological duct to a prosthesis, 5,480,434, Cl. 623-11.000.

## Ecolab Inc.: See—

Donovan, Daniel J.; McSherry, David D.; and Fredell, Dale L., 5,480,643, Cl. 424-409.000.

Economikos, Laertis; and Surprenant, Richard P., to International Business Machines Corporation. Structure and a method for repairing electrical lines, 5,481,138, Cl. 257-773.000.

Edelen, Stephen A.; Hussain, Syed F.; and Ong, Chiau-Chieh, to Eaton Corporation. Method and apparatus for controlling shift force in an automated mechanical transmission, 5,481,170, Cl. 318-650.000.

## Eden, James: See—

Altieri, Paul A.; Eden, James; Gribnau, Michael C.; Hoogendijk, Leendert; Krijnen, Lambertus B.; Solarek, Daniel B.; and Swarthoff, Ton, 5,480,575, Cl. 252-94.000.

## Edison Welding Institute: See—

Grimm, Robert A.; Wine, Wanda F.; and Molnar, John A., 5,481,091, Cl. 219-633.000.

## Edmundson, Robert J.: See—

Orr, Carl C.; Caradonna, John; Edmundson, Robert J.; and Jacks, Terry C., 5,480,632, Cl. 424-63.000.

## Edwards, Eric C.: See—

Shen, Francis N.; Shen, Anthony P.; Edwards, Eric C.; Schmid, Gerrard B.; and Kotzev, Grigor K., 5,481,594, Cl. 379-67.000.

Edwards, Myrtis C. Vehicle safety seat for pets, 5,479,892, Cl. 119-771.000.

## Egan, Daniel C.: See—

Gerfast, Sten R.; and Egan, Daniel C., 5,480,103, Cl. 242-347.000.

## Egashira, Yoshimi: See—

Hai, Xu; and Egashira, Yoshimi, 5,481,271, Cl. 343-749.000.

Egawa, Akira; and Aoshima, Chikara, to Canon Kabushiki Kaisha. Camera using film with magnetic storage section, 5,481,323, Cl. 354-106.000.

Eggers, Philip E.; and Manlove, Anthony J., to Hemostatic Surgery Corporation. Surgical instrument with auto-regulating heater and method of using same, 5,480,397, Cl. 606-29.000.

Eggers, Philip E., to Hemostatic Surgery Corporation. Endoscopic instrument with disposable auto-regulating heater, 5,480,398, Cl. 606-29.000.

## Eguchi, Hirotoshi: See—

Furuta, Toshiyuki; Horiguchi, Hiroyuki; and Eguchi, Hirotoshi, 5,481,646, Cl. 395-27.000.

Eguchi, Ken; Takamatsu, Osamu; and Kishi, Etsuro, to Canon Kabushiki Kaisha. Information processor and method using the information processor, 5,481,528, Cl. 369-126.000.

## Ehara, Toshiyuki: See—

Kawada, Masaya; Yamazaki, Koji; Ueda, Shigenori; Ehara, Toshiyuki; and Niino, Hiroaki, 5,480,750, Cl. 430-31.000.

## Ehret, Thomas: See—

Kost, Friedrich; Ruf, Wolf-Dieter; Hartmann, Uwe; Ehret, Thomas; Van Zanten, Anton; and Erhardt, Rainer, 5,480,219, Cl. 303-146.000.

## Eicher, Johannes: See—

Braun, Max; Eicher, Johannes; Rudolph, Werner; and Eichholz, Kerstin, 5,481,029, Cl. 560-234.000.

## Eichholz, Kerstin: See—

Braun, Max; Eicher, Johannes; Rudolph, Werner; and Eichholz, Kerstin, 5,481,029, Cl. 560-234.000.

Eicken, Karl; Goetz, Norbert; Harreus, Albrecht; Ammermann, Eberhard; Lorenz, Gisela; and Rang, Harald, to BASF Aktiengesellschaft. Anilide derivatives and their use for combating botrytis, 5,480,897, Cl. 514-365.000.

## Eisai Co., Ltd.: See—

Asakawa, Naoki; Oda, Yoshiya; Yoshida, Yutaka; and Sato, Tadashi, 5,480,542, Cl. 210-198.200.

Eisenhart, Eric K.; Graziano, Louis C.; and Lalas, Jose P., to Rohm and Haas Company. Adhesive composition, 5,480,720, Cl. 428-414.000.

## Ejiri, Kiyomi: See—

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Ejiri, Mitsuo; and Kinbara, Hidenori, to Mitsubishi Gas Chemical Company, Inc. Method of drilling a hole for printed wiring board, 5,480,269, Cl. 408-1.00R.

## Ekholm, Rolf: See—

Bergkvist, Lennart; Gustafsson, Sten; Lindblom, Kjell; Anderson, Jan; Ekholm, Rolf; and Höglund, Ronny, 5,480,546, Cl. 210-404.000.

Elangovan, Singaravelu; Khandkar, Ashok C.; and Hartvigsen, Joseph J., to Ceramtec, Inc. Fuel cell module, 5,480,738, Cl. 429-32.000.

## ElectroCom Automation, Inc.: See—

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## Electrolux Corporation: See—

Martin, Michael F.; Starr, William D.; and Hoekstra, Peter, 5,479,676, Cl. 15-323.000.

## Elf Atochem S.A.: See—

Devic, Michel, 5,480,788, Cl. 435-168.000.

El-Hamamsy, Sayed-Amr; and Kheraluwala, Mustansir H., to General Electric Company. Variable frequency generator for resonant power feedback, 5,481,161, Cl. 315-224.000.

## Eli Lilly and Company: See—

Bryant, Henry U.; and Grese, Timothy A., 5,480,904, Cl. 514-443.000.

Cremer, Lawrence C.; and Kirst, Herbert A., 5,480,906, Cl. 514-453.000.

Gillig, James R.; and Jirousek, Michael R., 5,481,003, Cl. 548-455.000.

Hertel, Larry W.; Jones, Charles D.; Kroin, Julian S.; and Mabry, Thomas E., 5,480,992, Cl. 544-313.000.

Hornback, William J.; Munroe, John E.; and Shepherd, Timothy A., 5,480,887, Cl. 514-301.000.

Elias, Sammed G. Artificial implant component and method for securing same, 5,480,443, Cl. 623-18.000.

## El Idrisi, Aziz: See—

Albert, David E.; and El Idrisi, Aziz, 5,481,255, Cl. 340-825.550.

Ellinger, Victor H., to E & S Dispenser Company. Portable tabletop cookie dispenser, 5,480,061, Cl. 221-75.000.

Ellis, James, to Western Atlas International, Inc. Shaped-charge with simultaneous multi-point initiation of explosives, 5,479,860, Cl. 102-313.000.

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Lyons, James E.; Ellis, Paul E., Jr.; and Wagner, Richard W., 5,480,986, Cl. 540-145.000.

## Ellwanger, Charles G.: See—

Pederse, Harry; and Ellwanger, Charles G., 5,480,343, Cl. 451-10.000.

## Ellwood, David: See—

Urbas, Donald J.; and Ellwood, David, 5,481,262, Cl. 340-870.170.

## Elsemans, Johan D. G.: See—

De Cock, Etienne M.; De Schampelaere, Lucien A.; Elsemans, Johan D. G.; and Verlyuten, Ludo, 5,481,339, Cl. 355-215.000.

El-Shoubary, Youssef; and Woodmansee, Donald E., to General Electric Company. Electric enhancement of adsorbent flotation separation, 5,480,558, Cl. 210-703.000.

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## Ember, Julia A.: See—

Morgan, Edward L.; Ember, Julia A.; and Hugli, Tony E., 5,480,974, Cl. 530-387.900.

## Emerson Electric Co.: See—

Hill, Jason J.; and Tevaarwerk, Joseph L., 5,480,003, Cl. 184-6.120.

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Tomasia, Mark J.; Dix, Gregory F.; and Moody, John F., 5,480,588, Cl. 261-72.100.

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Breuer, Hans-Jürgen; Cyron, Theodor; Maus, Wolfgang; Swars, Helmut; and Wieres, Ludwig, 5,480,621, Cl. 422-174.000.

## EMS-Inventa AG: See—

Schmid, Eduard; Buehler, Friedrich S.; and Schultze, Hans-Joachim, 5,480,923, Cl. 524-47.000.

## Enderle, Christian: See—

Kraemer, Michael; Wirbeleit, Friedrich; Enderle, Christian; Friess, Walter; Krutzsch, Bernd; Withalm, Gert; Schoen, Christof; Mikulic, Leopold; Hertweck, Gernot; and Thoma, Frank, 5,479,775, Cl. 60-274.000.

## Endermann, Rainer: See—

Petersen, Uwe; Schröck, Wilfried; Häbich, Dieter; Krebs, Andreas; Schenke, Thomas; Philipps, Thomas; Grobe, Klaus; Endermann, Rainer; Bremm, Klaus-Dieter; and Metzger, Karl-Georg, 5,480,879, Cl. 514-202.000.

## Endo, Isao: See—

Okumura, Yoshinobu; Yang, Xingbo; and Endo, Isao, 5,480,733, Cl. 428-694.00T.

## Endo, Koichiro: See—

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Matsuo, Kazuhiro; Kitahara, Yoshihiko; Endo, Shinya; and Tagawa, Yoichi, 5,480,509, Cl. 156-522.000.

Eng, Christian. Double thumb strap for pistol holster, 5,480,077, Cl. 224-243.000.

## Engelke, Stephan: See—

Tischer, Wilhelm; Klein, Joachim; Müller, Rolf-Joachim; and Engelke, Stephan, 5,480,790, Cl. 435-188.000.

Engle, Thomas H., to Knorr Brake Holding Corporation. Lock and coupler for a railway ramp car having fluid and electrical couplings, 5,480,042, Cl. 213-1.300.

English, George P., to Key Tronic Corporation. Computer keyboard with cantilever switch and actuator design, 5,481,074, Cl. 200-5.00A.

## English, Robert M.: See—

Chao, Chia-Chiang; English, Robert M.; Jacobson, David M.; Stepanov, Alexander A.; and Wilkes, Andrew J., 5,481,694, Cl. 395-439.000.

## ENPAC Corporation: See—

Litin, Michael H.; Milliken, John O.; and Onders, James P., 5,480,191, Cl. 280-831.000.

## Entapack Pty. Ltd.: See—

Papaluca, Vincent, 5,480,057, Cl. 220-403.000.

## Environmental Blades, Inc.: See—

Coble, John E., 5,479,763, Cl. 56-12.700.

## Eon Corporation: See—

Dinkins, Gilbert M., 5,481,546, Cl. 370-95.100.

## Epand, Richard M.: See—

Huang, Leaf; Epand, Richard M.; and Bottega, Remo, 5,480,817, Cl. 424-450.000.

## Epitope, Inc.: See—

Thieme, Thomas R.; Goldstein, Andrew S.; Piacentini, Stephen C.; and Klimkow, Nanette M., 5,479,937, Cl. 128-760.000.

Epstein, Joseph W.; Birnberg, Gary H.; Dutia, Minu D.; Claus, Thomas H.; and Larris, Elwood E., to American Cyanamid Company.  $\beta_2$ -adrenergic agents benzodioxole dicarboxylates and their use in pharmaceutical compositions, 5,480,908, Cl. 514-465.000.

## Equestrian Co., Ltd.: See—

Shimada, Mizuho, 5,481,408, Cl. 359-838.000.

Erez, Mordechai; and Reshef, Israel. Electrochemical cell including compressed, unbonded, electrode granules and liquid electrolyte, 5,480,742, Cl. 429-66.000.

## Erhardt, Rainer: See—

Kost, Friedrich; Ruf, Wolf-Dieter; Hartmann, Uwe; Ehret, Thomas; Van Zanten, Anton; and Erhardt, Rainer, 5,480,219, Cl. 303-146.000.

Erichsen, Thomas D.; Boerman, Gary L.; Richard, Daniel J.; and Gordon, Ian C. B., to FMC Corporation. Compact gas tungsten arc welding torch apparatus, 5,481,079, Cl. 219-75.000.

Erickson, Richard W. Carrier for containers, 5,480,204, Cl. 294-87.200.

## Erickson, Ronald E.: See—

Peck, Kevin B.; Erickson, Ronald E.; and Mathews, Stephen H., 5,481,088, Cl. 219-390.000.

## Erickson Inc.: See—

Doiron, Timothy J.; Dreon, Steven T.; and Priest, Mark D., 5,481,610, Cl. 380-21.000.

Maedjaja, Samuel; and Hughes, Houston H., III, 5,481,545, Cl. 370-95.100.

Sköld, Johan; and Eriksson, Per-Olof, 5,481,572, Cl. 375-347.000.

## Eriksson, Per-Olof: See—

Sköld, Johan; and Eriksson, Per-Olof, 5,481,572, Cl. 375-347.000.

Eriksson, Stig; Mogren, Lars-Ove; and Moritz, Bertil, to ASEA Brown Boveri AB. Distribution of cooling air in switchgear cubicles, 5,481,429, Cl. 361-678.000.

Ernst, Volker; Hainle, Rudi; and Lehmann, Volker, to Filterwerk Mann & Hummel GmbH. Toggle catch for intake air filters of internal-combustion engines, compressors and other machines which take in air, 5,480,197, Cl. 292-113.000.

Erwin, Barry C. Insecticide bait composition, 5,480,638, Cl. 424-84.000.

Erwin Sick GmbH Optik-Elektronik: See—

Hippenmeyer, Heinrich; and Kilian, Reinhold, 5,481,096, Cl. 235-454.000.

## Esaki, Toshiro: See—

Shimizu, Makoto; Esaki, Toshiro; Shibata, Tadayoshi; and Takahashi, Koichi, 5,479,691, Cl. 29-430.000.

## Eskal Medical GmbH &amp; Co.: See—

Grunde, Hans; and Moser, Heinz, 5,480,451, Cl. 623-23.000.

Eslambolchi, Hossein, to AT&T Corp. Method and apparatus for controlling excavation equipment, 5,479,729, Cl. 37-195.000.

## Esnault, Daniel: See—

Battard, Jean C.; Mane, Jean M. E.; and Esnault, Daniel, 5,479,949, Cl. 131-365.000.

Esparsa, Rodolfo; and Leonard, William, to Transmisiones y Equipos Mecánicos, S.A. de C.V. Reverse gear synchronizer, 5,479,835, Cl. 74-331.000.

Essen-Moller, Anders, to Synectics Medical, Inc. Ambulatory reflux monitoring system, 5,479,935, Cl. 128-734.000.

Esslinger, Klaus, to J. M. Voith GmbH. Applying pressure on the web at the wire end of a paper machine, 5,480,520, Cl. 162-301.000.

## Estang, Bernard: See—

Bonnau, Philippe; Estang, Bernard; Perrier, Bernard; Chazelas, Jean; and Lecucllet, Jérôme, 5,479,828, Cl. 73-800.000.

## Etablissements Antonine Bertheas &amp; Cie: See—

Sauvignat, Jean-Pierre, 5,480,709, Cl. 428-231.000.

## Etablissements Biebuyck S.A.: See—

Biebuyck, Leon, 5,480,467, Cl. 65-158.000.

Eat Français as represented by the Delege General pour l'Armement: See—

Amiand, Vincent J.; Le Blanc, Francis D.; and Borghetti, Paul R., 5,480,108, Cl. 244-115.000.

## Ethicon, Inc.: See—

Kammerer, Gene W.; Frederick, Royce; Howard, Barbara; and Walker, Edd, 5,480,404, Cl. 6



- Fankhaenel, Matthias: See—  
Lechtken, Peter; Sauer, Friedrich; Fankhaenel, Matthias; and Hermeling, Dieter, 5,481,041, Cl. 568-17.000.
- Far Great Plastics Industrial Co., Ltd.: See—  
Chen, Ting-Hsing, 5,480,168, Cl. 280-11.220.
- Fargo Electronics, Inc.: See—  
Gunderson, Ernest M., 5,480,242, Cl. 400-208.000.
- Farmer, David G.: See—  
Cullen, Michael J.; Christensen, Louis R.; Grutter, Peter J.; Weyburne, Michael A.; Ulrey, Joseph N.; and Farmer, David G., 5,479,898, Cl. 123-350.000.
- Farmitalia Carlo Erba S.r.l.: See—  
Visentia, Giuseppina; Zarini, Franco; Jabes, Daniela; Perrone, Ettore; della Bruna, Costantino; and Alpegiani, Marco, 5,480,880, Cl. 514-210.000.
- Farrel Corporation: See—  
Poscich, Douglas W.; and Mosher, Douglas E., 5,480,252, Cl. 403-371.000.
- Farzin-Nia, Farrok; and Otsen, William R., to Ormco Corporation. Orthodontic appliances having improved bonding characteristics and methods of making, 5,480,301, Cl. 433-9.000.
- Fattinger, Christof: See—  
Heming, Martin; Hochhaus, Roland; Kersten, Ralf; Krause, Dieter; Otto, Jürgen; Paquet, Volker; Segner, Johannes; and Fattinger, Christof, 5,480,687, Cl. 427-573.000.
- Favalora, Mark L.; and Minor, Randolph J., to Hubbell Incorporated. Pulling tool for pulling connectorized cable, 5,480,203, Cl. 294-86.420.
- Fawcett, Glenn S.; Witsaman, Mark L.; and Glessner, David W., to Glenayre Electronics, Inc. Method and apparatus for coordinating clocks in a simulcast network, 5,481,258, Cl. 340-825.470.
- Fedorov, Svyatoslav N.; and Zuev, Viktor K., to Mezhotraslevoi Nauchno-Tekhnichesky Komplex "Mikrokhirurgia Glaza". Corrective intraocular lens, 5,480,428, Cl. 623-6.000.
- Feigelson, Gregg: See—  
Ziegler, Carl B., Jr.; Curran, William V.; and Feigelson, Gregg, 5,480,987, Cl. 540-200.000.
- Fekete, Nicholas M. G., to Rochester Gauges, Inc. Cryogenic gauge, 5,479,820, Cl. 73-319.000.
- Feld, Marcel: See—  
Muh, Jürgen; and Feld, Marcel, 5,481,019, Cl. 558-451.000.
- Feldstein, Nathan; and Lancsek, Thomas S., to Surface Technology, Inc. Cobalt as a stabilizer in electroless plating formulations, 5,480,477, Cl. 106-1.240.
- Feng, Dong-Mei: See—  
Bowers, Cyril Y.; Folkers, Karl A.; Ljungqvist, Anders; Feng, Dong-Mei; and Janceka, Anna, 5,480,969, Cl. 530-328.000.
- Ferguson, Lee T. Method and apparatus for cutting decorative gift-wrap paper, 5,480,080, Cl. 225-1.000.
- Ferguson Limited: See—  
Flowers, Howard P., 5,481,318, Cl. 348-686.000.
- Ferguson, Robert M.: See—  
Badesha, Santokh S.; Heeks, George J.; Henry, Arnold W.; Pan, David H.; Fratangelo, Louis D.; and Ferguson, Robert M., 5,480,938, Cl. 525-104.000.
- Ferguson Hugo S., to Dynamic Systems Inc. High temperature deformable crucible for use with self-resistively heated specimens, 5,481,086, Cl. 219-385.000.
- Ferm, Paul M.: See—  
Zimmerman, Scott M.; Beeson, Karl W.; McFarland, Michael J.; Yardley, James T.; and Ferm, Paul M., 5,481,385, Cl. 359-40.000.
- Ferrari, Wayne T.: See—  
Fitzgerald, John J.; and Ferrari, Wayne T., 5,480,724, Cl. 428-447.000.
- Fitzgerald, John J.; Ferrari, Wayne T.; Binga, Tonya D.; and Fichtner, Michael W., 5,480,725, Cl. 428-447.000.
- Ferrero, Pietro, to Soremartec S.A. Method for applying coatings starting from flowable substances, 5,480,664, Cl. 426-307.000.
- Ferris, Sandra S.: See—  
Colón, Luis A.; Dadoo, Rajeev; Whitted, William H.; Zare, Richard N.; Ewing, Andrew G.; Ferris, Sandra S.; and Woelker, Jennifer U., 5,480,525, Cl. 204-180.100.
- Fiberlign Division of Preformed Line Products (Canada) Ltd.: See—  
Harman, Murray R.; Marshall, James D.; and Clark, Gordon A., 5,481,640, Cl. 385-147.000.
- Fichtel & Sachs AG: See—  
Büngeler, Jörg, 5,481,459, Cl. 364-424.050.
- Gilsdorf, Heinz-Joachim; Sydekum, Heinz; and Gubitz, Holger, 5,480,129, Cl. 267-64.240.
- Kurz, Walter; Baier, Wolfgang; and Meinig, Uwe, 5,480,016, Cl. 192-70.160.
- Fichtner, Michael W.: See—  
Fitzgerald, John J.; Ferrari, Wayne T.; Binga, Tonya D.; and Fichtner, Michael W., 5,480,725, Cl. 428-447.000.
- Fielden, Edward M.: See—  
Beylin, Vladimir G.; Sercel, Anthony D.; Showalter, Howard D. H.; Adams, Gerald E.; Fielden, Edward M.; Naylor, Matthew A.; and Stratford, Ian J., 5,481,000, Cl. 548-229.000.
- Fife, Richard K., to Gull Laboratories, Inc. Anti-microbial apparatus and method for dental handpieces, 5,480,302, Cl. 433-116.000.
- Figini, Aldo; and Beylis, Renato, to Locitite Corporation; and NKE S.r.l. Dispensing process particularly for a sealing/adhesive product, 5,480,487, Cl. 118-610.000.
- Filas, Robert W.; and Marchman, Herschel M., to AT&T Corp. Fiber probe fabrication having a tip with concave sidewalls, 5,480,046, Cl. 216-7.000.
- Filterwerk Mann & Hummel GmbH: See—  
Ernst, Volker; Hainle, Rudi; and Lehmann, Volker, 5,480,197, Cl. 292-113.000.
- Fine, Dale R.: See—  
Rotolo, Robert H.; Swenson, Charles B.; and Fine, Dale R., 5,480,623, Cl. 422-295.000.
- Fine, Stephen M.; Johnson, Andrew D.; and Langan, John G., to Air Products and Chemicals, Inc. Moisture removal and passivation of surfaces, 5,479,727, Cl. 34-516.000.
- Fingleson, Linda J.; and Richman, Lisa A. Garment having printed instructions for self-examination of the breasts, 5,479,661, Cl. 2-69.000.
- Finkenzeller, Ulrich: See—  
Plach, Herbert; Finkenzeller, Ulrich; Reiffenrath, Volker; Poetsch, Eike; Rieger, Bernhard; and Numata, Hiroshi, 5,480,581, Cl. 252-299.630.
- Firey, Joseph C. Combined reactor for cyclic char burning engines, 5,479,893, Cl. 123-23.000.
- Firmeich Incorporated: See—  
Peterson, Robert J., 5,480,674, Cl. 426-534.000.
- Firoozabady, Ebrahim; and Robinson, Karol, to Florigene Europe B.V. Genetically transformed rose plants and methods for their production, 5,480,789, Cl. 435-172.300.
- Fischer, Gerhard; Wamke, Ulrich; and König, Herbert, to Dr. Fischer Aktiengesellschaft. Device for transporting ions, in particular, protons, 5,480,373, Cl. 600-14.000.
- Fischer, Gunter; and Küllertz, Namen G., to Arzneimittelwerk Dresden GmbH. Cyclosporine assay, 5,480,779, Cl. 435-23.000.
- Fischer, Heinz; Mueller, Wolfgang; and Schmidt, Ruediger, to Deutsche Aerospace Airbus GmbH. Multiple zone air conditioning system with zone size altering feature for a passenger aircraft, 5,479,983, Cl. 165-22.000.
- Fischer, Jorgen T.: See—  
McCarter, Walter K.; and Fischer, Jorgen T., 5,480,743, Cl. 429-96.000.
- Fischer, Walter; Schmidhalter, Beat; and Wolleb, Heinz, to Ciba-Geigy Corporation. Azolyl thermochromic compounds, 5,481,002, Cl. 548-264.200.
- Fischle, Gerhard: See—  
Baumann, Matthias; and Fischle, Gerhard, 5,479,811, Cl. 73-2.000.
- Fish, James S.; and Deutsch, Dennis, to Pierce Companies, Inc. Portable podium, 5,480,119, Cl. 248-460.000.
- Fisher, Gregory J.: See—  
DeJong, Glenn A.; Bacrania, Kantilal; Church, Michael D.; Fisher, Gregory J.; Gasner, John T.; Ito, Akira; Johnston, Jeffrey M.; Kutchmarick, Dave; and Rhee, Choong-Sun, 5,481,129, Cl. 257-360.000.
- Fisher, Gregory M.: See—  
Nazif, Zaher A.; Shastry, Subramanya K.; Man, Susan K. K.; Chu, Edith H.; Chu, Francis Y.; Fisher, Gregory M.; and Nassirpour, Mohammad S., 5,481,601, Cl. 379-207.000.
- Fitzgerald, John J.; and Ferrar, Wayne T., to Eastman Kodak Company. Fuser roll for fixing toner to a substrate comprising tin oxide fillers, 5,480,724, Cl. 428-447.000.
- Fitzgerald, John J.; Ferrar, Wayne T.; Binga, Tonya D.; and Fichtner, Michael W., to Eastman Kodak Company. Fusing member having tin-filled, addition cured layer, 5,480,725, Cl. 428-447.000.
- Flagg, Kenneth C., Jr.: See—  
Pippin, James M.; Flagg, Kenneth C., Jr.; and Robertson, Gary S., 5,480,032, Cl. 209-583.000.
- Flatness, Randy G.: See—  
Wilcox, Milton E.; and Flatness, Randy G., 5,481,178, Cl. 323-287.000.
- Flawa Schweizer Verbandstoff- und Wattefabriken AG. Flawil: See—  
Gerhardt, Gerd; and Werner, Ernst, 5,480,699, Cl. 428-171.000.
- Fleming, George R.; and Green, James R. Long wear life flame-retardant cotton blend fabrics, 5,480,458, Cl. 8-115.580.
- Fleming, Joseph C., III. Mounting bracket for wall panel locks, 5,480,117, Cl. 248-231.900.
- Flemmer, Rory L. C.; and Byron, David L., to Bausch & Lomb Incorporated. Three-dimensional eyewinder apparatus, 5,479,683, Cl. 29-20.000.
- Flinm, Duane D.: See—  
Alvarez, Robert J.; Bredeesen, Scott E.; Wilson, James J.; Flim, Duane D.; Kniffen, Todd E.; and Schahrer, Clinton O., 5,479,707, Cl. 29-890.039.
- Flohr Metal Fabricators, Inc.: See—  
Hicks, Timothy S., 5,480,347, Cl. 452-170.000.
- Floren, Bengt: See—  
Storstrom, Helge; and Floren, Bengt, 5,480,469, Cl. 75-228.000.
- Florigene Europe B.V.: See—  
Firoozabady, Ebrahim; and Robinson, Karol, 5,480,789, Cl. 435-172.300.
- Flosbach, Carmen: See—  
Duecoffre, Volker; Flosbach, Carmeo; Schubert, Walter; Krumme, Manfred; Stephan, Werner; and Sadowski, Fritz, 5,480,936, Cl. 524-839.000.
- Flower, Ralph F. J., to Cross Manufacturing Company Limited. Brush seal assembly, 5,480,165, Cl. 277-53.000.
- Flowers, Howard P., to Ferguson Limited. Television receiver with additional display of characters, 5,481,318, Cl. 348-686.000.
- Floyd, Alton D.: See—  
Kelley, Thomas F.; and Floyd, Alton D., 5,480,484, Cl. 118-52.000.
- Fluid Automation Systems S.A.: See—  
Sarfati, Georges; Merz, Peter; and Sarfati, Freddy, 5,481,237, Cl. 335-278.000.

- Fluid Management Limited Partnership: See—  
Hellenberg, Leendert; and Mink, Johannes H., 5,480,288, Cl. 417-313.000.
- Fluke Corporation: See—  
Caris, Hubertus A.; and Dost, Paulus J. M., 5,481,447, Cl. 363-60.000.
- Flum, Alan: See—  
Lumsden, John; and Flum, Alan, 5,481,225, Cl. 330-254.000.
- Flynn, Richard M.: See—  
Clifton, Mark B.; Flynn, Richard M.; and Verdi, Fred W., 5,480,842, Cl. 437-226.000.
- FMC Corporation: See—  
Erichsen, Thomas D.; Boerman, Gary L.; Richard, Daniel J.; and Gordon, Ian C. B., 5,481,079, Cl. 219-75.000.
- Foerster, Martin: See—  
Klasen, Claas-Jürgen; Foerster, Martin; Höfler, Andreas; Bauer, Klaus-Peter; Riemenschneider, Herbert; Franta, Oliver; and Gilg, Rainer, 5,480,626, Cl. 423-449.100.
- Fogal, Robert, Sr.; and Hall, John, to International Marketing, Inc. Tire valve stem, 5,479,975, Cl. 152-429.000.
- Föhl, Artur, to TRW Repa GmbH. Energy converter in a restraining system for vehicle occupants, 5,480,190, Cl. 280-806.000.
- Folkers, Karl A.: See—  
Bowers, Cyril Y.; Folkers, Karl A.; Ljungqvist, Anders; Feng, Dong-Mei; and Janceka, Anna, 5,480,969, Cl. 530-328.000.
- Ford, Michael W., to GEC Avery Limited. Low profile load cell for a weighing machine, 5,481,072, Cl. 177-210.0FF.
- Ford Motor Company: See—  
Collie, Curtis B., 5,479,906, Cl. 123-525.000.
- Cullen, Michael J.; Christensen, Louis R.; Grutter, Peter J.; Weyburne, Michael A.; Ulrey, Joseph N.; and Farmer, David G., 5,479,898, Cl. 123-350.000.
- Davies, Richard G.; and Thornton, Peter H., 5,480,189, Cl. 280-797.000.
- DeBiasi, Charles J.; Tuteja, Vikas; Deljevic, Zeljko; and Renehan, John F., 5,481,176, Cl. 322-7.000.
- Ebenstein, Samuel E., 5,481,483, Cl. 364-561.000.
- Kolta, Tibor, 5,480,349, Cl. 454-52.000.
- Narula, Chaitanya K.; Visser, Jacobus H.; and Adamczyk, Andrew A., Jr., 5,480,622, Cl. 422-174.000.
- Polubinski, Ann T., 5,480,012, Cl. 192-3.290.
- Smith, Garry R., 5,480,186, Cl. 280-772.000.
- Zaluzec, Matthew J.; Popoola, Oludele O.; Reatherford, Larry; and Rose, Thomas W., 5,480,497, Cl. 148-512.000.
- Ford, Warwick S.; and Wiener, Michael J., to Northern Telecom Limited. Computer network cryptographic key distribution system, 5,481,613, Cl. 380-30.000.
- Forrester, David J., to Cerberus Institute for Research and Development, Inc. Augmented service pistol and ammunition weapons system, 5,479,736, Cl. 42-72.000.
- Forsvarets Forskningsanstalt: See—  
Lannevik, Stefan, 5,481,062, Cl. 588-203.000.
- Fort Lock Corporation: See—  
Myers, Gary L., 5,479,800, Cl. 70-365.000.
- Fort, Yves: See—  
Cauhere, Paul; Fort, Yves; and Ortat, Agnès, 5,481,012, Cl. 549-531.000.
- Foss, David T.: See—  
Parker, David M.; Foss, David T.; Lowe, Perry E.; and Amos, David J., 5,479,782, Cl. 60-747.000.
- Foster, L. Dale; and Ruehl, John W., to Hill-Rom Company, Inc. Foot egress chair bed, 5,479,666, Cl. 5-624.000.
- Foundation of Shamanic Studies: See—  
Hamer, Michael, 5,479,941, Cl. 128-845.000.
- Fowler, John O.; and Richardson, Brian, to Rolls-Royce plc. Method of manufacturing an article by superplastic forming and diffusion bonding, 5,479,705, Cl. 29-889.720.
- Fox, Kelly B.; and Evans, Alvin, Jr., to Phillips Petroleum Company. Acceleration of gelation of water soluble polymers, 5,480,933, Cl. 524-554.000.
- Fox, Kelly B.: See—  
Oakley, Johnna E.; Fox, Kelly B.; Evans, Alvin, Jr.; and Stewart, Wayne S., 5,480,863, Cl. 507-225.000.
- Fox, Robert F.; and Dawson, Craig R., to General Dynamics Corporation. Emergency power system for submarines, 5,479,871, Cl. 114-334.000.
- Framatome Connectors International: See—  
Rouhier, Maurice; and Striebig, Jean-Louis, 5,480,321, Cl. 439-374.000.
- Francavilla, Antonio T.; Hagiya, Michio; and Starzl, Thomas E., to Toyobo Co., Ltd.; and University of Pittsburgh. Augmenter of liver regeneration (ALR), 5,480,797, Cl. 435-240.200.
- France Telecom Etablissement Autonome de Droit Public: See—  
Campana, Mireille; Allegre, François; Arditti, David; and Millot, Jean, 5,481,612, Cl. 380-25.000.
- Frances, Arnold, to Du Pont de Nemours & E. I., and Company. Elastomer/aramid fiber dispersion, 5,480,941, Cl. 525-178.000.
- Francione, Innocenzo: See—  
Andrieu, Dominique; and Francione, Innocenzo, 5,481,606, Cl. 379-399.000.
- Frank, Brigitte, legal representative: See—  
Hock, Klaus; Frank, Lothar, deceased; and Schock, Friedrich, Sr., 5,480,931, Cl. 524-449.000.
- Frank, Lee F.; and Bischoff, David K., to Eastman Kodak Company. Film drying apparatus with uniform flow air tubes, 5,481,327, Cl. 354-300.000.
- Frank, Lothar, deceased (by Brigitte Frank, legal representative): See—  
Hock, Klaus; Frank, Lothar, deceased; and Schock, Friedrich, Sr., 5,480,931, Cl. 524-449.000.
- Franken, Wilhelm; Weigardt, Gerhard; and Michaelsen, Lars T., to Man Gutehoffnungshütte. Aircraft tug without tow bar, 5,480,274, Cl. 414-429.000.
- Franklin, James E.: See—  
Deken, Arthur D.; Franklin, James E.; and Sewell, Cody L., 5,479,728, Cl. 37-142.500.
- Frankosky, Michael S.; and Snyder, Adrian C., to Du Pont de Nemours & E. I., and Company. Fiberballs, 5,480,710, Cl. 428-288.000.
- Franta, Oliver: See—  
Klasen, Claas-Jürgen; Foerster, Martin; Höfler, Andreas; Bauer, Klaus-Peter; Riemenschneider, Herbert; Franta, Oliver; and Gilg, Rainer, 5,480,626, Cl. 423-449.100.
- Franz, Gerhard: See—  
van Bonn, Karl-Heinz; Kathrein, Hendrik; and Franz, Gerhard, 5,480,570, Cl. 252-62.560.
- Franz Gremser KG: See—  
Meyer, Gerhard, 5,480,136, Cl. 271-176.000.
- Franz Plasser Bahnbaumaschinen-Industries. m.b.H.: See—  
Theurer, Josef; and Brunner, Manfred, 5,479,725, Cl. 37-104.000.
- Franzen, Gustav: See—  
Ballhausen, Ulrich; Franzen, Gustav; Lorenz, Rainer; Lossa, Ulrich; and Spix, Guido, 5,479,771, Cl. 57-406.000.
- Fratangelo, Louis D.: See—  
Badesha, Santokh S.; Heeks, George J.; Henry, Arnold W.; Pan, David H.; Fratangelo, Louis D.; and Ferguson, Robert M., 5,480,938, Cl. 525-104.000.
- Fratelli Roda S.A.: See—  
Taddei, Renzo; and Roda, Franco, 5,480,090, Cl. 229-162.000.
- Frazier, Alan D.; and Lewis, Richard P., to Scott Paper Company. Secured disposable liquid soap dispenser, 5,480,068, Cl. 222-153.030.
- Freadman, Tommyca, to Sparkomatic Corporation. Plug-in sound accessory for portable computers, 5,481,616, Cl. 381-90.000.
- Fredell, Dale L.: See—  
Donovan, Daniel J.; McSherry, David D.; and Fredell, Dale L., 5,480,643, Cl. 424-409.000.
- Frederick, Kevin W.: See—  
Hunter, Wood E.; Frederick, Kevin W.; and Loeffler, Randy J., 5,480,921, Cl. 523-331.000.
- Frederick, Royce: See—  
Kammerer, Gene W.; Frederick, Royce; Howard, Barbara; and Walker, Edd, 5,480,404, Cl. 606-113.000.
- Fredin, Steven R.: See—  
Ward, Michael J.; Fredin, Steven R.; and Gans, Russell S., 5,480,183, Cl. 280-728.200.
- Freed, Jeffrey S., to JSF Consultants Ltd. Use of injectable biomaterials for the repair and augmentation of the anal sphincters, 5,480,644, Cl. 424-436.000.
- Freedman, Jerome E.: See—  
Urkowitz, Harry; Bucci, Nicholas J.; and Freedman, Jerome E., 5,481,270, Cl. 342-101.000.
- Freiburg, Kurt E.; and Liebel, James D., to Diesel Engine Retarders, Inc. Compression release engine brake slave piston drive train, 5,479,896, Cl. 123-90.160.
- Freidhoff, Carl B.: See—  
Krishnaswamy, Silaipillayarputhur V.; and Freidhoff, Carl B., 5,481,110, Cl. 250-288.000.
- Freitag, Lutz; Singvogel, Armin; and Schmitt, Klaus, to Willy Rusch AG. Tracheal stent, 5,480,431, Cl. 623-9.000.
- Freriks, Jan; Groeneweld, Pieter; Kooijmans, Petrus G.; and Raudenbush, Werner T., to Shell Oil Company. Process for the preparation of an acid functional polyester resin, 5,480,960, Cl. 528-198.000.
- Freund Industrial Co., Ltd.: See—  
Tanaka, Nagahiko; Takei, Narimichi; and Unosawa, Kazuomi, 5,480,654, Cl. 424-490.000.
- Frey, Donald J.; and Holtz, Michael J., to Architectural Energy Corporation. Automated diagnostic system having temporally coordinated wireless sensors, 5,481,481, Cl. 364-551.010.
- Freyssinet International et Cie: See—  
Stubler, Jérôme; Ladret, Patrick; and Dupuis, Joël, 5,479,671, Cl. 14-22.000.
- Fric, Thomas F.; and Gulati, Anil, to General Electric Company. Low emission combustor having tangential lean direct injection, 5,479,781, Cl. 60-740.000.
- Friedman, Steven M.; Crow, Mary K.; and Posnett, David, to Ruptured and Crippled, Maintaining the Hospital for Special Surgery, New York Society for the Relief of the . Method of producing antibodies to a restricted population of T lymphocytes, antibodies produced therefrom and methods of use thereof, 5,480,895, Cl. 435-7.240.
- Friedrich, Hans-Helmut: See—  
Wirth, Hermann O.; and Friedrich, Hans-Helmut, 5,481,039, Cl. 568-6.000.
- Friends of Freesia Co., Ltd.: See—  
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- Friess, Walter: See—  
Kraemer, Michael; Wirbeleit, Friedrich; Euderle, Christian; Friess, Walter; Kruttsch, Bernd; Withalm, Gert; Schoen, Christof; Mikulic, Leopold; Hertweck, Gernot; and Thoma, Frank, 5,479,775, Cl. 60-274.000.
- Frisco, Thomas A.: See—



- Hellstrom, Ake A.; Koester, Karsten G.; Frisco, Thomas A.; and Throm, James E., Jr., 5,479,720, Cl. 33-501.020.
- Frøger, Marie-Helene: See—  
Nagane, Hiromichi; Dodge, Alexandre; Frøger, Marie-Helene; Truffaut, Christophe; and Michel, Stéphane, 5,480,135, Cl. 271-176.000.
- Frontec Incorporated: See—  
Mitsumori, Kenichi; Kasama, Yasuhiko; Nakano, Akira; Abe, Akira; and Ohmi, Tadashi, 5,480,563, Cl. 210-748.000.
- Frye, Robert C.; Lau, Maureen Y.; and Tai, King L., to AT&T Corp. Temporary connections for fast electrical access to electronic devices, 5,481,205, Cl. 324-757.000.
- Frye, Ronald E., Jr., to VLSI Technology, Inc. Optical scan and alignment of devices under test, 5,481,202, Cl. 324-754.000.
- Fu Hsiang Textile Co., Ltd.: See—  
Tsai, Chung Y., 5,480,647, Cl. 424-443.000.
- Fuchs, Eberhard; Witzel, Tom; and Stadler, Klaus P., to BASF Aktiengesellschaft. Decontamination of tertiary amines from primary and secondary amines, 5,481,037, Cl. 564-437.000.
- Fuji Electric Co., Ltd.: See—  
Minowa, Hirofumi; Ishii, Shinichi; Yanase, Takao; and Yamazoe, Masaru, 5,481,172, Cl. 318-800.000.
- Ujiie, Takashi; and Ito, Makoto, 5,480,736, Cl. 429-13.000.
- Fuji Jukogyo Kabushiki Kaisha: See—  
Ito, Takenori, 5,479,905, Cl. 123-520.000.
- Manabe, Takao; Yamakawa, Yuhei; Shin, Shoichi; Yamada, Hideyuki; Nagashima, Mitsuo; Kokubo, Mitsunori; Tsunada, Masafumi; Nagakura, Yasuhiko; Nakajima, Yukio; Inoue, Tomohiro; and Kondo, Kiyoshi, 5,480,508, Cl. 156-353.000.
- Ogura, Akira, 5,481,456, Cl. 364-424.010.
- Fuji Photo Co., Ltd.: See—  
Ito, Kenji, 5,481,364, Cl. 358-261.100.
- Fuji Photo Film Co., Ltd.: See—  
Fujishiro, Takeshi, 5,481,419, Cl. 360-96.500.
- Hara, Shoji, 5,481,623, Cl. 382-128.000.
- Ishikawa, Takatoshi; and Yoneyama, Masakazu, 5,480,628, Cl. 430-493.000.
- Kawaoka, Yoshiaki, 5,480,236, Cl. 400-120.010.
- Nakashima, Hiroshi; and Fukuhara, Sanshiro, 5,480,086, Cl. 226-97.000.
- Naoe, Koji; and Ejiri, Kiyomi, 5,480,716, Cl. 428-328.000.
- Shimizu, Makoto; Esaki, Toshiro; Shibata, Tadayoshi; and Takahashi, Koichi, 5,479,691, Cl. 29-430.000.
- Toyama, Tadao; and Kunichika, Kenji, 5,480,762, Cl. 430-302.000.
- Yamazaki, Kazuki; Inoue, Nobuaki; Yamamoto, Seiichi; Ezoe, Toshihide; Sakai, Minoru; Ikeda, Tadashi; Okazaki, Masaki; and Fujiwara, Toshiaki, 5,480,886, Cl. 430-264.000.
- Yanagihara, Naoto; Takashima, Masanobu; Shimazaki, Masato; Iwakura, Ken; and Kodama, Tomohiro, 5,480,765, Cl. 430-338.000.
- Fuji Xerox Co., Ltd.: See—  
Furuta, Hideki, 5,481,089, Cl. 219-497.000.
- Koumo, Katuyuki; Taniuchi, Kazuman; and Sekine, Hiroshi, 5,481,372, Cl. 358-433.000.
- Fujicopian Co., Ltd.: See—  
Sogabe, Jun, 5,480,704, Cl. 428-212.000.
- Suematsu, Hideki, 5,480,703, Cl. 428-212.000.
- Fujii, Eiichi: See—  
Osato, Yoichi; Kawade, Hisaaki; Fujii, Eiichi; Kasama, Nobuhiro; and Kobayashi, Tadashi, 5,481,410, Cl. 360-13.000.
- Fujii, Hiroyuki: See—  
Tsuda, Masaomi; Fujiwara, Yoshito; Ikegami, Yuji; Sato, Masao; and Fujii, Hiroyuki, 5,480,608, Cl. 420-40.000.
- Fujii, Yasuhisa: See—  
Shimokata, Akihiro; Fujii, Yasuhisa; and Fujimoto, Hisayoshi, 5,479,685, Cl. 29-25.350.
- Fujikura, Toshiaki: See—  
Ohashi, Susumu; Tateishi, Hideo; and Fujikura, Toshiaki, 5,481,595, Cl. 379-67.000.
- Fujimori, Naoji: See—  
Ikegaya, Akihiko; and Fujimori, Naoji, 5,481,081, Cl. 219-121.480.
- Fujimori, Yoshitomo; and Mihara, Hiroaki, to Honda Giken Kogyo Kabushiki Kaisha. Fuel vapor collecting system for an internal combustion engine, 5,479,904, Cl. 123-520.000.
- Fujimoto, Hisayoshi: See—  
Shimokata, Akihiro; Fujii, Yasuhisa; and Fujimoto, Hisayoshi, 5,479,685, Cl. 29-25.350.
- Fujimoto, Katsumi: See—  
Motohashi, Shozo; Fujimoto, Katsumi; Nishiyama, Hiroshi; Heinouchi, Yoshiaki; Yoshitani, Kazuhiro; and Sakashita, Yukio, 5,479,822, Cl. 73-504.140.
- Fujimoto, Makoto, to Canon Kabushiki Kaisha. Color image reading apparatus, 5,481,381, Cl. 358-505.000.
- Fujimura, Yoshiichi; Yano, Hideaki; and Matsuura, Shizutaka, to Takata Corporation. Seat belt retractor, 5,480,105, Cl. 242-383.200.
- Fujiore Inc.: See—  
Matsumoto, Masakatsu; Watanabe, Nobuko; Mori, Eiko; Kobayashi, Hisako; and Ikawa, Hiroshi, 5,481,009, Cl. 549-375.000.
- Fujisaki, Kenichi, to Advantest Corporation. Memory testing device for multiported DRAMs, 5,481,671, Cl. 395-182.060.
- Fujisaki, Yoshihisa: See—  
Mochizuki, Kazuhiro; Mishima, Tomoyoshi; Nakamura, Tooru; Masuda, Hiroshi; Tanoue, Tomonori; Haga, Tooru; and Fujisaki, Yoshihisa, 5,481,120, Cl. 257-49.000.
- Fujishiro, Takeshi, to Fuji Photo Film Co., Ltd. Cassette holder moving mechanisms, 5,481,419, Cl. 360-96.500.
- Fujita, Hiroo, to Citizen Watch Co., Ltd. Optical device for measuring surface shape, 5,481,360, Cl. 356-360.000.
- Fujita, Kazuhiro: See—  
Isoai, Masaru; Harada, Toshiharu; Kurata, Tokihiro; Fujita, Kazuhiro; Takama, Kazushi; and Jikuhara, Shigekazu, 5,480,571, Cl. 252-62.560.
- Fujita, Satoshi; Kagiya, Naoto; Momiyama, Masayoshi; and Kondo, Yasumitsu, to Aisin Seiki Kabushiki Kaisha. Method of detecting phosphatase, 5,480,791, Cl. 435-196.000.
- Fujita, Tsuyosi: See—  
Sugita, Kouji; Kitahara, Tetsuo; Nonobe, Masatsugu; and Fujita, Tsuyosi, 5,480,982, Cl. 536-26.240.
- Fujitsu Limited: See—  
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- Kakutshi, Mitsuo; Awata, Yutaka; Ueno, Norio; Miyoshi, Seiji; Murakami, Norio; and Manabe, Atsushi, 5,481,564, Cl. 375-230.000.
- Kawamura, Hiromitsu, 5,481,559, Cl. 372-50.000.
- Kikkawa, Toshihide; and Ohori, Tatsuya, 5,480,833, Cl. 437-126.000.
- Masaki, Takashi; and Yanagi, Shigenori, 5,481,510, Cl. 369-32.000.
- Matsumoto, Tomotaka; Inoue, Jun; Ichimura, Teruhiko; Murata, Yuji; Watanabe, Junichi; Nagahiro, Yoshio; Hodate, Mari; Oki, Kenichi; and Okabe, Masahiro, 5,480,818, Cl. 437-40.000.
- Naito, Takao, 5,481,390, Cl. 359-174.000.
- Nakano, Rikizo; and Matsui, Noriyuki, 5,481,551, Cl. 371-27.000.
- Nakayama, Mikio, 5,481,593, Cl. 379-61.000.
- Ryu, Tadimitsu; Takahara, Toshiro; Hirono, Shingo; and Matsumoto, Tooru, 5,481,692, Cl. 395-700.000.
- Ryu, Tadimitsu; Ichikawa, Naomichi; Murakawa, Masahiko; Adachi, Takeshi; and Toyota, Masanobu, 5,481,718, Cl. 395-700.000.
- Suda, Hiroshi, 5,481,094, Cl. 235-383.000.
- Tabuchi, Haruhiko, 5,481,629, Cl. 385-14.000.
- Tokuyama, Saburo, 5,481,549, Cl. 371-27.000.
- Yamamoto, Yoshikazu; and Itabashi, Akio, 5,481,352, Cl. 355-308.000.
- Yanagida, Masahiro; Takahashi, Hiromasa; and Tachibana, Osamu, 5,481,489, Cl. 364-736.500.
- Yanagida, Tomokatsu, 5,481,511, Cl. 369-32.000.
- Fujiwara, Hideo: See—  
Daimon, Hideo; Kitakami, Osamu; and Fujiwara, Hideo, 5,480,694, Cl. 428-64.100.
- Fujiwara, Satoshi; and Ikeda, Takaaki, to Koyo Seiko Co., Ltd. One-way clutch incorporating a retainer having paired symmetric engagement portions, 5,480,013, Cl. 192-45.100.
- Fujiwara, Toshiaki: See—  
Yamazaki, Kazuki; Inoue, Nobuaki; Yamamoto, Seiichi; Ezoe, Toshihide; Sakai, Minoru; Ikeda, Tadashi; Okazaki, Masaki; and Fujiwara, Toshiaki, 5,480,886, Cl. 430-264.000.
- Fujiwara, Yoshito: See—  
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- Fukai, Toshimasa: See—  
Noda, Yasushi; Yoshioka, Nobuyuki; Suzuki, Nobutaka; Fukai, Toshimasa; Yoshihara, Tetsuo; and Koshiro, Koichi, 5,480,472, Cl. 75-351.000.
- Fukaya, Matuo; Nagai, Junichi; and Kuzuoka, Kaoru, to Nippondenso Co., Ltd. Thermistor-type temperature sensor, 5,481,240, Cl. 338-22.00R.
- Fukino, Kunihiro: See—  
Yamazaki, Satoshi; Takayama, Toru; Fukino, Kunihiro; Kodaka, Yoshiro; and Imanari, Hitoshi, 5,481,406, Cl. 359-694.000.
- Fukuda, Hiroaki; Funato, Hiroyoshi; and Misawa, Shigeyoshi, to Ricoh Company, Ltd. Wavelength conversion element, 5,481,636, Cl. 385-122.000.
- Fukuda, Masao: See—  
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- Senso, Hitoshi; Arai, Yoshio; and Fukuda, Masao, 5,481,306, Cl. 348-383.000.
- Fukuda, Seiji: See—  
Sasaki, Katsuhiro; Kuroda, Yuka; and Fukuda, Seiji, 5,481,547, Cl. 370-112.000.
- Fukuhara, Sanshiro: See—  
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- Fukui, Fumiaki: See—  
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- Fukui, Yutaka: See—  
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- Fukumoto, Takehiko; Hirokawa, Kazushi; and Okada, Kurao, to Shin-Etsu Chemical Co., Ltd. Process for the preparation of phosphonium salts, 5,481,040, Cl. 568-9.000.
- Fukuoka, Mikio: See—  
Yamamoto, Ken; Yamamoto, Michiyasu; Baba, Norimasa; Fukuoka, Mikio; Kuroyanagi, Isao; Sanada, Ryouichi; and Torigoe, Eiichi, 5,479,985, Cl. 165-176.000.

- Fukushima, Shinichi: See—  
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- Fulkerson, Don K.: See—  
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- Fuller, John M.; and Boothby, Scott A., to Rubbermaid Commercial Products, Inc. Utility cart, 5,480,180, Cl. 280-656.000.
- Fuller, Mark; and Robinson, Alan. Air powered water display nozzle unit, 5,480,094, Cl. 239-17.000.
- Fultz, Timothy J.: See—  
Kacian, Daniel L.; and Fultz, Timothy J., 5,480,784, Cl. 435-91.210.
- Funabashi, Kiyomi; Chino, Koichi; Kuriyama, Osamu; Baba, Tsutomu; Uchida, Shunsuke; and Kikuchi, Makoto, to Hitachi, Ltd. Method for solidifying radioactive waste, 5,481,061, Cl. 588-4.000.
- Funada, Masahiro: See—  
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- Funahashi, Akira: See—  
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- Funato, Hiroyoshi: See—  
Fukuda, Hiroaki; Funato, Hiroyoshi; and Misawa, Shigeyoshi, 5,481,636, Cl. 385-122.000.
- Funk, Guido: See—  
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- Furch, Joseph A., III: See—  
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- Furniture Medic, Inc.: See—  
Vieyra, Todd T., 5,480,680, Cl. 427-388.400.
- Furr, Michael G.; Kava, Joseph; Blackburn, Greg; and McGovern, Richard, to Applied Materials, Inc. Doped extension for process chamber electrode, 5,480,052, Cl. 216-71.000.
- Furuchi, Katsushi; Yokomizo, Yoshikazu; Honma, Toshio; and Murakami, Katsumi, to Canon Kabushiki Kaisha. Image forming apparatus having error detection with automatic error display, 5,481,335, Cl. 355-206.000.
- Furukawa Electric Co., Ltd.: See—  
Xu, Jie; Suzuki, Kenji; and Kinoshita, Isamu, 5,480,344, Cl. 451-28.000.
- Furukawa, Hideaki; and Yamakawa, Tadashi, to Canon Kabushiki Kaisha. Paper feeding device, 5,480,131, Cl. 271-9.060.
- Furusawa, Satoshi: See—  
Oishi, Tetsuya; Ozawa, Hiroshi; Karasawa, Minato; Inomata, Masamitsu; Mega, Izumi; Yamauchi, Atsuyoshi; Kamada, Kazunori; Nakahata, Shigeru; Sakamoto, Katsumi; Nakashima, Tatsunobu; Watanabe, Akito; Suzuki, Jin; Ohkawa, Kouhei; Furusawa, Satoshi; Ono, Hiroshi; and Sugazaki, Kazuo, 5,480,947, Cl. 525-509.000.
- Furuta, Hideki, to Fuji Xerox Co., Ltd. Heater control device for image forming apparatus, 5,481,089, Cl. 219-497.000.
- Furuta, Toshiyuki; Horiguchi, Hiroyuki; and Eguchi, Hirotoshi, to Ricoh Company, Ltd. Neuron unit and neuron unit network, 5,481,646, Cl. 395-27.000.
- Furutani, Kiyohiro: See—  
Yamauchi, Tadaaki; Miyamoto, Hiroshi; Morooka, Yoshikazu; Furutani, Kiyohiro; and Aoki, Makiko, 5,481,497, Cl. 365-189.050.
- Furuya, Yonezo, to Nippon Conlux Co., Ltd. Coin-distinguishing method and apparatus therefor, 5,480,019, Cl. 194-318.000.
- G. D. Searle & Co.: See—  
Cordi, Alexis A.; and Sun, Eric T., 5,480,876, Cl. 514-81.000.
- Garland, Robert B.; Miyano, Masateru; Zablocki, Jeffery A.; and Schretzman, Lori A., 5,481,021, Cl. 560-35.000.
- G. D. Societa' per Azioni: See—  
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- Gaboury, Pierre, to Kabushiki Kaisha Toshiba. Logic program comparison method for verifying a computer program in relation to a system specification, 5,481,717, Cl. 395-700.000.
- Gabriel, Jochen; and Bechtold, Herbert, to Medico Development Investment Company. Injection device, 5,480,387, Cl. 604-134.000.
- Gadelle, André: See—  
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- Gaghardi, John J.; Chesley, Jason A.; Houck, Charles H.; Cosmano, Richard J.; and Duwell, Ernest J., to Minnesota Mining and Manufacturing Company. Coated abrasive containing erodible agglomerates, 5,480,461, Cl. 51-295.000.
- Gaglianella, Robert D.: See—  
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- Gagnepain, Jean-Christophe: See—  
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- Gal, George; Anderson, William W.; Herman, Bruce J.; and Stiller, Marc A., to Lockheed Missiles and Space Company, Inc. Gray scale microfabrication for integrated optical devices, 5,480,764, Cl. 430-321.000.
- Gallagher, Peter T.: See—  
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- Gallien, Arnold. Electrolysis cell and method for gas-developing or gas-consuming electrolytic processes, 5,480,515, Cl. 204-1.110.
- Gallo, Paul S.; Goodman, R. W. Benjamin; Krantz, Lawrence L.; McLoughlin, Kathleen A.; and Wagner, Eric M., to Data General Corporation. Data transfer operations between two asynchronous buses, 5,481,681, Cl. 395-325.000.
- Gallus, Heinz E.: See—  
Walter, Hilger A.; Hönen, Herwart; and Gallus, Heinz E., 5,479,818, Cl. 73-116.000.
- Gambrell, Jeffrey S.; Hutchings, William F.; Markle, Stephen L.; Schutte, Marlin; and Palmer, John M., to General Signal Corporation. Mixer systems, 5,480,228, Cl. 366-273.000.
- Ganaja, Scott O.: See—  
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- Gano, John C.; Longbottom, Jim; Loughbridge, Bill W.; and Brothers, Lance E., to Halliburton Company. Temporary plug system, 5,479,986, Cl. 166-292.000.
- Gans, Russell S.: See—  
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- Garay, Luis H.: See—  
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- Garcia, John; Alt, Eckhard; and Stotts, Lawrence J., to Intermedics, Inc. Cardiac pacemaker with universal coating, 5,480,416, Cl. 607-36.000.
- Garcia, Rodolfo F.; and Graeve, Egbert, to Schlumberger Technologies, Inc. Apparatus for maintaining stimulation to a device under test after a test stops, 5,481,550, Cl. 371-27.000.
- Gardner, Gregory S.: See—  
Nolan, Paul; Tovey, H. Jonathan; Stone, Corbett W.; and Gardner, Gregory S., 5,480,406, Cl. 606-139.000.
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- Glebar Company, Inc.: See—  
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- Gogan, James R. Snowblower attachment for a pickup truck, 5,479,730, Cl. 37-231.000.
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- Goldman, Boris E. Compositions and methods for promoting hair growth, 5,480,889, Cl. 514-310.000.
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- Graham, Samuel L.; and deSolms, S. Jane, to Merck & Co., Inc. Inhibitors of farnesyl protein transferase, 5,480,893, Cl. 514-336.000.
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- Grauvogl, Petra: See—  
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- Grebel, Haim: See—  
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- Greff, Richard J.; Tighe, Patrick J.; Byram, Michael M.; and Barley, Leonard V., to MedLogic Global Corporation. Cyanoacrylate adhesive compositions, 5,480,935, Cl. 524-776.000.
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- Grimes, Gary J., to AT&T Corp. Selection of a communication terminal for receiving an incoming call, 5,481,590, Cl. 379-57.000.



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Scott, Danny E.; Grimes, Robert E.; Isbell, Matthew R.; and Pessier, Rudolf C. O., 5,479,997, Cl. 175-374.000.
- Grimm, Robert A.; Wine, Wanda F.; and Molnar, John A., to Edison Welding Institute. Thermoplastic welding, 5,481,091, Cl. 219-633.000.
- Grinberg, Eugene Y.; and Cisney, Rodney, to Intersoll-Rand Company. Engine speed control device, 5,479,908, Cl. 123-386.000.
- Groenvel, Pieter: See—  
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- Grohe, Klaus: See—  
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- Gromo, Gianni: See—  
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- Grondalski, Robert S., to Digital Equipment Corporation. Shift register divided into a number of cells and a number of stages within each cell to permit bit and multiple bit shifting, 5,481,749, Cl. 395-800.000.
- Grossman, Bert, to Novalek, Inc. Mesh cover attached to a terrarium by hook-and-loop fasteners, 5,479,884, Cl. 119-265.000.
- Grosse-Bley, Michael; Bömer, Bruno; Grosser, Rolf; Lange, Walter; Hoefer, Franz-Peter; and Arit, Dieter, to Bayer Aktiengesellschaft. Optically active amino acid sulphoxide and amino acid sulphone derivatives, 5,481,026, Cl. 560-153.000.
- Grosser, Rolf: See—  
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- Groth, Eric, to Belpont Company, Inc. Gingival retraction cord tool, 5,480,303, Cl. 433-136.000.
- Grumlose, Dean; and Gulick, Dale, to Advanced Micro Devices, Inc. Power-efficient external memory access control using external memory enable time durations independent of external memory accessing rate, 5,481,690, Cl. 395-494.000.
- Grumman Aerospace Corporation: See—  
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- Grundel, Hans; and Moser, Heinz, to Eska Medical GmbH & Co. Angularly adjustable offset spherical head endoprosthesis, 5,480,451, Cl. 623-23.000.
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- Gruskin, Elliott A.: See—  
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- Gruss, Hans-Juergen: See—  
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- Grueter, Peter J.: See—  
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- GTE Laboratories Incorporated: See—  
Owens, Leslie D.; Juenneman, Robert R.; Worrest, Ralph; and Davis, Alva B., 5,481,611, Cl. 380-25.000.
- Gu, Gong-En: See—  
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- Gubitz, Holger: See—  
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- Guenther, Klaus: See—  
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- Guerra, Michael A., deceased (by Sarah B. Cutler, executor): See—  
Glavish, Hilton F.; Guerra, Michael A., deceased, 5,481,116, Cl. 250-396.000.
- Guerrein, James A.: See—  
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- Guillemin, Genevieve; Christel, Pascal; Patat, Jean-Louis; and Meunier, Alain, to Inotek. Use of porous polycrystalline aragonite as a support material for in vitro culture of cells, 5,480,827, Cl. 435-240.230.
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- Gulick, Dale: See—  
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- Gull Laboratories, Inc.: See—  
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- Gullberg, Grant T.: See—  
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- Gunderson, Ernest M., to Fargo Electronics, Inc. Transfer materials supplier, 5,480,242, Cl. 400-208.000.
- Güngör, Timur: See—  
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- Gunnarsson, Gunnar K.: See—  
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- Guo, Shao-Hua, to ARCO Chemical Technology, L.P. Allyl ester copolymers with allylic alcohols or propoxylated allylic alcohols, 5,480,954, Cl. 526-330.000.
- Gupta, Amitava; and Blum, Ronald D., to Innotech, Inc. Method for manufacturing thin progressive addition lenses, 5,480,600, Cl. 264-1.700.
- Gupta, Dinesh: See—  
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- Gutwerk, Martin: See—  
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- Haas, Fritz: See—  
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- Häbich, Dieter: See—  
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- Hachenberg, Bernhard. Waste bag holder, 5,480,113, Cl. 248-100.000.
- Hackl, Harald. Apparatus for flue gas cleaning, 5,480,463, Cl. 55-222.000.
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- Hagenah, Gerhard, to SF-Kooperation GmbH Beton-Konzepte. Set of structural elements made up of concrete blocks, and a gravity retaining wall erected therefrom, 5,480,267, Cl. 405-284.000.
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- Hahn, Reinhard: See—  
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- Hai, Xu; and Egashira, Yoshimi, to Harada Kogyo Kabushiki Kaisha. Two-wave antenna for telephones used in vehicles, 5,481,271, Cl. 343-749.000.

- Haiduk, Herbert: See—  
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- Hain, Manfred, to Siemens Aktiengesellschaft. Method for the anisotropic etching of an aluminiferous layer, 5,480,051, Cl. 216-67.000.
- Hainle, Rudi: See—  
Ernst, Volker; Hainle, Rudi; and Lehmann, Volker, 5,480,197, Cl. 292-113.000.
- Hajishoreh, Kavch-Karimi. Syringe apparatus, 5,480,390, Cl. 604-192.000.
- Hale, Arthur H., to Shell Oil Company. Drilling and cementing with glycoside-blast furnace slag-drilling fluid, 5,479,987, Cl. 166-293.000.
- Halila, Ely E., to General Electric Company. Film cooling starter geometry for combustor liners, 5,479,772, Cl. 60-39.320.
- Hall, Bertie F., Jr., to Hoskins Manufacturing Company. Tube making mechanism having a fill tube for depositing a ceramic powder into the tube as it is being made, 5,479,690, Cl. 29-33.000.
- Hall, Charles A.: See—  
Belser, Robert S.; Tark, John R.; and Hall, Charles A., 5,480,589, Cl. 261-76.000.
- Hall, Hendley W.: See—  
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- Hall, John: See—  
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- Hall, Robert C.: See—  
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- Haller, Matthew L.: See—  
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- Gold, Randy, 5,481,105, Cl. 250-266.000.
- Shy, Perry C.; and Crow, Robert W., 5,479,989, Cl. 166-332.400.
- Haltof, Garry P. Hand release bracket, 5,480,115, Cl. 248-221.110.
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- Ham, Jay M.: See—  
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- Hamabe, Kenji: See—  
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- Hamada, Hirokazu: See—  
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- Hamada, Mamoru: See—  
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- Hamaguchi, Yoshihiro: See—  
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- Hamamoto, Takeshi: See—  
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- Hamilton, Graham; and Hagmann, Robert B., to Sun Microsystems, Inc. Method and apparatus for delegated communications in a computer system using trusted deputies, 5,481,715, Cl. 395-700.000.
- Hamilton, John V.; Caldarise, Salvatore; and Treacy, Debra J., to Johnson & Johnson Orthopaedics, Inc. Composite prosthesis and method of manufacture, 5,480,449, Cl. 623-66.000.
- Hamley, James P. Electronic charging system, 5,481,177, Cl. 320-23.000.
- Hammann, Peter: See—  
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- Hammer, Klaus-Dieter; Mans, Leo; and Siebrecht, Manfred, to Hoechst Aktiengesellschaft. Tubular food casing having improved peelability, 5,480,691, Cl. 428-34.800.
- Hammerslag, Gary R.: See—  
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- Hamre, John D., to Network Systems Corporation. Jitter measurement using a statistically locked loop, 5,481,563, Cl. 375-226.000.
- Han, Seok Woo, to Goldstar Electron Co., Ltd. Redundancy circuit for semiconductor memory device, 5,481,498, Cl. 365-185.090.
- Hancock, David S.: See—  
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- Hannum, Richard C.: See—  
Shepard, Randall B.; and Hannum, Richard C., 5,480,689, Cl. 428-15.000.
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- Hansen, Charles D., Jr.: See—  
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- Hansen, Richard W.: See—  
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- Hanson, James A.: See—  
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- Hara, Shoji, to Fuji Photo Film Co., Ltd. Apparatus for determining an image position on imaging media, 5,481,623, Cl. 382-128.000.
- Harada Kogyo Kabushiki Kaisha: See—  
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- Harada, Shigeru; Ishimaru, Kazuhiro; and Hagi, Kimio, to Mitsubishi Denki Kabushiki Kaisha. Method of forming an interconnection structure, 5,480,836, Cl. 437-192.000.
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- Hardaker, Philip R.: See—  
Lomp, Martin G.; and Hardaker, Philip R., 5,481,696, Cl. 395-500.000.
- Hardie, Gregory J.; Mantey, Paul-Gerhard; and Schwarz, Mark P., to Technological Resources Pty. Limited. Method for intensifying the reactions in metallurgical reaction vessels, 5,480,473, Cl. 75-501.000.
- Hardie, Robert; and Shaw, Kevin, to British Nuclear Fuels plc. Apparatus for dispensing substances which are biologically hazardous, 5,479,969, Cl. 141-130.000.
- Hardman, Stephen; Leng, Stephen A.; and Wilson, David C., to BP Chemicals Limited. Polymer cracking, 5,481,052, Cl. 585-241.000.
- Hardtmann, Dirk J.: See—  
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- Harford, Stephen: See—  
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- Harms, Axel, to MTU Motoren-und Turbinen-Union Muenchen GmbH. Shaft seal with in-line sealing rings, 5,480,160, Cl. 277-3.000.
- Harmuth, John F.: See—  
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- Harnden, Eric F.; and Harnden, Leif. Stationary bicycle trainer, 5,480,366, Cl. 482-61.000.
- Harnden, Leif: See—  
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- Harner, Michael, to Foundation of Shamanic Studies. Device for inducing altered states of consciousness, 5,479,941, Cl. 128-845.000.
- Harper, Jeffrey D.; Kalendra, Paul W.; Piazza, William J.; Tanner, Howard C.; and Vinh, Anh, to International Business Machines Corporation. Apparatus and method for addressing multiple adapter cards in one operation by distributing bits of registers across the adapter cards, 5,481,755, Cl. 395-823.000.
- Harreus, Albrecht: See—  
Eicken, Karl; Goetz, Norbert; Harreus, Albrecht; Ammermann, Eberhard; Lorenz, Gisela; and Rang, Harald, 5,480,897, Cl. 514-365.000.
- Harris, Colin, to Mitel Corporation. Compact CMOS analog crosspoint switch matrix, 5,481,125, Cl. 257-203.000.
- Harris Corporation: See—



- DeJong, Glenn A.; Bacrania, Kantilal; Church, Michael D.; Fisher, Gregory J.; Gasner, John T.; Ito, Akira; Johnston, Jeffrey M.; Kutchnick, Dave; and Rhee, Choong-Sun, 5,481,129, Cl. 257-360.000.
- Harris, Daniel S. Face mask and face mask cover. 5,479,658, Cl. 2-9.000.
- Harris, Frank W.; and Cheng, Stephen Z. D., to University of Akron, The. Negative birefringent polyimide films. 5,480,964, Cl. 528-353.000.
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- Harris, Michael T.; Basaran, Osman A.; Kollie, Thomas G.; and Weaver, Fred J., to United States of America, Energy. Silica powders for powder evacuated thermal insulating panel and method. 5,480,696, Cl. 428-69.000.
- Harris, Robert S.; and Griffin, Jeffery, to Stant Manufacturing Inc. Quick-on cap with removal delay mechanism. 5,480,055, Cl. 220-203.260.
- Harris, William H.: See—  
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- Harrison, John J.: See—  
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- Hart, Ian: See—  
Blakeslee, Wes; and Hart, Ian, 5,479,909, Cl. 123-491.000.
- Hart, James E.; and Sich, Gary M., to Westinghouse Air Brake Company. Railway brake pipe bracket with access ports. 5,480,218, Cl. 303-28.000.
- Hart, Paul R.: See—  
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- Hartmann, Uwe: See—  
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- Hartung, John; Jacquin, Arnaud E.; Michel, Thomas A.; and Podilchuk, Christine I., to AT&T Corp. Method and apparatus for synthesizing subband video images. 5,481,308, Cl. 348-398.000.
- Hartvigsen, Joseph J.: See—  
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- Harvey, Ronald G.: See—  
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- Harwood, H. James: See—  
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- Herron, Lester W.: See—  
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 Hirabayashi, Hiromu: See—  
 Kitahara, Tsuyoshi; Kumai, Eiji; Hirabayashi, Hiromu; Kanbayashi, Kenichi; and Watanabe, Kohji, 5,481,284, Cl. 347-42.000.  
 Hirai, Shigeru; Kurima, Kazunori; Saito, Masahide; Yul, Dai; Hattori, Tomoyuki; and Suganuma, Hiroshi, to Sumitomo Electric Industries, Ltd. Optical waveguide module and method of manufacturing the same. 5,481,632, Cl. 385-49.000.  
 Hirai, Takahiro: See—  
 Sakurada, Shinya; Hirai, Takahiro; Tsutai, Akihiko; and Sahashi, Masashi, 5,480,495, Cl. 148-301.000.  
 Hirai, Yoshihiko: See—  
 Udagawa, Masaharu; Yasui, Juro; Niwa, Masaaki; Hirai, Yoshihiko; Okada, Kenji; Morimoto, Kiyoshi; and Yuki, Koichiro, 5,480,492, Cl. 134-2.000.  
 Hiramatsu, Soichi: See—  
 Saikawa, Satoshi; Suzuki, Tetsuo; Hiramatsu, Soichi; Taniguro, Masahiro; Saito, Hiroyuki; Yanagi, Haruyuki; Nojima, Takashi; Kinoshita, Hiroyuki; and Kawakami, Hideaki, 5,480,247, Cl. 400-629.000.  
 Hiramoto, Tatsuji; Igarashi, Tatsushi; Matsuno, Hiromitsu; Yasuda, Yukio; and Yamaguchi, Akiyasu, to Ushiodenki Kabushiki Kaisha. Metal vapor discharge lamp. 5,481,159, Cl. 313-570.000.  
 Hirano, Isao: See—  
 Morita, Shigeru; Ishida, Hiroshi; and Hirano, Isao, 5,480,371, Cl. 493-117.000.  
 Hirano, Koichiro: See—  
 Jizomoto, Hiroaki; Hirano, Koichiro; and Kanaoka, Eri, 5,480,655, Cl. 424-492.000.  
 Hirata, Toichi: See—  
 Toyooka, Tsukasa; Hirata, Toichi; Sugiyama, Genroku; and Tatsumi, Akira, 5,479,778, Cl. 60-431.000.  
 Hiratsuka, Kazuya: See—  
 Tomonaga, Hiroyuki; Morimoto, Takeshi; and Hiratsuka, Kazuya, 5,480,722, Cl. 428-428.000.  
 Hirayama, Atsushi: See—  
 Kodama, Kazuhisa; Hirayama, Atsushi; and Masayasu, Hiroyuki, 5,480,888, Cl. 514-310.000.  
 Hiroi, Junichi, to Dai Nippon Printing Co., Ltd. Laminate sheet and card. 5,480,701, Cl. 428-204.000.  
 Hirokawa, Kazushi: See—  
 Fukumoto, Takehiko; Hirokawa, Kazushi; and Okada, Kurao, 5,481,040, Cl. 568-9.000.  
 Hirono, Shingo: See—  
 Ryu, Tadamitsu; Takahara, Toshio; Hirono, Shingo; and Matsumoto, Tohru, 5,481,692, Cl. 395-700.000.  
 Hirose, Toshio: See—  
 Itoh, Tutomu; Hirose, Toshio; Kokunishi, Motohide; Iwanaga, Masaharu; and Endo, Shinichi, 5,481,698, Cl. 395-185.010.  
 Hirose, Haruomi, to Daiwa Seiko, Inc. Fishline tension measuring device for fishing reel. 5,479,831, Cl. 73-862.440.  
 Hirose, Masanori: See—  
 Kawasaki, Miyoji; Hirose, Masanori; Suzuki, Toshitsugu; Matsuura, Tei; and Yokoyama, Yoshinada, 5,480,557, Cl. 210-695.000.  
 Hirose, Masayuki; Hata, Ryosuke; and Nakaura, Yoshiteru, to Sumitomo Electric Industries, Ltd. Direct current oil-filled self contained cable. 5,481,070, Cl. 174-120.0FP.  
 Hiroya, Masaaki; Saito, Masayuki; and Takagi, Hiroyuki, to Hitachi, Ltd.; and Hitachi Keiyo Engineering Co., Ltd. Method of controlling information in multimedia system. 5,481,664, Cl. 395-154.000.  
 Hirsch, Rüdiger; Hahn, Reinhard; and Schall, Norbert, to Sud-Chemie AG; and Dalli-Werke. Detergent additive for detergents containing a fabric softener. 5,480,578, Cl. 252-174.250.  
 Hirsenkorn, Rolf; Grauvogl, Petra; and Scheiding, Silke, to Consortium für Elektrochemische Industrie GmbH. Process for preparing branched cyclodextrins. 5,480,985, Cl. 536-124.000.  
 Hitachi Automotive Engineering Co., Ltd.: See—  
 Masaki, Ryoso; Morinaga, Shigeki; Tahara, Kazuo; Yamamura, Hirohisa; Kajiwara, Kenzo; Yamada, Hiroyuki; Inoue, Nobuo; and Suzuki, Toshio, 5,481,460, Cl. 364-424.070.  
 Hitachi Construction Machinery Co., Ltd.: See—  
 Toyooka, Tsukasa; Hirata, Toichi; Sugiyama, Genroku; and Tatsumi, Akira, 5,479,778, Cl. 60-431.000.  
 Hitachi Keiyo Engineering Co., Ltd.: See—  
 Hiroya, Masaaki; Saito, Masayuki; and Takagi, Hiroyuki, 5,481,664, Cl. 395-154.000.  
 Hitachi Koki Co., Ltd.: See—  
 Kawai, Katsuya; Anzai, Masayasu; Harada, Toshimitsu; and Nishino, Shinichi, 5,481,351, Cl. 355-298.000.  
 Hitachi, Ltd.: See—  
 Doi, Hiroyuki; Yasuda, Ken; Kashimura, Tetsuo; and Fukui, Yutaka, 5,480,283, Cl. 415-199.500.

- Funabashi, Kiyomi; Chino, Koichi; Kuriyama, Osamu; Baba, Tsutomu; Uchida, Shunsuke; and Kikuchi, Makoto, 5,481,061, Cl. 588-4.000.  
 Hattori, Morishige; Ohara, Mamoru; Okuno, Sumio; Okuto, Koichiro; and Irie, Hiroshi, 5,480,729, Cl. 428-593.000.  
 Hiroya, Masaaki; Saito, Masayuki; and Takagi, Hiroyuki, 5,481,664, Cl. 395-154.000.  
 Inoue, Kiyoshi; Abe, Masahiro; and Sagawa, Hirohiko, 5,481,454, Cl. 364-419.030.  
 Itoh, Tutomu; Hirose, Toshio; Kokunishi, Motohide; Iwanaga, Masaharu; and Endo, Shinichi, 5,481,698, Cl. 395-185.010.  
 Kamahori, Masao, 5,480,614, Cl. 422-70.000.  
 Kametani, Masatsugu, 5,481,747, Cl. 395-800.000.  
 Kando, Hidehiko; Kainuma, Mamoru; Muranishi, Masaru; and Kimura, Katsuhiko, 5,481,515, Cl. 369-44.120.  
 Kitamura, Naoya; Sugiyama, Hisashi; Yamaguchi, Yoshihide; Kyoui, Masayuki; Murooka, Hideyasu; Iwamura, Ryoji; and Watanabe, Makio, 5,480,048, Cl. 216-13.000.  
 Masaki, Ryoso; Morinaga, Shigeki; Tahara, Kazuo; Yamamura, Hirohisa; Kajiwara, Kenzo; Yamada, Hiroyuki; Inoue, Nobuo; and Suzuki, Toshio, 5,481,460, Cl. 364-424.070.  
 Mochizuki, Kazuhiro; Mishima, Tomoyoshi; Nakamura, Tohru; Masuda, Hiroshi; Tanoue, Tomonori; Haga, Tooru; and Fujisaki, Yoshihisa, 5,481,120, Cl. 257-49.000.  
 Mutoh, Nobuyoshi; Miyazaki, Taizou; Masaki, Ryoso; Ohmae, Tsutomu; and Obara, Sanhiro, 5,481,168, Cl. 318-432.000.  
 Nakano, Tetsuo; Takano, Yuichi; and Takada, Masami, 5,480,238, Cl. 400-120.040.  
 Nakata, Kiyoshi; Nakamura, Kiyoshi; Tanamachi, Tokunosuke; Tsutsui, Yoshio; and Terunuma, Mutsuhiro, 5,481,448, Cl. 363-137.000.  
 Ninomiya, Ken; Todokoro, Hideo; Kure, Tokuo; Mitsui, Yasuhiro; Kuroda, Katsuhiko; and Shichi, Hiroyasu, 5,481,109, Cl. 250-310.000.  
 Ogawa, Munehiro, deceased; Iwabuchi, Masato; Sugihara, Hitoshi; Hojo, Saburo; Kinoshita, Masami; Yamashiro, Osamu; Yokomizo, Goichi; and Miyama, Mikako, 5,481,484, Cl. 364-578.000.  
 Goichi; and Miyama, Mikako, 5,481,484, Cl. 364-578.000.  
 Satoh, Toshiya; Oikawa, Akiko; Onose, Katsuyoshi; Yagi, Keiji; and Kitagishi, Tomoji, 5,481,349, Cl. 355-290.000.  
 Shimano, Takeshi; Ito, Kenchi; Maruyama, Yooji; and Awano, Hiroyuki, 5,481,386, Cl. 369-44.120.  
 Takada, Yasuaki; Sakairi, Minoru; Hirabayashi, Atsumu; and Ose, Youichi, 5,481,107, Cl. 250-281.000.  
 Takahashi, Kikuo, 5,481,702, Cl. 395-600.000.  
 Uchida, Shuichiro, 5,479,783, Cl. 62-101.000.  
 Yano, Masayoshi; and Mochizuki, Kohei, 5,481,108, Cl. 250-283.000.  
 Hitachi Maxell, Ltd.: See—  
 Daimon, Hideo; Kitakami, Osamu; and Fujiwara, Hideo, 5,480,694, Cl. 428-64.100.  
 Matsumoto, Taiji; Suda, Atsuhiko; Sumiya, Kenji; and Yamamoto, Yoshinori, 5,480,702, Cl. 428-209.000.  
 Hitachi Software Engineering Co., Ltd.: See—  
 Itoh, Tutomu; Hirose, Toshio; Kokunishi, Motohide; Iwanaga, Masaharu; and Endo, Shinichi, 5,481,698, Cl. 395-185.010.  
 Hitec Co., Ltd.: See—  
 Kasai, Minoru; and Nakamura, Minoru, 5,480,346, Cl. 452-47.000.  
 Hobson, Gerald R. Method and apparatus for molding plastic products with flash removed. 5,480,607, Cl. 264-536.000.  
 Hoch, Dieter: See—  
 Mager, Herbert; Pasquier, Gilbert; Hoch, Dieter; and Aeby, Johann, 5,480,459, Cl. 8-408.000.  
 Hochhaus, Roland: See—  
 Heming, Martin; Hochhaus, Roland; Kersten, Ralf; Krause, Dieter; Otto, Jürgen; Paquet, Volker; Segner, Johannes; and Fattinger, Christof, 5,480,687, Cl. 427-573.000.  
 Höck, Klaus; Frank, Lothar, deceased (by Brigitte Frank, legal representative); and Schock, Friedrich, Sr., to Schock & Co. GmbH. Plastic castings having filler and flake particles dispersed in a polymer matrix to improve scratch resistance. 5,480,931, Cl. 524-449.000.  
 Hodapp, Mark: See—  
 Jackson, Michael L.; Abbate, Robert J.; Sopcich, Nicholas J.; Moeller, Raymond J., Jr.; Hodapp, Mark; and Palagi, Greg, 5,480,939, Cl. 525-120.000.  
 Hodate, Mari: See—  
 Matsumoto, Tomotaka; Inoue, Jun; Ichimura, Teruhiko; Murata, Yuji; Watanabe, Junichi; Nagahiro, Yoshio; Hodate, Mari; Oki, Kenichi; and Okabe, Masahiro, 5,480,818, Cl. 437-40.000.  
 Hoechst Aktiengesellschaft: See—  
 Hammer, Klaus-Dieter; Mans, Leo; and Siebrecht, Manfred, 5,480,691, Cl. 428-34.800.  
 Herrmann, Wolfgang A.; Manetsberger, Rainer; Bahrmann, Helmut; Kohlpaintner, Christian; and Lappe, Peter, 5,481,045, Cl. 568-454.000.  
 Hertenstein, Ulrich; and Neugebauer, Rudolf, 5,481,024, Cl. 560-78.000.  
 Kleiner, Hans-Jerg, 5,481,017, Cl. 558-82.000.  
 Kretschmar, Gerhard; Meiwes, Johannes; Schudok, Manfred; Hammann, Peter; Lerch, Ulrich; and Grabley, Susanne, 5,480,786, Cl. 435-106.000.  
 Pirmano, Ralf, 5,481,032, Cl. 562-418.000.  
 Stenger, Karl; Klenk, Ludwig; and Beissel, Dieter, 5,480,690, Cl. 428-34.800.  
 Weber, Jürgen; and Springer, Helmut, 5,481,044, Cl. 568-451.000.  
 Hoegnelid, Kurt; Thormander, Hans; and Obel, Martin, to Siemens Elema AB. Resorbable temporary medical electrode device. 5,480,420, Cl. 607-116.000.  
 Hoekstra, Peter: See—  
 Martin, Michael F.; Starr, William D.; and Hoekstra, Peter, 5,479,676, Cl. 15-323.000.  
 Hoenninger, John C., III, to University of California, The Regents of the . Microcode sequencer changing states in response to an external gating input level change upon the occurrence of a wait instruction. 5,481,744, Cl. 395-800.000.  
 Hoever, Franz-Peter: See—  
 Grosse-Bley, Michael; Bömer, Bruno; Grosser, Rolf; Lange, Walter; Hoever, Franz-Peter; and Arit, Dieter, 5,481,026, Cl. 560-153.000.  
 Hofacker, Bernd: See—  
 Schulz, Jürgen; and Hofacker, Bernd, 5,480,734, Cl. 429-7.000.  
 Hoffken, Erich; Krüger, Dieter; Mehring, Gisbert; and Pietzko, Günter, to Thyssen Stahl Aktiengesellschaft. Method for the production of a steel strip by the casting of a strand followed by rolling. 5,479,982, Cl. 164-454.000.  
 Hoffmann-La Roche, A.G.: See—  
 Heming, Martin; Hochhaus, Roland; Kersten, Ralf; Krause, Dieter; Otto, Jürgen; Paquet, Volker; Segner, Johannes; and Fattinger, Christof, 5,480,687, Cl. 427-573.000.  
 Hoffmann-La Roche Inc.: See—  
 Broger, Emil A.; Karpf, Martin; and Zutter, Ulrich, 5,481,008, Cl. 549-292.000.  
 Höfler, Andreas: See—  
 Klases, Claas-Jürgen; Foerster, Martin; Höfler, Andreas; Bauer, Klaus-Peter; Riemenschneider, Herbert; Franta, Oliver; and Gilg, Rainer, 5,480,626, Cl. 423-449.100.  
 Hofmann, Aaron A.; and Williams, James E., to Intermedics Orthopedics, Inc. Femoral prosthesis with wedge having opposed tapers. 5,480,452, Cl. 623-23.000.  
 Hoffmann-Werkstatt-Technik GmbH: See—  
 Goebel, Eickhart, 5,479,821, Cl. 73-457.000.  
 Hogan AB: See—  
 Storstrom, Helge; and Floren, Bengt, 5,480,469, Cl. 75-228.000.  
 Höglund, Ronny: See—  
 Bergqvist, Lennart; Gustafsson, Sten; Lindblom, Kjell; Anderson, Jan; Ekholm, Rolf; and Höglund, Ronny, 5,480,546, Cl. 210-404.000.  
 Hojo, Saburo: See—  
 Ogawa, Munehiro, deceased; Iwabuchi, Masato; Sugihara, Hitoshi; Hojo, Saburo; Kinoshita, Masami; Yamashiro, Osamu; Yokomizo, Goichi; and Miyama, Mikako, 5,481,484, Cl. 364-578.000.  
 Holcombe, Cressie E.: See—  
 Lauf, Robert J.; Holcombe, Cressie E.; and Dykes, Norman L., 5,481,428, Cl. 361-305.000.  
 Hollander, Jeffrey M. Mattress cover. 5,479,664, Cl. 5-499.000.  
 Hollenbaugh, William H., Jr.: See—  
 Mahabadi, Hadi K.; Agur, Enno E.; McAneney, T. Brian; Kao, Sheau V.; Allison, Gerald R.; Hawkins, Michael S.; Hollenbaugh, William H., Jr.; Jacobs, Robert M.; and Chow, Che C., 5,480,756, Cl. 430-109.000.  
 Hollenberg, David H.: See—  
 Patterson, Robert; Geddes, Daniel J.; Hollenberg, David H.; and Maynard, Patrick L., 5,480,693, Cl. 428-36.700.  
 Holloway, Brian R.; Howe, Ralph; and Rao, Balbir S., to Zeneca Limited. Chemical compounds. 5,480,910, Cl. 514-567.000.  
 Holly, G. Warren: See—  
 Wall, Albert; and Holly, G. Warren, 5,479,765, Cl. 56-256.000.  
 Holm, Niels E.: See—  
 Weis-Fogh, Ulla; Holm, Niels E.; and Hern, Søren, 5,480,378, Cl. 604-5.000.  
 Holmes, Terry J.: See—  
 Barney, Michael; Holmes, Terry J.; Moore, David; and Wass, Anthony C., 5,480,069, Cl. 222-401.000.  
 Holotek Ltd.: See—  
 Kramer, Charles J.; and Grettton, Geoffrey B., 5,481,384, Cl. 359-17.000.  
 Holtz, Michael J.: See—  
 Frey, Donald J.; and Holtz, Michael J., 5,481,481, Cl. 364-551.010.  
 Holzner, Rudolf: See—  
 Glaeser, Winfried; Holzner, Rudolf; and Watzlawik, Guenter, 5,481,676, Cl. 395-287.000.  
 Honchar, Dennis R.: See—  
 Pope, Daniel H.; Honchar, Dennis R.; and Medairy, Wilbur L., 5,480,564, Cl. 210-753.000.  
 Honda Giken Kogyo Kabushiki Kaisha: See—  
 Fujimori, Yoshitomo; and Mihara, Hiroaki, 5,479,904, Cl. 123-520.000.  
 Hara, Ikuro, 5,480,001, Cl. 180-227.000.  
 Itoh, Kazuo; Narita, Kazuhiko; Kitazawa, Shuichi; Tokoi, Masanori; Nakajima, Ayumi; and Sekine, Hiroshi, 5,481,465, Cl. 364-468.000.  
 Kobayashi, Yutaka; Aoki, Osamu; Hamabe, Kenji; Takeuchi, Atsushi; and Onda, Takayuki, 5,480,932, Cl. 524-451.000.  
 Nagai, Osamu; Okamoto, Kunihide; and Yamamoto, Kaoru, 5,480,011, Cl. 188-299.000.  
 Tanaka, Haruo; Takahashi, Noriaki; and Suzuki, Tetsuo, 5,480,362, Cl. 475-346.000.  
 Tochizawa, Toru; and Takanohashi, Toshikatsu, 5,480,093, Cl. 237-12.30C.  
 Yamamoto, Yorihiro; Nishi, Yutaka; Nishimori, Takashi; and Tokunaga, Hiroyuki, 5,481,457, Cl. 364-424.050.  
 Honda, Hiroki: See—



- Uga, Kimiharu; Honda, Hiroki; Ishida, Masahiro; and Ishigaki, Yoshiyuki, 5,480,816, Cl. 437-31,000.
- Honda, Michitaka; and Komatsu, Kenichi, to Kabushiki Kaisha Toshiba. Method and system for displaying serial images. 5,481,279, Cl. 345-200,000.
- Hönen, Herwart: See—  
Walter, Hilger A.; Hönen, Herwart; and Gallus, Heinz E., 5,479,818, Cl. 73-116,000.
- Honeywell Inc.: See—  
Johnson, Ralph H.; and Mehal, Edward W., 5,481,123, Cl. 257-102,000.  
Juntunen, Robert D.; and Roth, Roger R., 5,479,812, Cl. 73-3,000.  
Mildren, James W., 5,481,220, Cl. 327-512,000.
- Hong, Gary, to United Microelectronics Corporation. Structure for flash memory cell. 5,481,128, Cl. 257-320,000.
- Hong, Yeh S., to Korea Institute of Science and Technology. Linear index for rectilinear driving device. 5,481,155, Cl. 318-135,000.
- Hongo, Kimitoshi: See—  
Takada, Yukari; Onishi, Ken; and Hongo, Kimitoshi, 5,481,414, Cl. 360-64,000.
- Honig, Michael L.; and Madhow, Upamanyu, to Bell Communications Research, Inc. Hybrid intra-cell TDMA/inter-cell CDMA for wireless networks. 5,481,533, Cl. 370-18,000.
- Honma, Toshio: See—  
Furuchi, Katsushi; Yokomizo, Yoshikazu; Honma, Toshio; and Murakami, Katsumi, 5,481,335, Cl. 355-206,000.
- Honsho, Hironori: See—  
Yumiki, Naoto; and Honsho, Hironori, 5,481,361, Cl. 356-375,000.
- Hoogendijk, Leender: See—  
Altieri, Paul A.; Eden, James; Gribnau, Michael C.; Hoogendijk, Leender; Krijnen, Lambertus B.; Solarek, Daniel B.; and Swarthoff, Ton, 5,480,575, Cl. 252-94,000.
- Hoomaert, Daniel F.: See—  
Siaholpo, Hassan; Antonuccio, Robert S.; Carney, James M.; Hoomaert, Daniel F.; and Spano, Joseph M., 5,481,431, Cl. 361-685,000.
- Hopkins, Evan L., to Hopkins Manufacturing Corporation. Headlamp leveling apparatus. 5,479,714, Cl. 33-335,000.
- Hopkins Manufacturing Corporation: See—  
Hopkins, Evan L., 5,479,714, Cl. 33-335,000.
- Hoppe, Alfred: See—  
Noltemeyer, Friedrich; Hoppe, Alfred; Münzenmaier, Jürgen; Rusch, Friedrich; and Karl, Günter, 5,479,894, Cl. 123-74,0AC.
- Hörber, Gerhard: See—  
Birkholz, Michaela; Drauscke, Stefan; and Hörber, Gerhard, 5,480,610, Cl. 422-26,000.
- Horiguchi, Hiroyuki: See—  
Furuta, Toshiyuki; Horiguchi, Hiroyuki; and Eguchi, Hirotoshi, 5,481,646, Cl. 395-27,000.
- Horikawa, Hiroshi: See—  
Kimura, Yutaro; Ikeshima, Tetsuhiko; Tonami, Hiromichi; Konishi, Ikuo; Horikawa, Hiroshi; Daikoku, Akihiro; Sakabe, Shigekazu; Inoue, Masao; and Yamasaki, Akinori, 5,481,585, Cl. 378-134,000.
- Horiuchi, Yoshiaki: See—  
Shiotsu, Shinichiro; and Horiuchi, Yoshiaki, 5,480,585, Cl. 252-544,000.
- Horn, Roger D.: See—  
Birdwell, J. Douglas; and Horn, Roger D., 5,481,649, Cl. 395-75,000.
- Hornback, William J.; Munroe, John E.; and Shepherd, Timothy A., to Eli Lilly and Company. Protease inhibitors. 5,480,887, Cl. 514-301,000.
- Horváth, Anikó: See—  
Kéri, György; Mező, Imre; Horváth, Anikó; Vadász, Zsolt; Teplán, István; Balogh, Ágnes; Csuka, Orsolya; Bökönyi, Gyöngyi; Szőke, Balás; Horváth, Judit; Idei, Miklós; and Seprődi, János, 5,480,870, Cl. 514-16,000.
- Horváth, Judit: See—  
Kéri, György; Mező, Imre; Horváth, Anikó; Vadász, Zsolt; Teplán, István; Balogh, Ágnes; Csuka, Orsolya; Bökönyi, Gyöngyi; Szőke, Balás; Horváth, Judit; Idei, Miklós; and Seprődi, János, 5,480,870, Cl. 514-16,000.
- Hoshi, Hidenori: See—  
Kashida, Motokazu; Hoshi, Hidenori; Nagasawa, Kenichi; and Yamashita, Shinichi, 5,481,518, Cl. 369-53,000.
- Hoshida, Akira: See—  
Yamamori, Hisayoshi; Hoshida, Akira; and Kobayashi, Masumi, 5,480,553, Cl. 210-650,000.
- Hoshino, Keiichi: See—  
Tosaka, Yasuo; Nonaka, Yoshiyuki; and Hoshino, Keiichi, 5,480,767, Cl. 430-358,000.
- Hoskins Manufacturing Company: See—  
Hall, Bertie F., Jr., 5,479,690, Cl. 29-33,00R.
- Hoskins, Van W.: See—  
Rogers, Lisa W.; Kraft, Thomas L.; Berry, John F.; Kelley, Scott A.; Thompson, John A., III; Ober, Clifford D.; Kuchar, Michael C.; Mayer, Robert R., Jr.; Hoskins, Van W.; Weido, Vincent C.; and Henckel, Mark G., 5,480,062, Cl. 221-174,000.
- Hosoda, Shunji: See—  
Yamasaki, Kazuyuki; Hamaguchi, Yoshihiro; Hosoda, Shunji; Sakata, Kazuyuki; Imai, Takashi; Okatani, Shigetoshi; Nishio, Satoshi; Takahashi, Tuiyoshi; Matsuura, Kenji; Tanaka, Noriyuki; Nagayasu, Teruaki; and Makino, Hiroshi, 5,480,537, Cl. 210-96,100.
- Hosono, Kiyotaka: See—  
Miyamoto, Katsuhiko; Iida, Kazumasa; Kishimoto, Mitsuru; and Hosono, Kiyotaka, 5,481,461, Cl. 364-431,010.
- Hosoya, Hideki, to Canon Kabushiki Kaisha. Method for recording, reproducing and managing file data on a recording medium. 5,481,519, Cl. 369-58,000.
- Hottinger, Herbert: See—  
Gysler, Christof; Hottinger, Herbert; and Niederberger, Peter, 5,480,798, Cl. 435-255,200.
- Houche, George A.: See—  
Kleinecke, John D.; and Houche, George A., 5,481,075, Cl. 200-50,0AA.
- Houck, Charles H.: See—  
Gaghardi, John J.; Chesley, Jason A.; Houck, Charles H.; Cosmano, Richard J.; and Duwell, Ernest J., 5,480,461, Cl. 51-295,000.
- Houck, Willie G., Jr.: See—  
Counts, Mary E.; Houck, Willie G., Jr.; Houghton, Kenneth S.; Lilly, A. Clifton, Jr.; Lipowicz, Peter J.; Myracle, James L.; Sprinkel, F. Murphy; Washington, James M.; and Wrenn, Susan E., 5,479,948, Cl. 131-194,000.
- Hough, Eric J.: See—  
Graiver, Daniel; Hough, Eric J.; and Lomas, Arnold W., 5,481,014, Cl. 556-401,000.
- Houghten Pharmaceuticals, Inc.: See—  
Houghten, Richard A.; Ostresh, John M.; and Blondelle, Sylvie, 5,480,971, Cl. 530-328,000.
- Houghten, Richard A.; Ostresh, John M.; and Blondelle, Sylvie, to Houghten Pharmaceuticals, Inc. Peralkylated oligopeptide mixtures. 5,480,971, Cl. 530-328,000.
- Houghton, Kenneth S.: See—  
Counts, Mary E.; Houck, Willie G., Jr.; Houghton, Kenneth S.; Lilly, A. Clifton, Jr.; Lipowicz, Peter J.; Myracle, James L.; Sprinkel, F. Murphy; Washington, James M.; and Wrenn, Susan E., 5,479,948, Cl. 131-194,000.
- Houryu, Sakae: See—  
Matsugu, Masakazu; Saitoh, Kenji; Hattori, Jun; and Houryu, Sakae, 5,481,363, Cl. 356-401,000.
- Houston Industries Incorporated: See—  
Nguyen, Dung Hieu, 5,481,217, Cl. 327-333,000.
- Howard, Barbara: See—  
Kammerer, Gene W.; Frederick, Royce; Howard, Barbara; and Walker, Edd, 5,480,404, Cl. 606-113,000.
- Howe, James G.: See—  
Incavo, Stephen J.; and Howe, James G., 5,480,444, Cl. 623-20,000.
- Howe, Ralph: See—  
Holloway, Brian R.; Howe, Ralph; and Rao, Balbir S., 5,480,910, Cl. 514-567,000.
- Howie, John K.: See—  
Corrigan, Patrick J.; Howie, John K.; and Lin, Peter Y. T., 5,480,667, Cl. 426-531,000.
- Hox, Ketil: See—  
Lynum, Steinar; Haugsten, Kjell; Hox, Ketil; and Hugdahl, Jan, 5,481,080, Cl. 219-121,480.
- Hsiao, Tien J. Automatic rewinding device for the conductor of a telephone transmitter. 5,481,607, Cl. 379-438,000.
- Hsieh, Chang-Li: See—  
Yeoman, Neil; Griffith, Verne E.; and Hsieh, Chang-Li, 5,480,595, Cl. 261-114,100.
- Hsieh, Hsing-Chi. Structure of diving mask. 5,479,917, Cl. 128-200,290.
- Hsieh, Yu-Lung; Zeng, Gengsheng L.; and Gullberg, Grant T., to University of Utah. The electronic calibration of single photon emission computed tomography cameras. 5,481,115, Cl. 250-363,040.
- Hsiung, Christopher C.: See—  
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- Hsu, Chen-Chung, to United Microelectronics Corporation. Method of making high density ROM, without using a code implant. 5,480,823, Cl. 437-48,000.
- Hsu, Shun-Liang; Tsaur, Jyh-Min; Lin, Mou S.; and Ting, Jyh-Kang, to Taiwan Semiconductor Manufacturing Corp. Ltd. Differential gate oxide process by depressing or enhancing oxidation rate for mixed 3/5 V CMOS process. 5,480,828, Cl. 437-56,000.
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- Huang, Cheng-Hao: See—  
Simon, Gabriel; and Huang, Cheng-Hao, 5,480,396, Cl. 606-4,000.
- Huang, Gang, to AT&T Corp. FDDI bridge frame learning and filtering apparatus and method. 5,481,540, Cl. 370-85,130.
- Huang, Heng-Sheng, to United Microelectronics Corporation. Method of manufacture of high coupling ratio flash memory cell. 5,480,819, Cl. 437-43,000.
- Huang, Jen-Hsun: See—  
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- Huang, Jenn-Hwa: See—  
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- Huang, Leaf; Epand, Richard M.; and Bottega, Remo, to University of Tennessee Research Corporation, The; and McMaster University. Cationic lipids and stable mixed lipid dispersions. 5,480,817, Cl. 424-450,000.
- Huang, Ming-Chih. Muscle exerciser. 5,480,368, Cl. 482-123,000.
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- Huang, Yen-Tsai, to United Microelectronics Corp. Piecewisely-controlled tri-state output buffer. 5,481,208, Cl. 326-87,000.
- Hubbell Incorporated: See—  
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- Jorgensen, Robert W., 5,480,053, Cl. 220-62,000.
- Huber, Ulrich, to Givaudan-Roure Corporation. Light screening agent. 5,481,001, Cl. 548-243,000.
- Hubert, Christine: See—  
Soubrier, Florent; Alhenc-Gelas, Francois; Hubert, Christine; and Corvol, Pierre, 5,480,793, Cl. 435-212,000.
- Hudrik, Terrence R., to Medtronic, Inc. Rate-responsive heart pacemaker. 5,480,441, Cl. 607-17,000.
- Hudson, George C.: See—  
Rudder, Ronald A.; Hudson, George C.; Hendry, Robert C.; Markunas, Robert J.; and Mantini, Michael J., 5,480,686, Cl. 427-562,000.
- Hudson, Joseph D.: See—  
Muller, Willis; Mitchell, Albert W.; Hudson, Joseph D.; and Wiborg, Eric J., II, 5,481,076, Cl. 200-61,430.
- Huels Aktiengesellschaft: See—  
Leven, Thomas; Träger, Michael; and Perl, Horst, 5,480,599, Cl. 264-53,000.
- Muhr, Jürgen; and Feld, Marcel, 5,481,019, Cl. 558-451,000.
- Huete, David A.: See—  
Marshall, Peter W.; Huete, David A.; Morrison, Denby G.; and Smolinski, Susan L., 5,480,265, Cl. 405-224,000.
- Marshall, Peter W.; Huete, David A.; Morrison, Denby G.; and Smolinski, Susan L., 5,480,266, Cl. 405-224,000.
- Huettemeister, Franz: See—  
Ueffinger, Gerhard; and Huettemeister, Franz, 5,480,769, Cl. 430-401,000.
- Hugdahl, Jan: See—  
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- Hughes Aircraft Company: See—  
Borden, Michael R., 5,481,400, Cl. 359-350,000.
- McHardy, John; Townsend, Carl W.; and Megerle, Clifford A., 5,481,181, Cl. 324-71,100.
- Naglestad, Mark B.; Bohac, Frank J., Jr.; Aralis, James M.; Moriaki, Bert S.; Calabretta, Frank J.; and Troutman, Bruce L., 5,481,471, Cl. 364-489,000.
- Schwartz, David A.; and Radigan, James J., 5,481,736, Cl. 395-800,000.
- Sobhani, Mohi; and Brauning, John M., 5,481,134, Cl. 257-686,000.
- Stotelmeyer, L. Scott; and Fulkerson, Don K., 5,479,959, Cl. 137-559,000.
- Hughes, Houston H., III: See—  
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- Hughes, John R.: See—  
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- Hughes Missile Systems Company: See—  
Smith, John D.; and Lamberton, Ryan D., 5,480,111, Cl. 244-3,270.
- Hugli, Tony E.: See—  
Morgan, Edward L.; Ember, Julia A.; and Hugli, Tony E., 5,480,974, Cl. 530-387,900.
- Hulett, Randall V. Support for boatcover. 5,479,872, Cl. 114-361,000.
- Huls Aktiengesellschaft: See—  
Duve, Hans, 5,480,806, Cl. 436-52,000.
- Humenik, James N.: See—  
Casey, Jon A.; Golland, David B.; Gupta, Dinesh; Herron, Lester W.; Humenik, James N.; Lombardi, Thomas E.; Knickerbocker, John U.; Sullivan, Robert J.; and Wylder, James R., 5,480,503, Cl. 156-89,000.
- Hummel, Alan R.; and Kwolek, John P., to Wagner Electric Corporation. Brake friction pad assembly. 5,480,008, Cl. 188-73,370.
- Hunter, Andrew F., to Imodco, Inc. Offshore pipeline system. 5,480,264, Cl. 405-195,100.
- Hunter, Robert O., Jr.: See—  
Smith, Adlai H.; Hunter, Robert O., Jr.; and McArthur, Bruce B., 5,481,407, Cl. 359-742,000.
- Hunter, Ross A.: See—  
Bieniek, Cynthia L.; Hunter, Ross A.; McKee, Timothy P.; and Schroeder, David H., 5,481,667, Cl. 395-161,000.
- Hunter, Wood E.; Frederick, Kevin W.; and Loeffler, Randy J., to Calgon Corporation. Process for preparing novel high solids non-aqueous polymer compositions. 5,480,921, Cl. 523-331,000.
- Huntsman Corporation: See—  
Primeaux, Dudley J., II, 5,480,955, Cl. 528-60,000.
- Hussain, Syed F.: See—  
Edelen, Stephen A.; Hussain, Syed F.; and Ong, Chiau-Chieh, 5,481,170, Cl. 318-650,000.
- Husting, Thomas J., to Kohler Co. Door latching and seal assembly. 5,480,199, Cl. 292-198,000.
- Hutchens Industries, Inc.: See—  
Cheffey, Dean C., 5,480,171, Cl. 280-149,200.
- Hutchings, William F.: See—  
Gambrell, Jeffrey S.; Hutchings, William F.; Markle, Stephen L.; Schutte, Marlin; and Palmer, John M., 5,480,228, Cl. 366-273,000.
- Hutchins, Robert D. Multi-purpose-fold-down utility tray. 5,480,058, Cl. 220-478,000.
- Hwang, Wei: See—  
Henkels, Walter H.; Hwang, Wei; and Chappell, Terry I., 5,481,495, Cl. 365-189,020.
- Hydra-Tight Limited: See—  
Aston, Peter R., 5,479,710, Cl. 30-182,000.
- Hydro International PLC: See—  
Smisson, Robert P. M., 5,480,559, Cl. 210-727,000.
- Hyper-Therm High-Temperature Composites, Inc.: See—  
Steffier, Wayne S., 5,480,707, Cl. 428-229,000.
- Hyundai Electronics America: See—  
Barnes, Lawrence C.; and Thornberg, Gary R., 5,480,840, Cl. 437-209,000.
- Crafts, Harold S., 5,481,207, Cl. 326-86,000.
- Hyundai Motor Company: See—  
Kim, Taeyoung, 5,479,981, Cl. 164-16,000.
- Ibbott, Jack K., to Yoshida, Makiko. Self-energizing fluid treatment apparatus employing external electrodes. 5,480,522, Cl. 204-150,000.
- Ibenthal, Achim, to U.S. Philips Corporation. Rapidly resettable counting device. 5,481,582, Cl. 377-107,000.
- IBIS Technology Corporation: See—  
Glavish, Hilton F.; Guerra, Michael A., deceased, 5,481,116, Cl. 250-396,0ML.
- Ichida, Kiyofumi: See—  
Maegawa, Akihito; and Ichida, Kiyofumi, 5,480,324, Cl. 439-489,000.
- Ichikawa, Naomi: See—  
Ryu, Tadimitsu; Ichikawa, Naomi; Murakawa, Masahiko; Adachi, Takeshi; and Toyota, Masanobu, 5,481,718, Cl. 395-700,000.
- Ichimura, Teruhiko: See—  
Matsumoto, Tomotaka; Inoue, Jun; Ichimura, Teruhiko; Murata, Yuji; Watanabe, Junichi; Nagahiro, Yoshio; Hodate, Mari; Oki, Kenichi; and Okabe, Masahiro, 5,480,818, Cl. 437-40,000.
- IDAB Incorporated: See—  
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- Idei, Miklós: See—  
Kéri, György; Mező, Imre; Horváth, Anikó; Vadász, Zsolt; Teplán, István; Balogh, Ágnes; Csuka, Orsolya; Bökönyi, Gyöngyi; Szőke, Balás; Horváth, Judit; Idei, Miklós; and Seprődi, János, 5,480,870, Cl. 514-16,000.
- Idemitsu Kosan Co., Ltd.: See—  
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- Idemitsu Petrochemical Co., Ltd.: See—  
Kobayashi, Yutaka; Aoki, Osamu; Hamabe, Kenji; Takeuchi, Atsushi; and Onda, Takayuki, 5,480,932, Cl. 524-451,000.
- Igaki, Masahiko: See—  
Nyui, Masaru; Igaki, Masahiko; and Ishizuka, Ko, 5,481,106, Cl. 250-237,00G.
- Igarashi, Lawrence Y. Golf wood club with smooth groove-free face. 5,480,153, Cl. 273-167,00H.
- Igarashi, Tatsushi: See—  
Hiramoto, Tatsumi; Igarashi, Tatsushi; Matsuno, Hiromitsu; Yasuda, Yukio; and Yamaguchi, Akiyasu, 5,481,159, Cl. 313-570,000.
- Igari, Yasutaka: See—  
Kamei, Shigeru; Igari, Yasutaka; and Ogawa, Yasuaki, 5,480,868, Cl. 514-15,000.
- Iida, Kazumasa: See—  
Miyamoto, Katsuhiko; Iida, Kazumasa; Kishimoto, Mitsuru; and Hosono, Kiyotaka, 5,481,461, Cl. 364-431,010.
- Iida, Yoshio: See—  
Takahashi, Isamu; Hayashi, Shigeki; and Iida, Yoshio, 5,480,712, Cl. 428-316,600.
- Iijima, Kenzaburo; Kondo, Katsufumi; Masuda, Katsuhiko; Yataka, Kouji; and Chujo, Yasuyuki, to Yamaha Corporation. Flying spherical body measuring apparatus. 5,481,355, Cl. 356-28,000.
- Iikubo, Tomohito: See—  
Motomura, Yoshitada; Tawara, Hiroshi; Tsukuta, Kenji; and Iikubo, Tomohito, 5,480,299, Cl. 432-176,000.
- Iinuma, Munekazu: See—  
Hayashi, Kyoze; and Iinuma, Munekazu, 5,480,907, Cl. 514-457,000.
- Iiyama, Michitomo: See—  
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- Ikawa, Hiroshi: See—  
Matsumoto, Masakatsu; Watanabe, Nobuko; Mori, Eiko; Kobayashi, Hisako; and Ikawa, Hiroshi, 5,481,009, Cl. 549-375,000.
- Ikeda, Hiromichi, to Bridgestone Corporation. Pneumatic tires. 5,479,973, Cl. 152-209,00B.
- Ikeda, Hiroshi: See—  
Kawai, Katsuhiko; Douta, Hisayo; and Ikeda, Hiroshi, 5,479,897, Cl. 123-339,200.
- Ikeda, Kenji: See—



- Ikezawa, Zenro; Yokota, Shumpei; Tsubaki, Kazufumi; Kohno, Hiroshige; Sugiyama, Hiromu; Ikeda, Kenji; and Suzuki, Takashi, 5,480,660, Cl. 426-2.000.
- Ikeda, Masaaki: See—**  
Sugano, Masashi; Yamazaki, Yoshio; Ikeda, Masaaki; and Izawa, Tadashi, 5,481,378, Cl. 358-501.000.
- Ikeda, Masami: See—**  
Arashima, Teruo; Sugitani, Hiroshi; Masuda, Kazuaki; Ikeda, Masami; Kasamoto, Masami; Suzuki, Seiji; Ishinaga, Hiroyuki; Kawai, Jun; and Kamiyama, Yuji, 5,481,289, Cl. 347-93.000.
- Ikeda, Masao; and Ohata, Toyoharu, to Sony Corporation. Light emitting device. 5,481,558, Cl. 372-45.000.**
- Ikeda, Tadashi: See—**  
Yamazaki, Kazuki; Inoue, Nobuaki; Yamamoto, Seiichi; Ezoe, Toshihide; Sakai, Minoru; Ikeda, Tadashi; Okazaki, Masaki; and Fujiwara, Toshiaki, 5,480,886, Cl. 430-264.000.
- Ikeda, Takaaki: See—**  
Fujiwara, Satoshi; and Ikeda, Takaaki, 5,480,013, Cl. 192-45.100.
- Ikeda, Tsukasa: See—**  
Tamano, Akihiko; and Ikeda, Tsukasa, 5,479,706, Cl. 29-890.080.
- Ikeda, Yukio: See—**  
Takematsu, Tetsuo; Kume, Takashi; Yamaoka, Shoji; Komata, Takeo; Suzuki, Kiyoshi; Ikeda, Yukio; Kawamura, Matsue; Koda, Yumiko; and Mori, Kaoru, 5,481,022, Cl. 560-45.000.
- Ikegami, Masaaki: See—**  
Yoshihisa, Yasuki; and Ikegami, Masaaki, 5,481,130, Cl. 257-512.000.
- Ikegami, Yuji: See—**  
Tsuda, Masao; Fujiwara, Yoshito; Ikegami, Yuji; Sato, Masao; and Fujii, Hiroyuki, 5,480,608, Cl. 420-40.000.
- Ikegaya, Akihiko; and Fujimori, Naoji, to Sumitomo Electric Industries, Ltd. Method and apparatus of synthesizing diamond in vapor phase. 5,481,081, Cl. 219-121.480.**
- Ikeguchi, Yoshinori; and Murata, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Facsimile apparatus and telephone terminal apparatus having voice and image communication functions. 5,481,373, Cl. 358-434.000.**
- Ikemoto, Tetsuya: See—**  
Sakashita, Keiichi; Kageyama, Yoshitaka; and Ikemoto, Tetsuya, 5,480,580, Cl. 252-299.610.
- Ikeshima, Tetsuhiko: See—**  
Kimura, Yutaro; Ikeshima, Tetsuhiko; Tonami, Hiromichi; Konishi, Ikuo; Horikawa, Hiroshi; Daikoku, Akihiro; Sakabe, Shigekazu; Inoue, Masao; and Yamasaki, Akinori, 5,481,585, Cl. 378-134.000.
- Ikezawa, Zenro; Yokota, Shumpei; Tsubaki, Kazufumi; Kohno, Hiroshige; Sugiyama, Hiromu; Ikeda, Kenji; and Suzuki, Takashi, to Asahi Denka Kogyo K.K. Hypoallergenic wheat preparation, process for producing the same, and processed food including the same. 5,480,660, Cl. 426-2.000.**
- Ildari, Leonora; and Wenzel, Christine, to Lever Brothers Company, Division of Conopco, Inc. Process for preparing narrow range alkoxylated isethionates. 5,481,031, Cl. 562-110.000.**
- Illinois Tool Works Inc.: See—**  
Herzog, Richard R., 5,480,317, Cl. 439-340.000.
- IM International, Co., Ltd.: See—**  
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- Imai, Keisuke: See—**  
Kato, Keiichi; Imai, Keisuke; Oyabu, Masanori; Kouda, Yasuhiko; Isomura, Makoto; Nezaki, Takuya; and Watanabe, Koh, 5,480,104, Cl. 242-374.000.
- Imai, Takashi: See—**  
Yamasaki, Kazuyuki; Hamaguchi, Yoshihiro; Hosoda, Shunji; Sakata, Kazuyuki; Imai, Takashi; Okatani, Shigetoshi; Nishio, Satoshi; Takahashi, Tuiyoshi; Matsuura, Kenji; Tanaka, Noriyuki; Nagayasu, Teruaki; and Makino, Hiroshi, 5,480,537, Cl. 210-96.100.
- Imanari, Hiroyuki, to Kabushiki Kaisha Toshiba. Control apparatus for a continuous hot rolling mill. 5,479,803, Cl. 72-8.000.**
- Imanari, Hitoshi: See—**  
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- Imhoff, Scott A.; Woolfson, Martin G.; Bendor, Giora A.; Cheesman, Guy W., III; Brinsley, James R.; and Morici, Martin M., to Westinghouse Electric Corp. General frame wavelet classifier. 5,481,269, Cl. 342-90.000.**
- ImmuLogic Pharmaceutical Corporation: See—**  
Avjoglou, Asil; Singh, Mohan B.; and Knox, Robert B., 5,480,972, Cl. 530-379.000.
- Immunex Corporation: See—**  
Goodwin, Raymond G.; Smith, Craig A.; Armitage, Richard J.; and Gruss, Hans-Juergen, 5,480,981, Cl. 536-23.500.
- Imodeco, Inc.: See—**  
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- Imperial Chemical Industries PLC: See—**  
Mills, David A.; and Rakos, Karl, 5,480,715, Cl. 428-327.000.
- Imran, Mir A., to Physiometrix, Inc. EEG headpiece with disposable electrodes and apparatus and system and method for use therewith. 5,479,934, Cl. 128-731.000.**
- Inaba, Kohji: See—**  
Kasuya, Takashige; Kashimura, Noboru; Nakamura, Tatsuya; Chiba, Tatsuhiko; and Inaba, Kohji, 5,480,759, Cl. 430-126.000.
- Inaba, Masashi; Inui, Shiroh; Kurokawa, Hideki; and Mizutani, Fujio, to Mitsubishi Chemical Corporation. Process for preparing alpha-methylstyrene unsaturated dimer. 5,481,053, Cl. 585-406.000.**
- Inaba, Yutaka: See—**  
Hanyu, Yukio; Inaba, Yutaka; Asaoka, Masanobu; Taniguchi, Osamu; Shinjo, Kenji; and Uchimi, Toshiharu, 5,481,387, Cl. 359-078.000.
- Inalco S.p.A.: See—**  
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- Inazumi, Mitsuhiro, to Seiko Epson Corporation. Neural network speech recognition apparatus recognizing the frequency of successively input identical speech data sequences. 5,481,644, Cl. 395-2.410.**
- Incavo, Stephen J.; and Howe, James G. Hybrid tibial tray knee prosthesis. 5,480,444, Cl. 623-20.000.**
- Industrial Technology Research Institute: See—**  
Jang, Yi-Feng; Kao, Jinn-Nan; and Huang, Po-Chuan, 5,481,487, Cl. 364-725.000.
- Jou, Ming-Jiunn; Chang, Chuan-Ming; Lee, Bling-Jye; and Lin, Jyh-Feng, 5,481,122, Cl. 257-9.000.**
- Liaw, Ing-Ruey; and Lin, Shun-Ho, 5,480,837, Cl. 437-193.000.**
- Ing. C. Olivetti & C., S.p.A.: See—**  
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- Ingersoll-Rand Company: See—**  
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- Grimberg, Eugene Y.; and Cisney, Rodney, 5,479,908, Cl. 123-386.000.**
- Lewis, Frederick S., 5,480,545, Cl. 210-380.300.**
- Injection Footwear Corp: See—**  
Ross, Anselmo, 5,480,297, Cl. 425-119.000.
- Innotech, Inc.: See—**  
Gupta, Amitava; and Blum, Ronald D., 5,480,600, Cl. 264-1.700.
- Innovation Corporation: See—**  
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- Inomata, Masamitsu: See—**  
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- Inoteb: See—**  
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- Inoue, Hiroshi: See—**  
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- Inoue, Hiroyuki: See—**  
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- Inoue, Jun: See—**  
Matsumoto, Tomotaka; Inoue, Jun; Ichimura, Teruhiko; Murata, Yuji; Watanabe, Junichi; Nagahiro, Yoshio; Hodate, Mari; Oki, Kenichi; and Okabe, Masahiro, 5,480,818, Cl. 437-40.000.
- Inoue, Kiyoshi; Abe, Masahiro; and Sagawa, Hirohiko, to Hitachi, Ltd. Sign language/word translation system. 5,481,454, Cl. 364-419.030.**
- Inoue, Kouji: See—**  
Aoki, Nobuyuki; Hatanaka, Hideo; Inoue, Kouji; and Ueyama, Yasuhiro, 5,480,732, Cl. 428-694.00B.
- Inoue, Masahiro: See—**  
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- Inoue, Masao: See—**  
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- Inoue, Nobuaki: See—**  
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- Inoue, Nobuo: See—**  
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- Inoue, Tomohiro: See—**  
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- Inoue, Yasuhide: See—**  
Shoji, Yasuo; Tsuda, Yoshihiko; Tsutsumi, Kazuhiko; and Inoue, Yasuhide, 5,480,874, Cl. 514-80.000.
- Inoue, Yayoi: See—**  
Okada, Hiroaki; Inoue, Yayoi; and Ogawa, Yasuaki, 5,480,656, Cl. 424-493.000.
- Inoue, Yoshiaki: See—**  
Matsui, Akira; Morita, Yoshinori; Inoue, Hiroyuki; and Inoue, Yoshiaki, 5,480,844, Cl. 501-3.000.
- Inoue, Yuji, to Canon Kabushiki Kaisha. Solar cell module and installation method thereof. 5,480,494, Cl. 136-251.000.**
- Institut Francais de Petrole: See—**  
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- Institut National de la Sante et de la Recherche Medicale: See—**  
Cathignol, Dominique; Lavandier, Bernard; and Muchada, Raoul, 5,479,928, Cl. 128-662.060.
- Soubrier, Florent; Alhene-Gelas, Francois; Hubert, Christine; and Corvol, Pierre, 5,480,793, Cl. 435-212.000.**
- Institute for Personalized Information Environment: See—**

- Okada, Kazuhisa; Matsuura, Kazumi; and Asahi, Nobuo, 5,481,665, Cl. 395-155.000.**
- Instrumentarium Corporation: See—**  
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- Intel Corporation: See—**  
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- Goldstein, Judith; and Keith, Michael, 5,481,307, Cl. 348-384.000.**
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- Mathews, Gregory; Zager, Edward; and Mitra, Sundari, 5,481,697, Cl. 395-550.000.**
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- Interconnect Systems, Inc.: See—**  
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- Garcia, John; Alt, Eckhard; and Stotts, Lawrence J., 5,480,416, Cl. 607-36.000.**
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- Hofmann, Aaron A.; and Williams, James E., 5,480,452, Cl. 623-23.000.**
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- Ahsan, Aziz M.; Beyzavi, Kianoush; and Rao, Nagaraja P., 5,481,357, Cl. 356-338.000.**
- Aldereguia, Alfredo; Cromer, Daryl C.; and Sendlein, Kim K., 5,481,552, Cl. 371-40.100.**
- Andresen, Mark E.; Neer, Jay H.; and Nelson, Richard J., 5,481,069, Cl. 174-117.000.**
- Bakeman, Paul E., Jr.; Lee, Hyun K.; and Luce, Stephen E., 5,480,748, Cl. 430-11.000.**
- Barbee, Steven G.; Heinz, Tony F.; Li, Leping; and Ratzlaff, Eugene H., 5,480,511, Cl. 156-627.100.**
- Bartow, Neil G.; Goss, Steven N.; and Westcott, Douglas W., 5,481,738, Cl. 395-800.000.**
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- Chung, Virginia M.; and Stuart, James E., 5,481,472, Cl. 364-491.000.**
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- Cunto, Walter B.; and Goncalves, Jorge H., 5,481,748, Cl. 395-800.000.**
- Day, Kenneth F., III; and Dewey, Douglas W., 5,481,691, Cl. 395-425.000.**
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- Jacobowitz, Lawrence; and Stigliani, Daniel, Jr., 5,481,573, Cl. 375-356.000.**
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- Megiddo, Nimrod, 5,481,658, Cl. 395-119.000.**
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- Pipkin, Darryl; Rogers, Eddie; Jones-Scott, Linda; and Scott, Keith T., 5,481,714, Cl. 395-700.000.**
- Rehr, William R.; Chan, Yuen H.; and Lu, Pong-Fei, 5,481,500, Cl. 365-203.000.**
- Young, Ralph W., 5,481,475, Cl. 364-491.000.**
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- International Marketing, Inc.: See—**  
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- International Polymer Engineering, Inc.: See—**  
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- Intevip, S.A.: See—**  
Rivas, Hercilio; Acevedo, Socrates; and Gutierrez, Xiomara, 5,480,583, Cl. 252-311.500.
- Inui, Shiroh: See—**
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- Inventio AG: See—**  
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- Iris Graphics, Inc.: See—**  
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- ISCOM S.r.l.: See—**  
Menegoli, Fabio, 5,479,752, Cl. 52-549.000.
- Ishibashi, Kazuhiro: See—**  
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- Ishida Co., Ltd.: See—**  
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- Ishida, Hiroshi: See—**  
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- Ishida, Kenji; and Koboshi, Shigeharu, to Konica Corporation. Method for processing exposed silver halide photographic light-sensitive material using a solid processing composition replenisher. 5,480,768, Cl. 430-399.000.**
- Ishida, Koichi; Nakagawa, Teruyuki; and Watanabe, Takehiro, to Dow Corning Toray Silicone Co., Ltd. Method for blending a gas into a high viscosity liquid. 5,480,597, Cl. 264-40.400.**
- Ishida, Masahiro: See—**  
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- Ishida, Takumi: See—**  
Suzuki, Yutaka; Ishida, Takumi; and Hayakawa, Masaharu, 5,481,507, Cl. 368-200.000.
- Ishida, Yasushi; Yokoyama, Minoru; Tomoda, Akihiro; Yamada, Masakatsu; Awai, Takashi; Yoshida, Takehiro; Kobayashi, Makoto; Wada, Satoshi; Ono, Takeshi; and Takeda, Tomoyuki, to Canon Kabushiki Kaisha. Recording apparatus with improved ink sheet conveyance. 5,481,291, Cl. 347-217.000.**
- Ishigaki, Yoshiyuki: See—**  
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- Ishihara, Kazuya: See—**  
Kumaki, Satoshi; and Ishihara, Kazuya, 5,481,726, Cl. 395-200.010.
- Ishihara Sangyo Kaisha, Ltd.: See—**  
Maruo, Masatsuyo; Ando, Hitoshi; Watanabe, Mitsuru; and Mukai, Chitoshi, 5,480,636, Cl. 424-76.210.
- Ishihara, Teruo: See—**  
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- Ishihara, Yoko: See—**  
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- Ishii, Shinichi: See—**  
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- Ishii, Takashi; Watanabe, Tamio; and Nagano, Toru, to Yazaki Corporation. Multi-pole connector. 5,480,322, Cl. 439-378.000.**
- Ishikawa, Hirotomo, to Namco Ltd. Electronic powered motor vehicle. 5,479,998, Cl. 180-23.000.**
- Ishikawa, Jun; Kawashima, Michio; and Itoh, Kazuhiro, to Sony Corporation. Mode selector mechanism for cassette tape recorder including improved cam gear and drive selecting mechanism. 5,481,427, Cl. 360-137.000.**
- Ishikawa, Katuaki: See—**  
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- Ishikawa, Kenji, to Terumo Kabushiki Kaisha. Flexible member for use as a medical bag. 5,480,394, Cl. 604-327.000.**
- Ishikawa, Takatoshi; and Yoneyama, Masakazu, to Fuji Photo Film Co., Ltd. Color developer and processing method using the same. 5,480,628, Cl. 430-493.000.**
- Ishikura, Yoshiyuki: See—**  
Kimura, Shigeo; Ishikura, Yoshiyuki; Kihara, Takashi; and Masuda, Takashi, 5,479,827, Cl. 73-718.000.
- Ishimaru, Kazuhiro: See—**  
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- Ishinaga, Hiroyuki: See—**  
Arashima, Teruo; Sugitani, Hiroshi; Masuda, Kazuaki; Ikeda, Masami; Kasamoto, Masami; Suzuki, Seiji; Ishinaga, Hiroyuki; Kawai, Jun; and Kamiyama, Yuji, 5,481,289, Cl. 347-93.000.
- Ishiura, Ryoichi: See—**  
Miyagawa, Shigenori; Kobayashi, Koichi; Kunii, Shimpei; Kamio, Shizuo; Sakamoto, Hiroyuki; Sato, Fumitaka; and Ishiura, Ryoichi, 5,481,430, Cl. 361-681.000.
- Ishizuka, Ko: See—**



- Nyui, Masaru; Igaki, Masahiko; and Ishizuka, Ko, 5,481,106, Cl. 250-237.00G.
- Isoai, Masaru; Harada, Toshiharu; Kurata, Tokihiro; Fujita, Kazuhiro; Takama, Kazushi; and Jikuhara, Shigekazu, to Toda Kogyo Corp. Process for producing acicular goethite particles and acicular magnetic iron oxide particles. 5,480,571, Cl. 252-62.560.
- Isoe, Ryosuki: See—
- Sasaki, Kunitsuma; Goto, Narito; Takeda, Katsuyuki; Sekiguchi, Nobuyuki; Takahashi, Hideki; Isoe, Ryosuki; and Mori, Takahiro, 5,480,713, Cl. 428-323.000.
- Isumura, Makoto: See—
- Kato, Keiichi; Imai, Keisuke; Oyabu, Masanori; Kouda, Yasuhiko; Isumura, Makoto; Nezaki, Takuya; and Watanabe, Koh, 5,480,104, Cl. 242-374.000.
- Isumura, Yasuo; Takeuchi, Makoto; Hamada, Mamoru; Kaneko, Yoshisaburo; and Yamamoto, Noriya, to Yamanouchi Pharmaceutical Co., Ltd. Crystal of monohydrate of heterocyclic bis(phosphonic acid) derivative. 5,480,875, Cl. 514-80.000.
- Isozumi, Shuzou: See—
- Moribayashi, Satoshi; Isozumi, Shuzou; and Gotou, Takeo, 5,481,148, Cl. 310-154.000.
- Isuzu Motors Limited: See—
- Sato, Hiromi; Iwasa, Toyokazu; Ohya, Akihiro; and Nathume, Hiroshi, 5,479,889, Cl. 123-308.000.
- Itabashi, Akio: See—
- Yamamoto, Yoshiyazu; and Itabashi, Akio, 5,481,352, Cl. 355-308.000.
- Italfarmaco S.p.A.: See—
- Sala, Alberto; Barani, Roberto; Benedini, Francesca; Bertolini, Giorgio; Donà, Giancarlo; Gromo, Gianni; and Levi, Silvio, 5,480,882, Cl. 514-224.000.
- Ito, Akira; and Ishihara, Teruo, to Fujitsu Limited. Image data quantizing circuit with a memory for storing unquantized and quantized image data. 5,481,737, Cl. 395-800.000.
- Ito, Akira: See—
- DeJong, Glenn A.; Bacrania, Kantilal; Church, Michael D.; Fisher, Gregory J.; Gasner, John T.; Ito, Akira; Johnston, Jeffrey M.; Kutchmarick, Dave; and Rhee, Choong-Sun, 5,481,129, Cl. 257-360.000.
- Ito, Kenchi: See—
- Shimano, Takeshi; Ito, Kenchi; Maruyama, Yooji; and Awano, Hiroyuki, 5,481,386, Cl. 369-44.120.
- Ito, Kenji, to Fuji Photo Co., Ltd. Apparatus for adaptively generating a decoder table for variable-length codes using a stored coding table. 5,481,364, Cl. 358-261.100.
- Ito, Makoto: See—
- Ujiie, Takashi; and Ito, Makoto, 5,480,736, Cl. 429-13.000.
- Ito, Osamu: See—
- Watanabe, Isao; Takeuchi, Koichi; Ito, Osamu; Yosimoto, Kyosuke; Tanaka, Kunimaro; and Tsutsumi, Kazuhiko, 5,481,508, Cl. 369-13.000.
- Yoshimoto, Kyosuke; Nakajima, Yoshiki; Koyanagi, Kimiyuki; Ito, Osamu; Mashimo, Akira; Onda, Hiroyuki; Kobayashi, Yutaka; and Yamana, Koji, 5,481,517, Cl. 369-44.280.
- Ito, Shigenori: See—
- Kawasaki, Shinji; and Ito, Shigenori, 5,480,739, Cl. 429-33.000.
- Ito, Takenori, to Fuji Jukogyo Kabushiki Kaisha. Fuel vapor control system and the method thereof. 5,479,905, Cl. 123-520.000.
- Ito, Toshiyasu; Ogiu, Yasuhiko; Takahashi, Shigeyuki; Uemura, Toshiya; Nobata, Minoru; Nagaike, Ippai; Noguchi, Shigeru; and Arai, Kenjiro, to Toyoda Gosei Co., Ltd. Chipping-resistant resin molded article. 5,480,714, Cl. 428-324.000.
- Ito, Yoshiharu: See—
- Nagai, Shigekazu; Sugano, Shigeru; Saito, Mitsuhiro; Takebayashi, Takashi; Matsushima, Hiroshi; and Ito, Yoshiharu, 5,481,482, Cl. 364-558.000.
- Ito, Yoshinori: See—
- Mitsuda, Hiroshi; Sakamoto, Masahiko; Tanaka, Hitoshi; Kosaka, Nobuyuki; and Ito, Yoshinori, 5,481,095, Cl. 235-454.000.
- Ito, Yuji, and Saito, Atsushi, to Canon Kabushiki Kaisha. Method for measuring a specimen by the use of fluorescent light. 5,480,775, Cl. 435-7.200.
- Itoh, Kazuhiro: See—
- Ishikawa, Jun; Kawashima, Michio; and Itoh, Kazuhiro, 5,481,427, Cl. 360-137.000.
- Itoh, Kazuo; Narita, Kazuhiko; Kitazawa, Shuichi; Tokoi, Masanori; Nakajima, Ayumi; and Sekine, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Method of and system for producing solid models. 5,481,465, Cl. 364-468.000.
- Itoh, Tutomu; Hirosawa, Toshio; Kokunishi, Motohide; Iwanaga, Masaharu; and Endo, Shinichi, to Hitachi Ltd.; and Hitachi Software Engineering Co., Ltd. Computer system and job executing method. 5,481,698, Cl. 395-185.010.
- Itsekson, Alexander: See—
- Itsekson, Boris; Dyuzhenko, Michael; Itsekson, Vladimir; Itsekson, Alexander; and Tsigelman, Igor, 5,480,256, Cl. 404-72.000.
- Itsekson, Boris; Dyuzhenko, Michael; Itsekson, Vladimir; Itsekson, Alexander; and Tsigelman, Igor. Method and apparatus for the preparation, placement, and compacting of components of fibrous concrete and mixtures thereof. 5,480,256, Cl. 404-72.000.
- Itsekson, Vladimir: See—
- Itsekson, Boris; Dyuzhenko, Michael; Itsekson, Vladimir; Itsekson, Alexander; and Tsigelman, Igor, 5,480,256, Cl. 404-72.000.
- Iwabuchi, Masato: See—
- Ogawa, Munehiro, deceased; Iwabuchi, Masato; Sugihara, Hitoshi; Hojo, Saburo; Kinoshita, Masami; Yamashiro, Osamu; Yokomizo, Goichi; and Miyama, Mikako, 5,481,484, Cl. 364-578.000.
- Iwaki, Tsutomu: See—
- Sakai, Tetsuo; and Iwaki, Tsutomu, 5,480,741, Cl. 429-59.000.
- Seri, Hajime; Yamamura, Yasuharu; Tsuji, Yoichi; Owada, Naoko; and Iwaki, Tsutomu, 5,480,740, Cl. 429-59.000.
- Iwakura, Ken: See—
- Yanagihara, Naoto; Takashima, Masanobu; Shimazaki, Masato; Iwakura, Ken; and Kodama, Tomohiro, 5,480,765, Cl. 430-338.000.
- Iwamura, Ryoji: See—
- Kitamura, Naoya; Sugiyama, Hisashi; Yamaguchi, Yoshihide; Kyoui, Masayuki; Murooka, Hideyasu; Iwamura, Ryoji; and Watanabe, Makio, 5,480,048, Cl. 216-13.000.
- Iwanaga, Masaharu: See—
- Itoh, Tutomu; Hirosawa, Toshio; Kokunishi, Motohide; Iwanaga, Masaharu; and Endo, Shinichi, 5,481,698, Cl. 395-185.010.
- Iwasa, Toyokazu: See—
- Sato, Hiromi; Iwasa, Toyokazu; Ohya, Akihiro; and Nathume, Hiroshi, 5,479,889, Cl. 123-308.000.
- Iwasaki, Osamu: See—
- Otsuka, Naoki; Yano, Kentaro; Takahashi, Kiichiro; Arai, Atsushi; Nishikori, Hitoshi; and Iwasaki, Osamu, 5,481,281, Cl. 347-12.000.
- Iwata, Kazuya, to Canon Kabushiki Kaisha. Suction recovery device and ink jet recording apparatus with the device. 5,481,282, Cl. 347-30.000.
- Iwata, Michihiro: See—
- Wada, Shigeru; Funahashi, Akira; and Iwata, Michihiro, 5,481,325, Cl. 354-173.100.
- Iwata, Toru; and Yasuda, Sota, to Nissan Motor Co., Ltd. System for detecting hydroplaning of vehicle. 5,481,455, Cl. 364-424.010.
- Iwatsubo, Rieko: See—
- Maruyama, Kazuhiro; Inoue, Masahiro; Kushiro, Noriyuki; and Iwatsubo, Rieko, 5,481,140, Cl. 307-11.000.
- Iwatsuki, Kunihiro: See—
- Matsubara, Toru; and Iwatsuki, Kunihiro, 5,480,363, Cl. 477-63.000.
- Izawa, Tadashi: See—
- Sugano, Masashi; Yamazaki, Yoshio; Ikeda, Masaaki; and Izawa, Tadashi, 5,481,378, Cl. 358-501.000.
- Izumizaki, Masami: See—
- Nagao, Yoshinori; Amemiya, Koji; Izumizaki, Masami; and Sasanuma, Nobuatsu, 5,481,340, Cl. 355-246.000.
- J. M. Voith GmbH: See—
- Esslinger, Klaus, 5,480,520, Cl. 162-301.000.
- J. Morita Mfg. Corp.: See—
- Matsui, Akira; Morita, Yoshinori; Inoue, Hiroyuki; and Inoue, Yoshiaki, 5,480,844, Cl. 501-3.000.
- Jabes, Daniela: See—
- Visentin, Giuseppina; Zarini, Franco; Jabes, Daniela; Perrone, Ettore; della Brena, Costantino; and Alpeghiani, Marco, 5,480,880, Cl. 514-210.000.
- Jacks, Terry C.: See—
- Orr, Carl C.; Caradonna, John; Edmundson, Robert J.; and Jacks, Terry C., 5,480,632, Cl. 424-63.000.
- Jackson, Fred L.; McHugh, Kevin P.; and Robertson, John S., to Schuller International, Inc. Air filtration media. 5,480,466, Cl. 55-528.000.
- Jackson, Melvin R.: See—
- Ritter, Ann M.; Jackson, Melvin R.; Dupree, Paul L.; Wemple, Donald N., Jr.; and Hughes, John R., 5,480,468, Cl. 75-228.000.
- Jackson, Michael L.; Abbate, Robert J.; Sopcich, Nicholas J.; Moeller, Raymond J., Jr.; Hodapp, Mark; and Palagi, Greg, to Bee Chemical Company. Primer for polyolefin containing chlorinated polyolefin and rubberized epoxy. 5,480,939, Cl. 525-120.000.
- Jacobowitz, Lawrence; and Stigliani, Daniel, Jr., to International Business Machines Corporation. Synchronous clock distribution system. 5,481,573, Cl. 375-356.000.
- Jacobs, Mark E.; Thottuvelil, Vijayan J.; and Timm, Kenneth J., to AT&T Corp. Apparatus and method for generating negative bias for isolated MOSFET gate-drive circuits. 5,481,219, Cl. 327-434.000.
- Jacobs, Michael, to Iris Graphics, Inc. System for matching a picture on a monitor to a printed picture. 5,481,655, Cl. 395-109.000.
- Jacobs, Robert M.: See—
- Mahabadi, Hadi K.; Agur, Enno E.; McAneney, T. Brian; Kao, Sheau V.; Allison, Gerald R.; Hawkins, Michael S.; Hollenbaugh, William H., Jr.; Jacobs, Robert M.; and Chow, Che C., 5,480,756, Cl. 430-109.000.
- Jacobsen, Stephen C., to Sarcos Group. Movement actuator/sensor systems. 5,481,184, Cl. 324-106.000.
- Jacobson, David M.: See—
- Chao, Chia-Chiang; English, Robert M.; Jacobson, David M.; Stepanov, Alexander A.; and Wilkes, Andrew J., 5,481,694, Cl. 395-439.000.
- Jacomino, Jean-Marie: See—
- Hascoet, Gérard; LaCoste, Francois; Cathaud, Muriel; Jacomino, Jean-Marie; Devonec, Marian; and Perrin, Paul, 5,480,417, Cl. 607-101.000.
- Jacquin, Arnaud E.: See—
- Hartung, John; Jacquin, Arnaud E.; Michel, Thomas A.; and Podilchuk, Christine L., 5,481,308, Cl. 348-398.000.
- Jadwin, Thomas A.; Osterhoudt, Hans W.; Spence, John M.; and Tyagi, Dinesh, to Eastman Kodak Company. Two component electrophotographic developers and preparation method. 5,480,757, Cl. 430-110.000.
- Jagtiani, Ajay A.: See—

- Rogerson, Zebulon W., 5,481,093, Cl. 235-78.00R.
- Jakubicki, Gary; and McCandish, Elizabeth F., to Colgate-Palmolive Co. Light duty liquid detergent composition comprising a sulfosuccinamate-containing surfactant blend. 5,480,586, Cl. 252-545.000.
- James, Courtney D.; Nowak, William J.; and Shogren, David K., to Xerox Corporation. Tuned vibration absorbers for AC motors. 5,481,142, Cl. 310-51.000.
- James, Dean W., to Quickie Designs Inc. Three-wheeled competition wheelchair having an adjustable center of mass. 5,480,172, Cl. 280-250.100.
- James River Corporation of Virginia, The: See—
- Patterson, Robert; Geddes, Daniel J.; Hollenberg, David H.; and Maynard, Patrick L., 5,480,693, Cl. 428-36.700.
- Woginrich, Thomas J., Jr., 5,481,171, Cl. 318-778.000.
- James, Susan P.; Karydas, Daphne; McGarry, Frederick M.; and Harris, William H., to General Hospital Corporation, The; and Massachusetts Institute of Technology. Method and apparatus for reducing interfacial porosity in a cemented femoral prosthesis. 5,480,450, Cl. 623-23.000.
- Janceka, Anna: See—
- Bowers, Cyril Y.; Folkers, Karl A.; Ljungqvist, Anders; Feng, Dong-Mei; and Janceka, Anna, 5,480,969, Cl. 530-328.000.
- Janel Hydro Co.: See—
- Cooney, Leo A., 5,480,222, Cl. 303-114.100.
- Jang, Keun Y., to Goldstar Electron Co., Ltd. Transfer molding apparatus for encapsulating an electrical element in resin. 5,480,296, Cl. 425-116.000.
- Jang, Yi-Feng; Kao, Jinn-Nan; and Huang, Po-Chuan, to Industrial Technology Research Institute. Transpose memory for DCT/IDCT circuit. 5,481,487, Cl. 364-725.000.
- Janota, Kenneth F.: See—
- Banakis, Emanuel G.; Brinkman, Donald J.; Janota, Kenneth F.; and Lang, Harold K., 5,481,434, Cl. 361-756.000.
- Janousek, Alan J.: See—
- Beaudoin, Armand J.; Bryant, J. Daniel; Janousek, Alan J.; Kamat, Rajeev G.; Oliver, H. Edwin; and Ramage, Robert M., 5,480,498, Cl. 148-549.000.
- Janowski, Aaron: See—
- De Paulis, Tomas; Kessler, Robert M.; Smith, Howard E.; Janowski, Aaron; and Clanton, Jeffrey A., 5,480,631, Cl. 424-185.000.
- Jansen, Ronald E.: See—
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- Yamamoto, Yasuhiro, 5,481,173, Cl. 318-801.000.
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- Hano, Kazumi, 5,481,250, Cl. 340-825.060.
- Honda, Michitaka; and Komatsu, Kenichi, 5,481,279, Cl. 345-200.000.
- Imanari, Hiroyuki, 5,479,803, Cl. 72-8.000.
- Kanno, Hiroki, 5,481,293, Cl. 347-251.000.
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- Kobayashi, Hironobu, 5,481,661, Cl. 395-131.000.
- Miyagawa, Shigenori; Kobayashi, Koichi; Kunii, Shimpei; Kamio, Shizuo; Sakamoto, Hiroyuki; Sato, Fumitaka; and Ishiura, Ryoichi, 5,481,430, Cl. 361-681.000.
- Nomura, Katunori; Anse, Hiroaki; and Yamauchi, Yoshiyuki, 5,480,101, Cl. 242-160.400.
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- Shima, Takeshi, 5,481,212, Cl. 327-94.000.
- Sugiura, Satoshi, 5,481,190, Cl. 324-314.000.
- Todome, Tsyoshi, 5,481,338, Cl. 355-212.000.
- Yamamuro, Mikio, 5,481,531, Cl. 369-275.300.
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- Kagayama, Shigeru, to Brother Kogyo Kabushiki Kaisha. Image forming apparatus having staggered aperture electrodes that uniformly supply toner to form an image. 5,481,286, Cl. 347-55.000.
- Kageyama, Shuhei; Anzai, Shohji; Ueki, Tomiji; and Mitsuya, Yoshihide, to Kotobuki & Co., Ltd. Lead dispensing storage container. 5,480,249, Cl. 401-60.000.
- Kageyama, Yoshitaka: See—  
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- Kai, Yoshihide; Tanigawa, Hiroya; and Wakahara, Toshihiko, to Oki Electric Industry Co., Ltd.; and Nippon Telegraph And Telephone Corporation. Data transfer system in which data is transferred to or from a data memory during an instruction fetch cycle. 5,481,677, Cl. 395-280.000.
- Kaida, Hiroaki, to Murata Manufacturing Co., Ltd. Piezo-resonator. 5,481,154, Cl. 310-368.000.
- Kailasam, Ganesh: See—  
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- Kaiser, Ronald R., II. Cooler caddy, and methods of constructing and utilizing same. 5,480,170, Cl. 280-30.000.
- Kajiwar, Kenzo: See—  
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- Kalendra, Paul W.: See—  
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- Kalisiak, Michael S., to Moore Business Forms, Inc. Forms separating conveyance. 5,480,033, Cl. 209-584.000.
- Kaltenbach & Voigt GmbH & Co.: See—  
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- Kamada, Kazunori: See—  
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- Kamahori, Masao, to Hitachi, Ltd. Micro-reactor device for minute sample analysis. 5,480,614, Cl. 422-70.000.
- Kamat, Rajeev G.: See—  
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- Kambe, Yoshitaka; and Shinozawa, Tamio, to Toyota Jidosha Kabushiki Kaisha. Homopolar dynamoelectric machine. 5,481,149, Cl. 310-178.000.
- Kambin, Parviz, to Smith & Nephew Richards, Inc. Open surgical technique for vertebral fixation with subcutaneous fixators positioned between the skin and the lumbar fascia of a patient. 5,480,440, Cl. 623-17.000.

- Kamei, Shigeru; Igari, Yasutaka; and Ogawa, Yasuaki, to Takeda Chemical Industries, Ltd. Sustained-release preparation. 5,480,868, Cl. 514-15.000.
- Kameli, Nader; and Collins, James M., to Otis Elevator Company. Elevator downpeak sectoring. 5,480,006, Cl. 187-383.000.
- Kametani, Masatsugu, to Hitachi, Ltd. Synchronous method and apparatus for processors. 5,481,747, Cl. 395-800.000.
- Kamihata, Tomio: See—  
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- Kammerer, Gene W.; Frederick, Royce; Howard, Barbara; and Walker, Edd, to Ethicon, Inc. Surgical tissue retrieval instrument. 5,480,404, Cl. 606-113.000.
- Kamon, Kazuya, to Mitsubishi Denki Kabushiki Kaisha. Mask inspecting method and mask detector. 5,481,624, Cl. 382-144.000.
- Kamon, Kouichi; and Kawamoto, Hiroyuki, to Ricoh Company, Ltd. Image reading device having variable internal synchronization setting control. 5,481,371, Cl. 358-410.000.
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- Kanazawa, Manabu: See—  
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- Kanbayashi, Kenichi: See—  
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- Kanbe, Yoshitake: See—  
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- Kaneko, Masaaki: See—  
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- Kaneko, Norio: See—  
Yamamoto, Keisuke; Kishi, Fumio; Motoi, Taiko; Kawasaki, Takehiko; and Kaneko, Norio, 5,481,491, Cl. 365-148.000.
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- Kanno, Isao, to Sanshin Kogyo Kabushiki Kaisha. Warning for remote control system. 5,481,261, Cl. 340-870.160.
- Kanno, Naotaka, to NEC Corporation. DMA controller mailing auto-initialize halting unit. 5,481,756, Cl. 395-842.000.
- Kanome, Osamu: See—  
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- Kansas State University Research Foundation: See—  
Senock, Randall S.; and Ham, Jay M., 5,481,090, Cl. 219-535.000.
- Tokach, Mike D.; Nelssen, Jim L.; and Goodband, Robert D., 5,480,659, Cl. 426-2.000.
- Kanzaki Kokyukoki Mfg. Co., Ltd.: See—  
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- Kao Corporation: See—  
Muraoka, Tsutomu, 5,480,460, Cl. 8-416.000.
- Tsukada, Kiyoshi; Hattori, Yasuyuki; and Mimura, Taku, 5,481,048, Cl. 568-885.000.
- Yasuda, Shinichiro; and Nishikawa, Hideyo, 5,481,344, Cl. 355-260.000.
- Kao, Jinn-Nan: See—  
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- Kao, Sheau V.: See—  
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Failli, Amedeo A.; Bleymann, Oleg I.; Kao, Wenling; and Abou-Gharbia, Magid A., 5,480,988, Cl. 540-456.000.
- Kaplan, Martin; and Senak, Peter, Jr., to Dana Corporation. Synchronous inductor electric motor. 5,481,147, Cl. 310-154.000.
- Kapogiannis, Chris T.; and Harmuth, John F., to International Business Machines Corporation. Asynchronous serial communication system for delaying with software dwell time a receiving computer's acknowledgement in order for the transmitting computer to see the acknowledgement. 5,481,675, Cl. 395-200.130.
- Karasawa, Minato: See—  
Oishi, Tetsuya; Ozawa, Hiroshi; Karasawa, Minato; Inomata, Masamitsu; Mega, Izumi; Yamauchi, Atsuyoshi; Kamada, Kazunori; Nakahata, Shigeru; Sakamoto, Katsumi; Nakashima, Tatsunobu; Watanabe, Akito; Suzuki, Jin; Ohkawa, Kouhei; Furusawa, Satoshi; Ono, Hiroshi; and Sugazaki, Kazuo, 5,480,947, Cl. 525-509.000.
- Karim, Faraydon, to International Business Machines Corporation. Super scalar computer architecture using remand and recycled general purpose register to manage out-of-order execution of instructions. 5,481,683, Cl. 395-375.000.
- Karl, Günter: See—  
Noltemeyer, Friedrich; Hoppe, Alfred; Münzenmaier, Jürgen; Rusch, Friedrich; and Karl, Günter, 5,479,894, Cl. 123-74.0AC.
- Karlström, Anders; Haiduk, Herbert; and Schüle, Gerhard. Plug connector housing. 5,480,329, Cl. 439-731.000.
- Karpf, Martin: See—  
Broger, Emil A.; Karpf, Martin; and Zutter, Ulrich, 5,481,008, Cl. 549-292.000.
- Karydas, Daphne: See—  
James, Susan P.; Karydas, Daphne; McGarry, Frederick M.; and Harris, William H., 5,480,450, Cl. 623-23.000.
- Kasai, Minoru; and Nakamura, Minoru, to Hitec Co., Ltd. Apparatus for manufacturing a chain of linked food products. 5,480,346, Cl. 452-47.000.
- Kasama, Nobuhiro: See—  
Osato, Yoichi; Kawada, Hisaaki; Fujii, Eiichi; Kasama, Nobuhiro; and Kobayashi, Tadashi, 5,481,410, Cl. 360-13.000.
- Kasama, Yasuhiko: See—  
Mitsumori, Kenichi; Kasama, Yasuhiko; Nakano, Akira; Abe, Akira; and Ohmi, Tadahiho, 5,480,563, Cl. 210-748.000.
- Kasamoto, Masami: See—  
Arashima, Tetsuo; Sugitani, Hiroshi; Masuda, Kazuaki; Ikeda, Masami; Kasamoto, Masami; Suzuki, Seiji; Ishinaga, Hiroyuki; Kawai, Jun; and Kamiyama, Yuji, 5,481,289, Cl. 347-93.000.
- Kasanuki, Yuji; Kawada, Haruki; and Yanagisawa, Yoshihiro, to Canon Kabushiki Kaisha. Information processing apparatus with ferroelectric rewritable recording medium. 5,481,527, Cl. 369-126.000.
- Kashida, Motokazu; Hoshi, Hidenori; Nagasawa, Kenichi; and Yamashita, Shinichi, to Canon Kabushiki Kaisha. Multichannel digital-signal reproducing apparatus for switching access timing relative to reproducing timing. 5,481,518, Cl. 369-53.000.
- Kashima, Shingo; and Hayashi, Shinichi, to Olympus Optical Co., Ltd. Pupil modulation optical system. 5,481,393, Cl. 359-227.000.
- Kashima, Shingo: See—  
Kita, Nobuhiro; Kashima, Shingo; and Shimizu, Kazuo, 5,481,401, Cl. 359-353.000.
- Kashimura, Noboru: See—  
Kasuya, Takashige; Kashimura, Noboru; Nakamura, Tatsuya; Chiba, Tatsuhiko; and Inaba, Kohji, 5,480,759, Cl. 430-126.000.
- Kashimura, Tetsuo: See—  
Doi, Hiroyuki; Yasuda, Ken; Kashimura, Tetsuo; and Fukui, Yutaka, 5,480,283, Cl. 415-199.500.
- Kashiwagi, Kenichi; and Matsumoto, Masami, to Canon Kabushiki Kaisha. Digital image processing apparatus for synthesizing an image form at least two images. 5,481,653, Cl. 395-100.000.
- Kashiyama, Kotaro: See—  
Sasaki, Takayoshi; and Kashiyama, Kotaro, 5,480,231, Cl. 384-206.000.
- Kasper, Gerhard: See—  
Li, Yao-En; Rizos, John; and Kasper, Gerhard, 5,480,677, Cl. 427-248.100.
- Kasuya, Takashige; Kashimura, Noboru; Nakamura, Tatsuya; Chiba, Tatsuhiko; and Inaba, Kohji, to Canon Kabushiki Kaisha. Toner image transfer method. 5,480,759, Cl. 430-126.000.
- Katagiri, Hiroyuki: See—  
Takei, Tetsuya; Ohtoshi, Hirokazu; Okamura, Ryuji; Katagiri, Hiroyuki; and Takai, Yasuyoshi, 5,480,627, Cl. 430-127.000.
- Takei, Tetsuya; Segi, Yoshio; and Katagiri, Hiroyuki, 5,480,754, Cl. 430-65.000.
- Kathrein, Hendrik: See—  
van Bonn, Karl-Heinz; Kathrein, Hendrik; and Franz, Gerhard, 5,480,570, Cl. 252-62.560.
- Kato, Akihiko; Yamasato, Masaharu; Taguchi, Tomio; Yanagida, Yoshiki; and Katube, Teruaki, to Toa Electronics Ltd. Electrode for measuring PH. 5,480,534, Cl. 204-419.000.
- Kato, Hisahiro: See—  
Ishida, Hideki; Mizude, Kazuhiro; Kato, Hisahiro; and Tsutano, Tomohiro, 5,481,345, Cl. 355-273.000.
- Kato, Hisaki; Kimura, Suenori; Nakatsugawa, Kiyoshi; Uchino, Tsuguo; Ozawa, Itsuo; and Onda, Hiroyuki, to Hamamatsu Photonics K.K. Electron multiplier with improved dynode geometry for reduced crosstalk. 5,481,158, Cl. 313-533.000.
- Kato, Keiichi; Imai, Keisuke; Oyabu, Masanori; Kouda, Yasuhiko; Isomura, Makoto; Nezak, Takuya; and Watanabe, Koh, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Deactivating device for locking mechanism of pretensioner. 5,480,104, Cl. 242-374.000.
- Kato, Kohei; and Yoshioka, Tohru, to Sanko Motor Chemical Co., Ltd. Waste fluid treatment process. 5,481,064, Cl. 588-205.000.



Kato, Nobuhiro, to Kabushiki Kaisha Toshiba. Database restructuring system for detecting functionally dependent relations and converting them into third normal form. 5,481,703, Cl. 395-600.000.

Kato, Yasuhisa: See—  
Yasui, Motokazu; and Kato, Yasuhisa, 5,481,350, Cl. 355-290.000.

Katoh, Haruzo: See—  
Setoguchi, Shunichi; Katoh, Haruzo; and Matsufuji, Takashi, 5,480,481, Cl. 106-404.000.

Katsumi, Toru: See—  
Tsuchiya, Hiroaki; Shibayama, Tetsuhiro; Katsumi, Toru; and Kamiya, Yuji, 5,481,337, Cl. 355-208.000.

Katube, Teruaki: See—  
Kato, Akihiko; Yamasato, Masaharu; Taguchi, Tomio; Yanagida, Yoshiaki; and Katube, Teruaki, 5,480,534, Cl. 204-419.000.

Kauffman, Robert E.; and Wolf, James D., to University of Dayton, The. Voltammetric method for measuring peroxide concentration in hydrocarbon fuels. 5,480,808, Cl. 436-135.000.

Kaufman, Jeffrey M.: See—  
Heise, James A.; Turner, Duane L.; Kaufman, Jeffrey M.; and Leach, Thomas C., 5,481,235, Cl. 335-18.000.

Kaumeier, Michael W., to Auld Company, The. Shaped flexible decorative articles and method for making same. 5,480,688, Cl. 428-13.000.

Kaup, Douglas M.: See—  
Daigger, Glen T.; Stephenson, Joseph P.; Nolasco, Daniel A.; Stafford, Dalton R.; and Kaup, Douglas M., 5,480,548, Cl. 210-605.000.

Kava, Joseph: See—  
Furr, Michael G.; Kava, Joseph; Blackburn, Greg; and McGovern, Richard, 5,480,052, Cl. 216-71.000.

Kawabe, Nozomu: See—  
Yamamoto, Susumu; Murai, Teruyuki; Kawabe, Nozomu; and Tobioke, Masaaki, 5,480,601, Cl. 264-61.000.

Kawabe, Takako: See—  
Niimura, Koichi; Kawabe, Takako; Wada, Tsutomu; Saitoh, Tsuyoshi; and Bannai, Kenji, 5,480,878, Cl. 514-182.000.

Kawada, Haruki: See—  
Kasanuki, Yuji; Kawada, Haruki; and Yanagisawa, Yoshihiro, 5,481,527, Cl. 369-126.000.

Kawada, Hideaki; and Wakita, Toshiaki, to Sony Corporation. Magnetic recording and reproducing apparatus for a helical-scan system adapted for reproduction of data in a reverse sequential order from recording of data. 5,481,413, Cl. 360-53.000.

Kawada, Masaya; Yamazaki, Koji; Ueda, Shigenori; Ehara, Toshiyuki; and Niino, Hiroaki, to Canon Kabushiki Kaisha. Electrophotographic process and electrophotographic apparatus. 5,480,750, Cl. 430-31.000.

Kawade, Hisaaki: See—  
Osato, Yoichi; Kawade, Hisaaki; Fujii, Eiichi; Kasama, Nobuhiro; and Kobayashi, Tadashi, 5,481,410, Cl. 360-13.000.

Takimoto, Kiyoshi; Kawade, Hisaaki; Kishi, Etsuro; and Yano, Koji, 5,481,529, Cl. 369-126.000.

Kawaguchi, Sigeoki: See—  
Hayama, Kazuhide; Narazaki, Kanji; and Kawaguchi, Sigeoki, 5,480,634, Cl. 424-70.120.

Kawai, Jun: See—  
Arashima, Tetsuo; Sugitani, Hiroshi; Masuda, Kazuaki; Ikeda, Masami; Kasamoto, Masami; Suzuki, Seiji; Ishinaga, Hiroyuki; Kawai, Jun; and Kamiyama, Yuji, 5,481,289, Cl. 347-93.000.

Kawai, Katsuhiko; Doua, Hisayo; and Ikeda, Hiroshi, to Nippondenso Co., Ltd. Control apparatus for internal combustion engine. 5,479,897, Cl. 123-339.200.

Kawai, Katsuya; Anzai, Masayasu; Harada, Toshimitsu; and Nishino, Shinichi, to Hitachi Koki Co., Ltd. Electrophotographic recording apparatus having improved residual toner cleaning function. 5,481,351, Cl. 355-298.000.

Kawai, Yoshinari; Oyama, Fumihiro; and Yamagishi, Mikio, to Sumitomo Rubber Industries, Ltd. Floor panel support leg and double floor. 5,479,745, Cl. 52-126.600.

Kawaide, Hiroshi: See—  
Kimura, Hiromi; Okamura, Akio; Kawaide, Hiroshi; and Yamaura, Takuro, 5,480,781, Cl. 435-52.000.

Kawakami, Hideaki: See—  
Saikawa, Satoshi; Suzuki, Tetsuo; Hiramatsu, Soichi; Taniguro, Masahiro; Saito, Hiroyuki; Yanagi, Haruyuki; Nojima, Takashi; Kinoshita, Hiroyuki; and Kawakami, Hideaki, 5,480,247, Cl. 400-629.000.

Kawamoto, Hiroyuki: See—  
Kamon, Kouichi; and Kawamoto, Hiroyuki, 5,481,371, Cl. 358-410.000.

Kawamura, Hiromitsu, to Fujitsu Limited. Light modulator integrated light-emitting device and method of manufacturing the same. 5,481,559, Cl. 372-50.000.

Kawamura, Hiroyuki: See—  
Yano, Shingo; Ohno, Tomoyasu; Ogawa, Kazuo; Yamada, Haruo; Shirasaka, Tetsuhiko; Kawamura, Hiroyuki; and Watanabe, Shinichi, 5,480,899, Cl. 514-376.000.

Kawamura, Masahisa; and Ohashi, Ryota, to Kanzaki Kokyukoki Mfg. Co., Ltd. Fluid supply assembly for working vehicles. 5,479,845, Cl. 91-514.000.

Kawamura, Matsue: See—  
Takematsu, Tetsuo; Kume, Takashi; Yamaoka, Shoji; Komata, Takeo; Suzuki, Kiyoshi; Ikeda, Yukio; Kawamura, Matsue; Koda, Yumiko; and Mori, Kaoru, 5,481,022, Cl. 560-45.000.

Kawaoka, Yoshiaki, to Fuji Photo Film Co., Ltd. Line memory controller for printer and method thereof. 5,480,236, Cl. 400-120.010.

Kawasaki, Miyoji; Hirose, Masanori; Suzuki, Toshitsugu; Matsuura, Tei; and Yokoyama, Yoshinada, to Heisei Riken Kabushiki Kaisha. Method for preventing adhesion of scales in service water or circulating industrial water by applying the magnetic field. 5,480,557, Cl. 210-695.000.

Kawasaki, Shinji; and Ito, Shigenori, to NGK Insulators, Ltd. Solid oxide fuel cells and process for the production of the same. 5,480,739, Cl. 429-33.000.

Kawasaki Steel Corporation: See—  
Marui, Tomohiro; and Arai, Kazuo, 5,481,112, Cl. 250-339.140.

Kawasaki, Takehiko: See—  
Yamamoto, Keisuke; Kishi, Fumio; Motoi, Taiko; Kawasaki, Takehiko; and Kaneko, Norio, 5,481,491, Cl. 365-148.000.

Kawase, Hajime: See—  
Watanabe, Kaoru; and Kawase, Hajime, 5,480,312, Cl. 439-135.000.

Kawashima, Hiroshi: See—  
Suzuki, Masayasu; Mochizuki, Tuiyoshi; and Kawashima, Hiroshi, 5,480,685, Cl. 427-548.000.

Kawashima, Michio: See—  
Ishikawa, Jun; Kawashima, Michio; and Itoh, Kazuhiro, 5,481,427, Cl. 360-137.000.

Kawashima, Sumihiko, to Toyo Boseki Kabushiki Kaisha. Method and apparatus for improving image quality. 5,481,376, Cl. 358-455.000.

Kay Chemical Company: See—  
Harry, David R., Jr., 5,480,493, Cl. 134-4.000.

Kayes, Allan G., to Powermole International Limited. Soil displacement hammer for replacing underground pipes. 5,480,263, Cl. 405-154.000.

Kean, William W.: See—  
Beachy, Shawn A.; Kean, William W.; Morgan, DeCarla J.; and Okafor, Ani A., 5,481,534, Cl. 370-60.000.

Keane, Patrick J.; and Mitchell, Kathy P., to International Business Machines Corporation. Method of and system for providing application programs with an undo/redo function. 5,481,710, Cl. 395-700.000.

Keating, Kent G.; and Drago, Joseph A., to Photo Sculptures, Inc. Extension table for a table saw. 5,479,972, Cl. 144-287.000.

Keeling, Michael R.; and Weinberg, Hillar, to Linx Printing Technologies PLC. Modulation signal amplitude adjustment for an ink jet printer. 5,481,288, Cl. 347-80.000.

Keith, Brent, to Micron Technology, Inc. Voltage reference circuit with a common gate output stage. 5,481,179, Cl. 323-315.000.

Keith, Michael: See—  
Goldstein, Judith; and Keith, Michael, 5,481,307, Cl. 348-384.000.

Kel Corporation: See—  
Arisaka, Hiroshi, 5,480,309, Cl. 439-43.000.

Keller, Anthony F.: See—  
Connell, Lawrence E.; Collins, Timothy J.; Keller, Anthony F.; Marvin, Dennis F.; and Bushman, Michael L., 5,481,229, Cl. 331-158.000.

Keller, Ernst. Web for a built-in double lock cylinder. 5,479,801, Cl. 70-373.000.

Kelley, Scott A.: See—  
Rogers, Lisa W.; Kraft, Thomas L.; Berry, John F.; Kelley, Scott A.; Thompson, John A., III; Ober, Clifford D.; Kuchar, Michael C.; Mayer, Robert R., Jr.; Hoskins, Van W.; Weido, Vincent C.; and Henckel, Mark G., 5,480,062, Cl. 221-174.000.

Kelley, Thomas F.; and Floyd, Alton D., to StatSpin Technologies. Cytology centrifuge apparatus. 5,480,484, Cl. 118-52.000.

Kelly, Michael W.: See—  
Jorgensen, Glenn F.; and Kelly, Michael W., 5,480,271, Cl. 408-184.000.

Jorgensen, Glenn F.; and Kelly, Michael W., 5,480,272, Cl. 408-222.000.

Kelly, Scott: See—  
Crow, Harry; Anderson, Thomas M.; Kelly, Scott; Atherton, Terry; and Schmidt, Larry, 5,479,957, Cl. 137-101.190.

Kelman, Charles D.; and DeVore, Dale P., to Darby & Darby. Biologically compatible collagenous reaction product and articles useful as medical implants produced therefrom. 5,480,427, Cl. 623-6.000.

Kelsey-Hayes Company: See—  
Hartford, Dean J., 5,480,007, Cl. 188-18.00A.

Kemp, John, to Specialized Banking Furniture International. Trader desk nosing assembly. 5,479,864, Cl. 108-27.000.

Kennedy, James R.: See—  
Levy, Alan; Kennedy, James R.; and Papazian, John M., 5,479,829, Cl. 73-823.000.

Kent, Edward J.: See—  
Landry, Norman R.; and Kent, Edward J., 5,481,234, Cl. 333-238.000.

Kepler Plastics Fabricators, Inc.: See—  
Meyers, Frank; Brown, John A.; and Reidel, Robert, 5,480,261, Cl. 405-63.000.

Kepplinger, Leopold W.: See—  
Wallner, Felix; Kepplinger, Leopold W.; and Bohm, Christian, 5,480,070, Cl. 222-413.000.

Kéri, György; Mező, Imre; Horváth, Anikó; Vadsz, Zsolt; Teplán, István; Balogh, Ágnes; Csuka, Orsolya; Bökönyi, Gyöngyi; Szóke, Balás; Horváth, Judit; Idei, Miklós; and Sepródi, János, to Biosignal Kutató-Felkészítő Kft. Tumor growth-inhibiting somatostatin analogues, pharmaceutical compositions containing them and process for preparing same. 5,480,870, Cl. 514-16.000.

Kerner, Bradley D. Tire feeder, and methods of constructing and utilizing same. 5,479,882, Cl. 119-61.000.

Kerr, James F., to Kerr, James F. Dual track mounted ladder system. 5,480,002, Cl. 182-38.000.

Kerschbaum, Walter: See—  
Werner, Johannes; Thiele, Klaus-Jürgen; Bäuerle, Emil; Kerschbaum, Walter; and Bauknecht, Peter, 5,479,903, Cl. 123-509.000.

Kershaw, Natalie L.; Naylor, William C., Jr.; Pulver, Mark; and Brown, David R., to Canon Inc. Motion detection method and apparatus. 5,481,319, Cl. 348-699.000.

Kersten, Ralf: See—  
Heming, Martin; Hochhaus, Roland; Kersten, Ralf; Krause, Dieter; Otto, Jürgen; Paquet, Volker; Segner, Johannes; and Fattinger, Christof, 5,480,687, Cl. 427-573.000.

Kessler, Robert M.: See—  
De Paulis, Tomas; Kessler, Robert M.; Smith, Howard E.; Janowski, Aaron; and Clanton, Jeffrey A., 5,480,631, Cl. 424-185.000.

Kesting, Robert E.: See—  
Degen, Peter J.; Mischenko, John, III; Kesting, Robert E.; Bilich, Moira H.; and Staff, Trevor A., 5,480,554, Cl. 210-651.000.

Key Tronic Corporation: See—  
English, George P., 5,481,074, Cl. 200-5.00A.

Keyes, Denis E.; Randall, John R., Jr.; and Curcio, James V. Volumetric fluid dispensing apparatus. 5,480,063, Cl. 222-64.000.

Khandkar, Ashok C.: See—  
Elangovan, Singaravelu; Khandkar, Ashok C.; and Hartvigsen, Joseph J., 5,480,738, Cl. 429-32.000.

Khasat, Nitya P.; and Leach, Douglas, to Metton America, Inc. Polydiacyclopentadiene having improved stability and toughened with polymeric particles. 5,480,940, Cl. 525-290.000.

Kheralwala, Mustansir H.; and Steigerwald, Robert L., to General Electric Company. Efficient, high power density, high power factor converter for very low dc voltage applications. 5,481,449, Cl. 363-17.000.

Kheralwala, Mustansir H.: See—  
El-Hamamsy, Sayed-Amr; and Kheralwala, Mustansir H., 5,481,161, Cl. 315-224.000.

Khuchbandani, Teju J.: See—  
Mical, Robert J.; Needle, David L.; Khuchbandani, Teju J.; and Landrum, Stephen H., 5,481,275, Cl. 345-132.000.

Kiefer, Gary E.; and Simon, Jaime, to Dow Chemical Company, The. Bicyclopolyazamacrocyclohexanecarboxylic acid complexes for use as contrast agents. 5,480,990, Cl. 540-465.000.

Kihara, Takashi: See—  
Kimura, Shigeo; Ishikura, Yoshiyuki; Kihara, Takashi; and Masuda, Takashi, 5,479,827, Cl. 73-718.000.

Kikkawa, Shoshi; Kanazawa, Manabu; and Tsukada, Isao, to Canon Kabushiki Kaisha. Ink jet recording system. 5,480,243, Cl. 400-354.000.

Kikkawa, Toshihide; and Ohori, Tatsuya, to Fujitsu Limited. Semiconductor device having an isolation region enriched in oxygen and a fabrication process thereof. 5,480,833, Cl. 437-126.000.

Kikuchi, Makoto: See—  
Funabashi, Kiyomi; Chino, Koichi; Kuriyama, Osamu; Baba, Tsutomu; Uchida, Shunsuke; and Kikuchi, Makoto, 5,481,061, Cl. 588-4.000.

Kikuchi, Narumi; Matsushita, Tsuyoshi; and Wada, Yutaka, to Kabushiki Kaisha Tec. Output controller for a dot printer head. 5,481,654, Cl. 395-108.000.

Kikuchi, Shuichi, to Ricoh Company, Ltd. Zoom lens having super wide angle. 5,481,404, Cl. 359-674.000.

Kikuchi, Yutaka: See—  
Adachi, Nobukazu; and Kikuchi, Yutaka, 5,481,347, Cl. 355-285.000.

Kilbourn, Robert G.: See—  
Bonaventura, Joseph; DeAngelo, Joseph; and Kilbourn, Robert G., 5,480,866, Cl. 514-6.000.

Kilian, Reinhold: See—  
Hippenmeyer, Heinrich; and Kilian, Reinhold, 5,481,096, Cl. 235-454.000.

Kilman Electric Company: See—  
Kilman, John, deceased; Falkenstein, Kent C.; Beckstead, Donal O.; and Myers, Phillip L., 5,479,799, Cl. 70-231.000.

Kilman, John, deceased by Mary Helen Kilman, co-executor; Falkenstein, Kent C.; Beckstead, Donal O.; and Myers, Phillip L., to Kilman Electric Company. Key and bolt lock device. 5,479,799, Cl. 70-231.000.

Kim, Andrew C. Shoulder compression interlocking system. 5,480,402, Cl. 606-64.000.

Kim, Andrew S.; and Camp, Floyd E., to Crucible Materials Corporation. Re-Fe-B magnets and manufacturing method for the same. 5,480,471, Cl. 75-348.000.

Kim, Bum-Tae; Min, Yong-Ki; Park, No-Kyun; Kim, Tae-Jun; and Cho, Kwang-Yun, to Korea Research Institute of Chemical Technology. Fluorinated abscisic acid derivatives and plant growth regulator thereof. 5,481,034, Cl. 562-507.000.

Kim, Chun-sup, to Samsung Electronics Co., Ltd. Burst signal generating circuit of a video processing system. 5,481,313, Cl. 348-505.000.

Kim, Eun J., to Goldstar Co., Ltd. Optical disk pickup device including waveguide with separate integrated grating couplers for laser output, focus, and tracking error signals. 5,481,516, Cl. 369-44.120.

Kim, Hiroki, to Casio Computer Co., Ltd. Data inputting apparatus using rotary data drum. 5,481,264, Cl. 341-20.000.

Kim, Hyeon-si: See—  
Kwon, Sun-don; and Kim, Hyeon-su, 5,481,252, Cl. 340-825.220.

Kim, Hyung-Kun P.; Muller, Arno; and Nambudiri, Easwaran C. N., to Pitney Bowes Inc. Postage meter system having bit-mapped indicia image security. 5,480,239, Cl. 400-120.090.

Kim, Jong-Rak, to Daewoo Electronics Co., Ltd. Method for rectifying channel errors in a transmitted image signal encoded by classified vector quantization. 5,481,627, Cl. 382-254.000.

Kim, Soon-tae, to Samsung Electronics Co., Ltd. Apparatus for discriminating audio signals. 5,481,370, Cl. 358-341.000.

Kim, Tae-Jun: See—  
Kim, Bum-Tae; Min, Yong-Ki; Park, No-Kyun; Kim, Tae-Jun; and Cho, Kwang-Yun, 5,481,034, Cl. 562-507.000.

Kim, Taeyoung, to Hyundai Motor Company. Method for casting a hollow camshaft for internal combustion engine. 5,479,981, Cl. 164-16.000.

Kim, Young O.; Russell, Philip J.; and Weinert, Glenwood S., to International Business Machines Corporation. System and method for building interconnections in a hierarchical circuit design. 5,481,473, Cl. 364-490.000.

Kimbrel, Jean D.: See—  
Echols, Joseph A.; Kimbrel, Jean D.; and Montz, Sandra L., 5,480,193, Cl. 285-45.000.

Kimura, Hiromi; Okamura, Akio; Kawaide, Hiroshi; and Yamaura, Takuro, to Tokyo Tanabe Company, Limited. *Bacillus* strains for oxidizing hydroxy groups of cholic acid and cheno deoxycholic acid to keto groups. 5,480,781, Cl. 435-52.000.

Kimura, Hiroyuki: See—  
Okoshi, Shinichi; and Kimura, Hiroyuki, 5,480,300, Cl. 432-241.000.

Kimura, Katsuhiko: See—  
Kando, Hidehiko; Kainuma, Mamoru; Muranishi, Masaru; and Kimura, Katsuhiko, 5,481,515, Cl. 369-44.120.

Kimura, Katsui, to NEC Corporation. Differential amplifier circuit having a driver with square-law characteristic. 5,481,224, Cl. 330-253.000.

Kimura, Kenichi, to Canon Kabushiki Kaisha. Variable-apex prism controller. 5,481,394, Cl. 359-234.000.

Kimura, Shigeo; Ishikura, Yoshiyuki; Kihara, Takashi; and Masuda, Takashi, to Yamatake-Honeywell Co., Ltd. Capacitive pressure sensor isolating electrodes from external environment. 5,479,827, Cl. 73-718.000.

Kimura, Suenori: See—  
Kato, Hisaki; Kimura, Suenori; Nakatsugawa, Kiyoshi; Uchino, Tsuguo; Ozawa, Itsuo; and Onda, Hiroyuki, 5,481,158, Cl. 313-533.000.

Kimura, Yukio: See—  
Akazawa, Mitsui; Hama, Tetsuo; Kimura, Yukio; and Yasuda, Yoshinobu, 5,480,649, Cl. 424-449.000.

Kimura, Yutaro; Ikeshima, Tetsuhiko; Tonami, Hiromichi; Konishi, Ikuro; Horikawa, Hiroshi; Daikoku, Akihiro; Sakabe, Shigekazu; Inoue, Masao; and Yamasaki, Akinori, to Shimadzu Corporation; and Mitsubishi Denki Kabushiki Kaisha. Rotary cathode x-ray tube equipment. 5,481,585, Cl. 378-134.000.

Kinbara, Hidenori: See—  
Ejiri, Mitsuo; and Kinbara, Hidenori, 5,480,269, Cl. 408-1.00R.

Kinchin, Anthony E. Projectile with sabot. 5,479,861, Cl. 102-439.000.

Kinetic Limited: See—  
Heyring, Christopher B., 5,480,188, Cl. 280-772.000.

King, Brian; King, Paul; and McLean, Stan, to VKI Technologies, Inc. Lower chamber vent for the lower chamber of a brewing machine. 5,479,849, Cl. 99-287.000.

King, Harold B.: See—  
Johansson, Eric B.; and King, Harold B., 5,481,579, Cl. 376-446.000.

King, James M.: See—  
Dickey, Conwell J.; and King, James M., 5,481,276, Cl. 345-132.000.

King, Paul: See—  
King, Brian; King, Paul; and McLean, Stan, 5,479,849, Cl. 99-287.000.

Kingham, Douglas J., to Parkinson's Charitable Trust. Nutritional composition. 5,480,865, Cl. 514-2.000.

Kinoshita, Hiroyuki: See—  
Saikawa, Satoshi; Suzuki, Tetsuo; Hiramatsu, Soichi; Taniguro, Masahiro; Saito, Hiroyuki; Yanagi, Haruyuki; Nojima, Takashi; Kinoshita, Hiroyuki; and Kawakami, Hideaki, 5,480,247, Cl. 400-629.000.

Kinoshita, Isamu: See—  
Xu, Jie; Suzuki, Kenji; and Kinoshita, Isamu, 5,480,344, Cl. 451-28.000.

Kinoshita, Masami: See—  
Ogawa, Munehiro, deceased; Iwabuchi, Masato; Sugihara, Hirosaki; Hojo, Saburo; Kinoshita, Masami; Yamashiro, Osamu; Yokomizo, Goichi; and Miyama, Mikako, 5,481,484, Cl. 364-578.000.

Kinross, Timothy J.; and Thrus, Roger L., to Whitaker Corporation, The. Low insertion force card edge connector. 5,480,316, Cl. 439-326.000.

Kipp, Robert M.: See—  
Snyder, Dale R., Jr.; Smith, James D.; Stevens, James W.; and Kipp, Robert M., 5,480,521, Cl. 204-148.000.

Kirchner, Jack R., to Du Pont de Nemours, E. I., and Company. Fluorocarbamate soil-release agents. 5,481,027, Cl. 560-160.000.

Kirin Beverage Corporation: See—  
Niwa, Motohiro; Yasui, Tetsuji; and Ode, Takahiro, 5,480,804, Cl. 435-286.100.

Kirkman, Douglas F. Fluid couplings and seals. 5,479,960, Cl. 137-614.040.

Kirst, Herbert A.: See—  
Creemer, Lawrence C.; and Kirst, Herbert A., 5,480,906, Cl. 514-453.000.

Kishi, Etsuro: See—  
Eguchi, Ken; Takamatsu, Osamu; and Kishi, Etsuro, 5,481,528, Cl. 369-126.000.

Takimoto, Kiyoshi; Kawade, Hisaaki; Kishi, Etsuro; and Yano, Koji, 5,481,529, Cl. 369-126.000.

Kishi, Fumio: See—  
Yamamoto, Keisuke; Kishi, Fumio; Motoi, Taiko; Kawasaki, Takehiko; and Kaneko, Norio, 5,481,491, Cl. 365-148.000.

Kishimoto, Kazuyuki: See—  
Shigeta, Mitsuhiro; Nonomura, Keisaku; and Kishimoto, Kazuyuki, 5,481,273, Cl. 345-94.000.

Kishimoto, Mitsuru: See—



- Miyamoto, Katsuhiko; Iida, Kazumasa; Kishimoto, Mitsuru; and Hosono, Kiyotaka, 5,481,461, Cl. 364-431.010.
- Kishimoto, Tadami. Antibodies against the receptor protein for human B cell stimulatory factor-2. 5,480,796, Cl. 435-240.270.
- Kita, Kazunori, to Casio Computer Co., Ltd. Electronic devices with sensors. 5,481,506, Cl. 368-10.000.
- Kita, Nobuhiro; Kashima, Shingo; and Shimizu, Kazuo, to Olympus Optical Co., Ltd. Ultraviolet microscope. 5,481,401, Cl. 359-353.000.
- Kitagawa, Hidemasa: See—
- Suzuki, Kisoko; Kitagawa, Hidemasa; Endo, Koichiro; and Mori, Yoshihiro, 5,481,752, Cl. 395-800.000.
- Kitagishi, Tomoji: See—
- Sato, Toshiya; Oikawa, Akiko; Onose, Katsuyoshi; Yagi, Keijiro; and Kitagishi, Tomoji, 5,481,349, Cl. 355-290.000.
- Kitahara, Tetsuo: See—
- Sugita, Kouji; Kitahara, Tetsuo; Nonobe, Masatsugu; and Fujita, Tsuyosi, 5,480,982, Cl. 536-26.240.
- Kitahara, Tsuyoshi; Kumai, Eiji; Hirabayashi, Hiromu; Kanbayashi, Kenichi; and Watanabe, Kohji, to Seiko Epson Corporation. Printer having line-type ink jet recording head. 5,481,284, Cl. 347-42.000.
- Kitahara, Yoshihiko: See—
- Matsuo, Kazuhiro; Kitahara, Yoshihiko; Endo, Shinya; and Tagawa, Yoichi, 5,480,509, Cl. 156-522.000.
- Kitakami, Osamu: See—
- Daimon, Hideo; Kitakami, Osamu; and Fujiwara, Hideo, 5,480,694, Cl. 428-64.100.
- Kitamura, Minoru, to Yamaha Corporation. Automatic performance apparatus for storing chord progression suitable that is user settable for adequately matching a performance style. 5,481,066, Cl. 84-637.000.
- Kitamura, Naoya; Sugiyama, Hisashi; Yamaguchi, Yoshihide; Kyoui, Masayuki; Murooka, Hideyasu; Iwamura, Ryoji; and Watanabe, Makio, to Hitachi, Ltd. Multilayer wiring board fabricating method. 5,480,048, Cl. 216-13.000.
- Kitamura, Toshiyuki: See—
- Udagawa, Yutaka; Funada, Masahiro; Ohta, Ken-ich; Takaragi, Yoichi; Kitamura, Toshiyuki; and Ohta, Eiji, 5,481,377, Cl. 358-501.000.
- Kitaygorodskiy, Simon: See—
- Motev, Phil; and Kitaygorodskiy, Simon, 5,480,133, Cl. 271-85.000.
- Kitazawa, Shuichi: See—
- Itoh, Kazuo; Narita, Kazuhiko; Kitazawa, Shuichi; Tokoi, Masanori; Nakajima, Ayumi; and Sekine, Hiroshi, 5,481,465, Cl. 364-468.000.
- Kiyohara, Takehiko; and Nitta, Tetsuhiro, to Canon Kabushiki Kaisha. Sheet transport apparatus with disengagement means to allow reverse sheet movement. 5,480,132, Cl. 271-10.010.
- Klainer, Stanley M.; Walt, David R.; and Gottlieb, Amos J., to Optical Sensors Incorporated. Surface-bound fluorescent polymers and related methods of synthesis and use. 5,480,723, Cl. 428-441.000.
- Klasen, Claas-Jürgen; Foerster, Martin; Höfler, Andreas; Bauer, Klaus-Peter; Riemenschneider, Herbert; Franta, Oliver; and Gilg, Rainer, to Degussa Aktiengesellschaft. Method for producing spherical granulated materials from powered solids and granulated materials produced thereby. 5,480,626, Cl. 423-449.100.
- Klein, Bernd; and Mueller, Wolfgang, to Deutsche Aerospace Airbus GmbH. System for preventing the automatic opening of an improperly closed and locked aircraft door. 5,480,109, Cl. 244-129.500.
- Klein, Donald R.: See—
- Hathaway, Richard C.; Bridges, Mearl K.; and Klein, Donald R., 5,480,206, Cl. 296-36.000.
- Klein, Hans-Jürgen: See—
- Bitner, Hans J.; Klein, Hans-Jürgen; Küpper, Thomas; and Mörsen, Ewald, 5,480,488, Cl. 118-667.000.
- Klein, Joachim: See—
- Tischer, Wilhelm; Klein, Joachim; Müller, Rolf-Joachim; and Engelke, Stephan, 5,480,790, Cl. 435-188.000.
- Kleinecke, John D.; and Houche, George A., to Toshiba International Corporation. Compact motor controller with an improved arrangement for disconnecting and withdrawing a drawout unit. 5,481,075, Cl. 200-50.0AA.
- Kleiner, Christoph; Evans, Samuel; and Schmitt, Ralf, to Ciba-Geigy Corporation. Process for the preparation of hydroxyphenylcarboxylates. 5,481,023, Cl. 360-75.000.
- Kleiner, Hans-Jerg, to Hoechst Aktiengesellschaft. Method for preparing 6H-dibenzo[c,e][1,2]oxaphosphorin-6-one. 5,481,017, Cl. 558-82.000.
- Klenk, Ludwig: See—
- Stenger, Karl; Klenk, Ludwig; and Beissel, Dieter, 5,480,690, Cl. 428-34.800.
- Klietsch, Bernd-Jürgen: See—
- Brüne-Fischer, Anette; Burkhardt, Georg; Klietsch, Bernd-Jürgen; and Zellmer, Volker, 5,480,916, Cl. 521-112.080.
- Klimkow, Nanette M.: See—
- Thieme, Thomas R.; Goldstein, Andrew S.; Piacentini, Stephen C.; and Klimkow, Nanette M., 5,479,937, Cl. 128-760.000.
- Kloppel, Klaus D.: See—
- Dunfield, John C.; Knoche, Steven C.; and Kloppel, Klaus D., 5,481,144, Cl. 310-71.000.
- Kloss, Hans-Georg: See—
- Boenigk, Michael; Guenther, Klaus; Kloss, Hans-Georg; and Lehmann, Teja, 5,481,162, Cl. 315-307.000.
- Kluge, Johannes: See—
- Bitsch, Harald; Hasselmann, Heinz; Kluge, Johannes; Krebs, Wolfgang; Lichtenvort, Uwe; Münzebrock, Anton; and Somborn, Günter, 5,480,125, Cl. 254-264.000.
- Knapp, John F.: See—
- Sypula, Donald S.; Badesha, Santokh S.; Chang, Shu; Knapp, John F.; Trott, Robert E.; Chai, Stephen T.; Till, Henry R.; and Mammio, Joseph, 5,481,341, Cl. 355-256.000.
- Knickerbocker, John U.: See—
- Casey, Jon A.; Golland, David B.; Gupta, Dinesh; Herron, Lester W.; Humenik, James N.; Lombardi, Thomas E.; Knickerbocker, John U.; Sullivan, Robert J.; and Wylder, James R., 5,480,503, Cl. 156-89.000.
- Kniffen, Todd E.: See—
- Alvarez, Robert J.; Bredesen, Scott E.; Wilson, James J.; Flim, Duane D.; Kniffen, Todd E.; and Schahrer, Clinton O., 5,479,707, Cl. 29-890.039.
- Knight, Richard L.: See—
- Arroyo, Candido J.; Hancock, David S.; and Knight, Richard L., 5,481,635, Cl. 385-103.000.
- Knoche, Steven C.: See—
- Dunfield, John C.; Knoche, Steven C.; and Kloppel, Klaus D., 5,481,144, Cl. 310-71.000.
- Knorr Brake Holding Corporation: See—
- Engle, Thomas H., 5,480,042, Cl. 213-1.300.
- Knowles, Norman, to Software Control Systems, Inc. Jukebox entertainment system including removable hard drives. 5,481,509, Cl. 369-30.000.
- Knox, Robert B.: See—
- Avjioglu, Asil; Singh, Mohan B.; and Knox, Robert B., 5,480,972, Cl. 530-379.000.
- Kobayashi, Hironobu, to Kabushiki Kaisha Toshiba. Method and apparatus for converting attribute of display data into code. 5,481,661, Cl. 395-131.000.
- Kobayashi, Hisako: See—
- Matsumoto, Masakatsu; Watanabe, Nobuko; Mori, Eiko; Kobayashi, Hisako; and Ikawa, Hiroshi, 5,481,009, Cl. 549-375.000.
- Kobayashi, Kazuhiko: See—
- Nakamura, Akihiko; Sakakibara, Yoshio; Gotou, Makoto; and Kobayashi, Kazuhiko, 5,481,641, Cl. 388-800.000.
- Kobayashi, Koichi: See—
- Miyagawa, Shigenori; Kobayashi, Koichi; Kunii, Shimpei; Kamio, Shizuo; Sakamoto, Hiroyuki; Sato, Fumitaka; and Ishiura, Ryoichi, 5,481,430, Cl. 361-681.000.
- Kobayashi, Makoto: See—
- Ishida, Yasushi; Yokoyama, Minoru; Tomoda, Akihiro; Yamada, Masakatsu; Arai, Takashi; Yoshida, Takehiro; Kobayashi, Makoto; Wada, Satoshi; Ono, Takeshi; and Takeda, Tomoyuki, 5,481,291, Cl. 347-217.000.
- Kobayashi, Masumi: See—
- Yamamoto, Hisayoshi; Hoshide, Akira; and Kobayashi, Masumi, 5,480,553, Cl. 210-650.000.
- Kobayashi, Tadashi: See—
- Osato, Yoichi; Kawade, Hisaaki; Fujii, Eiichi; Kasama, Nobuhiro; and Kobayashi, Tadashi, 5,481,410, Cl. 360-13.000.
- Kobayashi, Toshifumi; Morooka, Yoshikazu; Yamada, Michihiro; and Hamamoto, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device and method of data transfer therefor. 5,481,496, Cl. 365-189.050.
- Kobayashi, Yoshikazu, to Kabushiki Kaisha Miike Tekkosho. Screening machine. 5,480,034, Cl. 209-667.000.
- Kobayashi, Yutaka; Aoki, Osamu; Hamabe, Kenji; Takeuchi, Atsushi; and Onda, Takayuki, to Idemitsu Petrochemical Co., Ltd.; and Honda Giken Kogyo Kabushiki Kaisha. Polypropylene resin composition and a molded article thereof. 5,480,932, Cl. 524-451.000.
- Kobayashi, Yutaka: See—
- Yoshimoto, Kyosuke; Nakajima, Yoshiki; Koyanagi, Kimiyuki; Ito, Osamu; Mashimo, Akira; Onda, Hiroyuki; Kobayashi, Yutaka; and Yamana, Koji, 5,481,517, Cl. 369-44.280.
- Koboshi, Shigeharu: See—
- Ishida, Kenji; and Koboshi, Shigeharu, 5,480,768, Cl. 430-399.000.
- Koch Engineering Chemical, Inc.: See—
- Yeoman, Neil; Griffith, Verne E.; and Hsieh, Chang-Li, 5,480,595, Cl. 261-114.100.
- Koda, Akira; Miyauchi, Tatsuo; Kanbe, Yoshitake; and Hamada, Hirokazu, to Chugai Seiyaku Kabushiki Kaisha. Benzodioxane derivatives. 5,480,905, Cl. 514-452.000.
- Koda, Yumiko: See—
- Takematsu, Tetsuo; Kume, Takashi; Yamaoka, Shoji; Komata, Takeo; Suzuki, Kiyoshi; Ikeda, Yukio; Kawamura, Matsue; Koda, Yumiko; and Mori, Kaoru, 5,481,022, Cl. 560-45.000.
- Kodaka, Yoshiro: See—
- Yamazaki, Satoshi; Takayama, Toru; Fukino, Kunihiro; Kodaka, Yoshiro; and Imanari, Hitoshi, 5,481,406, Cl. 359-694.000.
- Kodama, Kazuhisa; Hirayama, Atsushi; and Masayasu, Hiroyuki, to Daiichi Pharmaceutical Co., Ltd. Inhibitor for restenosis after percutaneous coronary arterioplasty. 5,480,888, Cl. 514-310.000.
- Kodama, Tomohiro: See—
- Yanagihara, Naoto; Takashima, Masanobu; Shimazaki, Masato; Iwakura, Ken; and Kodama, Tomohiro, 5,480,765, Cl. 430-338.080.
- Kodera, Hiroji: See—
- Yamano, Yoshiaki; Hashimoto, Masayoshi; and Kodera, Hiroji, 5,479,701, Cl. 29-825.000.

- Kodosky, Jeffrey L., to National Instruments Corporation. Method and apparatus for providing autoprobes features in a graphical data flow diagram. 5,481,740, Cl. 395-800.000.
- Kodosky, Jeffrey L.: See—
- McKaskle, Greg; and Kodosky, Jeffrey L., 5,481,741, Cl. 395-800.000.
- Koenen, Paul; and Hien, Manfred, to Mannesmann Aktiengesellschaft. Two-high cross rolling mill with guide disks. 5,479,805, Cl. 72-97.000.
- Koenig, Herbert: See—
- Thal, Claude; Quirora-Guillou, Catherine; Potier, Pierre; Renko, Dolor; Zanetta, Jean-Pierre; Portier, Marie-Madeleine; Sensenbrenner, Monique; Koenig, Janine; and Koenig, Herbert, 5,480,884, Cl. 514-275.000.
- Koenig, Janine: See—
- Thal, Claude; Quirora-Guillou, Catherine; Potier, Pierre; Renko, Dolor; Zanetta, Jean-Pierre; Portier, Marie-Madeleine; Sensenbrenner, Monique; Koenig, Janine; and Koenig, Herbert, 5,480,884, Cl. 514-275.000.
- Koerner, Hermann: See—
- Johannisbauer, Wilhelm; Koerner, Hermann; and Nitsche, Michael, 5,480,978, Cl. 536-4.100.
- Koester, Karsten G.: See—
- Hellstrom, Ake A.; Koester, Karsten G.; Frisco, Thomas A.; and Throm, James E., Jr., 5,479,720, Cl. 33-501.020.
- Koga, Eiji: See—
- Watanabe, Hitoshi; Kadosawa, Tsuneaki; Nakamura, Takashi; Koga, Eiji; and Asada, Satoshi, 5,481,705, Cl. 395-650.000.
- Kogashiwa, Norio: See—
- Suehiro, Atsuo; and Kogashiwa, Norio, 5,480,536, Cl. 205-151.000.
- Kohler Co.: See—
- Husting, Thomas J., 5,480,199, Cl. 292-198.000.
- Kohlpaintner, Christian: See—
- Herrmann, Wolfgang A.; Manetsberger, Rainer; Bahrmann, Helmut; Kohlpaintner, Christian; and Lappe, Peter, 5,481,045, Cl. 568-454.000.
- Kohmoto, Kenichiro; and Osada, Mitsuo, to Sumitomo Electric Industries, Ltd. Semiconductor element-mounting composite heat-sink base. 5,481,136, Cl. 257-712.000.
- Kohn, Harold: See—
- Desai, Kishor V.; Kohn, Harold; Senger, Richard C.; and Seraphim, Donald P., 5,479,703, Cl. 29-852.000.
- Kohno, Hiroshige: See—
- Ikezawa, Zeno; Yokota, Shumpei; Tsubaki, Kazufumi; Kohno, Hiroshige; Sugiyama, Hiromu; Ikeda, Kenji; and Suzuki, Takashi, 5,480,660, Cl. 426-2.000.
- Koike, Kazuyoshi: See—
- Sakamoto, Masashi; Shibata, Mitsuru; Nasuno, Ichiro; and Koike, Kazuyoshi, 5,480,858, Cl. 504-288.000.
- Koike, Yutaka: See—
- Morishima, Hajime; Koike, Yutaka; Nakano, Masato; Atsuumi, Shugo; Tanaka, Seiichi; and Matsuyama, Kenji, 5,481,036, Cl. 564-162.000.
- Kokubo, Mitsunori: See—
- Manabe, Takao; Yamakawa, Yuhei; Shin, Shoichi; Yamada, Hideyuki; Nagashima, Mitsuo; Kokubo, Mitsunori; Tsunada, Masafumi; Nagakura, Yasuhiko; Nakajima, Yukio; Inoue, Tomohiro; and Kondo, Kiyoshi, 5,480,508, Cl. 156-353.000.
- Kokunishi, Motohide: See—
- Itoh, Tutomu; Hirokawa, Toshio; Kokunishi, Motohide; Iwanaga, Masaharu; and Endo, Shinichi, 5,481,698, Cl. 395-185.010.
- Kola, Ratnaji R.; Miller, Gabriel L.; and Wagner, Eric R., to AT&T Corp. Apparatus for depositing low stress films. 5,480,529, Cl. 204-298.030.
- Kollie, Thomas G.: See—
- Harris, Michael T.; Basaran, Osman A.; Kollie, Thomas G.; and Weaver, Fred J., 5,480,696, Cl. 428-69.000.
- Kolta, Tibor, to Ford Motor Company. Paint spray booth air speed control. 5,480,349, Cl. 454-52.000.
- Koltz, Irving M.: See—
- Burtch, Ronald P.; and Koltz, Irving M., 5,479,732, Cl. 40-124.100.
- Komata, Takeo: See—
- Takematsu, Tetsuo; Kume, Takashi; Yamaoka, Shoji; Komata, Takeo; Suzuki, Kiyoshi; Ikeda, Yukio; Kawamura, Matsue; Koda, Yumiko; and Mori, Kaoru, 5,481,022, Cl. 560-45.000.
- Komatsu, Hisateru: See—
- Konno, Makoto; Komatsu, Hisateru; and Watanabe, Takashi, 5,481,421, Cl. 360-106.000.
- Komatsu, Kenichi: See—
- Honda, Michitaka; and Komatsu, Kenichi, 5,481,279, Cl. 345-200.000.
- Komiya, Yutaka: See—
- Arimoto, Shinobu; Shimizu, Katsuchi; Komiya, Yutaka; Yoshinaga, Kazuo; Hayashi, Toshio; Nakai, Takehiko; Utagawa, Tsutomu; Nagase, Tetsuya; and Sasanuma, Nobuatsu, 5,481,334, Cl. 355-201.000.
- Komori, Kenji; and Hirabayashi, Atsushi, to Sony Corporation. Oscillator, synthesizer tuner circuit and AM synchronous detect circuit employing the oscillator. 5,481,227, Cl. 331-2.000.
- Komura, Atsushi: See—
- Miura, Shoji; Sogisaka, Takayuki; Komura, Atsushi; and Sakakibara, Toshio, 5,480,832, Cl. 437-67.000.
- Kondo, Haruyoshi; Takahashi, Hideaki; Saji, Keiichi; Takeuchi, Masaharu; and Satta, Kozo, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Thin film multilayered air/fuel ratio sensor. 5,480,535, Cl. 204-425.000.
- Kondo, Hiroyuki; Nakao, Yuichi; and Koyama, Kazumi, to Mitsubishi Denki Kabushiki Kaisha. Data processor including selection mechanism for coupling internal and external request signals to interrupt and DMA controllers. 5,481,678, Cl. 395-280.000.
- Kondo, Katsufumi: See—
- Iijima, Kenzaburo; Kondo, Katsufumi; Masuda, Katsuhiko; Yataka, Kouji; and Chujo, Yasuyuki, 5,481,355, Cl. 356-28.000.
- Kondo, Kiyoshi: See—
- Manabe, Takao; Yamakawa, Yuhei; Shin, Shoichi; Yamada, Hideyuki; Nagashima, Mitsuo; Kokubo, Mitsunori; Tsunada, Masafumi; Nagakura, Yasuhiko; Nakajima, Yukio; Inoue, Tomohiro; and Kondo, Kiyoshi, 5,480,508, Cl. 156-353.000.
- Kondo, Tetsujiro, to Sony Corporation. Data transmission apparatus for transmitting code data. 5,481,554, Cl. 371-53.000.
- Kondo, Tetsuya; Murata, Kei; Nagai, Yoshikazu; and Ohshima, Katsumori, to Victor Company of Japan, Ltd. Method for manufacturing a stamper for high-density recording discs. 5,480,763, Cl. 430-320.000.
- Kondo, Yasumitsu: See—
- Fujita, Satoshi; Kagiya, Naoto; Momiyama, Masayoshi; and Kondo, Yasumitsu, 5,480,791, Cl. 435-196.000.
- Kongsberg Automotive A/S: See—
- Havdal, Hans P., 5,479,779, Cl. 60-591.000.
- Konica Corporation: See—
- Ishida, Kenji; and Koboshi, Shigeharu, 5,480,768, Cl. 430-399.000.
- Sasaki, Kunisuna; Goto, Narito; Takeda, Katsuyuki; Sekiguchi, Nobuyuki; Takahashi, Hideki; Isobe, Ryosuke; and Mori, Takahiro, 5,480,713, Cl. 428-323.000.
- Sugano, Masashi; Yamazaki, Yoshio; Ikeda, Masaaki; and Izawa, Tadashi, 5,481,378, Cl. 358-501.000.
- Tosaka, Yasuo; Nonaka, Yoshiyuki; and Hoshino, Keiichi, 5,480,767, Cl. 430-358.000.
- Konieczko, Jozef. Wheel chair having longitudinally adjustable arm rests. 5,480,173, Cl. 280-250.100.
- Konietzka, Uwe: See—
- Schlott, Martin; Kutzner, Martin; Weigert, Martin; Konietzka, Uwe; Gehman, Bruce; and Vahlstrom, Shawa, 5,480,532, Cl. 204-298.130.
- Weigert, Martin; Konietzka, Uwe; and Gehman, Bruce, 5,480,531, Cl. 204-298.130.
- König, Herbert: See—
- Fischer, Gerhard; Warnke, Ulrich; and König, Herbert, 5,480,373, Cl. 600-14.000.
- Konishi, Ikuo: See—
- Kimura, Yutaro; Ikeshima, Tetsuhiko; Tonami, Hiromichi; Konishi, Ikuo; Horikawa, Hiroshi; Daikoku, Akihiro; Sakabe, Shigekazu; Inoue, Masao; and Yamasaki, Akinori, 5,481,585, Cl. 378-134.000.
- Konishi, Satoshi: See—
- Haze, Setsuo; Nishimura, Ryoji; Fukuda, Masao; and Konishi, Satoshi, 5,479,756, Cl. 53-77.000.
- Konno, Makoto; Komatsu, Hisateru; and Watanabe, Takashi, to Mitsumi Electric Co., Ltd. Magnetic disk driver capable of decreasing ingress of noise in a main surface of a main frame. 5,481,421, Cl. 360-106.000.
- Konopka, John A.: See—
- Hu, Haoran; and Konopka, John A., 5,479,890, Cl. 123-322.000.
- Konrad, Rainer: See—
- Mueller, Hans-Joachim; Evertz, Kaspar; Weber, Siegfried; Funk, Guido; Konrad, Rainer; and Saive, Roland, 5,480,852, Cl. 502-210.000.
- Konuma, Toshimitsu; and Mase, Akira, to Semiconductor Energy Laboratory Co., Ltd. Electro-optical apparatus utilizing at least three electro-optical modulating device to provide a synthesized color image and method of driving same. 5,481,320, Cl. 348-751.000.
- Kooijmans, Petrus G.: See—
- Frenks, Jan; Groenewald, Pieter; Kooijmans, Petrus G.; and Raudenbush, Werner T., 5,480,960, Cl. 528-198.000.
- Koppe, Heinz: See—
- Nicolai, Norbert; Koppe, Heinz; Schwabe, Thomas; and Vogel, Jürgen, 5,480,692, Cl. 428-35.100.
- Korea Institute of Science and Technology: See—
- Hong, Yeh S., 5,481,155, Cl. 318-135.000.
- Korea Research Institute of Chemical Technology: See—
- Kim, Bum-Tae; Min, Yong-Ki; Park, No-Kyun; Kim, Tae-Jun; and Cho, Kwang-Yun, 5,481,034, Cl. 562-507.000.
- Korte, John E.: See—
- Gwiazdon, Rodney K.; Korte, John E.; Deadmond, Richard S.; and Smith, Wayne A., 5,480,372, Cl. 493-437.000.
- Korth, Ruth. Treatment of disease with paf-acether antagonists and procedure determining their efficacy. 5,480,881, Cl. 514-220.000.
- Kosaka, Nobuyuki: See—
- Mitsuda, Hiroshi; Sakamoto, Masahiko; Tanaka, Hitoshi; Kosaka, Nobuyuki; and Ito, Yoshinori, 5,481,095, Cl. 235-454.000.
- Koseki, Shuji, to Sony Corporation. Recording head apparatus for a tape player. 5,481,424, Cl. 360-106.000.
- Koshiro, Koichi: See—
- Noda, Yasushi; Yoshioka, Nobuyuki; Suzuki, Nobutaka; Fukai, Toshi-masa; Yoshihara, Tetsuo; and Koshiro, Koichi, 5,480,472, Cl. 75-351.000.
- Kost, Friedrich; Ruf, Wolf-Dieter; Hartmann, Uwe; Ehret, Thomas; Van Zanten, Anton; and Erhardt, Rainer, to Robert Bosch GmbH. Control of vehicle side slip using yaw rate. 5,480,219, Cl. 303-146.000.
- Kostianen, Arja: See—
- Gustafsson, Bill; Kostianen, Arja; and Sormunen, Pekka, 5,480,849, Cl. 502-115.000.



- Kotaka, Hiroaki: *See*—  
Shintani, Yoshitomo; Suganuma, Tetsuya; Matsuo, Shuitsu; Saito, Hajime; Yamaoka, Hidenori; Kuroko, Nobuhisa; and Kotaka, Hiroaki, 5,479,873, Cl. 117-75.000.
- Kotobuki & Co., Ltd.: *See*—  
Kageyama, Shuhei; Anzai, Shohji; Ueki, Tomiji; and Mitsuya, Yoshiohide, 5,480,249, Cl. 401-60.000.
- Kotowicz, Lawrence: *See*—  
Bischoping, Patricia; Altavela, Robert P.; Kotowicz, Lawrence; Schmitt, Peter J.; Herbert, William G.; Jansen, Ronald E.; Lennon, John H.; and Grey, Henry G., 5,480,528, Cl. 204-212.000.
- Kotzev, Grigor K.: *See*—  
Shen, Francis N.; Shen, Anthony P.; Edwards, Eric C.; Schmid, Gerrard B.; and Kotzev, Grigor K., 5,481,594, Cl. 379-67.000.
- Kouda, Yasuhiko: *See*—  
Kato, Keiichi; Imai, Keisuke; Oyabu, Masanori; Kouda, Yasuhiko; Isomura, Makoto; Nezaki, Takuya; and Watanabe, Koh, 5,480,104, Cl. 242-374.000.
- Kouno, Katuyuki; Taniuchi, Kazuman; and Sekine, Hiroshi, to Fuji Xerox Co., Ltd. Area control system for image processing apparatus, 5,481,372, Cl. 358-433.000.
- Kouyama, Satoshi; and Ohshima, Yasushi, to Dainippon Screen Mfg. Co., Ltd. Method of and apparatus for modifying base separation figure, 5,481,662, Cl. 395-135.000.
- Kovacevic, Radovan; and Zhang, Yu M., to University of Kentucky Research Foundation. Apparatus and method for measuring 3-D weld pool shape, 5,481,085, Cl. 219-130.010.
- Kowa Industry Works Co., Ltd.: *See*—  
Suehiro, Atsuo; and Kogashiwa, Norio, 5,480,536, Cl. 205-151.000.
- Koyama, Kazumi: *See*—  
Kondo, Hiroyuki; Nakao, Yuichi; and Koyama, Kazumi, 5,481,678, Cl. 395-280.000.
- Koyanagi, Kimiyuki: *See*—  
Yoshimoto, Kyosuke; Nakajima, Yoshiki; Koyanagi, Kimiyuki; Ito, Osamu; Mashimo, Akira; Onda, Hiroyuki; Kobayashi, Yutaka; and Yamana, Koji, 5,481,517, Cl. 369-44.280.
- Koyo Seiko Co., Ltd.: *See*—  
Daido, Toshihiko; Nishimoto, Mitsuhiro; and Matsuoka, Hirofumi, 5,480,000, Cl. 180-79.100.
- Fujiwara, Satoshi; and Ikeda, Takaaki, 5,480,013, Cl. 192-45.100.
- Kozaki, Takaharu: *See*—  
Tagawa, Itsuo; and Kozaki, Takaharu, 5,480,100, Cl. 241-266.000.
- Kozuka, Hiraku; Sugawa, Shigetoshi; and Shimizu, Hisae, to Canon Kabushiki Kaisha. Laminated solid-state image pickup device, 5,481,124, Cl. 257-185.000.
- Kraan, John D.: *See*—  
Valpey, Richard S., III; Yokoyama, Thomas W.; Kraan, John D.; and Harwood, H. James, 5,480,951, Cl. 526-271.000.
- Kraemer, Michael; Wirbeleit, Friedrich; Enderle, Christian; Friess, Walter; Krutzsch, Bernd; Withalm, Gert; Schoen, Christof; Mikulic, Leopold; Hertweck, Gernot; and Thoma, Frank, to Mercedes-Benz AG. Air-compressing fuel-injection internal-combustion engine with an exhaust treatment device for reduction of nitrogen oxides, 5,479,775, Cl. 60-274.000.
- Kraft Foods, Inc.: *See*—  
White, James D.; Croasmun, William R.; and Leland, Jane V., 5,479,815, Cl. 73-23.300.
- Kraft, Thomas L.: *See*—  
Rogers, Lisa W.; Kraft, Thomas L.; Berry, John F.; Kelley, Scott A.; Thompson, John A., III; Ober, Clifford D.; Kuchar, Michael C.; Mayer, Robert R., Jr.; Hoskins, Van W.; Weido, Vincent C.; and Henckel, Mark G., 5,480,062, Cl. 221-174.000.
- Kramer, Charles J.; and Grettson, Geoffrey B., to Holotek Ltd. Deflector system which produces dual, oppositely directed scanning beams simultaneously or successively, 5,481,384, Cl. 359-17.000.
- Kramer, Rachel H.: *See*—  
Johnson, C. Barry; and Kramer, Rachel H., 5,480,604, Cl. 264-138.000.
- Krankenhausentsorgungsgesellschaft mbH: *See*—  
Birkholz, Michaela; Drauscke, Stefan; and Hörber, Gerhard, 5,480,610, Cl. 422-26.000.
- Krantz, Lawrence L.: *See*—  
Gallo, Paul S.; Goodman, R. W. Benjamin; Krantz, Lawrence L.; McLoughlin, Kathleen A.; and Wagner, Eric M., 5,481,681, Cl. 395-325.000.
- Krasnikoff, Harry: *See*—  
Singer, Samuel; DeSantis, Francis J.; and Krasnikoff, Harry, 5,481,073, Cl. 200-1.00R.
- Kraus, Helmut, to Bayer Aktiengesellschaft. Process for the preparation of 6-amino-nicotinonitriles, 5,480,995, Cl. 546-250.000.
- Kraus, Matthias H.; and Aaronson, Stuart A., to United States of America, Health and Human Services. Isolated polypeptide erbB-3, related to the epidermal growth factor receptor and antibody thereto, 5,480,968, Cl. 530-326.000.
- Krause, Dieter: *See*—  
Herning, Martin; Hochhaus, Roland; Kersten, Ralf; Krause, Dieter; Otto, Jürgen; Paquet, Volker; Segner, Johannes; and Fattinger, Christof, 5,480,687, Cl. 427-573.000.
- Krebs, Andreas: *See*—  
Petersen, Uwe; Schröck, Wilfried; Häbich, Dieter; Krebs, Andreas; Schenke, Thomas; Philipps, Thomas; Grohe, Klaus; Endermann, Rainer; Bremm, Klaus-Dieter; and Metzger, Karl-Georg, 5,480,879, Cl. 514-202.000.
- Krebs, Wolfgang: *See*—  
Bitsch, Harald; Hasselmann, Heinz; Kluge, Johannes; Krebs, Wolfgang; Lichtenvort, Uwe; Münzebrock, Anton; and Somborn, Günter, 5,480,125, Cl. 254-264.000.
- Krespan, Carl G.: *See*—  
Petrov, Viacheslav A.; and Krespan, Carl G., 5,481,028, Cl. 560-184.000.
- Kretschmar, Gerhard; Meiwes, Johannes; Schudok, Manfred; Hammann, Peter; Lerch, Ulrich; and Grabley, Susanne, to Hoechst Aktiengesellschaft. Process for the biotechnological preparation of L-thienylalanines in enantiomerically pure form from 2-hydroxy-3-thienylacrylic acids, and their use, 5,480,786, Cl. 435-106.000.
- Krijnen, Lambertus B.: *See*—  
Altieri, Paul A.; Eden, James; Gribnau, Michael C.; Hoogendijk, Leendert; Krijnen, Lambertus B.; Solarek, Daniel B.; and Swarthoff, Ton, 5,480,575, Cl. 252-94.000.
- Krilich, Rose A.: *See*—  
Griffiths, Richard W.; Krilich, Rose A.; Kuchenbecker, William G.; and Richardson, Bryan M., 5,481,602, Cl. 379-210.000.
- Krisch, Igor: *See*—  
Rucman, Rudolf; Bole-Vunduk, Breda; Ocvirk, Magdalena; Lavric, Bogomila; and Krisch, Igor, 5,480,885, Cl. 514-288.000.
- Krishnan, Parameshwaran: *See*—  
Douglas, Frederick; Marsh, Brian D.; and Krishnan, Parameshwaran, 5,481,733, Cl. 395-750.000.
- Krishnaswamy, Silaipillayarputhur V.; and Freidhoff, Carl B., to Westinghouse Electric Corp. Thin film preconcentrator array, 5,481,110, Cl. 250-288.000.
- Krishnaswamy, Sridhar: *See*—  
Pouet, Bruno F.; Chatters, Tom C.; and Krishnaswamy, Sridhar, 5,481,356, Cl. 356-35.500.
- Kroin, Julian S.: *See*—  
Hertel, Larry W.; Jones, Charles D.; Kroin, Julian S.; and Mabry, Thomas E., 5,480,992, Cl. 544-313.000.
- Kruger, Albert A.; and Chartier, Pascal, to Saint-Gobain Vitre. Anti-fogging coating composition, product coated with said composition and method for preparation of said product, 5,480,917, Cl. 522-33.000.
- Krüger, Dieter: *See*—  
Höfken, Erich; Krüger, Dieter; Mehring, Gisbert; and Pietzko, Günter, 5,479,982, Cl. 164-454.000.
- Kruh, Brian A. Overhead cranes having collision avoidance capabilities, 5,481,248, Cl. 340-685.000.
- Krumme, Manfred: *See*—  
Duecoffre, Volker; Flosbach, Carmen; Schubert, Walter; Krumme, Manfred; Stephan, Werner; and Sadowski, Fritz, 5,480,936, Cl. 524-839.000.
- Krupp Maschinentechnik GmbH: *See*—  
Baumgarten, Wilfried, 5,480,227, Cl. 366-80.000.
- Krutzsch, Bernd: *See*—  
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- Kubota Corporation: *See*—  
Morimoto, Yousuke; Hataura, Kiyoshi; and Kamata, Yasukazu, 5,479,888, Cl. 123-262.000.
- Okumura, Yoshinobu; Yang, Xingbo; and Endo, Isao, 5,480,733, Cl. 428-694.00T.
- Kuchar, Michael C.: *See*—  
Rogers, Lisa W.; Kraft, Thomas L.; Berry, John F.; Kelley, Scott A.; Thompson, John A., III; Ober, Clifford D.; Kuchar, Michael C.; Mayer, Robert R., Jr.; Hoskins, Van W.; Weido, Vincent C.; and Henckel, Mark G., 5,480,062, Cl. 221-174.000.
- Kuchenbecker, William G.: *See*—  
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- Kudryashov, Boris B.: *See*—  
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- Kuettner, Thomas: *See*—  
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- Kuhn, John P.; and Heath, Thomas S., to Martin Marietta Corporation. Apparatus for and method of adaptively processing sonar data, 5,481,503, Cl. 367-100.000.
- Kuhnell, John S., III. Handcuff shield, 5,479,943, Cl. 128-846.000.
- Kuivalainen, Reijo, to A. Ahlstrom Corporation. Method for purification of waste gases, 5,480,624, Cl. 423-210.000.
- Kukol, Peter, to Borland International, Inc. System and methods for optimizing object-oriented compilations, 5,481,708, Cl. 395-700.000.
- Kulesa, Anthony G., to AT&T Corp. Method and apparatus to increase efficiency of systematic codes, 5,481,566, Cl. 375-259.000.
- Kulicke and Soffa Investments Inc.: *See*—  
Levinson, Gideon; and Goldberg, Eran, 5,479,911, Cl. 125-15.000.
- Küllertz, Namen G.: *See*—  
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- Kumai, Eiji: *See*—

- Kitahara, Tsuyoshi; Kumai, Eiji; Hirabayashi, Hiromu; Kanbayashi, Kenichi; and Watanabe, Kohji, 5,481,284, Cl. 347-42.000.
- Kumaki, Satoshi; and Ishihara, Kazuya, to Mitsubishi Denki Kabushiki Kaisha. Information processing system having a plurality of processors, 5,481,726, Cl. 395-200.010.
- Kumar, Ajith K., to General Electric Company. Method for inhibiting wheel slip in an electric alternating current induction motor powered vehicle, 5,480,220, Cl. 303-151.000.
- Kumar, Alok: *See*—  
Chung, Tze-Chiang; Chen, Frank J.; Stanat, Jon E.; and Kumar, Alok, 5,481,054, Cl. 585-459.000.
- Kume, Katsuya; Oishi, Yozo; Kuramoto, Mitsuo; and Takenoshita, Itsuroh, to Nitto Denko Corporation. Label and label sheet and ink therefor, 5,480,700, Cl. 428-195.000.
- Kume, Takashi: *See*—  
Takematsu, Tetsuo; Kume, Takashi; Yamaoka, Shoji; Komata, Takeo; Suzuki, Kiyoshi; Ikeda, Yukio; Kawamura, Matsue; Koda, Yumiko; and Mori, Kaoru, 5,481,022, Cl. 560-45.000.
- Kummerfeld, Ryszard, to Drägerwerk AG. Supply unit for medical treatment instruments, 5,479,958, Cl. 137-357.000.
- Kundel, Nikhil K., to Johnson & Johnson Consumer Products, Inc. Hydrogel laminate bandages and composites, 5,480,717, Cl. 428-338.000.
- Kunichika, Kenji: *See*—  
Toyama, Tadao; and Kunichika, Kenji, 5,480,762, Cl. 430-302.000.
- Kunii, Shimpei: *See*—  
Miyagawa, Shigenori; Kobayashi, Koichi; Kunii, Shimpei; Kamio, Shizuo; Sakamoto, Hiroyuki; Sato, Fumitaka; and Ishiura, Ryoichi, 5,481,430, Cl. 361-681.000.
- Küpper, Thomas: *See*—  
Bittner, Hans J.; Klein, Hans-Jürgen; Küpper, Thomas; and Mörsen, Ewald, 5,480,488, Cl. 118-667.000.
- Kuragano, Tetsuzo: *See*—  
Nosaka, Shiro; and Kuragano, Tetsuzo, 5,481,659, Cl. 395-123.000.
- Kuramoto, Mitsuo: *See*—  
Kume, Katsuya; Oishi, Yozo; Kuramoto, Mitsuo; and Takenoshita, Itsuroh, 5,480,700, Cl. 428-195.000.
- Kurashige, Masafumi; Fukushima, Shinichi; and Nakao, Ayumi, to Sony Corporation. Image converting apparatus, 5,481,660, Cl. 395-125.000.
- Kurata, Masaaki: *See*—  
Shigematsu, Hiroyuki; Nakamura, Yutaka; Sakamoto, Munenori; Nagasawa, Hiroyuki; Nakao, Hiroshi; Nakajima, Yasuhiro; and Kurata, Masaaki, 5,481,278, Cl. 345-179.000.
- Kurata, Tokihiro: *See*—  
Isoai, Masaru; Harada, Toshiharu; Kurata, Tokihiro; Fujita, Kazuhiro; Takama, Kazushi; and Jikuhara, Shigekazu, 5,480,571, Cl. 252-62.560.
- Kuratori, Yasunori; and Ogawa, Hisahito, to Matsushita Electric Industrial Co., Ltd. Device and method for recognizing an image based on a feature indicating a relative positional relationship between patterns, 5,481,621, Cl. 382-204.000.
- Kure, Tokuo: *See*—  
Ninomiya, Ken; Todokoro, Hideo; Kure, Tokuo; Mitsui, Yasuhiro; Kuroda, Katsuhiko; and Shichi, Hiroyasu, 5,481,109, Cl. 250-310.000.
- Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—  
Niimura, Koichi; Kawabe, Takako; Wada, Tsutomu; Saitoh, Tsuyoshi; and Bannai, Kenji, 5,480,878, Cl. 514-182.000.
- Kurihara, Yoshie; Arai, Soichi; Abe, Keiko; and Yamashita, Haruyuki, to Kurihara, Yoshie; Arai, Soichi; and Asahi Denka Kogyo K.K. Curculin B and DNA encoding same, and process for production thereof, 5,480,795, Cl. 435-91.400.
- Kurima, Kazunori: *See*—  
Hirai, Shigeru; Kurima, Kazunori; Saito, Masahide; Yui, Dai; Hattori, Tomoyuki; and Suganuma, Hiroshi, 5,481,632, Cl. 385-49.000.
- Kurita, Shinichi: *See*—  
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- Kuriyama, Osamu: *See*—  
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- Kuroda, Katsuhiko: *See*—  
Ninomiya, Ken; Todokoro, Hideo; Kure, Tokuo; Mitsui, Yasuhiro; Kuroda, Katsuhiko; and Shichi, Hiroyasu, 5,481,109, Cl. 250-310.000.
- Kuroda, Yoshimi: *See*—  
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- Kuroda, Yuka: *See*—  
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- Kurokawa, Hideki: *See*—  
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- Kuroko, Nobuhisa: *See*—  
Shintani, Yoshitomo; Suganuma, Tetsuya; Matsuo, Shuitsu; Saito, Hajime; Yamaoka, Hidenori; Kuroko, Nobuhisa; and Kotaka, Hiroaki, 5,479,873, Cl. 117-75.000.
- Kuroyanagi, Isao: *See*—  
Yamamoto, Ken; Yamamoto, Michiyasu; Baba, Norimasa; Fukuoka, Mikio; Kuroyanagi, Isao; Sanada, Ryouichi; and Torigoe, Eiichi, 5,479,985, Cl. 165-176.000.
- Kurz, Walter; Baier, Wolfgang; and Meinig, Uwe, to Fichtel & Sachs AG. Arrangement for fastening a clutch to a crankshaft, 5,480,016, Cl. 192-70.160.
- Kusaka, Yosuke: *See*—  
Uchiyama, Shigeyuki; Kusaka, Yosuke; and Yamano, Syozo, 5,481,329, Cl. 354-402.000.
- Kusano, Akihisa: *See*—  
Tachibana, Tatsuo; Narita, Izumi; Kusano, Akihisa; Seino, Yuzo; and Sato, Kaoru, 5,481,336, Cl. 355-207.000.
- Kusano, Keigo; Matsunaga, Osamu; and Hayashida, Naomasa, to Mitsui Kouzan Kabushiki Kaisha. Process for making preserved edible foods from rootcrops, 5,480,672, Cl. 426-615.000.
- Kushiro, Noriyuki: *See*—  
Maruyama, Kazuhiro; Inoue, Masahiro; Kushiro, Noriyuki; and Iwatsubo, Rieko, 5,481,140, Cl. 307-11.000.
- Kusina, Yuri, to Color Arts, Inc. Display apparatus, 5,479,733, Cl. 40-155.000.
- Kutchmarick, Dave: *See*—  
DeJong, Glenn A.; Bacrania, Kantilal; Church, Michael D.; Fisher, Gregory J.; Gasner, John T.; Ito, Akira; Johnston, Jeffrey M.; Kutchmarick, Dave; and Rhee, Choong-Sun, 5,481,129, Cl. 257-360.000.
- Kutzner, Martin: *See*—  
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- Kuwahara, Naruto, to Arex Electronics Corporation. AC-to-AC power inverter apparatus functioning without smoothing capacitor, and control method thereof, 5,481,451, Cl. 363-37.000.
- Kuzuoka, Kaoru: *See*—  
Fukaya, Matsu; Nagai, Junichi; and Kuzuoka, Kaoru, 5,481,240, Cl. 338-22.00R.
- Kvaerner Engineering A.S.: *See*—  
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- Kvaerner Pulping Technologies Aktiebolag: *See*—  
Bergkvist, Lennart; Gustafsson, Sten; Lindblom, Kjell; Anderson, Jan; Ekholm, Rolf; and Höglund, Ronny, 5,480,546, Cl. 210-404.000.
- KVM Technologies, Inc.: *See*—  
Rogers, Lisa W.; Kraft, Thomas L.; Berry, John F.; Kelley, Scott A.; Thompson, John A., III; Ober, Clifford D.; Kuchar, Michael C.; Mayer, Robert R., Jr.; Hoskins, Van W.; Weido, Vincent C.; and Henckel, Mark G., 5,480,062, Cl. 221-174.000.
- Kwasnick, Robert F.: *See*—  
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- Kwolek, John P.: *See*—  
Hummel, Alan R.; and Kwolek, John P., 5,480,008, Cl. 188-73.370.
- Kwon, Sun-don; and Kim, Hyeon-su, to SamSung Electronics Co., Ltd. Mode conversion method for multifunctional programmable remote controller, 5,481,252, Cl. 340-825.220.
- Kwon, Young D.: *See*—  
Li, Hsin L.; Kwon, Young D.; and Prevorsek, Dusan C., 5,480,706, Cl. 428-113.000.
- Kyle, Kenneth E., to Geo Olcot company, Inc. Guard for channel bed presses, 5,479,837, Cl. 74-608.000.
- Kyoto Daiichi Kagaku Co., Ltd.: *See*—  
Dou, Xiaoming; and Uenoyama, Harumi, 5,481,113, Cl. 250-341.100.
- Kyouti, Masayuki: *See*—  
Kitamura, Naoya; Sugiyama, Hisashi; Yamaguchi, Yoshihide; Kyouti, Masayuki; Murooka, Hideyasu; Iwamura, Ryoji; and Watanabe, Makio, 5,480,048, Cl. 216-13.000.
- LaBallister, John W.: *See*—  
Hilliard, James E.; Lane, William A.; Bartlett, John W.; LaBallister, John W.; and Jedlicka, Frederick B., 5,479,840, Cl. 83-477.200.
- Laboe, Kevin J.: *See*—  
Giasson, Eric J.; Gondusky, Joseph M.; and Laboe, Kevin J., 5,479,786, Cl. 62-222.000.
- Laboratoires UPSA: *See*—  
Bru-Magniez, Nicole; Güngör, Timur; and Teulon, Jean-Marie, 5,480,983, Cl. 536-27.620.
- Bru-Magniez, Nicole; Cordoliani, Jean-Francois; Thanvin, Gérard; and Drouin, Jehan-Yves, 5,480,652, Cl. 424-466.000.
- LaCoste, Francois: *See*—  
Hascot, Gérard; LaCoste, Francois; Cathaud, Muriel; Jacomino, Jean-Marie; Devonec, Marian; and Perrin, Paul, 5,480,417, Cl. 607-101.000.
- Ladret, Patrick: *See*—  
Stubler, Jérôme; Ladret, Patrick; and Dupuis, Joël, 5,479,671, Cl. 14-22.000.
- La Fosse, Hector M.; and Spector, George. Pain relieving adjustable leg support, 5,480,375, Cl. 601-23.000.
- Lagneaux, Patrick; and Peretti, Christian, to Prodifa (S.A.R.L.). Dynamic diffuser of a substance such as a perfume, 5,480,591, Cl. 261-30.000.
- Lago, Rudolph M.: *See*—  
Bell, Weldon K.; Huang, Tracy J.; Lago, Rudolph M.; Tsao, Ying-Yen P.; and Whitehurst, D. Duayne, 5,481,057, Cl. 585-722.000.
- Lai, Motor. Dust removing device for portable power saw, 5,479,709, Cl. 30-123.300.
- Lai, Patrick K.: *See*—  
Nonoyama, Meihan; Tanaka, Akiko; and Lai, Patrick K., 5,480,782, Cl. 435-70.300.
- Lairam Corporation, The: *See*—  
Greve, Christopher G., 5,480,295, Cl. 425-71.000.



- Lake, Rickie C.; and Tuttle, Mark E., to Micron Communications, Inc. Process of manufacturing an electrical bonding interconnect having a metal bond pad portion and having a conductive epoxy portion comprising an oxide reducing agent. 5,480,834, Cl. 437-183.000.
- Lalas, Jose P.: See—  
Eisenhart, Eric K.; Graziano, Louis C.; and Lalas, Jose P., 5,480,720, Cl. 428-414.000.
- Lam, Andrew C.; Lin, Samuel Q.; Taylor, Timothy J.; and Winters, John R., to Lever Brothers Company, Division of Conopco, Inc. Surfactant mixtures for fabric conditioning compositions. 5,480,567, Cl. 252-8.800.
- Lam, Si-Ty; and You, Young-Soo. Color ink transfer printing. 5,481,280, Cl. 346-140.100.
- LaManna, Frank A. Cap holder apparatus. 5,480,073, Cl. 223-1.000.
- Lambach, Chris: See—  
Mueller, Steve; Meyers, Scott; Lambach, Chris; Stern, Glenn; Cochenet, Joseph; Werth, John T., III; Rodriguez, Carlos E.; Wozniak, John N.; Hintz, John; Hansen, Richard W.; and Trotter, Steve, 5,481,193, Cl. 324-379.000.
- Lambert, Michael P.: See—  
Smith, Eliot S.; Lambert, Michael P.; and Wilkinson, Jason H., 5,480,085, Cl. 226-44.000.
- Lambert, Ronald L.: See—  
Carroll, James E.; and Lambert, Ronald L., 5,479,853, Cl. 101-32.000.
- Lamberton, Ryan D.: See—  
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- Lammerzahl, Maurice: See—  
Hauptenthal, Rudi; and Lammerzahl, Maurice, 5,480,138, Cl. 271-276.000.
- Lamnevik, Stefan, to Forsvarets Forskningsanstalt. Method of destroying explosive substances. 5,481,062, Cl. 588-203.000.
- Lampenius, Harry: See—  
Hiltunen, Matti; Lampenius, Harry; and Westerlund, Kurt, 5,481,063, Cl. 588-205.000.
- Lampert, Norman R.: See—  
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- Lancsek, Thomas S.: See—  
Feldstein, Nathan; and Lancsek, Thomas S., 5,480,477, Cl. 106-1.240.
- Lancot, Jane B.: See—  
Voegele, Kevin D.; Lancot, Jane B.; and Westfield, Brian L., 5,481,200, Cl. 324-718.000.
- Landini, Dennis J.: See—  
Sonuparlak, Birol; Hatton, Kenneth S.; Landini, Dennis J.; Canino, Sylvia J.; Aghajanian, Michael K.; and Patel, Aspi N., 5,480,676, Cl. 427-180.000.
- Landrum, Stephen H.: See—  
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- Stachuletz, Manfred; and Strohmeier, Helmut, 5,479,809, Cl. 72-244.000.
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- Spellmeyer, David C.; Moos, Walter H.; Martin, Eric J.; Zuckermann, Ronald N.; and Stauber, Gregory, 5,480,871, Cl. 514-18.000.
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- Urkowitz, Harry; Bucci, Nicholas J.; and Freedman, Jerome E., 5,481,270, Cl. 342-101.000.
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- Martinez, Ramon A.: See—  
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- Maruo, Masatsuyo; Ando, Hitoshi; Watanabe, Mitsuru; and Mukai, Chitoshi, to Ishihara Sangyo Kaisha, Ltd. Titanium oxide particles and method of scavenging noxious materials. 5,480,636, Cl. 424-76.210.
- Maruyama, Kazuhiro; Inoue, Masahiro; Kushihiro, Noriyuki; and Iwatsubo, Rieko, to Mitsubishi Denki Kabushiki Kaisha. Demand control apparatus and power distribution control system. 5,481,140, Cl. 307-11.000.
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- Marvin, Dennis F.: See—  
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- Masayasu, Hiroyuki: See—  
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- Masuda, Hiroshi: See—  
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- Masuda, Hisao: See—  
Harada, Shigeru; Masuda, Hisao; and Tamaki, Reiji, 5,481,137, Cl. 257-742.000.
- Masuda, Katsuhiko: See—  
Iijima, Kenzaburo; Kondo, Katsufumi; Masuda, Katsuhiko; Yataka, Kouji; and Chujo, Yasuyuki, 5,481,355, Cl. 356-28.000.
- Masuda, Kazuaki: See—  
Arashima, Tetsuo; Sugitani, Hiroshi; Masuda, Kazuaki; Ikeda, Masami; Kasamoto, Masami; Suzuki, Seiji; Ishinaga, Hiroyuki; Kawai, Jun; and Kamiyama, Yuji, 5,481,289, Cl. 347-93.000.
- Masuda, Takashi: See—

- Kimura, Shigeo; Ishikura, Yoshiyuki; Kihara, Takashi; and Masuda, Takashi, 5,479,827, Cl. 73-712.000.
- Masuzaki, Hisao; and Sugii, Shinji, to Minnesota Mining and Manufacturing Company. Self-fading color adhesive. 5,480,925, Cl. 524-86.000.
- Mathews, Gregory; Zager, Edward; and Mitra, Sundari, to Intel Corporation. An apparatus for providing a clock signal for a microprocessor at a selectable one of a plurality of frequencies and for dynamically switching between any of said plurality of frequencies. 5,481,697, Cl. 395-550.000.
- Matson, Carl G., to Triangle Engineering. High velocity fan and yoke mounting. 5,480,282, Cl. 415-125.000.
- Matsubara, Toru; and Iwatsuki, Kunihiro, to Toyota Jidosha Kabushiki Kaisha. Apparatus for controlling slip of lock-up clutch on motor vehicle during deceleration of the vehicle. 5,480,363, Cl. 477-63.000.
- Matsubayashi, Kazuhiro, to Canon Kabushiki Kaisha. Numerical expression recognizing apparatus. 5,481,626, Cl. 382-189.000.
- Matsuda, Yutaka; and Shimizu, Kaoru, to Matsushita Electric Industrial Co., Ltd. Roller of variable outer diameter type, and carrying apparatus and method using the same. 5,480,022, Cl. 198-782.000.
- Matsufuji, Takashi: See—  
Setoguchi, Shunichi; Katoh, Haruzo; and Matsufuji, Takashi, 5,480,481, Cl. 106-404.000.
- Matsugase, Hiroshi: See—  
Morioka, Shouji; Matsugase, Hiroshi; Togawa, Katsutake; and Nakagawa, Mitsuru, 5,481,512, Cl. 369-36.000.
- Matsugu, Masakazu; Saitoh, Kenji; Hattori, Jun; and Houryu, Sakae, to Canon Kabushiki Kaisha. Positional deviation detecting method. 5,481,363, Cl. 356-401.000.
- Matsui, Akira; Morita, Yoshinori; Inoue, Hiroyuki; and Inoue, Yoshiaki, to J. Morita Mfg. Corp. Crystallized-glass-made artificial nucleus for pearl, production process of the artificial nucleus, and pearl produced using the artificial nucleus. 5,480,844, Cl. 501-3.000.
- Matsui, Noriyuki: See—  
Nakano, Rikizo; and Matsui, Noriyuki, 5,481,551, Cl. 371-27.000.
- Matsukawa, Tsutomu: See—  
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- Matsumoto, Masakatsu; Watanabe, Nobuko; Mori, Eiko; Kobayashi, Hisako; and Ikawa, Hiroshi, to Fujirebio Inc. Methods of producing carboxylic acid ester derivatives and intermediates for use in the methods. 5,481,009, Cl. 549-375.000.
- Matsumoto, Masami: See—  
Kashiwagi, Kenichi; and Matsumoto, Masami, 5,481,653, Cl. 395-100.000.
- Matsumoto, Taiji; Suda, Atsuhiko; Sumiya, Kenji; and Yamamoto, Yoshinori, to Hitachi Maxell, Ltd. Article having indicia-receiving layer. 5,480,702, Cl. 428-209.000.
- Matsumoto, Tohru: See—  
Ryu, Tadamitsu; Takahara, Toshio; Hirono, Shingo; and Matsumoto, Tohru, 5,481,692, Cl. 395-700.000.
- Matsumoto, Tomotaka; Inoue, Jun; Ichimura, Teruhiko; Murata, Yuji; Watanabe, Junichi; Nagahiro, Yoshio; Hodate, Mari; Oki, Kenichi; and Okabe, Masahiro, to Fujitsu Limited. Method for forming a film and method for manufacturing a thin film transistor. 5,480,818, Cl. 437-40.000.
- Matsunaga, Kunihiro, to Tokico, Ltd. Hydraulic control apparatus of load-response type. 5,480,216, Cl. 303-9.690.
- Matsunaga, Mitsuhito, to NEC Corporation. Television receiver with multiple picture screen at appropriate aspect ratio. 5,481,315, Cl. 348-565.000.
- Matsunaga, Osamu: See—  
Kusano, Keigo; Matsunaga, Osamu; and Hayashida, Naomasa, 5,480,672, Cl. 426-615.000.
- Matsuno, Hiromitsu: See—  
Hiramoto, Tatsumi; Igarashi, Tatsushi; Matsuno, Hiromitsu; Yasuda, Yukio; and Yamaguchi, Akiyasu, 5,481,159, Cl. 313-570.000.
- Matsuo, Kazuhiro; Kitahara, Yoshihiko; Endo, Shinya; and Tagawa, Yoichi, to Canon Kabushiki Kaisha; and Canon Aptex Inc. Laminating apparatus. 5,480,509, Cl. 156-522.000.
- Matsuo, Mitsunori: See—  
Yamashita, Wataru; Okawa, Yuichi; Oikawa, Hideaki; Asanuma, Tadashi; Ishihara, Yuko; Matsuo, Mitsunori; Yamaguchi, Keizaburo; Yamaguchi, Akihiro; and Tamai, Shoji, 5,480,965, Cl. 528-353.000.
- Matsuo, Shuitsu: See—  
Shintani, Yoshitomo; Suganuma, Tetsuya; Matsuo, Shuitsu; Saito, Hajime; Yamaoka, Hidenori; Kurono, Nobuhisa; and Kotaka, Hiroaki, 5,479,873, Cl. 117-75.000.
- Matsuoka, Hirofumi: See—  
Daido, Toshihiko; Nishimoto, Mitsuhiro; and Matsuoka, Hirofumi, 5,480,000, Cl. 180-79.100.
- Matsushima, Hiroshi: See—  
Nagai, Shigekazu; Sugano, Shigeru; Saito, Mitsuhiro; Takebayashi, Takashi; Matsushima, Hiroshi; and Ito, Yoshiharu, 5,481,482, Cl. 364-558.000.
- Matsushima, Ryoichi: See—  
Nishiyama, Soji; Higuchi, Hiroyuki; Matsushita, Kiichiro; and Matsushima, Ryoichi, 5,480,745, Cl. 429-242.000.
- Matsushita Electric Industrial Co., Ltd.: See—  
Aoki, Nobuyuki; Hatanaka, Hideo; Inoue, Kouji; and Ueyama, Yasuhiro, 5,480,732, Cl. 428-694.00B.
- Bannai, Tatsushi; Shibata, Hideaki; Ohtsu, Masamitsu; and Okamoto, Hiroshi, 5,481,412, Cl. 360-18.000.
- Chikahisa, Naohiko; Takahashi, Ken; Naito, Takao; and Sasaki, Takashi, 5,479,854, Cl. 101-123.000.
- Higaki, Nobuo; and Matsuzaki, Toshimichi, 5,481,679, Cl. 395-308.000.
- Higashino, Hidetaka; Mizuno, Koichi; and Setsune, Kentaro, 5,481,119, Cl. 257-34.000.
- Ikeguchi, Yoshinori; and Murata, Hiroshi, 5,481,373, Cl. 358-434.000.
- Juri, Tatsuro; and Nishino, Masakazu, 5,481,309, Cl. 348-405.000.
- Kuratom, Yasunori; and Ogawa, Hisahito, 5,481,621, Cl. 382-204.000.
- Matsuda, Yutaka; and Shimizu, Kaoru, 5,480,022, Cl. 198-782.000.
- Mizuno, Koichi; Higashino, Hidetaka; and Setsune, Kentaro, 5,480,859, Cl. 505-190.000.
- Nakamura, Akihiko; Sakakibara, Yoshio; Gotou, Makoto; and Kobayashi, Kazuhiko, 5,481,641, Cl. 388-800.000.
- Ogino, Hiroyuki, 5,479,939, Cl. 128-782.000.
- Okayama, Hiroshi; and Ishibashi, Kazuhiro, 5,481,422, Cl. 360-120.000.
- Suzuki, Kikoko; Kitagawa, Hidemasa; Endo, Koichi; and Mori, Yoshihiro, 5,481,752, Cl. 395-800.000.
- Udagawa, Masaharu; Yasui, Juro; Niwa, Masaaki; Hirai, Yoshihiko; Okada, Kenji; Morimoto, Kiyoshi; and Yuki, Koichi, 5,480,492, Cl. 134-2.000.
- Yamamoto, Yasutoshi; Yoneyama, Masayuki; and Mori, Tsutomu, 5,481,302, Cl. 348-223.000.
- Yoshida, Yoshikazu, 5,480,533, Cl. 204-298.190.
- Yumiki, Naoto; and Honsho, Hironori, 5,481,361, Cl. 356-375.000.
- Matsushita Electronics Company: See—  
Ueno, Akira; Nakanishi, Hideyuki; Nagai, Hideo; and Yoshikawa, Akio, 5,481,524, Cl. 369-112.000.
- Matsushita, Kiichiro: See—  
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- Matsushita, Tsuyoshi: See—  
Kikuchi, Narumi; Matsushita, Tsuyoshi; and Wada, Yutaka, 5,481,654, Cl. 395-108.000.
- Matsutani, Takashi, to Mitsubishi Denki Kabushiki Kaisha; and Mitsubishi Engineering Company Limited. Data processor having circuitry for high speed clearing of an interrupt vector register corresponding to a selected interrupt request. 5,481,728, Cl. 395-293.000.
- Matsuura, Kazumi: See—  
Okada, Kazuhisa; Matsuura, Kazumi; and Asahi, Nobuo, 5,481,665, Cl. 395-155.000.
- Matsuura, Shizutaka: See—  
Fujimura, Yoshiichi; Yano, Hideaki; and Matsuura, Shizutaka, 5,480,105, Cl. 242-383.200.
- Matsuura, Tei: See—  
Kawasaki, Miyoji; Hirose, Masanori; Suzuki, Toshitsugu; Matsuura, Tei; and Yokoyama, Yoshinada, 5,480,557, Cl. 210-695.000.
- Matsuyama, Kenji: See—  
Morishima, Hajime; Koike, Yutaka; Nakano, Masato; Atsumi, Shugo; Tanaka, Seiichi; and Matsuyama, Kenji, 5,481,036, Cl. 564-162.000.
- Matsuzaki, Toshimichi: See—  
Higaki, Nobuo; and Matsuzaki, Toshimichi, 5,481,679, Cl. 395-308.000.
- Mattel, Inc.: See—  
Barthold, Mark J., 5,480,338, Cl. 446-219.000.
- Bogar, Brett M., 5,480,340, Cl. 446-227.000.
- Caveza, Martin J., 5,480,335, Cl. 446-75.000.
- Matthew, Linda C.: See—  
Bickford, Harry R.; Coteau, Paul W.; and Matthew, Linda C., 5,480,841, Cl. 437-209.000.
- Mathews, Stephen H.: See—  
Peck, Kevin B.; Erickson, Ronald E.; and Mathews, Stephen H., 5,481,088, Cl. 219-390.000.
- Matsushita Electric Industrial Co., Ltd.: See—  
Seri, Hajime; Yamamura, Yasuharu; Tsuji, Yoichi; Owada, Naoko; and Iwaki, Tsutomu, 5,480,740, Cl. 429-59.000.
- Matuura, Kenji: See—  
Yamasaki, Kazuyuki; Hamaguchi, Yoshihiro; Hosoda, Shunji; Sakata, Kazuyuki; Imai, Takashi; Okatani, Shigetoshi; Nishio, Satoshi; Takahashi, Tetsushi; Matuura, Kenji; Tanaka, Noriyuki; Nagayasu, Teruaki; and Makino, Hiroshi, 5,480,537, Cl. 210-96.100.
- Matzner, Bruce, to General Electric Company. Perforated tube debris catcher for a nuclear reactor. 5,481,578, Cl. 376-313.000.
- Mauch, Adrian: See—  
Bergler, Frank; Mauch, Adrian; and Hellenschmidt, Holger, 5,481,598, Cl. 379-94.000.
- Maultasch, Bruce: See—  
Maultasch, Jonathan; and Maultasch, Bruce, 5,480,031, Cl. 206-525.000.
- Maultasch, Jonathan; and Maultasch, Bruce. Combined pizza box lid support and cutter. 5,480,031, Cl. 206-525.000.
- Maus, Wolfgang: See—  
Breuer, Hans-Jürgen; Cyron, Theodor; Maus, Wolfgang; Swars, Helmut; and Wieres, Ludwig, 5,480,621, Cl. 422-174.000.
- Maxwell, G. Patrick: See—  
Carlisle, Daniel A.; and Maxwell, G. Patrick, 5,480,430, Cl. 623-8.000.
- May, Teddy J., to Lane Company, Inc., The. Mechanism for wall-proximity reclining chair. 5,480,209, Cl. 297-85.000.
- May, Timothy J., to Reynolds Consumer Products Inc. Double header package having a tear bead. 5,480,230, Cl. 383-9.000.
- Maybelline, Inc.: See—  
Orr, Carl C.; Caradonna, John; Edmundson, Robert J.; and Jacks, Terry C., 5,480,632, Cl. 424-63.000.



- Mayer, Klaus-Michael, to Robert Bosch GmbH. Method and optical device produced of optical polymer components having integrated vertical coupling structures. 5,481,633, Cl. 385-49.000.
- Mayer, Robert R., Jr.: See—  
Rogers, Lisa W.; Kraft, Thomas L.; Berry, John F.; Kelley, Scott A.; Thompson, John A., III; Ober, Clifford D.; Kuchar, Michael C.; Mayer, Robert R., Jr.; Hoskins, Van W.; Weido, Vincent C.; and Henckel, Mark G., 5,480,062, Cl. 221-174.000.
- Maynard, Patrick L.: See—  
Patterson, Robert; Geddes, Daniel J.; Hollenberg, David H.; and Maynard, Patrick L., 5,480,693, Cl. 428-36.700.
- Mayo, Randall D.: See—  
Bolash, John P.; Breswick, Curt P.; Eade, Thomas J.; Lane, David K.; Mayo, Randall D.; and Waldrop, David S., 5,480,240, Cl. 400-124.010.
- Maze, Gwendael; Poulain, Marcel; Carre, Jean-Yves; Soufiane, Abdelouhed; and Messaddeq, Younes, to Le Verre Fluore SA. Fluorinated glasses. 5,480,845, Cl. 501-40.000.
- Mazer, Terrence B.: See—  
Cope, Frederick O.; Richards, Ernest W.; Mazer, Terrence B.; Abbruzzese, Bonnie C.; Snowden, Gregory A.; and Chandler, Michael A., 5,480,872, Cl. 514-21.000.
- Mazess, Richard B., to Lunar Corporation. Radiographic phantom for vertebral morphometry. 5,481,587, Cl. 378-207.000.
- Mazess, Richard B.: See—  
Bisek, Joseph P.; Hanson, James A.; and Mazess, Richard B., 5,480,439, Cl. 623-16.000.
- Mazur, Richard A.; Watts, Gary; Bateman, Donald E.; and Crawford, Robert J., to Cummins-Allison Corp. Coin handling system with controlled coin discharge. 5,480,348, Cl. 453-10.000.
- MBT Corporation: See—  
Morgan, Robert K., 5,480,278, Cl. 414-790.300.
- McAneney, T. Brian: See—  
Mahabadi, Hadi K.; Agur, Enno E.; McAneney, T. Brian; Kao, Sheau V.; Allison, Gerald R.; Hawkins, Michael S.; Hollenbaugh, William H., Jr.; Jacobs, Robert M.; and Chow, Che C., 5,480,756, Cl. 430-109.000.
- McArthur, Bruce B.: See—  
Smith, Adlai H.; Hunter, Robert O., Jr.; and McArthur, Bruce B., 5,481,407, Cl. 359-742.000.
- McCabe, Thomas J. Circular internal combustion engine. 5,479,780, Cl. 60-624.000.
- McCandish, Elizabeth F.: See—  
Jakubicki, Gary; and McCandish, Elizabeth F., 5,480,586, Cl. 252-545.000.
- McCartner, Walter K.; and Fischer, Jorgen T., to ACR Electronics, Inc. Bipolar compression cell for a water-activated battery. 5,480,743, Cl. 429-96.000.
- McCarthy, Robert E., to University of Nebraska, The Board of Regents of the . Synthetic immunoregulators, and methods of use and preparation. 5,480,642, Cl. 424-278.100.
- McChesney, James D.: See—  
ElSohly, Hala N.; Croom, Edward M., Jr.; ElSohly, Mahmoud A.; and McChesney, James D., 5,480,639, Cl. 424-195.100.
- McClain, David R.; and Shattuck, Ewart H., to American Laundry Machinery, Inc. Apparatus for treating cellulosic fiber-containing fabric to improve durable press and shrinkage resistance. 5,480,485, Cl. 118-64.000.
- McClean, Stephen J.; and Yallop, Richard W., to Breville Pty Ltd. Fruit and vegetable juicer. 5,479,851, Cl. 99-512.000.
- McClure, John R.; and Schlottbeck, Steven C., to New Holland North America, Inc. Trash baffle for round baler. 5,479,767, Cl. 56-343.000.
- McClure, Kelly H.: See—  
Mouchawar, Gabriel; McClure, Kelly H.; and Moberg, Sheldon B., 5,480,412, Cl. 607-6.000.
- McComb, Russell K., Jr.: See—  
Alexander, James M.; and McComb, Russell K., Jr., 5,481,247, Cl. 340-578.000.
- McCombs, David E.; Dougald, Colin D.; and Rapp, Martin L., to Monsanto Enviro-Chem Systems, Inc. Apparatus for treating waste water oxidation ponds to abate malodors. 5,480,538, Cl. 210-151.000.
- McCoomb, Edward J.; Rosfjord, Thomas J.; Ross, Michael P.; Snyder, Timothy S.; and Lozyniak, Steven A., to United Technologies Corporation. Tangential air entry fuel nozzle. 5,479,773, Cl. 60-39.320.
- McEachern, Alexander, to Basic Measuring Instruments, Inc. Method and apparatus for storing an increasing number of sequential real-time samples in a fixed amount of memory. 5,481,468, Cl. 364-481.000.
- McElroy, James F.: See—  
Shane, Eric M.; and McElroy, James F., 5,480,518, Cl. 204-129.000.
- McEvoy, Thomas J.: See—  
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- McFadden, William C.: See—  
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- McFarland, Michael J.: See—  
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- McGarry, Frederick M.: See—  
James, Susan P.; Karydas, Daphne; McGarry, Frederick M.; and Harris, William H., 5,480,450, Cl. 623-23.000.
- McGhan Medical Corporation: See—  
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- McGill University: See—  
Salin, Eric D.; and Légre, Jean-Guy J., 5,480,809, Cl. 436-173.000.
- McGovern, Joseph P.: See—  
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- McGovern, Richard: See—  
Furr, Michael G.; Kava, Joseph; Blackburn, Greg; and McGovern, Richard, 5,480,052, Cl. 216-71.000.
- McGrath, Michael C.: See—  
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- McGuire Furniture Company, The: See—  
Shepard, Randall B.; and Hannum, Richard C., 5,480,689, Cl. 428-15.000.
- McHardy, John; Townsend, Carl W.; and Megerle, Clifford A., to Hughes Aircraft Company. Real-time toxic metals monitor device and method. 5,481,181, Cl. 324-71.100.
- McHugh, Kevin P.: See—  
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- McJunkin, James R.: See—  
Nachlas, Jesse A.; Powers, Kelly B.; and McJunkin, James R., 5,479,700, Cl. 29-825.000.
- McKaskle, Greg; and Kodosky, Jeffrey L., to National Instruments Corporation. Method and apparatus for providing attribute nodes in a graphical data flow environment. 5,481,741, Cl. 395-800.000.
- McKee, Timothy P.: See—  
Bieniek, Cynthia L.; Hunter, Ross A.; McKee, Timothy P.; and Schroeder, David H., 5,481,667, Cl. 395-161.000.
- McLean, Stan: See—  
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- McLoughlin, Kathleen A.: See—  
Gallo, Paul S.; Goodman, R. W. Benjamin; Krantz, Lawrence L.; McLoughlin, Kathleen A.; and Wagner, Eric M., 5,481,681, Cl. 395-325.000.
- McMaster University: See—  
Huang, Leaf; Epand, Richard M.; and Bottega, Remo, 5,480,817, Cl. 424-450.000.
- McMichael, Andre J.; Nixon, Douglas F.; Townsend, Alain R. M.; and Gotch, Frances M., to United Biomedical, Inc. HIV-1 core protein fragments. 5,480,967, Cl. 530-326.000.
- McMurry, Gary D. Winged practice ball. 5,480,143, Cl. 273-58.00R.
- McNeil, Michael, to Applied Magnetics Corporation. Method of making combination read/write magnetic head. 5,479,696, Cl. 29-603.000.
- McPherson, Robert F., Jr.: See—  
Gorlich, Michael P.; and McPherson, Robert F., Jr., 5,479,759, Cl. 53-432.000.
- McSherry, David D.: See—  
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- McWha, Keith; Talboys, Nigel; Gregg, Joseph J.; and Antoshkiw, William T., to Becton, Dickinson and Company. Method and apparatus for adjusting the length of a combined spinal-epidural needle. 5,480,389, Cl. 604-165.000.
- MDT Corporation: See—  
Rotolo, Robert H.; Swenson, Charles B.; and Fine, Dale R., 5,480,623, Cl. 422-295.000.
- Mead Corporation, The: See—  
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- Meadows, David L., to Allergan, Inc. Nonaqueous thixotropic drug delivery suspensions and methods of their use. 5,480,914, Cl. 514-743.000.
- Med-Pro Design, Inc.: See—  
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- Medairy, Wilbur L.: See—  
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- Medico Development Investment Company: See—  
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- MedLogic Global Corporation: See—  
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- Mednext Inc.: See—  
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- Medtronic, Inc.: See—  
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- Otten, Lynn M., 5,480,421, Cl. 607-122.000.
- Stroebel, John C.; and Markowitz, H. Toby, 5,480,414, Cl. 607-28.000.
- Mefferd, Thomas A.: See—  
Carter, Steven B.; and Mefferd, Thomas A., 5,479,787, Cl. 62-231.000.
- Mefferd, Peter: See—  
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- Mega, Izumi: See—  
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- Megerle, Clifford A.: See—  
McHardy, John; Townsend, Carl W.; and Megerle, Clifford A., 5,481,181, Cl. 324-71.100.

- Megiddo, Nimrod, to International Business Machines Corporation. Method and apparatus for displaying a line passing through a plurality of boxes. 5,481,658, Cl. 395-119.000.
- Mehal, Edward W.: See—  
Johnson, Ralph H.; and Mehal, Edward W., 5,481,123, Cl. 257-102.000.
- Mehlkopf, Antoon F.; and Ham, Cornelis L. G., to U.S. Philips Corporation. Magnetic resonance apparatus with noise cancellation. 5,481,192, Cl. 324-318.000.
- Mehring, Gisbert: See—  
Höfken, Erich; Krüger, Dieter; Mehring, Gisbert; and Pietzko, Günter, 5,479,982, Cl. 164-454.000.
- Meier, Reinhold: See—  
Richter, Karl-Hermann; Meier, Reinhold; Schmitt, Thilo; and Stimpert, Bernd, 5,479,704, Cl. 29-889.100.
- Meinig, Uwe: See—  
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- Meiwes, Johannes: See—  
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- Melhorn, Nathan R.: See—  
Pearson, Gregory; Melhorn, Nathan R.; Onarato, Michael F.; and Richards, Craig A., 5,481,562, Cl. 375-222.000.
- Melman, Steven A. Ear and skin cleanser. 5,480,658, Cl. 424-659.000.
- Melvin, Terence: See—  
Molitor, Robert P.; and Melvin, Terence, 5,480,155, Cl. 273-220.000.
- Mendelson, Richard N.: See—  
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- Mendes-Viegas, Maria-Fátima: See—  
Vieil, Eric; Bidan, Gérard; Gadelle, Andrée; and Mendes-Viegas, Maria-Fátima, 5,480,924, Cl. 524-48.000.
- Menegoli, Fabio, to ISCOM S.r.l. Planar roofing made of folded metal sheets. 5,479,752, Cl. 52-549.000.
- Mercedes-Benz AG: See—  
Baumann, Matthias; and Fischle, Gerhard, 5,479,811, Cl. 73-2.000.
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- Miller, Terry L. Child's carousel. 5,480,355, Cl. 472-29.000.
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- Blackwell, John A.; Chen, Daniel T.; Albend, Todd D.; and Perman, Craig A., 5,481,058, Cl. 585-833.000.
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- Minor, Randolph J. See—  
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- Minowa, Hirofumi; Ishii, Shinichi; Yanase, Takao; and Yamazoe, Masaru, to Fuji Electric Co., Ltd. Circuit for controlling power converting apparatus. 5,481,172, Cl. 318-800.000.
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- Miser, Hank T.; Pippert, Frederick B.; and Rogers, John T., to Utex Industries, Inc. Lip seal with reinforced backup. 5,480,163, Cl. 277-188.00A.
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- Mitchell, Albert W. See—  
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- Mitchell, Douglas G. See—  
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- Mitchell, J. Howell, Jr. See—  
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- Mitchell, Kathy P. See—  
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- Mitel Corporation. See—  
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- Mitra, Sundari. See—  
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- Mitre Corporation, The. See—  
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- Mitsubishi Chemical Corporation. See—  
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- Azekawa, Yoshifumi, 5,481,682, Cl. 395-375.000.
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- Kamon, Kazuya, 5,481,624, Cl. 382-144.000.
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- Kumaki, Satoshi; and Ishihara, Kazuya, 5,481,726, Cl. 395-200.010.
- Maruyama, Kazuhiro; Inoue, Masahiro; Kushi, Noriyuki; and Iwat-subo, Rieko, 5,481,140, Cl. 307-11.000.
- Matsutani, Takashi, 5,481,728, Cl. 395-293.000.
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- Mitsui, Katsuyoshi, 5,480,838, Cl. 437-203.000.
- Miyake, Takashi; and Abe, Nobusuke, 5,481,753, Cl. 395-823.000.
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- Takahashi, Chie, 5,481,157, Cl. 313-409.000.
- Tatsumi, Takashi, 5,481,745, Cl. 395-800.000.
- Togo, Ichiro, 5,479,697, Cl. 29-606.000.
- Uga, Kimiharu; Honda, Hiroki; Ishida, Masahiro; and Ishigaki, Yoshiyuki, 5,480,816, Cl. 437-31.000.
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- Yamamoto, Yousuke, 5,481,082, Cl. 219-121.630.
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- Yokoyama, Eiji; and Nagasawa, Masato, 5,481,417, Cl. 360-73.080.
- Yoshida, Toyohiko, 5,481,734, Cl. 395-775.000.
- Yoshihisa, Yasuki; and Ikegami, Masaaki, 5,481,130, Cl. 257-512.000.
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- Mitsubishi Engineering Company Limited. See—  
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- Mitsubishi Gas Chemical Company, Inc. See—  
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- Mitsubishi Jidosha Kogyo Kabushiki Kaisha. See—  
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- Miyamoto, Katsuhiko; Iida, Kazumasa; Kishimoto, Mitsuru; and Hosono, Kiyotaka, 5,481,461, Cl. 364-431.010.
- Morita, Takao; Matsukawa, Tsutomu; Yasunaga, Hiromichi; Tanaka, Tadao; Togashi, Akihiko; Taniguchi, Yasutaka; and Tani, Masanori, 5,480,221, Cl. 303-113.500.
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- Satake, Tokuki; Miyamoto, Hitoshi; Watanabe, Kiyoshi; Nanjo, Fusayuki; and Takenobu, Koichi, 5,480,737, Cl. 429-30.000.
- Mitsubishi Materials Corporation. See—  
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- Mitsubishi Rayon Company Ltd. See—  
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- Mitsubishi Rayon Co., Ltd. See—  
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- Mitsui Kouzan Kabushiki Kaisha. See—  
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- Mitsui Petrochemical Industries, Ltd. See—  
Shigemoto, Hiromi; and Noritomi, Katsumi, 5,480,718, Cl. 428-342.000.
- Yoshihara, Yukio, 5,480,937, Cl. 525-66.000.
- Mitsui Toatsu Chemicals, Inc. See—  
Oishi, Tetsuya; Ozawa, Hiroshi; Karasawa, Minato; Inomata, Masamitsu; Mega, Izumi; Yamauchi, Atsuyoshi; Kamada, Kazunori; Nakahata, Shigeru; Sakamoto, Katsumi; Nakashima, Tatsunobu; Watanabe, Akito; Suzuki, Jin; Ohkawa, Kouhei; Furusawa, Satoshi; Ono, Hiroshi; and Sugazaki, Kazuo, 5,480,947, Cl. 525-509.000.
- Yamashita, Wataru; Okawa, Yuichi; Oikawa, Hideaki; Asanuma, Tadashi; Ishihara, Yuko; Matsuo, Mitsunori; Yamaguchi, Keizaburo; Yamaguchi, Akihiro; and Tamai, Shoji, 5,480,965, Cl. 528-353.000.
- Mitsui, Yasuhiro. See—  
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- Mitsumi Electric Co., Ltd. See—  
Konno, Makoto; Komatsu, Hisateru; and Watanabe, Takashi, 5,481,421, Cl. 360-106.000.
- Sampei, Hiroshi; and Sato, Masashi, 5,481,425, Cl. 360-126.000.
- Mitsumori, Kenichi; Kasama, Yasuhiko; Nakano, Akira; Abe, Akira; and Ohmi, Tadahi, to Frontec Incorporated. Method for removing electrostatic charge from high resistivity liquid. 5,480,563, Cl. 210-748.000.
- Mitsuya, Yoshihide. See—  
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- Miura, Hiroshi. See—  
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- Miura, Shoji; Sugisaka, Takayuki; Komura, Atsushi; and Sakakibara, Toshio, to Nippondenso Co., Ltd. Method for fabrication of semiconductor device. 5,480,832, Cl. 437-67.000.
- Miyabe, Satoru; Toyama, Akira; and Takeda, Minoru, to Nippon Precision Circuits Inc. Sampling rate converter. 5,481,267, Cl. 341-61.000.
- Miyagawa, Shigenori; Kobayashi, Koichi; Kunii, Shimpei; Kamio, Shizuo; Sakamoto, Hiroyuki; Sato, Fumitaka; and Ishiura, Ryoichi, to Kabushiki Kaisha Toshiba. Portable computer having keyboard and coordinate input tablet hingedly connected to a main body case through a groove. 5,481,430, Cl. 361-681.000.
- Miyaji, Hiroshi. See—  
Urano, Teruo; Miyaji, Hiroshi; Ogura, Masatsune; Shimoda, Tetsuya; and Ishikawa, Katuaki, 5,480,584, Cl. 252-384.000.
- Miyake, Takashi; and Abe, Nobusuke, to Mitsubishi Denki Kabushiki Kaisha. I/O device having identification register and data register where identification register indicates output from the data register to be an identifier or normal data. 5,481,753, Cl. 395-823.000.
- Miyama, Mikako. See—  
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- Miyamoto, Hiroshi. See—  
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- Miyamoto, Hitoshi. See—  
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- Miyamoto, Katsuhiko; Iida, Kazumasa; Kishimoto, Mitsuru; and Hosono, Kiyotaka, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Automotive vehicle engine with cylinder suspending mechanism for switching between a partial-cylinder non-working mode and an all-cylinder working mode depending on running conditions of the engine. 5,481,461, Cl. 364-431.010.
- Miyamoto, Shinichi. See—  
Arima, Yuusuke; Miyamoto, Shinichi; and Sahira, Kensho, 5,480,438, Cl. 623-16.000.
- Miyano, Masateru. See—  
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- Miyata, Masahiro. See—  
Ezawa, Hirokazu; and Miyata, Masahiro, 5,480,839, Cl. 437-209.000.
- Miyata, Shigeo, to Kabushiki Kaisha Kaisui Kagaku Kenkyujo. Flame-retardant resin composition. 5,480,929, Cl. 524-413.000.
- Miyauchi, Tatsuo. See—  
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- Miyayama, Yoshiyuki. See—  
Nguyen, Le T.; Lentz, Derek J.; Miyayama, Yoshiyuki; Garg, Sanjiv; Hagiwara, Yasuaki; Wang, Johannes; and Trang, Quang, 5,481,685, Cl. 395-375.000.
- Miyaza, Masao. See—  
Eto, Koichi; Miyaza, Masao; Ohnishi, Kazuyuki; and Tamagaki, Akira, 5,481,375, Cl. 358-450.000.
- Miyazaki, Taizou. See—  
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- Miyoshi, Seiji. See—  
Kakuishi, Mitsuo; Awata, Yutaka; Ueno, Norio; Miyoshi, Seiji; Murakami, Norio; and Manabe, Atsushi, 5,481,564, Cl. 375-230.000.
- Mizude, Kazuhiro. See—  
Ishida, Hideki; Mizude, Kazuhiro; Kato, Hisahiro; and Tsutano, Tomohiro, 5,481,345, Cl. 355-273.000.
- Mizuno, Koichi; Higashino, Hidetaka; and Setsume, Kentaro, to Matsushita Electric Industrial Co., Ltd. Bi-Sr-Ca-Cu-O superconductor junction through a Bi-Sr-Cu-O barrier layer. 5,480,859, Cl. 505-190.000.
- Mizuno, Koichi. See—  
Higashino, Hidetaka; Mizuno, Koichi; and Setsume, Kentaro, 5,481,119, Cl. 257-34.000.
- Mizuno, Masaaki. See—  
Ueda, Chiga; Yoshida, Hidemi; and Mizuno, Masaaki, 5,481,530, Cl. 369-275.100.
- Mizutani, Fujio. See—  
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- Mizutani, Takao, to Mitsubishi Denki Kabushiki Kaisha. Method and apparatus for detecting the movement of an object with a micro machine that responds to a change in magnetic flux associated with the object. 5,481,188, Cl. 324-207.250.
- Moberg, Sheldon B. See—  
Mouchawar, Gabriel; McClure, Kelly H.; and Moberg, Sheldon B., 5,480,412, Cl. 607-6.000.
- Mobil Oil Corporation. See—  
Bell, Weldon K.; Huang, Tracy J.; Lago, Rudolph M.; Tsao, Ying-Yen P.; and Whitehurst, D. Duayne, 5,481,057, Cl. 585-722.000.
- Mochizuki, Kazuhiro; Mishima, Tomoyoshi; Nakamura, Tooru; Masuda, Hiroshi; Tanoue, Tomonori; Haga, Tooru; and Fujisaki, Yoshihisa, to Hitachi, Ltd. Semiconductor device and its fabrication method. 5,481,120, Cl. 257-49.000.



Mochizuki, Kohei: See—  
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Mochizuki, Tuyoshi: See—  
Suzuki, Masayasu; Mochizuki, Tuyoshi; and Kawashima, Hiroshi, 5,480,685, Cl. 427-548.000.

Mock, Robert W., Jr.: See—  
Anderson, Jerry M.; Lampert, Norman R.; and Mock, Robert W., Jr., 5,481,634, Cl. 385-76.000.

Modi, Jashawant J.: See—  
Angerer, John D.; Modi, Jashawant J.; and Szafranski, Robert C., 5,480,984, Cl. 536-88.000.

Moeller, Raymond J., Jr.: See—  
Jackson, Michael L.; Abbate, Robert J.; Sopcich, Nicholas J.; Moeller, Raymond J., Jr.; Hodapp, Mark; and Palagi, Greg, 5,480,939, Cl. 525-120.000.

Moerkke, Peter: See—  
Roth, Michael; Schneider, Karl; Liebich, Ernst; Dirmeyer, Josef; Wagner, Egbert; and Moerkke, Peter, 5,480,328, Cl. 439-607.000.

Mogren, Lars-Ove: See—  
Eriksson, Stig; Mogren, Lars-Ove; and Moritz, Bertil, 5,481,429, Cl. 361-678.000.

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Moisesescu, Gheorghe V.: See—  
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Moldavsky, Boris, to Grumman Aerospace Corporation, Monitored environment container, 5,481,245, Cl. 340-540.000.

Molex Incorporated: See—  
Banakis, Emanuel G.; Brinkman, Donald J.; Janota, Kenneth F.; and Lang, Harold K., 5,481,434, Cl. 361-756.000.

Molina, Luca; Crisci, Robert E.; and Crisci, Harry E., to Portola Packaging, Inc. Neck finish for a container and a matching registering multiple thread pattern in a flexible cap for engagement on said neck finish, 5,480,045, Cl. 215-256.000.

Molins PLC: See—  
Dyett, Derek H., 5,479,947, Cl. 131-37.000.

Molitor, Robert P.; and Melvin, Terence, to Lisco, Inc. Golf ball, 5,480,155, Cl. 273-220.000.

Moll, John: See—  
Chiang, Shang-Yi; and Moll, John, 5,480,811, Cl. 437-3.000.

Moller, Thomas: See—  
Lindner, Bernd; Pupic, Nikola; Schild, Helmut; Seib, Berthold; and Moller, Thomas, 5,479,859, Cl. 101-485.000.

Molnar, John A.: See—  
Grimm, Robert A.; Wine, Wanda F.; and Molnar, John A., 5,481,091, Cl. 219-633.000.

Molnar, Steven E.: See—  
Poulton, John W.; Molnar, Steven E.; and Eyles, John G., 5,481,669, Cl. 395-164.000.

Momber, Gregory J., to Robertshaw Controls Company, Control system for a water softener, control device therefor and methods of making the same, 5,480,555, Cl. 210-662.000.

Momyama, Masayoshi: See—  
Fujita, Satoshi; Kagiya, Naoto; Momyama, Masayoshi; and Kondo, Yasumitsu, 5,480,791, Cl. 435-196.000.

Monahan, Joseph J., Planter box, 5,479,742, Cl. 47-66.000.

Moniere, Henri: See—  
Servavalli, Alessandro; and Moniere, Henri, 5,481,246, Cl. 340-550.000.

Monnier, Vincent M.; and Sell, David R., to Case Western Reserve University, Process for assessing the biological age of a tissue, 5,480,807, Cl. 436-86.000.

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McCombs, David E.; Dougald, Colin D.; and Rapp, Martin L., 5,480,538, Cl. 210-151.000.

Montag, Bruce C.; Wenzel, Dennis J.; and Weyrauch, Richard P., to Southwest Research Institute, Weather simulation system, 5,480,305, Cl. 434-2.000.

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Echols, Joseph A.; Kimbrel, Jean D.; and Montz, Sandra L., 5,480,193, Cl. 285-45.000.

Moody, John F.: See—  
Tomasia, Mark J.; Dix, Gregory F.; and Moody, John P., 5,480,588, Cl. 261-72.100.

Mooradian, Mark, to Thermoscan, Inc. IR thermometer, 5,479,931, Cl. 128-664.000.

Moore Business Forms, Inc.: See—  
Kalisiak, Michael S., 5,480,033, Cl. 209-584.000.

Moore, David: See—  
Barney, Michael; Holmes, Terry J.; Moore, David; and Wass, Anthony C., 5,480,069, Cl. 222-401.000.

Moore, Walter A.: See—  
Lowe, William G.; Rink, Linda M.; Moore, Walter A.; and Smith, Bradley W., 5,480,185, Cl. 280-740.000.

Moos, Walter H.: See—  
Spellmeyer, David C.; Moos, Walter H.; Martin, Eric J.; Zuckermann, Ronald N.; and Stauber, Gregory, 5,480,871, Cl. 514-18.000.

Morales, Alvaro; and Wilson, James W. L., to Schering Corporation, Alpha interferon for treating prostate cancer, 5,480,640, Cl. 424-85.700.

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Morduch, Georg E., to Microlog Corporation, Detection of TDD signals in an automated telephone system, 5,481,589, Cl. 379-97.000.

Moreau, Jean-Michel, to SGS-Thomson Microelectronics S.A. Transistor with a predetermined current gain in a bipolar integrated circuit, 5,481,132, Cl. 257-566.000.

Moreira, Julio C., to Whirlpool Corporation, Motor control for brushless permanent magnet using only three wires, 5,481,166, Cl. 318-254.000.

Moretti, Jean P.: See—  
Pore, Jean; Cuccodoro, Sergio; Moretti, Jean P.; and Rouet, Patrice, 5,480,456, Cl. 8-94.180.

Morgan, DeCarla J.: See—  
Beachy, Shawn A.; Kean, William W.; Morgan, DeCarla J.; and Okafor, Ani A., 5,481,534, Cl. 370-60.000.

Morgan, Edward L.; Ember, Julia A.; and Hugli, Tony E., to Scripps Research Institute, The . Antibodies to human C5a receptor, 5,480,974, Cl. 530-387.900.

Morgan, Robert K., to MBT Corporation, Automatic stacker apparatus and method, 5,480,278, Cl. 414-790.300.

Mori, Eiko: See—  
Matsumoto, Masakatsu; Watanabe, Nobuko; Mori, Eiko; Kobayashi, Hisako; and Ikawa, Hiroshi, 5,481,009, Cl. 549-375.000.

Mori, Kaoru: See—  
Takematsu, Tetsuo; Kume, Takashi; Yamaoka, Shoji; Komata, Takeo; Suzuki, Kiyoshi; Ikeda, Yukio; Kawamura, Matsue; Koda, Yumiko; and Mori, Kaoru, 5,481,022, Cl. 560-45.000.

Mori, Mitsuhiro: See—  
Takahashi, Fumiharu; Naito, Yutaka; Mori, Mitsuhiro; and Nishimura, Sadaki, 5,481,056, Cl. 585-512.000.

Mori, Takahiro: See—  
Sasaki, Kunitsuma; Goto, Narito; Takeda, Katsuyuki; Sekiguchi, Nobuyuki; Takahashi, Hideki; Isobe, Ryosuki; and Mori, Takahiro, 5,480,713, Cl. 428-323.000.

Mori, Tsutomu: See—  
Yamamoto, Yasutoshi; Yoneyama, Masayuki; and Mori, Tsutomu, 5,481,302, Cl. 348-223.000.

Mori, Yoshihiro: See—  
Suzuki, Kiyoko; Kitagawa, Hidemasa; Endo, Koichiro; and Mori, Yoshihiro, 5,481,752, Cl. 395-800.000.

Moribayashi, Satoshi; Izozumi, Shuzou; and Goto, Takeo, to Mitsubishi Denki Kabushiki Kaisha, Permanent magnet type rotating machine, 5,481,148, Cl. 310-154.000.

Morici, Martin M.: See—  
Imhoff, Scott A.; Woolfson, Martin G.; Bendor, Giora A.; Cheesman, Guy W., III; Brinsley, James R.; and Morici, Martin M., 5,481,269, Cl. 342-90.000.

Morimoto, Kiyoshi: See—  
Udagawa, Masaharu; Yasui, Juro; Niwa, Masaaki; Hirai, Yoshihiko; Okada, Kenji; Morimoto, Kiyoshi; and Yuki, Koichiro, 5,480,492, Cl. 134-2.000.

Morimoto, Takeshi: See—  
Tomonaga, Hiroyuki; Morimoto, Takeshi; and Hiratsuka, Kazuya, 5,480,722, Cl. 428-428.000.

Morimoto, Yoshinari, to Brother Kogyo Kabushiki Kaisha, Tape printing apparatus, 5,480,246, Cl. 400-615.200.

Morimoto, Yousuke; Hataura, Kiyoshi; and Kamata, Yasukazu, to Kubota Corporation, Divided chamber type diesel engine, 5,479,888, Cl. 123-262.000.

Morinaga, Hidehiko, to Canon Kabushiki Kaisha, Character generator, 5,481,277, Cl. 345-143.000.

Morinaga, Shigeki: See—  
Masaki, Ryoso; Morinaga, Shigeki; Tahara, Kazuo; Yamamura, Hirohisa; Kajiura, Kenzo; Yamada, Hiroyuki; Inoue, Nobuo; and Suzuki, Toshio, 5,481,460, Cl. 364-424.070.

Morioka, Shouji; Matsugase, Hiroshi; Togawa, Katsutake; and Nakagawa, Mitsuru, to Victor Company of Japan, Ltd., Separable magazine for accommodating discs and a disc player, 5,481,512, Cl. 369-36.000.

Morishima, Hajime; Koike, Yutaka; Nakano, Masato; Atsuumi, Shugo; Tanaka, Seiichi; and Matsuyama, Kenji, to Banyu Pharmaceutical Co., Ltd., N-acetylamino acid derivatives and their use, 5,481,036, Cl. 564-162.000.

Morishima, Hideki; and Taniguchi, Naosato, to Canon Kabushiki Kaisha, Color image reader, 5,481,383, Cl. 359-15.000.

Morita, Shigeru; Ishida, Hiroshi; and Hirano, Isao, to Nippon Flute Company, Ltd. Box forming equipment, 5,480,371, Cl. 493-117.000.

Morita, Takao; Matsukawa, Tsutomu; Yasunaga, Hiromichi; Tanaka, Tadao; Togashi, Akihiko; Taniguchi, Yasutaka; and Tani, Masanori, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Rear wheel braking force control method and an apparatus therefor, 5,480,221, Cl. 303-113.500.

Morita, Yoshinori: See—  
Matsui, Akira; Morita, Yoshinori; Inoue, Hiroyuki; and Inoue, Yoshiaki, 5,480,844, Cl. 501-3.000.

Moritz, Bertil: See—  
Eriksson, Stig; Mogren, Lars-Ove; and Moritz, Bertil, 5,481,429, Cl. 361-678.000.

Moriwaki, Bert S.: See—  
Naglestad, Mark B.; Bohac, Frank J., Jr.; Aralis, James M.; Moriwaki, Bert S.; Calabretta, Frank J.; and Troutman, Bruce L., 5,481,471, Cl. 364-489.000.

Morooka, Yoshikazu: See—  
Kobayashi, Toshifumi; Morooka, Yoshikazu; Yamada, Michihiro; and Hamamoto, Takeshi, 5,481,496, Cl. 365-189.050.

Yamauchi, Tadaaki; Miyamoto, Hiroshi; Morooka, Yoshikazu; Furutani, Kiyohiro; and Aoki, Makiko, 5,481,497, Cl. 365-189.050.

Morrison, Denby G.: See—  
Marshall, Peter W.; Huete, David A.; Morrison, Denby G.; and Smolinski, Susan L., 5,480,265, Cl. 405-224.000.

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Morrow, Clifford E.; Gregory, Otto; Bhardwaj, Poonam; and Gu, Gong-En, to Surgilase, Inc. Monolithic hollow waveguide method, 5,480,050, Cl. 216-24.000.

Mörsen, Ewald: See—  
Bittner, Hans J.; Klein, Hans-Jürgen; Küpper, Thomas; and Mörsen, Ewald, 5,480,488, Cl. 118-667.000.

Morshedi, A. M.; Stevenson, Thomas E.; and Scott, David E., to Dynamic Optimization Technology Products, Inc. Process for machine generation of a control process program, 5,481,716, Cl. 395-700.000.

Mortensen, Craig; Roots, Logan; and Strelau, Klaus, to Apple Computer, Inc. Method for modifying packets that meet a particular criteria as the packets pass between two layers in a network, 5,481,735, Cl. 395-200.100.

Morton International, Inc.: See—  
Lauritzen, Donald R.; and Smith, Bradley W., 5,480,182, Cl. 280-728.200.

Lowe, William G.; Rink, Linda M.; Moore, Walter A.; and Smith, Bradley W., 5,480,185, Cl. 280-740.000.

Richart, Douglas S., 5,480,726, Cl. 428-482.000.

Ward, Michael J.; Fredin, Steven R.; and Gans, Russell S., 5,480,183, Cl. 280-728.200.

Moser, Friedrich, to Voest-Alpine Industrieanlagenbau GmbH, Coiler furnace for a hot strip, 5,479,807, Cl. 72-202.000.

Moser, Heinz: See—  
Grunde, Hans; and Moser, Heinz, 5,480,451, Cl. 623-23.000.

Mosgrove, Ronald: See—  
Jayakumar, Muthurajan; Mosgrove, Ronald; and Bynum, Hugh, 5,481,725, Cl. 395-725.000.

Mosher, Deane F., Jr.; and Checovich, William J., to Wisconsin Alumni Research Foundation, Use of lysophosphatidic acids to enhance fibronectin binding, 5,480,877, Cl. 514-134.000.

Mosher, Douglas E.: See—  
Poscich, Douglas W.; and Mosher, Douglas E., 5,480,252, Cl. 403-371.000.

Motev, Phil; and Kitaygorodskiy, Simon, to A.W.T. World Trade, Inc. Adjustable sheet take-off mechanism for a screen printing press, 5,480,133, Cl. 271-85.000.

Motohashi, Shozo; Fujimoto, Katsumi; Nishiyama, Hiroshi; Heinouchi, Yoshiaki; Yoshitani, Kazuhiro; and Sakashita, Yukio, to Murata Manufacturing Co., Ltd. Casing for a vibratory gyroscope, 5,479,822, Cl. 73-504.140.

Motoi, Taiko: See—  
Yamamoto, Keisuke; Kishi, Fumio; Motoi, Taiko; Kawasaki, Takehiko; and Kaneko, Nono, 5,481,491, Cl. 365-148.000.

Motomura, Yoshitada; Tawara, Hiroshi; Tsukuta, Kenji; and Iikubo, Tomohito, to Daido Tokushuko Kabushiki Kaisha, High-temperature gas blower impeller with vanes made of dispersion-strengthened alloy, gas blower using such impeller, and gas circulating furnace equipped with such gas blower, 5,480,299, Cl. 432-176.000.

Motorola, Inc.: See—  
Abrokwh, Jonathan K.; Huang, Jenn-Hwa; and Ooms, William J., 5,480,829, Cl. 437-57.000.

Bai, Lijun, 5,480,744, Cl. 429-218.000.

Bane, Ronald L., 5,481,259, Cl. 340-870.030.

Carney, Francis J.; Carney, George P.; and Mitchell, Douglas G., 5,480,835, Cl. 437-189.000.

Connell, Lawrence E.; Collins, Timothy J.; Keller, Anthony F.; Marvin, Dennis F.; and Bushman, Michael L., 5,481,229, Cl. 331-158.000.

Dydyk, Michael; and Lindberg, Craig E., 5,481,231, Cl. 333-112.000.

Gareh, Oded; Geller, Haim; and Cohen, Yitzhak, 5,481,541, Cl. 370-85.200.

Herold, Barry W., 5,481,651, Cl. 345-94.000.

Lomp, Martin G.; and Hardaker, Philip R., 5,481,696, Cl. 395-500.000.

Martin, Lara J.; and Garrett, Scott M., 5,481,174, Cl. 320-14.000.

Parkes, John J., Jr., 5,481,226, Cl. 330-279.000.

Qualich, John; Chmielewski, Cary; and Sievers, Kirk, 5,481,175, Cl. 320-15.000.

Romero, Guillermo L.; and Pinder, Brent W., 5,480,727, Cl. 428-539.500.

Ross, Danny E.; Reiff, David E.; and Murray, John F., 5,481,618, Cl. 381-205.000.

Roth, Scott S.; McFadden, William C.; and Pepe, Alexander J., 5,480,820, Cl. 437-43.000.

Staudinger, Joseph; Seely, Warren L.; and Patterson, Howard W., 5,481,131, Cl. 257-531.000.

Motta, Ricardo J. Image capture system, 5,481,300, Cl. 348-208.000.

Motter, Gregg A.: See—  
Sitzema, Ronald L.; Troppman, Dale A.; and Motter, Gregg A., 5,481,445, Cl. 362-308.000.

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Street, Michael J.; Mottram, Toby T. F.; Wilkin, Arthur L.; and Hall, Robert C., 5,479,876, Cl. 119-14.080.

Mouchawar, Gabriel; McClure, Kelly H.; and Moberg, Sheldon B., to Pacesetter, Inc. System and method for deriving hemodynamic signals from a cardiac wall motion sensor, 5,480,412, Cl. 607-6.000.

Moulinex (Societe Anonyme): See—  
Parise, Vital A.; Letorey, Joseph A. P. M.; and Leveque, Patrick M. G., 5,481,750, Cl. 395-800.000.

Mourer, David P.: See—  
Miller, Steven A.; Christensen, Roy W.; and Mourer, David P., 5,480,470, Cl. 75-338.000.

Mous, Frans, to Cordis Corporation, Angiography catheter, 5,480,392, Cl. 604-280.000.

Mowry, Gregory A.: See—  
Bark, Lindley W.; Yaniv, Gershon; Romeo, David J.; Hardtmann, Dirk J.; and Mowry, Gregory A., 5,480,181, Cl. 280-730.200.

Mozingo, Robert E., to Case Corporation, Three function control mechanism, 5,480,276, Cl. 414-685.000.

MTU Motoren-und Turbinen-Union Muenchen GmbH: See—  
Harms, Axel, 5,480,160, Cl. 277-3.000.

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Richter, Karl-Hermann; Meier, Reinhold; Schmitt, Thilo; and Stümper, Bernd, 5,479,704, Cl. 29-889.100.

Muchada, Raoul: See—  
Cathignol, Dominique; Lavandier, Bernard; and Muchada, Raoul, 5,479,928, Cl. 128-662.060.

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Mueller, Karl F.; and Bochnik, Michael C., to Ciba Geigy Corporation, Unsaturated urea polysiloxanes, 5,480,946, Cl. 525-479.000.

Mueller, Steve; Meyers, Scott; Lambach, Chris; Stern, Glenn; Cochenet, Joseph; Werth, John T., III; Rodriguez, Carlos E.; Wozniak, John N.; Hintz, John; Hansen, Richard W.; and Trotter, Steve, to SPX Corporation, Real-time computerized engine analyzer using multiple analog-to-digital conversion system, 5,481,193, Cl. 324-379.000.

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Fischer, Heinz; Mueller, Wolfgang; and Schmidt, Ruediger, 5,479,983, Cl. 165-22.000.

Klein, Bernd; and Mueller, Wolfgang, 5,480,109, Cl. 244-129.500.

Muhr, Jürgen; and Feld, Marcel, to Huels Aktiengesellschaft, Process for the preparation of alkali metal salts of cyanoacetone, 5,481,019, Cl. 558-451.000.

Muir, Max K., to Volt Information Sciences, Inc. Dry silver photographic imaging device and method, 5,481,403, Cl. 359-618.000.

Mukai, Chitoshi: See—  
Maruo, Masatsuyo; Ando, Hitoshi; Watanabe, Mitsuru; and Mukai, Chitoshi, 5,480,636, Cl. 424-76.210.

Mulcahy, Deborah J.: See—  
Janssen, Robert A.; Cooper, Charlotte L.; Mulcahy, Deborah J.; Peebles, Judy L.; and Stebbins, Leslie F., 5,480,927, Cl. 524-100.000.

Mülhaupt, Rolf; Schütze, Joachim; and Werth, Holger, to Rhone-Poulenc Rhodia Aktiengesellschaft, Plasticized cellulose acetate, process for its production and its use for producing filaments, 5,480,922, Cl. 524-41.000.

Müller, Arno: See—  
Kim, Hyung-Kun P.; Müller, Arno; and Nambudiri, Easwaran C. N., 5,480,239, Cl. 400-120.090.

Müller, Manfred, Process for manufacturing locket-halves, 5,479,798, Cl. 63-19.000.

Müller, Rolf-Joachim: See—  
Tischer, Wilhelm; Klein, Joachim; Müller, Rolf-Joachim; and Engelke, Stephan, 5,480,790, Cl. 435-188.000.

Muller, Willis; Mitchell, Albert W.; Hudson, Joseph D.; and Wiborg, Eric J., II, to Wayne-Dalton Corp. Astragal for closure members, 5,481,076, Cl. 200-61.430.

Mullin, Howard R.: See—  
Sweeney, Gerald W.; Pfeiffer, James W.; Hadden, David M.; Blanchard, Kenneth L.; and Mullin, Howard R., 5,480,030, Cl. 206-524.800.

Müller, Martin; Stern, Gerhard; and Rössler, Markus, to Chemie Linz Gesellschaft m.b.H. Process for the preparation of asymmetrically substituted ureas, carbamates, thiocarbamates and substituted isocyanates, 5,481,035, Cl. 564-61.000.

Multicolor Specialties, Inc.: See—  
Lynch, James F.; and Predkelis, John, 5,480,480, Cl. 106-311.000.

Munro, James L.: See—  
Schantz, David L.; and Munro, James L., 5,481,194, Cl. 324-522.000.

Munroe, John E.: See—  
Hornback, William J.; Munroe, John E.; and Shepherd, Timothy A., 5,480,887, Cl. 514-301.000.

Münzebrock, Anton: See—  
Biesch, Harald; Hasselmann, Heinz; Kluge, Johannes; Krebs, Wolfgang; Lichtenvort, Uwe; Münzebrock, Anton; and Somborn, Günter, 5,480,125, Cl. 254-264.000.

Münzenmaier, Jürgen: See—  
Noltemeyer, Friedrich; Hoppe, Alfred; Münzenmaier, Jürgen; Rusch, Friedrich; and Karl, Günter, 5,479,894, Cl. 123-74.0AC.

Mura, Albert J., Jr.: See—  
Bailey, David S.; and Mura, Albert J., Jr., 5,480,760, Cl. 430-203.000.

Bailey, David S.; and Mura, Albert J., Jr., 5,480,761, Cl. 430-203.000.

Murai, Teruyuki: See—  
Yamamoto, Susumu; Murai, Teruyuki; Kawabe, Nozomu; and Tobioka, Masaaki, 5,480,601, Cl. 264-61.000.



- Murakami, Katsumi: See—  
Furuichi, Katsushi; Yokomizo, Yoshikazu; Honma, Toshio; and Murakami, Katsumi, 5,481,335, Cl. 355-206.000.
- Murakami, Norio: See—  
Kakuishi, Mitsuo; Awata, Yutaka; Ueno, Norio; Miyoshi, Seiji; Murakami, Norio; and Manabe, Atsushi, 5,481,564, Cl. 375-230.000.
- Murakami, Tomoo; Ohnuki, Hidebumi; Tsunoda, Takanori; and Maniwa, Ryo, to NEC Corporation. Method of and apparatus for plating printed circuit board. 5,480,675, Cl. 427-98.000.
- Murakami, Yoshiyasu; Okahara, Hirofumi; Suzuki, Akito; and Maeda, Tsuyoshi, to Nissan Motor Co., Ltd.; and Aichi Machine Industry Co., Ltd. Change direction planetary gearing for continuously variable transmission. 5,480,361, Cl. 475-328.000.
- Murakashi Lime Industry Co., Ltd.: See—  
Urano, Teruo; Miyaji, Hiroshi; Ogura, Masatsune; Shimoda, Tetsuya; and Ishikawa, Katuaki, 5,480,584, Cl. 252-384.000.
- Murakawa, Masahiko: See—  
Ryu, Tadamitsu; Ichikawa, Naomi; Murakawa, Masahiko; Adachi, Takeshi; and Toyota, Masanobu, 5,481,718, Cl. 395-700.000.
- Muranishi, Masaru: See—  
Kando, Hidehiko; Kainuma, Mamoru; Muranishi, Masaru; and Kimura, Katsuhiko, 5,481,515, Cl. 369-44.120.
- Muraoka Co., Ltd.: See—  
Muraoka, Takaharu, 5,479,681, Cl. 24-16.00R.
- Muraoka, Takaharu, to Muraoka Co., Ltd. Cargo collapse preventing device. 5,479,681, Cl. 24-16.00R.
- Muraoka, Tsutomu, to Kao Corporation. Method for improving the stability in air of a hair dye concentrate. 5,480,460, Cl. 8-416.000.
- Murata, Hiroshi: See—  
Ikeguchi, Yoshinori; and Murata, Hiroshi, 5,481,373, Cl. 358-434.000.
- Murata, Kei: See—  
Kondo, Tetsuya; Murata, Kei; Nagai, Yoshikazu; and Ohshima, Katunori, 5,480,763, Cl. 430-320.000.
- Murata Manufacturing Co., Ltd.: See—  
Kaida, Hiroaki, 5,481,154, Cl. 310-368.000.
- Motohashi, Shozo; Fujimoto, Katsumi; Nishiyama, Hiroshi; Heinouchi, Yoshiaki; Yoshitani, Kazuhiro; and Sakashita, Yukio, 5,479,822, Cl. 73-504.140.
- Murata, Masae: See—  
Yamasaki, Hidetoshi; Murata, Masae; Noya, Yukio; Yomogita, Yasukazu; Taguchi, Manabu; Yamanaka, Akira; and Sibuya, Naoki, 5,481,514, Cl. 369-36.000.
- Murata, Yuji: See—  
Matsumoto, Tomotaka; Inoue, Jun; Ichimura, Teruhiko; Murata, Yuji; Watanabe, Junichi; Nagahiro, Yoshio; Hodate, Mari; Oki, Kenichi; and Okabe, Masahiro, 5,480,818, Cl. 437-40.000.
- Murata, Yukichi: See—  
Sano, Hideo; Murata, Yukichi; Nishimura, Toru; Yamada, Masahiro; Takimoto, Hiroshi; and Satoh, Nobuyoshi, 5,480,478, Cl. 106-22.00K.
- Muroi, Souichi; and Tsai, Hsi-Chuan, to W. R. Grace & Co.-Conn. Spherical curing agent for epoxy resin, curing agent masterbatch for epoxy resin and their preparation. 5,480,957, Cl. 528-87.000.
- Murooka, Hideyasu: See—  
Kitamura, Naoya; Sugiyama, Hisashi; Yamaguchi, Yoshihide; Kyoui, Masayuki; Murooka, Hideyasu; Iwamura, Ryoji; and Watanabe, Makio, 5,480,048, Cl. 216-13.000.
- Murphy, Michael E., to Design & Test Technology, Inc. Capacitive based gravity sensor. 5,479,716, Cl. 33-366.000.
- Murphy, Philip A., Jr.; Genetti, Wayne A.; Gunnarsson, Gunnar K.; Pullin, Edward J.; Thompson, Steven A.; Tickner, Robert H.; and Wu, Gary C-F, to Unisys Corporation. Dedicated processor for task I/O and memory management. 5,481,707, Cl. 395-650.000.
- Murphy, Richard D., to Compaq Computer Corporation. Method of manufacturing ink jet printheads by induction heating of low melting point metal alloys. 5,479,684, Cl. 29-25.350.
- Murphy, William G. Dead length collet chuck holder. 5,480,164, Cl. 279-50.000.
- Murray, David L.: See—  
Liles, Donald T.; and Murray, David L., 5,480,919, Cl. 522-86.000.
- Murray, John F.: See—  
Ross, Danny E.; Reiff, David E.; and Murray, John F., 5,481,618, Cl. 381-205.000.
- Murui, Taro: See—  
Negishi, Satoshi; Shirasawa, Seichi; Suzuki, Junko; and Murui, Taro, 5,480,787, Cl. 435-134.000.
- Musselman, Lawrence L.; and Greene, Howard L., to Aluminum Company of America. Materials for use as fire retardant additives. 5,480,587, Cl. 252-609.000.
- Mutoh, Nobuyoshi; Miyazaki, Taizou; Masaki, Ryoso; Ohmae, Tsutomu; and Obara, Sanhiro, to Hitachi, Ltd. Electric vehicle torque controller. 5,481,168, Cl. 318-432.000.
- Myers, Gary L., to Fort Lock Corporation. Plastic lock. 5,479,800, Cl. 70-365.000.
- Myers, Michael R.: See—  
Spada, Alfred P.; Myers, Michael R.; Maguire, Martin P.; and Persons, Paul E., 5,480,883, Cl. 514-249.000.
- Myers, Morris L.: See—  
Painter, Thomas P., Jr.; Obenchain, Gary A.; Myers, Morris L.; Christy, Charles S.; and Rhodes, James D., 5,480,112, Cl. 246-410.000.
- Myers, Phillip L.: See—  
Kilman, John, deceased; Falkenstein, Kent C.; Beckstead, Donal O.; and Myers, Phillip L., 5,479,799, Cl. 70-231.000.
- Myers, Richard S.: See—  
Starnier, William E.; and Myers, Richard S., 5,480,958, Cl. 528-96.000.
- Myhre, John D.: See—  
Dyott, Richard B.; Brooker, Eric L.; Bennett, Sidney M.; and Myhre, John D., 5,481,358, Cl. 356-350.000.
- Myracle, James L.: See—  
Counts, Mary E.; Houck, Willie G., Jr.; Houghton, Kenneth S.; Lilly, A. Clifton, Jr.; Lipowicz, Peter J.; Myracle, James L.; Sprinkel, F. Murphy; Washington, James M.; and Wrenn, Susan E., 5,479,948, Cl. 131-194.000.
- M2000 Group Inc., The: See—  
Doederlein, Dieter D.; Newman, G. Dale; Burgess, Brian J.; and Sharp, Anthony C., 5,480,156, Cl. 273-237.000.
- Nabai, Hossein; and Rahbari, Homayoon. Biopsy wound closure device and method. 5,479,936, Cl. 128-754.000.
- Nachlas, Jesse A.; Powers, Kelly B.; and McJunkin, James R., to Ceramtec, Inc. Design and manufacturing method for a solid electrolyte ion conducting device. 5,479,700, Cl. 29-825.000.
- Nader, Bassam S.: See—  
Pawloski, Chester E.; and Nader, Bassam S., 5,480,568, Cl. 252-46.700.
- Nadkarni, Gopal Krishna G.; and Mestha, Lingappa K. Up/down spectrum scaling of signals. 5,481,182, Cl. 324-76.240.
- Nadol, Joseph B., Jr. Method of treating hearing loss. 5,480,433, Cl. 623-10.000.
- Nadrep Limited: See—  
Goodlad, John S.; Cant, Jonathan R.; and Harford, Stephen, 5,480,973, Cl. 530-386.000.
- Nagahiro, Yoshio: See—  
Matsumoto, Tomotaka; Inoue, Jun; Ichimura, Teruhiko; Murata, Yuji; Watanabe, Junichi; Nagahiro, Yoshio; Hodate, Mari; Oki, Kenichi; and Okabe, Masahiro, 5,480,818, Cl. 437-40.000.
- Nagai, Hideo: See—  
Ueno, Akira; Nakanishi, Hideyuki; Nagai, Hideo; and Yoshikawa, Akio, 5,481,524, Cl. 369-112.000.
- Nagai, Junichi: See—  
Fukaya, Matuo; Nagai, Junichi; and Kuzuoka, Kaoru, 5,481,240, Cl. 338-22.00R.
- Nagai, Kazutoshi; Satake, Tooru; Hayashi, Hideaki; and Yasui, Takanari, to Ebara Corporation. Exhaust apparatus and vacuum pumping unit including the exhaust apparatus. 5,480,286, Cl. 417-48.000.
- Nagai, Osamu; Okamoto, Kunihide; and Yamamoto, Kaoru, to Showa Corp.; and Honda Giken Kogyo Kabushiki Kaisha. Hydraulic damper. 5,480,011, Cl. 188-299.000.
- Nagai, Shigekazu; Sugano, Shigeru; Saito, Mitsuhiro; Takebayashi, Takashi; Matsumura, Hiroshi; and Ito, Yoshiharu, to SMC Kabushiki Kaisha. Pressure information processing system suitable for use in a vacuum unit. 5,481,482, Cl. 364-558.000.
- Nagai, Toshinari, to Toyota Jidosha Kabushiki Kaisha. Apparatus for determining an altitude condition of an automotive vehicle. 5,481,462, Cl. 364-431.030.
- Nagai, Yoshikazu: See—  
Kondo, Tetsuya; Murata, Kei; Nagai, Yoshikazu; and Ohshima, Katunori, 5,480,763, Cl. 430-320.000.
- Nagaich, Laxmi. Extruded particle board. 5,480,602, Cl. 264-122.000.
- Nagaik, Ippai: See—  
Ito, Toshiyasu; Ogisu, Yasuhiko; Takahashi, Shigeyuki; Uemura, Toshiya; Nohata, Minoru; Nagaik, Ippai; Noguchi, Shigeru; and Arai, Kenjiro, 5,480,714, Cl. 428-324.000.
- Nagakura, Yasuhiko: See—  
Manabe, Takao; Yamakawa, Yuhei; Shin, Shoichi; Yamada, Hideyuki; Nagashima, Mitsuo; Kokubo, Mitsunori; Tsunada, Masafumi; Nagakura, Yasuhiko; Nakajima, Yukio; Inoue, Tomohiro; and Kondo, Kiyoshi, 5,480,508, Cl. 156-353.000.
- Nagane, Hiromichi; Dodge, Alexandre; Froger, Marie-Helene; Truffant, Christophe; and Michel, Stéphane, to Canon Kabushiki Kaisha. Sheet collating or storage device. 5,480,135, Cl. 271-176.000.
- Nagano, Toru: See—  
Ishii, Takashi; Watanabe, Tamio; and Nagano, Toru, 5,480,322, Cl. 439-378.000.
- Nagao, Yoshinori; Amemiya, Koji; Izumizaki, Masami; and Sasanuma, Nobuatsu, to Canon Kabushiki Kaisha. Image forming apparatus. 5,481,340, Cl. 355-246.000.
- Nagasawa, Hiroyuki: See—  
Shigematsu, Hiroyuki; Nakamura, Yutaka; Sakamoto, Munenori; Nagasawa, Hiroyuki; Nakao, Hiroshi; Nakajima, Yasuhiro; and Kurata, Masaaki, 5,481,278, Cl. 345-179.000.
- Nagasawa, Kenichi: See—  
Kashida, Motokazu; Hoshi, Hidenori; Nagasawa, Kenichi; and Yamashita, Shinichi, 5,481,518, Cl. 369-53.000.
- Nagasawa, Masato: See—  
Yokoyama, Eiji; and Nagasawa, Masato, 5,481,417, Cl. 360-73.080.
- Nagase Electronic Chemicals, Ltd.: See—  
Shiotsu, Shinichiro; and Horiuchi, Yoshiaki, 5,480,585, Cl. 252-544.000.
- Nagase, Tetsuya: See—  
Arimoto, Shinobu; Shimizu, Katsuchi; Komiya, Yutaka; Yoshinaga, Kazuo; Hayashi, Toshio; Nakai, Takehiko; Utogawa, Tsutomu; Nagase, Tetsuya; and Sasanuma, Nobuatsu, 5,481,334, Cl. 355-201.000.
- Nagashima, Masaaki: See—  
Okuno, Yasuhiro; Yamakawa, Tadashi; Nagashima, Masaaki; and Sasaki, Takayuki, 5,481,672, Cl. 395-188.010.
- Nagashima, Mitsu: See—  
Manabe, Takao; Yamakawa, Yuhei; Shin, Shoichi; Yamada, Hideyuki; Nagashima, Mitsuo; Kokubo, Mitsunori; Tsunada, Masafumi; Nagakura, Yasuhiko; Nakajima, Yukio; Inoue, Tomohiro; and Kondo, Kiyoshi, 5,480,508, Cl. 156-353.000.
- Nagayasu, Teruaki: See—  
Yamasaki, Kazuyuki; Hamaguchi, Yoshihiro; Hosoda, Shunji; Sakata, Kazuyuki; Imai, Takashi; Okatani, Shigetoshi; Nishio, Satoshi; Takahashi, Tuiyoshi; Matsuura, Kenji; Tanaka, Noriyuki; Nagayasu, Teruaki; and Makino, Hiroshi, 5,480,537, Cl. 210-96.100.
- Nagel, Jonathan A.; and Bahoun, Samia M., to AT&T Corp. In-line two-stage erbium doped fiber amplifier system with in-band telemetry channel. 5,481,399, Cl. 359-341.000.
- Naglestad, Mark B.; Bohac, Frank J., Jr.; Aralis, James M.; Moriaki, Bert S.; Calabretta, Frank J.; and Troutman, Bruce L., to Hughes Aircraft Company. Mixed signal integrated circuit architecture and test methodology. 5,481,471, Cl. 364-489.000.
- Nahajski, Anthony P.; and Nahajski, Stuart E. Method and apparatus for scour depth measurement. 5,479,724, Cl. 33-719.000.
- Nahajski, Stuart E.: See—  
Nahajski, Anthony P.; and Nahajski, Stuart E., 5,479,724, Cl. 33-719.000.
- Naito, Takao, to Fujitsu Limited. Optical amplifier repeater. 5,481,390, Cl. 359-174.000.
- Naito, Takao: See—  
Chikahisa, Naohichi; Takahashi, Ken; Naito, Takao; and Sasaki, Takashi, 5,479,854, Cl. 101-123.000.
- Naito, Yutaka: See—  
Takahashi, Fumiharu; Naito, Yutaka; Mori, Mitsuhiro; and Nishimura, Sadaki, 5,481,056, Cl. 585-512.000.
- Najac, Gregory. Exercise glove. 5,479,660, Cl. 2-20.000.
- Naka, Hiroshi: See—  
Suzuki, Kaoru; Ando, Tadahiho; Naka, Hiroshi; Sawada, Mitsutoshi; Ohata, Tomonori; Miura, Hiroshi; Nakabayashi, Masayoshi; and Ando, Eiji, 5,480,130, Cl. 270-53.000.
- Nakabayashi, Masayoshi: See—  
Suzuki, Kaoru; Ando, Tadahiho; Naka, Hiroshi; Sawada, Mitsutoshi; Ohata, Tomonori; Miura, Hiroshi; Nakabayashi, Masayoshi; and Ando, Eiji, 5,480,130, Cl. 270-53.000.
- Nakagawa, Mitsu: See—  
Morioka, Shouji; Matsugase, Hiroshi; Togawa, Katsutake; and Nakagawa, Mitsu, 5,481,512, Cl. 369-36.000.
- Nakagawa, Teruyuki: See—  
Ishida, Koichi; Nakagawa, Teruyuki; and Watanabe, Takehiro, 5,480,597, Cl. 264-40.400.
- Nakahata, Akinobu: See—  
Mihara, Takashi; Shirasaka, Kazumi; Oda, Kenji; Nakahata, Akinobu; Shinohara, Masahiro; and Sasaki, Wataru, 5,481,348, Cl. 335-290.000.
- Nakahata, Shigeru: See—  
Oishi, Tetsuya; Ozawa, Hiroshi; Karasawa, Minato; Inomata, Masamitsu; Mega, Izumi; Yamauchi, Atsuyoshi; Kamada, Kazunori; Nakahata, Shigeru; Sakamoto, Katsumi; Nakashima, Tatsunobu; Watanabe, Akito; Suzuki, Jin; Ohkawa, Kouhei; Furusawa, Satoshi; Ono, Hiroshi; and Sugazaki, Kazuo, 5,480,947, Cl. 525-509.000.
- Nakai, Takehiko: See—  
Arimoto, Shinobu; Shimizu, Katsuchi; Komiya, Yutaka; Yoshinaga, Kazuo; Hayashi, Toshio; Nakai, Takehiko; Utogawa, Tsutomu; Nagase, Tetsuya; and Sasanuma, Nobuatsu, 5,481,334, Cl. 355-201.000.
- Nakajima, Akio, to Minolta Co., Ltd. Image forming apparatus. 5,481,354, Cl. 355-324.000.
- Nakajima, Ayumi: See—  
Itoh, Kazuo; Narita, Kazuhiko; Kitazawa, Shuichi; Tokoi, Masanori; Nakajima, Ayumi; and Sekine, Hiroshi, 5,481,465, Cl. 364-468.000.
- Nakajima, Iwao: See—  
Sato, Keiichi; Seto, Yoko; and Nakajima, Iwao, 5,481,049, Cl. 568-909.500.
- Nakajima, Yasuhiro: See—  
Shigematsu, Hiroyuki; Nakamura, Yutaka; Sakamoto, Munenori; Nagasawa, Hiroyuki; Nakao, Hiroshi; Nakajima, Yasuhiro; and Kurata, Masaaki, 5,481,278, Cl. 345-179.000.
- Nakajima, Yoshiki: See—  
Yoshimoto, Kyosuke; Nakajima, Yoshiki; Koyanagi, Kimiyuki; Ito, Osamu; Mashimo, Akira; Onda, Hiroyuki; Kobayashi, Yutaka; and Yamana, Koji, 5,481,517, Cl. 369-44.280.
- Nakajima, Yukio: See—  
Manabe, Takao; Yamakawa, Yuhei; Shin, Shoichi; Yamada, Hideyuki; Nagashima, Mitsuo; Kokubo, Mitsunori; Tsunada, Masafumi; Nagakura, Yasuhiko; Nakajima, Yukio; Inoue, Tomohiro; and Kondo, Kiyoshi, 5,480,508, Cl. 156-353.000.
- Nakamura, Akihiko; Sakakibara, Yoshio; Gotou, Makoto; and Kobayashi, Kazuhiko, to Matsushita Electric Industrial Co., Ltd. Motor control apparatus. 5,481,641, Cl. 388-800.000.
- Nakamura, Katsushige, to Mitaka Kohki Co., Ltd. Biaxial balance adjusting structure for medical stand apparatus. 5,480,114, Cl. 248-123.200.
- Nakamura, Kenji; and Ukita, Nobuo, to Mitsubishi Denki Kabushiki Kaisha. Discharge lamp current controlling circuit. 5,481,163, Cl. 315-308.000.
- Nakamura, Kiyoshi: See—  
Nakata, Kiyoshi; Nakamura, Kiyoshi; Tanamachi, Tokunosuke; Tsutsui, Yoshio; and Terunuma, Mutsuhiro, 5,481,448, Cl. 363-137.000.
- Nakamura, Minoru: See—  
Kasai, Minoru; and Nakamura, Minoru, 5,480,346, Cl. 452-47.000.
- Nakamura, Norio: See—  
Tsukada, Katsumi; Nakamura, Norio; Nimura, Minoru; Suemori, Hiroyuki; Kamihata, Tomio; and Yamazaki, Mutsuaki, 5,481,432, Cl. 361-686.000.
- Nakamura, Rie: See—  
Tachibana, Takeshi; Saito, Kimitsugu; Hayashi, Kazushi; Nishimura, Kozu; and Nakamura, Rie, 5,479,875, Cl. 117-103.000.
- Nakamura, Takashi: See—  
Watanabe, Hitoshi; Kadosawa, Tsuneaki; Nakamura, Takashi; Koga, Eiji; and Asada, Satoshi, 5,481,705, Cl. 395-650.000.
- Nakamura, Tatsuya: See—  
Kasuya, Takashige; Kashimura, Noboru; Nakamura, Tatsuya; Chiba, Tatsuhiko; and Inaba, Kohji, 5,480,759, Cl. 430-126.000.
- Nakamura, Tooru: See—  
Mochizuki, Kazuhiro; Mishima, Tomoyoshi; Nakamura, Tooru; Masuda, Hiroshi; Tanoue, Tomonori; Haga, Tooru; and Fujisaki, Yoshihisa, 5,481,120, Cl. 257-49.000.
- Nakamura, Yutaka: See—  
Shigematsu, Hiroyuki; Nakamura, Yutaka; Sakamoto, Munenori; Nagasawa, Hiroyuki; Nakao, Hiroshi; Nakajima, Yasuhiro; and Kurata, Masaaki, 5,481,278, Cl. 345-179.000.
- Nakanishi, Hideyuki: See—  
Ueno, Akira; Nakanishi, Hideyuki; Nagai, Hideo; and Yoshikawa, Akio, 5,481,524, Cl. 369-112.000.
- Nakano, Akira: See—  
Mitsumori, Kenichi; Kasama, Yasuhiko; Nakano, Akira; Abe, Akira; and Ohmi, Tadahiro, 5,480,563, Cl. 210-748.000.
- Nakano, Masato: See—  
Morishima, Hajime; Koike, Yutaka; Nakano, Masato; Atsumi, Shugo; Tanaka, Seichi; and Matsuyama, Kenji, 5,481,036, Cl. 564-162.000.
- Nakano, Rikizo; and Matsui, Noriyuki, to Fujitsu Limited. IC element testing device. 5,481,551, Cl. 371-27.000.
- Nakano, Shiro: See—  
Nishikiori, Yoshiharu; Yamana, Masahiro; and Nakano, Shiro, 5,480,752, Cl. 430-49.000.
- Nakano, Tetsuo; Takano, Yuichi; and Takada, Masami, to Hitachi, Ltd. Thermal transfer printer. 5,480,238, Cl. 400-120.040.
- Nakao, Ayumi: See—  
Kurashige, Masafumi; Fukushima, Shinichi; and Nakao, Ayumi, 5,481,660, Cl. 395-125.000.
- Nakao, Hiroshi: See—  
Shigematsu, Hiroyuki; Nakamura, Yutaka; Sakamoto, Munenori; Nagasawa, Hiroyuki; Nakao, Hiroshi; Nakajima, Yasuhiro; and Kurata, Masaaki, 5,481,278, Cl. 345-179.000.
- Nakao, Yuichi: See—  
Kondo, Hiroyuki; Nakao, Yuichi; and Koyama, Kazumi, 5,481,678, Cl. 395-280.000.
- Nakashima, Hiroshi; and Fukuhara, Sanhiro, to Fuji Photo Film Co., Ltd. Non-contact web conveying apparatus. 5,480,086, Cl. 226-97.000.
- Nakashima, Tatsunobu: See—  
Oishi, Tetsuya; Ozawa, Hiroshi; Karasawa, Minato; Inomata, Masamitsu; Mega, Izumi; Yamauchi, Atsuyoshi; Kamada, Kazunori; Nakahata, Shigeru; Sakamoto, Katsumi; Nakashima, Tatsunobu; Watanabe, Akito; Suzuki, Jin; Ohkawa, Kouhei; Furusawa, Satoshi; Ono, Hiroshi; and Sugazaki, Kazuo, 5,480,947, Cl. 525-509.000.
- Nakata, Kiyoshi; Nakamura, Kiyoshi; Tanamachi, Tokunosuke; Tsutsui, Yoshio; and Terunuma, Mutsuhiro, to Hitachi, Ltd. Multilevel inverter having voltage dividing capacitors distributed across multiple arms. 5,481,448, Cl. 363-137.000.
- Nakatani, Yoichiro, to Victor Company of Japan, Ltd. Tape dubbing and divided master tape producing system. 5,481,411, Cl. 358-311.000.
- Nakatsugawa, Kiyoshi: See—  
Kato, Hisaki; Kimura, Suenori; Nakatsugawa, Kiyoshi; Uchino, Tsuguo; Ozawa, Itsuo; and Onda, Hiroyuki, 5,481,158, Cl. 313-533.000.
- Nakaura, Yoshiteru: See—  
Hirose, Masayuki; Hata, Ryosuke; and Nakaura, Yoshiteru, 5,481,070, Cl. 174-120.0FF.
- Nakayama, Mikio, to Fujitsu Limited. Cordless telephone set with a call detecting unit which protects a call and indicates receipt of the call. 5,481,593, Cl. 379-61.000.
- Nalette, Timothy A.; and Birbara, Philip J., to United Technologies Corporation. Enhancing carbon dioxide sorption rates using hygroscopic additives. 5,480,625, Cl. 423-230.000.
- Nambudiri, Easwaran C. N.: See—  
Kim, Hyung-Kun P.; Muller, Arno; and Nambudiri, Easwaran C. N., 5,480,239, Cl. 400-120.090.
- Namco Ltd.: See—  
Ishikawa, Hirotomo, 5,479,998, Cl. 180-23.000.
- Nanjo, Fusayuki: See—  
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- Nakajima, Yasuhiro: See—  
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- Nakajima, Yoshiki: See—  
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- Nakamura, Kenji; and Ukita, Nobuo, to Mitsubishi Denki Kabushiki Kaisha. Discharge lamp current controlling circuit. 5,481,163, Cl. 315-308.000.
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- Nakamura, Takashi: See—  
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- Nakamura, Tatsuya: See—  
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- Nakano, Akira: See—  
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- Nakano, Shiro: See—  
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- Narazaki, Kanji: See—  
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- Narita, Kazuhiko: See—  
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- Narula, Chaitanya K.; Visser, Jacobus H.; and Adamczyk, Andrew A., Jr., to Ford Motor Company. Electrically heatable catalyst device using electrically conductive non-metallic materials. 5,480,622, Cl. 422-174.000.
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- Nassirpour, Mohammad S.: See—  
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- Nastasi, Thomas, Jr.: See—  
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- National Instruments Corporation: See—  
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- McKaskle, Greg; and Kodosky, Jeffrey L., 5,481,741, Cl. 395-800.000.
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- Bergemont, Albert, 5,481,493, Cl. 365-185.180.
- Chang, Ming-Bing, 5,480,821, Cl. 437-43.000.
- Johnson, Nicky M., 5,481,213, Cl. 327-108.000.
- Utz, Hubert, 5,481,222, Cl. 327-544.000.
- Yeung, Pak-Ho, 5,481,216, Cl. 327-333.000.
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- Naylor, William C., Jr.: See—  
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- Nebraska Electronics, Inc.: See—  
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- NEC Corporation: See—  
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- Kimura, Katsuji, 5,481,224, Cl. 330-253.000.
- Matsunaga, Mitsuhiro, 5,481,315, Cl. 348-565.000.
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- Sasaki, Katsuhiko; Kuroda, Yuka; and Fukuda, Seiji, 5,481,547, Cl. 370-112.000.
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- Sotani, Yoshikazu, 5,481,711, Cl. 395-700.000.
- Suzuki, Toshiki, 5,481,591, Cl. 379-58.000.
- Takagi, Hitoshi, 5,481,688, Cl. 395-418.000.
- Takeuchi, Kiyoshi, 5,481,485, Cl. 364-578.000.
- Watanabe, Takeshi, 5,480,815, Cl. 437-31.000.
- Needham, Michael L.: See—  
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- Needle, David L.: See—  
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- Neer, Jay H.: See—  
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- Nefel, Frédéric: See—  
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- Nelson, Kathy L.: See—  
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- Nelson, Philip E.: See—  
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- Neri, Danilo. Fish-hook clasp. 5,479,795, Cl. 63-2.000.
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- Heyland, Sven; and Roth, Violette, 5,480,663, Cl. 426-262.000.
- Network Systems Corporation: See—  
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- Neudeck, Gerold W.: See—  
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- Neugebauer, Rudolf: See—  
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- New Holland North America, Inc.: See—  
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- New Jersey Institute of Technology: See—  
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- New Oji Paper Co., Ltd.: See—  
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- Newlong Machine Works, Ltd.: See—  
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- Newman, G. Dale: See—  
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- News Data Security Products Ltd.: See—  
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- Newsome, Reginald W.: See—  
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- NeXT Computer, Inc.: See—  
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- Nezaki, Takuya: See—  
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- Nguyen, Peter D.: See—  
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- Nguyen, Philip: See—  
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- Nickel, John R.: See—  
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- Nii, Satoshi. Emulsified composition of oil and fat, and bread made by using same. 5,480,671, Cl. 426-613.000.
- Niimura, Koichi; Kawabe, Takako; Wada, Tsutomu; Saitoh, Tsuyoshi; and Bannai, Kenji, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for treating prostatic hypertrophy with estradiol derivatives. 5,480,878, Cl. 514-182.000.
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- Nikon Corporation: See—  
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- Shiraishi, Naomasa, 5,481,332, Cl. 355-53.000.
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- Nippert, Andrew H.: See—  
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- Nippon Conlux Co., Ltd.: See—  
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- Nippon Flute Company, Ltd.: See—  
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- Nippon Steel Semiconductor Corp.: See—  
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- Nippon Telegraph And Telephone Corporation: See—  
Kai, Yoshihide; Tanigawa, Hiroya; and Wakahara, Toshihiko, 5,481,677, Cl. 395-280.000.
- Nippon Yakin Kogyo Co., Ltd.: See—  
Tsuda, Masaomi; Fujiwara, Yoshito; Ikegami, Yuji; Sato, Masao; and Fujii, Hiroyuki, 5,480,608, Cl. 420-40.000.
- Nippondenso Co., Ltd.: See—  
Fukaya, Matuo; Nagai, Junichi; and Kuzuoka, Kaoru, 5,481,240, Cl. 338-22.00R.
- Kawai, Katsuhiko; Douts, Hisayo; and Ikeda, Hiroshi, 5,479,897, Cl. 123-339.200.

- Miura, Shoji; Sugisaka, Takayuki; Komura, Atsushi; and Sakakibara, Toshio, 5,480,832, Cl. 437-67.000.
- Yamamoto, Ken; Yamamoto, Michiyasu; Baba, Norimasa; Fukuoka, Mikio; Kuroyanagi, Isao; Sanada, Ryouichi; and Torigoe, Eiichi, 5,479,985, Cl. 165-176.000.
- Nisato, Dino: See—  
Wagnon, Jean; de Cointet, Paul; Nisato, Dino; Plouzane, Claude; Serradeil-Legal, Claudine; and Tonnerre, Bernard, 5,481,005, Cl. 548-537.000.
- Nishi, Yutaka: See—  
Yamamoto, Yoshihisa; Nishi, Yutaka; Nishimori, Takashi; and Tokunaga, Hiroyuki, 5,481,457, Cl. 364-424.050.
- Nishiguchi, Yukihiko: See—  
Shibuya, Tadashi; Nishiguchi, Yukihiko; Suzuki, Tomikazu; and Takamine, Yasufumi, 5,481,729, Cl. 395-737.000.
- Nishikawa, Hideyo: See—  
Yasuda, Shinichiro; and Nishikawa, Hideyo, 5,481,344, Cl. 355-260.000.
- Nishikiori, Yoshiharu; Yamana, Masahiro; and Nakano, Shiro, to New Oji Paper Co., Ltd. Electrophotographic lithograph printing plate material. 5,480,752, Cl. 430-49.000.
- Nishikori, Hitoshi: See—  
Otsuka, Naoki; Yano, Kentaro; Takahashi, Kiichiro; Arai, Atsushi; Nishikori, Hitoshi; and Iwasaki, Osamu, 5,481,281, Cl. 347-12.000.
- Nishimori, Takashi: See—  
Yamamoto, Yoshihisa; Nishi, Yutaka; Nishimori, Takashi; and Tokunaga, Hiroyuki, 5,481,457, Cl. 364-424.050.
- Nishimoto, Mitsuhiro: See—  
Daido, Toshihiko; Nishimoto, Mitsuhiro; and Matsuoka, Hirofumi, 5,480,000, Cl. 180-79.100.
- Nishimura, Kozo: See—  
Tachibana, Takeshi; Saito, Kimitsugu; Hayashi, Kazushi; Nishimura, Kozo; and Nakamura, Rie, 5,479,875, Cl. 117-103.000.
- Nishimura, Ryoji: See—  
Haze, Setsuo; Nishimura, Ryoji; Fukuda, Masao; and Konishi, Satoshi, 5,479,756, Cl. 53-77.000.
- Nishimura, Sadaki: See—  
Takahashi, Fumiharu; Naito, Yutaka; Mori, Mitsuhiro; and Nishimura, Sadaki, 5,481,056, Cl. 585-512.000.
- Nishimura, Toru: See—  
Sano, Hideo; Murata, Yukichi; Nishimura, Toru; Yamada, Masahiro; Takimoto, Hiroshi; and Satoh, Nobuyoshi, 5,480,478, Cl. 106-22.00K.
- Nishino, Masakazu: See—  
Juri, Tatsuhiro; and Nishino, Masakazu, 5,481,309, Cl. 348-405.000.
- Nishino, Shinichi: See—  
Kawai, Katsuya; Anzai, Masayasu; Harada, Toshimitsu; and Nishino, Shinichi, 5,481,351, Cl. 355-298.000.
- Nishio, Satoshi: See—  
Yamasaki, Kazuyuki; Hamaguchi, Yoshihiro; Hosoda, Shunji; Sakata, Kazuyuki; Imai, Takashi; Okatani, Shigetoshi; Nishio, Satoshi; Takahashi, Toshiyuki; Manura, Kenji; Tanaka, Noriyuki; Nagayasu, Teruaki; and Makino, Hiroshi, 5,480,537, Cl. 210-96.100.
- Nishiyama, Hiroshi: See—  
Motohashi, Shozo; Fujimoto, Katsumi; Nishiyama, Hiroshi; Heinouchi, Yoshiaki; Yoshitani, Kazuhiro; and Sakashita, Yukio, 5,479,822, Cl. 73-504.140.
- Nishiyama, Soji; Higuchi, Hiroyuki; Matsushita, Kiichiro; and Matsushima, Ryoichi, to Nitto Denko Corporation. Porous film and use of the same. 5,480,745, Cl. 429-242.000.
- Niskanen, Juhani; and Odell, Michael, to Valmet Paper Machinery Inc. Method and device for controlling a wire in a forming gap of a web former. 5,480,513, Cl. 162-203.000.
- Nissan Chemical Industries Ltd.: See—  
Arai, Kunio; and Ajiri, Tadafumi, 5,480,630, Cl. 423-625.000.
- Nissan Motor Co., Ltd.: See—  
Iwata, Toru; and Yasuda, Sota, 5,481,455, Cl. 364-424.010.
- Nissan Motor Co., Ltd.: See—  
Murakami, Yoshiyasu; Okahara, Hirofumi; Suzuki, Akito; and Maeda, Tsuyoshi, 5,480,361, Cl. 475-328.000.
- Oyama, Hiroshi, 5,479,693, Cl. 29-469.000.
- Nisshin Oil Mills, Ltd., The: See—  
Negishi, Satoshi; Shirasawa, Seiichi; Suzuki, Junko; and Murui, Tateo, 5,480,787, Cl. 435-134.000.
- Nitruvid: See—  
Chabrol, Claude; Robelet, Marc; Leveque, Robert; Pichat néc Nedelec, Anne L. M.; Rieu, Jean F. E.; Rabbe, Louis M.; and Rambert, Andre, 5,480,683, Cl. 427-525.000.
- Nitsche, Michael: See—  
Johannisbauer, Wilhelm; Koerner, Hermann; and Nitsche, Michael, 5,480,978, Cl. 536-4.100.
- Nitta, Tetsuhiro: See—  
Kiyohara, Takehiko; and Nitta, Tetsuhiro, 5,480,132, Cl. 271-10.010.
- Nitto Denko Corporation: See—  
Kume, Katsuya; Oishi, Yozo; Kuramoto, Mitsuo; and Takenoshita, Itsuroh, 5,480,700, Cl. 428-195.000.
- Nishiyama, Soji; Higuchi, Hiroyuki; Matsushita, Kiichiro; and Matsushima, Ryoichi, 5,480,745, Cl. 429-242.000.
- Niwa, Masaaki: See—  
Udagawa, Masaharu; Yasui, Juro; Niwa, Masaaki; Hirai, Yoshihiko; Okada, Kenji; Morimoto, Kiyoshi; and Yuki, Koichiro, 5,480,492, Cl. 134-2.000.



Niwa, Motohiro; Yasui, Tetsuji; and Ode, Takahiro, to Kirin Beverage Corporation. Method of and apparatus for detecting microorganisms. 5,480,804, Cl. 435-286.100.

Nixon, Douglas F.: See—  
McMichael, Andre J.; Nixon, Douglas F.; Townsend, Alain R. M.; and Gotch, Frances M., 5,480,967, Cl. 530-326.000.

NKE S.r.l.: See—  
Figini, Aldo; and Beylis, Renato, 5,480,487, Cl. 118-610.000.

Nobel, Fred I.; Brash, William; Thomson, Donald; and Garay, Luis H., to LeaRon Inc. Electrolytic production of hypophosphorous acid. 5,480,517, Cl. 204-103.000.

Nobili, Rocco: See—  
Conti, Adelio; Nobili, Rocco; and Troyer, Paolo, 5,481,569, Cl. 375-347.000.

Noda, Yasushi; Yoshioka, Nobuyuki; Suzuki, Nobutaka; Fukai, Toshimasa; Yoshihara, Tetsuo; and Koshiro, Koichi, to Kabushiki Kaisha Meidensha. Method for forming an electrical contact material. 5,480,472, Cl. 75-351.000.

Nofre, Claude; and Tinti, Jean-Marie. N-substituted derivatives of aspartame useful as sweetening agents. 5,480,668, Cl. 426-548.000.

Noggle, Gary C.; and Andrews, Donald E., Jr., to Bridgestone/Firestone, Inc. Noise-reduction system for vehicle tires. 5,479,974, Cl. 152-333.100.

Noguchi, Shigeru: See—  
Ito, Toshiyasu; Ogisu, Yasuhiko; Takahashi, Shigeyuki; Uemura, Toshiya; Nohata, Minoru; Nagaike, Ippai; Noguchi, Shigeru; and Arai, Kenjiro, 5,480,714, Cl. 428-324.000.

Nohata, Minoru: See—  
Ito, Toshiyasu; Ogisu, Yasuhiko; Takahashi, Shigeyuki; Uemura, Toshiya; Nohata, Minoru; Nagaike, Ippai; Noguchi, Shigeru; and Arai, Kenjiro, 5,480,714, Cl. 428-324.000.

Noise Cancellation Technologies, Inc.: See—  
Eatwell, Graham P.; and Langley, Andrew, 5,481,615, Cl. 381-71.000.

Nojima, Koichi: See—  
Takamatsu, Ryoji; Watanabe, Tomohiro; and Nojima, Koichi, 5,481,513, Cl. 369-36.000.

Nojima, Takashi: See—  
Saikawa, Satoshi; Suzuki, Tetsuo; Hiramatsu, Soichi; Taniguro, Masa-hiro; Saito, Hiroyuki; Yanagi, Haruyuki; Nojima, Takashi; Kinoshita, Hiroyuki; and Kawakami, Hideaki, 5,480,247, Cl. 400-629.000.

Nolan, Paul; Tovey, H. Jonathan; Stone, Corbett W.; and Gardner, Gregory S., to United States Surgical Corporation. Method of employing surgical suturing apparatus to tie knots. 5,480,406, Cl. 606-139.000.

Nolasco, Daniel A.: See—  
Daigger, Glen T.; Stephenson, Joseph P.; Nolasco, Daniel A.; Stafford, Dalton R.; and Kaupp, Douglas M., 5,480,548, Cl. 210-605.000.

Noltemeyer, Friedrich; Hoppe, Alfred; Müntzenmaier, Jürgen; Rusch, Friedrich; and Karl, Günter, to Mercedes-Benz AG. Two-stroke internal combustion engine. 5,479,894, Cl. 123-74.0AC.

Nomura, Katunori; Anse, Hiroaki; and Yamauchi, Yoshiyuki, to Kabushiki Kaisha Toshiba. Thin strip core for magnetic amplifiers. 5,480,101, Cl. 242-160.400.

Nomura, Toshihiko, to Dow Corning Toray Silicone Co., Ltd. Method for preparation of siloxanyl phosphate. 5,481,015, Cl. 556-405.000.

Nonaka, Yoshiyuki: See—  
Tosaka, Yasuo; Nonaka, Yoshiyuki; and Hoshino, Keiichi, 5,480,767, Cl. 430-358.000.

Nonobe, Masatsugu: See—  
Sugita, Kouji; Kitahara, Tetsuo; Nonobe, Masatsugu; and Fujita, Tsuyosi, 5,480,982, Cl. 536-26.240.

Nonomura, Keisaku: See—  
Shigeta, Mitsuhiko; Nonomura, Keisaku; and Kishimoto, Kazuyuki, 5,481,273, Cl. 345-94.000.

Nonoyama, Meihan; Tanaka, Akiko; and Lai, Patrick K., to Tampa Bay Research Institute. Process for obtaining cellular protein having anti-HIV activity. 5,480,782, Cl. 435-70.300.

Norden, Stanley M., to Raychem Limited. Electrical cable. 5,481,068, Cl. 174-36.000.

Nordholt, Ernst; and Stoffels, Johannes, to Telefonaktiebolaget LM Ericsson. Logarithmic converter. 5,481,218, Cl. 327-350.000.

Nordica S.p.A.: See—  
Pozzebon, Adolfo; Pozzebon, Alessandro; and Morandin, Alessandro, 5,480,287, Cl. 417-53.000.

Nordson Corporation: See—  
Belser, Robert S.; Tark, John R.; and Hall, Charles A., 5,480,589, Cl. 261-76.000.

Buckler, Jeffrey M.; Loparo, Thomas A.; and Waryu, Joseph C., 5,481,260, Cl. 340-870.090.

Norfolk Southern Corporation: See—  
Painter, Thomas P., Jr.; Obenchain, Gary A.; Myers, Morris L.; Christy, Charles S.; and Rhodes, James D., 5,480,112, Cl. 246-410.000.

Noritomi, Katsumi: See—  
Shigemoto, Hiromi; and Noritomi, Katsumi, 5,480,718, Cl. 428-342.000.

Northern Telecom Limited: See—  
Ford, Warwick S.; and Wiener, Michael J., 5,481,613, Cl. 380-30.000.

Northrop Grumman Corporation: See—  
Levy, Alan; Kennedy, James R.; and Papazian, John M., 5,479,829, Cl. 73-823.000.

Northwestern University: See—

Marks, Tobin J.; Yang, Xinmin; and Jia, Li, 5,480,952, Cl. 526-308.000.

Pouet, Bruno F.; Chatters, Tom C.; and Krishnaswamy, Sridhar, 5,481,356, Cl. 356-35.500.

Norvell, Jean, to W. L. Gore & Associates, Inc. Lining material for use with prosthetics and similar devices and method for making and using same. 5,480,455, Cl. 623-36.000.

Nosaka, Shiro; and Kuragano, Tetsuzo, to Sony Corporation. Method for generating free-form surface data. 5,481,659, Cl. 395-123.000.

Nosov, Eugene, to Nebraska Electronics, Inc. Process and apparatus for microwave diagnostics and therapy. 5,481,196, Cl. 324-637.000.

Nosser, Steven E. Safety cap. 5,480,044, Cl. 215-228.000.

Novak, Robert M., to Paragon Electric Company, Inc. Electronic defrost controller with fan delay and drip time modes. 5,479,785, Cl. 62-155.000.

Novalek, Inc.: See—  
Grosman, Bert, 5,479,884, Cl. 119-265.000.

Novinson, Thomas, to United States of America, Navy. Reversible thermo-chromic pigments. 5,480,482, Cl. 106-498.000.

Novo Nordisk A/S: See—  
Wahlthner, Jill A.; Christensen, Bjoern E.; and Schneider, Palle, 5,480,801, Cl. 435-254.300.

Nowak, William J.: See—  
James, Courtney D.; Nowak, William J.; and Shogren, David K., 5,481,142, Cl. 310-51.000.

Noya, Yukio: See—  
Yamasaki, Hidetoshi; Murata, Masae; Noya, Yukio; Yomogita, Yasukazu; Taguchi, Manabu; Yamanaka, Akira; and Sibuya, Naoki, 5,481,514, Cl. 369-36.000.

Noyce, William B.: See—  
Harris, Kevin W.; and Noyce, William B., 5,481,723, Cl. 395-700.000.

NSK Ltd.: See—  
Sakai, Kouichi; Oumi, Hayato; and Suzuki, Hiroshi, 5,480,358, Cl. 474-117.000.

NSM Aktiengesellschaft: See—  
Schulze, Ullrich; Schattauer, Juergen; Heinen, Horst; and Rieck, Konrad, 5,480,158, Cl. 273-434.000.

nuArc Company, Inc.: See—  
Leonhart, Charles J., 5,481,333, Cl. 355-91.000.

Numata, Hiroshi: See—  
Plach, Herbert; Finkenzeller, Ulrich; Reiffenrath, Volker; Poetsch, Eike; Rieger, Bernhard; and Numata, Hiroshi, 5,480,581, Cl. 252-299.630.

Nury, Sylvie: See—  
Richou, Jacques; Grimaldi, Michel; Verger, Robert; Riviere, Claude; Bois, André; and Nury, Sylvie, 5,479,816, Cl. 73-64.480.

Nuttall, Albert H.: See—  
Donald, James B.; Nuttall, Albert H.; and Wilson, James H., 5,481,505, Cl. 367-130.000.

Nuyens, Karin J. M. M.: See—  
Janssen, Marcel A. C.; Van Daele, Georges H. P.; Bosmans, Jean-Paul R. M. A.; Van den Keybus, Frans M. A.; Nuyens, Karin J. M. M.; and Janssen, Paul A. J., 5,480,912, Cl. 514-649.000.

Nyui, Masaru; Igaki, Masahiko; and Ishizuka, Ko, to Canon Kabushiki Kaisha. Encoder with an optical scale and interference of zero and first order diffraction beams. 5,481,106, Cl. 250-237.000.

Oakley, Johana E.; Fox, Kelly B.; Evans, Alvin, Jr.; and Stewart, Wayne S., to Phillips Petroleum Company. Brine viscosification. 5,480,863, Cl. 507-225.000.

Obara, Sanhiro: See—  
Mutoh, Nobuyoshi; Miyazaki, Taizou; Masaki, Ryoso; Ohmae, Tsutomu; and Obara, Sanhiro, 5,481,168, Cl. 318-432.000.

Obel, Martin: See—  
Hoegnelid, Kurt; Thormander, Hans; and Obel, Martin, 5,480,420, Cl. 607-116.000.

Obenchain, Gary A.: See—  
Painter, Thomas P., Jr.; Obenchain, Gary A.; Myers, Morris L.; Christy, Charles S.; and Rhodes, James D., 5,480,112, Cl. 246-410.000.

Ober, Clifford D.: See—  
Rogers, Lisa W.; Kraft, Thomas L.; Berry, John F.; Kelley, Scott A.; Thompson, John A., III; Ober, Clifford D.; Kuchar, Michael C.; Mayer, Robert R., Jr.; Hoskins, Van W.; Weido, Vincent C.; and Henckel, Mark G., 5,480,062, Cl. 221-174.000.

Obersteller, Udo: See—  
Manusch, Christoph; Obersteller, Udo; and Hermmannsen, Wulf, 5,480,510, Cl. 156-577.000.

O'Brien, Dennis J.: See—  
Gaskill, Garold B.; O'Brien, Dennis J.; and Park, Michael C., 5,481,254, Cl. 340-825.520.

Oce-Nederland B.V.: See—  
Reinten, Hans, 5,481,292, Cl. 347-238.000.

Ocean Wash, Inc.: See—  
Dickson, Glen A.; and Gray, Donnie R., 5,480,457, Cl. 8-111.000.

O'Connor, John J.: See—  
Goodfellow, John W.; and O'Connor, John J., 5,480,446, Cl. 623-20.000.

Ocvirk, Magdalena: See—  
Rudman, Rudolf; Bole-Vunduk, Breda; Ocvirk, Magdalena; Lavrič, Bogomila; and Kršich, Igor, 5,480,885, Cl. 514-288.000.

Oda, Kenji: See—  
Mihara, Takashi; Shirasaka, Kazumi; Oda, Kenji; Nakahata, Akinobu; Shinohara, Masahiro; and Sasaki, Wataru, 5,481,348, Cl. 335-290.000.

Oda, Yoshiya: See—

Asakawa, Naoki; Oda, Yoshiya; Yoshida, Yutaka; and Sato, Tadashi, 5,480,542, Cl. 210-198.200.

Ode, Takahiro: See—  
Niwa, Motohiro; Yasui, Tetsuji; and Ode, Takahiro, 5,480,804, Cl. 435-286.100.

Odell, Michael: See—  
Niskanen, Juhani; and Odell, Michael, 5,480,513, Cl. 162-203.000.

Oelbermann, Max, to Rittershaus & Blecher GmbH. Device on filter presses for moving the filter plate which is the foremost at the time. 5,480,543, Cl. 210-230.000.

Oeste, Franz D., to Aalbers, Robert; and Dietrich nee Leye, Olga. Method and apparatus for removing undesirable chemical substances from gases, exhaust gases, vapors, and brines. 5,480,524, Cl. 204-158.200.

Ofsthun, Norma: See—  
Solty, Paul; and Ofsthun, Norma, 5,480,552, Cl. 210-645.000.

Ogata, Kazumi; and Yoshida, Kenichi, to Senju Pharmaceutical Co., Ltd. Method for preserving blood using ascorbic acid tocopheryl phosphate esters. 5,480,773, Cl. 435-2.000.

Ogawa, Hisahito: See—  
Kuratomi, Yasunori; and Ogawa, Hisahito, 5,481,621, Cl. 382-204.000.

Ogawa, Kazuo: See—  
Yano, Shingo; Ohno, Tomoyasu; Ogawa, Kazuo; Yamada, Haruo; Shirasaka, Tetsuhiko; Kawamura, Hiroyuki; and Watanabe, Shinichi, 5,480,899, Cl. 514-376.000.

Ogawa, Koji, to Newlong Machine Works, Ltd. Label supplying apparatus. 5,479,757, Cl. 53-135.100.

Ogawa, Munehiro, deceased (by Yoshihiro Ogawa, Mieke Ogawa, heirs); Iwabuchi, Masato; Sugihara, Hitoshi; Hojo, Saburo; Kinoshita, Masami; Yamashiro, Osamu; Yokomizo, Goichi; and Miyama, Mikako, to Hitachi, Ltd. Mixed mode simulation method and simulator. 5,481,484, Cl. 364-578.000.

Ogawa, Toshiaki, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device having a capacitor. 5,481,127, Cl. 257-308.000.

Ogawa, Yasuaki: See—  
Kamei, Shigeru; Igari, Yasutaka; and Ogawa, Yasuaki, 5,480,868, Cl. 514-15.000.

Okada, Hiroaki; Inoue, Yayoi; and Ogawa, Yasuaki, 5,480,656, Cl. 424-493.000.

Ogawa, Yoshihiro, Mieke Ogawa, heirs: See—  
Ogawa, Munehiro, deceased; Iwabuchi, Masato; Sugihara, Hitoshi; Hojo, Saburo; Kinoshita, Masami; Yamashiro, Osamu; Yokomizo, Goichi; and Miyama, Mikako, 5,481,484, Cl. 364-578.000.

Ogilvie, William F., to CarboMedics, Inc. Integrated heart valve rotator and holder. 5,480,425, Cl. 623-2.000.

Ogino, Hiroyuki, to Matsushita Electric Industrial Co., Ltd. Sleep detecting apparatus. 5,479,939, Cl. 128-782.000.

Ogino, Kazuya; Hayashi, Narutoshi; and Omura, Takashi, to Sumitomo Chemical Company, Limited. Disazo dyes having aminobenzoylamino group. 5,480,977, Cl. 534-717.000.

Ogisu, Yasuhiko: See—  
Ito, Toshiyasu; Ogisu, Yasuhiko; Takahashi, Shigeyuki; Uemura, Toshiya; Nohata, Minoru; Nagaike, Ippai; Noguchi, Shigeru; and Arai, Kenjiro, 5,480,714, Cl. 428-324.000.

Oguchi, Takahiro; and Sakai, Kunihiro, to Canon Kabushiki Kaisha. Recording/reproducing method and apparatus using probe. 5,481,522, Cl. 369-101.000.

Ogura, Akira, to Fuji Jukogyo Kabushiki Kaisha. Electronic control system having master/slave CPUs for a motor vehicle. 5,481,456, Cl. 364-424.010.

Ogura, Masatsune: See—  
Urano, Teruo; Miyaji, Hiroshi; Ogura, Masatsune; Shimoda, Tetsuya; and Ishikawa, Katuaki, 5,480,584, Cl. 252-384.000.

Oguro, Masaki, to Sony Corporation. Recording/reproducing apparatus that handles both digital and analog data and distinguishes between the two. 5,481,415, Cl. 360-69.000.

Ohara, Mamoru: See—  
Hattori, Morishige; Ohara, Mamoru; Okuno, Sumio; Okuto, Koichi; and Irie, Hiroshi, 5,480,729, Cl. 428-593.000.

Ohashi, Ryota: See—  
Kawamura, Masahisa; and Ohashi, Ryota, 5,479,845, Cl. 91-514.000.

Ohashi, Susumu; Tateishi, Hideo; and Fujikura, Toshiaki, to Uniden America Corp.; and Uniden Corporation. Voice tag in a telephone auto-dialer. 5,481,595, Cl. 379-67.000.

Ohata, Tomonori: See—  
Suzuki, Kaoru; Ando, Tadahi; Naka, Hiroshi; Sawada, Mitsutoshi; Ohata, Tomonori; Miura, Hiroshi; Nakabayashi, Masayoshi; and Ando, Eiiti, 5,480,130, Cl. 270-53.000.

Ohata, Toyoharu: See—  
Ikeda, Masao; and Ohata, Toyoharu, 5,481,558, Cl. 372-45.000.

Ohie, Mitsuya: See—  
Tamaki, Takashi; and Ohie, Mitsuya, 5,481,214, Cl. 327-172.000.

Ohkawa, Kouhei: See—  
Oishi, Tetsuya; Ozawa, Hiroshi; Karasawa, Minato; Inomata, Masamitsu; Mega, Izumi; Yamauchi, Atsuyoshi; Kamada, Kazunori; Nakahata, Shigeru; Sakamoto, Katsumi; Nakashima, Tatsunobu; Watanabe, Akito; Suzuki, Jin; Ohkawa, Kouhei; Furusawa, Satoshi; Ono, Hiroshi; and Sugazaki, Kazuo, 5,480,947, Cl. 525-509.000.

Ohlsson, Thomas: See—  
Atarius, Roozbeh; Ohlsson, Thomas; and Soemmo, Leif, 5,479,933, Cl. 128-696.000.

Ohlsson-Wilhelm, Betsy M.: See—

Baker, Margaret A.; and Ohlsson-Wilhelm, Betsy M., 5,480,901, Cl. 514-419.000.

Ohmae, Tsutomu: See—  
Mutoh, Nobuyoshi; Miyazaki, Taizou; Masaki, Ryoso; Ohmae, Tsutomu; and Obara, Sanhiro, 5,481,168, Cl. 318-432.000.

Ohmi, Tadahi: See—  
Mitsumori, Kenichi; Kasama, Yasuhiko; Nakano, Akira; Abe, Akira; and Ohmi, Tadahi, 5,480,563, Cl. 210-748.000.

Ohnishi, Kazuyuki: See—  
Eto, Koichi; Miyaza, Masao; Ohnishi, Kazuyuki; and Tamagaki, Akira, 5,481,375, Cl. 358-450.000.

Ohno, Tomoyasu: See—  
Yano, Shingo; Ohno, Tomoyasu; Ogawa, Kazuo; Yamada, Haruo; Shirasaka, Tetsuhiko; Kawamura, Hiroyuki; and Watanabe, Shinichi, 5,480,899, Cl. 514-376.000.

Ohnuki, Hidebumi: See—  
Murakami, Tomoo; Ohnuki, Hidebumi; Tsunoda, Takanori; and Maniwa, Ryo, 5,480,675, Cl. 427-98.000.

Ohnuma, Manami: See—  
Tajima, Masahiro; Ohnuma, Manami; and Lerner, Ethan L., 5,480,864, Cl. 514-2.000.

Oho, Tatsuya: See—  
Kikkawa, Toshihide; and Oho, Tatsuya, 5,480,833, Cl. 437-126.000.

Ohshima, Katunori: See—  
Kondo, Tetsuya; Murata, Kei; Nagai, Yoshikazu; and Ohshima, Katunori, 5,480,763, Cl. 430-320.000.

Ohshima, Yasushi: See—  
Kouyama, Satoshi; and Ohshima, Yasushi, 5,481,662, Cl. 395-135.000.

Ohta, Eiji: See—  
Udagawa, Yutaka; Funada, Masahiro; Ohta, Ken-ich; Takaragi, Yoichi; Kitamura, Toshiyuki; and Ohta, Eiji, 5,481,377, Cl. 358-501.000.

Ohta, Ken-ich: See—  
Udagawa, Yutaka; Funada, Masahiro; Ohta, Ken-ich; Takaragi, Yoichi; Kitamura, Toshiyuki; and Ohta, Eiji, 5,481,377, Cl. 358-501.000.

Ohtoshi, Hirokazu: See—  
Takei, Tetsuya; Ohtoshi, Hirokazu; Okamura, Ryuji; Katagiri, Hiroyuki; and Takai, Yasuyoshi, 5,480,627, Cl. 430-127.000.

Ohtsu, Masamitsu: See—  
Bannai, Tatsushi; Shibata, Hideaki; Ohtsu, Masamitsu; and Okamoto, Hiroshi, 5,481,412, Cl. 360-18.000.

Ohtsu, Nobuyuki, to Unisia Jecs Corporation. Anti-lock braking system. 5,480,217, Cl. 303-167.000.

Ohya, Akihiro: See—  
Sato, Hiromi; Iwasa, Toyokazu; Ohya, Akihiro; and Nathume, Hiroshi, 5,479,889, Cl. 123-308.000.

Ohzeki, Yukihiro; and Sato, Yasushi, to Canon Kabushiki Kaisha. Image forming apparatus capable of adjusting fixing conditions. 5,481,346, Cl. 355-285.000.

Oikawa, Akiko: See—  
Sato, Toshiya; Oikawa, Akiko; Onose, Katsuyoshi; Yagi, Keiji; and Kitagishi, Tomoji, 5,481,349, Cl. 355-290.000.

Oikawa, Hideaki: See—  
Yamashita, Wataru; Okawa, Yuichi; Oikawa, Hideaki; Asanuma, Tadashi; Ishihara, Yoko; Matsuo, Mitsunori; Yamaguchi, Keizaburo; Yamaguchi, Akihiro; and Tamai, Shoji, 5,480,965, Cl. 528-353.000.

Oishi, Tetsuya; Ozawa, Hiroshi; Karasawa, Minato; Inomata, Masamitsu; Mega, Izumi; Yamauchi, Atsuyoshi; Kamada, Kazunori; Nakahata, Shigeru; Sakamoto, Katsumi; Nakashima, Tatsunobu; Watanabe, Akito; Suzuki, Jin; Ohkawa, Kouhei; Furusawa, Satoshi; Ono, Hiroshi; and Sugazaki, Kazuo, to Mitsui Toatsu Chemicals, Inc. Diganamines and preparation process, derivatives and use thereof. 5,480,947, Cl. 525-509.000.

Oishi, Yoza: See—  
Kume, Katsuya; Oishi, Yoza; Kuramoto, Mitsuo; and Takenoshita, Itsuroh, 5,480,700, Cl. 428-195.000.

Okabe, Masahiro: See—  
Matsumoto, Tomotaka; Inoue, Jun; Ichimura, Teruhiko; Murata, Yuji; Watanabe, Junichi; Nagahiro, Yoshio; Hodate, Mari; Oki, Kenichi; and Okabe, Masahiro, 5,480,818, Cl. 437-40.000.

Okada, Hiroaki; Inoue, Yayoi; and Ogawa, Yasuaki, to Takeda Chemical Industries, Ltd. Prolonged release microcapsules. 5,480,656, Cl. 424-493.000.

Okada, Kazuhisa; Matsura, Kazumi; and Asahi, Nobuo, to Institute for Personalized Information Environment. User interface device for creating an environment of moving parts with selected functions. 5,481,665, Cl. 395-155.000.

Okada, Kenji: See—  
Udagawa, Masaharu; Yasui, Juro; Niwa, Masaaki; Hirai, Yoshihiko; Okada, Kenji; Morimoto, Kiyoshi; and Yuki, Koichiro, 5,480,492, Cl. 134-2.000.

Okada, Kurao: See—  
Fukumoto, Takehiko; Hirokawa, Kazushi; and Okada, Kurao, 5,481,040, Cl. 568-9.000.

Okafor, Ani A.: See—  
Beachy, Shawn A.; Kean, William W.; Morgan, DeCarla J.; and Okafor, Ani A., 5,481,534, Cl. 370-60.000.

Okahara, Hirofumi: See—  
Murakami, Yoshiyasu; Okahara, Hirofumi; Suzuki, Akito; and Maeda, Tsuyoshi, 5,480,361, Cl. 475-328.000.

Okamoto, Hiroshi: See—



- Bannai, Tatsushi; Shibata, Hideaki; Ohtsu, Masamitsu; and Okamoto, Hiroshi, 5,481,412, Cl. 360-18.000.
- Okamoto, Kunihide: See—  
Nagai, Osamu; Okamoto, Kunihide; and Yamamoto, Kaoru, 5,480,011, Cl. 188-299.000.
- Okamura, Akio: See—  
Kimura, Hiromi; Okamura, Akio; Kawaide, Hiroshi; and Yamaura, Takuro, 5,480,781, Cl. 435-52.000.
- Okamura, Ryuji: See—  
Takei, Tetsuya; Ohtoshi, Hirokazu; Okamura, Ryuji; Katagiri, Hiroyuki; and Takai, Yasuyoshi, 5,480,627, Cl. 430-127.000.
- Okatani, Shigetoshi: See—  
Yamasaki, Kazuyuki; Hamaguchi, Yoshihiro; Hosoda, Shunji; Sakata, Kazuyuki; Imai, Takashi; Okatani, Shigetoshi; Nishio, Satoshi; Takahashi, Tuiyoshi; Matuura, Kenji; Tanaka, Noriyuki; Nagayasu, Teruaki; and Makino, Hiroshi, 5,480,537, Cl. 210-96.100.
- Okawa, Yuichi: See—  
Yamashita, Wataru; Okawa, Yuichi; Oikawa, Hideaki; Asanuma, Tadashi; Ishihara, Yuko; Matsuo, Mitsunori; Yamaguchi, Keizaburo; Yamaguchi, Akihiro; and Tamai, Shoji, 5,480,965, Cl. 528-353.000.
- Okayama, Hiroshi; and Ishibashi, Kazuhiro, to Matsushita Electric Industrial Co., Ltd. Magnetic head with metallic magnetic film and protective film means, 5,481,422, Cl. 360-120.000.
- Okazaki, Kouji: See—  
Suzuki, Takahiro; and Okazaki, Kouji, 5,479,817, Cl. 73-115.000.
- Okazaki, Masaki: See—  
Yamazaki, Kazuki; Inoue, Nobuaki; Yamamoto, Seiichi; Ezoe, Toshihide; Sakai, Minoru; Ikeda, Tadashi; Okazaki, Masaki; and Fujiwara, Toshiki, 5,480,886, Cl. 430-264.000.
- Okazaki, Toru: See—  
Suzuki, Teruhiko; Yagasaki, Yoichi; Sudo, Tatsuya; and Okazaki, Toru, 5,481,553, Cl. 371-49.100.
- Oki Electric Industrial Co., Ltd.: See—  
Shizuo, Nagata; Yasuhiro, Suzuki; Tutomu, Tabata; and Masahiro, Takahashi, 5,481,526, Cl. 369-124.000.
- Oki Electric Industry Co., Ltd.: See—  
Jinbo, Hideyuki; and Yamashita, Yoshio, 5,480,746, Cl. 430-5.000.
- Kai, Yoshihide; Tanigawa, Hiroya; and Wakahara, Toshihiko, 5,481,677, Cl. 395-280.000.
- Tamaki, Takashi; and Ohie, Mitsuya, 5,481,214, Cl. 327-172.000.
- Oki, Kenichi: See—  
Matsumoto, Tomotaka; Inoue, Jun; Ichimura, Teruhiko; Murata, Yuji; Watanabe, Junichi; Nagahiro, Yoshio; Hodate, Mari; Oki, Kenichi; and Okabe, Masahiro, 5,480,818, Cl. 437-40.000.
- Okoshi, Shinichi; and Kimura, Hiroyuki, to Shin-Etsu Quartz Products Co. Ltd. Vertical heat-treating apparatus and heat insulator, 5,480,300, Cl. 432-241.000.
- Okubo, Akio: See—  
Watanabe, Fumihiko; Okubo, Akio; Saito, Atsushi; and Shinada, Yasuyuki, 5,481,283, Cl. 347-33.000.
- Watanabe, Fumihiko; Okubo, Akio; Saito, Atsushi; and Shinada, Yasuyuki, 5,481,290, Cl. 347-104.000.
- Okubo, Yukitoshi; Santoh, Tsuyoshi; Tamura, Miki; Mihara, Chieko; Sugata, Hiroyuki; Kanome, Osamu; and Yashima, Masataka, to Canon Kabushiki Kaisha. Optical recording medium substrate sheet producing apparatus having roll stamper with elastomer layer of predetermined hardness, 5,480,596, Cl. 264-1.330.
- Okumura, Yoshinobu; Yang, Xingbo; and Endo, Isao, to Kubota Corporation. Metal thin film magnetic recording medium, 5,480,733, Cl. 428-694.00T.
- Okuno, Sumio: See—  
Hattori, Morishige; Ohara, Mamoru; Okuno, Sumio; Okuto, Koichiro; and Irie, Hiroshi, 5,480,729, Cl. 428-593.000.
- Okuno, Yasuhiro; Yamakawa, Tadashi; Nagashima, Masaaki; and Sasaki, Takayuki, to Canon Kabushiki Kaisha. Detecting rewriting of stored data, using codes based on password and the stored data, 5,481,672, Cl. 395-188.010.
- Okuto, Koichiro: See—  
Hattori, Morishige; Ohara, Mamoru; Okuno, Sumio; Okuto, Koichiro; and Irie, Hiroshi, 5,480,729, Cl. 428-593.000.
- Oldham, Michael L.; and Buxton, Gerald L., to AT&T Corp. Circuit pack with light pipes, 5,481,440, Cl. 362-32.000.
- Olikara, Philip: See—  
Reed, David G.; and Olikara, Philip, 5,479,678, Cl. 16-325.000.
- Oliver, H. Edwin: See—  
Beaudoin, Armand J.; Bryant, J. Daniel; Janousek, Alan J.; Kamat, Rajeev G.; Oliver, H. Edwin; and Ramage, Robert M., 5,480,498, Cl. 148-549.000.
- Olympus Optical Co., Ltd.: See—  
Kashima, Shingo; and Hayashi, Shinichi, 5,481,393, Cl. 359-227.000.
- Kita, Nobuhiro; Kashima, Shingo; and Shimizu, Kazuo, 5,481,401, Cl. 359-353.000.
- Watanabe, Hitoshi; Kuroda, Yoshimi; and Tadokoro, Kaoru, 5,481,490, Cl. 365-145.000.
- Yamasaki, Masafumi, 5,481,330, Cl. 354-412.000.
- Omura, Takashi: See—  
Ogino, Kazuya; Hayashi, Narutoshi; and Omura, Takashi, 5,480,977, Cl. 534-717.000.
- Onarato, Michael F.: See—  
Pearson, Gregory; Melhorn, Nathan R.; Onarato, Michael F.; and Richards, Craig A., 5,481,562, Cl. 375-222.000.
- Onda, Hiroyuki: See—  
Kato, Hisaki; Kimura, Suenori; Nakatsugawa, Kiyoshi; Uchino, Tsuguo; Ozawa, Itsuo; and Onda, Hiroyuki, 5,481,158, Cl. 313-533.000.
- Yoshimoto, Kyosuke; Nakajima, Yoshiki; Koyanagi, Kimiyuki; Ito, Osamu; Mashimo, Akira; Onda, Hiroyuki; Kobayashi, Yutaka; and Yamana, Koji, 5,481,517, Cl. 369-44.280.
- Onda, Takayuki: See—  
Kobayashi, Yutaka; Aoki, Osamu; Hamabe, Kenji; Takeuchi, Atsushi; and Onda, Takayuki, 5,480,932, Cl. 524-451.000.
- Onders, James P.: See—  
Litin, Michael H.; Milliken, John O.; and Onders, James P., 5,480,191, Cl. 280-831.000.
- Ong, Chiau-Chieh: See—  
Edelen, Stephen A.; Hussain, Syed F.; and Ong, Chiau-Chieh, 5,481,170, Cl. 318-650.000.
- Onishi, Ken: See—  
Takada, Yukari; Onishi, Ken; and Hongo, Kimitoshi, 5,481,414, Cl. 360-64.000.
- Ono, Hiroshi: See—  
Oishi, Tetsuya; Ozawa, Hiroshi; Karasawa, Minato; Inomata, Masamitsu; Mega, Izumi; Yamauchi, Atsuyoshi; Kamada, Kazunori; Nakahata, Shigeru; Sakamoto, Katsumi; Nakashima, Tatsunobu; Watanabe, Akito; Suzuki, Jin; Ohkawa, Kouhei; Furusawa, Satoshi; Ono, Hiroshi; and Sugazaki, Kazuo, 5,480,947, Cl. 525-509.000.
- Ono Pharmaceutical Co., Ltd.: See—  
Hamanaka, Nobuyuki; Takahashi, Kanji; and Tokumoto, Hidekado, 5,480,998, Cl. 546-333.000.
- Ono, Takeshi: See—  
Ishida, Yasushi; Yokoyama, Minoru; Tomoda, Akihiro; Yamada, Masakatsu; Arai, Takashi; Yoshida, Takehiro; Kobayashi, Makoto; Wada, Satoshi; Ono, Takeshi; and Takeda, Tomoyuki, 5,481,291, Cl. 347-217.000.
- Onose, Katsuyoshi: See—  
Satoh, Toshiya; Oikawa, Akiko; Onose, Katsuyoshi; Yagi, Keiji; and Kitagishi, Tomoji, 5,481,349, Cl. 355-290.000.
- Onstad, Gregory W.: See—  
Mohapatra, Sarat K.; Viglienzoni, Alfredo G.; and Onstad, Gregory W., 5,480,766, Cl. 430-348.000.
- Ooms, William J.: See—  
Abrokwa, Jonathan K.; Huang, Jenn-Hwa; and Ooms, William J., 5,480,829, Cl. 437-57.000.
- Opar, Mark A. Greeting card display apparatus or the like, 5,480,036, Cl. 211-45.000.
- Optical Sensors Incorporated: See—  
Klainer, Stanley M.; Walt, David R.; and Gottlieb, Amos J., 5,480,723, Cl. 428-441.000.
- O'Rand, Michael G.; Widgren, Esther E.; Richardson, Richard T.; and Lea, Isabel A., to University of North Carolina at Chapel Hill, The. Sperm antigen corresponding to a sperm zona binding protein autoantigenic epitope, 5,480,799, Cl. 435-252.300.
- Orenco Systems, Inc.: See—  
Ball, Harold L.; Ball, Eric S.; Ball, Jeffrey L.; and Bounds, Terry R., 5,480,561, Cl. 210-744.000.
- Oriental Yeast Company, Ltd.: See—  
Sugita, Kouji; Kitahara, Tetsuo; Nonobe, Masatsugu; and Fujita, Tsuyosi, 5,480,982, Cl. 536-26.240.
- Ormc Corporation: See—  
Farzin-Nia, Farrokh; and Otsen, William R., 5,480,301, Cl. 433-9.000.
- Orr, Carl C.; Caradonna, John; Edmundson, Robert J.; and Jacks, Terry C., to Maybelline, Inc. Non-aqueous cosmetic compositions with high solids content, 5,480,632, Cl. 424-63.000.
- Ortar, Agnès: See—  
Caubere, Paul; Fort, Yves; and Ortat, Agnès, 5,481,012, Cl. 549-531.000.
- Orvik, Jon A.; and Shiang, Dawn, to DowElanco. 2-Alkoxy-4-hydroxypyrimidine compounds and their use in the preparation of 5-alkoxy-1,2,4-triazolo[4,3-c]pyrimidine-3(2H)-thione compounds, 5,480,991, Cl. 544-263.000.
- Osada, Mitsuo: See—  
Kohmoto, Kenichiro; and Osada, Mitsuo, 5,481,136, Cl. 257-712.000.
- Osato, Yoichi; Kawade, Hisaaki; Fujii, Eiichi; Kasama, Nobuhiro; and Kobayashi, Tadashi, to Canon Kabushiki Kaisha. Magneto-optical recording medium allowing overwriting with two or more magnetic layers and recording method utilizing the same, 5,481,410, Cl. 360-13.000.
- Osborne, Harold G., to Alba-Waldensian, Inc. Brassiere blank, brassiere and methods of making same, 5,479,791, Cl. 66-171.000.
- Osborne, William E.; and Blazek, Timothy V., to Martin Firearms Company, The. Firearm barrel assembly, 5,479,737, Cl. 42-76.010.
- Ose, Youichi: See—  
Takada, Yasuaki; Sakairi, Minoru; Hirabayashi, Atsumu; and Ose, Youichi, 5,481,107, Cl. 250-281.000.
- Osteotech, Inc.: See—  
Bakker, Dirkjan; Bakum, Erica A.; and van Blitterswijk, Clemens A., 5,480,436, Cl. 623-11.000.
- Osterhoudt, Hans W.: See—  
Jadwin, Thomas A.; Osterhoudt, Hans W.; Spence, John M.; and Tyagi, Dinesh, 5,480,757, Cl. 430-110.000.
- Ostermeyer, Walter H. Flavored musical instrument reeds, 5,479,842, Cl. 84-383.00A.
- Ostresh, John M.: See—  
Houghten, Richard A.; Ostresh, John M.; and Blondelle, Sylvie, 5,480,971, Cl. 530-328.000.
- Otis Elevator Company: See—

- Bittar, Joseph, 5,480,005, Cl. 187-383.000.
- Kameli, Nader; and Collins, James M., 5,480,006, Cl. 187-383.000.
- Otsen, William R.: See—  
Farzin-Nia, Farrokh; and Otsen, William R., 5,480,301, Cl. 433-9.000.
- Otsuka, Naoki; Yano, Kentaro; Takahashi, Kiichiro; Arai, Atsushi; Nishikori, Hitoshi; and Iwasaki, Osamu, to Canon Kabushiki Kaisha. Ink jet recording apparatus and method capable of performing high-speed recording, 5,481,281, Cl. 347-12.000.
- Otsuka Pharmaceutical Co., Ltd.: See—  
Yamasaki, Katsuya; Sakurai, Kazushi; and Akiyama, Kazuo, 5,480,891, Cl. 514-312.000.
- Otsuka Pharmaceutical Factory, Inc.: See—  
Shoji, Yasuo; Tsuda, Yoshihiko; Tsutsumi, Kazuhiko; and Inoue, Yasuhide, 5,480,874, Cl. 514-80.000.
- Otten, Lynn M., to Medtronic, Inc. Lead with stylet capture member, 5,480,421, Cl. 607-122.000.
- Otto, Jürgen: See—  
Heming, Martin; Hochhaus, Roland; Kersten, Ralf; Krause, Dieter; Otto, Jürgen; Paquet, Volker; Segner, Johannes; and Fattinger, Christof, 5,480,687, Cl. 427-573.000.
- Oumi, Hayato: See—  
Sakai, Kouichi; Oumi, Hayato; and Suzuki, Hiroshi, 5,480,358, Cl. 474-117.000.
- Outboard Marine Corporation: See—  
Brown, Peter W., 5,480,330, Cl. 440-38.000.
- Owada, Naoko: See—  
Seri, Hajime; Yamamura, Yasuhiro; Tsuji, Yoichiro; Owada, Naoko; and Iwaki, Tsutomu, 5,480,740, Cl. 429-59.000.
- Owen, Aubrey J., Jr.; and St. Louis, Henry E., Jr., to Owen, Jr., Aubrey J. Basketball practice assembly, 5,480,139, Cl. 273-1.50R.
- Owens-Illinois Plastic Products Inc.: See—  
Robinson, Gerald R., 5,480,028, Cl. 206-511.000.
- Owens, Leslie D.; Jueneman, Robert R.; Worrest, Ralph; and Davis, Alvah B., to GTE Laboratories Incorporated. Method and apparatus for entity authentication, 5,481,611, Cl. 380-25.000.
- Owski, Alexander J.: See—  
Van Hout, James E.; Owski, Alexander J.; Mangiapane, Anthony J.; and Briggs, Charles T., III, 5,479,823, Cl. 73-579.000.
- Owton, William M.: See—  
Brunavs, Michael; Dell, Colin P.; Dobson, David R.; Gallagher, Peter T.; Hicks, Terence A.; Owton, William M.; and Smith, Colin W., 5,480,873, Cl. 514-33.000.
- Oyabu, Masanori: See—  
Kato, Keiichi; Imai, Keisuke; Oyabu, Masanori; Kouda, Yasuhiko; Isomura, Makoto; Nezaki, Takuya; and Watanabe, Koh, 5,480,104, Cl. 242-374.000.
- Oyama, Fumihiko: See—  
Kawai, Yoshinari; Oyama, Fumihiko; and Yamagishi, Mikio, 5,479,745, Cl. 52-126.600.
- Oyama, Hiroshi, to Nissan Motor Co., Ltd. Automotive instrument panel installation arrangement and method for mounting, 5,479,693, Cl. 29-469.000.
- Ozaki, Hidetoshi, to Victor Company of Japan, Ltd. Frequency demodulating apparatus with inversion compensation, 5,481,368, Cl. 358-336.000.
- Ozawa, Hiroshi: See—  
Oishi, Tetsuya; Ozawa, Hiroshi; Karasawa, Minato; Inomata, Masamitsu; Mega, Izumi; Yamauchi, Atsuyoshi; Kamada, Kazunori; Nakahata, Shigeru; Sakamoto, Katsumi; Nakashima, Tatsunobu; Watanabe, Akito; Suzuki, Jin; Ohkawa, Kouhei; Furusawa, Satoshi; Ono, Hiroshi; and Sugazaki, Kazuo, 5,480,947, Cl. 525-509.000.
- Ozawa, Itsuo: See—  
Kato, Hisaki; Kimura, Suenori; Nakatsugawa, Kiyoshi; Uchino, Tsuguo; Ozawa, Itsuo; and Onda, Hiroyuki, 5,481,158, Cl. 313-533.000.
- Ozawa, Tadashi: See—  
Tanaka, Motoyuki; Hatano, Yasunori; and Ozawa, Tadashi, 5,481,150, Cl. 310-249.000.
- Ozzie's Pipeline Padder, Inc.: See—  
Bishop, William B., 5,479,726, Cl. 37-142.500.
- Pacesetter, Inc.: See—  
Mouchawar, Gabriel; McClure, Kelly H.; and Moberg, Sheldon B., 5,480,412, Cl. 607-6.000.
- Pacific Communication Sciences, Inc.: See—  
Balachandran, Kumar; and Quick, Roy F., Jr., 5,481,571, Cl. 375-347.000.
- Pacione, Joseph R., to Tac-Fast Systems SA. Method of installing looped backed carpet, 5,479,755, Cl. 52-746.100.
- Pacomex Co. Ltd.: See—  
Luu, Lu V., 5,480,311, Cl. 439-100.000.
- Paige Innovations Inc.: See—  
Dickie, Robert G.; Gatien, Larry W.; and Wiltshire, Suzanne J., 5,481,442, Cl. 362-95.000.
- Paik, Joon-ki: See—  
Park, Sung-wook; and Paik, Joon-ki, 5,481,304, Cl. 348-240.000.
- Painter, Thomas P., Jr.; Obenchain, Gary A.; Myers, Morris L.; Christy, Charles S.; and Rhodes, James D., to Norfolk Southern Corporation. Railroad switch stand having improved handle means, 5,480,112, Cl. 246-410.000.
- Pajerski, A. Victor: See—  
Patrick, Edward P.; and Pajerski, A. Victor, 5,481,084, Cl. 219-123.000.
- Pal, Debajyoti, to AT&T Corp. Method and apparatus for channel equalization, 5,481,565, Cl. 375-232.000.
- Palagi, Greg: See—  
Jackson, Michael L.; Abbate, Robert J.; Sopich, Nicholas J.; Moeller, Raymond J., Jr.; Hodapp, Mark; and Palagi, Greg, 5,480,939, Cl. 525-120.000.
- Palitex Project-Company GmbH: See—  
Ballhausen, Ulrich; Franzen, Gustav; Lorenz, Rainer; Lossa, Ulrich; and Spix, Guido, 5,479,771, Cl. 57-406.000.
- Palka, Cynthia L.: See—  
Malamas, Michael S.; Palka, Cynthia L.; and Gunawan, Iwan, 5,480,896, Cl. 514-364.000.
- Pall Corporation: See—  
Degen, Peter J.; Mischenko, John, III; Kesting, Robert E.; Bilich, Moira H.; and Staff, Trevor A., 5,480,554, Cl. 210-651.000.
- Williamson, Kenneth M.; Whitney, Scott A.; and Rausch, Alan R., 5,480,547, Cl. 210-533.000.
- Palmer, John M.: See—  
Gambrell, Jeffrey S.; Hutchings, William F.; Markle, Stephen L.; Schutte, Marlin; and Palmer, John M., 5,480,228, Cl. 366-273.000.
- Palmieri, Herman D.; and Gutwerk, Martin. Broadcast system for a facility, 5,481,478, Cl. 364-514.00R.
- Pan, David H.: See—  
Badesha, Santokh S.; Heeks, George J.; Henry, Arnold W.; Pan, David H.; Fratangelo, Louis D.; and Ferguson, Robert M., 5,480,938, Cl. 525-104.000.
- Panasonic Technologies, Inc.: See—  
Douglass, Frederick; Marsh, Brian D.; and Krishnan, Parameshwaran, 5,481,733, Cl. 395-750.000.
- Pankonin, Bradley M.: See—  
Williams, Paul; and Pankonin, Bradley M., 5,479,825, Cl. 73-644.000.
- Pannier, Michèle: See—  
Chudoba, Pavel; and Pannier, Michèle, 5,480,551, Cl. 210-616.000.
- Papaluca, Vincent, to Entapack Pty. Ltd. Bulk container having flexible inner container and rigid outer container, 5,480,057, Cl. 220-403.000.
- Papazian, John M.: See—  
Levy, Alan; Kennedy, James R.; and Papazian, John M., 5,479,829, Cl. 73-823.000.
- Papez, Thomas W.: See—  
Skaalen, Peter L., Jr.; Papez, Thomas W.; and Scheunemann, Roy A., 5,480,605, Cl. 264-234.000.
- Paquet, Volker: See—  
Heming, Martin; Hochhaus, Roland; Kersten, Ralf; Krause, Dieter; Otto, Jürgen; Paquet, Volker; Segner, Johannes; and Fattinger, Christof, 5,480,687, Cl. 427-573.000.
- Paragon Electric Company, Inc.: See—  
Novak, Robert M., 5,479,785, Cl. 62-155.000.
- Parise, Vital A.; Letorey, Joseph A. P. M.; and Leveque, Patrick M. G., to Moulinex (Societe Anonyme). Process for allocating addresses to newly connected apparatus in a domestic network controlled by a master controller, 5,481,750, Cl. 395-800.000.
- Park, Michael C.: See—  
Gaskill, Garold B.; O'Brien, Dennis J.; and Park, Michael C., 5,481,254, Cl. 340-825.520.
- Park, Nam-sin; and Choi, Seon-jeong, to Samsung Display Devices Co., Ltd. Method for making a field emission device, 5,480,843, Cl. 437-228.000.
- Park, No-Kyun: See—  
Kim, Bum-Tae; Min, Yong-Ki; Park, No-Kyun; Kim, Tae-Jun; and Cho, Kwang-Yun, 5,481,034, Cl. 562-507.000.
- Park Square, Inc.: See—  
Davey, Kent R., 5,481,146, Cl. 310-90.500.
- Park, Sung-wook; and Paik, Joon-ki, to Samsung Electronics Co., Ltd. Apparatus for zooming a digital video signal of a predetermined color order which is derived from a charge-coupled device, 5,481,304, Cl. 348-240.000.
- Parker, A. Bruce: See—  
Duback, Jeffrey E.; Vaught, Eric D.; and Parker, A. Bruce, 5,480,376, Cl. 602-8.000.
- Parker, Allen R.: See—  
Anderson, Karl F.; and Parker, Allen R., 5,481,199, Cl. 324-705.000.
- Parker, David M.; Foss, David T.; Lowe, Perry E.; and Ames, David J., to Westinghouse Electric Corporation. Gas turbine combustor, 5,479,782, Cl. 60-747.000.
- Parker, Kevin J.: See—  
Higgins, Joseph; Everbach, E. Carr; and Parker, Kevin J., 5,479,932, Cl. 128-671.000.
- Parker Medical Associates: See—  
Duback, Jeffrey E.; Vaught, Eric D.; and Parker, A. Bruce, 5,480,376, Cl. 602-8.000.
- Parker, Phillip M.: See—  
Douglas, Homer; Aberle, Marshall L.; Parker, Phillip M.; Pinch, Daniel R.; and Schwartzkopf, Robert A., 5,480,211, Cl. 297-174.000.
- Parkes, John J., Jr., to Motorola, Inc. Low-voltage intermediate frequency amplifier providing automatic gain control of a source amplifier, 5,481,226, Cl. 330-279.000.
- Parkinson's Charitable Trust: See—  
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- Precision Dynamics Corporation: See—  
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- Predkelis, John: See—  
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- Prevorsek, Dusan C.: See—  
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- Price, Peter D.: See—  
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- Prideco, Inc.: See—  
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- Priest, Mark D.: See—  
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- Prinsloo, Willem J. C.: See—  
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- Prodifa (S.A.R.L.): See—  
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- Profit Improvement and Engineering Limited: See—  
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- Progressive Tool & Industries Co.: See—  
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- Proia, Cataldo. Powered, automatic, self-tracking system for the rear axles of trucks, trailers and buses. 5,479,999, Cl. 180-24.010.
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- PSI: See—  
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- Puckette, Charles M.: See—  
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- Puller, Alonzo L. Baseball cap carrying bag. 5,480,023, Cl. 206-8.000.
- Pullin, Edward J.: See—  
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- Pulver, Mark: See—  
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- Pulvirenti, Francesco: See—  
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- Punzalan, Rubio R.: See—  
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- Pupic, Nikola: See—  
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- Purdue Research Foundation: See—  
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- Purdy, Mark J.: See—  
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- Putnam, Daniel: See—  
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- PVI Industries, Inc.: See—  
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- Pytlewski, Walter W. Hand trowel assembly. 5,479,675, Cl. 15-235.400.
- Qian, Yao-Jin: See—  
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- Queen, Lorne; and Queen, Kevin. Inflatable emergency shelter. 5,479,743, Cl. 52-2.220.
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- Quickie Designs Inc.: See—  
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- Rae, Steven P. Portable table apparatus. 5,479,866, Cl. 108-44.000.
- Raff Enterprises, Inc.: See—  
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- Rahbari, Homayoon: See—  
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- Rajanbabu, Thaliyil V.: See—  
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- Rajaram, Raj R.; Hayes, John W.; Ansell, Graham P.; and Hatcher, Helen A., to Johnson Matthey Public Limited Company. Catalyst. 5,480,854, Cl. 502-304.000.
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- Ramage, Robert M.: See—  
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- Ramakrishnan, K. K.: See—  
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- Rambert, Andre: See—  
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- Ramsden, Gary W., to U-Ship, Inc. System for collecting and shipping items. 5,481,464, Cl. 364-464.030.
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- Randall, John R., Jr.: See—  
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- Rang, Harald: See—  
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- Ransom, Woodbury S. Baling apparatus and method. 5,479,766, Cl. 56-341.000.
- Rantala, Börje T., to Instrumentarium Corporation. Method and apparatus for analyzing a sample. 5,479,923, Cl. 128-632.000.
- Rao, Balbir S.: See—  
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- Rao, Nagaraja P.: See—  
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- Rapp, Martin L.: See—  
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- Raudenbush, Werner T.: See—  
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- Rausch, Alan R.: See—  
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- Ravenscroft, Adrian C.; and Roberts, George T., to Boston Scientific Corporation. Prosthesis delivery. 5,480,423, Cl. 623-1.000.
- Raychem Corporation: See—  
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- Raychem Limited: See—  
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- Rehn, Patty. Method and apparatus for detecting mercury vapor content of unconsolidated porous materials. 5,479,814, Cl. 73-19.010.
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- Reiff, David E.: See—  
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- Reiffenrath, Volker: See—  
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- Reisch, Michael; and Ziemann, Klaus, to Siemens Aktiengesellschaft. Method for restoring a prescribed sequence for unordered cell streams in ATM switching technology. 5,481,536, Cl. 370-60.100.
- Reisinger, William S.: See—  
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- Reliance Medical Products, Inc.: See—  
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- Richardson, Brian: See—  
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- Richardson, Joel A.; Poppe, Wassily; Bolton, Benjamin A.; and Paschke, Edward E., to Amoco Corporation. Polycondensation apparatus. 5,480,616, Cl. 422-134.000.
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- Richou, Jacques; Grimaldi, Michel; Verger, Robert; Riviere, Claude; Bois, André; and Nury, Sylvie, to Université de Toulon et du Var, Laboratoire d'Optoelectronique. Method of physical-chemical analysis based on the control of interface tensions, and corresponding apparatus. 5,479,816, Cl. 73-64.480.
- Richter, David E.; Patten, Jay C.; and Blomgren, James S., to Exponential Technology, Inc. Emulating operating system calls in an alternate instruction set using a modified code segment descriptor. 5,481,684, Cl. 395-375.000.
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- Taddei, Renzo; and Roda, Franco, 5,480,090, Cl. 229-162.000.
- Rodel, Inc.: See—
- Cook, Lee M.; Loncki, Scott B.; and Brancaloni, Gregory, 5,480,476, Cl. 106-3.000.
- Rodriguez, Carlos E.: See—
- Mueller, Steve; Meyers, Scott; Lambach, Chris; Stern, Glenn; Cochenet, Joseph; Werth, John T., III; Rodriguez, Carlos E.; Wozniak, John N.; Hintz, John; Hansen, Richard W.; and Trotter, Steve, 5,481,193, Cl. 324-379.000.
- Roegner, Jerry J. Refrigerant recovery system. 5,479,788, Cl. 62-292.000.
- Roehm GmbH Chemische Fabrik: See—
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- Rogers, John T.: See—
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- Rogers, Lisa W.; Kraft, Thomas L.; Berry, John F.; Kelley, Scott A.; Thompson, John A., III; Ober, Clifford D.; Kuchar, Michael C.; Mayer, Robert R., Jr.; Hoskins, Van W.; Weido, Vincent C.; and Henckel, Mark G., to KVM Technologies, Inc. Vacuum operated medicine dispenser. 5,480,062, Cl. 221-174.000.
- Rogers, Ralph R. Side dump trailer. 5,480,214, Cl. 298-17.600.
- Rogerson, Zebulon W., to Jagtiani, Ajay A. Golf round timing device. 5,481,093, Cl. 235-78.000.
- Rohm and Haas Company: See—
- Eisenhart, Eric K.; Graziano, Louis C.; and Lalas, Jose P., 5,480,720, Cl. 428-414.000.
- Rohm Co., Ltd.: See—
- Shimokata, Akihiro; Fujii, Yasuhisa; and Fujimoto, Hisayoshi, 5,479,685, Cl. 29-25.350.
- Rohrbaugh, Mark E.; and Carbolante, Francesco, to SGS-Thomson Microelectronics, Inc. Amplifier and method for detecting the beam of a coil of a polyphase sensorless DC motor. 5,481,167, Cl. 318-254.000.
- Rokey, Galen J., to Wenger Manufacturing, Inc. Extruded high soluble protein animal feed and method of preparing same. 5,480,673, Cl. 426-635.000.
- Roll, Richard A.; and Shahid, Muhammed A., to AT&T Corp. Techniques for stripping optical fiber encapsulants. 5,481,638, Cl. 385-134.000.
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- Fowler, John O.; and Richardson, Brian, 5,479,705, Cl. 29-889.720.
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- Romano, Antonio, to Campagnolo S.r.l. Control device of a bicycle gear change. 5,479,776, Cl. 74-502.200.
- Romeo, David J.: See—
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- Romero, Guillermo L.; and Pinder, Brent W., to Motorola, Inc. Electronic device assembly and method for making. 5,480,727, Cl. 428-539.500.
- Ronald P. Burch & Associates Limited: See—
- Burch, Ronald P.; and Koltz, Irving M., 5,479,732, Cl. 40-124.100.
- Ronen, Itamar: See—
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- Rood, Dennis D.: See—
- Robison, Clark E.; and Rood, Dennis D., 5,479,991, Cl. 166-387.000.
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- Rose, Thomas W.: See—
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- Rosemont Inc.: See—
- Voegelé, Kevin D.; Lancot, Jane B.; and Westfield, Brian L., 5,481,200, Cl. 324-718.000.
- Rosenbach, Karlhans; and Ziegenbein, Jochen, to Atlas Elektronik GmbH. Method and device for determining target speed and distance with frequency modulated pulses. 5,481,504, Cl. 367-101.000.
- Rosfjord, Thomas J.: See—
- McCoomb, Edward J.; Rosfjord, Thomas J.; Ross, Michael P.; Snyder, Timothy S.; and Lozyiak, Steven A., 5,479,773, Cl. 60-39.320.
- Ross, Anselmo, to Injection Footwear Corp. Apparatus for precision manufacture. 5,480,297, Cl. 425-119.000.
- Ross, Danny E.; Reiff, David E.; and Murray, John F., to Motorola, Inc. Interconnection of a speaker using magnetic coupling. 5,481,618, Cl. 381-205.000.
- Ross, Michael P.: See—
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- Rössler, Markus: See—
- Müller, Martin; Stern, Gerhard; and Rössler, Markus, 5,481,035, Cl. 564-61.000.
- Rotatrol AG: See—
- Bey, Roger, 5,480,123, Cl. 251-305.000.
- Roth, Michael; Schneider, Karl; Liebich, Ernst; Dirmeyer, Josef; Wagner, Egbert; and Moerkner, Peter, to Siemens Aktiengesellschaft. Filter plug connector having a shield housing. 5,480,328, Cl. 439-607.000.
- Roth, Roger R.: See—
- Juntunen, Robert D.; and Roth, Roger R., 5,479,812, Cl. 73-3.000.
- Roth, Scott S.; McFadden, William C.; and Pepe, Alexander J., to Motorola, Inc. Method of making a vertically formed neuron transistor having a floating gate and a control gate and a method of formation. 5,480,820, Cl. 437-43.000.
- Roth, Violette: See—
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- Rotini, Leone G.: See—
- Marchi, Egidio; and Rotini, Leone G., 5,480,650, Cl. 424-464.000.
- Rotolo, Robert H.; Swenson, Charles B.; and Fine, Dale R., to MDT Corporation. Non-recirculating collection system for sterilizer effluent. 5,480,623, Cl. 422-295.000.
- Rouet, Patrice: See—
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- Rouget, Gabrielle: See—
- Rouget, Pierre; and Rouget, Gabrielle, 5,479,734, Cl. 40-373.000.
- Rouget, Pierre; and Rouget, Gabrielle. Device for individualizing vertically stored documents, for the purposes of locating and identifying them. 5,479,734, Cl. 40-373.000.
- Rouhier, Maurice; and Striebig, Jean-Louis, to Framatome Connectors International. Socket suitable for remote manipulation and plug-socket system comprising it. 5,480,321, Cl. 439-374.000.
- Roy, Apurba: See—
- Grader, Gideon S.; Johnson, David W., Jr.; Roy, Apurba; and Thomson, John, Jr., 5,479,695, Cl. 29-602.100.
- Rozelle, Paul F.: See—
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- Rubbermaid Commercial Products, Inc.: See—
- Fuller, John M.; and Boothby, Scott A., 5,480,180, Cl. 280-656.000.
- Rubino, Michael; and Berg, Michael, to Sensible Products, Inc. Pulling tool. 5,479,688, Cl. 29-259.000.
- Ručman, Rudolf; Bole-Vunduk, Breda; Ocivirk, Magdalena; Lavrič, Bogomila; and Kršic, Igor, to Lek, Tovarna Farmaceutskih in Kemicalnih. Ergoline derivatives of 1-propylamine, a process for the manufacture thereof and the use thereof for medicaments. 5,480,885, Cl. 514-288.000.
- Rudder, Ronald A.; Hudson, George C.; Hendry, Robert C.; Markunas, Robert J.; and Mantini, Michael J., to Research Triangle Institute. Process and apparatus for chemical vapor deposition of diamond films using water-based plasma discharges. 5,480,686, Cl. 427-562.000.
- Rudolph, James W.; Purdy, Mark J.; and Bok, Lowell D., to B. F. Goodrich Company, The. Apparatus for use with CVD/CVD processes. 5,480,678, Cl. 427-248.100.
- Rudolph, Werner: See—
- Braun, Max; Eicher, Johannes; Rudolph, Werner; and Eichholz, Kerstin, 5,481,029, Cl. 560-234.000.
- Ruefer, Bruce G. Nano-porous PTFE biomaterial. 5,480,711, Cl. 428-315.500.
- Ruehl, John W.: See—
- Foster, L. Dale; and Ruehl, John W., 5,479,666, Cl. 5-624.000.
- Ruehle, Walter; Nguyen, Ngoc-Thach; Binnenwies, Arno-Albert; and Schuette, Hartmut, to Robert Bosch GmbH. Engaging relay for the starter of an internal combustion engine. 5,481,236, Cl. 335-126.000.
- Ruf, Wolf-Dieter: See—
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- Runcio, Teri. Privacy covering for nursing mothers. 5,479,662, Cl. 7-104.000.
- Ruppel, Irving R.: See—
- Tenhover, Michael A.; and Ruppel, Irving R., 5,480,695, Cl. 428-65.500.
- Ruptured and Crippled, Maintaining the Hospital for Special Surgery, New York Society for the Relief of the See—
- Friedman, Steven M.; Crow, Mary K.; and Posnett, David, 5,480,895, Cl. 435-7.240.
- Rusch, Friedrich: See—
- Noltemeyer, Friedrich; Hoppe, Alfred; Münzenmaier, Jürgen; Rusch, Friedrich; and Karl, Günter, 5,479,894, Cl. 123-74.0AC.
- Rusconi, David M., to Triangle Engineered Products Co. Dual valve engine protective device. 5,479,895, Cl. 123-41.150.
- Russell, David C. Ergonomic customizable user/computer interface devices. 5,481,265, Cl. 341-22.000.
- Russell, Philip J.: See—
- Kim, Young O.; Russell, Philip J.; and Weinert, Glenwood S., 5,481,473, Cl. 364-490.000.
- Russell-Stanley Corporation: See—
- Lima, William; Lind, Earl V.; and Bartlett, Philip D., 5,480,056, Cl. 220-284.000.
- Russo, Baldassare, III. Oil containment boom. 5,480,262, Cl. 405-66.000.
- Rüster, Norbert: See—
- Mews, Hans-Peter; and Rüster, Norbert, 5,480,323, Cl. 439-395.000.
- Ruta, John C.: See—
- Stevenson, William W.; Ruta, John C.; Sandison, W. Bruce; and Blette, Russell E., 5,480,095, Cl. 239-104.000.
- Ryan, Richard B., to Ryan, Richard B. Curtain rod. 5,480,040, Cl. 211-105.100.
- Ryat, Marc H., to SGS-Thomson Microelectronics, Inc. PTAT current source. 5,481,180, Cl. 323-315.000.
- Rydborn, Sten Åke O. Reed associated light sensitive apparatus for monitoring weft thread in a loom. 5,479,965, Cl. 139-370.200.
- Ryu, Tadamitsu; Takahara, Toshio; Hirono, Shingo; and Matsumoto, Tohru, to Fujitsu Limited. Computing system for data processing apparatus. 5,481,692, Cl. 395-700.000.
- Ryu, Tadamitsu; Ichikawa, Naomichi; Murakawa, Masahiko; Adachi, Takeshi; and Toyota, Masanobu, to Fujitsu Limited. Object-oriented system having object models containing plural objects with instantiation following static classification by class relationships, dynamic classification by temporal instantiation, and causality restrictions. 5,481,718, Cl. 395-700.000.
- Rzedzian, Richard, to Advanced NMR Systems, Inc. Shielded gradient coil for nuclear magnetic resonance imaging. 5,481,191, Cl. 324-318.000.
- S-B Power Tool Company: See—
- Hathcock, Mary H., 5,479,711, Cl. 30-393.000.
- S.L.T. Japan Co., Ltd.: See—
- Daikuzono, Norio, 5,481,556, Cl. 372-34.000.
- Sa, Jong S.: See—
- Choi, Jong K.; Chung, In B.; Lee, Jae C.; Suh, Byoung W.; Sa, Jong S.; and Heo, Tae H., 5,480,993, Cl. 544-320.000.
- Sabolcik, Ross M.: See—
- Gerhardt, Lester A.; and Sabolic, Ross M., 5,481,622, Cl. 382-103.000.
- Sabourin, Ivan: See—
- Bernaquer, Normand; and Sabourin, Ivan, 5,480,255, Cl. 404-6.000.
- Sadjadi, Firooz A., to Loral Corporation. Smart crop yield monitor. 5,480,354, Cl. 460-7.000.
- Sadowski, Fritz: See—
- Duecoffre, Volker; Flosbach, Carmen; Schubert, Walter; Krumme, Manfred; Stephan, Werner; and Sadowski, Fritz, 5,480,936, Cl. 524-839.000.
- Saether, Christian D., to Digital Equipment Corporation. Durable atomic storage update manager. 5,481,699, Cl. 395-182.130.
- Sagaser, John E.: See—
- Toth, Laszlo; and Sagaser, John E., 5,480,490, Cl. 127-42.000.
- Sagawa, Hirohiko: See—
- Inoue, Kiyoshi; Abe, Masahiro; and Sagawa, Hirohiko, 5,481,454, Cl. 364-419.030.
- Sahashi, Masashi: See—
- Sakurada, Shinya; Hirai, Takahiro; Tsutai, Akihiko; and Sahashi, Masashi, 5,480,495, Cl. 148-301.000.
- Sahira, Kensho: See—



- Arima, Yuusuke; Miyamoto, Shinichi; and Sahira, Kensho, 5,480,438, Cl. 623-16.000.
- Saikawa, Satoshi; Suzuki, Tetsuo; Hiramatsu, Soichi; Taniguro, Masahiro; Saito, Hiroyuki; Yanagi, Haruyuki; Nojima, Takashi; Kinoshita, Hiroyuki; and Kawakami, Hideaki, to Canon Kabushiki Kaisha. Sheet supplying apparatus, 5,480,247, Cl. 400-629.000.
- Saimoto, Tetsuro, to Yazaki Corporation. Electrical connection element, 5,480,320, Cl. 439-852.000.
- Saint-Gobain Vitreage: See—
- Kruger, Albert A.; and Chartier, Pascal, 5,480,917, Cl. 522-33.000.
- Saint-Gobain/Norton Industrial Ceramics Corp.: See—
- Sundberg, Glenn; and Yeckley, Russell, 5,480,846, Cl. 501-65.000.
- Saito, Atsushi: See—
- Ito, Yuji; and Saito, Atsushi, 5,480,775, Cl. 435-7.200.
- Watanabe, Fumihiko; Okubo, Akio; Saito, Atsushi; and Shinada, Yasuyuki, 5,481,283, Cl. 347-33.000.
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- Saito, Hajime: See—
- Shintani, Yoshitomo; Suganuma, Tetsuya; Matsuo, Shuitsu; Saito, Hajime; Yamaoka, Hidenori; Kuroko, Nobuhisa; and Kotaka, Hiroaki, 5,479,873, Cl. 117-75.000.
- Saito, Hiroyuki: See—
- Tachibana, Shunichi; and Saito, Hitoshi, 5,481,374, Cl. 358-444.000.
- Saito, Jun; and Kurita, Shinichi, to Nikon Corporation. Pulse train condition/heat shut off condition determination method and apparatus for optical recording, and optical recording method and apparatus, 5,481,525, Cl. 369-116.000.
- Saito, Kimitsugu: See—
- Tachibana, Takeshi; Saito, Kimitsugu; Hayashi, Kazushi; Nishimura, Kozu; and Nakamura, Rie, 5,479,875, Cl. 117-103.000.
- Saito, Masahide: See—
- Hirai, Shigeru; Kurima, Kazunori; Saito, Masahide; Yui, Dai; Hattori, Tomoyuki; and Suganuma, Hiroshi, 5,481,632, Cl. 385-49.000.
- Saito, Masayuki: See—
- Hiroya, Masaaki; Saito, Masayuki; and Takagi, Hiroyuki, 5,481,664, Cl. 395-154.000.
- Saito, Mitsuhiro: See—
- Nagai, Shigekazu; Sugano, Shigeru; Saito, Mitsuhiro; Takebayashi, Takashi; Matsushima, Hiroshi; and Ito, Yoshiharu, 5,481,482, Cl. 364-558.000.
- Saitoh, Kenji: See—
- Matsugu, Masakazu; Saitoh, Kenji; Hattori, Jun; and Houryu, Sakae, 5,481,363, Cl. 356-401.000.
- Saitoh, Tsuyoshi: See—
- Niimura, Koichi; Kawabe, Takako; Wada, Tsutomu; Saitoh, Tsuyoshi; and Bannai, Kenji, 5,480,878, Cl. 514-182.000.
- Saive, Roland: See—
- Mueller, Hans-Joachim; Evertz, Kaspar; Weber, Siegfried; Funk, Guido; Konrad, Rainer; and Saive, Roland, 5,480,852, Cl. 502-210.000.
- Saji, Keiichi: See—
- Kondo, Haruyoshi; Takahashi, Hideaki; Saji, Keiichi; Takeuchi, Masaharu; and Satta, Kozo, 5,480,535, Cl. 204-425.000.
- Sakabe, Shigekazu: See—
- Kimura, Yutaro; Ikeshima, Tetsuhiko; Tonami, Hiromichi; Konishi, Ikuo; Horikawa, Hiroshi; Daikoku, Akihiro; Sakabe, Shigekazu; Inoue, Masao; and Yamasaki, Akinori, 5,481,585, Cl. 378-134.000.
- Sakai, Kouichi; Oumi, Hayato; and Suzuki, Hiroshi, to NSK Ltd. Auto tensioner, 5,480,358, Cl. 474-117.000.
- Sakai, Kunihiro: See—
- Oguchi, Takahiro; and Sakai, Kunihiro, 5,481,522, Cl. 369-101.000.
- Washizawa, Teruyoshi; and Sakai, Kunihiro, 5,481,521, Cl. 369-99.000.
- Sakai, Minoru: See—
- Yamazaki, Kazuki; Inoue, Nobuaki; Yamamoto, Seiichi; Ezoe, Toshihide; Sakai, Minoru; Ikeda, Tadashi; Okazaki, Masaki; and Fujiwara, Toshiki, 5,480,886, Cl. 430-264.000.
- Sakai, Tetsuo; and Iwaki, Tsutomu, to Agency of Industrial Science & Technology. Cell provided with gaseous diffusion electrode, and method of charging and discharging the same, 5,480,741, Cl. 429-59.000.
- Sakairi, Minoru: See—
- Takada, Yasuaki; Sakairi, Minoru; Hirabayashi, Atsumu; and Ose, Youichi, 5,481,107, Cl. 250-281.000.
- Sakakibara, Toshio: See—
- Miura, Shoji; Sugisaka, Takayuki; Komura, Atsushi; and Sakakibara, Toshio, 5,480,832, Cl. 437-67.000.
- Sakakibara, Yoshio: See—
- Nakamura, Akihiko; Sakakibara, Yoshio; Gotou, Makoto; and Kobayashi, Kazuhiko, 5,481,641, Cl. 388-800.000.
- Sakamoto, Hiroyuki: See—
- Miyagawa, Shigenori; Kobayashi, Koichi; Kunii, Shimpei; Kamio, Shizuo; Sakamoto, Hiroyuki; Sato, Fumitaka; and Ishiura, Ryoichi, 5,481,430, Cl. 361-681.000.
- Sakamoto, Katsumi: See—
- Oishi, Tetsuya; Ozawa, Hiroshi; Karasawa, Minato; Inomata, Masamitsu; Mega, Izumi; Yamauchi, Atsuyoshi; Kamada, Kazunori; Nakahata, Shigeru; Sakamoto, Katsumi; Nakashima, Tatsunobu; Watanabe, Akito; Suzuki, Jin; Ohkawa, Kouhei; Furusawa, Satoshi; Ono, Hiroshi; and Sugazaki, Kazuo, 5,480,947, Cl. 525-509.000.
- Sakamoto, Masahiko: See—
- Mitsuda, Hiroshi; Sakamoto, Masahiko; Tanaka, Hitoshi; Kosaka, Nobuyuki; and Ito, Yoshinori, 5,481,095, Cl. 235-454.000.
- Sakamoto, Masashi; Shibata, Mitsuru; Nasuno, Ichiro; and Koike, Kazuyoshi, to Idemitsu Kosan Co., Ltd. Cyclohexanedione derivatives, 5,480,858, Cl. 504-288.000.
- Sakamoto, Munenori: See—
- Shigematsu, Hiroyuki; Nakamura, Yutaka; Sakamoto, Munenori; Nagasawa, Hiroyuki; Nakao, Hiroshi; Nakajima, Yasuhiro; and Kurata, Masaaki, 5,481,278, Cl. 345-179.000.
- Sakamoto, Takashi, to Dainippon Screen Mfg. Co., Ltd. Method of and apparatus for producing a unit pattern on a printing cylinder for printing an endless pattern, 5,481,366, Cl. 358-296.000.
- Sakashita, Keiichi; Kageyama, Yoshitaka; and Ikemoto, Tetsuya, to Mitsubishi Rayon Company Ltd. Optically active compound having a  $\delta$ -valerolactone ring and liquid crystal composition containing same, 5,480,580, Cl. 252-299.610.
- Sakashita, Yukio: See—
- Motohashi, Shozo; Fujimoto, Katsumi; Nishiyama, Hiroshi; Heinouchi, Yoshiaki; Yoshitani, Kazuhiro; and Sakashita, Yukio, 5,479,822, Cl. 73-504.140.
- Sakata, Kazuyuki: See—
- Yamasaki, Kazuyuki; Hamaguchi, Yoshihiro; Hosoda, Shunji; Sakata, Kazuyuki; Imai, Takashi; Okatani, Shigetoshi; Nishio, Satoshi; Takahashi, Tuiyoshi; Matsumura, Kenji; Tanaka, Noriyuki; Nagayasu, Teruaki; and Makino, Hiroshi, 5,480,537, Cl. 210-96.100.
- Sakurada, Shinya; Hirai, Takahiro; Tsutai, Akihiko; and Sahashi, Masashi, to Kabushiki Kaisha Toshiba. Magnetic material, 5,480,495, Cl. 148-301.000.
- Sakurai, Kazushi: See—
- Yamasaki, Katsuya; Sakurai, Kazushi; and Akiyama, Kazuo, 5,480,891, Cl. 514-312.000.
- Sakurai, Shigeki; and Takashima, Shoichi, to Canon Kabushiki Kaisha. Private branch exchange capable of analyzing information received from ISDN, 5,481,605, Cl. 379-243.000.
- Sakurai, Toru: See—
- Yanai, Akira; Ueda, Yoshizumi; Sakurai, Toru; and Satoh, Masahiro, 5,480,956, Cl. 435-69.510.
- Sala, Alberto; Barani, Roberto; Benedini, Francesca; Bertolini, Giorgio; Donà, Giancarlo; Gromo, Gianni; and Levi, Silvio, to Italfarmaco S.p.A. Benzoxazinone and benzothiazinone derivatives having cardiovascular activity, 5,480,882, Cl. 514-224.200.
- Salient Software, Inc.: See—
- Chambers, Lloyd L., IV, 5,481,701, Cl. 395-600.000.
- Salin, Eric D.; and Légre, Jean-Guy J., to McGill University. Method and apparatus for removal of residual interfering nebulized sample, 5,480,809, Cl. 436-173.000.
- Salisbury, Roger S., to General Electric Company. Address line repair structure and method for thin film imager devices, 5,480,812, Cl. 437-3.000.
- Salisbury, Roger S.: See—
- Wei, Ching-Yu; Salisbury, Roger S.; Kwasnick, Robert F.; and Giambattista, Brian W., 5,480,810, Cl. 437-2.000.
- Sallee, Verney L.: See—
- DeSantis, Louis, Jr.; and Sallee, Verney L., 5,480,900, Cl. 514-392.000.
- Salomé, Marc L. V.: See—
- Legoux, Richard; Lelong, Philippe; and Salomé, Marc L. V., 5,480,800, Cl. 435-252.330.
- Salomon S.A.: See—
- Astier, Lionel; Arduin, Joel; and Bejean, Alain, 5,480,175, Cl. 280-607.000.
- Sampei, Hiroshi; and Sato, Masashi, to Mitsumi Electric Co., Ltd. Magnetic head for a hard disk device having a non-magnetic trailing core, 5,481,425, Cl. 360-126.000.
- Samsung Display Devices Co., Ltd.: See—
- Lee, Jong-deuk; Woo, Hyeon-su; Choi, Sun-jeong; and Lee, Gang-ok, 5,481,156, Cl. 313-309.000.
- Park, Nam-sin; and Choi, Seon-jeong, 5,480,843, Cl. 437-228.000.
- Samsung Electronics Co., Ltd.: See—
- Kim, Chun-sup, 5,481,313, Cl. 348-505.000.
- Kim, Soon-tae, 5,481,370, Cl. 358-341.000.
- Kwon, Sun-don; and Kim, Hyeon-su, 5,481,252, Cl. 340-825.220.
- Park, Sung-wook; and Paik, Joon-ki, 5,481,304, Cl. 348-240.000.
- Patel, Chandrakant B., 5,481,316, Cl. 348-614.000.
- Seo, Byong-Lyul, 5,481,416, Cl. 360-72.200.
- Samuels, Michael R.: See—
- Alms, Gregory R.; and Samuels, Michael R., 5,481,033, Cl. 562-486.000.
- Sanada, Ryouichi: See—
- Yamamoto, Ken; Yamamoto, Michiyasu; Baba, Norimasa; Fukuoka, Mikio; Kuroyanagi, Isao; Sanada, Ryouichi; and Torigoe, Eiichi, 5,479,985, Cl. 165-176.000.
- Sanagawa, Toshio; and Shimizu, Naoya, to Mitsubishi Jukogyo Kabushiki Kaisha. Apparatus having a pivoted eddy current probe for detecting flaws in the inner surface of a hole, 5,479,834, Cl. 73-866.500.

- Sanchez, Ismael R.; and Antonelli, Alexander A., to Xerox Corporation. Ink-filling apparatus and method for filling ink cartridges, 5,479,968, Cl. 141-110.000.
- Sander, Thomas W.: See—
- Lee, Daniel R.; and Sander, Thomas W., 5,480,403, Cl. 606-72.000.
- Sanders, Bobby W., Jr.: See—
- Schmitt, David E.; Sanders, Bobby W., Jr.; and Lundquist, James H., 5,479,689, Cl. 29-426.400.
- Sanders, Gary G.; Gorge, Brian C.; and Beach, Burt L., to Penberthy, Inc. High pressure, leak resistant explosionproof capacitance probe, 5,481,197, Cl. 324-690.000.
- Sandhu, Gurtej S., to Micron Technology, Inc. Method of reducing carbon incorporation into films produced by chemical vapor deposition involving organometallic precursor compounds, 5,480,684, Cl. 427-531.000.
- Sandison, W. Bruce: See—
- Stevenson, William W.; Ruta, John C.; Sandison, W. Bruce; and Blette, Russell E., 5,480,095, Cl. 239-104.000.
- Sankei Giken Kogyo Kabushiki Kaisha: See—
- Tamano, Akihiko; and Ikeda, Tsukasa, 5,479,706, Cl. 29-890.080.
- Sankeibutsusan Co., Ltd.: See—
- Yasuga, Masaki, 5,480,082, Cl. 225-96.500.
- Sanken Electric Co., Ltd.: See—
- Lee, Myung-Joo; and Ueki, Mitsuo, 5,481,450, Cl. 363-21.000.
- Sanko Motor Chemical Co., Ltd.: See—
- Kato, Kohji; and Yoshioka, Tohru, 5,481,064, Cl. 588-205.000.
- Sankt-Peter Burgsky Gorny Institut Imeni G.V. Plekhanova: See—
- Soloviev, Georgy N.; Kudryashov, Boris B.; and Litvinenko, Vladimir S., 5,479,994, Cl. 175-11.000.
- Sannholm, Krister, to A. Ahlstrom Corporation. Method of controlling sulfidity of a sulfate pulp mill, 5,480,512, Cl. 162-16.000.
- Sano, Hideo; Murata, Yukichi; Nishimura, Toru; Yamada, Masahiro; Takimoto, Hiroshi; and Satoh, Nobuyoshi, to Mitsubishi Chemical Corporation. Recording liquid, 5,480,478, Cl. 106-22.00K.
- Sanofi: See—
- Legoux, Richard; Lelong, Philippe; and Salomé, Marc L. V., 5,480,800, Cl. 435-252.330.
- Wagnon, Jean; de Cointet, Paul; Nisato, Dino; Plouzane, Claude; Serradeil-Legal, Claudine; and Tonnerre, Bernard, 5,481,005, Cl. 548-537.000.
- Sanshin Kogyo Kabushiki Kaisha: See—
- Kanno, Isao, 5,481,261, Cl. 340-870.160.
- Santagiuliana, Evans, to Taplast Srl. Measuring device for powder products, 5,480,071, Cl. 222-455.000.
- Santoh, Tsuyoshi: See—
- Okubo, Yukitoshi; Santoh, Tsuyoshi; Tamura, Miki; Mihara, Chieko; Sugata, Hiroyuki; Kanome, Osamu; and Yashima, Masataka, 5,480,596, Cl. 264-1.330.
- Sanyo Electric Co., Ltd.: See—
- Mihara, Yoshikazu; and Yamamoto, Yuji, 5,481,757, Cl. 455-3.100.
- Sarcos Group: See—
- Jacobsen, Stephen C., 5,481,184, Cl. 324-106.000.
- Sarfati, Freddy: See—
- Sarfati, Georges; Merz, Peter; and Sarfati, Freddy, 5,481,237, Cl. 335-278.000.
- Sarfati, Georges; Merz, Peter; and Sarfati, Freddy, to Fluid Automation Systems S.A. Solenoid valve with electrical connection elements and integrated safety devices, 5,481,237, Cl. 335-278.000.
- Sasaki, Beji, to Friends of Freesia Co., Ltd. Hoppers for machines with hoppers and processing method thereof, 5,480,018, Cl. 193-2.00R.
- Sasaki, Katsuhiko; Kuroda, Yuka; and Fukuda, Seiji, to NBC Corporation. SDH radio communication system and transmitter/receiver equipment therefor, 5,481,547, Cl. 370-112.000.
- Sasaki, Kunituna; Goto, Narito; Takeda, Katsuyuki; Sekiguchi, Nobuyuki; Takahashi, Hideki; Isobe, Ryosuki; and Mori, Takahiro, to Konica Corporation. Magnetic recording medium, 5,480,713, Cl. 428-323.000.
- Sasaki, Masahiko; and Kaneko, Masaaki, to Mitsui Engineering & Shipbuilding Co., Ltd.; and Toyama Light Metal Industry Co., Ltd. Apparatus for measuring dimensions of objects, 5,481,298, Cl. 348-135.000.
- Sasaki, Masaomi: See—
- Shimada, Tomoyuki; Sasaki, Masaomi; and Tanaka, Chiaki, 5,480,753, Cl. 430-59.000.
- Sasaki, Motonobu, to Mitsubishi Denki Kabushiki Kaisha. Control system for robot, 5,481,652, Cl. 395-97.000.
- Sasaki, Takashi: See—
- Chikahisa, Naotchi; Takahashi, Ken; Naito, Takao; and Sasaki, Takashi, 5,479,854, Cl. 101-123.000.
- Sasaki, Takayo: See—
- Takagawa, Makoto; Shigematsu, Ryusuke; and Sasaki, Takayo, 5,481,055, Cl. 585-481.000.
- Sasaki, Takayoshi; and Kashiwara, Kotaro, to Daido Metal Company Ltd. Spherical sliding bearing, 5,480,231, Cl. 384-206.000.
- Sasaki, Takayuki: See—
- Okuno, Yasuhiro; Yamakawa, Tadashi; Nagashima, Masaaki; and Sasaki, Takayuki, 5,481,672, Cl. 395-188.010.
- Sasaki, Wataru: See—
- Mihara, Takashi; Shirasaka, Kazumi; Oda, Kenji; Nakahata, Akinobu; Shiohara, Masahiro; and Sasaki, Wataru, 5,481,348, Cl. 335-290.000.
- Sasaki, Yusuke, to Autex, Inc. Initiator for photopolymerization, 5,480,918, Cl. 522-64.000.
- Sasanuma, Nobuatsu: See—
- Arimoto, Shinobu; Shimizu, Katsuchi; Komiya, Yutaka; Yoshinaga, Kazuo; Hayashi, Toshio; Nakai, Takehiko; Utogawa, Tsutomu; Nagase, Tetsuya; and Sasanuma, Nobuatsu, 5,481,334, Cl. 355-201.000.
- Nagao, Yoshinori; Amemiya, Koji; Izumizaki, Masami; and Sasanuma, Nobuatsu, 5,481,340, Cl. 355-246.000.
- Sasaoka, Kiyonori: See—
- Tamano, Akiyoshi; Hayashi, Motoo; Sasaoka, Kiyonori; Suzuki, Kazuya; and Hasegawa, Hirotugu, 5,479,977, Cl. 152-542.000.
- Sassy, Inc.: See—
- Douglas, Homer; Aberle, Marshall L.; Parker, Phillip M.; Pinch, Daniel R.; and Schwartzkopf, Robert A., 5,480,211, Cl. 297-174.000.
- Satake, Teruyuki, to Casio Computer Co., Ltd. Word processors for performing an automatic layout process, 5,481,663, Cl. 395-146.000.
- Satake, Tohru: See—
- Nagai, Kazutoshi; Satake, Tohru; Hayashi, Hideaki; and Yasui, Takanari, 5,480,286, Cl. 417-48.000.
- Satake, Tokuki; Miyamoto, Hitoshi; Watanabe, Kiyoshi; Nanjo, Fusayuki; and Takenobu, Koichi, to Mitsubishi Jukogyo Kabushiki Kaisha. Solid oxide electrolyte fuel cell, 5,480,737, Cl. 429-30.000.
- Sato, Fumitaka: See—
- Miyagawa, Shigenori; Kobayashi, Koichi; Kunii, Shimpei; Kamio, Shizuo; Sakamoto, Hiroyuki; Sato, Fumitaka; and Ishiura, Ryoichi, 5,481,430, Cl. 361-681.000.
- Sato, Hideaki, to Canon Kabushiki Kaisha. Bidirectional communication apparatus for transmitting/receiving information by wireless communication or through a power line, 5,481,249, Cl. 340-825.060.
- Sato, Hiromi; Iwasa, Toyokazu; Ohya, Akihiro; and Nabume, Hiroshi, to Isuzu Motors Limited. Multi-intake valve engine, 5,479,889, Cl. 123-308.000.
- Sato, Jun, to Shimano Inc. Baitcasting reel, 5,480,102, Cl. 242-310.000.
- Sato, Kaoru: See—
- Tachibana, Tatsuo; Narita, Izumi; Kusano, Akihisa; Seino, Yuzo; and Sato, Kaoru, 5,481,336, Cl. 355-207.000.
- Sato, Keiichi; Seto, Yoko; and Nakajima, Iwao, to Mitsubishi Chemical Corporation. Process for producing alkadienols, 5,481,049, Cl. 568-909.500.
- Sato, Masao: See—
- Tsuda, Masaomi; Fujiwara, Yoshito; Ikegami, Yuji; Sato, Masao; and Fujii, Hiroyuki, 5,480,608, Cl. 420-40.000.
- Sato, Masashi: See—
- Sampei, Hiroshi; and Sato, Masashi, 5,481,425, Cl. 360-126.000.
- Sato, Tadashi: See—
- Asakawa, Naoki; Oda, Yoshiya; Yoshida, Yutaka; and Sato, Tadashi, 5,480,542, Cl. 210-198.200.
- Sato, Yasushi: See—
- Ohzeki, Yukihiko; and Sato, Yasushi, 5,481,346, Cl. 355-285.000.
- Satoh, Masahiro: See—
- Yanai, Akira; Ueda, Yoshizumi; Sakurai, Toru; and Satoh, Masahiro, 5,480,956, Cl. 435-69.510.
- Satoh, Nobuyoshi: See—
- Sano, Hideo; Murata, Yukichi; Nishimura, Toru; Yamada, Masahiro; Takimoto, Hiroshi; and Satoh, Nobuyoshi, 5,480,478, Cl. 106-22.00K.
- Satoh, Toshiya; Oikawa, Akiro; Onose, Katsuyoshi; Yagi, Keijiro; and Kitagishi, Tomoji, to Hitachi, Ltd. Electrophotographic image fixing device avoiding offset in the image by means of differential roller speed, 5,481,349, Cl. 355-290.000.
- Satta, Kozo: See—
- Kondo, Haruyoshi; Takahashi, Hideaki; Saji, Keiichi; Takeuchi, Masaharu; and Satta, Kozo, 5,480,535, Cl. 204-425.000.
- Sauer, Friedrich: See—
- Lechtken, Peter; Sauer, Friedrich; Fankhaenel, Matthias; and Hermeling, Dieter, 5,481,041, Cl. 568-17.000.
- Saunders, Arthur E.: See—
- Green, Andrew; and Saunders, Arthur E., 5,481,480, Cl. 364-525.000.
- Sauvignat, Jean-Pierre, to Etablissements Antonine Bertheas & Cie. Elastic fabric for support articles, 5,480,709, Cl. 428-231.000.
- Savkar, Sudhir D.; and Jenkins, Harold J., to General Electric Company. Minimum dwell time reed ratchet for washing machine augers, 5,479,793, Cl. 68-133.000.
- Sawada, Mitsutoshi: See—
- Suzuki, Kaoru; Ando, Tadahiyo; Naka, Hiroshi; Sawada, Mitsutoshi; Ohata, Tomonori; Miura, Hiroshi; Nakabayashi, Masayoshi; and Ando, Eiichi, 5,480,130, Cl. 270-53.000.
- Sawdon, Edwin G., to BTM Corporation. Apparatus for joining sheets of material, 5,479,687, Cl. 29-243.500.
- Sawyer, Thomas F.: See—
- Carter, William T., Jr.; Sawyer, Thomas F.; Benz, Mark G.; and Braaten, Mark E., 5,480,097, Cl. 239-296.000.
- Scaburri, Adriano: See—
- Turetta, Daniele; and Scaburri, Adriano, 5,481,169, Cl. 318-560.000.
- Scanlon, Patrick J.: See—
- Braun, Phillip M.; Harrison, John J.; Perra, Arthur E.; Scanlon, Patrick J.; and Simonelli, David J., 5,480,088, Cl. 227-130.000.
- Schahrer, Clinton O.: See—
- Alvarez, Robert J.; Bredezen, Scott E.; Wilson, James J.; Flim, Duane D.; Kniffen, Todd E.; and Schahrer, Clinton O., 5,479,707, Cl. 29-890.039.
- Schall, Norbert: See—
- Hirsch, Rüdiger; Hahn, Reinhard; and Schall, Norbert, 5,480,578, Cl. 252-174.250.



- Schantz, David L.; and Munro, James L., to Westinghouse Electric Corp. Fault detection circuit for sensing leakage currents between power source and chassis. 5,481,194, Cl. 324-522.000.
- Schappeler, Hartmut: See—  
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- Schattauer, Juergen: See—  
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- Schätzle, Joachim: See—  
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- Scheiding, Silke: See—  
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- Schenke, Thomas: See—  
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- Schering Corporation: See—  
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- Scheunemann, Roy A.: See—  
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- Schiffleger, Alan J.; Gupta, Ram K.; and Hsiung, Christopher C., to Cray Research, Inc. Vector shift functional unit for successively shifting operations stored in a vector register by corresponding shift counts stored in another vector register. 5,481,746, Cl. 395-800.000.
- Schild, Helmut: See—  
Lindner, Bernd; Püpp, Nikola; Schild, Helmut; Seib, Berthold; and Möller, Thomas, 5,479,859, Cl. 101-485.000.
- Schindler, Jan-Erwin: See—  
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- Schlott, Martin; Kutzner, Martin; Weigert, Martin; Konietzka, Uwe; Gehman, Bruce; and Vahlstrom, Shawn, to Leybold Materials. Sputter target for cathodic atomization to produce transparent, conductive layers. 5,480,532, Cl. 204-298.130.
- Schlottnerbeck, Steven C.: See—  
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- Schlumberger Technologies, Inc.: See—  
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- Schmid, Eduard; Buehler, Friedrich S.; and Schultze, Hans-Joachim, to EMS-Inventa AG. Thermoplastically processible composition of starch acrylate copolymers. 5,480,923, Cl. 524-47.000.
- Schmid, Gerrard B.: See—  
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- Schmidhalter, Beat: See—  
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- Schmidhauser, John C., to General Electric Company. Substantially pure bisphenols and polymers comprising bisphenols. 5,480,959, Cl. 528-198.000.
- Schmidt, Elmer L.; and Amburgey, Terry L., to University of Minnesota. Regents of the. Prevention of enzyme mediated discoloration of wood. 5,480,679, Cl. 427-254.000.
- Schmidt, Glenn H.; and Helmstetter, Richard C., to Callaway Golf Company. Hollow, metallic golf club head with relieved sole and dendritic structure. 5,480,152, Cl. 273-167.00A.
- Schmidt, Larry: See—  
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- Schmidt, Randall G.: See—  
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- Schmidt, Ruediger: See—  
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- Schmidts, Kurt: See—  
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- Schmit, David E.; Sanders, Bobby W., Jr.; and Lundquist, James H., to Harmon Glass Company. Windshield expansion tool and method for removing vehicle windshields. 5,479,689, Cl. 29-426.400.
- Schmitt, Gunter: See—  
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- Schmitt, Klaus: See—  
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- Schmitt, Peter J.: See—  
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- Schmitt, Ralf: See—  
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- Schmitt, Thilo: See—  
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- Schmoll, Josef: See—  
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- Schneider, Heiko, to Langbein & Engelbracht GmbH & Co. KG. Arrangement for reducing the moisture content of sludge. 5,480,539, Cl. 210-177.000.
- Schneider, Herbert: See—  
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- Schneider, Karl: See—  
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- Schneider, Palle: See—  
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- Schneuing, Ralf; and Janzen, Paul, to Dürkopp Adler Aktiengesellschaft. Hanging device for a hanging conveyor. 5,480,020, Cl. 198-465.400.
- Schock & Co. GmbH: See—  
Hock, Klaus; Frank, Lothar, deceased; and Schock, Friedrich, Sr., 5,480,931, Cl. 524-449.000.
- Schock, Friedrich, Sr.: See—  
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- Schoemaker, Patrick A., to United States of America, Navy. Floating gate injection voltage regulator. 5,481,492, Cl. 365-185.230.
- Schoen, Christof: See—  
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- Schoettle, Klaus; Dreyer, Juergen; Pavelka, Bozidar; and Schmidts, Kurt, to BASF Magnetics GmbH. Cassette with recording medium, in particular magnetic tape cassette. 5,481,426, Cl. 360-132.000.
- Scholz, Harald: See—  
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- Schoon, David J., to Schoonscan, Inc. Temperature stabilization means for imaging output recorder. 5,481,398, Cl. 359-323.000.
- Schoonscan, Inc.: See—  
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- Heming, Martin; Hochhaus, Roland; Kersten, Ralf; Krause, Dieter; Otto, Jürgen; Paquet, Volker; Segner, Johannes; and Fattinger, Christof, 5,480,687, Cl. 427-573.000.
- Schoy, Albrecht: See—  
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- Schretzman, Lori A.: See—  
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- Schröck, Wilfried: See—  
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- Schroeder, David H.: See—  
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- Schroeder, Frank J.: See—  
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- Schubert, Paul C.; Lemberger, Richard R.; Joyce, Terrence H.; and Langmade, Todd G., to Minnesota Mining and Manufacturing Company. Multi-user digital laser imaging system. 5,481,657, Cl. 395-118.000.
- Schubert, Walter: See—  
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- Schudok, Manfred: See—  
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- Schuette, Hartmut: See—  
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- Schüle, Gerhard: See—  
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- Schuller International, Inc.: See—  
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- Schulte, William A.: See—  
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- Schultheis, Gary R.; and Heger, Charles E., to Zircor Corporation. Electronic level displaying inclination using a multi-segment fan-like display. 5,479,715, Cl. 33-366.000.
- Schultz, Thomas J. Miniature light holder. 5,481,444, Cl. 362-249.000.
- Schultze, Hans-Joachim: See—

- Schmid, Eduard; Buehler, Friedrich S.; and Schultze, Hans-Joachim, 5,480,923, Cl. 524-47.000.
- Schulz, Eric: See—  
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- Schulz, Juergen; and Hofacker, Bernd, to Adolf Wirth GmbH & Co. KG. Rechargeable accumulator. 5,480,734, Cl. 429-7.000.
- Schulz, Paul: See—  
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- Schulze, Ullrich; Schattauer, Juergen; Heinen, Horst; and Rieck, Konrad, to NSM Aktiengesellschaft. Entertainment installation. 5,480,158, Cl. 273-434.000.
- Schumann, Jochen: See—  
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- Schwabe, Thomas: See—  
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- Schwartz, David A.; and Radigan, James J., to Hughes Aircraft Company. Computer processing element having first and second functional units accessing shared memory output port on prioritized basis. 5,481,736, Cl. 395-800.000.
- Schwartz, Nira; Shahar, Arie; and Woods, Richard. Inspection method using templates images, unique histogram analysis, and multiple gray levels correlated to addresses of template images. 5,481,619, Cl. 382-141.000.
- Schwartzkopf, Robert A.: See—  
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- Schwarz, Mark P.: See—  
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- Schwing America, Inc.: See—  
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- Scientific Atlanta, Inc.: See—  
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- Pidgeon, Rezin E.; and Rand, Heather H., 5,481,389, Cl. 359-161.000.
- Scientific Design Company, Inc.: See—  
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- Scitex Corporation Ltd.: See—  
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- Scope Services, Inc.: See—  
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- Scott, Danny E.; Grimes, Robert E.; Isbell, Matthew R.; and Pessier, Rudolf C. O., to Baker Hughes Incorporated. Earth-boring bit with improved cutting structure. 5,479,997, Cl. 175-374.000.
- Scott, David E.: See—  
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- Scott Fetzer Company, The: See—  
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- Scott, Keith T.: See—  
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- Scott, Norman H.; Zimmermann, Joseph E.; and Glover, Bryan K., to UOP. Process for the removal of heavy hydrocarbonaceous co-products from a vapor effluent from a normally gaseous hydrocarbon dehydrogenation reaction zone. 5,481,060, Cl. 585-867.000.
- Scott Paper Company: See—  
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- Frazier, Alan D.; and Lewis, Richard P., 5,480,068, Cl. 222-153.030.
- Scripps Research Institute, The: See—  
Morgan, Edward L.; Ember, Julia A.; and Hugli, Tony E., 5,480,974, Cl. 530-387.900.
- Nicolaou, K. C.; Claiborne, Christopher F.; Nantermet, Philippe G.; Couladouris, Elias A.; and Sorensen, Erik J., 5,481,007, Cl. 549-229.000.
- Seagate Technology, Inc.: See—  
Dunfield, John C.; Knoche, Steven C.; and Kloeppel, Klaus D., 5,481,144, Cl. 310-71.000.
- Second Chance Body Armor, Inc.: See—  
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- Seder, Edmund V.: See—  
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- Seela, Frank, to Boehringer Mannheim GmbH. 7-Deaza-2'-deoxyguanosine nucleotides and nucleic acids analogs thereof. 5,480,980, Cl. 536-23.100.
- Seely, Warren L.: See—  
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- Segi, Yoshio: See—  
Takei, Tetsuya; Segi, Yoshio; and Katagiri, Hiroyuki, 5,480,754, Cl. 430-65.000.
- Segner, Johannes: See—  
Heming, Martin; Hochhaus, Roland; Kersten, Ralf; Krause, Dieter; Otto, Jürgen; Paquet, Volker; Segner, Johannes; and Fattinger, Christof, 5,480,687, Cl. 427-573.000.
- Seib, Berthold: See—  
Lindner, Bernd; Püpp, Nikola; Schild, Helmut; Seib, Berthold; and Möller, Thomas, 5,479,859, Cl. 101-485.000.
- Seiko Communications Holding N.V.: See—  
Gaskill, Garold B.; O'Brien, Dennis J.; and Park, Michael C., 5,481,254, Cl. 340-825.520.
- Seiko Epson Corporation: See—  
Inazumi, Mitsuhiro, 5,481,644, Cl. 395-2410.
- Kitahara, Tsuyoshi; Kumai, Eiji; Hirabayashi, Hiromu; Kanbayashi, Kenichi; and Watanabe, Kohji, 5,481,284, Cl. 347-42.000.
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- Seino, Yuzo: See—  
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- Sekiguchi, Nobuyuki: See—  
Sasaki, Kunisuna; Goto, Narito; Takeda, Katsuyuki; Sekiguchi, Nobuyuki; Takahashi, Hideki; Isobe, Ryosuki; and Mori, Takahiro, 5,480,713, Cl. 428-323.000.
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Itoh, Kazuo; Narita, Kazuhiko; Kitazawa, Shuichi; Tokoi, Masanori; Nakajima, Ayumi; and Sekine, Hiroshi, 5,481,465, Cl. 364-468.000.
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- Sekine, Jiro. Camera. 5,481,324, Cl. 354-152.000.
- Seksaria, Dinesh C.: See—  
Cobes, John W.; and Seksaria, Dinesh C., 5,480,208, Cl. 296-203.000.
- Sell, David R.: See—  
Monnier, Vincent M.; and Sell, David R., 5,480,807, Cl. 436-86.000.
- Sematech, Inc.: See—  
Vasudev, Prahalad K., 5,480,747, Cl. 430-5.000.
- Semiconductor Energy Laboratory Co., Ltd.: See—  
Konuma, Toshimitsu; and Mase, Akira, 5,481,320, Cl. 348-751.000.
- Zhang, Hongyong; Takayama, Toru; and Takemura, Yasuhiko, 5,481,121, Cl. 257-64.000.
- Senak, Peter, Jr.: See—  
Kaplan, Martin; and Senak, Peter, Jr., 5,481,147, Cl. 310-154.000.
- Senda, Kouji, to Kabushiki Kaisha Tec. Article information printer having means to measure print media size. 5,480,244, Cl. 400-582.000.
- Sendlein, Kim K.: See—  
Aldereguia, Alfredo; Cromer, Daryl C.; and Sendlein, Kim K., 5,481,552, Cl. 371-40.100.
- Senger, Richard C.: See—  
Desai, Kishor V.; Kohn, Harold; Senger, Richard C.; and Seraphim, Donald P., 5,479,703, Cl. 29-852.000.
- Senior Engineering Company: See—  
DeMarsh, Peter L.; and Crawford, William W., 5,479,961, Cl. 138-97.000.
- Senju Pharmaceutical Co., Ltd.: See—  
Ogata, Kazumi; and Yoshida, Kenichi, 5,480,773, Cl. 435-2.000.
- Senock, Randall S.; and Ham, Jay M., to Kansas State University Research Foundation. Sap flow gauge. 5,481,090, Cl. 219-535.000.
- Sensenbrenner, Monique: See—  
Thal, Claude; Quirós-Guillou, Catherine; Potier, Pierre; Renko, Dolor; Zanetta, Jean-Pierre; Portier, Marie-Madeleine; Sensenbrenner, Monique; Koenig, Janine; and Koenig, Herbert, 5,480,884, Cl. 514-275.000.
- Sensible Products, Inc.: See—  
Rubino, Michael; and Berg, Michael, 5,479,688, Cl. 29-259.000.
- Senso, Hitoshi; Arai, Yoshio; and Fukuda, Masao, to Pioneer Electronic Corporation. Display circuit for displaying an HDTV signal as twelve NTSC signals and for displaying an independent NTSC signal. 5,481,306, Cl. 348-383.000.
- Seo, Byong-Lyul, to Samsung Electronics Co., Ltd. Search method and circuit utilizing an audio signal. 5,481,416, Cl. 360-72.200.
- Seproódi, János: See—  
Kéri, György; Mező, Imre; Horváth, Anikó; Vadász, Zsolt; Teplán, István; Balogh, Ágnes; Csuka, Orsolya; Bökönyi, Gyöngyi; Szóke, Balázs; Horváth, Judit; Idei, Miklós; and Seproódi, János, 5,480,870, Cl. 514-16.000.
- Seraphim, Donald P.: See—  
Desai, Kishor V.; Kohn, Harold; Senger, Richard C.; and Seraphim, Donald P., 5,479,703, Cl. 29-852.000.
- Seravalli, Alessandro; and Moniere, Henri, to Verres Industries SA. Alarm device having a pick-up formed as a condenser with piezoelectric dielectric. 5,481,246, Cl. 340-550.000.
- Sercel, Anthony D.: See—



- Beylin, Vladimir G.; Serce, Anthony D.; Showalter, Howard D. H.; Adams, Gerald E.; Fielden, Edward M.; Naylor, Matthew A.; and Stratford, Ian J., 5,481,000, Cl. 548-229.000.
- Seref, See—  
Trapp, Claude, 5,479,846, Cl. 92-66.000.
- Seri, Hajime; Yamamura, Yasuharu; Tsuji, Yoichiro; Owada, Naoko; and Iwaki, Tsutomu, to Matsushita Electric Industrial Co., Ltd. Hydrogen storage alloy and electrode therefrom. 5,480,740, Cl. 429-59.000.
- Serlet, Bertrand; Boynton, Lee; and Tevian, Avadis, to NeXT Computer, Inc. Method for providing automatic and dynamic translation of object oriented programming language-based message passing into operation system message passing using proxy objects. 5,481,721, Cl. 395-700.000.
- Serradeil-Legal, Claudine, See—  
Wagnon, Jean; de Cointet, Paul; Nisato, Dino; Plouzane, Claude; Serradeil-Legal, Claudine; and Tonnerre, Bernard, 5,481,005, Cl. 548-537.000.
- Seto, Yoko, See—  
Sato, Keiichi; Seto, Yoko; and Nakajima, Iwao, 5,481,049, Cl. 568-909.500.
- Setoguchi, Shunichi; Katoh, Haruzo; and Matsufuji, Takashi, to Toyo Aluminum Kabushiki Kaisha. Aluminum pigments. 5,480,481, Cl. 106-404.000.
- Settsune, Kentaro, See—  
Higashino, Hidetaka; Mizuno, Koichi; and Settsune, Kentaro, 5,481,119, Cl. 257-34.000.  
Mizuno, Koichi; Higashino, Hidetaka; and Settsune, Kentaro, 5,480,859, Cl. 505-190.000.
- Sewell, Cody L., See—  
Deken, Arthur D.; Franklin, James E.; and Sewell, Cody L., 5,479,728, Cl. 37-142.500.
- SP-Kooperation GmbH Beton-Konzepte, See—  
Hagenah, Gerhard, 5,480,267, Cl. 405-284.000.
- SFT AG Spontanförderer, See—  
Staubert, Hans-Ulrich, 5,480,279, Cl. 414-792.900.
- SGS-Thomson Microelectronics, Inc., See—  
Rohrbach, Mark E.; and Carbolante, Francesco, 5,481,167, Cl. 318-254.000.
- Ryat, Marc H., 5,481,180, Cl. 323-315.000.
- SGS-Thomson Microelectronics S.A., See—  
Moreau, Jean-Michel, 5,481,132, Cl. 257-566.000.
- SGS-Thomson Microelectronics S.r.l., See—  
Gariboldi, Roberto; and Pulvirenti, Francesco, 5,481,221, Cl. 327-536.000.
- Shahar, Arie, See—  
Schwartz, Nira; Shahar, Arie; and Woods, Richard, 5,481,619, Cl. 382-141.000.
- Shahbazi, Horyeh D. CRT monitor power control unit. 5,481,732, Cl. 395-750.000.
- Shahid, Muhammed A., See—  
Roll, Richard A.; and Shahid, Muhammed A., 5,481,638, Cl. 385-134.000.
- Shane, Eric M.; and McElroy, James F., to United Technologies Corporation. High purity hydrogen and oxygen production using an ion exchange membrane having catalysts electrically isolated throughout. 5,480,518, Cl. 204-129.000.
- Sharma, Mahendra K.; Dobbs, Suzanne W.; and Hiller, John J., to Eastman Chemical Company. Ozone-friendly correction fluid. 5,480,920, Cl. 523-161.000.
- Sharp, Anthony C., See—  
Doederlein, Dieter D.; Newman, G. Dale; Burgess, Brian J.; and Sharp, Anthony C., 5,480,156, Cl. 273-237.000.
- Sharp Kabushiki Kaisha, See—  
Eto, Koichi; Miyaza, Masao; Ohnishi, Kazuyuki; and Tamagaki, Akira, 5,481,375, Cl. 358-450.000.
- Hibi, Keiichi, 5,481,310, Cl. 348-413.000.
- Shigematsu, Hiroyuki; Nakamura, Yutaka; Sakamoto, Munenori; Nagasawa, Hiroyuki; Nakao, Hiroshi; Nakajima, Yasuhiro; and Kurata, Masaaki, 5,481,278, Cl. 345-179.000.
- Shigeta, Mitsuhiro; Nonomura, Keisaku; and Kishimoto, Kazuyuki, 5,481,273, Cl. 345-94.000.
- Suzuki, Akihisa, 5,480,514, Cl. 162-231.000.
- Suzuki, Kaoru; Ando, Tadashi; Naka, Hiroshi; Sawada, Mitsutoshi; Ohata, Tomonori; Miura, Hiroshi; Nakabayashi, Masayoshi; and Ando, Eiiti, 5,480,130, Cl. 270-53.000.
- Tanigawa, Makoto; Tabuchi, Hiroki; and Taniguchi, Takayuki, 5,480,047, Cl. 216-12.000.
- Yamasaki, Kazuyuki; Hamaguchi, Yoshihiro; Hosoda, Shunji; Sakata, Kazuyuki; Imai, Takashi; Okatani, Shigetoshi; Nishio, Satoshi; Takahashi, Tetsuhiro; Matsumura, Kenji; Tanaka, Noriyuki; Nagayasu, Teruaki; and Makino, Hiroshi, 5,480,537, Cl. 210-96.100.
- Shastri, Subramanya K., See—  
Nazif, Zaher A.; Shastri, Subramanya K.; Man, Susan K. K.; Chu, Edith H.; Chu, Francis Y.; Fisher, Gregory M.; and Nassirpour, Mohammad S., 5,481,601, Cl. 379-207.000.
- Shattuck, Dennis R.; and Volpenhein, Eric C., to Dames & Moore. Ground water collection method and apparatus. 5,480,260, Cl. 405-36.000.
- Shattuck, Ewart H., See—  
McClain, David R.; and Shattuck, Ewart H., 5,480,485, Cl. 118-64.000.
- Shaw, Kevin, See—  
Hardie, Robert; and Shaw, Kevin, 5,479,969, Cl. 141-130.000.
- Sheldahl, Inc., See—  
Swisher, Richard L., 5,480,730, Cl. 428-621.000.
- Shell Oil Company, See—  
Freriks, Jan; Groenewald, Pieter; Kooijmans, Petrus G.; and Raudenbush, Werner T., 5,480,960, Cl. 528-198.000.
- Hale, Arthur H., 5,479,987, Cl. 166-293.000.
- Marshall, Peter W.; Huete, David A.; Morrison, Denby G.; and Smolinski, Susan L., 5,480,265, Cl. 405-224.000.
- Marshall, Peter W.; Huete, David A.; Morrison, Denby G.; and Smolinski, Susan L., 5,480,266, Cl. 405-224.200.
- Peppel, George W., 5,479,990, Cl. 166-350.000.
- Snyder, Dale R., Jr.; Smith, James D.; Stevens, James W.; and Kipp, Robert M., 5,480,521, Cl. 204-148.000.
- Shen, Anthony P., See—  
Shen, Francis N.; Shen, Anthony P.; Edwards, Eric C.; Schmid, Gerrard B.; and Kotzev, Grigor K., 5,481,594, Cl. 379-67.000.
- Shen, Francis N.; Shen, Anthony P.; Edwards, Eric C.; Schmid, Gerrard B.; and Kotzev, Grigor K., to Astra Corporation. Audio caller identification unit. 5,481,594, Cl. 379-67.000.
- Shepard, Phillip W., See—  
Davis, Glen; and Shepard, Phillip W., 5,481,098, Cl. 235-462.000.
- Shepard, Randall B.; and Hannum, Richard C., to McGuire Furniture Company, The. Decorative sleeve for furniture leg. 5,480,689, Cl. 428-15.000.
- Shepherd, Timothy A., See—  
Hornback, William J.; Munroe, John E.; and Shepherd, Timothy A., 5,480,887, Cl. 514-301.000.
- Sherwin-Williams Company, The, See—  
Valpey, Richard S., III; Yokoyama, Thomas W.; Kraan, John D.; and Harwood, H. James, 5,480,951, Cl. 526-271.000.
- Sherwood, Brad L. Correlated set of golf club irons. 5,480,145, Cl. 273-77.00A.
- Shiang, Dawn, See—  
Orvik, Jon A.; and Shiang, Dawn, 5,480,991, Cl. 544-263.000.
- Shibata, Hideaki, See—  
Bannai, Tatsushii; Shibata, Hideaki; Ohtsu, Masamitsu; and Okamoto, Hiroshi, 5,481,412, Cl. 360-18.000.
- Shibata, Mitsuru, See—  
Sakamoto, Masashi; Shibata, Mitsuru; Nasuno, Ichiro; and Koike, Kazuyoshi, 5,480,858, Cl. 504-288.000.
- Shibata, Tadayoshi, See—  
Shimizu, Makoto; Esaki, Toshiro; Shibata, Tadayoshi; and Takahashi, Koichi, 5,479,691, Cl. 29-430.000.
- Shibayama, Tetsuhiro, See—  
Tsuchiya, Hiroaki; Shibayama, Tetsuhiro; Katsumi, Toru; and Kamiya, Yuji, 5,481,337, Cl. 355-208.000.
- Shibukawa, Takeo, to Yamaha Corporation. Electronic musical instrument under control of multiple task requirement. 5,481,067, Cl. 84-659.000.
- Shibuya, Tadashi; Nishiguchi, Yukihiko; Suzuki, Tomikazu; and Takamine, Yasufumi, to NEC Corporation. Interrupt controller that reduces the number of scans needed to identify priority. 5,481,729, Cl. 395-737.000.
- Shichi, Hiroyasu, See—  
Ninomiya, Ken; Todokoro, Hideo; Kure, Tokuo; Mitsui, Yasuhiro; Kuroda, Katsuhiko; and Shichi, Hiroyasu, 5,481,109, Cl. 250-310.000.
- Shigematsu, Hiroyuki; Nakamura, Yutaka; Sakamoto, Munenori; Nagasawa, Hiroyuki; Nakao, Hiroshi; Nakajima, Yasuhiro; and Kurata, Masaaki, to Sharp Kabushiki Kaisha. Information processing apparatus. 5,481,278, Cl. 345-179.000.
- Shigematsu, Ryusuke, See—  
Takagawa, Makoto; Shigematsu, Ryusuke; and Sasaki, Takayo, 5,481,055, Cl. 585-481.000.
- Shigemoto, Hiromi; and Noritomi, Katsumi, to Mitsui Petrochemical Industries, Ltd. Laminated film or sheet and box-shaped vessel prepared therefrom. 5,480,718, Cl. 428-342.000.
- Shigeta, Mitsuhiro; Nonomura, Keisaku; and Kishimoto, Kazuyuki, to Sharp Kabushiki Kaisha. Transmission circuit of display signal for liquid crystal display and transmission method thereof. 5,481,273, Cl. 345-94.000.
- Shima, Takeshi, to Kabushiki Kaisha Toshiba. Sample-and-hold circuit device. 5,481,212, Cl. 327-94.000.
- Shimada, Mizuho, to Equestrian Co., Ltd. Method of manufacturing an illuminating reflection mirror. 5,481,408, Cl. 359-838.000.
- Shimada, Tomoyuki; Sasaki, Masaomi; and Tanaka, Chiaki, to Ricoh Company, Ltd. Electrophotographic photoconductor comprising diamine compound. 5,480,753, Cl. 430-59.000.
- Shimadzu Corporation, See—  
Kimura, Yutaro; Ikeshima, Tetsuhiko; Tonami, Hiromichi; Konishi, Ikuo; Horikawa, Hiroshi; Daikoku, Akihiro; Sakabe, Shigekazu; Inoue, Masao; and Yamasaki, Akinori, 5,481,585, Cl. 378-134.000.
- Shimano Inc., See—  
Sato, Jun, 5,480,102, Cl. 242-310.000.
- Tani, Masahiko, 5,480,359, Cl. 474-160.000.
- Shimano, Seiichi, to Nikkodo Co., Ltd. Ornament with a compact-disc. 5,479,796, Cl. 63-2.000.
- Shimano, Takeshi; Ito, Kenchi; Maruyama, Yooji; and Awano, Hiroyuki, to Hitachi, Ltd. Flying type optical bead integrally formed with light source and photodetector and optical disk apparatus with the same. 5,481,386, Cl. 369-44.120.
- Shimazaki, Masato, See—  
Yanagihara, Naoto; Takashima, Masanobu; Shimazaki, Masato; Iwakura, Ken; and Kodama, Tomohiro, 5,480,765, Cl. 430-338.000.
- Shimek, Daniel C., See—

- Shimek, Ronald J.; and Shimek, Daniel C., 5,479,916, Cl. 126-512.000.
- Shimek, Ronald J.; and Shimek, Daniel C. Low profile gas burner fireplace table. 5,479,916, Cl. 126-512.000.
- Shimizu, Hisae, See—  
Kozuka, Hiraku; Sugawa, Shigetoshi; and Shimizu, Hisae, 5,481,124, Cl. 257-185.000.
- Shimizu, Kaoru, See—  
Matsuda, Yutaka; and Shimizu, Kaoru, 5,480,022, Cl. 198-782.000.
- Shimizu, Katsuchi, See—  
Arimoto, Shinobu; Shimizu, Katsuchi; Komiya, Yutaka; Yoshinaga, Kazuo; Hayashi, Toshio; Nakai, Takehiko; Utagawa, Tsutomu; Nagase, Tetsuya; and Sasanuma, Nobuatsu, 5,481,334, Cl. 355-201.000.
- Shimizu, Kazuo, See—  
Kita, Nobuhiro; Kashima, Shingo; and Shimizu, Kazuo, 5,481,401, Cl. 359-353.000.
- Shimizu, Makoto; Esaki, Toshiro; Shibata, Tadayoshi; and Takahashi, Koichi, to Fuji Photo Film Co., Ltd. Method and apparatus for manufacturing photographic film and photographic film cassette. 5,479,691, Cl. 29-430.000.
- Shimizu, Naoya, See—  
Sanagawa, Toshio; and Shimizu, Naoya, 5,479,834, Cl. 73-866.500.
- Shimizu, Toshihiko, See—  
Hatahita, Toyohito; Taura, Motoharu; Shimizu, Toshihiko; and Umeoka, Hiroshi, 5,481,670, Cl. 395-182.050.
- Shimoda, Tetsuya, See—  
Urano, Teruo; Miyaji, Hiroshi; Ogura, Masatsune; Shimoda, Tetsuya; and Ishikawa, Katuaki, 5,480,584, Cl. 252-384.000.
- Shimokata, Akihiro; Fujii, Yasuhisa; and Fujimoto, Hisayoshi, to Rohm Co., Ltd. Method of producing ink jet print head. 5,479,685, Cl. 29-25.350.
- Shin-Etsu Chemical Co., Ltd., See—  
Fukumoto, Takehiko; Hirokawa, Kazushi; and Okada, Kurao, 5,481,040, Cl. 568-9.000.
- Shin-Etsu Quartz Products Co. Ltd., See—  
Okoshi, Shinichi; and Kimura, Hiroyuki, 5,480,300, Cl. 432-241.000.
- Shin, Shoichi, See—  
Manabe, Takao; Yamakawa, Yuhai; Shin, Shoichi; Yamada, Hideyuki; Nagashima, Mitsuo; Kokubo, Mitsunori; Tsunada, Masafumi; Nagakura, Yasuhiko; Nakajima, Yukio; Inoue, Tomohiro; and Kondo, Kiyoshi, 5,480,508, Cl. 156-353.000.
- Shinada, Yasuyuki, See—  
Watanabe, Fumihiko; Okubo, Akio; Saito, Atsushi; and Shinada, Yasuyuki, 5,481,283, Cl. 347-33.000.
- Watanabe, Fumihiko; Okubo, Akio; Saito, Atsushi; and Shinada, Yasuyuki, 5,481,290, Cl. 347-104.000.
- Shinano Kenshi Kabushiki Kaisha, See—  
Tokoro, Koichi, 5,481,520, Cl. 369-77.200.
- Shinjo, Kenji, See—  
Hanyu, Yukio; Inaba, Yutaka; Asaka, Masanobu; Taniguchi, Osamu; Shinjo, Kenji; and Uchimi, Toshiharu, 5,481,387, Cl. 359-078.000.
- Shinogle, Ronald D., See—  
Gibson, Dennis H.; Hefler, Gregory N.; Maley, Dale C.; and Shinogle, Ronald D., 5,479,901, Cl. 123-472.000.
- Shinohara, Masahiro, See—  
Mihara, Takashi; Shirasaka, Kazumi; Oda, Kenji; Nakahata, Akinobu; Shinohara, Masahiro; and Sasaki, Wataru, 5,481,348, Cl. 335-290.000.
- Shinon Denkisangyo Kabushiki Kaisha, See—  
Nemoto, Hisashi, 5,481,438, Cl. 361-810.000.
- Shinozawa, Tamio, See—  
Kambe, Yoshitaka; and Shinozawa, Tamio, 5,481,149, Cl. 310-178.000.
- Shintani, Yoshitomo; Suganuma, Tetsuya; Matsuo, Shitsuo; Saito, Hajime; Yamaoka, Hidenori; Kuroko, Nobuhisa; and Kotaka, Hiroaki, to Toyota Jidosha Kabushiki Kaisha; and Toshiba Ceramics Co., Ltd. Method of manufacturing aluminum borate whiskers having a reformed surface based upon gamma alumina. 5,479,873, Cl. 117-75.000.
- Shionogi Seiyaku Kabushiki Kaisha, See—  
Jizomoto, Hiroaki; Hirano, Koichiro; and Kanaoka, Eri, 5,480,655, Cl. 424-492.000.
- Shiotsu, Shinichiro; and Horiuchi, Yoshiaki, to Nagase Electronic Chemicals, Ltd. Stripping liquid compositions. 5,480,585, Cl. 252-544.000.
- Shiozaki, Tadashi, See—  
Wakabayashi, Kenichi; Takayama, Chitoshi; and Shiozaki, Tadashi, 5,481,656, Cl. 395-115.000.
- Shiraishi, Naomasa, to Nikon Corporation. Projection exposure method and apparatus for improved image transfer from photomask having periodic and non-periodic patterns. 5,481,332, Cl. 355-53.000.
- Shirasaka, Kazumi, See—  
Mihara, Takashi; Shirasaka, Kazumi; Oda, Kenji; Nakahata, Akinobu; Shinohara, Masahiro; and Sasaki, Wataru, 5,481,348, Cl. 335-290.000.
- Shirasaka, Tetsuhiko, See—  
Yano, Shingo; Ohno, Tomoyasu; Ogawa, Kazuo; Yamada, Haruo; Shirasaka, Tetsuhiko; Kawamura, Hiroyuki; and Watanabe, Shinichi, 5,480,899, Cl. 514-376.000.
- Shirasawa, Seiichi, See—  
Negishi, Satoshi; Shirasawa, Seiichi; Suzuki, Junko; and Murui, Tateo, 5,480,787, Cl. 435-134.000.
- Shiseido Co., Ltd., See—  
Tajima, Masahiro; Ohnuma, Manami; and Lerner, Ethan L., 5,480,864, Cl. 514-2.000.
- Shizuo, Nagata; Yasuhiro, Suzuki; Tutomu, Tabata; and Masahiro, Takahashi, to Oki Electric Industrial Co., Ltd. Tracking adjustment using the sum of the maximum and minimum tracking error signals or the mean value of the sum. 5,481,526, Cl. 369-124.000.
- Shmulewitz, Ascher, to NeoVision Corporation. Methods and apparatus for performing sonomammography and enhanced x-ray imaging. 5,479,927, Cl. 128-660.090.
- Shogren, David K., See—  
James, Courtney D.; Nowak, William J.; and Shogren, David K., 5,481,142, Cl. 310-51.000.
- Shoham, Yair, to AT&T Corp. Constrained-stochastic-excitation coding. 5,481,642, Cl. 395-2.280.
- Shoji, Yasuo; Tsuda, Yoshihiko; Tsutsumi, Kazuhiko; and Inoue, Yasuhide, to Otsuka Pharmaceutical Factory, Inc. Phosphonic diester derivatives. 5,480,874, Cl. 514-80.000.
- Showa Corp., See—  
Nagai, Osamu; Okamoto, Kunihide; and Yamamoto, Kaoru, 5,480,011, Cl. 188-299.000.
- Showalter, Howard D. H., See—  
Beylin, Vladimir G.; Serce, Anthony D.; Showalter, Howard D. H.; Adams, Gerald E.; Fielden, Edward M.; Naylor, Matthew A.; and Stratford, Ian J., 5,481,000, Cl. 548-229.000.
- Shukla, Premal, See—  
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- Reisch, Michael; and Ziemann, Klaus, 5,481,536, Cl. 370-60.100.
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- Signorino, Charles A., to Warner-Jenkinson Company, Inc. Wet powder film-forming compositions. 5,480,479, Cl. 106-162.000.
- Siller, Jose L. Friction connector for anchoring reinforcement tendons in reinforced or pre-stressed concrete girders. 5,479,748, Cl. 52-231.000.
- Sills, Nicholas V., to Underwater Excavation Limited. Underwater excavation apparatus. 5,480,291, Cl. 417-375.000.
- Silver, William M.; Druker, Samuel; Romanik, Philip; and Arbogast, Carroll, to Cognex Corporation. Method and apparatus for interactively generating a computer program for machine vision analysis of an object. 5,481,712, Cl. 395-700.000.
- Simbal, John J., to Minnesota Mining and Manufacturing Company. Stepless micrographic zoom lens having large magnification ratio. 5,481,405, Cl. 359-689.000.
- Simon, Frederick A.; Cagan, Robert H.; Rhein, Linda D.; Blake-Haskins, John C.; and Babulak, Stephen W., to Colgate-Palmolive Company. Mild cleanser and conditioner to yield soft smooth skin. 5,480,633, Cl. 424-70.100.
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- Skaalen, Peter L., Jr.; Papez, Thomas W.; and Scheunemann, Roy A., to Amity Leather Products Company: Method and apparatus for manufacturing coin pouch, 5,480,605, Cl. 264-234,000.
- Skiba, Jeffrey B., to International Polymer Engineering, Inc.: Joint implant, 5,480,447, Cl. 623-21,000.
- Skinner, Glenn, to Sun Microsystems, Inc.: Method and apparatus for merging change control delta structure files of a source module from a parent and a child development environment, 5,481,722, Cl. 395-700,000.
- Skold, Johan; and Eriksson, Per-Olof, to Ericsson Inc.: Method of and apparatus for reducing the complexity of a diversity combining and sequence estimation receiver, 5,481,572, Cl. 375-347,000.
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- SMC Kabushiki Kaisha: See—  
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- Smelser, Donald W.: See—  
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- Smisson, Robert P. M., to Hydro International PLC: Liquid treatment, 5,480,559, Cl. 210-727,000.
- Smith, Adlai H.; Hunter, Robert O., Jr.; and McArthur, Bruce B., to Liel Instruments: Apparatus and process for using Fresnel zone plate array for processing materials, 5,481,407, Cl. 359-742,000.
- Smith & Nephew Richards, Inc.: See—  
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- Smith, Bradley W.: See—  
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- Lowe, William G.; Rink, Linda M.; Moore, Walter A.; and Smith, Bradley W., 5,480,185, Cl. 280-740,000.
- Smith, Clark R.: Apparatus and method for removing compounds from a solution, 5,480,665, Cl. 426-490,000.
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- Smith, Craig A.: See—  
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- Smith, Garry R., to Ford Motor Company: Dynamic roll control system for a motor vehicle, 5,480,186, Cl. 280-772,000.
- Smith, Howard E.: See—  
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- Smith, James D.: See—  
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- Smith, Janet M., to Dow Corning Corporation: Alkylmethylsiloxane containing gels, 5,480,637, Cl. 424-78,020.
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- Smith, John M., to General Electric Company: Dishwasher rack with adjustable shelf, 5,480,035, Cl. 211-41,000.
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- Smith, W. Vernon; and Hall, Hendley W., to Excellon Automation Co.: Movable registration pin mechanism, 5,479,722, Cl. 33-617,000.
- Smith, Eliot S.; Lambert, Michael P.; and Wilkinson, Jason H., to F. L. Smith Machine Company, Inc.: Method and apparatus for controlling tension between variable speed driver rollers, 5,480,085, Cl. 226-44,000.
- Smiths Industries Public Limited Company: See—  
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- Smitson, Dave: See—  
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- Wangerin, Gerhard; and Richert, Withold, 5,480,499, Cl. 148-657,000.
- Smyth, Dale C., Jr., to Cincinnati, Incorporated: System and method for stacking and laser cutting multiple layers of flexible material, 5,481,083, Cl. 219-121,670.
- Snead, David E.; Smalley, Dennis R.; Cohen, Adam L.; Allison, Joseph W.; Vorgitch, Thomas J.; and Chen, Thomas P., to 3D Systems, Inc.: Boolean layer comparison slice, 5,481,470, Cl. 364-468,000.
- Snover, Jonathan L.: See—  
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- Snow, John P., to Lubriquip, Inc.: Crossport and singling manifold for a series progressive divider valve, 5,480,004, Cl. 184-7,400.
- Snowden, Gregory A.: See—  
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- Snyder, David A., to Westinghouse Electric Corporation: Apparatus for expanding tubular members, 5,479,699, Cl. 29-727,000.
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- Societe Francaise Hoechst: See—  
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- Societe Nationale d'Exploitation Industrielle des Tabacs et Allumette and Etablissements V.: See—  
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- Software Control Systems, Inc.: See—  
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- Sogabe, Jun, to Fujicopian Co., Ltd.: Thermal transfer printing medium, 5,480,704, Cl. 428-212,000.
- Solarek, Daniel B.: See—  
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- Soloviev, Georgy N.; Kudryashov, Boris B.; and Litvinenko, Vladimir S., to Sankt-Peterburgsky Gorny Institut Imeni G.V. Plekhanova: Method of electrothermomechanical drilling and device for its implementation, 5,479,994, Cl. 175-11,000.
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- Soltys, Paul; and Ofstun, Norma, to Baxter International Inc.: Method for concentrating a solute with an oscillating filtration device, 5,480,552, Cl. 210-645,000.
- Solvay Fluor und Derivate GmbH: See—  
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- Somborn, Günter: See—  
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- Sonuparlak, Birol; Hatton, Kenneth S.; Landini, Dennis J.; Canino, Sylvia J.; Aghajanian, Michael K.; and Patel, Aspi N., to Lanxide Technology Company, LP: Method of making ceramic composite bodies having a protective surface region thereon and bodies made thereby, 5,480,676, Cl. 427-180,000.
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- Hasegawa, Toshiaki, 5,480,489, Cl. 118-725,000.
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- Kondo, Tetsujiro, 5,481,554, Cl. 371-53,000.
- Koseki, Shuji, 5,481,424, Cl. 360-106,000.
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- Maikuma, Masahiro; and Takaoka, Tomoyasu, 5,481,418, Cl. 360-85,000.
- Nosaka, Shiro; and Kuragano, Tetsuzo, 5,481,659, Cl. 395-123,000.
- Oguro, Masaki, 5,481,415, Cl. 360-69,000.
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- Tanahashi, Makoto, 5,480,237, Cl. 400-120,020.
- Veltman, Markus H., 5,481,543, Cl. 370-94,100.
- Yada, Hiroaki, 5,481,568, Cl. 375-340,000.
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- Sopcich, Nicholas J.: See—  
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- Sorensen, Erik J.: See—  
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- Souder, Richard A.: See—  
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- Spada, Alfred P.; Myers, Michael R.; Maguire, Martin P.; and Persons, Paul E., to Rhone-Poulenc Rorer Pharmaceuticals Inc.: Bis mono- and bicyclic aryl and heteroaryl compounds which inhibit EGF and/or PDGF receptor tyrosine kinase, 5,480,883, Cl. 514-249,000.
- Spano, Joseph M.: See—  
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- Spartanburg Steel Products, Inc.: See—  
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- Specialized Banking Furniture International: See—  
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- Specialized Health Products, Inc.: See—  
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- Spector, George: See—  
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- Spence, John M.: See—  
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- Spergel, Steven H.: See—  
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- Spingler, Rolf A., to United States Surgical Corporation: Method and device for forming drilled needle blanks, 5,479,980, Cl. 163-5,000.
- Spinney, Barry: See—  
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- Spix, Guido: See—  
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- Springer, Helmut: See—  
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- Sprinkel, F. Murphy: See—  
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- Sproule, James, to Gentry Gallery, Inc.: The reclining sofa, 5,480,213, Cl. 297-232,000.
- SPX Corporation: See—  
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- Srinivasan, Ravi R.: See—  
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- Staats, Erik, to Apple Computer, Inc.: Vector quantization using thresholds, 5,481,739, Cl. 395-800,000.
- Stabila-Massgerate Gustav Ullrich GmbH: See—  
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- Stachuletz, Manfred; and Strohmeier, Helmut, to Mannesmann Aktiengesellschaft: Apparatus for adjusting the upper edge of a work roll to the rolling line, 5,479,809, Cl. 72-244,000.
- Stacy, Len E.; and Wnukoski, George J., to General Electric Company: Electromagnetic shield for alternating current induction railway motors, 5,481,151, Cl. 310-256,000.
- Stadler, Klaus P.: See—  
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- Staff, Trevor A.: See—  
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- Stafford, Dalton R.: See—  
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- Chung, Tze-Chiang; Chen, Frank J.; Stanat, Jon E.; and Kumar, Alok, 5,481,054, Cl. 585-459,000.
- Stanko, Ronald T., to University of Pittsburgh Medical Center. Method for inhibiting generation of free-radicals. 5,480,909, Cl. 514-557,000.
- Stanley-Bostich, Inc.: See—  
Braun, Phillip M.; Harrison, John J.; Perla, Arthur E.; Scanlon, Patrick J.; and Simonelli, David J., 5,480,088, Cl. 227-130,000.
- Stant Manufacturing Inc.: See—  
Harris, Robert S.; and Griffin, Jeffery, 5,480,055, Cl. 220-203,260.
- Starnier, William E.; and Myers, Richard S., to Air Products and Chemicals, Inc. Polycarbonate resins incorporating epoxy terminated urethanes as tougheners. 5,480,958, Cl. 528-96,000.
- Starr, William D.: See—  
Martin, Michael F.; Starr, William D.; and Hoekstra, Peter, 5,479,676, Cl. 15-323,000.
- Starzl, Thomas E.: See—  
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- State of Israel represented by the Prime Minister's Office, Israel Institute For Biological Research, The: See—  
Margalit, Yair, 5,480,612, Cl. 422-61,000.
- StatSpin Technologies: See—  
Kelley, Thomas F.; and Floyd, Alton D., 5,480,484, Cl. 118-52,000.
- Stauber, Gregory: See—  
Spellmeyer, David C.; Moos, Walter H.; Martin, Eric J.; Zuckermann, Ronald N.; and Stauber, Gregory, 5,480,871, Cl. 514-18,000.
- Stauber, Hans-Ulrich, to SFT AG Spontanfördertechnik. Gripper for handling and storing products in roll form. 5,480,279, Cl. 414-792,900.
- Staudinger, Joseph; Seely, Warren L.; and Patterson, Howard W., to Motorola, Inc. Integrated circuit having passive circuit elements. 5,481,131, Cl. 257-531,000.
- Stebbins, Leslie F.: See—  
Janssen, Robert A.; Cooper, Charlotte L.; Mulcahy, Deborah J.; Peeples, Judy L.; and Stebbins, Leslie F., 5,480,927, Cl. 524-100,000.
- Steffier, Wayne S., to Hyper-Therm High-Temperature Composites, Inc. Toughened ceramic composite materials comprising coated refractory fibers in a ceramic matrix wherein the fibers are coated with carbon and an additional coating of ceramic material and carbon mixture. 5,480,707, Cl. 428-229,000.
- Steigerwald, Robert L.: See—  
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- Steinhaus, Bruce: See—  
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- Stender, Axel; and Schappler, Hartmut, to Wabco Standard GmbH. Process and apparatus for monitoring a motor vehicle brake for overload. 5,480,215, Cl. 303-7,000.
- Stenger, Karl; Klenk, Ludwig; and Beissel, Dieter, to Hoechst Aktiengesellschaft. Multi-layer polyamide-based packaging casing. 5,480,690, Cl. 428-34,800.
- Stepanov, Alexander A.: See—  
Chao, Chia-Chiang; English, Robert M.; Jacobson, David M.; Stepanov, Alexander A.; and Wilkes, Andrew J., 5,481,694, Cl. 395-439,000.
- Stephan, Werner: See—  
Duecoffre, Volker; Flosbach, Carmen; Schubert, Walter; Krumme, Manfred; Stephan, Werner; and Sadowski, Fritz, 5,480,936, Cl. 524-839,000.
- Stephenson, Joseph P.: See—  
Daigler, Glen T.; Stephenson, Joseph P.; Nolasco, Daniel A.; Stafford, Dalton R.; and Kaupp, Douglas M., 5,480,548, Cl. 210-605,000.
- StereoGraphics Corp.: See—  
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- Sterling Pulp Chemicals, Ltd.: See—  
Lipsztajn, Marek; Cowley, Gerald; and Gourley, Dana, 5,480,516, Cl. 204-103,000.
- Stern, Gerhard: See—  
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- Stern, Glenn: See—  
Mueller, Steve; Meyers, Scott; Lambach, Chris; Stern, Glenn; Cochenet, Joseph; Werth, John T., III; Rodriguez, Carlos E.; Wozniak, John N.; Hintz, John; Hansen, Richard W.; and Trotter, Steve, 5,481,193, Cl. 324-379,000.
- Stevens, Daniel W. Adjustable light bar apparatus. 5,481,441, Cl. 362-35,000.
- Stevens, James W.: See—  
Sayder, Dale R., Jr.; Smith, James D.; Stevens, James W.; and Kipp, Robert M., 5,480,521, Cl. 204-148,000.
- Stevenson, Thomas E.: See—  
Morshedi, A. M.; Stevenson, Thomas E.; and Scott, David E., 5,481,716, Cl. 395-700,000.
- Stevenson, William W.; Ruta, John C.; Sandison, W. Bruce; and Blette, Russell E., to Minnesota Mining and Manufacturing Company. Actuator and container for dispensing fluids. 5,480,095, Cl. 239-104,000.
- Stewart, Wallace S.; Merz, Gary E.; and Marshall, Dale C., to Eastman Kodak Company. Ultrasonic apparatus and method for placing individual chips of light lock material. 5,480,501, Cl. 156-73,100.
- Stewart, Wayne S.: See—  
Oakley, Johnna E.; Fox, Kelly B.; Evans, Alvin, Jr.; and Stewart, Wayne S., 5,480,863, Cl. 507-225,000.
- Stewing Nachrichtentechnik GmbH & Co.: See—  
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- Stigliani, Daniel, Jr.: See—  
Jacobowitz, Lawrence; and Stigliani, Daniel, Jr., 5,481,573, Cl. 375-356,000.
- Stiller, Marc A.: See—  
Gal, George; Anderson, William W.; Herman, Bruce J.; and Stiller, Marc A., 5,480,764, Cl. 430-321,000.
- Stimper, Bernd: See—  
Richter, Karl-Hermann; Meier, Reinhold; Schmitt, Thilo; and Stimper, Bernd, 5,479,704, Cl. 29-889,100.
- St. John, Keith N.: See—  
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- St. Louis, Henry E., Jr.: See—  
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- Stoffels, Johannes: See—  
Nordholt, Ernst; and Stoffels, Johannes, 5,481,218, Cl. 327-350,000.
- Stone, Corbett W.: See—  
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- Stonehart Associates Inc.: See—  
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- Stonehart, Paul: See—  
Tsurumi, Kazunori; and Stonehart, Paul, 5,480,851, Cl. 502-185,000.
- Storstrom, Helge; and Floren, Bengt, to Hoganas AB. Powder mixture and method for the production thereof. 5,480,469, Cl. 75-228,000.
- Stotelmeyer, L. Scott; and Fulkerson, Don K., to Hughes Aircraft Company. Integrated storage and transfer system and method for spacecraft propulsion systems. 5,479,959, Cl. 137-559,000.
- Stotts, Lawrence J.: See—  
Garcia, John; Alt, Eckhard; and Stotts, Lawrence J., 5,480,416, Cl. 607-36,000.
- Stout, James T., to Mead Corporation, The. Stress-relieving arrangement for carton handles. 5,480,091, Cl. 229-117,140.
- Straka, Alfred: See—  
Lang, Hans-Walter; Straka, Alfred; and Berlinghoff, Frank, 5,480,307, Cl. 434-263,000.
- Strand, William L., to Bitmin Corporation. Method for releasing and separating oil from oil sands. 5,480,566, Cl. 210-772,000.
- Stratford, Ian J.: See—  
Beylin, Vladimir G.; Sercel, Anthony D.; Showalter, Howard D. H.; Adams, Gerald E.; Fielden, Edward M.; Naylor, Matthew A.; and Stratford, Ian J., 5,481,001, Cl. 548-229,000.
- Stratta, Julius J.; Rose, Julian K.; and Paxton, Herbert J., Jr., to Union Carbide Chemicals & Plastics Technology Corporation. Preparation of stable dispersions of ethylene oxide polymers. 5,480,928, Cl. 524-386,000.
- Street, Michael J.; Mottram, Toby T. F.; Wilkin, Arthur L.; and Hall, Robert C., to British Technology Group Ltd. Automatic milking. 5,479,876, Cl. 119-14,080.
- Strelau, Klaus: See—  
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- Striebig, Jean-Louis: See—  
Rouhier, Maurice; and Striebig, Jean-Louis, 5,480,321, Cl. 439-374,000.
- Stroebe, John C.; and Markowitz, H. Toby, to Medtronic, Inc. Method and apparatus for controlling pacemaker during automatic capture detection. 5,480,414, Cl. 607-28,000.
- Strohmeier, Helmut: See—  
Stachuletz, Manfred; and Strohmeier, Helmut, 5,479,809, Cl. 72-244,000.
- Strotman International, Inc.: See—  
Plakos, Andrew E., 5,480,341, Cl. 446-373,000.
- Stuart, James E.: See—  
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- Stubler, Jérôme; Ladret, Patrick; and Dupuis, Joël, to Freyssinet International et Cie. Methods and devices for installing discontinuous sheaths on cables and to cables thus sheathed. 5,479,671, Cl. 14-22,000.
- Stuhr, Darlene K.; and Stuhr, Donald E. Water filtering open tray bird feeder. 5,479,880, Cl. 119-57,800.
- Stuhr, Donald E.: See—  
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- Stuppner, Hermann: See—  
Wagner, Hildebert; Dorsch, Walter; Stuppner, Hermann; and Antus, Sandor, 5,481,043, Cl. 568-309,000.
- Sturtevant, Wayne R.: See—  
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- Su, Chuang-Hui: See—  
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- Sublette, Kerry L., to ABB Environmental Services, Inc. Biotreatment process for caustics containing inorganic sulfides. 5,480,550, Cl. 210-611,000.
- Subramanian, Chitra K.; and Neudeck, Gerold W., to Purdue Research Foundation. Semiconductor-on-insulator electronic devices having trench isolated monocrystalline active regions. 5,481,126, Cl. 257-273,000.
- Sud-Chemie AG: See—  
Hirsch, Rüdiger; Hähn, Reinhard; and Schall, Norbert, 5,480,578, Cl. 252-174,250.
- Suda, Atsuhiko: See—  
Matsumoto, Taiji; Suda, Atsuhiko; Sumiya, Kenji; and Yamamoto, Yoshinori, 5,480,702, Cl. 428-209,000.
- Suda, Hiroshi, to Fujitsu Limited. Point-of-sale terminal. 5,481,094, Cl. 235-383,000.
- Suding, David R.; and Seder, Edmund V., to Helix Medical Corporation. Extended dwell voice prosthesis. 5,480,432, Cl. 623-9,000.
- Sudo, Tatsuya: See—  
Suzuki, Teruhiko; Yagasaki, Yoichi; Sudo, Tatsuya; and Okazaki, Toru, 5,481,553, Cl. 371-49,100.
- Suehiro, Atsuo; and Kogashiwa, Norio, to Kowa Industry Works Co., Ltd. Corrosion-inhibited iron-based members and method of producing the same. 5,480,536, Cl. 205-151,000.
- Suematsu, Hideki, to Fujicopian Co., Ltd. Heat-resistant thermal transfer recording medium. 5,480,703, Cl. 428-212,000.
- Suemori, Hiroyuki: See—  
Tsukada, Katsumi; Nakamura, Norio; Nimura, Minoru; Suemori, Hiroyuki; Kamihata, Tomio; and Yamazaki, Mutsuaki, 5,481,432, Cl. 361-686,000.
- Sugahara, Kazuyuki; and Arima, Hideaki, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing semiconductor device having a capacitor. 5,480,826, Cl. 437-52,000.
- Sugano, Masashi; Yamazaki, Yoshio; Ikeda, Masaaki; and Izawa, Tadashi, to Konica Corporation. Image forming apparatus with an unapproved copy preventing means. 5,481,378, Cl. 358-501,000.
- Sugano, Shigeru: See—  
Nagai, Shigekazu; Sugano, Shigeru; Saito, Mitsuhiro; Takebayashi, Takashi; Matsushima, Hiroshi; and Ito, Yoshiharu, 5,481,482, Cl. 364-558,000.
- Suganuma, Hiroshi: See—  
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- Suganuma, Tetsuya: See—  
Shintani, Yoshitomo; Suganuma, Tetsuya; Matsuo, Shuitsu; Saito, Hajime; Yamaoka, Hidenori; Kuroki, Nobuhisa; and Kotaka, Hiroaki, 5,479,873, Cl. 117-75,000.
- Sugata, Hiroyuki: See—  
Okubo, Yukitoshi; Santoh, Tsuyoshi; Tamura, Miki; Mihara, Chieko; Sugata, Hiroyuki; Kanome, Osamu; and Yashima, Masataka, 5,480,596, Cl. 264-1,330.
- Sugawa, Shigetoshi: See—  
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- Sugaya, Hiroyuki; Minaga, Masahiro; Terada, Ryozo; Tayama, Toshikazu; Tanaka, Kazumi; and Fukui, Fumiaki, to Toray Industries, Inc. Hydrophilic material and semipermeable membrane made therefrom. 5,480,953, Cl. 526-320,000.
- Sugazaki, Kazuo: See—  
Oishi, Tetsuya; Ozawa, Hiroshi; Karasawa, Minato; Inomata, Masamitsu; Mega, Izumi; Yamauchi, Atsuyoshi; Kamada, Kazunori; Nakahata, Shigeru; Sakamoto, Katsumi; Nakashima, Tatsunobu; Watanabe, Akito; Suzuki, Jin; Ohkawa, Kouhei; Furusawa, Satoshi; Ono, Hiroshi; and Sugazaki, Kazuo, 5,480,947, Cl. 525-509,000.
- Sugihara, Hitoshi: See—  
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- Sugii, Shinji: See—  
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- Sugisaka, Takayuki: See—  
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- Sugita, Kouji; Kitahara, Tetsuo; Nonobe, Masatsugu; and Fujita, Tsuyosi, to Oriental Yeast Company, Ltd. Crystalline potassium salt of thionicotinamide adenine dinucleotide phosphate. 5,480,982, Cl. 536-26,240.
- Sugitani, Hiroshi: See—  
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- Sugiura, Satoshi, to Kabushiki Kaisha Toshiba. MRI auto power control method and system. 5,481,190, Cl. 324-314,000.
- Sugiyama, Genroku: See—  
Toyooka, Tsukasa; Hirata, Toichi; Sugiyama, Genroku; and Tatsumi, Akira, 5,479,778, Cl. 60-431,000.
- Sugiyama, Hiromu: See—  
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- Sugiyama, Hisashi: See—  
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- Suh, Byoung W.: See—  
Choi, Jong K.; Chung, In B.; Lee, Jae C.; Suh, Byoung W.; Sa, Jong S.; and Heo, Tae H., 5,480,993, Cl. 544-320,000.
- Suk, Young J. Compact golf pull cart with attached golf bag. 5,480,178, Cl. 280-646,000.
- Sullivan, Robert J.: See—  
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- Sumitomo Chemical Company, Limited: See—  
Ogino, Kazuya; Hayashi, Narutoshi; and Omura, Takashi, 5,480,977, Cl. 534-717,000.
- Sumitomo Electric Industries, Ltd.: See—  
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- Hirai, Shigeru; Kurima, Kazunori; Saito, Masahide; Yui, Dai; Hattori, Tomoyuki; and Suganuma, Hiroshi, 5,481,632, Cl. 385-49,000.
- Hirose, Masayuki; Hata, Ryosuke; and Nakaura, Yoshiteru, 5,481,070, Cl. 174-120,000.
- Ikegaya, Akihiko; and Fujimori, Naoki, 5,481,081, Cl. 219-121,480.
- Kohmoto, Kenichiro; and Osada, Mitsuo, 5,481,136, Cl. 257-712,000.
- Tanaka, So; and Iiyama, Michitomo, 5,480,861, Cl. 505-236,000.
- Yamamoto, Susumu; Murai, Teruyuki; Kawabe, Nozomu; and Tobioka, Masaaki, 5,480,601, Cl. 264-61,000.
- Sumitomo Light Metal Industries, Ltd.: See—  
Hattori, Morishige; Ohara, Mamoru; Okuno, Sumio; Okuto, Koichiro; and Irie, Hiroshi, 5,480,729, Cl. 428-593,000.
- Sumitomo Rubber Industries, Ltd.: See—  
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- Tamano, Akiyoshi; Hayashi, Motoo; Sasaoka, Kiyonori; Suzuki, Kazuya; and Hasegawa, Hirotosugu, 5,479,977, Cl. 152-542,000.
- Sumitomo Wiring Systems, Ltd.: See—  
Maegawa, Akihito; and Ichida, Kiyofumi, 5,480,324, Cl. 439-489,000.
- Watanabe, Kaoru; and Kawase, Hajime, 5,480,312, Cl. 439-135,000.
- Yamano, Yoshiaki; Hashimoto, Masayoshi; and Kodera, Hiroji, 5,479,701, Cl. 29-825,000.
- Sumiya, Kenji: See—  
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- Summey, Shala W., III, to Alexander Machinery, Inc. Doffing a cloth roll using a DC motor under full power. 5,479,962, Cl. 139-1,00E.
- Sun Company, Inc. (R&M): See—  
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- Sun, Eric T.: See—  
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- Sun Microsystems, Inc.: See—  
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- Siahpolo, Hassan; Antonuccio, Robert S.; Carney, James M.; Hoornaert, Daniel F.; and Spano, Joseph M., 5,481,431, Cl. 361-685,000.
- Skinner, Glenn, 5,481,722, Cl. 395-700,000.
- Sunbeam Plastics Corporation: See—  
Julian, Randall K., 5,480,606, Cl. 264-328,700.
- Sundberg, Glenn; and Yeckley, Russell, to Saint-Gobain/Norton Industrial Ceramics Corp. Borosilicate glass. 5,480,846, Cl. 501-65,000.
- Sunds Defibrator Industries Aktiebolag: See—  
Berg, Bertil; and Johansson, Ralph, 5,479,792, Cl. 68-5,00D.
- Supreme Corp.: See—  
Burns, Dennis L., 5,480,915, Cl. 521-50,000.
- Surface Technology, Inc.: See—  
Feldstein, Nathan; and Lancsek, Thomas S., 5,480,477, Cl. 106-1,240.
- Surgilase, Inc.: See—  
Morrow, Clifford E.; Gregory, Otto; Bhardwaj, Poonam; and Gu, Gong-En, 5,480,050, Cl. 216-24,000.
- Surprenant, Richard P.: See—  
Economikos, Laertis; and Surprenant, Richard P., 5,481,138, Cl. 257-773,000.
- Suwa, Yoshihito, to Tomoe-gawa Paper Co., Ltd. Method and device for the transfer of magnetic toner. 5,480,758, Cl. 430-126,000.
- Suzuki, Akihisa, to Sharp Kabushiki Kaisha. Diaphragm of electroacoustic transducer and method of manufacturing thereof. 5,480,514, Cl. 162-231,000.
- Suzuki, Akito: See—  
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- Suzuki, Hiroshi: See—  
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- Suzuki, Jin: See—  
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- Suzuki, Junko: See—  
Negishi, Satoshi; Shirasawa, Seichi; Suzuki, Junko; and Murui, Tateo, 5,480,787, Cl. 435-134,000.
- Suzuki, Kaoru; Ando, Tadahi; Naka, Hiroshi; Sawada, Mitsutoshi; Ohata, Tomonori; Miura, Hiroshi; Nakabayashi, Masayoshi; and Ando, Eiti, to Sharp Kabushiki Kaisha. Device for further processing after copying. 5,480,130, Cl. 270-53,000.
- Suzuki, Kazuya: See—  
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- Suzuki, Kenji: See—  
Xu, Jie; Suzuki, Kenji; and Kinoshita, Isamu, 5,480,344, Cl. 451-28,000.
- Suzuki, Kikoku; Kitagawa, Hidemasa; Endo, Koichiro; and Mori, Yoshihiro, to Matsushita Electric Industrial Co., Ltd. Method of editing multimedia data including graphic display of reproduction times. 5,481,752, Cl. 395-800,000.



- Suzuki, Kiyoshi: *See*—  
Takematsu, Tetsuo; Kume, Takashi; Yamaoka, Shoji; Komata, Takeo; Suzuki, Kiyoshi; Ikeda, Yukio; Kawamura, Matsue; Koda, Yumiko; and Mori, Kaoru, 5,481,022, Cl. 560-45.000.
- Suzuki, Masayasu; Mochizuki, Tuiyoshi; and Kawashima, Hiroshi, to Tomoe-gawa Paper Co., Ltd. Method of making a magnetic recording medium comprising two magnetic layers. 5,480,685, Cl. 427-548.000.
- Suzuki, Nobutaka: *See*—  
Noda, Yasushi; Yoshioka, Nobuyuki; Suzuki, Nobutaka; Fukai, Toshi-masa; Yoshihara, Tetsuo; and Koshiro, Koichi, 5,480,472, Cl. 75-351.000.
- Suzuki, Ryuta: *See*—  
Asano, Kenichi; and Suzuki, Ryuta, 5,481,727, Cl. 395-477.000.
- Suzuki, Seiji: *See*—  
Arashima, Teruo; Sugitani, Hiroshi; Masuda, Kazuaki; Ikeda, Masami; Kasamoto, Masami; Suzuki, Seiji; Ishinaga, Hiroyuki; Kawai, Jun; and Kamiyama, Yuji, 5,481,289, Cl. 347-93.000.
- Suzuki, Takahiro; and Okazaki, Kouji, to NGK Spark Plug Co., Ltd. Spark plug with built-in pressure sensor. 5,479,817, Cl. 73-115.000.
- Suzuki, Takashi: *See*—  
Ikezawa, Zenro; Yokota, Shumpei; Tsubaki, Kazufumi; Kohno, Hiroshige; Sugiyama, Hiromu; Ikeda, Kenji; and Suzuki, Takashi, 5,480,660, Cl. 426-2.000.
- Suzuki, Teruhiko; Yagasaki, Yoichi; Sudo, Tatsuya; and Okazaki, Toru, to Sony Corporation. Methods and apparatus for preventing rounding errors when transform coefficients representing a motion picture signal are inversely transformed. 5,481,553, Cl. 371-49.100.
- Suzuki, Tetsuo: *See*—  
Saikawa, Satoshi; Suzuki, Tetsuo; Hiramatsu, Soichi; Taniguro, Masa-hiro; Saito, Hiroyuki; Yanagi, Haruyuki; Nojima, Takashi; Kinoshita, Hiroyuki; and Kawakami, Hideaki, 5,480,247, Cl. 400-629.000.
- Tanaka, Haruo; Takahashi, Noriaki; and Suzuki, Tetsuo, 5,480,362, Cl. 475-346.000.
- Suzuki, Tomikazu: *See*—  
Shibuya, Tadashi; Nishiguchi, Yukihiko; Suzuki, Tomikazu; and Takamine, Yasufumi, 5,481,729, Cl. 395-737.000.
- Suzuki, Toshiki, to NEC Corporation. Private branch radio extension termi-nating system. 5,481,591, Cl. 379-58.000.
- Suzuki, Toshio, to Pioneer Electronic Corporation. Handwritten character recognition device. 5,481,625, Cl. 382-187.000.
- Suzuki, Toshio: *See*—  
Masaki, Ryoso; Morinaga, Shigeki; Tahara, Kazuo; Yamamura, Hiro-hisa; Kajiura, Kenzo; Yamada, Hiroyuki; Inoue, Nobuo; and Suzuki, Toshio, 5,481,460, Cl. 364-424.070.
- Suzuki, Toshitsugu: *See*—  
Kawasaki, Miyoji; Hirose, Masanori; Suzuki, Toshitsugu; Matsuura, Tei; and Yokoyama, Yoshinada, 5,480,557, Cl. 210-695.000.
- Suzuki, Yutaka; Ishida, Takumi; and Hayakawa, Masaharu, to Mitsubishi Denki Kabushiki Kaisha. Electronic timekeeping device reduced adjust-ment data storage requirement. 5,481,507, Cl. 368-200.000.
- Swars, Helmut: *See*—  
Breuer, Hans-Jürgen; Cyron, Theodor; Maus, Wolfgang; Swars, Helmut; and Wieres, Ludwig, 5,480,621, Cl. 422-174.000.
- Swarthoff, Ton: *See*—  
Altieri, Paul A.; Eden, James; Gribnau, Michael C.; Hoogendijk, Leen-dert; Krijnen, Lambertus B.; Solarek, Daniel B.; and Swarthoff, Ton, 5,480,575, Cl. 252-94.000.
- Sweeney, Gerald W.; Pfeiffer, James W.; Hadden, David M.; Blanchard, Kenneth L.; and Mullin, Howard R., to New West Products, Inc. Reusable, evacuable enclosure for storage of clothing and the like. 5,480,030, Cl. 206-524.800.
- Swenson, Charles B.: *See*—  
Rotolo, Robert H.; Swenson, Charles B.; and Fine, Dale R., 5,480,623, Cl. 422-295.000.
- Swenson, Paul F.: *See*—  
Tison, Raymond R.; and Swenson, Paul F., 5,479,966, Cl. 141-4.000.
- Swicker, Donald B.: *See*—  
Cash, Glenn L.; Civanlar, Mehmet R.; Gaglianella, Robert D.; and Swicker, Donald B., 5,481,297, Cl. 348-13.000.
- Swisher, Richard L., to Sheldahl, Inc. Metal-film laminate resistant to delamination. 5,480,730, Cl. 428-621.000.
- Sydekum, Heinz: *See*—  
Gilsdorf, Heinz-Joachim; Sydekum, Heinz; and Gubitz, Holger, 5,480,129, Cl. 267-64.240.
- Symbios Logic Inc.: *See*—  
Barnes, Lawrence C.; and Thornberg, Gary R., 5,480,840, Cl. 437-209.000.
- Symbol Technologies, Inc.: *See*—  
Dvorkis, Paul, 5,481,099, Cl. 235-462.000.
- Symetrix Corporation: *See*—  
Watanabe, Hitoshi; Kuroda, Yoshimi; and Tadokoro, Kaoru, 5,481,490, Cl. 365-145.000.
- Synectics Medical, Inc.: *See*—  
Essen-Moller, Anders, 5,479,935, Cl. 128-734.000.
- Sypula, Donald S.; Badesha, Santokh S.; Chang, Shu; Knapp, John F.; Trott, Robert E.; Chai, Stephen T.; Till, Henry R.; and Mammino, Joseph, to Xerox Corporation. Roller for controlling application of carrier liquid. 5,481,341, Cl. 355-256.000.
- Szabo, Jean-Louis: *See*—  
Daniel, Georges; Marienbach, Edouard; and Szabo, Jean-Louis, 5,481,114, Cl. 250-390.110.
- Szafranski, Robert C.: *See*—  
Angerer, John D.; Modi, Jashwant J.; and Szafranski, Robert C., 5,480,984, Cl. 536-88.000.
- Sznappa, Helmut: *See*—  
Diederichs, Ryszard; Sznappa, Helmut; and Bubniak, Józef, 5,480,195, Cl. 285-184.000.
- Szöke, Balás: *See*—  
Kéri, György; Mezö, Imre; Horváth, Anikó; Vadsz, Zsolt; Teplán, István; Balogh, Ágnes; Csuka, Orsolya; Bökönyi, Gyöngyi; Szöke, Balás; Horváth, Judit; Idei, Miklós; and Seprodi, János, 5,480,870, Cl. 514-16.000.
- Tabib, Isac: *See*—  
Lurie, Ranan R.; Putnam, Daniel; and Tabib, Isac, 5,481,243, Cl. 340-467.000.
- Tabuchi, Haruhiko, to Fujitsu Limited. Hybrid optical IC with optical axes at different levels. 5,481,629, Cl. 385-14.000.
- Tabuchi, Hiroki: *See*—  
Tanigawa, Makoto; Tabuchi, Hiroki; and Taniguchi, Takayuki, 5,480,047, Cl. 216-12.000.
- Tac-Fast Systems SA: *See*—  
Pacione, Joseph R., 5,479,755, Cl. 52-746.100.
- Tachibana, Osamu: *See*—  
Yanagida, Masahiro; Takahashi, Hiromasa; and Tachibana, Osamu, 5,481,489, Cl. 364-736.500.
- Tachibana, Shunichi; and Saito, Hitoshi, to Canon Kabushiki Kaisha. Image recording apparatus. 5,481,374, Cl. 358-444.000.
- Tachibana, Takeshi; Saito, Kimitsugu; Hayashi, Kazushi; Nishimura, Kozu; and Nakamura, Rie, to Kabushiki Kaisha Kobe Seiko Sho. Formation of highly oriented diamond film. 5,479,875, Cl. 117-103.000.
- Tachibana, Tatsuo; Narita, Izumi; Kusano, Akihisa; Seino, Yuzo; and Sato, Kaoru, to Canon Kabushiki Kaisha. Image recording apparatus with multiple feed detection and paper feed control. 5,481,336, Cl. 355-207.000.
- Tachihara, Masayoshi, to Canon Kabushiki Kaisha. Liquid jet recording head having a plurality of beating elements and liquid jet recording apparatus having the same. 5,481,287, Cl. 347-62.000.
- Taddei, Renzo; and Roda, Franco, to Fratelli Roda S.A. Wrapping as packaging. 5,480,090, Cl. 229-162.000.
- Tadokoro, Kaoru: *See*—  
Watanabe, Hitoshi; Kuroda, Yoshimi; and Tadokoro, Kaoru, 5,481,490, Cl. 365-145.000.
- Tafuya, Benny R., to PSC Inc. Apparatus and method for decoding bar codes. 5,481,097, Cl. 235-462.000.
- Tagawa, Itsuo; and Kozaki, Takaharu, to Tagawakougyou Co., Ltd. Apparatus for crushing concrete structures. 5,480,100, Cl. 241-266.000.
- Tagawa, Yoichi: *See*—  
Matsuo, Kazuhiro; Kitahara, Yoshihiko; Endo, Shinya; and Tagawa, Yoichi, 5,480,509, Cl. 156-522.000.
- Tagawakougyou Co., Ltd.: *See*—  
Tagawa, Itsuo; and Kozaki, Takaharu, 5,480,100, Cl. 241-266.000.
- Taguchi, Manabu: *See*—  
Yamasaki, Hidetoshi; Murata, Masae; Noya, Yukio; Yomogita, Yasukazu; Taguchi, Manabu; Yamanaka, Akira; and Sibuya, Naoki, 5,481,514, Cl. 369-36.000.
- Taguchi, Tomio: *See*—  
Kato, Akihiko; Yamasato, Masaharu; Taguchi, Tomio; Yanagida, Yoshiki; and Katube, Teruaki, 5,480,534, Cl. 204-419.000.
- Tahara, Kazuo: *See*—  
Masaki, Ryoso; Morinaga, Shigeki; Tahara, Kazuo; Yamamura, Hiro-hisa; Kajiura, Kenzo; Yamada, Hiroyuki; Inoue, Nobuo; and Suzuki, Toshio, 5,481,460, Cl. 364-424.070.
- Tai, King L.: *See*—  
Frye, Robert C.; Lau, Maureen Y.; and Tai, King L., 5,481,205, Cl. 324-757.000.
- Taiho Pharmaceutical Co., Ltd.: *See*—  
Yano, Shingo; Ohno, Tomoyasu; Ogawa, Kazuo; Yamada, Haruo; Shirasaka, Tetsuhiko; Kawamura, Hiroyuki; and Watanabe, Shinichi, 5,480,899, Cl. 514-376.000.
- Taiwan Semiconductor Manufacturing Company Ltd.: *See*—  
Liao, Siu-han; and Chen, Ling, 5,480,830, Cl. 437-58.000.
- Taiwan Semiconductor Manufacturing Co., Ltd.: *See*—  
Wuu, Shou-Gwo; Liang, Mong-Song; Wang, Chuan-Jung; and Su, Chung-Hui, 5,480,814, Cl. 437-41.000.
- Taiwan Semiconductor Manufacturing Corp. Ltd.: *See*—  
Hsu, Shun-Liang; Tsaur, Jyh-Min; Lin, Mou S.; and Ting, Jyh-Kang, 5,480,828, Cl. 437-56.000.
- Tajima, Masahiro; Ohnuma, Manami; and Lerner, Ethan L., to Shiseido Co., Ltd.; and General Hospital, The. Modified maxadilan protein, its prepara-tion and use, and DNA encoding the protein. 5,480,864, Cl. 514-2.000.
- Takada, Masami: *See*—  
Nakano, Tetsuo; Takano, Yuichi; and Takada, Masami, 5,480,238, Cl. 400-120.040.
- Takada, Yasuaki; Sakairi, Minoru; Hirabayashi, Atsumu; and Ose, Youichi, to Hitachi, Ltd. Mass spectrometer. 5,481,107, Cl. 250-281.000.
- Takada, Yukari; Onishi, Ken; and Hongo, Kimotoshi, to Mitsubishi Denki Kabushiki Kaisha. Magnetic recording and reproducing apparatus includ-ing a track scanning device for causing a single magnetic head to scan at least two tracks during a period of time corresponding to one cycle of information to be continuously recorded on a magnetic tape. 5,481,414, Cl. 360-64.000.

- Takagawa, Makoto; Shigematsu, Ryusuke; and Sasaki, Takayo, to Mitsubishi Gas Chemical Company, Inc. Method for isomerizing dimethylnaphtha-lene. 5,481,055, Cl. 585-481.000.
- Takagi, Hiroyuki: *See*—  
Hiroya, Masaaki; Saito, Masayuki; and Takagi, Hiroyuki, 5,481,664, Cl. 395-154.000.
- Takagi, Hitoshi, to NEC Corporation. Information processing system having an address translation table loaded with main/expanded memory presence bits. 5,481,688, Cl. 395-418.000.
- Takahara, Toshio: *See*—  
Ryu, Tadamitsu; Takahara, Toshio; Hirono, Shingo; and Matsumoto, Tohru, 5,481,692, Cl. 395-700.000.
- Takahashi, Chic, to Mitsubishi Denki Kabushiki Kaisha. Electron gun for cathode-ray tube. 5,481,157, Cl. 313-409.000.
- Takahashi, Fumiharu; Naito, Yutaka; Mori, Mitsuhiro; and Nishimura, Sadaki, to Tosoh Corporation. Process for the preparation of polyolefins. 5,481,056, Cl. 585-512.000.
- Takahashi, Hideaki: *See*—  
Kondo, Haruyoshi; Takahashi, Hideaki; Saji, Keiichi; Takeuchi, Masa-haru; and Satta, Kozo, 5,480,535, Cl. 204-425.000.
- Takahashi, Hideki: *See*—  
Sasaki, Kunituna; Goto, Narito; Takeda, Katsuyuki; Sekiguchi, Nobuyuki; Takahashi, Hideki; Isobe, Ryosuki; and Mori, Takahiro, 5,480,713, Cl. 428-323.000.
- Takahashi, Hiromasa: *See*—  
Yanagida, Masahiro; Takahashi, Hiromasa; and Tachibana, Osamu, 5,481,489, Cl. 364-736.500.
- Takahashi, Isamu; Hayashi, Shigeki; and Iida, Yoshio, to Ube-Nitto Kasei Co., Ltd. Non-hollow adsorbent porous fiber. 5,480,712, Cl. 428-316.600.
- Takahashi, Kanji: *See*—  
Hamanaka, Nobuyuki; Takahashi, Kanji; and Tokumoto, Hidekado, 5,480,998, Cl. 546-333.000.
- Takahashi, Kazuyoshi; and Yamada, Yasuhiro, to Canon Kabushiki Kaisha. Method of transmitting and receiving image data and apparatus which is used in such a method. 5,481,382, Cl. 358-529.000.
- Takahashi, Ken: *See*—  
Chikahisa, Naiochi; Takahashi, Ken; Naito, Takao; and Sasaki, Takashi, 5,479,854, Cl. 101-123.000.
- Takahashi, Kiichiro: *See*—  
Otsuka, Naoki; Yano, Kentaro; Takahashi, Kiichiro; Arai, Atsushi; Nish-ikori, Hitoshi; and Iwasaki, Osamu, 5,481,281, Cl. 347-12.000.
- Takahashi, Kikuo, to Hitachi, Ltd. Allocation optimization with different block-sized allocation maps. 5,481,702, Cl. 395-600.000.
- Takahashi, Koichi: *See*—  
Shimizu, Makoto; Esaki, Toshio; Shibata, Tadayoshi; and Takahashi, Koichi, 5,479,691, Cl. 29-430.000.
- Takahashi, Noriaki: *See*—  
Tanaka, Haruo; Takahashi, Noriaki; and Suzuki, Tetsuo, 5,480,362, Cl. 475-346.000.
- Takahashi, Shigeyuki: *See*—  
Ito, Toshiyasu; Ogisu, Yasuhiko; Takahashi, Shigeyuki; Uemura, Toshiya; Nohata, Minoru; Nagaike, Ippei; Noguchi, Shigeru; and Arai, Kenjiro, 5,480,714, Cl. 29-430.000.
- Takahashi, Tuiyoshi: *See*—  
Yamasaki, Kazuyuki; Hamaguchi, Yoshihiro; Hosoda, Shunji; Sakata, Kazuyuki; Imai, Takashi; Okatani, Shigetoshi; Nishio, Satoshi; Takahashi, Tuiyoshi; Matsuura, Kenji; Tanaka, Noriyuki; Nagayasu, Teru-aki; and Makino, Hiroshi, 5,480,537, Cl. 210-96.100.
- Takai, Yasuyoshi: *See*—  
Takei, Tetsuya; Ohtoshi, Hirokazu; Okamura, Ryuji; Katagiri, Hiroyuki; and Takai, Yasuyoshi, 5,480,627, Cl. 430-127.000.
- Takama, Kazushi: *See*—  
Isoai, Masaru; Harada, Toshiharu; Kurata, Tokihiro; Fujita, Kazuhiro; Takama, Kazushi; and Jikuhara, Shigekazu, 5,480,571, Cl. 252-62.560.
- Takamatsu, Osamu: *See*—  
Eguchi, Ken; Takamatsu, Osamu; and Kishi, Etsuro, 5,481,528, Cl. 369-126.000.
- Takamatsu, Ryoji; Watanabe, Tomohiro; and Nojima, Koichi, to Sony Cor-poration. Disc changing apparatus for disc player including improved translating chassis and eject mechanism for disc magazine. 5,481,513, Cl. 369-36.000.
- Takamine, Yasufumi: *See*—  
Shibuya, Tadashi; Nishiguchi, Yukihiko; Suzuki, Tomikazu; and Takamine, Yasufumi, 5,481,729, Cl. 395-737.000.
- Takano, Yuichi: *See*—  
Nakano, Tetsuo; Takano, Yuichi; and Takada, Masami, 5,480,238, Cl. 400-120.040.
- Takanohashi, Toshikatsu: *See*—  
Tochizawa, Toru; and Takanohashi, Toshikatsu, 5,480,093, Cl. 237-12.30C.
- Takaoka, Tomoyasu: *See*—  
Maikuma, Masahiro; and Takaoka, Tomoyasu, 5,481,418, Cl. 360-85.000.
- Takaragi, Yoichi: *See*—  
Udagawa, Yutaka; Funada, Masahiro; Ohta, Ken-ich; Takaragi, Yoichi; Kitamura, Toshiyuki; and Ohta, Eiji, 5,481,377, Cl. 358-501.000.
- Takashima, Masanobu: *See*—  
Yanagihara, Naoto; Takashima, Masanobu; Shimazaki, Masato; Iwakura, Ken; and Kodama, Tomohiro, 5,480,765, Cl. 430-338.000.
- Takashima, Shoichi: *See*—  
Sakurai, Shigeki; and Takashima, Shoichi, 5,481,605, Cl. 379-243.000.
- Takata Corporation: *See*—  
Fujimura, Yoshiichi; Yano, Hideaki; and Matsuura, Shizutaka, 5,480,105, Cl. 242-383.200.
- Takayama, Chitoshi: *See*—  
Wakabayashi, Kenichi; Takayama, Chitoshi; and Shiozaki, Tadashi, 5,481,656, Cl. 395-115.000.
- Takayama, Toru: *See*—  
Yamazaki, Satoshi; Takayama, Toru; Fukino, Kunihiro; Kodaka, Yoshiro; and Imanari, Hitoshi, 5,481,406, Cl. 359-694.000.
- Zhang, Hongyong; Takayama, Toru; and Takemura, Yasuhiko, 5,481,121, Cl. 257-64.000.
- Takebayashi, Takashi: *See*—  
Nagai, Shigekazu; Sugano, Shigeru; Saito, Mitsuhiro; Takebayashi, Takashi; Matsushima, Hiroshi; and Ito, Yoshiharu, 5,481,482, Cl. 364-558.000.
- Takeda Chemical Industries, Ltd.: *See*—  
Hayashi, Kyoze; and Iinuma, Munekazu, 5,480,907, Cl. 514-457.000.
- Okada, Hiroaki; Inoue, Yayoi; and Ogawa, Yasuaki, 5,480,656, Cl. 424-493.000.
- Takeda Chemical Industries, Ltd.: *See*—  
Kamei, Shigeru; Igari, Yasutaka; and Ogawa, Yasuaki, 5,480,868, Cl. 514-15.000.
- Takeda, Katsuyuki: *See*—  
Sasaki, Kunituna; Goto, Narito; Takeda, Katsuyuki; Sekiguchi, Nobuyuki; Takahashi, Hideki; Isobe, Ryosuki; and Mori, Takahiro, 5,480,713, Cl. 428-323.000.
- Takeda, Minoru: *See*—  
Miyabe, Satoru; Toyama, Akira; and Takeda, Minoru, 5,481,267, Cl. 341-61.000.
- Takeda, Tomoyuki: *See*—  
Ishida, Yasushi; Yokoyama, Minoru; Tomoda, Akihiro; Yamada, Masakatsu; Arai, Takashi; Yoshida, Takehiro; Kobayashi, Makoto; Wada, Satoshi; Ono, Takeshi; and Takeda, Tomoyuki, 5,481,291, Cl. 347-217.000.
- Takei, Narimichi: *See*—  
Tanaka, Nagahiko; Takei, Narimichi; and Unosawa, Kazuomi, 5,480,654, Cl. 424-490.000.
- Takei, Tetsuya; Ohtoshi, Hirokazu; Okamura, Ryuji; Katagiri, Hiroyuki; and Takai, Yasuyoshi, to Canon Kabushiki Kaisha. Method for treating sub-strate for electrophotographic photosensitive member and method for making electrophotographic photosensitive member. 5,480,627, Cl. 430-127.000.
- Takei, Tetsuya; Segi, Yoshio; and Katagiri, Hiroyuki, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member and method of manu-facturing the same. 5,480,754, Cl. 430-65.000.
- Takematsu, Tetsuo; Kume, Takashi; Yamaoka, Shoji; Komata, Takeo; Suzuki, Kiyoshi; Ikeda, Yukio; Kawamura, Matsue; Koda, Yumiko; and Mori, Kaoru, to Central Glass Company, Ltd. N-aryloxyacyl-n-phenyltetrahydrophthalamic acid derivatives, methods of producing same, and herbicides containing same as effective components. 5,481,022, Cl. 560-45.000.
- Takemura, Yasuhiko: *See*—  
Zhang, Hongyong; Takayama, Toru; and Takemura, Yasuhiko, 5,481,121, Cl. 257-64.000.
- Takenobu, Koichi: *See*—  
Satake, Tokuki; Miyamoto, Hitoshi; Watanabe, Kiyoshi; Nanjo, Fus-ayuki; and Takenobu, Koichi, 5,480,737, Cl. 429-30.000.
- Takenoshita, Itsuro: *See*—  
Kume, Katsuya; Oishi, Yozo; Kuramoto, Mitsuo; and Takenoshita, Itsuro, 5,480,700, Cl. 428-195.000.
- Takeo, Tsuyoshi: *See*—  
Harara, Mitsuhiro; Miichi, Yoshiki; Takeo, Tsuyoshi; and Tanaka, Tadao, 5,481,458, Cl. 364-424.050.
- Takeuchi, Atsushi: *See*—  
Kobayashi, Yutaka; Aoki, Osamu; Hamabe, Kenji; Takeuchi, Atsushi; and Onda, Takayuki, 5,480,932, Cl. 524-451.000.
- Takeuchi, Kiyoshi, to NEC Corporation. Effective channel length simulation using a single sample transistor. 5,481,485, Cl. 364-578.000.
- Takeuchi, Koichi: *See*—  
Watanabe, Isao; Takeuchi, Koichi; Ito, Osamu; Yosimoto, Kyosuke; Tanaka, Kunimaro; and Tsutsumi, Kazuhiko, 5,481,508, Cl. 369-13.000.
- Takeuchi, Makoto: *See*—  
Isomura, Yasuo; Takeuchi, Makoto; Hamada, Mamoru; Kaneko, Yoshis-aburo; and Yamamoto, Noriya, 5,480,875, Cl. 514-80.000.
- Takeuchi, Masaharu: *See*—  
Kondo, Haruyoshi; Takahashi, Hideaki; Saji, Keiichi; Takeuchi, Masa-haru; and Satta, Kozo, 5,480,535, Cl. 204-425.000.
- Takimoto, Hiroshi: *See*—  
Sano, Hideo; Murata, Yukichi; Nishimura, Toru; Yamada, Masahiro; Takimoto, Hiroshi; and Satoh, Nobuyoshi, 5,480,478, Cl. 106-22.00K.
- Takimoto, Kiyoshi; Kawade, Hisaaki; Kishi, Etsuro; and Yano, Koji, to Canon Kabushiki Kaisha. Scanning probe microscope for observing a sample surface while applying an AC bias voltage between the sample and a probe. 5,481,529, Cl. 369-126.000.
- Talbert, Donald; Patterson, Robert; and Cuba, Arnold C., Jr., to Taylor Iron-Machine Works, Inc. Fork lift truck. 5,480,275, Cl. 414-635.000.
- Talboys, Nigel: *See*—  
McWha, Keith; Talboys, Nigel; Gregg, Joseph J.; and Antoshkiw, William T., 5,480,389, Cl. 604-165.000.



- Taligent, Inc.: See—  
Nguyen, Frank T.; Anderson, David R.; and Catlin, Timothy J. O., 5,481,666, Cl. 395-159,000.
- Talmudi, Ran: See—  
Alpert, Donald B.; Avnon, Dror; Ben-Meir, Amos; and Talmudi, Ran, 5,481,751, Cl. 395-800,000.
- Tam, Sang W.: See—  
Ciganek, Engelbert; Tam, Sang W.; and Wright, Ann S., 5,480,892, Cl. 514-323,000.
- Tamagaki, Akira: See—  
Eto, Koichi; Miyaza, Masao; Ohnishi, Kazuyuki; and Tamagaki, Akira, 5,481,375, Cl. 358-450,000.
- Tamai, Shoji: See—  
Yamashita, Wataru; Okawa, Yuichi; Oikawa, Hideaki; Asanuma, Tadashi; Ishihara, Yuko; Matsuo, Mitsunori; Yamaguchi, Keizaburo; Yamaguchi, Akihiro; and Tamai, Shoji, 5,480,965, Cl. 528-353,000.
- Tamaki, Reiji: See—  
Harada, Shigeru; Masuda, Hisao; and Tamaki, Reiji, 5,481,137, Cl. 257-742,000.
- Tamaki, Takashi: and Ohie, Mitsuya, to Oki Electric Industry Co., Ltd. Voltage to pulse-width conversion circuit, 5,481,214, Cl. 327-172,000.
- Tamano, Akihiko; and Ikeda, Tsukasa, to Sankei Giken Kogyo Kabushiki Kaisha. Method for manufacturing silencer and apparatus for manufacturing same, 5,479,706, Cl. 29-890,080.
- Tamano, Akiyoshi; Hayashi, Motoo; Sasaoka, Kiyonori; Suzuki, Kazuya; and Hasegawa, Hirotosugu, to Sumitomo Rubber Industries, Ltd. Pneumatic tire with carcass structure for increased sidewall rigidity, 5,479,977, Cl. 152-542,000.
- Tamarack Storage Devices: See—  
Dewald, Duane S., 5,481,523, Cl. 369-103,000.
- Tampa Bay Research Institute: See—  
Nonoyama, Meihan; Tanaka, Akiko; and Lai, Patrick K., 5,480,782, Cl. 435-70,300.
- Tamura, Miki: See—  
Okubo, Yukitoshi; Santoh, Tsuyoshi; Tamura, Miki; Mihara, Chieko; Sugata, Hiroyuki; Kanome, Osamu; and Yashima, Masataka, 5,480,596, Cl. 264-1,330.
- Tanahashi, Makoto, to Sony Corporation. Color printer having a ribbon controller, 5,480,237, Cl. 400-120,020.
- Tanahashi, Naokazu, to Brother Kogyo Kabushiki Kaisha. Carrying handle, 5,480,248, Cl. 400-693,000.
- Tanaka, Akiko: See—  
Nonoyama, Meihan; Tanaka, Akiko; and Lai, Patrick K., 5,480,782, Cl. 435-70,300.
- Tanaka, Chiaki: See—  
Shimada, Tomoyuki; Sasaki, Masaomi; and Tanaka, Chiaki, 5,480,753, Cl. 430-59,000.
- Tanaka, Haruo; Takahashi, Noriaki; and Suzuki, Tetsuo, to Honda Giken Kogyo Kabushiki Kaisha. Double planetary carrier, 5,480,362, Cl. 475-346,000.
- Tanaka, Hitoshi: See—  
Mitsuda, Hiroshi; Sakamoto, Masahiko; Tanaka, Hitoshi; Kosaka, Nobuyuki; and Ito, Yoshinori, 5,481,095, Cl. 235-454,000.
- Tanaka, Kazumi: See—  
Sugaya, Hiroyuki; Minaga, Masahiro; Terada, Ryoze; Tayama, Toshikazu; Tanaka, Kazumi; and Fukui, Fumiaki, 5,480,953, Cl. 526-320,000.
- Tanaka Kikinzoku Kogyo K.K.: See—  
Tsurumi, Kazunori; and Stonehart, Paul, 5,480,851, Cl. 502-185,000.
- Tanaka, Kunimaro: See—  
Watanabe, Isao; Takeuchi, Koichi; Ito, Osamu; Yosimoto, Kyosuke; Tanaka, Kunimaro; and Tsutsumi, Kazuhiko, 5,481,508, Cl. 369-13,000.
- Tanaka, Motoyuki; Hatano, Yasunori; and Ozawa, Tadashi, to Kabushiki Kaisha Tec. Brush and commutator motor having brush device using the same, 5,481,150, Cl. 310-249,000.
- Tanaka, Nagahiko; Takei, Narimichi; and Unosawa, Kazuomi, to Freund Industrial Co., Ltd. Prolonged release dosage form of drug and method for producing the same, 5,480,654, Cl. 424-490,000.
- Tanaka, Noriyuki: See—  
Yamasaki, Kazuyuki; Hamaguchi, Yoshihiro; Hosoda, Shunji; Sakata, Kazuyuki; Imai, Takashi; Okatani, Shigetoshi; Nishio, Satoshi; Takahashi, Tuiyoshi; Matuura, Kenji; Tanaka, Noriyuki; Nagayasu, Teruaki; and Makino, Hiroshi, 5,480,537, Cl. 210-96,100.
- Tanaka, Seiichi: See—  
Morishima, Hajime; Koike, Yutaka; Nakano, Masato; Atsumi, Shugo; Tanaka, Seiichi; and Matsuyama, Kenji, 5,481,036, Cl. 564-162,000.
- Tanaka, So; and Iiyama, Michitomo, to Sumitomo Electric Industries Ltd. Layered structure comprising insulator thin film and oxide superconductor thin film, 5,480,861, Cl. 505-236,000.
- Tanaka, Tadao: See—  
Harara, Mitsubiko; Miichi, Yoshiaki; Takeo, Tsuyoshi; and Tanaka, Tadao, 5,481,458, Cl. 364-424,050.
- Morita, Takao; Matsukawa, Tsutomu; Yasunaga, Hiromichi; Tanaka, Tadao; Togashi, Akihiko; Taniguchi, Yasutaka; and Tani, Masanori, 5,480,221, Cl. 303-113,500.
- Tanamachi, Tokunosuke: See—  
Nakata, Kiyoshi; Nakamura, Kiyoshi; Tanamachi, Tokunosuke; Tsutsui, Yoshio; and Terunuma, Mutsuhiro, 5,481,448, Cl. 363-137,000.
- Tandy Corporation: See—  
Tran, Nam D.; Nguyen, Peter D.; and MacConnell, Richard J., 5,480,325, Cl. 439-578,000.
- Tang, Jihong; and Qian, Yao-Jin. Device for material separation using nondestructive inspection imaging, 5,481,584, Cl. 378-98,900.
- Tang, Yuan; and Cleveland, Lee E., to Advanced Micro Devices, Inc. Method for tightening VT distribution of 5 volt-only flash EEPROMS, 5,481,494, Cl. 365-185,240.
- Tani, Masahiko, to Shimano Inc. Bicycle chain wheel assembly and crank arm, 5,480,359, Cl. 474-160,000.
- Tani, Masanori: See—  
Morita, Takao; Matsukawa, Tsutomu; Yasunaga, Hiromichi; Tanaka, Tadao; Togashi, Akihiko; Taniguchi, Yasutaka; and Tani, Masanori, 5,480,221, Cl. 303-113,500.
- Tanigawa, Hiroya: See—  
Kai, Yoshihide; Tanigawa, Hiroya; and Wakahara, Toshihiko, 5,481,677, Cl. 395-280,000.
- Tanigawa, Makoto; Tabuchi, Hiroki; and Taniguchi, Takayuki, to Sharp Kabushiki Kaisha. Method for forming a fine resist pattern, 5,480,047, Cl. 216-12,000.
- Taniguchi, Naosato: See—  
Morishima, Hideki; and Taniguchi, Naosato, 5,481,383, Cl. 359-15,000.
- Taniguchi, Osamu: See—  
Hanyu, Yukio; Inaba, Yutaka; Asaoka, Masanobu; Taniguchi, Osamu; Shinjo, Kenji; and Uchimi, Toshiharu, 5,481,387, Cl. 359-078,000.
- Taniguchi, Takayuki: See—  
Tanigawa, Makoto; Tabuchi, Hiroki; and Taniguchi, Takayuki, 5,480,047, Cl. 216-12,000.
- Taniguchi, Yasutaka: See—  
Morita, Takao; Matsukawa, Tsutomu; Yasunaga, Hiromichi; Tanaka, Tadao; Togashi, Akihiko; Taniguchi, Yasutaka; and Tani, Masanori, 5,480,221, Cl. 303-113,500.
- Taniguro, Masahiro: See—  
Saikawa, Satoshi; Suzuki, Tetsuo; Hiramatsu, Soichi; Taniguro, Masahiro; Saito, Hiroyuki; Yanagi, Haruyuki; Nojima, Takashi; Kinoshita, Hiroyuki; and Kawakami, Hideaki, 5,480,247, Cl. 400-629,000.
- Taniuchi, Kazuman: See—  
Kouno, Katuyuki; Taniuchi, Kazuman; and Sekine, Hiroshi, 5,481,372, Cl. 358-433,000.
- Tanner, Howard C.: See—  
Harper, Jeffrey D.; Kalendra, Paul W.; Piazza, William J.; Tanner, Howard C.; and Vinh, Anh, 5,481,755, Cl. 395-823,000.
- Tanoue, Tomonori: See—  
Mochizuki, Kazuhiro; Mishima, Tomoyoshi; Nakamura, Tooru; Masuda, Hiroshi; Tanoue, Tomonori; Haga, Tooru; and Fujisaki, Yoshihisa, 5,481,120, Cl. 257-49,000.
- Taplast Srl: See—  
Santagiuliana, Evans, 5,480,071, Cl. 222-455,000.
- Tark, John R.: See—  
Belsner, Robert S.; Tark, John R.; and Hall, Charles A., 5,480,589, Cl. 261-76,000.
- Tateishi, Hideo: See—  
Ohashi, Susumu; Tateishi, Hideo; and Fujikura, Toshiaki, 5,481,595, Cl. 379-67,000.
- Tatsumi, Akira: See—  
Toyooka, Tsukasa; Hirata, Toichi; Sugiyama, Genroku; and Tatsumi, Akira, 5,479,778, Cl. 60-431,000.
- Tatsumi, Takashi, to Mitsubishi Denki Kabushiki Kaisha. High speed divider for performing hexadecimal division having control circuit for generating different division cycle signals to control circuit in performing specific functions, 5,481,745, Cl. 395-800,000.
- Taura, Motoharu: See—  
Hatashita, Toyohito; Taura, Motoharu; Shimizu, Toshihiko; and Umeoka, Hiroshi, 5,481,670, Cl. 395-182,050.
- Tawara, Hiroshi: See—  
Motomura, Yoshitada; Tawara, Hiroshi; Tsukuta, Kenji; and Iikubo, Tomohito, 5,480,299, Cl. 432-176,000.
- Taya, Masaaki: See—  
Uchiyama, Masaki; Jo, Yoshinobu; Akashi, Yasutaka; Taya, Masaaki; and Unno, Makoto, 5,480,755, Cl. 430-106,600.
- Tayama, Toshikazu: See—  
Sugaya, Hiroyuki; Minaga, Masahiro; Terada, Ryoze; Tayama, Toshikazu; Tanaka, Kazumi; and Fukui, Fumiaki, 5,480,953, Cl. 526-320,000.
- Tayar, Eli. Loading bow device for open tenders, 5,480,205, Cl. 296-3,000.
- Taylor Iron-Machine Works, Inc.: See—  
Talbert, Donald; Patterson, Robert; and Cuba, Arnold C., Jr., 5,480,275, Cl. 414-635,000.
- Taylor, Timothy J.: See—  
Lam, Andrew C.; Lin, Samuel Q.; Taylor, Timothy J.; and Winters, John R., 5,480,567, Cl. 252-8,800.
- Teac Corporation: See—  
Yoshimoto, Kyosuke; Nakajima, Yoshiki; Koyanagi, Kimiyuki; Ito, Osamu; Mashimo, Akira; Onda, Hiroyuki; Kobayashi, Yutaka; and Yamana, Koji, 5,481,517, Cl. 369-44,280.
- Teasdale, André, to Soniplastics Inc. Fencing construction, 5,480,126, Cl. 256-19,000.
- Technological Resources Pty. Limited: See—  
Hardie, Gregory J.; Mantey, Paul-Gerhard; and Schwarz, Mark P., 5,480,473, Cl. 75-501,000.
- Technomed Medical Systems: See—

- Hascoet, Gérard; LaCoste, Francois; Cathaud, Muriel; Jacomino, Jean-Marie; Devonec, Marian; and Perrin, Paul, 5,480,417, Cl. 607-101,000.
- Teikoku Seiki Kabushiki Kaisha: See—  
Akazawa, Mitsui; Hama, Teruo; Kimura, Yukio; and Yasuda, Yoshinobu, 5,480,649, Cl. 424-449,000.
- Teiryō Sangyo Co., Ltd.: See—  
Yoshida, Hirokazu, 5,481,101, Cl. 235-472,000.
- Tektronix, Inc.: See—  
Chang, Paul; Wolaver, Dan H.; and Mitchell, J. Howell, Jr., 5,481,230, Cl. 332-112,000.
- Teletronics Pacing Systems, Inc.: See—  
Greenhut, Saul; Steinhaus, Bruce; Dawson, Albert; and Nappholz, Tibor, 5,480,413, Cl. 607-14,000.
- Telefonaktiebolaget LM Ericsson: See—  
Nordholt, Ernst; and Stoffels, Johannes, 5,481,218, Cl. 327-350,000.
- Temic Telefunken Microelectronic GmbH: See—  
Genzel, Michael, 5,481,210, Cl. 326-93,000.
- Tenhover, Michael A.; and Ruppel, Irving R. Ceramic substrates and magnetic data storage components prepared therefrom, 5,480,695, Cl. 428-65,500.
- Ten Kate, Warner R. T.; Christensen, Karl-Ejner; and Sørensen, Erik, to U.S. Philips Corporation. Transmitter, receiver and record carrier for transmitting/receiving at least a first and a second signal component, 5,481,643, Cl. 395-2,360.
- Teplán, István: See—  
Kéri, György; Mező, Imre; Horváth, Anikó; Vadász, Zsolt; Teplán, István; Balogh, Ágnes; Csuka, Orsolya; Bökönyi, Gyöngyi; Szőke, Balás; Horváth, Judit; Idei, Miklós; and Seprodi, János, 5,480,870, Cl. 514-16,000.
- Terada, Ryoze: See—  
Sugaya, Hiroyuki; Minaga, Masahiro; Terada, Ryoze; Tayama, Toshikazu; Tanaka, Kazumi; and Fukui, Fumiaki, 5,480,953, Cl. 526-320,000.
- Terauchi, Junichi, to Riso Kagaku Corporation. Spirally arranged bar code, 5,481,100, Cl. 235-462,000.
- Ternes-Burton Company: See—  
Ternes, Gretchen, 5,479,723, Cl. 33-623,000.
- Ternes, Gretchen, to Ternes-Burton Company. Image registration board, 5,479,723, Cl. 33-623,000.
- Terrell, David: See—  
Dewanckele, Jean-Marie; Terrell, David; and Viaene, Kris, 5,480,770, Cl. 430-410,000.
- Terumo Kabushiki Kaisha: See—  
Ishikawa, Kenji, 5,480,394, Cl. 604-327,000.
- Terunuma, Mutsuhiro: See—  
Nakata, Kiyoshi; Nakamura, Kiyoshi; Tanamachi, Tokunosuke; Tsutsui, Yoshio; and Terunuma, Mutsuhiro, 5,481,448, Cl. 363-137,000.
- Teulon, Jean-Marie: See—  
Bru-Magniez, Nicole; Güngör, Timur; and Teulon, Jean-Marie, 5,480,983, Cl. 536-27,620.
- Tevaarwerk, Joseph L.: See—  
Hill, Jason J.; and Tevaarwerk, Joseph L., 5,480,003, Cl. 184-6,120.
- Tevanian, Avadis: See—  
Serlet, Bertrand; Boynton, Lee; and Tevanian, Avadis, 5,481,721, Cl. 395-700,000.
- Tew, Claude E., to Texas Instruments Incorporated. On-chip light sensor, 5,481,118, Cl. 250-551,000.
- Texas Instruments Incorporated: See—  
Abbott, Donald C.; Dainis, George A., III; and West, David W., 5,480,519, Cl. 204-129,350.
- Giasson, Eric J.; Gondusky, Joseph M.; and Laboe, Kevin J., 5,479,786, Cl. 62-222,000.
- Tew, Claude E., 5,481,118, Cl. 250-551,000.
- Th. Goldschmidt AG: See—  
Brüne-Fischer, Anette; Burkhardt, Georg; Klietsch, Bernd-Jürgen; and Zellmer, Volker, 5,480,916, Cl. 521-112,000.
- Thal, Claude; Quirós-Guillou, Catherine; Potier, Pierre; Renko, Dolor; Zanetta, Jean-Pierre; Portier, Marie-Madeleine; Sensenbrenner, Monique; Koenig, Janine; and Koenig, Herbert, to Centre National De La Recherche Scientifique. Compounds having a guanidine structure, 5,480,884, Cl. 514-275,000.
- Thangsiroojul, Onsrí, to IM International, Co., Ltd. Bag for alternative use, 5,480,229, Cl. 383-4,000.
- Thauvin, Gérard: See—  
Bru-Magniez, Nicole; Cordoliani, Jean-François; Thauvin, Gérard; and Drouin, Jehan-Yves, 5,480,652, Cl. 424-466,000.
- Thenappan, Alagappan: See—  
Van Der Puy, Michael; Madhavan, G. V. Biadu; Thenappan, Alagappan; and Tung, Hsueh S., 5,481,050, Cl. 570-135,000.
- Therasse, Yves: See—  
Goubert, Jozef A. O.; Therasse, Yves; Pauwels, Bart J. G.; and Wullemann, Raymond D. A., 5,481,687, Cl. 395-421,020.
- Thermoscan, Inc.: See—  
Mooradian, Mark, 5,479,931, Cl. 128-664,000.
- Thermtec, Inc.: See—  
Peck, Kevin B.; Erickson, Ronald E.; and Matthews, Stephen H., 5,481,088, Cl. 219-390,000.
- Therond, Jean-François: See—  
Cretin, Jacques; Therond, Jean-François; and Laurent, Jean, 5,481,502, Cl. 367-77,000.
- Theurer, Josef; and Brunner, Manfred, to Franz Plasser Bahnbaumaschinen-Industries. m.b.H. Method of and arrangement for rehabilitating a ballast bed of a track, 5,479,725, Cl. 37-104,000.
- Thiele, Klaus-Jürgen: See—  
Werner, Johannes; Thiele, Klaus-Jürgen; Bäuerle, Emil; Kerschbaum, Walter; and Bauknecht, Peter, 5,479,903, Cl. 123-509,000.
- Thieme, Thomas R.; Goldstein, Andrew S.; Piacentini, Stephen C.; and Klimkow, Nanette M., to Epitope, Inc. Oral collection device, 5,479,937, Cl. 128-760,000.
- Thimm Verpackung GmbH & Co.: See—  
Christoph, Michael; Welschlaue, Udo; and Becker, Wolfgang, 5,479,855, Cl. 101-174,000.
- Thirunagari, Aruna: See—  
Gutierrez, Franklin; Peters, Robert Y., Jr.; Thirunagari, Aruna; and Young, Joel K., 5,481,603, Cl. 379-221,000.
- Thoma, Frank: See—  
Kraemer, Michael; Wirbeleit, Friedrich; Enderle, Christian; Friess, Walter; Kruttsch, Bernd; Withalm, Gert; Schoen, Christof; Mikulic, Leopold; Hertweck, Gernot; and Thoma, Frank, 5,479,775, Cl. 60-274,000.
- Thomas, Holly A.: See—  
Wei, Edward T.; and Thomas, Holly A., 5,480,869, Cl. 514-16,000.
- Thomas, Martha M. Utensil holder for infants, 5,479,708, Cl. 30-122,000.
- Thomas, Nicholas, to Amersham International PLC. Apparatus for treating analytes, 5,480,803, Cl. 435-286,100.
- Thomas, William L.; and Lu, Daozheng, to A. C. Nielsen Company. Audience measurement system utilizing ancillary codes and passive signatures, 5,481,294, Cl. 348-1,000.
- Thompson, John A., III: See—  
Rogers, Lisa W.; Kraft, Thomas L.; Berry, John F.; Kelley, Scott A.; Thompson, John A., III; Ober, Clifford D.; Kuchar, Michael C.; Mayer, Robert R., Jr.; Hoskins, Van W.; Weido, Vincent C.; and Henckel, Mark G., 5,480,062, Cl. 221-174,000.
- Thompson, Mark E.; Snover, Jonathan L.; Joshi, Vijay; and Vermeulen, Lori A., to Trustees of Princeton University. The Catalytic production of hydrogen peroxide, 5,480,629, Cl. 423-584,000.
- Thompson, Steven A.: See—  
Murphy, Philip A., Jr.; Genetti, Wayne A.; Gunnarsson, Gunnar K.; Pullin, Edward J.; Thompson, Steven A.; Tickner, Robert H.; and Wu, Gary C-F, 5,481,707, Cl. 395-650,000.
- Thomson Composants Militaires et Spatiaux: See—  
Cazaux, Yvon; Coutures, Jean-Louis; Dautriche, Pierre; and Bouchariat, Gilles, 5,481,301, Cl. 348-218,000.
- Thomson Consumer Electronics S.A.: See—  
Boie, Werner, 5,481,311, Cl. 348-448,000.
- Thomson-CSF: See—  
Bonniau, Philippe; Estang, Bernard; Perrier, Bernard; Chazelas, Jean; and Lecucllet, Jérôme, 5,479,828, Cl. 73-800,000.
- Thomson, Donald: See—  
Nobel, Fred I.; Brasch, William; Thomson, Donald; and Garay, Luis H., 5,480,517, Cl. 204-103,000.
- Thomson, John, Jr.: See—  
Grader, Gideon S.; Johnson, David W., Jr.; Roy, Apurba; and Thomson, John, Jr., 5,479,695, Cl. 29-602,100.
- Thornander, Hans: See—  
Hoegnelid, Kurt; Thornander, Hans; and Obel, Martin, 5,480,420, Cl. 607-116,000.
- Thornberg, Gary R.: See—  
Barnes, Lawrence C.; and Thornberg, Gary R., 5,480,840, Cl. 437-209,000.
- Thorne, David L.: See—  
Thorne, Gale H.; Thorne, David L.; and Thorne, Sandra A., 5,480,385, Cl. 604-110,000.
- Thorne, Gale H.; Thorne, David L.; and Thorne, Sandra A., to Specialized Health Products, Inc. Self retracting medical needle apparatus and methods, 5,480,385, Cl. 604-110,000.
- Thorne, Sandra A.: See—  
Thorne, Gale H.; Thorne, David L.; and Thorne, Sandra A., 5,480,385, Cl. 604-110,000.
- Thornton, Peter H.: See—  
Davies, Richard G.; and Thornton, Peter H., 5,480,189, Cl. 280-797,000.
- Thottathil, John K.: See—  
Chen, Ping; Cheng, Peter T. W.; Spengel, Steven H.; Barrish, Joel C.; Thottathil, John K.; Zahler, Robert; Polniaszek, Richard P.; and Wang, Xuebao, 5,481,011, Cl. 549-514,000.
- Thottuvellil, Vijayan J.: See—  
Jacobs, Mark E.; Thottuvellil, Vijayan J.; and Timm, Kenneth J., 5,481,219, Cl. 327-434,000.
- Throm, James E., Jr.: See—  
Hellstrom, Ake A.; Koester, Karsten G.; Frisco, Thomas A.; and Throm, James E., Jr., 5,479,720, Cl. 33-501,020.
- Thrower, John H. Aggregate floor and method for forming same, 5,480,259, Cl. 404-117,000.
- Thrus, Roger L.: See—  
Kinross, Timothy J.; and Thrus, Roger L., 5,480,316, Cl. 439-326,000.
- Thuraisingham, Bhavani M., to Mitre Corporation. The Apparatus for design of a multilevel secure database management system based on a multilevel logic programming system, 5,481,700, Cl. 395-600,000.
- Thyssen Stahl Aktiengesellschaft: See—  
Höfken, Erich; Krüger, Dieter; Mehning, Gisbert; and Pietzko, Günter, 5,479,982, Cl. 164-454,000.



- Tickner, Robert M.: See—  
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- Tietz, Gerhard, to Alfred Ransmayer & Albert Rodrian. Type disk, 5,480,241, Cl. 400-144.200.
- Tighe, Patrick J.: See—  
Greff, Richard J.; Tighe, Patrick J.; Byram, Michael M.; and Barley, Leonard V., 5,480,935, Cl. 524-776.000.
- Tilbrook, Gary S.: See—  
Hider, Robert C.; Singh, Surinder; Tilbrook, Gary S.; and Dobbin, Paul S., 5,480,894, Cl. 514-348.000.
- Till, Henry R.: See—  
Sypula, Donald S.; Badesha, Santokh S.; Chang, Shu; Knapp, John F.; Trott, Robert E.; Chai, Stephen T.; Till, Henry R.; and Mammino, Joseph, 5,481,341, Cl. 355-256.000.
- Timm, Kenneth J.: See—  
Jacoba, Mark E.; Thottuvelli, Vijayan J.; and Timm, Kenneth J., 5,481,219, Cl. 327-434.000.
- Timmins, Graham J. A., to BOC Group plc, The. Inductor current-sensing circuitry, 5,481,446, Cl. 363-41.000.
- Ting, Jyh-Kang: See—  
Hsu, Shun-Liang; Tsur, Jyh-Min; Lin, Mou S.; and Ting, Jyh-Kang, 5,480,828, Cl. 437-56.000.
- Tinti, Jean-Marie: See—  
Nofre, Claude; and Tinti, Jean-Marie, 5,480,668, Cl. 426-548.000.
- Tischer, Wilhelm; Klein, Joachim; Müller, Rolf-Joachim; and Engelke, Stephan, to Boehringer Mannheim GmbH; and Gesellschaft für Biotechnologische Forschung mbH. Water-soluble proteins modified by saccharides, 5,480,790, Cl. 435-188.000.
- Tison, Raymond R.; and Swenson, Paul F., to Consolidated Natural Gas Service Company, Inc. Quick fill fuel charge process, 5,479,966, Cl. 141-4.000.
- Tkaczyk, John E., to General Electric Company. Low resistance electrical contact for oxide superconductors and a method for making, 5,480,728, Cl. 428-548.000.
- Toa Electronics Ltd.: See—  
Kato, Akihiko; Yamamoto, Masaharu; Taguchi, Tomio; Yanagida, Yoshiki; and Katube, Teruaki, 5,480,534, Cl. 204-419.000.
- Tobioka, Masaaki: See—  
Yamamoto, Susumu; Murai, Teruyuki; Kawabe, Nozomu; and Tobioka, Masaaki, 5,480,601, Cl. 264-61.000.
- Tochizawa, Toru; and Takanohashi, Toshikatsu, to Honda Giken Kogyo Kabushiki Kaisha. Combustion heater system for motor vehicles, 5,480,093, Cl. 237-12.30C.
- Toda Kogyo Corp.: See—  
Isoai, Masaru; Harada, Toshiharu; Kurata, Tokihiro; Fujita, Kazuhiro; Takama, Kazushi; and Jikuhara, Shigekazu, 5,480,571, Cl. 252-62.560.
- van Bonn, Karl-Heinz; Kathrein, Hendrik; and Franz, Gerhard, 5,480,570, Cl. 252-62.560.
- Todokoro, Hideo: See—  
Ninomiya, Ken; Todokoro, Hideo; Kure, Tokuo; Mitsui, Yasuhiro; Kuroda, Katsuhiko; and Shichi, Hiroyasu, 5,481,109, Cl. 250-310.000.
- Todome, Tuiyoshi, to Kabushiki Kaisha Toshiba. Image forming apparatus for forming an image on an image receiving medium carried by a conveyor belt, 5,481,338, Cl. 355-212.000.
- Togashi, Akihiko: See—  
Morita, Takao; Matsukawa, Tsutomu; Yasunaga, Hiromichi; Tanaka, Tadao; Togashi, Akihiko; Taniguchi, Yasutaka; and Tani, Masanori, 5,480,221, Cl. 303-113.500.
- Togawa, Katsutake: See—  
Morioka, Shouji; Matsugae, Hiroshi; Togawa, Katsutake; and Nakagawa, Mitsuru, 5,481,512, Cl. 369-36.000.
- Toggweiler, Peter: See—  
Stalder, Herbert; and Toggweiler, Peter, 5,479,680, Cl. 19-248.000.
- Togo, Ichiro, to Mitsubishi Denki Kabushiki Kaisha. Method for manufacturing magnetic pickup sensor, 5,479,697, Cl. 29-606.000.
- Tokach, Mike D.; Nelsen, Jim L.; and Goodband, Robert D., to Kansas State University Research Foundation. Sow lactation diet containing valine, 5,480,659, Cl. 426-2.000.
- Tokico, Ltd.: See—  
Matsunaga, Kunihiro, 5,480,216, Cl. 303-9.690.
- Tokoi, Masanori: See—  
Itoh, Kazuo; Narita, Kazuhiko; Kitazawa, Shuichi; Tokoi, Masanori; Nakajima, Ayumi; and Sekine, Hiroshi, 5,481,465, Cl. 364-468.000.
- Tokoro, Koichi, to Shinano Kenshi Kabushiki Kaisha. Disk player door assembly, 5,481,520, Cl. 369-77.200.
- Tokumoto, Hidekado: See—  
Hamanaka, Nobuyuki; Takahashi, Kanji; and Tokumoto, Hidekado, 5,480,998, Cl. 546-333.000.
- Tokunaga, Hiroyuki: See—  
Yamamoto, Yohisasa; Nishi, Yutaka; Nishimori, Takashi; and Tokunaga, Hiroyuki, 5,481,457, Cl. 364-424.050.
- Tokuyama, Saburo, to Fujitsu Limited. Apparatus for testing an integrated circuit in which an input test pattern can be changed with an selected application timing, 5,481,549, Cl. 371-27.000.
- Tokyo Tanabe Company, Limited: See—  
Kimura, Hiromi; Okamura, Akio; Kawaide, Hiroshi; and Yamaura, Takuro, 5,480,781, Cl. 435-52.000.
- Tollini, Dennis R. Securing tape, 5,480,719, Cl. 428-345.000.
- Tolliver, Howard R.; and Bailey, Terry R., to Minnesota Mining and Manufacturing Company. High strength non-chlorinated multi-layered polymeric article, 5,480,705, Cl. 428-217.000.
- Tolton, Graham N.: See—  
Smith, James A.; Corbett, Alfred R.; and Tolton, Graham N., 5,481,467, Cl. 364-474.280.
- Tomasiaik, Mark J.; Dix, Gregory F.; and Moody, John F., to Emerson Electric Co. Humidifier with exposed spaced bottles, 5,480,588, Cl. 261-72.100.
- Tomoda, Akihiro: See—  
Ishida, Yasushi; Yokoyama, Minoru; Tomoda, Akihiro; Yamada, Masakatsu; Awai, Takashi; Yoshida, Takehiro; Kobayashi, Makoto; Wada, Satoshi; Ono, Takeshi; and Takeda, Tomoyuki, 5,481,291, Cl. 347-217.000.
- Tomoe-gawa Paper Co., Ltd.: See—  
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- Suzuki, Masayasu; Mochizuki, Tuiyoshi; and Kawashima, Hiroshi, 5,480,685, Cl. 427-548.000.
- Tomonaga, Hiroyuki; Morimoto, Takeshi; and Hiratsuka, Kazuya, to Asahi Glass Company Ltd. Ultraviolet ray absorbent glass and method for preparing the same, 5,480,722, Cl. 428-428.000.
- Tonami, Hiromichi: See—  
Kimura, Yutaro; Ikeshima, Tetsuhiko; Tonami, Hiromichi; Konishi, Ikuo; Horikawa, Hiroshi; Daikoku, Akihiro; Sakabe, Shigekazu; Inoue, Masao; and Yamasaki, Akinori, 5,481,585, Cl. 378-134.000.
- Tonnerre, Bernard: See—  
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- Toray Industries, Inc.: See—  
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- Yanai, Akira; Ueda, Yoshizumi; Sakurai, Toru; and Satoh, Masahiro, 5,480,956, Cl. 435-69.510.
- Torigoe, Eiichi: See—  
Yamamoto, Ken; Yamamoto, Michiyasu; Baba, Norimasa; Fukuoka, Mikio; Kuroyanagi, Isao; Sanada, Ryouchi; and Torigoe, Eiichi, 5,479,985, Cl. 165-176.000.
- Torres, Martin R., to General Electric Company. On-line shaft crack detector, 5,479,824, Cl. 73-602.000.
- Tosaka, Yasuo; Nonaka, Yoshiyuki; and Hoshino, Keiichi, to Konica Corporation. Silver halide color photograph light-sensitive material and image-forming process, 5,480,767, Cl. 430-358.000.
- Toshiba Ceramics Co., Ltd.: See—  
Shintani, Yoshitomo; Suganuma, Tetsuya; Matsuo, Shuitsu; Saito, Hajime; Yamaoka, Hidenori; Kurono, Nobuhisa; and Kotaka, Hiroaki, 5,479,873, Cl. 117-75.000.
- Toshiba International Corporation: See—  
Kleinecke, John D.; and Houche, George A., 5,481,075, Cl. 200-50.0AA.
- Toshiba Kikai Kabushiki Kaisha: See—  
Manabe, Takao; Yamakawa, Yuhei; Shin, Shoichi; Yamada, Hideyuki; Nagashima, Mitsuo; Kokubo, Mitsunori; Tsunada, Masafumi; Nagakura, Yasuhiko; Nakajima, Yukio; Inoue, Tomohiro; and Kondo, Kiyoshi, 5,480,508, Cl. 156-353.000.
- Tosoh Corporation: See—  
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- Toth, Laszlo; and Sagaser, John E., to Western Sugar Company, The. Method for purifying beet juice using recycled materials, 5,480,490, Cl. 127-42.000.
- Tovey, H. Jonathan: See—  
Nolan, Paul; Tovey, H. Jonathan; Stone, Corbett W.; and Gardner, Gregory S., 5,480,406, Cl. 606-139.000.
- Townsend, Alain R. M.: See—  
McMichael, Andre J.; Nixon, Douglas F.; Townsend, Alain R. M.; and Gotch, Frances M., 5,480,967, Cl. 530-326.000.
- Townsend, Carl W.: See—  
McHardy, John; Townsend, Carl W.; and Megerle, Clifford A., 5,481,181, Cl. 324-71.100.
- Townsend Engineering Company: See—  
Carey, Joseph, 5,481,466, Cl. 364-474.090.
- Toyama, Akira: See—  
Miyabe, Satoru; Toyama, Akira; and Takeda, Minoru, 5,481,267, Cl. 341-61.000.
- Toyama Light Metal Industry Co., Ltd.: See—  
Sasaki, Masahiko; and Kaneko, Masaaki, 5,481,298, Cl. 348-135.000.
- Toyama, Tadao; and Kunichika, Kenji, to Fuji Photo Film Co., Ltd. Method for preparing lithographic printing plate, 5,480,762, Cl. 430-302.000.
- Toyo Aluminum Kabushiki Kaisha: See—  
Setoguchi, Shunichi; Katoh, Haruzo; and Matsufuji, Takashi, 5,480,481, Cl. 106-404.000.
- Toyo Boseki Kabushiki Kaisha: See—  
Kawashima, Sumihiko, 5,481,376, Cl. 358-455.000.
- Toyobo Co., Ltd.: See—  
Francavilla, Antonio T.; Hagiya, Michio; and Starzl, Thomas E., 5,480,797, Cl. 435-240.200.
- Toyoda Gosei Co., Ltd.: See—  
Ito, Toshiyasu; Ogisu, Yasuhiko; Takahashi, Shigeyuki; Uemura, Toshiya; Nohata, Minoru; Nagaike, Ipppei; Noguchi, Shigeru; and Arai, Kenjiro, 5,480,714, Cl. 428-324.000.

- Toyooka, Tsukasa; Hirata, Toichi; Sugiyama, Genroku; and Tatsumi, Akira, to Hitachi Construction Machinery Co., Ltd. Hydraulic control system for construction machines, 5,479,778, Cl. 60-431.000.
- Toyota Jidosha Kabushiki Kaisha: See—  
Kambe, Yoshitaka; and Shinozawa, Tamio, 5,481,149, Cl. 310-178.000.
- Matsubara, Toru; and Iwatsuki, Kunihiro, 5,480,363, Cl. 477-63.000.
- Nagai, Toshinari, 5,481,462, Cl. 364-431.030.
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- Toyota, Masanobu: See—  
Ryu, Tadamitsu; Ichikawa, Naomi; Murakawa, Masahiko; Adachi, Takeshi; and Toyota, Masanobu, 5,481,718, Cl. 395-700.000.
- Tracy, David H.: See—  
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- Träger, Michael: See—  
Leven, Thomas; Träger, Michael; and Perl, Horst, 5,480,599, Cl. 264-53.000.
- Tran, Nam D.; Nguyen, Peter D.; and MacConnell, Richard J., to Tandy Corporation. Coaxial connector plug and method for assembly, 5,480,325, Cl. 439-578.000.
- Trang, Quang: See—  
Nguyen, Le T.; Lentz, Derek J.; Miyayama, Yoshiyuki; Garg, Sanjiv; Hagiwara, Yasuaki; Wang, Johannes; and Trang, Quang, 5,481,685, Cl. 395-375.000.
- Trani, Christopher R. Funnell, 5,479,970, Cl. 141-297.000.
- Trans Tech Industries, Inc.: See—  
Zenkich, Elias R., 5,479,978, Cl. 137-493.300.
- Transmisiones y Equipos Mecánicos, S.A. de C.V.: See—  
Esparza, Rodolfo; and Leonard, William, 5,479,835, Cl. 74-331.000.
- Trapp, Claude, to Seref. Piston machine able to be used as a compressor or motor, 5,479,846, Cl. 92-66.000.
- Treacy, Debra J.: See—  
Hamilton, John V.; Caldarise, Salvatore; and Treacy, Debra J., 5,480,449, Cl. 623-66.000.
- Triangle Engineered Products Co.: See—  
Rusconi, David M., 5,479,895, Cl. 123-41.150.
- Triangle Engineering: See—  
Matson, Carl G., 5,480,282, Cl. 415-125.000.
- Trioplan Oy: See—  
Mannonen, Matti P., 5,479,746, Cl. 52-182.000.
- Troppman, Dale A.: See—  
Sitzema, Ronald L.; Troppman, Dale A.; and Motter, Gregg A., 5,481,445, Cl. 362-308.000.
- Trott, Robert E.: See—  
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- Trottier, Steve: See—  
Mueller, Steve; Meyers, Scott; Lambach, Chris; Stern, Glenn; Cochenet, Joseph; Werth, John T., III; Rodriguez, Carlos E.; Wozniak, John N.; Hintz, John; Hansen, Richard W.; and Trottier, Steve, 5,481,193, Cl. 324-379.000.
- Troutman, Bruce L.: See—  
Naglesstad, Mark B.; Bohac, Frank J., Jr.; Aralis, James M.; Moriwaki, Bert S.; Calabretta, Frank J.; and Troutman, Bruce L., 5,481,471, Cl. 364-489.000.
- Trovato, Karen I.: See—  
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- Troyer, Paolo: See—  
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- Trudeau, John, to Williams Electronics Games, Inc. Flipper feeder ramp, 5,480,149, Cl. 273-118.00R.
- Truffaut, Christophe: See—  
Nagane, Hiromichi; Dodge, Alexandre; Froger, Marie-Helene; Truffaut, Christophe; and Michel, Stéphane, 5,480,135, Cl. 271-176.000.
- Trumble, Dennis R., to Allegheny-Singer Research Institute. Muscle energy converter, 5,479,946, Cl. 128-899.000.
- Trustees of Princeton University, The: See—  
Thompson, Mark E.; Snover, Jonathan L.; Joshi, Vijay; and Vermeulen, Lori A., 5,480,629, Cl. 423-584.000.
- Trützschler GmbH & Co. KG: See—  
Leifeld, Ferdinand, 5,479,679, Cl. 19-105.000.
- TRW Repa GmbH: See—  
Föhl, Artur, 5,480,190, Cl. 280-806.000.
- Tsai, Chin-Lin. Internal combustion glue gun, 5,479,914, Cl. 126-401.000.
- Tsai, Chung Y., to Fu Hsiang Textile Co., Ltd. Far-infrared radiating medical compound and an adhesive surgical tape layering the compound, 5,480,647, Cl. 424-443.000.
- Tsai, Hsi-Chuan: See—  
Muroi, Souichi; and Tsai, Hsi-Chuan, 5,480,957, Cl. 528-87.000.
- Tsao, Ying-Yen P.: See—  
Bell, Weldon K.; Huang, Tracy J.; Lago, Rudolph M.; Tsao, Ying-Yen P.; and Whitehurst, D. Duayne, 5,481,057, Cl. 585-722.000.
- Tsaur, Jyh-Min: See—  
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- Tsigelman, Igor: See—  
Itsekson, Boris; Dyuzhenko, Michael; Itsekson, Vladimir; Itsekson, Alexander; and Tsigelman, Igor, 5,480,256, Cl. 404-72.000.
- Tsubaki, Kazufumi: See—  
Ikezawa, Zenro; Yokota, Shumpei; Tsubaki, Kazufumi; Kohno, Hiroshige; Sugiyama, Hiromu; Ikeda, Kenji; and Suzuki, Takashi, 5,480,660, Cl. 426-2.000.
- Tsuboyama, Hiroaki: See—  
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- Tsuchiya, Hiroaki; Shibayama, Tetsuhiro; Katsumi, Toru; and Kamiya, Yuji, to Canon Kabushiki Kaisha. Method and apparatus for correcting image formation in accordance with a potential measurement and a density measurement selected along an axial direction of a photosensitive drum, 5,481,337, Cl. 355-208.000.
- Tsuda, Masaomi; Fujiwara, Yoshito; Ikegami, Yuji; Sato, Masao; and Fujii, Hiroyuki, to Nippon Yakin Kogyo Co., Ltd. Ferritic stainless steel having an excellent oxidation resistance, 5,480,608, Cl. 420-40.000.
- Tsuda, Yoshihiko: See—  
Shoji, Yasuo; Tsuda, Yoshihiko; Tsutsumi, Kazuhiko; and Inoue, Yasuhide, 5,480,874, Cl. 514-80.000.
- Tsuji, Yoichiro: See—  
Seri, Hajime; Yamamura, Yasuharu; Tsuji, Yoichiro; Owada, Naoko; and Iwaki, Tsutomu, 5,480,740, Cl. 429-59.000.
- Tsukada, Isao: See—  
Kikkawa, Shoshi; Kanazawa, Manabu; and Tsukada, Isao, 5,480,243, Cl. 400-354.000.
- Tsukada, Katsumi; Nakamura, Norio; Nimura, Minoru; Suemori, Hiroyuki; Kamihata, Tomio; and Yamazaki, Mutsuaki, to Seiko Epson Corporation. Electronic device having connector with rows of terminals divided by ribs and ground or power terminal adjacent ribs, 5,481,432, Cl. 361-686.000.
- Tsukada, Kiyoshi; Hattori, Yasuyuki; and Mimura, Taku, to Kao Corporation. Method for preparing copper-containing hydrogenation reaction catalyst and method for producing alcohol, 5,481,048, Cl. 568-885.000.
- Tsukuta, Kenji: See—  
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- Tsunada, Masafumi: See—  
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- Tsunoda, Takanori: See—  
Murakami, Tomoo; Ohnuki, Hidebumi; Tsunoda, Takanori; and Maniwa, Ryo, 5,480,675, Cl. 427-98.000.
- Tsurufuzi, Tomoyoshi: See—  
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- Tsurumi, Kazunori; and Stonehart, Paul, to Tanaka Kikinzoku Kogyo K.K.; and Stonehart Associates Inc. Process of preparing catalyst supporting highly dispersed metal particles, 5,480,851, Cl. 502-185.000.
- Tsutai, Akihiko: See—  
Sakurada, Shinya; Hirai, Takahiro; Tsutai, Akihiko; and Sahashi, Masashi, 5,480,495, Cl. 148-301.000.
- Tsutano, Tomohiro: See—  
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- Tsutsui, Yoshio: See—  
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- Tsutsumi, Kazuhiko: See—  
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- Watanabe, Isao; Takeuchi, Koichi; Ito, Osamu; Yosimoto, Kyosuke; Tanaka, Kumimaro; and Tsutsumi, Kazuhiko, 5,481,508, Cl. 369-13.000.
- Tulane Educational Fund, The Administrators of the: See—  
Bowers, Cyril Y.; Folkers, Karl A.; Ljungqvist, Anders; Feng, Dong-Mei; and Janceka, Anna, 5,480,969, Cl. 530-328.000.
- Tung, Hsueh S.: See—  
Van Der Puy, Michael; Madhavan, G. V. Bindu; Thenappan, Alagappan; and Tung, Hsueh S., 5,481,050, Cl. 570-135.000.
- Turetta, Daniele; and Scaburri, Adriano, to Whirlpool Corporation. Device for controlling the operation of an appliance with a servo-assisted motor, 5,481,169, Cl. 318-560.000.
- Turner, Charles W., to British Technology Group Ltd. Acoustic non-destructive testing, 5,481,153, Cl. 310-334.000.
- Turner, Douglas L.: See—  
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- Turner, Duane L.: See—  
Heise, James A.; Turner, Duane L.; Kaufman, Jeffrey M.; and Leach, Thomas C., 5,481,235, Cl. 335-18.000.
- Turner, Eugene M. Trailer-mounted crane, 5,480,041, Cl. 212-273.000.
- Turner, Ted T.: See—  
Constant, Amanda L.; Webb, David W.; Withers-Miklos, Katherine Z.; Lannen, Kay C.; Turner, Ted T.; and Leong, Amos H.-K., 5,481,463, Cl. 364-464.010.
- Tuteja, Vikas: See—  
DeBiasi, Charles J.; Tuteja, Vikas; Deljevic, Zeljko; and Renehan, John P., 5,481,176, Cl. 322-7.000.
- Tutomu, Tabata: See—  
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- Tuttle, Mark E., to Micron Communications, Inc. Method of forming button-type battery lithium electrodes. 5,480,462, Cl. 29-623.500.
- Tuttle, Mark E.: See—  
Lake, Rickie C.; and Tuttle, Mark E., 5,480,834, Cl. 437-183.000.
- Tuttle, Willard N., to Callidus Technologies, Inc. Vapor recovery system. 5,480,475, Cl. 96-122.000.
- Twerdocblich, Michael; Beeson, Robert J.; Bateman, David E.; Rozelle, Paul F.; and DeMartini, John F., to Westinghouse Electric Corporation. Microwave system for monitoring turbine blade vibration. 5,479,826, Cl. 73-660.000.
- Tyagi, Dinesh: See—  
Jadwin, Thomas A.; Osterhoudt, Hans W.; Spence, John M.; and Tyagi, Dinesh, 5,480,757, Cl. 430-110.000.
- Tzikas, Athanasios; and Carisch, Claudia, to Ciba-Geigy Corporation. Reactive dyes containing a vinylsulfonyl-substituted 2-aminonaphthalene coupling component and a haloacryloylaniline diazo component or the like. 5,480,976, Cl. 534-642.000.
- U-Ship, Inc.: See—  
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- Ube-Nitto Kasei Co., Ltd.: See—  
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- Uchida, Shuichiro, to Hitachi, Ltd. Absorption chiller. 5,479,783, Cl. 62-101.000.
- Uchida, Shunsuke: See—  
Funabashi, Kiyomi; Chino, Koichi; Kuriyama, Osamu; Baba, Tsutomu; Uchida, Shunsuke; and Kikuchi, Makoto, 5,481,061, Cl. 588-4.000.
- Uchimi, Toshiharu: See—  
Hanyu, Yukio; Inaba, Yutaka; Asaoka, Masanobu; Taniguchi, Osamu; Shinjo, Kenji; and Uchimi, Toshiharu, 5,481,387, Cl. 359-078.000.
- Uchino, Tsuguo: See—  
Kato, Hisaki; Kimura, Suenori; Nakatsugawa, Kiyoshi; Uchino, Tsuguo; Ozawa, Itsumi; and Onda, Hiroyuki, 5,481,158, Cl. 313-533.000.
- Uchiyama Manufacturing Corp.: See—  
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- Uchiyama, Masaki; Jo, Yoshinobu; Akashi, Yasutaka; Taya, Masaaki; and Umno, Makoto, to Canon Kabushiki Kaisha. Magnetic toner, image forming method, surface-modified fine silica powder and process for its production. 5,480,755, Cl. 430-106.600.
- Uchiyama, Shigeyuki; Kusaka, Yosuke; and Yamano, Syozo, to Nikon Corporation. Focus condition detecting device. 5,481,329, Cl. 354-402.000.
- Udagawa, Masaharu; Yasui, Juro; Niwa, Masaaki; Hirai, Yoshihiko; Okada, Kenji; Morimoto, Kiyoshi; and Yuki, Koichiro, to Matsushita Electric Industrial Co., Ltd. Method for removing organic or inorganic contaminant from silicon substrate surface. 5,480,492, Cl. 134-2.000.
- Udagawa, Yutaka; Funada, Masahiro; Ohta, Ken-ich; Takaragi, Yoichi; Kitamura, Toshiyuki; and Ohta, Eiji, to Canon Kabushiki Kaisha. Image processing with anti-forgery function. 5,481,377, Cl. 358-501.000.
- Ueda, Chiga; Yoshida, Hidemi; and Mizuno, Masaaki, to Mitsubishi Chemical Corporation. High density optical recording method and recording medium. 5,481,530, Cl. 369-275.100.
- Ueda, Shigenori: See—  
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- Ueda, Yoshizumi: See—  
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- Ueffing, Norbert: See—  
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- Ueffinger, Gerhard; and Huetteneister, Franz, to Eastman Kodak Company. Method and apparatus for controlling electrolytic silver recovery for two film processing machines. 5,480,769, Cl. 430-401.000.
- Uehara, Hiroshi: See—  
Uenohara, Norihisa; and Uehara, Hiroshi, 5,480,017, Cl. 192-98.000.
- Uehara, Ryo, to Nikon Corporation. Electronic still camera with capacity warning indicator and method. 5,481,303, Cl. 348-231.000.
- Ueki, Mitsuo: See—  
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- Ueki, Tomiji: See—  
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- Uemura, Toshiya: See—  
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- Ueno, Akira; Nakanishi, Hideyuki; Nagai, Hideo; and Yoshikawa, Akio, to Matsushita Electronics Company. Diffraction element and optical pick-up assembly. 5,481,524, Cl. 369-112.000.
- Ueno, Norio: See—  
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- Uenohara, Norihisa; and Uehara, Hiroshi, to Exedy Corporation. Annular hydraulic clutch release cylinder device. 5,480,017, Cl. 192-98.000.
- Uenoyama, Harumi: See—  
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- Ueyama, Yasuhiro: See—  
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- Uga, Kimiharu; Honda, Hiroki; Ishida, Masahiro; and Ishigaki, Yoshiyuki, to Mitsubishi Denki Kabushiki Kaisha. Method of fabricating a bipolar transistor having a link base. 5,480,816, Cl. 437-31.000.
- Ugalde, Carlos V., to Continental Engineering Group, Inc. Convertible computer workstation. 5,480,224, Cl. 312-194.000.
- Uhlemann, Hans; Schmoll, Josef; and Bucheler, Manfred, to Bayer Aktiengesellschaft. Apparatus for continuous fluidized bed agglomeration. 5,480,617, Cl. 422-140.000.
- Uhler, G. Michael: See—  
Stamm, Rebecca L.; and Uhler, G. Michael, 5,481,689, Cl. 395-412.000.
- Ujiie, Takashi; and Ito, Makoto, to Fuji Electric Co., Ltd. Fuel cell generation apparatus and a method for starting the same. 5,480,736, Cl. 429-13.000.
- Ukita, Nobuo: See—  
Nakamura, Kenji; and Ukita, Nobuo, 5,481,163, Cl. 315-308.000.
- Ulan, Judith G. Trapping and sealing process. 5,480,556, Cl. 210-681.000.
- Ulrey, Joseph N.: See—  
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- Ulrich, Kalus H., to Mannesmann Aktiengesellschaft. Process and apparatus for smelting reduction of ores or pre-reduced metal carriers. 5,480,474, Cl. 75-502.000.
- Um, Gregory: See—  
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- Umeoka, Hiroshi: See—  
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- Underwater Excavation Limited: See—  
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- Underwood, John P. Vegetation maintenance system. 5,479,741, Cl. 47-30.000.
- Uniden America Corp.: See—  
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- Uniden Corporation: See—  
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- Union Carbide Chemical & Plastics Technology Corporation: See—  
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- Union Carbide Chemicals & Plastics Technology Corporation: See—  
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- Unisia Jecs Corporation: See—  
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- Unisys Corporation: See—  
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- United Biomedical, Inc.: See—  
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- United Memories, Inc.: See—  
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- United Microelectronics Corporation: See—  
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- Hsu, Chen-Chung, 5,480,823, Cl. 437-48.000.
- Hsu, Chen-Chung, 5,481,133, Cl. 257-621.000.
- Hsue, Chen-Chiu; and Yang, Ming-Tzong, 5,480,822, Cl. 437-48.000.
- Huang, Heng-Sheng, 5,480,819, Cl. 437-43.000.
- Huang, Yen-Tsai, 5,481,208, Cl. 326-87.000.
- Luo, Wenzhe; and Xu, Jiansheng, 5,481,488, Cl. 364-725.000.
- United States of America  
Energy: See—  
Harris, Michael T.; Basaran, Osman A.; Kollie, Thomas G.; and Weaver, Fred J., 5,480,696, Cl. 428-69.000.
- Looney, Brian B.; Lombard, Kenneth H.; Hazen, Terry C.; Pfiffner, Susan M.; Phelps, Tommy J.; and Borthen, James W., 5,480,549, Cl. 1210-610.000.
- Health and Human Services: See—  
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- National Aeronautics and Space Administration: See—  
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- Navy: See—  
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- Donald, James B.; Nuttall, Albert H.; and Wilson, James H., 5,481,505, Cl. 367-130.000.
- Novinson, Thomas, 5,480,482, Cl. 106-498.000.
- Schoemaker, Patrick A., 5,481,492, Cl. 365-185.230.
- U.S. Phillips Corporation: See—  
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- Mehlhopf, Antoon F.; and Ham, Cornelis L. G., 5,481,192, Cl. 324-318.000.
- Meyer, Peter, 5,481,499, Cl. 365-201.000.
- Minot, Joel, 5,481,604, Cl. 379-221.000.
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- Universal Electronics Inc.: See—  
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- Unson, Cecilia G.: See—  
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- Utex Industries, Inc.: See—  
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- Utz, Hubert, to National Semiconductor Corporation. Power conserving integrated circuit. 5,481,222, Cl. 327-544.000.
- Vadász, Zsolt: See—  
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- Vahlstrom, Shawn: See—  
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- Valkirs, Gunars E.: See—  
Buechler, Kenneth F.; and Valkirs, Gunars E., 5,480,792, Cl. 435-6.000.
- Valmet Paper Machinery Inc.: See—  
Niskanen, Juhani; and Odell, Michael, 5,480,513, Cl. 162-203.000.
- Valpey, Richard S., III; Yokoyama, Thomas W.; Kraan, John D.; and Harwood, H. James, to Sherwin-Williams Company, The. Curable compositions incorporating anhydride-functional polymers derived from alkenyl succinic anhydride. 5,480,951, Cl. 526-271.000.
- Van den Bergh Foods Co., Division of Conopco, Inc.: See—  
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- van Blitterswijk, Clemens A.: See—  
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- van Bonn, Karl-Heinz; Kathrein, Hendrik; and Franz, Gerhard, to Toda Kogyo Corp. Low coercive iron oxide pigments and a process for their preparation. 5,480,570, Cl. 252-62.560.
- Van Daele, Georges H. P.: See—  
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- Janssen, Marcel A. C.; Van Daele, Georges H. P.; Bosmans, Jean-Paul R. M. A.; Verdonck, Marc G. C.; and Janssen, Paul A. J., 5,480,997, Cl. 546-289.000.
- Van Den Brink, Marinus A.; Linders, Henk F. D.; and Wittekoek, Stefan, to ASM Lithography. Apparatus for projecting a mask pattern on a substrate. 5,481,362, Cl. 356-401.000.
- Van den Keybus, Frans M. A.: See—  
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- Van Der Puy, Michael; Madhavan, G. V. Bindu; Thenappan, Alagappan; and Tung, Hsueh S., to AlliedSignal Inc. Processes for the preparation of fluorinated olefins and hydrofluorocarbons using fluorinated olefin. 5,481,050, Cl. 570-135.000.
- van Deutekom, Cornelis A.: See—  
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- Van Dick, Robert C. Method and apparatus for reducing physiological stress. 5,480,374, Cl. 600-26.000.
- Van Houdt-Moree, Jeannette D.: See—  
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- Van Hout, James E.; Owski, Alexander J.; Mangiapane, Anthony J.; and Briggs, Charles T., III, to Chrysler Corporation. Method and apparatus for inducing audio vibrations. 5,479,823, Cl. 73-579.000.
- Van Zanten, Anton: See—  
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- Vapor Technologies, Inc.: See—  
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- Varadarajan, Godavarthi S.: See—  
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- Vasudev, Prahalad K., to Sematech, Inc. Attenuated phase shifting mask with buried absorbers. 5,480,747, Cl. 430-5.000.
- Vaughter, Eric D.: See—  
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- Velic Circuits, Inc.: See—  
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- Veltman, Markus H., to Sony Corporation. Rational input buffer arrangements for auxiliary information in video and audio signal processing systems. 5,481,543, Cl. 370-94.100.
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de Nanteuil, Guillaume; Remond, Georges; and Verbeuren, Tony, 5,481,030, Cl. 562-10.000.
- Verdi, Fred W.: See—  
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- Verdonck, Marc G. C.: See—  
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- Verger, Robert: See—  
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- Verhoest, Bart P.; and Claes, Jan, to AGFA-Gevaert N.V. Apparatus for processing photographic sheet material. 5,481,328, Cl. 354-324.000.
- Verity, Steve B.: See—  
Coffey, Lawrence G.; and Verity, Steve B., 5,481,299, Cl. 348-123.000.
- Verluyten, Ludo: See—  
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- Vermeulen, H. Richard. Method of coating with a gummer roll apparatus. 5,480,681, Cl. 427-428.000.
- Vermeulen, Lori A.: See—  
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- Verneau, Michel: See—  
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- Verres Industries SA: See—  
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- Verrette, Steven M.; and Bean, Christopher C., to C & S Industries. Golf bag cart detachable accessory carrier. 5,480,078, Cl. 224-274.000.
- Versini, Rolland. Device for the instant, automatic, pressurized percolation of food liquids. 5,479,848, Cl. 99-287.000.
- Viaene, Kris: See—  
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- Vicik, Stephen J., to Viskase Corporation. Amorphous nylon copolymer and copolyamide films and blends. 5,480,945, Cl. 525-432.000.
- Victor Company of Japan, Ltd.: See—  
Kondo, Tetsuya; Murata, Kei; Nagai, Yoshikazu; and Ohshima, Katunori, 5,480,763, Cl. 430-320.000.
- Morioka, Shouji; Matsugase, Hiroshi; Togawa, Katsutake; and Nakagawa, Mitsuru, 5,481,512, Cl. 369-36.000.
- Nakatani, Yoichiro, 5,481,411, Cl. 358-311.000.
- Ozaki, Hidetoshi, 5,481,368, Cl. 358-336.000.
- Yamasaki, Hidetoshi; Murata, Masae; Noya, Yukio; Yomogita, Yasukazu; Taguchi, Manabu; Yamanaka, Akira; and Sibuya, Naoki, 5,481,514, Cl. 369-36.000.
- Vieil, Eric; Bidan, Gérard; Gadelle, Andrée; and Mendes-Viegas, Maria-Fatima, to Commissariat à l'Energie Atomique. Conductive polymer doped by a sulphonated cyclodextrin salt and device for obtaining and/or supplying an active substance incorporating said polymer. 5,480,924, Cl. 524-48.000.
- Vietze, Helmut; Weissaupt, Bruno; Miller, Robin J.; and Schoy, Albrecht, to Baumer Electric AG. Automatic polarity switching output circuit. 5,481,211, Cl. 327-29.000.
- Vieyra, Todd T., to Furniture Medic, Inc. Method for refinishing wood. 5,480,680, Cl. 427-388.400.
- Vighenzoni, Alfredo G.: See—  
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- Vinh, Anh: See—  
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- Visentin, Giuseppina; Zarini, Franco; Jabes, Daniela; Perrone, Ettore; della Bruna, Costantino; and Alpegriani, Marco, to Farmitalia Carlo Erba S.r.l. Penem derivatives. 5,480,880, Cl. 514-210.000.
- Vision Medical and Dental: See—  
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- Viskase Corporation: See—  
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- Visser, Jacobus H.: See—  
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- Vita, Giandomenico: See—  
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- VKI Technologies, Inc.: See—  
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- Vlakancic, Constant G. Electrical connector latching apparatus. 5,480,319, Cl. 439-347.000.
- VLSI Technology, Inc.: See—  
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- Brasen, Daniel R.; and Gauthron, Christophe, 5,481,469, Cl. 364-483.000.
- Dockser, Kenneth A., 5,481,686, Cl. 395-375.000.
- Frye, Ronald E., Jr., 5,481,202, Cl. 324-754.000.
- Voegele, Kevin D.; Lancot, Jane B.; and Westfield, Brian L., to Rosemont Inc. Field transmitter built-in test equipment. 5,481,200, Cl. 324-718.000.
- Voeest-Alpino Industrieanlagenbau GmbH: See—  
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- Vogel, Jürgen: See—  
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- Vogel, Robert L.: See—  
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- Voissem, Ted J., to Badger Plug Company. Core plug for steel coils with variable length bridge. 5,480,106, Cl. 242-571.000.
- Volpenhein, Eric C.: See—  
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- Volponi, Allan J.; and Solomonides, Jason B., to United Technologies Corp. Fuzzy logic method and apparatus for changing the position of turbine blades via an induction motor, brake and a position lock. 5,481,648, Cl. 395-51.000.
- Volt Information Sciences, Inc.: See—  
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- von Wedemeyer, Peter, to Stabila-Massgerate Gustav Ullrich GmbH. Level indicator. 5,479,717, Cl. 33-379.000.
- Vorgitch, Thomas J.: See—  
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- Vortran Medical Technology, Inc.: See—  
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- Vorwerk & Co. Interholding GmbH: See—  
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- Vossloh-Schwabe GmbH: See—  
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- VSAR Systems of Atlanta, Inc.: See—  
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- Vu, Van N. Pad for applying medicaments. 5,480,646, Cl. 424-443.000.
- W. E. Hall Company: See—  
Andre, James R., 5,480,505, Cl. 156-201.000.
- W. L. Gore & Associates, Inc.: See—  
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- W. R. Grace & Co.-Conn.: See—  
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- Seech, Alan G.; Cairns, James E.; and Marvan, Igor J., 5,480,579, Cl. 252-181.000.
- Wabco Standard GmbH: See—  
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- Wada, Satoshi: See—  
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- Wada, Shigeru; Funahashi, Akira; and Iwata, Michihiro, to Minolta Camera Kabushiki Kaisha. Mechanism for locking cartridge compartment cover of camera. 5,481,325, Cl. 354-173.100.
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- Wada, Yutaka: See—  
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- Wade, Paul C.; Duncan, Samuel H.; and Smelser, Donald W., to Digital Equipment Corporation. System and method for error detection and reducing simultaneous switching noise. 5,481,555, Cl. 371-57.200.
- Wadia, Aspi R.; and Mielke, Mark J., to General Electric Company. Self bleeding rotor blade. 5,480,284, Cl. 416-91.000.
- Wagner, Egbert: See—  
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- Wagner Electric Corporation: See—  
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- Wagner, Eric M.: See—  
Gallo, Paul S.; Goodman, R. W. Benjamin; Krantz, Lawrence L.; McLoughlin, Kathleen A.; and Wagner, Eric M., 5,481,681, Cl. 395-325.000.
- Wagner, Eric R.: See—  
Kola, Ratnaji R.; Miller, Gabriel L.; and Wagner, Eric R., 5,480,529, Cl. 204-298.030.
- Miller, Gabriel L.; and Wagner, Eric R., 5,481,104, Cl. 250-214.000.
- Wagner, Hildebert; Dorsch, Walter; Stuppner, Hermann; and Antus, Sandor, to Plantamed Arzneimittel GmbH. Phenone compounds, manufacturing method and pharmaceutical preparations containing them. 5,481,043, Cl. 568-309.000.
- Wagner, Lee F.; and Schulte, William A., to Genlyte Group, Inc., The. In-ground directional light fixture. 5,481,443, Cl. 362-153.100.
- Wagner, Richard W.: See—  
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- Wagnon, Jean; de Cointet, Paul; Nisato, Dino; Plouzane, Claude; Serradeil-Legal, Claudine; and Tonnerre, Bernard, to Sanofi. N-sulfonylindoline derivatives, their preparation and the pharmaceutical compositions in which they are present. 5,481,005, Cl. 548-537.000.
- Wahleithner, Jill A.; Christensen, Bjoern E.; and Schneider, Palle, to Novo Nordisk A/S. Purified PH neutral *Rhizoctonia laccases* and nucleic acids encoding same. 5,480,801, Cl. 435-254.300.
- Wakabayashi, Kenichi; Takayama, Chitoshi; and Shiozaki, Tadashi, to Seiko Epson Corporation. Accessory control device and information processing method. 5,481,656, Cl. 395-115.000.
- Wakabayashi, Tsutomu, to Nikon Corporation. Camera with magnetic head for recording information on film. 5,481,322, Cl. 354-105.000.
- Wakahara, Toshihiko: See—  
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- Wakita, Toshiaki: See—  
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- Waldrop, David S.: See—  
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- Walker, Edd: See—  
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- Walker, Robert A., Jr. Combination in-line air-filter/air-oil separator/air-silencer with preseparator. 5,479,907, Cl. 123-573.000.
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- Werner, Johannes; Thiele, Klaus-Jürgen; Bäuerle, Emil; Kerschbaum, Walter; and Bauknecht, Peter, to Mercedes-Benz AG. V-shaped internal combustion engine. 5,479,903, Cl. 123-509.000.
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- Wilson, David C.: See—  
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- Wilson, James H.: See—  
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- Wilson, James J.: See—  
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- Wilson, Kevin R.; and Babkes, Mitchell H., to Diamant Boart, Inc. Scoring and breaking device with a carrying case therefor. 5,480,081, Cl. 225-96.500.
- Wilson, Mitchell E., to Innovation Corporation. Mobile watering device. 5,480,096, Cl. 239-148.000.
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- Windmüller & Höschel: See—  
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- Winters, Jack H., to AT&T Corp. Block radio and adaptive arrays for wireless systems. 5,481,570, Cl. 375-347.000.
- Winters, John R.: See—  
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- Witsaman, Mark L.: See—  
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- Witzel, Tom: See—  
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- Wnukowski, George J.: See—  
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- Woelker, Jennifer U.: See—  
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- Woginrich, Thomas J., Jr., to James River Corporation of Virginia. Method and apparatus for symmetrical current starting of polyphase induction motors. 5,481,171, Cl. 318-778.000.
- Wohlfahrt, Robert, to Crash Holding AG. Process for producing a case for receiving a watchwork. 5,479,686, Cl. 29-179.000.
- Wojnarski, Tadeusz, to Mettler-Toledo AG. Electronic balance with a key for enabling a specific function. 5,481,071, Cl. 177-124.000.
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- Wolf, Fred R.; and Cuellar, Richard E., to Amoco Corporation. Composition for modulating sterols in yeast. 5,480,805, Cl. 435-320.100.
- Wolf, James D.: See—  
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- Wolf, Michael L.: See—  
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- Wolfe, Gregory J.: See—  
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- Wolleb, Heinz: See—  
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- Wong, Gordon A.: See—  
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- Wong, Sam H., to Rockwell International Corporation. Bi-directional spatial power combiner grid amplifier. 5,481,223, Cl. 330-124.00R.
- Woo, Hyeon-su: See—  
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- Wood, David G. Hitting practice apparatus. 5,480,141, Cl. 273-26.00E.
- Wood, Robert W. Line block masonry alignment system for use in conjunction with door bucks and a plumb line. 5,479,713, Cl. 33-407.000.
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- Woodmansee, Donald E.: See—  
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- Woods, Richard: See—  
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- Wolfson, Martin G.: See—  
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Gorlich, Michael P.; and McPherson, Robert F., Jr., 5,479,759, Cl. 53-432.000.
- Worley, Michael E.; and Armstrong, James M., to Reed Elsevier Inc. Printer control apparatus for remotely modifying local printer by configuration signals from remote host to produce customized printing control codes. 5,481,742, Cl. 395-800.000.
- Worrest, Ralph: See—  
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- Wozniak, John N.: See—  
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- Wright, Ann S.: See—  
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- Wright, Antony P.: See—  
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- Wright, William R.: See—  
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- Wu, Gary C-F: See—  
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- Wu, Ming-Hsin. Conduit connecting mechanism for a screen panel. 5,479,747, Cl. 52-220.700.
- Wu, Shih-Chang; and Grebel, Haim, to New Jersey Institute of Technology. Optically controlled multilayer coplanar waveguide phase shifter. 5,481,232, Cl. 333-161.000.
- Wu, Teng-Hui, to Chieh Chang Co., Ltd. Automatically inflatable toy. 5,480,339, Cl. 446-220.000.
- Wulleman, Raymond D. A.: See—  
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- Wuu, Shou-Gwo; Liang, Mong-Song; Wang, Chuan-Jung; and Su, Chung-Hui, to Taiwan Semiconductor Manufacturing Co., Ltd. Process of making a polysilicon barrier layer in a self-aligned contact module. 5,480,814, Cl. 437-41.000.
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- Wykes, Harry B.: See—  
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- Wylder, James R.: See—  
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- X 2 M France S.A.: See—  
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- Xeikon NV: See—  
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- Xerox Corporation: See—  
Badesha, Santokh S.; Heeks, George J.; Henry, Arnold W.; Pan, David H.; Fratangelo, Louis D.; and Ferguson, Robert M., 5,480,938, Cl. 525-104.000.
- Bischoping, Patricia; Altavela, Robert P.; Kotowicz, Lawrence; Schmitt, Peter J.; Herbert, William G.; Jansen, Ronald E.; Lennon, John H.; and Grey, Henry G., 5,480,528, Cl. 204-212.000.
- Hicks, Derek C.; Bunker, Keith G.; and Wardrip, Riley L., 5,481,353, Cl. 355-311.000.
- James, Courtney D.; Nowak, William J.; and Shogren, David K., 5,481,142, Cl. 310-51.000.
- Mahabadi, Hadi K.; Agur, Enno E.; McAnency, T. Brian; Kao, Sheau V.; Allison, Gerald R.; Hawkins, Michael S.; Hollenbaugh, William H., Jr.; Jacobs, Robert M.; and Chow, Che C., 5,480,756, Cl. 430-109.000.
- Sanchez, Ismael R.; and Antonelli, Alexander A., 5,479,968, Cl. 141-110.000.
- Sypula, Donald S.; Badesha, Santokh S.; Chang, Shu; Knapp, John F.; Trott, Robert E.; Chai, Stephen T.; Till, Henry R.; and Mammino, Joseph, 5,481,341, Cl. 355-256.000.
- Williams, James E.; and Germain, Richard P., 5,480,751, Cl. 430-42.000.
- Xilinx, Inc.: See—  
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- Xu, Jiasheng: See—  
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- Xu, Jie; Suzuki, Kenji; and Kinoshita, Isamu, to Furukawa Electric Co., Ltd., The. Polishing process for optical connector assembly with optical fiber and polishing apparatus. 5,480,344, Cl. 451-28.000.
- Yada, Hiroaki, to Sony Corporation. Data detecting apparatus using an over sampling and an interpolation means. 5,481,568, Cl. 375-340.000.
- Yagasaki, Yoichi: See—  
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- Yager, Michael: See—  
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- Yagi, Keiji: See—  
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- Yallop, Richard W.: See—  
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- Yamada, Haruo: See—  
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- Yamada, Hideo, to Yamaha Corporation. Electronic musical instrument having pre-assigned microprogram controlled sound production channels. 5,481,065, Cl. 84-615.000.
- Yamada, Hideyuki: See—  
Manabe, Takao; Yamakawa, Yuhei; Shin, Shoichi; Yamada, Hideyuki; Nagashima, Mitsuo; Kokubo, Mitsunori; Tsunada, Masafumi; Nagakura, Yasuhiko; Nakajima, Yukio; Inoue, Tomohiro; and Kondo, Kiyoshi, 5,480,508, Cl. 156-353.000.
- Yamada, Hiroyuki: See—  
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- Yamada, Masahiro: See—  
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- Yamada, Masakatsu: See—  
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- Yamada, Michihiro: See—  
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- Yamada, Yasuhiro: See—  
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- Yamagishi, Mikio: See—  
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- Yamaguchi, Akihiro: See—  
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- Yamaguchi, Akiyasu: See—  
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- Yamaguchi, Keizaburo: See—  
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- Yamaguchi, Yoshihide: See—  
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- Yamaha Corporation: See—  
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- Kitamura, Minoru, 5,481,066, Cl. 84-637.000.
- Shibukawa, Takeo, 5,481,067, Cl. 84-659.000.
- Yamada, Hideo, 5,481,065, Cl. 84-615.000.
- Yamakawa, Tadashi: See—  
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- Okuno, Yasuhiro; Yamakawa, Tadashi; Nagashima, Masaaki; and Sasaki, Takayuki, 5,481,672, Cl. 395-188.010.
- Yamakawa, Yuhei: See—  
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- Yamamoto, Hisayoshi; Hoshida, Akira; and Kobayashi, Masumi, to Mitsubishi Rayon Co., Ltd. Hollow fiber membrane module. 5,480,553, Cl. 210-650.000.
- Yamamoto, Kaoru: See—  
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- Yamamoto, Keisuke; Kishi, Fumio; Motoi, Taiko; Kawasaki, Takehiko; and Kaneko, Norio, to Canon Kabushiki Kaisha. Recording medium, recording method, and readout method. 5,481,491, Cl. 365-148.000.
- Yamamoto, Ken; Yamamoto, Michiyasu; Baba, Norimasa; Fukuoka, Mikio; Kuroyanagi, Isao; Sanada, Ryouchi; and Torigoe, Eiichi, to Nippondenso Co., Ltd. Heat exchanger. 5,479,985, Cl. 165-176.000.
- Yamamoto, Michiyasu: See—  
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- Yamamoto, Noriya: See—  
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- Yamamoto, Seiichi: See—  
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- Yamamoto, Susumu; Murai, Teruyuki; Kawabe, Nozomu; and Tobioka, Masaaki, to Sumitomo Electric Industries, Ltd. Method for producing an elongated sintered article. 5,480,601, Cl. 264-61.000.
- Yamamoto, Yasuhiro, to Kabushiki Kaisha Meidensha. Vector control system for induction motor. 5,481,173, Cl. 318-801.000.
- Yamamoto, Yasutoshi; Yoneyama, Masayuki; and Mori, Tsutomu, to Matsushita Electric Industrial Co., Ltd. White balance adjustment apparatus. 5,481,302, Cl. 348-223.000.
- Yamamoto, Yorihiisa; Nishi, Yutaka; Nishimori, Takashi; and Tokunaga, Hiroyuki, to Honda Giken Kogyo Kabushiki Kaisha. Vehicle steering system. 5,481,457, Cl. 364-424.050.
- Yamamoto, Yoshikazu; and Itabashi, Akio, to Fujitsu Limited. Image forming apparatus using a continuous paper supply. 5,481,352, Cl. 355-308.000.
- Yamamoto, Yoshinori: See—  
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- Yamamoto, Yousuke, to Mitsubishi Denki Kabushiki Kaisha. Apparatus and method for die bonding semiconductor element. 5,481,082, Cl. 219-121.630.
- Yamamoto, Yuji: See—  
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- Yamamura, Hirohisa: See—  
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- Yamamura, Yasuharu: See—  
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- Yamamoto, Mikio, to Kabushiki Kaisha Toshiba. Optical disk apparatus for recording/erasing information in the M-CAV format by using gain switching to increase the speed of the master clock. 5,481,531, Cl. 369-275.300.
- Yamana, Koji: See—  
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- Yamana, Masahiro: See—  
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- Yamanaka, Akira: See—  
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- Yamano, Syozo: See—  
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- Yamano, Yoshiaki; Hashimoto, Masayoshi; and Kodera, Hiroji, to Sumitomo Wiring Systems, Ltd. Cover strip-off method in a covered wire cutting and stripping apparatus. 5,479,701, Cl. 29-825.000.
- Yamanouchi Pharmaceutical Co., Ltd.: See—  
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- Yamaoka, Hidenori: See—  
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- Yamaoka, Shoji: See—  
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- Yamasaki, Akinori: See—  
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- Yamasaki, Hidetoshi; Murata, Masae; Noya, Yukio; Yomogita, Yasukazu; Taguchi, Manabu; Yamanaka, Akira; and Sibuya, Naoki, to Victor Company of Japan, Ltd. Recording/reproducing apparatus including an auto changer for a disk-like recording medium. 5,481,514, Cl. 369-36.000.
- Yamasaki, Katsuya; Sakurai, Kazushi; and Akiyama, Kazuo, to Otsuka Pharmaceutical Co., Ltd. Method for treating diabetes mellitus. 5,480,891, Cl. 514-312.000.
- Yamasaki, Kazuyuki; Hamaguchi, Yoshihiro; Hosoda, Shunji; Sakata, Kazuyuki; Imai, Takashi; Okatani, Shigetoshi; Nishio, Satoshi; Takahashi, Tuiyoshi; Matsumura, Kenji; Tanaka, Noriyuki; Nagayasu, Teruaki; and Makino, Hiroshi, to Sharp Kabushiki Kaisha. Apparatus for waste water treatment using calcium carbonate mineral and microorganisms in combination. 5,480,537, Cl. 210-96.100.
- Yamasaki, Masafumi, to Olympus Optical Co., Ltd. Panoramic photograph processing system. 5,481,330, Cl. 354-412.000.
- Yamasato, Masaharu: See—  
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- Yamashiro, Osamu: See—  
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- Yamashita, Haruyuki: See—  
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- Yamashita, Shinichi: See—  
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- Yamashita, Wataru; Okawa, Yuichi; Oikawa, Hideaki; Asanuma, Tadashi; Ishihara, Yuko; Matsuo, Mitsunori; Yamaguchi, Keizaburo; Yamaguchi, Akihiro; and Tamai, Shoji, to Mitsui Toatsu Chemicals, Inc. Readily soluble, amorphous polyimide, and preparation process of same. 5,480,965, Cl. 528-353.000.
- Yamashita, Yoshio: See—  
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- Yamatate-Honeywell Co., Ltd.: See—  
Kimura, Shigeo; Ishikura, Yoshiyuki; Kihara, Takashi; and Masuda, Takashi, 5,479,827, Cl. 73-718.000.
- Yamauchi, Atsuyoshi: See—  
Oishi, Tetsuya; Ozawa, Hiroshi; Karasawa, Minato; Inomata, Masamitsu; Mega, Izumi; Yamauchi, Atsuyoshi; Kamada, Kazunori; Nakahata, Shigeru; Sakamoto, Katsumi; Nakashima, Tatsunobu; Watanabe, Akito; Suzuki, Jin; Ohkawa, Kouhei; Furusawa, Satoshi; Ono, Hiroshi; and Sugazaki, Kazuo, 5,480,947, Cl. 525-509.000.
- Yamauchi, Tadaaki; Miyamoto, Hiroshi; Morooka, Yoshikazu; Furutani, Kiyohiro; and Aoki, Makiko, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device providing external output data signal in accordance with states of true and complementary read buses. 5,481,497, Cl. 365-189.050.
- Yamauchi, Yoshiyuki: See—  
Nomura, Kanunori; Anse, Hiroaki; and Yamauchi, Yoshiyuki, 5,480,101, Cl. 242-160.400.
- Yamaura, Takuro: See—  
Kimura, Hiromi; Okamura, Akio; Kawaide, Hiroshi; and Yamaura, Takuro, 5,480,781, Cl. 435-52.000.
- Yamazaki, Kazuki; Inoue, Nobuaki; Yamamoto, Seiichi; Ezoe, Toshihide; Sakai, Minoru; Ikeda, Tadashi; Okazaki, Masaki; and Fujiwara, Toshiki, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 5,480,886, Cl. 430-264.000.
- Yamazaki, Koji: See—  
Kawada, Masaya; Yamazaki, Koji; Ueda, Shigenori; Ehara, Toshiyuki; and Niino, Hiroaki, 5,480,750, Cl. 430-31.000.
- Yamazaki, Mutsuaki: See—



- Tsukada, Katsumi; Nakamura, Norio; Nimura, Minoru; Suemori, Hiroyuki; Kamihata, Tomio; and Yamazaki, Mutsuaki, 5,481,432, Cl. 361-686.000.
- Yamazaki, Satoshi; Takayama, Toru; Fukino, Kunihiro; Kodaka, Yoshiro; and Imanari, Hitoshi, to Nikon Corporation. Mechanism for waterproofing operation member of interchangeable lens barrel. 5,481,406, Cl. 359-694.000.
- Yamazaki, Yoshio: See—  
Sugano, Masashi; Yamazaki, Yoshio; Ikeda, Masaaki; and Izawa, Tadashi, 5,481,378, Cl. 358-501.000.
- Yamazoe, Masaru: See—  
Minowa, Hirofumi; Ishii, Shinichi; Yanase, Takao; and Yamazoe, Masaru, 5,481,172, Cl. 318-800.000.
- Yan, Yi-Tsung. Dispensing syringe for a fluid glue. 5,480,064, Cl. 222-83.000.
- Yanagi, Haruyuki: See—  
Saikawa, Satoshi; Suzuki, Tetsuo; Hiramatsu, Soichi; Taniguro, Masahiro; Saito, Hiroyuki; Yanagi, Haruyuki; Nojima, Takashi; Kinoshita, Hiroyuki; and Kawakami, Hideaki, 5,480,247, Cl. 400-629.000.
- Yanagi, Shigenori: See—  
Masaki, Takashi; and Yanagi, Shigenori, 5,481,510, Cl. 369-32.000.
- Yanagida, Masahiro; Takahashi, Hiromasa; and Tachibana, Osamu, to Fujitsu Limited. Method of and apparatus for discriminating NaN. 5,481,489, Cl. 364-736.500.
- Yanagida, Tomokatsu, to Fujitsu Limited. Address table editing system for voice data recorded in an optical disk. 5,481,511, Cl. 369-32.000.
- Yanagida, Yoshiaki: See—  
Kato, Akihiko; Yamamoto, Masaharu; Taguchi, Tomio; Yanagida, Yoshiaki; and Katube, Teruaki, 5,480,534, Cl. 204-419.000.
- Yanagihara, Naoto; Takashima, Masanobu; Shimazaki, Masato; Iwakura, Ken; and Kodama, Tomohiro, to Fuji Photo Film Co., Ltd. Recording material. 5,480,765, Cl. 430-338.000.
- Yanagisawa, Misuo, to Pearl Musical Instrument Co. Spin-lock musical instrument stand. 5,479,843, Cl. 84-403.000.
- Yanagisawa, Yoshihiro: See—  
Kasanuki, Yuji; Kawada, Haruki; and Yanagisawa, Yoshihiro, 5,481,527, Cl. 369-126.000.
- Yanai, Akira; Ueda, Yoshizumi; Sakurai, Toru; and Satoh, Masahiro, to Toray Industries, Inc. Feline interferon and process for production thereof. 5,480,956, Cl. 435-69.510.
- Yanase, Takao: See—  
Minowa, Hirofumi; Ishii, Shinichi; Yanase, Takao; and Yamazoe, Masaru, 5,481,172, Cl. 318-800.000.
- Yang, Henry S.; Ramakrishnan, K. K.; and Spinney, Barry, to Digital Equipment Corp. Frame removal mechanism for token ring networks using one or more start strip delimiter frames or circulation time interval. 5,481,538, Cl. 370-85.500.
- Yang, Ming-Tzong: See—  
Hsue, Chen-Chiu; and Yang, Ming-Tzong, 5,480,822, Cl. 437-48.000.
- Yang, Tai-Her. Delay restoring type limit-torque coupling mechanism. 5,480,015, Cl. 192-56.100.
- Yang, Xingbo: See—  
Okumura, Yoshinobu; Yang, Xingbo; and Endo, Isao, 5,480,733, Cl. 428-694.000.
- Yang, Xinmin: See—  
Marks, Tobin J.; Yang, Xinmin; and Jia, Li, 5,480,952, Cl. 526-308.000.
- Yaniv, Gershon: See—  
Bark, Lindley W.; Yaniv, Gershon; Romeo, David J.; Hardtmann, Dirk J.; and Mowry, Gregory A., 5,480,181, Cl. 280-730.200.
- Yano, Hideaki: See—  
Fujimura, Yoshiichi; Yano, Hideaki; and Matsuura, Shizutaka, 5,480,105, Cl. 242-383.200.
- Yano, Kentaro: See—  
Otsuka, Naoki; Yano, Kentaro; Takahashi, Kiichiro; Arai, Atsushi; Nishikori, Hitoshi; and Iwasaki, Osamu, 5,481,281, Cl. 347-12.000.
- Yano, Koji: See—  
Takimoto, Kiyoshi; Kawade, Hisaaki; Kishi, Etsuro; and Yano, Koji, 5,481,529, Cl. 369-126.000.
- Yano, Masayoshi; and Mochizuki, Kohei, to Hitachi, Ltd. Method for ion detection and mass spectrometry and apparatus thereof. 5,481,108, Cl. 250-283.000.
- Yano, Shingo; Ohno, Tomoyasu; Ogawa, Kazuo; Yamada, Haruo; Shirasaka, Tetsuhiko; Kawamura, Hiroyuki; and Watanabe, Shinichi, to Taiho Pharmaceutical Co., Ltd. Oxazolidine derivatives and pharmaceutically acceptable salts thereof. 5,480,899, Cl. 514-376.000.
- Yardley, James T.: See—  
Zimmerman, Scott M.; Beeson, Karl W.; McFarland, Michael J.; Yardley, James T.; and Fern, Paul M., 5,481,385, Cl. 359-40.000.
- Yasunas, George D., to Radio Frequency Systems, Inc. Circularly polarized microcell antenna. 5,481,272, Cl. 343-797.000.
- Yashima, Masataka: See—  
Okubo, Yukitoshi; Santoh, Tsuyoshi; Tamura, Miki; Mihara, Chieko; Sugata, Hiroyuki; Kanome, Osamu; and Yashima, Masataka, 5,480,596, Cl. 264-1.330.
- Yasuda, Ken: See—  
Doi, Hiroyuki; Yasuda, Ken; Kashimura, Tetsuo; and Fukui, Yutaka, 5,480,283, Cl. 415-199.500.
- Yasuda, Shinichiro; and Nishikawa, Hideyo, to Kao Corporation. Auxiliary device, cartridge and apparatus for toner supply. 5,481,344, Cl. 355-260.000.
- Yasuda, Sota: See—  
Iwata, Toru; and Yasuda, Sota, 5,481,455, Cl. 364-424.010.
- Yasuda, Yoshinobu: See—  
Akazawa, Mitsui; Hama, Teruo; Kimura, Yukio; and Yasuda, Yoshinobu, 5,480,649, Cl. 424-449.000.
- Yasuda, Yukio: See—  
Hiramatsu, Tetsuo; Igarashi, Tatsushi; Matsuno, Hiromitsu; Yasuda, Yukio; and Yamaguchi, Akiyasu, 5,481,159, Cl. 313-570.000.
- Yasuga, Masaki, to Sankeibutsu Co., Ltd. Tile cutter. 5,480,082, Cl. 225-96.500.
- Yasuhiro, Suzuki: See—  
Shizuo, Nagata; Yasuhiro, Suzuki; Tutomu, Tabata; and Masahiro, Takahashi, 5,481,526, Cl. 369-124.000.
- Yasui, Juro: See—  
Udagawa, Masaharu; Yasui, Juro; Niwa, Masaaki; Hirai, Yoshihiko; Okada, Kenji; Morimoto, Kiyoshi; and Yuki, Koichiro, 5,480,492, Cl. 134-2.000.
- Yasui, Motokazu; and Kato, Yasuhisa, to Ricoh Company, Ltd. Heat roller fixing device divided into first and second frames and with positioning members of the first frame. 5,481,350, Cl. 355-290.000.
- Yasui, Takanari: See—  
Nagai, Kazutoshi; Satake, Tohru; Hayashi, Hideaki; and Yasui, Takanari, 5,480,286, Cl. 417-48.000.
- Yasui, Tetsuji: See—  
Niwa, Motohiro; Yasui, Tetsuji; and Ode, Takahiro, 5,480,804, Cl. 435-286.100.
- Yasukawa, Seiichi, to Nikon Corporation. Camera data communication device. 5,481,326, Cl. 354-286.000.
- Yasunaga, Hiromichi: See—  
Morita, Takao; Matsukawa, Tsutomu; Yasunaga, Hiromichi; Tanaka, Tadao; Togashi, Akihiko; Taniguchi, Yasutaka; and Tani, Masanori, 5,480,221, Cl. 303-113.500.
- Yataka, Kouji: See—  
Iijima, Kenzaburo; Kondo, Katsufumi; Masuda, Katsuhiko; Yataka, Kouji; and Chujo, Yasuyuki, 5,481,355, Cl. 356-28.000.
- Yates, Jack; Williamson, Harold E.; and Braaten, Roger L., to Siemens Power Corporation. Boiling water reactor fuel assembly filter. 5,481,577, Cl. 376-313.000.
- Yazaki Corporation: See—  
Aikawa, Jiro, 5,481,204, Cl. 324-756.000.
- Ishii, Takashi; Watanabe, Tamio; and Nagano, Toru, 5,480,322, Cl. 439-378.000.
- Saimoto, Tetsuro, 5,480,320, Cl. 439-852.000.
- Yeckley, Russell: See—  
Sundberg, Glenn; and Yeckley, Russell, 5,480,846, Cl. 501-65.000.
- Yeoman, Neil; Griffith, Verne E.; and Hsieh, Chang-Li, to Koch Engineering Chemical, Inc. Vapor-liquid contact tray and downcomer assembly and method employing same. 5,480,595, Cl. 261-114.100.
- Yeung, Pak-Ho, to National Semiconductor Corporation. Transistor drive circuit with shunt transistor saturation control. 5,481,216, Cl. 327-333.000.
- Yokoe, Yoshinori; and Hattori, Yuji, to Brother Kogyo Kabushiki Kaisha. Printing apparatus capable of changing print format. 5,481,367, Cl. 358-296.000.
- Yokomizo, Goichi: See—  
Ogawa, Munehiro, deceased; Iwabuchi, Masato; Sugihara, Hitoshi; Hojo, Saburo; Kinoshita, Masami; Yamashiro, Osamu; Yokomizo, Goichi; and Miyama, Mikako, 5,481,484, Cl. 364-578.000.
- Yokomizo, Yoshikazu: See—  
Furuichi, Katsushi; Yokomizo, Yoshikazu; Honma, Toshio; and Murakami, Katsumi, 5,481,335, Cl. 355-206.000.
- Yokota, Shumpei: See—  
Ikezawa, Zenro; Yokota, Shumpei; Tsubaki, Kazufumi; Kohno, Hiroshige; Sugiyama, Hiromu; Ikeda, Kenji; and Suzuki, Takashi, 5,480,660, Cl. 426-2.000.
- Yokoyama, Eiji; and Nagasawa, Masato, to Mitsubishi Denki Kabushiki Kaisha. Tape tension control for a magnetic recording and reproducing apparatus that adjusts spacing error based on the reproduced signal envelope. 5,481,417, Cl. 360-73.080.
- Yokoyama, Minoru: See—  
Ishida, Yasushi; Yokoyama, Minoru; Tomoda, Akihiro; Yamada, Masakatsu; Arai, Takashi; Yoshida, Takehiro; Kobayashi, Makoto; Wada, Satoshi; Ono, Takeshi; and Takeda, Tomoyuki, 5,481,291, Cl. 347-217.000.
- Yokoyama, Thomas W.: See—  
Valpey, Richard S., III; Yokoyama, Thomas W.; Kraan, John D.; and Harwood, H. James, 5,480,951, Cl. 526-271.000.
- Yokoyama, Yoshinada: See—  
Kawasaki, Miyoji; Hirose, Masanori; Suzuki, Toshitsugu; Matsuura, Tei; and Yokoyama, Yoshinada, 5,480,557, Cl. 210-695.000.
- Yomogita, Yasukazu: See—  
Yamasaki, Hidetoshi; Murata, Masae; Noya, Yukio; Yomogita, Yasukazu; Taguchi, Manabu; Yamanaka, Akira; and Sibuya, Naoki, 5,481,514, Cl. 369-36.000.
- Yoneda, Yoshifumi, to Aprica Kassai Kabushiki Kaisha. Chair. 5,480,177, Cl. 280-642.000.
- Yoneyama, Masakazu: See—  
Ishikawa, Takatoshi; and Yoneyama, Masakazu, 5,480,628, Cl. 430-493.000.
- Yoneyama, Masayuki: See—  
Yamamoto, Yasutoshi; Yoneyama, Masayuki; and Mori, Tsutomu, 5,481,302, Cl. 348-223.000.

- Yoon, InBae. Anchor applier instrument for use in suturing tissue. 5,480,405, Cl. 606-139.000.
- Yosefi, Hanan, to Scitex Corporation Ltd. Method for preparing polychromatic printing plates. 5,481,379, Cl. 358-501.000.
- Yoshida, Hidemi: See—  
Ueda, Chiga; Yoshida, Hidemi; and Mizuno, Masaaki, 5,481,530, Cl. 369-275.100.
- Yoshida, Hirokazu, to Teiryō Sangyo Co., Ltd. Two dimensional code data reading apparatus and method. 5,481,101, Cl. 235-472.000.
- Yoshida, Kenichi: See—  
Ogata, Kazumi; and Yoshida, Kenichi, 5,480,773, Cl. 435-2.000.
- Yoshida, Makiko: See—  
Ibbott, Jack K., 5,480,522, Cl. 204-150.000.
- Yoshida, Takehiro: See—  
Ishida, Yasushi; Yokoyama, Minoru; Tomoda, Akihiro; Yamada, Masakatsu; Arai, Takashi; Yoshida, Takehiro; Kobayashi, Makoto; Wada, Satoshi; Ono, Takeshi; and Takeda, Tomoyuki, 5,481,291, Cl. 347-217.000.
- Yoshida, Toyohiko, to Mitsubishi Denki Kabushiki Kaisha. Data processor having 2n bits width data bus for context switching function. 5,481,734, Cl. 395-775.000.
- Yoshida, Yoshikazu, to Matsushita Electric Industrial Co., Ltd. Microwave plasma source. 5,480,533, Cl. 204-298.190.
- Yoshida, Yutaka: See—  
Asakawa, Naoki; Oda, Yoshiya; Yoshida, Yutaka; and Sato, Tadashi, 5,480,542, Cl. 210-198.200.
- Yoshihara, Tetsuo: See—  
Noda, Yasushi; Yoshioka, Nobuyuki; Suzuki, Nobutaka; Fukai, Toshimasa; Yoshihara, Tetsuo; and Koshiro, Koichi, 5,480,472, Cl. 75-351.000.
- Yoshihara, Yukio, to Mitsui Petrochemical Industries, Ltd. Thermoplastic resin composition and use thereof. 5,480,937, Cl. 525-66.000.
- Yoshihisa, Yasuki; and Ikegami, Masaaki, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor III device with dielectric and diffusion isolation. 5,481,130, Cl. 257-512.000.
- Yoshikawa, Akio: See—  
Ueno, Akira; Nakanishi, Hideyuki; Nagai, Hideo; and Yoshikawa, Akio, 5,481,524, Cl. 369-112.000.
- Yoshiki Industrial Co., Ltd.: See—  
Yoshizawa, Yasuo, 5,479,838, Cl. 74-834.000.
- Yoshimoto, Kyosuke; Nakajima, Yoshiki; Koyanagi, Kimiyuki; Ito, Osamu; Mashimo, Akira; Onda, Hiroyuki; Kobayashi, Yutaka; and Yamana, Koji, to Mitsubishi Electric Corporation; and Teac Corporation. Track jump control means for a disk apparatus. 5,481,517, Cl. 369-44.280.
- Yoshinaga, Kazuo: See—  
Arimoto, Shinobu; Shimizu, Katsuchi; Komiya, Yutaka; Yoshinaga, Kazuo; Hayashi, Toshio; Nakai, Takehiko; Utagawa, Tsutomu; Nagase, Tetsuya; and Sasanuma, Nobuatsu, 5,481,334, Cl. 355-201.000.
- Yoshino, Masato: See—  
Hashida, Koichi; and Yoshino, Masato, 5,480,223, Cl. 303-119.200.
- Yoshioka, Nobuyuki: See—  
Noda, Yasushi; Yoshioka, Nobuyuki; Suzuki, Nobutaka; Fukai, Toshimasa; Yoshihara, Tetsuo; and Koshiro, Koichi, 5,480,472, Cl. 75-351.000.
- Yoshioka, Tohru: See—  
Kato, Kohji; and Yoshioka, Tohru, 5,481,064, Cl. 588-205.000.
- Yoshitani, Kazuhiro: See—  
Motohashi, Shozo; Fujimoto, Katsumi; Nishiyama, Hiroshi; Heinouchi, Yoshiaki; Yoshitani, Kazuhiro; and Sakashita, Yukio, 5,479,822, Cl. 73-504.140.
- Yoshizawa, Yasuo, to Yoshiki Industrial Co., Ltd. Two-stage drive type lever unit and machine apparatus using the same. 5,479,838, Cl. 74-834.000.
- Yosimoto, Kyosuke: See—  
Watanabe, Isao; Takeuchi, Koichi; Ito, Osamu; Yosimoto, Kyosuke; Tanaka, Kunimaro; and Tsutsumi, Kazuhiko, 5,481,508, Cl. 369-13.000.
- You, Young-Soo: See—  
Lam, Si-Ty; and You, Young-Soo, 5,481,280, Cl. 346-140.100.
- Young, Alfred; and Church, Fred E., to Design Tool, Inc. Fastener feeding apparatus. 5,480,087, Cl. 227-112.000.
- Young, Joel K.: See—  
Gutierrez, Franklin; Peters, Robert Y., Jr.; Thirunagari, Aruna; and Young, Joel K., 5,481,603, Cl. 379-221.000.
- Young, Ralph W., to International Business Machines Corporation. Method of semiconductor device representation for fast and inexpensive simulations of semiconductor device manufacturing processes. 5,481,475, Cl. 364-491.000.
- Young, William A. Inflatable occupant restraint device. 5,480,184, Cl. 280-731.000.
- Yuda, Lawrence F., to Compact Air Products, Inc. Release apparatus for pneumatic valve operator and method. 5,479,956, Cl. 137-15.000.
- Yui, Dai: See—  
Hirai, Shigeru; Kurima, Kazunori; Saito, Masahide; Yui, Dai; Hattori, Tomoyuki; and Suganuma, Hiroshi, 5,481,632, Cl. 385-49.000.
- Yuki, Koichiro: See—  
Udagawa, Masaharu; Yasui, Juro; Niwa, Masaaki; Hirai, Yoshihiko; Okada, Kenji; Morimoto, Kiyoshi; and Yuki, Koichiro, 5,480,492, Cl. 134-2.000.
- Yumiki, Naoto; and Honsho, Hironori, to Matsushita Electric Industrial Co., Ltd. Method of and device for measuring position coordinates. 5,481,361, Cl. 356-375.000.
- Zablocki, Jeffery A.: See—  
Garland, Robert B.; Miyano, Masateru; Zablocki, Jeffery A.; and Schretzman, Lori A., 5,481,021, Cl. 560-35.000.
- Zachariades, Anagnostis E.; and Shukla, Premal, to Polteco, Inc. Dental floss of ultra-high modulus line material with enhanced mechanical properties. 5,479,952, Cl. 132-321.000.
- Zadini, Filiberto P.; and Zadini, Giorgio C. Semi-automatic cannulation device. 5,480,388, Cl. 604-165.000.
- Zadini, Giorgio C.: See—  
Zadini, Filiberto P.; and Zadini, Giorgio C., 5,480,388, Cl. 604-165.000.
- Zager, Edward: See—  
Mathews, Gregory; Zager, Edward; and Mitra, Sundari, 5,481,697, Cl. 395-550.000.
- Zahler, Robert: See—  
Chen, Ping; Cheng, Peter T. W.; Spengel, Steven H.; Barrish, Joel C.; Thottathil, John K.; Zahler, Robert; Polniaszek, Richard P.; and Wang, Xuebao, 5,481,011, Cl. 549-514.000.
- Zallie, James P.; Altieri, Paul A.; Chiu, Chung-Wai; and Henley, Matthew, to National Starch and Chemical Investment Holding Corporation. Method for increasing expansion and improving texture of fiber fortified extruded food products. 5,480,669, Cl. 426-549.000.
- Zaluzec, Matthew J.; Popoola, Oludele O.; Reatherford, Larry; and Rose, Thomas W., to Ford Motor Company. High speed electrical discharge surface preparation internal surfaces for thermal coatings. 5,480,497, Cl. 148-512.000.
- Zamanzadeh, Mehrooz: See—  
Carey, Jay F., II; and Zamanzadeh, Mehrooz, 5,480,731, Cl. 428-648.000.
- Zanetta, Jean-Pierre: See—  
Thal, Claude; Quiroua-Guillou, Catherine; Potier, Pierre; Renko, Dolor; Zanetta, Jean-Pierre; Portier, Marie-Madeleine; Sensenbrenner, Monique; Koenig, Janine; and Koenig, Herbert, 5,480,884, Cl. 514-275.000.
- Zare, Richard N.: See—  
Colón, Luis A.; Dadoo, Rajeev; Whitted, William H.; Zare, Richard N.; Ewing, Andrew G.; Ferris, Sandra S.; and Woelker, Jennifer U., 5,480,525, Cl. 204-180.100.
- Zarini, Franco: See—  
Visentin, Giuseppina; Zarini, Franco; Jabes, Daniela; Perrone, Ettore; della Bruna, Costantino; and Alpegiani, Marco, 5,480,880, Cl. 514-210.000.
- Zeida, Jaroslav, to Leybold Aktiengesellschaft. Mask for covering the margin of a disk-shaped substrate. 5,480,530, Cl. 204-298.110.
- Zelker, Manfred, to Wilo GmbH. Submersible motor-driven pump. 5,480,290, Cl. 417-366.000.
- Zellmer, Volker: See—  
Brüne-Fischer, Anette; Burkhardt, Georg; Klietsch, Bernd-Jürgen; and Zellmer, Volker, 5,480,916, Cl. 521-112.000.
- Zeneca Limited: See—  
Holloway, Brian R.; Howe, Ralph; and Rao, Balbir S., 5,480,910, Cl. 514-567.000.
- Zeng, Gengsheng L.: See—  
Hsieh, Yu-Lung; Zeng, Gengsheng L.; and Gullberg, Grant T., 5,481,115, Cl. 250-363.040.
- Zenkich, Elias R., to Trans Tech Industries, Inc. Pressure-vacuum relief valve assembly. 5,479,978, Cl. 137-493.300.
- Zenli-Jones, Alyce. Thermal transfer hair treatment cap. 5,480,418, Cl. 607-110.000.
- Zhang, Hongyong; Takayama, Toru; and Takemura, Yasuhiko, to Semiconductor Energy Laboratory Co., Ltd. Semiconductor device having improved crystal orientation. 5,481,121, Cl. 257-64.000.
- Zhang, Rong: See—  
Liao, Jia-li; Zhang, Rong; and Siebert, Christopher, 5,480,526, Cl. 204-182.800.
- Zhang, Yu M.: See—  
Kovacevic, Radovan; and Zhang, Yu M., 5,481,085, Cl. 219-130.010.
- Zhou, Stephen Q.: See—  
Wang, Yading; Zhou, Stephen Q.; Richards, Thomas P.; and Liao, Xuegao, 5,480,950, Cl. 526-258.000.
- Ziegenbein, Jochen: See—  
Rosenbach, Karlhans; and Ziegenbein, Jochen, 5,481,504, Cl. 367-101.000.
- Ziegler, Carl B., Jr.; Curran, William V.; and Feigelson, Gregg, to American Cyanamid Company. 2-substituted alkyl-3-carboxy carbapenems as antibiotics and a method of producing them. 5,480,987, Cl. 540-200.000.
- Ziemann, Klaus: See—  
Reisch, Michael; and Ziemann, Klaus, 5,481,536, Cl. 370-60.100.
- Zimany, Edward J., Jr.: See—  
Evert, Benjamin H.; Vaiden, Robert H.; and Zimany, Edward J., Jr., 5,481,574, Cl. 375-356.000.
- Zimmerman, Scott M.; Beeson, Karl W.; McFarland, Michael J.; Yardley, James T.; and Fern, Paul M., to AlliedSignal Inc. Direct view display device with array of tapered waveguide on viewer side. 5,481,385, Cl. 359-40.000.
- Zimmermann, Joseph E.: See—  
Scott, Norman H.; Zimmermann, Joseph E.; and Glover, Bryan K., 5,481,060, Cl. 585-867.000.
- Zinser Textilmaschinen GmbH: See—



- Bothner, Jakob; and Dinkelmann, Friedrich, 5,479,770, Cl. 57-303.000.  
 Zarcon Corporation: *See—*  
 Schultheis, Gary R.; and Heger, Charles E., 5,479,715, Cl. 33-366.000.  
 Zola, Thomas J., to Whitaker Corporation, The. Electrical connector for cable. 5,480,327, Cl. 439-607.000.  
 Zuckermann, Ronald N.: *See—*  
 Ng, Simon; Warne, Robert L.; Zuckermann, Ronald N.; Martin, Eric J.; and Simon, Reyna J., 5,481,020, Cl. 560-27.000.  
 Spellmeyer, David C.; Moos, Walter H.; Martin, Eric J.; Zuckermann, Ronald N.; and Stauber, Gregory, 5,480,871, Cl. 514-18.000.  
 Zuev, Viktor K.: *See—*  
 Fedorov, Svyatoslav N.; and Zuev, Viktor K., 5,480,428, Cl. 623-6.000.  
 Zuranski, Edward S.: *See—*  
 Betts, William L.; and Zuranski, Edward S., 5,481,567, Cl. 375-261.000.  
 Zutter, Ulrich: *See—*  
 Broger, Emil A.; Karpf, Martin; and Zutter, Ulrich, 5,481,008, Cl. 549-292.000.
- ZymoGenetics, Inc.: *See—*  
 Piggott, James R., 5,480,903, Cl. 514-422.000.  
 Zynaxis, Inc.: *See—*  
 Baker, Margaret A.; and Ohlsson-Wilhelm, Betsy M., 5,480,901, Cl. 514-419.000.  
 Zytkevich, Duane J.; and McEvoy, Thomas J., to B. Braun Medical, Inc. Method of filling a bourdon tube with a gel substance. 5,479,967, Cl. 141-7.000.  
 3D Systems, Inc.: *See—*  
 Snead, David E.; Smalley, Dennis R.; Cohen, Adam L.; Allison, Joseph W.; Vorgitch, Thomas J.; and Chen, Thomas P., 5,481,470, Cl. 364-468.000.  
 3DO Company, The: *See—*  
 Mical, Robert J.; Needle, David L.; Khubchandani, Teju J.; and Landrum, Stephen H., 5,481,275, Cl. 345-132.000.

## LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 2nd DAY OF JANUARY, 1996

NOTE—Arranged in accordance with the first significant character or word if the name (in accordance with city and telephone directory practice).

- Bracker AG: *See—*  
 Oberholzer, Franz, Re. 35,139, Cl. 57-125.000.  
 Bryans, Mark A.; Cline, James H.; Frazee, Francis B.; and Lehman, Lark E., to Texas Instruments Incorporated. High speed serial data link. Re. 35,137, Cl. 375-293.000.  
 Cline, James H.: *See—*  
 Bryans, Mark A.; Cline, James H.; Frazee, Francis B.; and Lehman, Lark E., Re. 35,137, Cl. 375-293.000.  
 Coming Incorporated: *See—*  
 Weidman, David L., Re. 35,138, Cl. 385-42.000.  
 Frazee, Francis B.: *See—*  
 Bryans, Mark A.; Cline, James H.; Frazee, Francis B.; and Lehman, Lark E., Re. 35,137, Cl. 375-293.000.  
 Hasegawa, Jiro; Nakamura, Ikuo; and Hishinuma, Tadashi, to Jidosha Denki Kogyo Kabushiki Kaisha. Actuator of diaphragm type. Re. 35,136, Cl. 92-99.000.  
 Hishinuma, Tadashi: *See—*  
 Hasegawa, Jiro; Nakamura, Ikuo; and Hishinuma, Tadashi, Re. 35,136, Cl. 92-99.000.
- Jidosha Denki Kogyo Kabushiki Kaisha: *See—*  
 Hasegawa, Jiro; Nakamura, Ikuo; and Hishinuma, Tadashi, Re. 35,136, Cl. 92-99.000.  
 Lehman, Lark E.: *See—*  
 Bryans, Mark A.; Cline, James H.; Frazee, Francis B.; and Lehman, Lark E., Re. 35,137, Cl. 375-293.000.  
 Nakamura, Ikuo: *See—*  
 Hasegawa, Jiro; Nakamura, Ikuo; and Hishinuma, Tadashi, Re. 35,136, Cl. 92-99.000.  
 Oberholzer, Franz, to Bracker AG. Ring traveller for a bevelled flanged ring. Re. 35,139, Cl. 57-125.000.  
 Texas Instruments Incorporated: *See—*  
 Bryans, Mark A.; Cline, James H.; Frazee, Francis B.; and Lehman, Lark E., Re. 35,137, Cl. 375-293.000.  
 Weidman, David L., to Coming Incorporated. Achromatic overlaid fiber optic coupler. Re. 35,138, Cl. 385-42.000.

## LIST OF REEXAMINATION PATENTEEES

TO WHOM

CERTIFICATES WERE ISSUED

- Asano, Masamichi; and Iwahashi, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory device. B1 4,509,148, Cl. 365-230.060.  
 Bowen, Michael L.; and Liebelt, Roger A., to TCNL Technologies, Inc. Medical appliance securing device. B1 5,147,322, Cl. 604-180.000.  
 Cooper, J. Carl. Method and apparatus for preserving or restoring audio to video. B1 4,313,135, Cl. 348-512.000.  
 Gonnelli, Robert R.: *See—*  
 Gordon, Gary B.; and Gonnelli, Robert R., B1 5,008,804, Cl. 364-167.010.  
 Gordon, Gary B.; and Gonnelli, Robert R., to Total Spectrum Manufacturing Inc. Robotic television-camera dolly system. B1 5,008,804, Cl. 364-167.010.  
 Hoff, Marcian E., Jr.: *See—*  
 Tsang, Frederick; Kannal, Gregory A.; and Hoff, Marcian E., Jr., B1 4,250,570, Cl. 365-200.000.  
 Intel Corporation: *See—*  
 Tsang, Frederick; Kannal, Gregory A.; and Hoff, Marcian E., Jr., B1 4,250,570, Cl. 365-200.000.  
 Iwahashi, Hiroshi: *See—*  
 Asano, Masamichi; and Iwahashi, Hiroshi, B1 4,509,148, Cl. 365-230.060.
- Kannal, Gregory A.: *See—*  
 Tsang, Frederick; Kannal, Gregory A.; and Hoff, Marcian E., Jr., B1 4,250,570, Cl. 365-200.000.  
 Lenthall, Frank C., to Spotless Plastics Pty. Ltd. Indicators for garment hangers. B1 4,322,902, Cl. 40-322.000.  
 Liebelt, Roger A.: *See—*  
 Bowen, Michael L.; and Liebelt, Roger A., B1 5,147,322, Cl. 604-180.000.  
 Spotless Plastics Pty. Ltd.: *See—*  
 Lenthall, Frank C., B1 4,322,902, Cl. 40-322.000.  
 TCNL Technologies, Inc.: *See—*  
 Bowen, Michael L.; and Liebelt, Roger A., B1 5,147,322, Cl. 604-180.000.  
 Tokyo Shibaura Denki Kabushiki Kaisha: *See—*  
 Asano, Masamichi; and Iwahashi, Hiroshi, B1 4,509,148, Cl. 365-230.060.  
 Total Spectrum Manufacturing Inc.: *See—*  
 Gordon, Gary B.; and Gonnelli, Robert R., B1 5,008,804, Cl. 364-167.010.  
 Tsang, Frederick; Kannal, Gregory A.; and Hoff, Marcian E., Jr., to Intel Corporation. Redundant memory circuit. B1 4,250,570, Cl. 365-200.000.

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- Abbott Laboratories: *See—*  
 Tiefenthal, James L.; Goldhardt, Donald J.; and Morrow, James D., 365,880, Cl. D24-186.000.  
 Tiefenthal, James L.; Goldhardt, Donald J.; and Morrow, James D., 365,881, Cl. D24-186.000.  
 Abfner, Melvin; Leslie, Stuart M.; and Mittleman, Frederick, to Chesebrough-Pond's USA Co., Division of Conopco, Inc. Bottle. 365,761, Cl. D9-542.000.  
 Abraham, Leslie R., to Wenger Corporation. Acoustic baffle. 365,825, Cl. D14-299.000.  
 Abrams, Richard W.; Crossman, Russell J.; and Studer, John E., to Johnson & Johnson Vision Products, Inc. Contact lens package. 365,679, Cl. D3-264.000.  
 Action Electronics Co., Ltd.: *See—*  
 Shaanan, Gad, 365,809, Cl. D14-113.000.  
 Adams, Bret A.; Kolada, Paul P.; Painter, Michael J.; and Jones, Sherry L., to Advanced Sports Concepts, Inc. Beverage mug. 365,727, Cl. D7-536.000.  
 Adamson, Mark; Hurst, Jack W.; and Reinbold, James F., to UNR Industries, Inc. Luggage cart. 365,904, Cl. D34-17.000.  
 Advance Watch Company, Inc.: *See—*
- Healey, Clifton W., 365,766, Cl. D10-15.000.  
 Advanced Sports Concepts, Inc.: *See—*  
 Adams, Bret A.; Kolada, Paul P.; Painter, Michael J.; and Jones, Sherry L., 365,727, Cl. D7-536.000.  
 AirBoss Limited: *See—*  
 Chandler, Graeme A., 365,826, Cl. D15-28.000.  
 Chandler, Graeme A., 365,827, Cl. D15-28.000.  
 Alba-Waldensian, Inc.: *See—*  
 Charlet, Sandra K., 365,690, Cl. D6-315.000.  
 Alden, Tor A.; Beacken, Marc J.; Doran, Robert L.; Nordman, John E.; and Turner, James G., to AT&T Corp. Video circuit board housing associated with a multi-media terminal. 365,808, Cl. D14-107.000.  
 Alison, Wayne: *See—*  
 Gouveia, Dean; and Alison, Wayne, 365,750, Cl. D9-311.000.  
 Allegre, Jean P., to Allegre Puericulture Hygiene S.A. Sterilizer for baby bottles. 365,882, Cl. D24-217.000.  
 Allegre Puericulture Hygiene S.A.: *See—*  
 Allegre, Jean P., 365,882, Cl. D24-217.000.  
 American Tack & Hardware Co., Inc.: *See—*  
 Hollinger, Fred, 365,748, Cl. D8-381.000.



American Track & Hardware Co., Inc.: See—  
Lee, Martin, 365,700, Cl. D6-403.000.  
Anderson, James L. Pond filter. 365,871, Cl. D23-209.000.  
Anthem Sentech, Inc.: See—  
Lee, Cleve L., 365,906, Cl. D34-20.000.  
Antonious, Anthony J. Iron type golf club head. 365,865, Cl. D21-220.000.  
Aramis, Inc.: See—  
Otani, Laura; and Hirst, Ken, 365,759, Cl. D9-504.000.  
Archambeault, Carl. Earring post. 365,779, Cl. D11-88.000.  
Artus, Mark B.: See—  
Lechleiter, Paul R.; and Artus, Mark B., 365,699, Cl. D6-399.000.  
Ashley Furniture Industries, Inc.: See—  
Pauer, Jericho P.; and Swagel, Darrin M., 365,698, Cl. D6-397.000.  
Asia Optical Co., Ltd.: See—  
Tomita, Saburo, 365,858, Cl. D22-109.000.  
AT&T Corp.: See—  
Alden, Tor A.; Beacken, Marc J.; Doran, Robert L.; Nordman, John E.; and Turner, James G., 365,808, Cl. D14-107.000.  
Bales, Harold D.; Franks, Anthony D.; Karpicke, John A.; Reid, David A.; Straub, Paul J., Jr.; and Zambelli, Michael P., 365,821, Cl. D14-149.000.  
Danielson, David C.; Estevez-Alcolado, Sonia M.; Moroze, Michael L.; O'Donnell, Daniel J.; Patel, Dharendra M.; Saizan, Robert T.; Stowers, David C.; and Tuttle, Susan L., 365,824, Cl. D14-253.000.  
Autoshade Corporation Aktiengesellschaft: See—  
Dennis, Ronald N., 365,884, Cl. D25-56.000.  
Bailey, John A.; Bloomer, Glenn A.; Johnson, Gregory H.; and Staufenberg, Donald J., to Minnesota Mining and Manufacturing Company. Window and label area of a top surface for a videocassette. 365,814, Cl. D14-121.000.  
Bales, Harold D.; Franks, Anthony D.; Karpicke, John A.; Reid, David A.; Straub, Paul J., Jr.; and Zambelli, Michael P., to AT&T Corp. Personal information center telephone set. 365,821, Cl. D14-149.000.  
Balschunat, Gary. Storage unit for compact discs. 365,720, Cl. D6-629.000.  
Bausman, James D.: See—  
Boyle, Rick E.; and Bausman, James D., 365,903, Cl. D34-15.000.  
Beacken, Marc J.: See—  
Alden, Tor A.; Beacken, Marc J.; Doran, Robert L.; Nordman, John E.; and Turner, James G., 365,808, Cl. D14-107.000.  
Bell, Perry W.: See—  
Weber, Michael J.; Schmalix, Charles K.; Gammon, Nathan A.; McElfresh, Jeffrey J.; and Bell, Perry W., 365,794, Cl. D12-147.000.  
Bell, Ronald F.: See—  
Kanter, Joseph S.; Bell, Ronald F.; Borst, Rodney D.; Kearnes, Thomas; and Lewis, Gregg S., 365,755, Cl. D9-423.000.  
Bentley, Paul R., to Weber Aircraft, Inc. Telephone console for aircraft seats. 365,820, Cl. D14-142.000.  
Bertani, Alberto: See—  
Decursu, Giorgio; and Bertani, Alberto, 365,741, Cl. D8-310.000.  
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Blake, Kenneth R., to Scanlan International. Thoracoscopic ultra sharp scissors. 365,878, Cl. D24-148.000.  
Blockbuster Entertainment Corp.: See—  
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Bloomer, Glenn A.; Johnson, Gregory H.; and Staufenberg, Donald J., to Minnesota Mining and Manufacturing Company. Videocassette. 365,815, Cl. D14-121.000.  
Bloomer, Glenn A.: See—  
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Boesel, George F. W.; and Geis, Mark W., to Woods Industries, Inc. Electrical outlet block. 365,803, Cl. D13-142.000.  
Bone, Martin, to U.S. Philips Corporation. Moustache trimmer. 365,890, Cl. D28-53.000.  
Borden Company, Limited, The: See—  
Campbell, Duncan F., 365,706, Cl. D6-477.000.  
Campbell, Duncan F., 365,707, Cl. D6-477.000.  
Borgonovo, Alberto, to Thomson Consumer Electronics (Societe Anonyme). Combined compact disc player, radio and alarm clock. 365,823, Cl. D14-168.000.  
Borst, Rodney D.: See—  
Kanter, Joseph S.; Bell, Ronald F.; Borst, Rodney D.; Kearnes, Thomas; and Lewis, Gregg S., 365,755, Cl. D9-423.000.  
Boyle, Rick E.; and Bausman, James D. Gun transport cart. 365,903, Cl. D34-15.000.  
Bradbury, Daniel M.; Hatton, Anthony G.; and Wilkinson, Ronald A., to SmithKline Beecham plc. Edible composition, particularly a pharmaceutical tablet. 365,875, Cl. D24-101.000.  
Bradway, Helene M. Slip on sneaker. 365,673, Cl. D2-908.000.  
Braithwaite, Robert C.: See—  
Graves, Kevin L.; and Braithwaite, Robert C., 365,895, Cl. D30-199.000.  
Brendel, Fred, to EASEC-Schloss-Production GmbH & Co. KG. Bicycle lock. 365,745, Cl. D8-333.000.  
Bridgestone/Firestone, Inc.: See—  
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Brightbill, Keith E.; Craft, Charles W.; and Koenig, John W., to Rubbermaid Incorporated. Utensil tray. 365,730, Cl. D7-641.000.  
Brown, Graham; and London, Lyle, to Pure Art U.S.A. Inc. Display rack. 365,704, Cl. D6-467.000.  
Brown, Stephanie C.; Gilliam, Donald W.; Hoang, Andy N.; Kolowski, Michael A.; Miller, Frederick W.; Scarpitti, Anthony J.; and Trares, Keith C., to Goodyear Tire & Rubber Company, The. Tire tread. 365,791, Cl. D12-146.000.  
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Scarpitti, Anthony J.; Kolowski, Michael A.; Miller, Frederick W.; Gilliam, Donald W.; Trares, Keith C.; and Brown, Stephanie C., 365,795, Cl. D12-147.000.  
Scarpitti, Anthony J.; Kolowski, Michael A.; Miller, Frederick W.; Gilliam, Donald W.; Trares, Keith C.; and Brown, Stephanie C., 365,796, Cl. D12-147.000.  
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Bryan, Lamonte E. Holster for a steering wheel locking club. 365,719, Cl. D6-567.000.  
Bucher, Anne: See—  
Flanagan-Boos, Therese; Bucher, Anne; and Stephens, Melanie, 365,752, Cl. D9-335.000.  
Bycraft, John T.: See—  
Pomeroy, Charles; and Bycraft, John T., 365,692, Cl. D6-344.000.  
Calmeise, Randall; and Vura, John A., to Rubbermaid Incorporated. Storage bin container. 365,682, Cl. D3-319.000.  
Campbell, Duncan F., to Borden Company, Limited, The. Wallpaper display unit. 365,706, Cl. D6-477.000.  
Campbell, Duncan F., to Borden Company, Limited, The. Wallpaper display unit. 365,707, Cl. D6-477.000.  
Canavan, Richard W., to Uvex Safety, Inc. Safety eyeglasses. 365,837, Cl. D16-325.000.  
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Cardenas, John. Portable gun rack. 365,717, Cl. D6-552.000.  
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Chen, Cheng-Feng, to Bobson Hygiene International, Inc. Paper towel holder. 365,713, Cl. D6-522.000.  
Chen, Er-jui: See—  
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Chen, Jun-Hwa. Tire. 365,790, Cl. D12-146.000.  
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Denebeim, Sabrina S. Vented hairbrush. 365,686, Cl. D4-128.000.  
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- Wai, Choi L., to Goodway Electrical Co. Ltd. Steam iron. 365,899, Cl. D32-70.000.
- Walsh, John T.: See—  
Hubbard, Timothy M.; Osinaia, Taiwo T.; Ruse, Paula E.; and Walsh, John T., 365,830, Cl. D15-144.200.
- Wan, John C. Toothbrush. 365,683, Cl. D4-104.000.
- Watanabe, Hiroyuki: See—  
Ito, Masafumi; Sube, Minoru; Takita, Haruki; Watanabe, Hiroyuki; and Iikura, Yukio, 365,822, Cl. D14-168.000.
- Weber Aircraft, Inc.: See—  
Bentley, Paul R., 365,820, Cl. D14-142.000.
- Weber, Michael J.; Schmalix, Charles K.; Gammon, Nathan A.; McElfresh, Jeffrey J.; and Bell, Perry W., to Goodyear Tire & Rubber Company, The. Tire tread. 365,794, Cl. D12-147.000.
- Weintraut, Albert G. Combined hammer head and wood file. 365,739, Cl. D8-78.000.
- Welcome Company, Ltd.: See—  
Chou, Shu H.; and Fang, Heng G., 365,737, Cl. D8-30.000.
- Wenger Corporation: See—  
Abraham, Leslie R., 365,825, Cl. D14-299.000.
- Wennerstrom, Joel W.; Chen, Er-jui; and Chang, Ling C., to Century Products Company. Collapsible infant stroller. 365,784, Cl. D12-129.000.
- Werner, Theodore, to United States Marketing Corporation. Door viewer. 365,833, Cl. D16-135.000.
- West Bend Company, The: See—  
Duquaine, Edward J.; and Cesaroni, William C., 365,722, Cl. D7-350.000.
- West Coast Beauty Supply Co.: See—  
Gertsma, Kathy; and Davis, Christopher, 365,687, Cl. D4-133.000.
- Wilhelm, Werner; and Lehmann, Olrich, to Ows International AG. Water closet. 365,872, Cl. D23-299.000.
- Wilkinson Company, Inc.: See—  
Kamm, Christian P., 365,900, Cl. D34-1.000.
- Wilkinson, Ronald A.: See—  
Bradbury, Daniel M.; Hatton, Anthony G.; and Wilkinson, Ronald A., 365,875, Cl. D24-101.000.
- Wold, David R. Stacking container for baked goods. 365,729, Cl. D7-610.000.
- Wood, David J.: See—  
Zak, Krzysztof W.; and Wood, David J., 365,758, Cl. D9-503.000.
- Woods Industries, Inc.: See—  
Boesel, George F. W.; and Geis, Mark W., 365,803, Cl. D13-142.000.
- Fladung, Phillip, 365,802, Cl. D13-142.000.
- Wunderman, Severin, to Severin Montres AG (Severin Montres SA) (Severin Montres Ltd.). Watch and bracelet design. 365,772, Cl. D10-32.000.
- Yasuda, Koichi; and Morishita, Hiroki, to Mita Industrial Co., Ltd. Photo-conductive unit for a reprographic apparatus. 365,845, Cl. D18-43.000.
- Yemini, Zvi, to Zag Ltd. Storage box work seat. 365,905, Cl. D34-19.000.
- Young, Dave: See—  
Milne, Brenda; and Young, Dave, 365,847, Cl. D19-5.000.
- Yu, Henry T., to Sunnex Products Limited. Chafing dish. 365,724, Cl. D7-355.000.
- Zadro, Georg, to Casinos Austria Aktiengesellschaft. Plate for a gaming table. 365,853, Cl. D21-37.000.
- Zag Ltd.: See—  
Yemini, Zvi, 365,905, Cl. D34-19.000.
- Zak, Krzysztof W.; and Wood, David J., to Unipath Limited. Container. 365,758, Cl. D9-503.000.
- Zambelli, Michael P.: See—  
Bales, Harold D.; Franks, Anthony D.; Karpicke, John A.; Reid, David A.; Straub, Paul J., Jr.; and Zambelli, Michael P., 365,821, Cl. D14-149.000.
- Zebbedies, Dieter H. Long spined gun rack. 365,715, Cl. D6-552.000.
- Zuege, Steven J. Dusting glove. 365,896, Cl. D32-40.000.

## LIST OF PLANT PATENTEES

- Clearwater Nursery, Inc.: See—  
Hesse, Peter S., 9,416, Cl. Plt.-82.100.
- Hesse, Peter S., 9,417, Cl. Plt.-82.200.
- Hesse, Peter S., 9,418, Cl. Plt.-82.400.
- Conard-Pyle Company, The: See—  
Meilland, Alain A., 9,414, Cl. Plt.-8.200.
- Delbard, Georges, to Société Civile Agricole, Pépinières et Roseraies Georges Delbard. Hybrid tea rose plant named 'Delroumo'. 9,415, Cl. Plt.-20.000.
- Hesse, Peter S., to Clearwater Nursery, Inc. Chrysanthemum plant named 'Icey Isle'. 9,416, Cl. Plt.-82.100.
- Hesse, Peter S., to Clearwater Nursery, Inc. Chrysanthemum plant named 'Canary Isle'. 9,417, Cl. Plt.-82.200.
- Hesse, Peter S., to Clearwater Nursery, Inc. Chrysanthemum plant named 'Caribbean Isle'. 9,418, Cl. Plt.-82.400.
- McGredy, Samuel D. Miniature rose plant named 'Maccricke'. 9,413, Cl. Plt.-7.100.
- Meilland, Alain A., to Conard-Pyle Company, The. Miniature rose plant named 'Meigloyel'. 9,414, Cl. Plt.-8.200.
- Société Civile Agricole, Pépinières et Roseraies Georges Delbard: See—  
Delbard, Georges, 9,415, Cl. Plt.-20.000.

## LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM  
STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE  
2nd DAY OF JANUARY, 1996

- Boutique, Jean-Pol: See—  
Murch, Bruce P.; Panandiker, Rajan K.; Vander Meer, James M.; You, Jing-Feng; and Boutique, Jean-Pol, H1,513, Cl. 252-546.000.
- Cowan, Thomas W.; Mohan, Sankar K.; and Stephens, Carl F., to New Venture Gear, Inc. Viscous coupling plate hardening and flattening method. H1,512, Cl. 148-219.000.
- Fuji Photo Film Co., Ltd.: See—  
Hattori, Yasushi; and Yabuki, Yoshiharu, H1,515, Cl. 430-522.000.
- Ishizaka, Tatsuya, H1,516, Cl. 430-567.000.
- Hattori, Yasushi; and Yabuki, Yoshiharu, to Fuji Photo Film Co., Ltd. Silver halide photographic material. H1,515, Cl. 430-522.000.
- Ishizaka, Tatsuya, to Fuji Photo Film Co., Ltd. Silver halide photographic material. H1,516, Cl. 430-567.000.
- Mohan, Sankar K.: See—  
Cowan, Thomas W.; Mohan, Sankar K.; and Stephens, Carl F., H1,512, Cl. 148-219.000.
- Murch, Bruce P.; Panandiker, Rajan K.; Vander Meer, James M.; You, Jing-Feng; and Boutique, Jean-Pol, H1,513, Cl. 252-546.000.
- New Venture Gear, Inc.: See—  
Cowan, Thomas W.; Mohan, Sankar K.; and Stephens, Carl F., H1,512, Cl. 148-219.000.
- Panandiker, Rajan K.: See—  
Murch, Bruce P.; Panandiker, Rajan K.; Vander Meer, James M.; You, Jing-Feng; and Boutique, Jean-Pol, H1,513, Cl. 252-546.000.
- Procter & Gamble Company, The: See—  
Murch, Bruce P.; Panandiker, Rajan K.; Vander Meer, James M.; You, Jing-Feng; and Boutique, Jean-Pol, H1,513, Cl. 252-546.000.
- Willman, Kenneth W.; and Vander Meer, James M., H1,514, Cl. 252-547.000.
- Stephens, Carl F.: See—  
Cowan, Thomas W.; Mohan, Sankar K.; and Stephens, Carl F., H1,512, Cl. 148-219.000.
- Vander Meer, James M.: See—  
Murch, Bruce P.; Panandiker, Rajan K.; Vander Meer, James M.; You, Jing-Feng; and Boutique, Jean-Pol, H1,513, Cl. 252-546.000.
- Willman, Kenneth W.; and Vander Meer, James M., H1,514, Cl. 252-547.000.
- Willman, Kenneth W.; and Vander Meer, James M., to Procter & Gamble Company, The. Detergent compositions with oleoyl sarcosinate and polymeric dispersing agent. H1,514, Cl. 252-547.000.
- Yabuki, Yoshiharu: See—  
Hattori, Yasushi; and Yabuki, Yoshiharu, H1,515, Cl. 430-522.000.
- You, Jing-Feng: See—  
Murch, Bruce P.; Panandiker, Rajan K.; Vander Meer, James M.; You, Jing-Feng; and Boutique, Jean-Pol, H1,513, Cl. 252-546.000.



# CLASSIFICATION OF PATENTS

ISSUED JANUARY 2, 1996

NOTE—First number, class; second number, subclass; third number, patent number

CLASS 2		623	5,479,723	CLASS 62		659	5,481,067	CLASS 123		CLASS 137	
2.5	5,479,659	719	5,479,724	101	5,479,783	CLASS 91		23	5,479,893	15	5,479,955
9	5,479,658	CLASS 34		117	5,479,784	369.2	5,479,844	41.15	5,479,895	5,479,956	
20	5,479,660	516	5,479,727	155	5,479,785	514	5,479,845	74 AC	5,479,894	101.19	5,479,957
69	5,479,661	CLASS 37		222	5,479,786	CLASS 92		90.16	5,479,896	357	5,479,958
104	5,479,662	104	5,479,725	231	5,479,787	CLASS 96		179.17	5,479,910	493.3	5,479,978
CLASS 5		142.5	5,479,726	292	5,479,788	66	5,479,846	184.55	5,479,885	559	5,479,959
470	5,479,663	195	5,479,728	324.1	5,479,789	87	5,479,847	196 R	5,479,886	614.04	5,479,960
499	5,479,664	302	5,479,729	503	5,479,790	99	5,479,847	262	5,479,887	CLASS 138	
613	5,479,665	CLASS 40		CLASS 63		CLASS 99		308	5,479,888	97	5,479,961
624	5,479,666	124.1	5,479,732	2	5,479,795	122	5,480,475	322	5,479,889	CLASS 139	
636	5,479,667	155	5,479,733	3	5,479,796	287	5,479,848	339.2	5,479,897	1 E	5,479,962
656	5,479,668	322	B1 4,322,902	19	5,479,797	357	5,479,849	350	5,479,898	55.1	5,479,963
CLASS 7		373	5,479,734	39	5,479,798	512	5,479,850	386	5,479,908	76	5,479,964
107	5,479,669	593	5,479,735	158	5,480,467	CLASS 101		463	5,479,899	370.2	5,479,965
138	5,479,670	CLASS 42		CLASS 65		CLASS 104		470	5,479,900	CLASS 141	
94.18	5,480,456	72	5,479,736	171	5,479,791	32	5,479,853	472	5,479,901	4	5,479,966
111	5,480,457	CLASS 43		CLASS 68		123	5,479,854	491	5,479,909	7	5,479,967
115.58	5,480,458	76.01	5,479,737	5 D	5,479,792	174	5,479,855	498	5,479,902	110	5,479,968
408	5,480,459	CLASS 47		CLASS 70		423	5,479,856	509	5,479,903	130	5,479,969
416	5,480,460	1	5,479,738	226	5,479,794	477	5,479,857	520	5,479,904	297	5,479,970
CLASS 14		12	5,479,739	231	5,479,799	485	5,479,858	525	5,479,906	CLASS 144	
22	5,479,671	14	5,479,740	365	5,479,800	CLASS 102		573	5,479,907	34 R	5,479,971
98	5,479,672	30	5,479,741	373	5,479,801	313	5,479,860	15	5,479,911	287	5,479,972
111	5,479,673	66	5,479,742	443	5,479,802	439	5,479,861	CLASS 126		CLASS 148	
135.4	5,479,674	CLASS 51		CLASS 72		93	5,479,862	91 A	5,479,912	301	5,480,495
236.1	5,479,675	295	5,480,461	8	5,479,803	CLASS 105		360 R	5,479,913	512	5,480,496
323	5,479,676	CLASS 52		35	5,479,804	199.5	5,479,863	401	5,479,914	518	5,480,497
CLASS 16		2.22	5,479,743	97	5,479,805	CLASS 106		512	5,479,915	349	5,480,498
21	5,479,677	63	5,479,744	165	5,479,806	1.24	5,480,477	61	5,480,490	657	5,480,499
325	5,479,678	126.6	5,479,745	202	5,479,807	22 K	5,480,478	42	5,480,491	CLASS 149	
105	5,479,679	182	5,479,746	244	5,479,808	162	5,480,479	61	5,480,492	46	5,480,500
248	5,479,680	220.7	5,479,747	302	5,479,809	311	5,480,480	CLASS 127		CLASS 152	
CLASS 19		231	5,479,748	CLASS 73		401	5,480,481	200.29	5,479,917	209 B	5,479,973
16 R	5,479,681	236.9	5,479,749	2	5,479,811	314	5,480,482	201.15	5,479,918	333.1	5,479,974
67.11	5,479,682	300	5,479,750	3	5,479,812	498	5,480,483	202.27	5,479,919	429	5,479,975
CLASS 29		309.12	5,479,751	4 R	5,479,813	CLASS 108		204.23	5,479,920	518	5,479,976
20	5,479,683	549	5,479,752	19.01	5,479,814	27	5,479,864	207.17	5,479,921	542	5,479,977
25.35	5,479,684	741.4	5,479,753	23.3	5,479,815	42	5,479,865	630	5,479,922	CLASS 156	
33 R	5,479,685	745.16	5,479,754	64.48	5,479,816	44	5,479,866	632	5,479,923	73.1	5,480,501
179	5,479,686	746.1	5,479,755	115	5,479,817	54	5,479,867	653.2	5,479,924	86	5,480,502
243.5	5,479,687	CLASS 53		116	5,479,818	94	5,479,868	660.04	5,479,925	89	5,480,503
259	5,479,688	77	5,479,756	319	5,479,820	104	5,479,869	660.09	5,479,926	108	5,480,504
426.4	5,479,689	135.1	5,479,757	457	5,479,821	194	5,479,870	662.03	5,479,927	230	5,480,505
430	5,479,691	410	5,479,758	504.14	5,479,822	26	5,479,871	662.06	5,479,928	201	5,480,506
468	5,479,692	432	5,479,759	579	5,479,823	102	5,479,872	666.06	5,479,929	220	5,480,507
469	5,479,693	602	5,479,760	602	5,479,824	139	5,479,868	666.06	5,479,930	353	5,480,508
593	5,479,694	445	5,479,761	644	5,479,825	26	5,479,869	666.06	5,479,931	522	5,480,509
602.1	5,479,695	461	5,479,762	660	5,479,826	102	5,479,870	666.06	5,479,932	577	5,480,510
603	5,479,696	490	5,479,763	718	5,479,827	144	5,479,871	666.06	5,479,933	627.1	5,480,511
606	5,479,697	CLASS 55		800	5,479,828	CLASS 111		666	5,479,934	CLASS 160	
623.5	5,480,462	222	5,480,463	823	5,479,829	139	5,479,868	671	5,479,935	265	5,479,979
701	5,479,698	320	5,480,464	826	5,479,830	26	5,479,869	696	5,479,936	CLASS 162	
727	5,479,699	472	5,480,465	862.44	5,479,831	102	5,479,870	734	5,479,937	16	5,480,512
825	5,479,700	528	5,480,466	866.5	5,479,832	334	5,479,871	754	5,479,938	203	5,480,513
852	5,479,701	CLASS 56		866.5	5,479,834	361	5,479,872	760	5,479,939	231	5,480,514
889.1	5,479,703	12.7	5,479,763	CLASS 74		75	5,479,873	772	5,479,940	301	5,480,520
889.72	5,479,704	121.4	5,479,764	331	5,479,835	84	5,479,874	782	5,479,941	CLASS 163	
890.039	5,479,705	256	5,479,765	502.2	5,479,776	103	5,479,875	844	5,479,942	5	5,479,980
890.08	5,479,706	341	5,479,766	551.1	5,479,776	CLASS 118		846	5,479,943	CLASS 164	
CLASS 30		343	5,479,767	608	5,479,777	45	5,480,483	858	5,479,944	37	5,479,947
122	5,479,708	365	5,479,768	834	5,479,778	52	5,480,484	885	5,479,945	194	5,479,948
123.3	5,479,709	CLASS 57		CLASS 75		64	5,480,485	899	5,479,946	365	5,479,949
182	5,479,710	22	5,479,769	228	5,480,468	123	5,480,486	CLASS 131		16	5,479,981
393	5,479,711	125	Re.35,139	338	5,480,469	610	5,480,487	215	5,479,950	454	5,479,982
CLASS 33		303	5,479,770	348	5,480,470	667	5,480,488	265	5,479,951	CLASS 165	
265	5,479,712	406	5,479,771	351	5,480,472	725	5,480,489	321	5,479,952	22	5,479,983
335	5,479,714	CLASS 60		501	5,480,473	CLASS 119		CLASS 132		96	5,479,984
366	5,479,715	39.32	5,479,772	502	5,480,474	14.08	5,479,876	215	5,479,950	176	5,479,985
379	5,479,716	22	5,479,769	CLASS 83		23	5,479,877	265	5,479,951	CLASS 166	
407	5,479,717	39.36	5,479,774	23	5,479,839	51.03	5,479,878	321	5,479,952	292	5,479,986
412	5,479,718	274	5,479,775	477.2	5,479,840	52.2	5,479,879	2	5,480,492	293	5,479,987
449	5,479,719	327	5,479,777	CLASS 84		57.8	5,479,880	4	5,480,493	325	5,479,988
501.02	5,479,720	431	5,479,778	379	5,479,841	61	5,479,881	CLASS 133		332.4	5,479,989
531	5,479,721	591	5,479,779	383 A	5,479,842	265	5,479,882	66	5,479,953	350	5,479,990
617	5,479,722	624	5,479,780	615	5,481,065	715	5,479,891	98	5,479,954	387	5,479,991
CLASS 36		740	5,479,781	637	5,481,066	CLASS 1210		CLASS 136		CLASS 172	
265	5,479,712	747	5,479,782	CLASS 85		610	5,480,549	251	5,480,494	4	5,479,992
335	5,479,714	CLASS 59		23	5,479,839	23	5,479,876	CLASS 137		372	5,479,993
366	5,479,715	39.36	5,479,774	477.2	5,479,840	51.03	5,479,877	CLASS 138		CLASS 173	
379	5,479,716	274	5,479,775	CLASS 86		52.2	5,479,879	2	5,480,492	CLASS 174	
407	5,479,717	327	5,479,777	379	5,479,841	57.8	5,479,880	4	5,480,493	CLASS 175	
412	5,479,718	431	5,479,778	383 A	5,479,842	61	5,479,881	CLASS 139		CLASS 176	
449	5,479,719	591	5,479,779	615	5,481,065	265	5,479,882	66	5,479,953	CLASS 177	
501.02	5,479,720	624	5,479,780	637	5,481,066	715	5,479,891	98	5,479,954	CLASS 178	
531	5,479,721	740	5,479,781	CLASS 87		CLASS 1211		CLASS 140		CLASS 179	
617	5,479,722	747	5,479,782	23	5,479,839	610	5,480,549	251	5,480,494	CLASS 180	
CLASS 37		CLASS 58		477.2	5,479,840	23	5,479,876	CLASS 141		CLASS 181	
265	5,479,712	39.32	5,479,772	23	5,479,839	51.03	5,479,877	CLASS 142		CLASS 182	
335	5,479,714	22	5,479,769	477.2	5,479,840	52.2	5,479,879	CLASS 143		CLASS 183	
366	5,479,715	125	Re.35,139	379	5,479,841	57.8	5,479,880	CLASS 144		CLASS 184	
379	5,479,716	303	5,479,770	383 A	5,479,842	61	5,479,881	CLASS 145		CLASS 185	
407	5,479,717	406	5,479,771	615	5,481,065	265	5,479,882	CLASS 146		CLASS 186	
412	5,479,718	CLASS 61		637	5,481,066	715	5,479,891	CLASS 147		CLASS 187	
449	5,479,719	39.32	5,479,772	CLASS 88		CLASS 1212		CLASS 148		CLASS 188	
501.02	5,479,720	22	5,479,769	23	5,479,839	610	5,480,549	CLASS 149		CLASS 189	
531	5,479,721	125	Re.35,139	477.2	5,479,840	23	5,479,876	CLASS 150		CLASS 190	
617	5,479,722	303	5,479,770	379	5,479,841	51.03	5,479,877	CLASS 151		CLASS 191	
CLASS 38		406	5,479,7								



36	CLASS 174	5,481,068	583	CLASS 209	5,480,032	1	CLASS 223	5,480,073	148	CLASS 251	5,480,122	26 E	5,480,141	151	5,480,220
117 F	5,481,069	584	5,480,033	66	5,480,074	66	5,480,075	148	5,480,123	305	5,480,124	34 A	5,480,142	167	5,480,217
120 FP	5,481,070	585	5,480,034	88	5,480,076	88	5,480,077	309	5,480,125	309	5,480,126	58 R	5,480,143	167	5,480,218
				94					5,480,126	309	5,480,127	65 A	5,480,144	9.1	5,481,139
												77 A	5,480,145	11	5,481,140
11	CLASS 175	5,479,994	96.1	CLASS 210	5,480,537	243	CLASS 224	5,480,077	8.8	CLASS 252	5,480,567	81.4	5,480,146	106	5,481,141
74	5,479,995	151	5,480,538	243	5,480,078	46.7	5,480,079	46.7	5,480,568	86 B	5,480,147	85 R	5,480,148	106	5,481,142
135	5,479,996	177	5,480,539	274	5,480,078	62.56	5,480,079	62.56	5,480,570	118 R	5,480,148	163 A	5,480,149	106	5,481,143
374	5,479,997	181	5,480,540	551	5,480,079	62.56	5,480,079	62.56	5,480,571	138 R	5,480,150	167 A	5,480,151	51	5,481,142
		198.1	5,480,541			62.9	5,480,569	62.9	5,480,572	167 H	5,480,152	176 R	5,480,153	68 B	5,481,143
		198.2	5,480,542			67	5,480,573	67	5,480,574	176 R	5,480,154	213	5,480,155	71	5,481,144
124	CLASS 177	5,481,071	230	CLASS 225	5,480,080	78.3	5,480,574	78.3	5,480,575	213	5,480,155	220	5,480,156	90.5	5,481,145
210 FP	5,481,072	304	5,480,544	96.5	5,480,081	82	5,480,575	82	5,480,576	220	5,480,156	237	5,480,157	154	5,481,146
		380.3	5,480,545		5,480,082	94	5,480,576	94	5,480,577	237	5,480,157	249	5,480,158	178	5,481,147
			5,480,546	100	5,480,083	95	5,480,577	95	5,480,578	249	5,480,158	256	5,480,159	249	5,481,148
			5,480,547	106	5,480,084	174.13	5,480,578	174.13	5,480,579	256	5,480,159	328	5,481,152	256	5,481,149
			5,480,548		5,480,085	174.25	5,480,579	174.25	5,480,580	328	5,481,152	334	5,481,153	256	5,481,150
			5,480,549		5,480,086	299.61	5,480,580	299.61	5,480,581	334	5,481,153	368	5,481,154	256	5,481,151
			5,480,550		5,480,087	299.63	5,480,581	299.63	5,480,582	368	5,481,154			256	5,481,152
			5,480,551		5,480,088	301.4 F	5,480,582	301.4 F	5,480,583					256	5,481,153
			5,480,552		5,480,089	311.5	5,480,583	311.5	5,480,584					256	5,481,154
			5,480,553		5,480,090		5,480,584		5,480,585					256	5,481,155
			5,480,554		5,480,091		5,480,585		5,480,586					256	5,481,156
			5,480,555		5,480,092		5,480,586		5,480,587					256	5,481,157
			5,480,556		5,480,093		5,480,587		5,480,588					256	5,481,158
			5,480,557		5,480,094		5,480,588		5,480,589					256	5,481,159
			5,480,558		5,480,095		5,480,589		5,480,590					256	5,481,160
			5,480,559		5,480,096		5,480,590		5,480,591					256	5,481,161
			5,480,560		5,480,097		5,480,591		5,480,592					256	5,481,162
			5,480,561		5,480,098		5,480,592		5,480,593					256	5,481,163
			5,480,562		5,480,099		5,480,593		5,480,594					256	5,481,164
			5,480,563		5,480,100		5,480,594		5,480,595					256	5,481,165
			5,480,564		5,480,101		5,480,595		5,480,596					256	5,481,166
			5,480,565		5,480,102		5,480,596		5,480,597					256	5,481,167
			5,480,566		5,480,103		5,480,597		5,480,598					256	5,481,168
			5,480,567		5,480,104		5,480,598		5,480,599					256	5,481,169
			5,480,568		5,480,105		5,480,599		5,480,600					256	5,481,170
			5,480,569		5,480,106		5,480,601		5,480,602					256	5,481,171
			5,480,570		5,480,107		5,480,602		5,480,603					256	5,481,172
			5,480,571		5,480,108		5,480,603		5,480,604					256	5,481,173
			5,480,572		5,480,109		5,480,604		5,480,605					256	5,481,174
			5,480,573		5,480,110		5,480,605		5,480,606					256	5,481,175
			5,480,574		5,480,111		5,480,606		5,480,607					256	5,481,176
			5,480,575		5,480,112		5,480,607		5,480,608					256	5,481,177
			5,480,576		5,480,113		5,480,608		5,480,609					256	5,481,178
			5,480,577		5,480,114		5,480,609		5,480,610					256	5,481,179
			5,480,578		5,480,115		5,480,610		5,480,611					256	5,481,180
			5,480,579		5,480,116		5,480,611		5,480,612					256	5,481,181
			5,480,580		5,480,117		5,480,612		5,480,613					256	5,481,182
			5,480,581		5,480,118		5,480,613		5,480,614					256	5,481,183
			5,480,582		5,480,119		5,480,614		5,480,615					256	5,481,184
			5,480,583		5,480,120		5,480,615		5,480,616					256	5,481,185
			5,480,584		5,480,121		5,480,616		5,480,617					256	5,481,186
			5,480,585		5,480,122		5,480,617		5,480,618					256	5,481,187
			5,480,586		5,480,123		5,480,618		5,480,619					256	5,481,188
			5,480,587		5,480,124		5,480,619		5,480,620					256	5,481,189
			5,480,588		5,480,125		5,480,620		5,480,621					256	5,481,190
			5,480,589		5,480,126		5,480,621		5,480,622					256	5,481,191
			5,480,590		5,480,127		5,480,622		5,480,623					256	5,481,192
			5,480,591		5,480,128		5,480,623		5,480,624					256	5,481,193
			5,480,592		5,480,129		5,480,624		5,480,625					256	5,481,194
			5,480,593		5,480,130		5,480,625		5,480,626					256	5,481,195
			5,480,594		5,480,131		5,480,626		5,480,627					256	5,481,196
			5,480,595		5,480,132		5,480,627		5,480,628					256	5,481,197
			5,480,596		5,480,133		5,480,628		5,480,629					256	5,481,198
			5,480,597		5,480,134		5,480,629		5,480,630					256	5,481,199
			5,480,598		5,480,135		5,480,630		5,480,631					256	5,481,200
			5,480,599		5,480,136		5,480,631		5,480,632					256	5,481,201
			5,480,600		5,480,137		5,480,632		5,480,633					256	5,481,202
			5,480,601		5,480,138		5,480,633		5,480,634					256	5,481,203
			5,480,602		5,480,139		5,480,634		5,480,635					256	5,481,204
			5,480,603		5,480,140		5,480,635		5,480,636					256	5,481,205
			5,480,604		5,480,141		5,480,636		5,480,637					256	5,481,206
			5,480,605		5,480,142		5,480,637		5,480,638					256	5,481,207
			5,480,606		5,480,143		5,480,638		5,480,639					256	5,481,208
			5,480,607		5,480,144		5,480,639		5,480,640					256	5,481,209
			5,480,608		5,480,145		5,480,640		5,480,641					256	5,481,210
			5,480,609		5,480,146		5,480,641		5,480,642					256	5,481,211
			5,480,610		5,480,147		5,480,642		5,480,643					256	5,481,212
			5,480,611		5,480,148		5,480,643		5,480,644					256	5,481,213
			5,480,612		5,480,149		5,480,644		5,480,645					256	5,481,214
			5,480,613		5,480,150		5,480,645		5,480,646					256	5,481,215
			5,480,614		5,480,151		5,480,646		5,480,647					256	5,481,216
			5,480,615		5,480,152		5,480,647		5,480,648					256	5,481,217
			5,480,616		5,480,153		5,480,648		5,480,649					256	5,481,218
			5,480,617		5,480,154		5,480,649		5,480,650					256	5,481,219
			5,480,618		5,480,155		5,480,650		5,480,651					256	5,481,220
			5,480,619		5,480,156		5,480,651		5,480,652					256	5,481,221
			5,480,620		5,480,157		5,480,652		5,480,653					256	5,481,222
			5,480,621		5,480,158		5,480,653		5,480,654					256	5,481,223
			5,480,622		5,480,159		5,480,654		5,480,655					256	5,481,224
			5,480,623		5,480,160		5,480,655		5,480,656					256	5,481,225
			5,480,624		5,480,161										







## CLASSIFICATION OF PATENTS

## CLASSIFICATION OF PLANTS

P—	7.1	9,413 I	8.2	9,414 I	20	9,415 I	82.1	9,416 I	82.2	9,417 I	82.4	9,418
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## PATENTS

01 :	5,479,936	5,479,934	5,480,505	5,481,213	5,481,713	5,479,957
	5,480,196	5,479,951	5,480,526	5,481,216	5,481,715	5,480,005
	5,480,458	5,479,952	5,480,531	5,481,223	5,481,721	5,480,006
	5,481,590	5,479,959	5,480,532	5,481,233	5,481,722	5,480,039
04 :	5,479,741	5,480,030	5,480,582	5,481,245	5,481,725	5,480,073
	5,479,744	5,480,052	5,480,592	5,481,251	5,481,732	5,480,089
	5,479,953	5,480,065	5,480,600	5,481,256	5,481,735	5,480,122
	5,480,061	5,480,075	5,480,624	5,481,257	5,481,736	5,480,203
	5,480,111	5,480,076	5,480,646	5,481,268	5,481,739	5,480,239
	5,480,181	5,480,078	5,480,651	5,481,275	5,481,743	5,480,252
	5,480,447	5,480,080	5,480,665	5,481,280	5,481,744	5,480,406
	5,480,727	5,480,084	5,480,689	5,481,299	5,481,751	5,480,411
	5,480,829	5,480,094	5,480,707	5,481,300	4,250,570	5,480,518
	5,480,835	5,480,117	5,480,723	5,481,321	4,313,135	5,480,625
	5,481,131	5,480,120	5,480,764	5,481,396	5,008,804	5,480,735
	5,481,167	5,480,124	5,480,784	5,481,400	5,479,667	5,480,778
	5,481,231	5,480,147	5,480,789	5,481,407	5,479,707	5,480,783
	5,481,403	5,480,150	5,480,792	5,481,420	5,479,708	5,480,851
	5,481,441	5,480,152	5,480,801	5,481,431	5,480,027	5,480,961
	5,479,804	5,480,153	5,480,811	5,481,435	5,480,099	5,480,963
05 :	5,481,691	5,480,164	5,480,821	5,481,436	5,480,107	5,481,147
	5,479,891	5,480,172	5,480,830	5,481,468	5,480,275	5,481,243
	5,480,257	5,480,176	5,480,869	5,481,470	5,480,278	5,481,505
	5,480,258	5,480,204	5,480,871	5,481,471	5,480,280	5,481,560
	5,480,282	5,480,210	5,480,876	5,481,473	5,480,334	5,481,631
	5,480,590	5,480,224	5,480,914	5,481,474	5,480,413	5,481,648
	5,480,825	5,480,256	5,480,935	5,481,486	5,480,466	5,480,455
	5,481,042	5,480,261	5,480,950	5,481,492	5,480,490	5,480,676
06 :	5,479,661	5,480,301	5,480,971	5,481,493	5,480,527	5,480,710
	5,479,674	5,480,303	5,480,974	5,481,494	5,480,548	5,480,856
	5,479,696	5,480,319	5,481,007	5,481,550	5,480,593	5,480,940
	5,479,715	5,480,331	5,481,020	5,481,562	5,480,678	5,480,941
	5,479,722	5,480,335	5,481,059	5,481,571	5,480,776	5,480,984
	5,479,733	5,480,338	5,481,079	5,481,578	5,480,840	5,481,006
	5,479,760	5,480,340	5,481,088	5,481,584	5,481,207	5,481,027
	5,479,765	5,480,341	5,481,120	5,481,599	5,481,228	5,481,028
	5,479,766	5,480,353	5,481,134	5,481,600	5,481,262	5,481,033
	5,479,780	5,480,366	5,481,144	5,481,619	5,481,276	5,481,051
	5,479,797	5,480,369	5,481,178	5,481,658	5,481,440	5,481,620
	5,479,824	5,480,383	5,481,180	5,481,666	5,481,463	5,479,664
	5,479,884	5,480,388	5,481,181	5,481,674	5,481,481	5,479,739
	5,479,892	5,480,402	5,481,183	5,481,684	5,481,581	5,479,777
	5,479,895	5,480,412	5,481,199	5,481,685	5,481,597	5,479,782
	5,479,907	5,480,426	5,481,201	5,481,686	5,479,737	5,479,826
	5,479,920	5,480,430	5,481,202	5,481,693	5,479,837	5,479,877
	5,479,922	5,480,432	5,481,203	5,481,694	5,479,890	5,479,921
	5,479,926	5,480,482	5,481,206	5,481,697	5,479,896	5,479,938
	5,479,929	5,480,483	5,481,209	5,481,701	5,479,932	5,480,118
	5,479,931		5,481,211	5,481,708	5,479,941	5,480,143



5,480,148	5,481,336	5,481,696	5,480,407	5,479,781	5,481,738
5,480,162	5,481,358	5,481,700	5,480,424	5,479,784	5,479,711
5,480,285	5,481,434	5,481,712	5,480,507	5,479,793	5,479,787
5,480,297	5,481,537	5,481,749	5,480,538	5,479,813	5,479,791
5,480,396	5,481,680	5,479,687	5,480,588	5,479,829	5,479,899
5,480,434	5,479,658	5,479,690	5,480,661	5,479,870	5,480,087
5,480,681	5,479,665	5,479,698	5,479,881	5,479,874	5,480,146
5,480,743	5,479,666	5,479,712	5,479,971	5,479,925	5,480,167
5,480,782	5,479,842	5,479,716	5,480,214	5,479,968	5,480,254
5,481,069	5,479,886	5,479,718	5,480,642	5,479,970	5,480,259
5,481,076	5,480,010	5,479,753	5,481,196	5,479,972	5,480,310
5,481,103	5,480,055	5,479,790	5,480,184	5,479,999	5,480,316
5,481,129	5,480,154	5,479,823	5,480,562	5,480,026	5,480,376
5,481,225	5,480,318	5,479,853	5,481,116	5,480,031	5,480,493
5,481,226	5,480,403	5,479,879	5,480,157	5,480,033	5,480,632
5,481,294	5,480,465	5,479,898	5,480,545	5,480,042	5,480,641
5,481,552	5,480,606	5,479,906	5,481,239	5,480,077	5,480,686
5,481,567	5,480,887	5,479,936	5,481,723	5,480,097	5,480,799
5,481,618	5,480,904	5,479,950	5,479,673	5,480,115	5,480,866
5,481,651	5,480,906	5,480,002	5,479,695	5,480,161	5,480,934
5,481,709	5,480,992	5,480,007	5,479,729	5,480,178	5,481,139
5,481,719	5,481,003	5,480,012	5,479,830	5,480,207	5,481,532
5,481,724	5,481,038	5,480,024	5,480,046	5,480,228	5,481,579
5,481,754	5,481,083	5,480,053	5,480,049	5,480,270	5,481,669
5,479,763	5,481,247	5,480,128	5,480,056	5,480,281	5,481,078
5,479,799	5,481,596	5,480,155	5,480,063	5,480,298	5,479,720
5,480,038	5,480,276	5,480,170	5,480,271	5,480,342	5,479,762
5,480,091	5,480,352	5,480,186	5,480,272	5,480,343	5,479,772
5,480,112	5,480,607	5,480,189	5,480,332	5,480,375	5,479,825
5,480,121	5,480,777	5,480,211	5,480,365	5,480,427	5,479,850
5,480,193	5,481,235	5,480,213	5,480,370	5,480,468	5,479,865
5,480,225	5,479,714	5,480,222	5,480,389	5,480,470	5,479,966
5,480,374	5,479,751	5,480,308	5,480,400	5,480,501	5,479,974
5,480,680	5,479,847	5,480,315	5,480,404	5,480,503	5,480,004
5,480,927	5,480,268	5,480,349	5,480,410	5,480,504	5,480,028
5,481,142	5,480,613	5,480,393	5,480,477	5,480,511	5,480,144
5,481,146	5,480,659	5,480,497	5,480,529	5,480,517	5,480,202
5,481,198	5,480,673	5,480,555	5,480,569	5,480,525	5,480,206
5,481,259	5,480,863	5,480,568	5,480,575	5,480,528	5,480,212
5,481,389	5,481,090	5,480,573	5,480,540	5,480,540	5,480,284
5,481,542	5,481,385	5,480,603	5,480,577	5,480,541	5,480,355
5,481,634	5,479,802	5,480,622	5,480,586	5,480,547	5,480,377
5,481,635	5,480,637	5,480,637	5,480,615	5,480,554	5,480,397
5,481,639	5,480,234	5,480,889	5,480,629	5,480,558	5,480,398
5,479,670	5,480,240	5,480,919	5,480,633	5,480,565	5,480,409
5,479,675	5,480,260	5,480,930	5,480,669	5,480,567	5,480,448
5,479,694	5,480,351	5,480,991	5,480,674	5,480,595	5,480,485
5,480,140	5,481,085	5,481,000	5,480,706	5,480,623	5,480,506
5,480,462	5,479,943	5,481,014	5,480,717	5,480,644	5,480,589
5,480,684	5,479,995	5,481,016	5,480,813	5,480,670	5,480,602
5,480,834	5,480,295	5,481,046	5,480,842	5,480,695	5,480,619
5,481,074	5,480,336	5,481,135	5,480,850	5,480,698	5,480,667
5,481,179	5,480,638	5,481,166	5,480,853	5,480,719	5,480,688
5,481,342	5,480,969	5,481,170	5,480,867	5,480,724	5,480,807
5,479,688	5,479,730	5,481,176	5,480,895	5,480,725	5,480,808
5,479,758	5,480,166	5,481,265	5,480,902	5,480,728	5,480,872
5,479,761	5,479,789	5,481,395	5,480,944	5,480,749	5,480,964
5,479,800	5,479,869	5,481,433	5,480,988	5,480,751	5,481,091
5,479,815	5,480,289	5,481,445	5,481,011	5,480,756	5,481,260
5,479,840	5,480,314	5,481,483	5,481,031	5,480,757	5,481,534
5,479,868	5,480,345	5,479,689	5,481,057	5,480,760	5,481,583
5,479,901	5,480,405	5,479,723	5,481,104	5,480,761	5,481,742
5,479,978	5,480,418	5,479,750	5,481,186	5,480,771	5,479,728
5,480,027	5,480,572	5,479,764	5,481,205	5,480,810	5,480,072
5,480,040	5,480,658	5,479,812	5,481,232	5,480,812	5,480,074
5,480,054	5,480,968	5,479,909	5,481,234	5,480,841	5,480,141
5,480,133	5,480,972	5,479,916	5,480,908	5,480,908	5,480,233
5,480,149	5,481,092	5,479,967	5,481,272	5,480,928	5,480,475
5,480,173	5,481,194	5,480,095	5,481,297	5,480,938	5,480,550
5,480,245	5,481,269	5,480,103	5,481,307	5,480,946	5,480,848
5,480,250	5,481,561	5,480,116	5,481,308	5,480,959	5,480,933
5,480,294	5,479,742	5,480,119	5,481,312	5,480,987	5,480,948
5,480,317	5,479,773	5,480,134	5,481,316	5,481,050	5,481,255
5,480,333	5,479,786	5,480,242	5,481,325	5,481,086	5,479,794
5,480,348	5,479,849	5,480,354	5,481,391	5,481,099	5,479,814
5,480,364	5,479,945	5,480,372	5,481,399	5,481,111	5,479,852
5,480,390	5,480,029	5,480,414	5,481,533	5,481,138	5,479,937
5,480,408	5,480,139	5,480,421	5,481,540	5,481,143	5,480,277
5,480,443	5,480,423	5,480,441	5,481,544	5,481,161	5,480,561
5,480,480	5,480,433	5,480,643	5,481,565	5,481,164	5,481,098
5,480,552	5,480,449	5,480,679	5,481,566	5,481,327	5,481,171
5,480,616	5,480,450	5,480,705	5,481,570	5,481,331	5,481,241
5,480,677	5,480,453	5,480,730	5,481,580	5,481,341	5,481,242
5,480,721	5,480,484	5,480,766	5,481,592	5,481,254	5,481,254
5,480,744	5,480,519	5,480,994	5,481,601	5,481,357	5,481,731
5,480,805	5,480,708	5,481,058	5,481,602	5,481,384	5,479,659
5,480,913	5,480,772	5,481,200	5,481,603	5,481,449	5,479,678
5,480,939	5,480,794	5,481,296	5,481,614	5,481,472	5,479,699
5,480,945	5,480,831	5,481,392	5,481,638	5,481,475	5,479,727
5,480,951	5,480,846	5,481,398	5,481,642	5,481,476	5,479,767
5,480,952	5,480,855	5,481,405	5,481,650	5,481,479	5,479,808
5,481,021	5,480,864	5,481,563	5,481,673	5,481,495	5,479,810
5,481,060	5,480,975	5,481,657	5,481,733	5,481,500	5,479,832
5,481,141	5,481,191	5,479,961	5,479,726	5,481,503	5,479,908
5,481,160	5,481,230	5,480,209	5,481,220	5,481,535	5,479,942
5,481,175	5,481,266	5,480,639	5,481,359	5,481,539	5,479,946
5,481,187	5,479,663	5,479,663	Re.35,138	5,481,573	5,479,975
5,481,197	5,481,555	5,479,738	5,479,660	5,481,586	5,480,036
5,481,229	5,481,611	5,480,003	5,479,692	5,481,616	5,480,045
5,481,244	5,481,655	5,480,043	5,479,703	5,481,622	5,480,060
5,481,258	5,481,681	5,480,081	5,479,713	5,481,628	5,480,068
5,481,333	5,481,695	5,480,096	5,479,735	5,481,675	5,480,079
		5,480,171	5,479,749	5,481,704	5,480,085

5,480,208	5,481,478	5,479,966	5,481,118	5,481,115	5,480,917
5,480,218	5,481,574	5,479,987	5,481,123	5,481,184	5,480,981
5,480,220	5,481,707	5,479,989	5,481,126	5,480,058	5,481,177
5,480,327	5,479,871	5,479,990	5,481,182	5,480,444	5,481,248
5,480,337	5,480,050	5,479,991	5,481,215	5,480,748	5,481,577
5,480,440	5,480,088	5,479,997	5,481,217	5,479,662	5,481,667
5,480,471	5,480,598	5,480,032	5,481,219	5,479,788	5,481,699
5,480,476	5,481,630	5,480,044	5,481,253	5,479,948	5,479,683
5,480,479	5,479,759	5,480,062	5,481,285	5,480,008	5,479,841
5,480,486	5,479,864	5,480,142	5,481,343	5,480,025	5,480,023
5,480,502	5,479,955	5,480,151	5,481,443	5,480,041	5,480,731
5,480,587	5,479,956	5,480,163	5,481,501	5,480,180	5,479,785
5,480,682	5,479,962	5,480,201	5,481,523	5,480,187	5,479,866
5,480,720	5,480,232	5,480,264	5,481,595	5,480,264	5,479,872
5,480,726	5,480,549	5,480,265	5,481,647	5,480,498	5,479,880
5,480,797	5,480,604	5,480,266	5,481,683	5,480,657	5,479,918
5,480,817	5,481,117	5,480,305	5,481,690	5,481,093	5,479,993
5,480,883	5,479,768	5,480,325	5,481,706	5,481,102	5,480,106
5,480,892	5,479,882	5,480,415	5,481,710	5,481,174	5,480,191
5,480,893	5,479,676	5,480,416	5,481,714	5,481,189	5,480,199
5,480,896	5,479,867	5,480,425	5,481,716	5,481,545	5,480,230
5,480,901	5,480,066	5,480,445	5,481,720	5,480,546	5,480,330
5,480,909	5,480,226	5,480,454	5,481,730	5,481,548	5,480,439
5,480,921	5,480,594	5,480,457	5,481,740	5,481,576	5,480,461
5,480,943	5,480,631	5,480,521	5,481,741	5,481,589	5,480,605
5,480,954	5,480,696	5,480,564	5,481,755	5,481,610	5,480,666
5,480,958	5,480,920	5,480,574	5,479,322	5,479,724	5,480,693
5,480,986	5,480,926	5,480,711	5,479,668	5,479,893	5,480,877
5,480,989	5,480,962	5,480,747	5,479,700	5,479,927	5,481,185
5,481,054	5,481,428	5,480,820	5,480,182	5,479,930	5,481,193
5,481,073	5,481,649	5,480,860	5,480,183	5,480,145	5,481,409
5,481,077	Re.35,137	5,480,900	5,480,185	5,480,159	5,481,444
5,481,084	5,479,684	5,480,955	5,480,192	5,480,262	5,481,464
5,481,097	5,479,721	5,480,990	5,480,302	5,480,347	5,



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Ronald H. Brown, *Secretary*  
PATENT AND TRADEMARK OFFICE  
Bruce Lehman, *Commissioner*

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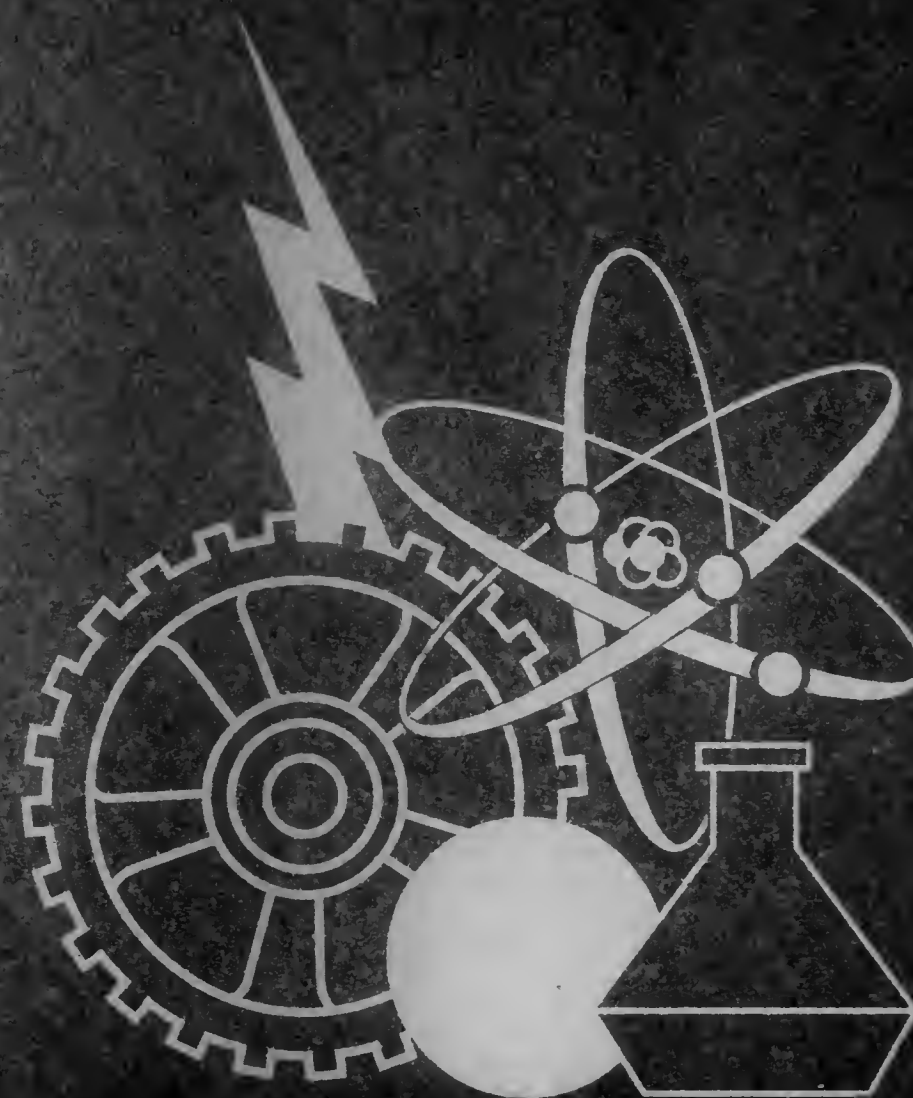
Vol. 1182 Number 2

# OFFICIAL GAZETTE

of the  
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

January 9, 1996



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS



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# PATENT AND TRADEMARK OFFICE NOTICES

## Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1181 O.G. 50, on December 19, 1995.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective June 20, 1995, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

International fees were changed, effective on January 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1995, and were announced in the *Official Gazette* at 1177 O.G. 171, on August 29, 1995.

The schedule of PCT fees (in U.S. dollars), effective January 1, 1996, is as follows:

## International Application (PCT Chapter I) fees:

Transmittal fee.....	220.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed.....	660.00
—Corresponding prior U.S. national application filed.....	430.00
—Supplemental search fee, per additional invention (payable only upon invitation).....	190.00
European Patent Office as ISA.....	1700.00

## International fees

Basic fee.....	677.00
Basic Supplemental fee (for each page over 30).....	13.00
Designation fee per country or region	
—For the first 11 national or regional offices designated.....	164.00
—For each designation in excess of 11 offices.....	No Charge

Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
—Designation fee.....	164.00
—Confirmation fee.....	82.00

## International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:

Handling fee.....	207.00
Preliminary examination fee	

## USPTO as International Preliminary Examining Authority (IPEA)

—USPTO was ISA in PCT Chapter I.....	470.00
—Additional examination fee, per additional invention (payable only upon invitation).....	140.00
—USPTO was not ISA in PCT Chapter I....	710.00
—Additional examination fee, per additional invention (payable only upon invitation).....	250.00

U.S. National Stage Fees	Small Entity	Regular
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## Basic National fee

### USPTO was IPEA

—All claims presented satisfied provisions of PCT Article 33(2) to (4).....	47.00	94.00
—All claims presented did not satisfy provisions of PCT Article 33(2) to (4).....	340.00	680.00
USPTO was ISA but not IPEA.....	375.00	750.00
USPTO was neither ISA nor IPEA		
—Search report has not been prepared by the European Patent Office or the Japanese Patent Office.....	505.00	1010.00
—Search report has been prepared by the European Patent Office or the Japanese Patent Office.....	440.00	880.00

## Other National fees

—For each independent claim in excess of 3.....	39.00	78.00
—For each claim in excess of 20..	11.00	22.00
—For each application containing a multiple dependent claim.....	125.00	250.00
—Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1).....	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1).....	130.00	130.00

Nov. 27, 1995

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

## Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.



Attention is drawn to the patents which were issued on January 5, 1993 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,175,886 through 5,177,809  
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 01, 1989 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,794,652 through 4,796,301  
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 01, 1985 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,490,855 through 4,491,984  
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1994, which are reproduced below:

#### 37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) .....\$495.00  
By other than a small entity .....\$990.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) .....\$995.00  
By other than a small entity .....\$1,990.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) .....\$1,495.00  
By other than a small entity .....\$2,990.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) .....\$65.00  
By other than a small entity .....\$130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee

where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable .....\$660.00  
(2) unintentional .....\$1,550.00

#### Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

#### PATENTS WHICH EXPIRED November 1, 1995 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,412,357	06/220,689	11/01/83
4,412,362	06/225,390	11/01/83
4,412,368	06/318,698	11/01/83
4,412,369	06/387,695	11/01/83
4,412,376	06/355,059	11/01/83
4,412,381	06/260,832	11/01/83
4,412,397	06/359,683	11/01/83
4,412,401	06/269,026	11/01/83
4,412,407	06/307,731	11/01/83
4,412,409	06/234,558	11/01/83
4,412,418	06/265,030	11/01/83
4,412,419	06/305,669	11/01/83
4,412,422	06/298,272	11/01/83
4,412,429	06/325,200	11/01/83
4,412,432	06/364,829	11/01/83
4,412,440	06/234,451	11/01/83
4,412,443	06/288,468	11/01/83
4,412,445	06/296,774	11/01/83
4,412,446	06/344,408	11/01/83
4,412,449	06/242,405	11/01/83
4,412,454	06/284,568	11/01/83
4,412,456	06/348,992	11/01/83
4,412,463	06/285,080	11/01/83
4,412,467	06/301,947	11/01/83
4,412,470	06/271,133	11/01/83
4,412,473	06/251,950	11/01/83
4,412,476	06/229,561	11/01/83
4,412,479	06/256,014	11/01/83
4,412,485	06/243,699	11/01/83
4,412,513	06/232,550	11/01/83
4,412,514	06/255,768	11/01/83
4,412,519	06/417,385	11/01/83
4,412,522	06/351,221	11/01/83
4,412,525	06/272,174	11/01/83
4,412,529	06/368,084	11/01/83
4,412,533	06/336,100	11/01/83
4,412,544	06/303,049	11/01/83
4,412,552	06/336,372	11/01/83
4,412,559	06/396,990	11/01/83
4,412,560	06/362,298	11/01/83
4,412,561	06/222,861	11/01/83
4,412,564	06/237,404	11/01/83
4,412,576	06/389,799	11/01/83
4,412,578	06/244,955	11/01/83
4,412,582	06/280,850	11/01/83
4,412,584	06/411,728	11/01/83
4,412,587	06/320,530	11/01/83
4,412,588	06/296,815	11/01/83
4,412,590	06/227,822	11/01/83
4,412,591	06/322,520	11/01/83
4,412,593	06/227,245	11/01/83
4,412,598	06/372,651	11/01/83

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4,412,599	06/360,155	11/01/83	4,412,897	06/310,121	11/01/83
4,412,600	06/247,716	11/01/83	4,412,899	06/464,300	11/01/83
4,412,605	06/218,902	11/01/83	4,412,909	06/336,266	11/01/83
4,412,608	06/288,793	11/01/83	4,412,912	06/471,116	11/01/83
4,412,609	06/278,255	11/01/83	4,412,915	06/300,148	11/01/83
4,412,618	06/306,603	11/01/83	4,412,919	06/372,235	11/01/83
4,412,622	06/418,134	11/01/83	4,412,922	06/304,012	11/01/83
4,412,623	06/334,551	11/01/83	4,412,923	06/353,169	11/01/83
4,412,633	06/349,172	11/01/83	4,412,924	06/335,536	11/01/83
4,412,635	06/407,575	11/01/83	4,412,928	06/333,998	11/01/83
4,412,638	06/304,950	11/01/83	4,412,933	06/255,166	11/01/83
4,412,639	06/301,825	11/01/83	4,412,940	06/353,301	11/01/83
4,412,640	06/330,084	11/01/83	4,412,941	06/217,731	11/01/83
4,412,643	06/241,214	11/01/83	4,412,943	06/313,928	11/01/83
4,412,647	06/404,383	11/01/83	4,412,944	06/347,675	11/01/83
4,412,648	06/364,427	11/01/83	4,412,945	06/280,369	11/01/83
4,412,650	06/361,949	11/01/83	4,412,946	06/336,827	11/01/83
4,412,657	06/274,204	11/01/83	4,412,947	06/300,910	11/01/83
4,412,658	06/253,532	11/01/83	4,412,952	06/382,133	11/01/83
4,412,664	06/392,096	11/01/83	4,412,954	06/373,450	11/01/83
4,412,667	06/286,890	11/01/83	4,412,955	06/283,174	11/01/83
4,412,674	06/252,603	11/01/83	4,412,957	06/378,938	11/01/83
4,441,696	06/274,766	11/01/83	4,412,960	06/388,625	11/01/83
4,412,699	06/272,409	11/01/83	4,412,961	06/241,644	11/01/83
4,412,701	06/236,224	11/01/83	4,412,978	06/334,093	11/01/83
4,412,702	06/265,945	11/01/83	4,412,981	06/358,050	11/01/83
4,412,710	06/272,385	11/01/83	4,412,983	06/302,942	11/01/83
4,412,712	06/314,169	11/01/83	4,412,988	06/423,951	11/01/83
4,412,713	06/239,477	11/01/83	4,412,990	06/310,392	11/01/83
4,412,721	06/263,415	11/01/83	4,412,991	06/394,977	11/01/83
4,412,723	06/267,950	11/01/83	4,412,994	06/297,442	11/01/83
4,412,725	06/329,107	11/01/83	4,413,006	06/383,375	11/01/83
4,412,726	06/224,791	11/01/83	4,413,012	06/374,106	11/01/83
4,412,736	06/286,041	11/01/83	4,413,017	06/382,264	11/01/83
4,412,738	06/289,685	11/01/83	4,413,025	06/272,446	11/01/83
4,412,747	06/346,594	11/01/83	4,413,027	06/313,130	11/01/83
4,412,749	06/374,404	11/01/83	4,413,033	06/265,575	11/01/83
4,412,751	06/410,760	11/01/83	4,413,040	06/385,798	11/01/83
4,412,758	06/265,206	11/01/83	4,413,042	06/372,089	11/01/83
4,412,761	06/299,903	11/01/83	4,413,047	06/372,088	11/01/83
4,412,770	06/353,587	11/01/83	4,413,052	06/367,252	11/01/83
4,412,772	06/234,949	11/01/83	4,413,057	06/361,701	11/01/83
4,412,780	06/248,529	11/01/83	4,413,070	06/378,682	11/01/83
4,412,783	06/309,860	11/01/83	4,413,072	06/248,899	11/01/83
4,412,784	06/342,907	11/01/83	4,413,080	06/272,068	11/01/83
4,412,785	06/245,490	11/01/83	4,413,081	06/390,638	11/01/83
4,412,792	06/227,168	11/01/83	4,413,082	06/462,848	11/01/83
4,412,797	06/345,915	11/01/83	4,413,101	06/348,901	11/01/83
4,412,798	06/319,773	11/01/83	4,413,102	06/318,730	11/01/83
4,412,799	06/237,693	11/01/83	4,413,108	06/344,080	11/01/83
4,412,800	06/241,769	11/01/83	4,413,115	06/289,702	11/01/83
4,412,801	06/259,675	11/01/83	4,413,117	06/427,018	11/01/83
4,412,804	06/318,282	11/01/83	4,413,122	06/385,273	11/01/83
4,412,809	06/277,504	11/01/83	4,413,126	06/285,358	11/01/83
4,412,810	06/240,347	11/01/83	4,413,130	06/386,833	11/01/83
4,412,811	06/296,904	11/01/83	4,413,133	06/362,220	11/01/83
4,412,815	06/316,182	11/01/83	4,413,135	06/321,145	11/01/83
4,412,825	06/303,010	11/01/83	4,413,146	06/385,075	11/01/83
4,412,826	06/299,992	11/01/83	4,413,150	06/325,179	11/01/83
4,412,837	06/373,409	11/01/83	4,413,153	06/332,381	11/01/83
4,412,840	06/225,491	11/01/83	4,413,168	06/436,158	11/01/83
4,412,848	06/361,270	11/01/83	4,413,170	06/356,058	11/01/83
4,412,851	06/347,651	11/01/83	4,413,174	06/274,376	11/01/83
4,412,858	06/397,222	11/01/83	4,413,176	06/376,482	11/01/83
4,412,861	06/437,082	11/01/83	4,413,178	06/355,722	11/01/83
4,412,862	06/399,974	11/01/83	4,413,182	06/246,830	11/01/83
4,412,864	06/253,044	11/01/83	4,413,188	06/221,144	11/01/83
4,412,871	06/349,212	11/01/83	4,413,196	06/279,873	11/01/83
4,412,873	06/320,428	11/01/83	4,413,197	06/298,148	11/01/83
4,412,875	06/308,770	11/01/83	4,413,201	06/298,149	11/01/83
4,412,878	06/366,020	11/01/83	4,413,202	06/269,043	11/01/83
4,412,883	06/287,634	11/01/83	4,413,203	06/482,279	11/01/83
4,412,884	06/365,744	11/01/83	4,413,204	06/307,125	11/01/83
4,412,893	06/464,867	11/01/83	4,413,209	06/336,815	11/01/83
4,412,894	06/280,795	11/01/83	4,413,215	06/308,295	11/01/83
4,412,895	06/307,137	11/01/83	4,413,223	06/268,723	11/01/83
4,412,896	06/281,533	11/01/83	4,413,227	06/257,534	11/01/83
				06/284,491	11/01/83
				06/323,801	11/01/83



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4,413,232	06/233,672	11/01/83	4,702,109	06/854,270	10/27/87
4,413,241	06/281,393	11/01/83	4,702,110	06/890,597	10/27/87
4,413,243	06/312,206	11/01/83	4,702,112	06/764,912	10/27/87
4,413,254	06/299,304	11/01/83	4,702,115	06/833,306	10/27/87
4,413,257	06/282,673	11/01/83	4,702,122	06/903,019	10/27/87
4,413,261	06/250,121	11/01/83	4,702,124	06/868,717	10/27/87
4,413,264	06/338,691	11/01/83	4,702,126	06/706,298	10/27/87
4,413,266	06/330,299	11/01/83	4,702,131	06/747,771	10/27/87
4,413,268	06/328,877	11/01/83	4,702,132	06/845,824	10/27/87
4,413,270	06/249,057	11/01/83	4,702,134	06/850,225	10/27/87
4,413,271	06/248,142	11/01/83	4,702,143	06/833,114	10/27/87
4,413,273	06/307,381	11/01/83	4,702,147	06/762,244	10/27/87
4,413,276	06/321,825	11/01/83	4,702,152	06/910,813	10/27/87
4,413,278	06/308,409	11/01/83	4,702,153	06/798,731	10/27/87
4,413,282	06/328,434	11/01/83	4,702,154	07/007,488	10/27/87
4,413,283	06/332,933	11/01/83	4,702,162	07/038,231	10/27/87
4,413,287	06/368,258	11/01/83	4,702,164	06/919,581	10/27/87
4,413,289	06/243,593	11/01/83	4,702,169	07/008,237	10/27/87
4,413,291	06/306,399	11/01/83	4,702,171	06/918,559	10/27/87
4,413,292	06/287,823	11/01/83	4,702,173	06/878,621	10/27/87
4,413,293	06/255,127	11/01/83	4,702,177	06/486,289	10/27/87
4,413,294	06/259,914	11/01/83	4,702,178	06/858,653	10/27/87
4,413,298	06/260,709	11/01/83	4,702,188	06/867,211	10/27/87
4,413,299	06/287,986	11/01/83	4,702,191	06/804,686	10/27/87
4,413,300	06/310,974	11/01/83	4,702,196	06/853,260	10/27/87
4,413,306	06/501,749	11/01/83	4,702,199	06/831,936	10/27/87
4,413,312	06/380,546	11/01/83	4,702,200	06/784,199	10/27/87
4,413,313	06/399,106	11/01/83	4,702,205	06/852,647	10/27/87
4,413,333	06/357,207	11/01/83	4,702,214	06/866,944	10/27/87
4,413,335	06/325,252	11/01/83	4,702,215	06/914,402	10/27/87
4,413,343	06/236,611	11/01/83	4,702,218	07/016,465	10/27/87
4,413,344	06/268,762	11/01/83	4,702,226	06/757,946	10/27/87
4,413,350	06/224,336	11/01/83	4,702,231	06/894,555	10/27/87
4,413,353	06/299,208	11/01/83	4,702,235	06/789,500	10/27/87
4,701,967	06/869,312	10/27/87	4,702,239	06/864,834	10/27/87
4,701,974	06/924,700	10/27/87	4,702,241	06/846,709	10/27/87
4,701,981	06/799,971	10/27/87	4,702,245	06/786,468	10/27/87
4,701,983	06/753,160	10/27/87	4,702,246	06/758,400	10/27/87
4,701,986	06/877,029	10/27/87	4,702,248	06/872,957	10/27/87
4,701,990	06/937,179	10/27/87	4,702,251	06/698,243	10/27/87
4,701,991	06/787,515	10/27/87	4,702,256	06/938,302	10/27/87
4,701,996	06/831,932	10/27/87	4,702,258	06/825,844	10/27/87
4,702,001	06/852,655	10/27/87	4,702,260	06/723,907	10/27/87
4,702,002	06/916,966	10/27/87	4,702,264	06/895,066	10/27/87
4,702,009	06/848,542	10/27/87	4,702,266	06/871,058	10/27/87
4,702,010	06/935,050	10/27/87	4,702,273	06/836,695	10/27/87
4,702,011	06/916,496	10/27/87	4,702,278	06/866,023	10/27/87
4,702,013	06/897,767	10/27/87	4,702,279	06/680,175	10/27/87
4,702,014	06/748,151	10/27/87	4,702,281	06/920,245	10/27/87
4,702,024	06/839,290	10/27/87	4,702,282	06/894,804	10/27/87
4,702,028	07/001,211	10/27/87	4,702,287	06/899,996	10/27/87
4,702,030	06/898,523	10/27/87	4,702,295	06/829,392	10/27/87
4,702,031	06/878,428	10/27/87	4,702,296	06/603,844	10/27/87
4,702,035	07/009,821	10/27/87	4,702,306	06/681,182	10/27/87
4,702,036	06/870,550	10/27/87	4,702,309	06/891,894	10/27/87
4,702,042	06/723,578	10/27/87	4,702,313	06/738,214	10/27/87
4,702,052	06/921,942	10/27/87	4,702,314	06/835,702	10/27/87
4,702,054	07/016,928	10/27/87	4,702,317	06/902,542	10/27/87
4,702,055	06/739,887	10/27/87	4,702,319	06/947,285	10/27/87
4,702,057	06/902,749	10/27/87	4,702,320	06/891,391	10/27/87
4,702,062	06/837,942	10/27/87	4,702,322	06/891,810	10/27/87
4,702,069	07/024,718	10/27/87	4,702,332	06/796,544	10/27/87
4,702,075	06/792,822	10/27/87	4,702,335	06/738,601	10/27/87
4,702,078	06/894,505	10/27/87	4,702,338	06/874,576	10/27/87
4,701,082	06/745,131	10/27/87	4,702,342	06/815,897	10/27/87
4,702,088	06/879,051	10/27/87	4,702,347	06/867,679	10/27/87
4,702,089	06/865,194	10/27/87	4,702,348	06/711,318	10/27/87
4,702,093	07/001,125	10/27/87	4,702,352	06/841,764	10/27/87
4,702,095	07/001,849	10/27/87	4,702,353	06/774,287	10/27/87
4,702,096	06/877,215	10/27/87	4,702,361	06/866,406	10/27/87
4,702,097	06/839,688	10/27/87	4,702,367	06/779,573	10/27/87
4,702,098	06/786,446	10/27/87	4,702,373	06/920,730	10/27/87
4,702,100	06/328,045	10/27/87	4,702,374	06/854,387	10/27/87
4,702,102	06/566,307	10/27/87	4,702,382	06/947,812	10/27/87
4,702,104	06/855,490	10/27/87	4,702,384	06/905,520	10/27/87
4,702,105	06/845,200	10/27/87	4,702,386	06/871,357	10/27/87
4,702,107	06/870,444	10/27/87	4,702,388	06/845,577	10/27/87
			4,702,389	06/414,463	10/27/87

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4,702,391	06/795,846		4,702,652	06/814,626	10/27/87
4,702,394	06/543,328	10/27/87	4,702,653	06/709,055	10/27/87
4,702,396	06/827,728	10/27/87	4,702,655	06/770,160	10/27/87
4,702,398	06/822,036	10/27/87	4,702,660	06/796,770	10/27/87
4,702,401	07/007,606	10/27/87	4,702,662	06/747,571	10/27/87
4,702,404	06/711,359	10/27/87	4,702,663	06/829,525	10/27/87
4,702,406	06/919,857	10/27/87	4,702,671	06/739,408	10/27/87
4,702,407	06/868,463	10/27/87	4,702,672	06/837,696	10/27/87
4,702,413	07/046,766	10/27/87	4,702,674	06/913,202	10/27/87
4,702,418	06/773,677	10/27/87	4,702,680	06/858,445	10/27/87
4,702,424	07/027,063	10/27/87	4,702,684	06/891,045	10/27/87
4,702,426	06/848,858	10/27/87	4,702,689	06/941,828	10/27/87
4,702,429	06/884,324	10/27/87	4,702,693	06/937,220	10/27/87
4,702,438	06/755,394	10/27/87	4,702,695	06/925,504	10/27/87
4,702,439	07/005,971	10/27/87	4,702,700	06/946,596	10/27/87
4,702,442	06/679,203	10/27/87	4,702,702	06/847,435	10/27/87
4,702,443	06/894,835	10/27/87	4,702,703	06/812,966	10/27/87
4,702,448	06/825,313	10/27/87	4,702,709	06/870,006	10/27/87
4,702,452	06/905,350	10/27/87	4,702,710	06/876,396	10/27/87
4,702,453	06/777,000	10/27/87	4,702,711	06/855,948	10/27/87
4,702,464	06/762,184	10/27/87	4,702,713	06/726,342	10/27/87
4,702,469	06/845,890	10/27/87	4,702,719	06/784,195	10/27/87
4,702,473	06/875,566	10/27/87	4,702,727	06/894,876	10/27/87
4,702,476	06/766,025	10/27/87	4,702,730	06/710,299	10/27/87
4,702,478	06/856,198	10/27/87	4,702,731	06/928,742	10/27/87
4,702,479	06/836,254	10/27/87	4,702,732	06/935,057	10/27/87
4,702,481	06/891,705	10/27/87	4,702,746	06/824,579	10/27/87
4,702,482	06/877,406	10/27/87	4,702,749	06/877,827	10/27/87
4,702,485	06/839,421	10/27/87	4,702,751	06/932,190	10/27/87
4,702,486	06/863,803	10/27/87	4,702,753	06/940,352	10/27/87
4,702,492	06/851,814	10/27/87	4,702,755	06/842,976	10/27/87
4,702,495	06/893,732	10/27/87	4,702,756	07/009,066	10/27/87
4,702,497	06/858,687	10/27/87	4,702,758	06/868,920	10/27/87
4,702,503	06/735,579	10/27/87	4,702,759	06/930,804	10/27/87
4,702,506	06/683,652	10/27/87	4,702,761	06/835,082	10/27/87
4,702,507	06/901,416	10/27/87	4,702,762	06/731,389	10/27/87
4,702,509	06/866,916	10/27/87	4,702,764	06/656,885	10/27/87
4,702,511	07/002,384	10/27/87	4,702,765	06/829,862	10/27/87
4,702,517	06/888,207	10/27/87	4,702,775	06/878,220	10/27/87
4,702,519	06/885,330	10/27/87	4,702,777	06/866,678	10/27/87
4,702,523	06/927,604	10/27/87	4,702,786	06/914,180	10/27/87
4,702,524	06/886,890	10/27/87	4,702,787	06/503,275	10/27/87
4,702,525	06/840,216	10/27/87	4,702,790	06/734,387	10/27/87
4,702,526	06/845,690	10/27/87	4,702,793	06/870,317	10/27/87
4,702,529	06/872,018	10/27/87	4,702,801	06/472,801	10/27/87
4,702,532	06/835,472	10/27/87	4,702,811	06/924,653	10/27/87
4,702,538	07/016,976	10/27/87	4,702,812	06/918,040	10/27/87
4,702,542	06/863,203	10/27/87	4,702,817	06/789,391	10/27/87
4,702,546	06/772,824	10/27/87	4,702,818	06/675,069	10/27/87
4,702,548	06/696,448	10/27/87	4,702,819	06/944,319	10/27/87
4,702,553	06/400,154	10/27/87	4,702,821	06/705,824	10/27/87
4,702,558	06/648,519	10/27/87	4,702,823	06/879,716	10/27/87
4,702,559	06/906,116	10/27/87	4,702,832	06/846,231	10/27/87
4,702,562	06/692,074	10/27/87	4,702,835	06/497,048	10/27/87
4,702,565	06/833,064	10/27/87	4,702,838	06/642,419	10/27/87
4,702,574	06/787,400	10/27/87	4,702,839	06/611,687	10/27/87
4,702,579	06/766,031	10/27/87	4,702,846	06/883,042	10/27/87
4,702,580	07/022,286	10/27/87	4,702,847	06/448,982	10/27/87
4,702,593	06/840,590	10/27/87	4,702,848	06/794,375	10/27/87
4,702,594	06/441,719	10/27/87	4,702,849	06/834,171	10/27/87
4,702,595	06/519,883	10/27/87	4,702,854	06/490,938	10/27/87
4,702,600	06/757,276	10/27/87	4,702,858	06/888,957	10/27/87
4,702,601	06/757,280	10/27/87	4,702,860	06/815,761	10/27/87
4,702,602	06/890,366	10/27/87	4,702,864	06/884,669	10/27/87
4,702,607	06/807,686	10/27/87	4,702,871	06/745,676	10/27/87
4,702,612	06/880,194	10/27/87	4,702,872	06/727,520	10/27/87
4,702,614	06/883,510	10/27/87	4,702,874	06/835,854	10/27/87
4,702,617	06/838,284	10/27/87	4,702,880	06/882,256	10/27/87
4,702,621	06/813,014	10/27/87	4,702,881	06/719,107	10/27/87
4,702,623	06/913,778	10/27/87	4,702,882	06/720,207	10/27/87
4,702,626	06/940,583	10/27/87	4,702,883	06/762,734	10/27/87
4,702,628	06/836,021	10/27/87	4,702,887	06/833,556	10/27/87
4,702,631	06/795,860	10/27/87	4,702,890	06/810,167	10/27/87
4,702,632	06/765,500	10/27/87	4,702,891	06/730,253	10/27/87
4,702,639	06/771,437	10/27/87	4,702,892	06/759,475	10/27/87
4,702,641	06/858,317	10/27/87	4,702,896	06/902,721	10/27/87
4,702,645	06/860,797	10/27/87	4,702,904	06/800,143	10/27/87
			4,702,905	06/771,378	10/27/87



Patent Number	Serial Number	Issue Date	4,703,237	06/879,265	10/27/87
4,702,909	06/604,061	10/27/87	4,703,240	06/836,309	10/27/87
4,702,910	06/797,796	10/27/87	4,703,242	07/009,072	10/27/87
4,702,916	06/804,211	10/27/87	4,703,261	06/680,363	10/27/87
4,702,920	06/931,525	10/27/87	4,703,264	06/732,999	10/27/87
4,702,922	06/826,515	10/27/87	4,703,265	06/702,314	10/27/87
4,702,923	06/914,835	10/27/87	4,703,267	06/756,066	10/27/87
4,702,926	06/376,729	10/27/87	4,703,269	06/895,895	10/27/87
4,702,930	06/890,854	10/27/87	4,703,270	06/853,447	10/27/87
4,702,946	06/925,390	10/27/87	4,703,273	06/759,783	10/27/87
4,702,953	06/729,919	10/27/87	4,703,280	06/771,354	10/27/87
4,702,957	06/905,353	10/27/87	4,703,281	06/225,178	10/27/87
4,702,961	06/783,813	10/27/87	4,703,304	06/888,362	10/27/87
4,702,964	06/754,792	10/27/87	4,703,313	06/767,174	10/27/87
4,702,965	06/810,533	10/27/87	4,703,322	06/946,663	10/27/87
4,702,969	06/881,879	10/27/87	4,703,326	06/821,695	10/27/87
4,702,974	06/923,364	10/27/87	4,703,333	06/823,904	10/27/87
4,702,976	06/909,300	10/27/87	4,703,334	06/644,493	10/27/87
4,702,979	06/889,648	10/27/87	4,703,354	06/610,560	10/27/87
4,702,980	06/872,671	10/27/87	4,703,360	06/843,782	10/27/87
4,702,991	06/875,527	10/27/87	4,703,363	06/669,784	10/27/87
4,702,998	06/843,181	10/27/87	4,703,366	06/739,328	10/27/87
4,702,999	06/832,422	10/27/87	4,703,369	06/654,575	10/27/87
4,703,010	06/859,007	10/27/87	4,703,374	06/696,202	10/27/87
4,703,012	06/651,679	10/27/87	4,703,376	06/778,883	10/27/87
4,703,015	06/904,751	10/27/87	4,703,382	06/684,030	10/27/87
4,703,016	06/859,822	10/27/87	4,703,388	06/779,329	10/27/87
4,703,023	06/843,077	10/27/87	4,703,390	06/866,805	10/27/87
4,703,025	07/016,449	10/27/87	4,703,391	06/616,685	10/27/87
4,703,031	06/925,793	10/27/87	4,703,396	06/924,779	10/27/87
4,703,034	06/856,252	10/27/87	4,703,401	06/940,542	10/27/87
4,703,042	06/808,689	10/27/87	4,703,407	06/935,351	10/27/87
4,703,048	06/815,452	10/27/87	4,703,415	06/746,034	10/27/87
4,703,049	06/808,844	10/27/87	4,703,428	06/678,885	10/27/87
4,703,050	06/927,751	10/27/87	4,703,430	06/672,591	10/27/87
4,703,061	06/753,613	10/27/87	4,703,432	06/680,827	10/27/87
4,703,069	06/879,435	10/27/87	4,703,434	06/602,878	10/27/87
4,703,070	06/886,986	10/27/87	4,703,436	06/576,066	10/27/87
4,703,073	06/908,930	10/27/87	4,703,437	06/668,322	10/27/87
4,703,078	06/855,145	10/27/87	4,703,439	06/678,205	10/27/87
4,703,081	06/849,608	10/27/87	4,703,441	06/705,424	10/27/87
4,703,085	06/895,990	10/27/87	4,703,445	06/701,194	10/27/87
4,703,087	06/942,142	10/27/87	4,703,450	06/942,919	10/27/87
4,703,088	06/332,282	10/27/87	4,703,454	06/750,517	10/27/87
4,703,090	06/806,974	10/27/87	4,703,456	06/858,465	10/27/87
4,703,091	06/933,655	10/27/87	4,703,459	06/677,776	10/27/87
4,703,093	06/692,098	10/27/87	4,703,465	06/804,803	10/27/87
4,703,097	07/031,855	10/27/87	4,703,466	06/667,798	10/27/87
4,703,100	06/855,296	10/27/87	4,703,469	06/681,992	10/27/87
4,703,104	06/828,215	10/27/87	4,703,472	06/839,343	10/27/87
4,703,111	06/849,066	10/27/87	4,703,490	06/787,070	10/27/87
4,703,113	06/764,999	10/27/87	4,703,493	06/892,943	10/27/87
4,703,119	06/741,099	10/27/87	4,703,498	06/842,675	10/27/87
4,703,123	06/909,443	10/27/87	4,703,499	06/831,558	10/27/87
4,703,130	06/679,789	10/27/87	4,703,502	06/823,250	10/27/87
4,703,131	06/799,041	10/27/87	4,703,503	06/915,234	10/27/87
4,703,139	06/874,895	10/27/87	4,703,506	06/888,057	10/27/87
4,703,156	06/789,907	10/27/87	4,703,516	06/748,147	10/27/87
4,703,163	06/768,258	10/27/87	5,060,313	07/502,797	10/29/91
4,703,168	06/757,178	10/27/87	5,060,316	07/635,811	10/29/91
4,703,173	06/836,896	10/27/87	5,060,317	07/513,897	10/29/91
4,703,179	07/033,390	10/27/87	5,060,318	07/503,891	10/29/91
4,703,187	06/836,763	10/27/87	5,060,321	07/532,970	10/29/91
4,703,191	06/806,800	10/27/87	5,060,324	07/556,352	10/29/91
4,703,192	06/776,032	10/27/87	5,060,325	07/628,576	10/29/91
4,703,196	06/763,628	10/27/87	5,060,326	07/391,510	10/29/91
4,703,198	06/883,264	10/27/87	5,060,329	07/595,554	10/29/91
4,703,201	06/765,491	10/27/87	5,060,333	07/468,689	10/29/91
4,703,203	06/914,970	10/27/87	5,060,339	07/583,125	10/29/91
4,703,208	06/861,847	10/27/87	5,060,340	07/392,193	10/29/91
4,703,213	06/885,767	10/27/87	5,060,341	07/667,683	10/29/91
4,703,214	06/913,754	10/27/87	5,060,346	07/591,742	10/29/91
4,703,215	07/010,737	10/27/87	5,060,348	07/505,805	10/29/91
4,703,217	06/866,875	10/27/87	5,060,352	07/555,191	10/29/91
4,703,219	06/667,348	10/27/87	5,060,355	07/426,312	10/29/91
4,703,226	06/810,302	10/27/87	5,060,374	07/361,492	10/29/91
4,703,228	06/770,386	10/27/87	5,060,376	07/660,297	10/29/91
4,703,230	06/900,516	10/27/87	5,060,381	07/566,545	10/29/91
			5,060,394	07/341,030	10/29/91

Patent Number	Serial Number	Issue Date	5,060,752	07/403,196	10/29/91
5,060,399	07/562,579	10/29/91	5,060,760	07/525,811	10/29/91
5,060,405	07/356,266	10/29/91	5,060,772	07/394,404	10/29/91
5,060,409	07/623,126	10/29/91	5,060,793	07/591,038	10/29/91
5,060,411	07/597,516	10/29/91	5,060,795	07/581,524	10/29/91
5,060,413	07/271,179	10/29/91	5,060,796	07/569,719	10/29/91
5,060,414	07/382,205	10/29/91	5,060,800	07/572,334	10/29/91
5,060,417	07/426,976	10/29/91	5,060,807	07/557,752	10/29/91
5,060,420	07/473,225	10/29/91	5,060,808	07/399,762	10/29/91
5,060,423	07/369,642	10/29/91	5,060,809	07/494,081	10/29/91
5,060,428	07/477,797	10/29/91	5,060,813	07/577,722	10/29/91
5,060,433	07/405,621	10/29/91	5,060,822	07/544,541	10/29/91
5,060,436	07/543,027	10/29/91	5,060,825	07/519,405	10/29/91
5,060,440	07/106,982	10/29/91	5,060,828	07/529,198	10/29/91
5,060,452	07/508,794	10/29/91	5,060,832	07/508,326	10/29/91
5,060,460	07/541,912	10/29/91	5,060,835	07/559,656	10/29/91
5,060,461	07/541,915	10/29/91	5,060,836	07/526,039	10/29/91
5,060,463	07/568,598	10/29/91	5,060,857	07/482,041	10/29/91
5,060,472	07/508,334	10/29/91	5,060,865	07/450,321	10/29/91
5,060,475	07/530,147	10/29/91	5,060,871	07/496,051	10/29/91
5,060,478	07/401,545	10/29/91	5,060,876	07/375,182	10/29/91
5,060,479	07/607,303	10/29/91	5,060,883	07/508,888	10/29/91
5,060,483	07/592,735	10/29/91	5,060,887	07/446,625	10/29/91
5,060,488	07/526,826	10/29/91	5,060,891	07/597,538	10/29/91
5,060,493	07/533,575	10/29/91	5,060,895	07/535,551	10/29/91
5,060,501	07/645,721	10/29/91	5,060,896	07/435,396	10/29/91
5,060,511	07/500,190	10/29/91	5,060,898	07/618,847	10/29/91
5,060,512	07/551,248	10/29/91	5,060,901	07/535,710	10/29/91
5,060,518	07/460,908	10/29/91	5,060,902	07/550,064	10/29/91
5,060,523	07/467,481	10/29/91	5,060,903	07/497,390	10/29/91
5,060,530	07/441,289	10/29/91	5,060,904	07/571,765	10/29/91
5,060,532	07/571,293	10/29/91	5,060,905	07/362,771	10/29/91
5,060,536	07/488,235	10/29/91	5,060,906	07/165,910	10/29/91
5,060,537	07/404,531	10/29/91	5,060,907	07/464,036	10/29/91
5,060,540	07/510,553	10/29/91	5,060,908	07/127,531	10/29/91
5,060,554	07/575,073	10/29/91	5,060,912	07/424,941	10/29/91
5,060,557	07/470,644	10/29/91	5,060,915	07/403,666	10/29/91
5,060,560	07/462,579	10/29/91	5,060,924	07/488,036	10/29/91
5,060,561	07/302,408	10/29/91	5,060,927	07/478,141	10/29/91
5,060,564	07/529,501	10/29/91	5,060,928	07/388,781	10/29/91
5,060,565	07/454,516	10/29/91	5,060,933	07/636,099	10/29/91
5,060,568	06/763,361	10/29/91	5,060,941	07/491,830	10/29/91
5,060,570	07/415,773	10/29/91	5,060,947	07/470,220	10/29/91
5,060,574	07/546,828	10/29/91	5,060,948	07/512,649	10/29/91
5,060,577	07/450,609	10/29/91	5,060,949	07/321,763	10/29/91
5,060,578	07/500,406	10/29/91	5,060,950	07/528,868	10/29/91
5,060,580	07/505,843	10/29/91	5,060,952	07/643,341	10/29/91
5,060,586	07/453,987	10/29/91	5,060,960	07/302,383	10/29/91
5,060,591	07/512,327	10/29/91	5,060,962	07/529,316	10/29/91
5,060,595	07/512,745	10/29/91	5,060,964	07/380,880	10/29/91
5,060,601	07/500,748	10/29/91	5,060,977	07/486,863	10/29/91
5,060,606	07/567,102	10/29/91	5,060,978	07/470,245	10/29/91
5,060,627	07/527,273	10/29/91	5,060,983	07/577,953	10/29/91
5,060,635	07/410,063	10/29/91	5,060,989	07/514,750	10/29/91
5,060,636	07/299,303	10/29/91	5,060,992	07/667,485	10/29/91
5,060,638	07/452,627	10/29/91	5,060,994	07/550,484	10/29/91
5,060,645	07/567,097	10/29/91	5,060,996	07/554,716	10/29/91
5,060,658	07/559,260	10/29/91	5,060,997	07/471,405	10/29/91
5,060,661	07/535,127	10/29/91	5,060,999	07/505,158	10/29/91
5,060,663	07/129,537	10/29/91	5,061,000	07/522,907	10/29/91
5,060,668	06/734,356	10/29/91	5,061,001	07/199,272	10/29/91
5,060,679	07/494,650	10/29/91	5,061,006	07/578,044	10/29/91
5,060,681	07/632,829	10/29/91	5,061,009	07/606,201	10/29/91
5,060,689	07/398,183	10/29/91	5,061,021	07/575,194	10/29/91
5,060,693	07/695,146	10/29/91	5,061,031	07/602,252	10/29/91
5,060,694	07/612,026	10/29/91	5,061,038	07/640,162	10/29/91
5,060,698	07/583,376	10/29/91	5,061,046	07/452,886	10/29/91
5,060,699	07/543,215	10/29/91	5,061,051	07/485,470	10/29/91
5,060,707	07/356,166	10/29/91	5,061,053	07/363,656	10/29/91
5,060,713	07/474,283	10/29/91	5,061,055	07/558,508	10/29/91
5,060,716	07/331,356	10/29/91	5,061,065	07/424,711	10/29/91
5,060,718	07/586,820	10/29/91	5,061,071	07/453,964	10/29/91
5,060,719	07/443,686	10/29/91	5,061,081	07/615,877	10/29/91
5,060,732	07/518,494	10/29/91	5,061,085	07/488,336	10/29/91
5,060,736	07/570,059	10/29/91	5,061,088	07/613,562	10/29/91
5,060,743	07/372,461	10/29/91	5,061,098	07/384,736	10/29/91
5,060,746	07/510,228	10/29/91	5,061,112	07/654,704	10/29/91
5,060,749	07/560,254	10/29/91	5,061,123	06/938,429	10/29/91
			5,061,130	07/561,314	10/29/91



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5,061,141	07/330,178	10/29/91	5,061,501	07/356,678	10/29/91
5,061,142	07/505,423	10/29/91	5,061,507	07/557,149	10/29/91
5,061,149	07/527,348	10/29/91	5,061,521	07/451,892	10/29/91
5,061,150	07/331,645	10/29/91	5,061,553	07/321,895	10/29/91
5,061,158	07/449,959	10/29/91	5,061,564	07/382,934	10/29/91
5,061,159	07/572,827	10/29/91	5,061,568	07/453,556	10/29/91
5,061,163	07/598,745	10/29/91	5,061,582	07/348,500	10/29/91
5,061,166	07/551,934	10/29/91	5,061,594	07/470,496	10/29/91
5,061,177	07/497,321	10/29/91	5,061,597	07/566,039	10/29/91
5,061,178	07/613,743	10/29/91	5,061,603	07/448,966	10/29/91
5,061,183	07/434,291	10/29/91	5,061,612	07/484,677	10/29/91
5,061,185	07/613,079	10/29/91	5,061,622	07/191,140	10/29/91
5,061,187	07/507,760	10/29/91	5,061,623	07/538,668	10/29/91
5,061,197	07/523,682	10/29/91	5,061,625	07/235,910	10/29/91
5,061,200	07/677,561	10/29/91	5,061,627	07/420,001	10/29/91
5,061,201	07/681,352	10/29/91	5,061,629	07/607,792	10/29/91
5,061,209	07/668,306	10/29/91	5,061,631	07/257,553	10/29/91
5,061,211	07/660,980	10/29/91	5,061,638	07/395,725	10/29/91
5,061,214	07/574,433	10/29/91	5,061,661	07/559,546	10/29/91
5,061,215	07/322,292	10/29/91	5,061,665	07/462,095	10/29/91
5,061,218	07/549,761	10/29/91	5,061,672	07/472,095	10/29/91
5,061,221	07/551,774	10/29/91	5,061,684	07/412,082	10/29/91
5,061,225	07/278,597	10/29/91	5,061,685	07/640,693	10/29/91
5,061,228	07/663,253	10/29/91	5,061,690	07/574,434	10/29/91
5,061,234	07/411,932	10/29/91	5,061,691	07/235,867	10/29/91
5,061,245	07/467,567	10/29/91	5,061,692	07/382,623	10/29/91
5,061,248	07/503,938	10/29/91	5,061,709	07/525,262	10/29/91
5,061,250	07/574,293	10/29/91	5,061,713	07/564,033	10/29/91
5,061,255	07/485,966	10/29/91	5,061,729	07/204,205	10/29/91
5,061,264	07/340,676	10/29/91	5,061,730	07/143,942	10/29/91
5,061,270	07/671,085	10/29/91	5,061,748	07/546,232	10/29/91
5,061,278	07/557,159	10/29/91	5,061,754	07/441,599	10/29/91
5,061,279	07/613,145	10/29/91	5,061,772	07/638,275	10/29/91
5,061,282	07/418,671	10/29/91	5,061,784	07/543,232	10/29/91
5,061,284	07/507,356	10/29/91	5,061,788	07/237,126	10/29/91
5,061,285	07/520,120	10/29/91	5,061,791	07/407,662	10/29/91
5,061,293	07/523,322	10/29/91	5,061,796	07/383,081	10/29/91
5,061,297	07/466,409	10/29/91	5,061,801	07/586,922	10/29/91
5,061,299	07/501,242	10/29/91	5,061,803	07/587,299	10/29/91
5,061,312	07/539,631	10/29/91	5,061,809	07/633,929	10/29/91
5,061,314	07/419,156	10/29/91	5,061,821	07/456,678	10/29/91
5,061,315	07/419,149	10/29/91	5,061,828	07/616,327	10/29/91
5,061,317	07/298,165	10/29/91	5,061,830	07/510,196	10/29/91
5,061,331	07/539,560	10/29/91	5,061,834	07/554,518	10/29/91
5,061,322	07/443,261	10/29/91	5,061,836	07/593,602	10/29/91
5,061,340	07/422,710	10/29/91	5,061,837	07/346,062	10/29/91
5,061,349	07/558,804	10/29/91	5,061,844	07/469,152	10/29/91
5,061,354	07/338,055	10/29/91	5,061,846	07/351,743	10/29/91
5,061,357	07/597,498	10/29/91	5,061,849	07/485,041	10/29/91
5,061,358	07/535,271	10/29/91	5,061,867	07/467,305	10/29/91
5,061,366	07/513,639	10/29/91	5,061,878	07/223,039	10/29/91
5,061,375	07/609,405	10/29/91	5,061,887	07/469,471	10/29/91
5,061,379	07/594,605	10/29/91	5,061,893	07/539,081	10/29/91
5,061,383	07/526,250	10/29/91	5,061,903	07/488,720	10/29/91
5,061,387	07/642,110	10/29/91	5,061,905	07/614,730	10/29/91
5,061,397	07/388,142	10/29/91	5,061,912	07/557,480	10/29/91
5,061,409	07/407,176	10/29/91	5,061,929	07/592,507	10/29/91
5,061,414	07/402,453	10/29/91	5,061,930	07/536,924	10/29/91
5,061,415	07/494,905	10/29/91	5,061,931	07/557,309	10/29/91
5,061,416	07/428,710	10/29/91	5,061,945	07/479,276	10/29/91
5,061,428	07/460,993	10/29/91	5,061,957	07/611,736	10/29/91
5,061,434	07/571,162	10/29/91	5,061,960	07/213,771	10/29/91
5,061,435	07/553,088	10/29/91	5,061,982	07/462,104	10/29/91
5,061,438	06/815,124	10/29/91	5,061,997	07/541,340	10/29/91
5,061,447	07/389,540	10/29/91	5,061,998	07/531,757	10/29/91
5,061,448	07/187,815	10/29/91	5,062,002	07/345,327	10/29/91
5,061,453	07/352,577	10/29/91	5,062,013	07/448,933	10/29/91
5,061,457	07/372,480	10/29/91	5,062,016	07/175,952	10/29/91
5,061,459	07/428,277	10/29/91	5,062,022	07/485,257	10/29/91
5,061,463	07/397,990	10/29/91	5,062,032	07/376,249	10/29/91
5,061,464	07/539,319	10/29/91	5,062,033	07/191,551	10/29/91
5,061,465	07/397,947	10/29/91	5,062,074	07/575,046	10/29/91
5,061,467	07/549,200	10/29/91	5,062,085	06/582,102	10/29/91
5,061,473	07/538,075	10/29/91	5,062,088	07/594,581	10/29/91
5,061,474	07/436,246	10/29/91	5,062,094	07/431,874	10/29/91
5,061,477	07/336,681	10/29/91	5,062,096	07/287,291	10/29/91
5,061,480	07/432,386	10/29/91	5,062,100	07/239,810	10/29/91
			5,062,114	07/558,483	10/29/91

Patent Number	Serial Number	Issue Date	5,062,138	07/494,940	10/29/91
5,062,123	07/394,330	10/29/91	5,062,141	07/361,031	10/29/91
5,062,133	07/376,433	10/29/91	5,062,146	07/420,959	10/29/91
5,062,134	07/583,470	10/29/91			

Patents Reinstated Due to the Acceptance of a Late  
Maintenance Fee From 11/10/95

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,536,840	06/432,135	09/30/82	08/20/85	11/13/95
5,027,862	07/493,627	03/15/90	07/02/91	11/15/95

Patents Reinstated Due to the Acceptance of a Late  
Maintenance Fee From 11/17/95

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
Re. 33,190	07/349,842	05/08/89	04/03/90	11/20/95
4,542,277	06/614,797	05/29/84	09/17/85	11/22/95
4,783,119	07/102,620	09/30/87	11/08/88	11/17/95
4,911,771	07/274,312	11/21/88	03/27/90	11/22/95
4,919,405	07/325,904	03/20/89	04/24/90	11/17/95
4,966,770	07/385,194	07/26/89	10/30/90	11/22/95

Patents Reinstated Due to the Acceptance of a Late  
Maintenance Fee From 11/24/95

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,375,948	06/221,370	12/30/80	03/08/83	11/30/95
4,441,536	06/218,669	12/22/80	11/08/83	11/29/95
4,479,667	06/258,645	04/29/81	10/30/84	11/29/95
4,522,072	06/487,731	04/22/83	06/11/85	11/27/95
4,522,518	06/511,741	07/07/83	06/11/85	12/01/95
4,534,051	06/453,749	12/27/82	08/06/85	11/24/95
4,534,364	06/533,365	09/19/83	08/13/85	11/30/95
4,535,960	06/507,650	06/27/83	08/20/85	11/29/95
4,545,641	06/493,338	05/10/83	10/08/85	11/29/95
4,612,968	06/763,759	08/07/85	09/23/86	11/30/95
4,622,847	06/540,601	10/07/83	11/18/86	11/30/95
4,630,839	06/759,995	07/29/85	12/23/86	11/30/95
4,653,738	06/809,589	12/13/85	03/31/87	11/30/95
4,665,918	06/816,399	01/06/86	05/19/87	11/30/95
4,672,743	06/906,987	09/15/86	06/16/87	11/29/95
4,685,803	06/321,773	01/23/86	08/11/87	11/30/95
4,722,268	06/818,098	01/10/86	02/02/88	11/29/95
4,738,721	06/943,090	12/18/86	04/19/88	11/30/95
4,812,045	07/087,695	08/20/87	03/14/89	11/29/95
4,820,053	07/194,942	05/17/88	04/11/89	11/27/95
4,842,588	07/151,117	02/01/88	06/27/89	11/29/95
4,901,737	07/037,609	04/13/87	02/20/90	11/29/95
4,950,872	07/394,752	08/16/89	08/21/90	11/30/95
4,963,857	07/371,070	06/26/89	10/16/90	11/30/95
4,984,722	07/514,101	04/25/90	01/15/91	11/29/95
4,998,527	07/498,946	03/26/90	03/12/91	11/29/95
5,002,908	07/428,965	10/30/89	03/26/91	11/30/95
5,009,540	07/348,669	04/25/89	04/23/91	11/30/95
5,010,062	07/411,674	09/25/89	04/23/91	11/30/95
5,011,161	07/412,011	09/25/89	04/30/91	11/30/95
5,014,640	07/402,763	09/05/89	05/14/91	11/30/95
5,021,087	07/566,151	08/13/90	06/04/91	11/30/95
5,025,382	07/448,965	12/12/89	06/18/91	11/30/95
5,039,084	07/315,933	02/24/89	08/13/91	11/27/95



## Errata

In the list of patents which expired on December 08, 1992, due to failure to pay maintenance fees, in the O.G. of February 16, 1993, the following patent should not have appeared:

Patent Number	Serial Number	Issue Date	Filing Date
4,790,107	06/921,123	12/13/88	10/21/86

## Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

4,688,745, Re. S.N. 08/545,967, Oct. 20, 1995, Cl. 244/134, SWIRL ANTI-ICE SYSTEM, Herman A. Rosenthal, Owner of Record: *Rohr Industries, Inc., San Diego, Calif.*, Attorney or Agent: Patrick J. Schlesinger, Ex. Gp.: 3105

5,234,166, Re. S.N. 08/513,099, Aug. 9, 1995, Cl. 239/333, SPINNER ASSEMBLY FOR A SPRAYER, Donald D. Foster, et. al., Owner of Record: *Continental Sprayers, Inc., St. Louis, Mo.*, Attorney or Agent: Joseph M. Rolnicki, Ex. Gp.: 3104

5,254,071, Re. S.N. 08/544,094, Oct. 17, 1995, Cl. 493/96, ROTARY FEEDER FOR THE ACCURATE PLACING OF SHEET ELEMENTS ON FLAT SUPPORTS, Francis Laroche, Owner of Record: *Klearfold, Inc., Warrington, Pa.*, *Societe Anonyme Etudes Services Automatismes Techniques Esatec, La Couronne, France*, Attorney or Agent: Stephen B. Goldman, Ex. Gp.: 3205

5,257,788, Re. S.N. 08/549,100, Oct. 27, 1995, Cl. 273/303, SIGNAL-RESISTANT CARD DECK AND DEVICE, Gary A. Robinson, Owner of Record: *Inventor*, Attorney or Agent: Sandra S. Schultz, Ex. Gp.: 3304

5,263,600, Re. S.N. 08/543,295, Oct. 16, 1995, Cl. 215/328, TAMPER-EVIDENT TWIST-OFF CLOSURE, John C. Henning, Owner of Record: *Product Investment, Inc., Cincinnati, Ohio*, Attorney or Agent: David S. Stallard, Ex. Gp.: 3207

5,279,200, Re. S.N. 08/545,132, Oct. 19, 1995, Cl. 89/14.3, BALLISTIC OPTIMIZING SYSTEM FOR RIFLES, Clyde E. Rose, Owner of Record: *Browning, Morgan, Utah*, Attorney or Agent: Joseph A. Walkowski, Ex. Gp.: 2201

5,365,709, Re. S.N. 08/544,858, Oct. 18, 1995, Cl. 52/406, ROOFING MATERIAL WITH NAIL TABS, Robert F. Lassiter, Owner of Record: *Inventor*, Attorney or Agent: Frank S. Vadan, III, Ex. Gp.: 3504

5,372,460, Re. S.N. 08/543,362, Oct. 16, 1995, Cl. 405/129, METHOD OF DISPOSING OF EARTH CONTAMINATED BY PETROLEUM PRODUCTS, Paul A. Ruehl, Owner of Record: *Inventor*, Attorney or Agent: William G. Conger, Ex. Gp.: 3501

5,384,927, Re. S.N. 08/524,842, Sept. 7, 1995, Cl. 5/662, SECURITY RAIL ATTACHMENT, Steve Mardero, et. al., Owner of Record: *Canadian Aging & Rehabilitation Product Development Corp., Manitoba, Canada*, Attorney or Agent: Adrian D. Battison, Ex. Gp.: 3508

5,395,850, Re. S.N. 08/544,943, Oct. 18, 1995, Cl. 514/471, 6,7-EPOXY PACLITAXELS, Gregory Roth, Owner of Record: *Bristol-Myers Squibb Co., New York, N.Y.*, Attorney or Agent: William T. Han Ph.D., Ex. Gp.: 1205

## Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

D. 325,246, Reexam. No. 90/004,041, Nov. 29, 1995, Cl. D23/290, SINK, Bruce M. Sauter, et. al., Owner of Record: *Kohler Co., Kohler, Wis.*, Attorney or Agent: Bruce M. Sauter, Quarles & Brady, Milwaukee, Wis., Ex. Gp.: 2904, Requester: Owner

4,196,901, Reexam. No. 90/004,036, Nov. 22, 1995, Cl. 273/73G, TENNIS RACQUET, Enoch J. Durbin, Owner of Record: *Inventor*, Attorney or Agent: Kenyon & Kenyon, New York, N.Y., Ex. Gp.: 3304, Requester: Owner

4,458,366, Reexam. No. 90/004,044, Dec. 12, 1995, Cl. 623/003, ARTIFICIAL IMPLANTABLE BLOOD PUMP, David C. MacGregor, Owner of Record: *Inventor*, Attorney or Agent: Sim & McBurney, Toronto, Ontario, Canada, Ex. Gp.: 3308, Requester: Owner

4,690,663, Reexam. No. 90/004,038, Dec. 8, 1995, Cl. 474/080, REAR DERAILLEUR FOR A BICYCLE, Masashi Nagano, Owner of Record: *Shimano, Inc., Osaka, Japan*, Attorney or Agent: J. Deland Law Office, San Ramon, Calif., Ex. Gp.: 3506, Requester: Owner

4,725,519, Reexam. No. 90/004,039, Nov. 28, 1995, Cl. 430/058, DUAL LAYER ELECTROPHOTOGRAPHIC PHOTO RECEPTOR COMPRISES TITANIUM PHTHALOCYANINE CHARGE GENERATOR AND HYDRAZONE CHARGE TRANSPORT MATERIALS, Owner of Record: *Mitsubishi Chemical Corp., Tokyo, Japan*, Attorney or Agent: Dike Bronstein Roberts & Cushman, George N. Neuner, Boston, Mass., Ex. Gp.: 1507, Requester: Owner

5,138,967, Reexam. No. 90/004,045, Dec. 12, 1995, Cl. 114/301, MARINE ANCHOR, Philip F. McCarren, et. al., Owner of Record: *Simpson-Lawrence, Ltd., Glasgow, Scotland*, Attorney or Agent: Pennie & Edmonds, New York, N.Y., Ex. Gp.: 3102, Requester: Davis Anchors, Inc., Kent, Wash., c/o H. Jay Spiegel, H. Jay Spiegel & Associates, Alexandria, Va.

5,161,883, Reexam. No. 90/004,042, Dec. 1, 1995, Cl. 362/263, MEANS AND METHOD FOR INCREASING OUTPUT, EFFICIENCY, AND FLEXIBILITY OF USE IN AN ARC LAMP, Myron K. Gordin, et. al., Owner of Record: *Musco Corp., Oskaloosa, Iowa*, Attorney or Agent: Mark D. Hansing, Zarley McKee Thorne Vorhees & Sease, Des Moines, Iowa, Ex. Gp.: 3406, Requester: Owner

5,315,830, Reexam. No. 90/004,040, Nov. 28, 1995, Cl. 062/03.2, MODULAR THERMOELECTRIC ASSEMBLY, Michael J. Doke, et. al., Owner of Record: *Marlow Industries, Inc., Dallas, Tex.*, Attorney or Agent: Thomas R. Felger, Baker & Botts, Dallas, Tex., Ex. Gp.: 3404, Requester: Owner

5,320,797, Reexam. No. 90/004,035, Nov. 21, 1995, Cl. 264/511, METHOD AND APPARATUS FOR THE CONTINUOUS MANUFACTURE OF A COMPOUND PIPE WITH A PIPE SOCKET, Ralph-Peter Helger, et. al., Owner of Record: *Wilhelm Helger, Bad Kissinger, Fed'l Republic of Germany*, Attorney or Agent: Robert F.I. Conte, Laff Whitesel Conte & Saret, Chicago, Ill., Ex. Gp.: 1307, Requester: Maurice U. Cohn, Beveridge De Grandi Weilacher & Young, Washington, D.C.

5,356,254, Reexam. No. 90/004,037, Dec. 6, 1995, Cl. 411/302, HIGH TEMPERATURE SELF-LOCKING THREADED FASTENER, Anthony E. Di Main, et. al., Owner of Record: *Nyllok Fastener Corp., Rochester, Mich.*, Attorney or Agent: Raymond P. Niro, Niro Seavone Haller & Nird, Chicago, Ill.,

Ex. Gp.: 3508, Requester: Thomas P. Liniak Myers Liniak & Berenato, Bethesda, Md.

5,385,770, Reexam. No. 90/004,033, Nov. 17, 1995, Cl. 428/195, METHODS FOR PRODUCING DETECTABLE WARNINGS ON SURFACES AND PRODUCTS THEREOF, Jon N. Julnes, Owner of Record: *Inventor*, Attorney or Agent: Stephen M. Evans, Garrison & Associates, Seattle, Wash., Ex. Gp.: 1513, Requester: Gerald K. White, Morton International, Inc., Chicago, Ill.

5,593,372, Reexam. No. 90/004,034, Nov. 21, 1995, Cl. 216/033, METHOD OF DISPLAYING INDICIA ON FOOTWEAR, Stephen D. Ammon, Owner of Record: *FILA U.S.A., Inc., Hunt Valley, Md.*, Attorney or Agent: Davis Hoxie Faithfull & Hapgood, New York, N.Y., Ex. Gp.: 1104, Requester: Deborah A. Peacock, Peacock & Myers, Albuquerque, N.M.

## Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

## TRADEMARK REGISTRATIONS WHICH EXPIRED OCTOBER 10, 1995 DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date	Reg. Number	Serial Number	Reg. Date
43,969	70/043,969	01/03/1905	71/659,011		01/04/1955
43,977	70/071,509	01/03/1905	71/664,634		01/04/1955
101,615	71/080,976	01/05/1915	71/652,200		01/04/1955
101,625	71/080,719	01/05/1915	71/655,548		01/04/1955
101,662	71/081,114	01/05/1915	71/658,373		01/04/1955
101,699	71/080,638	01/05/1915	71/649,278		01/04/1955
320,443	71/355,110	01/01/1935	71/653,467		01/04/1955
320,445	71/355,086	01/01/1935	71/653,608		01/04/1955
320,486	71/356,395	01/01/1935	71/622,139		01/04/1955
320,504	71/354,774	01/01/1935	71/665,017		01/04/1955
320,544	71/348,312	01/01/1935	71/642,628		01/04/1955
320,567	71/356,146	01/01/1935	71/645,097		01/04/1955
320,591	71/343,609	01/01/1935	71/657,624		01/04/1955
320,593	71/343,254	01/01/1935	71/657,625		01/04/1955
320,626	71/355,359	01/01/1935	71/644,356		01/04/1955
320,629	71/355,285	01/01/1935	71/660,348		01/04/1955
320,634	71/355,154	01/01/1935	71/634,014		01/04/1955
320,644	71/353,468	01/01/1935	71/648,251		01/04/1955
320,691	71/354,978	01/01/1935	71/556,724		01/04/1955
444,807	71/503,735	01/04/1955	71/632,235		01/04/1955
600,189	71/650,006	01/04/1955	71/646,969		01/04/1955
600,198	71/663,394	01/04/1955	71/651,341		01/04/1955
600,204	71/660,746	01/04/1955	71/655,968		01/04/1955
600,205	71/660,956	01/04/1955	71/659,186		01/04/1955
600,207	71/640,722	01/04/1955	71/666,273		01/04/1955
600,221	71/663,605	01/04/1955	71/651,809		01/04/1955
600,223	71/663,871	01/04/1955	71/667,195		01/04/1955
600,225	71/664,106	01/04/1955	71/667,227		01/04/1955
600,231	71/664,717	01/04/1955	71/518,515		01/04/1955
600,232	71/666,887	01/04/1955	71/597,674		01/04/1955
600,241	71/624,321	01/04/1955	71/618,870		01/04/1955
600,248	71/662,572	01/04/1955	71/621,035		01/04/1955
600,250	71/663,727	01/04/1955	71/623,031		01/04/1955
600,252	71/599,816	01/04/1955	71/627,531		01/04/1955
600,258	71/639,681	01/04/1955	71/632,693		01/04/1955
600,262	71/657,465	01/04/1955	71/647,924		01/04/1955
			71/655,024		01/04/1955
			71/661,505		01/04/1955
			71/662,442		01/04/1955
			71/662,977		01/04/1955
			71/648,281		01/04/1955
			71/654,858		01/04/1955
			71/661,516		01/04/1955
			71/619,114		01/04/1955
			71/652,673		01/04/1955
			71/611,141		01/04/1955
			71/632,958		01/04/1955
			71/663,889		01/04/1955
			71/641,451		01/04/1955
			71/668,392		01/04/1955
			71/656,878		01/04/1955
			71/642,756		01/04/1955
			71/649,245		01/04/1955
			71/662,895		01/04/1955
			72/433,250		05/07/1974
			73/014,585		12/31/1974
			73/014,778		12/31/1974
			73/016,644		12/31/1974
			73/011,051		12/31/1974
			73/011,052		12/31/1974
			73/011,109		12/31/1974
			73/012,234		12/31/1974
			73/012,958		12/31/1974
			73/014,132		12/31/1974
			73/014,298		12/31/1974
			73/017,055		12/31/1974
			73/017,063		12/31/1974
			73/004,278		12/31/1974
			73/005,022		12/31/1974
			73/005,023		12/31/1974
			73/007,769		12/31/1974
			73/007,829		12/31/1974
			73/008,518		12/31/1974
			73/010,400		12/31/1974
			73/025,547		12/31/1974
			73/025,755		12/31/1974
			73/026,003		12/31/1974
			73/014,081		12/31/1974
			73/008,711		12/31/1974



1,000,482	73/011,279	12/31/1974	1,000,680	72/463,177	12/31/1974
1,000,486	73/006,534	12/31/1974	1,000,685	72/423,009	12/31/1974
1,000,488	73/010,099	12/31/1974	1,000,686	72/430,148	12/31/1974
1,000,497	73/005,451	12/31/1974	1,000,687	72/430,149	12/31/1974
1,000,499	73/011,506	12/31/1974	1,000,690	72/445,058	12/31/1974
1,000,500	73/001,772	12/31/1974	1,000,691	72/445,226	12/31/1974
1,000,504	73/005,202	12/31/1974	1,000,692	72/449,102	12/31/1974
1,000,505	73/005,226	12/31/1974	1,000,693	72/449,205	12/31/1974
1,000,507	73/006,078	12/31/1974	1,000,694	72/449,831	12/31/1974
1,000,508	73/006,364	12/31/1974	1,000,695	72/450,874	12/31/1974
1,000,511	73/010,850	12/31/1974	1,000,696	72/453,138	12/31/1974
1,000,515	73/021,003	12/31/1974	1,000,697	72/457,664	12/31/1974
1,000,520	73/009,386	12/31/1974	1,000,713	72/464,446	12/31/1974
1,000,522	73/019,560	12/31/1974	1,000,715	72/466,745	12/31/1974
1,000,525	73/002,599	12/31/1974	1,000,718	72/434,229	12/31/1974
1,000,526	73/005,789	12/31/1974	1,000,719	72/438,670	12/31/1974
1,000,528	73/001,801	12/31/1974	1,000,727	72/453,276	12/31/1974
1,000,530	73/015,737	12/31/1974	1,000,729	72/454,276	12/31/1974
1,000,532	73/008,402	12/31/1974	1,000,746	72/441,735	12/31/1974
1,000,534	73/002,513	12/31/1974	1,000,747	72/443,769	12/31/1974
1,000,535	73/004,580	12/31/1974	1,000,748	72/464,579	12/31/1974
1,000,538	73/007,445	12/31/1974	1,000,749	72/410,947	12/31/1974
1,000,539	73/008,316	12/31/1974	1,000,758	72/461,601	12/31/1974
1,000,543	73/021,124	12/31/1974	1,000,761	72/242,018	12/31/1974
1,000,544	73/021,691	12/31/1974	1,000,762	72/323,957	12/31/1974
1,000,546	73/011,024	12/31/1974	1,000,763	72/434,604	12/31/1974
1,000,548	73/011,026	12/31/1974	1,000,764	72/444,514	12/31/1974
1,000,549	73/005,423	12/31/1974	1,000,765	72/446,165	12/31/1974
1,000,552	73/012,498	12/31/1974	1,000,767	72/455,581	12/31/1974
1,000,554	73/021,167	12/31/1974	1,000,770	72/464,780	12/31/1974
1,000,555	73/021,371	12/31/1974	1,000,772	72/465,526	12/31/1974
1,000,557	73/026,880	12/31/1974	1,000,778	72/449,311	12/31/1974
1,000,558	73/006,349	12/31/1974	1,000,779	72/458,743	12/31/1974
1,000,559	73/003,081	12/31/1974	1,000,781	72/396,875	12/31/1974
1,000,562	73/021,203	12/31/1974	1,000,782	72/365,416	12/31/1974
1,000,563	73/021,204	12/31/1974	1,000,786	72/407,990	12/31/1974
1,000,567	73/007,578	12/31/1974	1,000,792	72/458,371	12/31/1974
1,000,568	73/007,584	12/31/1974	1,000,793	72/458,372	12/31/1974
1,000,569	73/014,817	12/31/1974	1,000,794	72/460,613	12/31/1974
1,000,571	73/019,452	12/31/1974	1,000,796	72/463,702	12/31/1974
1,000,573	73/019,704	12/31/1974	1,000,798	72/449,222	12/31/1974
1,000,574	73/020,278	12/31/1974	1,000,800	72/463,591	12/31/1974
1,000,578	73/020,484	12/31/1974	1,000,803	72/446,281	12/31/1974
1,000,582	73/000,538	12/31/1974	1,000,805	72/345,619	12/31/1974
1,000,583	73/008,129	12/31/1974	1,000,813	72/464,710	12/31/1974
1,000,589	73/013,474	12/31/1974	1,000,820	72/461,461	12/31/1974
1,000,591	73/001,164	12/31/1974	1,000,826	72/442,773	12/31/1974
1,000,595	73/013,731	12/31/1974	1,000,829	72/460,997	12/31/1974
1,000,600	73/003,529	12/31/1974	1,000,833	72/466,623	12/31/1974
1,000,603	73/003,091	12/31/1974	1,000,839	72/449,348	12/31/1974
1,000,606	73/020,794	12/31/1974	1,000,840	72/461,446	12/31/1974
1,000,609	73/004,980	12/31/1974	1,000,842	72/454,059	12/31/1974
1,000,610	73/007,998	12/31/1974	1,000,849	73/000,969	12/31/1974
1,000,615	73/009,195	12/31/1974	1,000,850	73/001,316	12/31/1974
1,000,618	73/005,648	12/31/1974	1,000,851	72/464,858	12/31/1974
1,000,619	73/008,901	12/31/1974	1,000,852	72/464,989	12/31/1974
1,000,621	73/009,483	12/31/1974	1,000,853	72/465,080	12/31/1974
1,000,623	73/007,624	12/31/1974	1,000,854	72/447,957	12/31/1974
1,000,624	73/007,627	12/31/1974	1,000,856	72/451,072	12/31/1974
1,000,626	73/012,539	12/31/1974	1,000,858	72/466,470	12/31/1974
1,000,635	72/461,517	12/31/1974			
1,000,636	72/411,832	12/31/1974			
1,000,638	72/447,156	12/31/1974			
1,000,639	72/465,105	12/31/1974			
1,000,640	72/368,131	12/31/1974			
1,000,642	72/436,878	12/31/1974			
1,000,647	72/437,557	12/31/1974			
1,000,650	72/440,440	12/31/1974			
1,000,651	72/440,441	12/31/1974			
1,000,652	72/447,367	12/31/1974			
1,000,654	72/459,795	12/31/1974			
1,000,656	72/462,537	12/31/1974			
1,000,659	72/464,374	12/31/1974			
1,000,660	72/327,564	12/31/1974			
1,000,664	72/460,184	12/31/1974			
1,000,665	72/462,069	12/31/1974			
1,000,667	72/457,128	12/31/1974			
1,000,677	72/392,296	12/31/1974			
1,000,679	72/455,897	12/31/1974			

## Patents Available For License or Sale

08/428,884	LOW-POLLUTION HIGH-POWER EXTERNAL COMBUSTION ENGINE
Contact:	Otto Vance Long L&D Nrg., Inc. P.O. Box 370 Beaver Creek, Oreg. 97004 (voice): (503) 632-7083
08/445,104	OUTDOOR SURVIVAL GARMENT
Contact:	Mrs. Miriam Kea

4,423,523	OVERLAPPING BIBS ON A STRIP
Contact:	B. Liebmann 3 Cumberland Ct. Annapolis, Md. 21401 (voice): (410) 263-1434 (fax): (410) 992-3536
5,072,569	BUILDING PANELS AND METHOD THEREOF
Contact:	Robert C. Martin 1030 Liberty St. Franklin, Pa. 16323 (voice): (814) 432-2181 (fax): (814) 437-3212
5,098,223	GUTTER FERRULE
Contact:	Mr. Mittelstaedt, III Shermeta, Chimko & Kilpatrick, PC P.O. Box 5016 Rochester Hills, Mich. 48308-5016 (voice): (810) 652-8200 (fax): (810) 652-1292
5,144,897	SHIPPING PACKAGE COMBIN- ATION
Contact:	Jim De Cesare Dow Corning Corporation Patent Department-CO1232 Midland, Mich. 48684-0994 (voice): (517) 496-4235 (fax): (517) 496-6354
5,279,557	MULTIPLE CHAMBER IV DELIVERY DEVICE
Contact:	Joe Bryant Lomick 120 Kentington Rd. Durham, N.C. 27713 (voice): (919) 544-2293
5,429,538	MECHANISM CAPABLE OF MAKING VARIATION IN RADIAL ANGLE
Contact:	Chyn-Heng Hwu 901 Communication Bldg., No. 31 Aokuo Rd. Tapei, Taiwan R.O.C. (fax): 88627840375
5,465,686	COLLAPSIBLE HOUSE FOR PETS
Contact:	Steven A. Monetti Steven & Catherine Monetti 14 Crestwood Dr. Mountain Lakes, N.J. 07046 (voice): (201) 586-8827

Department of Commerce  
Patent and Trademark Office37 CFR Part 10  
[Docket No. 9511277-5277-01]  
RIN 0651-AA65Cross-Appeals in Patent and Trademark Office  
Disciplinary Proceedings

Agency: Patent and Trademark Office, Commerce.

## Action: Final Rule.

**Summary:** The Patent and Trademark Office (PTO) is amending a rule of practice in disciplinary cases to provide a time period for filing a cross-appeal to the Commissioner of Patents and Trademarks after the initial decision of the Administrative Law Judge (ALJ). This amendment will simplify the appeals practice in disciplinary cases by eliminating the need to file contingent appeals.

**Effective Date:** January 16, 1996.

**For Further Information Contact:** Karen L. Bovard, 703-308-5316.

**Supplementary Information:** The PTO issued a second notice of proposed rulemaking to amend a rule of practice in practitioner disciplinary proceedings. 60 FR 4395, Jan. 23, 1995. Under the existing practice, after the ALJ's initial decision, a party (either the respondent or the Director of the office of Enrollment and Discipline) might be obliged to file a contingent appeal to protect cross-appealable issues in the event the opposing party filed an appeal. The amended rule provides a time period for the party to file a cross-appeal after the opposing party has appealed to the Commissioner from the ALJ's initial decision.

No comment to the second notice of proposed rulemaking was received. The proposed rule is adopted.

## Other Considerations

This rule change conforms with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Orders 12612 and 12866, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy of the Small Business Administration that the rule change will not have a significant impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of the rule change is to provide a time period to file a cross-appeal in a PTO disciplinary proceeding. See the first notice of proposed rulemaking. 58 FR at 38996.

The PTO has determined that the rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive order 12612. The rule change is not significant for the purposes of Executive Order 12866.

The rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

## List of Subjects in 37 CFR Part 10

Administrative practice and procedure, Inventions and patents, Lawyers, Reporting and recordkeeping requirements.

Pursuant to the authority contained in 35 U.S.C. 6, the PTO amends 37 CFR part 10 as follows:

## Part 10-Representation of Others Before the Patent and Trademark Office

1. The authority citation for 37 CFR part 10 would continue to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

2. Section 10.155 is amended by revising paragraph (a) to read as follows:

## § 10.155 Appeal to the Commissioner.

(a) Within thirty (30) days from the date of the initial decision of the administrative law judge under § 10.154, either party may appeal to the Commissioner. If an appeal is taken, the time for filing a cross-appeal expires (1) 14 days after the date of service of the appeal pursuant to § 10.142 or (2) 30 days after the date of the initial decision of the administrative law judge, whichever is later. An appeal or cross-appeal by the respondent will be filed and served with the Director in duplicate and will include exceptions to the decisions of the adminis-



trative law judge and supporting reasons for those exceptions. If the Director files the appeal or cross-appeal, the Director shall serve on the other party a copy of the appeal or cross-appeal. The other party to an appeal or cross-appeal may file a reply brief. A respondent's reply brief shall be filed and served in duplicate with the Director. The time for filing any reply brief expires thirty (30) days after the date of service pursuant to § 10.142 of an appeal, cross-appeal or copy thereof. If the Director files a reply brief, the Director shall serve on the other party a copy of the reply brief. Upon the filing of an appeal, cross-appeal, if any, and reply briefs, if any, the Director shall transmit the entire record to the Commissioner.

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December 7, 1995

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

#### Service by Publication

A petition to cancel the registrations identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

Simon-Macawber Limited, Heath, Stockport SK3 0RT ENGLAND; Reg. No. 1,073,928, for the mark "DENSE-VEYOR" Canc. No. 23,093.

Sunbeam Corp., Providence, R.I., Reg. No. 641,093, for the mark "AIRJET", Canc. No. 23,248.

JEAN BROWN  
Technical Support Manager,  
Trademark Trial  
and Appeal Board, for  
ROBERT M. ANDERSON  
Deputy Assistant Commissioner  
for Trademarks

#### 37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Sandra J. Croak-Brossman) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The application number is 08/325,023 and was filed on October 18, 1994 in the names of Dennis, Rutherford, Croak-Brossman and Hill for the invention entitled 4 STRAIN DIRECT-FED MICROBIAL.

#### 37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Steve K. Brainerd) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The application number is 08/495,040 and was filed on June 27, 1995 in the names of Brainerd and Rolfsen for the invention entitled IMPROVED METHOD OF LITHOGRAPHY USING RETICLE PATTERNED BLINDERS.

#### 37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Charles J. Arntzen) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The application number is 08/479,742 and was filed on June 7, 1995 in the names of Arntzen and Lam for the invention entitled VACCINES EXPRESSED IN PLANTS.

#### 37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (James C. McClure) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The application number is 08/315,902 and was filed on September 30, 1994 in the names of McClure, McNally, Marks and Strange for the invention entitled PARTS WASHING SYSTEM.

#### 37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Iatneng Chan) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The application number is 08/296,456 and was filed on August 26, 1994 in the names of Xin, Xu, Chan, Salarno and Chan for the invention entitled METHOD OF FABRICATING THIN FILM SUPERCONDUCTING MATERIALS.

#### 37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of the sole inventor. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Martin Alpert) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The application number is 08/294,420 and was filed on August 23, 1994 in the name of Martin Alpert for the invention entitled PERSONAL COMPUTER WITH DICTATION FEATURE.

#### 37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of the sole inventor. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Martin Alpert) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The application number is 08/294,413 and was filed on August 23, 1994 in the name of Martin Alpert for the invention entitled IMPROVED CELLULAR MOBILE TELEPHONE.

#### 37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an application with a petition under 37 CFR 1.47 requesting acceptance of the

application without the signature of the sole inventor. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Martin Alpert) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The application number is 08/294,414 and was filed on August 23, 1994 in the name of Martin Alpert for the invention entitled CELLULAR TELEPHONE WITH ANSWERING MACHINE AND PERSONAL PAGER FEATURES.

#### 37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Joungho Kim) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The application number is 08/271,039 and was filed on July 6, 1994 in the names of Mourou, Son and Kim for the invention entitled PHOTOCONDUCTIVE ELEMENT AND METHOD FOR MEASURING HIGH FREQUENCY SIGNALS.

#### 37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Adam Rachlin) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The application number is 08/159,961 and was filed on November 26, 1993 in the names of Cummings, Cadotte and Rachlin for the invention entitled ULTRA BROADBAND WEAK LINK RF SWITCH.

#### 37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The application has been accorded status under 37 CFR 1.47(a). A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Ronald J. Easton) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The application number is 08/384,770 and was filed on February 7, 1995 in the names of Lauro, Easton, Frisch and Xiao for the invention entitled AQUEOUS COATING COMPOSITION.

#### 37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Joseph A. Kerul) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The application number is 08/406,734 and was filed on March 20, 1995 in the names of Kerul and Ralstin for the invention entitled LEADLESS CHIP CARRIER SOCKET.

#### 37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an application with a copy of a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The

application has been accorded status under 37 CFR 1.47(a). A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Ronald J. Easton) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The application number is 08/384,783 and was filed on February 7, 1995 in the names of Lauro, Easton, Frisch and Xiao for the invention entitled AQUEOUS COATING COMPOSITION.

#### 37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Nghii N. Nguyen) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The application number is 08/431,193 and was filed on April 28, 1995 in the names of Norton, Nguyen, Dahl and Linebarger for the invention entitled APPARATUS AND METHOD FOR CONTROL OF A LANGUAGE MODEL FOR SPEECH RECOGNITION.

#### 37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an application with a copy of a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The application has been accorded status under 37 CFR 1.47(a). A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Ronald J. Easton) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The application number is 08/384,775 and was filed on February 7, 1995 in the names of Lauro, Easton, Frisch and Xiao for the invention entitled AQUEOUS COATING COMPOSITION.

#### 37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an application with a copy of a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The application has been accorded status under 37 CFR 1.47(a). A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Ronald J. Easton) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The application number is 08/384,782 and was filed on February 7, 1995 in the names of Lauro, Easton, Frisch and Xiao for the invention entitled AQUEOUS COATING COMPOSITION.

#### 37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the non-signing inventors. The inventors whose signatures are missing (Jouko Harkonen and Reino Mustalampi) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The application number is 07/699,952 and was filed on May 14, 1991 in the names of Harkonen and Mustalampi for the invention entitled METHOD FOR CONTROLLING A VACUUM CLEANER OR A CENTRAL VACUUM CLEANER.



## Errata

"All reference to Patent No. 5,470,704 to Deborah L. Parkes, et. al., of California for HERPES SIMPLEX VIRUS TYPE 2-GLYCOPROTEIN G PROTEINS AND POLYPEPTIDES appearing in the *Official Gazette* of November 28, 1995 should be deleted since no patent was granted."

Certificate of Correction  
For Week of January 9, 1996

B1 4,678,783	5,254,823	5,339,709	5,391,147	5,418,136	5,439,132	5,444,831	5,452,064
Re. 34,422	5,264,728	5,346,595	5,392,394	5,418,239	5,439,281	5,445,835	5,452,236
D. 353,216	5,283,383	5,353,798	5,394,285	5,419,615	5,439,472	5,446,000	5,452,290
D. 359,489	5,293,096	5,356,904	5,396,286	5,420,012	5,439,504	5,446,554	5,452,729
D. 360,384	5,295,021	5,361,029	5,396,352	5,422,444	5,439,554	5,446,661	5,452,779
D. 362,825	5,296,354	5,365,594	5,396,904	5,422,481	5,439,640	5,446,725	5,452,788
D. 362,901	5,299,708	5,366,887	5,397,896	5,423,676	5,439,749	5,446,945	5,453,521
D. 363,972	5,304,473	5,367,561	5,401,908	5,423,895	5,439,846	5,447,001	5,453,693
4,799,689	5,305,405	5,376,358	5,403,262	5,424,008	5,439,882	5,447,085	5,453,807
5,029,593	5,308,906	5,379,371	5,406,559	5,425,125	5,440,002	5,447,657	5,453,965
5,094,005	5,309,345	5,381,752	5,406,767	5,425,309	5,440,054	5,447,746	5,454,789
5,120,953	5,309,483	5,381,934	5,407,401	5,425,361	5,440,169	5,448,413	5,455,178
5,124,169	5,310,562	5,383,179	5,410,410	5,427,198	5,440,895	5,448,461	5,455,213
5,126,975	5,311,484	5,384,115	5,411,289	5,427,714	5,441,030	5,448,551	5,455,250
5,136,057	5,316,837	5,385,994	5,413,650	5,427,913	5,441,437	5,448,581	5,455,390
5,149,533	5,316,864	5,386,025	5,414,305	5,428,242	5,441,459	5,448,595	5,455,601
5,151,266	5,318,652	5,387,271	5,416,726	5,429,598	5,441,860	5,448,776	5,455,617
5,168,317	5,321,680	5,388,437	5,417,020	5,430,458	5,441,955	5,448,921	5,455,667
5,177,524	5,332,792	5,388,476	5,417,639	5,431,457	5,442,322	5,449,012	5,456,317
5,239,999	5,333,934	5,389,615	5,417,767	5,431,765	5,442,793	5,449,087	5,456,721
5,247,500	5,338,490	5,389,813	5,418,102	5,431,772	5,442,901	5,449,375	5,456,728
				5,432,770	5,443,141	5,449,412	5,458,004
				5,433,196	5,443,185	5,449,488	5,458,845
				5,434,109	5,443,321	5,449,621	5,458,859
				5,434,495	5,443,358	5,449,624	5,459,175
				5,436,701	5,443,494	5,449,697	5,459,237
				5,436,862	5,443,516	5,450,284	5,460,100
				5,436,866	5,443,698	5,450,329	5,460,112
				5,437,571	5,443,742	5,451,463	5,460,972
				5,437,699	5,444,261	5,451,635	5,461,528
				5,438,044	5,444,491	5,451,740	5,461,636
				5,438,528	5,444,555	5,451,815	5,461,768
				5,438,675	5,444,730	5,451,871	5,462,117
				5,438,858	5,444,752	5,451,939	5,462,428

Summary of Final Decisions  
Issued by the  
Trademark Trial and Appeal Board  
September 11-15, 1995

Date Issued	Type of Case <sup>(1)</sup>	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
9-12	EX	74/439,481	Emerson Musical Instruments, Inc.	2(d)	Refusal Affirmed		"LEGACY" [flutes and piccolos]	"LEGACY" [drumheads]	No
9-13	EX	74/340,080	Benthin Management GmbH	2(c)(4)	Refusal Reversed		"BENTHIN" [business consultation and market analysis]		Yes
9-13	EX	74/391,889	ZEHO Hornung & Zeeb GmbH	2(d)	Refusal Affirmed		"EINHORN" [shirts and blouses for men and women]	"PATRICK EINHORN" [men's ladies' and children's shirts, etc.]	No
9-13	EX	74/174,185	Orogenta Ltd.	2(d)	Refusal Affirmed		"OG" [in stylized design] [gold jewelry]	"OG" [jewelry containing opals with or without other genuine stones in 14kt. or 18kt. gold]	No

(1) EX = EX PARTE APPEAL; OPP = OPPOSITION; CANG = CANCELLATION; CU = CONCURRENT USE; (R) = REQ. FOR RECONSIDERATION



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Washington, D.C. 20231

Box Designations	Explanation
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 12	Contributions to the Examiner Education Program.
Box 313b	Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or material related to the Disclosure Document Program.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62).
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box M Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee-Amendment	Non-fee amendments to patent applications.
Box PATENT APPLICATION	(Use Box AF for responses after final rejection).
Box Pat. Ext.	New patent application and associated papers and fees.
Box PCT	Applications for patent term extension.
Box Provisional Patent Application	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reconstruction	The filings of all provisional patent applications and any communications relating thereto.
Box Reexam	Correspondence pertaining to the reconstruction of lost patent files.
Box Sequence	Requests for Reexamination for <i>original</i> request papers <i>only</i> .
Box SN	Submission of diskette for biotechnical application.
	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications <i>prior</i> to the Office's standard notification (return postcard or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

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Box TTAB FEE	Oppositions, Cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions and extension requests.
Box STATUS NO FEE	Written status inquiries.
Box POST REG FEE	Affidavits, renewals, corrections, and amendments.
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Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor <i>except</i> communications relating to <i>pending litigation</i> ; papers relating to pending litigation shall be mailed only to the Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box OED	Mail for the Office of Enrollment and Discipline.



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All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

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State	Name of Library	Telephone Contact
Alabama	Anburn University Libraries	(205) 844-1747
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Alaska	Anchorage: Z.J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 228-7220
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4488
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 640-6249
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette Siegesmund Engineering Library, Purdue University	(317) 494-2872
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University	(316) 689-3155
Kentucky	Louisville Free Public Library	(502) 574-1611
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maine	Orono: Raymond H. Fogler Library, University of Maine	(207) 581-1678
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Library, University of Michigan	(313) 764-5298
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit: Great Lakes Patent and Trademark Center	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	(601) 359-1036
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 445-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
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North Carolina	New York Public Library (The Research Libraries)	(212) 930-0917
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Ohio	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
	Akron: Summit County Public Library	Not Yet Operational
	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	Not Yet Operational
Pennsylvania	Philadelphia: The Free Library of	(215) 686-5331
	Pittsburgh: Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Puerto Rico	Mayaguez General Library, University of Puerto Rico	Not Yet Operational
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Clemson University Libraries	(803) 656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology	(605) 394-6822
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 828-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 286-3051
Wyoming	Casper: Natrona County Public Library	(307) 237-4935



## PATENT EXAMINING CORPS

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 STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy  
 J.O. THOMAS, JR., Deputy Assistant Commissioner for Patent Process Services

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
<b>CHEMICAL EXAMINING GROUPS</b>		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100— JOHN E. KITTLE, Director .....	308-0661	06/16/94
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director .....	308-1235	06/28/94
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—BARRY S. RICHMAN, Director .....	308-0651	08/26/94
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director .....	308-2351	09/15/94
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director .....	308-0196	03/22/94
<b>ELECTRICAL EXAMINING GROUPS</b>		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director .....	308-1782	01/17/94
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director .....	308-0511	05/31/94
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300— BOBBY R. GRAY, Director .....	305-9600	06/23/93
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director .....	305-3800	03/30/94
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500— JANICE A. HOWELL, Director .....	308-0956	05/24/94
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600—NICHOLAS P. GODICI, Director .....	305-4700	04/19/94
DESIGN, GROUP 2900—JOHN E. KITTLE, Director .....	308-0661	05/30/94
<b>MECHANICAL EXAMINING GROUPS</b>		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—F.R. SCHMIDT, Director .....	308-1113	05/12/94
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—CARLTON R. CROYLE, Director .....	308-1148	07/12/94
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director .....	308-0858	09/26/94
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director .....	308-0861	08/25/94
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director .....	308-1021	06/20/94

\*A communication from the examiner should have been received in most applications filed prior to this date.

### Patents will Expire as Follows:

- (1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimer. 35 U.S.C. 154(c)(1).
- (2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
- (3) All design patents are granted for a term of 14 years from the date of the grant. However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

JANUARY 9, 1996

U.S. PATENT AND TRADEMARK OFFICE

1182 OG 527

## TRADEMARK OPERATION

Bruce A. Lehman, Commissioner  
 Philip G. Hampton, II, Assistant Commissioner  
 Robert M. Anderson, Deputy Assistant Commissioner  
 David E. Bucher, Director, Trademark Examining Office  
 Condition of Trademark Applications as of October 1, 1995

Law Office	Oldest Date	
	New*	Amendment Filed
Law Office 101—Ron Sussman, Acting Managing Attorney, (703) 308-9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 .....	03/23/95	05/25/95
Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308-9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 .....	05/23/95	07/03/95
Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308-9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 .....	04/26/95	08/21/95
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308-9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 .....	04/06/95	08/14/95
Law Office 105—Thomas Howell, Managing Attorney, (703) 308-9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 .....	05/23/95	05/01/95
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308-9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 .....	02/14/95	07/03/95
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308-9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 .....	06/02/95	07/24/95
Law Office 108—David Shallant, Managing Attorney, (703) 308-9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 .....	05/15/95	06/17/95
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308-9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 .....	06/30/95	05/30/95
**Collective Marks—Class 200 **Certification Marks—Classes A & B		
Office of Trademark Services—John Walker, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126 Affidavits Under Sections 8 & 15 (All Classes) .....	02/14/95	—0—
Renewals (All Classes) .....	07/25/95	—0—
Section 12(c) Publications (All Classes) .....	04/11/95	—0—

### 1. \*\* Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch tone phone should call (703) 305-8747 through (703) 305-9752 from 6:30 a.m. to Midnight EST, Monday thru Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. \* These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

## REEXAMINATIONS

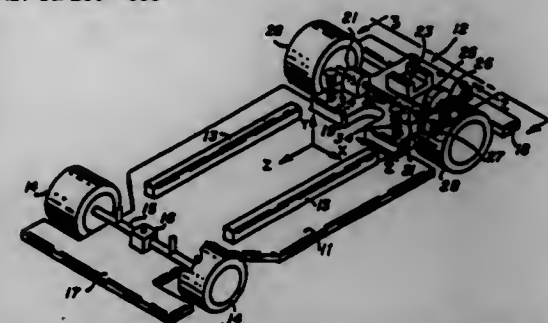
JANUARY 9, 1996

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

**B1 4,159,126 (2768th)**  
**MODEL RACING CAR HAVING AN IMPROVED REAR WHEEL SUSPENSION**  
 Roger W. Raleigh, 530 Alsace Lorraine, Half Moon Bay, Calif. 94109

Reexamination Request No. 90/003,644, Nov. 25, 1994.  
 Reexamination Certificate for Patent 4,159,126, issued Jun. 26, 1979, Ser. No. 851,120, Nov. 14, 1977.  
 Int. Cl.<sup>6</sup> B60G 11/00

U.S. Cl. 280—688



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 2, 3, 5 and 9 is confirmed.

Claims 1, 4 and 8 are cancelled.

Claims 6-7 and 10-11 are determined to be patentable as amended. New claims 12-14 are added and determined to be patentable.

12. In a model racing car wheel suspension system for suspending the motor and wheels from an elongated chassis:

a single support for supporting a motor, a rear axle and a pair of rear wheels mounted to said axle all for spring mounting to the chassis of said model racing car;

first and second coil springs for spring mounting of said support to said chassis in a shock absorbing manner at first and second mounting points located respectively on opposite lateral sides of a longitudinal centerline of said chassis and adjacent said rear axle to permit said support, motor, axle and wheels to move independently of said chassis;

said spring having opposite ends bearing against said chassis and said support, respectively;

mounting means for mounting said support to said chassis at a point longitudinally spaced relative to said first and second coil springs and adjacent said rear axle; and

twistable means operatively associated with said support for permitting twisting of said support about an axis of revolution extending longitudinally of said elongated chassis,

said first and second coil springs each having an axis of maximum compliance extending generally vertically and which further comprises means associated with said springs for restraining lateral movement of said support relative to said chassis.

**B1 4,515,506 (2769th)**  
**PALLET CARGO RESTRAINING DEVICE**  
 James Van Gompel, Fremont, Ind., and Ronald R. Akey, Footville, Wis., assignors to Palla-Gard International, Inc., Appleton, Wis.

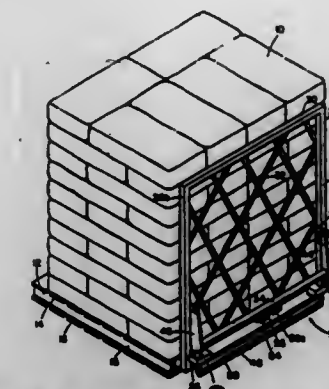
Reexamination Request No. 90/003,741, Feb. 24, 1995.  
 Reexamination Certificate for Patent 4,515,506, issued May 7, 1985, Ser. No. 370,131, Apr. 20, 1982.

Int. Cl.<sup>6</sup> B60P 1/64; 7/10; B61D 45/00

U.S. Cl. 410—46

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-15, 17 and 19 is confirmed.



Claims 16 and 18 are cancelled.

1. A cargo restraining device for restraining a palletized cargo load on the underlying support floor of a vehicular carrier; said device comprising:

(a) a platform for receiving a pallet with a cargo load thereupon, said pallet being of the type including an upper load supporting surface and a lower surface separated from the upper surface by cross-ties, said platform being adapted for receipt between said upper and lower surfaces;

(b) a substantially vertical frame extending upwardly from one end of said platform;

(c) a horizontally-extending frictional member being pivotally connected to said frame and movable at the side of said frame which faces away from said platform, between a withdrawn position whereat the bottom of said member resides above the bottom of said pallet, and an extended position whereat the bottom of said frictional member extends beneath the bottom of said pallet and is displaced laterally away from said vertical frame and platform, the engagement of said member with said underlying support floor thereby effecting vertical tipping of said device away from the zone of engagement of said member with said floor, to thereby generate an increased contact force between the underlying support floor and the said horizontal frictional member, thereby restraining lateral relative movement between said pallet-carrying device and said floor;

(d) handle means movable between first and second positions, for moving said horizontally-extending frictional member between said withdrawn and extended positions, said handle means being connected to said frame and said horizontally-extending member by a double pivot, which locks said member in its extended position when said handle means is at said second position; and

(e) means for releasably engaging said pallet, when said pallet is placed on said platform, thereby preventing movement of said pallet with respect to said platform and restraining device.

**B1 4,550,270 (2770th)**  
**TUNGSTEN HALOGEN LAMP HAVING A FINE-WIRE FILAMENT AND A HYDROGEN-IMPERVIOUS ENVELOPE**

Stephen F. Kimball, No. Andover; Emery G. Audesse, Beverly, and Robert M. Griffin, So. Hamilton, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Reexamination Request No. 90/003,704, Jan. 27, 1995.  
 Reexamination Certificate for Patent 4,550,270, issued Oct. 29, 1985, Ser. No. 490,603, May 2, 1983.

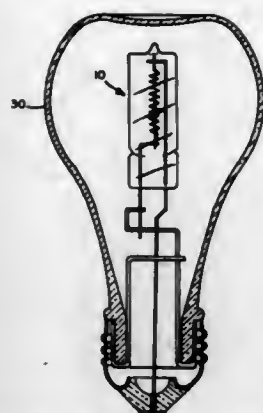
Int. Cl.<sup>6</sup> H01K 1/08

U.S. Cl. 313—579

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 1 is determined to be patentable as amended.





Claims 2-4, dependent on an amended claim, are determined to be patentable.

New Claims 5-9 are added and determined to be patentable.

1. A tungsten-halogen lamp comprising:

- (a) an envelope enclosing a hermetically sealed cavity, said envelope being impervious to hydrogen;
- (b) a fine-wire filament comprising tungsten operatively mounted with said hermetically sealed cavity, said fine-wire filament having a diameter of approximately 0.003 inches or less, said lamp being operable on line voltage, having a power rating of 150 watts or less and having an acceptably long mean lamp life; and
- (c) a fill within said hermetically sealed cavity, said fill comprising a halogen and hydrogen.

B1 4,832,506 (2771th)

# **FLEXIBLE CONTAINER TO BE FILLED WITH BULK MATERIAL AND METHOD FOR ITS MANUFACTURE**

Anders Juel, and Bjarne Omdal, both of Porsgrunn, Norway, assignors to Norsk Hydro A.S., Oslo, Norway

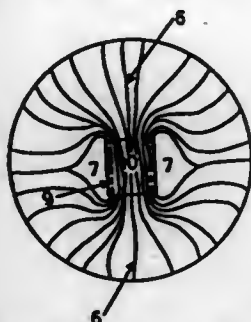
Reexamination Request No. 90/003,694, Jan. 18, 1995.

Reexamination Certificate for Patent 4,832,506, issued May 23, 1989, Ser. No. 792,171, Oct. 25, 1985.

Continuation of Ser. No. 580,557, Feb. 14, 1984, abandoned. Claims priority, application Norway, Mar. 2, 1983, 830718

Int. Cl.<sup>6</sup> B65D 33/06

U.S. Cl. 383-17



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 1 is determined to be patentable as amended.

Claims 2-10, dependent on an amended claim, are determined to be patentable.

1. In [a] an empty flexible container to be filled subsequent to the manufacture thereof with bulk material and for the transportation thereof, said flexible container being of the type formed by a single piece of material and including a bottom, a top and side

walls, with two opposite openings in top portions of said side walls below said top, the improvement comprising:

- the material of said top above said openings being folded or gathered in directions from said opposite openings toward the center of said top, thereby forming a single integral lifting loop extending over the center of said container between said opposite openings; and
- means joining the thus folded or gathered material at an uppermost lifting area of said lifting loop above said openings, thereby forming a permanent lifting handle enabling said flexible container to be lifted or supported during a subsequent filling operation.

B1 4,893,107 (2772th)

# **AXIAL MINIATURE FUSE WITH PLASTIC MOLDED BODY**

John M. Moner, Ballwin, Mo., assignor to Cooper Industries, Inc., Houston, Tex.

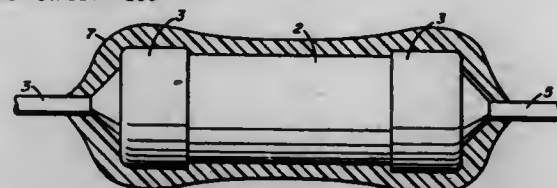
Reexamination Request No. 90/003,428, May 10, 1994.

Reexamination Certificate for Patent 4,893,107, issued Jan. 9, 1990, Ser. No. 139,359, Dec. 30, 1987.

Continuation-in-part of Ser. No. 31,489, Mar. 27, 1987, abandoned.

Int. Cl.<sup>6</sup> H01H 85/02

U.S. Cl. 337-186



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 4 is cancelled.

Claims 1 and 3 are determined to be patentable as amended.

Claims 2 and 5-13, dependent on an amended claim, are determined to be patentable.

1. A fuse comprising:
  - an oppositely open ended insulating housing in the form of a cylindrical sleeve;
  - a fusible element disposed within said housing; and
  - a pair of end cap means closing the ends of said sleeve, securing the ends of said fusible element and making electrical contact thereto, each of said cap means being cup-shaped to provide a cylindrical recess to accommodate an end of said sleeve and having an external lead connected thereto and extending outwardly therefrom for making external electrical connection to said fusible element; each of said cap means containing a quantity of solder fused to make electrical contact between said end cap means and said ends of said fusible element, said fusible element extending diagonally across the length of said sleeve housing and having a portion of each of its ends exiting the open ends of said sleeve and folded back over a portion of the external surface of said sleeve to be located between the sleeve ends and the end cap means; and
- an injection-molded insulating high temperature, resilient coating layer disposed over said sleeve, end cap means and leads to cover, seal, and physically interconnect the exposed exterior surfaces of said sleeve, said pair of end cap means, and a portion of each of said leads adjacent to said pair of end cap means, said quantity of solder which makes said electrical contact between said end cap means and said ends of said fusible element defining a reflowed solder joint reflowed by heat from said injection-molded layer.

## **REISSUES**

JANUARY 9, 1996

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,140

# **BLOW MOLDED BOTTLE WITH IMPROVED SELF SUPPORTING BASE**

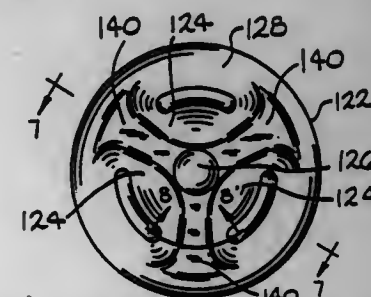
Thomas F. Powers, Jr., St. Francisville, La., assignor to Hoover Universal, Inc., Plymouth, Mich.

Original No. 4,867,323, dated Sep. 19, 1989, Ser. No. 219,732, Jul. 15, 1988. Application for reissue Sep. 17, 1991, Ser. No. 761,405

Int. Cl.<sup>6</sup> B65D 1/02

U.S. Cl. 215-375

11 Claims



9. A plastic bottle having a hollow body with a generally cylindrical side wall and a base structure merging with said side wall, said base structure comprising:

- an upwardly concave inner wall having a centrally located apex and extending downwardly and radially outwardly from said apex to an annular lower end;
- a convex outer wall of annular shape surrounding said inner wall, said outer wall having an upper end merging with said side wall and extending downwardly and inwardly to an annular lower end;
- an intermediate wall connecting the lower end of said inner wall with the lower end of said outer wall and including a bearing surface at the lower most point of said base structure for contact with a supporting surface, said intermediate wall and said concave inner wall being inclined relative to each other at said bearing surface and adjacent said lower end of said inner wall, when viewed in vertical section, so as to form a corner directed interiorly of said bottle directly above said bearing surface to stiffen and resist deformation of said base structure; and
- a plurality of radially outwardly extending ribs in said base structure, said ribs projecting upwardly and interrupting said intermediate wall and at least a portion of said outer wall so as to form in said base structure a plurality of circumferentially spaced apart hollow feet located below said ribs, said ribs being smoothly continuous over substantially the entire lengths thereof and merging with said outer wall at the radially outer ends of said ribs.

Re. 35,141

# **SUBSTRATE BIAS GENERATING CIRCUIT**

Hideyuki Ozaki; Kazuyasu Fujishima, and Kazuhiro Shimotori, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Original No. 4,455,628, dated Jun. 19, 1984, Ser. No. 439,215, Nov. 4, 1982. Application for reissue Oct. 29, 1993, Ser. No. 142,931

Claims priority, application Japan, Dec. 17, 1981, 56-204658

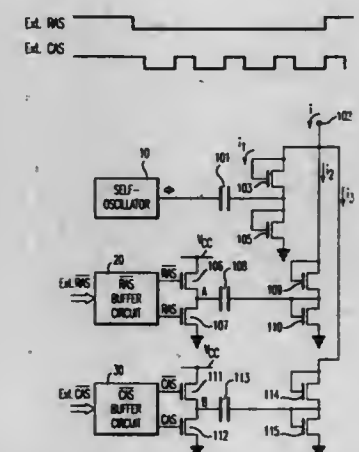
Int. Cl.<sup>6</sup> G11C 7/00

U.S. Cl. 365-226

4 Claims

1. A substrate bias generating device included in a dynamic type random access memory, comprising:

- a self-oscillator generating a periodic output;



a first capacitor having a first electrode connected with an output terminal of said self-oscillator;

a first rectifier circuit having a first terminal connected with a second electrode of said first capacitor and a second terminal which is connected with [said] an output terminal of said substrate bias generating device;

a charge pump circuit of RAS line including a second capacitor having a first electrode which receives a signal synchronized with an external RAS signal supplied from outside to said random access memory, and a second rectifier circuit having a first terminal connected with a second electrode of said second capacitor and a second terminal which is connected with [said] the output terminal of said substrate bias generating device; and

a charge pump circuit of CAS line including a third capacitor having a first electrode which receives a signal synchronized with an external CAS signal supplied from outside to said random access memory, and a third rectifier circuit having a first terminal connected with a second electrode of said third capacitor and a [third] second terminal which is connected with [said] the output terminal of said substrate bias generating device.

Re. 35,142

# **FLUORESCENT LAMP HAVING THREE ELECTRODES FOR STARTING AT LOW TEMPERATURES**

Ryoji Kikuchi; Shinyu Ikeda, and Masataka Nishiyama, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Original No. 5,081,395, dated Jan. 14, 1992, Ser. No. 368,512, Jun. 20, 1989. Application for reissue Jan. 13, 1994, Ser. No. 205,241

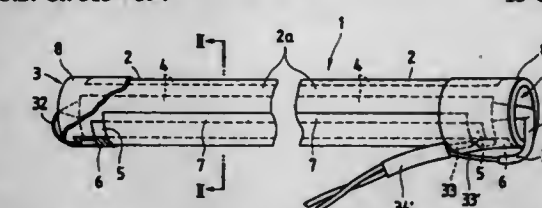
Claims priority, application Japan, Jun. 20, 1988, 63-82246

U

Int. Cl.<sup>6</sup> H01J 5/46; 61/54; 65/00

U.S. Cl. 313-594

13 Claims



1. A fluorescent lamp comprising: a glass tube, a gas under a low pressure sealed in said glass tube; first and second electrodes

mounted at respective opposite ends of said glass tube; a fluorescent material provided on an inner surface of said glass tube, said fluorescent material being caused to emit light by a discharge between said first and second electrodes; and a third electrode provided between said first and second electrodes, said third electrode being connected to said first electrode, wherein said third electrode comprises a layer of aluminum bonded to an outer surface of said glass tube in a region excluding a light-applying aperture of said tube, and a layer of copper bonded to an outer surface of said layer of aluminum.

Re. 35,143

## ZIRCONIUM OXIDE FIBERS AND PROCESS FOR THEIR PREPARATION

Eric F. Funkenbusch, White Bear Lake, and Tai T. Tran, Bloomington, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Original No. 4,937,212, dated Jun. 26, 1990, Ser. No. 286,654, Dec. 19, 1988. Application for reissue Apr. 20, 1994, Ser. No. 230,480

Int. Cl.<sup>6</sup> C04B 35/48

U.S. Cl. 501—95 20 Claims

16. A process of making a ceramic fiber containing crystalline zirconia grains comprising the steps of:

- (a) mixing crystalline, colloidal zirconia particles, at least one soluble zirconia compound, and solvent;
- (b) concentrating said mixture;
- (c) extruding or blowing [said fiber to provide] a green fiber from said mixture; and
- (d) heating said green fiber to a temperature in the range of 400° to 2000° C. in an oxygen-containing atmosphere to provide said ceramic fiber [containing crystalline colloidal zirconia particles].

Re. 35,144

## THIXOTROPIC ADHESIVE GEL

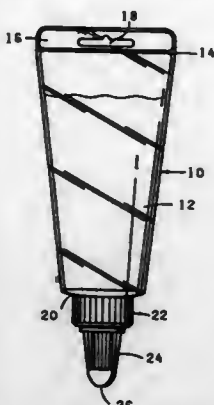
Peter S. Columbus, Melville, N.Y.; John Anderson, Hilliard, and Yogeshbhai B. Patel, Gahanna, both of Ohio, assignors to Borden, Inc., Columbus, Ohio

Original No. 5,322,880, dated Jun. 21, 1994, Ser. No. 150,435, Nov. 10, 1993. Division of Ser. No. 976,553, Nov. 16, 1992, Pat. No. 5,284,897. Application for reissue Aug. 15, 1994, Ser. No. 290,636

The portion of the term of this patent subsequent to Dec. 5, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> C08F 2/16; C08K 3/20; C08L 9/04

U.S. Cl. 524—459 16 Claims



1. An article of [manufacturing] manufacture comprising:
  - A. a flexible dispenser wherein the dispenser has a dispensing opening of from about [0.011 to 0.12] 0.0028 to about 0.018 square inches and contains a clear adhesive gel which can be dispensed therefrom by finger-pressure to form a glue line which does not run when extruded on paper in a vertical position;

B. said clear adhesive gel comprising:

- (1) about 70% to 93% of water;
- (2) about 5% to 25% of a partially hydrolyzed polyvinyl alcohol;
- (3) about 0.5% to 3% of a water soluble plasticizer for the polyvinyl alcohol;
- (4) a water soluble defoamer in an amount sufficient to prevent air bubbles from destroying the clarity of the gel; and
- (5) a water soluble thickening agent polymer compatible with the polyvinyl alcohol and in an amount sufficient to provide the gel with a thixotropic index of about 1.5 to 4.5, said thickening agent selected from the group consisting of sodium carboxymethylcellulose, sodium alginate and xanthan gum.

Re. 35,145

## SUBSTITUTED PHTHALOCYANINE

William Stark, Glasgow, Scotland; Nigel Hughes, Oldham, and Donald M. Gunn, Stockport, both of, England, assignors to Zeneca Limited, London, England

Original No. 4,824,948, dated Apr. 25, 1989, Ser. No. 162,513, Mar. 1, 1988. Application for reissue Oct. 25, 1993, Ser. No. 140,547

Claims priority, application United Kingdom, Mar. 10, 1987, 8705575.

Int. Cl.<sup>6</sup> C07D 487/22; C09B 47/04; 47/30

U.S. Cl. 540—125 6 Claims

1. A phthalocyanine compound of the formula:



wherein

Pc is a phthalocyanine nucleus (Pc);  
each R independently is a monovalent aromatic radical linked to a peripheral carbon atom of the Pc nucleus through X selected from phenyl, naphthyl, thienyl, furyl, pyrrol, thiazolyl, isothiazolyl, quinolyl, indolyl, pyridyl, benzimidazolyl and benzothiazolyl each of which is unsubstituted or substituted by up to 3 substituents selected from C<sub>1-20</sub>-alkyl, C<sub>1-20</sub>-alkoxy, S-C<sub>1-20</sub>-alkyl, halogen, aryl, S-aryl, nitro, cyano, di-N-alkylamino, N-alkyl-N-arylamino, di-N-arylamino, COOH, COT<sup>1</sup>, CONT<sup>1</sup>T<sup>2</sup>, SO<sub>2</sub>T<sup>1</sup> and SO<sub>2</sub>NT<sup>1</sup>T<sup>2</sup> in which T<sup>1</sup> and T<sup>2</sup> are selected from H, alkyl, aryl and aralkyl;

X selected from S, Se and Te;

m is 4 to 16;

each R<sup>1</sup> independently is a divalent aromatic radical linked to two adjacent peripheral carbon atoms of the Pc nucleus through Y and Z selected from phenylene, naphthylene, substituted phenylene and substituted naphthylene in which the substituents are selected from C<sub>1-20</sub>-alkyl, C<sub>1-20</sub>-alkoxy, S-C<sub>1-20</sub>-alkyl, halogen, aryl, S-aryl, nitro, cyano, di-N-alkylamino, N-alkyl-N-arylamino, di-N-arylamino, COOH, COT<sup>1</sup>, CONT<sup>1</sup>T<sup>2</sup>, SO<sub>2</sub>T<sup>1</sup> and SO<sub>2</sub>NT<sup>1</sup>T<sup>2</sup> in which T<sup>1</sup> and T<sup>2</sup> are selected from H, alkyl, aryl and aralkyl;

Y is selected from S, NT, Se and Te;

Z is selected from S, Se, Te, NT and O;

T is selected from H, alkyl and aryl;

n is 0 to [7] 6;

2n+m is 13 to 16;

M is selected from H; a metal; ammonium; substituted ammonium of the formula NQ<sub>4</sub> in which at least one Q is a C<sub>6-20</sub>-fatty aliphatic group or two Qs together with the nitrogen atom, form a heterocyclic or heteroaromatic group selected from pyridino, piperidino and morpholino and the other two or three Qs are each independently selected from H, C<sub>1-4</sub>-alkyl, phenyl and benzyl; and diarylguanidinium of the formula:

T<sup>3</sup>-NH-C(NHT<sup>4</sup>)-NH-T<sup>3</sup> in which each T<sup>3</sup> is phenyl or C<sub>1-4</sub>-alkylphenyl and T<sup>4</sup> is H or C<sub>1-4</sub>-alkyl; and p is from 1 to 16.

## PLANT PATENTS

GRANTED JANUARY 9, 1996

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,419

## MINIATURE ROSE PLANT NAMED 'POULIT'

Mogens N. Olesen, and Pernille Olesen, both of Fredensborg, Denmark, assignors to Weeks Wholesale Rose Grower, Inc., Upland, Calif.

Filed Jan. 3, 1995, Ser. No. 367,812

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—9

1 Claim

1. A new and distinct variety of miniature rose plant substantially as described and illustrated herein.

9,420

## MINIATURE ROSE PLANT NAMED 'POULXAS'

Mogens N. Olesen, and Pernille Olesen, both of Fredensborg, Denmark, assignors to Weeks Wholesale Rose Grower, Inc., Upland, Calif.

Filed Jan. 3, 1995, Ser. No. 367,811

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—10.1

1 Claim

1. A new and distinct variety of miniature rose plant substantially as described and illustrated herein.

9,421

## HYBRID TEA ROSE PLANT NAMED 'RUICREVI'

A. A. Pouw, Hazerswoude, Netherlands, assignor to De Ruiter's Nieuwe Rozen B.V., Netherlands

Filed Jan. 27, 1995, Ser. No. 379,272

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—14

1 Claim

1. A new and distinct variety of rose plant of the hybrid tea rose class, substantially as shown and described.

9,422

## HYBRID TEA ROSE PLANT NAMED 'JACMEM'

Keith W. Zary, Thousand Oaks, Calif., assignor to Bear Creek Gardens, Inc., Medford, Oreg.

Filed Feb. 9, 1995, Ser. No. 382,866

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—15

1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its novel flower color; its dark green, glossy, powdery mildew resistant foliage; its

9,423

## CHRYSANTHEMUM PLANT NAMED 'SOFT VOLARE'

Cornelis P. Vandenberg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Jul. 21, 1994, Ser. No. 277,284

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—82.4

1 Claim

1. A new and distinct Chrysanthemum plant named Soft Volare, as described and illustrated.

9,424

## KALANCHOE PLANT NAMED 'JAQUELINE'

Knud Jepsen, Hinnerup, Denmark, assignor to Knud Jepsen A/S, Hinnerup, Denmark

Filed Jan. 23, 1995, Ser. No. 376,931

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—87.15

1 Claim

1. A new and distinct Kalanchoe plant named Jaqueline, as described and illustrated.

9,425

## DIEFFENBACHIA PLANT NAMED TROPIC FOREST

Edwin J. Frazer, Kenmore, Australia, assignor to Twyford International Inc., Sebring, Fla.

Filed Jan. 19, 1995, Ser. No. 374,858

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—88.2

1 Claim

1. A new and distinct cultivar of Dieffenbachia plant named Tropic Forest, as illustrated and described.

9,426

## GUZMANIA PLANT NAMED TORCH

Gerardus J. Bak, Assendelft; Nicholas D. Steur, Oude Nledorp, and Elly Bak, Rijenbont, all of, Netherlands, assignors to Corn Bak B.V., Assendelft, Netherlands

Filed Dec. 29, 1994, Ser. No. 366,607

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Plt.—88.8

1 Claim

1. A new and distinct cultivar of Guzmania plant named 'Torch', as illustrated and described.



**PATENTS**  
**GRANTED JAN. 9, 1996**

**ERRATA**

<b>For CLASS</b>	<b>See PATENT NO.</b>
249-286 .....	5,481,817
451-075 .....	5,481,832
600-109 .....	5,482,029
137-135 .....	5,482,067
160-170 .....	5,482,100
164-312 .....	5,482,101
198-403 .....	5,482,140
473-032 .....	5,482,268
132-323 .....	5,482,466
434-272 .....	5,482,472
139-383 .....	5,482,567
149-083 .....	5,482,579
562-406 .....	5,482,596
502-402 .....	5,482,906
502-404 .....	5,482,914
502-417 .....	5,482,915
505-123 .....	5,482,917
505-440 .....	5,482,918
310-052 .....	5,482,919
354-010 .....	5,483,306
355-053 .....	5,483,311
369-013 .....	5,483,504
385-115 .....	5,483,623
385-142 .....	5,483,628

# PATENTS

GRANTED JANUARY 9, 1996

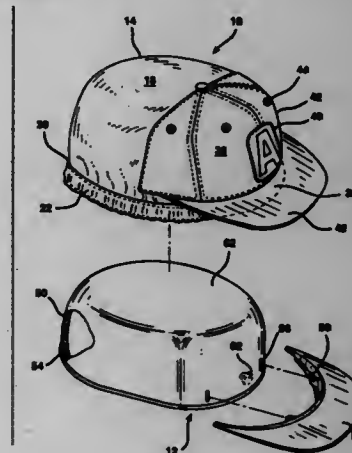
## GENERAL AND MECHANICAL

5,481,758  
**GARMENT HAVING A MESSAGE RELATING TO  
 MONEY PRINTED THEREON AND ADJACENT TO A  
 REPRODUCTION OF PAPER MONEY ATTACHED  
 THERETO**  
 Linda S. Gabler, 1566 Hummingbird Cir., Yardley, Pa. 19067  
 Filed Oct. 11, 1994, Ser. No. 320,868  
 Int. Cl.<sup>6</sup> A41B 1/00  
 U.S. Cl. 2—115 13 Claims



1. A message garment comprised of an article of clothing, a reproduction of paper money and a message; said reproduction of paper money having the appearance of real paper money when viewed from a distance at which a viewer will normally observe the garment on a wearer, said reproduction of paper money being formed on a separate fabric substrate and being secured to a surface of the article of clothing which will be exposed when the garment is worn; and said reproduction of paper money being positioned on the article of clothing at a location where it appears that the reproduction of the paper money is extending from and separate from the article of clothing; and said message being applied to the surface of the article of clothing which will be exposed and being in sufficiently close proximity to the reproduction of the paper money to cause a viewer when focused on the reproduction of the paper to also focus on the message.

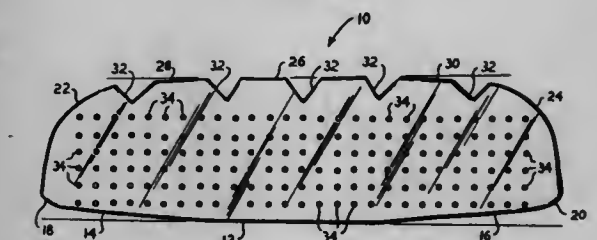
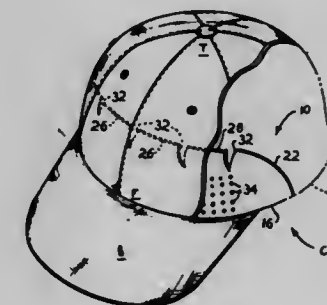
5,481,759  
**EXPANDABLE BASEBALL HAT AND COVER**  
 Robert Rinaldi, 139 S. Ridgedale Ave., E. Hanover, N.J. 07937  
 Filed Dec. 3, 1993, Ser. No. 161,924  
 Int. Cl.<sup>6</sup> A42B 1/00  
 U.S. Cl. 2—195.1 23 Claims



11. An expandable hat comprising:

a first flexible material to fit a wearer's head, said first flexible material having:  
 a front portion,  
 a rear portion,  
 a first inner surface which includes first and second tab members, said first and second tab members having coacting fastening means and being disposed at said rear portion of said first inner surface for releasable engagement with each other to gather said first flexible material,  
 a first outer surface, and  
 a peripheral edge forming a skirt, said skirt having fastening means disposed thereon at said front portion; and  
 a second flexible material having:  
 holes for ventilation,  
 a second inner surface,  
 a second outer surface,  
 wherein said second inner surface of said second flexible material is secured to said first outer surface of said first flexible material at said front portion, said skirt releasably securing said first flexible material to the wearer's head, and said coacting fastening means of said first and second tab members being engaged to gather said first flexible material to snugly conform to the wearer's head, and  
 a visor portion.

5,481,760  
**CAP BLOCKER**  
 William J. C. Wood, Jr., 4906 Salina St., Clinton, Md. 20735  
 Filed Aug. 18, 1994, Ser. No. 294,848  
 Int. Cl.<sup>6</sup> A42B 1/02  
 U.S. Cl. 2—195.5 14 Claims



1. A cap blocker comprising:  
 a single planar sheet of flexible, resilient material having central, left and right lower edge portions, corresponding central, left and right upper edge portions, and left and right curved lower end portions and left and right curved upper end portions, said upper end portions having a larger radius of curvature than said lower end portions;  
 said cap blocker being adapted for installation within the front portion of a billed cap and extending upward therein to preclude the deformation thereof, with said lower edge portions of said cap blocker being adapted for insertion between



the outer material and the underlying head band of the billed cap and retained therein while the cap is worn by a wearer thereof, whereby;  
said cap blocker is installed within the billed cap to provide for the continuous blocking of the front portion of the cap and to preclude any deformation of the front portion of the cap while the cap is being worn.

5,481,761

## SLEEVE SUPPORT

Cheryle Lichtl, 14311 - 117 Street, Edmonton, Alberta T5X 1N3, Canada

Filed Sep. 12, 1994, Ser. No. 302,023

Int. Cl.<sup>6</sup> A41D 27/26

U.S. Cl. 2-268

6 Claims



1. A sleeve stay comprising elongated, fabric panel means, said panel means including a first straight edge and a second convex edge opposite said first edge; resilient arcuate strip means connected to said first edge, said strip means and said panel means curving, whereby said first edge and said strip means define a segment of a circle and said panel means defines an arch, said first edge defining the outer edge of the arch when the stay is mounted in a sleeve, said strip means imparting sufficient rigidity to the arch to support the sleeve of a garment; and a plurality of pleats in said second edge extending towards said first edge and imparting puffiness to the stay.

5,481,762

## HELMET HAVING A PLANAR-MOLDED INFRASTRUCTURE

James J. Gentes, Soquel, and Steven K. Sasaki, Santa Cruz, both of Calif., assignors to Giro Sport Design, Inc., Santa Cruz, Calif.

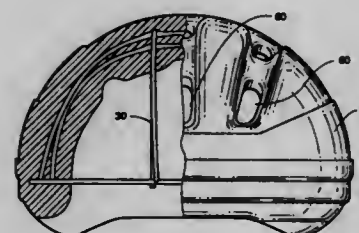
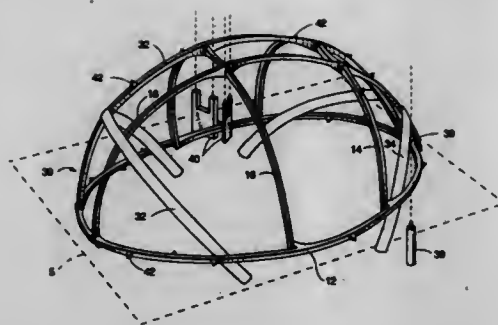
Filed Jan. 25, 1989, Ser. No. 301,696

Int. Cl.<sup>6</sup> A42B 3/04

U.S. Cl. 2-411

42 Claims

1. An injection molded helmet, comprising:  
a generally dome-shaped frame including a generally annular body and an integrally formed generally arced first rib extending between at least two points on said body; and  
an injection molded material substantially formed about said frame so as to form said helmet.



5,481,763

## MOLDED HEAD HARNESS

Gerald M. Brostrom, Burnsville, Minn., and David C. Byram, River Falls, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

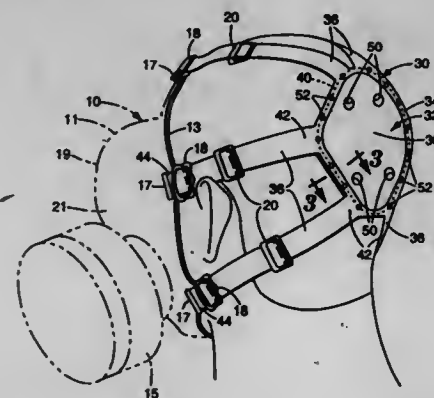
Division of Ser. No. 10,546, Jan. 28, 1993, Pat. No. 5,394,568.

This application Dec. 7, 1994, Ser. No. 350,793

Int. Cl.<sup>6</sup> A62B 18/08; B29D 5/00

U.S. Cl. 2-452

9 Claims



1. A process for making a head harness which is adapted for use in securing a respirator mask to the face of a wearer, comprising the steps of:

- inserting a moldable web into a mold, the web comprising a central portion and a peripheral portion extending at least partially around the central portion, the mold being adapted to receive the web as an insert and having a mold cavity shaped to permit the molding of a plurality of elastomeric fastening straps formed integrally with the peripheral portion of the web;
- positioning and securing the web within the mold so that the peripheral portion of the web can extend into the mold cavity during the molding process;
- clamping the blocks of the mold together at a suitable clamping pressure to thereby clamp the central portion of the web;
- contacting the peripheral portion of the web with a molten elastomeric resin in a quantity sufficient to embed the peripheral portion of the web in the molten resin and form a plurality of elastomeric fastening straps which are integral with the peripheral portion of the web;

- maintaining suitable pressure and temperature in the mold for a time sufficient to cure the resin and thereby form the head harness;
- releasing the clamping pressure of the mold blocks; and
- removing the head harness from the mold.

5,481,764

## UNDERWATER SEAT RESTRAINT APPARATUS

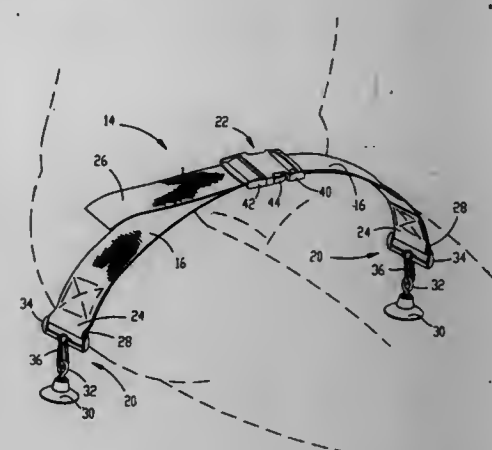
Robert K. Nelson, 2025 E. Timberhill Pl., Springfield, Mo. 65804

Filed Jun. 28, 1994, Ser. No. 267,882

Int. Cl.<sup>6</sup> A47K 3/00

U.S. Cl. 4-559

5 Claims



1. A seat restraint apparatus for use in restraining movement of a bather within a bath or spa, wherein the bath or spa includes a support surface that is normally submerged in water during use, the apparatus comprising:

- a seat belt including a pair of elongated, pliable straps, each having opposed first and second axial ends;
- a buckle for fastening the straps together at a point intermediate the first and second ends of each strap, the buckle including a pair of buckle members, one member of said pair of buckle members being supported on each of the straps;
- an attachment means for attaching the first axial end of each strap to the support surface, the attachment means including a pair of suction cups, one of said pair connected to the first end of each one of the straps by one of a pair of clips, and each clip releasably connecting a suction cup to a strap so that it is possible to release the bather from the support surface by disconnection of said buckle members or disconnection of one of the clips from a respective suction cup.

5,481,765

## ADJUSTABLE SHOWER HEAD HOLDER

Wen-Mu Wang, No. 32, Lane 266, Fu Te 1 Rd., Hsi Tze Chen, Taipei Hsien, Taiwan, Prov. of China

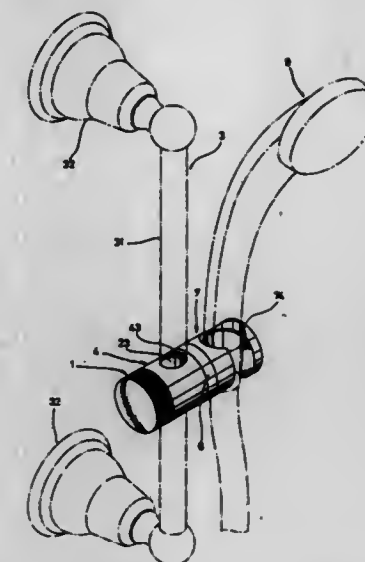
Filed Nov. 29, 1994, Ser. No. 350,071

Int. Cl.<sup>6</sup> A47K 3/22

U.S. Cl. 4-605

2 Claims

1. An adjustable shower head holder comprising:
- a rack having two wall mounting devices fixedly fastened to a wall and a hanging rod connected between said wall mounting devices;
  - a socket mounted around said hanging rod, said socket comprising a longitudinal coupling hole at one end, a longitudinal axle hole at an opposite end communicated with said longitudinal coupling hole, an annular groove around said longitudinal axle hole, and a latitudinal through hole intersecting said longitudinal coupling hole, which receives said hanging rod;



a mounting block mounted around said hanging rod and received in said socket, said mounting block comprising a longitudinal center through hole, an outer thread around said longitudinal center through hole at one end, a latitudinal through hole intersecting said longitudinal center through hole, which receives said hanging rod, and an inside annular flange concentrically disposed inside said longitudinal center through hole;

an adjustment knob having an inside tube inserted into the longitudinal center through hole of said mounting block, and an inner thread spaced around said inside tube and threaded onto said outer thread of said mounting block;

a holding down bolt received in said inside tube, having a from end inserted through said inside annular flange of said mounting block and forced by said adjustment knob against said hanging rod, said bolt having a collar disposed between said inside tube of said adjustment knob and said inside annular flange of said mounting block;

a shower head mount fastened to said socket for holding a shower head, said shower head mount comprising a screw receiving hole and a coupling hole longitudinally aligned at one end, an annular groove at said one end disposed around the coupling hole of said shower head mount, and a hanging hole latitudinally disposed at an opposite end for hanging a shower head;

a shower head hung on the hanging hole of said shower head mount;

a locating ring coupled between said socket and said shower head mount, said locating ring having a first annular flange at one end fitted into said annular groove on said shower head mount, and a second annular flange at an opposite end fitted into the annular groove on said socket;

a headed pivot received inside said socket and stopped at one end against said mounting block, said headed pivot having a coupling end extended through the axle hole on said socket and fitted into the coupling hole on said shower head mount and prohibited from rotary motion relative to said shower head mount, and having a through hole with a countersunk hole at an end opposite said coupling end;

a friction ring mounted around said headed pivot and stopped inside said socket by a land area surrounding said axle hole of said socket; and

a headed screw inserted through the countersunk hole of said headed pivot and threaded into the screw receiving hole on said shower head mount to connect said shower head mount to said socket; and

wherein said adjustment knob can be loosened from said mounting block to release said holding down bolt from said hanging rod, permitting said mounting block and said socket to be moved along or turned about said hanging rod to adjust the

position of said shower head and said shower head mount can be turned relative to said socket to adjust the position of said shower head.

5,481,766

## TOILET GUARD

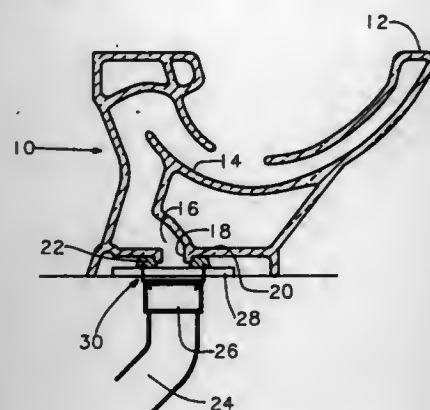
James Steadman, 4423 64th Ave., SE., Olympia, Wash. 98513

Filed Aug. 9, 1994, Ser. No. 288,680

Int. Cl.<sup>6</sup> A47K 17/00

U.S. Cl. 4-661

5 Claims



1. A guard for repelling animals from entering a toilet bowl fixture installed on a wax sealing ring attached to a waste conduit, comprising:

- a guard tube having an upper, relatively wide portion for insertion into the wax sealing ring, and a lower, relatively narrow portion, joined by an upwardly and outwardly flared central portion; and
- a plurality of flexible, resilient wires having a base end attached to an interior of the guard tube and having an opposite free end extending longitudinally and radially inward in a generally truncated, conelike, formation; whereby the wires present an obstruction to an animal that attempts to enter the fixture by movement through the wax sealing ring.

5,481,767

## MULTIPURPOSE BEACH BLANKET

Joyce D. Lewis, 33362 Astoria, Dana Point, Calif. 92629

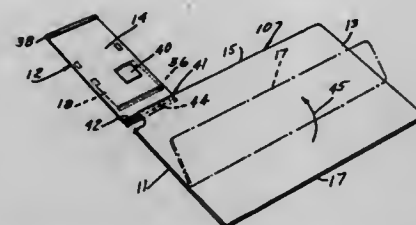
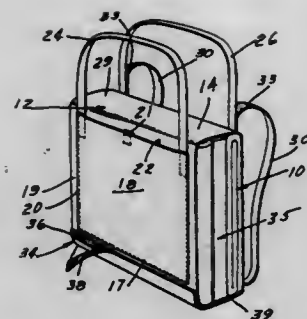
Filed Nov. 2, 1994, Ser. No. 333,275

Int. Cl.<sup>6</sup> A47G 9/06

U.S. Cl. 5-417

10 Claims

1. A multipurpose blanket comprising:
- a blanket having a quadrilateral configuration that includes a left edge and a right edge defining the width of said blanket, and a top edge and a bottom edge defining the length of said blanket;
  - a wraparound support carrier formed by an elongated piece of material, said wraparound support carrier being formed with a top edge and a bottom edge, and outer and inner sides; and wherein
  - at least one pocket is formed on the outer side and on the inner side of said wraparound support carrier;
  - a pillow having a width equal or less than the width of said wraparound support carrier;
  - a first fastening means having first and second fastening members, wherein said first fastening member is transversely mounted on said inner side of said bottom edge of said wraparound support carrier, and wherein said second fastening member is mounted along at least one side edge of said blanket, whereby said wraparound support carrier is removably attached to said blanket adjacent one corner thereof; and



a second fastening means having a first fastening member mounted transversely on said inner side of said top edge of said wraparound support carrier, and a second fastening member mounted transversely on said outer side of said wraparound support carrier, whereby said wraparound support carrier is wrapped around said blanket and said pillow for carrying and storage thereof.

5,481,768

## EASILY STORED PILLOW AND BLANKET AND METHOD

Joseph M. Shink, Valencia, Calif., assignor to Auto-Shade, Inc., Moorpark, Calif.

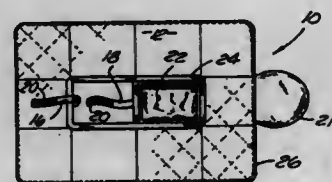
PCT No. PCT/US92/06774, § 371 Date Aug. 8, 1994, § 102(e) Date Aug. 8, 1994, PCT Pub. No. WO94/08497, PCT Pub. Date Apr. 23, 1994

PCT Filed Oct. 14, 1992, Ser. No. 244,955

Int. Cl.<sup>6</sup> A47G 9/00; 9/04

U.S. Cl. 5-482

2 Claims



1. A method of converting a blanket into a pillow, comprising the steps of:

- a) providing a fabric sheet with a first surface and a second surface and a pair of straps attached to said first surface, said fabric sheet being defined by a first longitudinal portion separated from a second longitudinal portion by a center longitudinal portion;
- b) folding said second surface of said first longitudinal portion onto said second surface of said center longitudinal portion;

- c) folding said second surface of said second longitudinal portion onto said first surface of said first longitudinal portion, such that there is created an intermediate fabric sheet being defined by a first side portion separated from a second side portion by a center portion that has a centerline;
- d) folding said first side portion onto said center portion;
- e) folding said second side portion onto said center portion;
- f) folding said center portion about said centerline such that said first side portion is adjacent to said second side portion, wherein there is defined a pillow with three unattached edges;
- g) wrapping said straps around said pillow; and
- h) attaching said straps together to secure said three unattached edges of said pillow.

5,481,770

## STRETCHER DEVICE

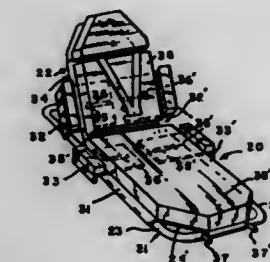
George E. Ahlsten, R.R. #2, Box 99, Wheaton, Minn. 56296

Filed Sep. 30, 1993, Ser. No. 129,684

Int. Cl.<sup>6</sup> A61G 1/00

U.S. Cl. 5-625

10 Claims



5,481,769

## LIFTING APPARATUS

Johannes Schneider, Bünde, Germany, assignor to Dewert Antriebs- U. Systemtechnik GmbH &amp; Co KG, Kirchlegern, Germany

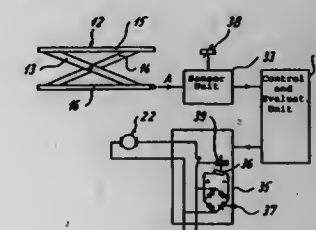
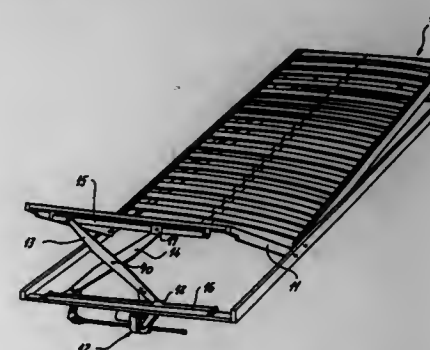
Filed Jan. 12, 1994, Ser. No. 180,876

Claims priority, application Germany, Jan. 15, 1993, 9300438 U

Int. Cl.<sup>6</sup> A61G 7/00

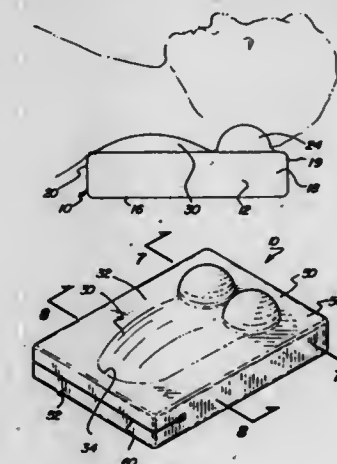
U.S. Cl. 5-617

13 Claims



1. A lifting device for swiveling parts of a piece of furniture; comprising:

- a scissor jack connected to a part being swiveled;
- drive means for actuating said scissor jack, said drive means including a spindle and a gear motor connected to said scissor jack; and
- safety means incorporated in said drive means for stopping movement of said scissor jack upon occurrence of a blockage, said safety means including a pair of disks engaging each other during normal operation via a complementary tooth gearing extending about the perimeter of each said disk, with one of said disks being stationary and the other one of said disks being a spring-loaded disk which is displaceable in axial direction for allowing disengagement of said disks upon blockage of a downward movement.



5,481,771

## TENSION ELIMINATOR PILLOW

John L. Burk, IV, 1906 S. First, Austin, Tex. 78704

Filed Nov. 1, 1994, Ser. No. 332,843

Int. Cl.<sup>6</sup> A47C 20/02

U.S. Cl. 5-636

4 Claims

1. A new and improved tension eliminator pillow comprising, in combination:



a block in a generally rectangular configuration having an upper surface, a lower surface, long side walls and short front and rear walls coupled therebetween in a generally rectangular configuration, the side walls, front wall and rear wall being planar in configuration, the lower surface also being planar in configuration;

two hemispherically-shaped projections symmetrically disposed on opposite sides of a center line midway between the side walls, the hemispherical projections extending upwardly a distance of between about 50 and 75 percent of the height of the side walls, the hemispherical projections being located adjacent to the front wall of the pillow within the lower half of the pillow;

a U-shaped projection symmetrically formed in the central extent of the block, the U-shaped projection being smoothly curved throughout its extent, the U-shaped projection having parallel side edges parallel with the side walls with the shaped projection constituting between about 50 and 75 percent of the lateral extent of the block measured from side wall to side wall, the U-shaped projection terminating in a curved portion adjacent to the rear wall of the block with the U-shaped projection initiating adjacent to the hemispherical projections and constituting between about 60 and 80 percent of the length of the block measured from front wall to rear wall;

the hemispherical projections and portion of the block therebeneath being fabricated of a firm closed-cell polyurethane foam, the central extent of the block beneath the U-shaped projection being fabricated of a medium firm closed-cell polyurethane foam, and the periphery of the block around the hemispherical projections and U-shaped projection being fabricated of a soft closed-cell polyurethane foam; and

a pillowcase formed in a generally rectangular configuration with parallel side walls and parallel front and rear walls, in a rectangular configuration and with a planar lower surface coextensive with the planar lower surface of the block and with an upper surface generally planar in configuration except in the area over the hemispherical projections and U-shaped projection where the pillow case is enlarged by all the projections, the pillow case also including an opening with a zipper across the central extent of the rear wall and extending a small distance into the side walls adjacent thereto.

5,481,772

## BED RAIL APPARATUS

William D. Glynn, 521 Babbs Rd., West Suffield, Conn. 06093, and Kathleen E. Monahan, 415 Spruce Dr., Exton, Pa. 19341  
Filed Mar. 24, 1994, Ser. No. 217,361

Int. Cl.<sup>6</sup> A47C 21/08

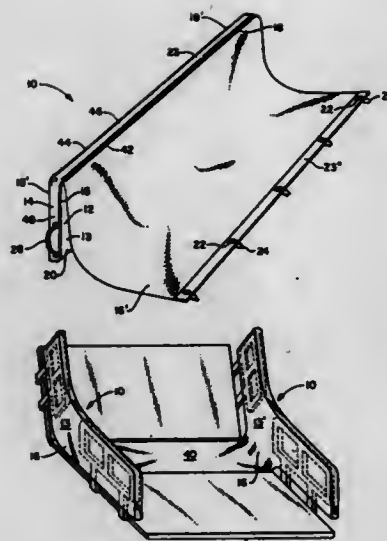
U.S. Cl. 5-663

12 Claims

1. A bed rail apparatus for a bed of a type having a mattress, a mattress support end at least one vertically variably positionable bed rail on at least one of its sides, the bed rail apparatus comprising:

envelope means for defining an envelope having opposed first and second side panels, each said side panels having opposite top and bottom portions and opposite first end second end portions, said envelope means further comprising closure means for at least partially closing said top portion, said first end portion and said second end portion of said first side panel with said top portion, said first end portion, and said second end portion of said second side panel respectively, said envelope means defining an opening adjacent said bottom portion, said bed rail apparatus being dimensioned to fit over and envelop the bed rail; and

means for securing said apparatus to the bed, said means for securing comprising a sheet of elastomeric material having opposite first and second edge portions, said first edge portion being attached to said top portion of said first side panel, said means for securing further comprising a plurality of grommets disposed in said second edge portion and clip means engaging said grommets for securing said second edge portion to the bed.



5,481,773

## RAMP BRIDGING MEMBER

Kurt Alten, Ringstr. 14, D-30974 Wennigsen, Germany  
Filed Mar. 10, 1995, Ser. No. 402,101

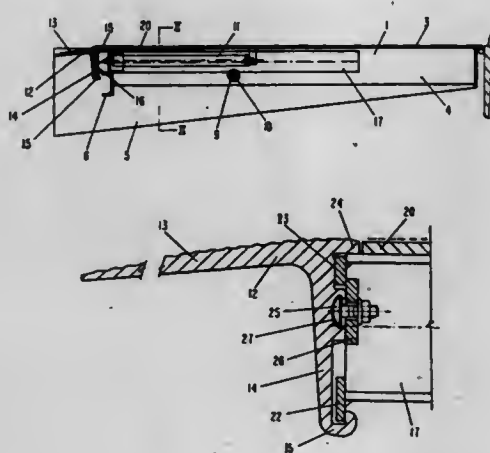
Claims priority, application Germany, Mar. 10, 1994, 44 08 069.7

Int. Cl.<sup>6</sup> E01D 15/00

U.S. Cl. 14-69.5

12 Claims

1. A ramp bridging member comprising:



a bridge plate connected to a ramp so as to be pivotable about a horizontal axis and having a free end;

an extension comprising a substantially vertical leg with which said extension is connected to said free end;

said extension being extendable from a rest position in a longitudinal direction of said bridge plate for resting on a vehicle to be loaded and unloaded and being retractable in the longitudinal direction into said rest position;

a plurality of parallel support beams extending in the longitudinal direction of said bridge plate, said support beams extendable and retractable together with said extension;

each one of said support beams having a front end and a rear end;

a vertical plate connected to said front end of said support beams;

said vertical leg has at least one arc-shaped projection engaging bottom edge of said vertical plate in a hook-like manner.

5,481,774

## SUPPORT MECHANISM FOR A DOCKLEVELER LIFT BAG

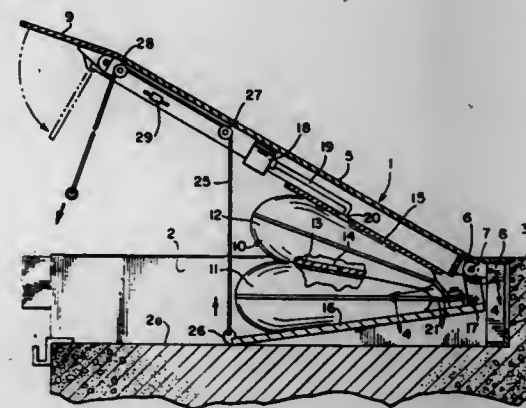
Charles H. Hodges, Ruxton, Md., and Robert J. Warner, Mukwonago, Wis., assignors to Kelley Company, Inc., Milwaukee, Wis.

Filed Oct. 4, 1993, Ser. No. 131,988

Int. Cl.<sup>6</sup> E01D 1/00

U.S. Cl. 14-71.7

13 Claims



1. In a dock leveler, a supporting structure, a ramp having a rear edge hinged to the supporting structure and movable between a generally horizontal position and an upwardly inclined position, bag support means spaced beneath the ramp, an inflatable bag assembly disposed between and ramp and the bag support means, mounting means for mounting said bag support means for movement relative to said ramp, said mounting means including pivot means for pivoting said bag support means to the ramp to permit said bag support means to be pivoted upwardly toward a position adjacent the underside of the ramp when said bag assembly is deflated, said pivot means comprising a hinge connection between said ramp and said supporting structure.

5,481,775

## TOOTHBRUSH WITH MOVABLE HEAD

James L. Gentile, Orange, Conn., and Joseph E. Meenan, Pleasantville, N.Y., assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

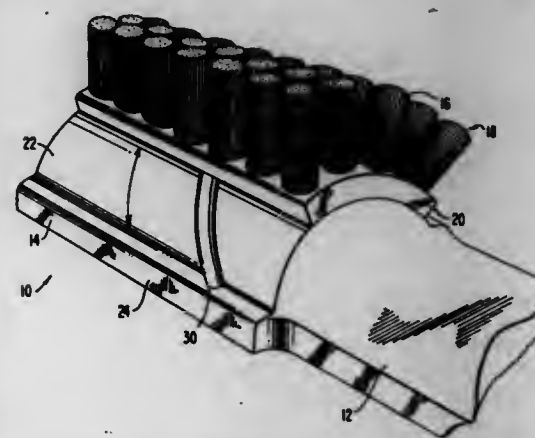
Continuation of Ser. No. 217,528, Mar. 22, 1994, abandoned.

This application May 30, 1995, Ser. No. 453,727

Int. Cl.<sup>6</sup> A46B 9/04; 7/06

U.S. Cl. 15-22.1

8 Claims



1. A toothbrush comprising a first end and a second end, said first end including a handle and said second end having, a head, a bristle base supported on said head, said head having a longitudinal axis and said bristle base having bristles extending upright from said bristle base, said bristle base having an arc-shaped bottom

shaped as an arc about the longitudinal axis, said head including a panel supporting said bristle base, said panel being curved in the shape of an arc about the longitudinal axis and including an elongated aperture forming a spiral track for the bristle base said bristle base having means engaging said spiral tracks, said bristle base being movable relative to said head by sliding of said bristle base arc shaped bottom over the arc-shaped supporting panel.

5,481,776

## BRUSH PRESSURE SYSTEM

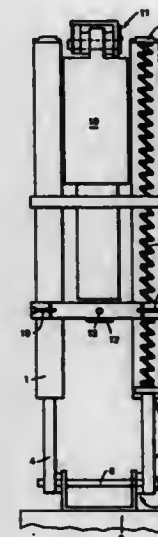
William A. Briscoe, Wades House, Barton Stacey, Winchester, Hampshire, United Kingdom

Filed Mar. 1, 1994, Ser. No. 203,557

Int. Cl.<sup>6</sup> A47L 11/16; 11/24

U.S. Cl. 15-49.1

11 Claims



1. A sweeping apparatus comprising:  
a sweeping brush head assembly for contacting a floor to effect sweeping a surface to be swept;  
spring means mounted to act as suspension means including means for biasing the brush head assembly towards the surface;  
tensioning means for tensioning the spring means so as to set the pressure the brush head assembly for movement towards and away from the surface; and  
said spring means being selectively adjustable said tensioning means over a continuous range to provide any one of a plurality of bias towards the surface.

5,481,777

## RELEASABLE MOP HEAD

Charles L. Nenninger, 335 Dena La., Cape Girardeau, Mo. 63701

Filed Aug. 3, 1994, Ser. No. 285,073

Int. Cl.<sup>6</sup> A47L 13/24

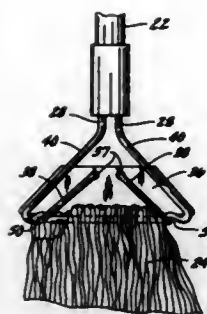
U.S. Cl. 15-151

18 Claims

1. A mop head for releasably securing absorbent mop material to a handle, the mop head comprising:

a mount for the absorbent material having a reaction surface thereon shaped and arranged for receiving the absorbent material thereacross, the mount comprising a pair of spaced apart mount members defining a guideway therebetween;

a clamp member disposed in the guideway and attached to the mop head for movement between a clamp position in which the clamp member is located relatively close to the reaction surface and is adapted to engage the absorbent material to clamp it against the reaction surface and a release position in

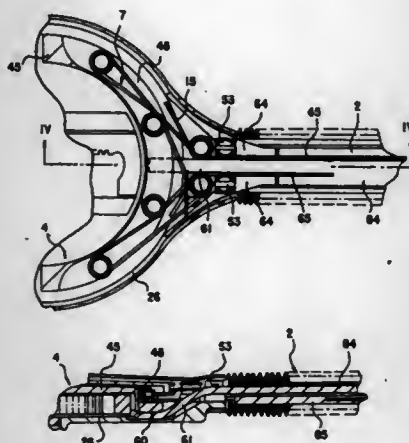


which the clamp member is located relatively farther away from the reaction surface and is adapted to release the absorbent material for removal of the absorbent material from the mop head; and means for urging said clamp member toward the reaction surface, said urging means being selected to have sufficient strength to hold the absorbent material on the mop head when used for mopping.

5,481,778

**WINDSHIELD WIPER SYSTEM WITH EXTENDABLE WIPER ARM AND ADJUSTABLE BLADE PRESSURE**  
Stefan Battlogg, Haus Nr. 26, A-6771 St. Anton I.M., Austria  
Filed Dec. 8, 1993, Ser. No. 164,257

Claims priority, application Austria, Jun. 18, 1991, A 1223/91  
Int. Cl.<sup>6</sup> B60S 1/32; 1/20; 1/44; 1/36  
U.S. Cl. 15—250.202 12 Claims



1. A windshield wiper system, comprising:

- a wiper arm having a free end, means for pivoting said wiper arm about a given pivot axis opposite said free end, and a wiper blade disposed at said free end of said wiper arm;
- means for telescopically extending said wiper arm such that said free end travels along a substantially horizontal line across a windshield during an oscillatory motion of said wiper arm across a windshield as said wiper arm is pivoted about said pivot axis;
- said means for pivoting said wiper arm including a pivot bearing and a driven basic body disposed on and pivotable about said pivot bearing;
- said wiper arm including a wiper arm member attached to said basic body and means for resiliently biasing said wiper blade towards the windshield;
- a control cam with a cam surface attached to said pivot bearing, and cam follower means attached to said wiper arm member for following the cam surface of said control cam during the oscillatory motion of said wiper arm across the windshield and for varying a torque defining a contact pressure of said wiper blade on the windshield; and

wherein said wiper arm member is formed by a leaf spring rigidly connected with said basic body and is attached to said cam follower means.

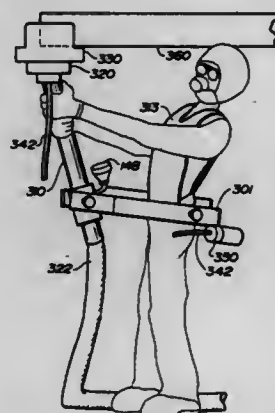
5,481,779

**ERGONOMIC TOOL SUPPORT APPARATUS AND MATERIAL REMOVAL SYSTEM**

Thomas S. Flynn, Larkspur; Tadeusz M. Krzanowski, San Anselmo, and Gary W. Bayne, Pleasant Hill, all of Calif., assignors to AEL, Emeryville, Calif.

Division of Ser. No. 702,765, May 17, 1991, Pat. No. 5,220,704, which is a continuation-in-part of Ser. No. 649,663, Feb. 1, 1991, abandoned. This application Jun. 8, 1993, Ser. No. 74,117

Int. Cl.<sup>6</sup> A47L 5/36  
U.S. Cl. 15—324 6 Claims



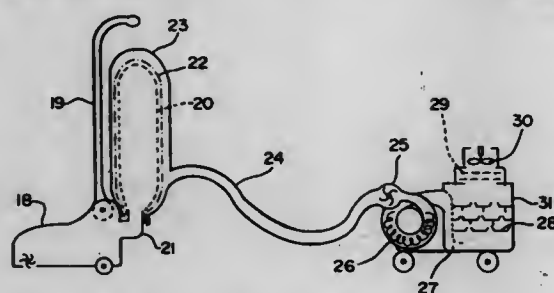
1. A portable material removing system comprising: a mounting yoke;
- a pivoting assembly connected to said mounting yoke;
- a tube having one end secured to said pivoting assembly and being adjustable to a plurality of angles with respect to said mounting yoke;
- head assembly attachment means secured to said tube at its other end;
- a head assembly, attached to said head assembly attachment means, for removing material from a surface;
- said head assembly attachment means including means for supporting said head assembly thereon and being adjustable to adjust the pitch of said head assembly to a plurality of angles relative to said tube;
- said head assembly including a scrubber head apparatus; and means for rotatably driving said scrubber head apparatus.

5,481,780

**CLEAN AIR VACUUM CLEANERS**

Yousef Daneshvar, 21459 Woodfarm, Northville, Mich. 48167  
Filed Jan. 12, 1994, Ser. No. 180,330

Int. Cl.<sup>6</sup> A47L 9/10; 9/18  
U.S. Cl. 15—339 21 Claims



1. A clean air vacuum cleaner comprising:

5,481,782

**CABINET/FURNITURE WITH SNAP-ON DEVICE FOR QUICK ASSEMBLY**

Günther Grabher, Fussach, Austria, assignor to Grass AG, Höchst/Vlb., Austria

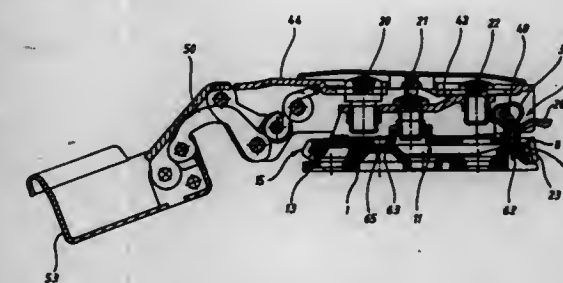
Filed Mar. 9, 1994, Ser. No. 208,354

Claims priority, application Germany, Mar. 12, 1993, 43 07 882.6

Int. Cl.<sup>6</sup> E05D 7/06; 7/12

U.S. Cl. 16—258

8 Claims



1. A snap-on device for attaching a furniture hinge to a frame, the furniture hinge being of a type including a hinge cup mountable to a door, a swivel arm pivoted at one end to the hinge cup and connected at the other end to a cover clamp, and an adjusting plate connected to the cover clamp, the snap-on attaching device comprising:

- a base plate having front and rear areas and mountable to said frame, the base plate having a retainer surface formed on the base plate front area and a wedge surface formed on the base plate rear area and having centering means disposed between the base plate front and rear areas, and the base plate having a projection with a bottom edge disposed on the base plate rear area; and
- a fastening plate having front and rear areas and connectable to said adjusting plate, the fastening plate having means disposed on said fastening plate front area for releasably engaging the base plate retainer surface and means disposed on the fastening plate rear area for engaging against the base plate wedge surface and having centering means disposed between the fastening plate front and rear areas engageable with the base plate centering means, and the fastening plate having a spring biased tilt member disposed on the fastening plate rear area, the tilt member having a grip nose releasably engageable under the base plate projection with the grip nose spaced from the bottom edge of the base plate projection.

5,481,781

**ROLLERED NOZZLE**

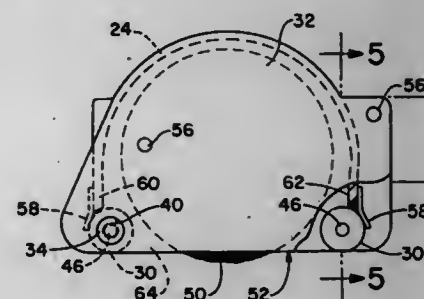
Vincent L. Weber, North Lawrence, Ohio, assignor to The Hoover Company, North Canton, Ohio

Filed Jan. 21, 1994, Ser. No. 183,870

Int. Cl.<sup>6</sup> A47L 9/04

U.S. Cl. 15—378

9 Claims



1. A suction nozzle for a cleaner having:

- a) an agitator chamber;
- b) a suction opening for said nozzle;
- c) a pair of rollers mounted in said agitator chamber and extending downwardly into said suction opening;
- d) said agitator chamber including an agitator;
- e) said rollers disposed, one forwardly and one rearwardly of said agitator;
- f) said agitator chamber including sealing means for sealing against said rollers to help maintain an envelope for suction within said suction nozzle;
- g) said sealing means taking the form of a pair of elastomeric sealing lips engaging resiliently against said rollers;
- h) said rollers being substantially elongated; and
- i) said sealing lips also being substantially elongated to extend along said rollers;
- j) said agitator chamber including side walls;
- k) said side walls having bottom terminations; and
- m) said elongated rollers having a bottom outer periphery aligned with said bottom terminations.

5,481,783

**ATTACHMENT DEVICE FOR GEARSHIFT LOCK**

Gaier Liou, No. 48, Ton Hwa St., San-Min Dist., Kaohsiung, Taiwan, Prov. of China

Filed Jun. 29, 1994, Ser. No. 267,375

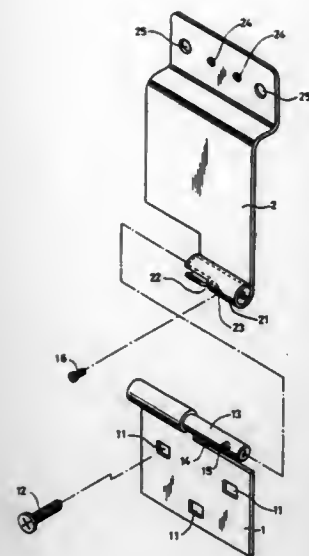
Int. Cl.<sup>6</sup> E05D 7/10

U.S. Cl. 16—264

1 Claim

1. An attachment device for attaching a gearshift lock to a vehicle, said attachment device comprising a base plate fixed to said vehicle, said base plate including a rod provided thereon, said rod including a projection formed thereon, a bar means for supporting said gearshift lock, said bar means including a sleeve formed thereon for rotatably engaging with said rod, said sleeve including a notch formed therein for engaging with said projection, and means for securing said sleeve to said rod so as to prevent said bar means from rotating relative to said base plate.





5,481,784

## CLIP APPARATUS

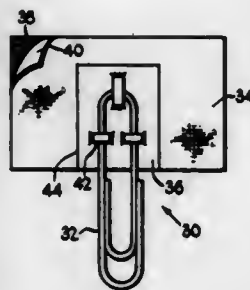
Edwin S. Sinaiko, 180 E. Pearson, Chicago, Ill. 60611

Filed May 10, 1994, Ser. No. 240,263

Int. Cl.<sup>6</sup> B42F 1/00

U.S. Cl. 24—67.9

10 Claims



1. An improved clip apparatus for affixation to a stack formed of one or more layers of substantially planar material, said clip apparatus comprising:

- a clip member, including
  - a first contact portion, and
  - a second contact portion arranged in interesting relation to the first contact portion,

the first and second contact portions being operably associated with one another so as to be resiliently displaceable in angular relation to one another, so as to enable insertion of the stack between the angularly displaced first and second contact portions, such that the first and second contact portions will engage the stack therebetween in a biased gripping manner; means for removably engaging at least one layer of the stack, at positions substantially remote from the clip member, for resisting dislodging of the clip member from the stack, the means for engaging at least one layer of the stack being operably associated with the clip member; and

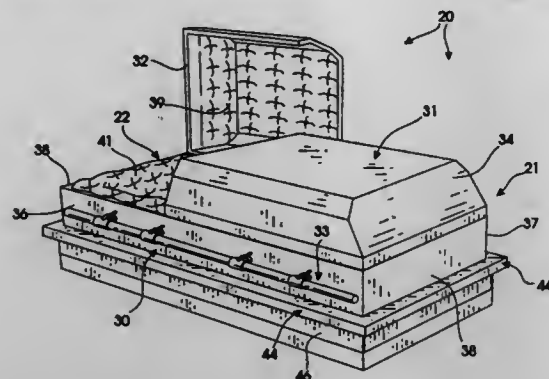
means for interengagement of the clip member with the means for engaging at least one layer of the stack, operably associated with the means for removably engaging at least one layer of the stack, and operably configured so as to preclude separation of the clip member from the means for engaging at least one layer of the stack.

said interengagement means being further operably configured so as to maintain at least a portion of said means for removably engaging at least one layer of the stack in a substantially fixed, stable orientation relative to the clip member.

5,481,785  
**REUSABLE CASKET ASSEMBLY**  
 Roy H. Minton, 905 N. Caraway, and Douglas L. Barker, 2213 Shoshoni, both of Jonesboro, Ark. 72401  
 Filed Jun. 20, 1994, Ser. No. 262,557  
 Int. Cl.<sup>6</sup> A61G 17/00

U.S. Cl. 27—27

18 Claims



1. A casket assembly comprising:
  - an outer shell comprising spaced apart parallel front and rear walls and spaced apart end walls, an open bottom and a hinged lid mounted on said rear wall;
  - an inner capsule adapted to be semi-permanently disposed within said outer shell in a locking relationship, said capsule comprising a frame and a separable lid, said frame having a generally rectangular base with walls extending upwardly therefrom;
  - a plurality of indents formed within said capsule walls;
  - pin assemblies comprising a plurality of moving pins adapted to extend through said front and rear walls, said pins adapted to move between a locked position wherein said pins extend into said indents to lock said capsule within said shell and an unlocked position wherein said pins retract from within said indents to release said capsule from within said shell; and,
  - a handle assembly adapted to fit around said inner capsule, said handle assembly comprising a rectangular frame mounting a plurality of studs adapted to engage said indents to attach said handle assembly to said capsule.

5,481,786  
**METHOD OF MANUFACTURING A RECYCLABLE CARPET**

Charles W. Smith, Rutherfordton, N.C., and Jimmy E. Millwood, Spartanburg, S.C., assignors to Spartan Mills, Spartanburg, S.C.

Filed Nov. 3, 1993, Ser. No. 148,218

Int. Cl.<sup>6</sup> B32B 5/02

U.S. Cl. 28—107

11 Claims



1. A method of manufacturing a carpet without external chemical binders, comprising the steps of:
  - forming a fibrous tufted primary backing having a front side through which tufts project and a back side;
  - forming a carded web of fibers separate from said fibrous tufted primary backing;
  - said carded web being free from further processing;
  - superposing said carded web of fibers onto said back side of said fibrous tufted primary backing to form an intermediate composite; and

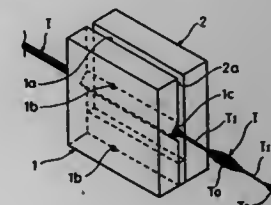
attaching fibers in said fibrous tufted primary backing to fibers in said carded web of fibers, said attaching causing said carded web of fibers to mesh with said primary backing to form a carpet backing; whereby said carpet backing and said tufts form an assembled tufted fabric.

5,481,787  
**APPARATUS FOR TREATING YARN WITH FLUID**  
 Takao Sano, Moriyama, and Teruaki Saijo, Otsu, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan  
 Filed Sep. 1, 1993, Ser. No. 114,163  
 Claims priority, application Japan, Sep. 4, 1992, 4-236921; Jan. 27, 1992, 4-288358

Int. Cl.<sup>6</sup> D02G 1/16

U.S. Cl. 28—276

17 Claims



1. An apparatus for treating yarn with a fluid, which apparatus is designed to provide a yarn consisting of multifilaments having cohesion using a working fluid, comprising:

- (A) a first component comprising:
  - (1) a flat surface;
  - (2) at least two fluid conduits extending through said first component and opening into said flat surface; wherein the axes of said fluid conduits are inclined at an angle ( $\theta$ ) with respect to each other and cross on the extended lines thereof; and
  - (3) a concave portion having a depth (b) and disposed along the entire length of said flat surface between said openings of said fluid conduits; and
- (B) a second component parallel to said first component, comprising a flat surface opposing said flat surface of said first component and separated therefrom by a gap (G); wherein said gap (G) is in the range of 0.2 mm to 5.0 mm, inclusive; and wherein said depth (b) is such that  $0.5 \leq (b)/(G) \leq 1.5$ , thereby providing the filaments of the yarn running through the gap along the concave portion with cohesion, by ejecting a working fluid with a specified pressure from said openings of said fluid conduits.

5,481,788  
**APPARATUS FOR PRODUCING WELDING ROD**  
 R. E. Simon, 603 Boulder Cir., Dayton, Nev. 89403, and L. E. Mann, 4222 Dant Blvd., Reno, Nev. 89509

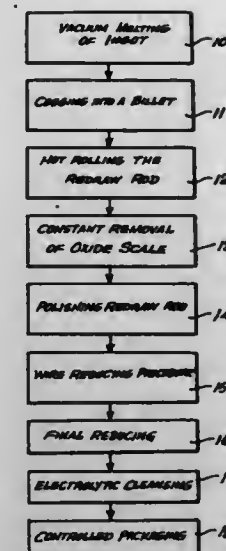
Filed Feb. 24, 1994, Ser. No. 201,371

Int. Cl.<sup>6</sup> B21C 43/02

U.S. Cl. 29—81.13

1 Claim

1. Apparatus for producing welding wire comprising, in cooperative relationship: means for double vacuum forming of ingots; means to machine the outer surface of the ingots; means for cogging redraw bars from the ingots including ultrasonic inspection means and cropping means; seam free turning means to

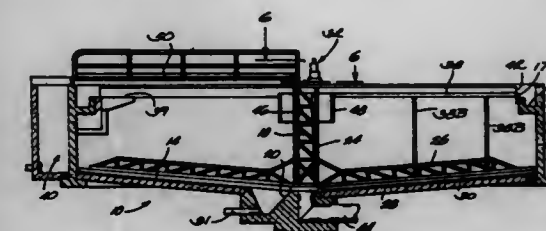


remove oxides from the redraw bars; means to polish the redraw bars; means to draw the redraw bars by compression to form reduced-diameter welding wire; means for electrolytic cleansing of the wire; and means for controlled packaging of the wire.

5,481,789  
**METHOD FOR REMOVING A GEAR OR BEARING IN CIRCULAR CLARIFIERS AND THICKENERS**  
 John Thomas, Brookfield, Wis., assignor to Envirex, Inc., Waukesha, Wis.  
 Filed Feb. 28, 1994, Ser. No. 202,514  
 Int. Cl.<sup>6</sup> B23P 19/00

U.S. Cl. 29—426.5

3 Claims



2. A method of removing a ring gear from a circular clarifier having a tank including a bottom and a generally cylindrical wall extending upwardly from the bottom, a central pier extending vertically upwardly from the bottom of the tank, a gear housing on the central pier and housing the ring gear, a rake structure in the tank and rotated in the tank by the ring gear, a bridge having a first end radially outward of the tank and having a second end above the central pier, a first bridge support spacing the second end of the bridge above the housing by a selectively adjustable vertical distance, the first bridge support being located within the inner periphery of the ring gear, the first bridge support being selectively removable from a location where it supports the second end of the bridge, to a location where it does not support the second end of the bridge, a second bridge support located within the inner periphery of the ring gear, spaced apart from the first bridge support, the second bridge support spacing the second end of the bridge above the housing by a selectively adjustable vertical distance, the second bridge support being selectively removable from a location where it supports the second end of the bridge, to a location where it does not support the second end of the bridge, said method comprising the following steps:

- shifting the weight of the bridge to the first bridge support;
- removing the second bridge support;
- translating the gear past where the second bridge support used to be;

replacing the second bridge support;  
shifting the weight of the bridge to the second bridge support;  
removing the first bridge support; and  
translating the gear past where the first bridge support used to be.

5,481,790

# METHOD FOR ALLOWING SELECTIVE ACCESS TO THE INTERIOR OF FLUID CONTAINMENT STRUCTURES

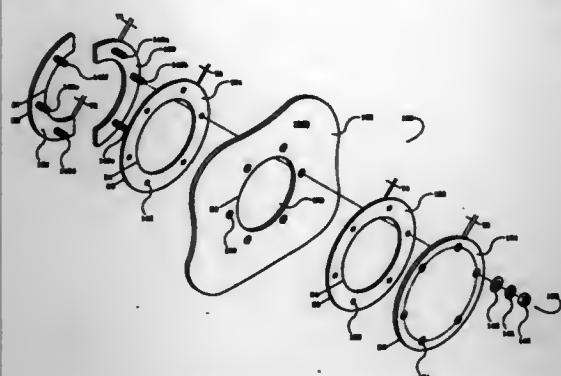
Joseph A. Korels, and Monte M. Korels, both of Bellingham, Wash., assignors to Clarus Technologies Corp., Bellingham, Wash.

Filed Jul. 1, 1994, Ser. No. 269,534

Int. Cl.<sup>6</sup> B65D 45/00; E21B 33/00; F16J 15/00

U.S. Cl. 29—428

7 Claims



1. A method of providing selective access to an interior of a fluid containment member, comprising the steps of:

- forming an opening in the fluid containment member;
- providing first and second rigid backing plates, each having inner perimeter edges;
- providing first and second flexible gasket means;
- providing an access member;
- assembling the first and second rigid backing plates and the first flexible gasket means together into an interior assembly;
- then contorting the interior assembly from an original configuration into a contorted configuration;
- passing the interior assembly in its contorted configuration through the opening in the fluid containment member;
- returning the interior assembly to its original configuration;
- assembling the interior assembly and second gasket means onto the fluid containment member such that
  - the first gasket means is arranged between the first and second backing plates and an interior surface of the fluid containment member,
  - the second gasket means is arranged adjacent to an exterior surface of the fluid containment member, and
  - inner perimeter edges of the backing plates and gasket means are arranged relative to the opening in the fluid containment member such that the backing plates and gasket means do not prevent access to the interior of the fluid containment member;
- when access to the interior of the fluid containment member is not desired, fastening the access member onto the fluid containment member such that
  - the first gasket means is securely held between the first and second backing plates and the interior surface of the fluid containment member to seal a first gap therebetween,
  - the second gasket means is securely held between the exterior surface of the fluid containment member and the access member to seal a second gap therebetween, and
  - the access member covers the opening; and
- when access to the interior of the fluid containment member is desired, removing the access member from the fluid containment member.

5,481,791

# METHOD OF MAKING A FLOATING-TYPE COMPOSITE MAGNETIC HEAD PROVIDED WITH A MAGNETIC CORE HAVING CONCAVE MARK(S) ON SIDE SURFACE THEREOF

Toshinori Matsubara; Toshiyuki Baba, and Yasuo Kuriyama, all of Mooka, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

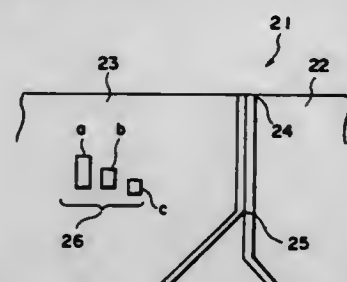
Filed Nov. 12, 1993, Ser. No. 150,828

Claims priority, application Japan, Nov. 13, 1992, 4-303340; Jun. 18, 1993, 5-147537

Int. Cl.<sup>6</sup> G11B 5/42

U.S. Cl. 29—603

6 Claims



1. A method for controlling finish grinding of an air bearing surface of a floating type composite head for use in connection with a flat magnetic storage medium so as to provide an accurate magnetic gap depth, said composite head including a slider having internal walls therein presenting a slit opening at said air bearing surface and extending into said slider and a magnetic core held in said slit by bonding glass, said core having an active surface at said air bearing surface of the slider, a side surface extending away from said active surface within said slit and disposed in face-to-face contact with an internal wall of said slider and a magnetic gap terminus spaced from said active surface, said method comprising: providing one or more shaped concavities in said side surface prior to said finish grinding, each said concavity being disposed at a known position relative to said terminus; simultaneously finish grinding said air bearing surface and said active surface; and observing the appearance or shape of one or more of said concavities at said active surface during said finish grinding to thereby determine the depth of said terminus in said slit.

5,481,792

# INDUCTOR WINDING METHOD

Donald R. Baird, Rte. 5, 21D Carriage House Rd., Sherman, Tex. 75090

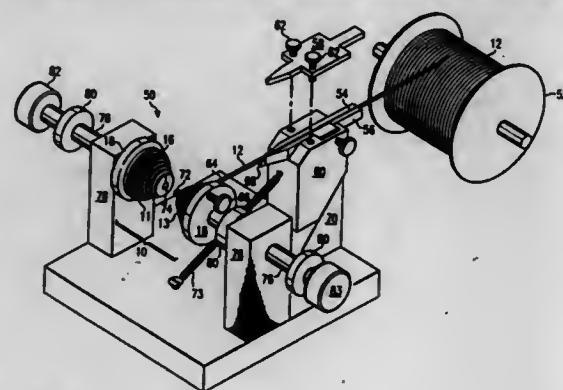
Division of Ser. No. 796,180, Nov. 22, 1991, Pat. No. 5,321,965. This application Dec. 3, 1993, Ser. No. 160,760

Int. Cl.<sup>6</sup> H01F 41/06

U.S. Cl. 29—605

9 Claims

1. A method of fabricating an inductor winding, comprising the



steps of:

winding an elongate conductive ribbon in one continuous direction on a generally hourglass shaped mandrel to form the ribbon into a double conical helix having two sides terminating in free ends and a plurality of spaced apart coils; threading a sheet of dielectric material having first and second opposed sides, and an orifice formed to extend between the first and second sides, onto the double conical helix so that the ribbon passes through the orifice near the point at which the two sides of the double conical helix are joined; compressing one side of the helix into a plane such that the coils in the compressed side lie flat and engage the adjacent side of the sheet of dielectric material; and compressing the opposite side of the helix into a plane such that the coils in that side also lie flat and engage the opposite side of the sheet of dielectric material.

5,481,793

# HOOK AND BOLT TYPE BOILER WALL TUBE TOOL

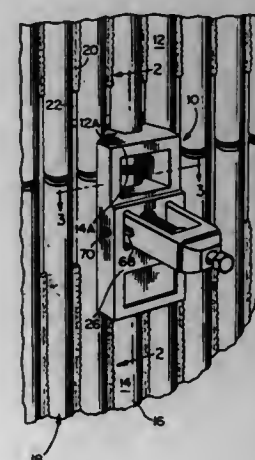
Gary W. McClure, Rte. 7, Box 228A, South Charleston, W. Va. 25309

Filed Apr. 29, 1994, Ser. No. 235,790

Int. Cl.<sup>6</sup> B23P 15/26

U.S. Cl. 29—726

17 Claims



7. A boiler wall tube tool for clamping together adjacent ends of boiler wall tube segments in a boiler wall, the tool comprising:

- first and second opposing clamping members, each clamping member including a recess suitable for engaging an exterior surface of adjacent ends of boiler wall tube segments, each clamping member comprising slot means extending through the clamping member; and
- means for tightening the clamping members extending through the slot means of one clamping member and suitable for passing through a spacing between laterally adjacent boiler wall tubes and extending through the slot means of the other clamping member, said slot means of said other clamping member including a sloped edge on a portion of the slot means and said means for tightening comprising means for locking onto said sloped edge and means for applying clamping force against the means for locking to draw and secure the clamping members together.

5,481,794

# DEVICE FOR HANDLING OBJECTS AND METHOD OF USING SAME

Bruno Fischer, Dietikon, and Bruno Bachofen, Bonstetten, both of, Switzerland, assignors to Sieba AG, Urdorf, Switzerland

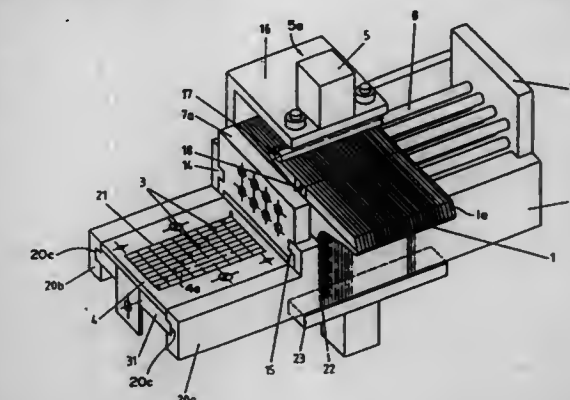
Filed Feb. 1, 1991, Ser. No. 634,214

Claims priority, application Switzerland, Jun. 1, 1989, 2068/89

Int. Cl.<sup>6</sup> B23P 19/04; B65G 47/32; H01R 43/00; H05K 13/02

U.S. Cl. 29—747

25 Claims



1. A device for manipulating objects with object carriers for gripping, holding and releasing the objects, said device comprising:

- a support apparatus (6) comprising at least one common guiding and support element (8, 71);
  - a plurality of at least three object carriers (1) being moveable laterally with respect to one another along said common guiding and support element (8, 71); and
  - means (3, 4a, 31) for moving said plurality of object carriers along said common guiding and support element (8, 71) between a first positional arrangement wherein the object carriers (1) are uniformly positioned relative to each other and a second positional arrangement wherein the object carriers (1) can be selectively, non-uniformly spaced relative to each other;
- said means (3, 4a, 31) being selectable or adjustable for selectively varying the positions and relative spacings of the object carriers (1) in the second positional arrangement; and said object carriers (1) being used simultaneously receiving objects arranged in said first positional arrangement and for simultaneously delivering said objects arranged in said second positional arrangement.

5,481,795

# METHOD OF MANUFACTURING ORGANIC SUBSTRATE USED FOR PRINTED CIRCUITS

Akihito Hatakeyama, Kadoma; Hiroshi Sogo, Nishinomiya; Tamao Kojima; Yasuhiko Horio, both of Osaka; Masahide Tsukamoto, Nara, and Yasushi Fukumura, Kyoto, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Division of Ser. No. 57,972, May 6, 1993, Pat. No. 5,346,750.

This application Jun. 10, 1994, Ser. No. 258,383

Claims priority, application Japan, May 6, 1992, 4-113527; May 20, 1992, 4-127160; Jul. 6, 1992, 4-178019; Jan. 12, 1993, 5-003263; Apr. 5, 1993, 5-077840

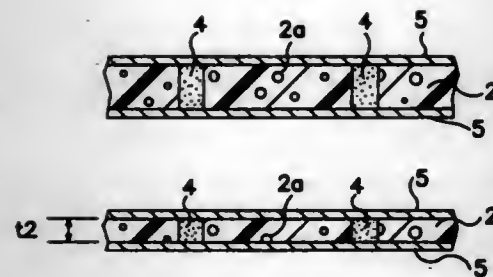
Int. Cl.<sup>6</sup> H01K 3/10

U.S. Cl. 29—852

10 Claims

1. A method of manufacturing an organic substrate used for printed circuits, which comprises the steps of forming through-holes in a porous raw material provided with free tackiness films and having compressive shrinkage comprising a composite material of a non-woven fabric and a thermosetting resin, filling electro-





conductive paste into said through-holes, separating the free tackless films from said porous raw material filled with the electroconductive paste in the through-holes thereof, applying metal foils onto the surfaces of said porous raw material from which said free tackless films have been separated, and then compressing said porous raw material applied with said metal foils through heating and pressurization.

5,481,796

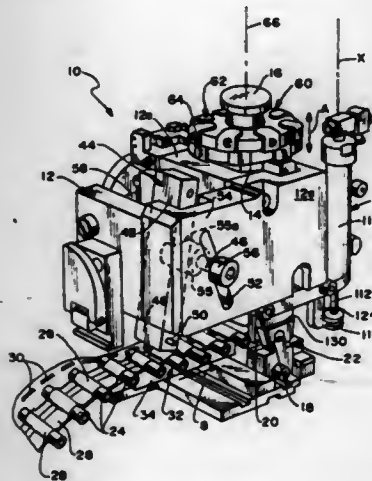
# ELECTRICAL TERMINAL APPLICATORS WITH IMPROVED TERMINAL TAPE MOVING MEANS

Robert L. Quinn, St. Petersburg, Fla., assignor to Molex Incorporated, Lisle, Ill.

Filed Dec. 8, 1993, Ser. No. 165,140  
Int. Cl.<sup>6</sup> H01R 43/055

U.S. Cl. 29-753

12 Claims



1. In an electrical terminal applicator for crimping terminals onto wires, the terminals being secured to a generally planar tape in a side-by-side relationship with their axes extending laterally of the tape, said tape having opposite surfaces with a plurality of openings extending therebetween to facilitate feeding of the tape, an applicator ram drivable in a first path through a working stroke towards, and a return stroke away from, a crimping anvil, a crimping die on the applicator ram for cooperation with the anvil to crimp a portion of a terminal onto a wire during each working stroke of the ram, track means for guiding the tape in a second path which generally intersects the first path of the ram, tape feeding means for engaging said openings in the tape to feed the tape along the second path to sequentially advance a leading uncrimped terminal on the tape, in response to reciprocation of the ram, tape moving means for moving the tape relatively away from the crimping die when the die is in crimping condition and in engagement with a crimped terminal to break the crimped terminal away from the tape, wherein the improvement in said tape moving means comprises:

tape clamping means for engaging and gripping said opposite surfaces of the tape and pulling the tape laterally of said second path thereof.

5,481,797

# LINK PIN DISPLACEMENT

David Barker, Burntwood, United Kingdom, assignor to Hydra-Tight Limited, England

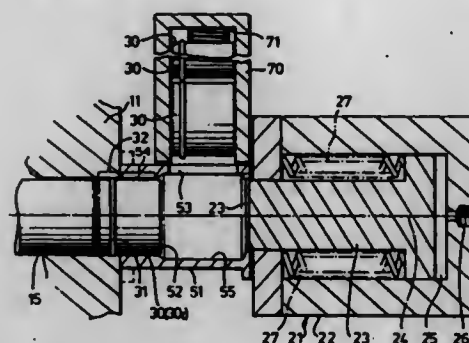
Filed Apr. 4, 1994, Ser. No. 222,595

Claims priority, application United Kingdom, Apr. 29, 1993, 9308827

Int. Cl.<sup>6</sup> B23P 19/02

U.S. Cl. 29-809

20 Claims



1. A link pin displacement arrangement suitable for cold displacement of a link pin extending between, and an interference fit in, through-bores of a first and a second side boss, comprising

- (1) a ram assembly, disposed facing the first side boss, including a ram body and a ram member reciprocable with respect to the ram body along a reciprocation axis in line with the link pin axis to be stroked towards said first side boss from a retracted position,
- (2) a set of drift blocks stackable to form an axially extensive drift stack, said set including a plurality of drift blocks each having a length along said stack axis of less than the ram member reciprocation stroke,
- (3) axial support means for axially supporting the ram assembly, including

- (i) a ram stroke reactor located adjacent to the second side boss for contacting the latter by way of reaction control points about the through-bore of said second side boss and
- (ii) tie means extending between the ram stroke reactor and the ram body for defining a maximum spacing from the bore of the first side boss of the retracted ram of at least the length of one of said drift blocks,

- (4) lateral support means coupled to the first side boss for maintaining alignment between the ram member reciprocation axis and link pin axis, and
- (5) guide means extending from the assembly towards the first side boss for supporting at least one drift block between the retracted ram member and said first side boss,

the ram member being reciprocable to effect, in stroking, a force on a drift block supported by the guide means to drive the stack of drift blocks including said supported block into the bore of the first side boss, and, in retracting, opening of a space between the end of the stack and the ram member for the guide means to receive and support another drift block.

5,481,798

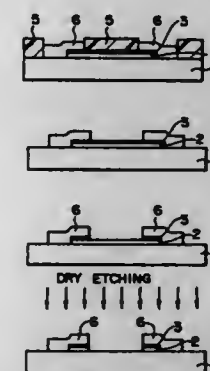
# ETCHING METHOD FOR FORMING A LEAD FRAME

Kenji Ohsawa; Makoto Ito, and Mutsumi Nagano, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan  
Filed Jan. 13, 1995, Ser. No. 372,247

Claims priority, application Japan, Jan. 19, 1994, 6-019948  
Int. Cl.<sup>6</sup> H01R 43/00

U.S. Cl. 29-827

6 Claims



1. A method of manufacturing a lead frame comprising the steps of:

- forming a bump forming metal layer on one surface of a metal base sheet on an area where a group of inner leads are to be formed; wherein the base sheet is made of a material different from the bump forming metal layer and is adapted to form outer leads;
- forming each inner lead, which is made of a metal different from that of said bump forming metal layer, on said bump forming metal layer, so that each inner lead contacts said bump forming metal layer and said base sheet;
- etching said bump forming metal layer using said inner lead as a mask, thereby forming a bump, and
- forming said outer leads by selective etching of said metal base sheet from a side opposite said bump, and exposing said bump by etching.

5,481,799

# PROCESS FOR PRODUCING A SELF-HEATING AUTO REGULATING CONNECTOR

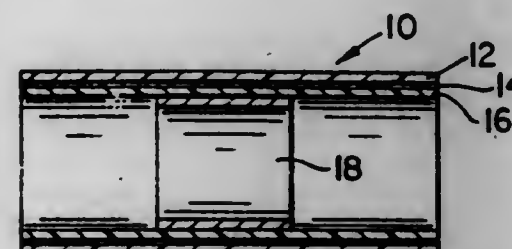
Thomas H. McGaffigan, Half Moon Bay, Calif., assignor to Metcal, Inc., Menlo Park, Calif.

Division of Ser. No. 14,164, Feb. 5, 1993, Pat. No. 5,319,173, which is a division of Ser. No. 404,621, Sep. 8, 1989, Pat. No. 5,208,443, which is a continuation-in-part of Ser. No. 242,208, Sep. 9, 1988, abandoned. This application Apr. 12, 1994, Ser. No. 226,320

Int. Cl.<sup>6</sup> H01R 43/02

U.S. Cl. 29-879

3 Claims



1. A process for producing a self-heating, auto-regulating connector, comprising the steps of:

- a) deforming a first dimensionally heat-stable sleeve to render the sleeve dimensionally heat-unstable at temperature T,

- b) coating the first sleeve with an electrically non-conductive layer of highly lossy, ferromagnetic particles having a Curie transition temperature greater than T,
- c) deforming a second dimensionally heat-stable sleeve to a dimensionally heat-unstable configuration at temperature T,
- d) positioning the second sleeve over the first sleeve so the coated particles are in contact with the second sleeve to form a composite sleeve, and
- e) exposing the combined sleeve to an alternating magnetic field causing the particles to heat to their Curie transition temperature which causes said first and second sleeves to substantially return to their dimensionally heat-stable configuration.

5,481,800

# METHOD OF MAKING A PARALLEL FLOW CONDENSER WITH LAP JOINED HEADERS

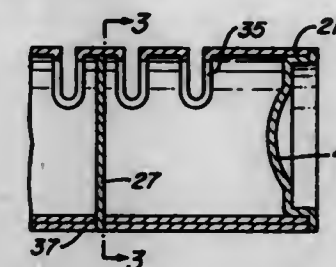
Scott L. Hutto; John M. McCrady, both of Burleson, and John T. Bertva, Colleyville, all of Tex., assignors to Wynn's Climate Systems, Inc., Fort Worth, Tex.

Filed Nov. 24, 1993, Ser. No. 157,674

Int. Cl.<sup>6</sup> B23P 15/26

U.S. Cl. 29-890.043

20 Claims



1. A method for producing a parallel flow heat exchanger, the method comprising the steps of:

- providing metal sheets, inlet and outlet fittings, flow tubes, fins, and end caps;
- rolling the metal sheets into a tubular shape to lap the two opposing edges of each of the metal sheets to provide tubular headers;
- forming first apertures into the metal sheets between two opposing edges of each of the metal sheets for receiving the flow tubes in a parallel arrangement longitudinally along one side of the tubular shape;
- forming a second aperture through the two opposing edges of one of the tubular headers, the second aperture arranged in an alignment for directing the fluid to flow into particular ones of the first apertures for providing a parallel pattern of fluid flow between the tubular headers;
- forming at least one baffle from one of the metal sheets into a shape of a flat disc having a circumferentially extending periphery which includes a smaller circumference for mating against an interior surface of the one of the tubular headers, a larger circumference for fitting flush with an exterior surface of the one of the tubular headers, and an end tip for fitting substantially flush with an exterior of the two opposing edges which are lap joined;
- inserting the flow tubes into the first apertures, aligning the flow tubes to extend in the parallel arrangement between the headers, and aligning the headers in parallel;
- placing fins about the flow tubes;
- inserting end caps into the longitudinal ends of the tubular headers;
- installing inlet and outlet fittings into the headers;
- inserting the at least one baffle into the second aperture by passing the at least one baffle through the opposing edges of the one of the tubular headers, mating the periphery at the smaller circumference for the at least one baffle against the interior surface of the one of the tubular headers, fitting periphery at the larger circumference for the at least one baffle

flush with the exterior surface of one of the tubular headers, and fitting the periphery at the end tip for the at least one baffle substantially flush with the exterior of the two opposing edges which are lap joined; and placing the condenser, after assembly, into a brazing furnace to sealingly secure the condenser together.

5,481,801

# PROCESS FOR MANUFACTURING A BEARING SEAT FOR A HALF-SHELL BEARING

Hans Baumgartner, Moosburg, and Dieter Bleker, Munich, both of, Germany, assignors to Knorr-Bremse AG, Munich, Germany

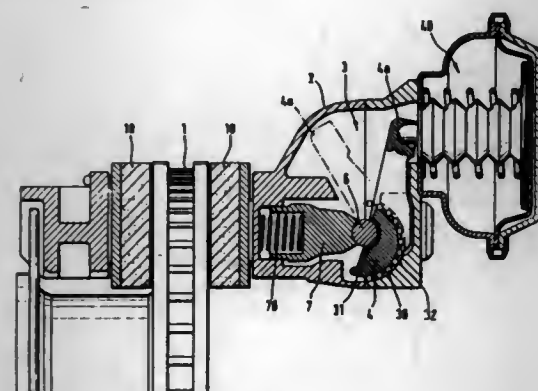
Filed Jul. 27, 1994, Ser. No. 281,021

Claims priority, application Germany, Nov. 4, 1993, 4337666

Int. Cl.<sup>6</sup> B23P 15/00

U.S. Cl. 29—898.06

6 Claims



1. A process for manufacturing a bearing seat for a half-shell bearing in a metal part, comprising:

- manufacturing a unitary structure having the metal part with a half-shell shaped recess therein whose diameter is slightly smaller than that of the half-shell bearing by a single forging or casting operation; and
- machining by a non-cutting process the recess until the diameter of the recess corresponds to that of the half-shell bearing.

5,481,802

# RAZOR HEAD, IN PARTICULAR A RAZOR BLADE UNIT OF A WET RAZOR

Max Lembke, Middlesex, Great Britain, assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 21, 1994, Ser. No. 185,437

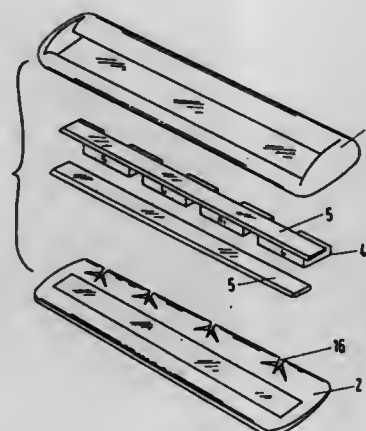
Claims priority, application United Kingdom, Jan. 21, 1993, 9301/56.

Int. Cl.<sup>6</sup> B26B 21/22

U.S. Cl. 30—50

11 Claims

1. A razor head for a wet razor, comprising:
- a first plastic part;
  - a second plastic part;
  - a razor blade means disposed between said first plastic part and said second plastic part, said razor blade means comprising two razor blades and a spacer disposed between said blades, wherein at least one indentation is provided on at least one of said first plastic part, said second plastic part, and said spacer of said razor blade means for receiving adhesive.



5,481,803

# SAFETY FEEDER

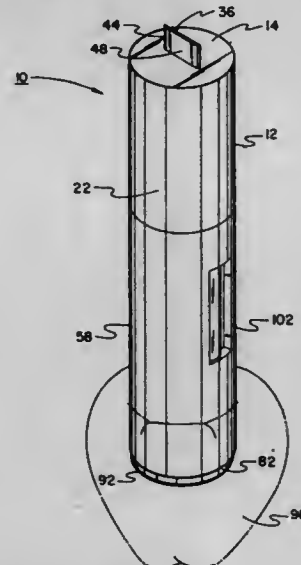
Ort S. Guthrie, and Mindy K. Guthrie, both of P.O. Box 118, Haines, Oreg. 97833

Filed Apr. 11, 1995, Ser. No. 420,143

Int. Cl.<sup>6</sup> A47J 17/00; 25/00

U.S. Cl. 30—113.3

14 Claims



1. A new and improved safety peeler for cutting and peeling fruit comprising, in combination:

- a short cylindrical shell of a rigid material having a closed exterior portion and an open interior portion with a cylindrical extension extending therefrom and an exterior surface therebetween with a top edge and a bottom edge, the exterior surface being about 1 inch in diameter, the short cylindrical shell having a length of about 3 inches in length with the cylindrical extension being about 10 percent of the length, the cylindrical extension having a diameter of about 1/4 inch including an external threaded portion;
- a generally rectangular tab of rigid material with a thin keen edged upper edge, a rectangular lower edge being in communication with the top portion of the shell and four vertical sides, the tab having a width of about 1/2 inch and a height of about 1/4 inch, each vertical side being equally spaced from the top edge of the exterior surface of the shell, the upper edge having a linear taper capable of cutting a fruit to the depth of about 1/4 inch, the upper edge further being capable of cutting away the skin of a citrus fruit;
- a long cylinder of rigid material being hollow having an interior opening with a top edge, an exterior opening with a bottom edge and an exterior surface and an internal wall therebetween,

tween, the long cylinder having a length of about 5 inches, the exterior surface being about 1 inch in diameter and having a length equal to the length of the long cylinder, the internal wall having a length equal to the length of the cylinder including an internal threaded portion, the internal threaded portion being adjacent to the top edge of the interior opening and being about ten percent of the length of the internal wall, the internal threaded portion further capable of engaging the external threaded portion of the cylindrical shell and placing the long cylinder juxtaposed with the short cylindrical shell;

- a cylindrical tapered edge having an upper edge in communication with the bottom edge of the exterior opening of the long cylinder and a lower edge with a thin keen edge extending exteriorly therefrom, the tapered edge being about 1/4 inch and 5 percent of the length of the long cylinder, the tapered edge further being capable of boring into an apple at the apple core with the lower edge and causing the core to be slidably received between the internal wall of the long cylinder; and
- a longitudinal slot formed in the long cylinder having a generally rectangular configuration with a side extent having a thin keen edge and three flush end edges, the slot having a length with the side extent having a length equal to the length of the slot, the slot being in communication with the exterior surface of the long cylinder, the slot being in communication with the internal wall of the long cylinder for release of air pressure to allow ease of insertion of the cylinder into the apple core, the slot being about twenty five percent of the length of the internal wall and the exterior surface of the long cylinder, the keen edge of the slot being capable of peeling away skin of a thin skinned fruit when the tapered edge of the long cylinder is not being used.

5,481,804

# RETRACTABLE-BLADED KNIFE

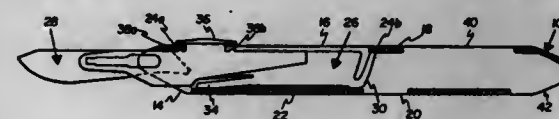
David Platts, 1932-B 42nd St., Los Alamos, N.M. 87544

Filed Oct. 12, 1994, Ser. No. 322,682

Int. Cl.<sup>6</sup> A61B 17/32

U.S. Cl. 30—162

4 Claims



1. A knife, comprising in combination:

- a generally flat, elongated handle member having a forward end and a rearward end, and further having two generally flat, parallel sides separated by a narrow top portion having an inner surface and a narrow bottom portion having an inner surface such that an elongated cavity extending substantially over the long dimension of said handle member and opening to the outside at the forward end thereof is formed, the top portion having an elongated notch therethrough toward the forward end of said handle member, there being formed a first indentation in the inner surface of the top portion forward of the notch and a second indentation in the inner surface of the top portion behind the notch, and the bottom portion having a notch therethrough in order to enable the second indentation in the top portion to be formed therein;
- a cutting blade; and
- a flat, elongated slide member adapted to slidably move longitudinally through the cavity in said handle member and adapted to receive said cutting blade, said slide member having a generally straight top portion along the narrow dimension thereof and an opposing bottom portion, and a digit-engaging tab protruding from the top portion adapted to extend through the notch in the top portion of said handle member such that the digit-engaging tab may be engaged by and actuated by a digit of an operator of said knife, said slide member having a first tab located toward one end of said slide member adapted to receive said cutting blade from the digit-engaging tab and adapted to engage the first indentation in the

top portion of said handle member, and a second tab located away from said one end of said slide member adapted to receive said cutting blade from the digit-engaging tab and adapted to engage the second indentation in the top portion of said handle member, said slide member further having a resilient, deformable tang projecting from the bottom portion thereof and opposing the digit-engaging tab such that the straight top portion of said slide member is forced against the inner surface of the top portion of said handle member by the action of the deformable tang of said slide member against the inner surface of the bottom portion of said handle member.

5,481,805

# EATING UTENSIL

Mark P. Wilson, 1773 Harmony Ln., Sarasota, Fla. 34239

PCT No. PCT/IT92/00070, § 371 Date May 19, 1994, § 102(e)

Date May 19, 1994, PCT Pub. No. WO93/00032, PCT Pub.

Date Jan. 7, 1993

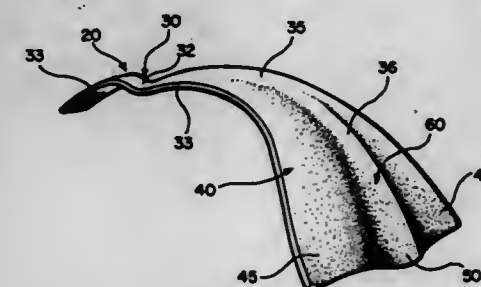
PCT Filed Jun. 27, 1992, Ser. No. 167,988

Claims priority, application Italy, Jun. 28, 1991, FI91A162

Int. Cl.<sup>6</sup> A47J 43/28

U.S. Cl. 30—322

20 Claims



17. An eating utensil suitable for use by individuals having hand impairments, comprising a head portion, an intermediate neck portion, and an arcuate handle portion extending rearwardly from said neck portion to a rear face, said neck portion and said handle portion forming a substantially S-shaped configuration for grasping by an individual, and said handle portion having an upper surface of a width sufficient to contact substantially the palm of a gripping hand of an individual.

5,481,806

# TONGUE ATTACHMENT FOR CIRCULAR SAW

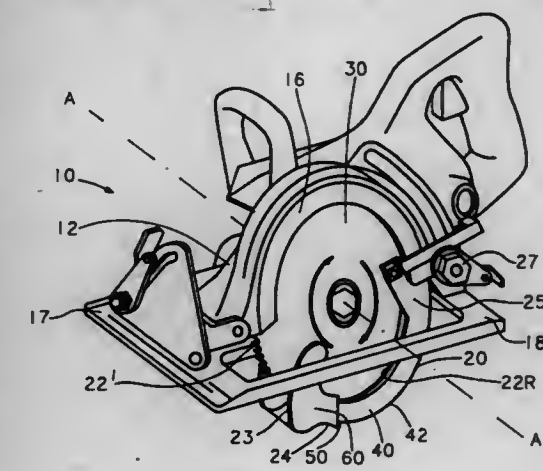
Edgar L. Pratt, P.O. Box 749, Montesano, Wash. 98563

Filed Jun. 27, 1994, Ser. No. 266,732

Int. Cl.<sup>6</sup> B23D 45/16; 47/00

U.S. Cl. 30—391

5 Claims





1. A tongue attachment for a portable electric circular saw equipped with a stationary upper guard fixed to the housing thereof and a lower guard pivotally supported on the housing and positionable to encompass the cutting edge of a circular saw blade along substantially the lower half of said blade, said lower guard having an interior wall with an arcuate leading edge for sliding engagement with a work piece, comprising:

a flat plate having a base end for attachment to an exterior surface of a forwardmost portion of the lower guard and a free end that extends from the base end radially inward toward the rotational axis of the blade, and having an arcuate leading edge substantially similar to the leading edge of the exterior wall and curved rearwardly from the base end toward the free end; and

means for attaching the base end of the tongue attachment to the lower guard;

wherein the leading edge of the tongue attachment includes substantially a quarter sector of a circle having a diameter half that of the largest diameter circular saw blade that the saw will accommodate, more or less, and whereby, in use, with the blade in powered circular motion, initial forward movement of the portable electric saw into a work piece causes a sliding engagement of the work piece along the leading edges of the interior wall and of the tongue attachment, thereby inducing a corresponding, smooth progressive movement of the lower guard from a first, closed position, to a second, retracted position, and further forward movement of the saw through the work piece likewise maintains the lower guard in a retracted position so that the leading edge of the tongue attachment smoothly slides over a bifurcated portion of the work piece and snags are thereby avoided.

5,481,807

## ARCHERY BOW SIGHT AND ADJUSTING TOOL

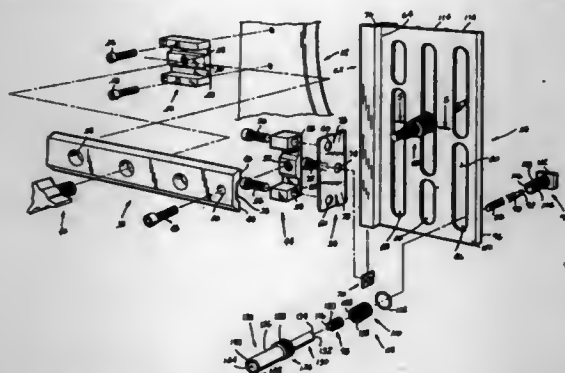
Terry Ploot, Hastings, Mich., assignor to Pro Line Company, Hastings, Mich.

Filed Mar. 15, 1994, Ser. No. 212,955

Int. Cl.<sup>6</sup> F41G 1/467

U.S. Cl. 33—265

13 Claims



1. In an archery bow sight assembly comprising:
  - a mounting plate adapted for attachment to an archery bow and having at least one slot therein;
  - at least one sight pin adapted to mount to the mounting plate and to extend through the at least one slot, said sight pin having a first locking collar to lock the sight pin to the plate against lateral movement within the slot and a second locking collar to lock the sight pin against longitudinal movement through the slot, one of the first and second locking collars having a diameter less than the other, the improvement comprising:
    - each of the first and second locking collars having at least one discontinuity on an annular edge thereof, and
    - a tool comprising an elongated body having a cavity open at one end and partially bounded by a first annular edge with a discontinuity complementary in shape to the discontinuity on one of the first and second locking collars, the cavity being

dimensioned to receive the smaller of the first and second locking collars in telescoping relationship, the body also having a second annular edge with a discontinuity complementary in shape to the discontinuity on the other of the first and second locking collars, whereby the tool can be used to selectively tighten or loosen the first and second locking collars, even when multiple sight pins are located closely adjacent to one another.

5,481,808

## VEHICLE ORIENTATION SENSOR AND METHOD WITH MAGNETIC STABILIZATION

Jacques C. S. Kools; Josef P. M. Naus; Wiepke Folkerts, and Martinus A. M. Gijls, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

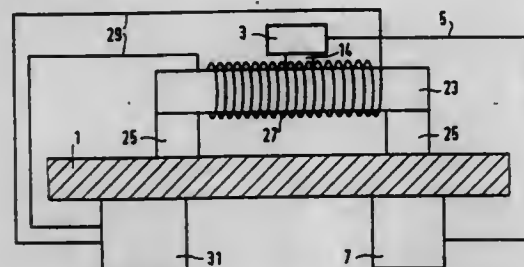
Continuation of Ser. No. 305,860, Sep. 14, 1994, abandoned, which is a continuation of Ser. No. 29,820, Mar. 11, 1993, abandoned. This application Apr. 10, 1995, Ser. No. 422,664

Claims priority, application European Pat. Off., Apr. 9, 1992, 92201018

Int. Cl.<sup>6</sup> G01C 17/38

U.S. Cl. 33—357

6 Claims



6. Apparatus for determining the orientation of a vehicle at various locations in an area of operation by sensing an external magnetic field having lines of force oriented in a predetermined direction, said vehicle having an outer body portion comprising a ferromagnetic material, said apparatus comprising:
  - a. means for producing a magnetic field in the outer body portion for stabilizing remanent magnetism of said body portion, means for alternating said magnetic field between first and second directions and, means for periodically reducing said magnetic field from a first magnitude to a predetermined lower magnitude during said alternations; and
  - b. means for sensing a component of said external magnetic field which is induced in the outer body portion.

5,481,809

## LASER PLUMB BOB AND APPARATUS

Michael Rooney, 1409 SW. Lake Rd., Redmond, Oreg. 97756

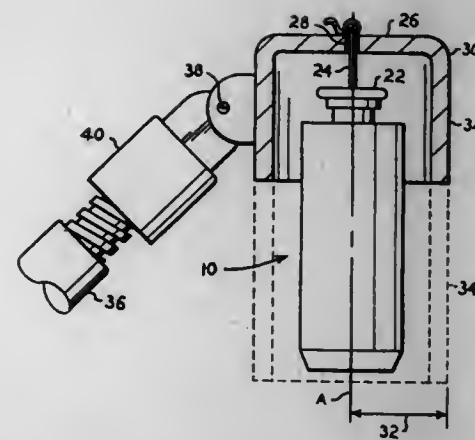
Filed Nov. 28, 1994, Ser. No. 348,256

Int. Cl.<sup>6</sup> G01C 15/10

U.S. Cl. 33—392

20 Claims

1. A laser plumb bob and apparatus for the determination of a line over a vertical distance defined by an upper point and a lower point, comprising:
  - a plumb bob body having an upper end including plumb line attachment means, an opposite open lower end defining a length therebetween, a longitudinal axis concentric with said line attachment means and having a precisely vertical alignment when said plumb bob body is suspended from said line attachment means, and an interior cavity containing a laser device therein adapted to project a laser beam from said open lower end of said plumb bob body and coaxially aligned with said longitudinal axis and said line attachment means of said plumb bob body;
  - apparatus for the remote holding of said laser plumb bob, comprising an upper plumb bob suspension member having



an edge and a plumb line passage therethrough at a predetermined distance from said edge, an extension column extending therefrom, a lower target with said target having an edge and having a central target point thereon at a predetermined distance from said target edge equal to said predetermined distance of said suspension member and aligned with said plumb line passage of said upper plumb bob suspension member when said edge of said target is aligned precisely with said edge of said upper plumb bob suspension member, and a short plumb line secured between said laser plumb bob and said suspension member and having a length substantially less than half of said vertical distance and adapted for the positioning of said laser plumb bob near said upper point of said vertical distance when said suspension member is placed adjacent said upper point, whereby;

said laser device projects a vertical laser line over the substantial majority of said vertical distance to said target when said laser plumb bob is suspended vertically by means of said short plumb line between said upper plumb bob suspension member and said plumb line attachment means and said target is placed below said laser plumb bob, with said vertical laser line hitting said target point precisely when said target is precisely aligned vertically below said upper plumb bob suspension member.

5,481,810

## COMBINATION TAPE MEASURE AND STRAIGHT EDGE APPARATUS

Michael R. Hastings, 25 Dole Rd., Gill, Mass. 01376, and John E. Remillard, Box 271, Bernardston, Mass. 01337

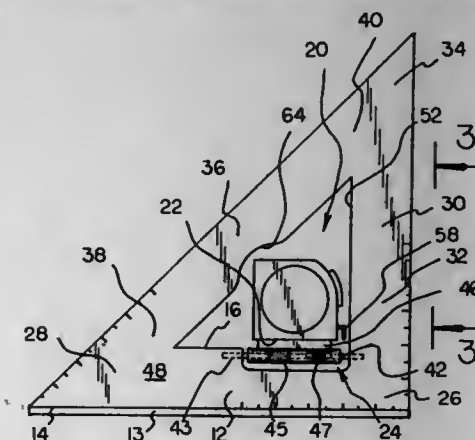
Filed Dec. 16, 1994, Ser. No. 357,592

Int. Cl.<sup>6</sup> B43L 7/027; G01B 3/10

U.S. Cl. 33—484

14 Claims

1. A combination tape measure and straight edge apparatus,



comprising:

- a first straight edge segment which includes an outer edge and an inner edge and which has a predetermined thickness,
  - a tape measure assembly which includes a bottom side, and
  - a hinge assembly connected between said bottom side of said tape measure assembly and said inner edge of said first straight edge segment, wherein said hinge assembly is adapted to permit said tape measure assembly to be rotated with respect to said first straight edge segment from a storage orientation to either a first in-use orientation or a second in-use orientation or from one of said in-use orientations to said storage orientation,
- wherein said hinge assembly includes,
- a sleeve member,
  - a fixed hinge pin connected to one end of said sleeve member and adapted to be in engagement with said inner edge of said first straight edge segment,
  - a movable hinge pin in sliding connection with an opposite end of said sleeve member and adapted to be in engagement with said inner edge of said first straight edge segment,
  - a spring connected to said movable hinge pin, and
  - a thumb-operated slide control button connected to said spring, such that, in order to remove said tape measure assembly from said first straight edge segment, a person slides said control button toward said fixed hinge pin, such that said movable hinge pin is freed up from connection with said inner edge of said first straight edge segment, and such that the person can move said fixed hinge pin out of contact with said inner edge of said first straight edge segment, whereby said tape measure assembly can be removed from the first straight edge segment.

5,481,811

## UNIVERSAL INSPECTION WORKPIECE HOLDER

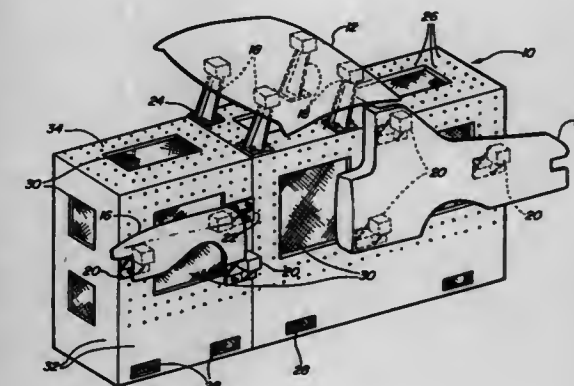
Larry L. Smith, Leonard, Mich., assignor to The Budd Company, Troy, Mich.

Filed Nov. 22, 1993, Ser. No. 156,313

Int. Cl.<sup>6</sup> B25B 1/00; F16B 1/00

U.S. Cl. 33—573

15 Claims



8. A casted riser for supporting a part being fastened to a base cube comprising:
  - a base plate with a top and bottom surface and integrally casted slugs at predesignated generalized locations, each slug directly adhered to the material of the casted riser and, each slug having an aperture precisely machined therein and each slug having an outer perimeter larger than the aperture therein to thereby accommodate variances in the generalized slug locations due to casting process while permitting the apertures to be substantially precisely located relative to each other;
  - an extension section connected at one end to the base plate; and
  - a holding section connected to an opposite end the extension section.

5,481,812

## SPACING TOOL FOR WALL CONSTRUCTION

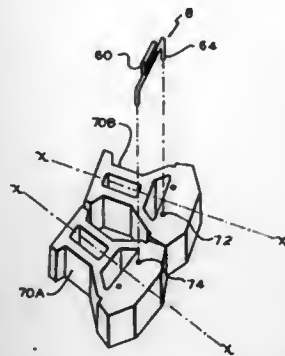
Michael Pedano, 33 Glen Roy Rd. S., Fairfield, N.J. 07004

Filed May 16, 1994, Ser. No. 260,950

Int. Cl.<sup>6</sup> G01B 3/30

U.S. Cl. 33—613

22 Claims



1. A spacing tool for construction utilizing building units having at least one alignment hole upon their surface comprising:
- a parallel pair of smooth insertion means held in a fixed position, each having a first end and a second end, for fitting the first end into said alignment hole, each of said insertion means having a length exceeding its width; and
  - spacing means for spanning said pair of insertion means and setting the spacing between two of said building units, said spacing means including:
  - (a) a spacing bar; and
  - (b) a handle attached to said spacing bar and having an opening between said handle and said spacing bar sized to allow fingers to curl under said handle between said handle and said spring bar, said handle and said insertion means being on opposite sides of said spacing bar, said handle being positioned to allow single handed gripping of said spacing tool at a position between and proximal to said second ends and approximately coplanar with said insertion means.

5,481,813

## TAPE MEASURE END RETENTION APPARATUS

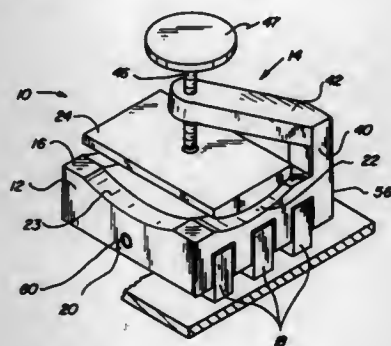
Harvey J. Templeton, 11934 Beverly DR., Houston, Tex. 77065

Filed May 16, 1994, Ser. No. 243,202

Int. Cl.<sup>6</sup> G01B 3/10

U.S. Cl. 33—758

11 Claims



1. A new and improved tape measure end retention apparatus, comprising:
- a base assembly,
  - a screw clamp assembly connected to said base assembly, said screw clamp assembly extending over a top side of said base assembly, said screw clamp assembly adapted to secure a free end of a tape measure to said base assembly, and
  - a plurality of magnets connected to said base assembly such that said magnets project from a bottom side of said base assembly,

bly, said magnets adapted to connect said apparatus to a magnetizable structure wherein said top side of said base assembly includes a first concave channel, said screw clamp assembly includes a pressure plate which includes a convex-shaped clamping surface, said screw clamp assembly further including means for permitting said pressure plate to rotate about an axis passing through said pressure plate, and said first concave channel is adapted to be placed in registration with said convex-shaped clamping surface, and wherein said top side of said base assembly includes a second concave channel, and said second concave channel is adapted to be placed in registration with said convex-shaped clamping surface when said pressure plate is rotated to be placed in registration with said second concave channel via said rotation means.

5,481,814

## SNAP-ON HINGED SHOE

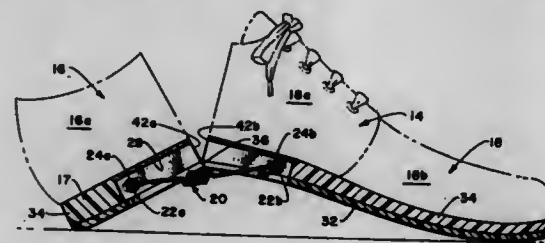
Robert A. Spencer, 16 E. Constance Ave., Santa Barbara, Calif. 93105

Filed Sep. 22, 1994, Ser. No. 310,499

Int. Cl.<sup>6</sup> A43B 11/00

U.S. Cl. 36—138

18 Claims



1. An article of footwear comprising separable front and back parts which are interconnected by a resilient sole at a crease line extending across said sole,
- a rigid element extending across said crease line having an axial extent defined by the distance between opposing first and second ends of said element,
  - said first end being attached to said sole adjacent said front part at a first location, said second end being attached to said sole adjacent said back part at a second location, the length of said sole extending between said first and second locations being greater than the axial extent of said rigid element.

5,481,815

## SYSTEM TO REDUCE SEDIMENT TOXICITY

Thomas Murphy, Grimsby, and Harry Savile, Burlington, both of, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by The Minister of The Environment, Hull, Canada

Continuation-in-part of Ser. No. 84,620, Jul. 1, 1993, abandoned. This application Apr. 10, 1995, Ser. No. 419,290

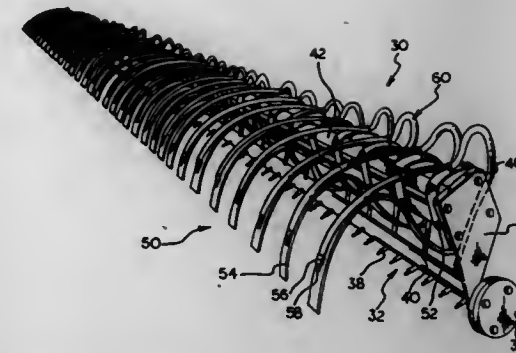
Int. Cl.<sup>6</sup> C12M 1/26; F02F 5/00

U.S. Cl. 37—344

10 Claims

1. An apparatus for treating sediment in a water body, said sediment containing chemical pollutants, comprising:
- a main support member;
  - a first dispensing means, mounted in spaced relation to said main support member, adapted for dispensing a treatment compound into the sediment to be treated at a first level;
  - a second dispensing means adapted for dispensing said treatment compound into said sediment at a second level, said second dispensing means comprising a plurality of individual flexible hoses, each having a nozzle at one end and connected at an opposed end to said first dispensing means for reception of said treatment compound;

separate members may be stored for future use without being visible through the display location.



resilient support means for supporting of said second dispensing means, said resilient support means adapted for penetrating said sediment, said resilient support means comprising a plurality of flexible fingers mounted to said main support member and separate from said first dispensing means and said second dispensing means; and means for connection for said first dispensing means with a supply of said treatment compound.

5,481,816

## MESSAGE SIGN WITH CHANGEABLE DISPLAY

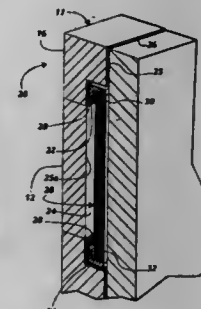
Jeffrey B. Cobb, Atlanta, and Jerry L. Kilgore, Lilburn, both of Ga., assignors to APCO Graphics, Inc., Atlanta, Ga.

Filed Oct. 6, 1993, Ser. No. 132,640

Int. Cl.<sup>6</sup> G09F 3/04

U.S. Cl. 40—450

4 Claims



1. A message sign having a changeable display, comprising:
- a sign body having a display location of a predetermined area;
  - a sign panel being insertable in the display location of the sign body and including at least one set of character elements that are operatively interrelated to selectively define a predetermined group of characters;
  - a plurality of separate members each operative to cover at least a selected one of the character elements in the set with the sign panel in the display location;
  - at least some of the members having a half-diamond portion to cover a selected one of said set of character elements when the member is placed thereon, and having an elongated base extending from the half-diamond portion, so that the member can cover a character element without covering part of an adjacent character element, so that only a subset of the character elements corresponding to a certain character from the group of characters remains visible to display a character at the display location; and
  - the sign panel has a planar surface of area greater than the area of the display location associated with the sign body so that a predetermined part of the surface area is not visible to view at the display location with the sign panel inserted at the display location,
- whereby the predetermined part of the surface area constitutes a storage location onto which unused ones of the plurality of

5,481,817

## FIREARM SUPPORT

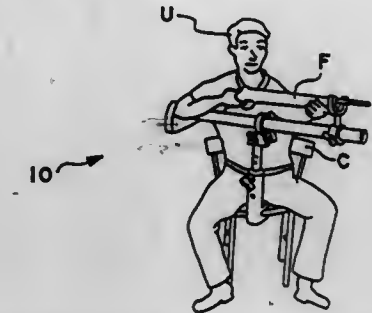
Michael A. Parker, 559 Rose Blvd., Nashville, N.C. 27856

Filed Oct. 18, 1993, Ser. No. 136,867

Int. Cl.<sup>6</sup> F41A 23/02

U.S. Cl. 248—286.1

8 Claims



1. A firearm support for use in adjusting a sight of a firearm, said firearm support comprising:
- a) an elongated tube having a forward end and a rear end, and defining a longitudinal axis;
  - b) a first collar releasably engageable with and surrounding said elongated tube, said first collar being slidably displaceable along the longitudinal axis of said elongated tube and having a clevis extending downwardly therefrom, said clevis being selectively rotatable in a horizontal plane;
  - c) a stand coupled to said elongated tube by said clevis so as to provide vertical support for said elongated tube, said clevis further being selectively pivotable in a vertical plane;
  - d) a second collar releasably attachable to said forward end of said elongated tube, said second collar being slidably displaceable along the longitudinal axis of said elongated tube and having a pair of prongs extending upwardly therefrom, said pair of prongs forming a fork for supporting a barrel of the firearm;
  - e) a plate-like member releasably attachable to said rear end of said elongated tube, said plate-like member being slidably displaceable along the longitudinal axis of said elongated tube, said plate-like member combining with said elongated tube to form an armrest for supporting an arm of a user; and
  - f) a clamp having means for telescopically receiving said stand, said clamp being releasably clampable to an object.

5,481,818

## GUN SIGHT MOUNTING SYSTEM

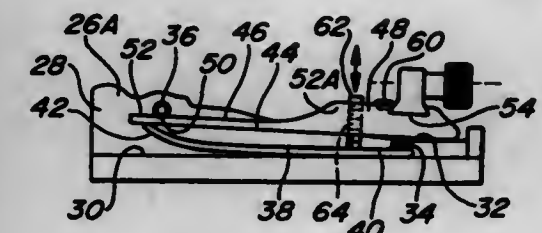
Gerald E. Stover, Lapeer, Mich., assignor to Williams Gunsight Company, Davison, Mich.

Filed Dec. 9, 1994, Ser. No. 353,054

Int. Cl.<sup>6</sup> F41G 1/26

U.S. Cl. 42—100

10 Claims



1. A gun sight mounting system comprising:



a housing including upwardly extending spaced apart side walls, an elongated floor and a shelf portion disposed above said floor;

a spring member having a relatively flat second end disposed along said floor and an upwardly extending arcuate first end; an elongated mounting base having a first end which is retained between said first end of the spring member and a roll pin and a second end which is disposed on said shelf portion said second end of the mounting base including recess means for receiving a selectively interchangeable sight embodiment; and an elevation screw which extends through said mounting base to contact said spring member;

whereby upon rotating the elevation screw the mounting base and sight embodiment can be simultaneously raised or lowered as desired, wherein said shelf portion at least partially overlaps the floor of said housing to provide a detent for receiving the second end of said spring member.

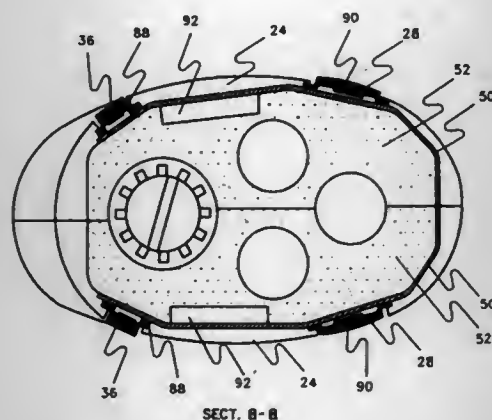
5,481,819

## LASER MODULE APPARATUS

James W. Teetzel, 14 Stratham Green, Stratham, N.H. 03885  
Continuation-in-part of Ser. No. 89,889, Jul. 12, 1993, Pat. No. 5,425,299, which is a continuation-in-part of Ser. No. 73,766, Jun. 8, 1993, Pat. No. 5,355,608. This application Feb. 23, 1994, Ser. No. 200,204  
Int. Cl.<sup>6</sup> F41G 1/35; 1/36

U.S. Cl. 42—103

10 Claims



6. A laser sight for a firearm having hand grips attachment members, said laser sight comprising:

a chassis mountable on said firearm, said chassis having a front face with at least one laser device housed within said chassis, with the light from said laser device exiting the front face of said chassis;

hand grips having interior and exterior surfaces, dimensioned and sized to be attached to the hand grips attachment members of said firearm, said hand grips having a plurality of waterproof rubber switches mounted on the exterior surfaces of said grips, said switches selecting said laser device;

connection means for electronically connecting said hand grips and said chassis.

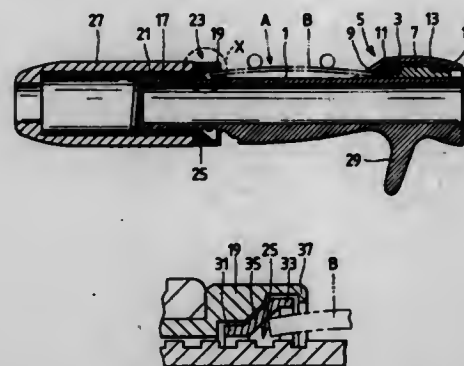
5,481,820

## REEL SEATS FOR FISHING RODS

Ryuichi Ohmura, Shizuoka, Japan, assignor to Fujii Kogyo Co., Ltd., Shizuoka, Japan  
Continuation of Ser. No. 53,857, Apr. 29, 1993, abandoned.  
This application Apr. 11, 1994, Ser. No. 225,937  
Claims priority, application Japan, Apr. 30, 1992, 4-137729  
Int. Cl.<sup>6</sup> A01K 87/06

U.S. Cl. 43—22

6 Claims



1. A reel seat for mounting a reel having a mounting leg to a fishing rod, said reel seat comprising a movable hood which comprises a hood portion adapted to extend over at least a part of said leg and a nut portion for moving said movable hood longitudinally along said fishing rod toward and away from said reel, said hood portion and nut portion being unitary, and a fastening piece disposed in its entirety within said hood portion and rotatable with respect thereto, said fastening piece contacting and exerting a clamping force on said mounting leg when said movable hood is moved toward said reel.

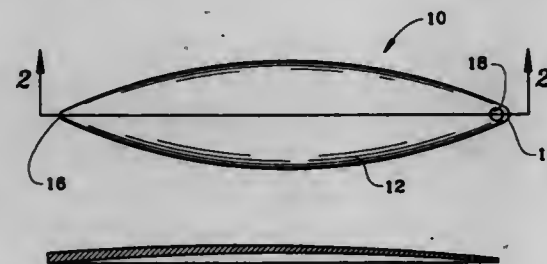
5,481,821

## SPINNER BLADE AND FISHING LURE USING THE SAME

Lonnie D. Stanley, P.O. Box 722, Huntington, Tex. 75949  
Continuation of Ser. No. 980,163, Nov. 23, 1992, abandoned.  
This application Sep. 15, 1994, Ser. No. 306,721  
Int. Cl.<sup>6</sup> A01K 85/00

U.S. Cl. 43—42.13

9 Claims



1. A spinner blade for fishing lures of the type having a V-shaped wire frame with a hook at one end, said blade comprising an elongated body having means at one end thereof for attaching the blade to the fishing lure, said body having a thickness which tapers uniformly from a maximum thickness at an opposite end to a minimum thickness at said one end of said blade.

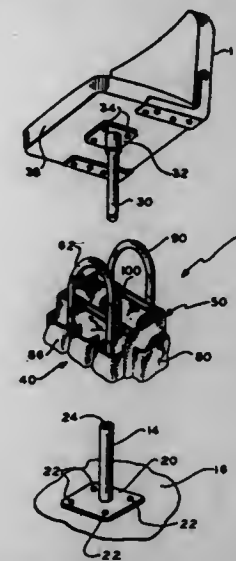
5,481,822

## FISHERMAN'S BAG

Russell W. Engels, R.D. 4, Box 429B, Samex, N.J. 08638  
Continuation of Ser. No. 414,690, Sep. 29, 1989, abandoned.  
This application Sep. 18, 1992, Ser. No. 946,786  
Int. Cl.<sup>6</sup> A01K 97/04

U.S. Cl. 43—54.1

21 Claims



1. A fisherman's bag, comprising:

(a) bag body means constructed from material which forms a bottom wall and opposed and spaced side walls defining therebetween an interior space;

(b) positioning tube means of predetermined size and configuration secured to and extending up from said bottom wall;

(c) the hollow of said tube means being of a size and configuration to be disposed about a vertical support post of a fisherman's seat; and

(d) opening means extending through said bottom wall in alignment with and of a size and configuration corresponding to that of the hollow of said tube means;

(e) said positioning tube means being secured only to said bottom wall and being unsupported at its top.

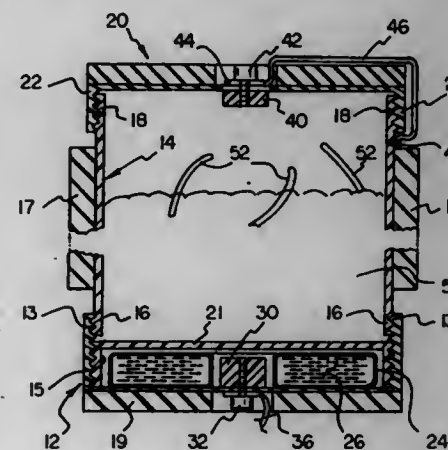
5,481,823

## WORM COOLER APPARATUS

Brian E. Hoover, and Cindy E. Hoover, both of 2087 Fort London Rd., Mercersburg, Pa. 17236  
Filed Oct. 21, 1994, Ser. No. 325,977  
Int. Cl.<sup>6</sup> A01K 97/04

U.S. Cl. 43—55

10 Claims



10. A live bait cooler apparatus, comprising:

a removable and replaceable bottom lid assembly which includes a first connector and which includes an interior chamber adapted for receiving a quantity of coolant material,

a tubular container assembly which includes a second connector adapted for connection with said first connector and which includes a third connector,

a removable and replaceable top lid assembly which includes a fourth connector which is adapted for connection with said third connector,

a first tether assembly connected to said bottom lid assembly, and

a second tether assembly connected between said top lid assembly and said container assembly,

wherein said second tether assembly includes a nut and bolt adapted for attachment to said top lid assembly, a bolt ring adapted for placement over said bolt for securing said bolt ring to said top lid assembly, a pin adapted for attachment to said container assembly, a pin ring adapted for placement over said pin for securing said pin ring to said container assembly, and a second tether connected between said bolt ring and said pin ring for connecting said top lid assembly with said container assembly.

5,481,824

## RUBBER BAND POWERED MOUSETRAP

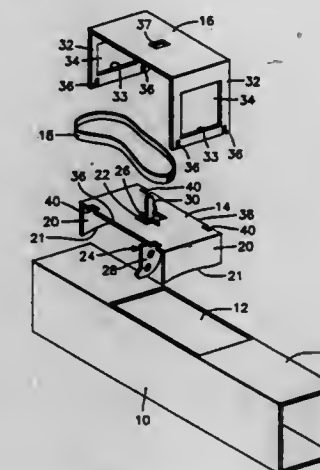
Joseph F. Flore, Jr., Lebanon, Pa., assignor to Woodstream Corporation, Lititz, Pa.

Filed Jun. 13, 1994, Ser. No. 261,180

Int. Cl.<sup>6</sup> A01M 23/24

U.S. Cl. 43—85

12 Claims



1. A trapping mechanism for a mousetrap, said mechanism comprising an anchor plate having depending end walls each formed with a lower edge, a striker plate to fit over the anchor plate, the striker plate having depending walls to fit outside the end walls of the anchor plate, the end walls of the striker plate being deeper than the end walls of the anchor plate and each having an aperture therein with a bottom edge spaced below the lower edge of the respective anchor plate end wall to form a trapping aperture therebetween, a resilient means to be fitted between the plates and provide a force urging the striker plate upwardly with respect to the anchor plate into a sprung position wherein said bottom edges of the apertures in the striker plate end walls approach the respective lower edges of the anchor plate end walls and wherein the striker plate can be pushed down against said force into a set position wherein said bottom edges are removed from said lower edges, and a trigger assembly carried by the anchor plate for releasably holding the striker plate in the set position.

5,481,825

## TRAY FOR CARRYING PLANT POTS

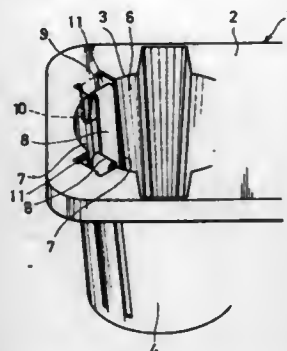
Matsuo Aoyama, Aichi, Japan, assignor to Kaneya Sangyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 20, 1994, Ser. No. 326,685

Claims priority, application Japan, Jan. 22, 1993, 5-264998  
Int. Cl.<sup>6</sup> A01G 9/00

U.S. Cl. 47-18

3 Claims



1. A tray for carrying a plurality of plant pots, comprising:  
a base plate;  
a plurality of container sections provided in said base plate and formed integrally therewith for receiving pots therein, each of said container sections having an open top end, a peripheral wall and a bottom wall; and  
retainer means, including a plurality of retainer members disposed on said peripheral wall of each of said container sections and spaced from each other in a direction circumferentially of said peripheral wall, each of said retainer members including an upper portion connected to said base plate and a lower portion connected to said peripheral wall at a position adjacent said bottom wall, each retainer member having both lateral sides separated from said peripheral wall by slits and said upper portion having at least one bent part which serves to provide resiliency to the corresponding retainer member, said retainer means being operable to resiliently apply a pressing force to the side wall of a pot received within said container section so as to fixedly hold the pot in position, whereby each of said retainer members resiliently deform in a direction away from the center of the corresponding container section through abutment on the side wall of the pot when the pot is inserted into said container section.

5,481,826

## SELF-WATERING PLANTER WITH CONVERTIBLE BASE

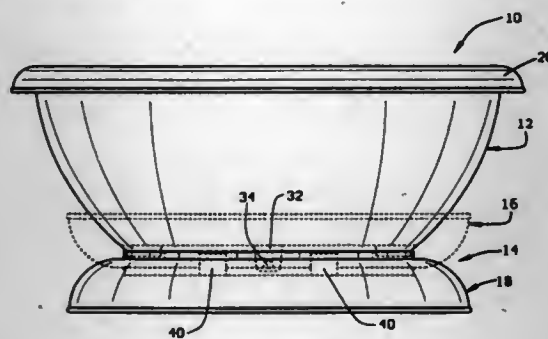
Thomas Dickinson, and Bradley D. Gale, both of St. Louis, Mo., assignors to Contico International, Inc., St. Louis, Mo.

Filed Dec. 5, 1994, Ser. No. 349,684

Int. Cl.<sup>6</sup> A01G 9/02; 9/04

U.S. Cl. 47-39

20 Claims



1. A self-watering planter comprising:

- a container having upwardly extending walls and a bottom from which downwardly depend one or more capillary wells for facilitating water transfer; and  
a convertible base which, in a first upright position, has one or more well reservoirs for collecting water and for correspondingly receiving each of said capillary wells and which, in a second inverted position, has a cavity reservoir for collecting water and for correspondingly receiving each of said capillary wells.

5,481,827

## METHOD FOR MANUFACTURING SOD

Henry F. Decker, Ostrander, Ohio, assignor to Buckeye Bluegrass Farms, Ostrander, Ohio

Continuation-in-part of Ser. No. 2,263, Jan. 8, 1993, abandoned, which is a continuation-in-part of Ser. No. 590,692, Oct. 1, 1990, Pat. No. 5,177,898, which is a continuation-in-part of Ser. No. 224,939, Jul. 27, 1988, Pat. No. 4,986,026.

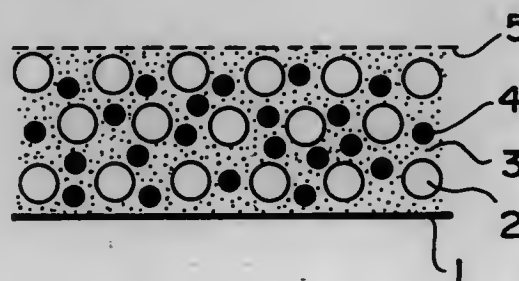
This application Apr. 1, 1994, Ser. No. 221,793

The portion of the term of this patent subsequent to Jan. 21, 2008, has been disclaimed.

Int. Cl.<sup>6</sup> A01C 1/04

U.S. Cl. 47-58

16 Claims



1. A method for producing and stabilizing sods having substantially less weight than conventional sods, the method comprising:  
(a) placing a layer of selected vegetative mulch upon a root impervious barrier sufficient to form a continuum, said mulch comprising an additional amount of a vegetative growing material; said vegetative growing material selected from the group consisting of plugs, stolons, springs, and mild sod;  
(b) infiltrating a suitable growing medium into the interstices of the mulch to form a stable mulch/medium/matrix;  
(c) planting seeds into the mulch/medium/matrix;  
(d) applying a fine mulch to the top of the matrix to further stabilize the sod;  
(e) applying a nurse crop to the matrix for further stabilization;  
(f) allowing the seeds and vegetative planting material to produce primary rooting sufficient to bind the mulch/medium/matrix into a strong sod;  
(g) growing the sod sequentially in contiguous beds that are sized in economical units that lend themselves to daily production;  
(h) harvesting a sod.

5,481,828

## SECURITY POST FOR AUTOMOBILES

Andreas Kentrotas, 134-06 58th Rd., Flushing, N.Y. 11355

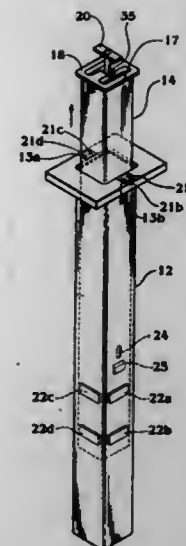
Filed Oct. 3, 1994, Ser. No. 316,728

Int. Cl.<sup>6</sup> E05B 65/00

U.S. Cl. 49-35

16 Claims

1. A security post comprising:  
a hollow sleeve having a top and a bottom, said sleeve having at least one opening at said top;  
a post slidably disposed in said hollow sleeve, said post having a top, a bottom and an outer surface;



- a post end plate disposed on said top of said post, said post end plate comprises:  
a substantially square plate having a pair of spaced rectangular parallel slots;  
a recess between said slots, said recess being perpendicular to said slots and extending from one of said spaced parallel slots to the other of said parallel slots; and  
drain holes disposed within each of said pair of rectangular slots;  
lifting means for raising and lowering said post, said lifting means formed in said post end plate;  
stopping means for preventing said lifting means from raising said post out of said sleeve; and  
locking means for securing said post in an upright position, said locking means comprises:  
a securing bolt having a first end and a spaced second end, each of said ends having a width, said first end having a hole therethrough, said width of said second end being larger than the width of said first end;  
a bore through said post near said bottom of said post, said first end of said securing bolt being inserted through said bore such that said hole in said first end extends beyond the outer surface of said post to secure said post in an upright position; and  
a lock releasably fastened through said hole in said securing bolt.

5,481,829

## DOOR AND WINDOW CONSTRUCTION AND MOUNTING ASSEMBLY FOR IMPROVED SECURITY, VENTILATION AND AESTHETICS

Dave G. Waytashek, 1702 Rio Vista La., Santa Maria, Calif. 93454

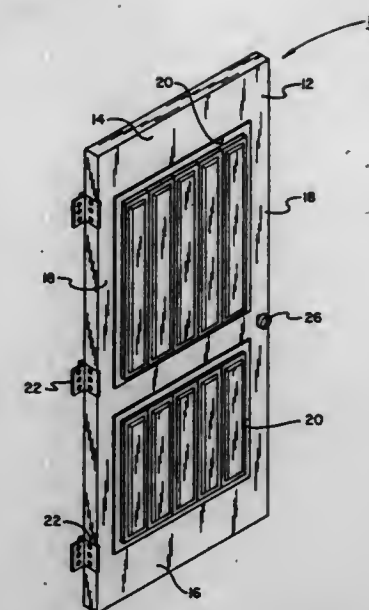
Filed Jul. 18, 1994, Ser. No. 276,837

Int. Cl.<sup>6</sup> E06B 7/28

U.S. Cl. 49-171

1 Claim

1. A new and improved door construction and mounting assembly for improved security, ventilation and aesthetics comprising, in combination:  
a steel frame in a rectangular configuration having short horizontal parallel upper and lower extents and long vertical parallel interior and exterior side extents with at least one central opening extending therethrough, the interior extent having hinges for the pivotal securement to a casement and the exterior extent having a handle assembly for locking and unlocking the door;  
a panel positioned within the central opening, the panel having a gridwork of horizontally disposed steel members and vertically disposed steel members in a gridlock configuration to



- form rectangular apertures extending therethrough, the vertical steel members having axially aligned bores therethrough, with the spacing between the apertures sized such as to preclude the passage of a person therethrough, the panel having a plurality of inserts located within the apertures with vertical disposed hinges coupling the inserts and the vertical steel members for allowing the selective covering and uncovering of the apertures; and  
adjustment mechanisms for moving the inserts between closed positions and open positions, the adjustment mechanisms including a horizontally disposed rotary drive rod with exterior threads on the surface thereof located through the aligned bores, cylindrical collars with interior threads located at spaced points along the length of the drive rod at locations adjacent to the inserts, coupling links pivotally secured between the cylindrical collars and the ends of the inserts remote from the hinges and a worm gear coupled to the drive rod with a handle located on the inside of the door whereby rotation of the handle and the worm gear will rotate the drive rod to move the cylindrical collars in unison to pivot the inserts between open positions and closed positions at the discretion of an operator.

5,481,830

## DOOR CHECK FOR VEHICLE SLIDING DOOR

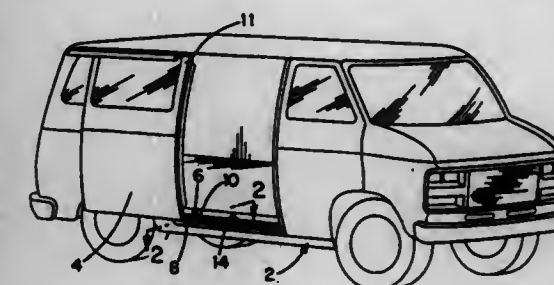
Roger C. Gooding, and Lloyd W. Rogers, Jr., both of Shelby Township, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 4, 1994, Ser. No. 205,422

Int. Cl.<sup>6</sup> E05B 55/00

U.S. Cl. 49-449

5 Claims



1. A door check arrangement for a sliding door of a vehicle comprising:



an arm generally fixably connected to the door along a first end of the arm, and the arm being generally translationally connected to the vehicle along a second end of the arm;

a track mounted within the vehicle for receiving the second end of the arm, the track having a striker plate and an entrapment section;

a support connected to the arm generally adjacent the second end of the arm, the support having a first slot with first and second ends and a second slot having first and second surfaces angled from one another;

a detent plate having a surface inclined with respect to the striker plate, the detent plate also having first and second pivot pins mounted within the first and second slots;

spring means biasing the detent plate to place the first pivot pin toward the first slot first end and the second pivot pin on the first surface of the second slot, whereby motion of the door from a closed position to a checked open position causes the detent plate inclined surface to contact the striker and to pivot the detent plate in a first angular direction and wherein further movement of the door toward a checked open position causes the detent plate to pivot again in a second angular direction opposite the first angular direction to place the detent plate in the entrapment section of the track with a low first threshold of force on the door in the opening direction and wherein the door is thereafter checked open even when the vehicle is on a declining surface toward the first end of the first slot, and wherein pulling the door closed from the open checked position with a second force on the door significantly higher than the first opening force causes the detent plate to contact the striker and the first pivot pin to move toward the first slot second end and for the second pivot pin to move from the second slot first surface to the second slot second surface, thereby causing the detent plate to pivot in the first angular direction and causing the detent plate to pivot out of the entrapment section to allow the detent plate to release the door from the checked position.

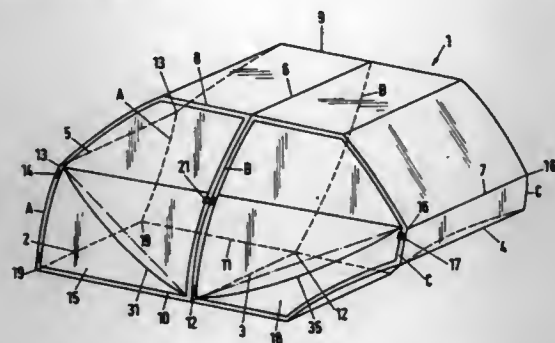
#### 5,481,831 VEHICLE DOOR

Gunther Heim, Obertshausen, and Bruno Kroll, Radevormwald, both of, Germany, assignors to YMOS Aktiengesellschaft Industrieerzeugnisse, Obertshausen, Germany  
Filed Jun. 30, 1993, Ser. No. 85,759  
Claims priority, application Germany, Jun. 30, 1992, 42 21 446.1

Int. Cl.<sup>6</sup> B60J 5/04

U.S. Cl. 49—502

13 Claims



1. A vehicle door comprising a door frame including at least one front frame section (26), at least one rear frame section (27), at least one lower frame member (29) and at least one upper frame member (30), door frame junctions (32, 33) at which said frame sections and said frame members are connected to each other to form said door frame that defines a frame plane, at least one diagonal strut (31, 35) connected at its ends to two of said door frame junctions (32, 33) positioned diagonally opposite each other, said at least one diagonal strut having a curvature vaulted out of said frame plane as viewed from inside a vehicle, whereby said

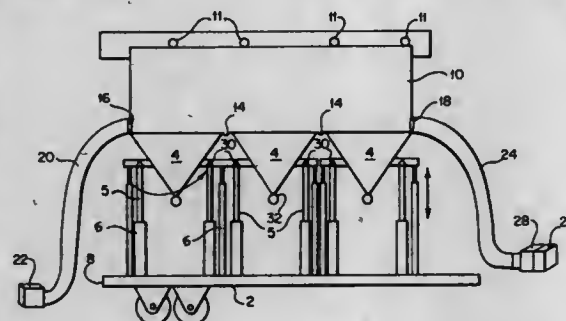
diagonal strut is positioned for transferring an impact force component applied to said diagonal strut from outside a vehicle, to said two door frame junctions (32, 33) positioned diagonally opposite each other.

#### 5,481,832 BRIDGE SAND BLASTING SUPPORT APPARATUS

Steven M. Tirikos, 278 Gordon Ave., Campbell, Ohio 44405  
Filed Sep. 23, 1993, Ser. No. 126,219  
Int. Cl.<sup>6</sup> B24C 1/00

U.S. Cl. 451—75

19 Claims



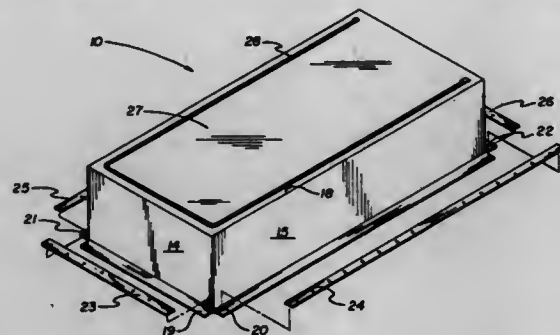
1. A bridge sand blasting support apparatus, comprising:  
A) a bin having a hollow interior, an open top face, and outer top edges;  
B) a trailer;  
C) support means mounted to the trailer and on which the bin is mounted, for supporting the bin;  
D) a grate covering the open top face of the bin;  
E) a skirt having a top edge and a bottom edge, the bottom edge being attached to the outer top edges of the bin such that the skirt forms a continuous sheet encircling the open top face of the bin; and  
F) attachment means on the top edge of the skirt for removably attaching the top edge of the skirt to the bridge;  
G) the grate, the skirt and the bridge defining a work area.

#### 5,481,833 ATTIC HATCHWAY COVER

Steve L. Williams, 164 Mill Pond Ln., Mooresville, N.C. 28115  
Filed Nov. 16, 1994, Ser. No. 340,609  
Int. Cl.<sup>6</sup> E06B 7/00

U.S. Cl. 52—19

6 Claims



1. An attic hatchway cover arranged for securement onto a framework of an attic opening, wherein the cover comprises, a first side wall spaced from a second side wall and a front wall connected to a rear wall, wherein the front wall is fixedly and obliquely secured to the first side wall and the second side wall, and the rear wall is obliquely and fixedly secured to the first side wall and the second side wall, and the rear wall spaced from the front wall, a top wall extending coextensively

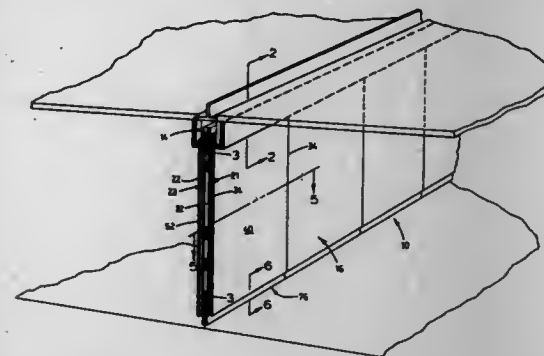
to the front wall, the first side wall, the second side wall, and the rear wall to define a cavity within the cover, and the top wall having a zipper member, and the zipper member having a first end spaced from a second end, and the top wall having a flap hingedly secured to the top wall between the first end and the second end, and selectively secured to the top wall through the zipper member, wherein the front wall, the rear wall, the first side wall, and the second side wall are each of a rigid construction.

#### 5,481,834 FIRE-RATED PANEL

Stanley Kowalczyk, Clinton; Todd A. Williams, Janesville; James D. Petzrick, Beloit, and Charles E. Williams, Delavan, all of Wis., assignors to Hufcor, Inc., Janesville, Wis.  
Filed Apr. 8, 1994, Ser. No. 224,953  
Int. Cl.<sup>6</sup> E06B 9/04

U.S. Cl. 52—64

28 Claims



28. A partition arrangement comprising a track;

a panel including:

a plurality of parallel vertically extending sheets of wallboard; means for supporting said sheets of wallboard from said track for horizontal movement and for fastening said sheets of wallboard together with each sheet of wallboard parallel to and spaced apart from the adjacent sheet of wallboard to define a member having first and second opposite vertically extending sides that are both parallel to the direction of movement, and having a top and bottom;

a vertically extending sheet of steel in contact with and covering one of said sides of said member; and  
a vertically extending sheet of steel in contact with and covering the other of said sides of said member; and

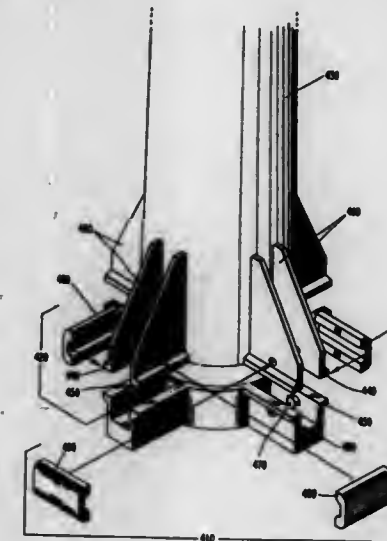
said partition arrangement further comprising a top housing including a first vertical surface on one side of said track and a second vertical surface on the other side of said track, said first and second surfaces of said top housing extending vertically down from above the top of said panel to below the top of the panel, said first and second surfaces of said top housing respectively facing said first and second sheets of steel so as to prevent flames from a fire from travelling directly across the top of the panel;

a bottom seal supported by said member and moveable relative to said member between a raised position, and a lowered position in engagement with a floor below said member, at least a portion of said seal being telescopically slidable in one of the spaces between two of said sheets of wallboard, and a weight mechanism attached to said bottom seal and including a weight pivotally movable relative to at least one of said sheets of wallboard, said weight mechanism selectively biasing said bottom seal downwardly for engagement with a floor to impede movement of said panel along said track.

#### 5,481,835 BREAKAWAY BASE AND UPPER-SEPARATION JOINT

Jeffrey A. Bloom, Silver Spring, Md., assignor to Adian Engineering Corporation, Silver Spring, Md.  
Continuation-in-part of Ser. No. 693,085, Apr. 30, 1991, abandoned, which is a continuation-in-part of Ser. No. 350,881, May 12, 1989, abandoned. This application Mar. 19, 1993, Ser. No. 34,195  
Int. Cl.<sup>6</sup> F04H 12/00; F01F 9/018  
U.S. Cl. 52—98

14 Claims



1. A breakaway base for a highway luminaire support, comprising:

a lower-base section having a radial-spoked shape with a first plurality of spokes when viewed from above, with a first plurality of rims on a side of each of the first plurality of spokes along an upper edge;

an upper-base section having a radial-spoked shape with a second plurality of spokes when viewed from above with a second plurality of rims on a side of each of the second plurality of spokes along a lower edge matching the positions of the first plurality of rims on the lower-base section;

a plurality of retainer segments, each of said plurality of retainer segments having a C-shaped cross-section, engaging and capturing the first and second plurality of rims and preventing relative vertical motion of the first and second plurality of rims; and

holding means, fastened through the plurality of retainer segments, for securing the plurality of retainer segments against the first and second plurality of rims, said holding means, responsive to horizontal loading, releasing the plurality of retainer segments unbroken, separating the upper-base section from the lower-base section.

#### 5,481,836 WALL SUPPORT SYSTEM

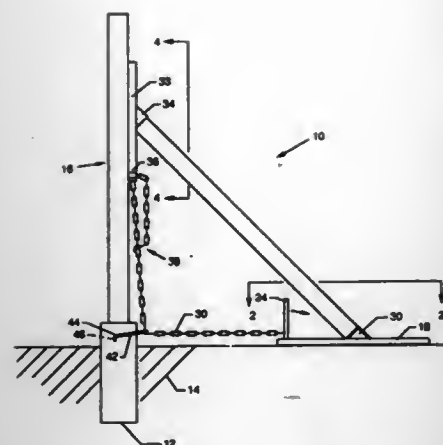
Mark M. Miller, 2374 Dempsey Ave. NW., Buffalo, Minn. 55313, and Michael M. Miller, 680 Virginia Shores, Excelsior, Minn. 55331  
Filed Apr. 15, 1994, Ser. No. 228,395  
Int. Cl.<sup>6</sup> E04G 21/26

U.S. Cl. 52—127.2

18 Claims

1. A wall support system for a wall in combination with a footing comprising:

a. a base including 1) a welded angled means for receiving a 4x4 at one end of said base; 2) opposing welded tabs with center holes at the other end of said base; 3) a handle mounted between said tabs with nut and bolt assemblies; and 4) a chain with a hook welded to a lower end of said handle;



- b. a wall support including 1) a welded angle means for receiving a 4x4 in a midportion of said wall support, and 2) a square loop tube welded to said wall support for passing through a chain;
- c. a cement loop means for attachment into a footing; and
- d. a 4x4 member engaged between said welded angle means whereby said chain is passed through said cement loop means, then through said square loop tube, said hook is hooked over a loop, and then said handle is rotated to tighten said chain thereby engaging said system between a wall, a ground, and about said cement loop means.

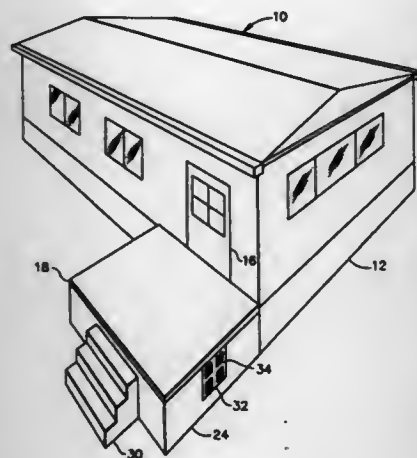
5,481,837

**STORM SHELTER FOR USE WITH A MOBILE HOME**  
William H. Minks, Jr., 3026 Graystone Manor Pkwy., Louisville, Ky. 40241

Filed Oct. 11, 1994, Ser. No. 321,408  
Int. Cl.<sup>6</sup> E02D 27/00; E04H 9/00

U.S. Cl. 52—169.6

10 Claims



1. A combination of a mobile home and shelter comprising a mobile home positioned on a foundation with an entrance spaced a distance above the ground and a storm shelter defining an enclosed volume for receiving at least one individual, said shelter including a top wall juxtaposed to said mobile home beneath said entrance and extending horizontally away from said mobile home thereby forming a floor of a stoop;
- at least one side wall secured to said top wall and extending into and anchored to the ground;
- a bottom wall secured to said side wall wherein said side wall has at least one door for access into the interior of said volume.

5,481,838  
**ANTI-FRACTURE, WATER-RESISTANT, MASONRY-BONDABLE MEMBRANE**

David L. Fishel, Caledonia, and Terry M. Digiglia, Columbus, both of Miss., assignors to GenCorp Inc., Fairlawn, Ohio  
Division of Ser. No. 969,893, Nov. 2, 1992, Pat. No. 5,318,832.  
This application Jan. 4, 1994, Ser. No. 177,057

Int. Cl.<sup>6</sup> E02D 19/00

U.S. Cl. 52—169.14

3 Claims



1. A masonry, anti-fracture, water-resistant construction, comprising: a lamina having a central layer comprising at least one ply of a flexible layer which is a vinyl chloride homopolymer or copolymer containing from about 35 to about 55 parts by weight of a plasticizer per 100 parts by weight of said vinyl chloride homopolymer or copolymer, and a nonwoven fiber layer physically bonded to each side of said central layer, said central layer having a total thickness of from about 0.63 to about 1.27 millimeters, said lamina bonded with a bonding material on one side to a masonry exterior article and bonded with a bonding material on the remaining side to a masonry substrate.

5,481,839

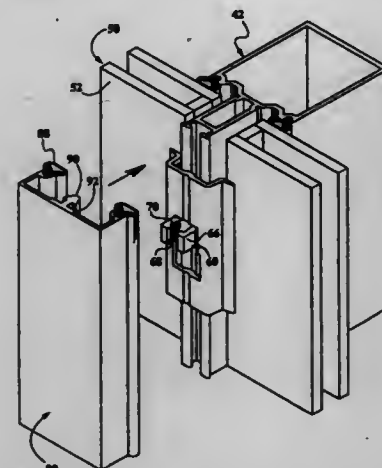
**GLAZED PANEL WALL CONSTRUCTION AND METHOD FOR ASSEMBLY THEREOF**

William J. Lang, Alpharetta, Ga., and Phillip E. Garling, Rogers, Ariz., assignors to Kawneer Company, Inc., Norcross, Ga.

Filed Sep. 9, 1992, Ser. No. 942,589  
Int. Cl.<sup>6</sup> E04B 2/62

U.S. Cl. 52—235

5 Claims



1. A glazed panel wall construction comprising:
- a frame member having a channel formed in its outer face and having glazing recesses formed on either side thereof;
- a glazing clip engaged within said channel in said outer face of said frame member and projecting forwardly therefrom;
- a pair of glazing panels each having an outer surface and having an edge disposed within a corresponding one of said glazing recesses;
- a glazing panel retainer which engages said glazing clip and which has bearing surfaces which engage a mutually facing marginal portion of said outer surface of each of said glazing panels to retain said glazing panels within said glazing recesses during assembly of said curtain wall construction; and

a cover member which engages said glazing clip, said cover member comprising means for retaining said glazing panels within said glazing recesses, and said glazing panel retainer being concealed beneath said cover member such that said glazing panel retainer does not have to be disengaged from said glazing clip prior to said cover member being engaged with said glazing clip.

5,481,840

**LATERAL LOAD TRANSFER SYSTEM FOR OPERABLE WALLS**

Wesley B. Dickson, Port Townsend, Wash., assignor to Advanced Equipment Corporation, Fullerton, Calif.

Continuation of Ser. No. 159,037, Nov. 29, 1993, abandoned.

This application Mar. 8, 1995, Ser. No. 400,664

Int. Cl.<sup>6</sup> E04B 2/56; 2/58

U.S. Cl. 52—241

29 Claims



9. Operable wall load transfer apparatus in combination with an operable wall panel suspended from a guide track above a floor, comprising:

top load transfer means mounted in a top edge of the wall panel and including at least one rigid member extendable into and out of the guide track for transferring lateral loads from said wall panel to said guide track; and

floor engagement means, mounted in the bottom edge of said panel and the floor beneath said panel, for removably engaging the panel with said floor, said floor engagement means comprising:

a continuous floor engagement member including an acoustic gasket member having a serrated bottom edge;

a floor insert means for mating with said engagement member, said floor insert means having a serrated edge which conformably mates with the serrated edge of said acoustic gasket member; and

means for spring biasing said engagement member in mating position with said floor insert means.

5,481,841

**VARIABLY ASSEMBLABLE FIGURATIVE TILE SET FOR COVERING SURFACES**

John A. L. Osborn, 250 Donegal Way, Martinez, Calif. 94553

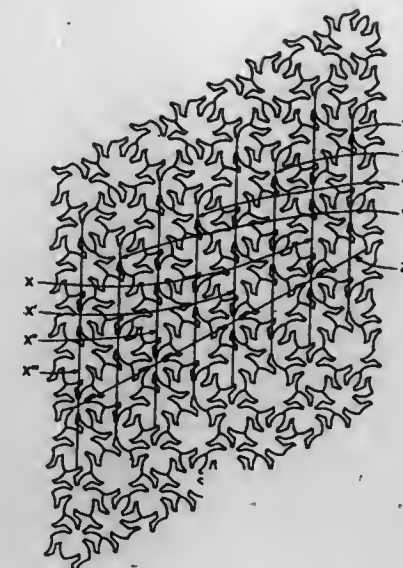
Filed Oct. 4, 1994, Ser. No. 317,899

Int. Cl.<sup>6</sup> A63F 9/10; E04F 13/00; 15/00

U.S. Cl. 52—311.2

1 Claim

1. A set of eight different bilaterally symmetrical and variably assemblable figurative tiles formed from eight regular hexagons all of the same size and formed by



- (a) using an asymmetrical and recurved pattern, moved in the plane, to replace each of three contiguous sides of each of said hexagons so that each of the eight possible arrangements of three differently oriented contiguous sides forms a hemiperimeter of one of said hexagons, and
- (b) reflecting the respective hemiperimeter as a unit to replace the three remaining unmodified sides, thus completing each of the eight different bilaterally symmetrical and variably assemblable figurative tiles.

5,481,842

**LINKING AND ASSEMBLY BLOCK FOR PROFILED BARS AND ASSEMBLY OF BARS APPLYING IT**

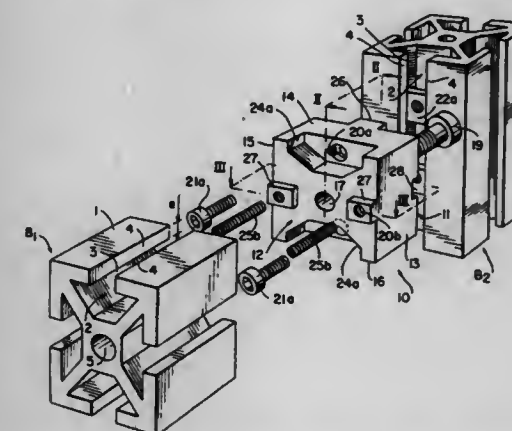
André Gautreau, 32, Rue de Colomb, 46100 Figeac, France  
Filed Jun. 3, 1993, Ser. No. 70,530

Claims priority, application France, Jun. 3, 1992, 92 06941

Int. Cl.<sup>6</sup> E04C 3/00

U.S. Cl. 52—656.9

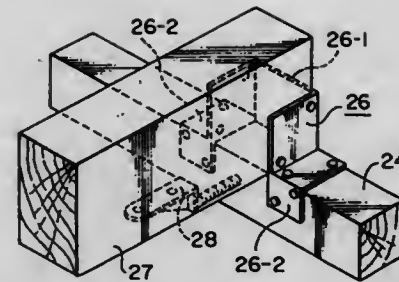
14 Claims



1. An assembly block for joining together profiled bars, each of said profiled bars having a T-shaped groove formed in a longitudinal face thereof, said block being adapted to be attached to said longitudinal face, said block comprising:
- a solid body having, in plan view, a polygonal cross section;
- two lateral faces;
- at least one bore extending through said block;
- and at least one counterbore formed one of said lateral faces as an extension of said bore, said bore being adapted to receive a screw with a head of the screw being disposed in the counterbore;



a plurality of through holes formed in orthogonal planes in said solid body, the through holes being adapted to receive screws a plurality of cutouts in at least one of said lateral faces and extending to a perimeter of said block, the cutouts extending to respective ones of said through holes; and  
at least one projection on each of said lateral faces, each projection having a maximum predetermined width which is equal to or less than a width of said T-shaped groove formed in the longitudinal face of said profile bar.



5,481,843

**LATH FOR WALL OR CEILING CONSTRUCTION**

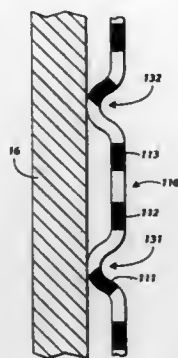
John E. Krelkemeler, 175 Ranchette Rd., Alpharetta, Ga. 30201

Continuation-in-part of Ser. No. 831,947, Feb. 6, 1992, Pat. No. 5,287,673. This application Feb. 22, 1994, Ser. No. 199,558

Int. Cl.<sup>6</sup> E04C 2/42

U.S. Cl. 52-664

7 Claims



## 1. A wall or ceiling construction comprising:

a substrate;

a lath mounted to said substrate and comprising a substantially planar grid including first portions extending laterally in a first direction and second portions extending laterally and generally transversely of said first portions, said grid having a generally smooth side, and said first portions and said second portions defining a plurality of openings extending transversely through said grid, said lath further comprising a plurality of spacer means positioned opposite said generally smooth side of said grid for spacing said grid away from said substrate, said spacer means comprising deformations formed in said grid; and

a surface treatment layer of plaster, stucco, or like material spread over and through said lath and in substantial contact with said substrate.

5,481,844

**JOINT PART FOR USE IN WOODEN BUILDINGS**

Yusuke Kajita, Hokkaido, Japan, assignor to Kajita Construction Company, Hokkaido, Japan

Division of Ser. No. 915,420, Jul. 17, 1992, Pat. No. 5,337,533.

This application Dec. 9, 1993, Ser. No. 165,032

Claims priority, application Japan, Jan. 31, 1991, 3-286514; Jan. 31, 1991, 3-286515

Int. Cl.<sup>6</sup> E04B 1/38; F16B 1/00

U.S. Cl. 52-702

4 Claims

1. A connector for connecting together wooden beams in a house construction comprising:

a joint part including a C-shaped member having opposed side walls having openings therein to receive first beam fasteners therethrough, and a rear wall interconnecting said side walls, said side walls and rear wall surrounding an interior space of said C-shaped member, said joint part further including

respective outwardly extending members each having a first substantially planar element perpendicularly extending from a respective side wall along an edge of said side wall perpendicular to said rear wall to extend away from said interior space in a direction perpendicular to said opposed side walls, each first planar element having openings therein to receive second beam fasteners therethrough; and  
a plate member with a long bolt for use in conjunction with said joint part upon placement parallel to said substantially planar elements and extending away from said interior space in a direction perpendicular to said rear wall;  
wherein said joint part and said plate member are used in conjunction to connect a free end of a beam to a cross-beam by: placing said outwardly extending members over a top surface of the cross-beam so that said C-shaped member extends away from the top surface of the cross-beam, placing the free end of the beam within said interior space of said C-shaped member so that the free end is adjacent said rear wall and rests on the cross-beam, and inserting said long bolt into the cross-beam with said plate member beneath and supporting the beam.

5,481,845

**FLEXIBLE CORNER FOR TRIMMING CURVED WALL**

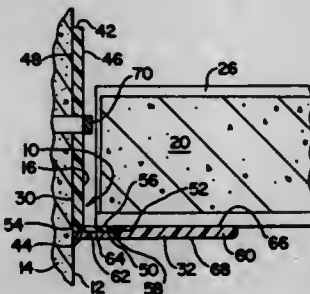
Joseph M. Koenig, Jr., Lincolnwood, Ill., assignor to Trim-Tex, Inc., Lincolnwood, Ill.

Filed Aug. 17, 1994, Ser. No. 291,769

Int. Cl.<sup>6</sup> E04C 2/38

U.S. Cl. 52-717.03

6 Claims



1. An elongate, flexible corner for trimming a curved surface, the flexible corner comprising

(a) an elongate angle extruded from a hard, flexible, polymeric material, comprising a first flange with a distal edge and a proximal edge, and comprising a second flange with a distal edge and a proximal edge, which is unitary with the proximal edge of the first flange, the second flange being smaller than the first flange and extending from the first flange approximately at a right angle relative to the first flange when the flexible corner is unstressed, the elongate angle having a generally uniform width measured between the distal and proximal edges of the second flange, at any point along the flexible corner, and

(b) an elongate strip extruded from a soft, pliable, polymeric material softer than the material of the elongate angle, the elongate strip being attached to the elongate angle, along the flexible corner, and being configured so as to have a proximal

portion extending beyond the distal edge of the second flange, approximately at a right angle relative to the first flange when the flexible corner is unstressed, the extending portion being wider than the generally uniform width of the elongate angle.

5,481,846

**SUPPORT POLE HAVING A BELL-SHAPED LOWER END**

Carl J. Macchietto, Omaha, Nebr., assignor to Valmont Industries, Inc., Valley, Nebr.

Filed Mar. 27, 1995, Ser. No. 409,843

Int. Cl.<sup>6</sup> E04C 3/32

U.S. Cl. 52-720.1

10 Claims



## 1. A support pole, comprising:

a horizontally disposed base plate for attachment to a footing;  
a hollow pole member having upper and lower ends;  
said lower end of said pole member being secured to said base plate;

said pole member having a horizontal, quadrilateral cross-section for a majority of its length;

said lower end of said pole member being bell-shaped so as to have a horizontal, circular cross-section at its connection with said base plate.

5,481,847

**APPARATUS FOR, AND A METHOD OF, PLACING AN INSERT IN A CONTAINER**

Derek C. Lockington, Oakham, Great Britain, assignor to Guinness Brewing Worldwide Limited, London, Great Britain

Continuation of Ser. No. 52,632, Apr. 23, 1993, abandoned.

This application Oct. 4, 1994, Ser. No. 317,784

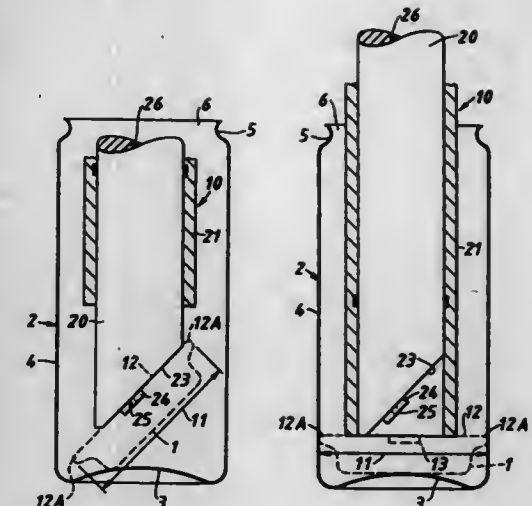
Claims priority, application United Kingdom, Apr. 29, 1992, 9209281

Int. Cl.<sup>6</sup> B65B 61/00

U.S. Cl. 53-128.1

3 Claims

1. A head assembly for placing an insert in a container and which assembly is to be mounted for displacement substantially along a longitudinal axis thereof, the assembly comprising a core and a longitudinally extending sleeve on the core, said core and sleeve being longitudinally displaceable relative to each other; the core having an end face which is fixed relative thereto and is inclined relative to said longitudinal axis and which end face has means for applying a vacuum suction therethrough for retaining and carrying an insert on said end face, and wherein said sleeve is displaceable along said longitudinal axis and relative to the core for displacing an insert carried by the inclined end face from that end face.



5,481,848

**METHOD FOR FEEDING AND PREPARING INFORMATION LEAFLETS ON A PRODUCT PACKAGING LINE AND A SYSTEM FOR IMPLEMENTING THIS METHOD**

Roberto Tagliaferri, Castel S. Pietro, and Franceschi Giancarlo, Budrio, both of Italy, assignors to I.M.A. Industria Macchine Automatiche S.p.A., Ozzano Emilia, Italy

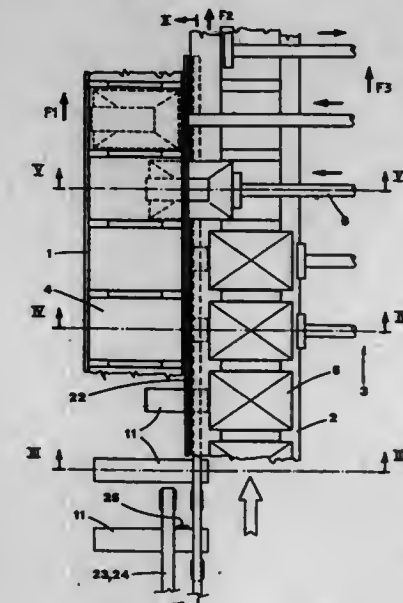
Filed Sep. 14, 1993, Ser. No. 121,287

Claims priority, application Italy, Sep. 16, 1992, BO92A0324

Int. Cl.<sup>6</sup> B65B 35/54

U.S. Cl. 53-157

7 Claims



## 1. A product and leaflet packaging system comprising:

a carton conveyor;  
a product conveyor extending parallel to said carton conveyor along at least a packaging path;  
product loading means disposed along said packaging path for loading products from said product conveyor into respective cartons on said carton conveyor; and  
leaflet conveyor means located between said carton conveyor and said product conveyor along said packaging path for transporting leaflets adjacent to the product loading means, the leaflets being inserted into said cartons, through contact with respective products, as said products are loaded into their respective cartons by said product loading means, said leaflet

conveyor means including a pair of coating belts extending parallel to one another and to said packaging path, said belts being in contact with one another along said packaging path, whereby the leaflets are gripped and transported between and by said belts.

5,481,849

# OPERATING UNIT FOR HANDLING MOVING PRODUCTS

Mario Spatafora, Bologna, Italy, assignor to Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A., Bologna, Italy

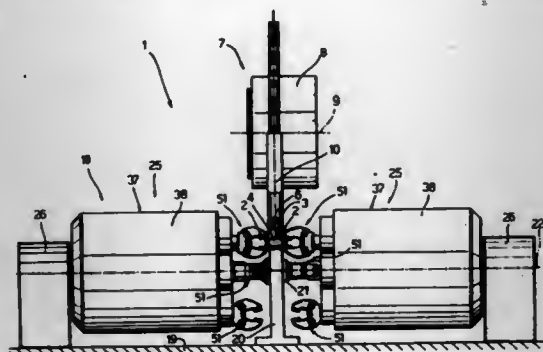
Filed Jan. 28, 1994, Ser. No. 187,514

Claims priority, application Italy, Feb. 24, 1993, BO93A0064

Int. Cl.<sup>6</sup> B65B 7/12; 51/00; 11/34

U.S. Cl. 53—370

19 Claims



1. An operating unit for handling moving products, the unit comprising:

an operating station for performing a given operation on said products;

a feed device having a given number of transportation heads for respective said products and designed to feed the products successively along a first given path through the operating station;

an operating device located at the operating station for performing said operation on said products, the operating device comprising at least one operating tool and drive means for moving said operating tool along a second, annular path extending about a fixed first axis, said annular path comprising an active portion substantially coinciding with said first path, said drive means being a hypocyclic drive means designed to move said tool along said second path at a speed which is variable according to a first given law of motion, and comprising a carrier element mounted for rotation solely about said first axis and supporting said tool, wherein each of said transportation heads is movable about a second axis parallel to the first axis; and

actuating means for moving each of the transportation heads at a speed which is variable according to a second law of motion, the second law of motion being substantially the same as the first law of motion, as the transportation heads travel along said first path.

5,481,850

# ROTARY COVERING AND FASTENING SYSTEM

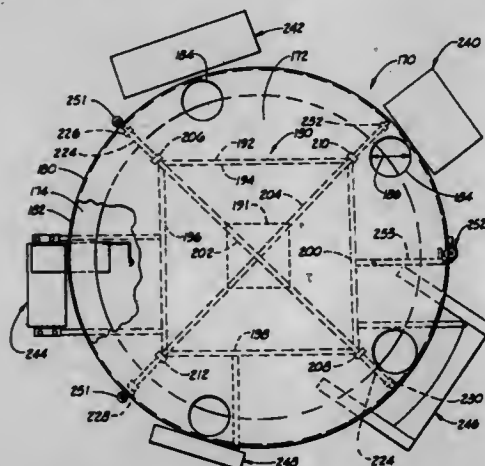
Donald E. Weder, Highland; William F. Straeter, Breese; Joseph G. Straeter, Highland, all of Ill.; Paul Fantz, Imperial, Mo.; James G. Carmody, Highland, and M. James Lelder, Deerfield, both of Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 819,311, Jan. 9, 1992, abandoned, which is a continuation of Ser. No. 765,416, Sep. 26, 1991, Pat. No. 5,105,599, which is a continuation of Ser. No. 530,491, May 29, 1990, abandoned, which is a continuation of Ser. No. 315,169, Feb. 24, 1989, abandoned. This application Jul. 7, 1993, Ser. No. 88,692

Int. Cl.<sup>6</sup> B65B 11/00; 51/08

U.S. Cl. 53—397

19 Claims



6. A method for forming a sheet of material about at least a portion of a pot means having an outer peripheral surface to provide a decorative covering for the pot means, the pot means having a botanical item disposed therein, the method comprising: providing a platform;

providing cover forming means adapted to form the sheet of material about at least a portion of the outer peripheral surface of a pot means;

placing the sheet of material on the platform at a material positioning station of the platform;

moving the platform to position the sheet of material and the platform at a forming station;

providing the pot means;

utilizing the cover forming means at the forming station to form the sheet of material into a cover extending about at least the portion of the outer peripheral surface of the pot means, the pot means carried by the platform;

moving the platform to a fastener station to position the pot means for application of a fastener about the cover;

applying a fastener about at least a portion of the cover for cooperating to hold the cover about the pot means;

moving the platform to a removal station to position the pot means for removal from the platform; and

removing the pot means by vertically lifting the pot means and the cover from the platform at the removal station.

5,481,851

# METHOD AND APPARATUS FOR CHARGING CONTAINERS WITH HAZARDOUS MATERIALS

Larry E. Koenig, c/o Komar Industries, Inc., 4425 Marketing Pl., Groveport, Ohio 43125

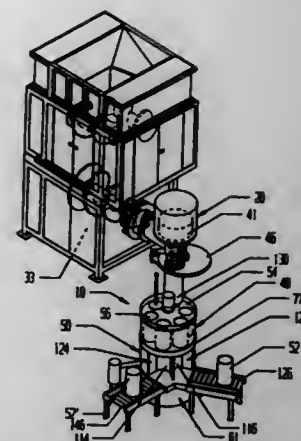
Filed May 3, 1993, Ser. No. 58,004

Int. Cl.<sup>6</sup> B65B 31/02

U.S. Cl. 53—432

27 Claims

1. A rotary cartridge filler for containerization of processed waste material comprising:



upper means including a cylindrical die module having a plurality of chambers for receiving predetermined volumes of waste, said upper means being sealed from the ambient; lower means including a cylindrical canister module having a plurality of chambers for receiving empty containers; means for indexing said upper and lower means through a plurality of stations, said predetermined volume of waste in said upper means being indexed from one of said stations to another; and

means mounted above one of said chambers of said upper means for positively displacing said volumes of waste from said upper means to said containers in said lower means, said lower means being sealed from the ambient whereby leakage of said waste material to the ambient is minimized,

wherein one of said stations is capable of charging a predetermined volume of waste into a selected one of said chambers of said upper means, and a distinct one of said stations is capable of transferring said predetermined volume of waste from said selected chamber to said lower means by using said positive displacing means.

5,481,852

# METHOD AND APPARATUS TO PROMOTE GAS EXCHANGE FROM A SEALED RECEPTACLE

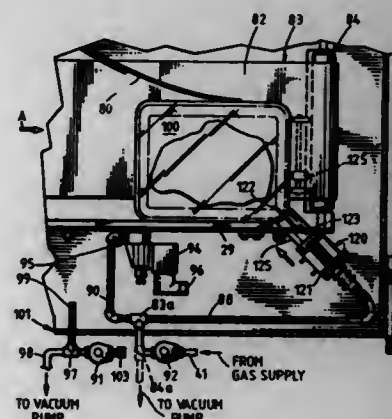
Jerry L. Mitchell, Livingston, Tex., assignor to Pakor, Inc., Livingston, Tex.

Continuation-in-part of Ser. No. 649,583, Feb. 1, 1991, abandoned, which is a continuation-in-part of Ser. No. 510,938, Apr. 19, 1990, abandoned, which is a continuation-in-part of Ser. No. 214,195, Jun. 27, 1988, Pat. No. 4,919,955, which is a division of Ser. No. 94,384, Sep. 8, 1987, abandoned. This application Jun. 24, 1993, Ser. No. 101,235

Int. Cl.<sup>6</sup> B65B 31/02

U.S. Cl. 53—432

27 Claims



1. A method for replacing a first gas contained within a sealed receptacle containing a food product with a second gas, comprising the sequential steps of:

(a) placing the sealed receptacle containing said product in a chamber capable of maintaining a desired pressure on said receptacle;

(b) placing the receptacle in fluid communication with the interior of said chamber through a self-sealing resealable valve so as to equalize the pressure therebetween while otherwise maintaining the sealed condition of said receptacle where said fluid communication occurs within said chamber;

(c) Drawing a first partial vacuum in said chamber so as to remove the first gas from said receptacle through the self-sealing valve;

(d) injecting an oxidizing gas into said receptacle while separately injecting a second gas into said chamber so as to equalize the pressure between the interior of the receptacle and the interior of the chamber;

(e) placing the receptacle containing the oxidizing gas in fluid communication with said chamber through the self-sealing valve;

(f) drawing a second partial vacuum in said chamber so as to substantially remove the oxidizing gas from the receptacle through the self-sealing valve;

(g) injecting a third gas into said receptacle through the self-sealing valve while separately injecting the second gas into said chamber so as to again equalize the pressure between the interior of the receptacle and the interior of the chamber; and

(h) removing the equalized receptacle containing the third gas from the chamber.

5,481,853

# BEVERAGE CONTAINER WITH BOTTOM CAVITY

Maurice Nasrallah, Tarrytown, N.Y.; Fred Sadeghi, Danbury, Conn., and James J. Wang, New City, N.Y., assignors to Kraft Foods, Inc., Northfield, Ill.

Division of Ser. No. 173,528, Dec. 23, 1993, Pat. No.

5,409,124. This application Dec. 20, 1994, Ser. No. 359,672

Int. Cl.<sup>6</sup> B65B 51/14; 51/20

U.S. Cl. 53—453

3 Claims



1. A method of forming a beverage container comprising the steps of:

blow molding a unitary beverage container including a main body which is vertically elongated defining a container volume in which a beverage is contained; a top of the main body; a bottom of the main body having (a) a continuous base surface, (b) a central concavity extending inwardly from the base surface defined by a horizontal recess surface and a peripheral recess band extending between the base surface and the recess surface, and (c) a filling conduit extending from the recess surface; a flexible straw having a proximal end which is fluidly connected with the container volume of



the main body and a distal end having an aperture therein which is located adjacent the top of the main body; and an attaching means for removably attaching the distal end of the flexible straw adjacent the top of the main body and for closing the aperture of the distal end of the flexible straw; orienting the beverage container with the filling conduit uppermost and extending vertically; filling of the beverage container with a beverage introduced through the filling conduit; locating two complementary pinching jaws on respective opposite vertical sides of the filling conduit and in the central concavity, with the pinching jaws each including a cutting member located vertically below the base surface; heating only an interior area of the filling conduit adjacent the pinching jaws to a melting temperature; and closing the pinching jaws to pinch the filling conduit closed in the central concavity so that the interior area is fused together and to cut off an upper portion of the filling conduit thereabove with the cutting members.

5,481,854

# **METHOD OF AND APPARATUS FOR INSERTING TRAYS OF ARTICLES INTO SLEEVES**

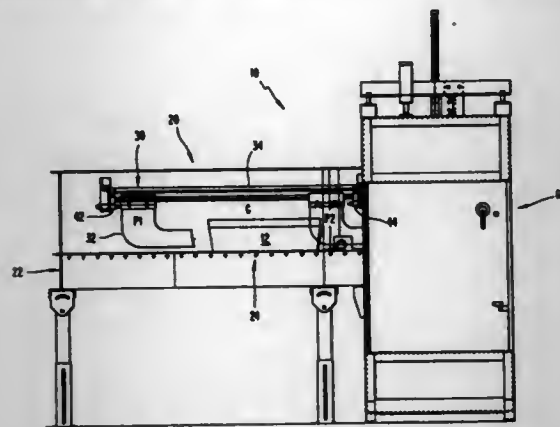
Carl D. Van Newkirk, Ellicott City, Md., assignor to Carter Control Systems, Inc., Frederick, Md.

Filed Sep. 24, 1993, Ser. No. 127,040

Int. Cl.<sup>6</sup> B65B 43/24; 43/44

U.S. Cl. 53—458

27 Claims



1. A method for handling articles, comprising the steps of: positioning a tray of articles for inserting the tray in a sleeve; gripping an uppermost sleeve blank from a supply of sleeve blanks; lifting the gripped sleeve blank from the supply to remove the gripped blank to a position above the supply; forming the gripped sleeve blank into a sleeve; positioning the gripped and formed sleeve for accepting a tray; and, inserting the tray of articles into the formed sleeve.

5,481,855

# **TABLET PACKING DEVICE AND METHOD FOR CONTROLLING THE SAME**

Shoji Yuyama, 3-8, Honan-cho Nishi 4-chome, Toyonaka-shi, Osaka, Japan

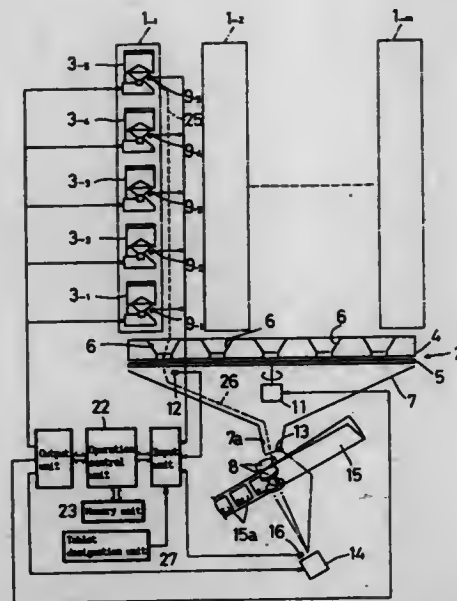
Filed Sep. 27, 1994, Ser. No. 312,993

Int. Cl.<sup>6</sup> B65B 1/06; 1/40; 35/12; 57/10

U.S. Cl. 53—493

6 Claims

1. A tablet packing device having a plurality of feeders accommodating different types of tablets, said tablets being selectively dropped from said feeders and packed, said packing device further comprising:



memory means for storing data of a time period for each type of tablets to settle down from the instant when a dropped tablet has landed; and control means for controlling said feeders to discharge one of said tablets from one of said feeders, to read out said time period specified for said one tablet from said memory means, and to drop the next one of said tablets from another one of said feeders after said time period has lapsed.

5,481,856

# **METHOD AND APPARATUS FOR CUTTING AQUATIC VEGETATION**

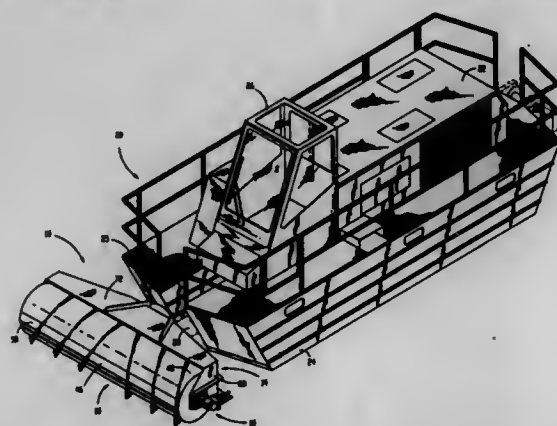
Ricard J. Wickoren, Shawnee, and Dean R. Wickoren, Paola, both of Kans., assignors to Innovative Material Systems, Inc., Olathe, Kans.

Filed Nov. 18, 1994, Ser. No. 342,253

Int. Cl.<sup>6</sup> A01D 44/00

U.S. Cl. 56—9

18 Claims



1. Apparatus for cutting aquatic vegetation comprising: a first stationary cutterbar presenting a first set of spaced-apart cutterbar teeth mounted therealong; a second stationary cutterbar presenting a second set of spaced-apart cutterbar teeth mounted therealong; a cutterhead shroud mounting said first and second stationary cutterbars; a drum rotatably mounted proximate said cutterhead shroud, said drum presenting a substantially smooth drum surface and presenting a plurality of radially projecting drum teeth therealong;

means rotatably mounting said drum proximate said cutterheads and means mounting said drum teeth to present gaps between the points thereof whereby some of said drum teeth pass closely adjacent said first set of teeth in tearing relationship and other of said drum teeth pass closely adjacent said second set of teeth in tearing relationship during rotation of said drum.

18. A method of cutting aquatic vegetation comprising the steps of:

providing a dredge including a pump and means for conveying cut vegetation from said pump; said pump mounting a cutterhead having a shroud and a drum, said drum presenting a substantially helical array of drum teeth, said shroud present at least one stationary cutterbar presenting a plurality of cutterbar teeth, at least some of said cutterbar teeth being oriented in vegetation tearing relationship to said drum when said drum is rotated relative to said shroud, said shroud further including a port for passing cut vegetation to said pump;

placing said cutterhead in engagement with aquatic vegetation; rotating said drum to cut said vegetation; moving said vegetation transversely along said drum by augering action of said helical array of teeth; and passing said vegetation through said port and into said pump.

5,481,857

# **MOWER BLADE MOUNTING STRUCTURE**

Hideya Umemoto; Hiroaki Kawakita; Kazuo Samejima; Mitsuhiro Matsuyama; Hideo Okura; Kaname Matsuzaki, and Masaji Kure, all of Sakai, Japan, assignors to Kubota Corporation, Osaka, Japan

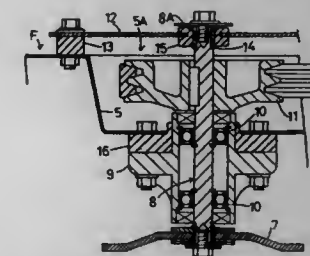
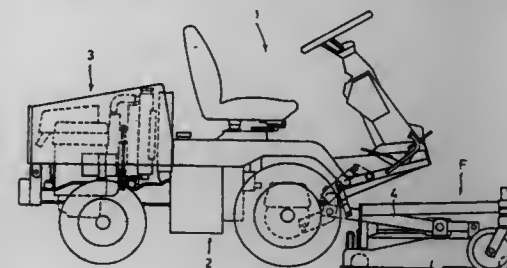
Filed Apr. 4, 1994, Ser. No. 223,503

Claims priority, application Japan, Sep. 3, 1993, 5-219917; Sep. 7, 1993, 5-221627; Sep. 30, 1993, 5-244038

Int. Cl.<sup>6</sup> A01D 34/66; 34/82; 67/00

U.S. Cl. 56—12.6

19 Claims



15. A mower unit comprising: a plurality of blade mechanisms each having a blade and a blade shaft fixed to said blade for supporting said blade;

drive transmitting means for transmitting drive among said blade mechanisms;

a mower deck mounting and housing said blade mechanism;

rigid connecting means for interconnecting said blade mechanisms and substantially covering an upper surface of said drive transmitting means and supporting said blade mechanisms said rigid connecting means maintaining said blade mechanisms at substantially fixed distances relative to one another; and

first vibration proofing means disposed in at least one of a position between said connecting means and said blade shafts and a position between said connecting means and said mower deck, and second vibration proofing means between said mower deck and said blade mechanisms.

5,481,858

# **APPARATUS FOR LAWN MOWING AND SHREDDING**

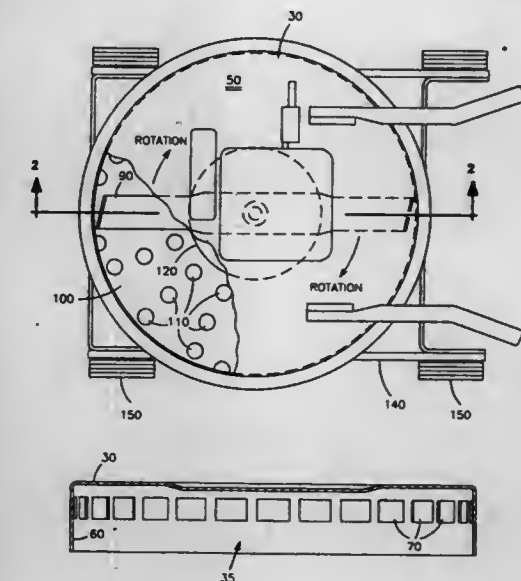
Matthew Chudy, 5724 Manton Ave., Woodland Hills, Calif. 91367

Filed Feb. 7, 1994, Ser. No. 192,704

Int. Cl.<sup>6</sup> A01D 34/68

U.S. Cl. 56—17.5

8 Claims



1. A mobile apparatus for mowing a lawn and shredding cut grass clippings, leaves and other lawn debris into a powder, while moving on a ground surface comprising:

a motor integrally mounted on a top cover with a drive shaft of the motor extending vertically downwardly through the top cover, the top cover having a generally horizontal top surface, integrally formed with a downwardly extending peripheral rim, the top cover and rim defining an interior cover space, the rim providing a series of upright first discharge slots, a push handle engaged with the top cover and extending upwardly at an angle therefrom for pushing the apparatus in a forward rolling motion on the ground surface, a linear shredder blade, the blade medially engaged with the drive shaft for rotation therewith driven by the motor, a partition having a plurality of spaced apart openings therein, the partition positioned below the shredder blade, in generally parallel alignment with the horizontal top surface, enclosing the cover save a central exhaust hole, the partition having an integral, peripheral, first downwardly extending skirt supported, for rolling on the ground surface, by an undercarriage including a plurality of wheels rotationally secured to the skirt in rolling support thereof;

a linear mower blade engaged medially with the drive shaft at a position below the perforated partition such that the partition separates the blades, the mower blade being of such shape as, in rotating, to generate a suction forcing air to move upward into the partition;

the shredder blade having a pair of horizontally disposed cutting edges spaced apart from the partition by a degree to enable shearing action between the cutting edges and the perforations of the partition;

a circular slot adjustment ring having a vertical wall providing a series of second discharge slots therethrough and a deflection skirt annularly positioned and extending radially outwardly

and downwardly from the vertical wall, said wall fitted for annular circular exterior contact with the peripheral rim of the top cover and slidably affixed thereto such that the relative positions of the series of first and second discharge slots adjust conductance of air flow exiting the apparatus, the deflection skirt forcing said air flow downwardly; whereby the lawn debris is sucked upwardly into the interior cover space, the interior cover space being pressurized thereby, a portion of the air being ejected through the discharge slots, the remainder of the air being forced to move radially inwardly and then downwardly through the central exhaust hole to the ground surface to move radially outwardly and then upwardly into the interior cover space.

5,481,859

# TEXTILE MACHINE FRAME WITH BRIDGE PLATES BETWEEN STANDS

Peter Mann, Süssen; Kurt Hack, Ebersbach, and Thomas Benkert, Deggingen, all of, Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Germany

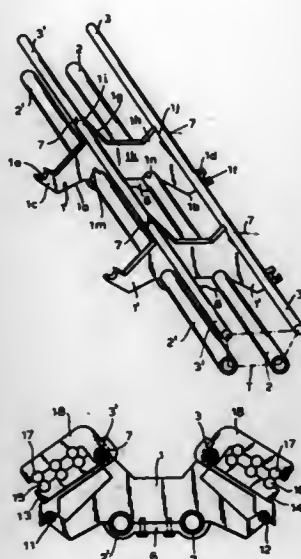
Filed Dec. 1, 1994, Ser. No. 347,603

Claims priority, application Germany, Dec. 1, 1993, 43 40 965.2

Int. Cl.<sup>6</sup> D01H 5/56; 7/40

U.S. Cl. 57—1 R

11 Claims



1. A textile-machine frame, comprising: a plurality of upright support stands spaced apart over a length of a machine and extending upwardly from a floor on which said stands support the machine; main girder means extending horizontally and including at least one main girder extending parallel to a longitudinal vertical median plane of said machine perpendicular to said upright support stands and continuously from one support stand to a following support stand along the length of said machine; at least one stamped bridge plate supported above the floor on said main girder means between each two successive support stands and lying in a plane perpendicular to said at least one main girder to opposite sides of said median plane and opposite working sides of said machine; and respective support bars on opposite sides of said machine carried by said bridge plate, each of said support bars extending in one piece between the two successive support stands and serving to mount support arms with respective drafting rollers and respective loading arms assigned to said support arms with pressing rollers bearing upon said drafting rollers of a respective yarn drafting mechanism.

# SPINNING MACHINE HAVING A PLURALITY OF SPINNING STATIONS WITH INDEPENDENTLY CONTROLLABLE DELIVERY ROLLERS

Fritz Stahlecker, Josef-Neldhart-Strasse 18, 7347 Bad Überkingen, and Hans Stahlecker, Haldenstrasse 20, 7334 Süssen, both of, Germany

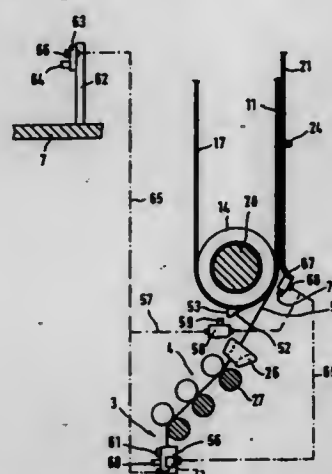
Continuation-in-part of Ser. No. 914,414, Jul. 17, 1992, abandoned. This application Apr. 1, 1994, Ser. No. 221,576

Claims priority, application Germany, Jul. 23, 1991, 41 24 312.9

Int. Cl.<sup>6</sup> D01H 13/04

U.S. Cl. 57—90

19 Claims



1. A spinning machine comprising a plurality of spinning stations which each include: a sliver feeder including a sliver feed delivery roller, a drafting unit having feeding rollers connected downstream of the delivery roller with respect to sliver supplied by the sliver feeder, and a delivery roller drive connection between a rotatably driven delivery roller drive shaft and the delivery roller, said drive connection being selectively switchable between a first condition rotatably driving the delivery roller and a second condition out of driving connection with the delivery roller, wherein said delivery roller drive shaft is spaced from and out of driving contact with said feeding rollers when said drive connection is in said first condition rotatably driving the delivery roller, and wherein respective delivery roller drive connections at respective ones of the spinning stations are operable independently of one another, whereby sliver supply at respective spinning stations can be interrupted without intervening in operation of respective associated drafting units and without intervening in sliver feeding and spinning operations at other ones of said spinning stations.

5,481,861

# METHOD OF MAKING A COMPOSITE ELASTIC YARN

George A. Frith, Loughborough, United Kingdom, assignor to Jones Stroud & Co. Ltd., Leicester, England

Continuation of Ser. No. 63,121, May 18, 1993, abandoned, which is a continuation of Ser. No. 951,904, Sep. 28, 1992, abandoned, which is a continuation of Ser. No. 529,874, May 29, 1990, abandoned. This application Apr. 21, 1994, Ser. No. 231,876

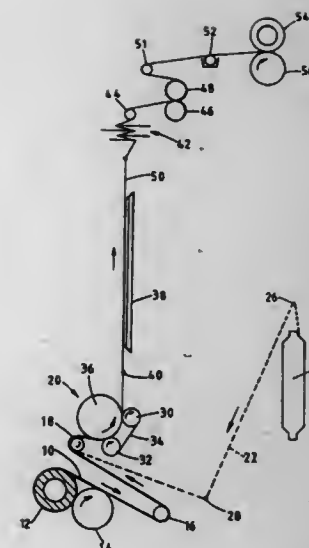
Claims priority, application United Kingdom, May 27, 1989, 8912305

Int. Cl.<sup>6</sup> D02G 1/04

U.S. Cl. 57—288

8 Claims

1. A method of manufacturing a combined yarn which comprises feeding a spandex yarn to a guide position with a driven feed at a



speed arranged to provide a pre-stretched condition in said spandex yarn, feeding a polyamide or polyester yarn separately from the spandex yarn to the guide position to lie adjacent the spandex yarn, feeding both yarns from the guide position to a false twister by way of a heater, heating both yarns at the heater to a temperature sufficient to soften but not melt them, whilst simultaneously subjecting the yarns to spiral twist, permitting the heated and spirally twisted composite yarn to set without fusing to retain imparted twist, a reverse twist being imparted to the set composite yarn at the exit from the false twister, said reverse twist providing an overall torque to the composite yarn in the same direction as that of the spirally-set twist so that the composite yarn has its component yarns locked together in spiral configuration, the pre-stretched spandex yarn being fed at a first speed to the guide position, the polyamide or polyester yarn being incompletely drawn and fed separately at a second speed to the guide position, and feeding the twisted and set composite yarn to a nip position at a third speed, the third speed being greater than both said first speed and said second speed so that the incompletely drawn polyamide or polyester yarn is drafted between a drafting device running at said second speed and the nip position.

5,481,862

# PNEUMATICALLY OPERATED DEBRIS REMOVAL DEVICE FOR AN OPEN-END SPINNING DEVICE

Heinz-Georg Wassenhoven, Monchengladbach, Germany, assignor to W. Schlafhorst AG & Co., Monchengladbach, Germany

Filed Sep. 26, 1994, Ser. No. 312,113

Claims priority, application Germany, Jan. 9, 1993, 43 34 483.6

Int. Cl.<sup>6</sup> D01H 4/00; 11/00

U.S. Cl. 57—301

7 Claims

1. In combination, an open-end spinning device, a sliver opening device for delivering opened fibers to the spinning device, and a pneumatically operated debris removal device disposed below the sliver opening device for receiving and disposing of debris released from sliver opened within the opening device, wherein the spinning device comprises a spinning chamber and a cover element covering the spinning chamber, the sliver opening device comprises the housing defining a debris discharge opening, and the debris removal device comprises a pneumatically chargeable debris collecting element disposed below and in opposed facing relation to the debris discharge opening and separated therefrom by a clear ambient air spacing sufficient to prevent pneumatic forces within the debris removal device from affecting operation of the sliver opening device.

5,481,863

# SPINNING DEVICE HAVING SPACED APART FRONT ROLLERS AND DELIVERY ROLLERS

Naritoshi Ota, Ohtsu, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

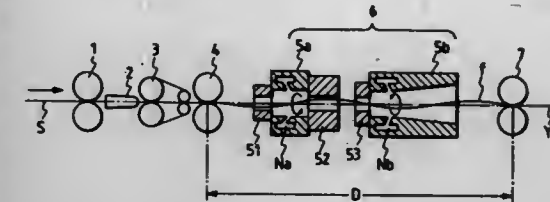
Filed Aug. 9, 1993, Ser. No. 103,973

Claims priority, application Japan, Aug. 28, 1992, 4-230005

Int. Cl.<sup>6</sup> D01H 13/04; 15/00

U.S. Cl. 57—328

2 Claims



1. A ply yarn spinning device for producing a plurality of spun yarns from staple fiber bundles and doubling together the plurality of spun yarns to produce a ply yarn, the device comprising: a plurality of spinning nozzles defining a fiber travel direction, each of spinning nozzles defining an axis, a draft unit having a corresponding plurality of front roller pairs for supplying staple fibers to the spinning nozzles, a corresponding plurality of delivery roller pairs, each of the delivery roller pairs being positioned downstream from a corresponding spinning nozzle in the fiber travel direction and spaced from a corresponding front roller pair by a distance that is shorter than the length of the longest fibers in the staple fiber bundle, each of the delivery roller pairs being located along the axis defined by the corresponding spinning nozzle, each yarn path is maintained in a substantially straight line until the spun yarn coming from each of the spinning nozzles passes through the delivery rollers, and means position downstream from said delivery roller pairs in the fiber travel direction for combining yarn from said delivery roller pairs together to form a ply yarn, whereby yarn breakage is reduced.

5,481,864

# CLOTH SCRAP RECYCLING METHOD

Herbert J. Wright, Rte. 4, Box 886, Decatur, Tex. 76324

Filed Jul. 11, 1994, Ser. No. 273,360

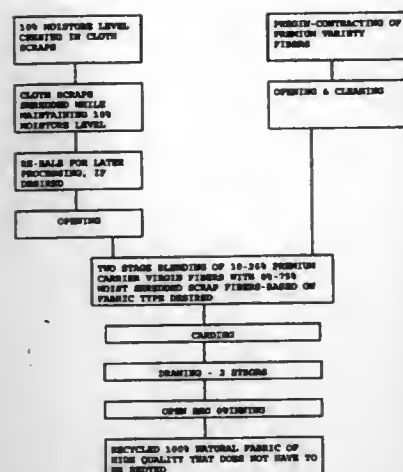
Int. Cl.<sup>6</sup> D01H 4/00; D01G 13/00

U.S. Cl. 57—400

15 Claims

1. A method for recycling scrap cloth materials comprising the steps of: moistening cloth scraps;





placing said cloth scraps into a shredding machine; applying moisture to said scraps while said scraps are shredded by said shredding machine in order to maintain a predetermined level of moisture in said scraps; opening said moist shredded cloth scraps into scrap fibers; selecting premium variety virgin cotton fibers; pre-gin contracting said premium variety virgin fibers; opening and cleaning said premium variety virgin fibers; and blending, carding, drawing, and spinning 10-25% virgin fibers around 90-75% said scrap fibers.

5,481,865

# METHOD FOR REGULATING A GAS-TURBINE ASSEMBLY EQUIPPED WITH TWO COMBUSTION CHAMBERS

Hans U. Fruttschi, Riniken, Switzerland, assignor to ABB Management AG, Baden, Switzerland

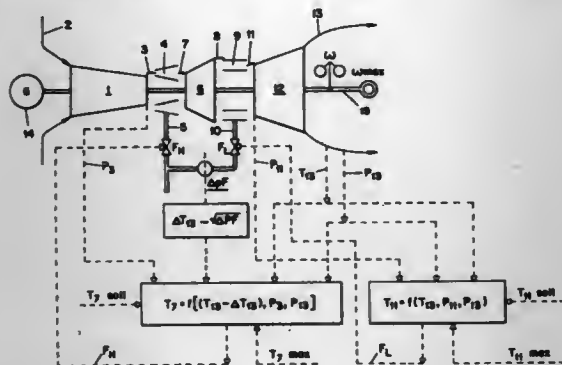
Filed Aug. 15, 1994, Ser. No. 290,519

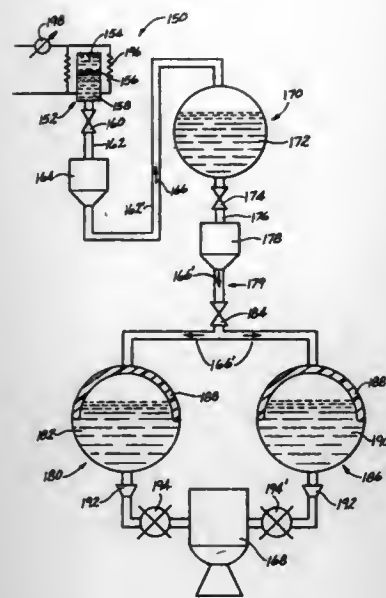
Claims priority, application European Pat. Off., Sep. 6, 1993, 93114229

Int. Cl.<sup>6</sup> F02C 9/00; F02G 3/00

U.S. Cl. 60—39.03

2 Claims





5,481,870

# ROCKET ENGINE NOZZLE WITH SELECTIVELY SMALLER OUTLET CROSS-SECTION

Claude Pacou, Nancy; Didier Vuillamy, Quincampoix; Etienne Tret, La Chapelle Reanville; Pierre Desclos, Vernon, and André Beaurain, Chambly, all of, France, assignors to Societe Europeenne de Propulsion, Suresnes, France

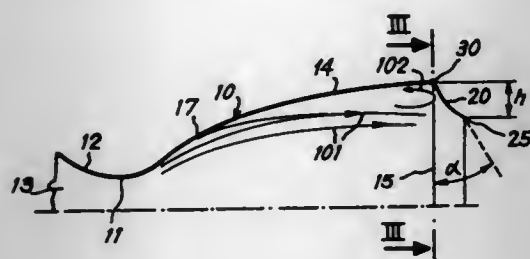
Filed May 25, 1994, Ser. No. 249,159

Claims priority, application France, May 28, 1993, 93 06455

Int. Cl.<sup>6</sup> F02K 1/06; 9/87

U.S. Cl. 60—266

14 Claims



1. A rocket engine nozzle for a launcher, the nozzle comprising a converging portion which receives the gases produced in a combustion chamber, a nozzle throat of small cross-section and a diverging part connected to the nozzle throat and terminating at its downstream portion in a gas outlet cross-section defining a cross-section ratio equal to or higher than 45, wherein an external releasable annular obstacle is connected externally to the downstream end of the diverging part so as to define at the outlet of the diverging part a zone of smaller cross-section than the total outlet cross-section of the diverging part to ensure stability of the separation of the flow of hot gases relative to the wall of the diverging part during a first phase of flight.

## 5,481,871 HYDRAULIC STEERING SYSTEM WITH SPOOL PRESSURE EQUALIZATION

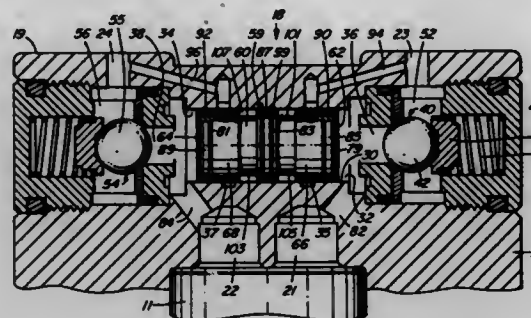
Andrew W. McFadyen, Richmond, Canada, assignor to Teleflex (Canada) Ltd., Richmond, Canada

Filed Mar. 2, 1995, Ser. No. 397,357

Int. Cl.<sup>6</sup> F16D 31/02

U.S. Cl. 60—385

20 Claims



19. A hydraulic system, comprising:

a reversible manual pump (11, 11.2) having two pump ports (15, 17, 15.2, 17.2);

a fluid actuator (16, 16.2);

a lock valve (18, 18.1, 18.2) having a body (19, 19.1, 19.2) with a bore (30, 30.1, 30.2, 30.3) therein, a first port (21, 21.1, 21.2), a second port (22, 22.1, 22.2) a third (23, 23.1, 23.2) and a fourth port (24, 24.1, 24.2), a valve spool (59, 59.1, 59.2, 59.3) having a valve spool (60, 60.1, 60.2, 60.3) reciprocally received in the bore, first means (60, 40, 54, 60.1, 40.1, 54.1, 60.2, 60.3, 40.2, 54.2) in the lock valve body for normally preventing fluid flowing between the ports, second means (40, 82, 36, 52, 82.1, 36.1, 40.1, 52.1, 140, 35.2, 105.2, 142, 30.3, 40.2, 151) for permitting a flow of fluid from the first port to the third port when the first port is pressurized, third means (54, 84, 38, 56, 84.1, 54.1, 56.1, 148, 30.2, 147, 37.3, 54.2, 145) for permitting a flow of fluid from the second port to the fourth port when the second port is pressurized, fourth means (96, 37, 107, 92, 38, 84, 96.1, 37.1, 120, 145, 107.3, 37.3, 147, 30.2, 148) for permitting a return flow of fluid from the fourth port to the second port when the first port is pressurized, the fourth means including an annular passageway (37, 37.1, 37.3) between the spool and the bore which can receive pressurized fluid from the fourth port, and fifth means (94, 35, 105, 90, 36, 82, 94.1, 35.1, 119, 151, 105.2, 35.2, 140) for permitting a return flow of fluid from the third port to the first port when the second port is pressurized, the fifth means including an annular passageway (35, 35.1, 35.2) between the spool and the bore which can receive pressurized fluid from the third port;

hydraulic conduits (7, 8, 7.2, 8.2) connecting the pump ports (15, 17, 15.2, 17.2) to the first and second ports (21, 22, 21.2, 22.2) respectively; and

hydraulic conduits (12, 14, 12.2, 14.2) connecting the cylinder (16, 16.2) to the third and fourth ports (23, 24, 23.2, 24.2) respectively.

5,481,872

## HYDRAULIC CIRCUIT FOR OPERATING PLURAL ACTUATORS AND ITS PRESSURE COMPENSATING VALVE AND MAXIMUM LOAD PRESSURE DETECTOR

Tadao Karakama, Musashino; Teruo Akiyama, Utsunomiya; Kouji Yamashita, Yokohama, and Naoki Ishizaki, Tochigi, all of, Japan, assignors to Kabushiki Kaisha Komatsu Sel-sakusho, Tokyo, Japan

PCT No. PCT/JP92/01540, § 371 Date Sep. 23, 1994, § 102(e)

Date Sep. 23, 1994, PCT Pub. No. WO93/11364, PCT Pub.

Date Jun. 10, 1993

PCT Filed Nov. 25, 1992, Ser. No. 244,439

Claims priority, application Japan, Nov. 25, 1991, 3-334592;

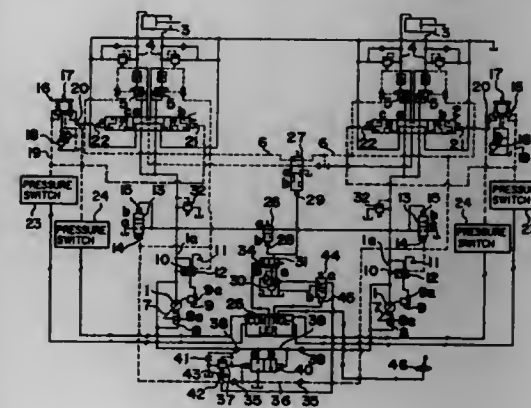
Dec. 24, 1991, 3-355647; Dec. 24, 1991, 3-355649; Dec. 24, 1991,

3-355650; Dec. 24, 1991, 3-355651; Mar. 30, 1992, 4-102548

Int. Cl.<sup>6</sup> F16D 31/02; F15B 11/08

U.S. Cl. 60—421

23 Claims



1. A hydraulic circuit for operating a plurality of actuators, said hydraulic circuit comprising:

said plurality of actuators;

a plurality of hydraulic pumps, each of said plurality of hydraulic pumps having a delivery passage and a tiltable swash plate;

a plurality of pressure compensating valves;

a plurality of operating valves, each of said plurality of operating valves being connected for passing pressurized hydraulic fluid from at least one of said plurality of hydraulic pumps through a respective one of said pressure compensating valves to a respective one of said actuators;

a plurality of load pressure introduction conduits, each of said plurality of load pressure introduction conduits detecting a load pressure of a respective one of the plurality of operating valves and feeding the thus detected load pressure back to a pressure compensating valve associated with the respective one of the plurality of operating valves;

a plurality of load sensing valves, each of said load sensing valves controlling the tilt of the swash plate of a respective one of the plurality of hydraulic pumps;

a load pressure relief valve which is connected to the load pressure introduction conduits and which has a variable set pressure;

a plurality of main relief valves, each of said main relief valves being provided in the delivery passage of a respective one of the plurality of hydraulic pumps and having a higher set pressure than the set pressure of said load pressure relief valve; and

means for varying the set pressure of the load pressure relief valve.

5,481,873

## HYDRAULIC ACTUATING SYSTEM FOR A FLUID TRANSFER APPARATUS

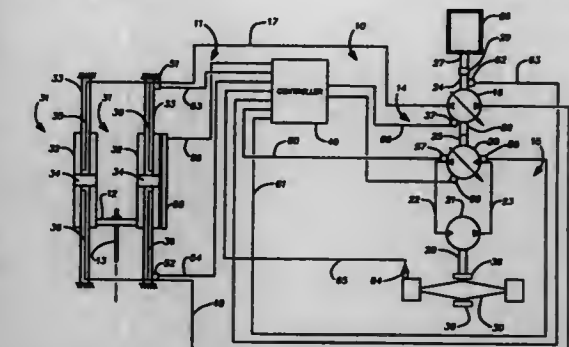
Minoru Saruwatari; Kevin S. Saruwatari, both of Calgary, and Fredrick A. Bourgonje, Dalmeny, all of, Canada, assignors to Qsine Corporation Limited, Calgary, Canada

Filed Nov. 17, 1994, Ser. No. 341,416

Int. Cl.<sup>6</sup> F16D 31/02; F15B 11/00

U.S. Cl. 60—421

24 Claims



1. A hydraulically operated drive system, comprising: a first hydraulic closed-loop circuit including an equal displacement cylinder means including a pair of opposite fluid ports and an output means, a first pump of the variable displacement, reversible flow type, having a pair of opposite fluid ports and an input shaft, and a first pair of fluid lines connecting the ports of the cylinder means and of the first pump so as to form said closed-loop circuit; a second closed loop hydraulic circuit including second and third pumps each having a pair of opposite fluid ports and an input/output shaft, said second and third pumps being pump/motor means, and at least one of said second and third pumps being of the variable displacement type, and a second pair of fluid lines connecting the ports of the second and third pumps so as to form said second closed-loop; a prime mover having an output shaft means; a drive connecting means for connecting the output shaft of said prime mover to said input shaft of said first pump and to the input/output shaft of said second pump and connecting said input/output shaft of said second pump to the input shaft of said first pump, a flywheel drivingly connected with said input/output shaft of said third pump for receiving rotating device therefrom and for transmitting driving power thereto; and control means for establishing

i) a setting of said first pump to control the quantity and directing of flow of fluid in said first circuit to thereby determine the direction and velocity of travel of said output means of said cylinder means; and

ii) the setting of displacement within said at least one of said second or third pumps to thereby establish the function of said second pump/motor as a motor or a pump.

5,481,874

## EXHAUST PRESSURIZING CIRCUIT INCLUDING FLOW AMPLIFICATION

Tadeusz Budzich, Moreland Hills, Ohio, assignor to Caterpillar Inc., Peoria, Ill.

PCT No. PCT/US91/04387, § 371 Date Jun. 20, 1991, § 102(e)

Date Jun. 20, 1991

PCT Filed Jun. 20, 1991, Ser. No. 966,179

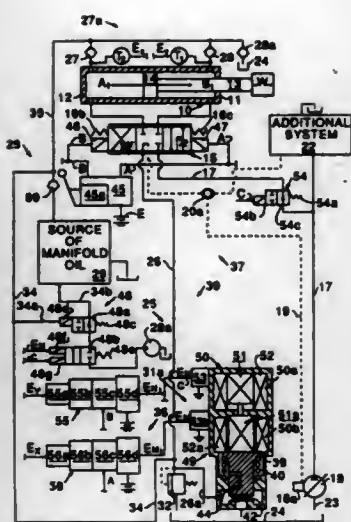
Int. Cl.<sup>6</sup> F16D 31/02

U.S. Cl. 60—428

21 Claims

1. In a fluid power and control system comprising a cylinder type fluid motor (10) subjected to a positive and a negative type load pressure and provided with a piston end (12) and a piston rod





end (11), direction control valve means (15) operably connected to said fluid motor (10), said direction control valve means (15) having means (46,47) responsive to a first (B) and a second (A) control signal, a system pump (18), reservoir means (24), and exhaust manifold means (25) interposed between said direction control valve means (15), said fluid motor (10) and said reservoir means (24), signal generating means (45) operable to generate said first (B) and second (A) control signals, said first control signal (B) through said direction control valve means (15) operable to induce displacement of said fluid motor (10) towards said piston rod end (11) and said second control signal (A) through said direction control valve means (15) operable to induce displacement of said fluid motor (10) towards said piston end (12), a source of manifold pressurizing oil (29) at relatively low pressure functionally interconnected to said exhaust manifold means (25), and first activating means (48) of said source of manifold pressurizing oil (29) having logic means (36) responsive to said first control signal (B) and to said negative load pressure ( $E_M, E_M', N_1, N_2$ ) and operable to interconnect said exhaust manifold means (25) with said source of manifold pressurizing oil (29) in response to simultaneous presence of said first control signal (B) and said negative load pressure ( $E_M, E_M', N_1, N_2$ ).

5,481,875

#### APPARATUS FOR CHANGING AND CONTROLLING VOLUME OF HYDRAULIC OIL IN HYDRAULIC EXCAVATOR

Fujitoshi Takamura, and Yoshinao Haraoka, both of Hirakata, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP92/01225, § 371 Date May 19, 1993, § 102(e) Date May 19, 1993, PCT Pub. No. WO93/06314, PCT Pub. Date Apr. 1, 1993

PCT Filed Sep. 25, 1992, Ser. No. 64,055

Claims priority, application Japan, Sep. 27, 1991, 3-274930

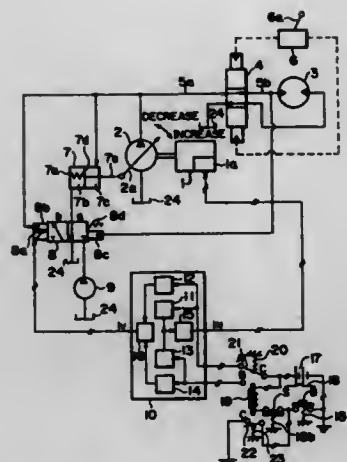
Int. Cl.<sup>6</sup> F16D 31/02

U.S. Cl. 60—443

16 Claims

1. A hydraulic oil volume change-over control apparatus for a hydraulic excavator comprising:

- a variable displacement hydraulic pump;
- an engine for driving said hydraulic pump;
- a governor drive device for said engine;
- an actuator;
- pipe lines connected between said hydraulic pump and said actuator so that said actuator can be driven by said hydraulic pump;
- an actuator control valve disposed in said pipe lines between said hydraulic pump and said actuator, and having an upstream side and a downstream side;
- a load sensing control device for said hydraulic pump;



a working mode change-over device for establishing a change-over signal representative of the selection for said actuator of one of a low power mode and a high power mode;

a controller receiving said change-over signal from said working mode change-over device, for delivering to said governor drive device an engine fuel injection volume signal, and for delivering to said load sensing control device a load sensing pressure differential signal for changing the volume of said variable displacement hydraulic pump and thereby changing a pressure differential between said upstream and downstream sides of said actuator control valve;

- a first engine fuel setting unit;
- a first load sensing pressure differential setting unit;
- a second engine fuel setting unit;
- a second load sensing pressure differential setting unit;
- an engine fuel signal generator; and
- a load sensing pressure differential signal generator;

wherein said controller (a) energizes said first engine fuel setting unit and said first load sensing pressure differential setting unit in accordance with a change-over signal from said working mode change-over device representative of the selection of said high power mode so that a first engine fuel setting signal is delivered to said engine fuel signal generator from said first engine fuel setting unit while a first load sensing pressure differential setting signal is delivered to said load sensing pressure differential signal generator from said first load sensing pressure differential setting unit, and (b) energizes said second engine fuel setting unit and said second load sensing pressure differential setting unit in accordance with a change-over signal from said working mode change-over device representative of the selection of said low power mode so that a second engine fuel setting signal is delivered to said engine fuel signal generator from said second engine fuel setting unit while a second load sensing pressure differential setting signal is delivered to said load sensing pressure differential signal generator from said second load sensing pressure differential setting unit, whereby an engine fuel injection volume signal is delivered to said governor drive device for the engine from said engine fuel signal generator while a load sensing pressure differential signal is delivered to said load sensing control device from said load sensing pressure differential signal generator.

5,481,876

#### INLET SCREEN FOR TRACTOR HYDRAULIC SYSTEM

Tod A. Bay, Denver; Norman M. Stauffer, New Holland, both of Pa., and Roy A. Blittner, Lisbon, Iowa, assignors to New Holland North America, Inc., New Holland, Pa.

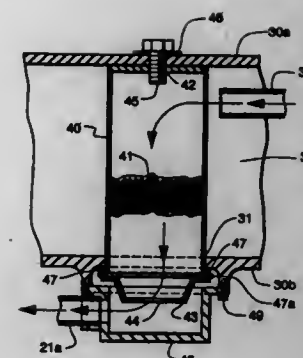
Filed Oct. 5, 1994, Ser. No. 318,306

Int. Cl.<sup>6</sup> F16D 31/02; B01D 24/00

U.S. Cl. 60—454

9 Claims

1. In a tractor having a wheeled chassis adapted for movement over the ground; an engine supported on said chassis for providing



operative power for said tractor; and a hydraulic system operably powered by said engine and having a plurality of remote couplers supported from said chassis for remote connection thereto, said hydraulic system further including a reservoir having first and second spaced-apart walls, a pump drawing hydraulic fluid through an intake line from said reservoir to provide a flow of hydraulic fluid under pressure to the remote couplers, and a return line to return hydraulic fluid from said remote couplers to said reservoir, the improvement comprising:

a screen member housed within said reservoir and being detachably mounted on a stationary stud affixed to said first reservoir wall and further being formed of screening material positioned to filter the flow of hydraulic fluid from said reservoir into said intake line, said intake line drawing hydraulic fluid from inside said screen member to effect a filtering of said hydraulic fluid through said screening material before being drawn into said intake line.

5,481,877

#### DOUBLE ACTING PULSATOR WITH VALVED PISTON

Asbjørn Bakke, and Kåre Wessel-Hanssen, both of Kongsberg, Norway, assignors to Kongsberg Automotive A/S, Kongsberg, Norway

PCT No. PCT/N091/00142, § 371 Date May 13, 1993, § 102(e) Date May 13, 1993, PCT Pub. No. WO92/08914, PCT Pub. Date May 29, 1992

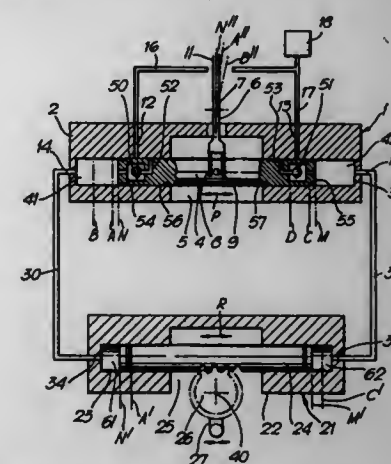
PCT Filed Nov. 14, 1991, Ser. No. 50,283

Claims priority, application Norway, Nov. 15, 1990, 90 4957

Int. Cl.<sup>6</sup> F15B 7/00; B60T 11/26; B60K 20/00

U.S. Cl. 60—571

1 Claim



1. A gear shift device for gear boxes for vehicles comprising at least one pair of double-acting hydraulic cylinders, the pair consisting of a double-acting hydraulic master cylinder having a piston that can be moved by means of a gear lever in a cylinder part and a double-acting hydraulic slave cylinder having a piston which via a mechanism is connected to gear selector carriers in a gear box,

5,481,878

#### PULSE TUBE REFRIGERATOR

Zhn Shaowei, Xixia county, China, assignor to Daido Hoxan Inc., Sapporo, Japan

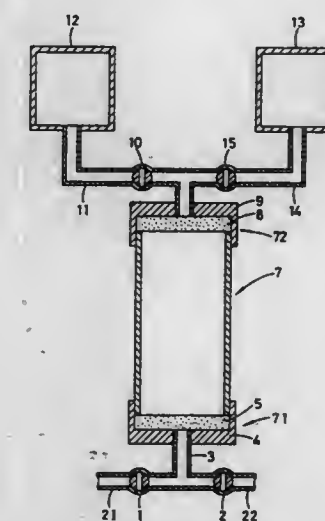
Filed May 16, 1994, Ser. No. 243,487

Claims priority, application China, May 16, 1993, 93105608; Jul. 25, 1993, 93109175

Int. Cl.<sup>6</sup> F25B 9/00

U.S. Cl. 62—6

7 Claims



1. A pulse tube refrigerator, comprising:

- a pulse tube;
- gas smoothers located at hot and cold ends of said pulse tube;
- a high pressure inlet gas valve; and
- a low pressure outlet gas valve connected to a sum up tube at the cold end of the pulse tube,

wherein a high pressure reservoir and a low pressure reservoir are positioned at the hot end of the pulse tube and two direction valves are positioned respectively between the high pressure reservoir, the low pressure reservoir and the pulse tube.

5,481,879

## REFRIGERATOR HAVING REGENERATOR

Hiroshi Asami, Yokohama, and Mitsuru Suzuki, Hiratsuka, both of, Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

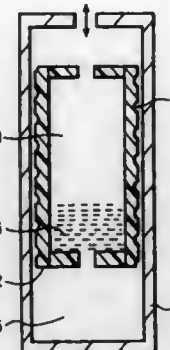
Filed Jun. 28, 1994, Ser. No. 267,775

Claims priority, application Japan, May 31, 1994, 6-118165

Int. Cl.<sup>6</sup> F25B 9/00

U.S. Cl. 62-6

32 Claims



1. A refrigerator with a regenerator comprising:

at least one cylinder having an inner circumferential surface with a circular tube shape and a diameter, each said cylinder being made of a material having a low heat conductivity and a high hermetic sealing performance;

at least one displacer, each displacer having an outer circumferential surface with a circular tube shape having a diameter slightly smaller than the diameter of the inner circumferential surface of a respective said cylinder and extending in an axial direction thereof, said displacer being disposed in said cylinder to be reciprocally movable in an axial direction of said cylinder and forming an expansion space near one end of an inside of said cylinder;

a groove pattern formed on one of (i) the outer circumferential surface of each said displacer and (ii) the inner circumferential surface of the respective said cylinder, for forming an auxiliary gas passage for supplying gas into the expansion space of said cylinder and recovering the gas from the expansion space, said groove pattern including a groove at least partially formed along direction intersecting the axial direction of said displacer, said groove allowing a gas to flow therethrough from one end to an opposite end of the outer circumferential surface of said displacer to positively heat-exchange with said cylinder and said displacer;

a main gas passage for supplying a gas to the expansion space of each said cylinder and recovering the gas from the expansion space thereof;

a regenerating material disposed at least partially in each main gas passage;

a gas supplying and recovering means for supplying a gas having a periodically varying gas pressure to each expansion space through said groove pattern and through said main gas passage, and recovering the gas from the expansion space through said groove pattern and through said main gas passage,

wherein each said displacer moves reciprocally in the axial direction of the respective said cylinder in accordance with pressure changes in the expansion space of the respective said cylinder, to cool the gas in the expansion space.

5,481,880

## PROCESS AND ASSEMBLY FOR THE COMPRESSION OF A GAS

Alain Guillard, Paris, and Bernard Saulnier, Colombes, both of, France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédés Georges Claude, Paris, France

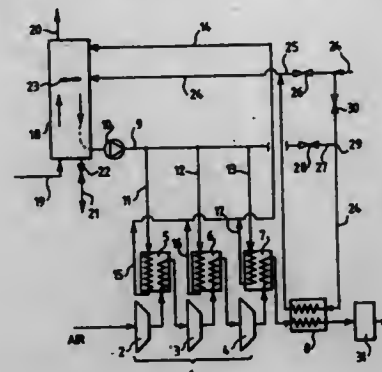
Filed Sep. 16, 1994, Ser. No. 307,001

Claims priority, application France, Sep. 21, 1993, 93 11232

Int. Cl.<sup>6</sup> F25J 3/00

U.S. Cl. 62-9

14 Claims



1. A process for the compression of a gas, comprising: compressing said gas by passing said gas to a first stage of a compression apparatus having a plurality of fluidly connected stages, withdrawing a compressed gas from a last stage of said compression apparatus, providing a water cooling circuit operatively associated with said compression apparatus, said water cooling circuit including an air refrigeration apparatus, refrigerating return water with air in said refrigerating apparatus, and supplying said air refrigeration apparatus with makeup water by initially placing said makeup water in heat exchange relation with said compressed gas from the last stage when said makeup water is cooler than said return water, and then sending the makeup water to said refrigeration apparatus.

5,481,881

## SYSTEM AND PROCESS FOR REMOVING POTENTIAL POLLUTANTS FROM A VAPOR STREAM

Michael P. Buet, 2 Mountain View Rd., New Fairfield, Conn. 06812, and Steve L. Petval, 2 Bell Air La., Wappinger Falls, N.Y. 12590

Filed Dec. 27, 1994, Ser. No. 364,544

Int. Cl.<sup>6</sup> B01D 47/00

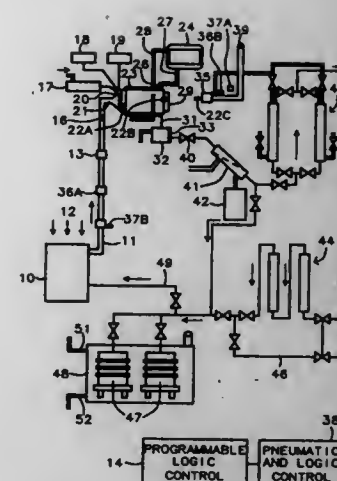
U.S. Cl. 62-20

7 Claims

1. A system for removing an organic compound capable of forming a negative azeotropic mixture with water from a vapor stream using condensation, comprising:

a conducting system for providing a path for communicating said vapor stream into a condensation region; first sensing means positioned in the path and operable for detecting and for evaluating the mass rate flow of said organic compound in said vapor stream flowing towards said condensation region; a second sensing means positioned in the path operable for sensing the temperature in said condensation region; first supplying means operable for supplying water in the form of a mist or vapor into said vapor stream; second supplying means operable for supplying a hydrophobic agent into said vapor stream;

third supplying means operable for supplying air at a predetermined temperature into said vapor stream so that the temperature of said vapor stream is at a temperature at least above the lowest boiling point of the mixture of said organic compound and water;



condensing means positioned to contact said vapor stream in said condensation region with the added water and hydrophobic agent for condensing the vapor stream; and cooling means coupled to said condensing means and operable for maintaining the temperature difference between said condensing means and said local vapor stream sufficient to induce substantial condensation of said vapor stream.

5,481,882

## LATENT HEAT ACCUMULATION SYSTEM

Yutaka Watanabe, Takayuki Hachimonji, both of Yokohama; Katsuya Yamashita; Sanae Sekita, both of Tokyo, and Tsuyoshi Noma, Yokohama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 22,556, Feb. 25, 1993, abandoned.

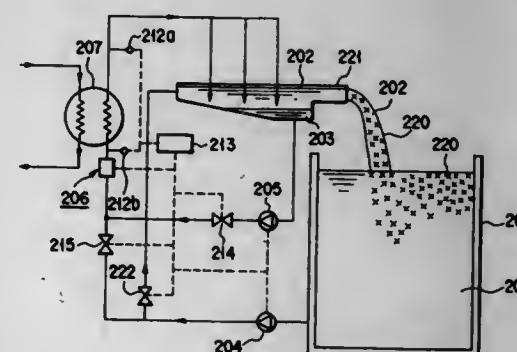
This application Apr. 5, 1995, Ser. No. 417,470

Claims priority, application Japan, Feb. 28, 1992, 4-043720; Mar. 5, 1992, 4-048153; Apr. 1, 1992, 4-078112

Int. Cl.<sup>6</sup> F25C 3/00

U.S. Cl. 62-70

2 Claims



1. A latent heat accumulation system for injecting a second fluid which does not combine with a first fluid, which has a specific gravity larger than that of the first fluid and which is cooled to a preset temperature level in the first fluid to produce a solid phase material of the first fluid by a solidification phenomenon of the first fluid and uses the latent heat of the solid phase material to cool an object to be cooled, which comprises:

a tank within which the solid phase material is formed, said tank having a hopper mechanism and a storage mechanism, the second fluid being stored in the hopper mechanism and the storage mechanism, the first fluid which is cooled by the solid phase material via a boundary surface with the second fluid; a supply mechanism supplying the first fluid into said tank;

a drawing device drawing out the first fluid, stored in said tank and cooled by the solid phase material, to an exterior of said tank as a heat accumulation medium; a collection device collecting the second fluid from the hopper mechanism and from the storage mechanism of said tank; a nozzle disposed in a preset position above said boundary surface in said tank and spaced from said boundary surface a predetermined distance, said nozzle being directed in and upward direction so as to maximize heat exchange effectiveness between the first and second fluids, said nozzle injecting the second fluid into the first fluid stored in said tank so as to produce said solid phase material of the first fluid by the solidification phenomenon of the first fluid; and a refrigerating device provided between said collection device and said nozzle, said refrigerating device refrigerating the second fluid to be supplied to said nozzle to the preset temperature level.

5,481,883

## METHOD AND APPARATUS FOR REDUCTION OF REFRIGERANT GASES ESCAPING FROM REFRIGERATION SYSTEMS

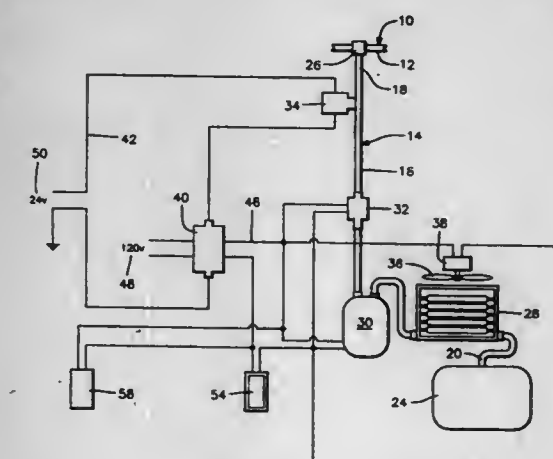
Charles A. Harkness, Jr., and Deborah A. Harkness, both of 5759 Windy Oaks Dr., Roanoke, Tex. 76262

Filed Oct. 20, 1994, Ser. No. 326,229

Int. Cl.<sup>6</sup> F25B 45/00

U.S. Cl. 62-77

7 Claims

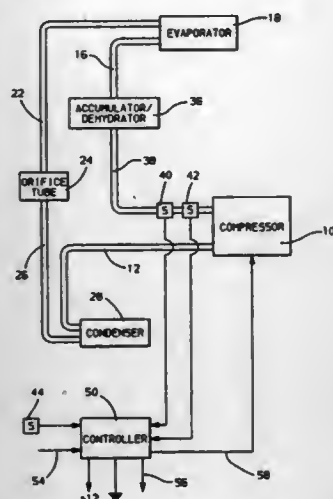


7. The method of limiting refrigerant loss to the exterior of a closed-loop refrigerant circuit including a low pressure refrigerant line upstream from a compressor and wherein the normal operating pressure of refrigerant in said low pressure refrigerant line falls within a predetermined range of pressure above atmospheric pressure, said method including communicating said circuit with the interior of a pressure vessel, sensing a drop in operating pressure in said low pressure refrigerant line to a predetermined pressure below said range of operating pressure, and, responsive to said predetermined pressure being sensed, pumping refrigerant from said circuit and into said pressure vessel for a predetermined time period, only, and, upon termination of said time period terminating.



the pumping of refrigerant and preventing backflow of refrigerant from said pressure storage vessel into said circuit.

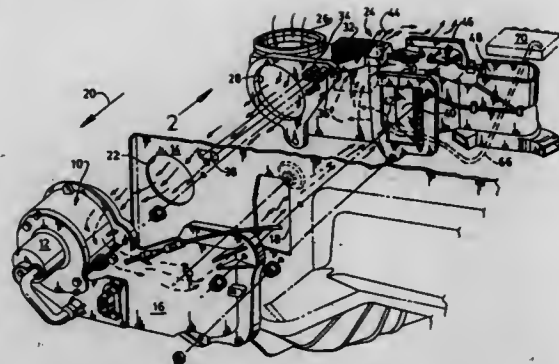
**5,481,884**  
**APPARATUS AND METHOD FOR PROVIDING LOW REFRIGERANT CHARGE DETECTION**  
 Ardeean Scoccia, Amherst, N.Y., assignor to General Motors Corporation, Detroit, Mich.  
 Filed Aug. 29, 1994, Ser. No. 297,466  
 Int. Cl.<sup>6</sup> F25B 49/02  
 U.S. Cl. 62—129 10 Claims



1. An apparatus for providing low refrigerant charge detection in a refrigeration system charged with a refrigerant and having a compressor with an inlet for receiving the refrigerant, the apparatus comprising:  
 means for sensing one of an operating and a non-operating states of the compressor;  
 means for measuring refrigerant pressure at the inlet of the compressor;  
 means for measuring ambient air temperature; and  
 means for indicating very low refrigerant charge not detected when  
 (i) the compressor is sensed in the non-operating state, and  
 (ii) the measured refrigerant pressure is greater than a pressure value that is a predetermined function of the measured ambient air temperature.

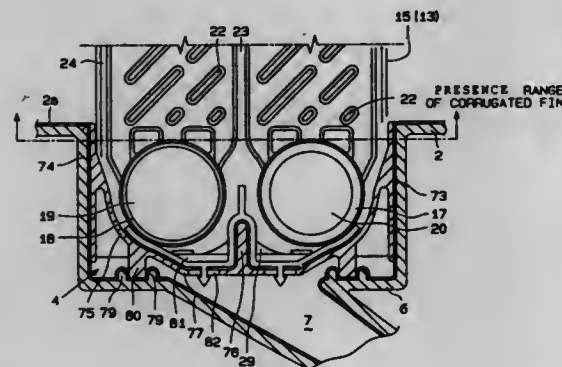
**5,481,885**  
**VENTILATION SYSTEM FOR AN AUTOMOTIVE VEHICLE INSTRUMENT PANEL**  
 Antonio O. Xavier, Westland; Joseph M. Huk, Jr., Southfield, and Donna A. Lew, Oak Park, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.  
 Filed Jul. 22, 1994, Ser. No. 279,138  
 Int. Cl.<sup>6</sup> B60H 1/28; B25D 1/00  
 U.S. Cl. 62—259.2 4 Claims

1. A cooling air plenum assembly for an automotive vehicle instrument panel containing electrical components, said plenum assembly comprising a housing, a fresh air inlet port in said housing;  
 a heater core in said plenum assembly, coolant flow conduits communicating with said heater core;  
 an air discharge port in said plenum assembly, an air duct defined by said plenum assembly and adapted to conduct fresh air to an upstream side of said heater core; and  
 a flexible air conduit communicating with said air duct and extending through said instrument panel to at least one of said



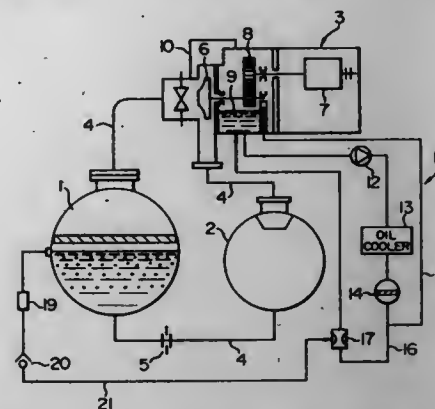
electrical components whereby the operating temperature of said component is reduced.

**5,481,886**  
**COOLING UNIT AND DRAIN CASE FOR AIR CONDITIONERS**  
 Etsuo Hasegawa, Kounan; Yoshiharu Kajikawa, Hekinan; Takayuki Morita, Nagoya; Suehiro Okazaki, Kariya; Toshihiro Yamamoto, Gifu; Toshiya Nagasawa, Obu, and Shogo Sumi, Toyooka, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan  
 Filed May 18, 1994, Ser. No. 245,502  
 Claims priority, application Japan, May 19, 1993, 5-117367; Aug. 27, 1993, 5-213060; Nov. 5, 1993, 5-276375; Mar. 16, 1994, 6-045601  
 Int. Cl.<sup>6</sup> F25D 21/14  
 U.S. Cl. 62—285 13 Claims



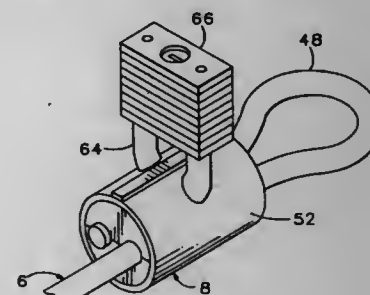
10. A drain case disposed under a refrigerant evaporator, comprising:  
 plural pairs of stacked plates with at least two pieces of tank parts formed at a lower end part of said evaporator;  
 a windward side inclined part contacting a windward side end part of said evaporator;  
 a lee side inclined part contacting a lee side end part of said evaporator;  
 a protruded part contacting the lower end part of said evaporator and between said two pieces of tank parts; and  
 a drain hole for draining condensed water generated by said evaporator, wherein said windward and lee side inclined parts and said protruded part are formed integrally.

**5,481,887**  
**COMPRESSION TYPE REFRIGERATOR**  
 Masatoshi Terasaki, Tsuchiura, Japan, assignor to Hitachi, Ltd., Tokyo, Japan  
 Filed Sep. 8, 1994, Ser. No. 302,214  
 Claims priority, application Japan, Sep. 13, 1993, 5-226896  
 Int. Cl.<sup>6</sup> F25B 43/02  
 U.S. Cl. 62—471 6 Claims



1. A compression type refrigerator comprising an evaporator, a condenser, a compressor for compressing a refrigerant gas, an oil tank for storing a lubricating oil, and an oil supply device connected to said oil tank and including an oil pump for supplying the lubricating oil to said compressor,  
 wherein a discharge side of said oil pump is connected to said oil tank through an ejector, and a pipe, connected at one end to said evaporator to remove a refrigerant liquid, is connected at the other end to a negative pressure generation portion of said ejector.

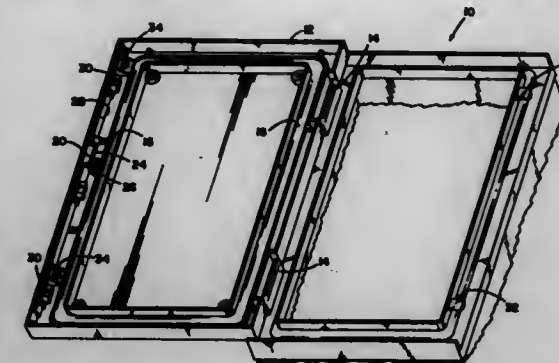
**5,481,888**  
**TERMINATION DEVICE FOR FLEXIBLE CABLE**  
 Robert C. Perry, 5755 SW. Willow La., Lake Oswego, Oreg. 97035-5340  
 Filed Aug. 19, 1994, Ser. No. 293,145  
 Int. Cl.<sup>6</sup> E05B 73/00  
 U.S. Cl. 70—18 22 Claims



17. A device for attachment to a length of rod-like material, comprising:  
 first and second jaw members each having a clamping face in which it is formed with at least one recess, whereby when the jaw members are placed with their clamping faces in confronting relationship, the recesses form a cavity for receiving the length of rod-like material, at least one of the jaw members being formed with a groove,  
 at least one removable clamping element for clamping the jaw members together and thereby releasably retaining the length of rod-like material in the cavity,  
 a sleeve for fitting over the jaw members and preventing removal of the clamping element, the sleeve being formed with apertures that align with the groove when the sleeve is fitted over the jaw members, and

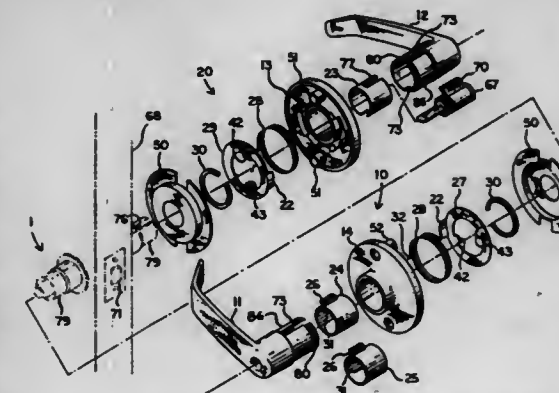
a padlock having a shackle that extends through the holes in the sleeve and passes within the groove with an interference fit relative to said one of the first and second jaw members for holding the sleeve in position relative to the jaw members.

**5,481,889**  
**MECHANICAL LATCH SYSTEM**  
 John E. Richard, Rogers; David B. Wightman, White Bear Lake; Clifford A. Klinger, Minneapolis; Steven J. Hammond, Andover, and Joseph D. Ricke, Arden Hills, all of Minn., assignors to Federal-Hoffman, Inc., Anoka, Minn.  
 Filed Jan. 15, 1993, Ser. No. 5,013  
 Int. Cl.<sup>6</sup> E05B 63/14  
 U.S. Cl. 70—118 20 Claims



1. A latch apparatus for a container and lid, comprising:  
 a rack and pinion drive device mounted on the lid, wherein the rack is mounted to a latch bar, and wherein the latch bar slides with the rack upon rotation of a pinion gear, wherein the latch bar includes a plurality of engagement members mounted thereon engaging complementary members on the container;  
 latch actuation means rotatable with the pinion gear in a normal position; wherein the latch actuation means is unlocked in its normal position; and,  
 a plurality of interchangeable latch actuation devices for actuating the rack and pinion drive device; wherein the plurality of interchangeable latch actuation devices have a plurality of different latch actuation means.

**5,481,890**  
**CYLINDRICAL LOCKSET KNOB TO LEVER CONVERSION ASSEMBLY**  
 Norman A. Millman, 536 Cardinal Dr., Dresher, Pa. 19025  
 Filed Mar. 11, 1993, Ser. No. 29,545  
 Int. Cl.<sup>6</sup> E05B 13/10  
 U.S. Cl. 70—224 17 Claims



1. A field conversion means to convert a knob-handle pure cylindrical lockset having a cylinder lock spindle coaxing with a

latch, initially installed in a door, to a lever-handle lockset, said means comprising a pair of lever-handles, a pair of rosettes or escutcheons, wherein each said rosette or escutcheon is provided with a pair of mounting studs, each of said studs sized and configured to receive a through bolt, a through bolt connecting said pair of rosettes or escutcheons, spring means in said rosette or escutcheon, said spring means being biased to oppose droop of said lever-handle from a normal horizontal position and to oppose downward operating force applied to said lever-handle, stop means in said rosettes or escutcheons to limit the angular rotational travel of said lever-handle, and a drive cartridge adapter cylinder wherein an inside drive cartridge adaptor is provided with an external projecting tab to engage a longitudinal slot in said initially installed lockset spindle and an internally projecting tab aligned with said external tab to operatively connect said lever-handle to said spindle, said tab and slot providing only a rotational connection between said lever-handle and said cylinder lock spindle, said lever-handle being solely supported on and solely axially connected to said rosette or escutcheon.

5,481,891

## TUBE BENDING APPARATUS AND METHOD

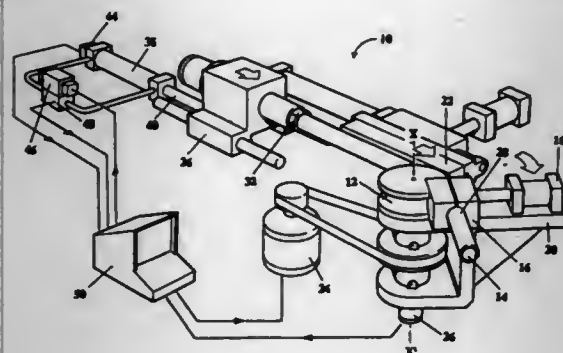
James R. Sabine, Burlington, Canada, assignor to Eagle Precision Technologies Inc., Brantford, Canada

Filed Dec. 20, 1993, Ser. No. 169,079

Int. Cl.<sup>6</sup> B21B 37/12

U.S. Cl. 72-24

4 Claims



1. An improved tube rotary draw bending apparatus for bending a tube having a tube end, a first portion adjacent said tube end and a second portion retained by said apparatus, said apparatus comprising a bend die around which a bend in said first portion of said tube is formed; means for retaining said first portion of said tube; a tube stop abutting said tube end; means for applying a boost force to said tube end; the improvement comprising:

means to determine the relative position of said tube stop and said second portion of said tube, one to the other, during the bending operation;

means to determine operational stretch factor values created in said second portion of said tube from said relative positions during the bending operation; and

boost force change means to change said boost force applied to said tube end in response to said operational stretch factor values to effect adjustment of said operational stretch factor values to a desired, pre-selected stretch factor value.

5,481,892  
APPARATUS AND METHOD FOR FORMING A TUBULAR MEMBER

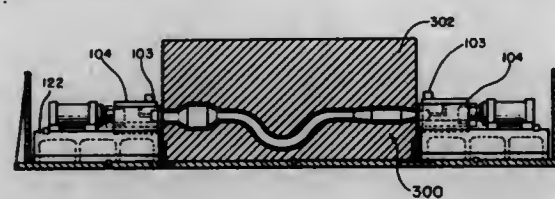
Ralph E. Roper, 2930 Somerset Bay, Indianapolis, Ind. 46240; Gary A. Webb, 1875 Windside, West Bloomfield, Mich. 48324; Douglas W. Tyger, 8262 Country Oaks Station, West Chester, Ohio 45069, and Donald F. Lowen, 1841 Auburndale, West Bloomfield, Mich. 48324

Continuation of Ser. No. 74,886, Jun. 10, 1993, abandoned, which is a continuation-in-part of Ser. No. 945,322, Sep. 15, 1992, abandoned, which is a continuation-in-part of Ser. No. 837,081, Feb. 13, 1992, Pat. No. 5,239,852, which is a continuation of Ser. No. 482,782, Feb. 21, 1990, abandoned, which is a continuation-in-part of Ser. No. 398,272, Aug. 24, 1989, abandoned. This application Jul. 29, 1993, Ser. No. 99,484

Int. Cl.<sup>6</sup> B21D 9/15

U.S. Cl. 72-61

19 Claims



1. A method for forming a complex-shaped tubular metal member from a tubular blank having two ends, comprising the following steps:

- applying hydraulic pressure inside of the tubular blank;
- applying mechanical forces to bend the tubular blank while the hydraulic pressure is being applied inside of the tubular blank;
- increasing the hydraulic pressure inside the tubular blank to expand at least two sections of the tubular blank so as to form bulge regions, a circumference of at least one of said bulge regions being at least about 20% larger than the circumference of the tubular blank;
- axially compressing the ends of the tubular blank to permit the metal to flow into the expanding sections so as to reduce the thinning of the metal in said sections.

5,481,893

## APPARATUS FOR HOSE CRIMPING MACHINE

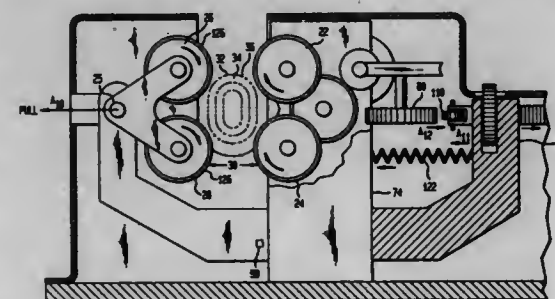
Michael M. Barjasteh, Rockaway, N.J.; Jerry Umbra, Rhinebeck, N.Y., and Ali M. Sadegh, Closter, N.J., assignors to Mastercool USA, Inc., Rockaway, N.J.

Filed Jan. 24, 1994, Ser. No. 185,559

Int. Cl.<sup>6</sup> B21D 15/00; 17/04

U.S. Cl. 72-107

17 Claims



5. A crimper apparatus for securing a fitting to a hose comprising:

- a frame;
- a knurl drive roller attached to said frame, said knurl drive roller having a raised portion, said raised portion being knurled on an inner surface thereof and a crimp drive roller attached to said frame above said knurl roller, said crimp drive roller and said knurl drive roller rotating said fitting;

gear means for rotating said knurl drive roller and said crimp drive roller;

deflector roller means positioned opposite of said knurl drive roller and said crimp drive roller, said deflector roller means having at least one raised portion on the outside surface thereof, said raised portion contacting said fitting for crimping said fitting;

a frame arm slidable within said frame, said deflector roller means attached to said slidable frame arm, said deflector roller means is moveable towards and away from said crimp drive roller and said knurl drive roller;

cam means coupled to said gear means, said cam means being rotated by said gear means;

follower roller positioned opposite of said cam means, said follower roller contacting said cam means during formation of said crimp for moving said cam means in a linear direction for gradually moving said knurl drive roller and said crimp drive roller toward said deflector roller means;

an adjustable dial for adjusting the distance between said follower roller and said cam means;

a first gear coupled to said knurl drive roller;

a second gear coupled to said crimp drive roller;

a third gear coupled to said first and second gears;

a spur gear coupled to said third gear; and

a first worm gear coupled to said spur gear, wherein rotation of said first worm gear rotates said first, second and third gears.

5,481,894

## METHOD FOR MANUFACTURING A CONDUCTOR FOR A FLAT CABLE

Haruo Saen; Ryuzo Suzuki, both of Tachigi; Hiroshi Fujii, and Atsushi Iizuka, both of Gunma, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

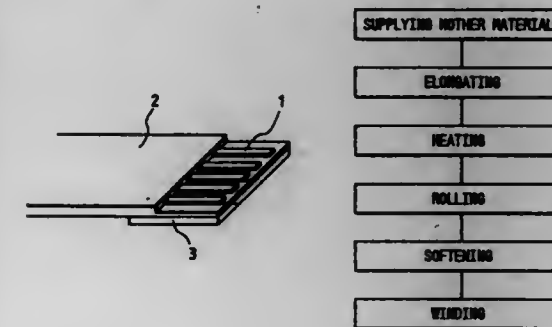
Filed Apr. 15, 1994, Ser. No. 228,394

Claims priority, application Japan, Apr. 16, 1993, 5-009766; Aug. 2, 1993, 5-210059; Feb. 21, 1994, 6-047873

Int. Cl.<sup>6</sup> B21B 3/00

U.S. Cl. 72-200

4 Claims



1. A method of manufacturing a conductor for a flat cable comprising the steps of:

rolling a tin or tin alloy plated conductive material into an elongated material of a predetermined size;

heating said elongated material;

rolling said heated material to produce a flat conductor; and

softening the flat conductor.

5,481,895

## SECOND INTERMEDIATE IDLER ROLL FOR USE IN A 20-HIGH CLUSTER MILL

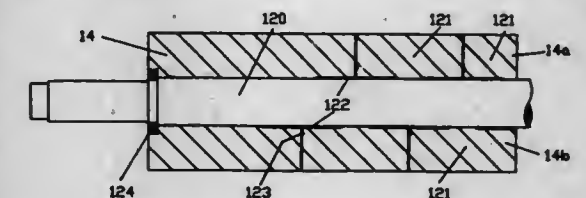
Michael G. Sendzimir, Woodbury, and John W. Turley, Oxford, both of Conn., assignors to T. Sendzimir, Inc., Waterbury, Conn.

Division of Ser. No. 917,157, Jul. 20, 1992, abandoned. This application Aug. 25, 1994, Ser. No. 296,280

Int. Cl.<sup>6</sup> B21B 27/03

U.S. Cl. 72-242.4

1 Claim



1. A second intermediate idler roll for use in a 20-high (1-2-3-4) cluster mill, said second intermediate idler roll comprising a solid, rod-like, transversely flexible core, a series of hardened rings mounted on said core with narrow gaps between adjacent rings, each of said rings having a length, each of said rings contacting said core for less than its length by virtue of one of counterbores in said ring and annular recesses formed in said core, whereby a low rigidity of said second intermediate idler roll is achieved.

5,481,896

## KNIFE BENDING APPARATUS

Chuji Yanagimoto, Yao, Japan, assignor to Itami Industrial Co., Ltd., Yao, Japan

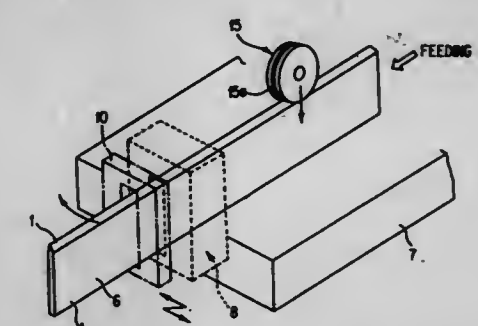
Filed Jun. 11, 1993, Ser. No. 74,544

Claims priority, application Japan, Jun. 11, 1992, 4-151874; Jan. 8, 1993, 5-001967

Int. Cl.<sup>6</sup> B21D 5/16

U.S. Cl. 72-307

23 Claims



1. A knife bending apparatus for bending a long and thin plate-like knife having two lateral sides, a blade edge and a back end opposite said blade edge, the apparatus comprising:

a supporting mechanism for slidably supporting said knife at said two lateral sides thereof, a surface plate located adjacent the supporting mechanism, said supporting mechanism holding the blade in such a state that said back end of the knife in a lengthwise direction of the knife thereof is made to run along a top surface of said surface plate;

a bending mechanism, which is placed next to, and a required distance from the supporting mechanism, for repeatedly giving a bending force to the knife supported by the supporting mechanism by a bending die which selectively presses the knife from either side thereof so as to selectively bend the blade in opposite directions; and

a feeding mechanism for feeding the knife from the supporting mechanism whenever a bending process is carried out by the bending mechanism.



5,481,897

## DOUBLE PLANE BEND FORMER

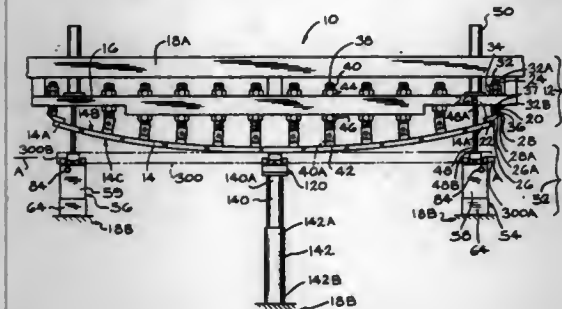
Richard E. Jessop, DeWitt, and John E. Demmer, Lansing, both of Mich., assignors to Demmer Corporation, Lansing, Mich.

Filed Jan. 19, 1994, Ser. No. 183,675

Int. Cl.<sup>6</sup> B21D 5/01

U.S. Cl. 72—389

40 Claims



1. An apparatus for bending of an elongate strip having opposed ends and a length between the opposed ends defining an axis of the strip to produce an arcuate shape along the length and made of a deformable material which comprises:

a pair of spaced apart bending members which are moved together to bend the strip and then are moved apart,

(a) a first one of the bending members having an arcuate surface for bending the strip to form a bend in the strip when the bending members are moved together; and

(b) a second one of the bending members comprising at least two tool members mounted along the axis defined by the strip when the bending members are apart and wherein each of the tool members has holders which mount the strip, wherein at least one of the holders is pivotable around a holder axis parallel to the axis of the strip and is biased such that the strip mounted in the holder is urged towards the arcuate surface of the first one of the bending members, wherein the holder also rotates around the holder axis parallel to the axis of the strip prior to or during bending, wherein the bending members rotate the strip on the one of the holders which is pivotable and move against the bias of the one of the holders to deform the strip as the bending members are moved together and wherein the bending members are adapted to be mounted in a driving means for movement of the bending members.

5,481,898

## TOOLING MODULE FOR A STAMPING AND FORMING MACHINE

Johannes C. W. Bakermans, Harrisburg, Pa., assignor to The Whitaker Corporation, Wilmington, Del.

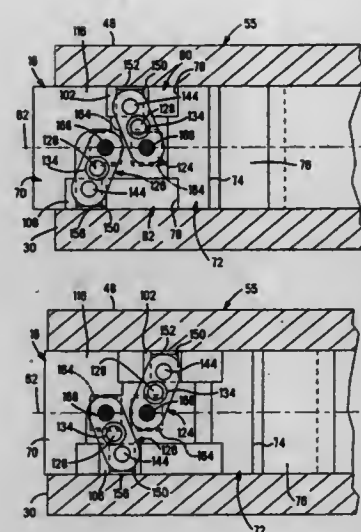
Filed Apr. 28, 1994, Ser. No. 234,906

Int. Cl.<sup>6</sup> B21J 9/18

U.S. Cl. 72—450

20 Claims

1. In a stamping and forming machine for performing stamping and forming operations on strip stock, said machine including a drive shaft, first and second ram assemblies which are reciprocative within a box, having a box-like interior, toward and away from each other between forward and retracted positions along an axis of reciprocation, first and second actuator levers for reciprocating said first and second ram assemblies, respectively, each ram assembly having a first portion and a second portion, both said first and second portions being in sliding engagement with said box-like interior, each lever being coupled to said first portion of a respective one of said ram assemblies and to said drive shaft for effecting said reciprocation of its said ram assembly, tooling coupled to said second portion of said first ram assembly and mating tooling coupled to said second portion of said second ram assembly, respectively, for reciprocation of said tooling and said mating tooling toward each other for performing said operations and away from each other.



apparatus interconnecting said first and second portions so that during said reciprocation said second portion moves at a different rate than does said first portion.

5,481,899

## PRESSURE DIFFERENTIAL DOWNSET APPARATUS

Guy Harris, Carrollton; Duane Callaway, Grand Prairie, and Rajesh Shah, Lewisville, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

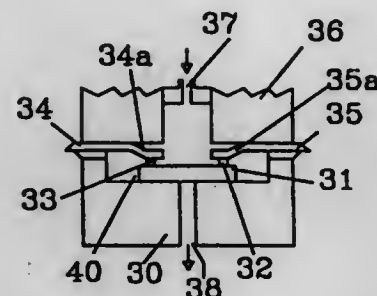
Division of Ser. No. 943,278, Sep. 10, 1992, Pat. No. 5,338,705.

This application Jun. 27, 1994, Ser. No. 245,381

Int. Cl.<sup>6</sup> B21J 9/18

U.S. Cl. 72—453.11

3 Claims



1. An apparatus for producing a downset of a semiconductor die having lead frame leads, to move the die away from the lead frame leads attached to the die, comprising:

a base with a recess therein to hold the semiconductor die with the lead frame leads supporting the die over the recess; a clamp for clamping the lead frame leads against the base; an inlet in the clamp for introducing a gas to provide a downward pressure on the semiconductor die; and vacuum means including an outlet in the base for providing a vacuum under the semiconductor die;

wherein the downward pressure over the die and vacuum under the die provides a downset pressure to move the die downward towards a bottom of said recess in the base, bending the lead frame leads away from edges of the die.

5,481,900

## PIPETTE SYSTEM

Dieter Husar, Hamburg, Germany, assignor to Eppendorf-Netheler-Hinz GmbH, Hamburg, Germany

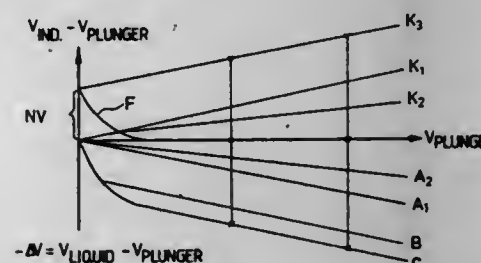
Filed Mar. 11, 1993, Ser. No. 29,817

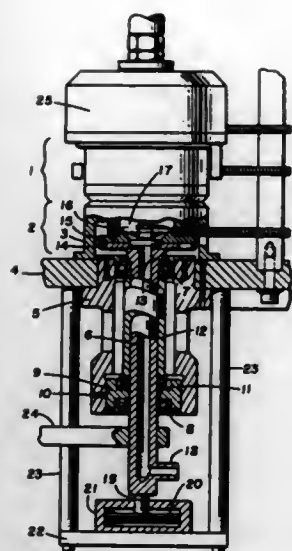
Claims priority, application Germany, Mar. 25, 1992, 42 69 620.0

Int. Cl.<sup>6</sup> G01N 1/14; B01L 3/02; G01F 25/00

U.S. Cl. 73—1 H

1 Claim





temperature between two opposed, temperature-controlled dies and in which the sample is subjected to an oscillatory, rotary shearing force by oscillatory rotation of one of said dies relative to the other, and a torque which is indicative of the response of the sample to the shearing force is measured, characterised in that at least once during its residence between the dies the sample is (i) cooled at an average rate of cooling of at least 1° C. per second and, if necessary, the resultant pressure drop is limited to avoid slippage between the sample and the dies, and (ii) reheated, and information on the characteristics of the sample is derived from the torque measurements at least during the period or periods of cooling.

5,481,904

## OIL SPILLAGE DETECTOR

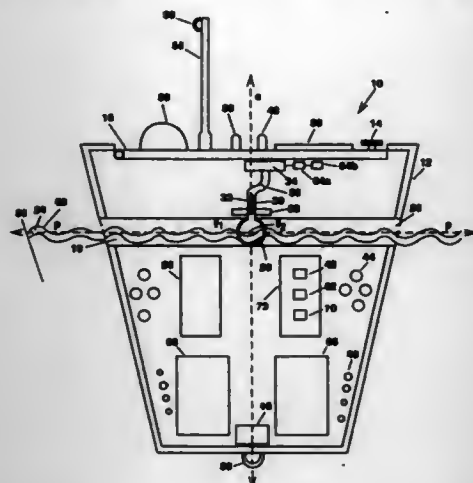
Charles J. Fleck, Sr., National Park; Charles J. Fleck, Jr., Sicklerville, both of N.J., and Michael J. Sweeney, Glenolden, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 28, 1994, Ser. No. 313,958

Int. Cl. G01N 33/26; 1/20; G08B 17/10; 25/10

U.S. Cl. 73—61.51

20 Claims



1. Apparatus for discerning the presence of hydrocarbonous matter at or near the surface of an aqueous/hydrous substance, said hydrocarbonous matter including a hydrocarbonous liquid substance and a hydrocarbonous gaseous substance, said apparatus comprising:

a buoyant hollow cylindroid object;

at least two diametrical horizontal tubes, said horizontal tubes extending through said object and unobstructively intersecting so as to form a central spatial junction within said object, said horizontal tubes being for fluidly capturing, at said central spatial junction, portions of said aqueous/hydrous substance and of said hydrocarbonous liquid substance;

a sensor remotely situated above said central spatial junction, said sensor being for detecting some said hydrocarbonous gaseous substance which is given off from at least one of said fluidly captured portions; and

conduction means between said central spatial junction and said sensor, said conduction means including a conduit, a valve and a heater;

said conduit being long and narrow, said valve being for checking conducting said aqueous/hydrous substance and said hydrocarbonous liquid substance, said heater being for promoting conducting of said hydrocarbonous gaseous substance by said conduit, said conduction means thereby being adapted to permit said hydrocarbonous gaseous substance to reach said sensor and to prevent said aqueous/hydrous substance and said hydrocarbonous liquid substance from reaching said sensor.

5,481,905

## TRANSDUCER CIRCUIT HAVING NEGATIVE INTEGRAL FEEDBACK

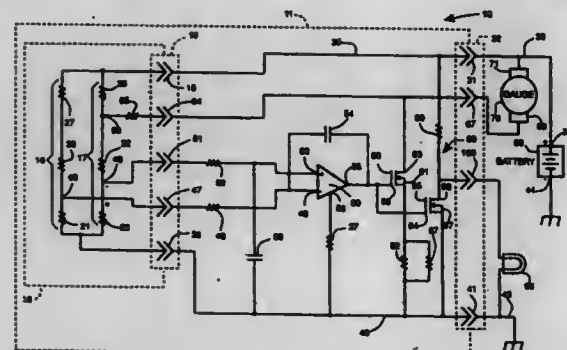
Bud E. Pratt, Pinckney, Mich., assignor to Phillips Electronics North America Corporation, New York, N.Y.

Filed Nov. 3, 1992, Ser. No. 970,746

Int. Cl. G01P 15/00

U.S. Cl. 73—115

21 Claims



1. A transducer circuit comprising:

a. means responsive to a variable condition, said condition varying from a first value to a second value;

b. a bridge circuit having at least one arm including said responsive means and first and second output terminals, said bridge circuit having a first output voltage between said output terminals when said responsive means is subjected to said first condition value and having a second output voltage between said output terminals different from said first output voltage when said responsive means is subjected to said second condition value;

c. means for establishing a transducer output signal at an output terminal which is a function of an integral of said bridge circuit output voltage, said establishing means including:

(1) a difference amplifier having a first input terminal coupled to said first bridge circuit output terminal, a second input terminal coupled to said second bridge circuit output terminal, and an output terminal coupled to said establishing means output terminal;

(2) a first integrating capacitor connected between said difference amplifier first input terminal and said difference amplifier output terminal;

(3) a second integrating capacitor connected between said difference amplifier second input terminal and a circuit ground;

(4) a first resistor connected between said difference amplifier first input terminal and said first bridge circuit output terminal; and

(5) a second resistor connected between said difference amplifier second input terminal and said second bridge circuit output terminal;

said difference amplifier and said integrating capacitors cooperating to establish said transducer output signal; and further wherein the product of the values of said first integrating capacitor and said first resistor defines a first time constant and the product of the values of said second integrating capacitor and said second resistor defines a second time constant that is less than said first time constant; and

d. negative feedback means coupling said transducer output signal to said bridge circuit to return said bridge output voltage from said second output voltage to said first output voltage.

5,481,906

## FAULT DIAGNOSIS APPARATUS AND METHOD FOR VEHICLE CONTROL SYSTEM

Yoshimasa Nagayoshi, Kyoto; Takeshi Asano, Kusatsu; Ikuo Maruyama, Kameoka, and Masakazu Kinoshita, Kyoto, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

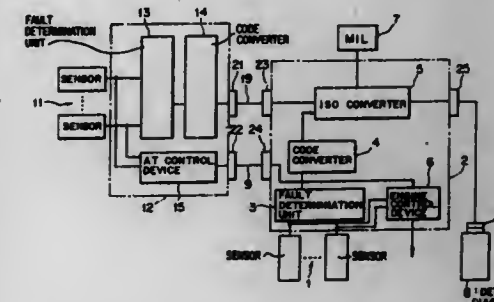
Filed Jun. 27, 1994, Ser. No. 265,850

Claims priority, application Japan, Jun. 30, 1993, 5-161887

Int. Cl. G06F 17/00

U.S. Cl. 73—116

16 Claims



1. A fault diagnosis apparatus for a vehicle control system having:

first operation state detection means for detecting the state of operation of a desired first element out of vehicle-constructing elements mounted on a vehicle,

second operation state detection means for detecting the state of operation of a desired second element out of said vehicle-constructing elements, said desired second element being different from said first element,

a first control unit for controlling said desired first element on the basis of an output from said first operation state detection means, and

a second control unit for controlling said desired second element on the basis of an output from said second operation state detection means, whereby a fault of at least one of said first operation state detection means, said second operation state detection means, said first control unit and said second control unit is diagnosed, which apparatus comprises:

first fault detection means arranged in association with said first control unit to detect a fault of at least one of said first control unit and said first operation state detection means,

first fault signal output means arranged in association with said first control unit to output to said second control unit a fault detection signal, which has been received from said first fault detection means, as a fault signal specific to said first control unit;

second fault detection means arranged in association with said second control unit to detect a fault of at least one of said second control unit and said second operation state detection means;

second fault signal output means arranged in association with said second control unit to output a fault detection signal, which has been received from said second fault detection means, as a fault signal specific to said second control unit; converter means arranged in association with said second control unit to receive the fault signal from at least one of said first fault signal output means and said second fault signal output means and then to convert said fault signal into a signal which conforms with a predetermined communication system;

first determining and diagnosing means for reading the fault signal so converted, thereby determining and diagnosing the fault of at least one of said first control unit, said first operation state detection means, the fault of said second control unit and said second operation state detection means; and

second determining and diagnosing means for reading a fault signal from said first fault signal output means to determine and diagnose a fault of said first control unit or said first operation state detection means.

5,481,907

## TIRE TESTING SYSTEM HAVING FOCUSED LINKS REDUCING COSINE ERRORS

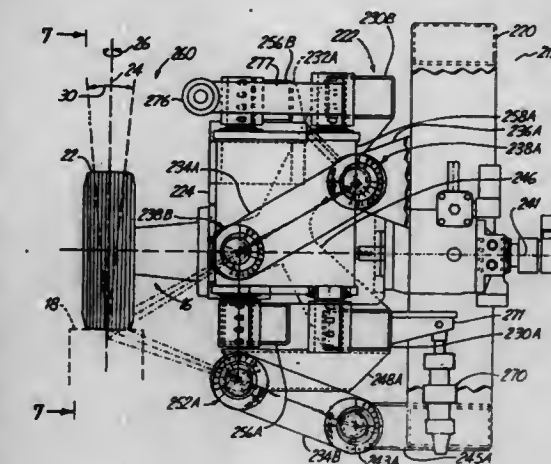
David G. Chasco, and Dennis J. Willis, both of Bloomington, Minn., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Continuation-in-part of Ser. No. 166,093, Dec. 13, 1993, abandoned. This application Jun. 30, 1994, Ser. No. 268,951

Int. Cl. G01M 17/02

U.S. Cl. 73—146

26 Claims



1. A wheel positioning assembly for supporting a wheel relative to a roadway simulator, the assembly comprising:

a support frame, wherein the wheel is mounted on a side of the support frame;

a moveable frame;

first linkage means for joining the moveable frame to the support frame, the first linkage means defining a first set of representative planes that intersect on the side of the support frame having the wheel;

a support member for supporting the wheel; and

second linkage means for joining the support member to the moveable frame, the second linkage means defining a second set of representative planes that intersect on the side of the support frame having the wheel.



5,481,908

# RESONANCE CONTACT SCANNING FORCE MICROSCOPE

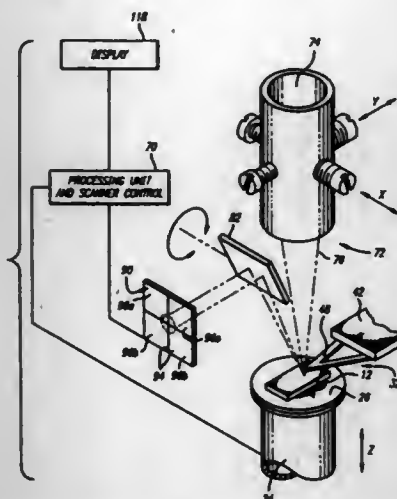
Ronald C. Gamble, Pasadena, Calif., assignor to Topometrix Corporation, Santa Clara, Calif.

Filed Apr. 28, 1993, Ser. No. 55,236

Int. Cl.<sup>6</sup> G01B 11/24

U.S. Cl. 73—105

17 Claims



1. A resonance contact scanning force microscope for examining surface contours of a specimen, the microscope comprising: a cantilever arm having a first free end and a second end secured to a means to move said cantilever arm, said cantilever arm having a fundamental resonance frequency; probe means secured to said free end of said cantilever arm, said probe means including a probe tip adapted to follow the surface contours of the specimen; scanning means for scanning said specimen relative to said probe tip; oscillator drive means for causing said means to move said cantilever arm to oscillate said cantilever arm at a desired harmonic frequency of said fundamental resonance frequency above the cantilever arm fundamental resonance frequency; deflection measuring means for measuring the deflection of said free end of said cantilever arm and for generating a deflection signal indicative of an amount of deflection of the free end of said cantilever arm; and probe position feedback control means for maintaining said probe tip in substantially constant contact with the surface of the specimen in response to said deflection signal.

5,481,909

# APPARATUS AND METHOD FOR MEASURING RECIPROCATING ENGINE PERFORMANCE DEPENDENT ON POSITIONAL BEHAVIOR OF A MEMBER DRIVEN BY ENGINE TORQUE

Robert W. Deutsch, Sugar Grove, and Scott A. Robb, Buffalo Grove, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 7, 1994, Ser. No. 206,584

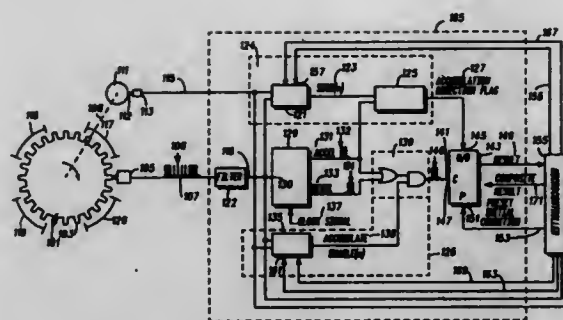
Int. Cl.<sup>6</sup> G01M 15/00

U.S. Cl. 73—117.3

44 Claims

1. An apparatus for measuring reciprocating engine performance dependent on torque output of the reciprocating engine, where the torque output is measured by observing positional behavior of a rotating member driven by the reciprocating engine, said apparatus comprising:

measurement means for providing an acceleration signal indicative of acceleration of said rotating member;  
gated ACCEL-DECEL means for providing a gated acceleration signal, dependent on the acceleration signal gated by an



accumulate enable flag corresponding to a first span of rotary position of said rotating member; and accumulation means for accumulating the gated acceleration signal, and for providing an accumulated result dependent thereon.

5,481,910

# ADJUSTABLE SPINDLE

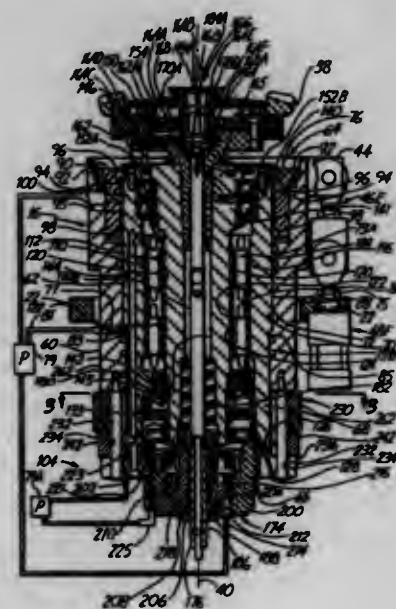
Yevsey Gutman, Minneapolis, Minn., assignor to GEI Systems, Inc., Minneapolis, Minn.

Filed Jul. 30, 1993, Ser. No. 100,114

Int. Cl.<sup>6</sup> G01M 13/02

U.S. Cl. 73—162

14 Claims



1. An adjustable spindle comprising: an outer stationary housing having a cavity with a longitudinal axis and an opening extending along the longitudinal axis from the cavity to an outer surface; an inner housing positioned in the cavity and cooperating with an inner surface of the outer stationary housing to define a chamber; a pump operably coupled to the chamber for pressurizing the chamber and replacing the inner housing relative to the outer stationary housing parallel to the longitudinal axis; a clamping device located between the outer stationary housing and the inner housing for selectively fixing the position of the inner housing relative to the outer stationary housing; and an electric rotating machine secured in the inner housing for displacement therewith, the electric rotating machine having a rotating shaft.

5,481,911

# CESSPIT WATER LEVEL INDICATOR

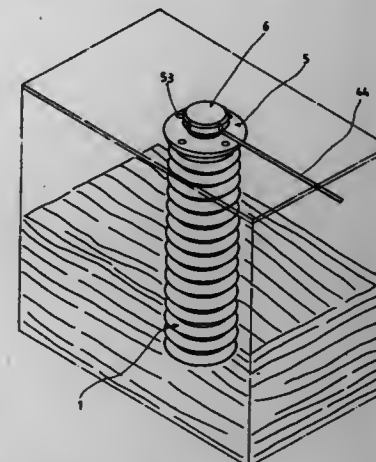
Chung-Ho Llang, I/F., No. 10, Lane 16, Shuang-Ho St., Yungho City, Taipei Hsien, Taiwan, Prov. of China

Filed Nov. 16, 1993, Ser. No. 152,374

Int. Cl.<sup>6</sup> G01F 23/60; H01C 10/10

U.S. Cl. 73—313

1 Claim



1. A cesspit water level indicator, comprising: a hollow expandable element formed of a corrosion-resisting flexible material having a closed end and an opposing open end for longitudinal extension within a cesspit; a fixed rod member disposed within said hollow expandable element and being defined by a longitudinally extended first cylindrical wall and a first through bore extending between opposing longitudinal ends thereof, said fixed rod member having an enlarged circular head formed on a first of said opposing longitudinal ends and coupled to said open end of hollow expandable element to form a closure therefore, said circular head having an externally threaded perimeter surface and a slotted through opening formed longitudinally therethrough and in open communication with said first through bore, said slotted through opening extending radially from a central portion of said circular head through said perimeter surface thereof, said circular head having a pair of vent holes formed longitudinally therethrough for passage of air to and from said hollow expandable element, said fixed rod member having a pair of slotted through openings extending longitudinally on opposing sides of said first cylindrical wall; a sliding rod member disposed within said hollow expandable element and telescopically coupled to said fixed rod member, said sliding rod member being defined by a longitudinally extended second cylindrical wall and a second through bore extending between opposing longitudinal ends thereof, said sliding rod member having a first of said opposing longitudinal ends coupled to said closed end of said hollow expandable element for longitudinal displacement therewith responsive to a raising water level within the cesspit and a pair of apertures formed through opposing sides of said second cylindrical wall adjacent a second of said opposing longitudinal ends thereof, a second of said opposing ends of said fixed rod member being displaceably disposed within said second through bore adjacent said second end of said sliding rod member and secured thereto by a connecting pin extending through said pair of apertures of said second cylindrical wall and said pair of slotted through opening of said first cylindrical wall; control circuit means for detecting displacement of said sliding rod member, said control circuit means including (1) a variable resistor disposed in said first through bore, said variable resistor being defined by a longitudinally extended resistive element disposed in sliding contact with said connecting pin, and (2) a cable extending through said slotted opening of said circular head for providing electrical coupling to said variable resistor; a ring-shaped mounting plate secured to an upper portion of the cesspit and having a central through opening formed therein,

said central through opening having a female thread formed therein for threaded coupling with said circular head of said of said fixed rod member; and, a circular cap having a female threaded portion for coupling on said circular head of said fixed rod member, said cap being spaced above said ring-shaped mounting plate to form a gap for passage of said cable and air flowing from and to said vent holes.

5,481,912

# METHOD AND APPARATUS FOR DYNAMICALLY BALANCING A ROTARY MEMBER

Gunther Himmler, Darmstadt, Germany, assignor to Hofmann Maschinenbau GmbH, Germany

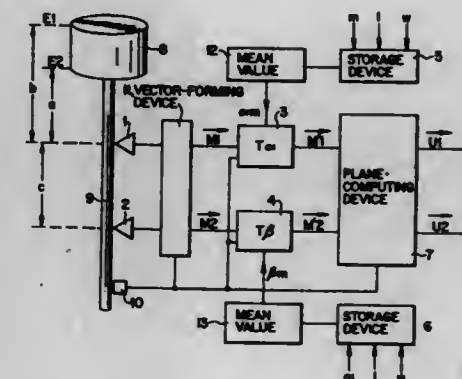
Filed Dec. 3, 1993, Ser. No. 160,863

Claims priority, application Germany, Dec. 4, 1992, 42 40 7877

Int. Cl.<sup>6</sup> G01M 1/16; G01L 25/00

U.S. Cl. 73—460

6 Claims



1. A method of dynamically balancing a rotary member in first and second correction planes on the rotary member, comprising the steps of: ascertaining measurement value vectors during a measuring run corresponding to the rotary member unbalance in selected measuring planes of a measuring apparatus; calculating the correction phase angles  $\alpha_{mv}$  and  $\beta_{mv}$  from phases shifts being determined during calibration runs and stored in a family of characteristic curves, as phase differences between the angles position of a known calibration unbalance vector in each of the first and second correction planes and the thereby achieved measurement value vectors in accordance with the following equations:

$$\alpha_{mv} = \frac{\alpha_a + \alpha_b}{2}$$

$$\beta_{mv} = \frac{\beta_{(a+c)} + \beta_{(b+c)}}{2}$$

wherein  $\alpha_a$  is the phase shift obtained in the first measuring plane having a spacing (a) from the first correction plane,  $\alpha_b$  is the phase shift obtained in the second correction plane having a spacing (b) from the first measuring plane,  $\beta_{(a+c)}$  is the phase shift in the second measuring plane having a spacing (a+c) from the first correction plane, and  $\beta_{(b+c)}$  is the phase shift obtained from the second correction plane having a spacing (b+c) from the second measuring plane; turning the measurement value vectors through correction phase angles  $\alpha_{mv}$  and  $\beta_{mv}$ , specific to the rotary member and dependent on given rotary member parameters, into a common plane which contains an angular position of a correction vector in a respective correction plane; determining correction vectors for the correction planes on the rotary member from the turned measurement value vectors, and

providing correction at the appropriate angular positions in the correction planes in dependence on the determined correction vectors.

5,481,913

# ANGULAR VELOCITY SENSOR AND METHOD OF ADJUSTING THE SAME

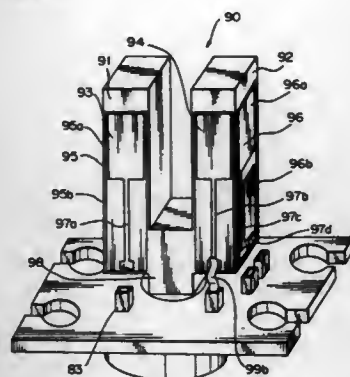
Takeshi Ito, Okazaki; Tomoyuki Kanda, Inabe, and Muneco Yoninaga, Anjo, all of Japan, assignors to Nippondenso Co. Ltd., Kariya, and Nippon Soken Inc., Nishio, both of Japan  
Filed Oct. 12, 1993, Ser. No. 134,813

Claims priority, application Japan, Jan. 12, 1992, 4-272848; Jan. 12, 1992, 4-273201; Jan. 13, 1992, 4-274528; Sep. 24, 1993, 5-237637; Sep. 24, 1993, 5-237638; Jan. 1, 1993, 5-246991; Jan. 8, 1993, 5-253039

Int. Cl.<sup>6</sup> G01P 9/04

U.S. Cl. 73-504.16

17 Claims



7. An angular velocity sensor comprising:  
a tuning fork member, comprising:

a pair of vibrating portions adjacently arranged in parallel relation to one another, each vibrating portion of said pair of vibrating portions having first and second terminal end portions, said first terminal end portions being fixedly coupled to each other,

each vibrating portion consisting of a longitudinal elongated member having a predetermined longitudinal length and a rectangular cross-sectional shape, said cross-sectional shape of said longitudinally elongated members being substantially uniform along longitudinal axes of said longitudinal elongated members;

driver piezo-electric elements, one of said driver piezo-electric elements being fastened to a surface of each vibrating portion, respectively, proximate a one of said first and second terminal end portions of each vibrating portion, said driver piezo-electric elements being disposed on non-facing surfaces of said pair of vibrating portions so that said pair of vibrating portions are moveable in a first direction in which said pair of vibrating portions approach and move apart from each other when driving signals are applied to said driver piezo-electric elements; and

detector piezo-electric elements, one of said detector piezo-electric elements being fastened to a surface of each vibrating portion oriented at right angles with respect to the surfaces to which said driver piezo-electric elements are fastened, said detector piezo-electric elements being disposed proximate an opposed one of said first and second terminal end portions of each vibrating portion from said one of said first and second terminal end portions proximate with said driver piezo-electric elements are disposed,

wherein said detector piezo-electric elements detect a vibration of each vibrating portion generated in response to a rotational angular velocity applied to said tuning fork member while said pair of vibrating portions are vibrating in said first direction, said rotational angular velocity generated vibration of each vibrating portion being in second directions opposite to one another and at right angles to the first direction,

said detector piezo-electric element generating a detection signal in response to said vibration of said pair of vibrating portions generated at a time when the rotational angular velocity is applied to said tuning fork member while said pair of vibrating portions are vibrating in the first direction, said detector piezo-electric element and said driver piezo-electric element being arranged in an axially spaced relation with respect to each other on along said longitudinally elongated member of each vibrating portion so as not to overlap each other to thereby be substantially unaffected by noise generated at said detector piezo-electric element caused by a vibration of said tuning fork member due to expansion and contraction of said driver piezo-electric elements when driving signals are applied to said driver piezo-electric elements.

5,481,914

# ELECTRONICS FOR CORIOLIS FORCE AND OTHER SENSORS

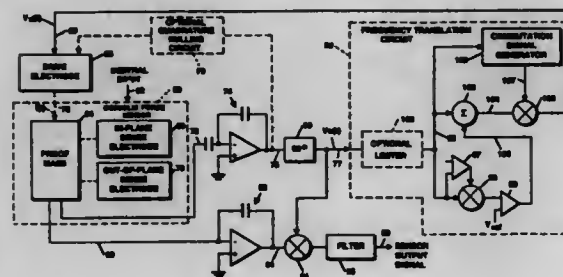
Paul Ward, Waltham, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Mar. 28, 1994, Ser. No. 219,023

Int. Cl.<sup>6</sup> G01P 9/04

U.S. Cl. 73-504.16

23 Claims



1. A Coriolis force sensor comprising:

an input transducer receiving a drive voltage signal and converting said drive voltage signal into a force signal having a nonlinear relationship with respect to said drive signal;

a sensor responsive to said force signal from said input transducer and Coriolis forces induced by an inertial input for providing an inertial sense signal having a predetermined frequency and an amplitude related to said inertial input and a force sense signal having said predetermined frequency and an amplitude related to said force signal;

a first output transducer for converting said force sense signal into a feedback voltage signal;

a frequency translation circuit, disposed in a feedback relationship between said output transducer and said input transducer, for suppressing a component of said feedback voltage signal at said predetermined frequency to provide said drive signal;

a second output transducer for converting said inertial sense signal into a sensor output signal indicative of said inertial input; and

means for reducing error in the sensor output signal, said means including at least one of a circuit for reducing phase error and a circuit for reducing error due to motion of said sensor at ninety degrees out of phase with respect to motion of said sensor due to said Coriolis forces.

5,481,915

# ACCELERATION SENSOR WITH DIRECT MOUNTING

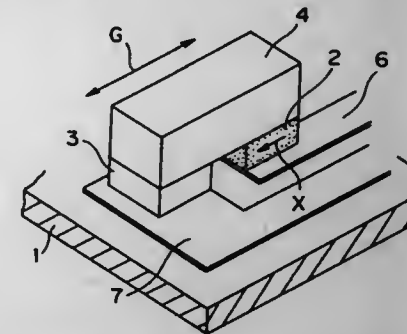
Jun Tabata; Muneharu Yamashita; Hiroshi Asano; Toshihiro Mizuno, and Jiro Inoue, all of Nagakakyō, Japan, assignors to Murata Mfg. Co., Ltd., Japan  
Filed Dec. 8, 1993, Ser. No. 163,436

Claims priority, application Japan, Dec. 8, 1992, 4-328025  
The portion of the term of this patent subsequent to Feb. 14, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> G01P 15/09

U.S. Cl. 73-514.34

17 Claims



1. An acceleration sensor comprising:

a circuit board having an acceleration signal output electrode and a ground electrode formed directly on one major surface of the circuit board;

a piezoelectric element fixed on said acceleration signal output electrode and having an axis of polarization;

a conductive member fixed on said ground electrode; and

a weight member fixed on said conductive member and said piezoelectric element, and conductively connecting said conductive member to said piezoelectric element, and wherein said axis of polarization of said piezoelectric element is substantially parallel to a direction in which acceleration is applied.

5,481,916

# COMBINED ULTRASONIC AND ROTATING EDDY CURRENT PROBE AND METHOD OF NON-DESTRUCTIVE TESTING OF MATERIALS

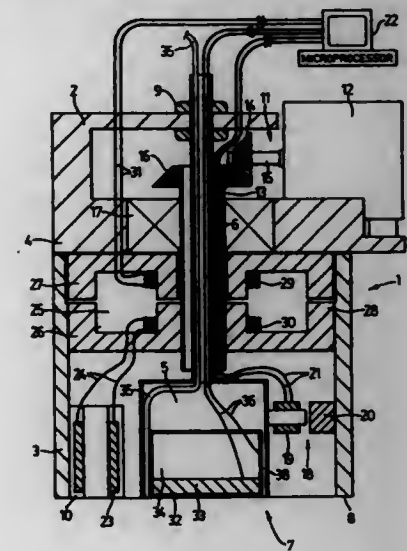
Mirek Maccecek, Toronto; Alec Florel, Brampton, and William R. Sturrock, Victoria, all of Canada, assignors to TSI Sensor Incorporated, Sydney, Canada

Filed Jul. 22, 1994, Ser. No. 279,116

Int. Cl.<sup>6</sup> G01N 29/10

U.S. Cl. 73-601

22 Claims



1. An apparatus for non-destructively testing for flaws in materials, the apparatus comprising:

(a) a housing assembly for passage over the surface of said material to be tested, said housing assembly including a rotor and a stator;

(b) an ultrasonic probe, fixedly mounted on said stator of said housing assembly, for transmitting ultrasonic energy to said material to be tested and for receiving ultrasonic energy reflected back toward said ultrasonic probe;

(c) an eddy current probe, mounted on said rotor of said housing assembly, for the generation of eddy currents in said material to be tested; and,

(d) rotating means for rotationally moving said eddy current probe about said ultrasonic probe.

5,481,917

# ULTRASONIC INSPECTION AND IMAGING INSTRUMENT

Yukio Arima, Thukuba; Toshihiro Kimura, Ibaraki; Tohru Miyata, and Yuichi Kunitomo, both of Tsuchiura, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

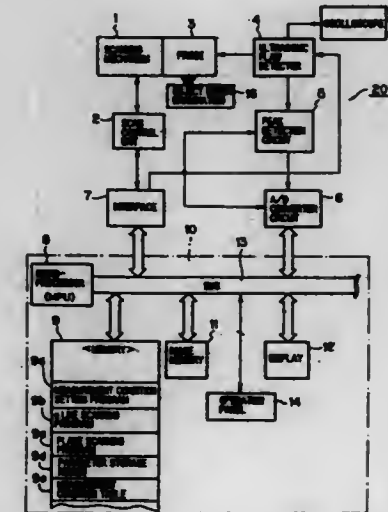
PCT No. PCT/JP94/00003, § 371 Date Aug. 24, 1994, § 102(e) Date Aug. 24, 1994, PCT Pub. No. WO94/16321, PCT Pub. Date Jul. 21, 1994

PCT Filed Jan. 5, 1994, Ser. No. 290,960

Claims priority, application Japan, Jan. 6, 1993, 5-016760  
Int. Cl.<sup>6</sup> G01N 29/04

U.S. Cl. 73-621

10 Claims



1. An ultrasonic inspection and imaging instrument, comprising:  
means for dividing a scanning range of an object under examination into m pieces (m is an integer equal to or more than 2) in a subscanning direction;

means for setting one of measurement conditions or one of measurement parameters in each of m steps;

means for performing an ultrasonic measurement on the object under examination while allotting successively the m-stepped measurement conditions or the m-stepped measurement parameters to the respective scanning regions divided in the subscanning direction;

display means for displaying a plurality of measurement images obtained under the m-stepped measurement conditions on a display screen so as to permit comparison of the measurement images on the display screen; and

means for setting one of the m-stepped measurement conditions or one of the m-stepped parameters which corresponds to an image selected from the displayed screen as the measurement condition or measurement parameter for the object under examination.



5,481,918

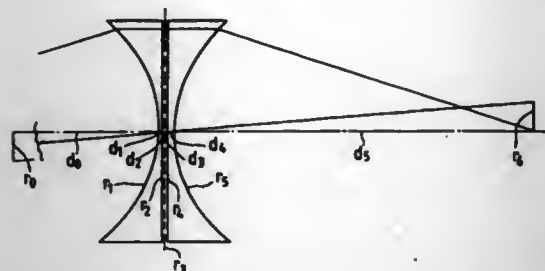
## ACOUSTIC LENS SYSTEM

Akira Hasegawa, Mitaka; Masayoshi Omura, Moroyama; Shinichi Imade, Iruma, and Eishi Ikuta, Sagami-hara, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan Division of Ser. No. 680,235, Apr. 3, 1991, Pat. No. 5,333,503.

This application Jun. 13, 1994, Ser. No. 258,814  
Claims priority, application Japan, Apr. 3, 1990, 2-89319  
Int. Cl.<sup>6</sup> G01N 29/06; 29/24

U.S. Cl. 73-642

12 Claims



1. An acoustic lens system for imaging acoustic waves emitted from an object, wherein at least one lens surface of acoustic lenses constituting said acoustic lens system is configured as an aspherical surface;

wherein said acoustic lens system has an acoustic beam stop therein; and  
wherein said acoustic lens system satisfies the condition:

$$\sum P_{oi} d_{oi} > \sum P_{oj} d_{oj}$$

where  $P_{oi}$  and  $P_{oj}$  are refracting powers of concave and convex surfaces directed toward the acoustic beam stop, respectively, and  $d_{oi}$  and  $d_{oj}$  are distances from these surfaces to the acoustic beam stop, respectively.

5,481,919

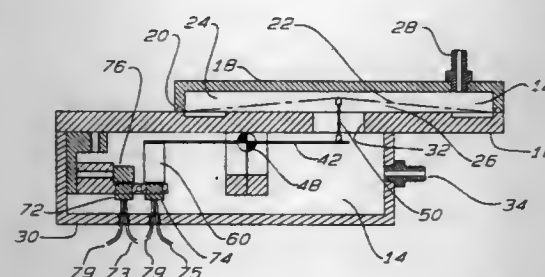
## FORCE MULTIPLYING PRESSURE TRANSMITTER DIAPHRAGM AND METHOD EMPLOYING FLEXIBLE FORCE TRANSMITTING COLUMN

Robert O. Brandt, Jr., P.O. Box 5606 Hanover Center, Wilmington, N.C. 28403

Filed Dec. 21, 1993, Ser. No. 171,905  
Int. Cl.<sup>6</sup> G01L 7/08; 9/00

U.S. Cl. 73-723

20 Claims



1. An apparatus for converting an applied force in the form of an input pressure into a corresponding proportional electrical output signal, characterized by its ability to sense input pressures as low as 0.00015 inch of water column and comprising:

a housing defining an open internal chamber;  
a substantially constant area membrane spanning said chamber and secured about its perimeter to the housing such that it includes concave and convex opposite sides as disposed in the open chamber and wherein the convex side of the membrane forms an input side for receiving an input force;  
force transmitting means disposed on the concave side of said membrane comprising:

a beam having a proximal end and a distal end, said beam being secured for pivotal movement about the central portion of its longitudinal axis to the housing,

the proximal end of said beam mounting a flexible column means for converting a displacement of said membrane into a corresponding displacement of said beam, said column means having one end connected to said beam and the opposite end being in contacting relation with said membrane, and wherein said column means transmits substantially all of the forces exerted thereon by the membrane to said beam,

reflector means connected to the distal end of said beam, means for sensing the displacement of the distal end of said beam operatively associated with said reflector means and adapted to produce an output signal proportional to the distance therebetween and,

whereby a force applied to the convex side of said membrane is converted into a proportional electrical output signal free of inaccuracies due to side loading.

5,481,920

## FLUID PRESSURE MEASURING SENSOR USING STRAIN GAUGES

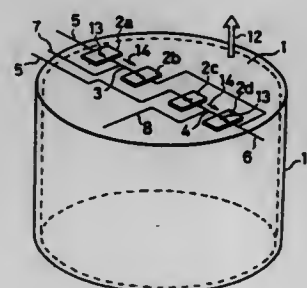
Kolchi Nara, Tsukuba, Japan, assignor to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Continuation-in-part of Ser. No. 144,430, Nov. 2, 1993, abandoned. This application Apr. 29, 1994, Ser. No. 235,692

Claims priority, application Japan, Nov. 17, 1992, 4-332335  
Int. Cl.<sup>6</sup> G01L 9/04

U.S. Cl. 73-726

2 Claims



1. A fluid pressure measuring sensor comprising:  
a diaphragm;

first, second, third and fourth strain gauges disposed on said diaphragm with prescribed spacing so that a majority of current flowing through said first strain gauge has a predetermined direction and a majority of current flowing through each of said second, third and fourth strain gauges has a direction identical with or opposite to said predetermined direction;

a first conductor interconnecting said first and second strain gauges;

a second conductor interconnecting said third and fourth strain gauges;

an electric current supply connected to the four strain gauges;

a first voltage lead and a second voltage lead connected, respectively, to said first conductor and said second conductor from a side identical with or opposite to a direction of a vector product determined by a vector in a direction of current flow through said conductors and a vector in a direction normal to said diaphragm; and

a voltmeter measuring voltage between said first voltage lead and said second voltage lead.

5,481,921

## SNAP-FIT ASSEMBLY OF DIRECT DRIVE BOURDON TUBE PRESSURE GAUGE

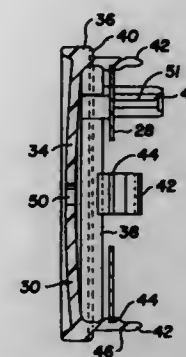
David M. Carpenter, Berea; Thomas M. Philyaw, and Arthur P. Pandaru, both of Richmond, all of Ky., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 17, 1995, Ser. No. 390,496

Int. Cl.<sup>6</sup> G01L 7/04

U.S. Cl. 73-743

10 Claims



1. A pressure gauge comprising:

a dial containing graduations of pressure values;  
a transparent window including means for supporting said dial and providing a face affording viewing capability of the dial;  
a Bourdon tube supported coiled behind said dial and operable to effect displacement changes in response to pressure changes in a fluid to which it is exposed;

a pointer secured to said Bourdon tube for displacement therewith and extending to between said window and said dial for pointing to graduations corresponding to values of pressure being sensed by said Bourdon tube;

a case internally enclosing at least the coiled portion of said Bourdon tube and assembled to said window in a snap-in relation therewith; and

a socket assembled to said case in a snap-in relation therewith and including a stem extending away from said case for connection to a source of fluid pressure to be exposed to said Bourdon tube.

5,481,922

## ELASTIC TRANSDUCER DESIGNS INCORPORATING FINITE LENGTH MEASUREMENT PATHS

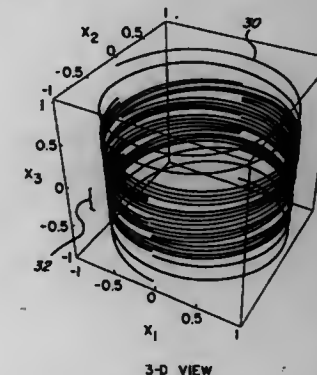
Peter D. Washabaugh, 626 Westwood, Ann Arbor, Mich. 48103

Filed May 31, 1994, Ser. No. 251,536

Int. Cl.<sup>6</sup> G01B 11/00

U.S. Cl. 73-774

12 Claims



1. The load measuring transducer comprising a loadable structure, at least two energy-conductive strands mounted to said structure in a predetermined three dimensional geometric relation to said structure, each said conductive strand having a geometrically

distinct path in relation to said structure, and means for comparing the propagation of energy through said conductive strands in response to strain imposed on said structure.

5,481,923

## HOLDER OF FATIGUE TEST PIECE

Masao Ohmi; Fumiki Takada, and Minoru Kizaki, all of Ibaraki, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

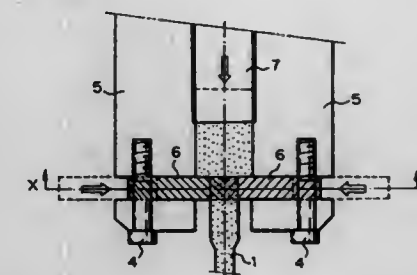
Continuation of Ser. No. 145,567, Nov. 4, 1993, abandoned.

This application Jan. 11, 1995, Ser. No. 371,445

Claims priority, application Japan, Nov. 6, 1992, 4-296764  
Int. Cl.<sup>6</sup> G01N 3/08; 3/02

U.S. Cl. 73-860

6 Claims



1. A holder of a test piece on a fatigue tester that comprises a cylinder portion having a center hole through which the test piece is inserted, a reciprocating ram rod that is inserted into said hole from above and which is vertically slidable under hydraulic pressure to push down the test piece, and a test piece fixing plate that is inserted under said cylinder portion, said test piece fixing plate being slidable from either right or left at a lower end of said cylinder portion in a horizontal direction generally perpendicular to the direction of movement of said ram rod such that the thicker part of the test piece is compressively held between said fixing plate and the working end of said ram rod after said test piece is inserted into said center hole from below;

wherein said test piece fixing plate includes a first part and a second part, said first and second parts being horizontally slidable from opposing directions between an upper section and a lower section of said cylinder portion such that an upper generally planar surface of said fixing plate slides along a horizontal surface of said upper section of said cylinder portion and a lower generally planar surface of said fixing plate slides along a horizontal surface of said lower section; wherein said upper section and said lower section of said cylinder portion are releasably joined together by at least two securing elements; and

wherein said securing elements limit the horizontal sliding movement of said first and second parts of said fixing plate.

5,481,924

## METHOD AND APPARATUS FOR ASSESSING AND QUANTIFYING PULSATION INDUCED ERROR IN GAS TURBINE FLOW METERS

Cecil R. Sparks, and Robert J. McKee, both of San Antonio, Tex., assignors to Gas Research Institute, Chicago, Ill.

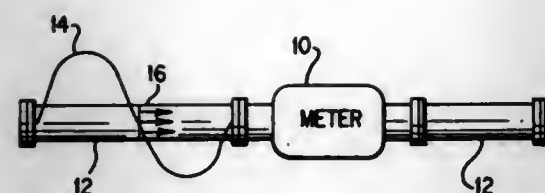
Continuation-in-part of Ser. No. 708,357, May 31, 1991, abandoned. This application Jul. 15, 1993, Ser. No. 92,270

Int. Cl.<sup>6</sup> G01F 1/00

U.S. Cl. 73-861.03

18 Claims

1. A system for detecting and quantifying pulsation-induced errors in a turbine meter measuring gas flow in a pipe, comprising:  
a turbine meter;  
transducer means coupled to said turbine meter for producing an output signal correlatable with the flow of a gas stream through said turbine meter; and



processing means for processing said output signal to obtain an amount of pulsation-induced error in the flow measurement provided by said meter.

5,481,925

## LOW TURBULENCE AIRFLOW SENSOR

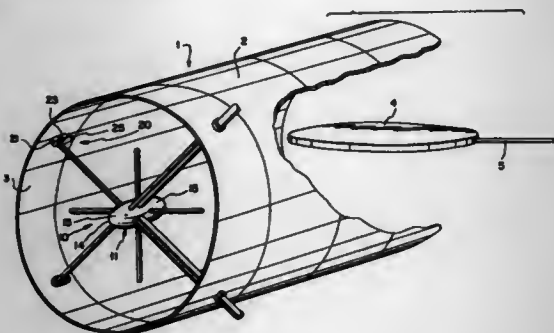
Ronald E. Woodbury, Largo, Fla., assignor to Environmental Technologies, Inc., Largo, Fla.

Filed Sep. 9, 1994, Ser. No. 303,714

Int. Cl.<sup>6</sup> G01F 1/46

U.S. Cl. 73—861.66

11 Claims



1. An airflow sensor adapted to be mounted within a flow conduit comprising:

- a streamlined central hub of air foil shape having an upstream region smoothly transitioning to a downstream region;
- at least two pair of diametrically opposed upstream airflow sensing tubes extending radially outwardly from said central hub, each of said upstream airflow sensing tubes including:
  - a plurality of radially spaced holes therethrough fluidly connecting regions exterior to said tube to an internal flow passage thereof, said holes being spaced from one another such that each hole receives air flow from an equal concentric cross-sectional area of a flow conduit; and
  - a streamlined attachment member for attaching said tube to an inner wall of a flow conduit; and
- a number of downstream airflow sensing tubes corresponding in number to a number of said upstream airflow sensing tubes, each downstream airflow sensing tube extending radially outwardly from said central hub a distance shorter than a distance of radial extension of said upstream airflow sensing tubes, each downstream airflow sensing tube having a single inlet at an end thereof and being circumferentially spaced from a respective adjacent upstream airflow sensing tube.

5,481,926

## TENSION TESTER OF TENNIS RACQUET STRING

Darryl D. Manson, 8725 Burchen Rd., Gilroy, Calif. 95020

Filed Dec. 9, 1994, Ser. No. 353,505

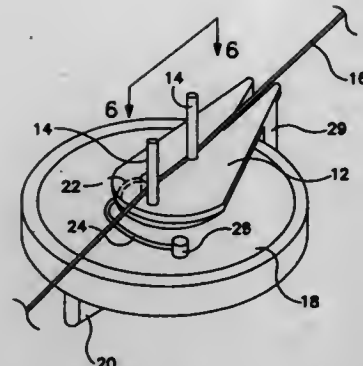
Int. Cl.<sup>6</sup> G01L 5/00

U.S. Cl. 73—862.452

10 Claims

1. A device for measuring resiliency in an elongated flexible member having a thickness wherein ends of said elongated flexible member are anchored, said device comprising:

- a base member having a first surface;



an extending member extending from said first surface and having a space adapted for straddling said elongated member having anchored ends such that an elongated dimension of said flexible elongated member is parallel to said surface;

- a lever member rotatably mounted on a second surface of said base member opposite said first surface;
- said lever member mounted to rotate about an axis perpendicular to said first surface and intermediate said space in said extending member;
- a restoring position means having one end secured to said base member and another end secured to said lever member for biasing said lever member to rotate to a home position relative to said base member;
- a dial means for reading orientation of said lever member relative to said base member;

said dial means, base member, extending member, lever member and restoring means arranged in operable combination with one another such that, when said extending member straddles said flexible member with said elongated dimension substantially parallel to said first surface and said lever member is rotated such as to apply torque through said restoring member to said base member and thus through said extending member to bend said flexible member, and when said torque is sufficient to cause alignment of a preset location on said base with a direction of said elongated dimension, said dial displays an angle by which said lever member has been rotated relative to said base member thereby indicating resiliency of said flexible member.

5,481,927

## VAPOR PORT AND GROUNDWATER SAMPLING WELL

Joel M. Hubbell, and Allan H. Wylie, both of Idaho Falls, Id., assignors to Lockheed Idaho Technologies Company, Idaho Falls, Id.

Filed Sep. 24, 1993, Ser. No. 126,471

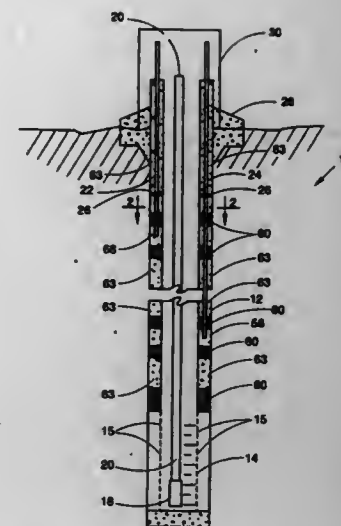
Int. Cl.<sup>6</sup> E21B 43/04; G01N 1/22; 1/26; 1/16

U.S. Cl. 73—863.71

15 Claims

1. A system for extracting underground vapors and groundwater from a single well within a borehole extending downward from the earth surface, comprising:

- a casing extending downward from the earth surface within a borehole, said casing having a diameter less than the borehole, thereby forming an annular space between the casing and the borehole, and the casing having a bottom screened section;
- a multiplicity of vapor tubes extending downward from the earth surface within said annular space, each of said tubes having a plurality of ports at a bottom portion of the tubes and an upper portion of each of said tubes being attached to vacuum means located on the earth surface for extracting underground vapors through said tubes to the earth surface;
- a riser pipe within the casing, said riser pipe having a water pump at a bottom section of the riser pipe for pumping groundwater surrounding said borehole through said bottom screened section of the casing;



enclosure and having at least one aperture opening onto the inner surface of said enclosure and connected to a sampling pipe passing through said panel and opening onto an outer surface of said enclosure.

5,481,929

## INSTRUMENT HOLDER AND METHOD FOR INSPECTION OF A DYNAMO-ELECTRIC MACHINE IN A GAP BETWEEN A STATOR AND A ROTOR AND DYNAMO-ELECTRIC MACHINE HAVING THE INSTRUMENT HOLDER

Erich Kohlert, Erlangen, and Otto Wirxel, Essen, both of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

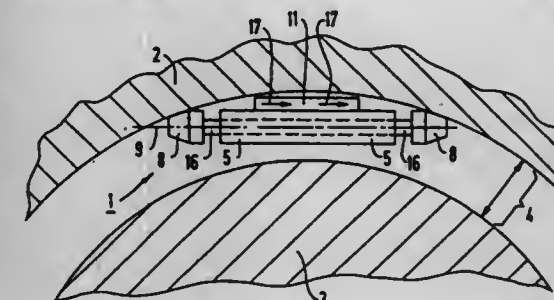
Filed Dec. 21, 1993, Ser. No. 188,534

Claims priority, application European Pat. Off., Jun. 21, 1991, 91110269; Jul. 4, 1991, 91111160; Germany, Sep. 3, 1991, 9110922 U

Int. Cl.<sup>6</sup> G01M 19/00

U.S. Cl. 73—865.8

32 Claims



5,481,928

## MODULAR WALL MEMBER OF AN ENCLOSURE FOR COVERING A RECEPTACLE AND IN PARTICULAR THE VESSEL HEAD OF A NUCLEAR RECTOR

Claude Falduti, Saint-Michel-sur-Orge, and Norbert Bouron, Acheres, both of, France, assignors to Framatome, Courbevoie, France

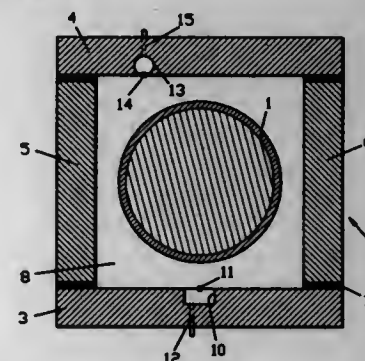
Filed Feb. 7, 1994, Ser. No. 192,581

Claims priority, application France, Feb. 17, 1993, 93 01799

Int. Cl.<sup>6</sup> G01N 1/02

U.S. Cl. 73—863.81

8 Claims



1. In a confinement and heat-insulating enclosure of a receptacle enclosing a fluid at high temperature, said enclosure having a wall covering at least a part of an outer surface of said receptacle and providing, between an inner surface of said wall facing said outer surface of said receptacle and said outer surface of said receptacle, a sealed chamber for confinement and recovery of fluid leaking from said receptacle, a modular wall member of said enclosure in the form of a heat-insulating panel comprising a sampling means for sampling fluid from said chamber constituted by at least one duct extending in a direction parallel to said panel housed in an interior part of said panel adjacent to the inner surface of said

1. In a dynamo-electric machine including a stator having a ferromagnetic yoke with an internal recess and a rotor disposed in the internal recess defining a gap between the yoke and the rotor, an instrument holder to be introduced into the gap for inspecting the dynamo-electric machine, comprising:

- a frame section, instruments secured to said frame section for inspecting the dynamo-electric machine;
  - at least one wheel set having at least three wheels for moving the instrument holder in the gap, approximately mutually parallel axes, each of said wheels being rotatable about a respective one of said axes;
  - a connection device to be connected to leads for connecting the instrument holder to a control and evaluation device; and
  - magnets mounted at respective ones of said wheels for pressing said wheels of the instrument holder against the yoke in the gap; and
- wherein each of said magnets is rotationally symmetrical, is aligned axially with said axis about which said wheel associated with said magnet is rotatable, has an internal bore formed therein being axial with said axis, and has a magnetization direction being aligned approximately parallel to said axis, and including hubs each being disposed in a respective one of said internal bores.

5,481,930

## PROBE GUIDE ASSEMBLY FOR A REACTOR COOLANT PUMP MOTOR

Hsiang-Jung Kuo; David A. Mohr, both of Trafford, and Richard E. Sainick, Monroeville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 19, 1994, Ser. No. 182,914

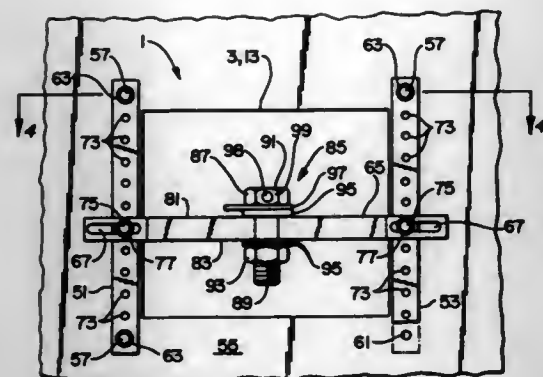
Int. Cl.<sup>6</sup> G01M 19/00; G01N 21/88; G21C 17/01

U.S. Cl. 73—866.5

21 Claims

1. An adjustable probe guide assembly for removable attachment to an outer surface of a motor housing defining a vent, the probe guide assembly comprising:





mounting means for removable attachment to the outer surface near the vent;  
 an elongated cross bar adjustably fastened to the mounting means and almost spanning the vent in a first direction outside the vent;  
 cross bar positioning means for adjustably positioning the cross bar substantially across the vent in a second direction about orthogonal to the first direction;  
 a probe guide member attached to the cross bar including means for attaching an elongated probe guide extending through the vent into the interior of the housing; and  
 probe guide member positioning means for fastening the probe guide member at a selected position on the cross bar that is adjustable in a direction that is substantially parallel to the first direction, wherein the position of the probe guide member can be adjusted substantially transverse to the probe guide for adjustably positioning the probe guide within the housing.

5,481,931

# DEVICE FOR THE ADJUSTMENT OF THE ORIENTATION OF DOOR MIRRORS IN MOTOR VEHICLES

Luigi Vecchiarino, Vaprio D'Adda, Italy, assignor to Commer S.p.A., Salerno, Italy

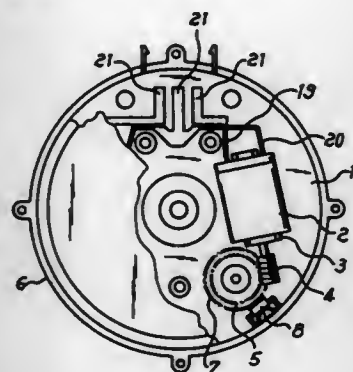
Filed Nov. 3, 1993, Ser. No. 145,129

Claims priority, application European Pat. Off., Nov. 4, 1992, 92830608

Int. Cl.<sup>6</sup> B60R 1/06

U.S. Cl. 74—89.14

10 Claims



1. In a device for the adjustment of the orientation of a door mirror for motor vehicles, of the type comprising a base accommodating a couple of electric motors each of whose shafts are connection by reduction units and a rack to a support for said door mirror, wherein the improvement comprises: for each motor at least a first worm screw and gear wheel reduction unit driven by the motor, as well as a second worm screw having a worm thread coupled directly to the rack, said second worm screw being integral and coaxial to said gear wherein operation of said electric motors moves said racks; each of said racks being provided at one

of its ends with an unelongated hole which engages in a loose way a separate pivot provided within an assembling seat present in said support for the door mirror; each of said pivots being radially oriented to project towards the center of said support and presenting a spherical projection at one of its ends, whereby said racks adjust said door mirror upon being driven by said motors.

5,481,932

# MULTI-AXIS COUNTERSHAFT POWER TRANSMISSION

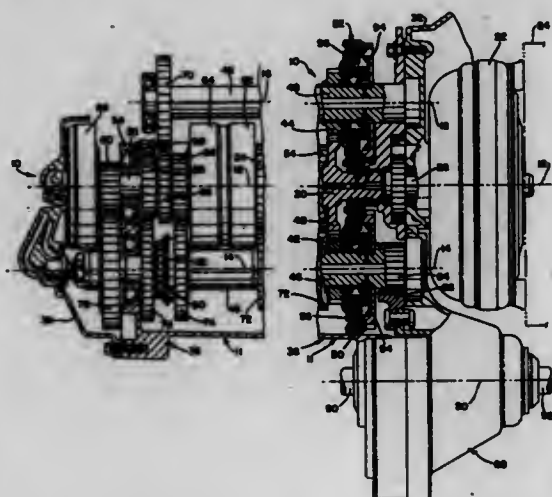
Robert C. Downs, Clarkston, and John D. Malloy, Troy, both of Mich., assignors to General Motors Corporation, Detroit, and Saturn Corporation, Troy, both of Mich.

Filed Mar. 29, 1994, Ser. No. 219,311

Int. Cl.<sup>6</sup> F16H 3/08

U.S. Cl. 74—331

5 Claims



1. A multi-speed ratio parallel shaft power transmission comprising:

- an input shaft;
- an output shaft;
- a secondary shaft;

speed ratio establishing means including a plurality of gear members and clutch means selectively connectable between said input shaft and said output shaft for providing a plurality of speed ratios therebetween including a first forward speed ratio, a second forward speed ratio and a reverse speed ratio, mechanical clutch means for connecting selective gear means to one of said input and output shafts and a transfer gear means rotatably supported on the other of said input and output shafts in substantial axial alignment with a portion of said mechanical clutch;

a forward ratio gear and clutch means operatively connectable with said secondary shaft including first gear means meshing with the gear means providing the first forward speed ratio, second gear means meshing with the transfer gear means, and selectively engageable clutch means for establishing a third forward speed ratio of lesser value than said first forward speed ratio and greater value than said second forward speed ratio; and

said first forward speed ratio is defined between said input shaft and said output shaft, said third forward speed ratio is partially defined between said input shaft and said secondary shaft at a ratio equal to the first forward speed ratio.

5,481,933

Patent Not Issued For This Number

5,481,934

# BICYCLE SPEED CHANGE OPERATION ASSEMBLY

Koichi Tagawa, Kawachinagano, Japan, assignor to Mory Sun-tour Inc., Osaka, Japan

PCT No. PCT/JP93/01913, § 371 Date Aug. 5, 1994, § 102(e)

Date Aug. 5, 1994, PCT Pub. No. WO94/14645, PCT Pub. Date Jul. 7, 1994

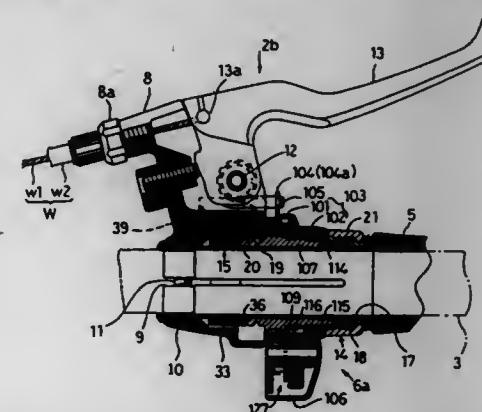
PCT Filed Dec. 27, 1993, Ser. No. 284,496

Claims priority, application Japan, Dec. 28, 1992, 4-349154

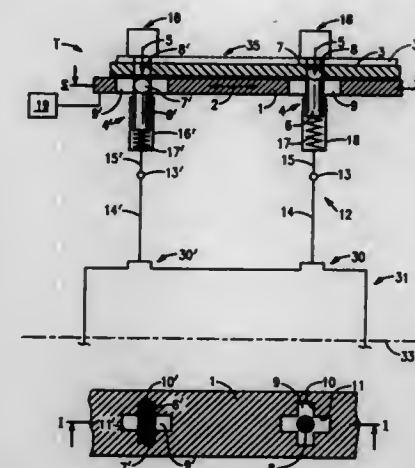
Int. Cl.<sup>6</sup> B62M 25/04

U.S. Cl. 74—475

5 Claims



1. A bicycle speed change operation assembly comprising:  
 a first speed change operation member and a second speed change operation member each supported around a grip end portion of the handlebar about an axis of a handlebar for rotation;  
 a cable winding member rotated in response to a rotating operation of the speed change operation members for winding or paying out a speed control cable; and  
 a retaining mechanism for holding the cable winding member at a predetermined rotational position;  
 wherein the first speed change operation member is connected to the cable winding member for integral rotation therewith in a cable pulling direction and a cable paying out direction;  
 whereas the second speed change operation member is connected to the cable winding member by a transmission mechanism for rotating the cable winding member in the cable pulling direction or the cable paying out direction in response to rotational reciprocation of the second speed change operation member from a predetermined commencing point.



a portion of each lever (12, 12') on a first side of the fulcrum defining a gearshifting fork (14, 14'), with an end of the fork (14, 14') remote from the fulcrum being operatively connected to a corresponding gearshifting sleeve (30, 30');  
 a portion of each lever (12, 12') on a second side of said fulcrum defining a gearshifting arm (15, 15');  
 a gearshifting element (1, 4) for selectively engaging the gearshifting arms (15, 15') to selectively pivot the levers (12, 12') and selectively move said gearshifting sleeves (30, 30'), via the forks (14, 14');

wherein the gearshifting element comprises a single connecting rod (1) selectively reciprocally moveable relative to a housing wall (3) of the transmission in a direction parallel to rotational axes (33) of gears of the transmission (T) into a neutral and gearshifting positions;

each gearshifting arm (15, 15') has a coupling mechanism (4, 4') axially reciprocally mounted on an end of the arm (15, 15') remote from the fulcrum (13, 13'), for:

- a) when the coupling mechanism (4, 4') is in an actuated state, immovably coupling the remote end of the gearshifting arm (15, 15') with the connecting rod (1), such that the connecting rod (1) pivots the corresponding lever (12, 12') and thereby moves the corresponding gearshifting sleeve to selectively engage and disengage a corresponding gear of the transmission; and
- b) when the coupling mechanism (4, 4') is in an unactuated state, uncoupling the remote end of the arm (15, 15') from the connecting rod (1) and simultaneously immovably coupling the remote end of the arm (15, 15') to the housing wall (3) of the transmission.

5,481,936

# ROTARY DRIVE POSITIONING SYSTEM FOR AN INDEXING TABLE

Ken Yanagisawa, Matsumoto, Japan, assignor to Yugen Kaisha Sozoan, Nagano, Japan

Filed Jun. 24, 1994, Ser. No. 264,933

Claims priority, application Japan, Jun. 29, 1993, 5-158499

Int. Cl.<sup>6</sup> A47B 11/00; G05G 11/00

U.S. Cl. 74—490.06

10 Claims

1. A rotary drive system, comprising:  
 a pair of first guides being provided in a first direction;  
 a pair of second guides being provided in a second direction perpendicular to the first direction;  
 a first moving guide being provided in parallel to said first guides, each end section of said first moving guide being movably connected to each of said second guides whereby said first moving guide is capable of moving in the second direction along said second guides;  
 a second moving guide being provided in parallel to said second guides, each end section of said second moving guide being movably connected to each of said first guides whereby said

5,481,935

# GEARSHIFTING ARRANGEMENT FOR ACTUATING MOTOR VEHICLE MULTI-SPEED GEARBOXES

Gerhard Bailly, and Ünal Gazyakan, both of Friedrichshafen, Germany, assignors to ZF Friedrichshafen AG, Germany

PCT No. PCT/EP92/02604, § 371 Date Apr. 20, 1994, § 102(e)

Date Apr. 20, 1994, PCT Pub. No. WO93/10377, PCT Pub. Date May 27, 1993

PCT Filed Nov. 12, 1992, Ser. No. 211,930

Claims priority, application Germany, Nov. 12, 1991, 41 37

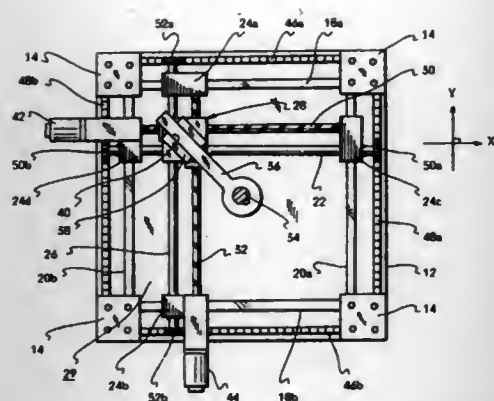
145.3

Int. Cl.<sup>6</sup> F16H 63/36

U.S. Cl. 74—477

19 Claims

1. A gearshifting system for shifting motor vehicle multi-speed transmissions comprising:  
 a plurality of gearshifting levers (12, 12'), each being pivotally mounted about a fulcrum (13, 13');



guide means in said intermediate steering shaft for guiding said two shaft parts along a helical path.

5,481,938

### POSITION CONTROL APPARATUS FOR STEERING COLUMN

Richard T. Stuedemann; Russell L. Herliche, both of Saginaw, and Ray G. Armstrong, Bay City, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

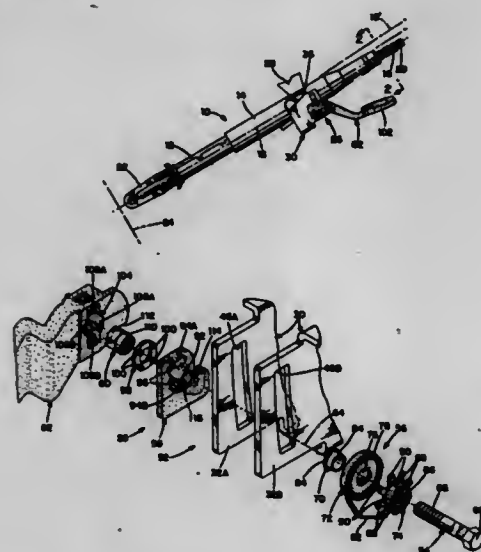
Filed May 2, 1994, Ser. No. 236,075

Int. Cl.<sup>6</sup> B62D 1/18

U.S. Cl. 74-493

7 Claims

second moving guide is capable of moving in the first direction along said first guides;  
a moving body being capable of moving on said first moving guide and said second moving guide;  
a first driving means for moving said moving body in the first direction;  
a second driving means for moving said moving body in the second direction;  
an output shaft being capable of rotating on its axis; and  
a lever for rotating said output shaft when said moving body moves round said output shaft, an outer end section of said lever being rotatably connected to said moving body and capable of moving in the longitudinal direction with respect thereto, an inner end section of said lever being fixed to said output shaft.



5,481,937

### TELESCOPIC STEERING COLUMN FOR MOTOR VEHICLES

Ludger Uphaus, Neuenkirchen; Rainer Schmidt, Diepholz, and Burkhard Schäfer, Stuhr-Seckenhausen, all of Germany, assignors to Lemförder Metallwaren AG, Lemford, Germany

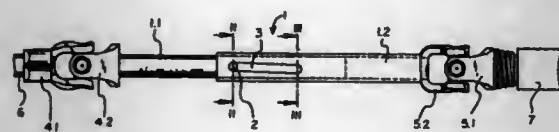
Filed Nov. 15, 1994, Ser. No. 340,271

Claims priority, application Germany, Nov. 27, 1993, 43 40 429.4

Int. Cl.<sup>6</sup> B62D 1/18

U.S. Cl. 74-493

3 Claims



1. A telescopic steering column for motor vehicles, comprising:  
an upper steering shaft guided in a steering column jacket, said upper steering shaft having an end with a steering wheel mounted thereon;  
a lower steering shaft engaging a steering gear of the motor vehicle;  
a telescopic intermediate steering shaft including a first shaft part and a second shaft part, said intermediate steering shaft being connected to said upper steering shaft and said lower steering shaft via a first universal joint and a second universal joint, respectively, wherein said first shaft part and said second shaft part have, in each position of the steering wheel, a three-dimensional bending angle that changes during a telescoping process; and

1. A position control apparatus for a rake adjustable motor vehicle steering column comprising:

- a stationary bracket having a first vertical leg with a first substantially vertical slot therein and a second vertical leg with a second substantially vertical slot therein disposed on opposite sides of a mast jacket of said steering column,
- a bolt rotatably supported on said mast jacket spanning said first and said second vertical legs through said first and said second substantially vertical slots having a head outboard of said first vertical leg and a screw thread portion outboard of said second vertical leg,
- a nut outboard of said second vertical leg engaging said screw thread portion of said bolt such that relative rotation between said bolt and said nut in a clamping direction tensions said bolt between said first and said second vertical legs and relative rotation in an opposite releasing direction releases said bolt tension between said first and said second vertical legs,
- a one-way clutch means between said bolt head and said first vertical leg operative to permit rotation of said bolt relative to said first vertical leg in only said bolt tensioning direction,
- an operating lever, and
- means connecting said operating lever to said nut for rotation as a unit therewith between a clamped position corresponding to maximum bolt tension between said first and said second vertical legs and a released position corresponding to minimum bolt tension between said first and said second vertical legs.

5,481,939

### CABLE STRAIN RELIEF DEVICE

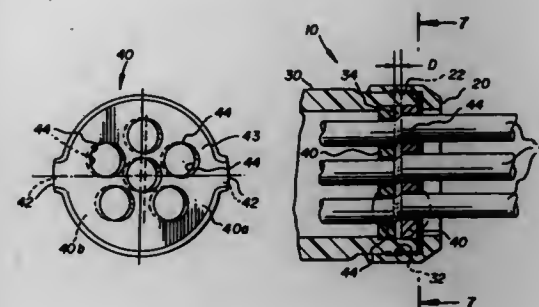
Allen J. Bernardini, Southbury, Conn., assignor to Litton Systems, Inc., Watertown, Conn.

Filed Dec. 28, 1993, Ser. No. 174,356

Int. Cl.<sup>6</sup> H02G 15/02; H01R 3/02

U.S. Cl. 74-502.4

1 Claim



1. A cable strain relief device comprising:

- a) a pair of disks, each of said disks having a plurality of openings therein sized to allow cables to be passed therethrough, wherein the plurality of openings on each disk is comprised of a first opening offset from the central longitudinal axis of the disk, and other openings positioned away from and around said first opening, such that a circle centered on and circumscribing the first opening passes through the center of the other openings and
- b) means to maintain said disks in a position relative to one another such that the openings are proximate and offset whereby cable passed through said openings is kinked and retained therebetween.

5,481,940

### PISTON AND CYLINDER UNIT FOR USE IN A VEHICLE SAFETY BELT PRETENSIONER

Hans-Peter Betz, Böblingen, Germany, assignor to TRW Repa GmbH, Alfdorf, Germany

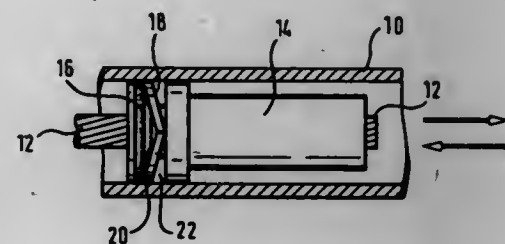
Filed Mar. 29, 1994, Ser. No. 219,942

Claims priority, application Germany, Apr. 2, 1993, 9305086 U

Int. Cl.<sup>6</sup> B60R 22/46

U.S. Cl. 74-502.6

4 Claims



1. A piston and cylinder unit for use in a vehicle safety belt pretensioner, comprising a tubular cylinder with an inner wall surface and a central axis, a piston slidably accommodated in said cylinder tube and having a circumferential groove between a pair of axially spaced radial shoulders, a cable connected to said piston and a pair of semi-annular disks located in said groove with circumferential ends bearing on each other, said semi-annular disks being held in positions with opposite oblique slope in relation to said central axis and with an outer edge portion held in engagement with said inner wall surface.

5,481,941

### INFINITELY ADJUSTABLE TRACK LOCKING MECHANISM

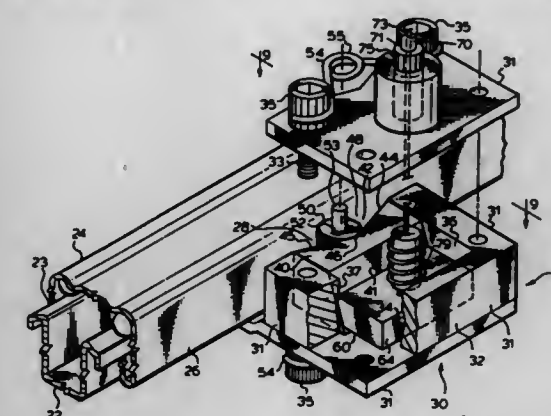
Gulam Premji, Mississauga, Canada, assignor to Bertrand Faure Ltd., Mississauga, Canada

Filed Dec. 8, 1994, Ser. No. 351,958

Claims priority, application Canada, Aug. 19, 1994, 2130497 Int. Cl.<sup>6</sup> G05G 5/16

U.S. Cl. 74-531

17 Claims



1. A mechanism for selectively locking, in infinitely adjustable relation to each other, a stationary element and a movable element co-operatively mounted on said stationary element for movement in opposed first and second directions, said movable element having a generally planar engagement surface, said locking mechanism comprising:

- a casing rigidly mounted to said stationary element, said casing including a fixed abutment portion;
- a pawl block mounted within the casing and having a substantially "V"-shaped cavity defined by two ramp surfaces inversely inclined towards an apex of intersection, which inclined ramp surfaces, together with said engagement surface, define a substantially triangular recess, said pawl block being slidably mounted with respect to said casing, so as to be slidably movable in opposite first and second linear directions along a first axis substantially transverse to said engagement surface, thereby to respectively increase and decrease the linear distance between the apex of intersection and said engagement surface;
- a striated roller member operatively mounted on the casing so as to be positioned within said substantially triangular recess for simultaneous circumferential engagement with said generally planar engagement surface and at least one of said inclined ramp surfaces when said pawl block is moved in said first linear direction along said first axis to a locking configuration, and for removal from said simultaneous circumferential engagement when said pawl block is moved in said second linear direction along said first axis to an unlocked configuration; and,
- a wedge block means having a substantially planar pawl-contacting surface and an abutment portion engagement surface, said wedge block means slidably mounted with respect to said casing so as to be movable in opposite third and fourth linear directions along a second axis generally transverse to said first axis, respectively between a blocking position, whereat said wedge block means is wedgingly engaged between a substantially planar wedge-contacting surface located on said pawl block and said abutment portion of said casing so as to thereby urge said pawl block into said locking configuration, and a withdrawn position, whereat said wedge block is removed from said wedging engagement so as to permit movement of said pawl block from said locking configuration to said unlocked configuration, thereby to permit relative movement of said stationary and movable elements; and,
- an actuation means operatively connected to said wedge block means to provide for selective movement of said wedge block means in said third and fourth linear directions.



5,481,942

**CRANKSHAFT OF V-TYPE 6-CYLINDER INTERNAL COMBUSTION ENGINE**

Sungyeon Baek, Suwon, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

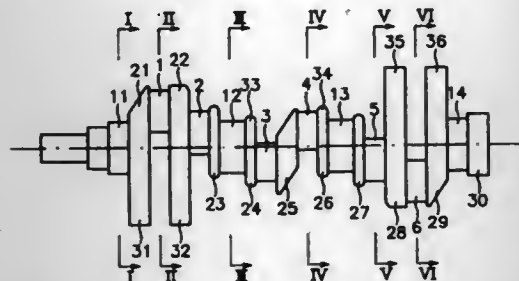
Filed Jun. 30, 1993, Ser. No. 83,569

Claims priority, application Rep. of Korea, Dec. 30, 1991, 91-25216; Dec. 30, 1991, 91-25217

Int. Cl.<sup>6</sup> F02B 75/06; F16C 3/04

U.S. Cl. 74-603

4 Claims



1. A crankshaft of a V-type 6-cylinder internal combustion engine including first to sixth crank pins connected with connecting rods, having first to fourth crank journals between said first to sixth crank pins, and first to ninth crank arms between first to sixth crank pins and the first to fourth crank journals, the combination therewith comprising:

- a first balance weight provided to said first crank arm, a center of gravity of said first balance weight being initially mal-distributed to a lower part of said first crank arm with respect to a center axis of the crankshaft;
- a second balance weight provided to said second crank arm, a center of gravity of said second balance weight being initially mal-distributed to a lower part of said first crank arm, and offset from said first balance weight in a counterclockwise direction, wherein the center of gravity of said second balance weight is formed to be offset by 30 degrees in a counterclockwise direction from said first balance weight;
- third and fourth balance weights provided respectively to said fourth crank arm and sixth crank arm, with centers of gravity of said third and fourth balance weights being initially mal-distributed to be offset from said first balance weight in a clockwise direction;
- a fifth balance weight provided to said eighth crank arm, a center of gravity of said fifth balance weight being initially mal-distributed to be in vertical symmetry with said second balance weight; and
- a sixth balance weight provided to said ninth crank arm, a center of gravity of said sixth balance weight being initially mal-distributed to be in vertical symmetry with said first balance weight, and wherein said fifth crank arm is free of a balance weight.

5,481,943

**SAFETY DEVICE AGAINST RUPTURE OF A ROTARY SHAFT**

Bernard Kraentler, Dunieres, France, assignor to Nergeco (Societe Anonyme), Dunieres, France

Filed Jul. 26, 1993, Ser. No. 96,269

Claims priority, application France, Jul. 29, 1992, 92 09391

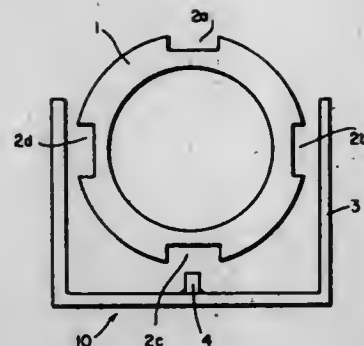
Int. Cl.<sup>6</sup> F16P 7/02; E06B 9/80

U.S. Cl. 74-609

12 Claims

6. A safety element for a roll up door including a shaft suspended above a door way, said safety element comprising:

- first means disposed parallel to the length of the shaft for supporting the shaft in the event of a shaft rupture, which rupture thereby moves a ruptured portion of the shaft into contact with said first means; and



second means for preventing rotation of said ruptured portion of the shaft when the ruptured portion of the shaft moves into contact with said first means.

5,481,944

**INDEXING DEVICE**

Tetsuya Oketani, and Toshio Ito, both of Gifu, Japan, assignors to Howa Machinery, Ltd., Aichi, Japan

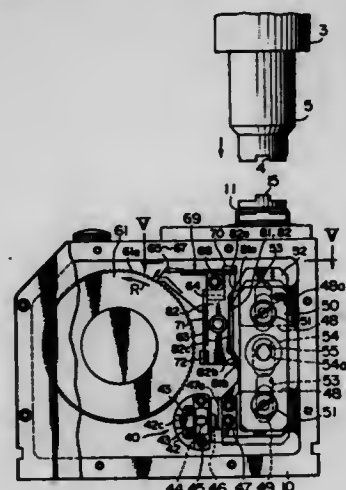
Filed Mar. 24, 1994, Ser. No. 217,250

Claims priority, application Japan, Mar. 29, 1993, 5-095378

Int. Cl.<sup>6</sup> B23Q 16/02

U.S. Cl. 74-816

16 Claims



1. An indexing device comprising:
- a body structure for supporting components of the device;
  - a table shaft rotatably supported on the body structure;
  - an indexing table fixed coaxially to the table shaft;
  - a worm shaft having a worm formed thereon and rotatably supported perpendicularly to the table shaft on the body structure;
  - an indexing gear secured coaxially and unitarily to the indexing table and meshed with said worm;
  - an input shaft supported rotatably and movably in the axial direction thereof in the body structure and coupled via meshed gears to the worm shaft;
  - clutch means for disengageably coupling a drive spindle of a machine tool to the input shaft thereby to transmit rotation of the drive spindle via the input shaft and the worm shaft to drive the indexing table in indexing rotation;
  - correction means operable, prior to positioning of the indexing table, to temporarily stop the rotation of the worm shaft relative to the body structure; and
  - positioning means including rotary motion imparting means for imparting a rotational torque to the indexing table, after the worm shaft has been temporarily stopped, and for causing a gear tooth face of the indexing gear to press against and hold a worm tooth face of the worm.

5,481,945

**LOCK PLATE ADJUSTMENT FOR GENEVA DRIVE MECHANISM**

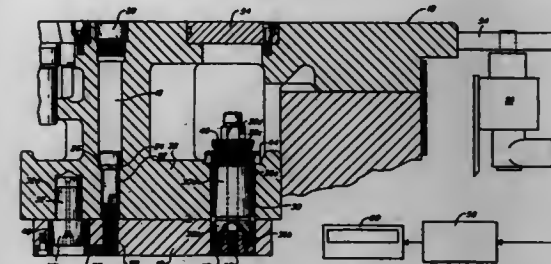
Richard L. Whipple, and Larry W. Forbus, both of Keene, N.H., assignors to Kingsbury Corporation, Keene, N.H.

Filed Nov. 15, 1993, Ser. No. 152,186

Int. Cl.<sup>6</sup> B23Q 16/02

U.S. Cl. 74-820

10 Claims



1. A machine tool having a rotatable table with a lock plate located on the underside thereof at at least one of a plurality of circumferentially spaced stations, and a Geneva drive mechanism arranged to coact with said lock plate in the rotational indexing of said table about a central axis, the improvement comprising:

- a pair of mutually spaced first and second locating pins at the said at least one station, said first and second locating pins being rotatable about axes fixed with respect to said table and being provided respectively with first and second eccentrics, said first and second eccentrics being out of phase with respect to each other and being journaled for rotation in said lock plate;
- adjustment means for rotating said first locating pin and its said first eccentric to shift said lock plate in relation to said table, the shifting of said lock plate being accommodated by a reactionary rotation of said second locating pin and its said second eccentric; and
- securing means for releasably fixing said first and second locating pins against rotation and said lock plate against shifting with respect to said table.

5,481,946

**PLUG-OPENING DEVICE FOR SEALED CONTAINER**

Susumu Nishikawa, Shizuoka, and Mariko Ikuma, Hamamatsu, both of Japan, assignors to System Stack, Co., Ltd., Hamana, Japan

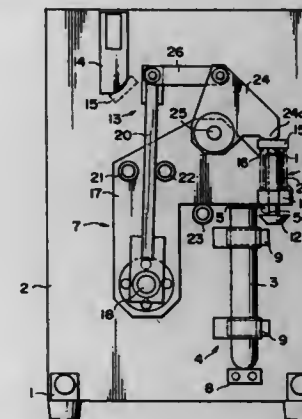
Filed May 12, 1994, Ser. No. 242,086

Claims priority, application Japan, May 14, 1993, 5-136665

Int. Cl.<sup>6</sup> B67B 7/00

U.S. Cl. 81-3.2

9 Claims



1. A plug-opening device for a sealed container having an upwardly facing opening which is sealed with a sealing type plug having a plug-opening tab extending laterally therefrom, comprising:

- a gripping mechanism for gripping upper and lower sides of the tab of the sealed container at a plug-opening position at a first side of the sealed container; and
- a plug-opening mechanism for moving said gripping mechanism from the plug-opening position through a position above said sealed container obliquely across said opening and upwardly to a second side of the sealed container opposite to said first side to a position for placing the tab.

5,481,947

**T LEVER ADAPTER FOR A RATCHET WRENCH**

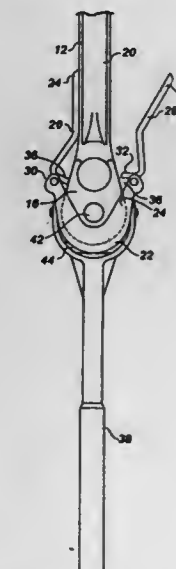
Stoke Banns, 12478 223rd St., Maple Ridge, British Columbia, Canada

Filed Mar. 15, 1995, Ser. No. 404,448

Int. Cl.<sup>6</sup> B25B 23/16

U.S. Cl. 81-177.2

5 Claims



1. A T lever adapter, comprising:
- a. a body having a generally "U" shaped channel, the channel being adapted to receive in mating engagement a head of a ratchet wrench;
  - b. clamping means secured to the body at opposed ends of the channel, whereby the head of the ratchet wrench is clamped in engagement with the channel; the clamping means including levers pivotally mounted to the opposed ends of the channel for movement between engaged and disengaged positions, each of the levers having a handle end and head end, the head end engaging the head of the ratchet wrench to clamp it securely in the channel in the engaged position; and
  - c. a handle extending from the body, the handle being substantially coaxial with a handle of the ratchet wrench when the head of the ratchet wrench is received in the channel, the handle ends of the clamping levers being positioned against the handle of the ratchet wrench when in the engaged position.

5,481,948

**TOOL FOR TIGHTENING FOR SLACKENING A THREADED MEMBER**

Jean-Paul Zerkovitz, Lardy, France, assignor to Facom, Morangis Cedex, France

Filed Apr. 7, 1994, Ser. No. 224,547

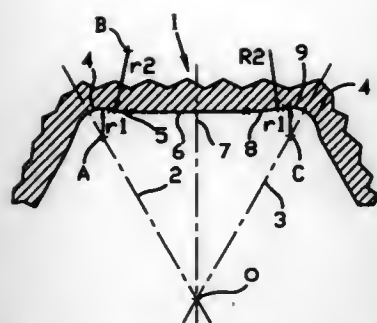
Claims priority, application France, Apr. 7, 1993, 93 04142

Int. Cl.<sup>6</sup> B25B 13/00

U.S. Cl. 81-186

8 Claims

1. A tool for tightening and slackening a driven threaded member possessing a polygonal driven profile, said tool comprising:

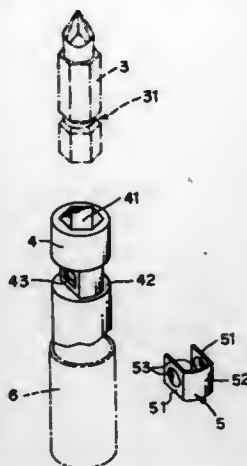


an active head having a cross section of roughly polygonal shape;  
at least two sides of said cross section of said head of said tool being formed by two half-sides; and  
active zones of each of said half-sides being constituted, for both opposite directions of rotation of said tool, by fillets or sharp edges interacting with plane faces of the polygonal profile, and have general shapes which are mutually asymmetrical with respect to an axial mid-plane of said each side, so that, for a given torque applied to said tool, stresses induced in said tool are smaller in a first said direction than in an opposite second said direction, whereas, conversely, stresses induced in the driven member are larger in said first direction than in said second direction, which makes it possible to apply, to the driven member, a greater torque in said first direction than in said second direction before destroying said head of said tool.

**5,481,949**  
**LOCKING MEMBER FOR USE IN HAND TOOLS**  
En-Ji Yen, 18178 E. Wellington, Rowland Hts., Calif. 91748  
Filed Aug. 15, 1994, Ser. No. 288,722  
Int. Cl.<sup>6</sup> B25B 23/00

U.S. Cl. 81—438

5 Claims



1. A locking member for use in hand tools for temporarily locking a detachable rod object inserted into a sleeve, said locking member comprising:

said sleeve having at least one axial hole, and a groove provided in the outer surface of said sleeve, said groove being provided with a pair of holes arranged face-to-face with each other and in a direction perpendicular to the axis of said sleeve, said holes penetrating said groove into said axial hole of said sleeve;

a U-shaped spring plate having a pair of clamp portions arranged face-to-face with each other and a link portion extending from an end of each of the corresponding clamp portions; the inner surface of each of said clamp portions being provided with a protrusion which is smaller than each of said holes in said groove of said sleeve, wherein when said U-shaped spring

plate is inserted into said groove, said protrusions extend through said holes in said groove to project within said sleeve for temporarily clamping a rod object inserted via said axial hole of said sleeve.

**5,481,950**  
**MULTIPURPOSE TOOL FOR USE WITH RAILROAD CARS**

Don R. Browning, Salem, Va., assignor to Norfolk Southern Railway Co., Norfolk, Va.

Filed Apr. 22, 1994, Ser. No. 231,477

Int. Cl.<sup>6</sup> B25B 33/00

U.S. Cl. 81—488

3 Claims



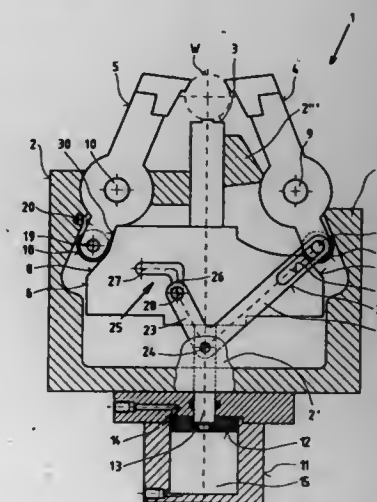
1. A multipurpose tool for use with railroad cars comprising an elongated handle having a longitudinal axis, a rigid head attached to said handle and extending laterally therefrom, said head having an upper and a lower edge and an inner and an outer edge, said inner edge being disposed adjacent said longitudinal axis, said outer edge being spaced laterally away from said longitudinal axis, said head having an elongated slot formed therethrough for receiving the handle of a valve, said slot having a longitudinal axis substantially aligned with the longitudinal axis of said handle, the upper edge of said head including a first generally concave surface portion for receiving a spoke of a brake wheel, and the lower edge of said head including a second generally concave surface portion for receiving a spoke of a brake wheel, said first concave surface portion having opposite ends which have a similar slope approaching ninety degrees with respect to said upper edge where said opposite ends join said upper edge to prevent kick-out of the tool from a brake wheel when pushing on the brake wheel, said second concave surface portion including a first end adjacent said handle having a slope approaching ninety degrees with respect to said lower edge where said first end of said second concave surface portion joins said lower edge, said second concave surface portion including an opposite end adjacent said outer edge having a slope with respect to said lower edge where said opposite end of said second concave surface portion joins said lower edge which is significantly less than that of the first end of said second concave surface portion to facilitate kick-out of the tool from a brake wheel when pulling on the brake wheel, said second concave surface portion sloping to a point where it joins said outer edge so that the point is adapted to cooperate with a knuckle on a railroad car and facilitate opening of the knuckle.

**5,481,951**  
**SELF-CENTERING SUPPORT**  
Jürgen Klefer, Friedrichshafen, Germany, assignor to SMW Schneider & Weisshaupt GmbH, Meckenbeuren, Germany  
Filed Nov. 16, 1993, Ser. No. 153,566  
Claims priority, application Germany, Nov. 16, 1992, 42 38 613.6

Int. Cl.<sup>6</sup> B23B 13/12; 31/00

U.S. Cl. 82—162

16 Claims



1. A self-centering support for clamping and securing a workpiece on a turning lathe, said support comprising:

a housing;  
three securing members connected in said housing and adjustable in a common plane for securing a workpiece, said three securing members each having a first end for securing the workpiece;

a first and a second one of said securing members positioned laterally in said housing and arranged mirror-symmetrically to one another;

said first and said second securing members each comprising a pivot bolt for pivotably connecting said first and said second securing members to said housing;

a third one of said securing members positioned between said first and said second securing members and slidably guided within said housing so as to be radially displaceable relative to a workpiece;

said third securing member comprising a center piece connected thereto, said center piece having control surfaces;

said first and said second securing members each having a second end opposite said first end for cooperating with said control surfaces of said center piece;

a first rocker arm for coupling said first securing member to said third securing member for displacement of said first securing member such that upon actuation of said first rocker arm an insertion opening for the workpiece between said three securing members is enlarged;

said first rocker arm being in the form of an angular lever with a first and a second leg, said first rocker arm being pivotably supported at at least one of said housing and said first securing member;

said center piece having a control curve in the form of a recess and said first rocker arm pivotable by a displacement of said third securing member according to said control curve;

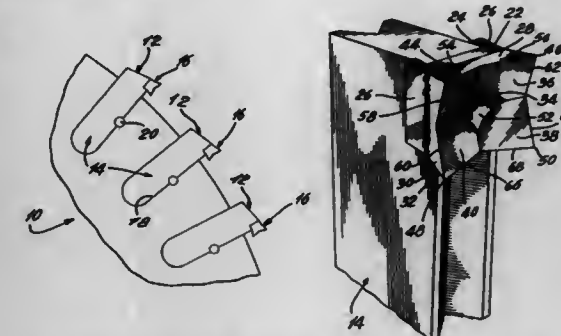
wherein said control curve is located at said third securing member and wherein one of said first and second legs of said first rocker arm coordinated with said control curve has a guide element for engaging said control curve; and

wherein said control curve is comprised of a first portion extending parallel to a direction of displacement of said third securing member and a second portion extending perpendicularly to said direction of displacement of said third securing member.

**5,481,952**  
**SLASHER SAW BLADE ASSEMBLY**  
Charles D. MacLennan, 153 Cote St-Charles, Hudson Heights, Quebec, Canada  
Filed Jan. 27, 1994, Ser. No. 187,080  
Int. Cl.<sup>6</sup> B27B 33/08

U.S. Cl. 83—839

2 Claims



1. A slasher saw blade assembly comprising a rotary saw blade including a circular disc and a plurality of slasher teeth, each tooth comprising a shank mounted to the circular disc and extending radially beyond the periphery of the circular disc, each tooth including a saw tooth head fixed to said shank outside the periphery of said circular disc, each saw tooth head having a width greater than the width of said circular disc and said shank and including a front attack face oriented in a direction of rotation of said circular saw disc, said saw tooth head including a top surface farthest from the circular disc, opposed side surfaces intersecting with said top surface and a bottom surface intersecting with said side surfaces, these surface defining with said front attack face top, side and bottom cutting edges, respectively, on said head; the top, side and bottom surfaces diverging away from one another as they extend forwardly towards said front attack face in the direction of rotation of said circular saw disc; the front attack face being recessed in a rearward direction from said cutting edges and comprising flat quadrant surfaces extending outwardly and forwardly from the center of said front attack face to said cutting edges; the intersection of said top and side cutting edges forming a pair of spaced-apart upper cutting tips, the distance between which being greater than the width of said shank and circular saw disc; the intersection between the side and bottom cutting edges defining a pair of spaced-apart lower cutting tips, the distance between which being greater than the width of said shank and circular saw disc; each of said cutting edges being formed by cutting edge portions; each flat quadrant surface including one of said cutting tips and a pair of said cutting edge portions extending therefrom, one each from adjacent cutting edges; each of said pairs of said cutting edge portions diverging rearwardly from their respective cutting tip to define shallow, V-shaped cutting edges that extend between each of said pair of tips; said cutting edges being coincident with the top, side and bottom surfaces of said saw tooth head whereby both the upper and lower cutting tips and edge therebetween progressively sever wooden fibers during a slashing operation forming a kerf and providing an increased cutting-use span to said slasher saw blade assembly.

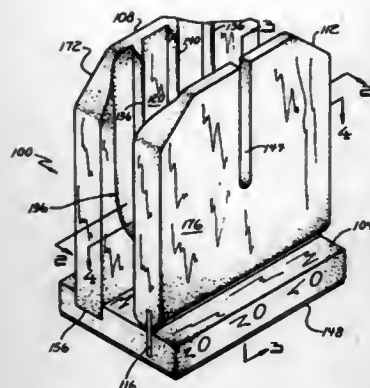
**5,481,953**  
**BAGEL HOLDER**  
John A. McLeod, W. Main St., Wilmington, Vt. 05363  
Filed Jul. 15, 1994, Ser. No. 275,278  
Int. Cl.<sup>6</sup> B26D 3/30

U.S. Cl. 83—762

28 Claims

1. In a food article holding device having a base operable to rest on a surface together with a first upstanding wall attached to the base and a second upstanding wall attached to the base, a cavity being defined between inner surfaces of the first and second walls, the walls comprising means for holding the food article in the cavity,





a string connector for attachment to a guitar string extending through the guitar body through aperture.

5,481,955

## TREMOLO DEVICE

Takao Goto, Gunmaki, Japan, assignor to Gotoh Gut Yugen Kaisha, Gunmaki, Japan

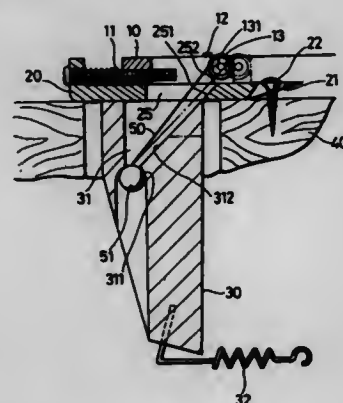
Filed Dec. 6, 1994, Ser. No. 354,077

Claims priority, application Japan, Dec. 30, 1993, 5-355092

Int. Cl.<sup>6</sup> G10D 3/00

U.S. Cl. 84—313

3 Claims



wherein the improvement comprises means for resiliently attaching the second wall to the base wherein the second wall can move relative to the first wall while a bottom portion of the second wall remains attached to the base, wherein the means for resiliently attaching comprises a planar piece of resilient material attached to both the base and the second wall.

5,481,954

## BACK PLATE MOUNTED SHOULDER STRAP CONTROL FOR ELECTRIC TYPE STRINGED INSTRUMENTS

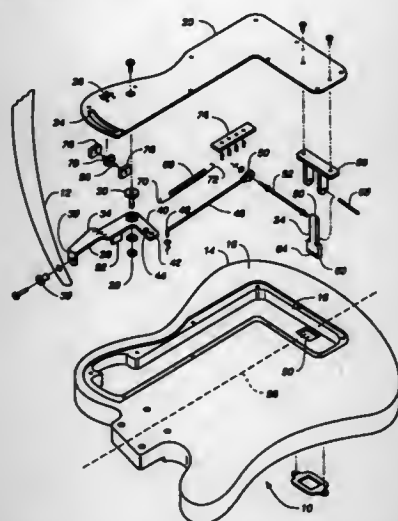
Gene V. Parsons, 44201 Caspar Orchard Rd., Caspar, Calif. 95420

Filed Dec. 6, 1994, Ser. No. 350,729

Int. Cl.<sup>6</sup> G10D 3/00

U.S. Cl. 84—291

3 Claims



1. A back plate mounted shoulder strap control apparatus for an electric guitar having a shoulder strap and a guitar body having a back side bearing a routed cavity and a through aperture, the apparatus comprising:

- a cover plate portion adapted to be secured to said guitar body back side to generally cover said routed cavity, said cover plate including a shoulder strap aperture;
- a strap lever member pivotally mounted to said cover plate portion, said strap lever having a first arm terminating in a first end including fastening means for attachment to said guitar shoulder strap, and a second arm terminating in a second end;
- a connecting rod having a first end connected to said strap lever second arm, and a second end connected to a mandrel linkage;
- a string pulling mandrel member pivotally supported on a mandrel support by a fulcrum pin, said mandrel support connected to said cover plate, said mandrel member having a first end connected to said mandrel linkage, and a second end carrying

1. A tremolo device comprising:  
a base on which are arranged a required number of pedestals respectively provided with string receiving members;  
a block for engaging ends of strings, said block being coupled at A right angle to said base;  
said block being provided with string inserting holes for inserting and engaging ends of the strings;  
said base being provided with through holes which communicate with respective said string inserting holes; and  
said string inserting holes and said through holes being constructed to define string extension passages in which strings are straightly extended to be free between respective string engaging parts of said string inserting holes and respective string receiving surfaces of said string receiving members.

5,481,956

## APPARATUS AND METHOD OF TUNING GUITARS AND THE LIKE

Richard J. LoJacono, Templeton, and James D. Walseth, Whittier, both of Calif., assignors to Francis X. LoJacono, Sr., Laguna Niguel, Calif.

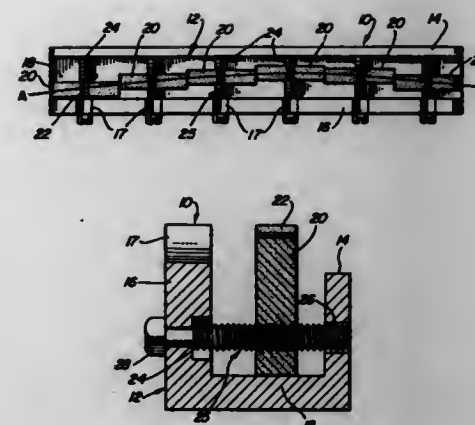
Filed Mar. 7, 1994, Ser. No. 206,395

Int. Cl.<sup>6</sup> G10D 3/06

U.S. Cl. 84—314 N

17 Claims

1. In combination a guitar having a body member and a fretboard on which is mounted a plurality of frets including a first fret and a twelfth fret over which the guitar strings are positioned and fixedly engaged with a bridge means at one end of the fretboard and to a nut means positioned at the opposite end of the fretboard, the improvement which comprises a nut member having a defined sinusoidal configuration whereby all of the guitar strings can be properly tuned to establish pure tuned intervals over the entire length of the fretboard, wherein said nut means comprises:  
a channel member arranged transversely along the length of the fretboard;  
a plurality of saddle nut members mounted in said channel member and arranged to be individually adjusted with respect to the first fret; and  
means operably mounted in said channel member for selectively adjusting each of said saddle nut members so as to selectively adjust the length of each respective guitar string.



5,481,958

## WEAPON WITH A MOBILE BREECH BLOCK

Patrick Balbo, and Jean-Pierre Brange, both of Bourges, France, assignors to Giat Industries, France

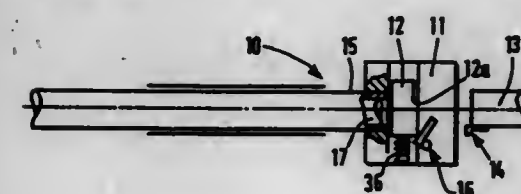
Filed Nov. 30, 1994, Ser. No. 352,100

Claims priority, application France, Dec. 7, 1993, 93 14633

Int. Cl.<sup>6</sup> F41A 9/38

U.S. Cl. 89—45

10 Claims



1. A weapon, comprising:  
a chamber in one end of a barrel, said chamber having an open end;  
a loading tube for loading ammunition into said chamber through said open end;  
a breech block provided at said open end of the chamber, said breech block being movable between open and closed positions, whereby in said open position said breech block permits loading of said chamber;  
a lock for locking said breech block in the open position; and  
a unlocking means for unlocking the breech block when said loading tube is retracted from said chamber, thereby allowing said breech block to move to said closed position, said unlocking means being mounted on said loading tube.

5,481,957

## AIMING AND POINTING SYSTEM FOR GROUND BASED WEAPONS EQUIPMENT

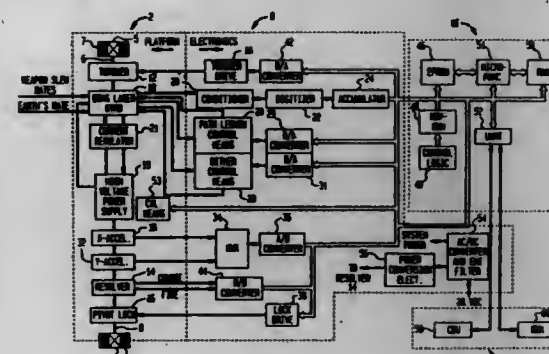
Isadore R. Paley, Rockway; George Galuschak, Hasbrouck Heights; Thomas Beneventano, Washington Township, and Alex R. Strashinsky, Jr., Whippany, all of N.J., assignors to AlliedSignal Inc., Morris Township, N.J.

Filed Jul. 6, 1992, Ser. No. 909,325

Int. Cl.<sup>6</sup> F41G 3/10

U.S. Cl. 89—41.19

8 Claims



1. An aiming and pointing system for ground based weapons equipment, comprising:

north finding means mounted to a rotating part of ground based weapons equipment so as to rotate therewith when said equipment is pointed and including an inertial platform for supporting inertial instrumentation including a single gyroscope having one input axis for sensing earth's rate during north finding and the weapons equipment slew rate after north finding, with said north finding means being effective for continuously sensing the azimuth and elevation angles of the pointed equipment and for providing corresponding signals, and further including control means;  
display and indicating means connected in an output mode to the control means and operator-operated in the output mode for applying signals corresponding to the azimuth and elevation angles of a target and signals corresponding to the slew rate of the equipment to the control means;  
said control means being responsive to the equipment azimuth and elevation signals and the target azimuth and elevation signals for controlling the inertial platform to align the one gyro input axis with the weapons equipment, and providing output signals; and  
the display and indicating means connected in an input mode to the control means and responsive to the output signals provided thereby for displaying at least equipment azimuth, elevation and cant angles in real time, target azimuth and elevation signals in real time, and the differences between said equipment and target angles in real time, and for indicating

5,481,959

## AUTOMATIC AIR BALANCER SYSTEM

Masayuki Watanabe; Nobuhiro Fujiwara; Kunihisa Kaneko, and Kenji Kanazawa, all of Yawara, Japan, assignors to SMC Corporation, Tokyo, Japan

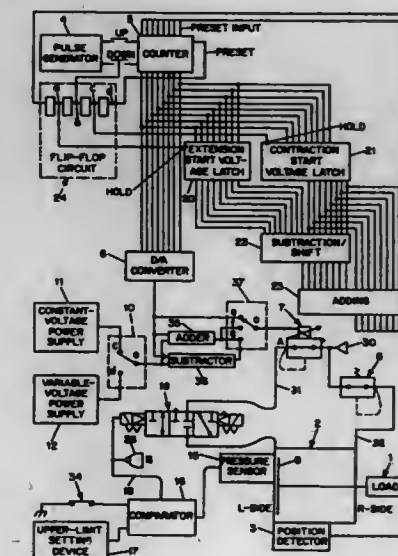
Filed Nov. 30, 1994, Ser. No. 346,675

Claims priority, application Japan, Mar. 28, 1994, 6-079264

Int. Cl.<sup>6</sup> F15B 13/16; 13/044

U.S. Cl. 91—361

5 Claims



1. An automatic air balancer system comprising:

- (a) means for controlling a pressure at one end side of a balance cylinder to a desired level by a first pressure control valve and for controlling a pressure at the other end side of said balance cylinder to a predetermined level by a second pressure control valve;
- (b) means for obtaining a balance pressure signal for said balance cylinder; and
- (c) means for adding or subtracting another signal to or from said balance pressure signal and for inputting the result of the addition or subtraction to said first pressure control valve; wherein said another signal is a signal output from a constant-voltage power supply or a signal output from a variable-voltage power supply.

5,481,960

## INFUSION TUBE FOR WINE BARRELS

Stephen T. Sullivan, P.O. Box 1693, Sausalito, Calif. 94966

Filed Nov. 29, 1994, Ser. No. 346,466

Int. Cl.<sup>6</sup> G12H 1/22

U.S. Cl. 99—277.1

8 Claims



1. An infusion tube for wine barrels having a bung hole, said infusion tube comprising:

- a section of tubing having a central cavity and a plurality of perforations disposed about its surface, and having a first sealed end adapted for releasable securing adjacent said wine barrel bung hole by a bung member carried on a rod, and a second open end adapted for releasable sealing by a stopper member; and
- a quantity of pre-toasted cubes of flavor-imparting material adapted to be placed within said tubing central cavity, wherein said infusion tube can be installed into a wine barrel so that said bung member is captured by and seals said wine barrel bung hole, and at least some portion of said perforated tubing is submerged into the wine in the barrel.

5,481,961

## INSTALLATION FOR PRODUCING WORT

Karl-Dieter A. Wirth, Ichenhausen, Germany, assignor to Anton Steinecker Entwicklungs GmbH &amp; Co., Freising/Attaching, Germany

Filed Jan. 25, 1994, Ser. No. 186,790

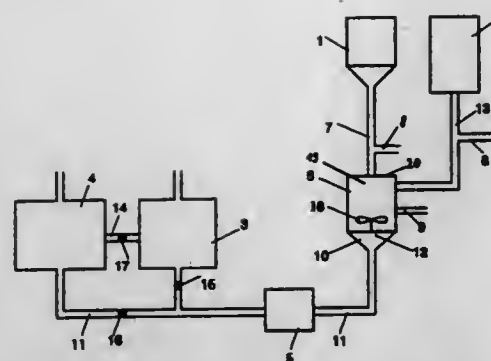
Claims priority, application Germany, Feb. 1, 1993, 43 02 729.6

Int. Cl.<sup>6</sup> C12C 7/14

U.S. Cl. 99—177.2

9 Claims

1. An installation for producing wort comprising:



- a malt adjunct bin (1) and a grist bin (2) connected to a combination bin (5) respectively by a first pipeline (7) and a second pipeline (13);
- a cereal cooker (4) and a mash tun (3) connected to said combination bin (5) by a third pipeline (11);
- said combination bin including washing means for prewashing malt adjunct received from said malt adjunct bin (1) and including mashing means for mashing grist received from said grist bin (2).

5,481,962

## COUNTERTOP PUFFING OVEN FOR PELLETIZED FOODSTUFFS

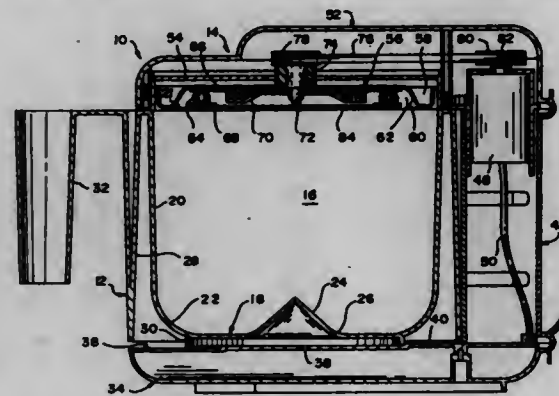
Jon D. Tedesco, 231 Marketplace #246, San Ramon, Calif. 94583

Filed Apr. 22, 1994, Ser. No. 231,158

Int. Cl.<sup>6</sup> A23L 1/18; A47J 27/00; 37/00

U.S. Cl. 99—323.4

18 Claims



1. A countertop puffing oven for expanding food pellets, said oven comprising a container with an internal chamber for receiving pellets, said chamber having an open mouth, a housing removably receiving said container, said housing including means for sealing said open mouth to said housing, heater means for rapidly heating air to a sufficient degree to puff food pellets, said heater means being mounted in said housing in communication with said chamber through said mouth thereof, high speed air flow generating means for discharge of air across said heater means and into said chamber through said mouth at sufficient force to entrain and move pellets with said air flow to enhance heat transfer from the air to the pellets, and flow directing means in said chamber for directing air flow and entrained pellets about the interior of said chamber and generally centrally therein to maximize contact of said air flow with the pellet surfaces, said chamber mouth upwardly opening, said heater means being positioned immediately above and located relative to said mouth as to subject the interior of said chamber, and the pellets therein, to radiant heat, said air flow moving through said heater means and downwardly into said chamber through said mouth, said chamber having a bottom and a peripheral wall, said flow directing means extending upwardly from said chamber bottom along an arcuate path for a directing of said flow

along a generally reversing direction toward said mouth whereby under the continuing action of the flow generating means, a circuitous flow of hot air and pellets is achieved.

5,481,963

## AUTOMATED PANCAKE MAKER

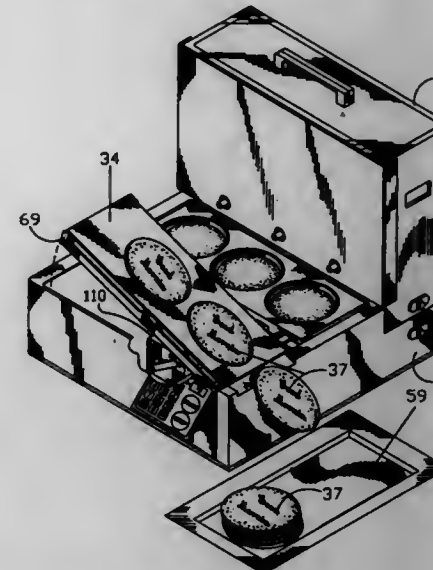
Albert J. Sesona, 7731 Manassas Ct., N., Jacksonville, Fla. 32277, and Ernesto E. Blanco, 36 Sandrick Rd., Belmont, Mass. 02178

Filed Apr. 24, 1995, Ser. No. 426,706

Int. Cl.<sup>6</sup> A47J 37/06; 37/10

U.S. Cl. 99—335

5 Claims



1. An automated pancake maker having a continuous operating cycle comprising a first heated cooking surface including a plurality of heated pancake cooking dishes in an original horizontal position, a second heated cooking surface pivotably attached to said first cooking surface, a hopper for holding liquid pancake batter, means for automatically supplying a selected amount of said batter to each of said pancake dishes at a selected starting time, timed means for pivoting said second cooking surface from its original horizontal position onto the tops of cooking pancakes on said cooking dishes, means to lock said first cooking surface to said second cooking surface with said cooking pancakes between said two surfaces and to pivot said two surfaces reversely until said second cooking surface returns to its original horizontal position; means for unlocking said first cooking surface from said second cooking surface and pivoting said first cooking surface reversely to its original horizontal position and adapted to begin another said cycle; timed means for tilting said second cooking surface into an inclined plane to enhance removal of fully cooked pancakes therefrom, and means to return said second cooking surface to its original horizontal position ready to begin the next said cycle.

5,481,964

## BARBECUE PIT STRUCTURE AND METHOD

Jerry Kitten, Rte. 2, Box 6, Slaton, Tex. 79364-9501

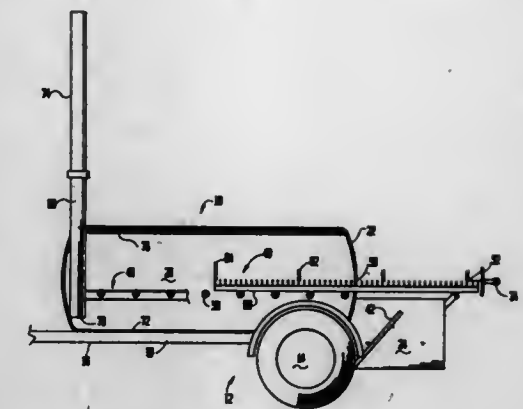
Filed Dec. 12, 1994, Ser. No. 319,878

Int. Cl.<sup>6</sup> A47J 37/04; A23B 4/04

U.S. Cl. 99—339

12 Claims

1. A Bar-B-Que pit having:
- a) a firebox,
- b) an oven having
- c) walls
- d) means for transferring the smoke and heat from the firebox to the oven;



wherein the improved pit comprises:

- e) an oven support on the inside of the oven,
- f) an opening in one of the walls of the oven,
- g) a rack resting upon the support in the oven, and
- h) a door plate on the rack for closing said opening in the wall of the oven,
- i) said oven support being rollers so that the rack rolls on the rollers.

5,481,965

## RACK AND SCREEN ASSEMBLY FOR CONVERTING GAS GRILLES INTO CHARCOAL AND/OR WOOD BURNING GRILLES

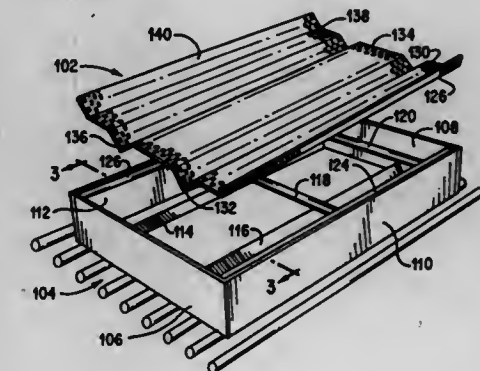
Leonard Kronman, Charlestown, Mass., assignor to Natural Grilling &amp; Fuel Systems, Inc., Charlestown, Mass.

Filed Apr. 21, 1995, Ser. No. 426,736

Int. Cl.<sup>6</sup> A47J 37/00; 37/07

U.S. Cl. 99—340

6 Claims



1. A rack and screen assembly for converting gas grilles into charcoal and/or woodburning stations, said assembly comprising:

- a) a rack including a first end wall, a second end wall, and a first side wall and a second side wall secured thereto to form an open frame,
- b) a first runner leg and a second runner leg secured between said first and second end walls, near the bottom of said frame,
- c) said runner legs adapted to fit on top of cylindrical pipes in a gas grille,
- d) a plurality of braces extending transversely across said open frame to reinforce same,
- e) a first ledge extending longitudinally along the upper end of said first side wall and a second ledge extending longitudinally along the upper end of said second side wall, and
- f) a perforated metal screen with a first side wall and a second side wall situated along opposite, longitudinally extending sides thereof,
- g) said screen being inserted into the upper end of said rack until said side walls on said screen rest upon said first and second ledges within the open frame.

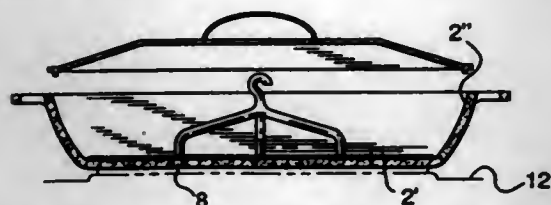


**5,481,966**  
**COOKING APPARATUS, AND METHODS OF**  
**CONSTRUCTING AND UTILIZING SAME**

Tehong C. Mao, 15319 Pleasant Valley, Houston, Tex. 77062  
 Filed Aug. 12, 1994, Ser. No. 289,639  
 Int. Cl.<sup>6</sup> A47J 37/10

U.S. Cl. 99—425

14 Claims



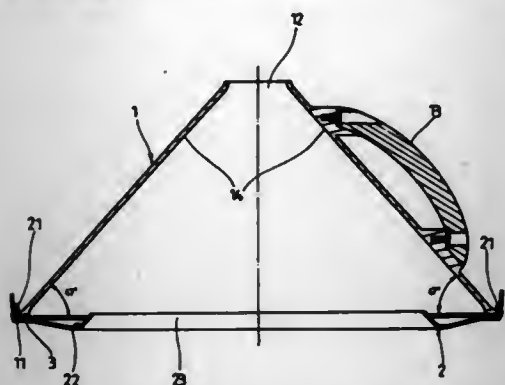
1. A cooking utensil for cooking food together with a cooking vessel having a cooking cavity defined therein, comprising:  
 a food supporting member having an upper surface for supporting food thereon and a bottom surface shaped substantially identically to a lower surface of the cooking cavity of the cooking vessel such that the food supporting member completely covers the lower surface of the cooking cavity in flush contact therewith and an outer peripheral edge of the food supporting member abuts a side wall of the cooking cavity when the food supporting member is placed in the cooking vessel, such that said food supporting member prevents food particles and residue from contacting said lower surface of said cooking cavity during a cooking operation;  
 said food supporting member being a substantially planar, thin metal plate; and  
 handle means connected to the food supporting member for lifting and manipulating the food supporting member.

**5,481,967**  
**VENTED LID FOR BAKING AND FRYING ON FLAT**  
**SURFACES**

Ming-Jing Chen, No. 29, Alley 39, Lane 206, Sec. 2, Tai-Ho Rd.,  
 Ah-Yi Li, Changhua City, Taiwan, Prov. of China  
 Filed Dec. 28, 1994, Ser. No. 364,941  
 Int. Cl.<sup>6</sup> A23N 15/00; A47J 43/00

U.S. Cl. 99—446

2 Claims



1. A vented lid for baking and frying on a flat pan, comprising:  
 a glass lid having a frusto-conical shaped wall defining an interior volume and a circularly shaped flange on a bottom end of said wall, said wall extending from said circularly shaped flange at a predetermined angle to a centrally located ventilation opening formed at a top end of said wall for passage therethrough of heated air from said interior volume; and  
 an oil gathering plate positioned on a flat cooking surface and releasably coupled to said glass lid, said oil gathering plate having an annular rim defining a large centrally located through opening to position food being cooked in open communication with said interior volume, said annular rim having

an undulating cross-sectional contour forming (1) an annular recess in said rim for receiving cooking oil which drips from said glass lid and (2) a slit between said coupled glass lid and said rim for passage of air into said interior volume, said oil gathering plate having three elastic hooks formed in radially spaced relation on a perimeter edge of said rim for releasably engaging said flange of said glass lid to said annular rim.

**5,481,968**  
**APPARATUS FOR CONTINUOUS MULTIPLE STREAM**  
**DENSITY OR RATIO CONTROL**

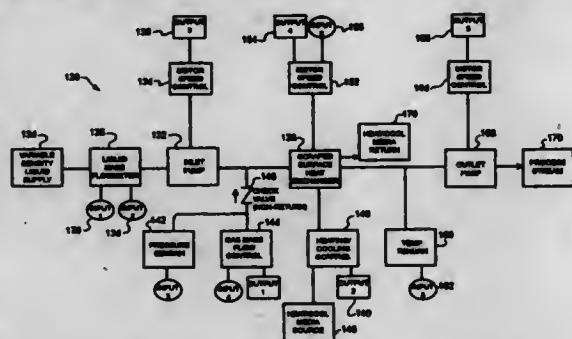
Lyle W. Clem, Algonquin, Ill., assignor to Accurate Metering Systems, Inc., Schaumburg, Ill.

Filed Jun. 30, 1994, Ser. No. 268,634

Int. Cl.<sup>6</sup> A23G 9/00; G05D 11/06

U.S. Cl. 99—452

8 Claims



1. An apparatus for forming a multi-component having predictable density comprising:  
 a) a first fluid stream forming device for forming a first fluid including a first means to adjust a density of a fluid stream;  
 b) the means to adjust including means to determine a viscosity and a density for the fluid stream, means to adjust a viscosity and a density for the fluid stream, means to add a component to the fluid stream to form a mixture and means to determine the viscosity and density of the mixture;  
 c) a second fluid stream forming device for forming a second fluid including a second means to adjust a density of a fluid stream;  
 d) the second means to adjust being similar to the first means to adjust;  
 e) means to integrate the first fluid stream with the second fluid to form a product.

**5,481,969**  
**APPARATUS FOR THE IN-REGISTER POSITIONING OF**  
**A CUTTING PLATE ON A CUTTING CYLINDER,**  
**PREFERABLY IN ROTARY PRINTING MACHINES**

Heinrich Beck, Weisenheim a. Sand, and Heinz Dobrowolski,  
 Rudesheim-Aulhausen, both of, Germany, assignors to MAN  
 Roland Druckmaschinen AG, Germany

Filed Oct. 18, 1994, Ser. No. 324,875

Claims priority, application Germany, Jan. 23, 1993,  
 9316230 U

Int. Cl.<sup>6</sup> B41F 27/00

U.S. Cl. 101—389.1

6 Claims

1. Apparatus for the in-register positioning of a cutting plate on a cutting cylinder, said apparatus comprising a contact plate extending substantially tangentially of the cylinder, said contact plate having a slot extending generally parallel to the axis of the cylinder, said slot being adapted to receive said cutting plate and having means serving as a stop for said cutting plate, a first measuring bar extending substantially parallel to the axis of the cylinder and extending along substantially the entire length of the cylinder, and a second measuring bar extending circumferentially of the cylinder and crossing said first measuring bar.

**5,481,971**  
**DRIVE FOR A PRINTING PRESS WITH A PLURALITY**  
**OF PRINTING UNITS**

Bertold Grützmaier, Schriesheim; Anton Rodi, Leimen, and  
 Bernhard Wagensommer, Wiesloch, all of, Germany, assignors  
 to Heidelberger Druckmaschinen AG, Heidelberg, Germany

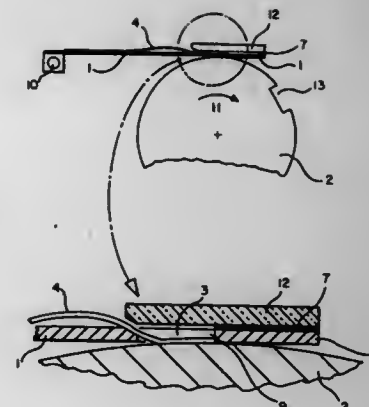
Continuation-in-part of Ser. No. 227,199, Apr. 13, 1994, abandoned,  
 which is a continuation-in-part of Ser. No. 979,069,  
 Nov. 19, 1992, abandoned. This application Nov. 21, 1994,  
 Ser. No. 343,028

Claims priority, application Germany, Nov. 19, 1991, 41 37  
 979.9

Int. Cl.<sup>6</sup> B41F 5/02

U.S. Cl. 101—183

6 Claims



**5,481,970**  
**MACHINE FOR THE OFFSET PRINTING OF FLAT**  
**OBJECTS, IN PARTICULAR FOR COMPACT DISCS**

Fermo Terzi, Fabbri, and Massimo Verona, Reggio Emilia,  
 both of, Italy, assignors to O.M.S.O. S.P.A., Reggio Emilia,  
 Italy

Continuation of Ser. No. 100,032, Jul. 30, 1993, abandoned.

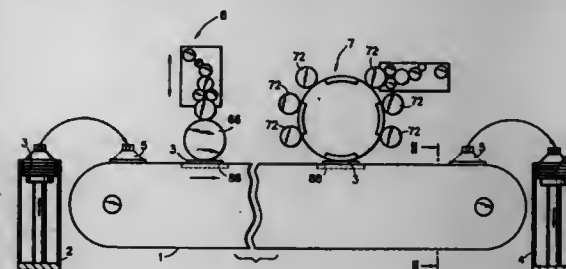
This application Mar. 30, 1994, Ser. No. 220,910

Claims priority, application Italy, Jul. 31, 1992, Re92A0063

Int. Cl.<sup>6</sup> B41L 9/04

U.S. Cl. 101—146

5 Claims



1. A printing machine of offset type for flat objects of the type comprising a flat object carrying conveyor for feeding the objects to be printed to a printing station of offset type having at least one printing cylinder for at least one colour, said cylinder being driven with uniform rotary movement by cylinder drive means, further comprising:

a chain link conveyor having a rectilinear upper portion;  
 means positioned at regular intervals along said chain link conveyor to receive the object to be printed and maintain it in position;  
 means for driving said chain link conveyor with intermittent movement in which halt periods alternate with periods during which the speed increases, then remains constant and then decreases;  
 said printing station comprising a printing cylinder of offset type;  
 means for loading and discharging the objects onto and from the chain link conveyor, and operated in synchronism with its halt periods.

1. In a printing press including a plurality of mutually mechanically decoupled printing-unit groups, each printing-unit group having at least one individual printing unit, a drive for the printing press, comprising:  
 sheet transfer means between said printing-unit groups for transferring sheets between the printing unit groups,  
 a plurality of drive motors, each drive motor being coupled with a respective one of the printing-unit groups,  
 a plurality of angle sensing devices, each angle sensing device being coupled with a respective printing-unit group for sensing at least one of rotational-speed and angle-of-rotation of the respective printing-unit group, and  
 an angle computing device having a plurality of inputs, each input being connected to a respective one of said angle sensing devices for computing an angle-of-rotation deviation between the respective printing-unit groups; a setpoint entry device having an output connected to said angle computing device for entering a given angle-of-rotation setpoint value into said computing device, wherein said computing device includes angle of rotation control means connected to said drive, and angle-of-rotation deviation computing means for computing angle-of-rotation deviations between the respective printing unit groups such that the angle-of-rotation deviation at the point of sheet transfer is at a minimum value.

**5,481,972**  
**DEVICE FOR REMOVING PRINTING-UNIT CYLINDERS**  
**FROM ROTARY PRINTING PRESSES**

Gotthard Schmid, Malsch, Germany, assignor to Heidelberger  
 Druckmaschinen AG, Heidelberg, Germany

Filed Mar. 1, 1995, Ser. No. 396,656

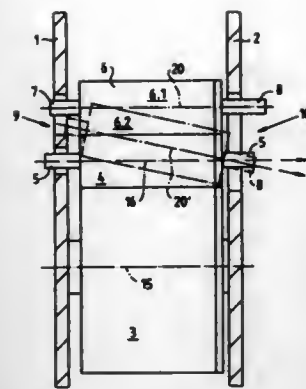
Claims priority, application Germany, Mar. 1, 1994, 44 06  
 573.6

Int. Cl.<sup>6</sup> B41F 5/00

U.S. Cl. 101—216

5 Claims

1. Device for removing printing-unit cylinders from a rotary printing press having a transfer cylinder and a printing-unit cylinder, the rotary printing press having side walls formed with openings through which a bearing location of a printing-unit cylinder is accessible, comprising means defining one part of at least one



opening of one of the side walls disposed concentrically to the axis of the transfer cylinder; said one opening comprising a removal region connected through the intermediary of a cutout to the bearing location of the printing-unit cylinder; the printing-unit cylinder, after removal of the transfer cylinder through said one opening which comprises said removal region, being removable through the same one-opening removal region.

5,481,973

# DEVICE FOR STIFFENING A ROTARY PRINTING PRESS

Gotthard Schmid, Malch, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

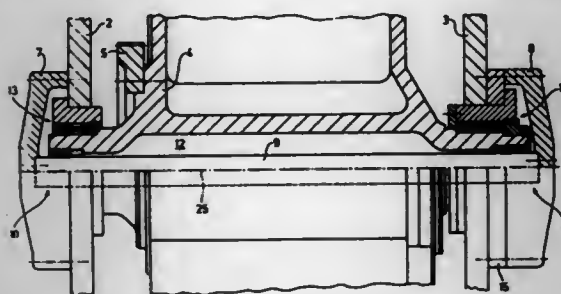
Filed Mar. 1, 1995, Ser. No. 396,659

Claims priority, application Germany, Mar. 1, 1994, 44 06 572.8

Int. Cl.<sup>6</sup> B41F 5/00

U.S. Cl. 101—216

6 Claims



1. Device for stiffening a rotary printing press having at least one stock-conducting printing-unit cylinder cooperating with at least one ink-conducting transfer cylinder disposed in accordance with a satellite formation, the cylinders being journaled in side walls of the rotary printing press, comprising stiffening means passing through a hollow space formed in the printing-unit cylinder and having respective end regions, and adapters secured to the side walls wherein the printing-unit cylinder is journaled, said respective end regions of said stiffening means being connected to said adapters, respectively.

## 5,481,974 INSERT FOR INK FOUNTAINS FOR PRINTING MACHINES

David Sarazen, Stonington, Conn., and Josef Plantsch, Augsburg, Germany, assignors to MAN Roland Druckmaschinen AG, Offenbach A.M., Germany

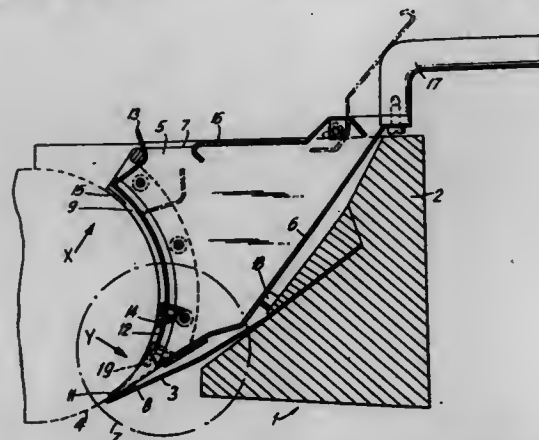
Filed May 11, 1994, Ser. No. 240,907

Claims priority, application Germany, May 11, 1993, 43 15 595.2

Int. Cl.<sup>6</sup> B41F 31/06

U.S. Cl. 101—363

16 Claims



1. An insert for an ink fountain of a printing machine, which ink fountain includes an ink blade, a blade rail and an ink fountain roller, the insert comprising: a base having a lower end; side walls each having a forward end shaped to compliment the ink fountain roller; a resilient strip that extends from the lower end of the base so as to facilitate placement of the insert on the ink blade of the ink fountain, and so that a portion of the strip can deflect; a resilient wedge supported by the side walls at the deflectable portion of the strip; and, a stub mounted on the base, whereby the insert is supportable in a three-point manner by the forward ends of the side walls at the ink fountain roller and by the stub at the blade rail.

5,481,975

## PRINTING CYLINDER MANDREL AND IMAGE CARRIER SLEEVE

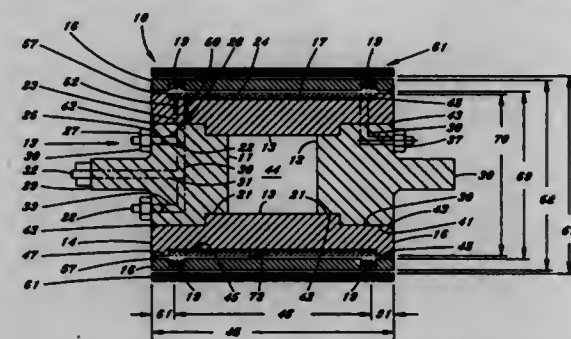
Werner Schulz, 44 Hundred Acres Rd., Newtown, Conn. 06470

Filed Oct. 3, 1994, Ser. No. 317,635

Int. Cl.<sup>6</sup> B41F 12/10

U.S. Cl. 101—375

7 Claims



1. An expandable printing mandrel having particular utility for removably supporting an image printing cylinder, comprising: a first tubular cylinder (13) having axially-spaced end portions each defining a respective cylindrical opening of predetermined dimension; a pair of axially-spaced journal members (11, 12) each having an outer cylindrical portion received within a respective one of said cylindrical openings and affixed to the respective tubular end portion;

a second tubular cylinder (16) having an inner diameter (69) greater than the outer diameter (70) of said first tubular cylinder and being mounted thereon and affixed thereto, said second tubular cylinder having two spaced apart groove means (19) for facilitating a relatively uniform circumferentially expandable portion axially extending (46) between said journal members;

actuatable pressure means (18) having a circumferential pressure chamber (17) axially and substantially co-extending with said expandable portion of said second tubular cylinder, said pressure chamber being generally defined between circumferentially spaced wall portions (45) of said first and second tubular cylinders.

5,481,976

## PRINTING ROLL AND ELASTIC PLATE INSTALLED ON PRINTING ROLL

Yasuhiro Hashimura; Satoshi Noguchi; Kenichi Masaki, and Takahiro Akai, all of Kyoto, Japan, assignors to Nissha Printing Co., Ltd., Kyoto, Japan

PCT No. PCT/JP94/00957, § 371 Date Feb. 15, 1995, § 102(e) Date Feb. 15, 1995, PCT Pub. No. WO94/29109, PCT Pub. Date Dec. 22, 1994

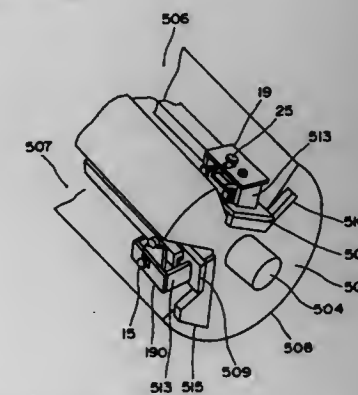
PCT Filed Jun. 14, 1994, Ser. No. 387,716

Claims priority, application Japan, Jun. 16, 1993, 5-171161; Jun. 16, 1993, 5-171162

Int. Cl.<sup>6</sup> B41F 1/28

U.S. Cl. 101—415.1

20 Claims



1. A printing roll comprising: a printing roll barrel; a thin-film forming elastic plate having an elastic portion to which printing ink is applied; a first elastic plate holder, holding the elastic portion at a leading end thereof that is to travel firstly around with the printing roll, and having a first printing roll-chucking hole penetrating therethrough in a thickness direction of the elastic portion; a second elastic plate holder, holding the elastic portion at a trailing end thereof that is to travel lastly around with the printing roll, and having a second printing roll-chucking hole extending therethrough in the thickness direction of the elastic portion, and which thin-film forming elastic plate is to be wound around said printing roll barrel in the order of the first elastic plate holder, the elastic portion, and the second elastic plate holder along a circumferential direction of the printing roll barrel; a first chucking means for detachably securing said first elastic plate holder to the printing roll barrel when the thin-film forming elastic plate is wound on the printing roll barrel, said first chucking means comprising a first placing base provided on a part of the circumferential surface of the printing roll barrel and having a front surface, a rear surface, and a through-hole extending from the rear surface to the front surface; a first chucking member extending through said through-hole in the first placing base and insertable into the first printing roll-chucking hole of the first elastic plate holder; and a first driving means, provided at a rear side of the

first placing base, for driving the first chucking member, when extending into the first printing roll-chucking hole, into engagement with the first elastic plate holder to chuck the first elastic plate holder to the front surface of the first placing base; and

a second chucking means for detachably securing said second elastic plate holder to the printing roll barrel when the thin-film forming elastic plate is wound on the printing roll barrel, said second chucking means comprising a second placing base provided on another part of the circumferential surface of the printing roll barrel and having a front surface, a rear surface, and a through-hole extending from the rear surface to the front surface; a second chucking member extending through said through-hole in the second placing base and insertable into the second printing roll-chucking hole of the second elastic plate holder; and a second driving means, provided at a rear side of the second placing base, for driving the second chucking member, when extending into the second printing roll-chucking hole, into engagement with the second elastic plate holder to chuck the second elastic plate holder to the front surface of the second placing base.

5,481,977

## WORK-CONTROLLED LAUNCHING DEVICE WITH ACCUMULATOR

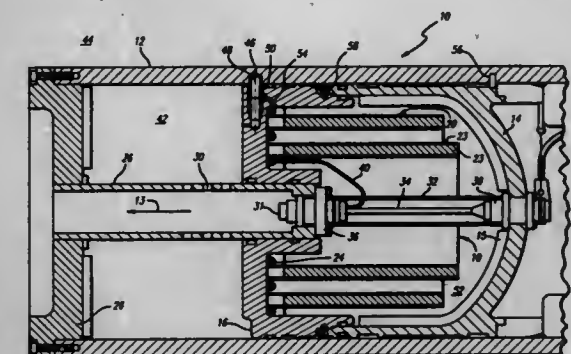
Paul S. Evans, Mesa; Jimmy D. Wiggins, and Howard W. Rippey, both of Chandler, all of Ariz., assignors to AlliedSignal Inc., Morris Township, N.J.

Filed Jul. 30, 1993, Ser. No. 100,580

Int. Cl.<sup>6</sup> F42B 3/00

U.S. Cl. 102—328

8 Claims



1. A launching device, comprising in combination: a launching tube having means for generating gas defining an axial direction thereof the generating means comprises a plurality of concentric cylinders containing a pyrotechnic material; a main piston coaxial with and slidably disposed in the launching tube; a dampening tube coaxial with and disposed in the launching tube; a dampening piston coaxial with and circumferentially surrounding the dampening tube; the dampening piston being slidable on the dampening tube in the axial direction; the dampening tube having an axially extending series of holes formed therethrough, whereby sliding movement of the dampening piston relative to the dampening tube and in the axial direction successively covers the holes.



5,481,978

## CARTRIDGE CASE

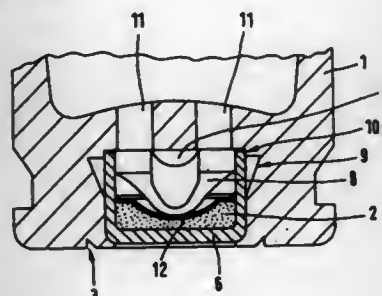
Friedrich Müller, Bechhofen, and Heinz Riess, Fürth, both of, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Nov. 30, 1994, Ser. No. 351,178

Claims priority, application Germany, Dec. 1, 1993, 43 40 998.9; Dec. 1, 1993, 43 41 002.2

Int. Cl.<sup>6</sup> F42B 5/26

U.S. Cl. 102—470



1. A cartridge case for firing in handguns, which comprises a primer receiving pocket formed in a rear portion of the case as a cylindrical recess, at least one flash hole terminating in a top portion of the pocket, a primer cap mounted flush in the primer pocket, said cap comprising a cup-shaped capsule that consists of a capsule bottom and a cylindrical side wall and a primer charge located inside the capsule, and an anvil positioned above the primer charge and contained in the capsule, said primer receiving pocket being provided, in a vicinity of a side wall of the capsule, with an annular circumferential expansion zone, said expansion zone being provided in an area of the rear portion of the case adjoining the top portion of the primer receiving pocket to allow an end portion of the cylindrical side wall to expand into the expansion zone so that the anvil located near the end portion of the cylindrical side wall, following ignition of the primer charge and expansion of the capsule, has room to deflect outwardly thereby avoiding rupture of the capsule bottom during deformation by a firing pin.

5,481,979

## PRACTICE DUMMY FOR AN EXPLOSIVE BODY

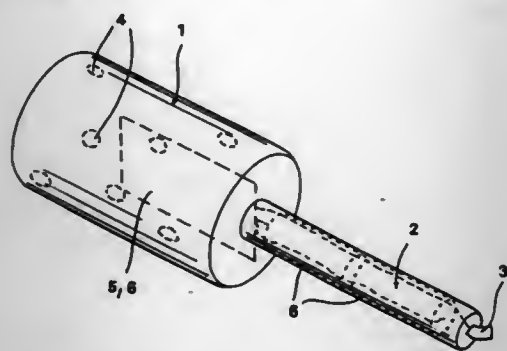
Herbert Walder, Zürich, Switzerland, assignor to I.L.E.E. AG Industrial Laser and Electronic Engineering, Switzerland

Filed Feb. 1, 1994, Ser. No. 189,662

Claims priority, application Switzerland, Feb. 3, 1993, 00317/93

Int. Cl.<sup>6</sup> F42B 8/28

U.S. Cl. 102—498



1. A practice dummy for an explosive body comprising:  
a housing;  
an optical signal emitter means arranged in the housing for generating a light signal for simulating an explosion; and

a modulator for modulating the light signal for transmitting information.

5,481,980

## RELEASABLE SABOT FOR A SUBCALIBER PROJECTILE

Walter Engel, Schwerzenbach; Rudolf Rossmann, Bulach, and Anton Ernst, Regensdorf, all of, Switzerland, assignors to Oerlikon-Contraves Pyrotec AG, Zurich, Switzerland

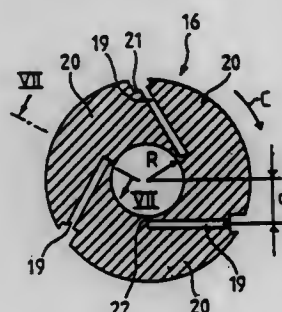
Filed Apr. 18, 1994, Ser. No. 228,905

Claims priority, application Switzerland, May 27, 1993, 01594/93

Int. Cl.<sup>6</sup> F42B 14/06

U.S. Cl. 102—521

13 Claims



1. A jettisonable sabot for a subcaliber projectile that is capable of being fired from a weapon barrel having helical grooves, said sabot comprising:

a sabot body and a coaxial sabot jacket, with said sabot body and said sabot jacket having a central aperture for receiving the subcaliber projectile;  
said sabot body and sabot jacket being divisible into segments, in order to permit a separation of the sabot during the exit of the subcaliber projectile from the muzzle of the weapon barrel; and

wherein one of parting planes and slots, in the form of grooves, having reference fracture locations between the segments of the sabot body, are located parallel to radial planes at a specified distance (d), wherein the distance (d) between one of the parting planes and slots and the corresponding radial planes is greater than a radius (R) of a projectile body.

5,481,981

## SABOT FOR A SUBCALIBER PROJECTILE

Achim Sippel, Rotenburg/Fulda; Thomas Heitmann, Düsseldorf; Wilhelm Becker, Willich; Klaus Unterstein, Düsseldorf; Jürgen Lecker, Neuss, and Walter Simon, Herzogenrath, all of, Germany, assignors to Rheinmetall GmbH, Ratingen, Germany

Filed Sep. 8, 1994, Ser. No. 303,027

Claims priority, application Germany, Sep. 8, 1993, 43 30 417.6

Int. Cl.<sup>6</sup> F42B 14/06

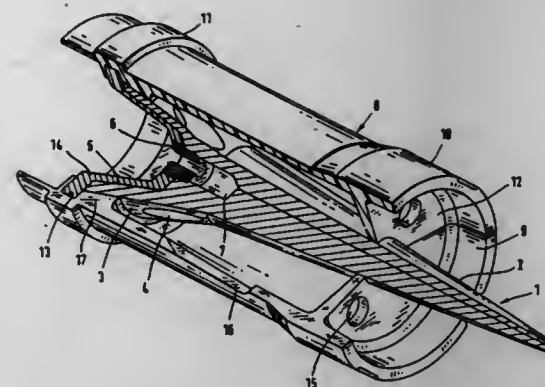
U.S. Cl. 102—522

20 Claims

1. A sabot for a subcaliber projectile comprising:

a guide cage having an essentially cylindrical side wall and which is segmented in its longitudinal axial direction, said side wall having a radially inwardly-extending support wall, for supporting a projectile body, in its forward to central region, and having an annular groove in an inner surface in its tail region, said support wall being provided with axial bores; and

a drive element detachably connected to said guide cage in said tail region for tail-side support of a projectile body, said drive element being a propelling disk that is received by and supported in said annular groove of said guide cage.



5,481,982

## TRACK SURFACING MACHINE AND METHOD FOR CORRECTING THE TRACK GEOMETRY BASED ON TRACK CANT AND MEASURED LINING FORCE

Josef Theurer, Vienna, and Gernot Böck, Aschach/Donau, both of, Austria, assignors to Franz Plasser Bahnbaumaschinen-Industries, m.b.H., Vienna, Austria

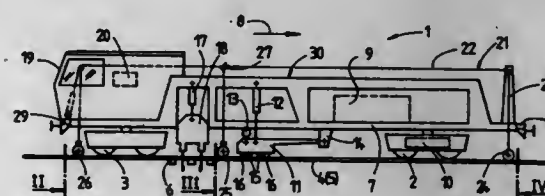
Filed Nov. 7, 1994, Ser. No. 335,322

Claims priority, application Austria, Nov. 5, 1993, 2246/93

Int. Cl.<sup>6</sup> E01B 29/04

U.S. Cl. 104—7.2

7 Claims



1. A track surfacing machine for correcting the track geometry, comprising:

a machine frame supported by undercarriages for mobility in an operating direction on a track;  
a lining drive means supported on said machine frame and exerting lining forces for displacing the track in a direction transversely to the track;  
a measuring means forming with said machine frame a reference system for determining the actual track geometry, with said machine frame forming a reference base, said measuring means including in the operating direction a leading measuring carriage and a trailing measuring carriage, with each measuring carriage having a measuring instrument for determining a cant of the track; and  
a pressure pickup for determining the lining forces of said lining drive means.

5,481,983

MAGNETIC SWEEPER APPARATUS AND METHOD  
Alberto M. Guzman; Hodge E. Jenkins, III, both of Pittsburgh, Pa.; Ronald R. Newman, Arlington, Tex.; Suryanarayan G. Sankar, Upper St. Clair, and John G. Tabacchi, Oakmont, both of Pa., assignors to Burlington Northern Railroad Company, Fort Worth, Tex.

Continuation-in-part of Ser. No. 56,131, Apr. 30, 1993, abandoned. This application Oct. 27, 1994, Ser. No. 330,351

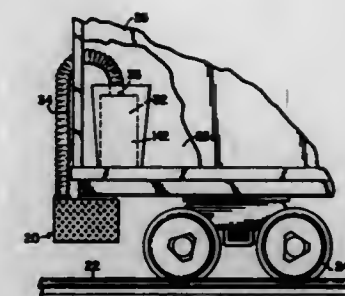
Int. Cl.<sup>6</sup> B61F 19/06

U.S. Cl. 104—279

26 Claims

1. A magnetic particle sweeper apparatus for railroad beds, of the type which collects airborne particles exhibiting ferromagnetic behavior, comprising:

(a) a support frame;



(b) first and second rollers located at opposite ends of said frame;

(c) a continuous driven belt passing over said first and second rollers;

(d) magnetic means operatively connected to said frame and located within said belt, wherein airborne particles are attracted to said magnetic means and are impinged on said belt; and

(e) particle collection means, cooperatively connected to said second end of said frame, for collecting the particles to minimize allowing the impinging particles from becoming airborne, wherein subsequent to the particles being transported along a portion of said belt and away from said magnetic means said collection means transports the particles to a remote location, and wherein said particle collection means includes:

(i) a particle flange which is arranged and configured at said second end of said frame; and

(ii) a vacuum source operatively inserted through said particle flange and which tends to draw the particles from said second end.

5,481,984

## LEG APPARATUS FOR THE MAGNETICALLY LEVITATED VEHICLE

Kazuhiro Oda, Murayama; Hideyuki Takizawa, Kokubunji; Masamichi Yamada, Kobe; Fumio Iwamoto, Takatsuki, and Shoji Iwai, Akashi, all of, Japan, assignors to Railway Technical Research Institute, Tokyo, and Sumitomo Precision Products Co., Ltd., Amagasaki, both of, Japan

Continuation of Ser. No. 3,434, Jan. 12, 1993, abandoned.

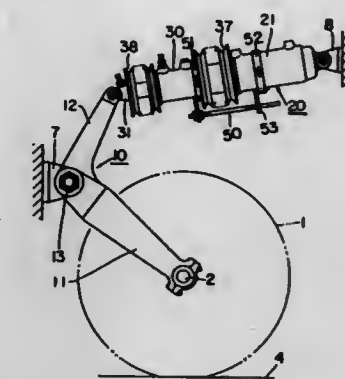
This application Aug. 9, 1994, Ser. No. 287,609

Claims priority, application Japan, Mar. 31, 1991, 4-108954

Int. Cl.<sup>6</sup> B60L 13/06

U.S. Cl. 104—284

6 Claims



1. A leg apparatus for adjustably connecting a wheel to a bracket on a magnetically levitated vehicle, said leg apparatus comprising:  
a generally L-shaped lever that provides a fork arm to which said wheel is axially connected and a lever arm, said lever being

pivotaly connected to said bracket where said fork arm and said lever arm merge, and

an expandable lifting actuator connected between said lever arm of said lever and said vehicle to pivot said lever and said wheel about said bracket and move said wheel from a storage position to a use position, said expandable lifting actuator including a barrel which is connected to said vehicle, a piston cylinder that includes a damper cylinder and a lifting rod which extends into said barrel, a damper rod which is connected to said lever arm and extends into said damper cylinder, and an internal lock mechanism.

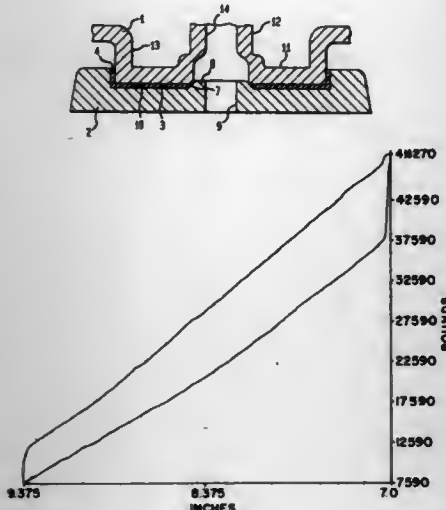
5,481,985

**UNITARY BOWL LINER OF SUBSTANTIALLY RIGID SYNTHETIC RESIN FOR A BOLSTER OF A TRUCK**  
Mark W. Lin, Hillsdale, and John T. Sarnicki, Elgin, both of Ill., assignors to Standard Car Truck Company, Park Ridge, Ill.

Filed Jul. 1, 1994, Ser. No. 269,555  
Int. Cl.<sup>6</sup> B61F 5/00

U.S. Cl. 105—199.4

19 Claims



1. A center plate assembly in combination with a truck bolster of a railroad car, to mount a car body upon said bolster so as to permit relative movement of said car and said track assembly about a vertical axis, comprising, a truck bolster having a central bowl-shaped right-cylindrical recess with a horizontal floor within which recess is swivelably mounted a disc-shaped center plate of said center plate assembly having a shape corresponding to that of said recess, except uniformly diminished, vertically and radially inwards from said recess's surface, by a distance corresponding to the thickness of a unitary liner interposed between said center plate and said floor of said recess, said liner comprising a substantially rigid and essentially non-deformable reaction injection molded polymer matrix having a hardness in the range from 70–90 Shore D, said liner being fully dense and resistant to the presence of a particulate contaminant between surfaces of said liner and said center plate assembly; being stable to thermal and oxidative degradation; having a modulus of elasticity in tension (tension modulus) of at least 689 MPa (100,000 psi); a modulus of elasticity in shear (shear modulus) of at least 350,000 kPa (50,000 psi); said tension modulus and said shear modulus each measured at room temperature 25.5° C. (78° F.); and having essentially no compressive deformation under pressure of 6900 kPa (1000 psi) and a temperature of 38.8° C. (100° F); said liner having an exterior surface adapted to conform to said recess's inner surface before said center plate is thrust into said recess, and said liner having an inner surface adapted to conform to said center plate assembly's exterior surface at room temperature.

5,481,986

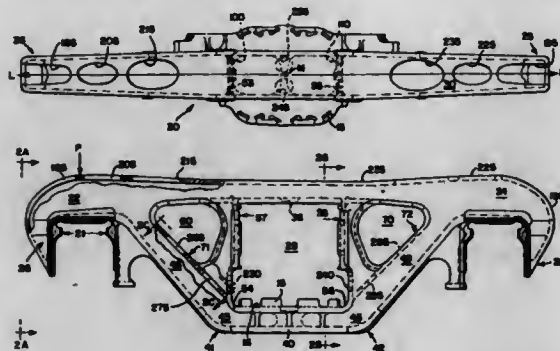
**LIGHTWEIGHT TRUCK SIDEFRAME**

Charles P. Spencer, Staunton, Ill.; Franklin S. McKeown, St. Louis, and Donald J. Lane, Imperial, both of Mo., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Nov. 9, 1994, Ser. No. 336,763  
Int. Cl.<sup>6</sup> B61F 5/52

U.S. Cl. 105—206.1

7 Claims



1. An improved railcar truck sideframe of relatively light weight construction having a longitudinal axis and a longitudinal side-frame midpoint, said sideframe including a longitudinally extending upper compression member having a front end with a downwardly projecting front pedestal jaw depending therefrom and a back end with a downwardly projecting rear pedestal jaw depending therefrom,

a longitudinally extending lower tension member having a central portion disposed generally parallel to said upper compression member and having a first end and a second end, said first end interconnected to an upwardly extending first diagonal arm and defining a first bend point, said second end connected to an upwardly extending second diagonal arm and defining a second bend point, each of said diagonal arms extending upwards to and connecting with a respective upper compression member end at a respective said pedestal jaw,

a first and a second vertical column member respectively disposed fore and aft of said sideframe midpoint and connecting said upper and lower members together, thereby defining a bolster opening and a midsection of said sideframe, each of said vertical columns having a base and a wear plate area, said wear plate area above said base,

said compression member, said tension member, and each of said vertical column members comprised of a respective top wall, a respective bottom wall, and a pair of respective arcuate sidewalls interconnecting said top and bottom walls together to form a respective compression member core, a tension member core, and a pair of vertical column member cores, said lower tension member top wall further including a horizontally disposed spring seat plate, said plate substantially square in configuration and extending longitudinally between said vertical column members,

said upper compression member, said first vertical column member, and said first diagonal arm on said lower tension member defining a front periphery, which said front periphery includes a front lightener opening substantially therebetween, and said upper compression member, said second vertical column member, and said second diagonal arm on said lower tension member defining a rear periphery, which said rear periphery includes a rear lightener opening substantially therebetween, the improvement comprising:

said upper compression member top wall having a pair of longitudinally spaced lightener hole sets formed therein, each of said hole sets generally disposed between a respective said vertical column member and a respective said pedestal jaw, each said hole set extending through said upper compression member top wall and in communication with said upper compression member core, each said hole set comprised of a first lightener hole and a second lightener hole, each said first and second lightener hole laterally centered on said upper compression member top wall, said first lightener holes of

each said hole set substantially equal in cross-sectional area and proximate to a respective vertical column member, said second lightener holes of each said hole set substantially equal in cross-sectional area, said first lightener hole cross-sectional area being about twice the cross-sectional area of said second hole, said upper compression member further including an enlarged pedestal jaw hole at each said sideframe end in close proximity to a respective first lightener hole of said hole set, each said pedestal jaw hole extending through said upper compression member top wall and communicating with said upper compression member core, each respective said enlarged jaw hole extending around a respective said respective pedestal jaw and laterally centered on said upper compression member top wall;

said lower tension member having a substantially solid bottom wall and a top wall with a respective pair of lightener holes in each respective said diagonal arm, each respective said pair of tension member lightener holes comprised of a first lightener hole and a second lightener hole, all said tension member lightener holes substantially equal in cross-sectional area, said first lightener hole on said front diagonal arm generally centered below said front lightener opening, and said second lightener hole on said front diagonal arm generally centered between said first lightener hole and said first bend point, said first lightener hole on said rear diagonal arm generally centered below said rear lightener opening, and said second lightener hole on said rear diagonal arm generally centered between said second lightener hole and said second bend point, each said pair of tension member lightener holes extending through said lower tension member top wall and in communication with said lower tension member core;

said spring seat plate having a pair of spaced lightener openings formed in a top face of said plate such that said spring plate lightener openings are generally centered on said plate and laterally spaced from each other, said spring plate lightener openings extending through said plate and in communication with said lower tension member core;

each of said vertical column member, including a respective set of twin lightener openings generally located in said vertical wear plate area of said column, each said set of twin lightener openings in opposed confronting relationship to each other, each said set of twin lightener openings having substantially similar rectangular shapes defined by a vertical extent and a horizontal extent, said vertical extent of said rectangular shape being greater than said horizontal extent, said twin lightener openings on each said vertical column member extending through said respective column member top wall and in communication with a respective vertical column member core.

5,481,987

**DESK-MOUNTED COMPUTER WORKSTATION MODULES**

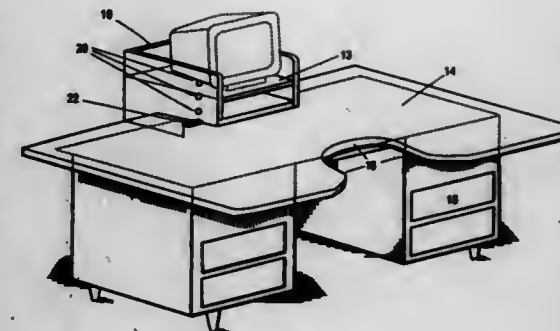
Anthony J. Maitland, 913 Provincetown Dr., Salinas, Calif. 93906

Filed Jun. 24, 1994, Ser. No. 265,312  
Int. Cl.<sup>6</sup> A47B 13/08

U.S. Cl. 108—90

1 Claim

1. A work station for mounting on a desk comprising a support module having a base mounted on a horizontal surface, vertical side walls extending at least upwardly from said base, a shelf mounted between side walls for supporting a computer monitor and an adjustable work surface mounted on said horizontal surface for extending said horizontal surface, said work surface having a cutout on one side extending at least partially around said module side walls such that said module and said work surface fit together, means for adjustable engagement between the work surface and said module side walls such that the angle of the work surface relative to the support surface is variable.



5,481,988

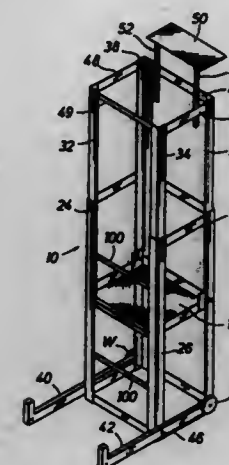
**TELESCOPING WORK PLATFORM**

Daniel B. Deas, 2701 W. Bellfort Ave., #1303, Houston, Tex. 77054

Filed May 4, 1994, Ser. No. 237,763  
Int. Cl.<sup>6</sup> A47B 9/00

U.S. Cl. 108—106

14 Claims



1. A telescoping work platform comprising:

- an outer frame including a base adapted to rest on a support surface and having a plurality of outer vertical support members integrally connected to said base;
- an inner frame defining upper and lower ends and having a work platform at said lower end and having a plurality of inner vertical support members integrally connected to said work platform and extending vertically thereabove, said inner frame adapted to nest telescopically within said outer frame such that each of said outer vertical support members is parallel and proximate with a corresponding one of said inner vertical support members;
- means for releasably locking said inner vertical support members and said outer vertical support members in selectively positioned relation such that said inner vertical support members are secured in a predetermined position in relation to said outer vertical support members thus positioning said work platform at a selected height above said base of said outer frame and thus, the support surface on which said base rests; and
- a plurality of ladder rungs being connected in vertically spaced relation to said outer frame and being selectively pivotal relative to said outer frame to permit user access to said work platform.



5,481,989

**METHOD OF COLLECTING AND CONDITIONING A PETROLEUM COKE FLUID BED COMBUSTION ASH**  
 Joel H. Beeghly, Bessemer, Pa., and John C. Davis, Lake Charles, La., assignors to J. H. Beeghly to Dravo Lime Company, Pittsburgh, Pa.

Filed Aug. 23, 1994, Ser. No. 294,554  
 Int. Cl.<sup>6</sup> F23J 3/00

U.S. Cl. 110—344

14 Claims

1. A method of collecting and conditioning a fluid bed combustion ash formed by the combustion of a sulfur-containing petroleum coke, in the presence of excess limestone over that required to remove sulfur dioxide resulting from said sulfur as anhydrous calcium sulfate, with the production of a resultant lime from said excess limestone, comprising:

- transferring dry combustion ash, containing anhydrous calcium sulfate and said resultant lime, to a pneumatic tanker at a source of production of said ash;
- transferring said pneumatic tanker with said dry ash, containing said anhydrous calcium sulfate and resultant lime, to a remote location having a storage site;
- discharging said dry ash, containing said anhydrous calcium sulfate and resultant lime, from said pneumatic tanker onto said storage site through a mixing pump while adding thereto an amount of water sufficient to hydrate said anhydrous calcium sulfate and said resultant lime and provide between about 7 to 25 percent by weight of excess moisture in said ash.

5,481,990

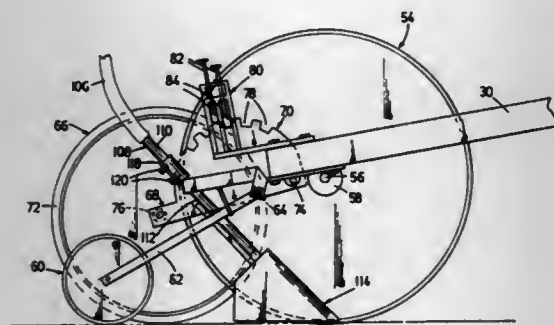
**AIR DRILL APPARATUS**

Victor Zacharias, Altona, Canada, assignor to Tor-Master Mfg. Ltd., Altona Manitoba, Canada

Filed Mar. 10, 1994, Ser. No. 208,150  
 Int. Cl.<sup>6</sup> A01C 5/06

U.S. Cl. 111—174

17 Claims



1. Air drill apparatus for towing behind a tractor and for placing particulate material in the ground, comprising:

- wheeled implement means adapted to be towed behind the tractor, said implement means including at least one transversely extending implement mounting bar;
- at least one air drill assembly mounted to said implement mounting bar; and
- container means for the particulate material to be placed in the ground, said container means including means for creating a positive air pressure to drive particulate material therefrom to said air drill assembly;
- said air drill assembly comprising:
  - an elongated arm pivotally connected to said mounting bar;
  - a single thin, circumferentially sharp disc wheel rotatably mounted to said arm at a slight angle to the vertical and at a slight angle to the direction of travel for cutting a narrow furrow in the ground;
  - seed boot means connected to said container means and mounted to said arm adjacent said disc wheel and the ground for depositing particulate material in said furrow;

seed lock wheel means mounted to said arm adjacent and behind said disc wheel for pushing deposited seed or other particulate material deeper into said furrow; and

a single adjustable depth control wheel for controlling the depth of furrow cut by said disc wheel, said depth control wheel means being rotatably mounted to one end of a journal member the other end of which is rotatably mounted to said arm, said journal member including, extending upwardly therefrom, an arcuate portion having a series of equally spaced apart notches therein, said arm carrying a housing with at least one reciprocable latch member therein, said latch member being engageable with a selected one of said notches to adjust the position of said depth control wheel relative to said disc wheel.

5,481,991

**DEVICE FOR INSERTING ELONGATED ARTIFICIAL GRASS FIBRES INTO THE GROUND**

Jan F. M. Geerts, Leest-Mechelen, Belgium, assignor to Tapijt-fabriek H. Desseaux N.V., Netherlands

PCT No. PCT/NL92/00182, § 371 Date Jun. 30, 1994, § 102(c)  
 Date Jun. 30, 1994, PCT Pub. No. WO93/08332, PCT Pub. Date Apr. 29, 1993

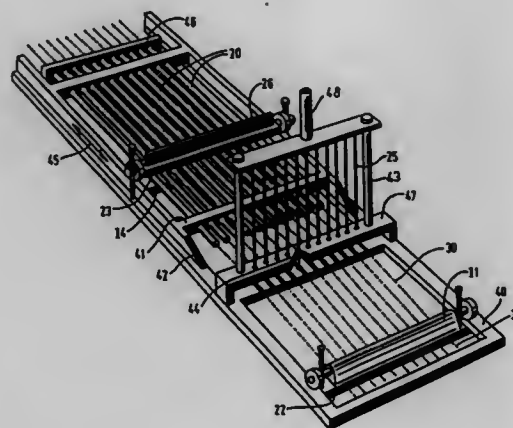
PCT Filed Oct. 9, 1992, Ser. No. 204,307

Claims priority, application Netherlands, Jan. 14, 1991, 240227

Int. Cl.<sup>6</sup> A01C 7/00

U.S. Cl. 111—200

12 Claims



1. A device for inserting elongated artificial grass fibers into the ground, said device comprising a frame which is movable across the ground and which has at least one planting pin mounted thereon so as to be movable up and down in said frame, means for placing an artificial grass fiber to be inserted into the ground under said planting pin in such a manner that the artificial grass fiber can be pressed, at least partially, into the ground by said planting pin, said device further including hold-down means for placing a holding force on the artificial grass fiber to be inserted, said hold-down means being coupled to and being movable up and down with respect to said planting pin and cooperating with a guide plate disposed under said planting pin in said frame so that the artificial grass fiber to be inserted can be clamped between said guide plate and said hold-down means.

5,481,992

**EMBROIDERY SEWING MACHINE**

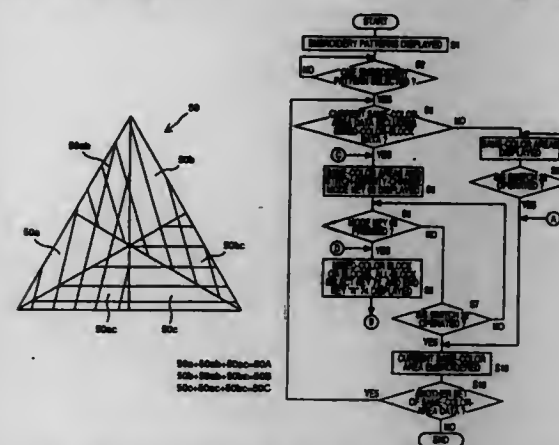
Chiyo Fujimura, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Feb. 22, 1994, Ser. No. 199,750

Claims priority, application Japan, Mar. 1, 1993, 5-039675  
 Int. Cl.<sup>6</sup> D05B 21/00; D05C 9/04

U.S. Cl. 112—102.5

38 Claims



1. An embroidery sewing machine for producing an embroidery pattern in an embroidery area on a work sheet by filling the embroidery area with stitches, comprising:

- a stitch-forming device including at least one sewing needle each of which carries a needle thread and reciprocates in an axial direction thereof, and a needle-thread catcher which cooperates with said at least one sewing needle to form said stitches into said work sheet;
- a displacing device which displaces at least one of said stitch-forming device and said work sheet to form said stitches;
- a data memory in which control data are stored, said control data comprising (a) first sewing data to control said stitch-forming device and said displacing device to form, with a first one of a plurality of color-different needle threads, first stitches at least a portion of which fill a predetermined portion of said embroidery area, and (b) second sewing data to control the stitch-forming device and the displacing device to form, with a second one of said plurality of color-different needle threads, second stitches at least a portion of which fill said predetermined portion of the embroidery area, so that the predetermined portion is seen to have a hue of color different from a hue of color of each of said color-different needle threads; and
- a control device which controls, according to said first and second sewing data, said stitch-forming device and said displacing device so that said predetermined portion of said embroidery area is filled with mixed stitches comprising said portion of said first stitches formed with said first one of said plurality of color-different needle threads and said portion of said second stitches formed with said second one of said plurality of color-different needle threads.

5,481,993

**METHOD AND APPARATUS FOR EMBROIDERING BEADS**

Akira Kurihara, 5718 Ravenspur Dr. #101, Rancho Palos Verdes, Calif. 90274

PCT No. PCT/US91/06792, § 371 Date Nov. 30, 1993, § 102(c)  
 Date Nov. 30, 1993, PCT Pub. No. WO93/00468, PCT Pub. Date Jan. 7, 1993

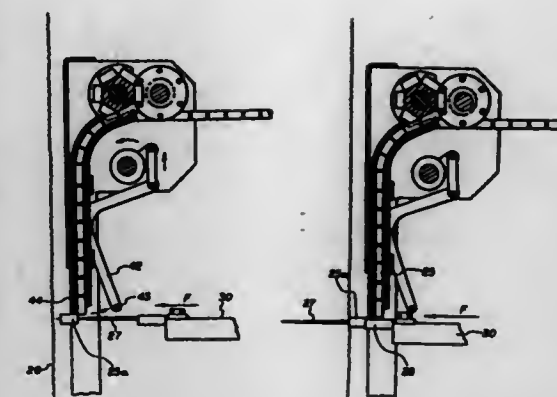
PCT Filed Sep. 18, 1991, Ser. No. 157,008

Claims priority, application Japan, Jun. 24, 1991, 3-152031  
 Int. Cl.<sup>6</sup> D05C 7/08

U.S. Cl. 112—475.01

14 Claims

1. A method for embroidering beads (14) onto a cloth (26) comprising:



providing an embroidering apparatus equipped with at least one thread carrying needle (27) which performs a reciprocating motion relative to the surface of a cloth (26) to attach a thread stitch to said cloth (26);

providing at least one continuous bead string having multiple numbers of tube shaped beads (14, 16) each having an axial tube bore therethrough, said beads (14, 16) of said continuous bead string interconnected via separable connecting sections, said beads (14, 16) being provided sequentially wherein said axial tube bores of said beads (14, 16) are aligned with each other in said at least one continuous bead string;

installing said at least one continuous bead string in said embroidering apparatus in an arrangement conductive to the respective sewing of said beads (14, 16) to the surface of said at least one cloth (26);

repetitively engaging a tip bead (14, 16) of said at least one continuous bead string with said thread carrying needle (27); severing said at least one connecting section (15, 18) between said needle engaged tip bead (14, 16) and said at least one continuous bead string; and

affixing said severed tip bead (14, 16) to said cloth (26).

5,481,994

**THREAD CUTTER FOR A CHAINSTITCH SEWING MACHINE**

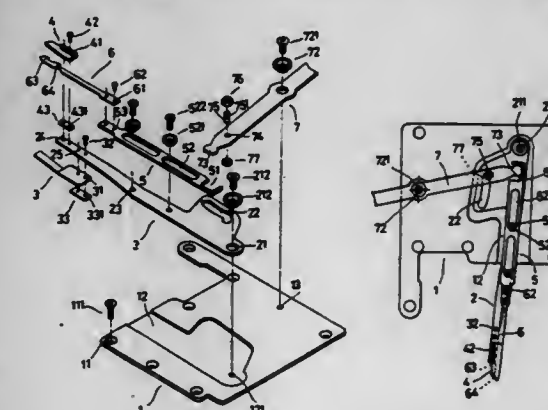
Fei-Lung Ku, No. 10, Alley 6, Lane 148, Kai Yuan Road, Tainan, Taiwan, Prov. of China

Filed Apr. 7, 1995, Ser. No. 418,188

Int. Cl.<sup>6</sup> D05B 65/00

U.S. Cl. 112—298

1 Claim



1. A thread cutter for a chainstitch sewing machine comprising: a base plate nearly shaped square, having a plurality of location holes spaced apart in a peripheral edge for screws to lock said base plate on a table of a sewing machine, and a threaded hole in one side; a cutter arm shaped elongate, having two threaded holes and two holes behind said threaded holes spaced in a front portion;

a pincher being flat and having two-holes in a rear portion for screws to pass through and also through said holes of said cutter arm to engage a threaded hole of a locking member, said pincher thus being fixed on a front end of said cutter arm;

a hook rod arm having two threaded holes in a front portion;

a hook rod shaped elongate end having two holes in a rear end for a screw to pass through to engage said threaded hole of said hook rod arm and to fix said hook rod on said front end of said rod arm, and a front hook and a rear hook behind said front hook in a front end portion of said hook rod;

a swing arm shaped elongate and having a hole in an intermediate portion for a screw and a washer to pass through to engage said threaded hole of said base plate so as to fix said swing arm thereon, a rear end connected with a driving means so that said swing arm can be moved by said driving means to swing with said screw as a fulcrum, moving a front head through an angle; and characterized by:

said base plate having a recess in its upper surface, for said cutter arm to lie therein, a threaded hole in a rear portion of said recess for a screw to engage so as to pivotally fix said cutter arm;

said cutter arm having a hole for a screw and a washer to pass through to engage said threaded hole of said base plate, a guide slot having a slightly curved shape section and a bent rear end section, and two holes in an intermediate portion;

said hook rod arm having a notch in a rear end, two slots provided in line in an intermediate portion, a screw and a washer provided respectively to pass through and engage said threaded hole of said cutter arm so as to fix said hook rod arm on said cutter arm; and,

said swing arm having its front head fitting in said notch of said hook rod arm, a hole behind said front head for a screw to pass through and also through said guide slot of said cutter arm, said screw having a male thread in an upper portion to engage a nut and fitting in a slide ring at its bottom end.

5,481,995

## BAR TACKING STITCH PATTERN

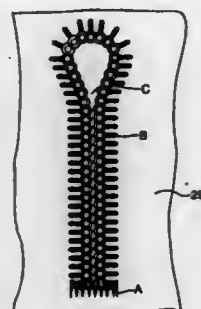
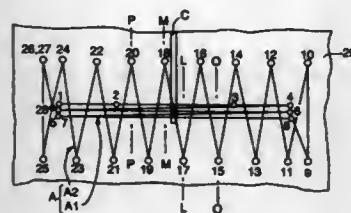
Katsuo Hiratsuka, Haga; Masanori Ayuta, and Koichi Nakayama, both of Tochigi, all of Japan, assignors to The Singer Company N.V., Curacao, Netherlands

Filed Dec. 30, 1993, Ser. No. 175,446

Claims priority, application Japan, Jul. 22, 1993, 5-044366 U

Int. Cl.<sup>6</sup> A41F 1/02; D05B 3/06

U.S. Cl. 112-437



1. In combination:

a buttonhole having an enlarged end, an opposite narrow end and an elongated narrow opening connecting the two ends, the buttonhole having small overedge chain stitches which are

disposed end to end and extend continuously from a starting side of the narrow end along one side of the narrow opening and the enlarged end and along the other side of the narrow opening to the opposite ending side of the narrow end; and

a bar tacking stitch pattern covering the starting and ending sides of the narrow end and extending therebetween, said pattern including lines of lateral stitches which extend at right angles to the direction of the narrow opening and zig-zag stitches which cover the area defined by the lateral stitches and extend from the starting to the ending sides of the narrow end, the lines of lateral stitches extending through the zig-zag stitches.

5,481,996

## SPEED-INCREASED SMALL BOAT

Masakazu Osawa, and Hidemori Osawa, both of 34-14, Kameido 9-chome, Koto-ku, Tokyo-to, Japan

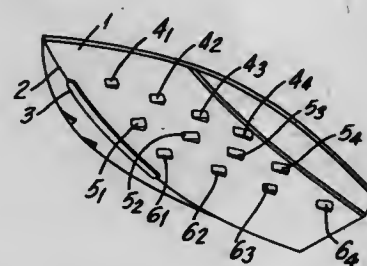
Filed Dec. 3, 1993, Ser. No. 161,750

Claims priority, application Japan, Dec. 4, 1992, 4-350163

Int. Cl.<sup>6</sup> B63B 1/34

U.S. Cl. 114-67 R

4 Claims



1. A high-speed powered boat which is provided on the side surfaces of the boat hull, symmetrically relative to the centerline of the keel on the boat bottom, with a plural number of fins, each being fixed at the front end line thereof to the side surface of the boat hull without leaving a gap opening therebetween and the rear end thereof outwardly extending making an angle with the hull surface, arranged in at least two rows on each of the side surfaces of the boat hull, each of the fins in the uppermost row extending above and below the waterline made when the boat speed is from 0 to intermediate speed and each of the fins in the lowermost row extending above and below the waterline made when the boat is proceeding at the highest speed.

5,481,997

## WATER JET PROPELLED KAYAK

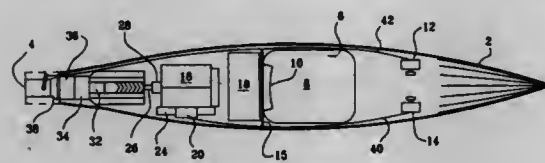
Raymond U. Arndt, P.O. Box 84243, San Diego, Calif. 92138

Filed Apr. 26, 1994, Ser. No. 223,709

Int. Cl.<sup>6</sup> B63B 35/00

U.S. Cl. 114-347

18 Claims



1. A powered kayak comprising:

- (a) a kayak-style hull defining an operator's cockpit and having a stern,
- (b) means, disposed within the hull aft of the cockpit, for accelerating water sternward,
- (c) intake means, communicating with a body of water on which the kayak is located, for providing water to the means for accelerating water,

- (d) means, at the stern of the hull and at least partially below the water level of the body of water, for laterally redirecting the accelerated water over an angular range centered on a long axis of the hull, and
- (f) means, accessible to an operator in the cockpit, for selectively controlling the angular position within said angular range of the means for redirecting the accelerated water.

5,481,998

## RECREATIONAL BOAT CONSTRUCTION

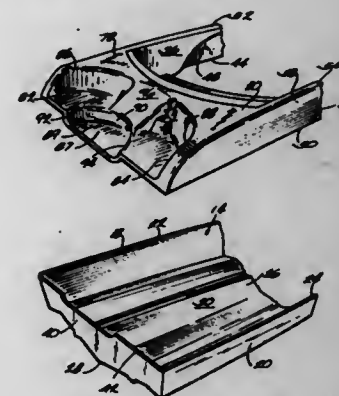
Gary D. Trent, Redmond, Oreg., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed May 19, 1993, Ser. No. 64,194

Int. Cl.<sup>6</sup> B63B 3/00

U.S. Cl. 114-355

20 Claims



1. A fiberglass recreational boat comprising a hull piece having a port side wall having a top edge, a starboard side wall having top edge, a bottom wall having an outer running surface and an inner surface, and a cockpit floor spaced above said bottom wall inner surface and having a top surface, and a deck piece having an outer edge supportingly engaged by said hull piece, port and starboard side wall top edges, a port inner wall joined to said port side wall top edge, a starboard inner wall joined to said starboard side wall top edge, an arcuate seat joined to said port deck inner wall and said starboard deck inner wall, supported above said cockpit floor top surface solely by said engagement of said outer edge of said deck piece with said port and starboard side wall top edges of said hull piece, and including a substantially vertical back wall and a substantially horizontal lower ledge, a port raised horizontal portion behind said seat, a starboard raised horizontal portion behind said seat, an outboard motor well behind said seat, a port aft swim platform aft of said seat and beside said motor well, and a starboard aft swim platform aft of said seat and beside said motor well.

5,481,999

## TRAILER-MOUNTED BOAT COVER

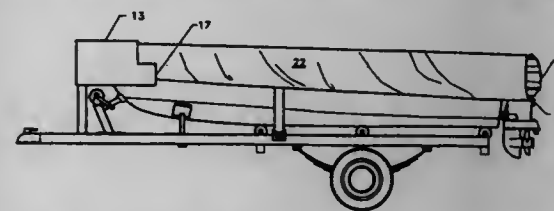
James F. Clark, Rte. 2, Box 19, Amity, Ark. 71921

Filed Jan. 13, 1995, Ser. No. 372,574

Int. Cl.<sup>6</sup> B63B 17/00

U.S. Cl. 114-361

10 Claims



1. A trailer-mounted boat cover comprising:  
a rigid forward shield;

means for supporting a flexible cover attached to said rigid forward shield; and  
a flexible cover attached to said rigid forward shield and extending along and supported by said means for supporting.

5,482,000

## SURFACE MOUNT OVERHEAT INDICATOR WITH PROJECTING FUSIBLE DISK

Michael S. Ward, Liberty, Mo., assignor to Patent Master, Inc., Kansas City, Mo.

Filed Jun. 15, 1994, Ser. No. 259,901

Int. Cl.<sup>6</sup> G01K 1/02; 11/00

U.S. Cl. 116-217

9 Claims



1. An overheat indicator adapted for adhesive mounting on a test surface to indicate an overheat condition of said test surface and comprising:

- (a) an indicator frame;
- (b) a fuse member positioned within said frame such that when said indicator frame is adhesively attached to said test surface, the fuse member directly engages said test surface to enable transfer of heat therefrom, said fuse member being formed of a material which melts at a selected temperature of said test surface in contact therewith; and
- (c) at least one adhesive relief aperture formed in said frame to enable the flow therethrough of an adhesive used to mount said indicator on said test surface to prevent said adhesive from insulating said fuse member from the test surface.

5,482,001

## PROCESS FOR PRODUCING LITHIUM NIOBATE SINGLE CRYSTAL

Tomoko Katoono, Iwaki, and Hideki Tominaga, Kita-Ibaraki, both of Japan, assignors to Nippon Mektron, Ltd., Tokyo, Japan

Filed Oct. 5, 1994, Ser. No. 318,251

Claims priority, application Japan, Feb. 8, 1994, 6-014301

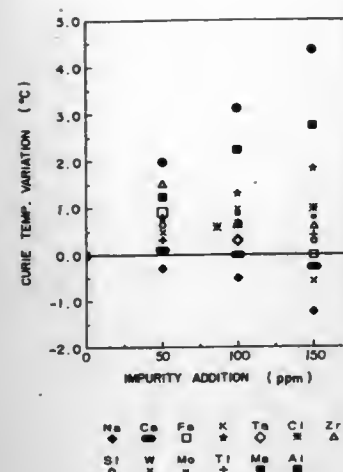
Int. Cl.<sup>6</sup> C30B 15/02

U.S. Cl. 117-4

11 Claims

1. A process for producing a lithium niobate single crystal from lithium carbonate and niobium pentoxide, wherein said crystal has a variation in Curie point due to impurities of  $\pm 0.1^\circ \text{C.}$ , comprising growing a crystal from a melt solution of lithium carbonate and niobium pentoxide, wherein said lithium carbonate has a purity of at least 99.99% wherein said lithium carbonate may comprise Na, K, Mg, and Al impurities, and wherein the content of Na in said lithium carbonate is 5.0 ppm or less, the content of K in said lithium carbonate is 2.0 ppm or less, the content of Mg in said lithium carbonate is 0.5 ppm or less, and the content of Al in said lithium carbonate is 0.9 ppm or less.





5,482,002

# **MICROPROBE, PREPARATION THEREOF AND ELECTRONIC DEVICE BY USE OF SAID MICROPROBE**

Hisaaki Kawade, Atsugi; Haruki Kawada, Yokohama; Kunihiro Sakai; Hiroshi Matsuda, both of Ischarya; Yuko Morikawa, Kawasaki; Yoshihiro Yanagisawa, Atsugi; Tetsuya Kaneko, Yokohama; Toshimitsu Kawase; Hideya Kumomi, both of Atsugi; Hiroyasu Nose, Zama, and Elgo Kawakami, Ebina, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

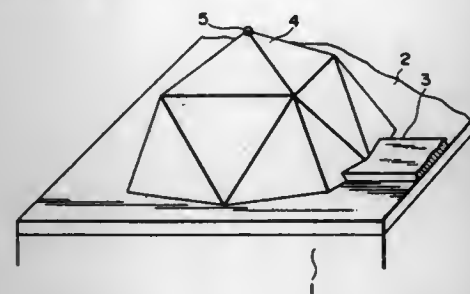
Division of Ser. No. 643,209, Jan. 18, 1991, Pat. No. 5,255,258, which is a division of Ser. No. 610,314, Nov. 9, 1990, Pat. No. 5,072,116, which is a continuation of Ser. No. 249,178, Sep. 26, 1988, abandoned. This application Jul. 8, 1993, Ser. No. 87,537

Claims priority, application Japan, Sep. 24, 1987, 62-237499; Sep. 24, 1987, 62-237500; Dec. 18, 1987, 62-318951; Sep. 6, 1988, 63-221403; Sep. 7, 1988, 63-222232; Sep. 12, 1988, 63-226420

Int. Cl.<sup>6</sup> C30B 25/04

U.S. Cl. 117—90

4 Claims

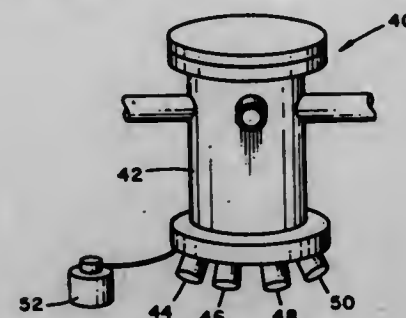


1. A method for preparing a microprobe, comprising the steps of: providing on a part of one main surface of a substrate or on a part of a thin film formed on one main surface of the substrate a different material having a nucleation density sufficiently larger than the nucleation density of said substrate or thin film, and being small to such an extent that only a single nucleus can be grown thereon; and forming a single crystal having an apex portion surrounded by facets by growing a single nucleus on said material.

**5,482,003**  
**PROCESS FOR DEPOSITING EPITAXIAL ALKALINE EARTH OXIDE ONTO A SUBSTRATE AND STRUCTURES PREPARED WITH THE PROCESS**  
Rodney A. McKee, Kingston, and Frederick J. Walker, Oak Ridge, both of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.  
Continuation-in-part of Ser. No. 683,401, Apr. 10, 1991, Pat. No. 5,225,031. This application Jul. 6, 1993, Ser. No. 88,554  
Int. Cl.<sup>6</sup> C30B 25/14

U.S. Cl. 117—108

21 Claims



1. A process for depositing an epitaxial oxide having a sodium chloride-type lattice structure onto a material surface provided by an ordered face-centered-cubic (fcc) lattice structure like that of silicon or an alkaline earth oxide having a sodium chloride-type lattice structure, the process comprising the steps of:

- providing a base having a surface defined by material which is provided by an ordered fcc lattice structure like that of silicon or an alkaline earth oxide having a sodium chloride-type lattice structure;
- positioning the base within an ultra-high vacuum facility;
- selecting at least one metal which, when combined with oxygen to form an alkaline earth oxide, has a lattice parameter which is not identical to but is within about 0.002 nm of that of the lattice structure which provides the material surface; and
- growing with the selected metal and within the facility a film of epitaxial layers of the alkaline earth oxide upon the material surface so that the lattice parameter of the layers of grown oxide is not identical to but is within about 0.002 nm of that of the lattice structure of the material surface to reduce the likelihood of any appreciable lattice strain at the interfaces of the material surface and the epitaxial layers of the alkaline earth oxide built thereon.

5,482,004

# **COLLAPSIBLE TEAT LINER WITH REINFORCED BARREL**

Mofazzal H. Chowdhury, Lenexa, Kans., assignor to Alfa Laval Agri, Inc., Kansas City, Mo.

Filed May 16, 1994, Ser. No. 242,859

Int. Cl.<sup>6</sup> A01J 5/04

U.S. Cl. 119—14.52

16 Claims

1. In an elongated, flexible teat cup liner having an apertured mouthpiece adjacent one end thereof, an elongated, intermediate barrel presenting an elongated, inwardly collapsible, teat-receiving region having an axial length and a maximum internal diameter, and a connecting tube adjacent the other end thereof adapted for connection with a vacuum source, the improvement which comprises means for creating a differential resistance to said inward collapse of said teat-receiving region along the axial length thereof, with a relatively high resistance to inward collapse at a first location adjacent said mouthpiece and a gradual and progressive decrease in said resistance to inward collapse along an axial length of the teat-receiving region from said first location towards said connecting tube, said axial length of said teat-receiving region having said gradual and progressive decrease in said resistance to



inward collapse having a dimension at least about three times greater than said maximum internal diameter of said teat-receiving region.

5,482,005

# **ANIMAL CAGE**

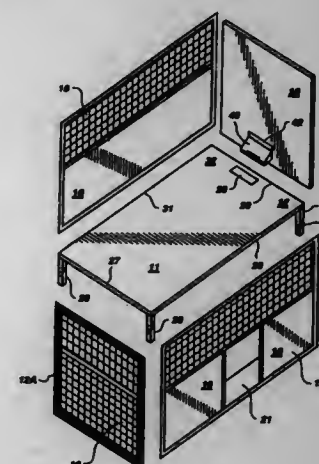
Jerry D. Thom, Sandy, Utah, assignor to T Kennel Systems, Inc., Kansas City, Kans.

Filed Nov. 12, 1993, Ser. No. 157,338

Int. Cl.<sup>6</sup> A01K 31/00

U.S. Cl. 119—17

12 Claims



1. An animal cage comprising:

- an impermeable floor panel having a first end, a second end and two sides, said impermeable floor panel defining an opening thereon disposed proximate said first end, said opening being positioned between said sides wherein a section of section of said impermeable floor panel is positioned between each said side and a perimeter of said opening;
- a plurality of walls associated with said impermeable floor panel disposed to be upstanding therefrom to define an enclosure; and
- a cover mechanically intercooperated with a first said wall, said cover being spacedly positioned above said impermeable floor panel to extend over said opening for restricting access to said opening in said impermeable floor panel to upstanding, spatially restricted access openings defined between said cover and said impermeable floor panel.

5,482,006

# **AUTOMATIC FEEDING DEVICE FOR SUPPLYING DOMESTIC ANIMALS**

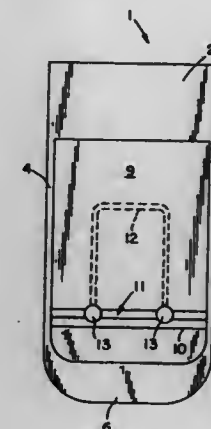
Rainer von Taschitzki, Cologne, Germany, assignor to Aratow-erk Walter von Taschitzki GmbH & Co. KG, Germany  
Filed Jul. 5, 1994, Ser. No. 267,223

Claims priority, application Germany, Jul. 2, 1993, 43 22 004.5

Int. Cl.<sup>6</sup> A01K 5/00

U.S. Cl. 119—54

20 Claims



1. An automatic feeding device for dispensing bulk feed of varying flowability to domestic animals comprising a feed bin located substantially above a feed trough, said feed bin having a lower edge defining an outlet, said feed trough having a feed plate below and spaced from said lower edge and defining with said lower edge a generally horizontal feed dispensing slot, tool means for agitating and loosening feed in said feed bin in response to animal actuation, said tool means including a pair of arms resting upon said feed plate and projecting through said dispensing slot into an area proximate said feed trough, said pair of arms being interconnected by an upstanding member extending away from said feed plate into said feed bin, and said pair of arms and upstanding member being otherwise unconnected to said feed trough.

5,482,007

# **DISPOSABLE PET TOILET ASSEMBLY**

Robert R. Kumlin, 109 Wexford Dr., Cherry Hill, N.J. 08003

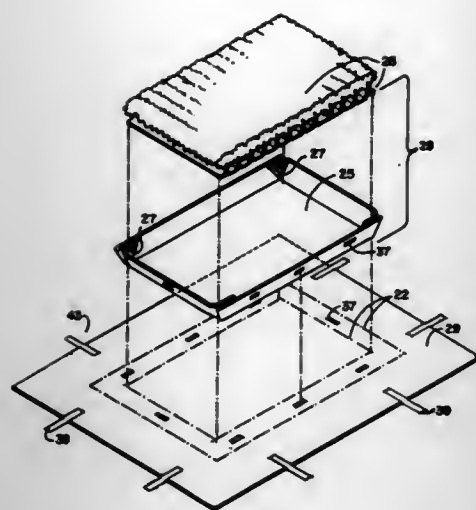
Filed Mar. 31, 1994, Ser. No. 220,829

Int. Cl.<sup>6</sup> A01K 29/00

U.S. Cl. 119—169

22 Claims

1. A pet toilet absorbent pad comprising a plurality of flexible and resilient strips of absorbent material adhered to a base sheet, said strips being secured to said base sheet so that a portion of the strips stand substantially freely upright, said strips being spaced apart so as to touch and develop frictional support for one another along discontinuous portions of adjacent strips.



5,482,008

**ELECTRONIC ANIMAL IDENTIFICATION SYSTEM**

Rodney A. Stafford, Ballyross, Glencree, County Wicklow, Ireland, and Michael M. Kilroy, Castlecor, Oldcastle, County Meath, Ireland

PCT No. PCT/IE92/00009, § 371 Date Jun. 22, 1994, § 102(e) Date Mar. 11, 1994, PCT Pub. No. WO93/05648, PCT Pub. Date Apr. 1, 1993

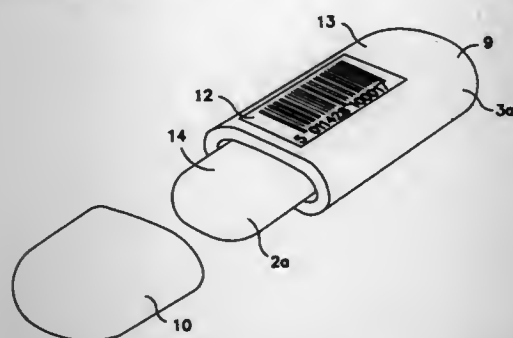
PCT Filed Sep. 11, 1992, Ser. No. 204,378

Claims priority, application Ireland, Sep. 13, 1991, 3238/91; Jan. 6, 1992, 920031; Jan. 28, 1992, 3238/91

Int. Cl.<sup>6</sup> A01K 29/00

U.S. Cl. 119—174

24 Claims



1. A bolus for oral administration to a ruminant animal and for retention in the rumen or reticulum of the animal, the bolus having an electronic identification device housed therein with an identification code encoded in the electronic device, characterized by a permanent visual representation of the said identification code on the bolus.

5,482,009

**COMBUSTION DEVICE IN TUBE NESTED BOILER AND ITS METHOD OF COMBUSTION**

Hiroshi Kobayashi; Yoshiharu Ueda; Masanari Kinoshita; Masamichi Yamamoto, and Atsumi Kaminashi, all of Osaka, Japan, assignors to Hirakawa Guldor Corporation, Osaka, Japan

Filed Feb. 24, 1994, Ser. No. 201,419

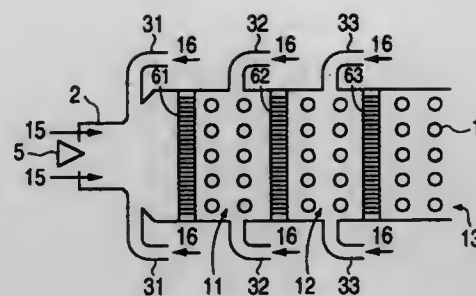
Claims priority, application Japan, Feb. 25, 1993, 5-063522

Int. Cl.<sup>6</sup> F22B 23/06

U.S. Cl. 122—367.1

18 Claims

1. A combustion device comprising:  
a boiler having an upstream end and a downstream end;



a water tube nest mounted in said boiler, said water tube nest comprising a plurality of water tubes separated from one another along a downstream direction;  
a plurality of fuel supply tubes mounted in said boiler and being spaced upstream from an upstream-most one of said water tubes;  
wherein a diameter of each of said fuel supply tubes is substantially equal to a diameter of each of said water tubes; and  
wherein  $L \geq 3D$ , where L is a pitch by which each of said fuel supply tubes is spaced upstream from said upstream-most one of said water tubes and D is said diameter of each of said water tubes.

5,482,010

**COOLING SYSTEM FOR AN INTERNAL-COMBUSTION ENGINE OF A MOTOR VEHICLE WITH A THERMOSTATIC VALVE HAVING AN ELECTRICALLY HEATABLE EXPANSION ELEMENT**

Heinz Lemberger, Unterfoehring; Gerhart Huemer, Neuheferloh, and Peter Leu, Denkendorf, all of, Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, and Behr-Thomson-Dehnstoffregler GmbH & Co., Kornwestheim, both of, Germany

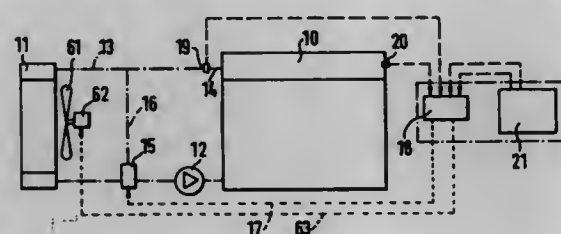
Filed Jul. 19, 1994, Ser. No. 277,033

Claims priority, application Germany, Jul. 19, 1993, 43 24 180.8; Mar. 19, 1994, 44 09 547.3

Int. Cl.<sup>6</sup> F01P 7/14

U.S. Cl. 123—41.1

5 Claims



1. A cooling system for an internal-combustion engine of a motor vehicle comprising:  
a radiator;  
a thermostatic valve coupled between the radiator and the internal-combustion engine and which controls a flow of a coolant between the internal-combustion engine and the radiator such that:  
during a warm-up phase, coolant from the internal-combustion engine flows substantially back to the internal-combustion engine while bypassing the radiator through a short circuit;  
during an operating phase in a mixed operating mode, the coolant from the internal-combustion engine flows partially through the radiator and partially through the short circuit back to the internal-combustion engine; and  
during a further operating phase, in a cooling operating mode, the coolant from the internal-combustion engine flows back to the internal-combustion engine substantially through the radiator;

the thermostatic valve having an expansion element that fixes the working range for the mixed operating mode to a predetermined temperature, the expansion element containing an electrically heatable expansion material which, for enlarging a valve opening cross-section in comparison to a position caused by the temperature of the coolant, is suppliable with electrical energy;

a control, coupled to the expansion element, which receives operating data of the internal-combustion engine and which, as a function of these operating data, controls the supply of electric energy to the expansion element to shift the working range of the thermostatic valve from the mixed operating mode to the cooling operating mode and back, wherein the control has at least three comparison stages which are connected in parallel, each of said comparison stages comparing a respective actual value (VFZG; TL; TS) with a respective predetermined value (VFZG<sub>des</sub>; TL<sub>des</sub>; TS<sub>des</sub>) and, when said respective predetermined value is exceeded, opens up the supply of electric energy to the expansion element, said comparison stages including:

a speed comparison stage which compares actual speed of the motor vehicle (VFZG) with a predetermined speed value (VFZG<sub>des</sub>); a load condition comparison stage which compares an actual load condition (TL) of the internal-combustion engine with a predetermined load condition value (TL<sub>des</sub>), and an intake air temperature comparison stage which compares an actual temperature of air taken in by the internal-combustion engine with a predetermined temperature value (TS<sub>des</sub>).

5,482,012

**VALVE TIMING CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE**

Mamoru Yoshioka, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

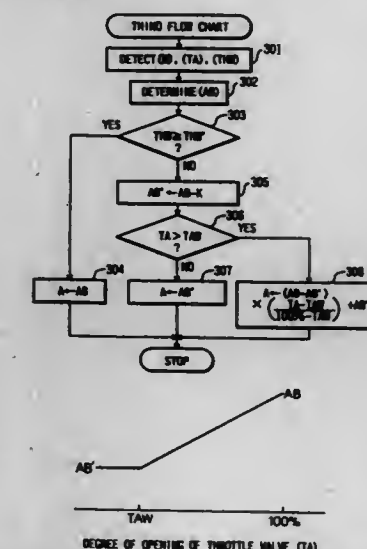
Filed Sep. 27, 1994, Ser. No. 312,586

Claims priority, application Japan, Sep. 28, 1993, 5-241378

Int. Cl.<sup>6</sup> F01L 1/34; 13/00

U.S. Cl. 123—90.15

3 Claims



1. A valve timing control device for an internal combustion engine comprising:

first determination means for determining a first optimal value of a valve overlap period in a current engine operating condition, on the basis of a current engine speed and load;  
second determination means for determining a second optimal value of the valve overlap period in the current engine operating condition by reducing said first optimal value when the engine has not warmed up; and  
valve overlap period control means for controlling a valve overlap period such that it varies gradually from said second optimal value to said first optimal value when a current degree of opening of a throttle valve is larger than a predetermined value, even if the engine has not warmed up.

5,482,013

**AIR INTAKE HEATING AND DIAGNOSTIC SYSTEM FOR INTERNAL COMBUSTION ENGINES**

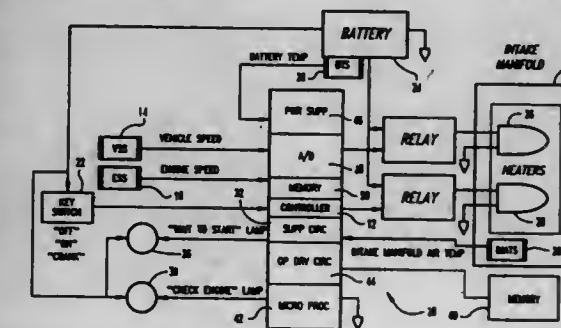
Eric B. Andrews, and Mark R. Stepper, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Sep. 23, 1994, Ser. No. 311,562

Int. Cl.<sup>6</sup> F02P 19/00

U.S. Cl. 123—179.21

64 Claims



1. A diagnostic system for warning a vehicle operator of a fault in an air intake heating system for supplying heated air to an

5,482,011

**FOUR-CYCLE INTERNAL COMBUSTION ENGINE HAVING A ROTATING CYLINDER SLEEVE**

Giorgio E. Falck, Milan, Italy, assignor to F.I.N.G.E.F. S.r.l., Milan, Italy

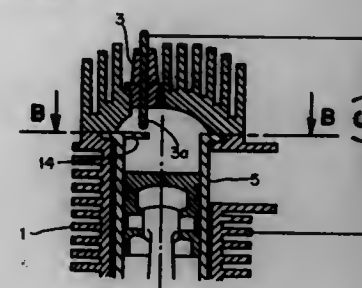
Filed Jun. 29, 1994, Ser. No. 268,171

Claims priority, application Italy, Jul. 19, 1993, MI93A1587

Int. Cl.<sup>6</sup> F01L 7/00

U.S. Cl. 123—80 C

11 Claims



1. A four-cycle internal combustion engine having a crankshaft, a spark plug with a central electrode and a piston cylinder with an internal surface, a radial and an axial direction, an intake opening and an exhaust opening, the engine comprising:

a sleeve rotatably disposed adjacent the internal surface of the cylinder, said sleeve being restricted against movement in the axial direction, said sleeve having a top end and a spaced opposite bottom end;  
a port formed within said sleeve configured and positioned to sequentially coincide with the intake opening and the exhaust opening;  
a conducting element on said top end of said sleeve extending radially inwardly to brush against the central electrode of the spark plug to initiate combustion, wherein said conducting element is positioned to provide proper ignition advance relative to the top dead center position of the piston;  
gear means on said bottom end of said sleeve and on the crankshaft, wherein said gear means rotates said sleeve at one-half the speed of the crankshaft to realize the four cycles of the engine.



internal combustion engine of the vehicle, said air intake heating system having means for sensing intake manifold air temperature and producing a temperature signal corresponding thereto, said engine having switch means for starting and stopping said engine, said switch means being switchable between "off", "on" and "crank" states, said system further having means for prompting said operator to wait for a predetermined time period prior to starting said engine after switching said switch means from said "off" state to said "on" state, said diagnostic system comprising:

means for storing first and second reference temperature signals, and first and second predetermined time periods;

means for warning said vehicle operator of an air intake heating system fault; and

controller means for detecting air intake heating system faults and activating said warning means and said prompting means in response thereto, said controller means receiving said temperature signal and

(a) continuously activating and deactivating said prompting means at a predetermined frequency in response to said temperature signal falling below said first reference temperature signal for at least said first predetermined time period, and

(b) activating said warning means in response to said temperature signal exceeding said second reference temperature signal for at least said second predetermined time period,

when said switch means is switched from said "off" state to said "on" state prior to starting said engine, until said switch means is returned to said "off" state.

5,482,014

#### HIGH OUTPUT AUTOMOTIVE ENGINE GASKET ASSEMBLY AND METHOD OF MAKING SAME

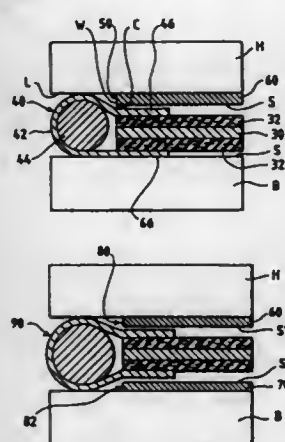
Gerald A. Rosenquist, Lake Zurich, and Arnold B. Fox, Deerfield, both of Ill., assignors to Fel-Pro Incorporated, Skokie, Ill.

Filed Jan. 17, 1995, Ser. No. 373,560

Int. Cl.<sup>6</sup> F16J 15/12

U.S. Cl. 123—193.3

11 Claims



1. A method of sealing a high-performance internal combustion engine having a head and a block, each having a main clamping surface, and an associated head gasket between said main clamping surfaces, the method comprises the steps of:

providing a head gasket comprising a main body having a central core and compressible facing layers laminated to the surfaces of the core, said main body defining a plurality of combustion openings, bolt holes and liquid passageways, and a fire ring for each combustion opening, each of said fire rings comprising a wire ring and an armor ensheathing said wire ring and having legs which grip the edges of the main body adjacent the associated combustion opening;

providing a shim for each combustion opening at one or both of said head and said block, each said shim defining openings complementary to the head gasket combustion openings;

securing each said shim to one of said head and block so that said complementary shim openings are generally concentric with said combustion openings and spaced outwardly from said combustion openings to define grooves communicating with said combustion openings, each said groove having a land area and a generally vertical wall which intersects with a main clamping surface provided by said shim; and positioning said gasket on said block, between said head and block, so that when said head is torqued down, each said fire ring is disposed within a groove and said land area compresses said fire rings to provide primary seals therewith at said land area.

5,482,015

#### DEVICE FOR COUPLING RECIPROCATING AND ROTATING MOTIONS

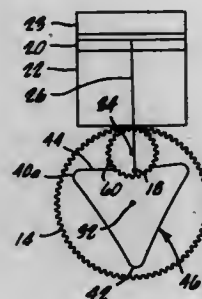
Robert D. Fish, 3000 S. Augusta Ct., La Habra, Calif. 90631

Filed Jul. 11, 1994, Ser. No. 274,395

Int. Cl.<sup>6</sup> F02B 75/32

U.S. Cl. 123—197.4

6 Claims



1. A device comprising:  
a first gear carrying a crank pin;  
a second gear more than twice the size of said first gear and coupled in a planetary relationship with respect to said first gear such that said crank pin travels in one of a substantially triangular, quadrilateral and pentagonal paths.

5,482,016

#### PILOT INJECTION CONTROL SYSTEM

Takashi Ohishi; Hiroshi Ishiwata, and Nobuhiro Kitahara, all of Saitama, Japan, assignors to Zexel Corporation, Japan

Filed Aug. 26, 1994, Ser. No. 296,708

Claims priority, application Japan, Sep. 9, 1993, 5-247277

Int. Cl.<sup>6</sup> F02B 3/00

U.S. Cl. 123—299

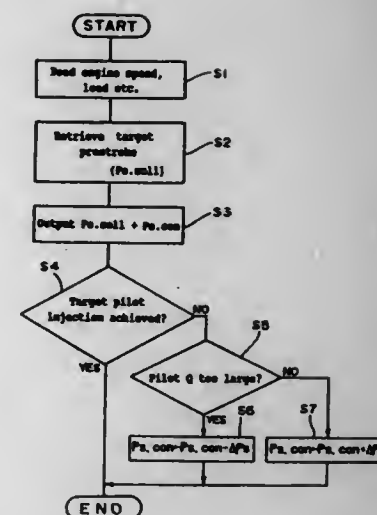
14 Claims

1. A pilot injection control system adapted for use in a fuel injection system which controls a plurality of fuel injection nozzles to conduct pilot injection of fuel into cylinders of an internal combustion engine prior to conducting main injection of fuel into the cylinders, the system comprising:

a plurality of fuel injection nozzles each equipped with a valve having a specific valve-opening pressure, the valve-opening pressure of at least one of the fuel injection nozzles being set slightly higher than the valve-opening pressures of the other fuel injection nozzles and being designated as a reference nozzle,

means for detecting presence/absence of pilot injection or a quantity corresponding to a pilot injection quantity of the at least one reference nozzle as detected pilot injection information, and

means for feedback controlling the pilot injection quantity of the at least one reference nozzle based on the detected pilot injection information.



5,482,017

#### REDUCTION OF COLD-START EMISSIONS AND CATALYST WARM-UP TIME WITH DIRECT FUEL INJECTION

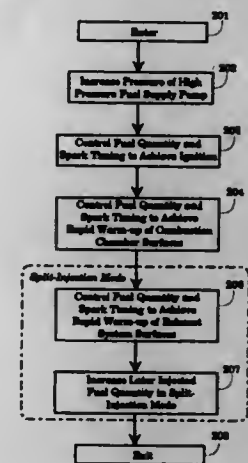
Diana D. Brehob, Dearborn; Richard W. Anderson, Ann Arbor; Jialin Yang, and Robert M. Whiteaker, both of Canton, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 3, 1995, Ser. No. 383,132

Int. Cl.<sup>6</sup> F02B 3/04; F02D 43/00

U.S. Cl. 123—299

13 Claims



1. In a spark ignited internal combustion engine which includes fuel injectors positioned to inject fuel directly into combustion chambers of the engine, a high pressure fuel supply pump for pumping fuel to said fuel injectors, and an engine controller for controlling operation of the engine, a method of reducing hydrocarbon emissions generated by the engine during cold start, the method comprising the steps of:

at engine start, upon initiation of electrical power to said engine, waiting a predetermined period of time to allow said high pressure fuel supply pump to reach a predetermined operating pressure and upon the first engine cycle, controlling the quantity of fuel injected into each cylinder and the ignition timing to achieve combustion in the first engine cycle by injecting a quantity of fuel to compensate for combustion chamber wall wetting effects and to achieve a substantially stoichiometric air/fuel ratio in each combustion chamber, and controlling spark timing according to an empirically determined value which provides the greatest probability for ignition;

for a first predetermined number of subsequent engine cycles, controlling the quantity of fuel injected into each cylinder and

the spark timing to rapidly increase the temperature of surfaces of said combustion chambers by injecting a quantity of fuel into each combustion chamber to achieve an air/fuel ratio substantially equal to or marginally leaner than a stoichiometric air/fuel ratio and advancing spark timing in each cylinder by a predetermined number of degrees of crankshaft rotation from a predetermined optimal ignition timing point; and for a subsequent second predetermined number of engine cycles, controlling the quantity of fuel injected into each cylinder and the spark timing to rapidly increase the temperature of the surfaces of the exhaust system components of the engine, by injecting a first quantity of fuel for each engine cycle during the intake stroke of the engine cycle and injecting a second quantity of fuel later in the same engine cycle during the combustion stroke of the engine cycle, and retarding spark timing from the predetermined optimal ignition timing point.

5,482,018

#### INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

Detlev Potz, Stuttgart; Theodor Duetsch, Bamberg; Guenter Lewentz, Hemmingen, and Uwe Gordon, Markgroeningen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE93/00446, § 371 Date Dec. 12, 1994, § 102(e) Date Dec. 12, 1994, PCT Pub. No. WO93/25813, PCT Pub. Date Dec. 23, 1993

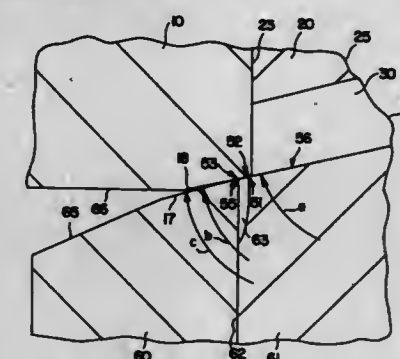
PCT Filed May 21, 1993, Ser. No. 351,393

Claims priority, application Germany, Jun. 10, 1992, 42 18 980.2; Aug. 26, 1992, 42 28 360.4

Int. Cl.<sup>6</sup> F02M 61/08

U.S. Cl. 123—305

16 Claims



1. A fuel injection nozzle for internal combustion engines, having a combustion chamber with direct injection, having a nozzle body (10), in which an axial through bore with a guide part (23) and, on an end toward the combustion chamber, a frustoconical valve seat (18) are formed, the annular edge between the guide parts (23) of the through bore and the valve seat forming a control edge (52), having a spring-loaded outward-opening valve needle (15) that is displaceable with a piston-slidelike guide portion (20) in the guide part (23) of the nozzle body, which needle on an end protruding past the valve seat (18) has a closing head (16) with a valve cone (17), whose seat face axially coincides with the valve seat (18), wherein the cone angle (16) of the seat face of the valve cone (17) differs slightly from that (c) of the valve seat (18) so that an annular sealing seat line (53) is formed, and which piston-slidelike guide portion (20) of the valve needle (15) is covered by the guide part (23) of the nozzle body and has injection ports (30) that can be opened as a function of the needle stroke by the control edge (52) of the nozzle body in the opening stroke, relative to the extension of which ports the inclination of the valve cone (17) is aligned, the control edge (52) at a transition of the valve seat (18) to the cylindrical guide part (23) of the nozzle body (10) is embodied as sharp-edged; that the cone angle (c) of the valve seat (18) on the nozzle body is slightly greater than the cone angle (b) of the valve cone (17) on the valve needle (15); and that the radially inner boundary of the valve face of the valve cone (17) is



embodied as a sharp annular edge (55), whose diameter is slightly greater than the diameter of the control edge (51) of the nozzle body (10), so that an annular sealing seat line (53) is formed immediately next to the control edge (51).

5,482,019

# ENGINE CONTROL SYSTEM WITH MOTORIZED BUTTERFLY BODY

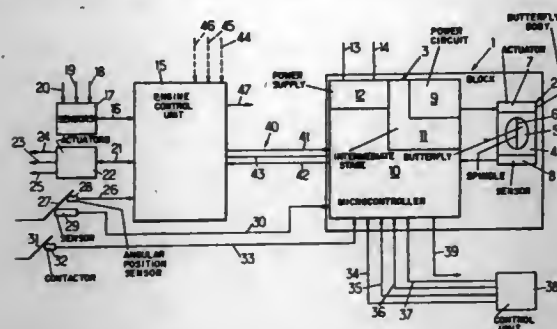
Francesco P. Ausiello, Bologna, Italy; Olivier Queleis, Rueil-Malmaison, and Philippe Wallerand, Sartrouville, both of France, assignors to Solex, France, and Weber SRL, Italy  
PCT No. PCT/FR93/01046, § 371 Date Jun. 28, 1994, § 102(e) Date Jun. 28, 1994, PCT Pub. No. WO94/10434, PCT Pub. Date May 11, 1994

PCT Filed Oct. 26, 1993, Ser. No. 256,191

Claims priority, application France, Jan. 29, 1992, 92 12931  
Int. Cl.<sup>6</sup> F02D 41/00

U.S. Cl. 123—361

21 Claims



1. An engine control system for a spark-ignition internal combustion engine of a vehicle equipped with a fuel injection system, comprising:

an integrated assembly including:

a motorized butterfly unit, having a butterfly body including:

a) a duct and a spindle, b) at least one butterfly rotatably mounted on said spindle in said duct of said body, c) at least one first actuator for actuating said butterfly by controlling rotation of said spindle, and d) at least one first sensor for sensing a butterfly angular position, and wherein said first actuator and said first sensor are incorporated within said butterfly body;

a first electronic calculation and control unit (ECCU) for controlling said butterfly, said first ECCU being directly built into said butterfly body and including: a) at least one power circuit for operating said first actuator and directly connected to said first actuator, b) at least one control circuit for automatically controlling said butterfly angular position, said control circuit directly connected to said first sensor; said control circuit receiving a butterfly angular position signal from said first sensor, comparing said butterfly angular position signal with at least one butterfly angular position reference signal corresponding to a desired angular position of said butterfly, and formulating, on the basis of an error signal resulting from the comparison, control signals for regulating said butterfly angular position, which control signals are transmitted to said power circuit;

an interface stage between said power circuit and said control circuit, said interface stage providing for shaping of said control signals; and

an electric power supply unit for powering at least said power circuit, said control circuit, and said first sensor;

second sensors for sensing operating parameters of said engine including engine rotational speed, engine shaft position, engine cooling water temperature, and at least one parameter chosen from a group comprising intake manifold air pressure and intake manifold air flowrate;

second actuators for actuating fuel injection and ignition circuits of the engine;

a second ECCU, connected to said second sensors and to said second actuators, for controlling said engine by transmitting, via said second actuators, on the basis of signals received from said second sensors, orders for controlling fuel injection and ignition to injector windings, to a fuel pump, and to ignition coils of said vehicle, said second ECCU further formulating said butterfly angular position reference signal, as well as a reconstructed butterfly angular position signal, said reconstructed butterfly angular position signal being formulated on the basis of an engine rotational speed signal and of a signal chosen from the group comprising intake manifold air pressure and intake manifold air flowrate, received from said second sensors;

a third sensor, directly connected to said second ECCU, for sensing the angular position of an accelerator pedal of the vehicle and transmitting an accelerator pedal angular position signal to said second ECCU, said second ECCU formulating said butterfly angular position reference signal based on said accelerator pedal angular position signal;

a fourth sensor, for sensing actuation of said accelerator pedal, being one of a contactor sensitive to the actuation of said accelerator pedal or an additional sensor for sensing the angular position of said accelerator pedal, said fourth sensor being directly connected to said first ECCU so as to dissociate the signals coming from said accelerator pedal toward said first ECCU via said fourth sensor, and toward said second ECCU via said third sensor;

a fifth sensor for sensing actuation of a brake pedal of the vehicle being directly connected to said first ECCU; and

a communication line interconnecting said first and second ECCUs, said first and second ECCUs exchanging information via said communication line, said information including signals from said first, fourth and fifth sensors transmitted from said first to said second ECCU as well as said butterfly angular position reference signal and said reconstructed butterfly angular position signal transmitted from said second to said first ECCU.

5,482,020

# CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

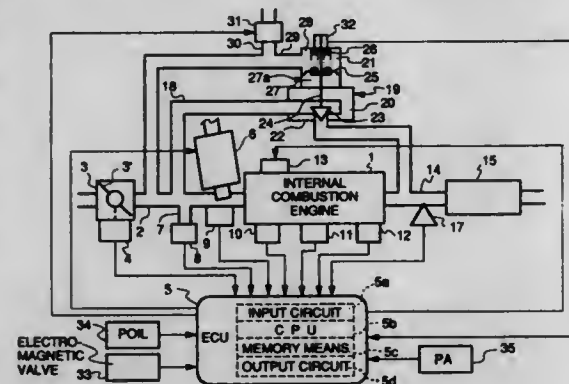
Daisuke Shimizu; Kotaro Miyashita; Yoshihisa Hara, and Yamamoto Yoshio, all of Wako, Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Oct. 12, 1994, Ser. No. 322,086

Claims priority, application Japan, Jan. 19, 1993, 5-284369  
Int. Cl.<sup>6</sup> F02P 5/15; F02D 41/04; F02M 25/07

U.S. Cl. 123—417

8 Claims



1. In a control system for an internal combustion engine having an intake system, and an exhaust system, including an exhaust gas recirculation passage extending between said intake system and said exhaust system, for recirculating part of exhaust gases emitted from said engine, an exhaust gas recirculation control valve for controlling a flow rate of exhaust gases to be recirculated through said exhaust gas recirculation passage, exhaust gas concentration-

detecting means for detecting concentration of oxygen present in said exhaust gases, engine operating condition-detecting means for detecting operating conditions of said engine, and ignition timing advance value-calculating means for calculating an ignition timing advance value, based on operating conditions of said engine detected by said engine operating condition-detecting means, the improvement comprising:

dynamic characteristic-determining means for determining dynamic characteristics of said exhaust gases to be recirculated, based on operating conditions of said engine detected by said engine operating condition-detecting means;

virtual operation amount-calculating means for calculating a virtual operation amount of said exhaust gas recirculation control valve, based on the dynamic characteristics determined by said dynamic characteristic-determining means;

exhaust gas recirculation rate-calculating means for calculating a recirculation rate of said exhaust gases, based on the virtual operation amount calculated by said virtual operation amount-calculating means, and operating conditions of said engine detected by said engine operating condition-detecting means;

inert gas recirculation rate-calculating means for calculating a recirculation rate of inert gases present in exhaust gases to be recirculated, based on the exhaust gas recirculation rate calculated by said exhaust gas recirculation rate-calculating means, and the concentration of oxygen present in said exhaust gases detected by said exhaust gas concentration-detecting means; and

advance correction value-calculating means for calculating an ignition timing advance correction, based on operating conditions of said engine detected by said engine operating condition-detecting means and the inert gas recirculation rate calculated by said inert gas recirculation rate-calculating means; and

ignition timing advance value-correcting means for correcting said ignition timing advance value, based on the ignition timing advance correction value calculated by said advance correction value-calculating means.

5,482,021

# AIR/FUEL HANDLING SYSTEM FOR FUEL INJECTION ENGINE

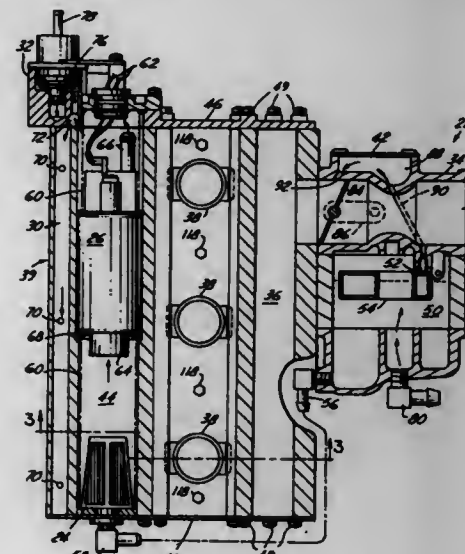
Ronald H. Roche, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Filed Nov. 11, 1993, Ser. No. 150,474

Int. Cl.<sup>6</sup> F02M 37/04

U.S. Cl. 123—456

23 Claims



1. An air/fuel handling system for a fuel injection engine comprising:

a body having a fuel chamber, a fuel rail passage having at least one outlet to supply fuel to at least one fuel injector, and an air chamber having an inlet and at least one outlet to supply air to the engine,

a fuel pump disposed in said fuel chamber and having a low pressure inlet and a high pressure outlet in fluid communication with the fuel rail passage,

a housing connected to said body,

a low pressure fuel metering chamber in said housing in communication with said low pressure inlet of said fuel pump, and having a metering valve to control fuel flow from a remote supply to said metering chamber,

an air flow passage in said housing communicating with the inlet of said air chamber and having a throttle valve therein to control air flow to said air chamber, and

a vapor separator carried by said housing in communication with said fuel metering chamber and the inlet of said air chamber to allow fuel vapor to flow into said air chamber.

5,482,022

# FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

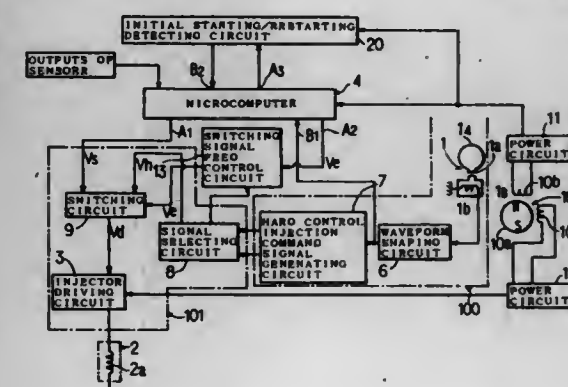
Narutoshi Aoki, Mishima; Tsuneaki Endou, and Mitsugi Koike, both of Numazu, all of Japan, assignors to Kokusan Denki Co., Ltd., Shizuoka, Japan

Filed Jun. 21, 1994, Ser. No. 263,080

Int. Cl.<sup>6</sup> F02D 41/06

U.S. Cl. 123—479

11 Claims



1. A fuel injection system for an internal combustion engine, comprising:

a generator driven by the internal combustion engine;

a fuel injector for ejecting fuel when it is fed with a driving current while using said generator as a power supply therefor; an initial starting/restarting detecting circuit including a charge storage element charged by means of an output of said generator and discharging charges stored therein during stoppage of the internal combustion engine;

said initial starting/restarting detecting circuit detecting depending on the amount of charges stored in said charge storage element whether starting of the internal combustion engine is initial starting or restarting while starting of the internal combustion engine is carried out;

a microcomputer for generating an injection command signal containing information on a fuel injection period; said microcomputer operating while using said generator as a power supply therefor;

said microcomputer carrying out, during starting of the internal combustion engine, an operation of the fuel injection period suitable for the initial starting while said detecting circuit detects that the starting is initial starting, an operation of the fuel injection period suitable for the restarting while said detecting circuit detects that the starting is restarting and an operation of the fuel injection period suitable for a steady operation of the internal combustion engine after completion of the starting based on various control conditions; and



an injector driving current feed control circuit for feeding said fuel injector with said driving current during said fuel injection period provided by said injection command signal.

5,482,023

## COLD START FUEL CONTROL SYSTEM

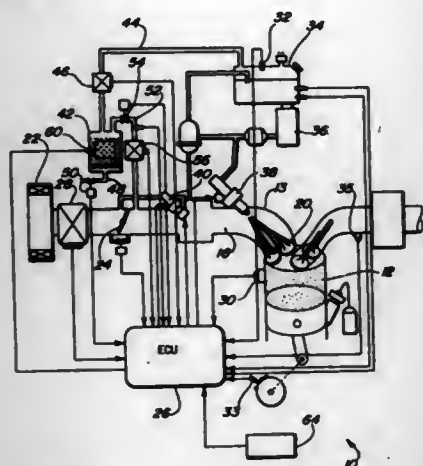
Frank W. Hunt, White Lake, and Toshiharu Nogi, Novi, both of Mich., assignors to Hitachi America, Ltd., Research and Development Division, Tarrytown, N.Y.

Filed Dec. 27, 1994, Ser. No. 364,893

Int. Cl.<sup>6</sup> F02D 41/06; F02M 33/02; 51/00

U.S. Cl. 123—491

32 Claims



1. A cold start fuel control system for an internal combustion engine of the type having at least one combustion chamber, an intake manifold fluidly connected with the combustion chamber and a source of fuel, said fuel control system comprising:

a fuel vapor canister having an interior chamber fluidly connected to the source of fuel and a normally closed purge valve fluidly connected between the canister and the intake manifold,

means for measuring an operating temperature of the engine and for providing a temperature output signal representative,

a cold start fuel injector having an inlet and an outlet,

means for fluidly connecting said injector inlet to the fuel source and for fluidly connecting said injector outlet to the intake manifold,

means responsive to said temperature output signal whenever said temperature output signal is less than a predetermined amount for selectively activating said fuel injector so that said fuel injector injects fuel at its outlet,

means responsive to said temperature output signal whenever said temperature output signal is less than said predetermined amount for selectively opening the purge valve.

5,482,024

## COMBUSTION ENHANCER

Robert H. Elliott, Box 519, Plymouth, Mich. 48170

Continuation-in-part of Ser. No. 364,541, Jun. 6, 1989, abandoned. This application Oct. 29, 1990, Ser. No. 604,801

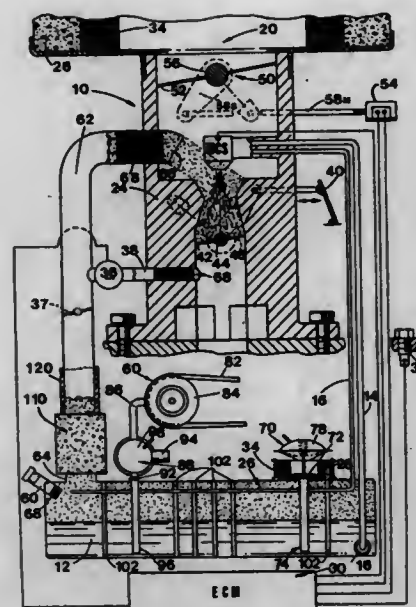
Int. Cl.<sup>6</sup> F02M 33/02; 17/22; 21/02

U.S. Cl. 123—516

34 Claims

1. In an electronic, dual state fuel delivery system for the operation of an internal combustion engine having a combustion air induction system for the controlled delivery of a metered quantity of vaporized liquid fuel/air mixture in variable amounts for the operation of said internal combustion engine, the improvement of,

an atmospherically vented fuel storage tank containing liquid fuel therein, along with evaporated gaseous fuel that is generated therewithin;



a large hollow conduit member communicating the evaporated gaseous state fuel directly into the combustion air induction system along with reduced controlled quantities of said liquid vaporized fuel/air mixture to compensate for the increased volume of gaseous evaporated fuel delivered via said large hollow conduit member.

5,482,025

## ARROW SUPPORT FOR AN ARCHERY BOW

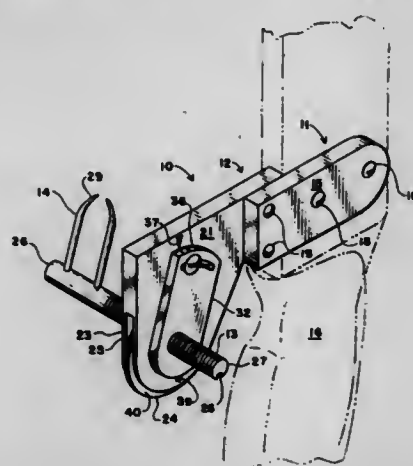
Bryan D. Finkel, P.O. Box 172, Rte. 626, Wake, Va. 23176

Filed Jan. 30, 1995, Ser. No. 380,728

Int. Cl.<sup>6</sup> F41B 5/22

U.S. Cl. 124—44.5

8 Claims



1. An arrow rest device attachable to a conventional archery bow above the ledge of the window thereof, said device comprising:

a) a substantially flat mounting panel having an interior surface, directed toward said bow, and opposed exterior surface,

b) a flat base panel connected to said mounting panel and coextensive therewith, said base panel defined in part by opposed interior and exterior surfaces, an upper edge, rearward edge, and a bifurcated lower edge which defines a receiving slot centered within said base panel,

c) a threaded control rod disposed orthogonally through said base panel and receiving slot and having an axially oriented straight guide recess and interior and exterior extremities,

d) a pair of arrow-supporting prongs fixedly attached to and upwardly directed from said control rod adjacent said interior

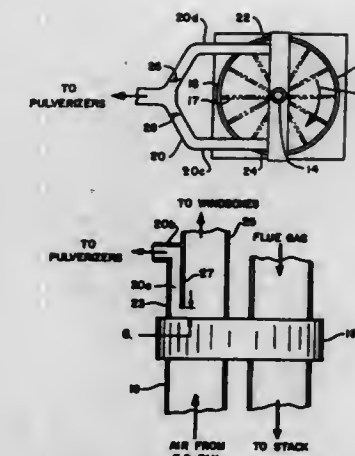
extremity and having opposed arrow contacting tips at their uppermost extremities,

e) a vertical adjustment plate slideably positioned against the exterior face of said base panel and having a lower extremity penetrated by said control rod, and an upper extremity provided with an arcuate retaining slot having interactive securing means for said plate,

f) an adjustment wheel disposed partially within said receiving slot, the center of said wheel being threadably engaged with said control rod, and

g) means secured within said vertical adjustment plate for adjustably entering said guide recess, whereby

h) said control rod and attached prongs can be moved horizontally by rotation of said wheel, and can be rotated axially, causing vertical adjustment of said prongs.



5,482,026

## PRECISION ABRASIVE SAW

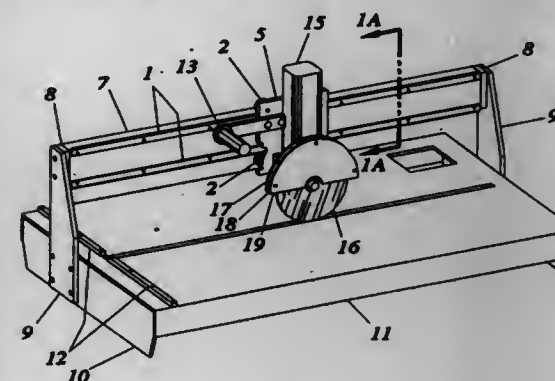
Karl L. Russell, 526 E. 39 St., Hialeah, Fla. 33013

Filed Oct. 12, 1993, Ser. No. 133,857

Int. Cl.<sup>6</sup> B28D 1/04

U.S. Cl. 125—12

2 Claims



1. A precision abrasive saw comprising a table;

a v-track & v-wheel carriage system mounted on a horizontal beam above said table including

a motor,

an abrasive saw coupled to the motor,

a v-track fixed to the length of the horizontal beam,

a plurality of v-wheels horizontally fixed to roll on v-track;

a carriage, including a handle for manually tracking the carriage, said carriage having a first side for mounting the motor and abrasive saw to cut a horizontal length perpendicular to the table, and said carriage having a second side for mounting v-wheels to the carriage;

a precision means to adjust clearance between v-wheels and v-track.

a bisector regenerative air heater having a drum shaped rotor having heat transfer surfaces thereon, a housing having a generally cylindrical cavity in which said drum shaped rotor having heat transfer surfaces thereon is mounted for rotation on a shaft, said heater including ducting for directing flue gas and forced draft air respectively into first and second angular sectors of the cavity which at any one instant will flow over respective angular sectors of said rotor;

said rotor being heated during the travel of any portion thereof in said first angular sector and being cooled in said second angular sector;

an elongated duct for conducting all of the forced draft air out of said heater;

first means for ducting, said first means for ducting directing only the forced draft air flowing over a portion of said rotor immediately after passage of each portion thereof from said first angular sector into said second angular sector; and second means for ducting, said second means for ducting directing the forced draft air from said first means for ducting to said pulverizer.

5,482,028

## MODULAR FIREPLACE INSERT WITH MOVABLE MANIFOLD

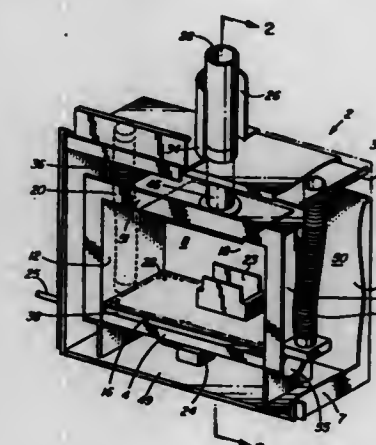
Lothar Binzer, 5721 124th Street, Surrey, B.C., Canada

Filed Sep. 22, 1993, Ser. No. 125,529

Int. Cl.<sup>6</sup> F24C 3/00

U.S. Cl. 126—512

10 Claims



1. A fireplace insert for a fireplace cavity formed in a building, the cavity having a fresh air inlet and a combustion gas outlet comprising:

5,482,027

## PARTITIONED BISECTOR REGENERATIVE AIR HEATER

Mark H. Stiller, Manchester, Mo., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 11, 1994, Ser. No. 288,843

Int. Cl.<sup>6</sup> F24H 3/00

U.S. Cl. 126—99 R

20 Claims

1. A furnace apparatus which comprises:

a plurality of water walls each including a plurality of tubes, said water walls collectively enclosing a combustion chamber;

a plurality of windboxes, each of said windboxes being disposed intermediate adjacent water walls;

a pulverizer and ducting to direct the flow of pulverized coal to said windboxes;

an enclosure having top, rear, bottom, and two side panels and an open front dimensioned to be insertable within the fireplace cavity to define a combustion chamber for generating heat;

a movable manifold chamber separate from the combustion chamber having an intake for connection with the fresh air inlet and first flexible duct means communicating with the combustion chamber for distributing fresh air to the combustion chamber; and

second flexible duct means communicating the combustion chamber with the combustion gas outlet; and wherein the moveable manifold chamber is mountable within the fireplace cavity in at least a position adjacent the rear panel of the combustion chamber and a position adjacent the top panel of the combustion chamber to render the fireplace insert configurable for connection to the cavity inlet and outlet regardless of the positioning of said cavity inlet and outlet in the fireplace cavity.

5,482,029

## VARIABLE FLEXIBILITY ENDOSCOPE SYSTEM

Tadashi Sekiguchi, Saitamaken; Hiroshi Fujita, Tochigiken; Megumi Yoshinaga, Tochigiken; Masashi Honda, Tochigiken, and Izumi Watanabe, Tochigiken, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

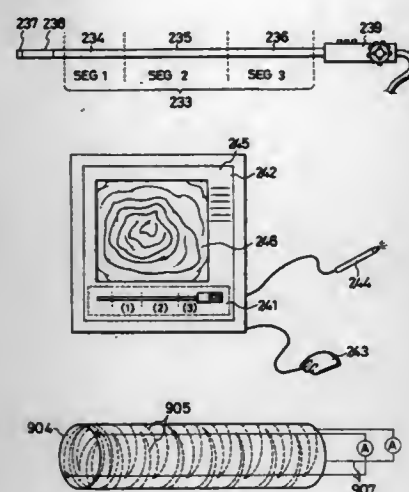
Filed Jun. 24, 1993, Ser. No. 80,630

Claims priority, application Japan, Jun. 26, 1992, 4-168743; Apr. 9, 1993, 5-083390

Int. Cl. A61B 1/005;1/31

U.S. Cl. 600—109

7 Claims



1. An endoscope system comprising:

an endoscope section having a flexible pipe insertable into a body cavity, said flexible pipe including a plurality of segments with flexibility variation means for varying the flexibility of each of said segments;

a monitor section for displaying images obtained by said endoscope as a picture; and

a main frame unit having a flexibility control section for controlling the flexibility of said flexibility variation means for each segment and an image display control section for controlling said monitor section; wherein said main frame unit further comprises a central control section for controlling said flexibility control section and said image display control section, a data base for storing flexibility quantities for each segment of said flexible pipe in the form of a plurality of flexibility control patterns, and input means for inputting data to said central control section, said monitor section includes a display for displaying at least one flexibility control pattern as a picture,

said central control section extracts any flexibility control patterns from said data base on the basis of data inputted by said input means to said central control section and further displays extracted patterns on said display, and

when any one of said displayed flexibility control patterns is selected by said input means, said flexibility control section controls the flexibility of said flexibility variation means in accordance with said selected flexibility control pattern.

5,482,030

## AEROSOL AND NON-AEROSOL SPRAY COUNTER

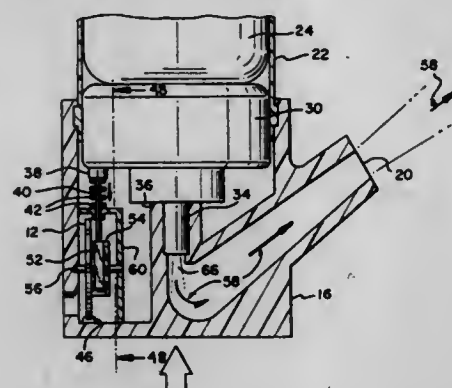
David Klein, 190 Ross St., Apt. 1A, Brooklyn, N.Y. 11211

Filed Jun. 13, 1994, Ser. No. 259,195

Int. Cl. A61M 11/02

U.S. Cl. 128—200.23

1 Claim



1. An aerosol and non-aerosol spray counter comprising:

a) a counter housing, at least one spray container housing for receiving a standard size spray container therein, at least one counter disk housing further comprising a counter disk housing top and at least one counter disk housing rear wall, at least one counter housing spray container spout receptacle capable of receiving a spout of a standard size spray container, at least one egress nozzle through which spray can exit a nozzle opening at a distal end therein, and

b) at least one manually operated counting means comprising a counter disk having a plurality of numbers thereon, means comprising a finger operated wheel enabling a user to reset set counting means, a counter plunger with a distal end, counter plunger rollers, a counter plunger washer, said counter plunger contacting a counter plunger shaft, a counter disk rotating means directly connected to said counter disk so that when said spray container is depressed, said counter plunger distal end upon being depressed transmitting energy to said counter plunger with said counter plunger washer thereon which is guided within said counter rollers further transmitting energy to said counter shaft which depresses said counter rotating means thereby rotating said counter disk exhibiting said sequential counter numbers correlating to a number of sprays, said counter disk having a plurality of counter disk rotation stopper indents corresponding to said counter numbers, and at least one counter disk rotation stopper attached to said disk housing, and cooperating with said indents whereby when a spray container is depressed, said counting means self activates, thus, counting the number of times said spray has been discharged therethrough.

5,482,031

## ARRANGEMENT FOR CONNECTING A PATIENT TO A RESPIRATOR, AND THE USE OF A MOISTURE-HEAT-EXCHANGER IN THE ARRANGEMENT

Hans Lambert, Stockholm, Sweden, assignor to Gibeck Respiration AB, Väsby, Sweden

Continuation of Ser. No. 946,925, Sep. 17, 1992, abandoned.

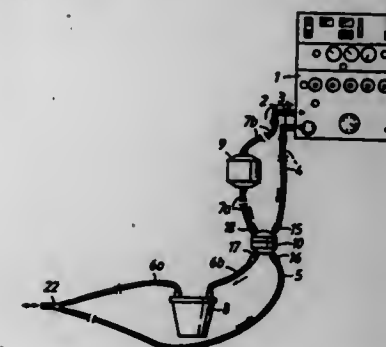
This application Feb. 8, 1994, Ser. No. 192,980

Claims priority, application Sweden, Sep. 20, 1991, 9102731

Int. Cl. A61M 15/00

U.S. Cl. 128—203.12

4 Claims



1. An arrangement for dehumidifying air comprising a respirator having an inlet connected to a patient and an outlet including a moisture-heat-exchanger having one side connected to separate first and second conduits which are connected to said inlet and outlet, respectively, said moisture-heat-exchanger having another side adapted to be connected through separate third and fourth conduits to a patient such that inspired and expired gases are separated from each other between said other side and the patient, at least one of said third and fourth conduits containing a check valve connected to said moisture-heat-exchanger whereby gases are free to flow from the exchanger to the patient through the third conduit and to the exchanger from the patient through the fourth conduit, said moisture-heat-exchanger absorbing moisture from the expired gases before reaching the respirator inlet, and moisture from the moisture-heat-exchanger being at least partly emitted by means of the gases from the respirator outlet to the patient, and a humidifier located in the third conduit whereby the gases inspired by the patient will be humidified by the humidifier after having passed the moisture heat-exchanger.

5,482,032

## DRY POWDER INHALERS

David K. Smith, Loughborough; Peter D. Hodson, Trowell, and Anthony C. L. Wass, Stamford, all of England, assignors to Astra Aktiebolag, Sodertalje, Sweden

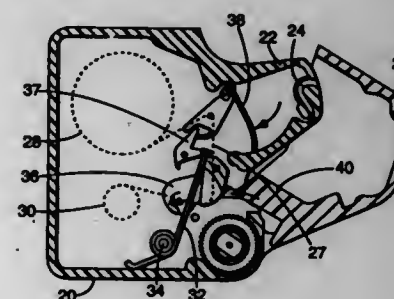
Filed Jul. 12, 1994, Ser. No. 273,898

Claims priority, application United Kingdom, Jul. 14, 1993, 9314614

Int. Cl. A61M 15/00

U.S. Cl. 128—203.15

25 Claims



1. A device for delivering a powder comprising:

a flexible sheet material carrying a powder to be delivered on a surface thereof; and

an impactor for dislodging said powder from said sheet material comprising

- (a) a shaft having a first end that is mounted within the device, and
- (b) a cantilevered arm extending from said shaft to a second, free end that is moveable between a first, primed position and a second position in which at least a portion of said arm impacts a substantially planar portion of said flexible sheet material, said free end being resiliently biased toward said second position,

the movement of said shaft between said first and second positions defining a plane of motion,

at least a portion of said cantilevered arm, disposed intermediate (i) the intersection of said arm with said shaft and (ii) said free end, extending out of a first plane that includes said shaft and is perpendicular to said plane of motion, towards a second plane that is defined by said substantially planar portion of said flexible sheet material.

5,482,033

## ANESTHETIC WASTE GAS EVACUATION SYSTEM

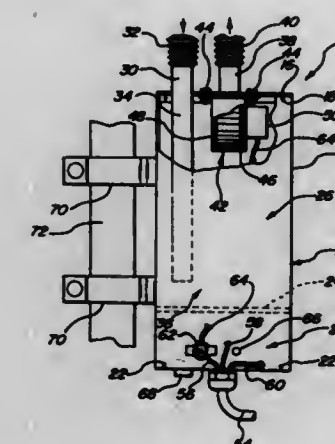
John R. Engle, 103 Duncan Ave., Paris, Ky. 40361, and Jeff Baker, 185 Forest Park, Lexington, Ky. 40502

Filed Feb. 8, 1994, Ser. No. 192,362

Int. Cl. A62B 31/00;9/02

U.S. Cl. 128—205.19

10 Claims



1. An anesthetic waste gas evacuation system for use with an anesthetic machine delivering an anesthetic gas to a patient, the machine having a discharge valve for discharging anesthetic waste gas, said system comprising:

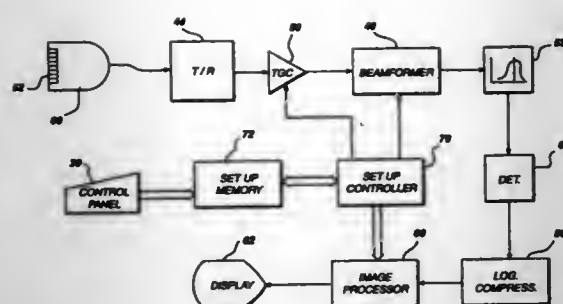
- a housing forming a gas collection chamber having upper and lower spaced ends;
- a gas inlet for introducing gas into said gas collection chamber adjacent said lower end;
- inlet conduit means coupled to said inlet for directing anesthetic waste gas to said inlet;
- a gas outlet adjacent said upper end of said gas collection chamber;
- blower means having a gas inlet in communication with said gas collection chamber for receiving anesthetic waste gas from said gas collection chamber;
- outlet conduit means in communication with said blower means for receiving anesthetic waste gas from said blower means; and
- vent means in said housing at said upper end of said gas collection chamber for providing vapor communication between the interior of said gas collection chamber and the











means for controlling the amplification of said sequence as a function of depth comprising:

- means for storing a plurality of predetermined time gain compensation characteristics;
- processor means for selecting one of said predetermined time gain compensation characteristics in response to selection by a user of a particular ultrasonic diagnostic procedure;
- amplifier means coupled to said processor means for controlling the amplification of said sequence of ultrasonic echo signals in accordance with said selected one of said predetermined time gain compensation characteristics; and
- means for displaying said selected one of said predetermined time gain compensation characteristics.

5,482,046

## ACOUSTIC POWER CONTROL TECHNIQUE

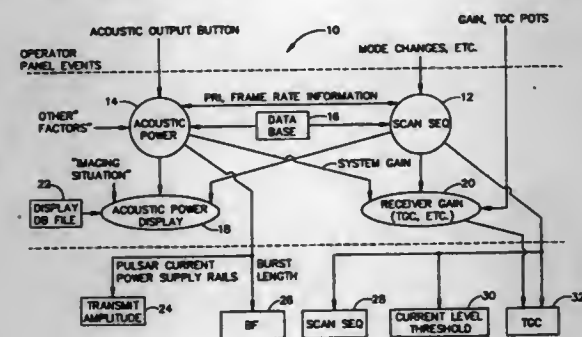
Thomas L. Deitrich, Durham, N.C., assignor to General Electric Company, Milwaukee, Wis.

Filed Nov. 23, 1994, Ser. No. 344,245

Int. Cl.<sup>6</sup> A61B 8/00

U.S. Cl. 128—662.02

8 Claims



1. An acoustic power control method for optimizing acoustic power levels in an ultrasound imaging system having an operator control panel, the method comprising the steps of:
  - providing a measurement database containing measured database parameters;
  - optimally combining a current system imaging configuration with the measured database parameters to provide an optimal combination;
  - computing relevant system transmit parameters using the optimal combination to achieve optimization of transmit parameters;
  - using a scan sequencer to collect and process mode and operator control information to produce frame rate and pulse repetition intervals data; and
  - adjusting the measured database parameters through the use of current scanning parameters to maximize system performance.

5,482,047

## INTRAOPERATIVE ULTRASOUND PROBE

Timothy F. Nordgren, Bothell; Deborah K. Imiling, Bellevue; Joseph L. Ungari, Everett; Donald G. Killam, and Ronald E. McKeighen, both of Woodinville, all of Wash., assignors to Advanced Technology Laboratories, Inc., Bothell, Wash.

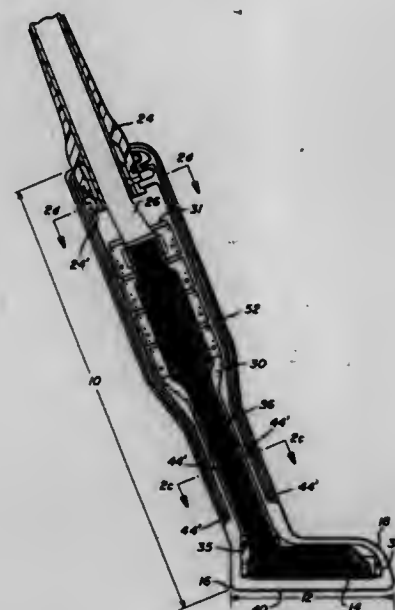
Division of Ser. No. 155,447, Nov. 19, 1993, Pat. No. 5,381,795. This application Dec. 5, 1994, Ser. No. 349,593

Claims priority, application United Kingdom, Nov. 23, 1992, 9224585

Int. Cl.<sup>6</sup> A61B 8/00

U.S. Cl. 128—662.03

11 Claims



1. A termination assembly for retaining coaxial wires of a multiwire cable in a predetermined alignment for attachment of said coaxial wires to conductive traces of a printed circuit comprising:

- a planar body having an aperture located therein;
- a plurality of said coaxial wires attached to said planar body and traversing said aperture in said predetermined alignment, the electrical paths of the central conductors of said coaxial wires being simultaneously accessible through said aperture to electrically connect said central conductors to aligned conductive traces of a printed circuit; and
- wherein the electrical paths of the shield conductors of said coaxial wires are accessible through said aperture to electrically connect said shield conductors to a ground plane of said printed circuit.

5,482,048

## SYSTEM AND METHOD FOR MEASURING AND QUANTITATING FACIAL MOVEMENTS

Peter C. Johnson, Pittsburgh, Pa., assignor to University of Pittsburgh, Pittsburgh, Pa.

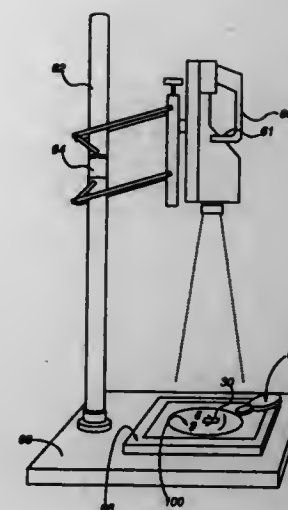
Filed Jun. 30, 1993, Ser. No. 85,283

Int. Cl.<sup>6</sup> G06F 159/00; G06K 9/00

U.S. Cl. 128—665

29 Claims

1. A system for measuring and quantitating movements of a face, the system comprising:
  - at least one marker applied to at least one specific zone of the face to track motion of the specific zone of the face;
  - apparatus for recording an image of the marked face at repose and for recording an image of the marked face at at least one selected facial position, said selected position being the result of facial movement;
  - apparatus for assigning at least one location coordinate to the marker of the facial image at repose and for assigning at least



- one location coordinate to the marker of the facial image at the selected facial position;
- means for converting the location coordinate of the marker to actual positions on the face;
- means for determining a change in actual marker position; and
- means for displaying the change in actual marker position.

5,482,049

## PROGRAMMABLE ELECTRONIC BLOOD PRESSURE MONITORING LABELS

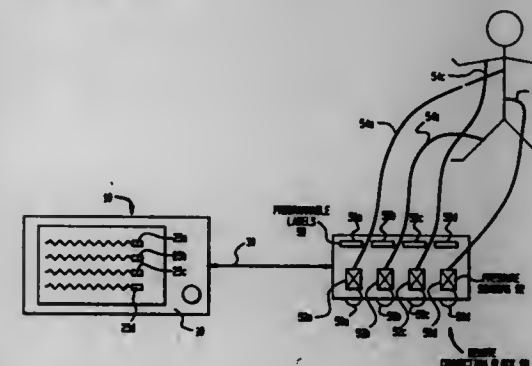
Robert R. Addiss, Bedford; Stephen E. Gordon, Cambridge, and Stephen J. Staats, Wenham, all of Mass., assignors to Siemens Medical Systems, Inc., Iselin, N.J.

Filed Mar. 16, 1994, Ser. No. 214,345

Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 128—673

11 Claims



1. In combination:
  - a patient monitoring device, which monitoring device is adapted for use with a plurality of blood pressure transducers adapted for coupling to a patient by associated fluid lines, each of said transducers producing electrical signals representing a different blood pressure of the patient, and which monitoring device includes, a display device for displaying the electrical signals from the transducers representing the different blood pressures of the patient, said display device having a display monitor including, (1) a microprocessor to control the display monitor for displaying the electrical signals representing the blood pressures of the patient, and (2) means for receiving the transmission of electrical signals representing the blood pressures of the patient from a remote connection block; and
  - a blood pressure labeling display system comprising,
    - (a) a remote connection block in close proximity to the patient for mechanically supporting the blood pressure transducers, comprising;

- (1) a plurality of blood pressure programmable electronic display labels, each one of the plurality of blood pressure display labels adapted to be collocated with a corresponding one of the plurality of blood pressure transducers and their associated fluid lines;
- (2) means for receiving the electrical signals representing the blood pressures of the patient from the transducers;
- (3) means for transmitting the electrical signals representing the blood pressures of the patient to the display device from the means for receiving electrical signals; and
- (4) means for receiving label data representing a plurality of selections of label content data from a predetermined menu made by a user and for receiving communications/character data for display on each of the plurality of blood pressure programmable electronic display labels;
- (b) means for the user to input the plurality of selections of label content data made by the user for display on each of the plurality of blood pressure display labels on the remote connection block; and
- (c) means for transmitting the plurality of selections of label content data made by the user to the programmable electronic display labels on the remote connection block.

5,482,050

## METHOD AND SYSTEM FOR PROVIDING SAFE PATIENT MONITORING IN AN ELECTRONIC MEDICAL DEVICE WHILE SERVING AS A GENERAL-PURPOSE WINDOWED DISPLAY

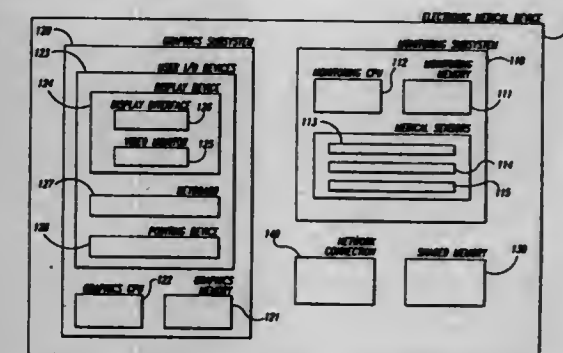
Timothy L. Smokoff, Renton, and Erik R. Horsley, Redmond, both of Wash., assignors to SpaceLabs Medical, Inc., Redmond, Wash.

Filed Feb. 17, 1994, Ser. No. 198,100

Int. Cl.<sup>6</sup> G06F 159/00

U.S. Cl. 128—710

27 Claims



1. In an electronic medical device capable of providing services to executing programs in response to requests for services from executing programs, the requests for services specifying a service to be provided, a method for ensuring the integrity of an executing patient monitoring program while simultaneously providing services to an executing non-patient monitoring program, the method comprising the steps of:
  - executing the patient monitoring program;
  - providing the service specified by each request for services from the executing patient monitoring program;
  - executing the non-patient monitoring program; and
  - declining to provide services as specified by requests for services from the executing non-patient monitoring program if provision of the service as specified would interfere with the executing patient monitoring program,
 wherein at least a portion of the requests for services from executing programs specify a window display service for displaying a window containing output from the requesting application, the displayed window having an area, and wherein, for these requests, the declining step is accomplished by the steps of:

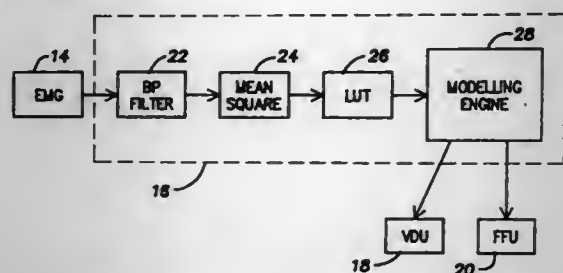
providing the window display service specified by the executing non-patient monitoring program; detecting an alarm condition; and upon detecting the alarm condition, if the displayed window has an area greater than a threshold area, reducing the area of the displayed window.

5,482,051

**ELECTROMYOGRAPHIC VIRTUAL REALITY SYSTEM**  
Narender P. Reddy, and Sujat M. Sukthankar, both of Akron, Ohio, assignors to The University of Akron, Akron, Ohio  
Filed Mar. 10, 1994, Ser. No. 209,992  
Int. Cl.<sup>6</sup> A61B 5/04

U.S. Cl. 128-733

11 Claims



1. A method of manipulating a computer simulation of a physical structure in response to an operator having musculature, said method comprising:

- detecting an electromyographic signal from said musculature;
- producing a force signal in response to said electromyographic signal;
- applying said force to a computer model of said physical structure, said model having nodes;
- determining force values and displacements for said nodes; and
- providing a visual representation of said model, said representation being formed in response to said displacements.

5,482,052

**METHOD AND APPARATUS FOR DETERMINING SENSORY FUNCTIONS**

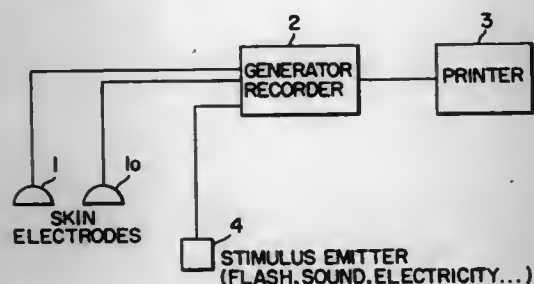
Eduard N. Lerner, Ernststraat 17, NL-1083 GP Amsterdam, Netherlands

PCT No. PCT/NL91/00071, § 371 Date Dec. 27, 1993, § 102(e)  
Date Dec. 27, 1993, PCT Pub. No. WO92/19154, PCT Pub.  
Date Nov. 12, 1992

PCT Filed Apr. 29, 1991, Ser. No. 140,058  
Int. Cl.<sup>6</sup> A61B 5/05

U.S. Cl. 128-734

7 Claims



1. Method for measuring sensory functions of a human or an animal comprising the steps of:

- a) applying a first stimulation of a sense of said human or animal under investigation, said first stimulation being selected from the group consisting of auditory, visual, olfactory, tactile, and pain stimuli;

- b) inducing a conditioned reflex to said first stimulation by applying a second sensory stimulation after said first stimulation of the sense so as to prevent habituation to said first stimulation;
- c) applying said first stimulation and said second stimulation repeatedly in pairs;
- d) recording a skin potential change in response to said first stimulation of the sense under investigation, said potential change being indicative of a functioning of the sense under investigation.

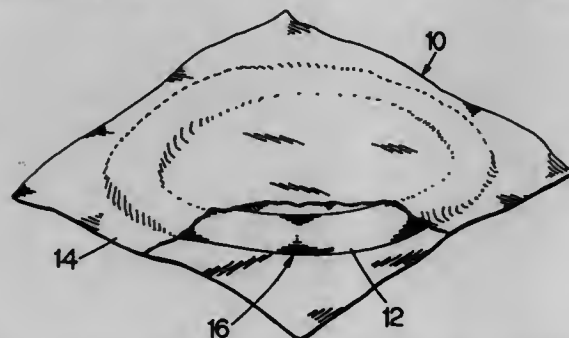
5,482,053

**CONDOM LUBRICANTS CONTAINING ZINC AS AN ANTI-VIRAL AGENT**

Patrick D. Kelly, 33 Berry Oaks, St. Louis, Mo. 63122  
Continuation-in-part of Ser. No. 737,169, Jul. 29, 1991, Pat. No. 5,208,031, and a continuation-in-part of Ser. No. 528,495, May 25, 1990, abandoned, which is a continuation-in-part of Ser. No. 362,058, Jun. 6, 1989, abandoned. This application  
May 3, 1993, Ser. No. 57,001  
Int. Cl.<sup>6</sup> A61F 6/04

U.S. Cl. 128-844

5 Claims



1. An article of manufacture comprising a condom, a fluidized lubricant, and a watertight package containing the condom and lubricant, wherein the lubricant contains a zinc salt that releases zinc ions when dissolved in water, at an effective concentration which reduces the risk of sexual transmission of at least one sexually transmitted virus from an infected person to an uninfected person, and wherein the lubricant is physiologically acceptable and does not irritate genital surfaces or mucous membranes.

5,482,054

**EDOSCOPIC BIOPSY FORCEPS DEVICES WITH SELECTIVE BIPOLAR CAUTERY**

Charles R. Slater, Fort Lauderdale; Matthew A. Palmer, Miami; John R. Whittier, Miami, and Aaron R. Zwiefel, Miami, all of Fla., assignors to Symbiosis Corporation, Miami, Fla.

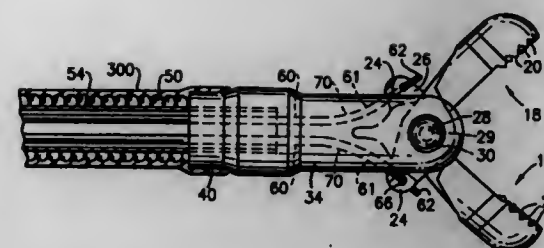
Continuation of Ser. No. 16,595, Feb. 11, 1993, abandoned, which is a continuation-in-part of Ser. No. 959,247, Oct. 9, 1992, Pat. No. 5,312,400, Ser. No. 865,913, Apr. 9, 1992, Pat. No. 5,228,451, and Ser. No. 837,046, Feb. 18, 1992, which is a continuation of Ser. No. 521,766, May 10, 1990, Pat. No. 5,133,727. This application Jun. 24, 1994, Ser. No. 265,217  
Int. Cl.<sup>6</sup> A61B 10/00

U.S. Cl. 128-751

30 Claims

1. An endoscopic bipolar cauterizing biopsy forceps for use with an electrical cautery supply, comprising:

- a) a conduit having proximal and distal ends;
- b) a pair of opposed jaws hingedly disposed at said distal end of said conduit, said jaws each having a proximal end portion with an electrically conductive portion and a distal end portion with an electrically conductive portion, wherein the electrically conductive portions of the proximal and distal end portions of each particular jaw are electrically coupled to each other;



other, and said electrically conductive portions of said opposed jaws are insulated from each other when said opposed jaws are in an open position, said jaws each forming a cup for receiving a biopsy sample;

- c) a pair of flexible electrically conductive pull wires, each having a proximal and a distal end, said pull wires extending through said conduit and insulated from each other in said conduit, the distal end of each of said pull wires being mechanically and electrically coupled to the proximal end portion of a respective one of said opposed jaws, and the proximal ends of said pull wires being capable of being coupled to the electrical cautery supply; and
- d) actuation means disposed at the proximal end of said conduit and coupled to said pull wires for moving said pull wires to open and close said jaws relative to each other.

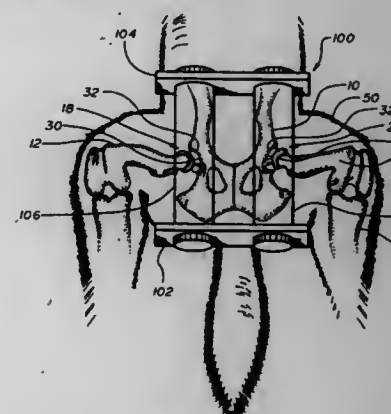
5,482,055

**METHOD FOR ASSESSING CANINE HIP DYSPLASIA**  
Gail K. Smith, Havertown, Pa., assignor to The Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Nov. 1, 1993, Ser. No. 146,870  
Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 128-782

9 Claims



1. A method for determining whether a dog between about 16 weeks and two years in age will develop canine hip dysplasia, comprising the steps of:

- (a) positioning the hip joints of the dog, in a coordinate system having three degrees of freedom, a first degree of freedom for flexion and extension of the hip joint, a second degree of freedom for adduction and abduction of the hip joint, and a third degree of freedom for internal and external rotation of the hip joint, where a neutral position is defined as positioning of an axis of the femur perpendicular to a plane defined by both ischiatric tuberosities and both cranial dorsal iliac spines and where both femoral condyles are perpendicular to the long axis of the pelvis, between about 10 degrees of flexion and 30 degrees of extension, between about 10 and about 30 degrees of abduction, and from about zero degrees of rotation to about 10 degrees of external rotation;
- (b) simultaneously with said step (a), applying a substantially lateral outward force to each femoral head of the dog, the magnitude of said force being sufficient to reach a high stiffness region of the hip;

- (c) while continuing to apply force as in said step (b), obtaining a radiographic image of the hip;
- (d) determining the displacement between the center of the acetabulum and the center of the femoral head relative to a reference corrected for image magnification and size of the dog, to obtain a normalized displacement; and
- (e) if the normalized displacement is less than a selected lower threshold, determining that the dog has a very low probability of developing canine hip dysplasia, and if the normalized displacement is greater than a selected upper threshold, determining that the dog has a high probability of developing canine hip dysplasia.

5,482,056

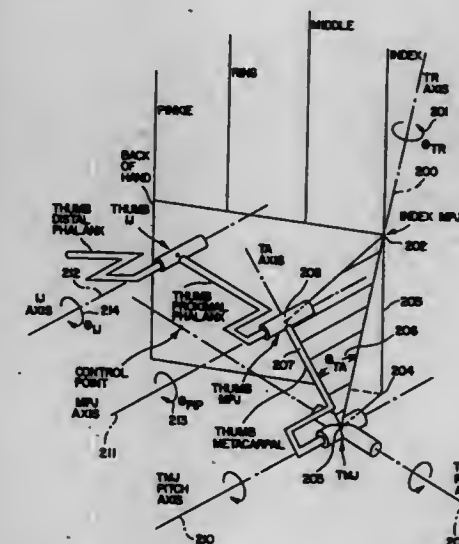
**DETERMINATION OF THUMB POSITION USING MEASUREMENTS OF ABDUCTION AND ROTATION**

James F. Kramer, P.O. Box 5984, Stanford, Calif. 94309

Filed Apr. 4, 1994, Ser. No. 223,284  
Int. Cl.<sup>6</sup> A61B 5/10

U.S. Cl. 128-782

11 Claims



1. A method employing sensors, a data processor and a memory for measuring the position of an anatomical model of at least a portion of a thumb relative to a reference coordinate system, wherein said anatomical model comprises joints and links, wherein each joint is a revolute joint and the axis of each joint represents the center of rotation between two articulated bone segments and each bone segment is represented by a link, said measuring using said anatomical model employing at least some of the following components: (1) a thumb rotation axis (TR axis) and the angle about said axis,  $\theta_{TR}$ ; (2) a trapeziometacarpal joint, TMJ, comprising a pitch axis (TMJP) and a roll axis (TMJR); (3) a thumb metacarpal; (4) a thumb proximal phalanx; (5) a thumb distal phalanx; (6) a thumb metacarpophalangeal joint (thumb MPJ); (7) an interphalangeal joint (IJ); (8) a thumb abduction axis (TA axis) and the angle about said TA axis,  $\theta_{TA}$ ; said TA axis normal to the plane defined by (a) the thumb metacarpal and (b) the TR axis; (9) an index metacarpophalangeal joint (index MPJ), wherein each of said components has a known initial value for an initial thumb position; said method comprising:

- transmitting signals to said data processor from said sensors mounted in juxtaposition to said thumb, wherein said signals indicate the change in values,  $\Delta\theta_{TR}$  and  $\Delta\theta_{TA}$ , for  $\theta_{TR}$  and  $\theta_{TA}$  from said initial values defining the movement of the thumb from said initial position;
- processing said signals in said memory relating to said  $\Delta\theta_{TR}$  and  $\Delta\theta_{TA}$ , by first rotating said initial position of said thumb MPJ about the initial TA axis by an amount  $\Delta\theta_{TA}$  to determine a first rotated thumb MPJ; and further rotating said first rotated



thumb MPJ about the TR axis by an amount  $\Delta\theta_{TR}$  to produce a signal related to a second rotated thumb MPJ; processing said signal related to a second rotated thumb MPJ in conjunction with said thumb TMJ to define the position of said thumb metacarpal relating the position of said TMJP axis as being normal to the plane defined by said thumb metacarpal and said TMJR axis to specify the orientation of said thumb metacarpal; whereby the position and orientation of said thumb metacarpal relative to a reference coordinate system is determined.

5,482,057

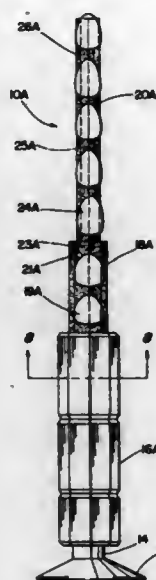
## NAIL POLISHING WAND

Mikel J. Bushmaker, 1104 Town Crest Rd., Williamsport, Pa. 17701

Filed Apr. 21, 1994, Ser. No. 230,715  
Int. Cl.<sup>6</sup> A45D 29/00

U.S. Cl. 132—73

2 Claims



1. A device, capable of being stood on end, for retaining artificial fingernails while polishing, displaying or storing the artificial fingernails comprising:

a cylinder having three diameters along its length, one diameter suitable for a handle, a second diameter of sufficient size to hold at least one set of artificial thumbnails, a third diameter of sufficient size to hold at least one set of artificial fingernails; a suction cup affixed to a base end of said cylinder suitable for a handle; two tape rolls, sticky side out for adhering the fingernails to and with perforations for removal of one layer of tape at a time, friction fit over the cylinders dimensioned to receive the fingernails and which tape rolls after wearing out, one layer at a time, can easily be replaced with new tape rolls.

5,482,058

## LIQUID DISPENSING COMB

Michael Garçonnet, Meulers, 76510 Saint Nicolas d'Allermont, France

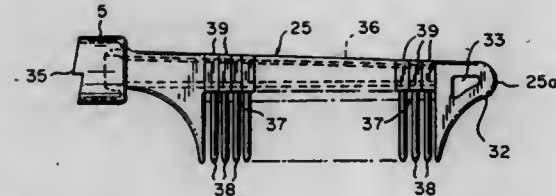
Filed Feb. 9, 1994, Ser. No. 194,054

Claims priority, application France, Feb. 10, 1993, 9301473  
Int. Cl.<sup>6</sup> A45D 24/22; A46B 11/04

U.S. Cl. 132—116

6 Claims

5. A comb device enabling a dosed distribution of a liquid for capillary care, comprising:  
a comb having a tapped nipple,



a flask containing said liquid and having a neck provided with a thread receiving said tapped nipple of said comb, said comb having a back with at least one series of parallel each having a lower part with said parallel teeth defining intervals therebetween, said back having a central duct longitudinally arranged therein and in communication with said tapped nipple, said central duct leading to capillary channels opening in one portion of the comb taken among said intervals between said teeth and said lower part of said teeth of said comb, and wherein said central duct is of a circular shape with a cross-section varying from said tapped nipple to an opposite end part of said comb, and wherein said comb comprises a hollow elongated part arranged with equidistant channels for a distribution of said liquid, said hollow elongated part carrying spaced apart rings each supporting a tooth of said at least one series of parallel teeth, in order to permit a desired spacing of said teeth.

5,482,059

## TRIPLE ZONE MASCARA BRUSH

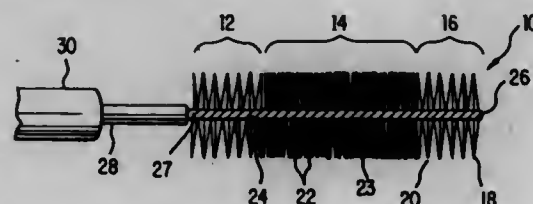
Loretta A. Miraglia, Monsey, N.Y., assignor to Estee Lander Inc., New York, N.Y.

Filed Apr. 3, 1995, Ser. No. 415,289

Int. Cl.<sup>6</sup> A45D 40/26; A46B 11/00

U.S. Cl. 132—218

21 Claims



1. A mascara brush, comprising:  
a twisted wire core extending longitudinally; and  
a plurality of bristles mounted to said twisted wire core, said plurality of bristles comprising a middle cylindrical section containing a plurality of at least first and second different bristle types of relatively uniform length randomly intermingled throughout the length of said middle section and two end sections containing a third type of bristles.

5,482,060

## HAIR CURLER ROLLER

George Barradas, 15 River View Ct., Greenwich, Conn. 06831

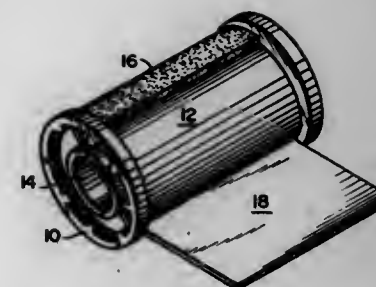
Filed Aug. 26, 1994, Ser. No. 296,429

Int. Cl.<sup>6</sup> A45D 2/12

U.S. Cl. 132—226

11 Claims

1. A hair curler roller having a hollow cylindrical roller body, an outer foam sleeve on said roller body and provided with a front surface, said foam sleeve having an impervious inside membrane juxtaposed to said roller body, the front surface of said sleeve being foraminous so that when said roller is placed in a heated misting atmosphere the mist penetrates into said foraminous front surface and radiates throughout said sleeve while said membrane maintains the heated temperature therein for a period of time.



5,482,061

## WASH SYSTEM

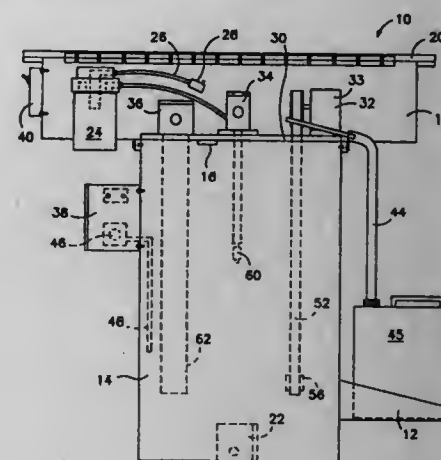
Jack W. Bell, 9371 Kiowa Trail, Chanhassen, Minn. 55317

Filed Mar. 9, 1994, Ser. No. 208,437

Int. Cl.<sup>6</sup> B08B 3/02

U.S. Cl. 134—56 R

1 Claim



1. A parts washing system comprising:  
a. a base member on a floor;  
b. a large tank reservoir secured on said base member and including an electrical resistance heater extending into said tank, and a thermostat control means connected between a power source and said electrical resistance heater for maintaining a predetermined temperature in said large tank reservoir;  
c. a rectangular sink on said large tank reservoir for washing parts and including a central drain emptying into said large tank reservoir;  
d. an aqueous based cleaner/degreaser with water forming a solution in said large tank reservoir and heated by said electrical resistance heater;  
e. a submersible pump submerged in said large tank reservoir and connected to said power source;  
f. a flexible nozzle mounted to said rectangular sink and connected to said sump pump by a hose;  
g. a disposable screw-on filter for capturing particulate, metal filings from the solution connected between said sump pump and said flexible nozzle; and,  
h. a belt driven grease and oil skimmer mounted on one side of said large tank reservoir through a hole in said large tank reservoir and including a belt circulating through said solution and a scraper for scraping said belt to remove any contaminants for recycling, whereby a process for washing a greasy item in the rectangular sink includes filling said large tank reservoir with said aqueous based cleaner/degreaser and water constituting the solution, pumping with the submersible pump from said large tank reservoir through the filter into the nozzle above the sink, draining said solution from the sink into said large tank reservoir, skimming grease and oil from said solution from said tank reservoir into a container adjacent said

tank reservoir by the belt, reclaiming the skimmed grease and oil for recycling, and recycling the screw-on filter as scrap metal.

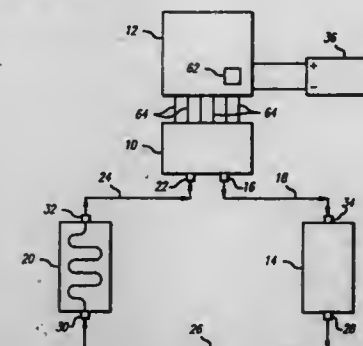
5,482,062

## APPARATUS AND METHOD FOR AUTOMATIC TRANSMISSION SYSTEM FLUID EXCHANGE AND INTERNAL SYSTEM FLUSHING

We-Yu Chen, 3708 Avalon Blvd., Los Angeles, Calif. 90011  
Continuation-in-part of Ser. No. 76,996, Jun. 15, 1993, Pat. No. 5,337,708. This application Jun. 3, 1994, Ser. No. 253,968  
Int. Cl.<sup>6</sup> B08B 9/02

U.S. Cl. 134—56 R

11 Claims



1. Apparatus for internally flushing and exchanging fluid within an automatic transmission system while the automatic transmission system operates, comprising:

a storage tank for holding fluid to treat said automatic transmission system;  
a transfer conduit connected to a pump for delivering said fluid to said automatic transmission system;  
a supply conduit leading from said pump to an outlet port, said outlet port adapted to be connected to a conduit which leads to said automatic transmission system;  
a return conduit leading from an inlet port to a waste conduit, said inlet port adapted to be connected to a conduit leading from said automatic transmission system and said waste conduit leading to a location for disposal of waste fluid passing from said automatic transmission system while it operates;  
a bypass conduit connected between a first valve apparatus located in said supply conduit and a second valve apparatus located in said return conduit;  
said first valve apparatus selectively directing flow to said outlet port from one of said bypass conduit and said pump; and  
said second valve apparatus for selectively directing flow from said inlet port to one of said bypass conduit and said waste conduit.

5,482,063

## TANK CLEANING DEVICE

Takan Miura, and Isao Miura, both of Kawaguchi, Japan, assignors to Kabushiki Kaisha Kit, Saitama, Japan

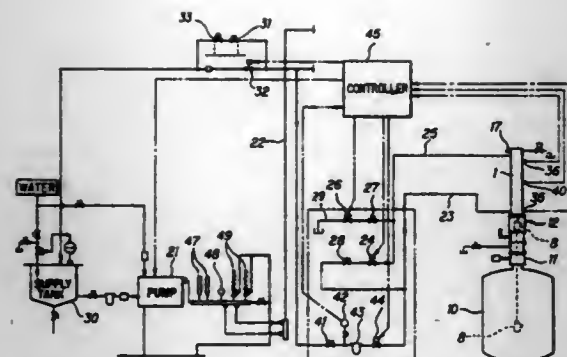
Filed Apr. 7, 1994, Ser. No. 272,499

Claims priority, application Japan, May 13, 1993, 5-111919  
Int. Cl.<sup>6</sup> B08B 9/06

U.S. Cl. 134—56 R

7 Claims

1. A tank cleaning device comprising:  
a cylinder fixed to an outside of a tank,  
a piston housed inside said cylinder such that it is free to slide axially in said cylinder,  
a piston rod fixed to said piston and having an end projecting inside said tank, said piston rod elongating and contracting outside said cylinder between a limiting elongated position and a limiting contracted position according to the slide of said piston,



a first pressure chamber formed by said piston around said piston rod inside said cylinder,  
 a second pressure chamber formed by said piston on the opposite side of said piston rod inside said cylinder,  
 a nozzle attached to the projecting end of said piston rod,  
 pump means for providing a pressurized fluid,  
 a first supply passage connecting said first pressure chamber to said pump means,  
 a return passage connecting said second pressure chamber to a drain,  
 a first valve provided in said return passage,  
 a second supply passage connecting said second pressure chamber to said pump means,  
 a second valve provided in said second supply passage,  
 a passage formed inside said piston rod for the purpose of guiding said pressurized fluid from said first pressure chamber to said nozzle,  
 means for detecting a contracted position of said piston rod,  
 means for detecting an elongated position of said piston rod,  
 means for closing said first valve and opening said second valve when said contracted position is detected,  
 means for opening said first valve and closing said second valve when said elongated position is detected,  
 means for counting the number of contraction and elongation cycles executed by said piston rod between said contracted position and said elongated position, and  
 means for stopping operation of said pump means when it is detected that said number of contraction and elongation cycles has reached a predetermined value.

5,482,064

## CLEANING APPARATUS

Fenton Goddard, Perth, Australia, assignor to Robowash Pty Ltd., Welshpool, Australia

PCT No. PCT/AU92/00652, § 371 Date Jun. 6, 1994, § 102(e) Date Jun. 6, 1994, PCT Pub. No. WO93/10914, PCT Pub. Date Jun. 10, 1993

PCT Filed Dec. 3, 1992, Ser. No. 290,796

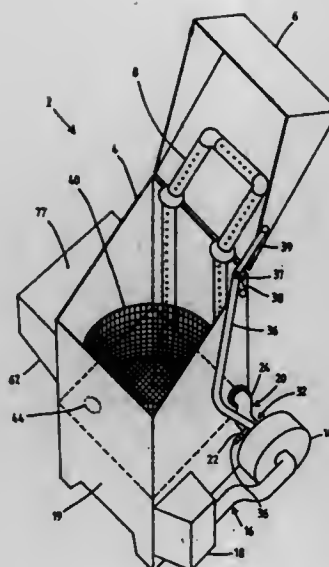
Claims priority, application Australia, Dec. 3, 1991, PK9824 Int. Cl.<sup>6</sup> B08B 3/02

U.S. Cl. 134—57 R

29 Claims

1. A cleaning apparatus for cleaning articles, said apparatus comprising:

- a trough in which cleaning of said articles can be performed;
- a lid connected to said trough and movable between a closed position covering said trough and an opened position to allow access to said trough;
- a first cleaning fluid dispensing means located within said apparatus and a second portable cleaning fluid dispensing receptacle for containing a volume of said cleaning fluid, said receptacle communicating with said dispensing means and said trough so that cleaning fluid can be recirculated through said apparatus; and
- pumping means including a valve for selectively pumping said cleaning fluid to said first or second cleaning fluid dispensing means, wherein said lid operatively cooperates with said valve in a manner such that when the lid is in the closed



position, the pumping means can pump the cleaning fluid via the valve to said first cleaning fluid dispensing means, and when the lid is in the opened position, the pumping means can pump the cleaning fluid via the valve to the second portable cleaning fluid dispensing means.

5,482,065

## INDUSTRIAL WASHING MACHINE

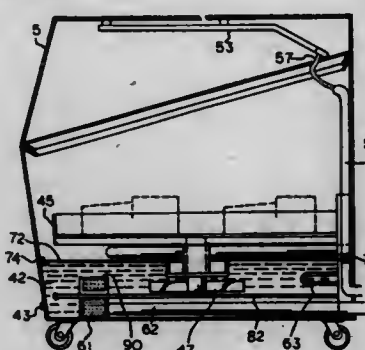
James O'Leary, Komoka, Canada, assignor to Clam Industries Incorporated, Lakeland, Fla.

Continuation-in-part of Ser. No. 745,338, Aug. 15, 1991, abandoned. This application May 28, 1993, Ser. No. 68,094

Claims priority, application Canada, Aug. 22, 1990, 2023822 Int. Cl.<sup>6</sup> B08B 3/02

U.S. Cl. 134—111

10 Claims



1. A surface draining apparatus within an industrial washing machine, the washing machine having a casing with a lid, a liquid reservoir therein and a collecting means associated with said reservoir, said apparatus being adapted to remove a surface layer from a body of liquid in the reservoir into said collecting means;
- a cover positioned within said casing and extending over said reservoir covering said collecting means and said liquid reservoir;
- filter means associated with said cover and disposed within said casing; and
- means beneath said cover for injecting air for acting on a surface of a liquid in said liquid reservoir for effecting lateral movement of floating grease and oil from the liquid in said liquid reservoir towards a fixed point for collection of said grease and oil in said collecting means within said casing and whereby wash water from a wash cycle flows laterally over said cover into said filter means for removal of debris, said wash water flowing subsequently into said reservoir and over-

flowing into said collecting means, and including means for draining collected surface liquid from said collecting means.

5,482,066

## PARTS WASHING MACHINE

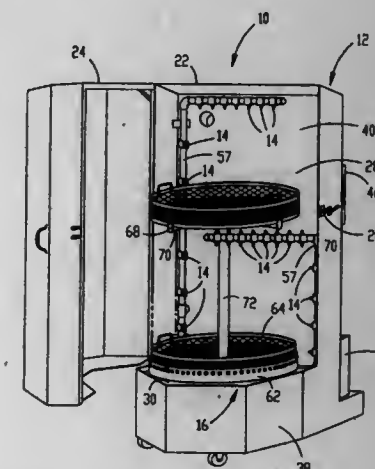
Milton W. Krueger, Kearney, Mo., assignor to Kemac, Inc., Kearney, Mo.

Filed Jan. 11, 1994, Ser. No. 179,102

Int. Cl.<sup>6</sup> B08B 3/02

U.S. Cl. 134—111

9 Claims



1. In apparatus for washing parts including an enclosure, a tray within said enclosure and rotatable about a tray rotation axis and adapted for receiving parts to be washed, at least one spray nozzle oriented for directing a spray of cleaning fluid onto parts received by the tray, drive means having a motor and a drive member rotatably coupled with and driven by said motor and operatively engaging said tray for rotating the tray, said drive member being rotated about a drive axis, and means mounting said drive member for pivoting movement thereof about a pivot axis spaced from said motor, the improvement which comprises cooperating drive components on said tray and drive member respectively for meshed, driving interengagement between the drive components during rotation of the drive member and tray, and structure locating said pivot axis in an upright orientation at a point where the distance between said pivot axis and said tray rotation axis is greater than the distance between said drive axis and said tray rotation axis in order to maintain said driving interengagement between said drive components during rotation of the drive member and tray.

5,482,067

## INSTRUMENT CLEANING CASSETTE WITH GUIDED DOUBLE HINGE

Paul Wittrock; Paul Porteous, and Don D. Porteous, all of 600 E. Hueneme Rd., Oxnard, Calif. 93033

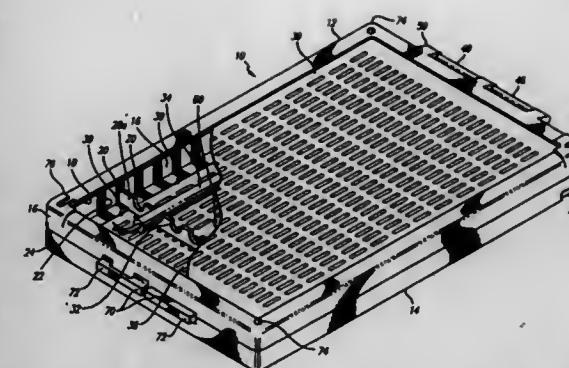
Filed Feb. 15, 1995, Ser. No. 388,012

Int. Cl.<sup>6</sup> B08B 3/10

U.S. Cl. 134—135

25 Claims

22. Cassette for retaining medical, dental and veterinary instruments during fluid-carried ultrasonic vibration cleaning, said cassette being normally horizontally disposed for loading and unloading and comprising generally rectangular, registered top and bottom interiorly open solid frames formed of synthetic organic plastic material molded to define interior instrument supports and resistant to cleaning conditions, said frames having a tendency to dampen ultrasonic vibration, each of said frames defining a recess sized to receive said instruments, a series of separately formed and movable instrument support brackets, a series of support bracket mounts within said cavity integrally formed with said frames in opposed registration for mounting said support brackets in instru-



ment receiving relation; a hinge linking like ends of said top and bottom frames for hinged pivoted movement opening and closing said cassette to receive and disgorge said instruments, said hinge comprising on each of said top and bottom frames a hinge pin and flange arrangement and between said hinge pins an elongated link having an intermediate extent and terminal portions journaling said hinge pins for separate hinging movement such that said frames are registerable with each other in normal position to form said cavity and in inverted position to provide a display of said instruments in one frame elevated by being atop the other frame inverted and registered, and separately formed fluid-passing top and bottom frame panels respectively closing said top and bottom frames to contain said instruments within said cassette against injury to persons handling said cassette, said top and bottom frame panels being metallic and fluid-porous to have less tendency to dampen ultrasonic vibrations than said frames, whereby said cassette is molded to receive said instruments and said instruments are cleanable within said cassette by ultrasonic means.

5,482,068

## CLEANING APPARATUS

Shigenori Kitahara, Kumamoto, and Takashi Terada, Kurume, both of, Japan, assignors to Tokyo Electron Limited, Tokyo, and Tokyo Electron Kyushu Limited, Tosu, both of, Japan

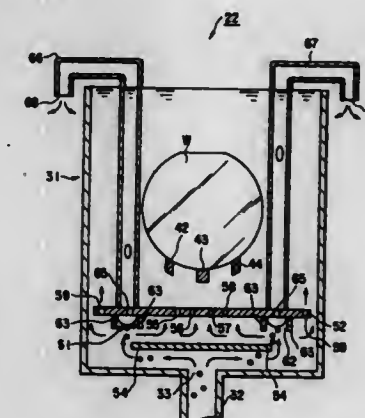
Filed Aug. 18, 1994, Ser. No. 292,284

Claims priority, application Japan, Aug. 18, 1993, 5-226496

Int. Cl.<sup>6</sup> B08B 3/04

U.S. Cl. 134—182

19 Claims



1. A cleaning apparatus in a semiconductor processing system, comprising:
  - a processing vessel storing a cleaning liquid;
  - a supplying system supplying the cleaning liquid, said supplying system having a supplying port arranged in a lower portion of the processing vessel;
  - a holder holding a plurality of substrates to be processed in the processing vessel, such that the substrates are arranged in a first direction at intervals, the holder being provided above the supplying port in the vessel;



a rectifying plate, interposed between the supplying port and the holder, partitioning the processing vessel into a cleaning area in which the holder is provided and a bottom area in which the supplying port is arranged, the rectifying plate having a slit which connects the bottom area and the cleaning area, the slit extending in the first direction and being located under the substrates to be processed, which are arranged on the holder; and

a diffusion plate interposed between the supplying port and the rectifying plate, said diffusion plate crossing a vertical line connecting the supplying port and the slit wherein the rectifying plate has a central portion and a pair of inclined portions inclined upwards from both sides of the central portion along bend lines extending in the first direction.

5,482,069  
SUNSHADE

Chong-Cheng Lee, No. 6, Lane 224, We Feng South Road, Chia Yi City, Taiwan, Prov. of China  
Filed May 16, 1995, Ser. No. 442,345  
Int. Cl.<sup>6</sup> A45B 25/00

U.S. Cl. 135—31

2 Claims



1. A sunshade comprising a support rib set and a stretching rib set disposed in radial direction and associated with runners fitted movably around a solid shaft, each support rib of said support rib set being pivotally and crossingly connected with each stretching rib of said stretching rib set at an end portion of each said stretching rib and at an intermediate portion of each said support rib, an upper shading canvas being located to cover an upper half portion of said support rib set with its lower end secured around said end portion of each said stretching rib, a lower shading canvas being located to cover a lower annular portion of said support rib set, and an aperture being formed between said upper canvas and said lower canvas for air to flow through said aperture from the interior of said sunshade to the exterior thereof so that said whole sunshade may not sway hard or fall down owing to strong wind.

5,482,070

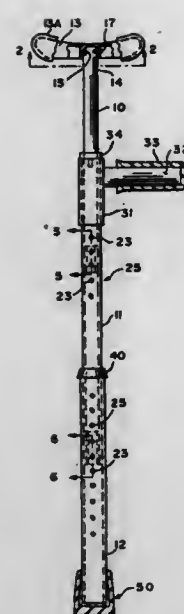
## COMBINED ADJUSTABLE CRUTCH AND CANE

James V. Kelly, 2617 Amarillo Blvd. East, Amarillo, Tex. 79107  
Filed Oct. 4, 1994, Ser. No. 317,481  
Int. Cl.<sup>6</sup> A61H 3/02

U.S. Cl. 135—66

13 Claims

1. A combined adjustable crutch and cane comprising:  
an upper, middle and lower tubular member arranged in telescopic relation;  
each of said upper, middle and lower tubular members having an upper and lower terminal end;  
a unitary one-piece connector and hand grip support means including an integral collar fixedly secured thereto said inte-



gral collar having an upper and lower end, said lower end of said collar receiving said upper terminal end of said middle tubular member said upper end of said collar receiving said lower terminal end of said upper tubular member;  
under arm support means operably connected to said upper terminal end of said upper tubular member;  
adjustment means allowing vertical height adjustments of said upper tubular member relative to said middle tubular member and said lower tubular member relative to said middle tubular member;  
said under arm support means and said unitary one-piece connector and hand grip support means each including anti-rotation means on inner surfaces thereof for preventing relative rotation between the respective tubular members the upper tubular member being removable from said unitary one-piece connector and hand grip support means such that insertion of a plug therein said upper end of said integral collar converts said adjustable crutch to a cane.

5,482,071

## CRUTCH COMBINATION HAVING RESCUING TOOLS

Ching-Yuan Liu, No. 15 Alley 90, Jong-Nan South Lane, Guang-Shing Road, Tai-Ping Hsiang, Taichung County, Taiwan, Prov. of China

Filed Mar. 7, 1995, Ser. No. 399,532

Int. Cl.<sup>6</sup> A45B 3/00

U.S. Cl. 135—66

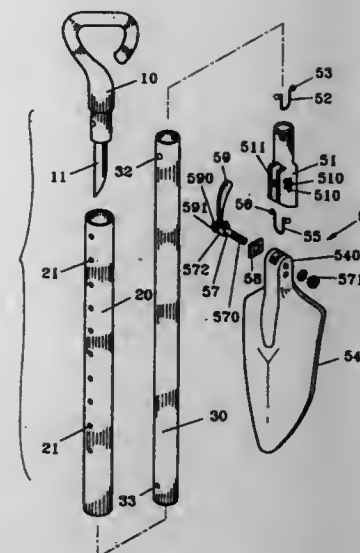
5 Claims

1. A crutch combination, comprising:

a longitudinally extended tubular member having opposing upper and lower ends and an open bore extending therebetween, said tubular member having a plurality of longitudinally spaced holes formed through a peripheral wall thereof and in open communication with said bore;

a handle releasably secured to said upper end of said tubular member, said handle having a lower portion extending into said bore of said tubular member, said lower portion having at least one aperture formed therethrough and disposed in aligned relationship with a respective one of said plurality of holes formed in said tubular member, said handle including a knife blade extending from said lower portion into said bore of said tubular member;

first projection means for releasably coupling said handle to said tubular member disposed in said lower portion of said handle, said first projection means extending through a said aperture and said aligned hole of said tubular member and being displaceable therefrom;



an extension tube having an upper end slidably engaged within said bore of said tubular member and a lower end extending from said lower end of said tubular member, said extension tube having a central bore extending between said opposing upper and lower ends thereof and at least one through opening respectively formed adjacent said upper and lower ends of said extension tube;

second projection means for coupling said extension tube to said tubular member disposed in said central bore of said extension tube, said second projection means extending through said through opening adjacent said upper end of said extension tube and a selected one of said plurality of holes of said tubular member and being displaceable therefrom to provide an adjustable and releasable coupling therebetween;

head means releasably coupled to said lower end of said extension tube, said head means including a coupler having a tubular stud formed on an upper end thereof and extending into said central bore of said extension tube, said tubular stud having at least one aperture formed therethrough and positioned in aligned relationship with said through opening formed adjacent said lower end of said extension tube, said head means including third projection means for releasably coupling said coupler to said extension tube disposed in said tubular stud, said third projection means extending through said tubular stud aperture and said through opening adjacent said lower end of said extension tube and being displaceable therefrom, said coupler having a lower end with a recess formed therein, said head means including (1) a tool head pivotally coupled to said coupler within said recess by a bolt, (2) fourth projection means disposed within said tool head for securing said tool head to said coupler, (3) a nut engaged on a first end of said bolt, (4) a rod rotatably engaged to a second end of said bolt, (5) a knob secured to said rod for rotation thereof, and (6) cam means secured to said rod for rotation therewith to engage said coupler to force opposing sides of said recess against said tool head for securement thereof responsive to rotation of said knob.

5,482,072

## VERSATILE AND UNIVERSAL HANDLE

Thomas C. Cimino, 25706½ Eschelman Ave., Lomita, Calif. 90717

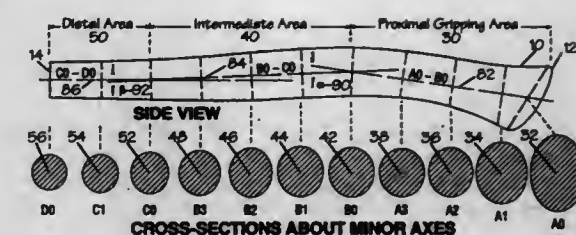
Filed Dec. 17, 1993, Ser. No. 169,431

Int. Cl.<sup>6</sup> A61H 3/02

U.S. Cl. 135—72

21 Claims

1. A long cane, staff, or probe having a handle suitable for alternate or reverse gripping, comprising:  
an elongated shaft; said handle intercoupled with one end of said shaft, said handle comprising:



(a) a proximal gripping area;  
(b) an intermediate area; and  
(c) a distal area intercoupling said intermediate area and said shaft;

each said area having an axis defined therethrough;  
said handle having a bilaterally symmetrical, curvilinear shape; said axis of said proximal gripping area making an angle of between eight degrees and fifteen degrees with respect to said axis of said intermediate area;  
said axis of said intermediate area making an angle of approximately one degree to five degrees with respect to said axis of said distal area;

said proximal gripping area of said handle having a cross-section of the outer end of the proximal gripping area which is substantially oval, with a transition within the proximal gripping area to a substantially circular cross-section of the central portion of the proximal gripping area, and a further transition to a substantially oval cross-section of the central portion of said intermediate area; and  
whereby the handle when firmly gripped in the forward or reverse orientation and manipulated promotes correct posture and ergonomically correct patterns of movement for a variety of tasks.

5,482,073

## METHOD OF CHANGING OUT GAS METERS

Harold R. Winnie, Kansas City; Ronald D. Bridgewater, Lee's Summit, and Robert K. Kitterman, Kearney, all of Mo., assignors to R. W. Lyall & Company, Inc., Corona, Calif.

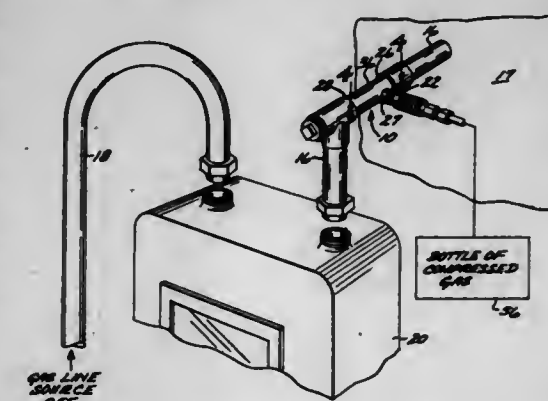
Division of Ser. No. 337,768, Nov. 14, 1994, Pat. No.

5,437,300. This application Jun. 5, 1995, Ser. No. 462,697

Int. Cl.<sup>6</sup> G01F 15/00

U.S. Cl. 137—15

12 Claims



1. A method of servicing a gas meter connected between a supply line at a predetermined gas pressure and a distribution line, including:

selecting a bypass valve of the type having a main upstream end and a main downstream end, a flow chamber having confronting spaced apart upstream and downstream seats having a poppet cage therebetween to normally flow gas from said upstream end through a cage outlet in the side wall thereof to flow about said cage to said main downstream end, a floating poppet interposed between said seats and to shift therebetween and selectively seat thereon, and an auxiliary fitting

having an auxiliary inlet port formed on a side wall of said valve and leading to an auxiliary inlet in said downstream seat;  
 inserting said bypass valve in said distribution line to connect said main upstream end with said meter and said main downstream end with said distribution line;  
 connecting an auxiliary gas source with said auxiliary inlet port; raising the pressure of said auxiliary gas at said auxiliary inlet port above said predetermined pressure to drive said poppet in said cage into engagement with said upstream seat to seal off gas from said meter and flow gas from said auxiliary supply through said auxiliary fitting and out said cage outlet through said main downstream end; and  
 while continuing the flow of gas from said auxiliary supply, uncoupling said distribution line from said meter to service said meter.

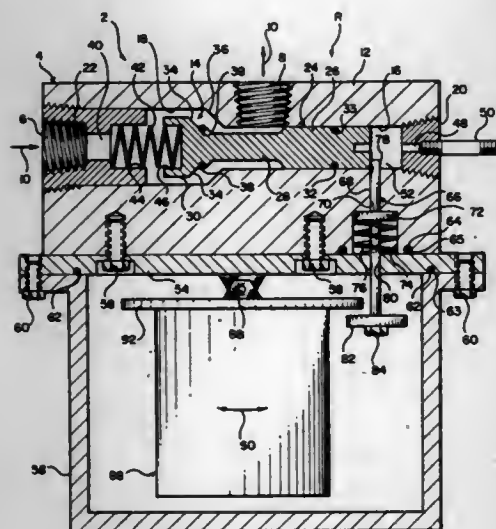
5,482,074

## SAFETY CUT-OFF DEVICE FOR PIPING SYSTEMS AND THE LIKE

David J. Hanson, 1409 Stagner Dr., Carlsbad, N.M. 88220  
 Filed May 26, 1994, Ser. No. 249,600  
 Int. Cl.<sup>6</sup> F16K 17/36

U.S. Cl. 137-45

21 Claims



1. A safety cut-off device, comprising:
  - a) a valve for controlling fluid flow;
  - b) said valve including a body having a passageway therethrough;
  - c) said valve having inlet and outlet communicating with said passageway for permitting fluid flow therethrough;
  - d) said valve including a closure member disposed within said passageway, said closure member having an open position for permitting fluid flow through said body and a closed position for shutting off the fluid flow;
  - e) a stop having an operative position engaging said closure member in the open position and an inoperative position when said closure member is in the closed position, said stop being biased in the operative position;
  - f) a vibration sensitive member secured to said valve body, said vibration sensitive member being adapted to move said stop to the inoperative position in response to vibrations in the environment, whereby said closure member is permitted to move to the closed position;
  - g) said stop including a member adapted to engage with said vibration sensitive member thereby to move said stop to the inoperative position, said vibration sensitive member being spaced apart from said stop member; and

h) said stop is biased in the operative position in engagement against said closure member in the open position.

5,482,075

## PRESSURE SURGE RESISTANT RUPTURE DISK ASSEMBLY

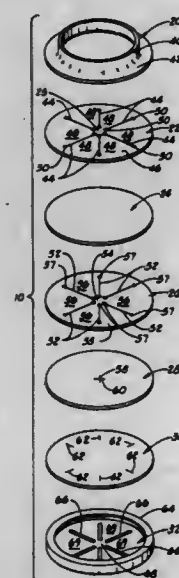
Stephen P. Farwell, Owasso, and Zhenggang Wang, Tulsa, both of Okla., assignors to BS&B Safety Systems, Inc., Tulsa, Okla.

Division of Ser. No. 106,447, Aug. 16, 1993, Pat. No. 5,377,716. This application Nov. 9, 1994, Ser. No. 336,507  
 The portion of the term of this patent subsequent to Jan. 3, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> F16K 17/40; 47/14

U.S. Cl. 137-68.11

10 Claims



1. A method of providing overpressure relief to a vessel or system containing pressurized fluid when the pressure of said fluid slowly rises to an overpressure condition, but not providing relief when an overpressure condition is momentarily reached as a result of a surge in pressure, comprising:

sealingly placing a composite rupture disk assembly in a pressure relief passageway connected to said vessel or system, said composite rupture disk assembly including first and second rupture members having predetermined rupture pressures sealingly clamped together in close proximity to each other with said second rupture member facing said pressurized fluid; and

said second rupture member having at least one opening therein for allowing a restricted flow of pressurized fluid therethrough so that when the pressure of said pressurized fluid slowly rises to an overpressure condition, the overpressure condition is communicated through said opening in said second rupture member to said first rupture member whereby said first rupture member ruptures and overpressure relief is provided, but when said overpressure condition is the result of a momentary surge said overpressure condition is prevented from being communicated to said first rupture member as a result of the flow of said pressurized fluid through said second rupture member being restricted and rupture does not occur.

5,482,076

## ENHANCING PIPES

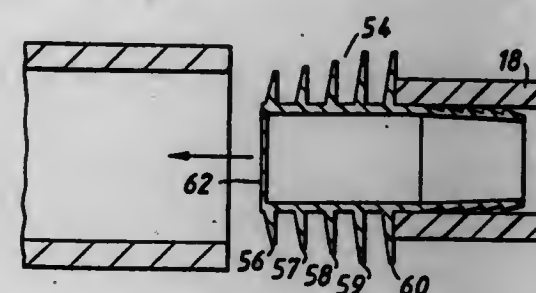
John Taylor, South Godstone; Michael Hicks, Woking; Richard Lamb, Worcester Park; Robert N. Bennett, Hextable; Keith Nixon, Biggin Hill; Ian Ashcroft, Purley; Adrian S. Parkes, Burgess Hill, and John P. Smith, Sevenoaks, all of, Great Britain, assignors to British Gas plc, London, Great Britain  
 Division of Ser. No. 566,411, Oct. 23, 1990. This application  
 Nov. 22, 1994, Ser. No. 346,184

Claims priority, application United Kingdom, Dec. 23, 1988, 8830111

Int. Cl.<sup>6</sup> F16L 55/165; 55/18; F16K 43/00

U.S. Cl. 137-318

6 Claims



1. A seal for use in replacing an existing fluid-carrying pipe for the replacement pipe, the seal comprising:

a tubular body of a flexible material, the body having a rear portion providing a connection to the leading end of the replacement pipe and a front portion having a plurality of vanes disposed around the outer surface of the body, one of the rear portion and front portion having a seal member closing off one end of the tubular body, the vanes providing a barrier to the flow of fluid along the angular gap between the internal wall of the existing pipe and the external wall of the replacement pipe, and the seal member being one of a puncturable, detachable and breakable seal member to permit the flow of fluid through the seal wherein the rear portion has a plurality of gripping elements disposed thereon for securing the tubular body to the replacement pipe, and the plurality of vanes increasing in diameter from the front portion to the rear portion to assist insertion of the tubular body into the existing pipe while providing an effective seal therebetween.

5,482,077

## HIGH PRESSURE ABRASIVE SLURRY CHECK VALVE

Mark Serafin, Apple Valley, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 14, 1994, Ser. No. 339,027

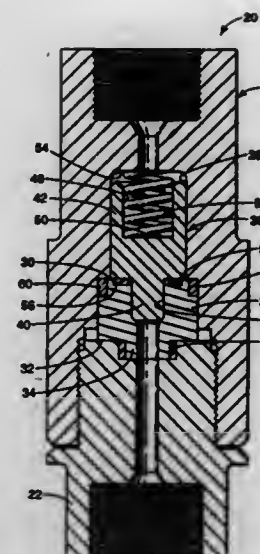
Int. Cl.<sup>6</sup> F16K 15/06

U.S. Cl. 137-516.25

12 Claims

1. A piston check valve, for use in a system which conveys abrasive materials in which the particles range from submicron sizes to sizes that may exceed that captured by a 60 mesh screen and at throughputs exceeding 1.5 gpm, and capable of operating at pressures of up to 2,873,000 N/m<sup>2</sup> and for time periods exceeding 100 hours, comprising:

a valve body having a central cavity which forms part of the fluid flow path through the valve;  
 a valve seat mounted on the valve body and having a first end, a second end, and a through bore, wherein the first end of the valve seat is formed of a crenelated shape and with materials selected to withstand bombardment of abrasive particles ranging from submicron sizes to sizes that may exceed that captured by a 60 mesh screen and at throughputs exceeding 1.5 gpm, and to be capable of operating at pressures of up to 2,873,000 N/m<sup>2</sup> and for time periods exceeding 100 hours;  
 a piston translatable within the central cavity in the valve body and the through bore of the valve seat which contacts the first end of the valve seat when the valve is closed;  
 means for biasing closed the valve;



an O-ring mounted on the first end of the valve seat wherein the width of the O-ring is at least 50% of the diameter of the through bore.

5,482,078

## WATER FAUCET FITTING SEAT CAPABLE OF PRODUCING MUSICAL TONE OR ANIMAL HOWL

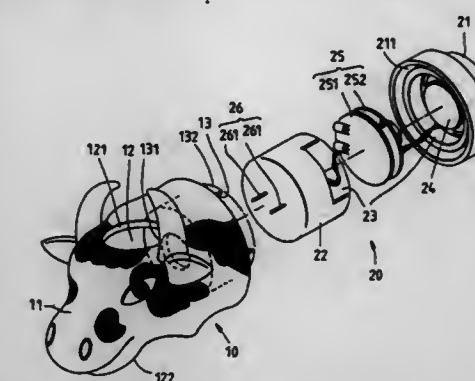
Thomas Yeh, 10F, No. 97, Sec. 2, Nan-Gun Rd., Taipei, Taiwan, Prov. of China

Filed Oct. 28, 1994, Ser. No. 330,581

Int. Cl.<sup>6</sup> F16K 37/00; G08B 21/00

U.S. Cl. 137-551

1 Claim



1. A water faucet fitting seat capable of producing a musical tone or an animal howl comprising:

a base having an animal profile or a geometric shape, and a hollow interior provided with a channel having one end serving as a water outlet and another end which serves as a water inlet and can be fastened to the outlet of a water faucet, said base provided therein with a recessed seat having a round hole in communication with said channel; and  
 a sound producing device disposed in said recessed seat of said base and provided with a speaker, a sound control circuit board and a conducting switch which is connected with said sound control circuit board and is provided with two terminals spaced at an interval and located in said channel via said round hole of said recessed seat of said base, said two terminals of said conducting switch capable of communicating with each other to trigger a reproduction of a musical tone or animal howl stored programmably in an integrated circuit of said sound control circuit board when said water faucet is turned on to permit water to flow through said channel of said base, with said water acting as a conducting medium to cause said two terminals to be in communication with each other.



5,482,079

## AIR FLOW DISTRIBUTION AND EQUALIZATION SYSTEM

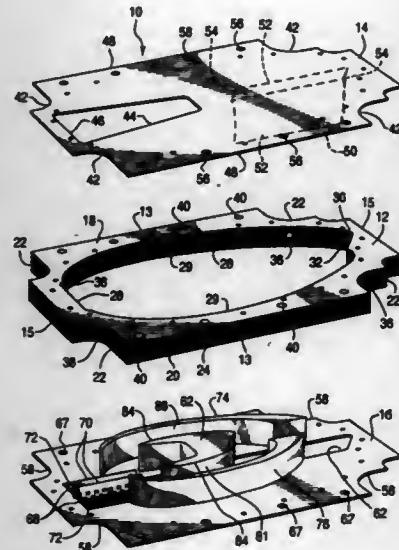
Richard Bozzelli, 4140 Brigantine Blvd., Brigantine, N.J. 08203

Filed Jun. 16, 1994, Ser. No. 260,898

Int. Cl.<sup>6</sup> F02B 27/02; F02M 29/04

U.S. Cl. 137—561 A

22 Claims



1. Air distribution apparatus for a super charged internal combustion engine comprising:

- a metal body having an enlarged opening therethrough and top and bottom surfaces;
- a metal top plate extending over and secured to the top surface of the body and having an air inlet opening therethrough adjacent one end thereof;
- a metal bottom plate extending over and secured to the bottom surface of the body and having first and second spaced, aligned air outlet openings therethrough; and
- a plurality of ribs within the opening in the body and extending between the top and bottom plates, said ribs forming a plurality of passages which extend between the first and second openings in the bottom plate so that air entering the apparatus through the opening in the top plate flows through the passages and is distributed substantially uniformly over the first and second opening in the bottom plate.

5,482,080

## CHECK VALVE

Konrad Bergmann, Wittlich, Germany, assignor to Ideal-Standard GmbH, Bonn, Germany

PCT No. PCT/EP92/00539, § 371 Date Feb. 15, 1994, § 102(e) Date Feb. 15, 1994, PCT Pub. No. WO93/01434, PCT Pub. Date Jan. 21, 1993

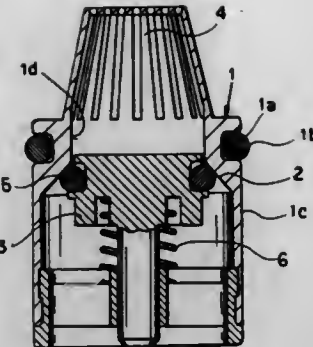
PCT Filed Mar. 10, 1992, Ser. No. 178,248

Claims priority, application Austria, Jul. 5, 1991, 1354/91 Int. Cl.<sup>6</sup> F16K 21/04

U.S. Cl. 137—549

3 Claims

1. A check valve comprising:
- a cylindrical housing having an outer diameter; means forming a beveled valve seat in said housing, said valve seat having an inner diameter;
  - a frustoconical dirt-trapping filter formed in one piece with said housing, upstream of said seat and having a large end facing said housing and of an outer diameter less than said outer diameter of said housing and an inner diameter equal to said inner diameter of said valve seat, said housing having a passage of a diameter equal to said inner diameter between said large end of said filter and said valve seat, said housing



further having a cylindrical portion of said outer diameter of said housing extending away from said seat opposite said passage; and

a valve closing member in said housing cooperating with said seat.

5,482,081

## SINGLE HANDLE MANIFOLD

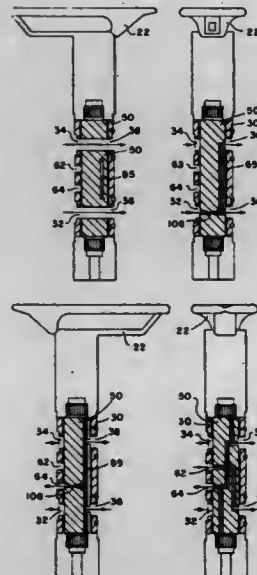
Don L. Adams, Tulla, Tex., assignor to D/A Manufacturing Co. Inc., Tulla, Tex.

Filed Apr. 14, 1995, Ser. No. 421,752

Int. Cl.<sup>6</sup> F16K 11/087

U.S. Cl. 137—597

11 Claims



1. A manifold for connecting a differential pressure transmitter to a source of differential pressure, comprising:

- a body having first and second input passageways adapted to be connected to the source of differential pressure, first and second instrument passageways adapted to be connected to a transmitter for measuring differential pressure, an equalizer passageway, a differential pressure calibration passageway, and a vent/static calibrate passageway;
- a rotor mounted for motion within the body between a first limit and a second limit;
- the rotor having a first selectable "NORMAL" position at the first limit, where the first input passageway is connected through the rotor to the first instrument passageway, and the second input passageway is connected through the rotor to the second instrument passageway, with the equalizer passageway, differential pressure calibration passageway and vent/static calibrate passageway being blocked by the rotor;
- the rotor having a second selectable "ZERO/REPRESSURIZE" position moved from the first selectable "NORMAL" position in the direction of the second limit, where the first input

passageway is connected through the rotor to the first and second instrument passageways by way of the equalizer passageway, the second input passageway is blocked by the rotor, with the differential pressure calibration passageway and vent/static calibrate passageway being blocked by the rotor;

the rotor having a third selectable "DEPRESSURIZE/GAGE P CALIBRATE" position moved from the second selectable "ZERO/REPRESSURIZE" position in the direction of the second limit, where the first and second input passageways are blocked by the rotor, the first and second instrument passageways are connected through the rotor to the vent/static calibrate passageway, with the differential pressure calibration passageway being blocked by the rotor; and

the rotor having a fourth selectable "AP CALIBRATE" position moved from the third selectable "DEPRESSURIZE/GAGE P CALIBRATE" position to the second limit, where the first and second input passageways are blocked by the rotor, the second instrument passageway is connected through the rotor to the vent/static calibrate passageway, and the first instrument passageway is connected through the rotor to the differential pressure calibration passageway.

5,482,082

## MULTI-PASSAGE FLUID COUPLING AND METAL SEAL THEREFOR

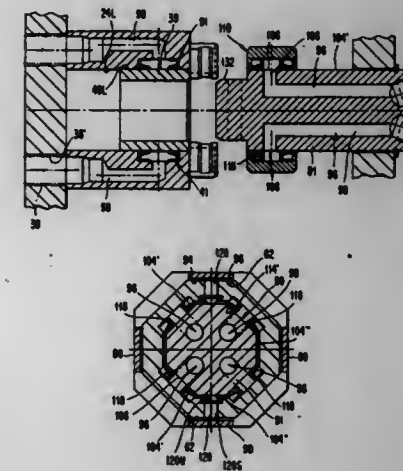
Edwin C. Turner, and Danny K. Wolff, both of Houston, Tex., assignors to Cooper Cameron Corporation, Houston, Tex.

Filed Jun. 22, 1994, Ser. No. 264,075

Int. Cl.<sup>6</sup> F16L 37/28

U.S. Cl. 137—614.03

15 Claims



1. A fluid coupling, comprising:

- a female part including:
  - a housing having a longitudinal aperture formed therein defining a longitudinal axis, said aperture being of polygonal cross-section comprising at least three inwardly facing walls,
  - a first plurality of at least three fluid-conducting passages formed in said housing and intersecting respective ones of said walls to form first lateral ports, and
  - a gate mounted in said aperture for longitudinal sliding movement between a port-blocking position sealingly blocking said first lateral ports and a port-unblocking position unblocking said first lateral ports;
- a male part including:
  - a conduit body defining a longitudinal axis and configured to enter said aperture, said conduit body being of polygonal cross-section corresponding to that of said aperture and comprising at least three outwardly facing walls arranged to be disposed opposite respective ones of the inwardly facing walls once the male and female parts have been joined,

5,482,083

## QUICK CONNECT COUPLING

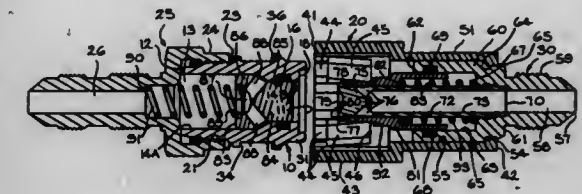
Gary M. Jensi, Jackson, Mich., assignor to Aeroquip Corporation, Maumee, Ohio

Filed Oct. 24, 1994, Ser. No. 327,982

Int. Cl.<sup>6</sup> F16L 37/28

U.S. Cl. 137—614.03

21 Claims



4. A coupling comprising:

- (a) A female member including a sleeve having an annular end defining an inlet and extending along an axis to an opposing end, a plurality of fingers, each extending cantilevered from a fixed end in the vicinity of said annular end in a direction away from said annular end and tapering inwardly toward said axis to a free end, said fingers being resiliently urgeable to move said free ends away from said axis, said free ends being spaced from said axis; and
  - (b) a male member including a body extending along an axis from a first end to an engagement end, said body including an engagement section in the vicinity of said engagement end having a generally cylindrical exterior sized to be receivable in said inlet, said exterior including cylinder defining portions and a plurality of camming faces recessed from said cylinder defining portions and cooperating therewith to form shoulders at said camming faces spaced from and facing away from said engagement end, each camming face being circumferentially separated from adjacent camming faces by said cylinder defining portions, said body, upon insertion of said engagement end into said female member inlet engaging and urging said fingers free ends away from said axis and, upon movement of said shoulders axially beyond said fingers free ends permitting said fingers free ends to move inwardly to engage said camming faces and said shoulders to retain said body engaged to said female member,
- said female member sleeve being capable of rotation relative to said body, said rotation causing said fingers to move circumferentially relative to said camming faces to a position engaged to said cylinder defining portions between adjacent camming faces thereby moving said fingers out of alignment with said shoulders and releasing said body from engagement with said female member and said female member sleeve being provided with a plurality of inwardly facing longitudinal grooves extending from said annular end, said grooves being circumferentially spaced around said inlet such that a pair of adjacent grooves are aligned on opposite sides of each

of said fingers and said body being provided with a plurality of posts positioned to be received in said grooves upon insertion of said body into said female member, said posts being releasably engageable with said fingers to prevent, and upon release permit, rotation of said female member sleeve relative to said body.

8. The coupling according to claim 4, wherein said body has positioned therein an axially displaceable valve yieldingly urgeable from a closed position when said body is disengaged from said female member to an open position when said body is engaged to said female member and wherein said female member is provided with an axially extending valve yieldingly moveable axially from a closed position when said female member is disengaged from said body to an open position when said female member is engaged to said body member.

5,482,084

## EAVESTROUGH DOWNSPOUT

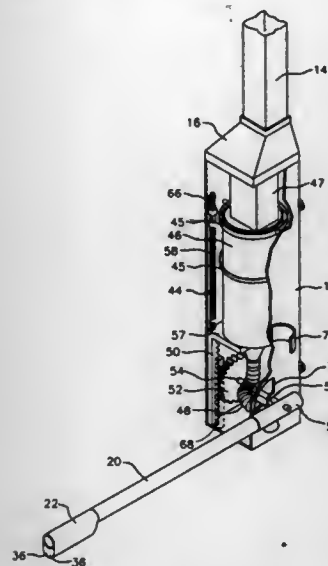
Douglas A. Cassidy, 335 Parkwood Close S.E., Calgary, Alberta, Canada, and Ronald S. Kossowan, #321, 1313 13th Avenue S.W., Calgary, Alberta, Canada

Filed May 10, 1995, Ser. No. 435,427

Int. Cl.<sup>6</sup> F16L 27/00

U.S. Cl. 137—615

8 Claims



## 1. An eavestrough downspout comprising:

an extension member for transporting water from an eavestrough system, the member being moveable between a storage position and a lowered position for transporting water away from the eavestrough system; and,

an actuator responsive to passage of water through the downspout to exert a force on the extension member to move the extension member between the storage position and the lowered position, the extension member having a reservoir for retaining an amount of water therein when in the lowered position, the reservoir being formed to retain an amount of water selected to have a relative weight in combination with the extension member sufficient to act against the force of the actuator to maintain the extension member in the lowered position.

5,482,085  
PILOT PRESSURE SUB-ASSEMBLY FOR FLUID CONTROL VALVE

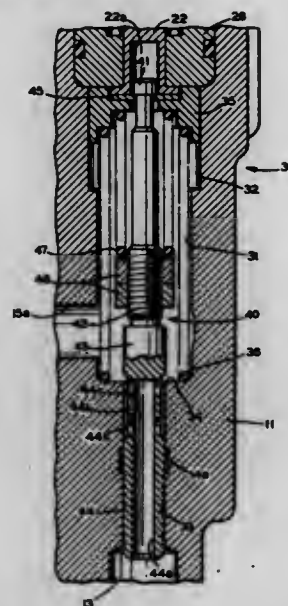
Jeffrey B. Wasson, Circle Pines, Minn., assignor to Dana Corporation, Toledo, Ohio

Filed Oct. 5, 1992, Ser. No. 956,681

Int. Cl.<sup>6</sup> F15B 13/02

U.S. Cl. 137—625.68

17 Claims



## 1. A control valve comprising:

a case including a first port, a second port, and a bore which is capable of providing communication between said first and second ports;

plunger means having at least a portion disposed within said bore for movement between first and second plunger means positions;

a spool disposed within said bore for movement between a closed position, wherein fluid communication is prevented between said first and second ports, and an opened position, wherein fluid communication is permitted between said first and second ports;

a spool spring seat mounted on said spool;

cooperating means formed on said spool and said spool spring seat and responsive to relative movement therebetween for adjustably positioning said spool spring seat on said spool at a desired location; and

a spring reacting between said plunger means and said spool spring seat for urging said spool from said closed position to said opened position when said plunger means is moved from said first plunger means position to said second plunger means position.

5,482,086

## HOSE WITH INTERMEDIATE COUPLING

Tadayoshi Hori; Terumitsu Oshima; Satoshi Mizutani, and Masanori Kumazaki, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Japan

Filed Jul. 18, 1994, Ser. No. 274,729

Int. Cl.<sup>6</sup> F16L 33/00

U.S. Cl. 138—103

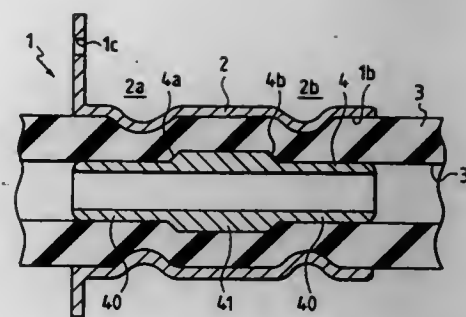
6 Claims

## 1. A hose coupling assembly comprising:

a coupling portion including a hollow sleeve extending therefrom;

a hose having an intermediate portion thereof housed within said hollow sleeve; and

a hollow, elongate nipple member disposed within said hose at a position generally corresponding to said intermediate portion of said hose, said nipple member comprising a first end



portion, a second end portion opposite said first end portion, and an intermediate portion between said first and second end portions, wherein an external diameter of said first end portion and an end portion of said second end portion are substantially equal to one another and are different than an external diameter of said intermediate portion,

wherein said nipple member includes a first tapered surface between said first end portion and said intermediate portion and a second tapered surface between said second end portion and said intermediate portion,

wherein said hollow sleeve includes at least first and second crimped portions at positions substantially corresponding to the locations of said first and second tapered surfaces, respectively.

5,482,087

## METHOD OF ENVIRONMENTALLY PROTECTING A PIPELINE

Noel M. M. Overbergh, Rotselaar, and Yvo Leest, Binkom, both of, Belgium, assignors to N.V. Raychem S.A., Kessel-Lo, Belgium

PCT No. PCT/GB92/01049, § 371 Date Dec. 21, 1993, § 102(e) Date Dec. 21, 1993, PCT Pub. No. WO93/00014, PCT Pub. Date Jan. 7, 1993

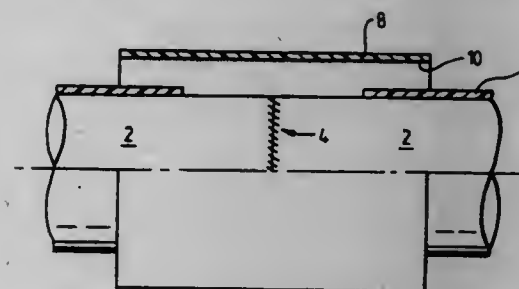
PCT Filed Jun. 11, 1992, Ser. No. 167,921

Claims priority, application United Kingdom, Jun. 24, 1991, 9113563

Int. Cl.<sup>6</sup> F16L 59/16

U.S. Cl. 138—110

18 Claims



1. A method of environmentally protecting a polymer-coated metal pipeline, or a joint between two such pipelines where the pipelines have been bared of polymer coating at the joint region, the method comprising:

(i) positioning a heat recoverable sheet which is coated on one surface thereof with a hot melt adhesive composition, such that the adhesive faces the pipeline, and such that the adhesive-coated sheet at least overlaps the polymer coating, the adhesive (a) comprising a mixture of 25 to 40 parts by weight of a polyethylene alkyl acrylate terpolymer containing maleic anhydride and having a melt flow index as determined according to ASTM D1238-70 of at least 40, and 25 to 70 parts by weight of a polyethylene alkyl acrylate copolymer having a melt flow index as determined according to ASTM D1238-70 of at least 40, and (b) having a maximum service

temperature at which the adhesive maintains a bond to a substrate and shows no movement when subjected to a static shear creep force of 2.50 to 2.75 N/cm<sup>2</sup>; and

(ii) heating the pipeline or joint to a temperature of at most 40° C. above the maximum service temperature of the adhesive, said temperature being sufficient to recover the sheet and to activate the adhesive.

18. A pipeline or joint between pipelines having a heat recovered sheet or helically wrapped tape adhered thereto by an adhesive (1) comprising a mixture of (i) 25 to 40 parts by weight of a polyethylene alkyl acrylate terpolymer containing maleic anhydride and having a melt flow index as determined according to ASTM D1238-70 of at least 40, and (ii) 25 to 70 parts by weight of a polyethylene alkyl acrylate copolymer having a melt flow index as determined according to ASTM D1238-70 of at least 40, and (2) having a maximum service temperature at which the adhesive maintains a bond to a substrate and shows no movement when subjected to a static shear creep force of 2.50 to 2.75 N/cm<sup>2</sup>; wherein the sheet or tape was recovered and the adhesive was activated to bond it to the pipeline by heating the pipeline or joint to a temperature of at most 40° C. above the maximum service of the adhesive.

5,482,088

## DOUBLE-CONTAINMENT SYSTEMS WITH AXIAL-GUIDING AND FLEXIBILITY SUPPORTS

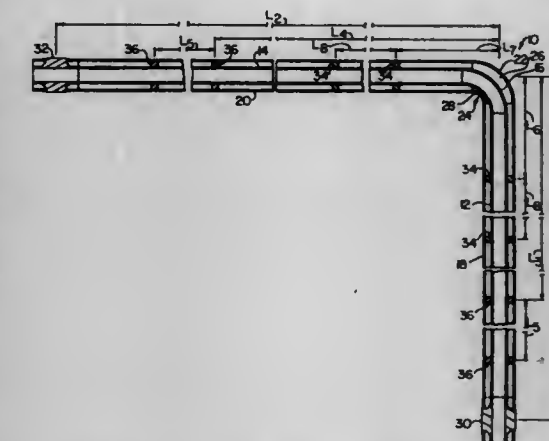
Christopher G. Zlu, 227 E. Lafayette St., Easton, Pa. 18042, assignor to Christopher G. Zlu, Merrimack, N.H.

Filed Jul. 9, 1993, Ser. No. 89,745

Int. Cl.<sup>6</sup> F16L 9/18

U.S. Cl. 138—113

23 Claims



## 1. A double-containment assembly, comprising:

a first anchor support;

at least one elbow fitting including an inner elbow section contained within an outer elbow section, and defining an unobstructed annulus between the inner and outer elbow sections permitting movement of the inner elbow section relative to the outer elbow section;

a first inner pipe section coupled between the first anchor support and the inner elbow section;

a first outer pipe section coupled between the first anchor support and the outer elbow section;

a first axial-guiding support spaced a first predetermined distance from the at least one elbow fitting and supporting the first inner pipe section within the first outer pipe section and including means for permitting axial movement of the first inner pipe section and first outer pipe section relative to each other and substantially preventing lateral movement of the first inner pipe section relative to the first outer pipe section; and

a first flexibility support spaced a second predetermined distance from the elbow fitting less than the first predetermined distance and supporting the first inner pipe section within the first outer pipe section.



first outer pipe section and including means for permitting axial and lateral movement of the first inner pipe section relative to the first outer pipe section.

5,482,089

# FLEXIBLE CONDUIT FOR THE EXHAUST LINE FOR AN INTERNAL COMBUSTION ENGINE

Otto Weber, Wolfsburg; Siegfried Grohnert, Cremlingen, and Rolf Kirach, Braunschweig, all of, Germany, assignors to Volkswagen AG, Wolfsburg, Germany

Continuation of Ser. No. 152,571, Nov. 15, 1993, abandoned.

This application Nov. 29, 1994, Ser. No. 346,351

Claims priority, application Germany, Dec. 18, 1992, 42 42 950.1

Int. Cl.<sup>6</sup> F16L 11/00

U.S. Cl. 138—122

4 Claims



1. A flexible conduit for an exhaust line of an internal combustion engine comprising a corrugated tube having a plurality of adjacent helical corrugations of like pitch forming a multiple thread providing separate adjacent troughs and only one helical spring-wire supporting coil which is frictionally received in the trough of only one of the plurality of adjacent helical corrugations and which has at least one end portion fixedly connected to the corrugated tube.

5,482,090

# WELDED TUBE WITH EXCELLENT CORROSION-RESISTANT INNER SURFACE

Hiroshi Yamanashi, Mishima, Japan, assignor to Usui Kokusai Sangyo Kaisha Limited, Shizuoka, Japan

Division of Ser. No. 984,628, Dec. 2, 1992, Pat. No. 5,277,228.

This application Jun. 2, 1993, Ser. No. 70,288

Claims priority, application Japan, Dec. 2, 1991, 3-343902

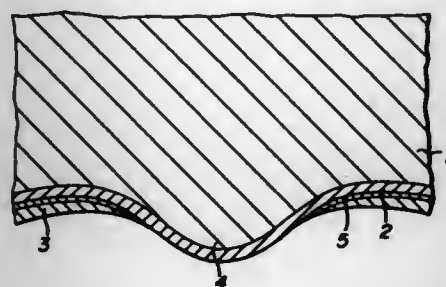
The portion of the term of this patent subsequent to Jan. 11, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> F16L 900/914

U.S. Cl. 138—171

5 Claims

1. A welded tube with an excellent corrosion-resistant inner



surface, comprising a tube having an inner surface, said inner surface comprising a bead part, said inner surface, including said bead part, having a first plate layer of one material selected from Sn, Sn-Zn, Sn-Ni, Ni-P and Ni-B, said first plate layer being overcoated with a second plate layer of one material selected from Ni, Co and alloys based on two or more of Ni, Co, Sn, Zn and B.

5,482,091

# FABRIC

Johnny Debaes, Wenduine, Belgium, assignor to N.V. Michel van de Wiele, Marke, Belgium

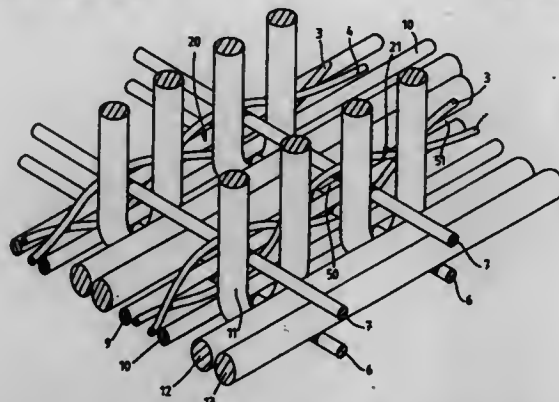
Filed Feb. 9, 1995, Ser. No. 385,803

Claims priority, application Belgium, Feb. 10, 1994, 09400159

Int. Cl.<sup>6</sup> D03D 27/00

U.S. Cl. 139—391

8 Claims



1. A fabric comprising:  
a plurality of binding warp threads arranged in pairs, each pair of binding warp threads being crossed to each other to form a plurality of openings;  
at least two weft threads passing through selected ones of said openings; and  
a plurality of tension warp threads, each pair of binding warp threads being disposed between at least two of said tension warp threads, the number of said tension warp threads relative to the number of pairs of said binding warp threads being maintained at a ratio of at least two to one.

5,482,092

# NON-ROTATING WIRE ROUTING DEVICE AND METHOD

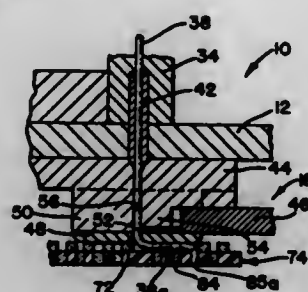
Alan C. Van Zeeland, Cortland, and Louis J. Liguore, Poland, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 31, 1992, Ser. No. 937,027

Int. Cl.<sup>6</sup> B21F 27/00

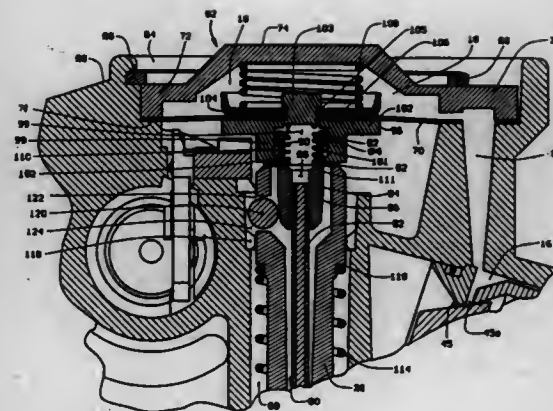
U.S. Cl. 140—92.1

22 Claims



1. A wire routing device (10) for routing conductor wire onto a bus plate to manufacture routed wire bussing assemblies comprising:

a base plate (12) supporting a wire feed mechanism (14) and a wire routing head (16),  
the wire routing head (16) comprising a horn plate (44) and a horn (48) that are non-rotatably secured to the base plate (12), the horn plate (44) having a depending rib (50) that has two steps that provide an anvil riser (52) beneath an intermediate guide step (54) and a through bore (56) that is chamfered at its upper end to receive a tip of a feed tube (42) and whose bottom end opens onto the guide step (54) next to the anvil riser (52),  
the wire routing head (16) further comprising a cutter blade (46) having a hollow end (58) that is guided on the guide step (54) and that has a lower cutting edge (60) that cooperates with the anvil riser (52) to cut off wire that is being fed through the through bore (56),  
the horn (48) having a disk shaped body that is fastened to the underside of the horn plate (44) over the depending rib (50) and that has a longitudinal slot (64) that receives the depending rib (50) and the cutting end of the cutter blade (46) when it is fastened in place, and  
the horn (48) having an inverted funnel shaped orifice (72) including an inverted funnel shaped portion (72f) whose diameter progressively increases toward an exit end for routing wire (38) onto an adjacently located bus plate (76) having islands defining a network of wire receiving channels and passages in order to manufacture bus assemblies.



vided upon the nozzle body to actuate said poppet valve, and an automatic shut-off means responsive to pressure to effect the closing of said poppet valve, said automatic shut-off means having a plunger connected to said lever and moving said lever away from said poppet valve when said automatic shut-off means is activated, a cavity provided within the nozzle body to house the automatic shut-off means, a latch ring mounting within the body cavity, a plurality of retention balls seated in an upper end of said plunger and disposed to engage said latch ring when biased outwardly, a latch pin disposed to seat in the upper end of said plunger and normally biasing said retention balls outwardly to engage said latch ring and to hold said nozzle poppet valve open for dispensing of fuel, said latch pin having a collar-like means including an annular sleeve-like collar mounted upon and extending upwardly from the latch pin integrally formed proximate its upper end thereof to limit the downward movement of the latch pin with respect to the plunger, and for further limit the downward movement of the diaphragm support with respect to the latch pin collar it surrounds, a diaphragm provided above said latch pin within the cavity, said diaphragm having a diaphragm support, said diaphragm support operatively associated with said latch pin, said diaphragm and said diaphragm support disposed to rise and fall with changes in pressure generated upon said diaphragm during fuel dispensing, said diaphragm support having a shoulder means formed surrounding its lower end thereof and surrounding said collar-like means of the latch pin to engage said collar-like means upon the latch pin during functioning of the automatic shut-off means, the collar-like means of said latch pin and the shoulder means of the diaphragm support defining a lost motion gap therebetween so that said latch pin can move downwardly for a distance independently of said diaphragm and said diaphragm support, and said diaphragm and diaphragm support can move upwardly for a distance, independent of said latch pin in response to changes in pressure generated upon said diaphragm, without effecting premature shut-off from said nozzle during fuel dispensing.

5,482,093

# AUTOMOTIVE FLUIDS CATCH BASIN

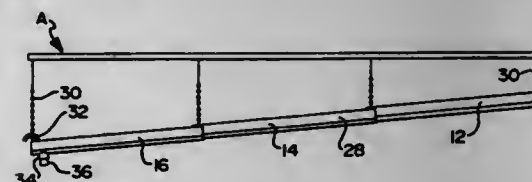
Brian M. Tremonti, Bloomfield Hills; Michael S. Belling, Royal Oak; Douglas W. Holmes, Eastpointe, all of Mich., and Robert B. Kujawski, 24272 Kelly Rd., Eastpointe, Mich. 48021, assignors to Baytech, Inc., Southfield, Mich.

Filed Jul. 15, 1994, Ser. No. 275,769

Int. Cl.<sup>6</sup> B65B 1/04; 3/04; B67C 3/02

U.S. Cl. 141—98

21 Claims



1. A catch basin for automotive fluids adapted for use beneath a mechanic's catwalk which is itself extended beneath an automobile undergoing maintenance or repair operations, said catch basin comprising:

a generally rectangular, planar body portion formed of two dihedrally angled planar body halves, said diedral angle generally along a longitudinal, generally medial axis of said rectangular body portion, said body halves angled downwardly to form a trough; and  
supports for supporting said body portion from the catwalk.

5,482,094

# FUEL DISPENSING NOZZLE WITH DELAYED SHUT-OFF

Thomas O. Mitchell, St. Louis County, Mo., assignor to Husky Corporation, Pacific, Mo.

Filed Aug. 1, 1994, Ser. No. 283,609

Int. Cl.<sup>6</sup> B67D 5/377

U.S. Cl. 141—209

1 Claim

1. A fuel dispensing nozzle comprising, a nozzle body with a fuel passage formed therethrough, a spout assembly attached to said nozzle body and in fluid communication therewith, a poppet valve interposed in said fluid passage within said nozzle body to control fuel flow through said nozzle, a hand operated lever pro-

5,482,095

# CASE FOR A DOSING ACCESSORY ADAPTED TO BE FIXED ON A BOTTLE

Michel de Chollet, Paris, France, assignor to Laboratoire Suppo Steril, Rambouillet, France

Filed Aug. 24, 1994, Ser. No. 295,206

Claims priority, application France, Aug. 26, 1993, 93 10267

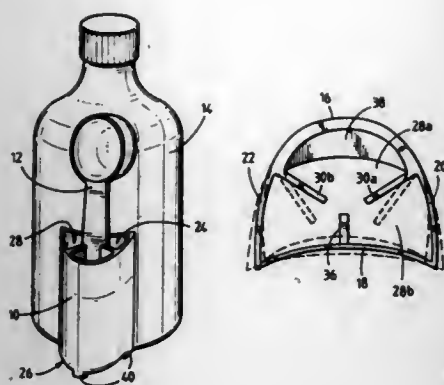
Int. Cl.<sup>6</sup> B65D 21/00

U.S. Cl. 141—380

11 Claims

1. A case for a dosing accessory adapted to be fixed on a bottle comprising a front wall, a rear wall, two side walls, an open upper end and a lower end, said case presenting a housing adapted to receive, at least partially, a dosing accessory received via said open upper end, wherein:

a) the housing is delimited by the front wall, the rear wall and the side walls, all of said walls being integral with one another,



- b) the rear wall is capable of being adhered to the bottle, and  
c) the rear wall and the side walls are elastically deformable and fit bottles of different curvatures.

5,482,096

### TRANSPOSING INCLINED MORTISE TEMPLATE ASSEMBLY

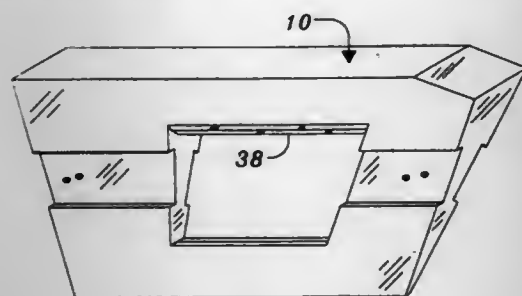
Thomas G. Russell, 1368 Cedar La., Middletown, Del. 19709-9312

Filed Jul. 18, 1994, Ser. No. 276,796

Int. Cl.<sup>6</sup> B27C 5/10

U.S. Cl. 144—144.5 R

12 Claims



1. In a template assembly for facilitating cutting a first, angularly, inclined recess and a second, transposed, angularly, inclined recess into a work-piece having a plurality of sides and suitable for use with a power tool with a work contacting surface, the combination of:

- A. a first pair of spaced inclined power tool supports,  
1. said first supports defining a first plane and providing a support surface to receive the work contacting surface of the power tool;  
B. a second pair of spaced inclined power tool supports,  
1. said second supports being attached to said first supports and defining a second plane disposed at an acute angle to said first pair of spaced power tool supports and providing a second support surface to receive the work contacting surface of the power tool;  
2. a template for locating the engagement of the power tool cutting blade, having a trapezoidal interior perimeter and defining a plane, positioned upon the bisecting plane of the created angle between the first and second pairs of power tool supports;  
C. a first work holding surface,  
1. said first work holding surface defining a plane, recessed within and parallel to said first pair of power tool supports;  
D. a second work holding surface,  
1. said second work holding surface defining a plane, recessed within and parallel to said second pair of power tool supports.

5,482,097

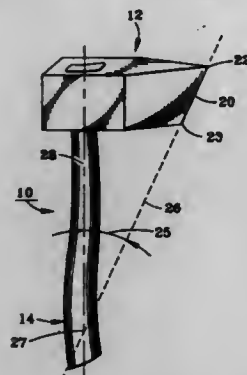
### WOOD SPLITTING MAUL

Nelson D. Maine, 138 Western Ave., Henniker, N.H. 03242  
Continuation-in-part of Ser. No. 216,257, Mar. 22, 1994, Pat. No. 5,394,917. This application Feb. 14, 1995, Ser. No. 389,132

Int. Cl.<sup>6</sup> B27L 7/00; B26B 23/00

U.S. Cl. 144—193 C

19 Claims



1. In an improved striking tool head unit having a means for attaching a handle of predetermined length with a head end and a bottom end, said head unit having incorporated thereon at least one striking face said improvement comprising:  
at least one striking face having a topmost point and a lowermost point;  
a striking face angle substantially defined by a drawn straight line connecting said topmost point and said lowermost point of said striking face to a pivot point and an axis of said handle when said handle is attached to said striking tool head unit, said handle pivot point located between substantially a user gripping section proximate said bottom end and a location defined by about the elbow of a user of said improved striking tool head unit with said handle attached thereto; and  
a substantially flat outward surface substantially perpendicular to said handle when said handle is attached to said head unit said flat outward surface being adjacent to said topmost point of said striking face.

5,482,098

### FEEDING DEVICE FOR CURVED WORKPIECES

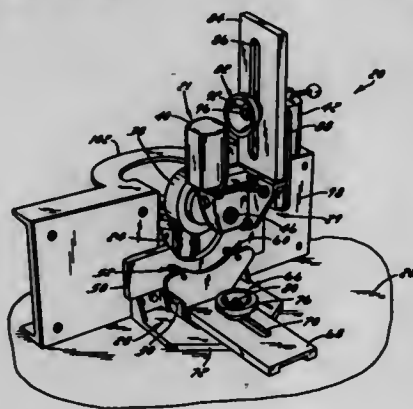
Dean A. Loppnow, N8619 Ski Slide Rd., Ixonia, Wis. 53036, and Dale D. Steffen, W264 N5695 Mountain Meadow Dr., Sussex, Wis. 53089

Filed Sep. 1, 1994, Ser. No. 299,843

Int. Cl.<sup>6</sup> B23B 31/00

U.S. Cl. 144—253 B

18 Claims



8. A feeding device for feeding a workpiece through a shaping device having a vertically projecting cutting head and a base, the feeding device comprising:

first, second, and third rollers for feeding the workpiece past the cutting head and for providing a three point support for the workpiece;

- a horizontal guide which horizontally guides the workpiece through the jig;  
a horizontal adjustment mounted to the base and to the horizontal guide for adjusting the distance between the horizontal guide and the cutting head; and  
a vertical adjustment mounted to the base for adjusting the height of at least one of the rollers with respect to the base.

5,482,099

### PNEUMATIC RADIAL TIRE INCLUDING A TREAD PORTION DIVIDED INTO FOUR CIRCUMFERENTIAL REGIONS

Shinzo Kajiwara; Yoshio Konli, and Minao Yanase, all of Kobe, Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan

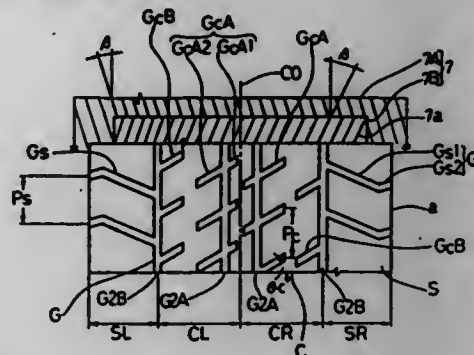
Continuation of Ser. No. 695,324, May 3, 1991, abandoned, which is a division of Ser. No. 441,973, Nov. 28, 1989, abandoned. This application Apr. 30, 1993, Ser. No. 54,828

Claims priority, application Japan, Nov. 30, 1988, 63-302983; Nov. 30, 1988, 63-302984; Nov. 30, 1988, 63-302985; Nov. 30, 1988, 63-302988; Nov. 30, 1988, 63-302990

Int. Cl.<sup>6</sup> B60C 101/00; 111/00

U.S. Cl. 152—209 R

2 Claims



1. A pneumatic radial tire comprising  
a pair of bead portions,  
a bead core disposed in each of said bead portions,  
a carcass extending between the pair of bead portions and turned up around each of the bead cores,  
a belt comprising at least two plies of steel cords disposed radially outside the carcass,  
said steel belt cords in each of said at least two belt plies laid at an inclination of 18 degrees or less with respect to the tire equator, one of said at least two plies being the radially outermost ply,  
each of said at least two belt plies having a cord quantity NS of 18.0 mm<sup>2</sup> or more, wherein the cord quantity NS is defined as the total cross sectional area of said steel belt cords S (mm<sup>2</sup>) per 10 centimeters width of belt ply,  
a tread portion disposed radially outside the carcass and having a pair of tread edges, said tread portion including only four straight circumferential grooves made up of a pair of axially outer circumferential grooves and a pair of axially inner circumferential grooves,  
said tread portion being divided in the axial direction of the tire into four circumferential regions having substantially equal axial widths made up of a pair of axially inner circumferential regions, one of said inner circumferential regions extending axially outward from each side of the tire equator, and a pair of axially outer circumferential regions, one of said outer circumferential regions extending axially inward from each said tread edge,  
one of said pair of axially outer circumferential grooves disposed axially between the axially inner and outer circumferential regions, and one of said pair of axially inner circumferential

ential grooves disposed in each said axially inner circumferential regions,

said tread portion being provided with a plurality of first lateral grooves, a plurality of second lateral grooves and a plurality of third lateral grooves, said first lateral grooves being disposed in each of said outer circumferential regions, each of said first lateral grooves having a first part and a second part, said first part having an axially outer end and a length exceeding 70% of the axial width of each of said outer circumferential regions and being inclined at a first inclination angle of 40 degrees or less with respect to the axial direction of the tire, said first inclination angle being reverse to the inclination of the cords of the outermost ply, said second part extending between said outer end to said tread edge,

said second lateral grooves being disposed in each of said inner circumferential regions, each of said second lateral grooves being divided by intersection with one of said axially inner circumferential grooves into a primary part and a secondary part, each said primary part and each said secondary part having a blind end, said blind end of said secondary part being disposed axially near the tire equator and said blind end of said primary part being disposed axially apart from the tire equator, said second lateral grooves being inclined at a second inclination angle of 35 degrees or less with respect to the axial direction of the tire, said second inclination angle inclining along the inclination of said cords of the outermost ply and said second inclination angle being reverse to said first inclination angle, and

said third lateral grooves being disposed to each of said inner circumferential regions, each of said third lateral grooves having an axially inward blind end and an axially outward end which opens to one of said axially outer circumferential grooves and being inclined at a third inclination angle of 35 degrees or less with respect to the axial direction of the tire, said third inclination angle inclining along the inclination of said cords of the outermost ply.

5,482,100

### CORDLESS, BALANCED VENETIAN BLIND OR SHADE WITH CONSISTENT VARIABLE FORCE SPRING MOTOR

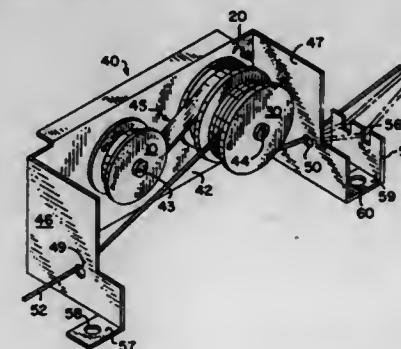
Otto Kuhar, Garfield, N.J., assignor to Newell Operating Company, Freeport, Ill.

Filed Apr. 6, 1994, Ser. No. 223,989

Int. Cl.<sup>6</sup> E06B 9/30

U.S. Cl. 160—170

19 Claims



1. A window covering of the type including a top member for supporting the covering in a horizontal position and a bottom member, the window covering further including a cord means coupled to the bottom member and extending to the top member for supporting the bottom member as it is moved toward and away from the top member, wherein the covering accumulates on and is supported by the bottom member as the bottom member is moved toward the top member, the improvement comprising:

at least one consistent variable force spring drive motor being coupled to the cord means and wherein the spring drive motor comprises a coiled, elongate spring generally rectangular in



cross-section which varies in width from a first end thereof to a second end thereof, wherein the spring force varies to substantially balance the combined weight of the bottom member and the covering as it accumulates on the bottom member as the bottom member is moved toward the top member, and wherein the spring force is sufficient to maintain the bottom member at any position with respect to the top member.

# 5,482,101 PRESSING-IN DEVICE

Roland Fink, Winterbach, Germany, assignor to Oskar Frech GmbH & Co., Schorndorf, Germany

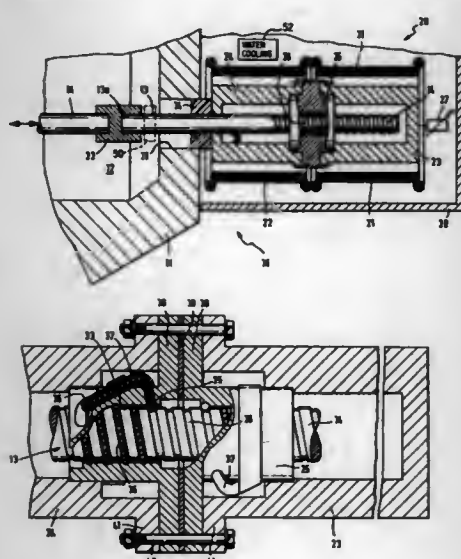
Filed Mar. 28, 1994, Ser. No. 218,593

Claims priority, application Germany, Mar. 30, 1993, 43 10 310.3

Int. Cl.<sup>6</sup> B22D 17/00

U.S. Cl. 164—312

9 Claims



1. An apparatus comprising:  
a pressure die casting machine;  
a pressing-in device for said pressure die casting machine, said pressing-in device comprising a casting piston for pressing casting material into a mold, and an electric motor for driving said casting piston via a spindle interacting with a nut;  
wherein the nut for the spindle is fixedly connected with rotors of the electric motor, said nut engaging with a threaded portion of the spindle, and wherein said rotors form a protective housing completely enclosing the threaded portion of the spindle.

# 5,482,102

## PNEUMATIC MOTORCYCLE TIRE FOR IMPROVED CORNERING AND STRAIGHT RUNNING STABILITY

Shigehiko Suzuki, Amagasaki, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Filed Jun. 1, 1994, Ser. No. 251,970

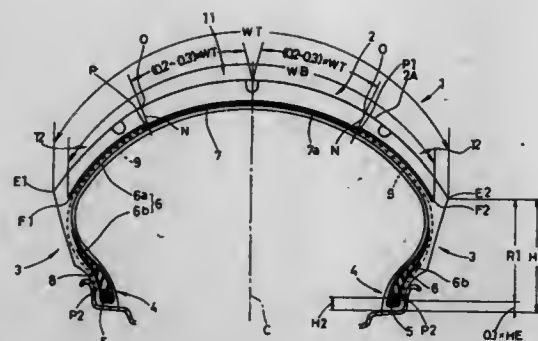
Claims priority, application Japan, Jun. 7, 1993, 5-164002; Apr. 4, 1994, 6-090594

Int. Cl.<sup>6</sup> B60C 9/09; 9/22

U.S. Cl. 152—530

3 Claims

1. A pneumatic motorcycle tire comprising  
a tread portion with axial edges, said tread portion curved so that the maximum cross-sectional width of the tire lies between the tread edges,  
a pair of axially spaced bead portions,



- a pair of sidewall portions extending between the tread edges and the bead portions,
- a pair of bead cores, one disposed in each bead portion,
- a carcass comprising at least one ply of cords having a main portion extending between the bead portions and a pair of turned up portions each turned up around one of said bead cores,
- a belt disposed radially outside the carcass and inside the tread portion, said belt consisting of a single ply formed by spirally winding a ribbon-shaped strip of rubber in which at least one cord is embedded along the longitudinal direction thereof, at an angle to the tire equator, said belt having a width in a range of 0.85 to 0.95 times a tread surface width,
- a pair of axially spaced reinforcing cord layers disposed radially inside of the belt and outside of the carcass,
- each reinforcing cord layer extending from a point (P1) in the tread portion on each side of the tire equator towards the sidewall portion beyond the belt edge,
- said point (P1) being spaced apart from the tire equator such that, when a straight line is drawn normal to the tread surface through the point, the distance measured along the tread surface from the tire equator to the normal line is in a range of from 0.2 to 0.3 times the tread surface width measured along a tread surface from one tread edge to the other tread edge,
- with respect to the tire equator, the cords of one of the reinforcing cord layers are inclined reversely to the cords of the other reinforcing cord layer,
- each reinforcing cord layer consisting of a single ply of parallel organic fiber cords inclined at an angle of 20 to 70 degrees to the tire equator to cross the carcass cords,
- said ply of each said reinforcing cord layer being rubberized with a topping rubber having a 100% modulus of 25 to 55 kgf/cm<sup>2</sup>,
- each reinforcing cord layer has a radially inner edge extended to near the bead core, not turned up around the bead core, and terminated at a height in a range of from 0.1 to 0.3 times a height of a tread edge, each measured from a base of the bead portion.

# 5,482,103

## DOOR APPARATUS WITH RELEASE ASSEMBLY

Coy H. Burgess, and Joel M. Bonnell, both of Dixon, Ill., assignors to Raynor Garage Doors, Dixon, Ill.

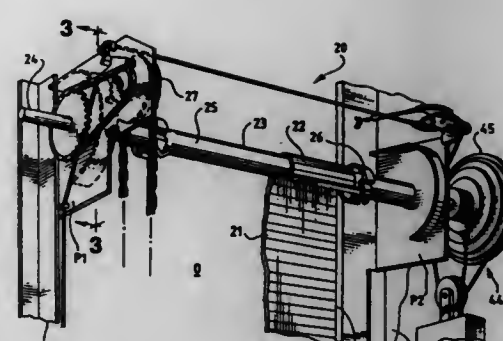
Filed Feb. 3, 1994, Ser. No. 191,419

Int. Cl.<sup>6</sup> F05F 15/20

U.S. Cl. 160—9

17 Claims

1. A closure apparatus closing an opening in a partition including a frame disposed around the opening, said opening including a top end and a bottom end, said closure apparatus comprising: core means rotatably mounted to the partition at the top end of the opening for rotation about a predetermined axis; a curtain member secured to the core means, said curtain member wrapping around the core means to move out of the opening and extending from the core means to close the opening; counterweight means connected to the core means for countering the weight of the curtain member; reducing weight means connected to the frame for reducing the weight of the counterweight means; activating means for engaging



the reducing weight means with the counterweight means to reduce the weight of the counterweight means and allow the curtain member to unwind from the core means and close the opening and for disengaging the reducing weight means from the counterweight means.

# 5,482,104

## GUIDE SYSTEM FOR VERTICALLY MOVEABLE FLEXIBLE DOOR

Dale M. Lichy, 214 Royal Daulton Ct., Gibsonsia, Pa. 15044

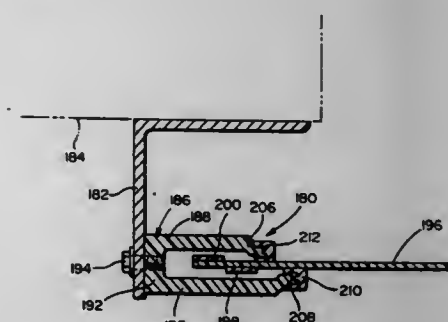
Continuation-in-part of Ser. No. 70,949, Jun. 4, 1993. This

application Nov. 12, 1993, Ser. No. 151,384

Int. Cl.<sup>6</sup> E06B 9/17

U.S. Cl. 160—273.1

6 Claims



1. In a vertically movable closure door including a flexible curtain movable vertically between a closed position in occluding relation to a door opening and an open position out of registry with the door opening, a guide structure along side edges of a door opening for guiding movement of the flexible curtain, the improvement comprising each guide structure including a guide channel opening toward the door opening, said guide channel being defined by spaced, generally parallel flanges, coacting means adjacent the side edge of the curtain and the flanges of the guide channel to releasably retain the side edge of the curtain within the guide channel, to guide the vertical movement of the curtain, and to release the curtain from the guide channel upon engagement of a sufficient impact force on said curtain, said coacting means including laterally extending, outwardly and inwardly facing projections adjacent the side edge of the curtain on opposite surfaces thereof and laterally extending inwardly facing projections on each of said flanges with the projections on the flanges and curtain normally facing each other during vertical movement of the curtain said projections on said flanges of the guide channel being releasably secured to said flanges to retain the side edge of the curtain within the guide channel during vertical movement and enabling the projections on said flanges to be displaced by separation from the flanges of the guide channel upon an excessive impact force engaging the curtain, thereby enabling the side edge of the curtain to separate from the guide channel.

# 5,482,105 CLUTCH CONTROL FOR ROLLER SHADES

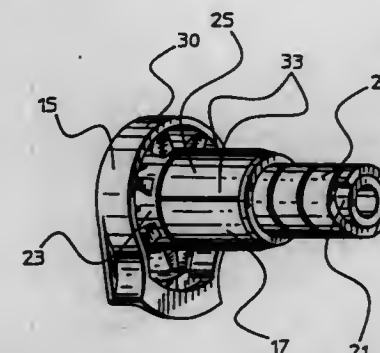
Edward T. Rude, Columbia, Md., assignor to General Clutch Corporation, Stamford, Conn.

Filed May 12, 1994, Ser. No. 241,848

Int. Cl.<sup>6</sup> E06B 9/56

U.S. Cl. 160—307

16 Claims



1. A spring clutch assembly for a window shade system comprising:  
a fixed housing element including an extending shaft;  
a rotating pulley element comprising a pulley member rotatably mounted to said housing element and adapted to receive therealong an operating cord or chain;  
at least one helically wound axially mounted spring which makes a frictional braking contact with said shaft and having one end thereof irrotatably affixed to said rotating pulley element.

# 5,482,106

## PROCESS FOR THE CASTING OF METALS IN A CONTINUOUS CASTING INSTALLATION WITH CONTINUOUS STRAND WITHDRAWAL

Erich Höffken; Dieter Krüger, both of Dinslaken; Heinz Matzen, Oberhausen; Günter Pietzko, Essen, and Jürgen Scharlack, Duisburg, all of, Germany, assignors to Thyssen Stahl AG, Duisburg, Germany

Continuation of Ser. No. 972,284, Nov. 4, 1992, abandoned.

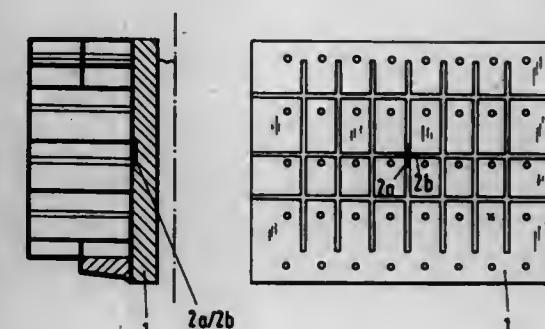
This application Aug. 6, 1994, Ser. No. 286,986

Claims priority, application Germany, Nov. 15, 1991, 41 37 588.2

Int. Cl.<sup>6</sup> B22D 11/16; 11/20

U.S. Cl. 164—454

8 Claims



1. A process for continuous casting of a metal, comprising, continuously withdrawing a strand of said metal from a mold along a strand withdrawal direction, measuring the expansion of an inside wall of said mold along said strand withdrawal direction, eliminating from the measurement of the expansion of said inside wall of said mold along said withdrawal direction a heat expansion component to obtain a component of the expansion of the metal strand.

inside wall expansion in the stand withdrawal direction due to mechanical forces exerted on said inside wall, and controlling the speed of said withdrawal based on said component of the inside wall expansion in the stand withdrawal direction due to mechanical forces.

5,482,107

## CONTINUOUSLY CAST ELECTRICAL STEEL STRIP

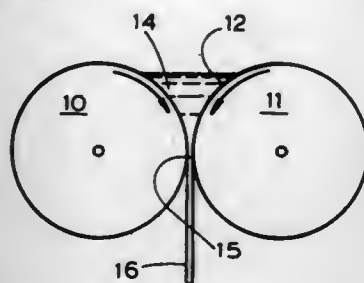
Robert R. Judd, Crown Point, Ind., assignor to Inland Steel Company, Chicago, Ill.

Filed Feb. 4, 1994, Ser. No. 192,056

Int. Cl.<sup>6</sup> A22D 11/06; 11/00

U.S. Cl. 164—480

30 Claims



1. A method for producing an electrical steel strip having an aim final thickness from which core laminations for rotating electrical machinery or transformers are to be punched, said strip having a predominant crystalline texture characterized by a {100} plane of the unit cubes lying in a plane of the strip parallel to the surface of the steel strip with said {100} planes being randomly oriented in said plane of the strip, said method comprising the steps of:

providing a molten steel having a composition comprising sufficient ferrite stabilizer (a) to provide a body-centered-cubic (b.c.c.) phase in said steel initially upon solidification thereof and (b) to maintain said b.c.c. phase during cooling of the steel to ambient temperature following solidification;

subjecting said molten steel to a continuous strip casting step to produce a strip having an initial thickness less than about 120% of said aim final thickness;

said continuous strip casting step comprising solidifying said molten steel into a strip that, initially upon full solidification, comprises a predominantly dendritic steel microstructure having said b.c.c. phase and said predominant crystalline texture characterized by a {100} plane of the unit cubes lying in a strip plane parallel to the plane of the surface of the steel strip with said {100} planes being randomly oriented in said strip plane (a {100} <uvw> texture);

and providing said strip with said aim final thickness;

said method being devoid of any step after said continuous strip casting step which substantially changes said b.c.c. phase and said predominant crystalline texture that existed in said strip initially upon full solidification.

5,482,108

## METHOD FOR REGENERATIVE HEAT EXCHANGER

Stefan Essle, Tyresö, and Bo Sångfors, Nacka, both of, Sweden, assignors to Svenska Rotor Maskiner AB, Stockholm, Sweden

PCT No. PCT/SE92/00867, § 371 Date May 27, 1994, § 102(e) Date May 27, 1994, PCT Pub. No. WO93/12386, PCT Pub. Date Jun. 24, 1993

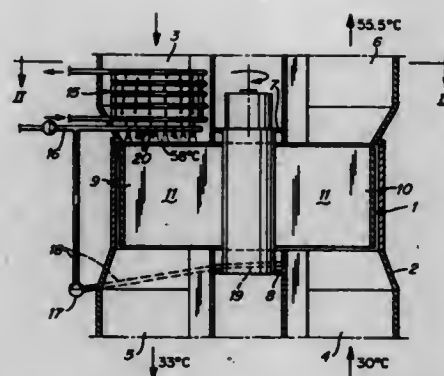
PCT Filed Dec. 16, 1992, Ser. No. 244,478

Claims priority, application Sweden, Dec. 17, 1991, 9103730 Int. Cl.<sup>6</sup> F23L 15/02

U.S. Cl. 165—3

12 Claims

1. A method for operating a heat exchanger to achieve optimal energy exchange for heat exchange in a regenerative heat exchange



unit between combustion air and precooled wet flue gasses, which flue gasses were precooled in a cooling device (15), said regenerative heat exchange unit having a flue gas side (9), an air side (10) and regenerative heat exchanger heat transferring elements (13) which are rotated from the flue gas side (9) to and through the air side (10) and then return to the flue gas side (9), the method comprising:

sprinkling water on surfaces of the heat transferring elements (13) on the flue gas side (9) so that a water film is formed on the surfaces of the heat transferring elements (13) to such an extent that said heat transferring element surfaces are sufficiently wet so that during their entire stay on the air side (10), while being rotated through the air side (10), said heat transferring element surfaces are substantially 100% covered with water.

5,482,109

## MODULAR HEAT EXCHANGER

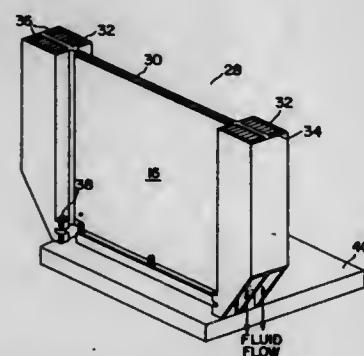
Scott H. Kunkel, Centreville, Va., assignor to E-Systems, Inc., Dallas, Tex.

Filed Mar. 15, 1994, Ser. No. 212,781

Int. Cl.<sup>6</sup> F28F 7/00; H05K 7/20

U.S. Cl. 165—80.3

21 Claims



1. A modular heat exchanger comprising: a chassis having a mounting surface; plural modules, each of said modules being removably attachable to said mounting surface and comprising, a thermally conductive plate for carrying electronic components, and a heat transfer duct attached to each of two opposing edges of said plate for conveying a coolant along an edge of said plate, each said duct being connected so that coolant does not pass through more than one said duct, said plate and each said heat transfer duct forming an uninterrupted thermal path for conducting heat from the electronic components to the coolant; and plural fins in said duct for facilitating conduction of heat from said duct to the coolant, said fins being in thermal communication with said duct.

5,482,110

## DEVICE FOR COOLING A DEPOSIT-FORMING GAS

Ralf-Uwe Hartermann, Wiehl; Hubert Scheid, Gummersbach; Reinald Schulze-Eckel, Munster, and Joachim Papendick, Engelskirchen, all of, Germany, assignors to L. & C. Steinhilber GmbH, Gummersbach, Germany

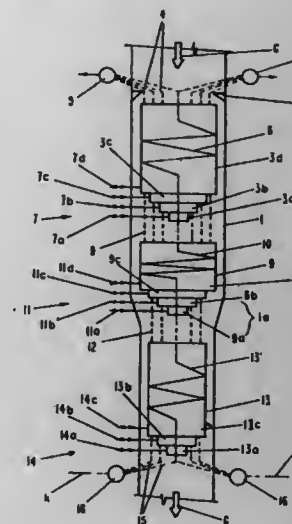
Filed Jul. 22, 1994, Ser. No. 278,877

Claims priority, application Germany, Jul. 22, 1993, 43 24 586.2

Int. Cl.<sup>6</sup> F28G 1/08

U.S. Cl. 165—84

10 Claims



1. A device for cooling a gas that forms deposits, said device comprising:

an upright container through which a gas to be cooled flows; at least two heating surface units comprised of at least one heating surface of a closed geometry, said at least two heating surface units positioned within said upright container one atop the other, wherein a cooling medium flows through said at least two heating surface units;

a plurality of heating devices, wherein each said heating surface has one said heating device coordinated therewith;

said container comprising a support, wherein an upper one of said at least two heating surface units is supported at said support of said container; and

at least one array of connecting tubes for conveying the cooling medium, with said at least one array of connecting tubes connecting respectively a lower one of said at least two heating surface units to an adjacent upper one of said at least two heating surface units such that said lower one of said at least two heating surface units is suspended by said connecting tubes and such that the cooling medium flows sequentially through said at least two heating surface units, wherein said at least one array of connecting tubes has an open geometry such that a beating effect of said beating devices on said heating surfaces is unimpaired by said at least one array of connecting tubes.

5,482,111

## INSTALLATIONS FOR CLEANING TUBES BY CIRCULATING SPONGY BALLS, IN PARTICULAR IMPROVEMENTS RELATING TO IMPREGNATING THE BALLS WITH WATER

André Bizard, Paris, France, assignor to Technos et Compagnie, Suresnes, France

Filed Jun. 20, 1994, Ser. No. 262,530

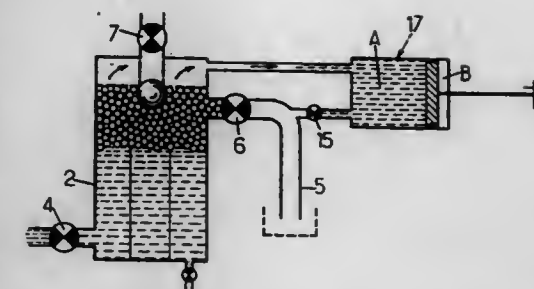
Claims priority, application France, Jun. 22, 1993, 93 07547

Int. Cl.<sup>6</sup> F28G 1/12

U.S. Cl. 165—95

7 Claims

1. Apparatus for impregnating spongy balls for cleaning tubes, the apparatus comprising a tank interposed between first and



second valves associated respectively with a water inlet duct and with a water outlet duct, a coupling provided with a third valve connecting the top of the tank to a source of new cleaning balls, a grid having a mesh that is too small to allow the balls to pass disposed inside the tank in such a manner as to define an upper chamber at the top of the tank which is inaccessible to the balls, a duct fitted with a fourth valve connecting said chamber to an outlet, and a device suitable for generating a pressure reduction in said chamber, said device for generating a pressure reduction comprising a pump having two compartments separated by a moveable member, one of said compartments being in fluid communication with said upper chamber whereby, when the first, second, third and fourth valves are all closed, movement of said moveable member in a first direction causes an increase in the volume defined by the inside of said tank and by the spaces in fluid communication with the inside of the tank and movement of said moveable member in a second direction, opposite to said first direction, eliminates the increase in said volume, said apparatus further comprising means for moving said moveable member in said first and second directions.

5,482,112

## CONDENSER

Hironaka Sasaki; Ryochi Hoshino, and Takayuki Yasutake, all of Oyamashi, Japan, assignors to Showa Aluminium Kabushiki Kaisha, Osaka, Japan

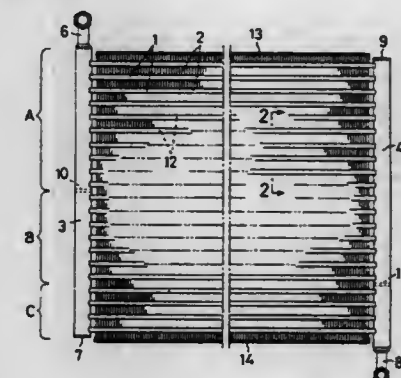
Continuation of Ser. No. 16,475, Feb. 10, 1993, abandoned, which is a continuation of Ser. No. 614,016, Nov. 14, 1990, abandoned, which is a continuation of Ser. No. 358,821, May 30, 1989, abandoned, which is a continuation-in-part of Ser. No. 328,896, Mar. 27, 1989, Pat. No. 4,936,379, which is a division of Ser. No. 77,815, Jul. 27, 1987, Pat. No. 4,825,941.

This application Nov. 17, 1994, Ser. No. 341,428 Claims priority, application Japan, Jul. 29, 1986, 61-179763; Nov. 4, 1986, 61-263138; Sep. 14, 1988, 63-120820 The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.

Int. Cl.<sup>6</sup> F28B 1/06; F28F 1/02

U.S. Cl. 165—110

5 Claims



1. A condenser for liquefying gaseous coolant in an air conditioning system of an automobile after the system has compressed the coolant, said condenser comprising:



- (i) a plurality of flat tubular elements defining flow paths and disposed in a spaced, substantially parallel relation, each element including at least one inside wall;
- (ii) a plurality of fin members, each fin member disposed between adjacent tubular elements;
- (iii) a pair of headers disposed in a spaced, substantially parallel relation at opposite ends of the tubular elements, the one and/or the other header defining a coolant inlet and a coolant outlet for the condenser, each header being an elongate member and defining, for each tubular element, an opening through which it receives the tubular element and establishes fluid communication with the element;
- (iv) at least one partitioning plate mounted in one of the headers transversely of the header to divide the inside opening of the header, said plate including a first portion which extends into a slit in the header and a second portion which is generally co-extensive with the inside opening of the header, said second portion of the partitioning plate being without any perforations;

the coolant flowing from the inlet into one header and making a first pass through a plurality of the tubes to the other header, the coolant also making a final pass through a plurality of tubes to the outlet, the tubular elements and headers forming a first zone which receives gaseous coolant from the inlet and a final zone through which the coolant flows before discharging through the outlet, the effective cross sectional area of the flow paths defined by the tubular elements through which the coolant makes the final pass being 30 to 60% of the effective cross sectional area of the flow paths of those through which the coolant makes the first pass; said condenser being able to resist internal pressures greater than 10 atmospheres;

each flat tubular element having the following dimensions:  
width: 6.0 to 20 mm  
height: 1.5 to 7.0 mm  
height of each cooling medium flow path: 1.0 mm or more;  
the fin members having the following dimensions:  
height: 6.0 to 16 mm  
fin pitch: 1.6 to 4.0 mm.

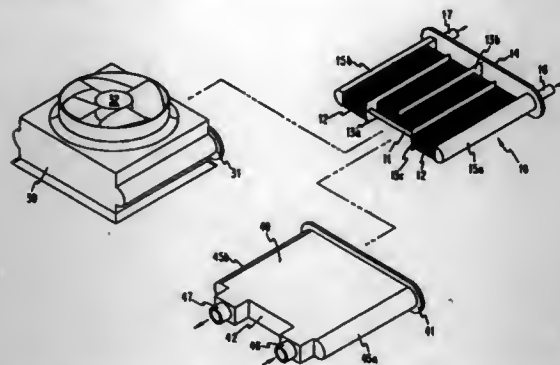
5,482,113

#### CONVERTIBLE HEAT EXCHANGER FOR AIR OR WATER COOLING OF ELECTRONIC CIRCUIT COMPONENTS AND THE LIKE

Dereje Agonafer; Timothy M. Anderson; Gregory M. Chrysler; Richard C. Chu; Robert E. Simons, all of Poughkeepsie, N.Y., and David T. Vader, Mechanicsburg, Pa., assignors to International Business Machines Corporation, Armonk, N.Y.  
Filed Aug. 25, 1993, Ser. No. 111,755  
Int. Cl.<sup>6</sup> F28F 9/00

U.S. Cl. 165—137

10 Claims



1. A convertible heat exchanger, especially for air or liquid cooling of electronic circuit components, said heat exchanger comprising:

- a base plate;
- a plurality of liquid flow conduits in fluid flow communication with inlet and outlet manifold means with fluid being supplied

able to and withdrawable from said inlet and outlet manifold means through said base plate; and  
a plurality of fins arranged in parallel with respect to one another and through which said liquid flow conduits pass and with which said fins are in thermal contact, said fins also being configured in a staggered pattern so as to at least partially define a serpentine liquid flow path when employed in conjunction with a shroud which completes said flow path definition and which may be disposed around said fins and said conduits, said shroud being sealably affixable to said base plate.

5,482,114

#### CHARGED AIR COOLER MOUNTING BARS

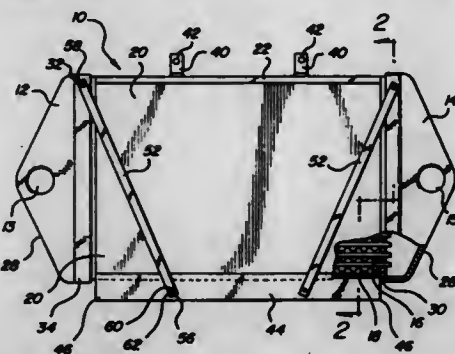
James W. B. Lu, Mt. Pleasant, S.C., assignor to Behr Heat Transfer Systems, Inc., Charleston, S.C.

Filed Feb. 13, 1995, Ser. No. 387,348

Int. Cl.<sup>6</sup> F28F 9/00

U.S. Cl. 165—149

8 Claims



1. A heat exchanger assembly comprising:  
a pair of manifolds (12, 14) having openings (13, 15) to convey fluid therethrough and including first and second distal ends (32, 34);  
a core member (20) connected between said pair of manifolds (12, 14) and between said first and second distal ends (32, 34) for conveying fluid between said manifolds (12, 14) and through said core member (20) for heat exchange;  
said core member (20) including a plurality of fluid tubes (16) extending and connected between said manifolds (12, 14) for communicating fluid, a plurality of fins (18) connected between said fluid tubes (16) for enhancing heat exchange with fluid within said fluid tubes (16), and an upper structural side support member (22) extending between and connected to said manifolds (12, 14) at said distal ends;  
a lower structural side support member comprising a mounting bracket (44) extends between and is connected to said manifolds (12, 14) at said distal ends for mounting said assembly in operation; and  
said assembly characterized by including loading member (52) extending between and directly connected to said mounting bracket (44) and said manifold (12, 14) to provide support of said assembly through said manifolds (12, 14) and said mounting bracket (44).

5,482,115

#### HEAT EXCHANGER AND PLATE FIN THEREFOR

Jitsuo Ikeya; Yoshiro Nakamura, and Hirotohi Fukuoka, all of Shizuoka, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 24, 1995, Ser. No. 394,297

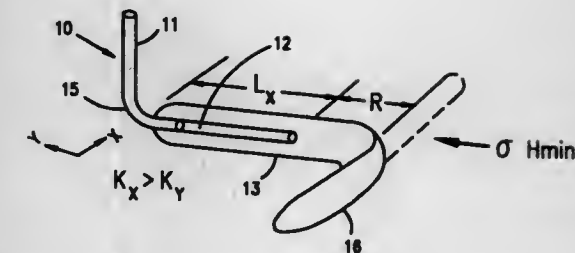
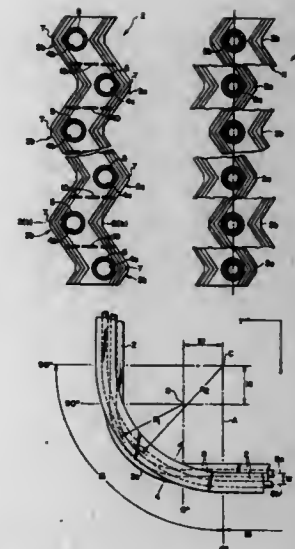
Claims priority, application Japan, Feb. 25, 1994, 6-028308

Int. Cl.<sup>6</sup> F28D 1/04; F28F 1/32

U.S. Cl. 165—151

8 Claims

1. A plate fin having a zigzag shape defining a plurality of sharp parts pointing alternately in opposite directions, the plate fin hav-



steps (b) and (c) being performed without a vertical fracture being initially formed that is transverse to the minimum horizontal stress.

5,482,117

#### GAS-LIQUID SEPARATOR FOR WELL PUMPS

Miroslav Kolpak, Dallas, and S. Michel Bucaram, Plano, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 13, 1994, Ser. No. 354,535

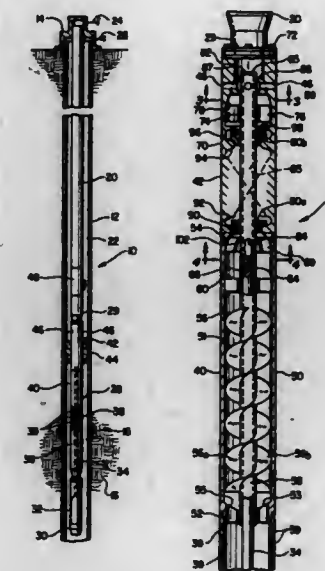
Int. Cl.<sup>6</sup> E21B 43/38

U.S. Cl. 166—265

24 Claims

ing a plurality of weakened portions each provided between adjacent sharp parts and holes in the sharp parts aligned in two lines in the longitudinal direction of the plate fin.

3. A bent heat exchanger comprising:  
a plurality of plate fins, each fin having a zigzag shape defining a plurality of sharp parts pointing alternately in opposite directions, a plurality of weakened portions each provided between adjacent sharp parts and holes in the sharp parts aligned in two lines in the longitudinal direction of the plate fin; and  
a plurality of tubes, each passing through one of the holes of each of the plate fins, respectively, so as to form two rows of tubes in the longitudinal direction of the plate fins; said tubes being bent so that a first row of tubes and a second row of tubes at a corner section are the same length, and said sharp parts are separated from each other at the weakened portions along the corner section.
6. A method for manufacturing a heat exchanger comprising the steps of:  
stacking a plurality of longitudinal plate fins with a predetermined space therebetween, each of the plate fins having a zigzag shape defining a plurality of sharp parts pointing alternately in opposite directions, the plate fins including a plurality of weakened portions, each between adjacent sharp parts and holes provided at the sharp parts;  
inserting each of a plurality of tubes into one of the holes of each of the plate fins, respectively, so as to form two rows of tubes in the longitudinal direction of the plate fins; and  
bending a predetermined portion of the tubes and fins, the bending causing adjacent sharp parts of each of the plate fins to separate from each other so that the lengths of the tubes of the first and second rows are equalized.



5,482,116

#### WELLBORE GUIDED HYDRAULIC FRACTURING

A. Wadood El-Rabaa, Plano, and Jon E. Olson, Dallas, both of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 10, 1993, Ser. No. 165,072

Int. Cl.<sup>6</sup> E21B 43/26; 47/00

U.S. Cl. 166—250.1

20 Claims

1. A method of controlling the direction of a hydraulic fracture induced from a highly deviated wellbore comprising the steps of:  
(a) drilling a highly deviated wellbore in a formation in a direction parallel to a desired fracture direction;  
(b) supplying fracturing fluid through said wellbore to induce a hydraulic fracture in said formation; and  
(c) maintaining in said hydraulic fracture an average net treating pressure at least greater than the maximum horizontal stress pressure less the minimum horizontal stress pressure to extend said hydraulic fracture beyond the end of the wellbore;

1. In a well pump for pumping fluids from a wellbore space through a tubing string to the surface, said pump including a motor section and pump means drivenly connected to said motor section for pumping liquid through said well to the surface, the improvement characterized by:

- a gas-liquid separator including housing means connected to said pump and in communication with a gas-liquid mixture in a wellbore space of said well;
- a substantially helical baffle interposed in said housing means and operable to receive a gas-liquid mixture and for effecting separation of said gas-liquid mixture into a gas flow stream and a liquid flow stream;
- a conduit disposed downstream of said baffle in the direction of flow of fluid through said separator for conducting gas to bypass said pump; and
- said housing means defines a passage for admitting liquid to an inlet opening of said pump for pumping said liquid through said well toward the surface.

5,482,118

**PROCESS FOR RECOVERING HYDROCARBON**  
Thomas J. Clough, Grover Beach, Calif., assignor to Ensci Inc., Pismo Beach, Calif.

Continuation-in-part of Ser. No. 981,185, Nov. 24, 1992, Pat. No. 5,339,900. This application May 16, 1994, Ser. No. 242,187

Int. Cl.<sup>6</sup> E21B 43/22

U.S. Cl. 166—274

33 Claims

1. A process for reducing the contaminant component composition in an aqueous-based material comprising:  
contacting said aqueous-based material with at least one added plant derived aromatic component having ortho-quinone functionality and mixtures thereof, said contacting occurring at conditions effective to chemically modify the contaminant; and  
reduce the contaminant level of said contaminant aqueous-based material.

5,482,119

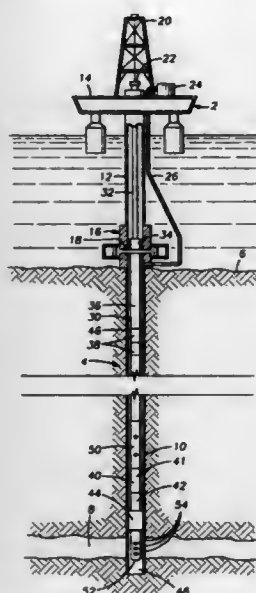
**MULTI-MODE WELL TOOL WITH HYDRAULIC BYPASS ASSEMBLY**

Kevin R. Manke, Flower Mound, and Curtis Wendler, Carrollton, both of Tex., assignors to Halliburton Company, Houston, Tex.

Filed Sep. 30, 1994, Ser. No. 316,534  
Int. Cl.<sup>6</sup> E21B 34/10

U.S. Cl. 166—374

20 Claims



13. A method of operating a testing string tool comprising the steps of:

- providing a tool for use in a testing string disposed in a well bore, the tool comprising:
  - an exterior housing defining a central flow conducting passage;
  - an operating element within the exterior housing operable between two positions, a first position wherein the flow conducting passage through said tool is blocked, and a second position, wherein the flow conducting passage is not blocked;
  - a fluid circulating assembly within the housing operable between two positions, a first position wherein fluid is communicated between an external well bore annulus and the central flow conducting passage, and a second position wherein fluid communication between an external well bore annulus and the central flow conducting passage is blocked;

- an operating mandrel assembly slidably disposed within the exterior housing and operably associated with the operating element and the fluid circulating assembly, the operating mandrel assembly being responsive to variations in annulus pressure to move between a number of mandrel positions each of which correspond to preset positions for the operating element and for the fluid circulating assembly to configure the tool into distinct operative modes;
- a pressure conducting channel within the housing for effecting responsiveness of the operating mandrel assembly to annulus pressure changes, the pressure conducting channel comprising a fluid spring to store increases in fluid pressure within the channel and release the stored pressure into a channel upon a decrease in annulus pressure, and, a pressure passageway in fluid communication with an external wellbore annulus and the fluid spring;
- an overrideable position controller to dictate response of the operating mandrel assembly to variations in annulus pressure, the position controller comprising a ratchet assembly interrelating the operating mandrel assembly and the exterior housing, the ratchet assembly comprising a ratchet path and a ratchet member which is movably received in and directable within the ratchet path providing a default position sequence provided by a first, cyclical ratchet path within which the ratchet member is directed to maintain the operating mandrel assembly in its primary mandrel positions during annulus pressure changes, said position controller being overrideable to permit selective movement of the operating mandrel assembly into alternate mandrel positions;
- configuring the tool into a well test mode in which the operating element is in its second position and the circulating assembly is in its second position;
- operating said tool such that the ratchet member is maintained within the primary ratchet path by increasing annulus pressure, storing the increase within the fluid spring and releasing the stored pressure;
- redirecting said ratchet member into the second ratchet path by increasing annulus pressure during the release of stored pressure.

5,482,120

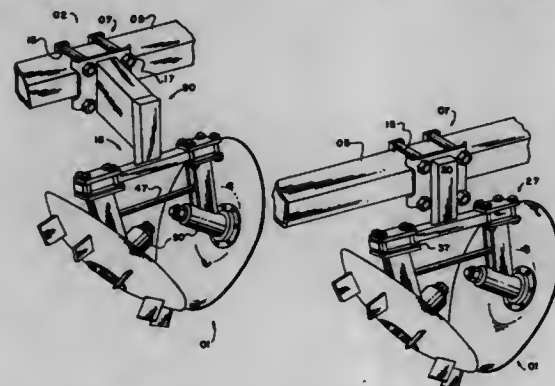
**METHOD AND APPARATUS FOR REMOVING PLANT STALKS**

Drew Lloyd, 119 Mae Ave., Floydada, Tex. 79235  
Filed Jan. 21, 1994, Ser. No. 184,579

Int. Cl.<sup>6</sup> A01B 45/02

U.S. Cl. 172—21

20 Claims



- A plant stalk pulling device, comprising:
  - a paired disk pulling assembly connected to a tool bar by an inverted T-shaped mounting assembly;
  - said paired disk pulling assembly comprising two concave disks, said two disks oriented to engage one another at a pinch point so that said engagement occurs at a circumferential edge of a first of said disks and an interior face of a second of said disks;

said inverted T-shaped mounting assembly comprising:  
a vertical member connected to said tool bar at an upper end of said vertical member;  
a horizontal member connected to a lower end of said vertical member so that two distal ends of said horizontal member each project away from said vertical member;  
two disk extension arms are connected to and project below said horizontal member with one disk connected at lower distal ends of each of said arms;  
a first of said extension arms is connected by an adjustable connecting assembly to said horizontal member proximate to one of said two distal ends of said horizontal member and a second of said extension arms is connected to said horizontal member proximate to the other of said two distal ends of said horizontal member;  
said horizontal member being oriented so that said paired disk pulling assembly is canted forward so that a line extending from a center point of either of said disks to said pinch point departs from vertical at approximately twenty-two degrees; and  
said extension arms being spaced upon said horizontal member so that said pinch point is established between said two disks.

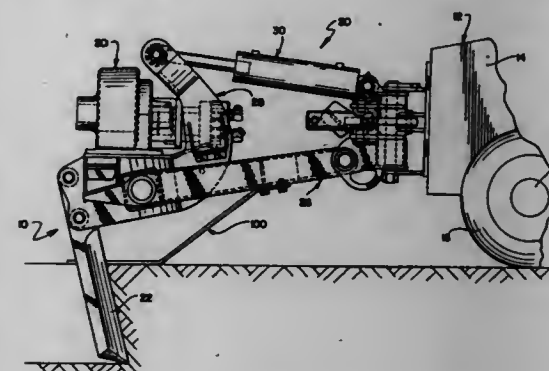
5,482,121

**VIBRATORY CABLE PLOW ASSEMBLY**  
Robert G. Draney; James W. Donoghue, both of Wichita; Mark D. Bird, Clearwater, and David W. Beatenbough, Wichita, all of Kans., assignors to Case Corporation, Racine, Wis.

Filed Nov. 18, 1993, Ser. No. 154,305  
Int. Cl.<sup>6</sup> E02F 5/02

U.S. Cl. 172—40

21 Claims



- A vibratory cable plow assembly comprising:
  - a lower fore-and-aft elongated linkage including a pair of laterally spaced arms at a distal end thereof, with a proximal end of said linkage having a connection for allowing said linkage to be pivotally connected to a fore-and-aft extending frame of an off-highway implement such that the lower linkage is permitted to vertically move about a forward generally horizontal axis;
  - a frame connected intermediate its free ends between and for rocking movement relative to the laterally spaced arms of said lower linkage about a rearward generally horizontal axis spaced in a fore-and-aft direction from and extending generally parallel to said forward generally horizontal axis, said frame having an elongated plow blade connected to and extending in depending angular relation from a first free end, and wherein a second free end of said frame terminates vertically above the rearward horizontal axis thereof;
  - a vibratory assembly mounted on said frame for imparting vibratory movements to an elongated plow blade connected toward one end of said frame; and
  - a linearly distensible/retractable driver having a proximal end adapted for pivotal connection to the frame of said implement, said driver extending above said lower linkage and is pivot-

ally connected toward the second free end of said frame whereby distention/retraction of said driver causes rocking movements of the frame about the rearward axis thereby selectively modifying the disposition of said elongated plow blade relative to the lower elongated linkage.

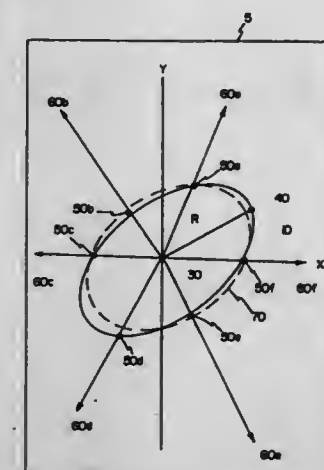
5,482,122

**ORIENTED-RADIAL-CORES RETRIEVAL FOR MEASUREMENTS OF DIRECTIONAL PROPERTIES**  
Hazim H. Abass; Matthew E. Blach, both of Duncan, Okla., and James J. Venditto, Sugar Land, Tex., assignors to Halliburton Company, Dallas, Tex.

Filed Dec. 9, 1994, Ser. No. 352,469  
Int. Cl.<sup>6</sup> E21B 49/02

U.S. Cl. 175—50

9 Claims



- A method for the determination of anisotropic material properties within a generally horizontal plane of a subterranean rock formation, comprising the steps of:
  - extracting a plurality of radially oriented core samples from the sidewall of an open well borehole within a given horizontal plane;
  - testing said core samples to determine a measurement of at least one material property of each core sample;
  - estimating the anisotropic distribution of said material property within said horizontal plane in response to said determined measurements of said material property.

5,482,123

**METHOD AND APPARATUS FOR PRESSURE CORING WITH NON-INVADING GEL**

Pierre E. Collee, Kingwood, Tex., assignor to Baker Hughes Incorporated, Houston, Tex.

Continuation-in-part of Ser. No. 51,093, Apr. 21, 1993, Pat. No. 5,360,074, and a continuation-in-part of Ser. No. 214,392, Mar. 16, 1994. This application Oct. 25, 1994, Ser. No. 328,872

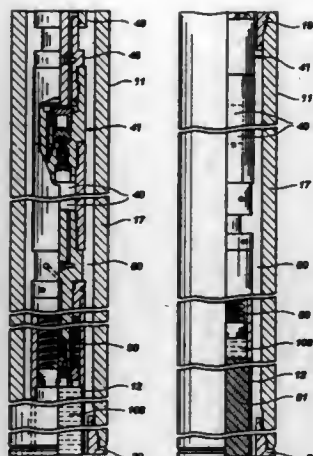
Int. Cl.<sup>6</sup> E21B 25/08

U.S. Cl. 175—58

17 Claims

- An apparatus for taking a core sample of rock from a subterranean formation, comprising:
  - a pressure core barrel including:
    - an outer barrel having a core bit secured to the lower end thereof adapted to cut said core sample for receipt by said core barrel;
    - an inner tube assembly adapted to receive said core sample and maintain said core sample under pressure; and
    - a non-invasive gel disposed in said inner tube assembly for encapsulating said core sample as it is received by said inner tube.





6. A method of taking a core sample of rock from a subterranean formation at the bottom of a borehole filled with drilling fluid, comprising:

- providing a pressure core barrel including an outer barrel having a core bit secured to the lower end thereof, and an inner tube assembly structured to receive a core sample cut by said core bit and to maintain said core sample under pressure;
- disposing a quantity of non-invasive gel in said inner tube assembly;
- running said core barrel to the bottom of said borehole at the end of a drill string;
- cutting said core sample by rotating said outer barrel with said drill string and engaging said formation with said core bit;
- receiving said core sample in said inner tube assembly as it is cut and encapsulating said core sample as it is received with said non-invasive gel;
- trapping said core sample under pressure in said inner tube assembly; and
- retrieving said core barrel with said pressurized, encapsulated core sample contained in said inner tube assembly.

5,482,124

## ROCK DRILL

August Haussmann, Oberzell, and Bernhard Moser, Altschausen, both of, Germany, assignors to Hawera Probst GmbH + Co., Ravensburg, Germany

Filed Nov. 4, 1994, Ser. No. 336,649

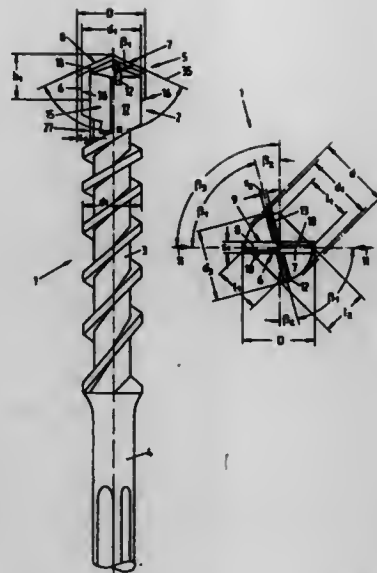
Claims priority, application Germany, Dec. 11, 1993, 43 42 324.8; Mar. 4, 1994, 44 07 119.1

Int. Cl.<sup>6</sup> E21B 10/36; 10/44

U.S. Cl. 175—415

14 Claims

1. A rock drill for a hammer drilling machine, comprising:
  - one of a single-thread and a multi-thread discharge helix;
  - a drill head connected with said discharge helix and having an end face, and a cross section taken approximately transverse to a longitudinal axis of said drill, the cross section having one of a substantially rectangular and lozenge-shaped profile defined by two mutually opposite, approximately axially parallel side flanks forming respective drilling dust grooves and by two mutually opposite segment portions;
  - a main cutting tip arranged on said end face and extending over an entire diameter of said drill head to project radially beyond an outer circumferential contour thereof, and being comprised of a hard metal, said main cutting tip further being inclined in a shape of a roof as viewed relative to a side thereof, and including two cutting edges; and
  - an auxiliary cutting tip arranged transversely to said main cutting tip at an acute angle between about 60° and about 90°; said auxiliary cutting tip and said main cutting tip each passing diagonally through said cross section, and each having a first side surface having an applied force acting thereupon, and a second side surface opposite to said first side



surface; a radially outer region of at least the second side surface of said auxiliary cutting tip and said main cutting tip being substantially entirely embedded in and supported by said drill head at at least said segment portions.

5,482,125

## STEERABLE FOUR WHEEL DRIVE VEHICLE

Jeffery M. Pagett, Griffith, Australia, assignor to J. Pagett Industries Pty Limited, New South Wales, Australia

PCT No. PCT/AU92/00649, § 371 Date Jun. 3, 1994, § 102(e)

Date Jun. 3, 1994, PCT Pub. No. WO93/10735, PCT Pub.

Date Jun. 10, 1993

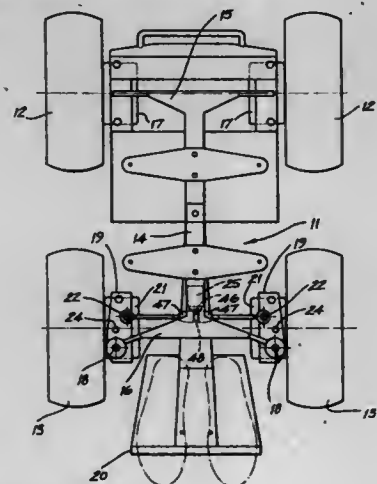
PCT Filed Jul. 14, 1994, Ser. No. 244,705

Claims priority, application Australia, Dec. 5, 1991, PK9870

Int. Cl.<sup>6</sup> B62D 9/00

U.S. Cl. 180—6.32

15 Claims



1. A wheelchair comprising:

- a frame, with a pair of front wheels and a pair of rear wheels movably supporting the frame, and a seat and a footrest mounted on the frame;
- a motor drivably connected to each wheel for rotating that wheel in its vertical plane;
- a steering means wherein at least the front pair of wheels is castor mounted on the frame so that each wheel freely pivots about a respective vertical axis, the steering means further comprising a linkage means connecting the pair of castor mounted wheels so that the castor mounted wheels pivot

generally in unison, and control means to control power to be independently delivered to each of the wheels to steer the wheelchair; and

wherein the frame comprises a slender, longitudinally extending intermediate portion with front and rear end portions at respective opposite ends thereof, the front and rear pairs of wheels being mounted to the front and rear end portions respectively; wherein the footrest is mounted to the front end portion of the frame, is positioned between a forward portion of each of the front pair of wheels, and has a width which is greater than that of the intermediate portion of the frame which is positioned between a rearward portion of each of the front pair of wheels; and wherein each one of the castor mounted front wheels has a positive trail with a horizontal axis about which the wheel rotates, being spaced from and on a rearward side of the vertical pivotal axis about which it pivots so as to maximize the pivotal movement of the front wheels while not allowing the wheels to interfere with the footrest or the frame.

5,482,126

## TRACK-TENSIONING EQUIPMENT

René Bouit, Riorges; André Lorrain, Mably, and Jacques Tillier, Montagny, all of, France, assignors to Giat Industries, France

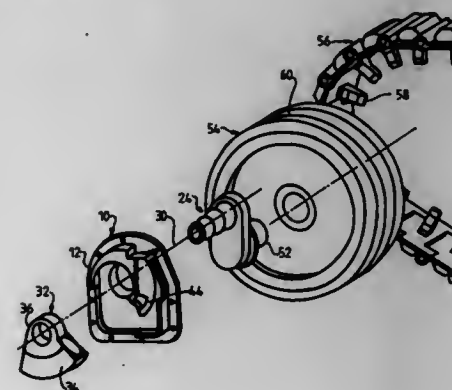
Filed Dec. 8, 1994, Ser. No. 352,245

Claims priority, application France, Dec. 8, 1993, 93 14704

Int. Cl.<sup>6</sup> B62D 55/30

U.S. Cl. 180—9.1

11 Claims



1. Track-tensioning equipment for a vehicle, comprising:

- a pulley for guiding a track of a vehicle;
- a crankshaft on which said pulley is rotatably mounted;
- a rotary hydraulic actuator for rotating said crankshaft about an axis of rotation, thereby displacing said pulley to tension the track, said rotary hydraulic actuator comprising a cylinder element and a piston element, one of said cylinder and piston elements being stationary and adapted to be secured to the vehicle, the other of said cylinder and piston elements being secured to said crankshaft to be rotatable therewith about said axis of rotation; and
- feed and control means for controlling the rotary hydraulic actuator.

5,482,127

## ELECTRIC POWER STEERING DEVICE

Hiroshi Eda; Hironobu Shiono, and Isamu Chikuma, all of Maebashi, Japan, assignors to NSK Ltd., Tokyo, Japan

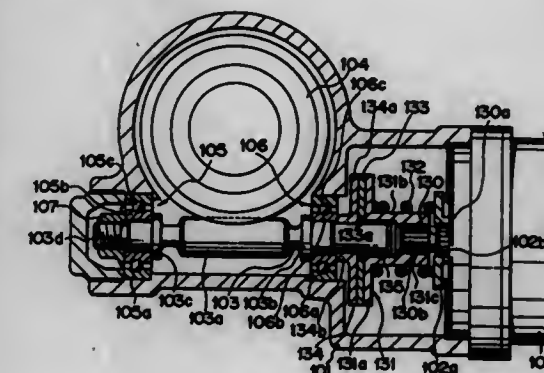
Filed Jun. 1, 1994, Ser. No. 251,946

Claims priority, application Japan, Jun. 1, 1993, 5-029057 U; Dec. 13, 1993, 5-066258 U

Int. Cl.<sup>6</sup> B62D 5/04

U.S. Cl. 180—79.1

3 Claims



1. An electric power steering device, comprising:

- a housing;
  - a motor with a rotary shaft, mounted on said housing;
  - an output shaft adapted to be connected to a steering mechanism for steering wheels;
  - a reducing mechanism coupled to said output shaft; and
  - power transmission means coupling said rotary shaft to said reducing mechanism and adapted to effect power transmission;
- wherein said power transmission means includes a transmission shaft, a rolling bearing rotatably supporting said transmission shaft relative to said housing, and a frictional face and pressure means which are frictionally engaged to couple said transmission shaft to said rotary shaft to effect power transmission, said pressure means being pressed to said frictional face by a spring with a spring force which is predetermined to allow slippage between said frictional face and said pressure means when said transmission shaft is subjected to a force tending to counteract an output force of said motor;
- said power transmission means further including a portion disposed to transmit pressing force of said pressure means to a ring of said rolling bearing to eliminate play of said rolling bearing.

5,482,128

## POWER STEERING APPARATUS

Manabu Takaoka, Kitakatsuragi, and Masayuki Watanabe, Uji, both of, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Dec. 7, 1994, Ser. No. 350,947

Claims priority, application Japan, Dec. 7, 1993, 6-017485; Dec. 7, 1993, 5-306583; Feb. 14, 1994, 5-327933

Int. Cl.<sup>6</sup> B62D 5/04

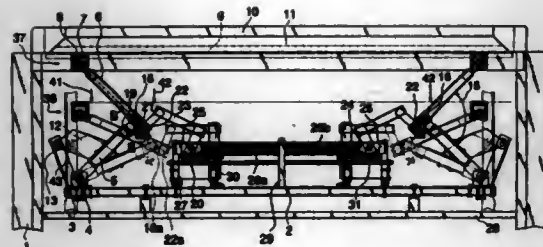
U.S. Cl. 180—79.1

13 Claims

1. An electric power steering apparatus, comprising:
  - steering assisting electric motor;
  - worm directly connected to an output side of said electric motor;
  - an output shaft connected to a steering mechanism of a vehicle;
  - a lock nut screwed on an outer circumference of said output shaft;
  - a worm wheel fitted on the outer circumference of said output shaft and installed coaxially therewith by tightening said lock nut, said worm wheel engaging with said worm; and
  - a slip plate that, is interposed at least between contact faces of said worm wheel and said output shaft, and that causes stable







maximum distance from the truck and an out-of-operation position where said bail is positioned within a contour of the truck, said out-of-operation position causing pushing forces to be directly transmitted from one truck travelling in rearmost position to another industrial truck travelling in front thereof, said toggle lever means including a plurality of toggle levers, each toggle lever forming part of a multiarticulated lever mechanism designed as a four-bar mechanism and arranged between said bail and said truck, said plurality of toggle levers including a first lever arm articulated to a hinge point that is rigidly integrated in the truck, said plurality of toggle levers also including a second lever arm articulated at a hinge point that is rigidly integrated into said bail, said toggle lever means also including a spring lever with a first end displaceable in a linearly guided manner against spring force, said spring lever having a second end articulated at an end side of said second lever arm behind a corresponding one of said toggle levers;

displacement means for displacing said bail from said operating position to said out-of-operation position in cooperation with a stationary guide;

switch means for deactivating the truck when said bail is in said out-of operation position and for reactivating the truck when said bail is in said operating position.

5,482,135

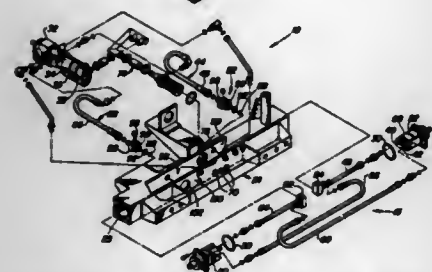
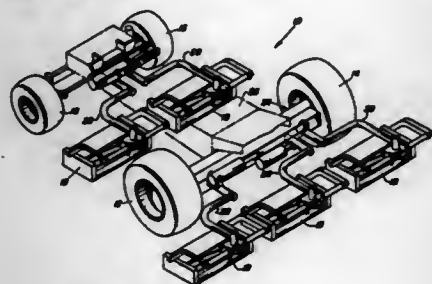
### COMBINED HYDRAULIC RESERVOIR AND VEHICLE AXLE

David L. Phillips, Mayville, and Michael J. Jenkins, Milwaukee, both of Wis., assignors to Deere & Company, Moline, Ill.  
Filed Jun. 29, 1993, Ser. No. 85,218

Int. Cl.<sup>6</sup> B60K 7/00

U.S. Cl. 180—308

19 Claims



1. A hydraulic mechanism for a vehicle, comprising:  
a hydraulic reservoir defining and interior portion within which hydraulic fluid is contained, said reservoir including a wall having an opening into the interior portion of the reservoir,  
a hydraulic pump positioned outside of said reservoir,

at least one hydraulic motor having input and output ports, said motor being coupled with the hydraulic reservoir such that the input and output ports are positioned within the interior portion of the reservoir, said motor being detachably coupled with said reservoir generally closing said opening and blocking hydraulic fluid from passing through the opening, and hydraulic lines, a portion of which extend within the interior portion of the reservoir for operatively coupling the hydraulic pump with the input and output ports of the hydraulic motor for driving said hydraulic motor.

5,482,136

### ANTI-THEFT GAS PEDAL LOCK

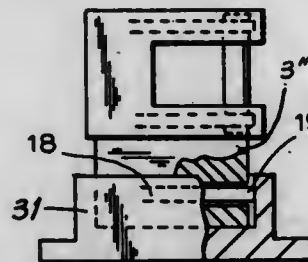
Mikhail Sorkin, 337 E. 41st St., New York, N.Y. 10017

Filed Jun. 6, 1994, Ser. No. 254,591

Int. Cl.<sup>6</sup> B60R 25/00

U.S. Cl. 180—287

3 Claims



1. A vehicle anti-theft device, comprising a support to be arranged in an interior of a vehicle in the vicinity of a gas pedal arranged on a holding arm; and a locking part arranged on said support and having a locking body provided with an opening having an unbounded side and a locking element movable relative to said locking body between a locked position in which it closes said unbounded side of said opening and an unlocked position in which it opens said unbounded side of said opening, so that in said unlocked position the device can be moved over a gas pedal of the vehicle and a holding arm, while in said locked position with said closed unbounded side of the opening the device cannot be removed from the holding arm and the gas pedal since the size of the opening in the locked position is smaller than the size of the gas pedal, and therefore the gas pedal cannot be activated to drive a vehicle, said locking part having at least one engaging element which cooperates with said locking element so as to engage and hold said locking element or to disengage said locking element and allow its displacement, a key hole, and a key insertable in said key hole and movable so as to activate said at least one engaging element to engage said locking element and to disengage from said locking element, said support being composed of at least two parts which are telescopic relative to one another so as to adjust a position of said opening relative to a position of a gas pedal in a vehicle, said locking part having an additional engaging element which is moveable in one of said telescopic parts under the action of said key so as to engage the other of said telescopic parts and fix said telescopic parts relative to one another in an adjusted position.

5,482,137

### TREE STAND

Thomas L. McNeill, 406 S. Fourth St., Smithfield, N.C. 27577

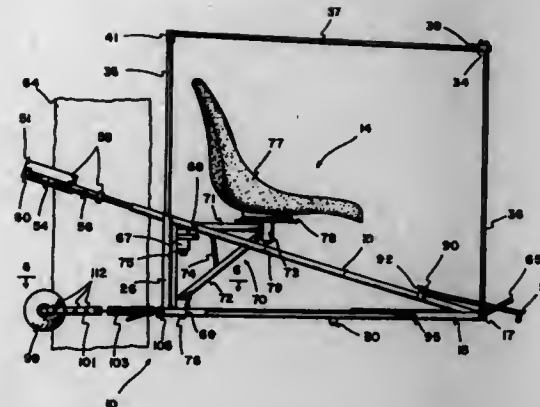
Filed Aug. 18, 1993, Ser. No. 107,585

Int. Cl.<sup>6</sup> A01M 31/02

U.S. Cl. 182—187

7 Claims

1. An improved climbing tree stand having a generally horizontally disposed base frame, an elevated angle means mounted on said frame for engaging the rear of an upright support on which said frame is mounted, and an engaging means mounted on said



frame for engaging the front of said upright support, the improvement comprising: U-shaped, generally horizontally disposed guard rail means mounted on said stand above and in spaced relation to said base frame; an outwardly extending seat bracket mounted on said stand for swinging about a generally vertical axis above said base frame and within the confines of said guard rail; a seat rotatively mounted on the outer end of said seat bracket to allow the user of the tree stand to swing the seat to the right to a position adjacent the guard rail and rotate on said seat to the left, as well as swing the seat to the left to a position adjacent the opposite side of the guard rail and rotate on said seat to the right to give the user a 360 degree view within the relatively limited confines of the guard rail; and at least three pairs of wheels mounted in tandem on said stand, the end pairs of wheels being disposed in a horizontal plane above the horizontal plane in which the middle pair of wheels are disposed whereby when said stand is balanced with only the center pair of wheels contacting the ground, said stand can be turn within its own length.

5,482,138

### AUTOMATIC GREASING SYSTEM FOR CONSTRUCTION MACHINES AND ABNORMALITY DETECTING METHOD THEREFOR

Shigeki Mori; Yohjiro Ohbatake, and Morio Tsuchie, all of Hirakata, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP92/01438, § 371 Date May 26, 1994, § 102(e) Date May 26, 1994, PCT Pub. No. WO93/09301, PCT Pub. Date May 13, 1993

PCT Filed Nov. 6, 1992, Ser. No. 232,296

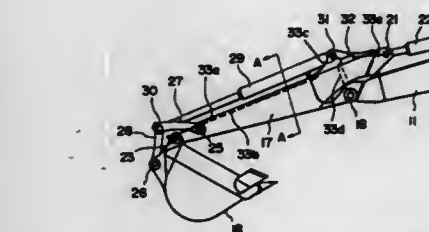
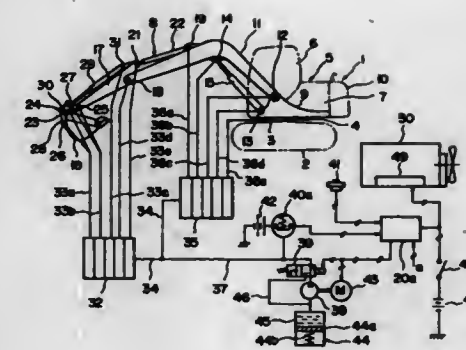
Claims priority, application Japan, Nov. 6, 1991, 3-099353 U; Jan. 29, 1992, 4-038525

Int. Cl.<sup>6</sup> F01M 1/18

U.S. Cl. 184—6.4

19 Claims

1. An automatic greasing system for a machine having a plurality of greased parts, said system comprising:  
a drive operation detector for detecting that at least one of said plurality of greased parts is being operated, and for establishing a drive detection signal in response thereto;  
a grease pump;  
a plurality of pipes for supplying grease from said grease pump to said plurality of greased parts of the machine;  
a drive source for driving said grease pump;  
a greasing operation completion detector for establishing a completion signal upon the completion of an operation of supplying grease from said grease pump to said plurality of greased parts; and  
a controller for controlling said drive source, wherein said controller comprises:  
(a) an operating time accumulator for accumulating the operating times of said greased parts of the machine,  
(b) a first comparator for comparing a signal, which is responsive to the thus accumulated operating time, with a first predetermined value, and for providing a comparison signal in response to results of the comparison, and



(c) a drive signal generator for generating a drive signal generating command in response to the comparison signal, for outputting the drive signal generating command to said drive source to drive said grease pump when said accumulated operating time exceeds said first predetermined value, and for applying a drive signal stop command to said drive source to stop said grease pump in response to said completion signal; and

wherein said operating time accumulator accumulates the drive detection signal as a representation of the accumulation of the operating times of said greased parts.

5,482,139

### AUTOMATED DRIVE-UP VENDING FACILITY

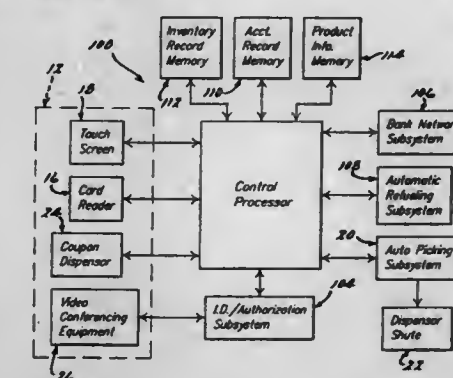
Michael A. Rivalto, Memphis, Tenn., assignor to M.A. Rivalto Inc., Memphis, Tenn.

Filed Feb. 16, 1995, Ser. No. 389,319

Int. Cl.<sup>6</sup> E04H 3/02

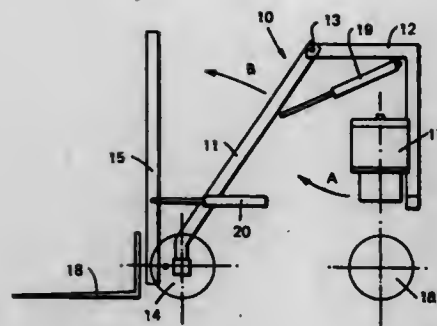
U.S. Cl. 186—36

20 Claims



1. An automated drive-up vending system comprising:  
a storage facility for housing a plurality of saleable goods, wherein the sale of at least some of said plurality of saleable goods may be subject to particular restrictions;  
at least one customer input means positioned outside of said storage facility, said at least one customer input means being accessible to an occupant of a vehicle when the vehicle is positioned adjacent to said at least one input means;  
an automated goods retrieval means located within said storage facility which is responsive to said at least one customer input means for retrieving any goods which are selected by a customer;

a goods dispensing means for delivering to the customer the goods retrieved by said retrieval means; and  
a purchase authorization means comprising:  
means for detecting customer selection of a good subject to a sales restriction;  
means responsive to said detection means for automatically providing direct communication between the customer and an authorization attendant;  
means for communicating customer identification information to the authorization attendant; and  
means remotely operated by the authorization attendant for enabling completion of the restricted goods sales transaction upon attendant verification of acceptable customer identification information.



stowage configuration in which the front section is folded in a first direction of rotation substantially vertically against the mast and the rear section is folded in an opposite direction of rotation against the front section.

5,482,140

### BOARD INVERTER FOR USE IN LUMBER PROCESSING MACHINE

Stuart G. Moore, P.O. Box 338 - 505 Upper Bayview Rd., Lions Bay, British Columbia, Canada

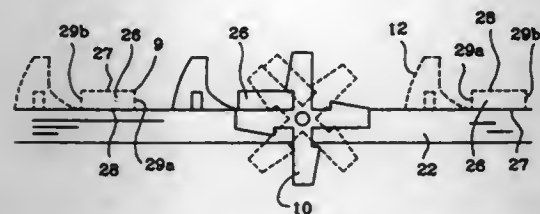
Division of Ser. No. 26,768, Mar. 5, 1993, Pat. No. 5,412,220.

This application Feb. 1, 1995, Ser. No. 382,159

Int. Cl.<sup>6</sup> B65G 47/24

U.S. Cl. 198-403

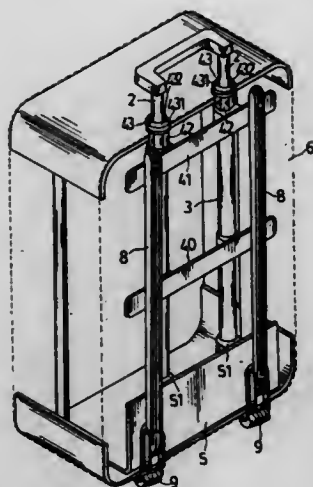
13 Claims





said tip end portion being configured to receive a brake cable of a parking brake, and a lug extending from said vertical portion at a location between said tip portion and said fitting portion; and

a helical return spring disposed above said fitting portion of the brake lever and fitted around the end portion of said cam shaft protruding from said caliper, said return spring having one end fixed relative to said portion of the caliper and another end engaged with said lug at a location between said tip portion and said fitting portion of the brake lever with respect to the axial direction of said cam shaft.



5,482,146

**EDDY CURRENT BRAKING EQUIPMENT**

Michel Estaque, Taverny, and Philippe Gernot, Suresnes, both of France, assignors to Labavia - SGE, Montigny-Le Bretonneux, France

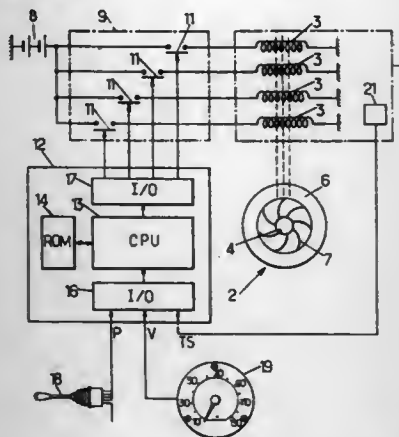
Filed Dec. 9, 1993, Ser. No. 163,518

Claims priority, application France, Dec. 15, 1992, 92 15101

Int. Cl.<sup>6</sup> H02P 15/00; B60L 7/28

U.S. Cl. 188—164

7 Claims



1. Eddy current brake equipment for a vehicle, comprising a stator including inductor windings, a rotor adapted for mounting on a transmission shaft of the vehicle and including an armature facing the stator, a manual control member having a plurality of positions, control means for establishing a power feed setting as a function of a plurality of parameters including the position of the manual control member and the temperature of the armature, and excitation means for selectively exciting the inductor windings from an electricity source of the vehicle in response to the power feed setting, wherein the control means comprise a processor adapted to evaluate in real time the temperature of the armature at successive instants, the armature temperature at each instant in the succession being evaluated by the processor as a function of a plurality of computation variables comprising the armature temperature evaluated at the preceding instant of the succession, the speed of rotation of the rotor, and the power feed setting.

5,482,147

**RETRACTABLE LUGGAGE HANDLE MOUNTING HARDWARE**

King S. Wang, No. 569, Ching-Kuo Rd., Ta-Chia Chen, Tai-chung Hsien, Taiwan, Prov. of China

Division of Ser. No. 247,569, May 23, 1994, abandoned. This application Nov. 23, 1994, Ser. No. 346,237

Int. Cl.<sup>6</sup> A45C 13/00

U.S. Cl. 190—115

2 Claims

1. A retractable luggage handle mounting hardware for luggage having a top panel, a bottom panel, a front panel, a back panel, and two opposite side panels, and comprising: a top mounting frame fastened to the top and back panels; a bottom mounting frame

fastened to the bottom and back panels of said luggage; a first sleeve holder transversely fastened to the back panel of said luggage at a top thereof; a second sleeve holder transversely fastened to the back panel of said luggage and spaced between said bottom mounting frame and said first sleeve holder; and a retractable handle, said retractable handle comprising: a hand grip; two sleeves each having a top end inserted through a respective barrel on said second sleeve holder and fitted into a respective barrel on said first sleeve holder; and a bottom end fitted into a respective barrel on said bottom mounting frame; two inner tubes each having a bottom end slidably inserted into a sleeve and a top end extending out of said top mounting frame and coupled to an end of said hand grip; two flanged octagonal nuts each respectively mounted on a barrel of said first sleeve holder to hold the top end of a sleeve and each having an outward top flange and a screw hole; and two flanged hollow screw members threaded into the screw hole on a flanged octagonal nut, through which the top end of an inner tube passes, said flanged hollow screw members each having an outward top flange stopped above the top panel of said luggage against the outward top flange of the corresponding octagonal nut.

5,482,148

**SYSTEM FOR TRANSMISSION OVERSPEED AND HORSEPOWER LIMIT PROTECTION**

Martin R. Dadel, Plainfield, and Charles F. Long, Pittsboro, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 26, 1994, Ser. No. 296,559

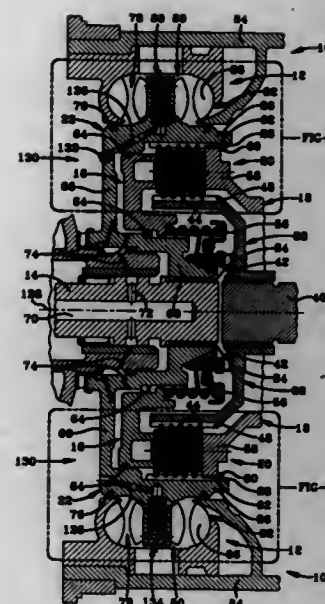
Int. Cl.<sup>6</sup> F16D 67/04; 57/02

U.S. Cl. 192—12 A

12 Claims

1. A retarder control system for protection against transmission overspeed, said system comprising:

- a rotatable input member;
- an output member that is rotatable relative to said input member;
- a torque transfer device operatively connected between said relatively rotatable input and output members;
- a piston assembly;
- an input control chamber selectively to receive pressurized hydraulic fluid and effect translation of said piston assembly to engage said torque transfer device and thereby effect a driving connection between said relatively rotatable input and output members;
- a hydrodynamic retarder assembly having a work cavity to receive hydraulic fluid;
- a retarder input valve assembly supported from one of said relatively rotatable members selectively to deliver pressurized hydraulic fluid from said input control chamber to said retarder cavity.



5,482,149

**CLUTCH/BRAKE UNIT HAVING FRICTION DRIVE OUTPUT SHAFT**

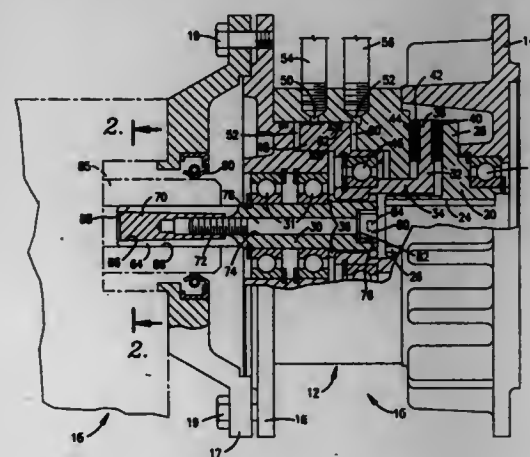
Rodney D. Bruntz, Valley Center, Kans., assignor to The Carlson Company, Inc., Wichita, Kans.

Filed Aug. 22, 1994, Ser. No. 294,069

Int. Cl.<sup>6</sup> F16D 67/04

U.S. Cl. 192—18 A

11 Claims



5. In a clutch/brake unit having a housing, a rotatable input hub, a rotatable output shaft, clutch means for frictionally coupling the input hub with the output shaft and brake means for frictionally braking the output shaft, the improvement comprising:

- an end portion of said output shaft having a size to fit in a gear reducer bore which is surrounded by a bore wall, said end portion being split in a manner allowing generally radial expansion and contraction thereof; and
- wedge means in said output shaft for expanding the split portion thereof radially against the bore wall in a manner to frictionally couple the output shaft with the gear reducer.

5,482,150

**BUSHED OVERRUNNING CLUTCHES**

Johann Stark, Alsch, Germany, assignor to Inn Walzlager Schaeffler KG, Germany

Continuation of Ser. No. 36,027, Mar. 23, 1993, abandoned.

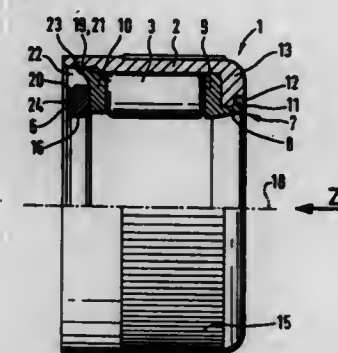
This application May 26, 1995, Ser. No. 452,095

Claims priority, application Germany, Mar. 31, 1995, 42 10 560.9

Int. Cl.<sup>6</sup> F16D 41/06

U.S. Cl. 192—45

28 Claims



1. An overrunning clutch (1) provided with a bushing (2) which is open at one end and partially closed at a second end and into which are inserted firstly a cage (5) serving to guide latching needles (3) and comprising at least one flange and clutch springs (4), and secondly a slide ring (6) arranged on one end of the cage (5), the bushing (2) overlapping the cage (5) and the slide ring (6), characterized in that, to enable a non-destructive disassembly of the overrunning clutch (1) and re-usability of individual components, the flange (9) of the cage is positively and releasably coupled with the bushing (2) via a snap engagement (7,7d) which comprises retaining elements (8,8d) which are arranged on the flange (9) of the cage (5) and engage a flange (13) of the bushing (2) or a substantially closed bottom (14) of the bushing (2).

5,482,151

**LOCKUP UNIT FOR TORQUE CONVERTER HAVING A FRICTION ELEMENT**

Mamoru Ookubo, Neyagawa; Mitsugu Yamaguchi, Osaka, and Shigeru Takeshita, Neyagawa, all of Japan, assignors to Kabushiki Kaisha Dalkin Seisakusho, Neyagawa, Japan

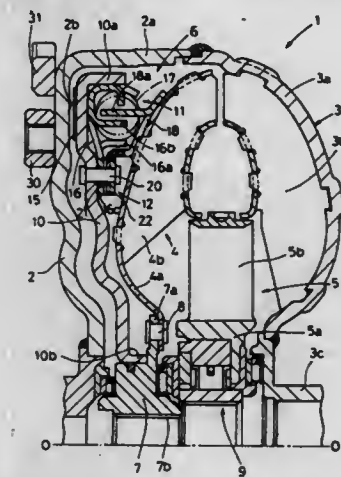
Filed Sep. 27, 1994, Ser. No. 312,739

Claims priority, application Japan, Jan. 7, 1993, 5-054534 U

Int. Cl.<sup>6</sup> F16H 45/02; F16D 3/14

U.S. Cl. 192—3.29

5 Claims



5. A lockup unit for a torque converter comprising: a torque converter housing having a rotatable turbine disposed within said housing;

- a disc-like piston disposed between an inner surface of said housing and said turbine, said piston axially displaceable therebetween for selective engagement and disengagement with said surface;
- a interconnecting flexible coupling and friction producing mechanism coupling said disc-like piston and the turbine for limited rotary displacement therebetween, including;
- a first member connected to said disc-like piston for rotation therewith having at least one spring retaining member and a first spring engaging member,
- a friction member in pressing contact with said first member, disposed for limited rotary displacement with said first member and formed with at least one extending finger,
- a second member connected to said turbine having a second spring engaging member and at least two extending fingers which engage either side of said friction member extending finger, and
- a spring member disposed between said first and second spring engaging members.

5,482,152

## SORTATION TABLE

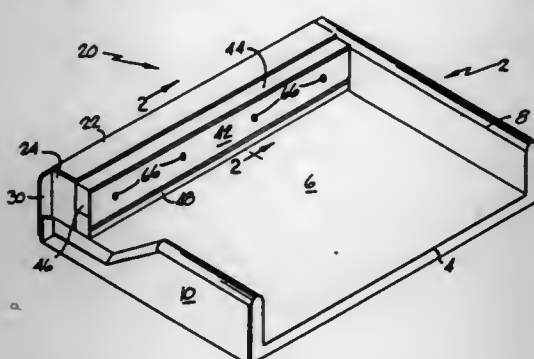
James E. Sulzer, Colorado Springs, Colo., assignor to Portec, Inc., Oak Brook, Ill.

Filed Jul. 18, 1994, Ser. No. 276,442

Int. Cl.<sup>6</sup> B65G 11/20

U.S. Cl. 193-32

7 Claims



1. A sortation table comprising:
- a base portion having a bottom portion having a relatively planar surface located at the end of a spiral chute;
- at least two spaced apart sidewalls extending upwardly from said relatively planar surface;
- a housing mounted on said base portion;
- said housing having a top wall, a back wall and opposite sidewalls each having an inner surface;
- longitudinally extending support means mounted on said inner surface of said opposite sidewalls of said housing;
- a slidable bumper having a top wall, a front wall and opposite sidewalls;
- said opposite sidewalls of said slidable bumper having bottom edges in contact with and supported by said longitudinally extending support means for sliding movement thereover; and
- resilient means for resisting said sliding movement to absorb forces applied by articles moving over said relatively planar surface and into contact with said front wall.

# 5,482,153 OPERATION PANEL FOR A PASSENGER CONVEYING DEVICE

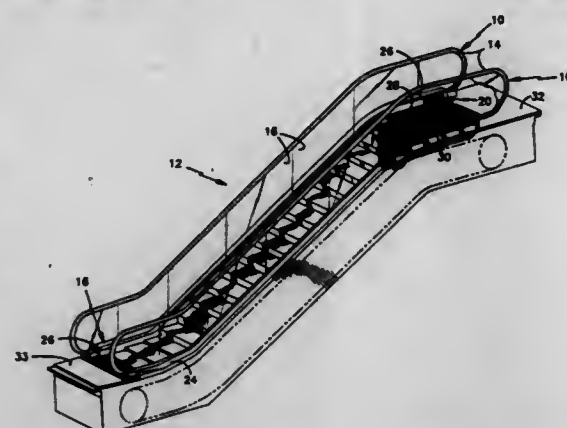
Detlev Abraham, and Hans-Dietrich Riedel, both of Berlin, Germany, assignors to Otis Elevator Company, Farmington, Conn.

Filed Jul. 25, 1994, Ser. No. 280,037

Int. Cl.<sup>6</sup> B65G 43/00

U.S. Cl. 198-322

24 Claims



1. An operation panel for a passenger conveying device having a balustrade, comprising:
- a key switch, which may be actuated into a plurality of switch positions by an independent key;
- a keypad, for inputting data;
- a processor, for processing data from external inputs and from said keypad, said processor having a programmable memory selectively accessible by password;
- wherein a first level of said processor is accessible without actuating said key switch from a first switch position or entering a password into said keypad;
- wherein a second level of said processor is accessible by actuating said key switch into a second switch position; and
- wherein a third level of said processor is accessible by actuating said key switch into said second switch position and inputting a password to said processor through said keypad.

5,482,154

# APPARATUS AND METHOD FOR DETECTING CHAIN STRETCH IN A SORTING AND CONVEYING SYSTEM

Henry A. Affeldt, Victorville, and Tim D. Conway, Stockton, both of Calif., assignors to Sunkist Growers, Inc., Ontario, Calif.

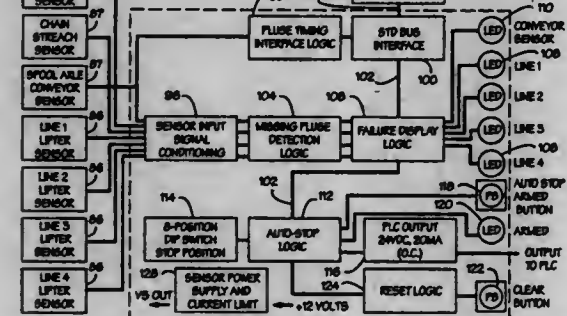
Division of Ser. No. 201,511, Feb. 24, 1994, Pat. No. 5,431,273.

This application Sep. 26, 1994, Ser. No. 335,266

Int. Cl.<sup>6</sup> B65G 47/46

U.S. Cl. 198-370.04

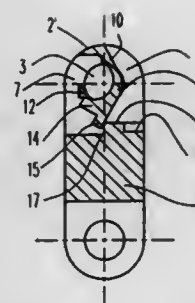
7 Claims



1. An apparatus for the detection of malperformance in a conveyor system used for sorting objects, wherein said conveyor

system comprises a chain carrying said ejectors, and said chain includes a plurality of periodically spaced indicial pins, said apparatus comprising:

- a plurality of ejectors carried by said conveyor systems for selectively ejecting objects from said conveyor system;
- a plurality of solenoid assemblies for activating selected ones of said plurality of ejectors;
- a chain stretch sensor for detecting said indicial pins;
- a reference sensor for detecting said indicial pins, said reference sensor being disposed in said conveyor system at a reference position relative to said chain stretch sensor;
- computer means for controlling said conveyor system and solenoid assemblies, and for initially establishing a timing between detections by said chain stretch sensor and said reference sensor of said indicial pins, said computer means continuously monitoring said timing between said chain stretch sensor and reference sensor to detect changes in said timing indicative of chain stretch, and
- means responsive to said computer means to adjust activation of said ejectors according to chain stretch.



alignment with the bore of the outboard hinge eye to prevent axial movement of a shaft through the bore of the outboard hinge eye.



5,482,158

**PROMOTIONAL DEVICE FOR DELIVERING A PRIZE FROM A BEVERAGE CAN**

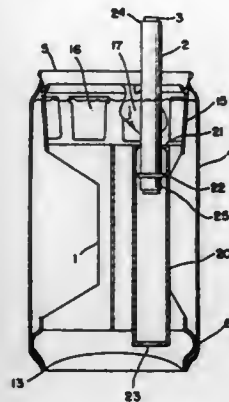
George Plester, Brussels, Belgium, assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Nov. 23, 1994, Ser. No. 347,091

Int. Cl.<sup>6</sup> B65D 85/72

U.S. Cl. 206—217

28 Claims



1. A container assembly for housing liquid products and a prize, comprising:

a can for containing the liquid product, said can having an open end and closed end and sidewalls connecting the open and closed ends, said sidewalls having interior surfaces defining an interior chamber;

prize holding means positioned within said interior chamber for retaining the prize therein, said prize holding means having at least a portion thereof which is expandable outwardly against the interior surfaces of the sidewalls for firmly gripping the sidewalls and securing the prize holding means in a fixed position relative thereto;

closure means cooperatively associated with the open end of the can for opening and closing the same; and

prize presentation means for moving the prize between a first storage position within the prize holding means and a second position in juxtaposed, exposed relationship with the open end of the can in response to opening of the closure means.

5,482,159

PIN KIT

Gerald G. Roraback, Jr., Litchfield, and Richard A. Labbe, Bristol, both of Conn., assignors to LAB Security Systems Corporation, Terryville, Conn.

Filed May 23, 1994, Ser. No. 247,712

Int. Cl.<sup>6</sup> B65D 69/00

U.S. Cl. 206—223

24 Claims

1. A pin kit comprising:

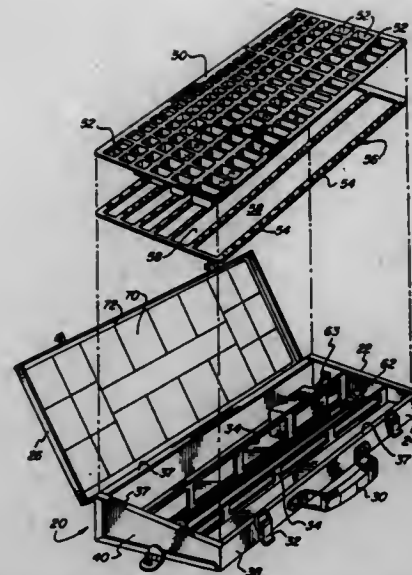
a case having a case body and a case lid, said case body having a front wall and a rear wall, said front wall having a lower height than said rear wall, said case body having side walls connecting said front and rear;

a transparent pin tray having an array of pin reservoir pockets extending downwardly from a planar sheet, said pin tray being supported by said case body, whereby said pin tray is angled relative to a horizontal plane;

an insert located between said pin tray and said case, said insert having a plurality of apertures, said pin reservoir pockets extending through said plurality of apertures and said insert being located against a lower surface of said planar sheet of said pin tray, said insert being provided on an upper surface thereof with indicia thereon for identification of pins, said indicia being visible through said transparent pin tray;

a plurality of incrementally sized pins, each pin of a selected size being colored a specific color, said pins being located in said pin reservoir pockets, said indicia being visible adjacent

1. A golf bag comprising a frame and a fabric body carried by said frame in a taut disposition thereon, said frame comprising an upper support member, a lower support member, a first plurality of stay receiving channels defined by said upper support member, a second plurality of stay receiving channels defined by said lower support member in opposed axial alignment with said first plurality of channels so as to define a plurality of aligned pairs of opposed channels, a plurality of flexible resilient support stays, each of said stays extending into and between one of said pairs of opposed channels in a flexed disposition so as to continuously urge said



each said pin reservoir pocket to identify the size of the pins located in said pin reservoir pockets; an arrangement of color coded information affixed to said case, said information displaying a correlation between the said specific color and the said size of each pin.

5,482,160

GOLF BAG

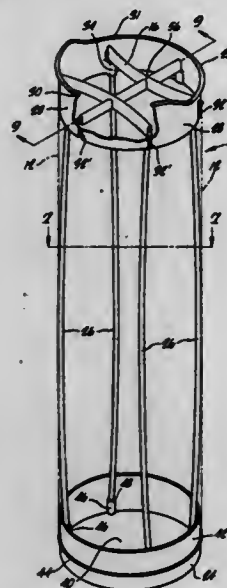
Stephen J. Perrin, Camarillo, Calif., assignor to Illah/California Inc., Oxnard, Calif.

Filed Aug. 26, 1994, Ser. No. 296,709

Int. Cl.<sup>6</sup> A63B 55/00

U.S. Cl. 206—315.8

18 Claims



upper and lower support members in axially opposed directions and thereby maintain said fabric body in tension therebetween, a rigid divider carried by and spanning said upper support member and an elongated fabric divider defining end portions and lateral edge portions, said end portions being carried by said rigid divider and said edge portions defining open-ended elongated loops, each of said loops extending about and along one of said stays.

the box door with the wafer carrier is received by the box the finger engages the wafer carrier and thereby swings the retaining arm portion into an alignment and retaining position.

5,482,162

**TOOL CHEST ASSEMBLY CONSTRUCTED OF A PLASTIC MATERIAL**

Thomas Dickinson, St. Louis, Mo., assignor to Contico International, Inc., St. Louis, Mo.

Filed Apr. 20, 1993, Ser. No. 50,542

Int. Cl.<sup>6</sup> B65D 85/00

U.S. Cl. 206—373

77 Claims

5,482,161

**MECHANICAL INTERFACE WAFER CONTAINER**

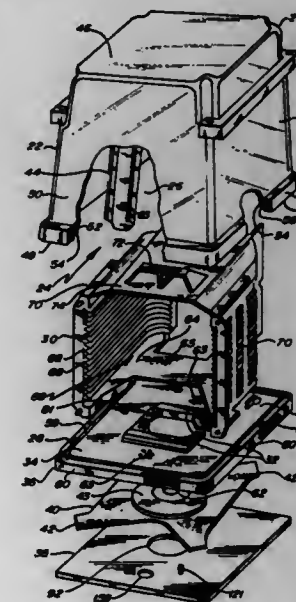
Randall S. Williams, Chaska, and Nicholas T. Cheesbrow, St. Paul, both of Minn., assignors to Fluoroware, Inc., Chaska, Minn.

Filed May 24, 1994, Ser. No. 248,306

Int. Cl.<sup>6</sup> B65B 1/04; B65D 85/30

U.S. Cl. 206—711

25 Claims



1. A transportable container for sealingly enclosing articles in a substantially particle free environment and for interfacing with processing equipment, the container comprising:

(a) a box having an open interior, an open end, and a plurality of inwardly facing recesses adjacent to the open end;

(b) a removable box door closing the open end, the box door having a housing, the housing having a plurality of sidewalls, the sidewalls having a plurality of slots positioned to be adjacent to the recesses in the box, the housing having an open interior; and,

(c) a plate rotatably mounted in the open interior of the box door housing, the plate having a plurality of latching tips peripherally located on the plate, the plate configured such that each tip is positioned at a slot and such that as the plate is rotated the tips rotate outwardly through the slots and into the recesses in the box.

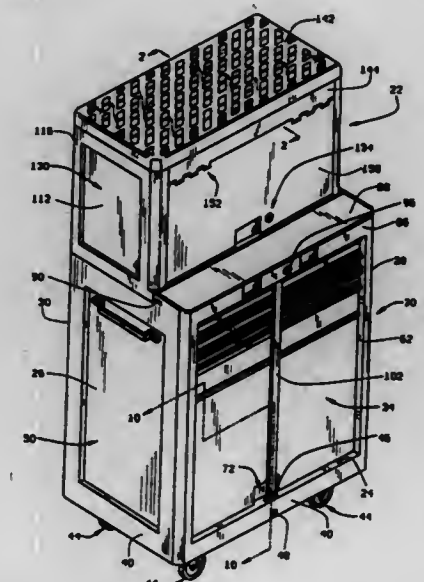
12. A transportable container for interfacing with processing equipment and for sealingly enclosing wafers in a substantially particle free environment, the container comprising:

(a) a box, the box having an open interior and an open end;

(b) a box door sized to be received by the box and to close the open end, the box door having a surface facing the interior, the surface having a wafer carrier receiving region;

(c) a wafer carrier, the carrier sized to be received by the receiving region on the interior facing surface of the box door, the carrier having an open side for receiving wafers; and

(d) an alignment arm having opposing ends with a finger on one end and a retaining arm portion on the opposing end, the alignment arm swingably attached to the box only intermediate the retaining arm portion and the finger, the retaining arm portion extending across the open end of the box, whereby as



1. A tool chest assembly comprising:

a lower chest having a bottom panel, left and right sidewalls, a back wall and a top panel that are all connected together in a box configuration surrounding an interior volume of the lower chest and having a front opening providing access to the interior volume;

an upper chest having a bottom panel, left and right sidewalls, a back wall and a top panel that are all connected together in a box configuration surrounding an interior volume of the upper chest and having a front opening providing access to the interior volume of the upper chest;

the top panel of the lower chest is divided into forward and rearward sections, the upper chest is positioned on the rearward section and the forward section projects forwardly of the upper chest front opening; and,

a tray is provided in the interior volume of the lower chest beneath the forward section of the lower chest top panel, and the forward section of the lower chest top panel is connected to the lower chest for movement of the forward section relative to the lower chest between a closed position where the forward section covers over the tray and an open position where the forward section is displaced from over the tray exposing an access opening to the tray.

5,482,163

LAST EVENT INDICATOR

Kenneth L. Hoffman, 32591 Flanders St. NE., Cambridge, Minn. 55008

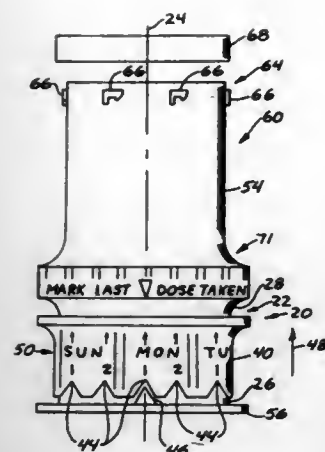
Filed Dec. 27, 1994, Ser. No. 364,083

Int. Cl.<sup>6</sup> B65D 83/04

U.S. Cl. 206—534

18 Claims

1. A last event indicator apparatus comprising:



a cylindrical support having a longitudinal axis and an outer surface and a tapered flange structure, the tapered flange structure having a first end with first diameter and a second diameter that is greater than the first diameter; and an expandable indicator ring disposed over the outer surface, the indicator ring axially displaceable along the longitudinal axis to engage the tapered flange structure and cause expansion of the indicator ring, the expandable ring rotatable about the longitudinal axis over the outer surface to each of a plurality of selected positions.

5,482,164

**E-BLOCK SHIPPING COMB**

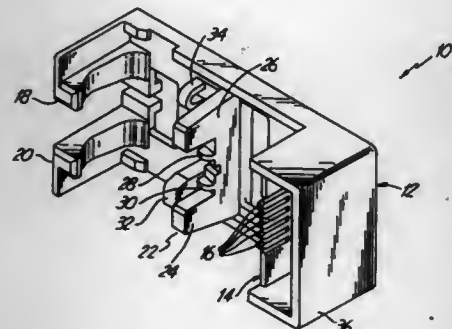
Phillip L. Karns, Oklahoma City, Okla., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Aug. 3, 1994, Ser. No. 285,564

Int. Cl.<sup>6</sup> B65D 73/02

U.S. Cl. 206—728

6 Claims



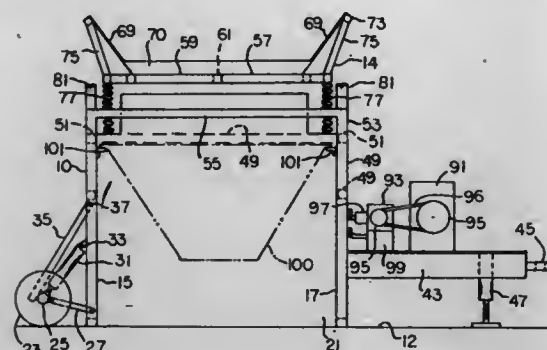
1. An E-block shipping comb, comprising:  
a frame having a front and a rear;  
a flexure comb coupled to the front of the frame adapted for receiving flexures of an E-block assembly;  
a clamp coupled to the rear of the frame adapted for receiving an E-block frame of the E-block assembly;  
a guide coupled to the frame between the flexure comb and clamp, adapted for receiving armatures of the E-block assembly the guide comprises a first arm for receiving a top portion of an E-block frame of the E-block assembly and a second arm for receiving a bottom portion of the E-block frame; and  
a latch coupled to the frame and moveable between a first position and a second E-block securing position.

5,482,165

**MOBILE GRAVEL SCREENING APPARATUS**  
Rafe Johnston, R.F.D. #3, Box 366A, Caribou, Me. 04736  
Filed Jun. 10, 1994, Ser. No. 258,220  
Int. Cl.<sup>6</sup> B07B 1/34; 1/49

U.S. Cl. 209—244

7 Claims



1. A mobile aggregate screening apparatus comprising:  
a box adapted to rest on the ground surface;  
said box comprising a rear wall, a side wall, and a front wall;  
said box having an open top, an open bottom, and an open side;  
said box side wall comprising a horizontal tube defining the side wall upper edge;  
a horizontal tubular beam extending between the box rear wall and front wall in the plane of said open side;  
said horizontal beam being elevated relative to said horizontal tube;  
a vibratable screen assembly located above said box;  
said screen assembly comprising a rectangular frame sloped downwardly in the direction of said box side wall, a perforated panel overlying said frame, and two upwardly divergent trough walls extending upwardly from said frame for guiding aggregates onto said perforated panel;  
said trough walls having lower edges in contiguous relation to said perforated panel;  
two pair of coil springs for resiliently supporting said screen assembly above said box;  
the springs in one pair extending between said horizontal tube and the rectangular frame; and  
the springs in the other pair extending between said horizontal beam and the rectangular frame.

5,482,166

**MEAT TRIM SORTING**

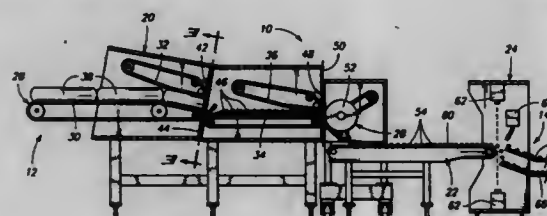
Gary Brown, Milton Freewater, Oreg., assignor to Key Technology, Inc., Walla Walla, Wash.

Filed Sep. 6, 1994, Ser. No. 301,200

Int. Cl.<sup>6</sup> B07C 5/00; B26D 5/00

U.S. Cl. 209—580

15 Claims



1. A sorting system for reclaiming lean meat from high-fat meat trimmings, comprising:  
a whole trimmings conveyor which conveys laterally extending whole meat trimmings longitudinally;  
a cutter positioned relative to the whole trimmings conveyor to dice the laterally extending whole meat trimmings without disturbing the lateral positioning of the meat trimmings, the

cutter cutting the whole meat trimmings into a plurality of meat dices which remain laterally distributed after being cut; a high-speed wide-belt inspection conveyor positioned to receive the laterally distributed meat dices directly from the whole trimmings conveyor, the meat dices remaining laterally distributed on the high-speed wide-belt inspection conveyor; and an inspection and sorting station positioned relative to the high-speed wide-belt inspection conveyor to differentiate relatively lean meat dices from relatively fatty meat dices and to separate said meat dices from each other, the inspection station disposed in signal transmitting relation relative to the sorting station.

5,482,167

**ADJUSTABLE VEHICLE-CARRYING FRAME**

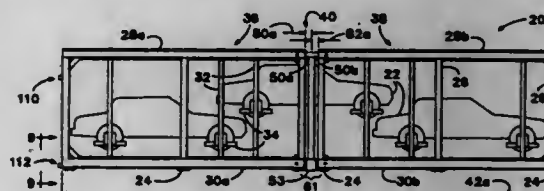
Peter Gearin, Portland, and Everett A. Leech, Oregon City, both of Oreg., assignors to G & G Intellectual Properties, Inc., Portland, Oreg.

Continuation of Ser. No. 871,288, Apr. 20, 1992, which is a continuation-in-part of Ser. No. 720,893, Jun. 25, 1991, Pat. No. 5,105,951, which is a continuation of Ser. No. 500,476, Mar. 28, 1990, Pat. No. 5,040,938, which is a continuation of Ser. No. 261,504, Oct. 24, 1988, Pat. No. 4,963,067, which is a continuation-in-part of Ser. No. 943,688, Dec. 18, 1986, Pat. No. 4,797,049. This application Dec. 1, 1994, Ser. No. 307,351 The portion of the term of this patent subsequent to Jan. 10, 2006, has been disclaimed.

Int. Cl.<sup>6</sup> A47F 5/00

U.S. Cl. 211—13

13 Claims



1. A system for transporting wheeled vehicles comprising:  
(a) an elongate 3-dimensional cargo-carrying enclosure;  
(b) a frame positionable inside said enclosure so as to be elongate in the same direction as said enclosure;  
(c) at least one forward pair and one rearward pair of transversely-spaced elongate upright posts included on said frame and arranged so that at least one of said pairs of elongate upright posts is spaced adjustably from the other in a direction longitudinal of said frame; and  
(d) respective forward and rearward wheel supports included on said frame to support the front and rear wheels, respectively, of a first vehicle, said forward and rearward wheel supports being movable vertically along said forward and rearward pairs of elongate upright posts, respectively, without requiring any movement by said forward and rearward pairs of elongate upright posts and while supporting said front and rear wheels, respectively, of said first vehicle so as to enable positioning of said front and rear wheels of said first vehicle at variable elevations relative to each other.

5,482,168

**MODULAR WALL-MOUNTED STORAGE SYSTEM**

Robert J. Welch, Dallas, and Michael A. Ward, Wilkes-Barre, both of Pa., assignors to Metro Industries, Inc., Reno, Nev.

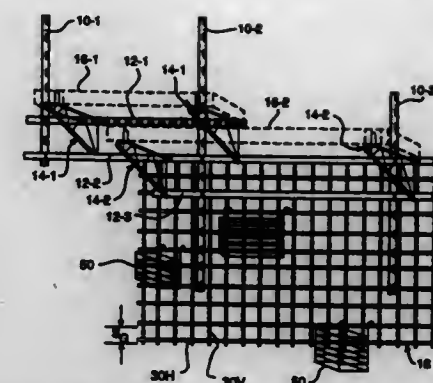
Filed Aug. 25, 1993, Ser. No. 111,448

Int. Cl.<sup>6</sup> A47F 5/00

U.S. Cl. 211—106

22 Claims

1. A modular wall-mounted storage system for supporting at least one storage structure in generally horizontal relation, said system comprising:



a first horizontal bar;  
a bracket, including means for supporting a storage structure and means for engaging said first horizontal bar; and  
a pair of slotted supports, each slotted support including a plurality of slots for receiving and supporting said first horizontal bar at a variety of spaced vertical locations, wherein said first horizontal bar is supportable on said pair of slotted supports at a variety of vertical and horizontal locations relative to said pair of slotted supports; said bracket is engageable on said first horizontal bar; and a storage structure is supportable on said supporting means of said bracket.

5,482,169

**CABLE LIFTING DEVICE FOR HANDLING HEAVY LOADS WITHIN A TIGHT SHIELDED ENCLOSURE**

Alain Simon, Paris, and Bernard Dirollo, Pont St. Esprit, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

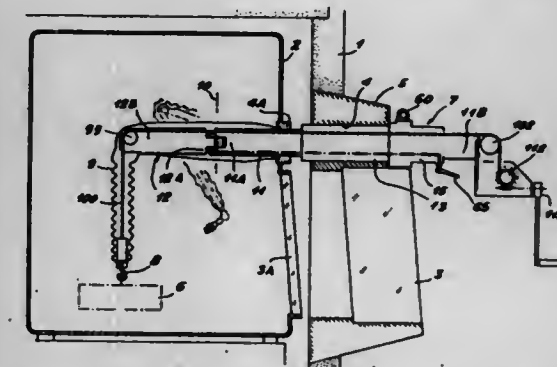
Continuation of Ser. No. 61,057, May 14, 1993, abandoned.

This application Jan. 3, 1995, Ser. No. 368,052

Claims priority, application France, May 15, 1992, 92 05942 Int. Cl.<sup>6</sup> B25J 11/00

U.S. Cl. 212—245

4 Claims



4. A cable lifting device for handling loads within a tight, shielded enclosure, the lifting device comprising:  
a horizontal carrier structure having a pulley which is located at an end of the horizontal carrier structure;  
a lifting cable which passes around said pulley, an end of said lifting cable comprising a base and an object gripping means, said object gripping means being pivotally mounted on said base through a horizontal pin;  
rotating means for pulling or lowering the lifting cable;  
a control system for controlling a movement of the horizontal carrier structure; and  
a passage hose in which the horizontal carrier structure is slidably mounted, wherein said passage hose is adapted to be located within a hole of a shielded enclosure, and an external shape of said passage hose corresponds with an internal shape of the hole, wherein a pulling of said cable by said rotating



means to a maximum upward position causes the object gripping means and the base to be substantially horizontally positioned, thereby permitting the lifting device to be fittable in the hole of the shielded enclosure;

wherein said horizontal carrier structure comprises:

a horizontally extending main arm and a horizontally extending articulated beam, said main arm being slidably mounted in the passage hose, a first end of said main arm being located at the shielded enclosure, a second end of said main arm being pivotally attached to a first end of said articulated beam such that said articulated beam is pivotable about a vertical pivoting axis, wherein said control system controls a pivoting movement of said articulated beam about said vertical pivoting axis, said pulley being fitted on a second end of said articulated beam;

wherein guide rollers are mounted so as to be freely rotatable in said passage hose and on a periphery of said main arm to permit the sliding of the horizontal carrier structure with respect to said passage hose, and the control system comprises two rods longitudinally positioned within the main arm and positioned on each side of a portion of said lifting cable which is positioned adjacent to the main arm, said two rods being parallel to said portion of the lifting cable and being parallel to one another so as to form a parallelogram, a first end of each of said rods being fitted in an articulated manner to the first end of the articulated beam on either side of the pivoting axis, and a second end of each of said rods being fitted to the control system; and

wherein said rotating means act on the cable by means of a dynamometer shaft in order to read off a weight of a load suspended on the cable.

5,482,170

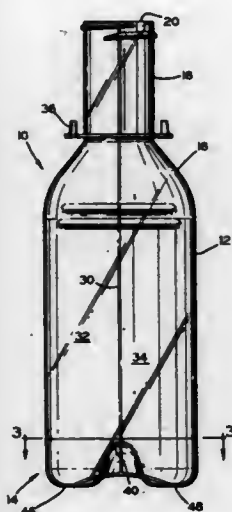
## MULTI-CHAMBER CONTAINERS

Frank E. Semersky, and Daniel J. Durham, both of Toledo, Ohio, assignors to Plastic Technologies, Inc., Holland, Ohio  
Filed Nov. 15, 1994, Ser. No. 339,940

Int. Cl.<sup>6</sup> B65D 1/04

U.S. Cl. 215-6

7 Claims



1. In a multi-chamber container having a base, outlet aperture, a sidewall joining the base and the aperture, and at least one integral web disposed within the container and extending from the base to the aperture forming separate chambers in the container, the improvement comprising:

the base having a generally outward convex bottom wall, an axial inwardly arched lineal impression in said base, the inner surface of said base in the region of the lineal impression forming a juncture with the bottommost edge of the web

thereby dividing the interior of the container into separate chambers, each of the chambers communicating with the outlet aperture; and  
outwardly extending footed positions providing impact support for the container.

5,482,171

## CAP FOR SELF-CONTAINED BIOLOGICAL INDICATORS

Steven G. Palmer, Apex, N.C., assignor to American Sterilizer Company, Erie, Pa.

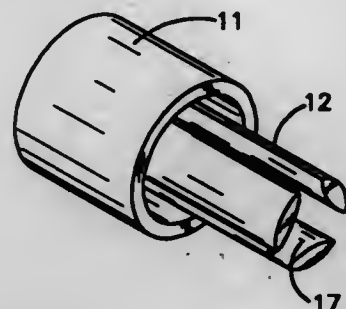
Division of Ser. No. 125,773, Sep. 24, 1993, Pat. No. 5,405,580.

This application Sep. 30, 1994, Ser. No. 315,983

Int. Cl.<sup>6</sup> B65D 39/00

U.S. Cl. 215-228

1 Claim



1. A cap used with a biological indicating system comprising: a plurality of flexible projections depending from said cap and constructed to wedge between an ampule and a vial and thereby fracture said ampule as said cap is moved from a first position to a second position;
- a convex surface upon the interior of each of said flexible projections, configured such that the surface substantially makes line contact with said ampule, and further configured so that when said cap is moved from said first position to said second position, the force is placed upon the line of contact with said ampule, facilitating the fracture thereof.

5,482,172

## CONTAINER WITH DUAL DISPENSERS

C. Calvin Braddock, P.O. Box 6636, Shreveport, La. 71136

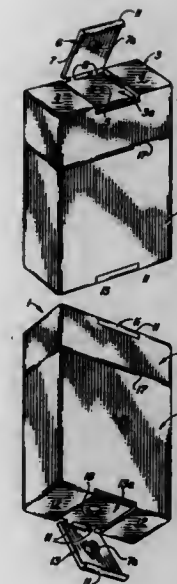
Filed Sep. 16, 1993, Ser. No. 123,758

Int. Cl.<sup>6</sup> B65D 47/08

U.S. Cl. 215-235

3 Claims

1. A container comprising a generally rectangular body portion for containing a liquid; a container bottom having a bottom recess and a bottom access opening provided in said bottom recess mounted in a bottom end of said body portion and a bottom lid hingedly connected in transverse orientation to said container bottom at substantially the midpoint of said container bottom for selectively sealing said bottom access opening, wherein said bottom lid is seated in said bottom recess when said bottom lid is in sealing configuration; a generally rectangular closure friction-fitted on an upper end of said body portion, a closure top having a closure recess and a closure access opening provided in said closure recess mounted on said closure and a top lid hingedly connected in transverse orientation to said closure top at substantially the midpoint of said closure top for selectively sealing said closure access opening, wherein said top lid is seated in said closure recess when said top lid is in sealing configuration.



5,482,173

## MANUFACTURING METHOD OF FORMING A PASSIVATION LAYER IN A LIQUID CRYSTAL DISPLAY DEVICE

Woon-Yong Park, Seoul; Dong-Gyu Kim, Suwon, and Sang-Soo Kim, Seoul, all of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

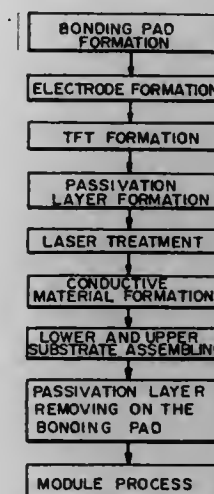
Filed Jul. 27, 1994, Ser. No. 280,888

Claims priority, application Rep. of Korea, Jul. 27, 1993, 1993-14298

Int. Cl.<sup>6</sup> C30B 33/00; B44C 1/22

U.S. Cl. 216-23

19 Claims



1. A method for manufacturing a liquid crystal display device, comprising the steps of:  
forming at least one first electrode on an inner surface of a lower substrate, said first electrode being connected with an external terminal on a periphery of said lower substrate;  
forming a liquid crystal cell on a central portion of said lower substrate;  
forming a passivation layer on substantially all of said inner surface of said lower substrate;  
removing a first portion of said passivation layer formed on said first electrode, using a laser beam, to expose a contact area of said first electrode;  
forming a conductive layer on said contact area of said first electrode; and

assembling said lower substrate with an upper substrate so that said conductive layer forms an electrical connection between said contact area of said first electrode on said lower substrate and a common electrode formed on an inner surface of said upper substrate, said inner surface of said lower substrate being assembled to face said inner surface of said upper substrate.

5,482,174

## METHOD FOR REMOVING COPPER OXIDE ON THE SURFACE OF A COPPER FILM AND A METHOD FOR PATTERNING A COPPER FILM

Takahisa Namiki; Yasuo Yamagishi, and Ei Yano, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

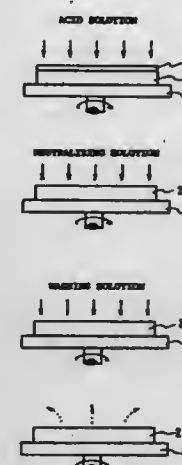
Filed Jun. 3, 1994, Ser. No. 253,559

Claims priority, application Japan, Aug. 2, 1993, 5-191274

Int. Cl.<sup>6</sup> B44C 1/22; C23F 1/00

U.S. Cl. 216-41

16 Claims



1. A method for removing copper oxide on the surface of a copper film, comprising the steps of:  
disposing a copper film, having oxide on a surface thereof, on a turnable support with said oxide being exposed;  
turning said support and said copper film to a first station at which the surface of a copper film is treated with an acid in order to remove copper oxide on the surface of the copper film;  
turning said support and said copper film to a second station at which the surface of the copper film which has been treated with acid is neutralized; and then  
turning said support and said copper film to a third station at which the neutralized surface of the copper film is washed.

5,482,175

## PRESSURIZED CONTAINER TOP

Naseem B. Arrar, Salhiya Complex Mezzanine 2 Entrance 1, P.O. Box 26636, Safat, Kuwait

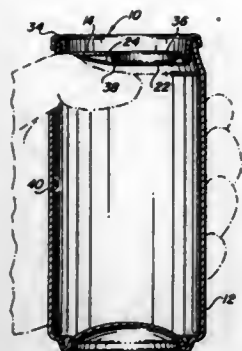
Filed Dec. 28, 1993, Ser. No. 175,194

Int. Cl.<sup>6</sup> B65D 17/30; 51/22; B21D 51/44

U.S. Cl. 220-203.08

21 Claims

8. An easy open end for a pressurized container comprising:  
an end panel having an opening, the panel further having a cutting edge portion adjacent the opening for extending into a container; a frangible member across the opening and biased against the cutting edge portion; and  
means for increasing pressure against the frangible member when the end panel is affixed to a pressurized container, wherein the increased pressure causes rupture of the frangible member outwardly from the container and away from the panel.



15. A method for easily opening a container, the method comprising the steps of:

- providing a pressurized container having an edge for affixing a panel thereto;
- providing a panel for affixing to the pressurized container edge, the panel having an opening for passing contents of the container therethrough;
- providing a cutting edge portion adjacent the opening;
- extending the cutting edge portion into the container;
- placing a frangible member across the opening of the panel;
- biasing the cutting edge portion against the frangible member;
- affixing the panel to the container edge; and
- increasing pressure within the pressurized container for rupturing the frangible member outwardly from the container and away from the panel, thus providing access into container through the panel opening.

5,482,176

# MEMBRANE PIERCING CLOSURE AND SPOUT ASSEMBLY

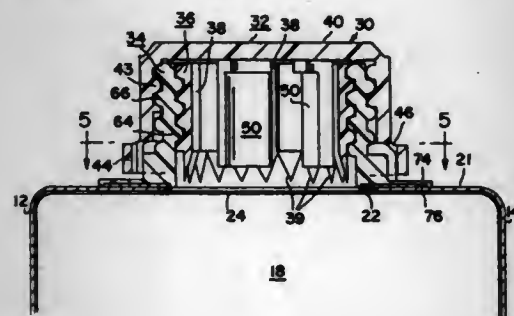
Michael Maletta, Cogan Station, and Thomas A. Frazier, Williamsport, both of Pa., assignors to The West Company, Incorporated, Lionville, Pa.

Filed Mar. 16, 1994, Ser. No. 214,799

Int. Cl.<sup>6</sup> B65D 17/42

U.S. Cl. 220—277

8 Claims



1. A closure assembly for piercing a diaphragm sealingly engaged over a discharge opening in a container comprising:

- a cap of cup-like form;
- a generally tubular spout member mounted on the container over said discharge opening and a piercing fitment disposed interiorly of said spout member, said piercing fitment having a series of depending teeth arranged in a circular array;
- a first interengaging means for allowing an interlocking fit between the spout member and said piercing fitment; and
- a second interengaging means for allowing an interlocking fit between said spout member and said cap whereby operation of said second interengaging means enables movement of the cap in a first direction for removing said cap from said spout member and simultaneously operates said first interengaging means and thereby effects displacement of said piercing fit-

ment in a direction substantially opposite said first direction to pierce said diaphragm.

5,482,177

# CLOSURE ON A CARTRIDGE

Wilhelm A. Keller, Obstgartenweg 9, CH-6402 Merlischachen, Switzerland

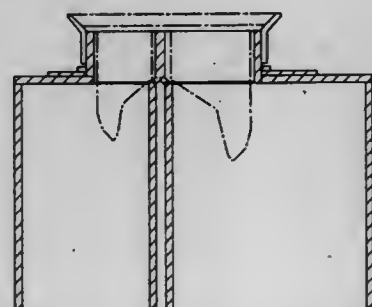
Filed Nov. 23, 1993, Ser. No. 155,763

Claims priority, application European Pat. Off., Nov. 23, 1992, 92810907

Int. Cl.<sup>6</sup> B65D 51/22

U.S. Cl. 220—278

10 Claims



1. In combination, a closure and a multiple cartridge, said multiple cartridge comprising a plurality of dispensing openings and a membrane for covering said dispensing openings, said closure comprising means for piercing the membrane adjacent each dispensing opening when said closure is placed over the dispensing openings and an orienting means for placing said closure over the dispensing openings in only one predetermined position;

wherein said orienting means consist of stoppers having different dimensions and of correspondingly dimensioned dispensing openings of said cartridge.

5,482,178

# RECEPTACLE WITH A DEFORMABLE FOOT SUSCEPTIBLE OF SERVING AS A SAUCER

Philippe Cohu, Bretoncelles, France, assignor to Soparco, France

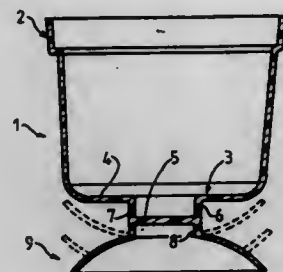
Filed May 25, 1994, Ser. No. 248,912

Claims priority, application France, Feb. 16, 1994, 94 01848

Int. Cl.<sup>6</sup> B29C 45/00; A01G 9/02

U.S. Cl. 220—469

7 Claims



2. A receptacle provided with a tubular foot which comprises first and second successive portions, said first portion being connected to the receptacle and said second portion having a shape flared outwardly and being connected to the first portion through a first circular hinging means which allows said second portion to be upturned about said first hinging means and to form with said first portion a first annular saucer extending beneath said receptacle, said second portion being divided by a second circular hinging means into an inner part and an outer part which may be upturned

about said second annular hinging means so as to form with said inner part a second annular saucer extending beneath said receptacle.

5,482,179

# PACK FOR LIQUIDS WITH BAG

Krister Bruhn, Seeheim-Jungenheim, Germany, assignor to Tetra Laval Holdings & Finance S.A., Pully, Switzerland

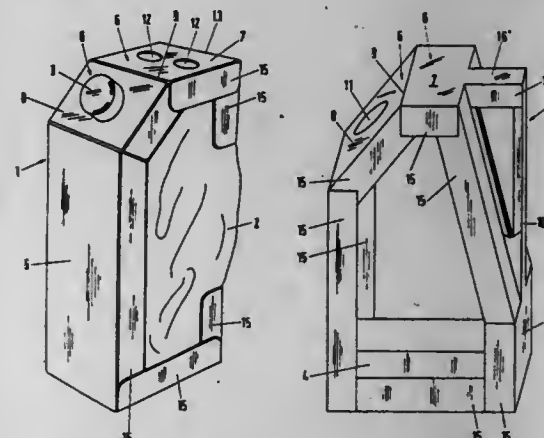
Filed Jan. 21, 1994, Ser. No. 184,658

Claims priority, application Germany, Jan. 22, 1993, 43 01 620.0

Int. Cl.<sup>6</sup> B65D 5/56

U.S. Cl. 220—410

12 Claims



1. A pack for liquids, having a supportive covering and a flexible bag arranged therein having a closable pouring device, wherein the supportive covering has a bottom, a side wall and a top wall, characterized in that the supportive covering is designed as a rigid framework, the top wall of the framework has a flat first wall zone parallel to the bottom and a flat second wall zone which is disposed at an angle to the first wall zone, the first and second wall zones being positioned adjacent to each other along a first broken line, the second wall zone being joined to the bottom by way of the side wall and the first wall zone being joined to the bottom by way of a limb portion, the second wall zone disposed at an angle has a hole for passage therethrough of the pouring device arranged on the bag, and that the bag is secured to the second wall zone.

5,482,180

# GRIPPING APPARATUS FOR OMNIFARIOUS CONTAINERS

Fred P. Smith, Alpine, Utah; Marcel G. Stragler, Scottsdale, Ariz.; Fred T. Smith, Alpine, and Kevin L. McAllister, Orem, both of Utah, assignors to The Heil Company, Chattanooga, Tenn.

Continuation-in-part of Ser. No. 13,774, Feb. 5, 1993, abandoned, which is a continuation-in-part of Ser. No. 728,186, Jul. 10, 1991, Pat. No. 5,209,537. This application Jan. 19, 1994, Ser. No. 158,960

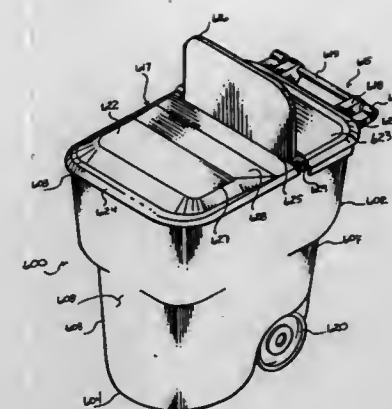
Int. Cl.<sup>6</sup> B65D 21/00

U.S. Cl. 220—523

9 Claims

1. A self-aligning refuse container configured to be engaged by a conventional container handling mechanism, said container comprising:

- a refuse container body having an open top, a closed bottom, and a gripping portion positioned intermediate said top and said bottom;
- a divider panel mounted within said body dividing said body into separate compartments;
- a lid assembly coupled to and closing said open top of said body; and



an overload panel extending from said divider panel, through said lid assembly in a substantially upright manner with respect thereto, to permit refuse to be carried atop said lid assembly.

5,482,181

# PORTABLE LIQUID DRAIN PAN WITH CANTILEVER EXTENSIONS AND POUR SPOUT

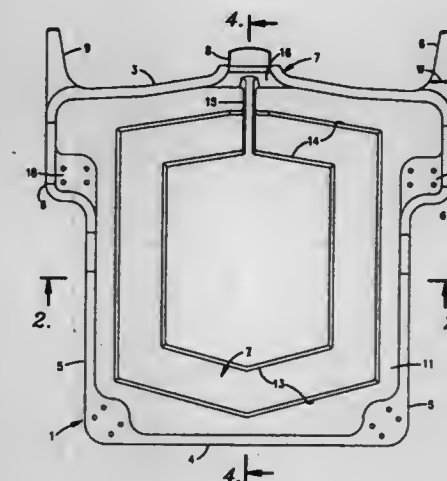
Donald L. Weaver, 524 S. Georgia, Pittsburg, Kans. 66762

Filed Mar. 20, 1995, Ser. No. 406,532

Int. Cl.<sup>6</sup> B65D 23/10

U.S. Cl. 220—573

10 Claims



1. A portable container for collecting liquids drained from vehicles, said container having a bottom, a front end wall and a back end wall and side walls, the container comprising:

- a pour spout, formed at a center point along the front end wall, for draining said container into another container, and
- a pair of cantilever extensions, formed on opposite sides of and projecting beyond the pour spout and extending in a direction forward of the front end wall, for elevating, and moving in said forward direction, said pour spout by engaging a floor when the back end wall of the container is lifted.

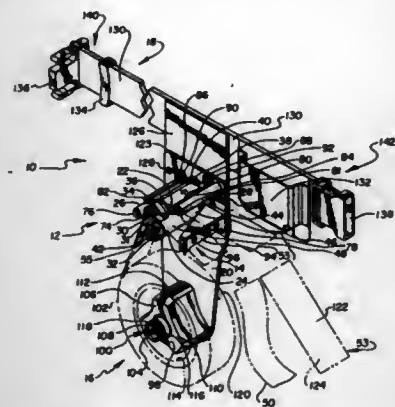


# 5,482,182 TAPE DISPENSER

Craig D. Thompson, Inver Grove Heights, Minn., and Robert A. Luhman, Deer Park, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.  
Continuation-in-part of Ser. No. 138,850, Oct. 18, 1993, abandoned. This application Oct. 7, 1994, Ser. No. 319,890  
Int. Cl.<sup>6</sup> B65H 5/28

U.S. Cl. 221-73

20 Claims



1. A portable dual advance dispenser for a supply of lined tape comprised of a plurality of separable strips on a release liner, the dispenser comprising a frame for supporting a supply of lined tape and a dispensing means for dispensing desired portions of the adhesive tape, said dispensing means comprising:

- (a) rotatable liner dispensing means for directing a portion of the liner in a different direction from the adhesive tape;
- (b) rotatable adhesive tape dispensing means adjacent the rotatable liner dispensing means for dispensing the separable adhesive tape strips;
- (c) separation means proximate the rotatable adhesive tape dispensing means and the rotatable liner dispensing means for separating the liner from the adhesive tape; and
- (d) drive transfer means between the rotatable liner dispensing means and the rotatable adhesive tape dispensing means so that when one of the rotatable liner dispensing means and the rotatable adhesive tape dispensing means is rotated, the other of the rotatable liner dispensing means and the rotatable adhesive tape dispensing means rotates;

wherein the user may select either a first dispensing option in which the adhesive tape is pulled from the rotatable adhesive tape dispensing means and the drive transfer means causes the liner to advance through the rotatable liner dispensing means, or a second dispensing option in which the liner is pulled from the rotatable liner dispensing means and the drive transfer means causes the adhesive tape to advance through the rotatable adhesive tape dispensing means.

# 5,482,183

## HEATER AND DISPENSER FOR VIALS

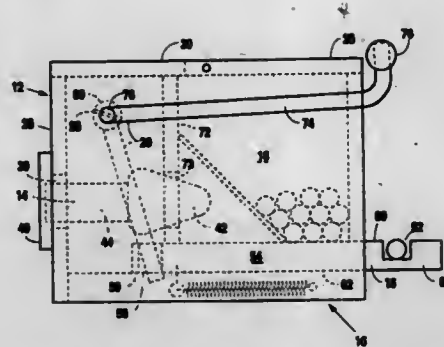
Jeff R. Beal, 3901 Diadem, and Mike T. Kalinowski, Sr., 5103 Redding Dr., both of San Antonio, Tex. 78219  
Filed Sep. 30, 1994, Ser. No. 315,967  
Int. Cl.<sup>6</sup> G07F 11/72

U.S. Cl. 221-150 A

9 Claims

1. A device for heating and manually dispensing small vials, the device comprising:

- a housing, said housing having walls, the walls including two side walls, a top wall a front wall, and a rear wall, the walls defining an interior, the top wall including an access member for providing access to the interior of said housing;
- an incandescent light bulb, said incandescent light bulb being located substantially within said housing for heating the interior thereof;



a dispensing member, said dispensing member having a receiving notch thereon, said dispensing member slidably engaging said housing and movable between an extended position for dispensing a vial and a retracted position for reloading the receiving notch of said dispensing member with a new vial; walls defining a feed chamber, wherein said walls defining the feed chamber include a partition, the partition including an access port for receipt of said incandescent light bulb therein, said feed chamber capable of containing a multiplicity of small vials, said walls including at least one slanted wall, the slanted wall for urging the vials towards the receiving notch of said dispensing member, and for allowing the vials to fall into the receiving notch of said dispensing member; and actuating means, said actuating means including a handle extending beyond said housing, said actuating means engaging said dispensing member to move said dispensing member between the extended and the retracted positions when the handle is manually engaged.

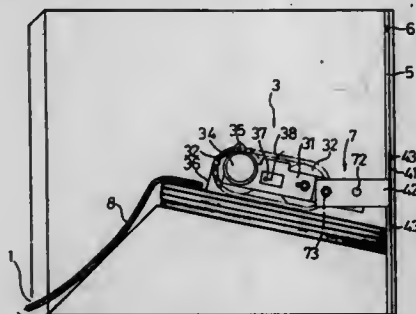
# 5,482,184

## NEWSPAPER CONVEYING MECHANISM OF A NEWSPAPER VENDING

Wei-Ping Chang, 2F, No. 21-1, Alley 37, Lane 46, 20 Jang Road, Shin Diann City, Taipei Hsien, Taiwan, Prov. of China  
Filed Aug. 16, 1994, Ser. No. 291,677  
Int. Cl.<sup>6</sup> B65G 59/02; B65H 3/36

U.S. Cl. 221-259

2 Claims



1. A newspaper conveying mechanism of a newspaper vending machine, comprising a newspaper conveying apparatus, a sliding assembly, two parallel upright rails, a locating plate and a joint apparatus, wherein:

- the newspaper apparatus includes a fixing seat, two gears mounted thereon and a circling chain meshing with the gears, one of the gears being engaged with a driving shaft of a motor, whereby the chain is able to continuously circle, a set of friction wheels and a driving claw means being locked on the chain at a certain interval, a microswitch being disposed on one side of the fixing seat, having an upward extending controlling rod, a driving rod being disposed on the chain near the driving claw means, whereby after the chain revolves through one circle, the driving rod touches the controlling rod to switch off the microswitch and cut off power;

the sliding assembly includes a fixing board and four rollers respectively disposed on four corners of the fixing board, wherein the fixing board is vertically slidably mounted on the rails by means of the four rollers, the fixing board having a projecting plate on which the fixing seat is fixed by a screw; the joint apparatus is disposed between the fixing seat and the projecting plate, including an arch slot formed on a rear portion of the fixing seat and a pin passing through one side of the projecting plate into the arch slot, whereby the newspaper conveying apparatus is pivotable about the screw which fixes the fixing seat on the projecting plate within a range defined by the arch slot;

the locating plate is formed with an elliptic slot, whereby a screw is passed through the slot to transversely lock the locating plate on an upper end of one of the rails, a spring being connected between the screw and the locating plate, permitting the locating plate to transversely resiliently displace within a notch of the rail, the locating plate having a semicircular front end, whereby one of the rollers is able to transversely push and retract the locating plate into the notch of the rail along the semicircular front end.

# 5,482,185

## APPARATUS FOR CATCHING CONTAINERS DISPENSED FROM A CONTAINER STORAGE UNIT

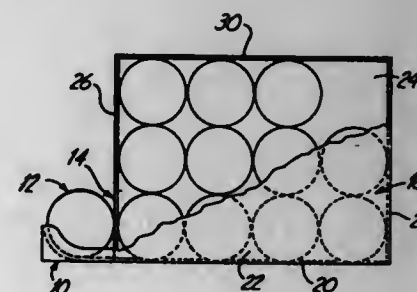
Patrick J. McNaughton, Minneapolis, Minn., assignor to McNaughton, Inc., Minneapolis, Minn.

Filed Jan. 14, 1994, Ser. No. 182,640

Int. Cl.<sup>6</sup> A47F 1/04

U.S. Cl. 221-303

19 Claims



1. An apparatus for catching containers dispensed from an opening of a portable storage unit formed by opposed side walls, the storage unit having a plurality of said containers for the transport and storage of said containers therein, the storage unit being positionable such that each of the plurality of containers exits the storage unit one at a time through the opening, the apparatus comprising:

- a base member having a raised leading portion running parallel to a bottom wall of the storage unit and permitting the bottom wall of the storage unit to be inserted thereunder, the base member extending outward from the bottom wall of the storage unit such that a discharge station is defined adjacent the opening for receiving and dispensing each of the plurality of containers, the base member having a recessed area in the discharge station for preventing a container in the discharge station from rolling back into the storage unit, the recessed area having a depth equal to at least approximately the thickness of the bottom wall of the storage unit;
- stop means attached to the base member for retaining each of the plurality of containers in the discharge station such that the plurality of containers remaining within the storage unit are retained therein, such that when one of the containers is removed from the discharge station one of the plurality of containers remaining in the storage unit is forced into the discharge station and retained thereon by the stop means; and
- engaging means operable with the base member for engaging the apparatus to opposed side walls of the storage unit.

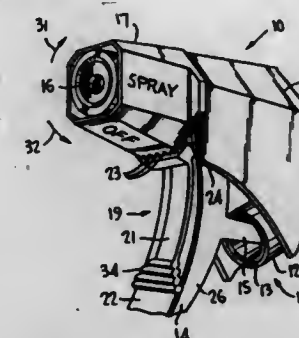
5,482,186  
REMOVABLE LOCK ELEMENT FOR IMMOBILIZING ROTATION OF A TRIGGER SPRAYER NOZZLE  
Edward J. Rodden, Jr., Upland, Calif., assignor to Calmar Inc., City of Industry, Calif.

Filed Jun. 20, 1994, Ser. No. 262,272

Int. Cl.<sup>6</sup> B67B 5/00

U.S. Cl. 222-153.07

9 Claims



1. A trigger actuated liquid dispensing pump assembly, comprising: a pump body including a shroud cover; a discharge nozzle mounted to said body adjacent a forward end of said shroud cover for rotation between discharge open and closed positions upon manual rotation of said nozzle in either direction about a central axis thereof; a trigger lever having opposed side walls said lever being movably mounted to said body for operating a pumping mechanism upon actuation thereof; said cover having opposing side walls spaced outwardly of and respectively forming first and second gaps with said lever side walls; a locking element removably connected to said nozzle by frangible connecting ties; said locking element having at least first means extending into said first gap; said first means engaging first stop means comprising one of said cover side walls and one of said lever side walls in the discharge closed position to prevent rotation of the nozzle in said either direction; and said element being disengaged from said stop means by removal of said locking element from said assembly.

# 5,482,187

## DISPENSER FOR VISCOUS SUBSTANCES

Kevin A. Poulsen, Newtonville; James H. Edwards, Winchester, and Peter A. Latham, Boston, all of Mass., assignors to Hygienix, Inc., Cambridge, Mass.

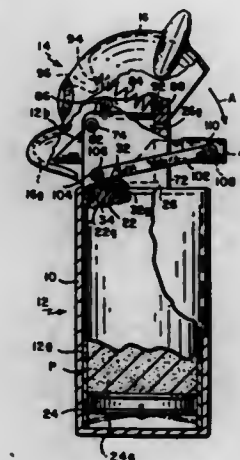
Continuation of Ser. No. 120,976, Sep. 13, 1993, abandoned.

This application Nov. 29, 1994, Ser. No. 346,533

Int. Cl.<sup>6</sup> G01F 11/00

U.S. Cl. 222-207

25 Claims



1. A dispenser for a viscous substance comprising a disposable container for said substance;

a pump section mounted to the top of said container for pumping said substance from the container, said pump section comprising a housing connected to, and communicating with the interior of, the container, and pumping means including a wall and a tube slidably received in said wall, said pumping means being movable in the housing along a motion axis between extended and retracted positions relative to the housing, so that said tube constitutes both an extensible dispensing conduit for said substance and a mover of said wall, and an actuator for said pump section, said actuator including support means removably attached to said pump section, a target member movably connected to the support means, and means releasably linking said target member to said tube so that when the target member is moved in one direction, the pumping means are moved to said extended position and when the target member is moved in another direction, the pumping means are moved to said retracted position.

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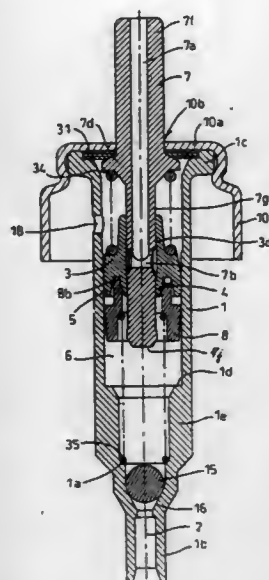
## PRECOMPRESSION PUMP

Jean-Pierre Lina, Le Neubourg, France, assignor to Valois S.A., Le Neubourg, France  
PCT No. PCT/FR93/00046, § 371 Date Sep. 14, 1994, § 102(e) Date Sep. 14, 1994, PCT Pub. No. WO93/13873, PCT Pub. Date Jul. 22, 1993

PCT Filed Jan. 19, 1993, Ser. No. 256,549  
Claims priority, application France, Jan. 20, 1992, 92 00559  
Int. Cl.<sup>6</sup> G01F 11/00

U.S. Cl. 222—321.2

11 Claims



1. A precompression pump, comprising: a cylindrical pump housing (1) containing a slidable annular plunger (3) controlled by a push-rod (7, 40), said push rod being slidably disposed in said plunger and including an outlet passage (7a, 41a, 42a) leading to the pump housing via a side opening (7b, 42b), the plunger including a substantially axial, annular inner lip (4) that interacts with the push rod to block or clear said side opening, the push rod being connected to the plunger by a first resilient member (34, 47) which urges the plunger into a position whereat said side opening is blocked, said first resilient member urging said plunger towards an annular ram (8, 44) which urges said lip (4) radially inwardly towards the push rod (7, 40) by wedging it, wherein the ram is configured to abut the plunger outwardly of said lip and at a site distinct therefrom to limit movement of the ram and plunger towards each other, and to attendantly limit a radial force applied to said plunger lip.

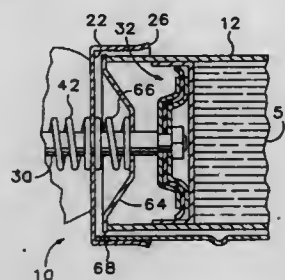
5,482,189  
CAULK GUN

Christopher G. Dentler, Portland, Oreg., and William Zagone, Ridgefield, Wash., assignors to Z-Pro International, Inc., Portland, Oreg.

Division of Ser. No. 269,063, Jun. 30, 1994. This application Oct. 11, 1994, Ser. No. 320,607  
Int. Cl.<sup>6</sup> B67D 5/42

U.S. Cl. 222—391

9 Claims



1. A dripless caulk gun, comprising:
  - (a) an elongate body;
  - (b) a handle attached to the body;
  - (c) a trigger hingedly connected to the handle;
  - (d) an elongate plunger slidably connected to the body and operably connected to the trigger so that operation of the trigger moves the plunger longitudinally relative to the body, wherein the plunger has a piston at one end thereof, the piston having a flexible, circumferential rim;
  - (e) a cylindrical canister wherein the canister has an open end with an inside diameter and wherein the body is adapted to receive the canister; and
  - (f) back disc having a diameter that is larger than the inside diameter of the canister, wherein the back disc is slidably connected to the plunger.

5,482,190

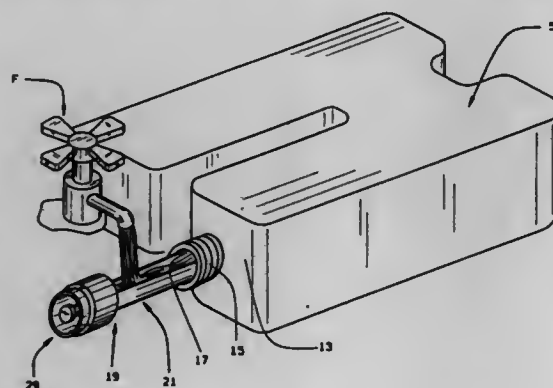
## FILLING TROUGH/DISPENSING CAP

Terrence L. Stanek, St. Louis, and Stephen L. Rhea, St. Charles, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Sep. 26, 1994, Ser. No. 312,549  
Int. Cl.<sup>6</sup> B65D 25/44

U.S. Cl. 222—501

21 Claims



1. A trough/cap for a filling/dispensing opening at a lower end of a container for holding liquids, comprising:
  - a retractable/extensible liquid filling trough that extends through the filling/dispensing opening of the container and is movable to a retracted position within the container or an extensible position outside the container, said retractable/extensible liquid filling trough having an inner end and an outer end; and

a dispensing cap associated with the outer end of the retractable/extensible liquid filling trough which covers the filling/dispensing opening when the retractable/extensible trough is retracted within the container, said dispensing cap includes a liquid dispenser for dispensing liquid from the container.

wherein said air inlet connection extends directly upwardly from said inlet opening to said chamber.

5,482,192

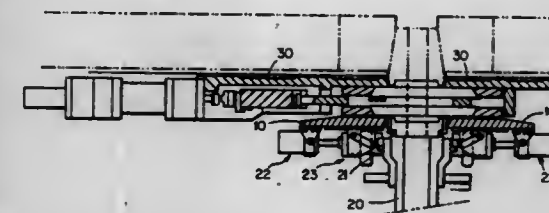
PLATE BRICK CARTRIDGE FOR A SLIDE GATE VALVE, AND SLIDE GATE VALVE OF USING THE CARTRIDGE  
Mitsukuni Sato, Okayama; Yosuke Kobayashi, Bizen; Masahiko Nose, and Kenji Yamamoto, both of Okayama, all of Japan, assignors to Shinagawa Refractories Co., Ltd., Tokyo, Japan

PCT No. PCT/JP92/00351, § 371 Date Sep. 27, 1993, § 102(e) Date Sep. 27, 1993, PCT Pub. No. WO92/17299, PCT Pub. Date Oct. 15, 1992

PCT Filed Mar. 23, 1992, Ser. No. 119,247  
Claims priority, application Japan, Mar. 29, 1991, 3-066645  
Int. Cl.<sup>6</sup> B22D 41/24

U.S. Cl. 222—600

6 Claims



1. A plate brick assembly cartridge for a slide gate valve comprising:

a bottom plate brick, a sliding plate brick and a seal plate brick, each of said plate bricks having upper and lower planar surfaces, having an aperture for the flow of material there-through, and having a metallic or ceramic holder mounted peripherally thereof, said sliding plate brick being slidably interposed between said bottom plate brick and said seal plate brick with the upper planar surface of said sliding plate brick being in sliding contact with the lower surface of said bottom plate brick and with the lower surface of said sliding plate brick being in sliding contact with the upper surface of said seal plate brick, the holder of said sliding plate brick having upper and lower surfaces that are set back relative to the upper and lower surfaces of said sliding plate brick whereby, on sliding movement of said sliding plate brick between said bottom plate brick and said seal plate brick, the upper and lower surfaces of said sliding plate brick holder will not contact said lower surface of said bottom plate brick or the upper surface of said seal plate brick;

means carried by said holders of said bottom and seal plate bricks for positioning said bottom and seal plate bricks in superposed adjacency with said sliding plate brick slidably interposed therebetween and with the apertures of said bottom and seal plate bricks in registry whereby said sliding plate brick is slidable therebetween such that its aperture can be moved into and out of registry with the apertures in said bottom and seal plate bricks;

means carried by said holders of said bottom and seal plate bricks for urging the lower surface of said bottom plate brick against the upper sliding surface of said sliding plate brick and for urging the upper surface of said seal plate brick against the lower sliding surface of said sliding plate brick; and

temperature monitoring means located within at least one of said holders for monitoring the temperature thereof.

5,482,191

## DEVICE FOR FILLING WRITING, DRAWING, PRINTING OR PAINTING UTENSILS

Rainer Kaufmann, Delmenhorst, Germany, assignor to Dataprint Datendrucksysteme R. Kaufmann KG, Delmenhorst, Germany

Continuation of Ser. No. 150,028, Nov. 10, 1993, abandoned.

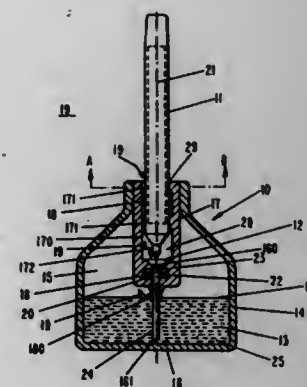
This application Jun. 5, 1995, Ser. No. 469,087

Claims priority, application Germany, May 10, 1991, 41 15 275.1

Int. Cl.<sup>6</sup> B43L 27/00

U.S. Cl. 222—577

19 Claims



1. A device for filling a writing utensil having an applicator tip for applying a liquid, said device comprising:

a container for receiving a liquid, said container having an air inlet connection to connect an interior of said container to a surrounding atmosphere and further having an opening;

a receiving member for receiving the writing utensil or a liquid reservoir of the writing utensil, said receiving member sealingly connected within said opening;

a capillary liquid conveying connection, having a first and a second end, for conveying the liquid from said container into a writing utensil or a liquid reservoir of a writing utensil, said first end opening into said receiving member and contacting a writing tip of the writing utensil or an inlet of the liquid reservoir of the writing utensil; and

said air inlet connection having a lower end with an inlet opening that opens into said interior and an upper end opening to the atmosphere, said air inlet connection comprising at least one chamber, positioned between said upper and lower ends and being wider than said upper and lower ends, for taking up a volume of writing liquid displaced from said interior through said inlet opening into said air inlet connection.



5,482,193

## DISPENSER FOR MEDIA

Karl-Heinz Fuchs, Radolfzell, Germany, assignor to Ing. Erich Pfeiffer GmbH & Co. KG, Radolfzell, Germany  
Continuation of Ser. No. 973,868, Nov. 9, 1992, abandoned.

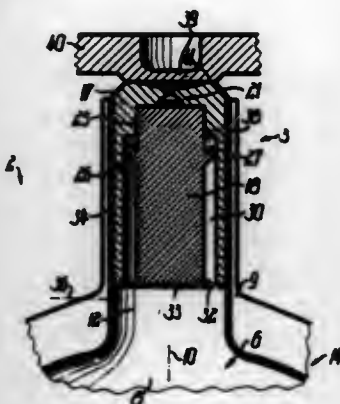
This application Apr. 15, 1994, Ser. No. 228,178

Claims priority, application Germany, Nov. 8, 1991, 41 36 826.6

Int. Cl.<sup>6</sup> B05B 11/06

U.S. Cl. 222—633

35 Claims



1. A dispenser for discharging media comprising:
  - a medium outlet (20);
  - a medium reservoir providing a medium chamber (30) at least partly emptyable via said medium outlet (20), and
  - a propellant pump (5) having a pressure chamber (6), said pressure chamber (6) being at least partly separated from said medium chamber (30), and in an initial state said pressure chamber (6) enclosing a propellant;
  - said propellant pump (5) providing a manually operable pump, means being provided for pressing said propellant in said pressure chamber (6) against medium contained in said medium chamber (30),
  - wherein said medium chamber (30) is provided as an annular reservoir space bounded by circumferential faces including outer and inner circumferential faces, and wherein an annular closure (27) is situated in a closed position between said circumferential faces at an outlet end of said annular reservoir space, said annular closure (27) being movable to an open position by an increase in pressure in said reservoir space (30) that allows passage of the medium past the annular closure (27), while the inner and outer circumferential faces remain positionally stable in relation to each other.

5,482,194

## FOLDING BICYCLE RACK

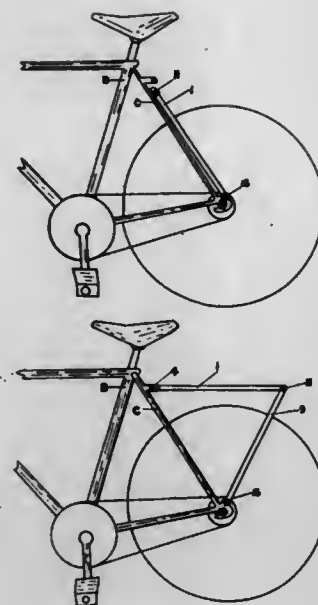
Orrin S. Hallock, III, 33 Roberts Rd., Cambridge, Mass. 02138  
Filed Dec. 13, 1993, Ser. No. 165,678

Int. Cl.<sup>6</sup> B62J 7/04

U.S. Cl. 224—40

1 Claim

1. A folding bicycle luggage rack for a bicycle having a wheel, said rack comprised of a pair of legs and a pair of rails, upper ends of said legs are pivotally secured to either end of a tail piece, pivotal ends of said rails are pivotally secured to either end of said tail piece outside of said upper ends of said legs, thereby providing a folding bicycle luggage rack wherein lower ends of the legs are secured to the bicycle to either side of the wheel, free ends of said rails are removably secured in one of two positions, a first carrying position in which the free ends of said rails are secured to seat stays of said bicycle providing a carrying platform for mounting and supporting articles on the bicycle, or a second storage position in which said free ends of said rails are secured outside of and parallel to said lower ends of said legs on either side of said bicycle wheel.



5,482,195

## FISH STRINGER

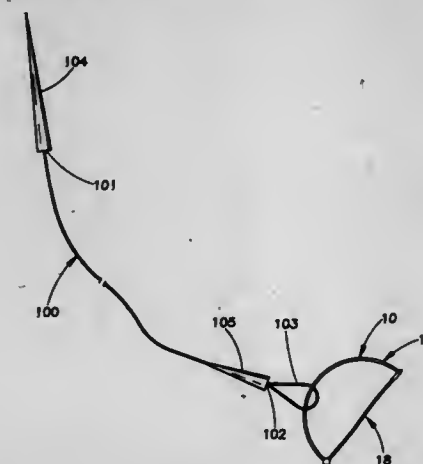
Sidney C. Hobbs, P.O. Box 334, Clifton, Ala. 36522

Filed Nov. 21, 1994, Ser. No. 342,899

Int. Cl.<sup>6</sup> A01K 97/20

U.S. Cl. 224—103

2 Claims



1. A fish stringer apparatus comprising:
  - (a) a substantially semi-hemispheric leg;
  - (b) a first end and a second end on the substantially semi-hemispheric leg;
  - (c) a hinge mechanism attached to the first end;
  - (d) the hinge mechanism comprising:
    - a hinge base;
    - a first stop on the hinge base; and
    - a second stop on the hinge base;
  - (e) a latch bar comprising:
    - a hinge end; and
    - a latch end;
  - (f) the latch bar hingedly connected to the hinge mechanism at the hinge end of the latch bar;
  - (g) a latch mechanism attached to the second end;
  - (h) the latch bar adapted to be releasably placed in the latch mechanism;
  - (i) the latch bar abutting the second stop causing the latch end of the latch bar to stop below a level corresponding to an entrance to the latch mechanism such that the latch bar is bent

above the entrance to the latch mechanism and is subsequently springingly biased down into the latch mechanism by way of the entrance;

- (j) a cord comprising:
  - a lance end; and
  - an attachment end;
- (k) the attachment end of the cord adapted to be releasably attached to the semi-hemispheric leg;
- (l) a lance attached to the lance end.

5,482,196

## ATTACHING ARTICLES TO SHEET MATERIAL WITH FLEXIBLE TIES

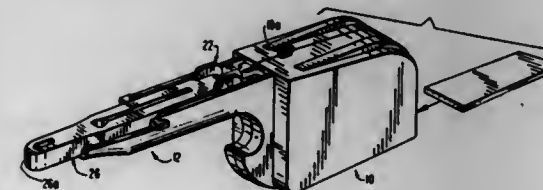
John S. Doyel, 404 W. 20th St., New York, N.Y. 10011

Filed Mar. 22, 1993, Ser. No. 34,098

Int. Cl.<sup>6</sup> B65C 7/00

U.S. Cl. 227—67

9 Claims



1. A hand operated implement for attaching articles such as buttons or tags to sheet material such as fabric with flexible ties, comprising:

- a housing having a handle shaped and dimensioned to be grasped by the hand of a user and a barrel extending forwardly from the handle and having a channel formed therein;
  - a needle secured to and extending forwardly from the barrel and having a sharp free end for penetrating material and a groove extending rearwardly from said sharp end and shaped to accommodate a part of a flexible tie slidable along the groove for exiting the sharp end thereof;
  - a slide secured in said channel and configured to slide along the barrel, and a pusher mounted on the slide to slide in the groove of the needle between a tie loading position and a tie ejecting position, to push forward and out of the needle a flexible tie loaded into said groove in the needle, said slide and pusher being biased rearwardly; and
  - a needle cover secured to the slide and movable between a storage position to cover the sharp end of the needle and an operative position exposing said sharp end;
- said needle cover, when in the operative position, being slidable along the housing forwardly when pushed by a user to move the slide and the pusher forwardly and thereby push out of the sharp end of the needle a flexible tie loaded into said groove in the needle, and being slidable rearwardly under the bias applied to the slide to retract the pusher to said tie loading position so as to free the needle for the loading of another flexible tie therein.

5,482,197

## ARTICULATING SURGICAL CARTRIDGE ASSEMBLY

David T. Green, Westport; Keith Ratcliff, Sandy Hook; Keith L. Millman, Norwalk; Henry R. Sienkiewicz, Stamford, and Mitchell J. Palmer, New Milford, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

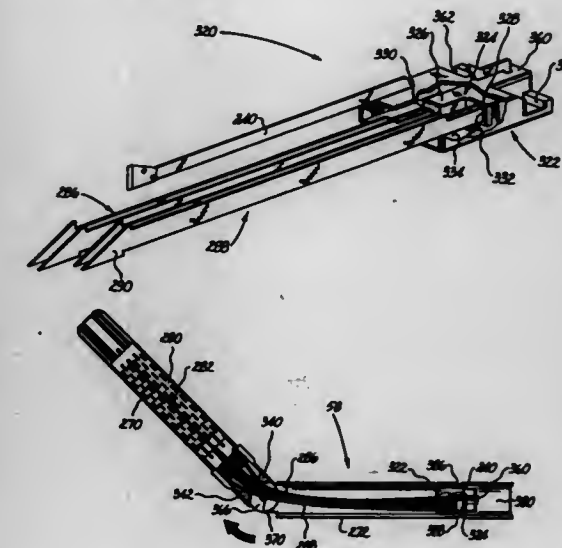
Division of Ser. No. 949,685, Sep. 23, 1992, Pat. No. 5,326,013, which is a continuation-in-part of Ser. No. 915,425, Jul. 17, 1992, abandoned, which is a continuation-in-part of Ser. No. 781,012, Oct. 18, 1991, abandoned. This application May 17, 1994, Ser. No. 245,148

The portion of the term of this patent subsequent to Jul. 5, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> A61B 17/068

U.S. Cl. 227—178.1

7 Claims



1. An articulating cartridge assembly for a surgical apparatus comprising:

- a) a mounting portion adapted to be mounted in said apparatus;
- b) a housing portion connected to a distal end portion of said mounting portion, said housing portion mounted for pivotable movement relative to said mounted portion;
- c) a cartridge disposed in said housing portion for holding a plurality of surgical fasteners slidably disposed therein in abutment with a plurality of corresponding pusher elements, said cartridge defining at least one longitudinal slot; and
- d) a cam bar adapted disposed in said mounting portion for retaining at least one cam bar, said at least one cam bar adapted for translation through said at least one longitudinal slot to engage said pusher elements so as to eject said surgical fasteners from said cartridge.

5,482,198

## SOLDER PREFORM PICK-AND-PLACE MACHINE AND OPERATION

Harold Kohn, Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 985,397, Dec. 4, 1992, Pat. No. 5,303,824.

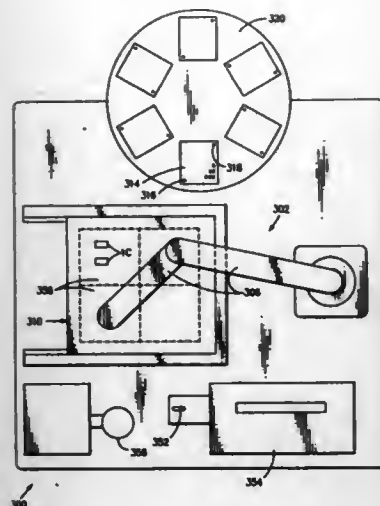
This application Jan. 14, 1994, Ser. No. 182,902

Int. Cl.<sup>6</sup> B23K 37/00

U.S. Cl. 228—6.2

10 Claims

1. A solder-preform pick-and-place machine comprising: vacuum means for automatically and sequentially for each solder-preform of a two dimensional stationary array of preforms, applying vacuum and moving vertically for picking the solder-preform up from a respective position of the solder-preform holder, moving in two horizontal axis to a selected position above a stationary circuit board, and moving vertical and controlling the vacuum for



placing the preform at a predetermined respective position on the circuit board accurately in horizontal directions as well as rotationally;

post means for accurately positioning the solder-preform holder in relation to the vacuum means in a stationary position for picking up a solder-preform from each position of a two dimensional array of positions of the holder and accurately placing the preform on a stationary circuit board.

5,482,199

# ELECTRIC SOLDERING IRON HAVING SOLDER HOLDING MEANS

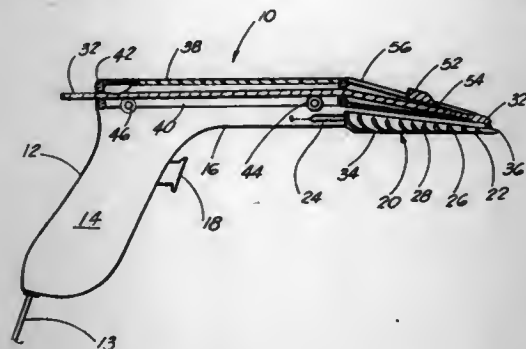
Leroy Walker, 4719 Rhodes Dr., New Orleans, La. 70126

Filed Nov. 22, 1993, Ser. No. 155,284

Int. Cl.<sup>6</sup> B23K 3/06

U.S. Cl. 228—52

12 Claims



1. A soldering tool comprising:

- (a) an elongated housing configured to be engaged by the hand of a user;
- (b) an elongated conduit secured within said housing and sized to accept and pass a length of solid wire solder therethrough, one end region of said conduit having an opening therein;
- (c) guide means within said housing for supporting and guiding said solder along said conduit;
- (d) biasing means secured to said conduit for biasing or moving said solder through said conduit and out said opening; and,
- (e) heated tip means within said housing for heating said one end region of said conduit and for heating said solder therein, said heated tip means comprising solder retaining recesses therein whereby melted solder flowing out of said opening can be collected and stored in said recesses during operation, said solder retaining recesses being defined by one or more pairs of alternating baffles and notches forming a part of said heated tip means.

5,482,200

# METHOD FOR APPLYING SOLDER TO A FINE PITCH FLIP CHIP PATTERN

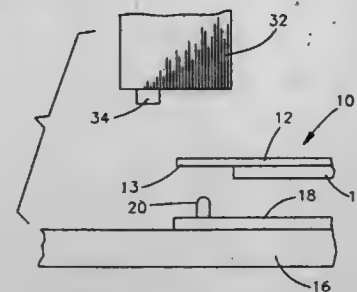
Bruce A. Myers, and Ronnie J. Runyon, both of Kokomo, Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Feb. 22, 1994, Ser. No. 200,038

Int. Cl.<sup>6</sup> B23K 1/018;31/02

U.S. Cl. 228—191

2 Claims



1. A method for soldering a flexible circuit to a flip chip conductor pattern formed on a rigid electronic circuit board, said method comprising the steps of:

- providing a plurality of circuit conductors on said electronic circuit board so as to define said flip chip conductor pattern;
- forming solder bumps on a surface of a flip chip and registering each of said solder bumps with a corresponding one of said plurality of circuit conductors;
- reflowing said solder bumps to solder said chip to said flip chip conductor pattern;
- heating said flip chip while simultaneously applying a force to separate said flip chip from said flip chip conductor pattern, thereby to remove said flip chip from said solder bumps, and to transfer said solder bumps to said plurality of circuit conductors;
- registering said flexible circuit with said conductor pattern such that a plurality of conductors extending from said flexible circuit register with said plurality of circuit conductors; and
- heating said plurality of conductors so as to solder said flexible circuit to said flip chip conductor pattern.

5,482,201

# TRANSPORT DEVICE AND PROCESS FOR A VAPOR-PHASE SOLDERING INSTALLATION

Helmut W. Leicht, Messerschmitttring 61, 86343 Königsbrunn, Germany

PCT No. PCT/EP93/00493, § 371 Date Sep. 2, 1994, § 102(e) Date Sep. 2, 1994, PCT Pub. No. WO93/17824, PCT Pub. Date Sep. 16, 1993

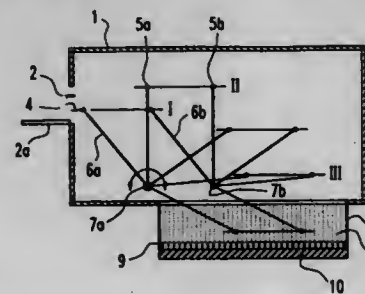
PCT Filed Mar. 4, 1993, Ser. No. 295,764

Claims priority, application Germany, Mar. 6, 1992, 42 07 166.6

Int. Cl.<sup>6</sup> B23K 37/047;31/02; B65G 49/04

U.S. Cl. 228—49.5

18 Claims



1. A transport device for a vapor-phase soldering equipment comprising a housing (1), a medium container (3) and at least one aperture (2) for loading and removing the part to be soldered, comprising

- a support (4) for the part to be soldered, and
- a transport unit comprising
  - a holder for said support (4), said holder pivoting about an axis, and
  - a drive which acts on the holder, and
  - a stabilizing device to guide the support (4) in parallel when the holder pivots,

wherein the holder and the stabilizing device comprise two front and rear parallel struts (6a and 6b, respectively) which are positioned at the front and rear end of the support (4) respectively, and which are removably and pivotally fixed to said support in bearings (5a and 5b, respectively),

the front pair of struts (6a) being drivable via a drive shaft (7a) at its lower end and the rear pair of struts (6b) pivoting about a bearing shaft (7b) at its lower end, and the support (4) together with the front and rear struts (6a and 6b, respectively) pivoting about the drive shaft (7a) and the bearing shaft (7b) in such a way that the plane of the support (4) is displaced in parallel.

5,482,202

# DRINK BOX WITH BUILT-IN STRAW

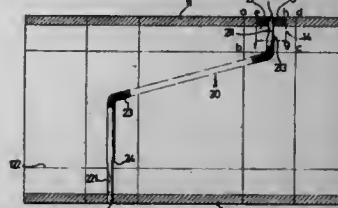
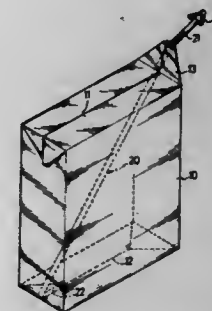
Chung-hsin Wen, No. 9, Lane 24, Tawu St., Tainan, Taiwan, Prov. of China

Filed Jun. 2, 1995, Ser. No. 458,124

Int. Cl.<sup>6</sup> B65D 5/72;25/38

U.S. Cl. 229—103.1

11 Claims



1. A drink box with a built-in straw comprising:
  - a container for preserving drink having an upper sealing edge and a lower sealing edge;
  - a tip portion integral on the container and comprising a part of the upper sealing edge, the tip portion being detachable from the rest of the container;
  - a straw being composed of an upper end portion, a lower end portion and a middle portion connecting the two end portions, the upper end portion being attached on a superimposition area of the upper sealing edge and the tip portion, the lower end portion being attached on the lower sealing edge, the middle portion being able to extend a lengthwise distance in response to a movement of the upper end portion with respect to the lower end portion; and
  - a semi-perforated line being formed adjacent to a junction between the upper end portion and the middle portion of the straw, the straw being easily breakable along the semi-perforated line to separate a segment thereof together with the detached tip portion from the rest of the straw, thereby exposing the remaining straw for access from outside.

5,482,203

# HANDLE REINFORCEMENT FOR A CARTON

James T. Stout, Ellijay, Ga., assignor to The Mead Corporation, Dayton, Ohio

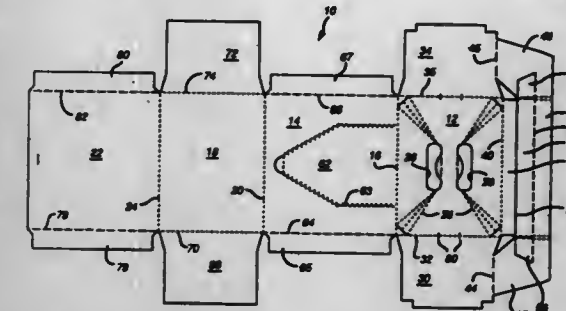
Continuation of Ser. No. 116,307, Sep. 3, 1993, abandoned.

This application Jul. 28, 1994, Ser. No. 281,549

Int. Cl.<sup>6</sup> B65D 5/46

U.S. Cl. 229—117.13

15 Claims



1. A blank for forming a carton, comprising: a top wall panel having opposed first and second side edges and opposed first and second end edges; a series of wall panels foldably connected one to the next, including a first panel in said series foldably connected to said top wall panel along said first side edge thereof and a last panel in said series disposed at an opposite end of said series from said first panel;

first and second end flaps each having top edges, said first end flap being connected along said top edge to said first end edge of said top wall panel, and said second end flap being connected along said top edge to said second end edge of said top wall panel, each of said end flaps further having first and second side edges corresponding generally to said first and second side edges of said top panel;

a handle aperture defined in said top wall panel and positioned thereon generally centrally of said top wall; and

a handle reinforcing structure including first and second end portions, said first end portion connected along a fold line to said second side edge of said first end flap, and said second end portion connected along a fold line to said second side edge of said second end flap, and a central portion connected to each of said end portions and extending therebetween generally along said second side edge of said top panel; wherein said central portion defines a pair of free edges extending along the length thereof, whereby said central portion is separated from said top wall panel.

5,482,204

# CARTON BOTTOM SEALER

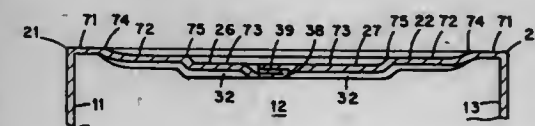
Tim P. Hughes, Cedar Rapids, Iowa, assignor to International Paper Company, Purchase, N.Y.

Filed Mar. 21, 1994, Ser. No. 215,173

Int. Cl.<sup>6</sup> B65D 5/08

U.S. Cl. 229—137

5 Claims



1. A paperboard container comprising four materially integral side walls of thermoplastic film coated paperboard formed about a container axis, said walls being laterally delineated by wall corners that are substantially parallel with each other and said container axis and vertically delineated at one end thereof by substantially coplanar bottom corners, a bottom closure wall formed by a layered folding of bottom panels that are materially integral extensions of said side walls, said bottom closure wall being sealed fluid-tight by a heat fusion of thermoplastic coating respective to



adjacent surfaces of said lapped panels and formed to an approximate lenticular geometry that is concave within said bottom corners, said lenticular geometry being a substantially symmetric stepped pyramid of diminishing area step-planes.

5,482,205

# **SPIRALLY-WOUND EASY-OPEN CONTAINER HAVING A SCORE CUT OPENING PANEL**

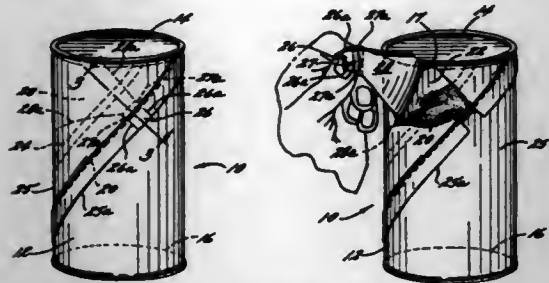
Michael T. Drummond, Florence; William C. Suski; Calvin G. Hill, both of Hartsville; James W. Lowry, Florence, all of S.C., and Rodney W. Roberts, Otisco, Ind., assignors to Sonoco Products Company, Hartsville, S.C.

Filed Aug. 1, 1994, Ser. No. 283,648

Int. Cl.<sup>6</sup> B65D 85/00

U.S. Cl. 229—201

10 Claims



1. An easy-open container particularly adapted for packaging products under pressure and comprising:

- a spirally-wound paperboard bodywall layer in strip form defining a substantially cylindrical container having opposed ends, said bodywall layer having longitudinal edges lying adjacent each other to thereby define an easy-open spiral seam extending between said opposed ends;
- a flexible barrier liner layer in strip form spirally-wound inside said bodywall layer in superimposed position therewith;
- a flexible label layer in strip form spirally-wound outside said bodywall layer in superimposed position therewith and having longitudinal edge portions overlapped with each other adjacent to and to one side of said easy-open spiral seam, the uppermost of said label layer overlapped edge portions being positioned in bridging relation to said easy-open spiral seam;
- high strength bonding means positioned between said label layer and said bodywall layer;
- tab cuts extending through the upper of said label layer edge portions and inwardly from an outer edge thereof past said spiral seam and through said bodywall layer longitudinal edge portion superimposed thereunder to define an easy-open pull tab including both the upper of said label layer edge portions and the inwardly underlying bodywall layer longitudinal edge portion; and
- score cuts extending through said bodywall layer and extending in diverging lines from said pull tab to define an easy-open panel for said container which is adapted to tear when said pull tab is pulled to easy-open said container.

5,482,206

# **AUTOMATIC MAIL DELIVERY SIGNALING DEVICE**

Cecil M. Waycasy, 345 S. 1230 East, Spanish Fork, Utah 84660

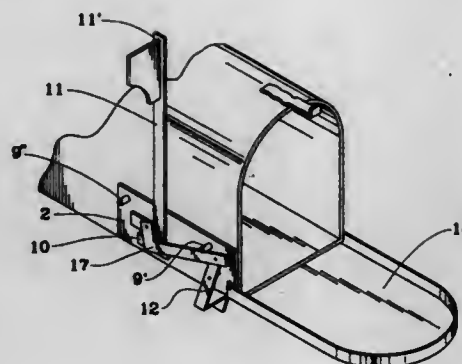
Filed Jul. 18, 1994, Ser. No. 276,632

Int. Cl.<sup>6</sup> B65D 91/00

U.S. Cl. 232—35

3 Claims

1. A mail delivery signaling device comprising:
- a rectangular enclosure having a backboard, a front cover, a top plate, a bottom plate, a side plate, first and second machine screws, first and second collars, forward flag stop, a flag, a trigger arm, and a flag connecting lever;
  - said enclosure attaching to the mail box by said first and second machine screws;



- said machine screws pass through said front cover and said backboard;
- said first and second machine screws being surrounded by a first and second collar that forms spacers between said front cover and said backboard;
- said first and said second machine screws passing through holes drilled in the side of said mail box;
- said first and second machine screws having acorn nuts threaded on the free ends which extend through said side of said mail box;
- said second collar is positioned adjacent to said side plate and functions as a back flag stop;
- said forward flag stop being firmly attached to said backboard;
- said forward flag stop being located to support the vertical position of said flag;
- said backboard having first and second attachment points;
- said first attachment point having said trigger arm pivotally attached;
- said second attachment point having said flag pivotally attached;
- said trigger arm having a first end and a second end;
- said first end of said trigger arm being pivotally attached to said flag connecting lever;
- said second end of said trigger arm being shaped in a manner to engage the mail box door as it is lowered;
- said flag connecting lever having a first and second end;
- said first end of said flag connecting lever being pivotally attached to said trigger arm;
- said second end of said flag connecting lever having a member attached at an angle to provide leverage for raising said flag;
- said member of said second end of said flag connecting lever being an integral part of said flag connecting lever;
- said flag connecting lever being pivotally connected to said flag adjacent to said end of said member of said flag connecting lever;
- said flag having a first end and a second end;
- said first end of said flag having a projection at a right angle from the surface of said flag;
- said second end of said flag being "L" shaped;
- said second end of said flag being pivotally connected to said flag connecting lever at the inner aspect of said right angle formed by said "L" shape of said second end of said flag;
- said flag being pivotally connected to said flag connecting lever at a position adjacent to said second end of said flag;
- said flag stop being placed to engage the outer aspect of said "L" shape of said second end of said flag;
- said flag stop supporting said flag in a vertical position in respect to said bottom plate;
- said bottom plate having a slot allowing movement of said trigger arm;
- said trigger arm protruding through said slot in said bottom plate allowing said trigger arm to engage said mail box door;
- said top plate having a slot allowing movement of said flag from a horizontal to vertical position;
- said side plate having a slot adjacent to said top plate accommodating said flag in a vertical position; and,
- said second collar being located to act as back flag stop.

5,482,207

# **SYSTEM FOR FACILITATING THE REMOVAL AND SAFE DISPOSITION OF MEDICAL NEEDLES**

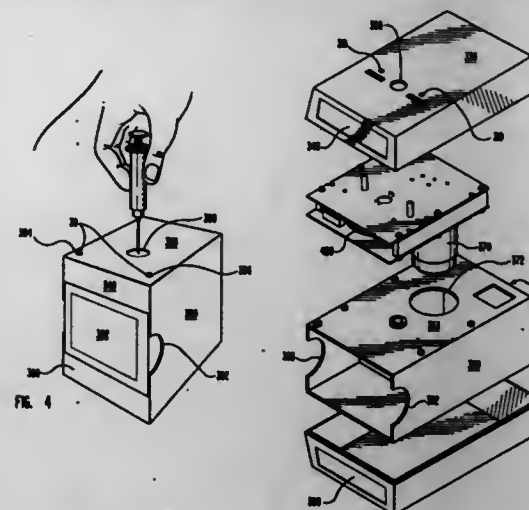
Mark Nelson, Sandy; David Vangelson, Salt Lake City; Phillip K. Evans, Murry, and Robert Wells, Salt Lake City, all of Utah, assignors to Life Medical Technologies, Inc., Salt Lake City, Utah

Filed Apr. 29, 1994, Ser. No. 235,388

Int. Cl.<sup>6</sup> B65D 91/00

U.S. Cl. 232—43.2

9 Claims



1. An apparatus for removing needles of the type received by medical syringes comprising:
- a first housing means;
  - sensor means contained within the housing means;
  - needle removing means contained within said first housing means that includes an electric motor with said first housing means and having a rotating output shaft that mounts a plurality of cam members, each mounted for rotation and revolution about an axis which defined a passageway into said first housing means through which a needle can be inserted for gripping and rotation by said cam members;
  - second housing means for containing removed needles;
  - feedback control means for interconnecting said sensor means and said needle removing means such that when said sensor means detects a needle, said needle removing means removes said needle and permits it to drop into said second housing means.

5,482,208

# **ONE-HANDED OPENING DEVICE**

Brad Johnston, 4027 Brandywine St., Northwest, Washington, D.C. 20016

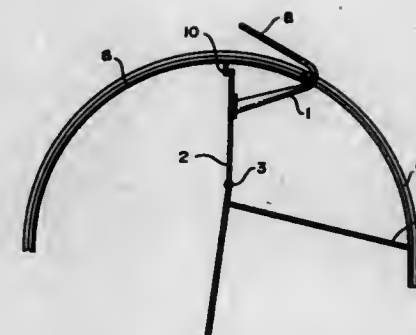
Continuation-in-part of Ser. No. 906,746, Jun. 30, 1992, abandoned. This application May 18, 1993, Ser. No. 72,101

Int. Cl.<sup>6</sup> B65G 11/04

U.S. Cl. 232—47

5 Claims

1. A hinged receptacle having a top, an overhang connected to the top, an opening, a closure and a handle attached to the closure, the closure having a hinge edge and a hinge-opposed edge with a hinge connecting the hinge edge to the receptacle, the handle being attached to an outward face of the closure between the hinge and the hinge-opposed edge, projecting away from the outward face of the closure for a distance sufficient to clear the overhang of the top of the receptacle and then bending back over the top of the receptacle in the general direction of the closure, terminating beyond the hinge-opposed edge of the closure in the hinge-opposed direction, a point of attachment of the handle to the closure being the only point of physical engagement between any element or component or part of the handle and any element or component or part of the receptacle, the handle functioning as a



5,482,209

# **METHOD AND MEANS FOR PROGRAMMING A PROGRAMMABLE ELECTRONIC THERMOSTAT**

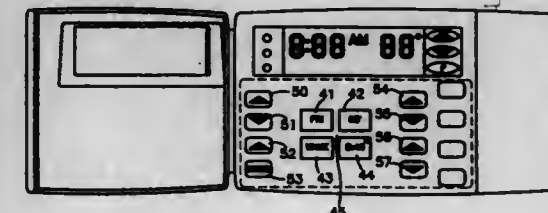
Edward L. Cochran, Minneapolis, and Stephen V. Metz, St. Paul, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 1, 1994, Ser. No. 252,038

Int. Cl.<sup>6</sup> G05D 23/00

U.S. Cl. 236—46 R

17 Claims



1. A programmable electronic thermostat wherein said thermostat utilizes time and temperature pairs, said thermostat comprising:
- a first display means displaying current status information of said thermostat;
  - a second display means displaying programming information for said thermostat, said programming information simultaneously indicating programming day, set point temperature, period, and start time; and
  - programming buttons adjacent to said second display means for programming programming day, set point temperature, period, and start time.

5,482,210

# **POULTRY ENVIRONMENTAL CONTROL SYSTEMS AND METHODS**

Richard A. Carey, Stone Mountain; Marlon M. Moses, Norcross, and Wayne D. R. Daley, Stone Mountain, all of Ga., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

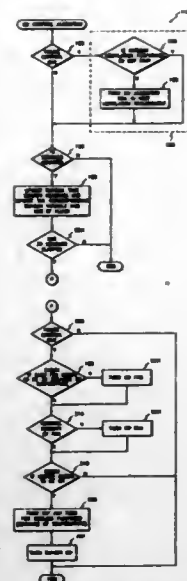
Division of Ser. No. 113,851, Aug. 30, 1993. This application Sep. 19, 1994, Ser. No. 308,850

Int. Cl.<sup>6</sup> F24F 7/00

U.S. Cl. 236—49.3

2 Claims

1. A system for optimally controlling the temperature and ventilation in an enclosure for poultry, comprising:
- heaters disposed in said enclosure;



temperature sensors for sensing temperature within said enclosure and for generating temperature feedback signals indicative thereof, each of said temperature sensors associated with one of said heaters;

fans for blowing air out of said enclosure;

humidity sensors for sensing humidity within said enclosure and for generating humidity feedback signals indicative thereof, each of said humidity sensors associated with one of said fans;

a control means for selectively actuating said heaters and said fans in response to said temperature feedback signals and said humidity feedback signals, said control means for periodically actuating a fan for a predefined time period within a predefined time interval in order to meet minimum ventilation requirements; and

ventilation control means for monitoring actuation of said fans, said ventilation control means for decreasing said predefined time period pertaining to said fan by a time amount corresponding to actuation of another fan within said predefined time interval.

5,482,211

### SUPERCRITICAL FLUID CLEANING APPARATUS WITHOUT PRESSURE VESSEL

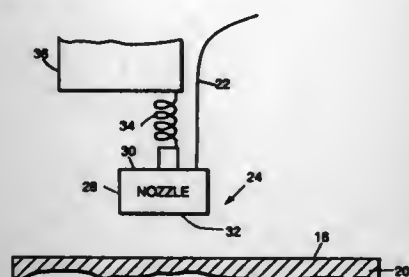
Sidney C. Chao, Manhattan Beach; Thomas B. Stanford, Jr., San Pedro; Edward J. Palen, Marina Del Rey, and Chris Lee, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 21, 1994, Ser. No. 230,656

Int. Cl.<sup>6</sup> B05B 1/24

U.S. Cl. 239—135

9 Claims



1. A nozzle for generating a supercritical fluid from a cleaning fluid including means for directing said supercritical fluid onto a surface of a part to be cleaned, said nozzle comprising a body having

- an interior portion which includes means for generating said supercritical fluid by suitable temperature and pressure increase of said cleaning fluid;
- an inlet portion for introducing the cleaning fluid into said interior portion;
- an outlet portion for directing said supercritical fluid generated in said interior portion onto said surface of said part to be cleaned; and
- counteracting means for resisting high pressure that is produced during the generation of said supercritical fluid so as to permit said nozzle to be maintained a suitable distance from said surface of said part to be cleaned so that said supercritical fluid impinges on said surface.

5,482,212

### VEHICLE WASHING MACHINE

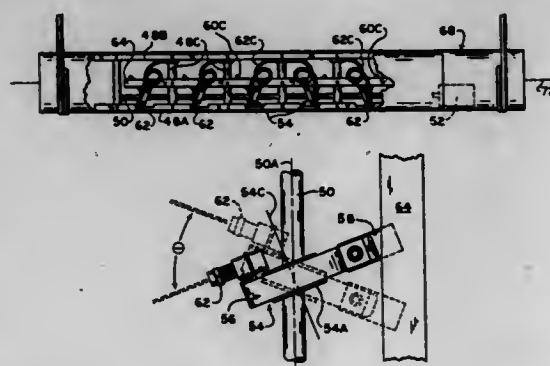
Scott Kobryn, 209 Main Street West, Grimsby, Ontario, Canada, and Donald Kobryn, 2284 Hollow Road North, Pelham, Ontario, Canada

Filed Jul. 5, 1994, Ser. No. 270,466

Int. Cl.<sup>6</sup> B05B 3/18; F16H 23/00

U.S. Cl. 239—227

11 Claims



1. A mechanism for applying liquid in a fan-like spray pattern to a surface to be cleaned comprising in combination:
  - at least one liquid discharge nozzle;
  - a drive shaft having an axis of rotation;
  - a bearing having inner and outer parts journaled for relative rotation about a bearing axis, said inner part being fixed to said drive-shaft for rotation therewith and to arrange said bearing axis thereof to reside at an angle relative to said axis of rotation, said outer part mounting said at least one nozzle; and
  - means for constraining said outer part against rotation about said axis of rotation of said drive shaft.

5,482,213

### FUEL INJECTION VALVE OPERATED BY EXPANSION AND CONTRACTION OF PIEZOELECTRIC ELEMENT

Masanobu Matsusaka, Handa; Susumu Sugimoto, Obu; Moto-nobu Akaki, Anjo, and Yasutoshi Yamada, Aichi, all of, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 27, 1994, Ser. No. 249,991

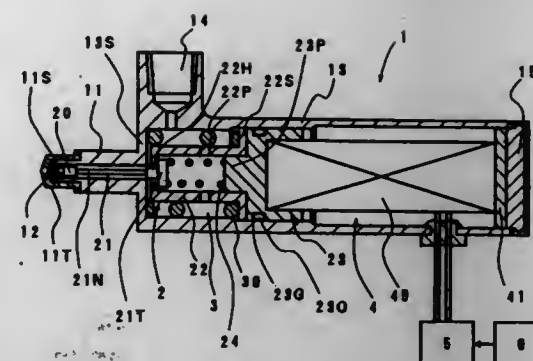
Claims priority, application Japan, May 31, 1993, 5-154387; May 31, 1993, 5-154388

Int. Cl.<sup>6</sup> B05B 1/30

U.S. Cl. 239—584

11 Claims

1. A fuel injection valve comprising:
  - a valve body having an injection port at a tip portion thereof;
  - a needle valve member being interposed in said valve body[,] for opening or closing said injection port;
  - a first spring member being interposed in said valve body for biasing said needle valve member in one direction;



a piezoelectric device comprising a piezoelectric element having a solid cylindrical body interposed in said valve body for pushing said needle valve member in a direction opposite to said one direction; and

a control device connected to the piezoelectric device to control a polarity of voltage applied to the piezoelectric device for controlling a position of said needle valve member relative to said injection port.

5,482,214

### ELECTROSTATIC POWDER-COATING GUN

Radovan Talacko, St. Gallen, Switzerland, assignor to Wagner International AG, Alstatten, Switzerland

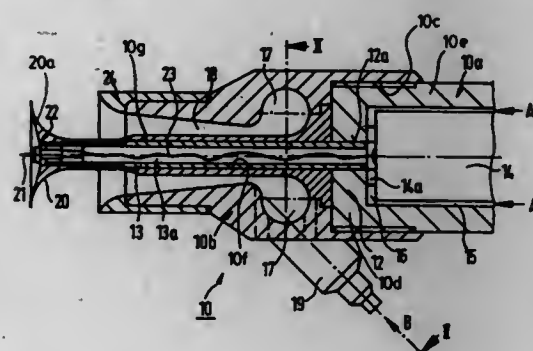
Filed Dec. 17, 1992, Ser. No. 991,504

Claims priority, application Germany, Dec. 17, 1991, 41 41 663.5

Int. Cl.<sup>6</sup> B05B 5/025

U.S. Cl. 239—698

15 Claims



1. An electrostatic powder-coating gun having a gun barrel, comprising:
  - a powder duct which is connectable to a supply conduit for a powder-air-mixture and is arranged along the longitudinal axis of the gun barrel towards the work to be coated and terminating in a mouth;
  - a high-voltage generator which is connectable to a power supply line;
  - an electrode supporting tube extending through the powder duct in axial direction thereof; and
  - a high-voltage electrode which is carried by the supporting tube and which protrudes beyond the mouth of the powder duct towards the work and is connected to the high-voltage generator via a conductor passing through the supporting tube, wherein the high-voltage generator and the powder duct are disposed in series along the longitudinal axis of the gun barrel, and
- wherein the powder duct comprises a toroidal powder duct coaxial with the electrode supporting tube and an annular channel extending to said mouth, and a supply port for the powder-air-mixture, extending into the toroidal powder duct tangentially, at an inclination to the longitudinal axis.

5,482,215

### METHOD OF RECLAIMING RUBBER FROM VEHICLE TIRES

George Veres, City Beach, Australia, assignor to CMHT Technology (Australia) Pty Ltd, Osborne Park, Australia

PCT No. PCT/AU92/00282, § 371 Date Jan. 24, 1994, § 102(e) Date Jan. 24, 1994, PCT Pub. No. WO92/22409, PCT Pub. Date Dec. 23, 1992

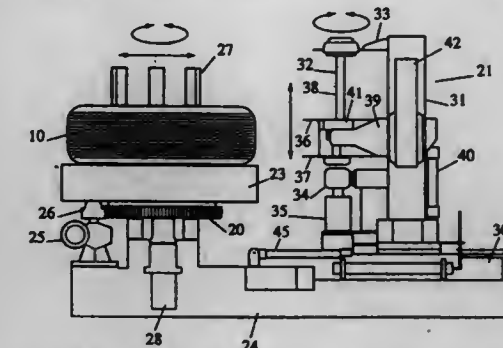
PCT Filed Jun. 12, 1992, Ser. No. 162,064

Claims priority, application Australia, Jun. 13, 1991, PK6674

Int. Cl.<sup>6</sup> B02C 19/00; 19/12

U.S. Cl. 241—1

6 Claims



1. A method of reclaiming rubber from a vehicle tire incorporating an annular tread portion having a metallic reinforcement belt underlying a layer of tread rubber, and respective sidewalls, said method comprising:
  - separating the tread portion from the respective sidewalls and forming a tread portion strip;
  - treating said tread portion strip to remove the layer of tread rubber from the reinforcement belt in a particle form;
  - separately treating the tread portion strip to remove the remaining rubber from the reinforcement belt in a particle form, and separately treating the sidewalls to reduce the sidewalls to a particle form,
  - the steps of treating the tread strip portion to remove the remaining rubber and the treating of the sidewalls each being performed independently of the step of removal of the tread rubber and each by the use of ultra high pressure liquid jets.

5,482,216

### METHOD FOR RECLAIMING PLASTIC WHICH CONTAINS UNDESIRABLE CONTAMINANTS

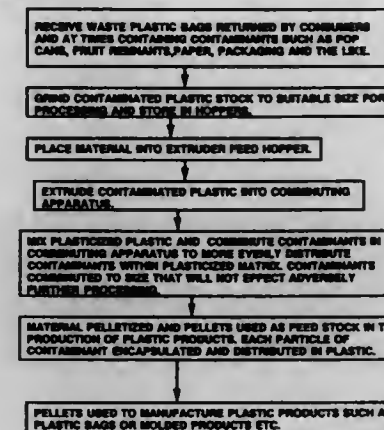
Markus Hess, Thornhill, Canada, assignor to Alfa Loop Inc., Toronto, Canada

Filed Apr. 21, 1993, Ser. No. 49,376

Int. Cl.<sup>6</sup> B02C 23/00

U.S. Cl. 241—23

34 Claims



1. A method for reclaiming plastic, which contains undesirable contaminants said method comprising:



- (a) accumulating said plastic,  
 (b) heating and pressurizing said plastic to a predetermined temperature and pressure so as to plasticize said plastic within which said contaminants are contained,  
 (c) delivering said plasticized plastic containing said contaminants to a comminuting device, mixing the plasticized plastic and at the same time shearing the contaminants progressively as the plastic passes through the comminuting device, thus comminuting said contaminants to a very fine predetermined particle size, thereby providing finely dispersed particles of the contaminants of predetermined size throughout the plasticized plastic.

wherein each finely comminuted particle of contaminant is encapsulated by plastic and being separated from one another, to allow products to be manufactured from the reclaimed plastic.

5,482,217

# METHOD OF AND APPARATUS FOR FINE, VERY FINE, AND MICROFINE COMMUNITION OF MATERIALS HAVING BRITTLE BEHAVIOR

Klaus Schonert, and York Reichardt, both of Clausthal-Zellerfeld, Germany, assignors to Klaus Schönert, Clausthal-Zellerfeld, Germany

PCT No. PCT/EP92/00962, § 371 Date Jun. 15, 1994, § 102(e) Date Jun. 15, 1994, PCT Pub. No. WO92/19379, PCT Pub. Date Nov. 12, 1992

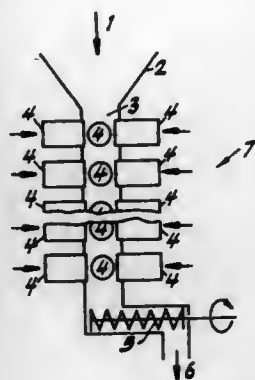
PCT Filed May 4, 1992, Ser. No. 140,112

Claims priority, application Germany, May 3, 1991, 41 14 521.6

Int. Cl.<sup>6</sup> B02C 19/00;23/08;9/04

U.S. Cl. 241—24

15 Claims



1. A method of comminution of brittle materials by compression between non-yielding surfaces to produce fine to microfine materials, comprising the steps of:

- providing a grinding chamber with non-yielding surfaces into and out of which pistons with non-yielding surfaces are reciprocable;  
 supplying material to be ground into said grinding chamber to form a bed of particles;  
 successively and in different directions subjecting the bed of particles to compression between said non-yielding surfaces of said pistons at a pressure of at least 50 MPa (500 kg/cm<sup>2</sup>) by repeatedly reciprocating the pistons;  
 terminating the reciprocation of the pistons after a predetermined number of strokes;  
 discharging the material including any agglomerates that have formed during the compressing step from the grinding chamber;  
 disagglomerating the material discharged from the grinding chamber; and  
 separating fine material from any coarse material in the product of said disagglomerating step by classification.

5,482,218

# ROCK CRUSHING APPARATUS AND METHOD

Yonggan Ha, 11318 - 159B Street, Surrey, British Columbia, Canada

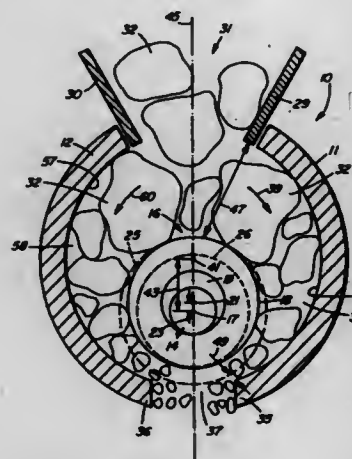
Filed Jan. 27, 1994, Ser. No. 187,036

Claims priority, application Rep. of Korea, Jan. 20, 1993, 21813

Int. Cl.<sup>6</sup> B02C 25/00;4/32

U.S. Cl. 241—30

35 Claims



1. A method of crushing material, the method comprising the steps of:

- (a) admitting the material into a crushing chamber,  
 (b) moving an eccentrically mounted rotor in an orbital motion about a shaft axis within the crushing chamber to provide a rotor wall which is disposed parallel to the shaft axis when viewed laterally of the axis and which moves cyclically and laterally with respect to the shaft axis as the rotor describes the orbital motion, the rotor being moved by rotatably mounting a shaft carrying the rotor in axially spaced apart housing end walls of the crushing chamber, each end wall comprising separable end wall portions, providing the end wall portions with releasable connecting means for releasably interconnecting the separable adjacent end wall portions and for mounting the shaft, and mounting two axially spaced apart end wall portions for limited hinged rotation with respect to a chassis,  
 (c) spacing a stator laterally from the rotor to provide oppositely facing rotor and stator walls which are parallel to each other when viewed laterally of the axis and which define in part walls of the crushing chamber so that, when the rotor is moving, spacing between the opposing walls varies cyclically, the stator being supported by hinging a first end portion of the stator with respect to the hinged end wall portion, and yieldably restraining a second end portion of the stator with a linear actuator having an inner end hinged to the chassis, and an outer end hinged to the stator to permit the stator wall to move yieldably when the crushing force exceeds a predetermined threshold force,  
 (d) discharging crushed material from the crushing chamber, and  
 (e) if servicing is required, after stopping the rotor, disconnecting the releasable connecting means of the end walls and the shaft to permit eventual separation thereof, and releasably connecting the stator to the hinged end wall of the housing, and actuating the linear actuator so as to rotate the end wall portions and the connected stator with respect to the chassis, so as to swing the end wall portions and the said stator away from the stator to permit access for servicing the rotor, the rotor shaft and stator.

5,482,219

# ROPE GUIDE FOR WIRE AIR OR ELECTRIC HOISTS

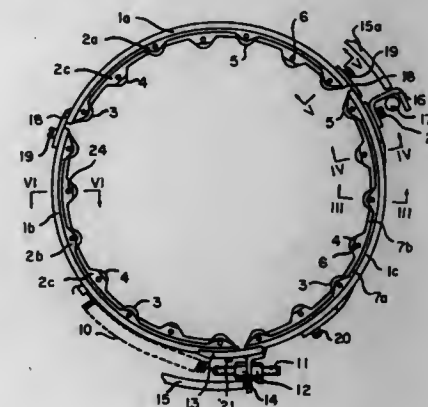
Stoll M C/O Roddy; Kenneth A. Tcholakov, 2916 W. T.C. Jester Blvd., Houston, Tex. 77018

Filed Nov. 1, 1993, Ser. No. 144,332

Int. Cl.<sup>6</sup> B65H 54/28

U.S. Cl. 242—158 R

9 Claims



1. A rope guide for encircling the drum of a hoist and guiding a rope being wound onto or unwound from a helical rope groove on the drum and pressing the rope into the rope groove, comprising:

- a plurality of sectors connected together forming a segmented ring to encircle the drum and turns of rope wound thereon, each sector having a U-shaped interior portion facing radially inwardly toward the exterior of the drum, and one of said sectors having a slot extending therethrough with radially inward converging side walls to facilitate passage of a rope onto or from the drum;  
 a plurality of axles mounted transversely in each said U-shaped portion in circumferentially spaced relation;  
 roller means rotatably mounted on said plurality of axles including disc-shaped drum engaging elements having peripheral surfaces adapted to roll in a vacant portion of the helical rope groove in the drum, and rope engaging elements having disc-shaped portions received in grooves between adjacent turns of rope with inwardly curved surfaces on each outer side of said disc-shaped portion adapted to roll on the outer peripheral surfaces of said two adjacent turns of rope;  
 means for urging said sectors radially inward toward the drum whereby said disc-shaped drum engaging elements are urged into rolling engagement with the vacant portion of the helical rope groove and said rope engaging elements are urged into rolling engagement with the peripheral surfaces of said adjacent turns of rope and grooves therebetween, and upon relative rotation between said drum and said rope guide, said disc-shaped drum engaging elements rolling in the vacant portion of the helical rope groove and said disc-shaped portion of said rope engaging elements rolling in the grooves between said adjacent turn of rope move said rope guide axially of the drum while maintaining said slot aligned with the helical rope groove, and said rope engaging elements rolling on the peripheral surfaces of the turns of rope press the turns of rope into the helical rope groove of the drum.

5,482,220

# DOUBLE-BEARING REEL WITH IMPROVED LEVEL WINDER ASSEMBLY

Hiroshi Hashimoto, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Filed Dec. 22, 1993, Ser. No. 171,407

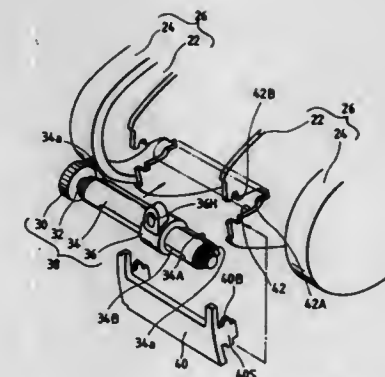
Claims priority, application Japan, Dec. 24, 1992, 4-357340

Int. Cl.<sup>6</sup> A01K 89/015

U.S. Cl. 242—279

7 Claims

1. A double-bearing reel comprising:



a spool supported between side plates and driven to rotate through a take-up driving mechanism;

a level winder for guiding and uniformly winding a fishing line onto said spool in parallel, wherein said level winder includes a worm shaft adapted to be rotatably geared to said take-up driving mechanism, a guide tube embracing said worm shaft and having a slit, and a fishing line guide which reciprocates along said slit of said guide tube as said worm shaft rotates and said level winder is removable from said reel as a unit construction;

a notched hole portion defined by a peripheral edge of each of said side plates, said notched hole portion comprising a recess for receiving said level winder and at least one notch extending in a direction transverse to said recess; and

a removal preventive member for detachably retaining said level winder into said recess in said notched hole portion, wherein said removal preventive member comprises a mating projection means for matingly engaging said at least one notch and is at least partially fitted into said notched hole portion, said removal preventive member preventing said removal preventive member from being removed from said recess.

5,482,221

# SINGLE ACTION FLY FISHING REEL HAVING AN INFINITELY VARIABLE SILENT DRAG

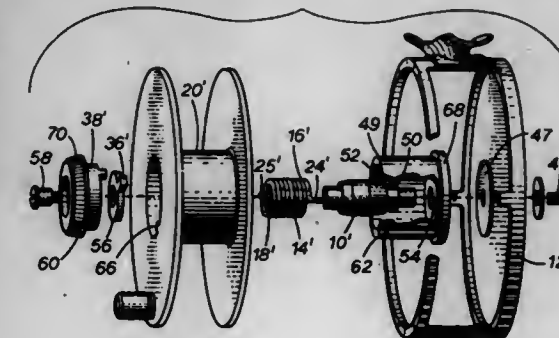
Dean M. Peterson, 2730 Peet La., Escondido, Calif. 92025, and Norman L. Stauffer, Grand Lake, Colo., assignors to Dean M. Peterson, Escondido, Calif.

Filed Jul. 25, 1994, Ser. No. 280,116

Int. Cl.<sup>6</sup> A01K 89/033;89/02; F16D 63/00;23/00

U.S. Cl. 242—285

15 Claims



1. A fishing reel comprising:

- a) a frame,  
 b) a post mounted on said frame,  
 c) a helically coiled spring axially surrounding said post, said spring having a first end connected to a first number of coils of said spring in loose contact with said post and said spring having a second end connected to a second number of coils of said spring in intimate contact with said post,

- d) a spool for winding fishing line thereon, said spool having a handle thereon, said spool further having an axial cavity therein whereby said spool is rotatably mounted over said spring and said post, wherein said first spring end is connected to said spool, and wherein said second spring end is free and extends into said cavity,
- e) a drag adjustment knob axially mounted on said spool, said knob having a pin extending into said cavity whereby said pin by adjustment of said knob is adjustably angularly positioned at a set angle from said second spring end, whereby when said spool is rotated in the direction to strip said line from said spool, said first number of coils tighten about said spool linearly increasing the torque between said spool and said post until said pin rotates into the position whereby it contacts said second end of said spring causing said second number of coils to loosen about said post reducing the torque between said spool and said post, and whereby said torque is maintained at a substantially constant value.

5,482,222

# LIGHTWEIGHT SOLID-CORE VIDEO CASSETTE CARTRIDGE

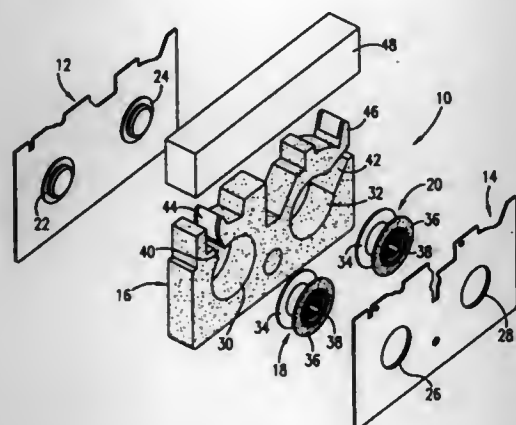
Kenneth T. Krantz, and Charles R. Jones, Jr., both of Leawood, Kans., assignors to V-Lite Corporation, Leawood, Kans.

Continuation-in-part of Ser. No. 1,670, Jan. 7, 1993. This application Nov. 22, 1994, Ser. No. 343,369.

Int. Cl.<sup>6</sup> G11B 23/087

U.S. Cl. 242—347

8 Claims



4. A video cassette cartridge for use in a video cassette recorder/player comprising:

- a cartridge shell including spaced apart top and bottom panels defining an interior hollow chamber therebetween;
  - a solid core structural member presenting a volume nearly equal to the volume of said interior chamber positioned within said hollow chamber for maintaining the spaced relationship between said top and bottom panels, said solid core member including walls defining a pair of circular reel wells; and
  - a pair of video tape reels rotatably mounted within said circular wells for winding of video tape;
- whereby said solid core structural member and said video tape reels fill substantially the entire volume of said cartridge shell hollow chamber, wherein said solid core structural member is formed of styrofoam.

5,482,223

# REUSABLE FILM CANISTER AND METHOD OF REUSING A FILM CANISTER

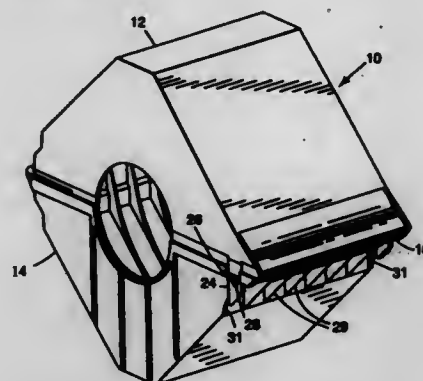
Timothy B. Bresina, Shoreview, and Virgil L. Peterson, Coon Rapids, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 18, 1994, Ser. No. 183,028

Int. Cl.<sup>6</sup> B65H 16/02; G03B 17/26

U.S. Cl. 242—348.4

5 Claims



1. A reusable film canister for receiving and holding film, comprising:
  - first and second partial shells adapted to be mated together to form a cavity receiving said film;
  - said first partial shell having at least one projecting tab, said tab containing a receptacle;
  - said second partial shell having at least one peg adapted to engage with said receptacle of said tab and adapted to secure said first and second shells together when so engaged;
  - said tab being flexible to allow said tab to slide over said peg; wherein said tab has a mating surface intended to engage said peg and said peg has a mating surface intended to engage said tab, said mating surfaces of said tab and said peg being angled with respect to each other in order to facilitate mating of said tab with said peg;
  - wherein said tab has an unflexed position, has a point of maximum flexure beyond which said tab would not return to near said unflexed position and wherein said second partial shell has a rib which prevents flexure of said tab beyond said point of maximum flexure when said first partial shell and said partial shell are engaged.

5,482,224

# SEAT BELT RETRACTOR

Yoshiichi Fujimura, Shiga, Japan, and Henry Hanna, Craighaven, Northern Ireland, assignors to Takata Corporation, Tokyo, Japan.

Filed Oct. 20, 1994, Ser. No. 325,169

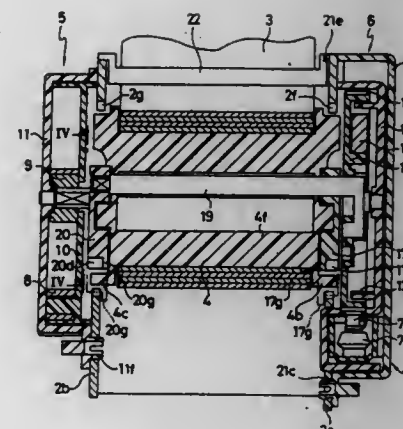
Claims priority, application Japan, Nov. 24, 1993, 5-293481

Int. Cl.<sup>6</sup> B60R 22/405

U.S. Cl. 242—376

5 Claims

1. A seat belt retractor comprising a reel shaft having a webbing winding portion, and a frame having right-hand and left-hand side walls each of which has a circular through-hole pierced with said reel shaft, said webbing winding portion being positioned inside said right-hand and left-hand side walls, wherein:
  - said webbing winding portion has at least one projection protruding in the radial direction at least on one of right and left sides thereof, and the maximum dimension of a profile formed with said projection and said webbing winding portion is smaller than the diameter of said adjacent through-hole and is set so that said projection projects radially beyond the dimension of the through-hole when the center of said through-hole is aligned with the central axis of said reel shaft.



5,482,225

# PROCESS FOR LOADING A PROCESSING MACHINE HAVING A FINE CENTERING STEP AND APPARATUS FOR THIS PURPOSE

Thomas Hartwig, Egnach; Georg Laager, Turbenthal, and Ingomar J. K. Summerauer, Arbon, all of, Switzerland, assignors to Bruderer AG, Switzerland

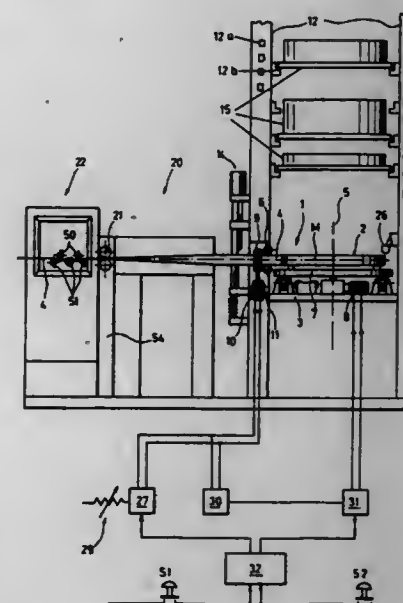
Continuation of Ser. No. 46,359, Apr. 8, 1993, abandoned, which is a continuation of Ser. No. 775,277, Oct. 11, 1991, abandoned. This application Feb. 18, 1994, Ser. No. 198,534

Claims priority, application Switzerland, Jan. 12, 1990, 3286/90

Int. Cl.<sup>6</sup> B65H 19/12; 23/02

U.S. Cl. 242—559.4

18 Claims



1. A method for loading a processing machine with band-like material from a coil, comprising the steps of:
  - resting said coil substantially horizontally on a turntable with a substantially vertical unwinding axis and unwinding said coil with rotation;
  - initially holding the plane of said band-like material approximately vertical;
  - determining the position of the two edges of the unwound, band-like material in order to determine the width of the band-like material;
  - centering the band-like material at least a first time in order to orient the band-like material with its longitudinal axis horizontally with regard to a central plane which is determined

with respect to the dimensions of the processing machine, the height of the coil being adjusted for this purpose; and before the first centering step which effects fine centering relative to said central plane, pre-centering the coil roughly by determining the upper edge of the band-like material, the height of the coil being adjusted for this purpose.

5,482,226

# STORAGE DEVICE WITH SUPPORT CARRIER AND METHOD

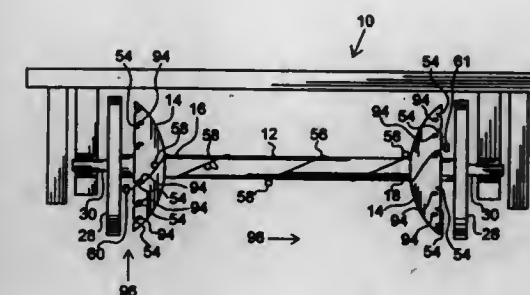
David A. Choate, 14553 E. 47th Ave., Denver, Colo. 80239

Filed Mar. 21, 1994, Ser. No. 215,352

Int. Cl.<sup>6</sup> B65H 75/40

U.S. Cl. 242—588

20 Claims



1. A storage device with support carrier for use with electrical cords of the type having electrical sockets, receptacles, lights and similar objects spaced along the electrical cord, the electrical cord having opposite cord ends, the storage device with support carrier being designed to easily and conveniently store several such electrical cords, comprising:

- a. an elongated cylinder having opposite ends;
- b. cord end retaining means having an inner surface and an outer surface, the outer surface being fixedly attached to the opposite ends of the elongated cylinder, the cord end retaining means having a central opening passing from the inner surface to the outer surface, the cord end retaining means also having an outer perimeter;
- c. a plurality of cord receiving means formed in the outer perimeter of the cord end retaining means;
- d. a plurality of indicia fixedly attached to the cord end retaining means, the plurality of indicia corresponding to the plurality of cord receiving means;
- e. extension means having first and second ends, the first end being fixedly attached to the inner surface of the cord end retaining means, the extension means having a hollow portion passing through the extension means from the first end to the second end;
- f. end support means fixedly attached to the second end of the extension means, the end support means having a diametrical center, the end support means having a central opening passing through the diametrical center;
- g. at least one axle having ends, the at least one axle being removably and rotatably disposed through the central opening of the cord end retaining means, through the extension means and through the central opening of the end support means, the ends of the at least one axle extending beyond the outer surface of the end support means;
- h. axle support means having an outer surface, the axle support means removably and rotatably engaging the at least one axle near the ends of the at least one axle;
- i. a support brace fixedly attached to the axle support means, the support brace having opposite ends; and
- j. axle retaining means having an inner surface, the axle retaining means being fixedly attached near the opposite ends of the support brace, the inner surface of the axle retaining means facing the outer surface of the axle support means.



5,482,227

**DEVICE FOR A CURVED CONDUCTOR PIPE FOR A PULL WIRE**

Per H. Hystad, Kopervik, Norway, assignor to Karmoy Winch A/S, Kopervik, Norway

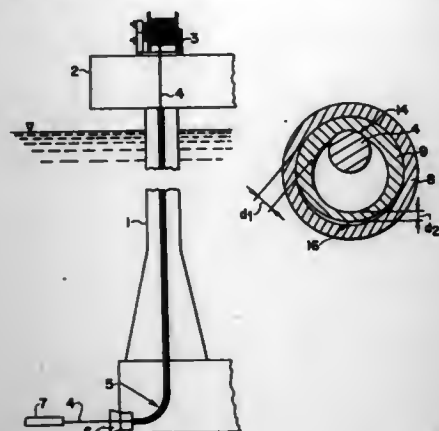
Filed Oct. 6, 1994, Ser. No. 319,230

Claims priority, application Norway, Jan. 8, 1993, 933605

Int. Cl.<sup>6</sup> B65H 57/12

U.S. Cl. 242—615.3

3 Claims



1. A lining assembly for a longitudinally archingly curved conductor pipe of a given hardness and given internal diameter, for a pull wire, which, when pulled longitudinally of the pipe while housed by the pipe would, absent said lining assembly, tend to abradingly, rubbingly engage an inner peripheral wall surface of the pipe along a longitudinal path which extends along an inner side of a longitudinally arched curve of the pipe so as to exert a compression force transversally of said pipe on said surface in said path, which, absent said lining assembly, would tend to cut into said pipe along said path,

said lining assembly comprising:

a plurality of longitudinally adjoining individually cast tubular sections serially lining corresponding portions of said inner peripheral wall of said pipe;

said lining sections each having an inner peripheral surface defining respective portions of a guide seat recess which extends along said path to provide a contact face for said wire;

said lining sections being thicker within and laterally adjacent said guide seat portions, than diametrically opposite said guide seat portions; and

said lining sections being made of a material which is harder than and less subject to being abradingly worn by longitudinal pulling of said wire than would be said inner peripheral surface of said pipe were said lining assembly absent.

5,482,228

**LANDING GEAR ASSEMBLY FOR AIRPLANE**

Takaaki Hoshino, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 5, 1993, Ser. No. 131,705

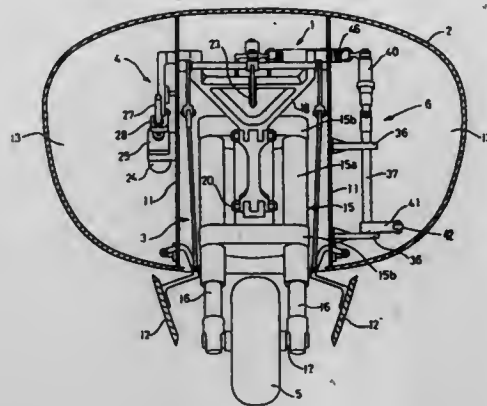
Claims priority, application Japan, Jan. 5, 1992, 4-290757

Int. Cl.<sup>6</sup> B64C 25/10

U.S. Cl. 244—50

24 Claims

1. A landing gear assembly on an airplane, comprising: a fuselage having a wheel bay defined therein and a pair of laterally spaced side walls on each side of said wheel bay; a landing gear mounted on the fuselage; an actuator disposed laterally outwardly of one of said side walls for lifting said landing gear into and lowering said landing gear out of said wheel bay; and a steering device disposed laterally outwardly of the other of said side walls for steering said landing gear during taxiing of the airplane.



5,482,229

**APPARATUS FOR GENERATING ENERGY ON BOARD OF AN AIRCRAFT**

Hartwig Asshauer, Hamburg, Germany, assignor to Deutsche Aerospace Airbus GmbH, Hamburg, Germany

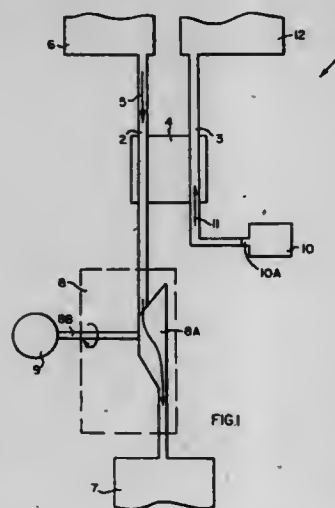
Filed Jun. 15, 1994, Ser. No. 260,043

Claims priority, application Germany, Jun. 18, 1993, 43 20 302.7

Int. Cl.<sup>6</sup> B64D 13/00

U.S. Cl. 244—118.5

16 Claims



1. An apparatus for generating energy in an aircraft having a pressurizable cabin and at least one engine with an engine bleed air discharge tap, and being surrounded by an ambient environment, comprising an air conditioning plant connected to the cabin, a cabin exhaust air duct connected at a first end to the cabin and connected at a second end to the ambient environment so that an exhaust air stream can flow in said exhaust air duct from the cabin to the environment, a supply duct connected at a first end to the discharge tap and connected at a second end to said air conditioning plant so that engine bleed air can flow from said discharge tap to said air conditioning plant in said supply duct, a heat exchanger arranged between said exhaust air duct and said supply duct so that said exhaust air stream entering said heat exchanger has a relatively low temperature that is increased as said exhaust air stream flows through said heat exchanger and said bleed air entering said heat exchanger has a relatively high temperature that is decreased as said bleed air flows through said heat exchanger, an energy conversion unit interposed in said exhaust air duct downstream from said heat exchanger, and an energy consuming load connected to said energy conversion unit.

5,482,230

**VEHICLE BULKHEAD SAFETY SYSTEM**

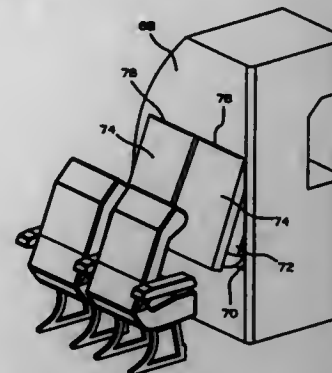
Michael S. Bird, Lake Worth, Fla., and Andreas Demopolous, Leighton Buzzard, England, assignors to B E Aerospace, Inc., Delray Beach, Fla.

Filed Jun. 25, 1993, Ser. No. 83,999

Int. Cl.<sup>6</sup> B64D 25/04; B64C 1/12

U.S. Cl. 244—121

10 Claims



1. A safety system for reducing the risk of injury during a survivable crash of a high-speed passenger vehicle, said safety system comprising:

at least one bulkhead support base mountable to the vehicle within a passenger compartment;

a bulkhead panel having a compliant impact surface, mounted to a portion of said bulkhead support base;

energy absorbing means operatively associated with said bulkhead panel for absorbing the energy of a passenger impacting on said bulkhead panel and thereby minimizing injury to said passenger;

said bulkhead support base including a recessed cavity within which said energy absorbing means may be mounted, and said bulkhead panel mounted at least partially within said recessed cavity; and

said bulkhead panel pivotally mounted to said bulkhead support base by means of a hinge secured along an upper edge of said recessed cavity and an upper edge of said bulkhead panel.

5,482,231

**RAIL SWITCH POINT ASSIST APPARATUS**

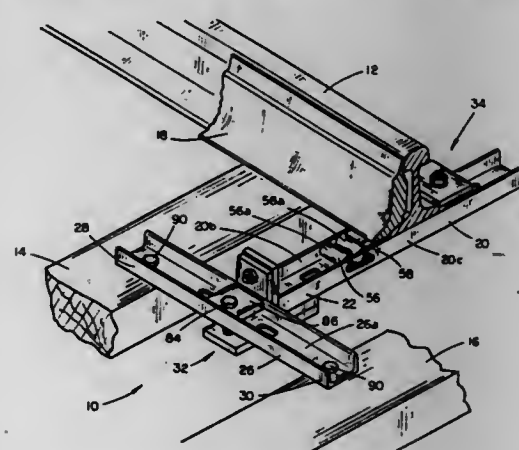
Charles W. Turner, Omaha, Nebr., and Michael K. Flaherty, Palatine, Ill., assignors to Double T Railroad Products, Omaha, Nebr.

Filed Jun. 7, 1994, Ser. No. 254,924

Int. Cl.<sup>6</sup> E01B 7/00

U.S. Cl. 246—415 R

11 Claims



1. A rail switch point assist apparatus, comprising:

5,482,232

**APPARATUS AND METHOD FOR WALL-MOUNTED HARDWARE SYSTEM**

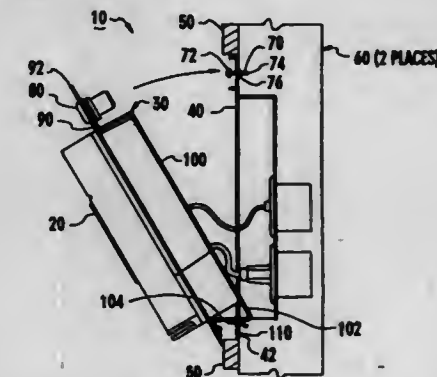
Stephen A. Wynn; Ernest R. Pearce; Michael H. D'Amico; Ursula M. Conway, and Troy W. Newberry, all of Las Vegas, Nev., assignors to Mirage Resorts, Incorporated, Las Vegas, Nev.

Filed Jun. 21, 1993, Ser. No. 80,194

Int. Cl.<sup>6</sup> A47B 81/06

U.S. Cl. 248—27.1

20 Claims



1. A wall-mounted hardware system, including an electronics box mounted into a mounting bracket and bezel assembly secured within a wall frame device that frames a hole in a wall, the wall frame device being directly affixed to the wall, which comprises, a set screw inserted through said wall frame device; a cam lock secured through an upper portion of said mounting bracket and bezel assembly, said cam lock receiving said set screw;

means for slidably rotating and pivoting said mounting bracket and bezel assembly into and out of said wall frame device.

5,482,233

**DISMOUNTABLE, SLIDABLE TUBE SUPPORT CLIP FOR ACCOMMODATING HIGH-TEMPERATURE THERMAL EXPANSION**

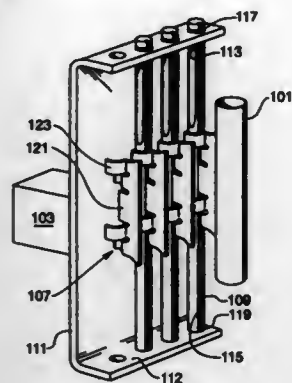
Myroslaw Marko, Westlake Village, and Mohamad A. Dagher, San Dimas, both of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Feb. 28, 1994, Ser. No. 202,419

Int. Cl.<sup>6</sup> F16L 3/08

U.S. Cl. 248—73

3 Claims



1. A dismountable slidable tube support clip and guide rod comprising:

- said guide rod having an assembly flat and a groove;
- said slidable tube support clip for engaging the rod guide;
- the slidable clip having a strongback with a key portion, the key portion being inserted into the groove on the rod guide;
- at least two end lobes attached to the strongback, engaging the rod guide;
- at least two center lobes attached to the strongback, engaging the rod guide;
- a full radius on the lobes to minimize stress during severe thermal transients
- the strongback having chamfered ends to minimize stress during severe thermal transients.

5,482,234  
CLEAT

Robert C. Lyon, "Regina", Ludovic Terrace, Greenhill, Wigan, Lancashire, United Kingdom

PCT No. PCT/GB93/00319, § 371 Date Aug. 15, 1994, § 102(e) Date Aug. 15, 1994, PCT Pub. No. WO93/16312, PCT Pub. Date Aug. 19, 1993

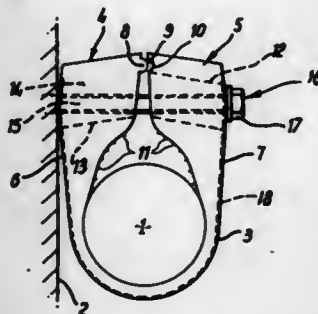
PCT Filed Feb. 15, 1993, Ser. No. 290,829

Claims priority, application United Kingdom, Feb. 15, 1992, 9203242

Int. Cl.<sup>6</sup> F16L 3/08

U.S. Cl. 248—74.5

10 Claims



1. A cleat for securing an elongate article (1) to a support structure (2), comprising:  
a flexible strap (3)

a respective rigid end part (4,5) at each end of said strap, each said end part having a bottom region connected to said strap (3), a top surface opposite said bottom region, and a through bore (12, 13) between said regions;  
an elongate clamping element (15) arranged to be fixed at one end to the support structure (2) and to be passed through the bores (12, 13) in the end parts (4,5) with the strap (3) looped around the elongate article (1);  
a clamping member (17) at the other end of the clamping element (15) to clamp the end parts (4,5) against each other; one only of the end parts (4) having a slot therethrough in communication with the side of the respective bore (13), said slot (14) extending upwardly to open at said top surface; whereby such end part (4) can be moved sideways into and out of engagement with the clamping element (15) by displacement of the clamping element (15) relative to the end part (4) through the slot (14) whilst the other end part (5) is retained on the clamping element (15) by engagement thereof with the respective bore (12).

5,482,235

**CYMBAL CLAMPING DEVICE**

Shizuo Atsumi, Hamamatsu, Japan, assignor to Yamaha Corporation, Shizuoka, Japan

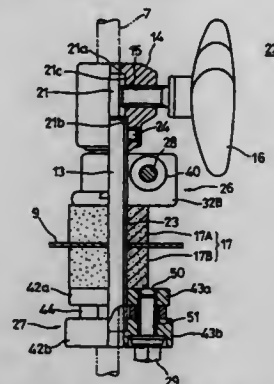
Filed Oct. 18, 1994, Ser. No. 325,508

Claims priority, application Japan, Jan. 28, 1993, 5-062623 U

Int. Cl.<sup>6</sup> F16L 3/00

U.S. Cl. 248—121

8 Claims



1. A cymbal clamping device being secured to an extension rod, said device for use in a high-hat stand that includes telescopic upper and lower pipes, legs attached to a lower end of said lower pipe and an extension rod provided in said upper and lower pipes, said cymbal clamping device comprising:

- a cylindrical attachment fixture fitted on an upper end of said extension rod, said attachment fixture being provided with an external thread;
- a pair of washers fitted on said attachment fixture for holding a cymbal in between;
- a U-shaped lock nut screwed to said attachment fixture so as to be positioned above said washers, said lock nut having a pair of screw mounting brackets so that one of said screw mounting brackets has a screw attachment hole and another of said screw mounting brackets has a screw hole so that said screw attachment hole and screw hole are horizontally coaxial;
- a first clamp screw brought into said screw hole of one of said screw mounting brackets and screwed to said screw hole of said another of said screw mounting brackets so that a distance between said two screw mounting brackets is decreased when said first clamp screw is tightened;
- a clutch nut screwed to said attachment fixture so as to be positioned below said washers, said clutch nut having a pair of screw mounts so that one of said screw mounts has a screw attachment hole and another of said screw mounts has a screw hole so that said screw attachment hole and said screw hole are vertically coaxial; and

5,482,236

**LOCKING LEVELER**

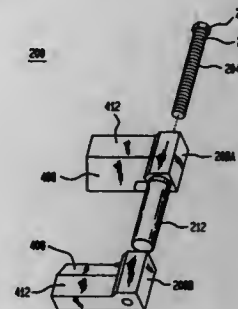
Scott T. Abell, Longmont, and Matthew D. Woodbury, North Glenn, both of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Dec. 23, 1993, Ser. No. 172,212

Int. Cl.<sup>6</sup> F16M 11/00

U.S. Cl. 248—188.4

9 Claims



1. A leveler comprising:

- a first wedge member, having a mating portion with a bore and a first sloped surface;
- a second wedge member, facing said first wedge member and having a mating portion with a bore and a sloped surface;
- a mating device, extending through said bore of said first wedge and at least partially into said bore of said second wedge, wherein adjustment of said mating device adjusts the proximity of said first wedge with respect to said second wedge; and
- a sleeve inserted within said bores of said first and second wedge members.

5,482,237

**MOUNTING BLOCK**

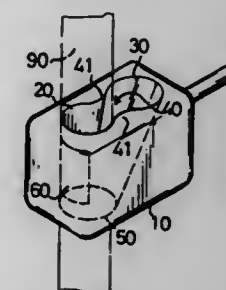
Tin-Chou Wang, No. 54, Lane 120, Sec. 6, Minchuan E. Rd., Taipei, Taiwan, Prov. of China

Filed May 3, 1994, Ser. No. 237,382

Int. Cl.<sup>6</sup> A47B 96/06

U.S. Cl. 248—219.3

6 Claims



1. A block adjustably mounted to a rod, comprising:

- a block body having longitudinally spaced upper and lower sides, said block body having a first through hole extending from said upper side through said lower side and having upper and lower ends and an inner periphery extending continuously between said upper and lower ends, a second through hole extending from said upper side through said lower side and having upper and lower ends, a necking passage section defined by a pair of spaced substantially longitudinally directed curved resilient walls formed as a unitary continuous

tion of and disposed between said first and second through holes, and said walls extending substantially from the surface to the bottom surface of said block and providing open communication therebetween, said lower end of said first through hole coincides with said lower end of said second through hole, said first through hole having a central axis which is at an angle with respect to a central axis of said second through hole, said first through hole having a diameter the same as that of said rod, said upper end of said second through hole having a diameter greater than that of said rod and tapering to said lower end of said second through hole which coincides with said lower end of said first through hole, said necking passage section being resilient to allow said rod to be forcibly moved between said first and second through holes; and,

antislip means coupled to said inner periphery of said first through hole for resisting displacement of said block body along said rod, whereby when said rod is received in said first through hole, said rod is retained in position, and when said rod is received in said second through hole, said block is slidable along said rod.

5,482,238

**DISPLAY AND SUPPORT ASSEMBLIES**

Donald E. Kreiter, 463 James Way, Wyckoff, N.J. 07481

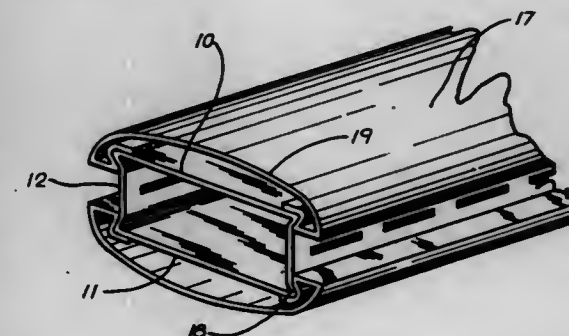
Continuation of Ser. No. 257,494, Oct. 13, 1988, abandoned.

This application Jan. 10, 1991, Ser. No. 639,608

Int. Cl.<sup>6</sup> A47F 5/00

U.S. Cl. 248—222.12

3 Claims



1. A display or support assembly comprising

- (a) a generally rectangular support member having spaced apertures therein, four generally flat sides, wherein each of said four generally flat sides is generally perpendicular to an adjacent side, and at least two snap-on edges along the length of said support member located proximate the intersection of two separate sets of said generally flat sides, and
- (b) at least one flexible post cover having a generally flat interior edge portion, and adapting corners adjacent said generally flat interior edge portion for snap-on mating along said snap-on edges of said support member and for snap-off disengagement from said support member, wherein said at least one flexible post cover is secured to said generally rectangular support member along one of said generally flat sides by snap-on mating between said snap-on edges of said support member and said adapting corners of said post cover.



5,482,239

**PORTABLE ATTACHMENT BAR FOR ATTACHING AN INTRAVENOUS CONTAINER SUPPORT APPARATUS TO A PATIENT TRANSPORTATION APPARATUS**

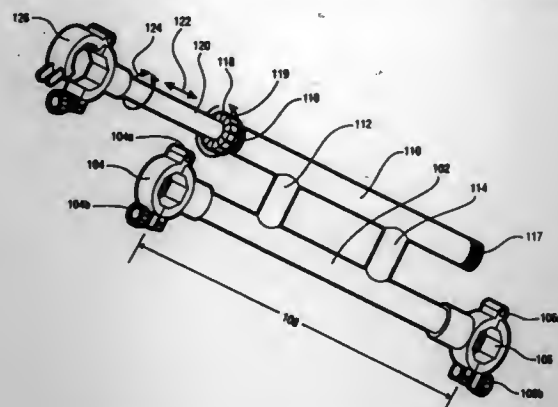
K. C. Smith, 2011 11th St., Bay City, Mich. 48708

Filed Sep. 12, 1994, Ser. No. 304,120

Int. Cl.<sup>6</sup> A47B 96/06; A47C 7/62

U.S. Cl. 248—229.13

18 Claims



1. An attachment device for removably securing an intravenous container support apparatus to a patient transportation apparatus, wherein said attachment device comprises:

- a main support member having a main first end and a main second end;
- a secondary support member fixedly attached in parallel to said main support member at a central position, wherein said secondary support member has a secondary first end and a secondary second end;
- a tertiary support member that is telescopically slidable within said secondary support member;
- main clamping means for removably clamping said main support member to said patient transportation apparatus, wherein said main clamping means is fixedly attached to said main first end and to said main second end;
- secondary clamping means attached to said secondary support member for adjustably clamping said tertiary support member into a fixed position within said secondary support member; and
- tertiary clamping means attached to said tertiary support member for removably clamping said portable intravenous container support apparatus to said tertiary support member.

5,482,240

**ADJUSTABLE HANGER FOR SUSPENDED CEILINGS**

Thomas R. Caraher, 22235 River Ridge Trail, Farmington Hills, Mich. 48335

Filed Aug. 25, 1993, Ser. No. 113,053

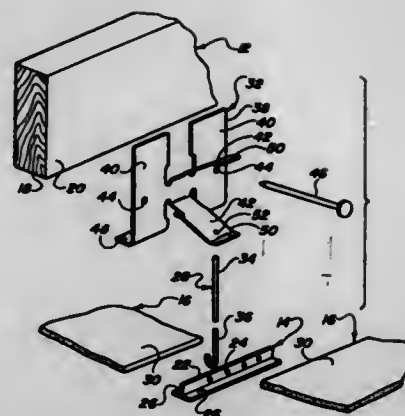
Int. Cl.<sup>6</sup> E04C 1/40

U.S. Cl. 248—297.51

18 Claims

1. A set for use with a decorative false ceiling, said false ceiling including a support member superjacent a built ceiling, and a suspension member having at least one web disposed horizontally for carrying a panel of the false ceiling and a flange disposed vertically, the set comprising:

- an axially elongated support rod having a lower portion which is connectable to the flange and an upper portion;
- a clamp having an H-shaped plate which is connectable to the support member and includes a pair of vertical plate portions and a transverse plate portion, said clamp further having a pair of resilient spring flanges having first and second end portions, said first and second end portions being connected to said plate, extending from said transverse plate portion and resiliently deflectable between a first position for gripping the upper end portion of the support rod a second position for releasing the support rod, each said spring flange having an



aperture for receiving and gripping said support rod, said clamp being integrally formed from a resilient metal and including a lip extending transversely of said plate for positioning the clamp relative to said support member; and means associated with said vertical portions of the H-shaped plate for securing said plate to said support member.

5,482,241

**ARCHERY BOW SUPPORT**

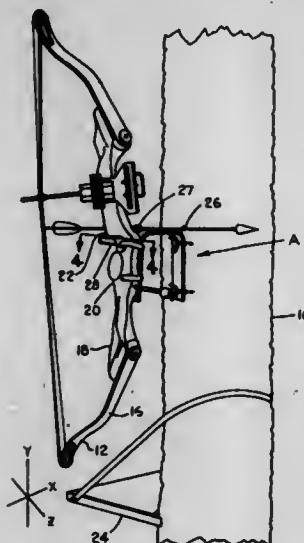
Harvey D. Oglesby, 600 Hopewell Ridge Rd., Anderson, S.C. 29621

Filed Jan. 17, 1995, Ser. No. 373,064

Int. Cl.<sup>6</sup> A47F 5/00

U.S. Cl. 248—309.1

8 Claims



1. An archery bow support for supporting an archery bow in an upright position, said archery bow support for use in association with an upstanding structure such as a tree, said archery bow having a hand grip of a given width as measured along the front of said grip and a given depth as measured along the side of said grip and said bow having a lip above said hand grip and extending beyond the hand grip towards the bow string of said bow, said archery bow support comprising:

- a mount for mounting said bow support to an associated structure;
- a bow holder carried by said mount for retaining said bow in an upright position;
- said bow holder including a horizontally disposed first hook element terminating in a horizontally disposed distal finger;
- a horizontal member carried by said bow holder spaced opposite said first hook element and said distal finger;

said first hook element and said horizontal member defining a bow receptacle for receiving said archery bow in a vertical position;

said horizontal member and said distal finger defining a bow passage leading into said bow receptacle;

said bow holder passage being smaller than the depth of said hand grip, and said bow passage being larger than the width of said hand grip, so that said bow may be rotated to a side facing position for being received thru said bow passage and thereafter rotated to a forward facing position for retention within said bow receptacle;

whereby said bow holder supports said archery bow in an upright position for easy accessibility.

5,482,242

**SUSPENSION DEVICE FOR LOW WEIGHT ARTICLES**

Lennart Jegelius, Allhelgonagatan 11, S-118 58 Stockholm, Sweden

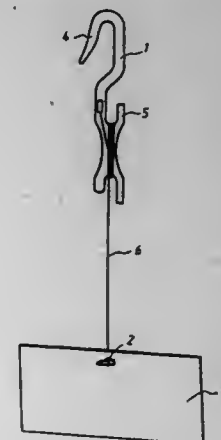
Filed Nov. 17, 1994, Ser. No. 341,421

Claims priority, application Sweden, Apr. 11, 1994, 9401194

Int. Cl.<sup>6</sup> A47H 1/10

U.S. Cl. 248—328

11 Claims



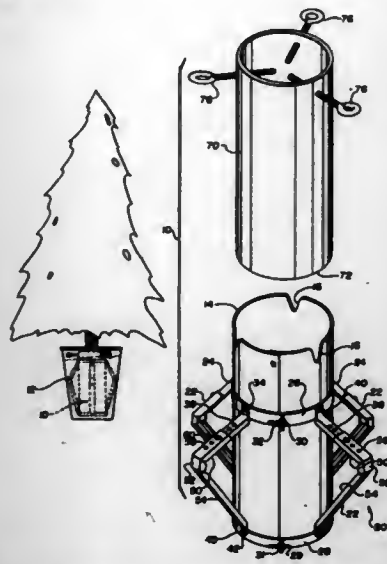
5,482,245

## TREE AND POLE STAND

Lori L. Graves, 3851 Kenroy Rd., Duluth, Minn. 55811  
Continuation of Ser. No. 143,880, Oct. 28, 1973, abandoned.  
This application Mar. 27, 1995, Ser. No. 410,405  
Int. Cl.<sup>6</sup> A47G 33/12

U.S. Cl. 248—523

27 Claims



1. A support for a tree or pole structure, comprising:
  - (a) a first holder having a generally cylindrical shape and an aperture;
  - (b) a second holder having a generally cylindrical shape, a top end, a bottom end and an aperture defining the top end and being removably slidably receivable by the first holder;
  - (c) a fixing member for insertion into the tree or pole structure, the fixing member being removably receivable by the second holder and resting on the bottom end of the second holder; and
  - (d) a plurality of braces adapted to abut an inner wall of a container, thereby bracing the support in the container, each brace including a first arm and a second arm, said first arm having first and second ends, said first end of said first arm, the braces connected to an upper portion of the outside of the first holder, said second arm having a first end and a second end, said first end of said second arm slidably, adjustably connected to said second end of said first arm, and said second end of said second arm connected to a lower portion of said first holder.

5,482,246

## ANCHORING DEVICE HAVING AN AUGER AND A SPIRAL-SHAPED MEMBER MOUNTED TO A DISTAL END OF THE ANCHORING DEVICE

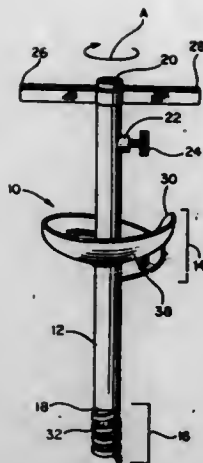
Barbara Derkowski, Tuckerton, N.J., assignor to Sandgrabbers, Inc., Little Egg Harbor, N.J.

Filed Jun. 17, 1994, Ser. No. 262,012  
Int. Cl.<sup>6</sup> F16M 13/00

U.S. Cl. 248—530

11 Claims

1. An anchoring device for a beach umbrella comprising:
  - a shaft having a first longitudinal end, a second longitudinal end, and a given length, said second longitudinal end being adapted to accommodate a beach umbrella post;
  - a spiral-shaped member connected to, and extending beyond, said first longitudinal end of the shaft, and outwardly therefrom a first distance, to facilitate entry of said anchoring device into the ground when said anchoring device is rotated in a first rotational direction about a longitudinal axis thereof;
  - an auger disposed circumferentially around said shaft and having a curved bottom edge to facilitate entry of said auger into the ground upon continuing rotation of said anchoring device



in said first rotational direction, said auger also having an upwardly curved radial outward edge to form a scooped-shaped configuration to firmly hold earthen material in a manner which restricts withdrawal of said auger from the ground after said auger has been inserted into the ground; at least one handle coupled with said first longitudinal end of said shaft to rotate said anchoring device about said longitudinal axis; and means for fastening said shaft to said beach umbrella post; and wherein said auger extends outwardly from said shaft a second distance greater than said first distance.

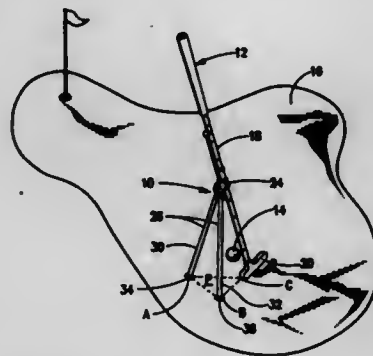
5,482,247

## GOLF CLUB STAND DEVICE

Jerry R. Smith, 5690 W. Rowland Ave., Littleton, Colo. 80123  
Filed Oct. 7, 1993, Ser. No. 133,671  
Int. Cl.<sup>6</sup> A63B 53/00

U.S. Cl. 248—688

19 Claims



1. A golf club stand device adapted for use with a conventional golf club employed for striking a golf ball laying on a support surface, the golf club including a shaft having a shaft end portion attached to a club head, the golf club stand device comprising:
  - (a) a connector adapted to connect to a portion of the shaft of the golf club; and
  - (b) a leg structure secured to said connector and including a pair of legs, each of said legs terminating in a distal end portion

and adapted to contact the support surface in a non-penetrating manners so that, in cooperation with the club head when in contact with the support surface, the golf club is supported in an upright state.

5,482,248

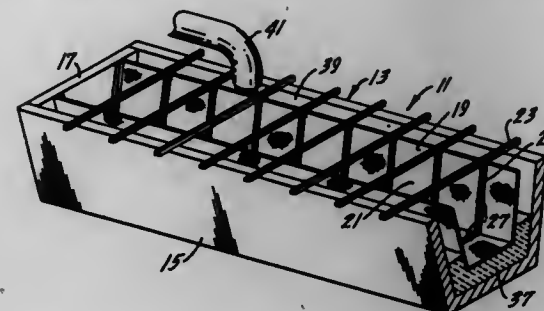
## MOLD FOR MANUFACTURING METAL CONTAINMENT VESSELS

Charles W. Connors, Jr., Chicago, Ill., assignor to Magnecor/Metrel, Inc., Addison, Ill.

Continuation of Ser. No. 893,377, Jun. 4, 1992, abandoned, which is a continuation of Ser. No. 673,954, Mar. 22, 1991, abandoned. This application Nov. 15, 1993, Ser. No. 153,266  
Int. Cl.<sup>6</sup> B28B 7/16; 7/34; B29C 33/76

U.S. Cl. 249—62

19 Claims



1. A mold for forming an open top, walled member, having side walls and a bottom surface of a molten metal containment vessel, which walled member has sufficient structural integrity to support a molten metal poured in said member, comprising:

an inner screen having a plurality of openings to allow air to freely flow therethrough and comprising inner side walls and an inner bottom surface for shaping inner surfaces of said side walls and said bottom surface of said open top, walled member; and an outer wall, wherein said inner screen and said outer wall are spaced a sufficient distance relative to each other to define a space so that said side walls and said bottom surface of said open top, walled member of said molten metal containment vessel are formed therebetween, said walled member so formed having said sufficient structural integrity to support a molten metal poured in said member.

5,482,249

## FLUID CONTROL VALVE WITH ATTENUATOR AND DYNAMIC SEAL

Paul J. Schafbuch, and Charles R. Kuhlman, both of Marshalltown, Iowa, assignors to Fisher Controls International, Inc., Clayton, Mo.

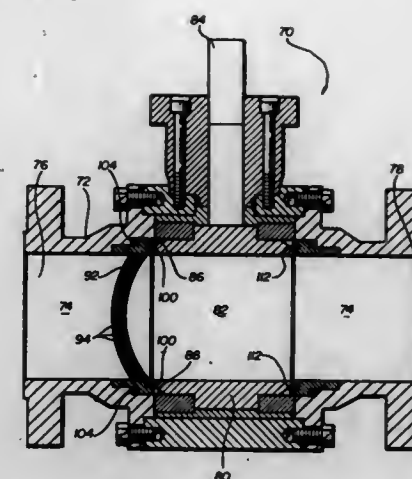
Filed Jun. 21, 1994, Ser. No. 262,914  
Int. Cl.<sup>6</sup> F16K 47/02

U.S. Cl. 251—118

15 Claims

1. A rotary fluid control valve and noise attenuator combination for providing reliable fluid flow shut-off in a pipeline system, the combination comprising:

a valve body having a first port, a second port, and an interconnecting passageway;  
a ball rigidly mounted in said valve body and rotatable within said passageway from a valve shut-off position to a valve open position for controlling the flow of fluid through said passageway;  
an attenuator floatably mounted in said passageway adjacent said ball, said attenuator including a plurality of apertures for reducing the noise within the pipeline system;  
an annular seal mounted in said attenuator so as to contact said ball; and



spring means coupled to said annular seal for urging said annular seal into engagement with said ball in the valve shut-off position.

5,482,250

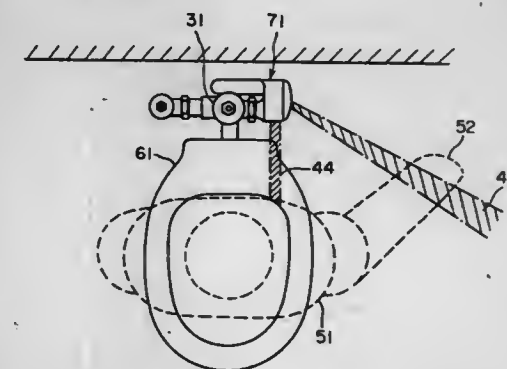
## AUTOMATIC FLUSHING DEVICE

Makoto Kodaira, Shinagawa, Japan, assignor to Uro Denshi Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1994, Ser. No. 312,148  
Claims priority, application Japan, Jan. 14, 1993, 5-55623 U

Int. Cl.<sup>6</sup> E03D 5/10  
U.S. Cl. 251—129.04

2 Claims



1. An automatic flushing device comprising:
  - a first sensor means for detecting presence of a human body in a first predetermined sensing range and withdrawal of the human body from the first predetermined sensing range;
  - a second sensor means for outputting a detection signal when a portion of the human body exists within a second predetermined sensing range that is shorter than the first predetermined sensing range;
  - a signal processing circuit operative to output a drive signal when the first sensor means detects the withdrawal of the human body after more than a predetermined time elapses from the time point when the first sensor means detects the approach of the human body, or when the second sensor means outputs the detection signal;
  - an electromagnetic valve mechanism; and
  - attachment means for attaching a unit of the first and second sensor means, the signal processing circuit and the electromagnetic valve mechanism to a flush valve,



wherein the electromagnetic valve mechanism responds to the drive signal by operating the flush valve when the attachment means has attached the unit to the flush valve.

of the longitudinal axis of said operating handle corresponds to the predetermined relationship to the position of said control means.

5,482,251

## STEM EXTENSION FOR QUARTER-TURN VALVES

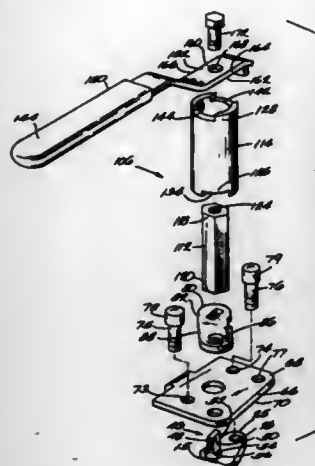
John L. Roberts, Greenfield, Wis., assignor to Milwaukee Valve Company, Inc., Milwaukee, Wis.

Filed Aug. 11, 1994, Ser. No. 288,684

Int. Cl.<sup>6</sup> F16K 31/46; 51/00

U.S. Cl. 251—288

16 Claims



1. A rotatable control device including a body housing a control means; a control shaft mounted in said body for rotation about an axis and having an internal portion connected to said control means and an external portion extending outwardly from said body; first and second stop means extending outwardly from said body and spaced radially outwardly from and circumferentially spaced relative to the rotational axis of said control shaft at locations corresponding to first and second positions of said control means; a stop arm operably connected to the external portion of said control shaft for common rotation therewith and engageable with said first and second stop means to limit rotational movement of said control means between the first and second positions; an elongated extension having an inner end portion and an outer end portion; an elongated operating handle having a longitudinal axis, an inner end portion and a gripping portion; handle connecting means for drivingly connecting the inner end portion of said operating handle to the outer end portion of said extension with the longitudinal axis of said operating handle extending generally perpendicularly to the rotational axis of said control shaft and with the orientation of the longitudinal axis of said operating handle corresponding in a predetermined relationship to the position of said control member; and registration means on said stop arm and the inner end portion of said extension for permitting, during assembly of said control device, said extension to be drivingly connected to said stop arm for common rotation therewith only when the orientation

### 5,482,252 SEAT RING AND BUTTERFLY VALVE FITTING THIS SEAT RING THERETO

Jiro Kamezawa, Higashi-Osaka, Japan, assignor to Tomoe Technical Research Company, Osaka, Japan

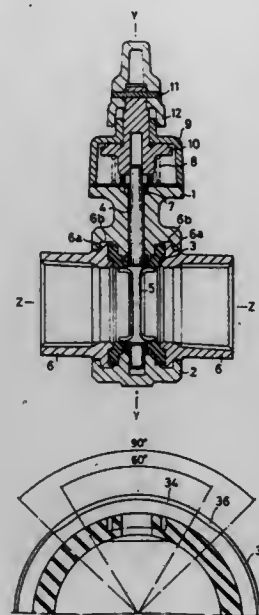
Filed Feb. 8, 1995, Ser. No. 384,534

Claims priority, application Japan, Jan. 14, 1994, 6-249448

Int. Cl.<sup>6</sup> F16K 1/22

U.S. Cl. 251—306

11 Claims



1. A seat ring resiliently fitted into upper and lower main bodies of a butterfly valve provided by dividing the butterfly valve into two sections in a horizontal direction of piping so as to prevent a fluid from being leaked from the butterfly valve; the seat ring comprising: a cylindrical portion for storing a valve body of said butterfly valve and constructed such that both end faces of the cylindrical portion respectively come in contact with two flanged annular adapters of said butterfly valve; two valve rod holes opposed to each other and formed in said cylindrical portion such that a valve rod for pivotally supporting said valve body extends through the valve rod holes; two first projecting portions having an annular shape and a rectangular shape in cross section and respectively projecting from an outer circumferential face of the cylindrical portion onto an outer side in a diametrical direction at both end edges of said cylindrical portion; a first chamfer formed in the range of a first angle around each of the valve rod holes as a center on each of valve rod hole sides of said first projecting portions coming in contact with inner faces of said main bodies; and a second chamfer formed in the range of an angle except for said first angle on each of the valve rod hole sides of said first projecting portions; the seat ring being constructed such that a size of said first chamfer is larger than that of said second chamfer and a third chamfer is gradually connected between the first and second chamfers.

5,482,253

## BALL VALVE

Ingolf Klyde, Rageveien 42, N-4040 Harsjøfjord, Norway

Continuation of Ser. No. 924,080, Sep. 17, 1992, abandoned.

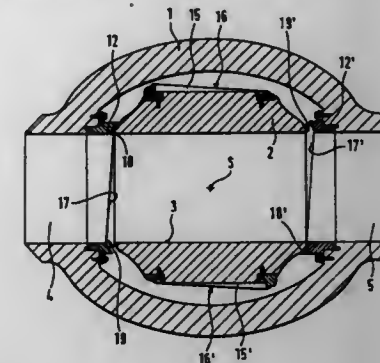
This application Apr. 28, 1994, Ser. No. 234,586

Claims priority, application Norway, Mar. 19, 1990, 901251

Int. Cl.<sup>6</sup> F16K 5/20

U.S. Cl. 251—315.07

6 Claims



1. A ball valve of the trunnion type, comprising: a valve housing comprising: oppositely directed coaxially aligned inlet and outlet, each inlet and outlet having a central axis, and two annular seal mounting surfaces; two detachable valve housing seats mounted respectively to said two seat mounting surfaces of said valve housing, each valve housing seat having a respective sealing surface, said sealing surfaces having central axis skewed relative to the central axis of said inlet and outlet; a valve ball rotatable about its geometric center axis between an open position for opening said ball valve to fluid flow and a closed position for closing said ball valve to fluid flow, said valve ball comprising: a passage in the form of a centrally through-going bore having a longitudinal axis and adapted to be brought substantially into alignment with said inlet and outlet in the open position of the ball valve, said central axis of said inlet and outlet and said longitudinal axis of said bore being coaxial in the open position of the valve, and two annular seal mounting surfaces; and two detachable valve ball seals mounted respectively to said two seal mounting surfaces, each valve ball seal having a respective sealing surface cooperating respectively with said sealing surfaces of said valve housing seats, said valve ball being adapted to close the passage through the valve housing in the closed position of the ball valve, wherein said respective sealing surfaces of said valve housing seats and said valve ball follow an eccentric course with regard to the geometric center axis of said valve ball to maintain sealing at the respective valve ball seals and valve housing seats when said valve ball is in the closed position, and to form a pair of slots at said inlet and outlet respectively, when said valve ball is in the open position, allowing fluid to pass through to the interior of the valve housing to flush and clean said valve housing and valveball.

5,482,254

## FLUID FLOW VALVE

Peter J. Greenwood, Danbury; Benedict L. Allano, Oxford;

Taecon Lee, and Martin M. Barolli, both of Waterbury, all of Conn., assignors to Carten Controls Inc., Cheshire, Conn.

Continuation of Ser. No. 92,709, Jul. 16, 1993, Pat. No.

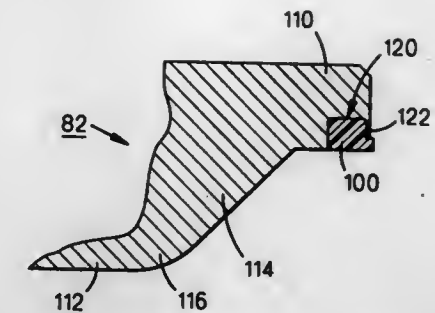
5,385,334. This application May 23, 1994, Ser. No. 247,571

Int. Cl.<sup>6</sup> F16K 31/00

U.S. Cl. 251—335.3

19 Claims

1. In a fluid flow valve having a body and having a movable member with a lower face, said movable member being movable



between a position spaced from a sealing position in said body when said valve is in an open position and movable to said sealing position when said valve is in a closed position, the improvement comprising: an annular sealing member disposed in the outer periphery of said lower face of said movable member to sealingly engage a portion of said body when said valve is in said closed position, said annular sealing member having a width less than one-eighth the diameter of said lower face and having a sealing surface at all times joining, at a substantially flush interface, with a portion of said lower face immediately adjacent said annular sealing member, with no crevice or surface discontinuity therebetween.

5,482,255

## WINCH HAVING HEAT DISSIPATING BRAKING

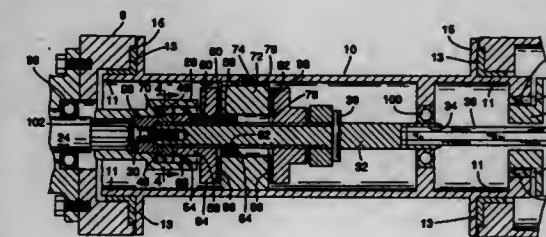
Matthew D. Daschel, Milwaukie, and Thomas M. Telford, Gladstone, both of Oreg., assignors to Warn Industries, Inc., Milwaukie, Oreg.

Filed May 2, 1994, Ser. No. 236,637

Int. Cl.<sup>6</sup> B66D 5/14

U.S. Cl. 254—378

6 Claims



1. A winch comprising: a housing; a cable drum assembly having opposed ends and a cylindrical exterior surface, said drum assembly rotatably mounted to the housing and a cable mounted to the exterior surface of the drum to be wound onto and off of the drum upon alternate rotation of the drum; a motor having a drive shaft mounted to the housing at one end of the drum, a brake shaft coupled to the motor drive shaft and extended through the center of the drum toward the opposite end of the drum, a gear reducer mechanism at said opposite end engaged with the brake shaft, said gear reducer mechanism engaged with the drum and configured to reduce the rotational affect of the drive shaft as applied to the drum; a brake surface on said cable drum assembly, a movable braking member provided on said brake shaft and rotatable therewith and movable between engaged and disengaged frictional braking engagement with said brake surface of the drum assembly whereby, when engaged, the relative rotative movement between the brake shaft and drum is resisted; and a stator fixedly mounted to the drum interior comprising a heat conductive cylinder having a cylindrical outer surface constantly in surface-to-surface contact with a cylindrical inner surface of the drum, and having opposed end faces, one of which is disposed in a plane normal to the axis of the drum, said one end surface providing the brake surface whereby

axial movement of the braking member produces surface-to-surface braking engagement in the manner of a disc brake, and said cylinder further having a center opening and a brake shaft extended through said center opening.

5,482,256

## SLAT SYSTEM FOR CHAIN LINK FENCE

Lévis Caron, 113 Landreville, St-Sulpice, Québec, Canada

Filed Mar. 11, 1994, Ser. No. 208,597

Int. Cl.<sup>6</sup> B21F 27/00

U.S. Cl. 256—34

7 Claims



1. A slat system to be mounted on a chain link fence formed with a plurality of links, comprising:

an elongate slat-retaining member to be mounted on the chain link fence;

a plurality of solid, substantially flat slats to be woven through the links of the chain link fence generally parallel to each other but at a predetermined angle to the elongate slat-retaining member, each of said slats comprising a flat body with two opposite sides having longitudinal protrusions and a first end;

first and second mutually interlocking connective means located on the first end of each said slat and on the elongate slat-retaining member, respectively, wherein said second connective means comprises a longitudinal slot formed on the elongate slat-retaining member, and wherein said first connective means comprises transverse grooves formed on the longitudinal protrusions at the first end of each said slat to form at least one gripping element locking in the longitudinal slot of the elongate slat-retaining member for thereby fastening the first ends of the slats to the elongate slat-retaining member and prevent said slats from moving longitudinally on the chain link fence.

5,482,257

## NON-GRAPHITE CRUCIBLE FOR HIGH TEMPERATURE APPLICATIONS

Cressie E. Holcombe, Knoxville, and William A. Pfeiler, Norris, both of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

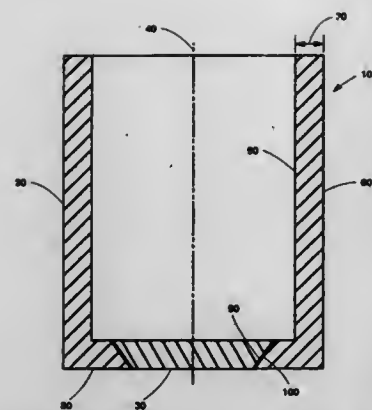
Continuation-in-part of Ser. No. 951,742, Sep. 25, 1992, Pat. No. 5,333,844. This application Jan. 25, 1994, Ser. No. 186,837

Int. Cl.<sup>6</sup> B22D 41/00

U.S. Cl. 266—275

13 Claims

1. A multi-piece crucible for containing a melt of a material for high temperature applications comprising: a tubular member and a bottom member, said tubular member having a centerline, an inner side wall, a lower portion, a thickness, and a lip, said lip being located on said inner side wall of said lower portion of said tubular



member, said lip having a tapered side tapered in a downward direction toward said centerline of said tubular member, said bottom member having an outer side tapered in an upward direction toward said tubular member at an angle that provides a matching angle with said tapered side of said lip for enclosing said lower portion of said tubular member to form said crucible for containing said melt of said material in high temperature casting operations, said outer side of said bottom member contacting a ceramic sealing material and said tapered side of said lip contacting said ceramic sealing material forming a seal sufficient to contain said melt of said material used in high temperature casting operations, said lip of said tubular member supporting said bottom member, said crucible being made of a material chemically inert to said melt and having structural integrity at the melting point temperature of said melt, said tubular member has a length and a vertical portion of said tubular member removed to form a vertical slot, said vertical slot traversing said length and said thickness said tubular member to provide for expansion or contraction of said tubular member to prevent cracking of said tubular member, said vertical slot being filled with a ceramic sealing material.

5,482,258

## SHOCK MITIGATING TETHER SYSTEM

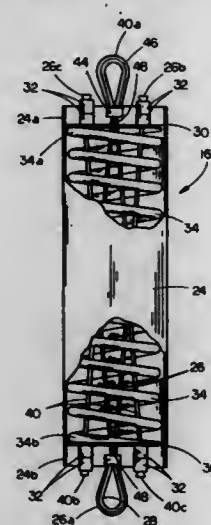
Walton E. Clauson, deceased, late of Apple Valley, Calif., and Nacelle A. Troeger, 2806 Mars Cir., Bellevue, Nebr. 68005

Filed Nov. 7, 1994, Ser. No. 335,135

Int. Cl.<sup>6</sup> F16F 3/07

U.S. Cl. 267—71

3 Claims



1. A shock mitigating tether system, comprising:

a helical coil spring operably mounted within a tubular housing for compressible movement inwardly and outwardly along a longitudinal axis coaxial with the longitudinal axis of the housing;

a first ring-shaped plate mounted on a first end of the spring, perpendicular to the longitudinal axis of the spring;

a pin journaled through diametric apertures in a first end of the housing, located longitudinally outwardly from the first plate;

a second ring-shaped plate mounted on a second end of the spring, perpendicular to the longitudinal axis of the spring;

a second pin journaled through diametric apertures in a second end of the housing, located longitudinally outwardly from the second plate;

said pins retaining said plates and spring therebetween within said housing;

a first cable folded in half to form a loop at one end and a pair of ends opposite the loop end, said cable journaled longitudinally through said spring with the loop end projecting longitudinally outwardly through a central opening in the first plate, and the pair of first cable ends connected to said second plate;

a second cable folded in half to form a loop at one end and a pair of ends opposite the loop end, said second cable journaled longitudinally through said spring with the second cable loop end projecting longitudinally outwardly from a central opening in the second plate, and the pair of second cable ends connected to said first plate; and

a tether cord removably connected to said first cable loop and extending therefrom.

5,482,259

## PIPE RESTRAINT

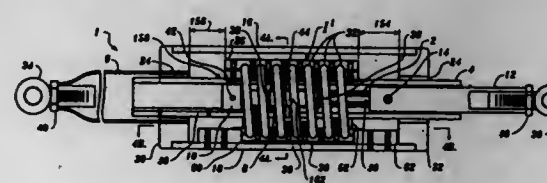
Lawrence A. Loziuk, Vernon Hills, Ill., assignor to Vectra Technologies, Inc., Wash.

Continuation of Ser. No. 978,018, Nov. 19, 1992, Pat. No. 5,360,210, which is a continuation-in-part of Ser. No. 915,477, Jul. 19, 1992, Pat. No. 5,240,232, which is a continuation-in-part of Ser. No. 808,132, Dec. 19, 1991, abandoned. This application Oct. 11, 1994, Ser. No. 320,740

Int. Cl.<sup>6</sup> F16F 3/00

U.S. Cl. 267—136

13 Claims



1. An improved energy absorption and pipe displacement limiting device for connection between a pipe subject to movement due to dynamic loads and thermal deformation and an adjacent structure the restraint comprising:

a central rod;

a cylinder including walls spaced from and surrounding an intermediate portion of the central rod for axial movement relative thereto;

a first base member mounted at the intermediate portion of the central rod;

a second base member held in place on the walls at a location opposite said first base member;

a sliding bearing or friction member mounted between the second base member and the central rod;

an arrangement of wire energy absorbing rope bights, each of said bights being directly fixed to said first base member and to said second base member which provide a restraint to movement of the central rod relative to the cylinder.

5,482,260

## DAMPING ELEMENT

Alfred Schmidt, Rinestrasse 13,, D-35279 Neustadt, Germany

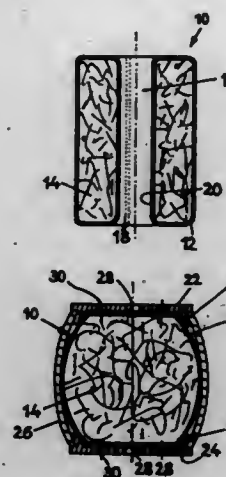
Filed May 10, 1994, Ser. No. 241,195

Claims priority, application Germany, May 10, 1993, 9307059 U

Int. Cl.<sup>6</sup> F16F 7/00

U.S. Cl. 267—141

27 Claims



1. Damping element (10) comprising granulate filling, including loose shreds or incoherent granules (14) of closed-cell polyurethane foam material retained under predetermined stress within a container (12), wherein said container (12) is an envelope made of elastically yielding material of given fluid permeability and deformably encloses the granulate filling, wherein the envelope (12) comprises fiber material selected from the group of gas-permeable material consisting of jute, fleece or elastic fabrics of predetermined density, and perforated plastics foils.

5,482,261

## NESTED SPRING ASSEMBLY

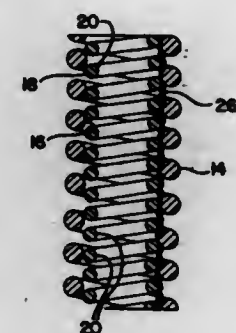
Emilio J. Ortega, Chicago, Ill., assignor to Automatic Spring Coiling Co., Chicago, Ill.

Filed Feb. 15, 1995, Ser. No. 388,996

Int. Cl.<sup>6</sup> E16F 1/06

U.S. Cl. 267—168

8 Claims



1. A nested spring assembly, said assembly comprising: a first spring and a second spring, said first spring having an inner and outer surface, and said second spring having an inner and outer surface, said second spring being nested within a cavity formed by said first spring, and said second spring being releasably secured to



said first spring by a longitudinal strip of adhesive contacting both said outer surface of said second spring and said inner surface of said first spring.

5,482,262

## HYDRAULIC AUTOTENSIONER

Hisashi Hayakawa; Kazuki Kawashima; Norio Yamazaki, all of Iwata; Ken Yamamoto, Shizuoka, and Satoshi Kitano, Hamakita, all of Japan, assignors to NTN Corporation, Osaka, Japan

Continuation of Ser. No. 992,202, Dec. 17, 1992, abandoned.

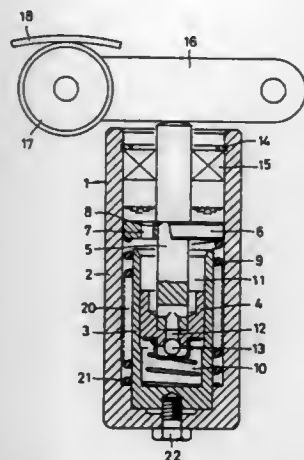
This application Sep. 23, 1994, Ser. No. 310,994

Claims priority, application Japan, Dec. 20, 1991, 3-105486 U; Nov. 26, 1992, 4-081724 U

Int. Cl.<sup>6</sup> F16H 7/08

U.S. Cl. 267—226

5 Claims



1. A hydraulic autotensioner comprising a cylinder having a closed bottom end, a sleeve mounted in said cylinder, a plunger slidably mounted in said sleeve to define a reservoir chamber and a pressure chamber, said plunger being formed with a passage through which said reservoir chamber and said pressure chamber communicate with each other, a check valve provided in said passage for closing said passage when the pressure of hydraulic oil in said pressure chamber increases above the pressure of hydraulic oil in said reservoir chamber, a rod axially movable together with said plunger, a return spring for biasing said rod in such a direction as to protrude from an upper opening of said cylinder, a wear ring having a hole which allows the passage of hydraulic oil there-through and mounted on said rod so as to be guided along an inner peripheral surface of said cylinder, said return spring being mounted in a spring mounting space defined between the outer peripheral surface of said sleeve and the inner peripheral surface of said cylinder, said wear ring having a larger outer diameter than the outer diameter of said sleeve, said spring mounting space extending downward beyond said passage.

5,482,263

## ANGLE ADJUSTABLE CLAMPS

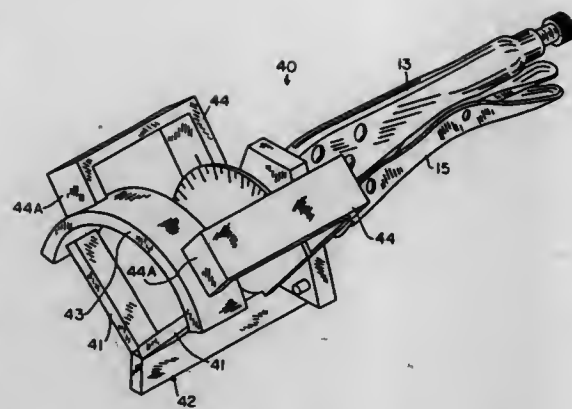
Kurt Kutzleb, 54 Wasinger Dr., Bayfield, Colo. 81122  
Filed Jan. 21, 1994, Ser. No. 184,653

Int. Cl.<sup>6</sup> B25B 1/00

U.S. Cl. 269—6

8 Claims

1. An adjustable clamp comprising:  
(a) a handle portion;  
(b) a clamp portion connected to said handle portion; wherein said clamping portion comprises first and second jaw members; wherein at least one of said jaw members includes first and second faces; wherein the angle between said faces is adjustable; wherein the other of said jaw members comprises



a curved member which defines an arc; and wherein said first and second jaw members are movable by said handle portion between open and closed positions.

5,482,264

## DOCUMENT FEEDING APPARATUS FOR ALIGNING ORIGINAL DOCUMENTS IN DUPLEX COPYING MOVE

Tomoyuki Atsumi; Yuusuke Morigami, and Hirokazu Matsuo, all of Toyohashi, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 135,730, Oct. 13, 1993. This application

Jun. 16, 1994, Ser. No. 261,341

Claims priority, application Japan, Jan. 15, 1992, 4-277482;

Jan. 15, 1992, 4-277483; Jan. 15, 1992, 4-277484

Int. Cl.<sup>6</sup> B65H 5/00

U.S. Cl. 271—10.02

7 Claims



1. A document feeding apparatus, comprising:  
means for successively forwarding sheets accommodated in a state of stacked layer one by one;  
transport means for receiving a sheet forwarded by said forwarding means and forwarding the sheet in a predetermined transport direction;  
detecting means for detecting a sheet being transported by said transport means; and  
control means for controlling operation of the transport means based on a result of a detection conducted by the detecting means, wherein the control means positions a rear end of a preceding sheet by transporting the sheet for a predetermined distance after the rear end of the sheet is detected by the detecting means, and positions a leading end of a following sheet at a predetermined position by transporting the following sheet for the predetermined distance after the leading end of the following sheet is detected by the detecting means whereby the rear end of the preceding sheet and the leading end of the following sheet correspond with each other, and thereafter, said two sheets are forwarded simultaneously.

5,482,265

## SHEET FEEDER FOR AN IMAGE FORMING APPARATUS

Yasushi Nakazato, Tokyo; Hiroyuki Shibaki, Yokohama; Tetsuo Yamanaka, Kawasaki, and Hiroshi Hosokawa, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

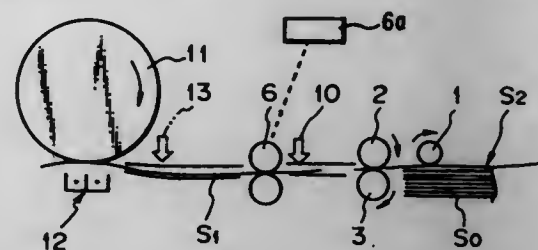
Division of Ser. No. 987,189, Dec. 8, 1992, abandoned. This application Aug. 1, 1994, Ser. No. 283,663

Claims priority, application Japan, Dec. 9, 1991, 3-324596; Apr. 14, 1992, 4-094285; Aug. 17, 1992, 4-217725; Sep. 24, 1992, 4-254964; Jan. 23, 1992, 4-286214

Int. Cl.<sup>6</sup> B65H 5/34

U.S. Cl. 271—242

11 Claims



1. A sheet feeder for continuously feeding cut sheets to an image forming section of an image forming apparatus, comprising:

control rollers adjoining the image forming section on an upstream side of the image forming section with respect to an intended direction of sheet transport for transporting the sheets to said image forming section at a desired transport speed;

control means for accelerating said control rollers to a first speed, higher than an image forming speed for a desired period of time after a leading edge of the sheet has been gripped by said control rollers and reducing the speed of said control rollers from said first speed to said sheet processing speed before said leading edge of the sheet reaches the image forming section to thereby reduce a distance between a preceding sheet and a succeeding sheet, said control means further controlling said control rollers to stop or start rotating in synchronism with a rotation of a photoconductive element of the image forming section; and

a transport roller located upstream of the image forming section and downstream of said control rollers with respect to the intended direction of sheet feed and rotatable at a transport speed substantially equal to a transport speed of said image forming section, wherein said transport roller decelerates a speed of the sheet transported by the control rollers when the transport roller grips the leading edge of the sheet, said control means controlling said transport roller and said control rollers such that after the leading edge of the sheet transported by said control rollers rotating at the high speed has been gripped by said transport roller, the transport speed of said control rollers is reduced to one substantially equal to the transport speed of said image forming section.

5,482,266

## PAPER CONVEYING APPARATUS HAVING A BELT TENSION ADJUSTING MECHANISM

Takatoshi Takemoto, Tokyo; Noriaki Kano, Hanamaki; Yoshide Kurihara, Hanamaki; Kousiro Nakai, Hanamaki, and Elzai Ito, Hanamaki, all of Japan, assignors to Kabushiki Kaisha Ace Denken, Japan

Filed Sep. 14, 1994, Ser. No. 306,138

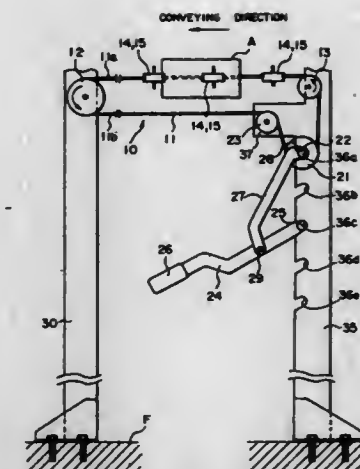
Claims priority, application Japan, Apr. 3, 1991, 3-71014

Int. Cl.<sup>6</sup> B65H 5/00

U.S. Cl. 271—272

7 Claims

1. A paper conveying apparatus for conveying paper comprising: an endless belt to be in contact with one main face of the paper to be conveyed;



a bias member to be in contact with the other main face of the paper for biasing the paper being conveyed toward said endless belt;

drive and driven pulleys, over which said endless belt is placed; a pulley rotating mechanism for rotating said drive pulley; and a belt tension adjusting mechanism for adjusting the tension of said endless belt;

said belt tension adjusting mechanism including:

a belt tension adjusting pulley having a rotary shaft over which said endless belt is further placed;

a support member extending from an imaginary segment connecting said drive pulley and said driven pulley, and having at least three recesses arranged in an extending direction of said support member, for receiving said rotary shaft of said belt tension adjusting pulley therein;

a handle formed as a bar having, at one end thereof, a pin which is engageable with any one of said recesses and, at the other end thereof, a grip; and

a linking member formed as a bar and having one end which is connected to said rotary shaft of said belt tension adjusting pulley, allowing relative rotation thereto and having another end which is connected to said handle at an intermediate position between the pin and the grip, allowing relative rotation between the linking member and the handle.

5,482,267

## DEVICE FOR ADJUSTING THE POSITION OF SUCTION-TYPE GRIPPERS ON A SHEET-TRANSFER DRUM

Rudi Hauptenthal, Epfenbach, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

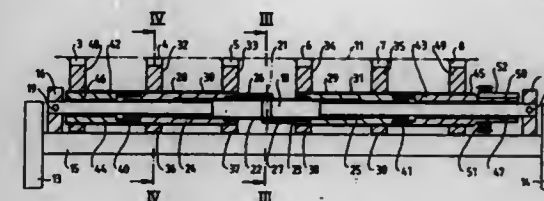
Filed May 18, 1994, Ser. No. 240,922

Claims priority, application Germany, May 10, 1993, 43 15 540.5; May 10, 1993, 43 15 515.4

Int. Cl.<sup>6</sup> B65H 5/12

U.S. Cl. 271—276

11 Claims



1. Device for adjusting the position of suction-type grippers on a sheet-transfer drum, wherein the suction-type grippers, disposed basically along at least one generating line, are displaceable perpendicularly to a sheet-transport direction and are fixably disposed, comprising a multi-member differential worm-gear unit having output members secured against rotation relative thereto, the suction-type grippers being fastened to said output members, and

precisely one rotational input member disposed on said differential worm-gear unit for simultaneously adjusting all of the suction-type grippers.

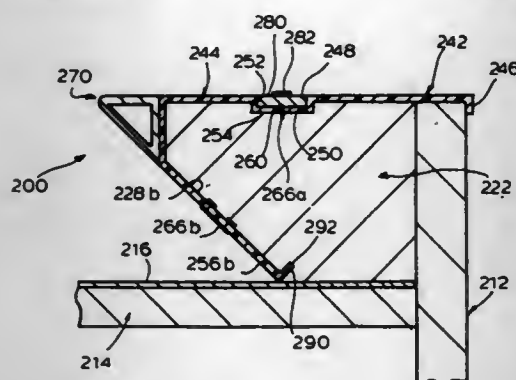
5,482,268

**BUMPER FOR TABLE GAME**

John J. Driska, Princeton Junction, N.J., assignor to Azrak-Hamway International, Inc., New York, N.Y.  
Filed Dec. 15, 1992, Ser. No. 990,721  
Int. Cl.<sup>6</sup> A63D 15/06

U.S. Cl. 473-32

15 Claims



1. A bumper for a table game, comprising:

- (A) a rigid rail form defining a generally horizontal upper surface and an inner surface depending from said form upper surface, said upper surface having inner and outer marginal sections, said inner surface having an upper vertically-extending portion and a lower portion;
- (B) a plastic cover having a first section disposed on said outer marginal section of said, form upper surface and a second section of a first rigidity disposed on said inner marginal section of said form upper surface, said upper vertically-extending portion of said form inner surface and said lower portion said form inner surface, said second section of said plastic cover having a vertically-extending portion; and
- (C) a plastic cushion of a second rigidity disposed on said vertically-extending portion of said second section of said plastic cover,

said first rigidity being greater than said second rigidity; and said second section of said plastic cover and said cushion being of integral, one-piece, unitary construction formed in a single co-extrusion operation.

5,482,269

**DRIVING RANGE TEE AREA DIVING METHOD**

Ralph M. Scott, 3901 Chadbury Rd., Mount Laurel, N.J. 08054, and John C. Scarperia, 81 N. Church St., Beverly, N.J. 08010

Filed Jan. 10, 1995, Ser. No. 370,864

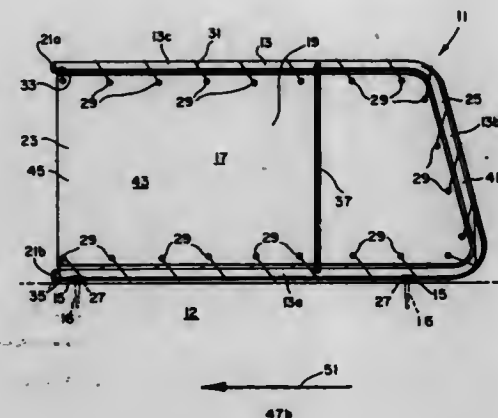
Int. Cl.<sup>6</sup> A63B 57/00; 67/02

U.S. Cl. 273-35 B

12 Claims

1. The method of dividing a tee area of a golf driving range into subsections and/or for blocking golf balls hit by a first golfer from hitting other golfers or spectators in the path of a shanked or laterally projected golf ball hit by the first golfer, comprises the steps of

providing a tee divider having a frame having substantially a toppled U-shape, the frame comprising a tube having a circular cross-section and being bent at various points along its length to form a bottom leg portion, a side leg portion, and a top leg portion of the frame, mounting feet mounted on the bottom leg portion of the frame for securing the tee divider on the tee area and for supporting the tee divider in an upright position substantially perpendicular to the plane of the tee



area, a deflector sheet, which is impervious to golf balls, extending substantially across the entire area formed by the frame for blocking golf balls that are shanked or laterally hit by a golfer, and attachment means for attaching the deflector sheet to the frame,

positioning the tee divider on the tee area so that said side leg portion is vertically oriented and positioned rearwardmost on the tee area to divide the tee area into subsections or to form a lateral border to the tee area,

forming a hitting area on the tee area adjacent to the tee divider for hitting golf balls, and

blocking laterally hit golf balls hit from the hitting area with the tee divider, thereby preventing laterally hit golf balls from hitting golfers and spectators standing beyond the tee divider.

5,482,270

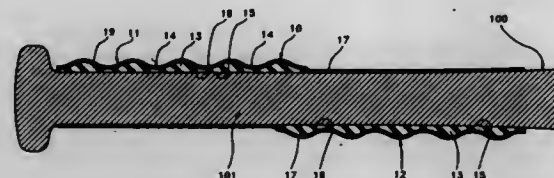
**HANDGRIP FOR A BAT**

J. Al Smith, 5918 Portview Cir., Chattanooga, Tenn. 37421  
Filed Sep. 30, 1994, Ser. No. 315,568

Int. Cl.<sup>6</sup> A63B 51/06

U.S. Cl. 273-72 R

3 Claims



1. A gripping member, for a handle portion of a bat held in at least one hand of a user, said gripping member comprising:

- (a) a first longitudinally curvilinear shim and a second longitudinally curvilinear shim positioned substantially opposite the first longitudinally curvilinear shim;
- b) the first longitudinally curvilinear shim and the second longitudinally curvilinear shim intimately abutting an outer surface of the handle portion, said first longitudinally curvilinear shim and said second longitudinally curvilinear shim, each comprising:
- a resilient cushioning member comprising:
- at least four radial indentations into which the fingers of the at least one hand are placed; and
- a first non-slip surface on an outer surface of the cushioning member; and
- (c) a retaining sleeve member, intimately abutting, enclosing and securing the first longitudinally curvilinear shim and said second longitudinally curvilinear shim to the handle portion, the retaining sleeve member comprising:
- a heat-shrinkable plastic cover; and
- a second non-slip surface on the cover.

5,482,271

**HUMAN RESTRAINT OR HOBBLE FOR CATCHING AND HOLDING**

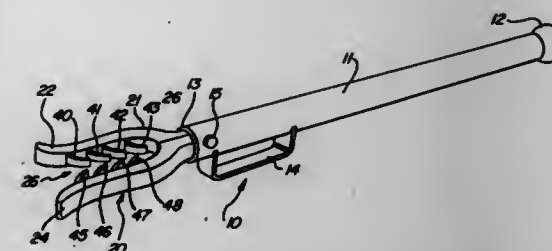
Dennis M. McNutt, 2865 Drake Ave., Costa Mesa, Calif. 92626

Filed Jan. 7, 1994, Ser. No. 178,782

Int. Cl.<sup>6</sup> F41B 15/02; A01K 15/00

U.S. Cl. 273-84 R

3 Claims



1. For use in releasibly grasping an appendage, a restraint comprising:

- an elongated rigid pole having an end portion;
- a clasp formed of a generally rigid material secured to said end and defining first and second spaced apart tine supports forming a closed end appendage receiving channel between said first and second spaced apart tine supports;
- first and second pluralities of tines pivotally supported upon said first and second tine supports respectively, said tines each being independently movable with respect to said tine supports between a first position forming an acute angle with its respective tine support and a second position generally parallel to its respective tine support; and
- a plurality of spring means, each operative independently upon one of said tines, for urging said individual tines toward said first position.

5,482,272

**BALL CUP FOR TABLE SOCCER GAME**

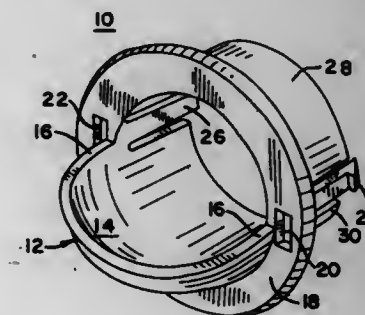
Peter J. Hylak, Northbrook, and Gary Berge, Crystal Lake, both of Ill., assignors to E & H Plastics Co., Inc., Chicago, Ill.

Filed Dec. 2, 1994, Ser. No. 348,729

Int. Cl.<sup>6</sup> A63F 7/06

U.S. Cl. 273-85 D

26 Claims



1. A unitary ball cup for a table game comprising a means for receiving a spherical ball, a flange, and an integral, resilient latch for releasibly securing the ball cup to the table game.

5,482,273

**LACROSSE GAME TABLE**

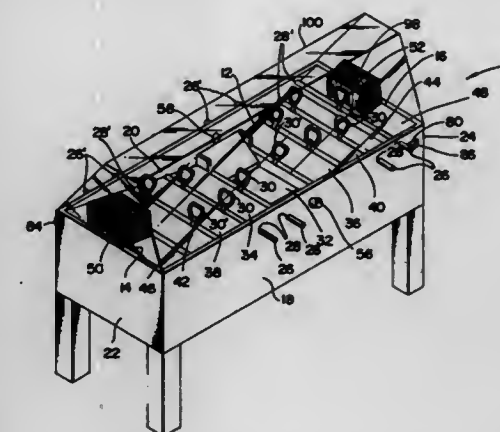
Curtis L. Wilton, 11503 Frederick Farms Cir., Midlothian, Va. 23112

Filed Mar. 29, 1995, Ser. No. 413,171

Int. Cl.<sup>6</sup> A63F 7/06

U.S. Cl. 273-85 D

27 Claims



1. A lacrosse game apparatus, comprising:

- a playing field having first and second opposed ends;
- first and second opposed side walls connected to and extending upwardly above said playing field;
- first and second opposed end walls connected to and extending between said side walls;
- a plurality of actuating rods extending between and rotatably and slideably positioned with respect to said side walls;
- at least one ball control device fixedly attached to each of said actuating rods;
- said playing field including a plurality of spaced-apart, side-by-side playing field sections connected to said side walls;
- said actuating rods positioned one each substantially directly between adjacent ones of said playing field sections; and
- first and second ball-receiving goal devices positioned, respectively, at said opposed ends of said playing field.

5,482,274

**ROLLER HOCKEY PUCK WITH RECESSED RUNNERS**

Alex R. Bellehumeur, 6242 Napoli Ct., Long Beach, Calif. 90803

Continuation-in-part of Ser. No. 150,420, Nov. 10, 1993, abandoned, which is a division of Ser. No. 949,077, Sep. 22, 1992,

Pat. No. 5,275,410. This application Sep. 6, 1994, Ser. No.

301,074

Int. Cl.<sup>6</sup> A63B 71/00

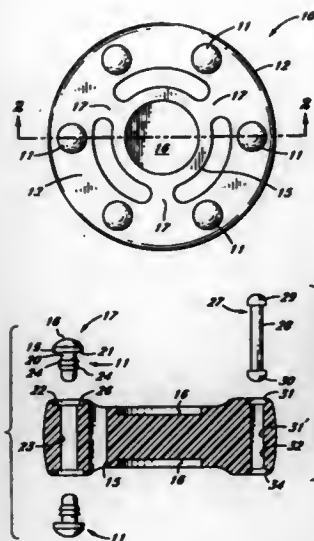
U.S. Cl. 273-128 R

10 Claims

1. A roller hockey puck having a generally cylindrical outer peripheral surface, an upper face and a lower face and a plurality of runners having heads extending above and below the upper and lower faces respectively, wherein the improvement comprises:

- a plurality of runners on each face, each of said runners having an enlarged head and a shaft and the enlarged head having a bottom surface extending outwardly from the shaft, a side wall and a top surface and the puck having an enlarged recess having a floor and a side wall, the floor being adjacent the bottom surface of each head and said recess extending upwardly from its floor to a face, and the puck having openings extending into the puck from a portion of the floor of the recess and said openings being in direct contact with the respective shafts of the runners which are retained in said openings.





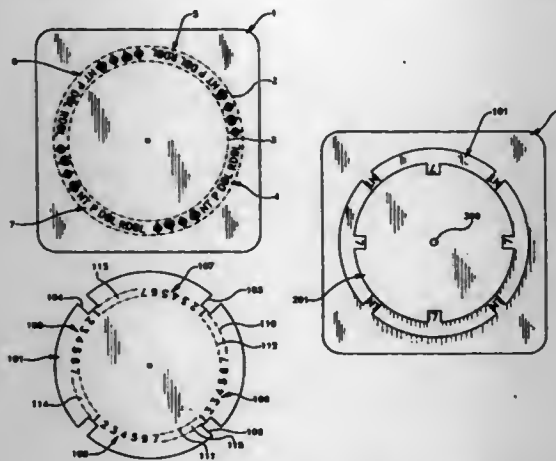
5,482,275

**DEVICE AND METHOD FOR SILENT BRIDGE BIDDING**  
Abraham Grinich, 27 Knollwood Rd., Morristown, N.J. 07960,  
and Ethel Sheffer, 4301 N. Ocean Blvd., Boca Raton, Fla.  
33431

Filed Nov. 18, 1994, Ser. No. 342,099  
Int. Cl.<sup>6</sup> A63F 1/06

U.S. Cl. 273-142 HA

3 Claims

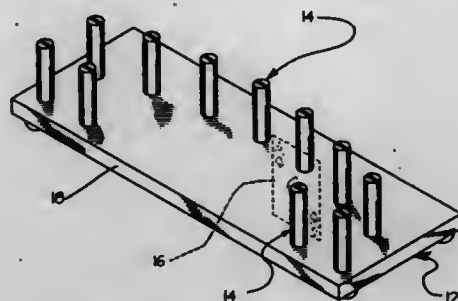


1. A device for non-verbal contract bridge bidding comprised of a base, a first lower rotatable member mounted on top of said base adapted to be separately and manually rotated, and an upper second rotatable member mounted on top of said first member on said base adapted to be separately and manually rotated, said base having four groups of first notations each group of first notations having the same sequence of notations identifying the card suits, no trump, pass, double and redouble, each group of first notations spaced 90 degrees from each adjacent group, said first lower member having four open slots located 90 degrees apart each slot adapted to identically expose only one first notation on said base while the remaining first notations are covered from view by said first lower member, said first lower member having four groups of second notations each group of second notations having the same sequence of notations 1, 2, 3, 4, 5, 6 and 7, each group of second notations spaced 90 degrees apart, said second upper member having four open slots located 90 degrees apart each slot adapted to identically expose only one second notation on said first member while all the remaining second notations are covered.

5,482,276  
**PLAYING CARD HOLDER**  
Laurence S. Hall, 73 Mels, Lakeland, Fla. 33801  
Filed Jan. 5, 1995, Ser. No. 369,149  
Int. Cl.<sup>6</sup> A63F 1/10

U.S. Cl. 273-150

13 Claims

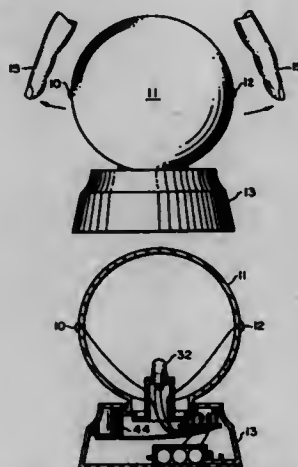


6. A playing card holder comprising:  
a support means for positioning upon a horizontal support surface; and,  
a plurality of engaging means coupled to the support means for engaging a plurality of cards to support the cards relative to the support means, the support means comprising a base plate; wherein the base plate includes a plurality of cylindrical bores directed thereinto, and further wherein the engaging means are each positioned partially into an individual one of the bores, wherein the engaging means can be rotated relative to the base plate such that the playing cards positioned within the engaging means can be selectively oriented towards a player.

5,482,277  
**METHOD OF OPERATING A TALKING CRYSTAL BALL TOY**  
Gordon Young, 1270 Champion Cir., Carrollton, Tex. 75006  
Filed Jun. 22, 1994, Ser. No. 263,826  
Int. Cl.<sup>6</sup> A63F 9/18

U.S. Cl. 273-161

1 Claim



1. A method of operating a child's fortune telling toy comprising the steps of supporting a glass sphere on a base to simulate a known fortune teller's display, embodying said fortune teller's display with an electrical circuit having an operating mode of alternately illuminating said glass sphere and emitting a simulated voice message, establishing two open electrical contacts for said electrical circuit each on an opposite side of said glass sphere adapted when contacted and released by a user of the toy to provide said operating mode of said electrical circuit, contacting simultaneously said two electrical contacts so as to electrically complete said electrical circuit to illuminate said glass sphere and to provide a dwell interval in the operation of said toy during

which a question is posed for response to said toy, and releasing said electrical contacts to allow the completion of said electrical circuit operating mode so as to provide the emitting of a simulated voice message, whereby said voice message is perceived as the response to the posed question to contribute to the play value of said toy.

5,482,278  
**HANDICAPPED-ACCESSIBLE GOLF COURSE**  
David H. Hill, and Kurt Paulin, both of P.O. Box 159, Shelbourne, Vt. 05482  
Filed Apr. 14, 1995, Ser. No. 421,961  
Int. Cl.<sup>6</sup> A63B 67/02

U.S. Cl. 273-176 A

3 Claims



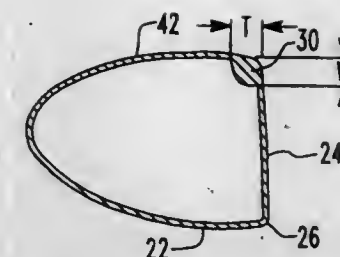
1. A golf course which is accessible to physically handicapped golfers, which comprises a playing surface and:  
(a) a clubhouse which is equipped with at least one wheelchair-accessible ramp, at least one room equipped with at least one bed, and toilets accessible to wheelchairs;  
(b) a plurality of playing holes, each playing hole comprising (i) a tee area which comprises a plurality of areas for tee placement; (ii) a fairway area which is free from water traps, which comprises a surface which contains a pitch sufficient to afford water drainage and (iii) a green area which contains a plurality of holes which may be plugged so as to present different locations of the playing hole at different times, an artificial turf, and a rubber layer beneath the artificial turf;  
(c) a plurality of climate-controlled rest houses on the course, each rest house being accessible by wheelchair ramps and containing at least one bed and refreshments; and  
(d) hazards which are at least one member selected from the group consisting of (i) boulders, (ii) concrete slabs which are flush with the playing surface, and (iii) sand traps which are flush with the playing surface;  
the playing surface of the golf course being essentially flat except for the drainage pitch.

5,482,279  
**GOLF CLUB METAL WOOD-TYPE HEAD WITH IMPROVED PERIMETER STRUCTURE AND WEIGHT CONFIGURATION**  
Anthony J. Antonious, 7738 Calle Facil, Sarasota, Fla. 34238  
Filed Jul. 25, 1994, Ser. No. 280,177  
Int. Cl.<sup>6</sup> A63B 53/04

U.S. Cl. 273-167 H

59 Claims

1. A metal wood-type golf club head comprising:

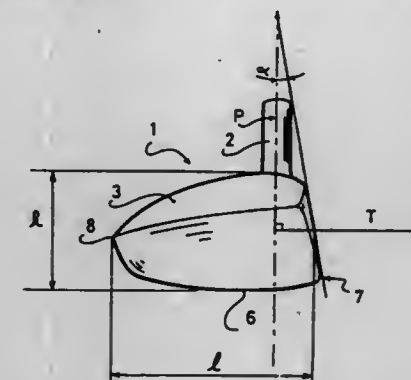


a golf club head body including a heel, toe, bottom, crown, side walls, ball striking face and a rear club face, said ball striking face intersecting with a forward most progression of said bottom to define a leading edge of the ball striking face; a hosel integrally connected to said club head body; and a peripheral mass positioned along at least the majority of the interface of the ball striking face and the crown of the club head, wherein the hosel extends into and connects with a portion of said peripheral mass, thereby providing added strength and stability to the club head and minimizing ping of the club head when ball contact is made.

5,482,280  
**SET OF GOLF CLUBS**  
Koichi Yamawaki, Chiba, Japan, assignor to Taylor Made Golf Company, Carlsbad, Calif.  
Filed Jan. 13, 1995, Ser. No. 372,331  
Claims priority, application Japan, Jan. 14, 1994, 6-002374  
Int. Cl.<sup>6</sup> A63B 53/04

U.S. Cl. 273-167 J

7 Claims



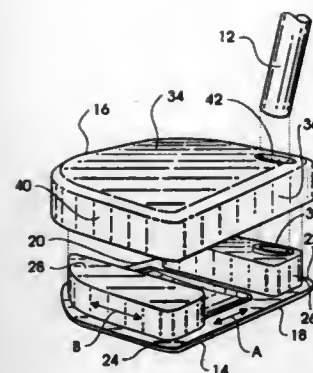
1. Set of wood-type golf clubs, in which each club comprises a shaft extending in a vertical plane (P) perpendicular to a hitting line (T), and on which is mounted a head (1) incorporating a series of walls, including a sole plate (6), designed to rest on the ground and at least one front inclined wall (4) having an angle of loft ( $\alpha$ ) value in relation to the plane (P), the intersection of said sole plate (6) and of said front wall (4) constituting a curved leading edge (7) incorporating at least one portion of an arc tangent to the ground and having a radius (R), wherein said radius (R) of said portion increases as said angle of loft ( $\alpha$ ) increases in the set.

5,482,281  
**GOLF PUTTER HEAD**  
Douglas W. Anderson, Glendale, Ariz., assignor to Karsten Mfg. Corp., Phoenix, Ariz.  
Filed Feb. 17, 1995, Ser. No. 390,053  
Int. Cl.<sup>6</sup> A63B 53/04

U.S. Cl. 273-169

19 Claims

1. A golf putter head comprising:  
a lower plate-like member having a front side, a back side, a width dimension measured between said front and back sides,



a heel end, a toe end, and a length dimension measured between said heel and toe ends;  
 a heel weight mounted on said lower plate-like member adjacent said heel end;  
 a toe weight mounted on said lower plate-like member adjacent said toe end;  
 said heel and toe weights extending upwardly and being spaced apart in a heel-to-toe direction extending along the length dimension of said lower plate-like member; and  
 an upper shell-like member attached to said lower plate-like member for enclosing said heel and toe weights.

#### 5,482,282 GOLF CLUB

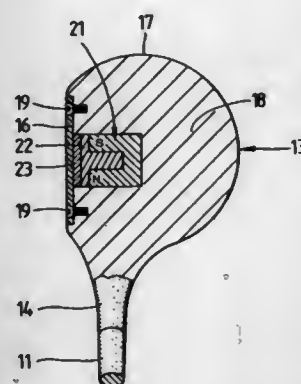
Samuel C. Willis, 1001 Ironwood Dr., Bowling Green, Ky. 42103

Filed Dec. 22, 1994, Ser. No. 362,194

Int. Cl.<sup>6</sup> A63B 69/36

U.S. Cl. 273—186.2

16 Claims





dimples located within said first set of triangles and between said second set of triangles, said hemisphere having a total of 201 dimples;

said dimples including three different diameters, D1, D2, and D3, with the relative diameters being  $D1 > D2 > D3$ ; and the dimples lying along said legs of said first set of triangles which radiate from said polar dimple and all of the legs of said second set of triangles are of a diameter D1.

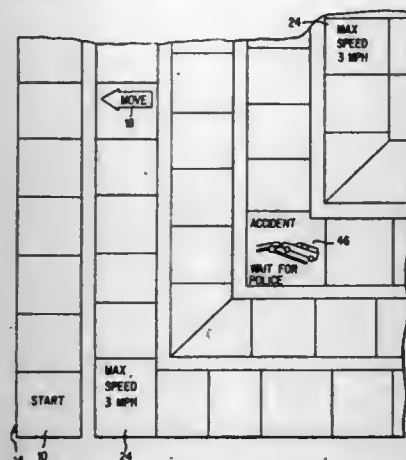
5,482,288

# RACE-TO-THE-FINISH BOARD GAME WITH OBSTACLES

Isaac Cedeno, Bayamon, Puerto Rico, assignor to Commonwealth of Puerto Rico, San Juan, Puerto Rico  
Filed Oct. 31, 1994, Ser. No. 331,901  
Int. Cl.<sup>6</sup> A63F 3/00

U.S. Cl. 273—249

5 Claims



1. A board game comprising a path leading from a start station to a final station, a series of intermediate stations between said start and final stations, a set of first and second tokens for each player, each set being different from every other set and both tokens of each set bearing identical distinguishing indicia, the first token of each set representing a player personally and the second token of each set representing a public servant, chance means actuated by a player for producing one number of a first predetermined range of numbers representing those stations over which a player's first token is to be advanced, some of said stations bearing directions affecting further movement of said first token upon landing thereon, other of said stations representing public buildings for occupation by respective public servants, yet other of said stations depicting scenes of respective events each requiring the presence of a relevant public servant before a first token can be advanced beyond said last mentioned station, said chance means being operable by said player to advance a respective public servant represented by a player's second token from an applicable public building appropriate to said event to or beyond the station indicating said event thereby enabling a player's first token to be advanced beyond said last mentioned station.

5,482,289

# METHOD OF PLAYING A BINGO GAME WITH PROGRESSIVE JACKPOT

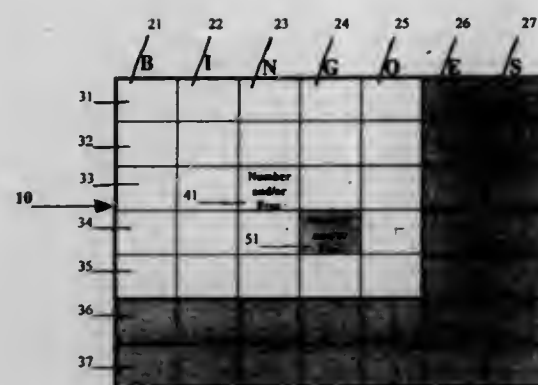
Gary Weingardt, Henderson, Nev., assignor to Gary Weingardt Trust, a Nevada Trust, Henderson, Nev.  
Filed Jan. 18, 1994, Ser. No. 182,850  
Int. Cl.<sup>6</sup> A63F 3/00

U.S. Cl. 273—269

10 Claims

1. The method of playing a game of bingo comprising:

a) providing a player with a bingo card consisting essentially of:



- 1) a plurality of numbered spaces formed as a matrix having seven rows and seven columns;
- 2) a first indicium designating a portion of the matrix comprising five contiguous rows and five contiguous columns whereby a five-by-five bingo game can be played thereon; and
- 3) a second indicium designating a portion of the matrix comprising two contiguous rows and two contiguous columns whereby, when combined with the first indicium, a seven-by-seven bingo game can be played thereon;
- b) providing a plurality of bingo balls each having individual numbers corresponding to the numbered spaces on the bingo card;
- c) a player making a first wager to be eligible for the five-by-five bingo game and a second wager to be eligible for the seven-by-seven bingo game;
- d) randomly selecting consecutive bingo balls;
- e) awarding a first preselected amount when the player achieves a predetermined winning combination on the five-by-five matrix of the bingo card;
- f) awarding a second preselected amount when the player achieves a predetermined winning combination on the seven-by-seven matrix of the bingo card;
- g) a player making a third wager to be eligible for a progressive jackpot;
- h) designating a portion of the third wager to a separate progressive jackpot pool;
- i) establishing a predetermined combination as a winning combination for the progressive jackpot pool; and
- j) awarding the progressive jackpot pool to the player when he achieves the predetermined winning combination on the bingo card.

5,482,290

Patent Not Issued For This Number

5,482,291

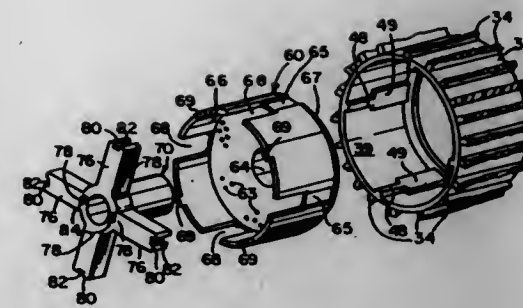
# DART BOARD APPARATUS WITH INDEPENDENTLY SUPPORTED DOUBLE BULL SEGMENT

John W. Houriet, Jr., Yardley; Peter Feuer, Rydal, and William A. Rollin, III, Hatboro, all of Pa., assignors to Merit Industries, Inc., Bensalem, Pa.  
Filed Apr. 25, 1995, Ser. No. 248,379  
Int. Cl.<sup>6</sup> F41J 3/00

U.S. Cl. 273—376

5 Claims

1. A dart board apparatus comprising:
- a) a housing;
- a spider being generally circular in shape and having a series of circumferentially and radially extending ribs which define a plurality of target segment openings, and a circumferential center rib which defines a center opening, located in the housing;



- a plurality of target segments slidably disposed in the target segment openings;
- an annular outer bull segment, having a target surface with a center opening, and a generally tubular sidewall with a least two slots therethrough, the outer bull segment being slidably disposed for movement within the circumferential center rib;
- an inner bull segment slidably disposed within the center opening in the outer bull segment;
- the inner bull segment including at least two spokes, in an aligned position with the slots in the outer bull segment sidewall, each spoke includes a first end connected to the inner bull, and a second end in slidable contact with the center rib so that the inner bull segment may slide independently of the movement of the outer bull segment; and
- at least one sensor associated with each target segment, the outer bull segment and the inner bull segment.

5,482,292

# DUMPING TOY

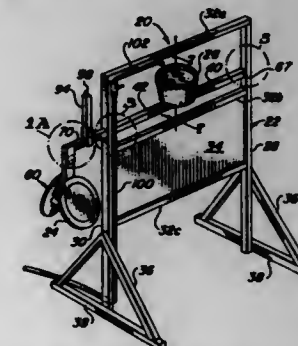
Robert S. Stone, 20908 San Luis Ave., Woodland Hills, Calif. 91364

Filed Jan. 30, 1995, Ser. No. 380,834

Int. Cl.<sup>6</sup> A63B 63/00; F41J 5/00

U.S. Cl. 273—384

29 Claims



1. A toy for dumping a selected material, for example water, comprising:
- a frame having a pivotable cross-beam;
- a receptacle flexibly connected to the cross-beam, the receptacle filled with the selected material; and
- a target connected to the cross-beam such that when struck by a projectile, the receptacle pivots from an upright position to a tipped position thereby dumping the selected material.

5,482,293

# ARROWHEAD

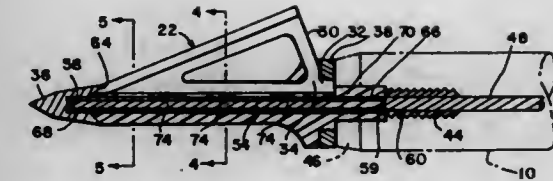
Carl W. Lekavich, 21529 Menlo Ave., Torrance, Calif. 90502  
Continuation of Ser. No. 711,167, Jun. 5, 1991, abandoned.  
This application Apr. 6, 1994, Ser. No. 223,831

Int. Cl.<sup>6</sup> F42B 6/08

U.S. Cl. 273—422

16 Claims

1. A broadhead for use with an arrow shaft comprising:



- a blade having a substantially straight mounting edge and a cutting edge supported by the mounting edge;
- an elongated ferrule for connecting to the arrow shaft having an exterior groove for receiving the mounting edge of the blade, the groove having a bottom floor with a plurality of spaced apart deformable lands; and
- means for pressing the mounting edges against the lands, deforming the lands to suit the applied pressure and for holding the mounting edges in place.

5,482,294

# ARCHERY BROADHEAD

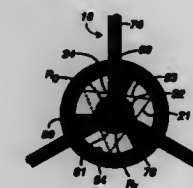
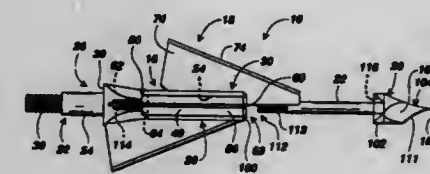
Dennis E. Sullivan, 342F Camp Creek Rd., and Kevin M. Sullivan, Rte. 1, Box 3095, both of Lakemont, Ga. 30552

Filed May 16, 1995, Ser. No. 442,472

Int. Cl.<sup>6</sup> F42B 6/08

U.S. Cl. 273—422

28 Claims

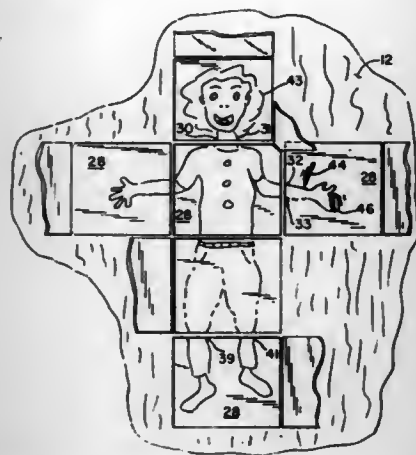


1. An archery broadhead assembly comprising:
- a ferrule, said ferrule including an elongate body having an outer peripheral surface, a shaft engaging end and an opposed tip end, said ferrule body defining an axially extending centrally located ferrule cavity and having an inner cavity side wall adjacent said ferrule cavity, said ferrule body further defining at least one ferrule slot extending longitudinally along said ferrule body and communicating between said outer peripheral surface and said ferrule cavity;
- at least one blade element comprising a substantially planar blade body defining an exterior exposed edge, and also defining a side edge opposing said exterior exposed edge, said blade element also comprising a securing flange attached to and extending substantially along said side edge of said blade body, said securing flange also defining a free flange edge extending along said securing flange substantially opposite said blade body, said blade element being adapted to be secured in said ferrule slot such that said blade body, including said blade edge, extends through said slot and outwardly of said peripheral surface and said securing flange and said free flange edge are disposed within said ferrule cavity; and
- an elongate engaging bar disposed within said ferrule cavity effective to capture said securing flange substantially along the length thereof between said engaging bar and said cavity side wall to discourage movement of said blade element relative to said ferrule slot.

5,482,295  
**ROUND ROBIN DRAWING GAME BOARD**  
**John J. Phelan, 109 Jeanette Ave., Inwood, N.Y. 11696**  
**Filed May 8, 1995, Ser. No. 438,105**  
**Int. Cl.<sup>6</sup> A63F 9/00**

U.S. Cl. 273-459

#### 4 Claims



1. A round robin drawing game board for playing a game in which each player in round robin fashion draws his version of a portion of the human body, said game board comprising:

- (a) a rectangular cover board having an upper surface and a lower surface, said cover board having a plurality of doors opening on its upper surface, each door having an upper edge, a lower edge, and an edge whereby the door may be opened, said door being opened by pulling outward on the openable edge thereof;
- (b) pieces of mating hook and loop pile fastener material attached to the upper surface of the cover board and extending in an outward and downwardly direction therefrom;
- (c) a rectangular drawing board having an upper surface and a lower surface, wherein the upper surface of the drawing board comprises erasable marker board, the lower surface has four patches of mating hook and 12 pile fastener material positioned so as to be attachable to the pieces of mating hook and loop fastener material extending outward and downward the upper surface of the cover board; whereby when the cover board is attached to the drawing board by the pieces of mating hook and loop pile fastener material, and the plurality of doors on the upper surface of the cover board are opened portions of the erasable marker board surface of the drawing board are exposed.

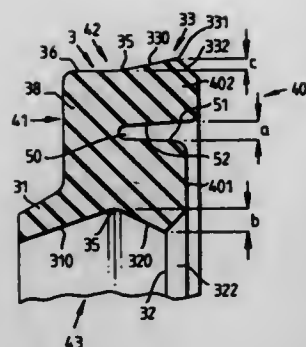
**5,482,296**  
**SEALING RINGS AND SEALED ASSEMBLIES**  
**Nicholas A. Peppiatt, Lightwater, England, and Willibald**  
**Nentwig, Seevetal, Germany, assignors to Hallite Seals Inter-**  
**national Limited, Middlesex, Great Britain**  
**Filed Sep. 21, 1993, Ser. No. 124,709**  
**Claims priority, application United Kingdom, Sep. 22, 1992,**  
**9219963; Ang. 19, 1993, 9317228**

U.S. Cl. 277-24

## 16 Claims

1. A sealing ring for sealing between opposed surfaces of a bore and a rod extending axially in the bore, the sealing ring comprising a ring body of elastomeric material having oppositely axially-directed faces, a radially-inwardly directed sealing face to seal against the rod and a radially-outwardly directed sealing face to seal against the bore.

the radially-inwardly directed sealing face having a circumferentially-extending inward sealing lip, projecting radially on said face by an inward lip projection distance, the radially inwardly-directed sealing face having a wiper lip in addition to and axially spaced from said inward sealing lip.



and the radially outwardly-directed sealing face having a circumferentially-extending outward sealing lip, projecting radially on said face by an outward lip projection distance, the inward and outward sealing lips being adjacent a first one of the axially-directed faces of the ring body, and at least one of the sealing lips being defined by a circumferentially-extending lip edge, adjacent said first axially-directed face, and a tapering portion of the ring body leading to said lip edge on the axial side thereof remote from the first axially-directed face, and

the ring body defining an internal annular closable slot, extending circumferentially between the inward and outward sealing lips, the internal slot being open at said first axially-directed face, and having radially-opposed slot walls spaced radially from one another by a mean radial width, the mean radial width being from 30% to 80% of a sum of the inward lip projection distance and the outward lip projection distance and the radially-opposed slot walls being substantially straight in axial cross-section and complementary to one another, whereby in an operational sealing condition, in which the sealing ring is radially compressed between opposed surfaces, the slot walls are pressed together in complementary contact to give bodily radial compression of the elastomeric material of the ring body in axial alignment with the sealing lips.

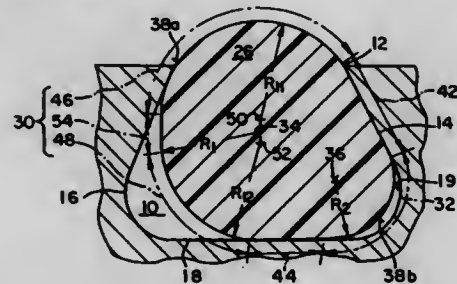
5,482,297  
SEAL ELEMENT FOR INSTALLATION IN AN ANNULAR  
DOVE-TAIL GROOVE

**James W. Burns, Harleysville, Pa., and John A. Burke, Rocky River, Ohio, assignors to Greene, Tweed of Delaware, Inc., Wilmington, Del.**

**Filed Jan. 9, 1995, Ser. No. 369,941**  
**Int. Cl.<sup>6</sup> F16J 9/20**

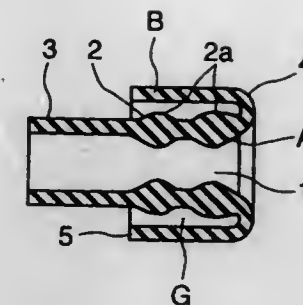
U.S. Cl. 277-169

### 8 Claims



1. A seal element for installation in an annular groove having a mouth, first and second side walls, and a base wall axially extending between the side walls, the side walls extending toward each other as each side wall respectively approaches the mouth to form a dove-tail shape in toroidal cross-section, the first side wall meeting the base wall at a generally inwardly rounded surface, the seal element for sealing a sealed fluid and comprising a generally annularly shaped element formed of an elastomeric material and having an external seal surface including, in toroidal cross-section:

- a first generally arcual portion having a first radius and a first radial center, the first radius being sized to allow the first arcual portion to contact the side walls and the base wall and to partially protrude through the mouth of the groove;
- a second generally arcual portion having a second radius smaller than the first radius and a second radial center, the second radius being sized and the second radial center being offset from the first radial center to allow the second arcual portion to be complementarily received by a portion of the inwardly rounded surface of the groove; and
- a pair of mold flashing points generally oppositely situated on the external seal surface, each flashing point being positioned on a part of the external seal surface located away from contact with the sealed fluid.



supporting portion and extends forward therefrom so as to cover said plug body, said cover sleeve being able to be unfolded at said annular supporting portion to expose said sealing surface.

5,482,298

**METAL LAMINATE TYPE CYLINDER HEAD GASKET  
HAVING GROMMETS WITH DIFFERENT THICKNESSES**

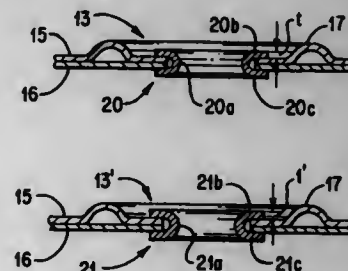
Takekazu Udagawa, Ichikawa, Japan, assignor to Ishikawa  
Gasket Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1994, Ser. No. 272,339

Claims priority, application Japan, Jun. 13, 1993, 5-038378  
Int. Cl.<sup>6</sup> F16J 15/08

U.S. CL. 277-180

## 7 Claims



1. A metal laminate type cylinder head gasket comprising,  
 at least two metal plates for constituting the gasket and having a plurality of cylinder bores arranged in a longitudinal direction, a plurality of first holes including at least one of the cylinder bores situated in longitudinal end areas of the basket, and at least one second hole including at least one of the cylinder bores situated in a longitudinal middle area of the gasket,  
 a plurality of first grommets situated in and around the first holes, and  
 at least one second grommet situated in and around the second hole, the thickness of the second grommet being thinner than that of the first grommet so that when the gasket is tightened, deformation of a cylinder head is reduced.

5,482,299  
**WATER SEAL PLUG FOR CONNECTOR**  
 Hltoshi Saito, Shizuoka, Japan, assignor to Yazaki Corporation, Japan

Filed Aug. 26, 1994, Ser. No. 295,067

Claims priority, application Japan, Aug. 31, 1993, 5-216041  
Int. Cl.<sup>6</sup> F16J 15/02

U.S. Cl. 277-209

### 8 Claims

1. A water seal plug for an electrical connector, comprising:  
a substantially cylindrical plug body having a central wire passage bore and an outer peripheral surface which serves as a sealing surface;  
an annular supporting portion connected to a rear end of said plug body; and  
a cover sleeve which covers said sealing surface in such a manner as to expose said sealing surface when said plug is used, wherein said cover sleeve continues from said annular

**5,482,300**  
**COLLET ADAPTER FOR CONVERTING MACHINE VISE  
TO A COLLET FIXTURE**

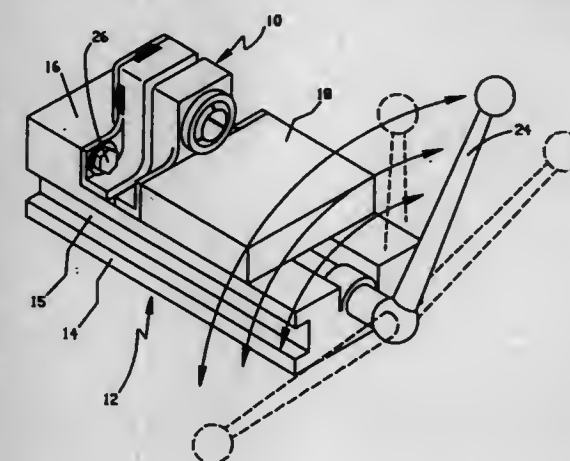
**Kurt F. Wendhack, 700 Perrie Dr. Unit 308, Elk Grove Village,  
Ill. 60007**

**Filed Jul. 1, 1994, Ser. No. 265,270**

Int. Cl.<sup>6</sup> B23B 31/20; B23Q 3/06; B25B 1/02

U.S. CL. 279—51

### 13 Claims



1. A collet adapter for converting a standard machine vise into a collet fixture wherein the vise includes relatively removable members, vise jaws and an actuator, comprising: a first support and second support each having a bore therethrough aligned with one another, means on the first and second supports for fixedly attaching them to the vise members, a sleeve in the bores in the first and second supports having an axially tapered internal portion, a workpiece receiving collet in the sleeve having an axially tapered outer portion engaging the tapered internal portion in the sleeve, and means for moving the collet axially relative to the sleeve as the first support moves relative to the second support so a workpiece in the collet is radially clamped thereby, whereby upon movement of the vise actuator the vise members move the first and second supports effecting workpiece clamping and unclamping without requiring the set up of a conventional collet fixture.



5,482,301

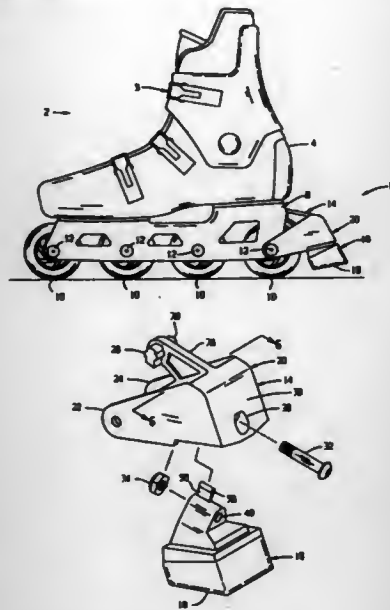
**SELF LEVELING IN-LINE SKATE BRAKE**

Martin Babcock, 2214 Tower Ct., Woodbury, Minn. 55125  
Continuation-in-part of Ser. No. 146,529, Nov. 1, 1993, which  
is a continuation-in-part of Ser. No. 969,980, Nov. 2, 1992,  
Pat. No. 5,257,795. This application Oct. 18, 1994, Ser. No.  
324,589

Int. Cl.<sup>6</sup> A63C 17/14

U.S. Cl. 280—11.2

15 Claims



## 1. Skate braking apparatus comprising:

- a) a support frame including a plurality of wheels aligned serially between sidewalls of the support frame and along a longitudinal axis of the support frame; and
- (b) a skid pad having a terrain contacting brake surface, wherein said skid pad is mounted to said support frame and to a pivot having a pivot axis coaxial to the longitudinal axis such that the skid pad can rotate about the pivot to maintain said brake surface parallel to the terrain and normal to a plumb axis to the terrain and through said pivot and independent of a cant angle of said frame from the plumb axis, whereby the brake surface uniformly engages the terrain without incurring uneven wear at the brake surface.

5,482,302

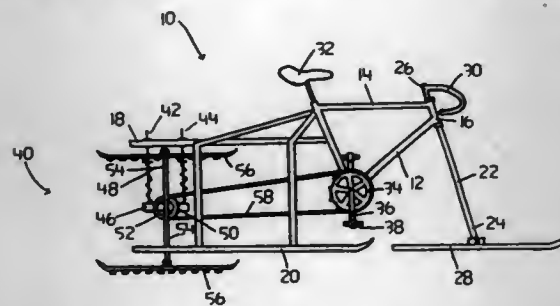
**HUMAN POWERED SKIBOB**

Alfred Yu, 1923 - 73 Street, Edmonton, Alberta, Canada  
Filed Sep. 15, 1994, Ser. No. 306,375

Int. Cl.<sup>6</sup> B62M 29/00

U.S. Cl. 280—12.12

10 Claims



## 1. A human powered skibob, comprising:

- a frame having a top, a front, a back, two snow engaging runners fixed in spaced relation at the back of the frame, a generally vertical shaft rotatably mounted to the front of the frame, the

shaft having a lower end to which is mounted a snow engaging runner and an upper end to which is mounted a steering member, a seat being secured to the top of the frame;  
a primary drive sprocket rotatably mounted to the frame, the primary drive sprocket having two radially extending force receiving members offset by 180 degrees and terminating in pedals;  
a drive assembly, including:  
at least one rigid suspension member depending vertically from the frame;  
a sliding beam slidably mounted to the at least one suspension member, for sliding movement relative to the frame;  
biasing means disposed between the sliding beam and the at least one suspension member, thereby urging the sliding beam toward a remote end of the at least one suspension member;  
a secondary drive sprocket rotatably mounted to the sliding beam, the secondary drive sprocket having at least one drive member with at least two radially extending force transmitting members angularly offset, each of the force transmitting members terminating in a ground surface engaging pivotally mounted foot-like gripping member, only one of the foot-like gripping members engaging a snow covered ground surface at any one time during forward locomotion, the radially extending members being capable of orientation to lift the gripping members clear of the snow covered ground surface in order to permit uncontrolled sliding down a slope, the length of the force transmitting members being such that the biasing means are compressed when the force transmitting member is vertically extended with the foot-like gripping member engaging the snow covered ground surface; and  
a continuous drive linkage extending between the primary drive sprocket and the secondary drive sprocket such that a force exerted via the pedals of the force receiving members to rotate the primary drive sprocket is transmitted by the continuous drive linkage to rotate the secondary drive sprocket resulting in each of the foot-like gripping members on the force transmitting members alternately engaging a snow covered ground surface with a bouncing rolling gait that is accommodated by the biasing means and the pivotal mounting of the gripping members.

5,482,303

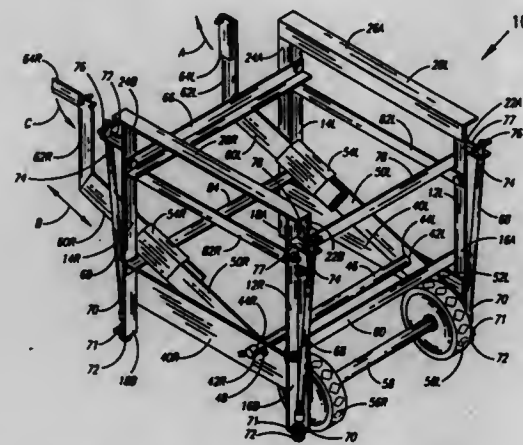
**CARRIAGE TABLE**

John Meloy, 820 N. Creek, Dewey, Okla. 74029  
Filed Mar. 7, 1995, Ser. No. 399,560

Int. Cl.<sup>6</sup> B62B 1/12; 5/00

U.S. Cl. 280—43.17

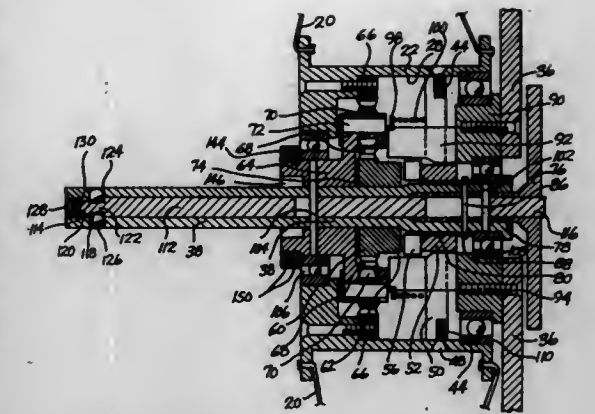
17 Claims



## 1. A carriage table for mounting a tool comprising:

- an upper portion supported on two front and two rear legs, at least one arm pivotally mounted to a supporting member, said supporting member interconnected between said front and rear legs so a lower end of each at least one arm extends

downward and between the two front legs and an upper end extends upward and toward the rear legs,  
a wheel rotatably carried on the lower end of each said at least one arm,  
said at least one arm pivotally mounted intermediate said wheel carrying lower end and said upper end,  
a means for lifting being provided on the upper end of each said at least one arm so that each said at least one arm pivots when each said means for lifting is raised upward in order to cause an associated wheel to be lowered and to raise the front legs off a supporting surface, and  
a stop member being provided attached to at least one of said rear legs so that each means for lifting engages said stop member as the means for lifting is raised upward in order to raise the rear legs off the supporting surface.



5,482,304

**BICYCLE ATTACHMENT FOR TRAILERING A PULL-TYPE GOLF CART**

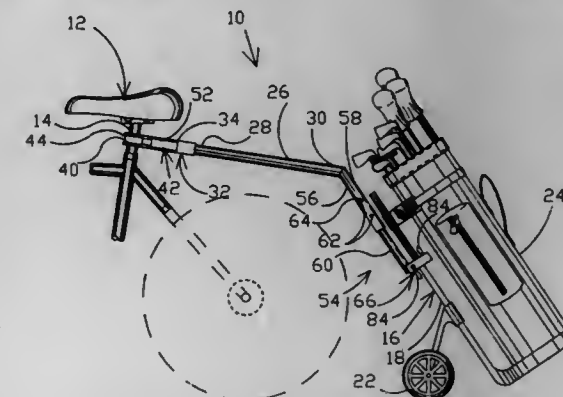
Phillip S. Smith, 362 Woodhill Dr., Huntington, Carroll County, Tenn. 38344

Filed Jun. 10, 1994, Ser. No. 258,655

Int. Cl.<sup>6</sup> B62K 27/00

U.S. Cl. 280—204

20 Claims



1. A bicycle attachment for trailering a pull-type golf cart behind a bicycle, the pull-type golf cart including a frame and being supported by a plurality of wheels, the bicycle including a seat post for supporting the seat, said bicycle attachment comprising:  
a connecting rod defining a proximal end and a distal end;  
a bicycle attachment member secured to said proximal end of connecting rod and pivotally and releasably securable to the seat post of the bicycle, said bicycle attachment member limiting movement of said connecting rod to pivotal movement about the axis of the seat post when the bicycle attachment member is releasably secured to the seat post; and  
a golf cart attachment member secured to said distal end of said connecting rod and releasably securable to the golf cart at a selected location.

5,482,305

**SHIFTING MECHANISM AND QUICK RELEASE FOR MULTISPEED WHEELCHAIR**

Benjamin L. Jeffries, Seattle; Barry Hyman, Bellevue; Matthew A. Shepherd, Seattle; Steven Nguyen, Seattle; Jaures F. Cleofe, Seattle, all of Wash., and Dachwan D. Kim, Alea, HI., assignors to University of Washington, Seattle, Wash.

Filed Jan. 6, 1995, Ser. No. 369,385

Int. Cl.<sup>6</sup> B62M 1/14; B60B 23/04

U.S. Cl. 280—250.1

13 Claims

1. A wheel for a manual multispeed wheelchair, having a direct drive mode and at least one low gear mode, said wheel comprising:  
a main axle for mounting the wheel on a wheelchair frame;

a tubular hub on the main axle for carrying the wheel;  
a plurality of drive chocks mounted within an interior of the tubular hub and being spaced apart so as to form openings therebetween;  
a planetary gear assembly mounted within the interior of the tubular hub and spaced axially from the drive chocks for driving the tubular hub in a low gear mode, the planetary gear assembly including a sun gear having a coupling mechanism;  
a shift member movable axially along the main axle between a first position for engaging the drive chocks and a second position for engaging the sun gear, the shift member including a plurality of radially extending arms adapted to fit into the openings between the drive chocks with the shift member in a first position direct drive, and the shift member also including a complementary coupling mechanism adapted to couple with the coupling mechanism of the sun gear with the shift member in a second position low gear,  
a hand wheel mounted on a hand wheel hub for driving the shift member; and  
a shifting assembly, including a rotatable first member and an axially moving second member, whereby rotation of the first member causes the second member to move the shift member between its first and second positions.

5,482,306

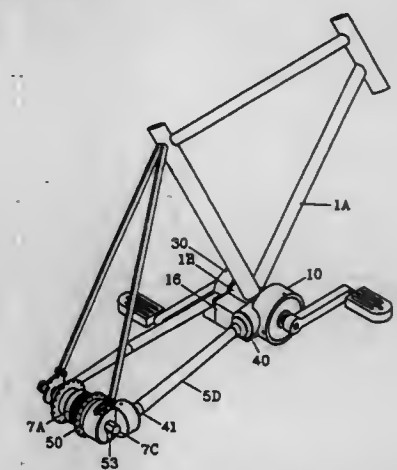
**CHAINLESS TRANSMISSION MECHANISM FOR BICYCLES**

Sung-Hua Hsu, P.O. Box 82-144, Taipei, Taiwan, Prov. of China  
Filed Dec. 12, 1994, Ser. No. 353,807

Int. Cl.<sup>6</sup> B62M 1/02

U.S. Cl. 280—260

1 Claim



1. A chainless transmission mechanism of the type comprising a right bottom bracket bearing axle holder and a left bottom bracket bearing axle holder bilaterally connected to the bottom bracket of a bicycle, a bearing axle disposed in said right and left bottom

bracket bearing axle holders and said bottom bracket, a gear box coupled to the freewheel hub of said bicycle, a sleeve connected between said right bottom bracket bearing axle holder and said gear box, a transmission shaft received in said sleeve, a first pair of bevel gears coupled between said bearing axle and said transmission shaft, and a second pair of bevel gears coupled between said freewheel hub and said transmission shaft, wherein: said right bottom bracket bearing axle holder comprises a right gear chamber an outer side, which receives said first pair of bevel gears, an axle hole through said right gear chamber through which said bearing axle passes, a bearing cup's shoulder, a ball bearing mounted around said bearing axle within the bearing hole of said right bottom bracket bearing axle holder, a connecting tube mounted around said bearing axle and disposed within said bottom bracket at one side, a tubular coupling portion connected to one end of said sleeve by a connector, and a connecting block perpendicularly extended from said tubular coupling portion, said connecting block having a screw hole at one end; said left bottom bracket bearing axle holder comprises an axle hole through which said bearing axle passes, a bearing cup's shoulder, a ball bearing mounted around said bearing axle within the bearing hole of said left bottom bracket bearing axle holder, a connecting tube mounted around said bearing axle and disposed within said bottom bracket at an opposite side, a countersunk hole connected to the screw hole on said connecting block of said right bottom bracket bearing axle holder by a screw bolt; said gear box comprises an inner chamber, which receives said second pair of bevel gears, a mounting slot perpendicularly downwards extended from said inner chamber and coupled to one end of said freewheel hub, the bevel gear on the wheel hub being mounted directly on the original driver of the wheel hub by tightening up screw, and a forkend at a top thereof, said forkend having a plurality of screw holes for fastening to the bicycle frame of said bicycle.

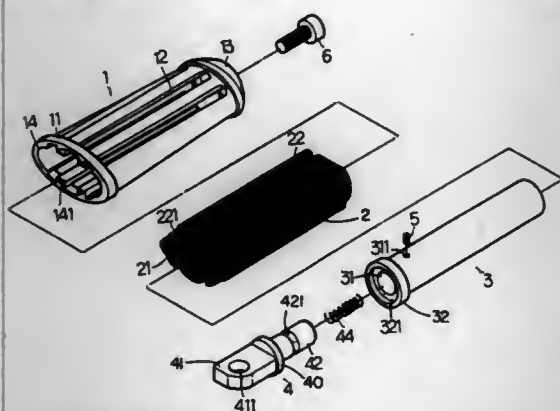
5,482,307

**FOOTREST ASSEMBLY FOR MOTORCYCLE**  
Frank Lin, No. 377, Sec. 1, Changmei Road, Changhua, Taiwan, Prov. of China

Filed Jun. 7, 1994, Ser. No. 255,084  
Int. Cl.<sup>6</sup> B62H 1/08

U.S. Cl. 280—291

1 Claim



1. A footrest assembly including:
  - a supporting bracket is made from a rigid material and a supporting stuffing made from a soft material, said supporting bracket having an outer wall defining a hollow chamber at its center and being provided with a plurality of elongate slots formed in the wall, said supporting bracket further including a flange portion at an end, a cap being attached to a distal end of the supporting bracket and being provided with a threaded hole formed therein, the inner side of said cap being provided with a pair of positioning wedges and said flange portion at the end opposite to the cap being provided with a pair of curvilinear retaining slots;
  - said supporting stuffing having a passage defined in its center and a plurality of projecting rib portions formed on the outer

surface thereof in alignment with the slots of the supporting bracket, said projecting rib portions of the supporting stuffing including a recessed portion retained by the flange portion of the supporting bracket, said supporting stuffing insertable into the supporting bracket from its open end, said projecting rib portions projecting beyond the outer surface of the supporting bracket through said slots;

a shaft member being received and retained within the passage of said supporting stuffing to provide a rigid support to said supporting stuffing and said supporting bracket, said shaft member having a cylindrical recess at one end and a hole defined in the wall of the shaft member such that said hole is in communication with the recess, a flange being provided at one end of the shaft member, an annular slot being disposed within the flange, the distal end of said shaft member being provided with a threaded hole;

a connecting adaptor having a lug which has a hole defined at one end and a shaft at the other end, said shaft of said connecting adaptor being further provided with an annular slot in alignment with said hole of said shaft member, the end portion of the shaft being provided with a channel wherein a spring member is disposed,

said connecting adaptor being rotatably retained within the shaft member by a dowel screw disposed within said hole of said shaft member and which projects into said annular slot of said shaft of said connecting adaptor.

5,482,308

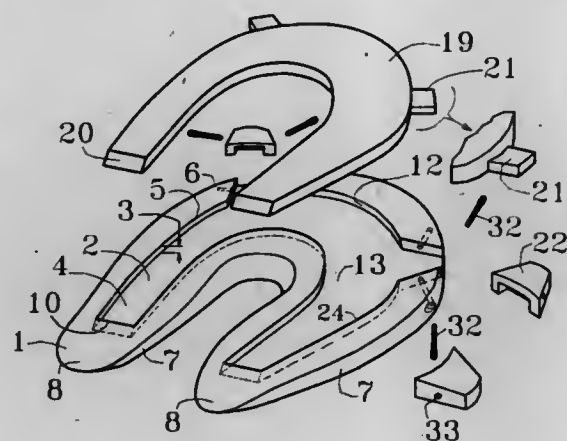
**FIFTH WHEEL BEARING PLATE IMPROVEMENTS**  
Mihail I. Marcu, 43 Renata Ct., Dundas, Ontario, Canada

Filed Jun. 28, 1994, Ser. No. 266,717

Int. Cl.<sup>6</sup> B62D 53/08; F16C 17/04

U.S. Cl. 280—433

1 Claim



1. An improved fifth wheel bearing plate comprising:
  - a fifth wheel bearing plate including left and right engaging ramps and a periphery,
  - a recess located in the fifth wheel bearing plate, the recess having a constant recess depth,
  - a plurality of cuts in said fifth wheel bearing plate, said cuts communicating with said recess and the periphery of the fifth wheel bearing plate, the cuts being trapezoidal in shape,
  - an antifriction plastic liner disposed in said recess and having a thickness greater than said recess depth, the antifriction plastic liner including a plurality of rectangular retaining ears protruding from an outside periphery thereof, said retaining ears protruding into said cuts in the fifth wheel bearing plate,
  - a plurality of trapezoidal retaining blocks disposed in said cuts and overlying said retaining ears, and
  - means for releasibly securing said retaining blocks in said cuts.

5,482,309  
**SCISSOR CLOSURE COUPLER FOR GOOSENECK TRAILERS**

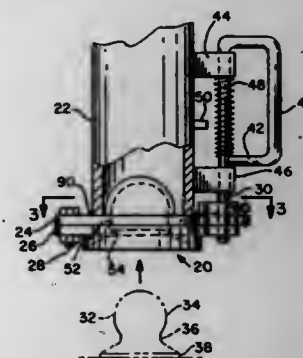
Michael S. Hollis, 1326 East St., Minden, La. 71055

Filed Mar. 14, 1994, Ser. No. 209,468

Int. Cl.<sup>6</sup> B62D 1/06

U.S. Cl. 280—423.1

6 Claims



1. A scissor closure coupler for gooseneck trailers, for attaching to a trailer hitch ball having a widest point and a neck, comprising:
  - a) a bottom plate, having a bottom plate bore having a diameter substantially the same as the widest point of the trailer hitch ball and a bevel contained on said bottom plate for guiding said trailer hitch ball into said bottom plate bore;
  - b) a top plate, the top plate atop the bottom plate, the top plate having a top plate bore having a diameter substantially the same as the bottom plate bore;
  - c) a hinge bolt, connecting the top plate to the bottom plate allowing the top plate and bottom plate to pivot with respect to each other from a closed position to an open position; and
  - d) a main spring, connecting the top plate and the bottom plate, biasing the top and bottom plate to remain in the closed position, wherein in the open position, the top plate bore and bottom plate bore are concentric, allowing the widest point of the trailer hitch ball to travel through both the top plate bore and bottom plate bore, and wherein in the closed position, the top plate bore and bottom plate bore are not concentric creating an elliptical hole between them, a minor axis of the elliptical hole is narrower than the widest point of the trailer hitch ball but is wider than the neck of the trailer hitch ball so that the elliptical hole can trap the trailer hitch ball at the neck.

5,482,310

**TRAILER HITCH MIRROR ALIGNMENT DEVICE**

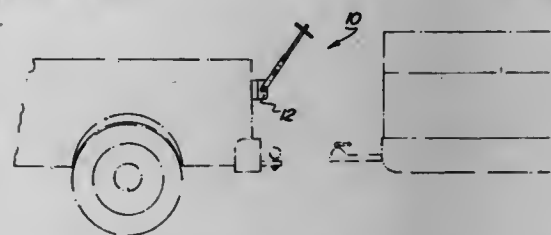
Jimmy L. Staggs, 133 W. 6th St., Krum, Tex. 76248

Filed Dec. 20, 1994, Ser. No. 359,570

Int. Cl.<sup>6</sup> B60D 1/40

U.S. Cl. 280—477

5 Claims



2. A trailer hitch mirror alignment device comprising:
  - a mounting bracket;
  - a pair of spaced rigid linear telescopically adjustable legs, each leg having an upper end and a lower end with the lower ends thereof pivotally and adjustably coupled to the mounting bracket;
  - a mirror pivotally and adjustably coupled between the upper end of the legs; and

a magnet coupled to the mounting bracket and removably securable to a recipient metal surface, particularly a rear of a vehicle with a hitch coupled thereto, with the mirror positionable such that an image of the hitch and surrounding area is provided to a driver of the vehicle, thereby facilitating the positioning of the hitch by the driver in alignment with a hitch on an associated trailer.

5,482,311

**ADJUSTING/POSITIONING DEVICE FOR A BACKREST OF A STROLLER**

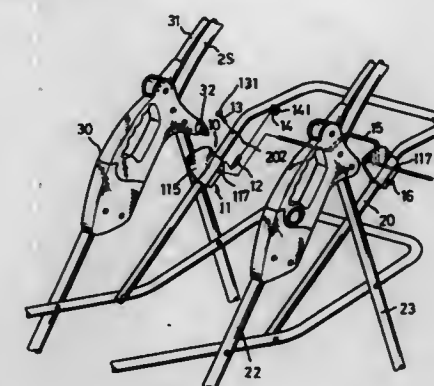
Li-Chu C. Huang, No. 9, Alley 2, Lane 606, Sec. 2, Po Ai Rd., Chia Yi City, Taiwan, Prov. of China

Filed Sep. 2, 1994, Ser. No. 300,407

Int. Cl.<sup>6</sup> B62B 7/08

U.S. Cl. 280—642

4 Claims



1. A backrest adjusting device for a stroller having a frame and a backrest frame member with two limbs, comprising:
  - a pair of sockets defined in the frame of the stroller;
  - a slidable seat slidably mounted to each of said limbs and comprising:
    - a receptacle;
    - a spring mounted in said receptacle;
    - a first pin mounted above said spring and transversely passing through associated said limb of said backrest frame member;
    - a stop piece mounted in said receptacle and located above said first pin thereby defining a lowermost position of said slidable seat; and
    - a second pin projecting outward from an outer periphery thereof; and
  - a pull bar mounted between said slidable seats;
 whereby said second pins engage with said sockets when said backrest frame member is in a substantially upright position, and said backrest frame member is pivotable to a substantially horizontal position when said second pins disengage with said sockets upon actuation of said pull bar which causes upward movements of said slidable seats.

5,482,312

**INFLATOR FOR A VEHICLE AIR BAG ASSEMBLY AND A METHOD OF MAKING THE SAME**

Steven W. Maurer, Fraser, Mich., assignor to TRW Vehicle Safety Systems Inc., Cleveland, Ohio

Continuation of Ser. No. 886,147, May 18, 1992, abandoned.

This application Jun. 23, 1994, Ser. No. 265,499

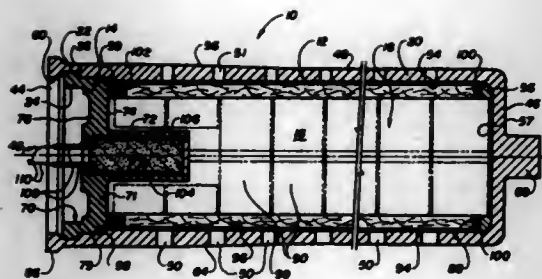
Int. Cl.<sup>6</sup> B60R 21/16

U.S. Cl. 280—728.1

24 Claims

1. An inflator for an air bag assembly comprising a first housing member, a second housing member coupled to said first housing member to form a closed chamber, and a source of inflation fluid contained within said chamber;





said first housing member having an inner surface partially defining said chamber, said inner surface comprising (i) a chamber-defining portion which partially defines said chamber, and (ii) a first coupling portion lying outside of said chamber-defining portion and having a circumferential recess proximate an opening of said first housing member; said second housing member also partially defining said chamber and having a second coupling portion which includes an integral projection which is mechanically-deformed into said recess to be tightly received within said recess.

5,482,313

### PASSIVE RESTRAINT SYSTEM FOR A VEHICLE OCCUPANT USING AN AIR BAG

Akihiro Ikeda; Minoru Kanda, and Toshiya Sakai, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

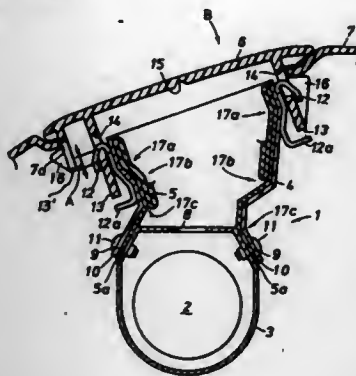
Filed Oct. 13, 1994, Ser. No. 322,571

Claims priority, application Japan, Jan. 19, 1993, 5-286103; Jan. 22, 1993, 5-287547; Jan. 25, 1993, 5-289955

Int. Cl.<sup>6</sup> B60R 21/16

U.S. Cl. 280-728.2

18 Claims



1. A passive restraint system for a vehicle occupant using an air bag that can be inflated upon detection of a deceleration exceeding a certain threshold level, comprising:

- an inflator housing containing an inflator for producing gas for inflating an air bag and having a first opening from which gas produced from said inflator may be expelled;
- an air bag housing attached to said inflator housing, and having a second opening disposed so as to be communicated with said first opening of said inflator housing when said air bag housing is attached to said inflator housing, and a third opening placed opposite to said second opening;
- an air bag received in said air bag housing in a folded state, and adapted to be projected and deployed from said third opening of said air bag housing when said air bag is inflated by said gas, said air bag being provided with an open base end from which gas produced from said inflator may be introduced into said air bag to inflate the same; and
- said third opening being placed in an opening provided in a part of a vehicle body part, and closed by a lid member which can rupture when said air bag is deployed, said lid member being engaged by said vehicle body part by first engagement means

which guides said lid member into alignment with said opening of said vehicle body part, and by said air bag housing by second engagement means which secures said lid member in said opening of said vehicle body part and resiliently allows a slight lateral movement of said lid member with respect to said vehicle body part.

5,482,314

### AUTOMOTIVE OCCUPANT SENSOR SYSTEM AND METHOD OF OPERATION BY SENSOR FUSION

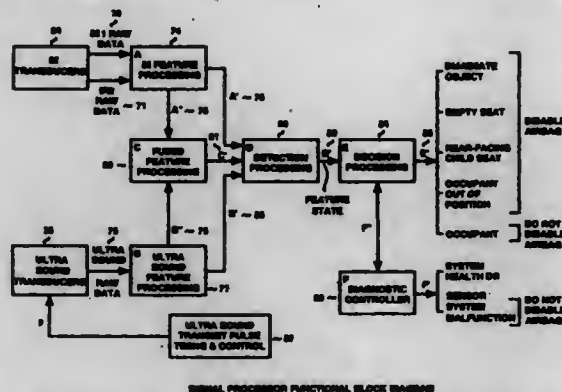
Anthony P. Corrado, Upland; Stephen W. Decker, La Cressa, and Paul K. Benbow, Upland, all of Calif., assignors to Aerojet General Corporation, Fairlawn, Ohio

Filed Apr. 12, 1994, Ser. No. 227,531

Int. Cl.<sup>6</sup> B60R 21/32

U.S. Cl. 280-735

65 Claims



1. A method for determining whether or not to de-activate a vehicle's passenger passive restraint system as a function of a current state value determined by comparing measured signal features to a predetermined set of confidence values and empirical relationships obtained using various known occupancy scenarios and a set of state change criteria, comprising the steps of:

- (a) sensing the characteristics of occupancy of a particular passenger seat within the vehicle using a plurality of sensors functionally associated with said passenger seat and developing a set of corresponding electrical signals;
- (b) evaluating said electrical signals to determine a plurality of signal features included in each of said signals;
- (c) combining certain ones of said signal features to obtain a plurality of fused features;
- (d) associating said signal features and said fused features with the confidence values and empirical relationships to determine a feature state value;
- (e) identifying the feature state value as the current state value if the set of state change criteria is met; and
- (f) generating a de-activate signal if said current state value is one of a predetermined subset of state values for which said passive restraint system is to be de-activated.

5,482,315

### LARGE L/D RATIO TUBULAR HYBRID GAS GENERATOR FOR THE INFLATION OF AIR BAGS

William A. Chandler, Jr., Murr, Germany; Leland B. Kort, Lakewood, Colo., and Randall J. Clark, Pleasant View, Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Jun. 7, 1994, Ser. No. 255,147

Int. Cl.<sup>6</sup> B60R 21/26

U.S. Cl. 280-741

5 Claims



1. An inflator dimensioned to serve as a structural element in a vehicle comprising:

- an elongated hollow cylinder having an inner wall within which there are disposed the following components:
- a first diaphragm welded to the inner wall of said cylinder spaced from one end of said cylinder, so as to define a cup shaped cavity at said end of said cylinder,
- a pyrotechnic charge and an igniter positioned in said cavity,
- a second diaphragm secured to the inner walls of said cylinder near the other end of said cylinder,
- a screen at said other end of said cylinder so as to define a diffuser chamber in said cylinder,
- a storage chamber in said elongated cylinder consisting of the volume between said diaphragms for storing a gas under pressure,
- all of said components being contained inside said elongated hollow cylinder.

5,482,317

### STRUCTURALLY EFFICIENT INFLATABLE PROTECTIVE DEVICE

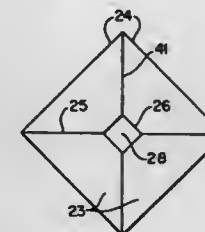
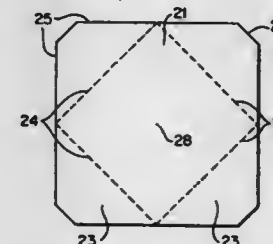
James M. Nelsen, Tjeras; Larry D. Whinery, Albuquerque; Kenneth W. Gwinn, Cedar Crest; Donald D. McBride, Albuquerque; Daniel A. Luna, Los Lunas, all of N.M.; Joseph P. Holder, and Richard J. Bliton, both of Greensboro, N.C., assignors to Sandia Corporation, Albuquerque, N.M.

Filed Jun. 28, 1993, Ser. No. 82,471

Int. Cl.<sup>6</sup> B60R 21/16

U.S. Cl. 280-743.1

32 Claims



5,482,316

### AIR BAG INFLATORS HAVING HOUSINGS WITH CRIMP-FORMED JOINTS

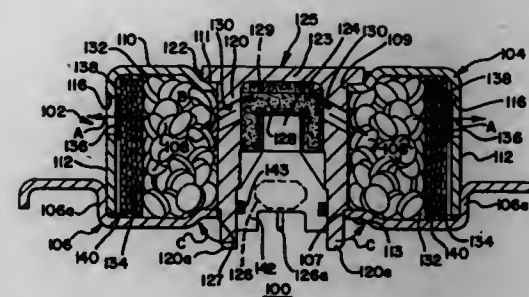
Gregory J. Lang, South Ogden; Todd S. Parker, Centerville; Brian H. Fulmer, Farr West; David P. Kosoff, and Harry W. Miller, II, both of Ogden, all of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Oct. 27, 1994, Ser. No. 330,333

Int. Cl.<sup>6</sup> B60R 21/26

U.S. Cl. 280-741

35 Claims



1. An air bag inflator including a housing formed of stamped sheet metal, comprising:

- an annular base having a central opening;
- a cover for containing gas generating pyrotechnic material including an annular top wall spaced from said base having a central opening in coaxial alignment with said central opening of said base and a cylindrical, ported, outer side wall integrally formed around a periphery of said top wall extending downwardly thereof having a lower edge secured with a portion of said base outwardly of said central opening; and
- a hollow, igniter-containing, rivet including an upper end wall closing over said central opening of said top wall and having a tubular, ported, side wall integrally formed with said upper end wall extending downwardly through said central openings of said base and said top wall, said tubular side wall having a lower end portion of reduced wall thickness below an upper surface of said base around said central opening forming an outer annular shoulder supportively engaging said base, with said lower end portion being deformed radially outwardly to engage an underside of said base.

5,482,318

### PLEATED INFLATABLE CUSHION FOR PASSENGER RESTRAINT

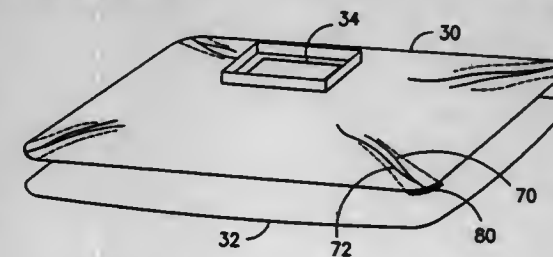
John A. Sollars, Jr., LaGrange, Ga., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 27, 1993, Ser. No. 144,673

Int. Cl.<sup>6</sup> B60R 21/16

U.S. Cl. 280-743.1

15 Claims



1. An inflatable cushion restraint for restraining a vehicle occupant in the event of a collision, the inflatable cushion restraint comprising:

- a body portion having an interior and a perimeter, said perimeter of said body portion including a plurality of pleated corner portions wherein said pleated corner portions include expandable folded pleats extending from said perimeter of said body portion to the interior of said body portion, said pleated corner portions being separated from one another by substantially straight non heat shrunk boundary edge portions;

a web portion including an interior and a perimeter, said perimeter of said web portion being joined to said perimeter of said body portion to form an enclosure by seam means formed along the perimeter of the web portion and the substantially straight boundary edge portions of said body portion such that the perimeter of said web portion and the substantially straight boundary edge portions of said body portion are in substantially flat overlaying relationship; and

entrance means for introducing an inflating medium between said web portion and said body portion such that said inflatable cushion may be expanded to an operable state by the unfolding of said expansible folded pleats.

5,482,319

### PASSENGER PROTECTION DEVICE FOR AN AUTOMOTIVE VEHICLE

Toshitaka Yoshimura, and Katsutoshi Nakamura, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

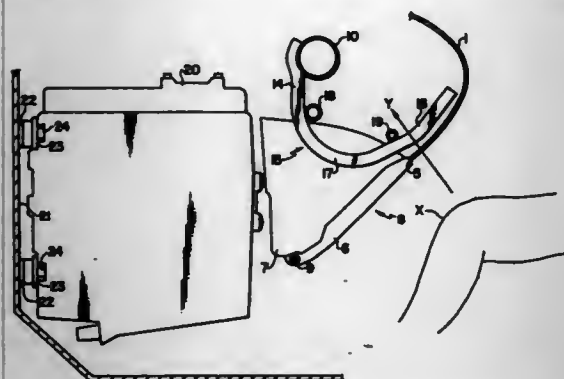
Filed Dec. 15, 1993, Ser. No. 166,630

Claims priority, application Japan, Dec. 15, 1992, 4-354554

Int. Cl.<sup>6</sup> B60R 21/02

U.S. Cl. 280—752

12 Claims



1. A passenger protection device for an automotive vehicle comprising:

a steering support member for supporting a steering column and extending transversely of the vehicle in front of an instrument panel;

a pair of knee protector members, disposed in front of the instrument panel in positions corresponding to positions of knees of a passenger sitting on a front passenger seat, each of said knee protector members being connected to said steering support member, having a U shaped form, and having a receiving portion for receiving an impact from one of the knees of the passenger and a deformable portion for deforming when the receiving portion receives an impact from said one of the knees of the passenger;

equipment installed in front of the instrument panel and in front of the knee protector members; and

a movement restricting member mounted on the steering support member, positioned in front of said deformable portion of each of the knee protector members, and disposed between the equipment and the knee protector members for restricting movement of the equipment backwardly of the vehicle during a collision.

5,482,320  
STEERING COLUMN ASSEMBLY AXIALLY RETRACTABLE IN THE EVENT OF IMPACT, IN PARTICULAR FOR AN AUTOMOBILE VEHICLE  
Ghislain Passebecq, Audincourt, France, assignor to ECLIA - Equipements et Composants pour l'Industrie, Audincourt, France

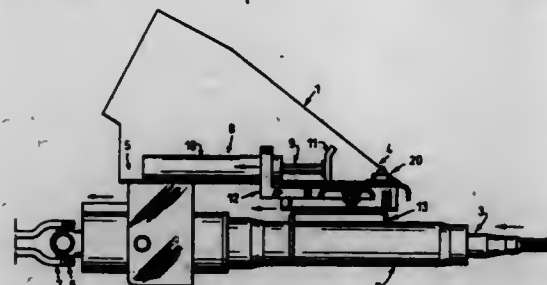
Filed Jul. 15, 1994, Ser. No. 275,549

Claims priority, application France, Jul. 16, 1993, 93 08779

Int. Cl.<sup>6</sup> B62D 1/11

U.S. Cl. 280—777

6 Claims



1. A steering column assembly, axially retractable in the event of impact, for an automobile vehicle, said assembly comprising in combination: a support structure fixed to the vehicle, a steering column body having a first end portion and an opposed second end portion, a steering shaft disposed within said column body, and means for axially retracting said column body, and consequently said steering shaft, in the event of impact;

said retracting means comprising a force generator, actuatable upon impact, operatively connected to said column body for displacing said column body relative to said support structure; said generator comprising a first part and a second part movable relative to each other, said first part being connected to said support structure, and said second part being connected to said column body in the vicinity of said first end portion of said column body;

said assembly further comprising first fixing means for connecting said first end portion of said column body to said support structure and releasable upon actuation of said force generator, first guide means associated with said first end portion of said column body, complementary second guide means associated with said support structure and cooperative with said first guide means for guiding said column body during the displacement thereof, and second fixing means for connecting said second end portion of said column body to said support structure and comprising a bearing for guiding said column body during the displacement thereof;

wherein said column body and said steering shaft each comprise two telescopic parts engaged one in the other.

5,482,321

### SUBFRAME CROSS MEMBER

Friedhelm Soeffge, Leonberg-Gebersheim; Rudolf Kronewitter, Böblingen, and Ralph Michalski, Vaihingen, all of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Germany

Filed Nov. 8, 1993, Ser. No. 148,230

Claims priority, application Germany, Nov. 6, 1992, 42 37 533.9

Int. Cl.<sup>6</sup> B62D 21/12

U.S. Cl. 280—781

6 Claims

1. A motor vehicle subframe, comprising a cross member located at least between two adjoining vehicle subframe sides extending in the lengthwise direction of the vehicle for reception of a wheel suspension wherein a portion of the cross member is retained by two mounting bolts on a side of the motor vehicle subframe, said bolts being spaced from each other in a vertical distance and extending in the lengthwise direction of the vehicle, and the cross member has two angular supports of identical configuration located in a transverse plane of the subframe, each

5,482,323

### AUTOMOTIVE FRAME SHORTENING DEVICE

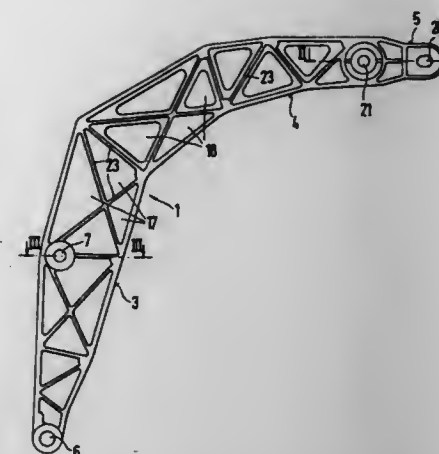
Robert L. Hicks, Rte. 1, Box 265, Glyndon, Minn. 56547

Filed Apr. 28, 1995, Ser. No. 431,496

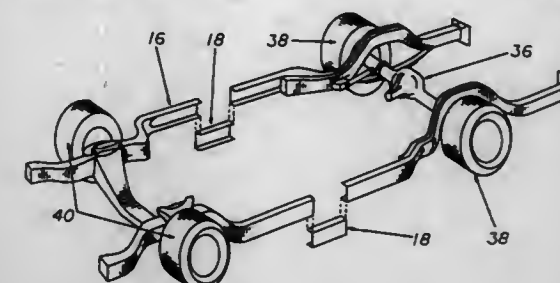
Int. Cl.<sup>6</sup> B62D 21/12

U.S. Cl. 280—785

6 Claims



having an upper transverse leg and a tongue at an end of the support, said tongues overlapping in a vertical plane, each tongue having a thickened receptacle as a support on a horizontal plane for a threaded nut and another receptacle as a support for a bolt head of a support mounting bolt.



1. An Automotive Frame Shortening Device comprising: a channel type replacement frame member having an upper and lower horizontal surface and a single vertical surface said member further having vertical bolt attachment holes spaced along its upper and lower surface and horizontal bolt attachment holes spaced along its vertical surface; a structural channel box support weldably attached to the outside of said channel type replacement frame members vertical surface; and a means for mounting said frame shortening device to a shortened automotive frame.

5,482,322

### VEHICLE WITH WHEEL TOE DEVICE

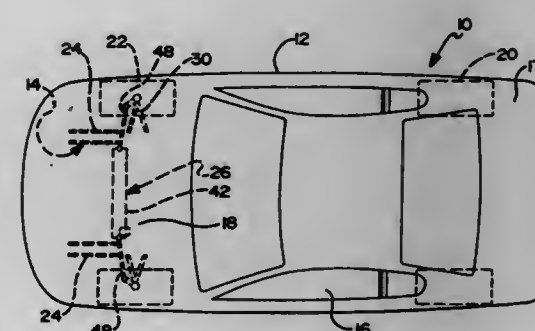
Donald G. Wheatley, Ann Arbor, and Ronald M. Campbell, Northville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 18, 1994, Ser. No. 293,345

Int. Cl.<sup>6</sup> B62D 21/00

U.S. Cl. 280—784

10 Claims



1. A vehicle comprising:

a vehicle frame having a pair of longitudinally extending support rails disposed in spaced relationship with respect to one another and terminating at one end proximal to a front of said vehicle;

at least one pair of wheels and a steering mechanism operatively connected to said wheels for controlling the direction of said vehicle in response to driver input through said steering mechanism;

said steering mechanism including a pair of tie rods operatively connected to said wheels to control the rotation of said wheels about a vertical axis; and

a pair of tie rod impact members fixedly mounted to said support rails and moveable in a direction substantially longitudinally along said support rails in response to a predetermined force acting on said vehicle such that said tie rod impact members engage said tie rods to cause said wheels to rotate about a vertical axis independent of driver input through said steering mechanism.

5,482,324

### SUPPLEMENTAL CAR SEAT BELT FOR PROTECTING USERS WITH STOMAS

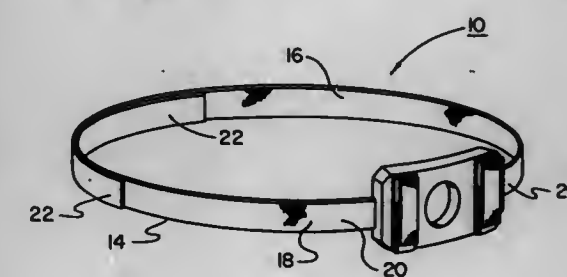
Linda J. Gardiner, and George E. Gardiner, both of 3309 SE. 3rd Ave., Camas, Wash. 98607

Filed Oct. 17, 1994, Ser. No. 323,843

Int. Cl.<sup>6</sup> B60R 22/00

U.S. Cl. 280—801.1

1 Claim



1. A new and improved supplemental car seat belt for protecting users with stomas comprising, in combination:

a belt positionable about the waist of a wearer with a stoma, the belt being formed of two components with interior ends, inboard edges, outboard edges and exterior ends the exterior ends being fabricated with intermingling pile-type fasteners to allow the coupling and uncoupling thereof;

a cushion fabricated of an elastomeric foam with long upper and lower edges and short vertical side edges and with a front surface positionable away from the wearer and a rear surface positionable adjacent to the wearer, the cushion including a centrally positioned circular aperture, the circular aperture being positioned around the stoma of the user in an operative orientation, the cushion having a cover layer over its entire surface, the inboard edges of the belt components being stitched to the cover layer at an interface adjacent to the side edges and the rear surface; and

a pair of supplemental belt loops, the supplemental belt loops being formed of a pair of straps having central extents secured through the front surface of the cushion through stitching with upper edges extending upwardly therefrom and downward



edges extending downwardly therefrom, the upper and downward edges of the supplemental belt loops being fabricated with a pile-type fastener to allow the intercoupling of the free ends of the loops to form two closed loops for the passage therethrough of an automotive seat belt.

5,482,325

# HEIGHT-ADJUSTABLE GUIDE FITTING FOR A SEAT BELT OF A MOTOR VEHICLE

Thomas Möller, Hamburg, and Helmut Möckel, Uetersen, both of, Germany, assignors to Autoliv Development AB, Vargarda, Sweden

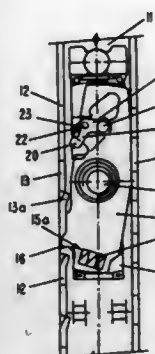
Filed Aug. 19, 1994, Ser. No. 293,124

Claims priority, application Germany, Aug. 19, 1993, 43 27 824.5

Int. Cl.<sup>6</sup> B60R 22/20

U.S. Cl. 280—301.2

3 Claims



1. A height-adjustable guide fitting for a seat belt of a motor vehicle, said guide fitting comprising:
  - a rail member connected to the motor vehicle, said rail member having a guide groove;
  - said rail member having catch openings spaced at a distance from one another;
  - a slide positioned within said guide groove so as to be longitudinally slidable therein;
  - a locking member connected to said slide so as to be pivotable between a locked position and a release position;
  - said locking member comprising a spring for biasing said locking member into said locked position;
  - said locking member having a locking projection for engaging in said locked position one of said catch openings to thereby block said locking member relative to said rail member;
  - said locking member further comprising a lock lever pivotable between a position within a contour of said locking member and an outwardly pivoted engaging position for engaging one of said catch openings; and
  - a forced guiding system for coupling said lock lever to said slide such that a movement of said locking member relative to said slide upon displacement of said locking member from said locked position to said release position causes a pivoting of said lock lever relative to said locking member.

5,482,326

# APPARATUS PROVIDING A PIVOT AXIS TO REAR WHEELS

Abraham Levi, Moshav Bet HaLevy 42870, Israel

Filed Jan. 18, 1995, Ser. No. 374,496

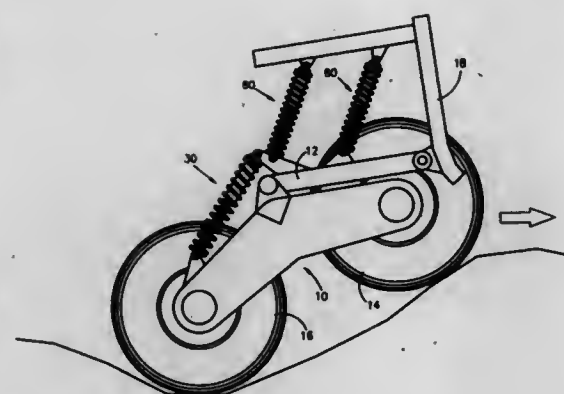
Claims priority, application Israel, Jan. 19, 1994, 106376

Int. Cl.<sup>6</sup> B60G 5/00

U.S. Cl. 280—682

16 Claims

1. Apparatus providing a pivot axis for rear wheels of a vehicle, the vehicle having a chassis and four rear wheels divided into two forward wheels and two rearward wheels, the apparatus comprising:



- two halves, each half including
  - an arm pivotally attached to the chassis;
  - a rocking member pivotally attached to said arm at a central location on said rocking member and rotatably connected to one forward and one rearward wheel at front and back locations, respectively, of said rocking member; and
  - a ground directing unit pivotally attached to said arm and to said rocking member near said rearward wheel which provides a force to said rearward wheel while no force is provided to said forward wheel.

5,482,327

# DEVICE FOR SECURING A GENERALLY CYLINDRICAL GAS GENERATOR CARTRIDGE IN A HOUSING BLOCK OF A SAFETY BELT TENSIONER DRIVE

Johannes Schmid, Schwäbisch Gmünd, Germany, assignor to TRW Repp GmbH, Affalter, Germany

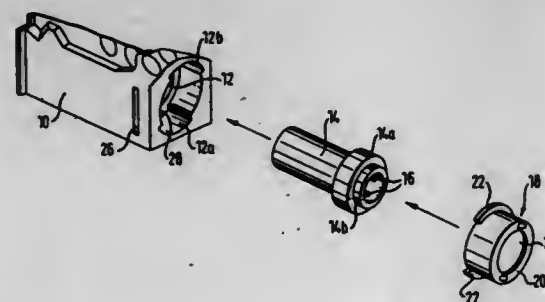
Filed Aug. 25, 1994, Ser. No. 295,613

Claims priority, application Germany, Aug. 26, 1993, 43 28 760.3

Int. Cl.<sup>6</sup> B60R 22/46

U.S. Cl. 280—306

4 Claims



1. A device for securing a generally cylindrical gas generator cartridge in a housing block of a safety belt tensioner drive, said housing block having a bore, said gas generator cartridge being located in said bore and said gas generator cartridge having a first axial end provided with a gas outlet and a second axial end provided with an igniter, and comprising a sleeve fitting around said second cartridge end and having a radially inwardly extending flange on a first end and at least one radially outward extending rim on a second end, said bore being provided with an axially extending recessed channel and a shoulder formed by a peripheral groove in said borer said channel opening into said groove and said rim having a shape congruent with said channel for permitting passage of said rim through said channel upon fitting of said sleeve over said second cartridge end after insertion of said cartridge into said bore, and said rim extending behind said shoulder subsequent to rotation of said sleeve.

5,482,328

# BUSINESS FORM WITH REMOVABLE LABEL AND METHOD FOR PRODUCING THE SAME WITH LABEL STOCK

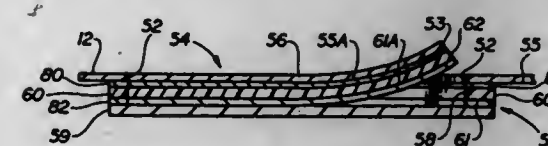
Gary E. Stewart, 4502 E. Desert Crest, Paradise Valley, Ariz. 85253

Filed May 20, 1994, Ser. No. 246,966

Int. Cl.<sup>6</sup> G09F 3/04

U.S. Cl. 283—81

2 Claims



1. A business form having a die cut laminate label removable therefrom, said form including
  - (a) a sheet of paper having a back side, a front side and an outer peripheral edge;
  - (b) at least one piece of label stock having an outer peripheral edge and including a layer of face stock, a layer of liner material, and a first layer of adhesive intermediate said layer of face stock and said layer of liner material, said layer of adhesive adhering to said face stock and separating from said layer of liner material when said layer of face stock is peeled away from said layer of liner material;
  - (c) a second layer of adhesive fixedly securing said layer of face stock of said label stock to a limited area on the back side of said paper sheet such that the outer peripheral edge of said piece of label stock generally lies within said outer peripheral edge of said paper sheet;
  - (d) a removable label area which is die cut in said sheet of paper above said layer of liner material and has an outer peripheral edge, the outer peripheral edge of said removable label area generally lying within the outer peripheral edge of said label stock;
  - (e) a removable label backing which is die cut in said layer of face stock and said first layer of adhesive of said label stock above said layer of liner material and has an outer peripheral edge coterminating with the outer peripheral edge of said removable label area, said removable label backing including
    - (i) a backing piece die cut in said face stock,
    - (ii) a portion of said first layer of adhesive lying between said layer of liner material and said backing piece and adhering to said backing piece and separating from said layer of liner material when said backing piece is peeled away from said layer of liner material, and
    - (iii) a first central portion of said second layer of adhesive lying between said removable label area and said backing piece, and adhering said removable label area to said backing piece when said removable label backing and removable label area are peeled away from said liner material;
- an outlying portion of said sheet of paper lying between the outer peripheral edge of said removable label area and the outer peripheral edge of said sheet of paper,
- an outlying portion of said layer of face stock lying between the outer peripheral edge of said label stock and the outer peripheral edge of said removable label backing which is die cut in said layer of face stock,
- a second outer portion of said second layer of adhesive lying intermediate said outlying portion of said sheet of paper and said outlying portion of said layer of face stock,
- said label stock being sized such that said second outer portion of said second layer of adhesive is sufficient to maintain said outlying portion of said layer of face stock in position on and adhering to said outlying portion of said sheet of paper when said backing piece is peeled from said liner material of said label stock.

5,482,329

# PIPE ADAPTOR AND INSTALLING DEVICE

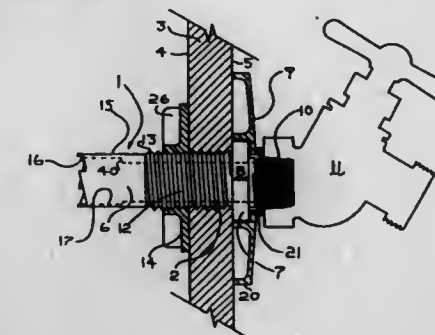
Delmar L. McCall, P.O. Box 357, Cotati, Calif. 94931; Donald P. Millerick, 3619 Banyan St., Santa Rosa, Calif. 95403, and Jeffery T. Millerick, 420 Lincoln Ave., Cotati, Calif. 94931

Filed May 21, 1993, Ser. No. 65,980

Int. Cl.<sup>6</sup> F16L 41/14

U.S. Cl. 285—39

7 Claims



1. An adaptor for extending a pipe through a barrier and securing the pipe therein comprising a pipe segment with a leading end for insertion through the barrier and a trailing end that remains at the insertion side of the barrier upon insertion of the adaptor, each end being adapted for connection to a pipe fitting, and having:
  - a stop extending outward from the exterior of the pipe segment at a position therealong at a distance toward the trailing end from said leading end for engaging the surface of the barrier to stop penetration of said segment beyond said position,
  - an externally threaded section extending along said segment in the direction of said leading end from said stop, the threads thereof being configured to engage the sides of the hole to draw the threaded section into the hole upon rotation of the adaptor about its longitudinal axis, and
  - a plurality of cutting means at the periphery of the leading end, said cutting means being actuated by rotation of said adaptor about its longitudinal axis, for cutting a hole in said barrier of a size to receive the threaded section in self-threading relationship upon rotation of said adaptor about its longitudinal axis, to thereby engage the sides of the hole to draw the threaded section into the hole and secure the adaptor therein, upon further rotation of the adaptor.

5,482,330

# APPARATUS FOR THE FLEXIBLE CONNECTION OF PIPES IN EXHAUST LINES OF MOTOR VEHICLES

Wieland Holzhausen, Auerbach, Germany, assignor to IWK Regler Und Kompensatoren GmbH, Stutensee, Germany

Filed May 12, 1994, Ser. No. 241,699

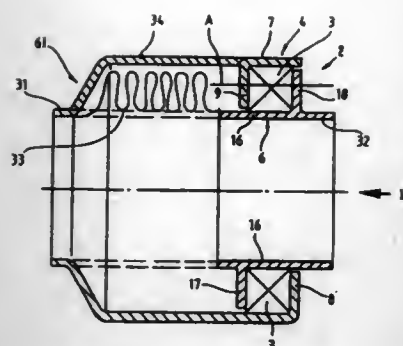
Claims priority, application Germany, May 25, 1993, 43 17 334.9

Int. Cl.<sup>6</sup> F16L 21/00

U.S. Cl. 285—226

20 Claims

1. An apparatus for providing a flexible connection of two pipes, comprising:
  - a first pipe end member adapted for connection to a first pipe;
  - a second pipe end member adapted for connection to a second pipe;
  - a flexible line element flexibly connecting said first pipe end member to said second pipe end member;
  - a casing, including a plurality of first casing wall portions extending radially from said first pipe end member and a plurality of second casing wall portions extending radially from said second pipe end member and axially movable relative to said first casing wall portions, said first casing wall portions and said second casing wall portions being circumferentially juxtaposed in relation to each other, wherein said



recess means and said support means being circumferentially spaced from one another;  
pawl means located in said second ring assembly and having a pawl member mounted for pivotal movement about a pivot axis arranged normal to a central axis of the pin member, said pawl member having a cam finger element for engagement with a cam surface in said first ring assembly for moving said first and second ring assemblies axially of one another when said locking elements are in an unlocking position and when said pawl member is rotated about the pivot axis.

#### 5,482,332 PIPE JOINT

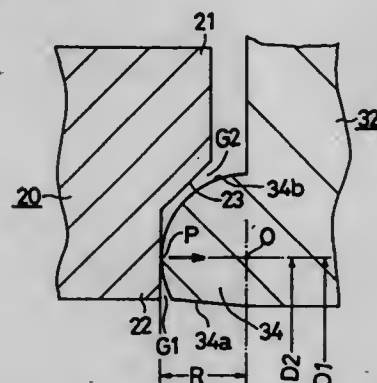
Tadahiro Ohmi, Sendai; Tsutomu Shinohara, Osaka; Michio Yamaji, Osaka; Nobukazu Ikeda, Osaka, and Kenji Yamamoto, Osaka, all of Japan, assignors to Fujikin Incorporated, Osaka, Japan

Filed Oct. 27, 1994, Ser. No. 329,963

Claims priority, application Japan, Jan. 28, 1993, 5-270813  
Int. Cl.<sup>6</sup> F16L 25/00

U.S. Cl. 285—328

5 Claims



1. A pipe joint comprising a pair of tubular joint members each having a gasket holding annular protuberance on an abutting end face thereof, an annular gasket interposed between the abutting end faces of the respective joint members, and threaded means for joining the joint members together, the annular protuberance having an inner peripheral surface continuous with the inner peripheral surface of the joint member, and a sealing face adapted to intimately contact an end face of the gasket at a position radially outward from the inner peripheral surface thereof, the pipe joint being characterized in that the sealing face is most protuberant at a position radially outward from an inner edge thereof, and that when the most protuberant end of the sealing face comes into contact with the end face of the gasket, a clearance is formed between the portion of the sealing face radially inward from the most protuberant end and the radially inward portion of the gasket end face, the gasket deforming to eliminate the clearance when the pipe joint is tightened up.

#### 5,482,333

#### ONE-PIECE POLYMERIC DOOR LATCH WITH AN INTEGRAL SPRING

Donald F. Gehrs, Brandon; Louis L. Runge, and Percy A. White, both of Clinton, all of Miss., assignors to Eaton Corporation, Cleveland, Ohio

Filed Nov. 15, 1993, Ser. No. 153,059

Int. Cl.<sup>6</sup> E05C 1/10

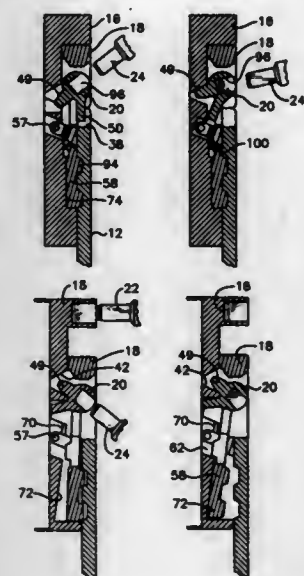
U.S. Cl. 292—163

4 Claims

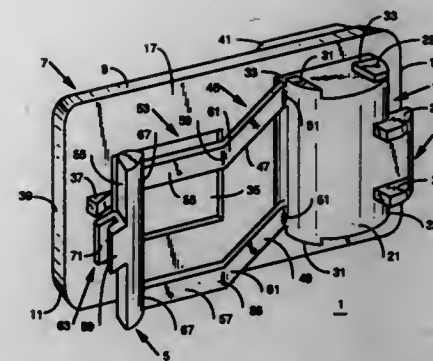
1. A door, comprising:  
a one-piece polymeric door latch disposed in an opening having a first end and second end in said door, said door latch comprising:

5,482,331  
**QUICK CONNECT COUPLING DEVICE**  
James B. Shore, 41 Wildcat Mountain Rd., Waynesville, N.C. 28786  
Filed Jan. 24, 1995, Ser. No. 377,409  
Int. Cl.<sup>6</sup> F16L 37/10; 37/12; 37/18  
U.S. Cl. 285—314

16 Claims



1. A coupling device for interconnecting a pin member with a socket member, said device including:  
a socket member having at least one internal locking groove;  
a pin member having an annular first ring assembly rotatably mounted on said pin member and a second ring assembly rotatably mounted on said first ring assembly for relative rotation between a rotative locking first position and a rotative unlocking second position; and  
said second ring assembly having at least one circumferentially disposed segmental locking element mounted for limited radial movement between a radial locking position in locking engagement with the locking groove in said locking first position and a radial unlocking position out of engagement with the locking groove in said unlocking second position,  
said first ring assembly having recess means for receiving such locking element in an unlocking position and support means for retaining such locking element in a locking position, said



a base member covering said opening from a front side of said door and reciprocally slidable toward said first and second ends of said opening;  
an actuator integral with and extending generally transversely from said base member through said opening;  
a latch finger integral with and projecting from said actuator toward said first end of said opening;  
a spring member integral with and extending generally perpendicularly from said base member and engaging said door; said spring member biasing said latch member toward said first end of said opening to place said latch finger in a latched position and yielding to sliding of said latch member toward said second end of said opening; and  
said spring member having a first pair of spaced, parallel, elongated elements each having a first end integrally hinged to said latch member and a second end, a second pair of spaced, parallel elongated elements each having a first end integrally hinged to said second end of a separate one of said first pair of elongated elements and having second ends, a transverse beam integrally hinged to said second end of each of said elongated elements of said second pair of elongated elements and a hook member integral with said beam and having a slot which engages said door.

#### 5,482,334

#### HANDLE ASSEMBLY FOR DUAL-STEM DOOR LOCK

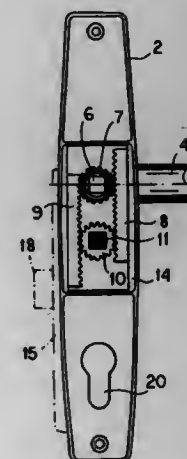
Manfred Hötzl, Graz, Austria, assignor to Roto Frank Eisenwarenfabrik Aktiengesellschaft, Karlsdorf bei Graz, Austria

Filed Oct. 6, 1993, Ser. No. 132,450

Claims priority, application Australia, Jan. 6, 1992, 1965/92  
Int. Cl.<sup>6</sup> E05B 15/02

U.S. Cl. 292—357

6 Claims



1. In combination with a door lock having upper and lower vertically spaced actuator seats centered on and rotatable independently of each other about respective vertically spaced upper and lower axes, a handle assembly comprising:

outside and inside mounting plates horizontally flanking the door lock;  
an inside stem fitted in the upper actuator seat and supported on the inside plate for rotation about the upper actuator axis;  
an inside handle carried on the inside stem;  
a lower stem fitted in the lower actuator seat and supported on the outside plate for rotation about the lower axis;  
an outside stem separate from the inside stem and supported on the outside plate for rotation about the upper axis coaxially with the inside stem;  
an outside handle carried on the outside stem; and  
gearing interconnecting the lower and outside stems for rotation of the lower stem about the lower axis on rotation of the outside stem about the upper axis, the gearing including respective upper and lower gears on the outside and lower stems,  
a rack meshing with the upper and lower gears and  
a guide in one of the plates permitting the rack to slide while in mesh with the gears as the gears rotate.

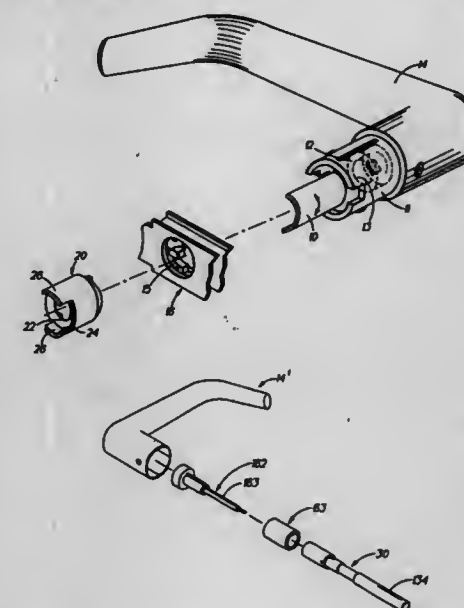
5,482,335  
**TUBULAR LOCK ASSEMBLY**  
Martin Zuckerman, Villa Park, Calif., assignor to Emhart Inc., Newark, Del.

Filed Aug. 3, 1994, Ser. No. 283,463

Int. Cl.<sup>6</sup> F05B 13/00

U.S. Cl. 292—359

10 Claims



1. A tubular lock assembly comprising  
a latch assembly,  
an interior operator assembly including a half round portion for operating said latch assembly when rotated from a neutral orientation,  
a cylindrical coupling including  
a body portion,  
an axial bore extending through said body portion,  
an axial slot extending through said body portion for receiving said half round portion so that said half round portion and said cylindrical coupling will rotate conjointly, and  
coupling tang means extending axially from said body portion,  
a cam assembly including  
a cylindrical cam support,  
spindle means supported within said body portion axial bore for supporting said cylindrical cam support for selected rotation,  
a cam on said cylindrical cam support,  
an exterior operator assembly including



a hub having  
a cylindrical portion having a cylindrical inner surface for sliding engagement with said cylindrical cam support, a cam follower on said inner surface for engaging said cam so that said hub can be displaced relative to said cylindrical cam support between axially spaced decoupling and coupling positions as said spindle means is rotated from a first decoupling orientation to a second coupling orientation, coupling means cooperating with said tang means when said hub is displaced from said decoupling position to said coupling position to rotatively interconnect said hub assembly and said cylindrical coupling, and means for preventing the rotation of said hub when said hub is at said decoupling position.

5,482,336

### IMPACT RESISTENT FLEXIBLE GRILLE ARRANGEMENT

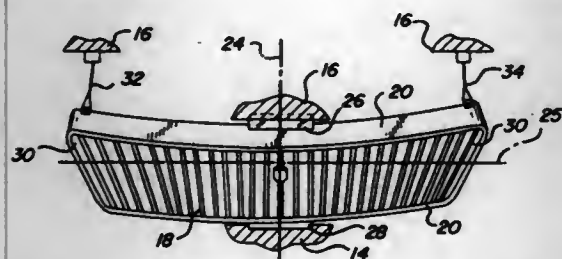
Alan S. Rouse, Clinton Township; Robert Juzwiak, Livonia, both of Mich., and Colin Frost, Dover, N.H., assignors to Davidson Textron Inc., Dover, N.H.

Filed Oct. 25, 1994, Ser. No. 328,856

Int. Cl.<sup>6</sup> B62D 25/08

U.S. Cl. 293-115

7 Claims



1. An arrangement for attaching a impact resistant flexible grille in an impact zone at a front end of an automobile having a grille support structure at the front end and an energy absorbing bumper at the front end that collapses rearwardly and then returns to its original position with respect to the grille support structure in response to front end impacts up to a predetermined limit, the arrangement comprising:

- a first rigid attachment fastening the flexible grille to the grille support structure,
- a second rigid attachment fastening the flexible grille to the bumper,

the first and second rigid attachments being located so that the flexible grille flexes and an unfastened portion of the flexible grille deflects away from the grille support structure to avoid damage when the front bumper collapses rearwardly, and at least one elastomeric tether connecting the unfastened portion of the flexible grille to the grille support structure so the elastomeric tether stretches elastically when the unfastened portion of the flexible grille deflects away from the grille support structure so as to guide and return the unfastened portion of the flexible grille back to its original position with respect to the grille support structure when the bumper returns to its original position.

5,482,337

### PORTABLE ANIMAL EXCREMENT SCOOP

Archie D. Rose, 1001 Strachan Dr. #3, Fort Collins, Colo. 80525  
Filed May 26, 1995, Ser. No. 451,664

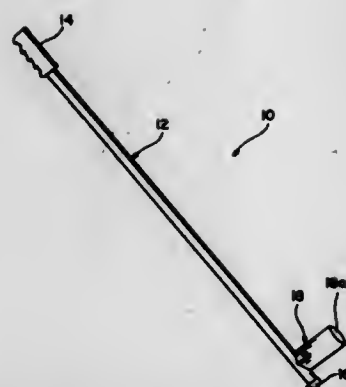
Int. Cl.<sup>6</sup> A01K 29/00; E01H 1/12

U.S. Cl. 294-1.4

8 Claims

1. Portable animal excrement scoop comprising:
  - (a) elongated handle means having first and second ends;
  - (b) a cup member having an open upper end and also including a lower end secured to said first end of said handle means;

wherein said lower end of said cup member includes an aperture therein; and valve means at said lower end of said cup member which permits water flow out of said cup member and which prevents water flow into said cup member through said aperture.



5,482,338

### GOLF BALL RETRIEVER

Norman E. Hall, 60 W. Richle Rd., Gladwin, Mich. 48624

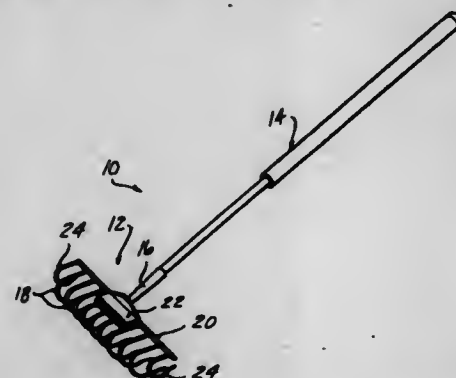
Continuation of Ser. No. 837,149, Feb. 19, 1992, abandoned.

This application May 28, 1993, Ser. No. 68,832

Int. Cl.<sup>6</sup> A63B 47/02

U.S. Cl. 294-19.2

8 Claims



1. A golf ball retriever adapted to retrieve golf balls buried in muck comprising:

- an elongated handle;
- a retriever head mounted to one end of said handle, said retriever head comprised of a parallel array of spaced apart substantially rigid fingers, said fingers spaced apart in said array a distance substantially smaller than the diameter of a golf ball to enable trapping of golf balls by said parallel array of fingers, each finger shaped with a forwardly extending upper section and a rearwardly extending lower end section, and a connecting intermediate curved section, said end section extending generally horizontally with said handle disposed at a substantial acute angle with respect to the ground;
- a cross element extending across said upper section of each finger and fixed thereto to secure said fingers together, said fingers connected only by said cross element so that said intermediate and lower sections are unconnected and completely open and free from each other, said fingers being sufficiently rigid so that said unconnected lower and intermediate sections are to be self supporting during use in penetrating muck to retrieve golf balls, and further including a handle mounting bracket means fixed atop said upper section, said handle mounted by said mounting bracket means to extend at an upward acute angle with respect to the direction in which said lower sections of said fingers extend, whereby when said

handle is held at said substantial acute angle, said lower sections extend generally horizontally.

5,482,339

### ONE HANDED POUR HANDLE FOR PAINT CANS

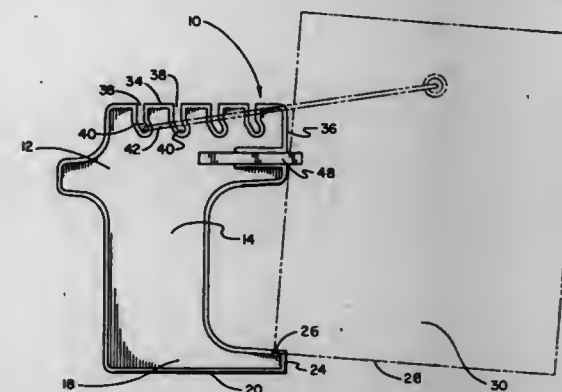
Donald A. Chishko, Jr., 6 Robin Rd., Cardiff, N.J. 08232

Filed Sep. 9, 1994, Ser. No. 303,319

Int. Cl.<sup>6</sup> B65D 25/28

U.S. Cl. 294-27.1

2 Claims



1. A new and improved one handed pour handle for paint cans comprising, in combination:

- a handle formed of a rigid plastic material having a central vertically oriented section for being grasped by the user;
- a lower vertically oriented section having a flat lower edge and outboard edge formed as a continuation of the outboard edge of the central section and having a forwardly extending lower portion with a notch extending downwardly from the upper edge for the receipt of the lower rim of a paint can to be held;
- an upper vertically oriented section with an inboardly extending projection formed as a continuation of the outboard edge of the central section and positionable in contact with the upper portion of the hand of a user between the thumb and index finger, the upper edge being provided with a plurality of downwardly extending notches with outboardly angled continuations, one of which is adapted to receive the handle of a paint can as a function of the degree of tipping required to allow proper pouring of paint therefrom, the upper section extending inboardly and being formed with an inboardly directed recess for the receipt of a supplemental support; and
- a supplemental support having an inboard recess adapted to receive the recess of the upper section, the sides of the supplemental support extending outboardly in a flared manner with a curved outboard edge having a radius of curvature substantially equal to that of the paint can to be held for providing a bearing surface during the tilting of the can for the pouring of its contents.

5,482,340

### ARTICULATING OVERHEAD MANDREL MANIPULATOR

Donald A. Jensen, Kent; Hassan Faraz, Bothell, and Joel M. Thomas, Kent, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 31, 1994, Ser. No. 299,929

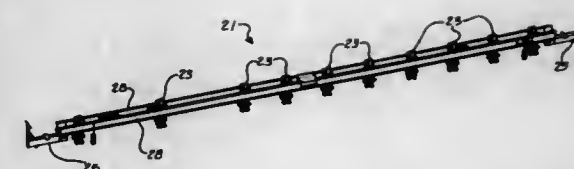
Int. Cl.<sup>6</sup> B66C 1/62

U.S. Cl. 294-81.51

14 Claims

1. An overhead manipulator for manipulating two composite lay-up mandrels, the manipulator comprising:

- (a) an overhead support;
- (b) a plurality of articulating arm assemblies, each of said articulating arm assemblies including:
  - 1) a support plate;



- 2) a pair of opposed brackets, each of said brackets including at least one outwardly extending arm, said brackets being rotatably coupled to said support plate such that the arms of said brackets are movable between an open position, in which the outer ends of the arms lie in approximately the same plane, and a closed position, in which the outer ends of the arms face each other;
- 3) attachment means for releasably attaching each of said arms to one of two composite lay-up mandrels;
- 4) a drive motor;
- 5) coupling means for coupling said drive motor to said pair of opposed arms such that the operation of said drive motor moves said arms between said open and said closed positions; and
- (c) an extension and retraction mechanism for coupling said plurality of articulating arm assemblies to said overhead support such that said articulating arm assemblies are movable vertically between a retracted position in which the articulating arm assemblies are adjacent to the overhead support and an extended position in which the articulating arm assemblies are spaced away from the overhead support.

5,482,341

### APPARATUS FOR LIFTING STORAGE TANKS AND THE LIKE

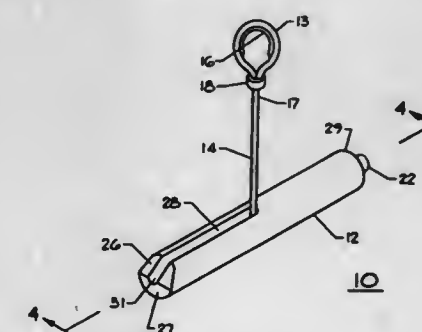
John W. Schmitz, Jr., 382 Prince Frederick St., King of Prussia, Pa. 19406

Filed Jul. 14, 1994, Ser. No. 275,028

Int. Cl.<sup>6</sup> B66C 1/66

U.S. Cl. 294-93

20 Claims



1. An apparatus for lifting objects, comprising:
  - (a) a substantially tubularly-shaped body, having a radial slot of generally uniform width extending axially from a first end of the body to substantially the lengthwise mid-point of the body and communicating with the hollow interior of the body;
  - (b) a cable having first and second ends and a maximum cross-section less than the narrowest section of the width of the slot, wherein the second end is at least partially threaded through the hollow interior of the body; and
  - (c) a stop connected proximate to the second end of the cable, wherein the stop prevents the body from sliding off of the cable.

5,482,342

# **REMOVABLE AND TRANSPORTABLE STORAGE BIN ORGANIZER**

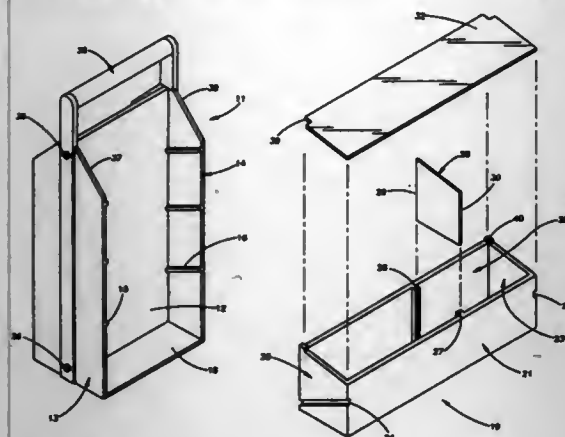
Dennis G. Kowalski, 109 Lake Aire Dr., and Lauren A. Davis,  
P.O. Box 211, Chetak, both of Wis. 54728

Filed Feb. 28, 1994, Ser. No. 202,732

Int. Cl.<sup>6</sup> A47G 29/00

U.S. Cl. 294—160

5 Claims



1. A storage assembly comprising:
  - (a) a storage rack comprising:
    - a back rack wall;
    - a right side rack wall connected to the back rack wall;
    - a left side rack wall connected to the back rack wall and opposing the right side rack wall;
    - at least one first rail connected to the right side rack wall;
    - at least one second rail connected to the left side rack wall and opposing the first rail; and
    - a handle attached to the left side rack wall and attached to the right side rack wall.
  - (b) at least one storage bin comprising:
    - a back bin wall;
    - a front bin wall;
    - a right side bin wall connected to the back bin wall and to the front bin wall;
    - a left side bin wall, connected to the back bin wall and to the front bin wall, opposing the right side bin wall;
    - a first groove, to receive the first rail, in the right side bin wall;
    - a second groove, to receive the second rail, in the left side bin wall;
    - a third groove in the back bin wall;
    - a fourth groove, in the front bin wall, opposing the third groove;
    - a removable partition wall having a rear edge inserted in the third groove and having a front edge inserted in the fourth groove; and
    - a transparent lid pivotally connected to the right side bin wall.

5,482,343

# **VEHICLE DOOR AND WATER DEFLECTOR**

William G. Bradac, Cleveland, Ohio, assignor to The Excello Specialty Company, Cleveland, Ohio

Filed Jul. 25, 1994, Ser. No. 279,445

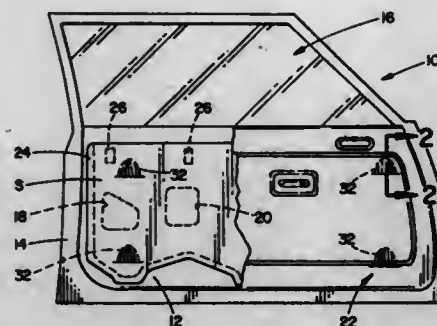
Int. Cl.<sup>6</sup> B32B 3/28; B60R 27/00

U.S. Cl. 296—39.1

17 Claims

1. In the formation of a water deflector sheet from thin plastic for use in vehicle doors, a method of forming an access opening through the deflector sheet with the access opening having a laterally deflectable awning-like portion of deflector sheet adjacent thereto comprising:

forming an array of side-by-side corrugations in the sheet at the desired location of the awning-like portion adjacent the location of the desired opening with the desired opening through the sheet extending transversely of the array of corrugations.



5,482,344

# **DEPLOYABLE VEHICLE DOOR TRIM PANEL**

Lee A. Walker, Shelby Township; Srinivasan Sundararajan, Belleville, and Geoffrey D. Fletcher, Detroit, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 23, 1994, Ser. No. 363,056

Int. Cl.<sup>6</sup> B60R 21/04

U.S. Cl. 296—39.1

20 Claims



1. An energy absorbing vehicle door, comprising:
  - an inner panel;
  - an outer panel joined to said inner panel;
  - a trim panel having energy absorbing means attached thereto, said trim panel releasably mounted on said inner panel for deployment into a vehicle occupant compartment during a side collision type impact of said vehicle door so as to present the energy absorbing means in a substantially undeformed state to an occupant seating area in the occupant compartment.

5,482,345

# **VAN-TYPE VEHICLE SEAT FRONT RISER LATCH SYSTEM**

James Bolsworth; Kenneth S. Pyszel, both of Sterling Heights; Garrett P. Baitinger, St. Clair Shores, and Joseph D. Kondziola, Troy, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

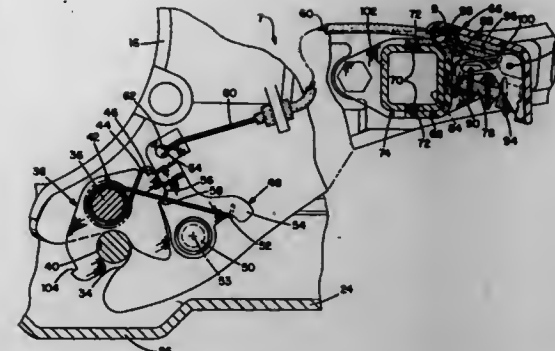
Filed Apr. 22, 1994, Ser. No. 231,631

Int. Cl.<sup>6</sup> B60N 2/10

U.S. Cl. 276—65.1

6 Claims

1. A latch system for a support of a vehicle seat, the seat having a seating position wherein a seating portion of the seat is generally horizontally oriented, the seat also having first and second supports which are connected to the floor of the vehicle, the first support being connected via a floor pin, and the seat having a storage position wherein only the first support is connected to the vehicle floor with the seating portion inclined upwardly, the latch system in combination comprising:



- a riser floor pin contact surface provided on the first support to make contact with the floor pin;
- a fork bolt pivotally mounted with respect to the first support, the fork bolt having a nest for engagement with the floor pin, the fork bolt being spring biased to a first locking position engaged with the floor pin, capturing the floor pin between itself and the first support contact surface, and the fork bolt having a second releasing position allowing removal of the first support from the floor pin;
- a detent lever pivotally mounted with respect to the first support, the detent lever being spring biased to a first position preventing movement of the fork bolt to the fork bolt second position and the detent lever having a second releasing position allowing the fork bolt to move to the fork bolt second releasing position;
- a cable connected to the detent lever for pulling the detent lever to the second releasing position;
- a handle connected to the cable, the handle being mounted for relative motion with respect to the seat and spring biased to a first locking position away from a second releasing position wherein the handle is pulling on the cable, thereby moving the detent lever to the detent lever's second releasing position; and
- a pendulum pivotally mounted with respect to the handle, having a first position when the seat is in the first seating position wherein the pendulum blocks movement of the handle to the handle second position when the seat is in the seating position and wherein the pendulum allows the handle to move to the handle's second releasing position when the seat is in the storage position.

5,482,346

# **FOLD-AWAY AUXILIARY SEAT UNIT FOR A VEHICLE**

Bruno Lesourd, Chatillon Colligny, France, assignor to Cesa-Compagnie Europeenne de Sieges Pour Automobiles, Levallois-Perret Cedex, France

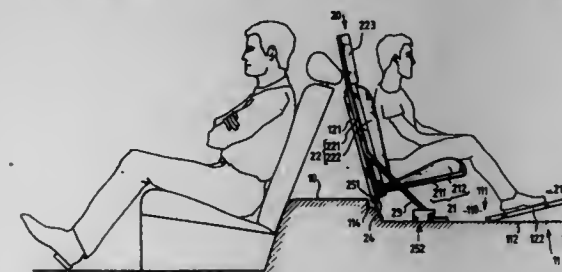
Filed Oct. 24, 1994, Ser. No. 328,002

Claims priority, application France, Jan. 26, 1993, 93 12760

Int. Cl.<sup>6</sup> B60N 2/36

U.S. Cl. 296—66

15 Claims



1. Improved auxiliary seat unit for combining with a vehicle comprising a floor defining a cavity which has an opening, a bottom and lateral walls which together define an enclosure for housing said seat unit in a folded away position thereof, a movable

cover for closing said cavity when said seat unit is placed therein, said seat unit comprising in combination: a seat, a frame for said seat, which frame comprises lateral members and outer and inner cross-bars, and a backrest, a frame for said backrest, which backrest frame comprises lateral posts and upper and lower cross-members, said seat unit further comprising two lateral arms each having a free end portion adapted to bear on said bottom, an anchored end portion, a first pivot connecting said anchored end portion to a respective one of said lateral posts, an intermediate portion, a second pivot connecting said intermediate portion to a respective one of said lateral members of said seat frame, an articulation which defines a pivot axis for said seat unit and said cover and which comprises a fixed part connected to a respective one of said lateral walls of said cavity in proximity to said opening and a movable part which carries said frame of said backrest and said cover, and retaining means cooperative with said inner cross-bar of said seat frame for maintaining said seat unit in an unfolded position out of said cavity in which it is capable of receiving an occupant after pivoting from a folded away position in said cavity, said pivots being so disposed that when said seat unit passes from said unfolded position to said folded away position, said seat and said backrest are relatively offset in a direction orthogonal to a direction in which said pivot axis extends.

5,482,347

# **ROLL-UP TARP APPARATUS AND METHOD**

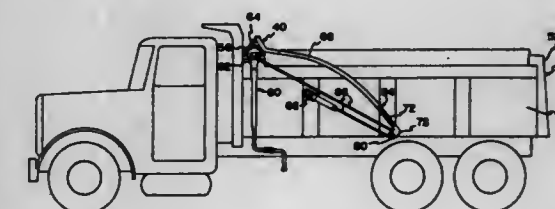
Bernard J. Clarys, and Charles M. Schmeichel, both of Jamestown, N. Dak., assignors to Agri-Cover, Inc., Courtenay, N. Dak.

Filed Mar. 1, 1994, Ser. No. 203,430

Int. Cl.<sup>6</sup> B60P 7/04

U.S. Cl. 296—98

26 Claims



24. An open container, being covered or uncovered by a roll-up flexible cover assembly mounted thereon, comprising:
  - front and back walls, two side walls, and a bottom wall;
  - a roll tube transversely extending over the side walls adjacent a first end of the container, the roll tube being mounted on the side walls of the container;
  - a flexible cover being rolled about the roll tube, one end of the flexible cover being attached to the roll tube;
  - a cross bar transversely extending over the container, the other end of the flexible cover interconnecting with the cross bar;
  - a flexible arm being mounted on each end of cross bar, the flexible arms each having a pivot point mounted on the side walls of the container, each of the flexible arms being biasedly to keep constant tension on the flexible cover;
  - a pulley being disposed proximate an end of each flexible arm;
  - a spool being connected to each end of the roll tube;



a pair of cables, one end of each of the cables being attached to each of the spools, the other end of each of the cables being attached to tension means for adjusting the tension of each of the cables, each of the cables being looped around each of the pulleys;

each of the tension means being mounted on the side walls of the container; and

rotating means, being interconnected to one end of the roll tube, for rotating the roll tube.

5,482,346

## VEHICLE HOOD SUPPORT POST MEMBER

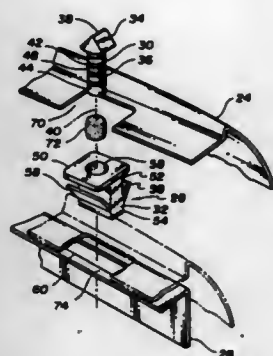
Nash B. Mass, Ann Arbor; Mark C. White, Livonia, and Martin G. Hagen, Berkley, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 12, 1993, Ser. No. 89,363

Int. Cl.<sup>6</sup> B60R 27/00

U.S. Cl. 296-207

4 Claims



1. In combination, a vehicle body panel support assembly supporting a vehicular body panel part member such as an automobile hood, at a position flush with a second body part and within a predetermined height range, said body panel support assembly consisting of:

an unthreaded height establishing member having a longitudinal axis;

said height establishing member comprising a pin having an elongate shank extending along said longitudinal axis, a panel supporting head at one end of said pin and a pilot portion at the opposite end of said pin;

a support member for retaining and supporting said height establishing member at a fixed final height relative to said support member at any initial infinitely variable point within a predetermined range along said longitudinal axis;

said pilot portion being initially slidably received within said support member to a point along said longitudinal axis at said fixed final height; and

means for fixing the final height between said members consisting of an adhesive applied between said members along said longitudinal axis, said adhesive being applied to said pilot portion to thereby secure the pin in fixed position relative to said support member and with said head of the height establishing member projecting beyond said support member at the fixed final height to thereby support said body panel part at a position flush with a second body part.

5,482,349

# COMBINATION RECLINING AND FOLDING MECHANISM FOR AUTOMOTIVE SEAT ASSEMBLIES

Herbert A. Richter, Waterford, and Wojciech Smuk, Troy, both of Mich., assignors to Bertrand Faure Ltd., Mississauga, Canada

Filed Apr. 28, 1994, Ser. No. 234,954

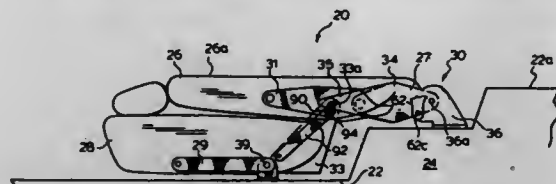
Claims priority, application Canada, Dec. 18, 1993, 2111725

Int. Cl.<sup>6</sup> B60N 2/30

U.S. Cl. 297-15

14 Claims

1. A movable seat assembly for use in a vehicle having a floor



member, said seat assembly comprising:

a seatback member pivotally mounted on a seat cushion member so as to permit pivotal movement in a forward direction between a generally upright occupiable configuration and a relatively forwardly folded unoccupiable configuration, said seat cushion member having front seat legs pivotally mounted thereon adjacent the upper ends of said front seat legs and said seatback member having rear seat legs pivotally mounted thereon adjacent the upper ends of said rear seat legs;

each of said front seat legs being pivotally mounted adjacent their lower ends to a respective front attachment member shaped and dimensioned to be affixable to said floor member; each of said rear seat legs being pivotally mounted adjacent their lower ends to a respective rear attachment member shaped and dimensioned to be affixable to said floor member and with at least one of said rear attachment members having a circumferential surface presenting first teeth means;

said pivotal mounting of said front and rear seat legs permitting movement of said seat cushion member from a first in-use position within the vehicle to a second forwardly translated stowed position within the vehicle;

a latch means operatively connected between the seatback member and the seat cushion member for movement between a first latched configuration at which said pivotal movement of said seatback member is arrested and a second unlatched configuration at which said pivotal movement of said seatback member is permitted;

a lock means mounted on the rear seat leg associated with the rear attachment member having said first teeth means for movement between a first locked configuration whereat a second teeth means mounted on said lock means restrainingly engages said first teeth means on the respective rear attachment member so as to hold said seat cushion member in said first in-use position, and a second unlocked configuration at which said second teeth means on said lock means are removed from engagement with said first teeth means on said rear attachment member, and the seat cushion member is permitted to move as aforesaid toward said second forwardly translated stowed position;

a first actuation means mounted on the seat assembly so as to be operatively moveable by a user from a neutral position whereat said latch means is held by the actuation means in said first latched configuration, to an actuated position whereat said latch means has been urged by said first actuation means to said second unlatched configuration to permit said pivotal movement of the seatback member; and,

a second actuation means mounted on the seat cushion member so as to be operatively contacted by a portion of the seatback member at a first design position of the seatback member upon said pivotal movement of said seatback member in said forward direction to move the lock means from said first locked configuration to said second unlocked configuration, so as to permit said movement of said seat cushion member from said first in-use position to said second forwardly trans-

lated stowed position upon continued pivotal movement of the seatback member beyond said first design position in said forward direction.

5,482,350

# LINEAR ACTUATION DRIVE MECHANISM FOR POWER-ASSISTED CHAIRS

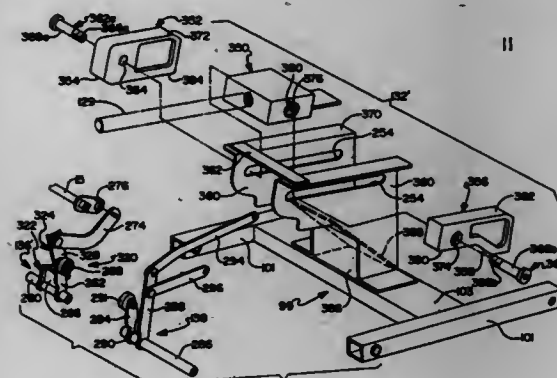
Karl J. Komorowski, Petersburg; Jonathan R. Saul, Erie; Larry P. LaPointe, Temperance, and Richard E. Marshall, Monroe, all of Mich., assignors to La-Z-Boy Chair Company, Monroe, Mich.

Continuation-in-part of Ser. No. 154,977, Nov. 19, 1993, which is a continuation-in-part of Ser. No. 951,902, Sep. 28, 1992, Pat. No. 5,314,238, which is a continuation-in-part of Ser. No. 774,536, Oct. 8, 1991, Pat. No. 5,215,351, which is a continuation of Ser. No. 613,355, Nov. 14, 1990, Pat. No. 5,061,010, which is a continuation-in-part of Ser. No. 425,384, Oct. 18, 1989, Pat. No. 4,993,777, which is a continuation of Ser. No. 196,750, May 20, 1988, abandoned. This application May 6, 1994, Ser. No. 239,108

Int. Cl.<sup>6</sup> A47C 1/035

U.S. Cl. 297-85

8 Claims



1. A power-assist chair comprising:

a base assembly;

a chair frame;

a single piece attachment plate for pivotally supporting said base assembly on said chair frame;

a rotatable drive shaft extending transversely between opposite side portions of said chair frame;

a leg rest assembly supported from said chair frame and operatively coupled to said drive shaft for movement from a retracted position to an extended position in response to rotation of said drive shaft in a first direction;

follower means supported for pivotal movement on said base assembly and operably interconnected to said drive shaft; and actuation means for actuating said leg rest assembly, said actuation means including a driven member, power operated means for causing movement of said driven member relative to said follower means, and a cam member supported for pivotable movement on said driven member, said cam member adapted to engage and pivot said follower means in response to movement of said driven member for causing corresponding rotation of said drive shaft in said first direction so as to extend said leg rest assembly.

5,482,351

# AIRCRAFT SEAT WITH CRASH ABSORPTION MECHANISM

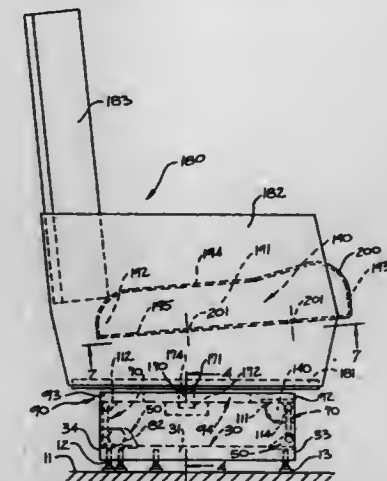
Ronald L. Young, Menominee, Mich.; Kurt F. Breuer, and David E. Brandt, both of Marinette, Wis., assignors to ERDA, Inc., Peshtigo, Wis.

Filed Jul. 19, 1993, Ser. No. 93,771

Int. Cl.<sup>6</sup> B60N 2/42

U.S. Cl. 297-216.20

10 Claims



1. A seat comprising:

a first portion including a frame which defines a channel, and which further has an aperture formed therein, and wherein a mounting block is movably mounted in the channel and includes a shaft which extends through the aperture, and wherein the seat is mounted on a floor, and wherein the shaft is fastened on the floor;

a support member borne by the first portion;

a second portion borne by the support member and disposed in spaced relation thereto; and

a seat portion borne by the second portion, and wherein the first portion is positioned in force transmitting relation relative to the support member, and wherein force applied to the seat portion is transmitted through the first portion to the support member thus causing the support member to deform and thereby dissipate some of the force acting upon the seat, and wherein the mounting block rotates in the channel upon distortion of the floor thereby maintaining the first portion fixed on the floor.

5,482,352

# CHILD SEAT WITH AUDIO

Horacio Leal, and Teresita Leal, both of 3420 SW. 84th Ave., Miami, Fla. 33155

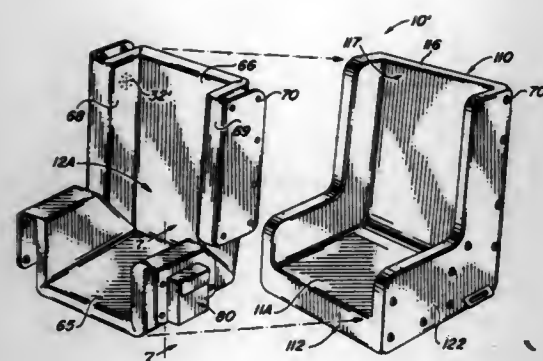
Filed Sep. 28, 1994, Ser. No. 314,056

Int. Cl.<sup>6</sup> A47C 31/00

U.S. Cl. 297-217.4

5 Claims

1. An apron for use on a child seat including a seat base, a backrest and oppositely disposed armrests, said apron comprising: a flexible body including a top layer and a bottom layer and further including a lower portion defining a seat base cover, an upper portion defining a backrest cover, and opposite side flaps extending from said lower portion and defining armrest covers, securing means on said apron body for removably attaching said apron to the child seat, means formed on said apron body for carrying an audio playing source and including a pouch structured and configured to receive the audio playing source in supported, captivated relation therein, speaker means on said apron body, structured and disposed to transmit sound therefrom, and



conductor means including a wire harness extending between said top and bottom layers of said apron body from said pouch to said speaker means for delivering electrical sound signals to said speaker means, and including a free distal end zone within said pouch and an audio plug attached to said distal end zone for electrical connection to the audio source.

5,482,353

**ADJUSTABLE LUMBAR SUPPORTS FOR SEATS**

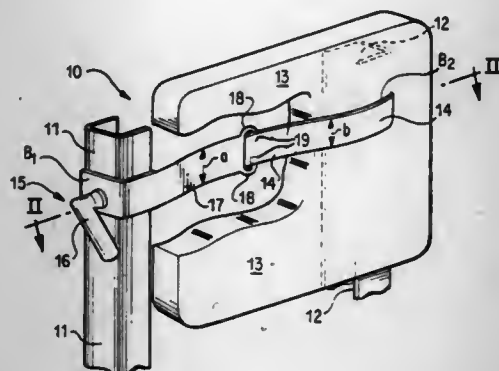
Mark A. Lance, Pascoe Vale South, Australia, assignor to Henderson's Industries Pty. Ltd., Camberwell, Australia  
PCT No. PCT/AU92/00254, § 371 Date Dec. 6, 1993, § 102(e)  
Date Dec. 6, 1993, PCT Pub. No. WO92/21269, PCT Pub. Date Dec. 10, 1992

PCT Filed Jun. 1, 1992, Ser. No. 150,197

Claims priority, application Australia, Jun. 4, 1991, PK 6505  
Int. Cl.<sup>6</sup> A47C 7/14

U.S. Cl. 297—284.4

17 Claims



1. A lumbar support arrangement for a seat having seat cushioning material disposed between a pair of seat side frames, comprising:

- a waistband adopted to extending between the seat side frames behind the seat cushioning material, and for supportingly engaging with the seat cushioning material, wherein the waistband is adopted for use with a waistband length adjusting device that is adopted to be operably engaged with the waistband at one seat side frame for varying the effective length of the waistband to thereby vary the lumbar support position of the seat cushioning material,
- and friction reducing material for interposing between facing surfaces of the waistband and the seat cushioning material to thereby reduce sliding friction between the seat cushioning material and the waistband during adjusting of said waistband length by the adjusting device.

5,482,354

**SWIVEL SEAT, ESPECIALLY FOR VEHICLES**

Dennis J. Gryp, Silvis, Ill., assignor to Sears Manufacturing Company, Davenport, Iowa

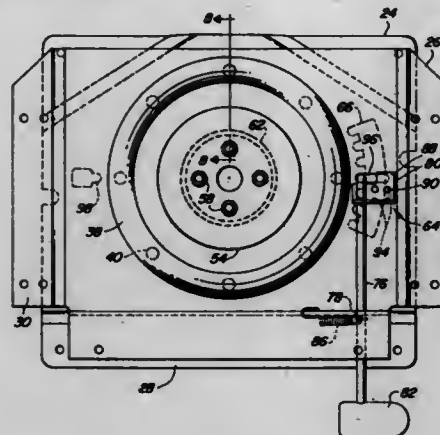
Continuation of Ser. No. 445,216, Dec. 4, 1989, abandoned.

This application Dec. 11, 1990, Ser. No. 625,384

Int. Cl.<sup>6</sup> A47C 1/02

U.S. Cl. 297—344.22

15 Claims



1. Swivel Mechanism for a seat or the like, comprising: a lower, fixed substantially horizontal plate-like element an upper substantially horizontal element superimposed over and spaced above the lower element and having a through opening centered on a vertical axis passing through the elements, turntable means in the form of an annulus about said axis and interposed between the elements for supporting the upper element for angular movement on the lower element, retainer means centered on said axis and overlying the upper element opening, annular bearing means interposed between an under portion of the retainer means and a top portion of the upper element, adjustable securing means centered on said axis and engaging the lower element within the turntable annulus and extending upwardly through the turntable annulus and through the upper element opening and engaging the retainer means, said securing means being operative to draw the upper element downwardly relative to the lower element, and stop means additional to the bearing means and interposed between the retainer means and the lower element to limit said downward movement of the upper element and latch means selectively lockable between the elements to prevent angular movement of the upper element and releasable to enable such angular movement, said latch means being operative in first, second and third modes when released and re-locked to provide for angular movement of the upper element respectively in a first range of less than 180° a second range of 180° and a third range of 360°.

5,482,355

**ORTHOPEDIC PILLOW**

Paul W. Franzen, Jr., 550 Ridge Pike, Lafayette Hill, Pa. 19444

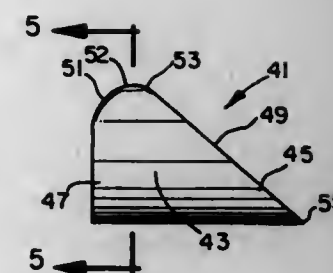
Filed Apr. 9, 1993, Ser. No. 44,951

Int. Cl.<sup>6</sup> A47C 7/40; 7/38

U.S. Cl. 297—410

3 Claims

- 1. A chair comprising a seat, first support means attached to the seat for supporting the seat, second support means mounted on the seat and extending upwardly from the seat for supporting the back of a person sitting on the seat, and third support means mounted on the second support means for supporting the neck area of a person sitting on the seat and for promoting correct alignment of a thoracic spine of a person sitting on the seat, said third support means including a pillow having an upper end portion and a lower end portion, the lower end portion having a substantially semi-conical



shape having a generally semi-circular cross-section and being tapered from an upper end of the lower end portion to a lower end of the lower end portion, the upper end of the lower end portion having a width that is greater than a relatively narrow width of the lower end of the lower end portion, and an upright member to which the pillow is attached, the upright member having attachment means for mounting the upright member to the second support means.

5,482,356

**REAR DUMP TRAILER**

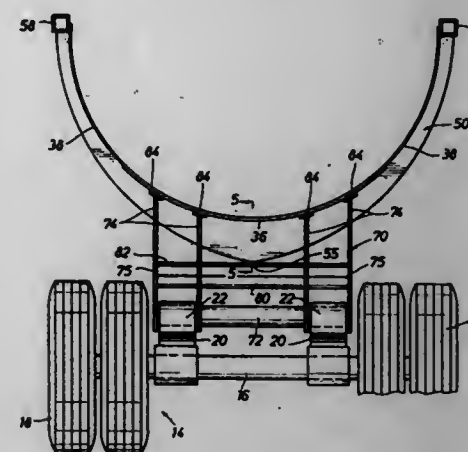
Albert A. Goodson, Jr., Houston, Tex., assignor to Goodson Building Systems, Inc., Houston, Tex.

Filed Mar. 31, 1994, Ser. No. 221,065

Int. Cl.<sup>6</sup> B60P 1/04

U.S. Cl. 298—22 AE

11 Claims



- 1. A dump trailer adapted to be removably connected to a fifth wheel on a tractor for transport; said dump trailer comprising: a trailer shell of a semicircular shape in cross section and having a pair of upper parallel side rails extending longitudinally along the upper edges of said shell; a plurality of generally parallel transverse U-shaped reinforcing ribs spaced along the length of said shell and secured to the outer surface of said semicircular shell between said side rails, said reinforcing ribs being of a minimum depth adjacent said side rails and being of a maximum depth at the bottom of said semicircular shell; a body bolster structure secured to said shell adjacent a rear end of said trailer, said body bolster structure including a longitudinally extending reinforcing member on said shell secured to at least one of said plurality of U-shaped reinforcing ribs; and another one of said plurality of U-shaped reinforcing ribs spaced forwardly of said body bolster structure and secured to the outer surface of said semicircular shell between said side rails.

5,482,357

**PLASMA BLASTING PROBE ASSEMBLY**

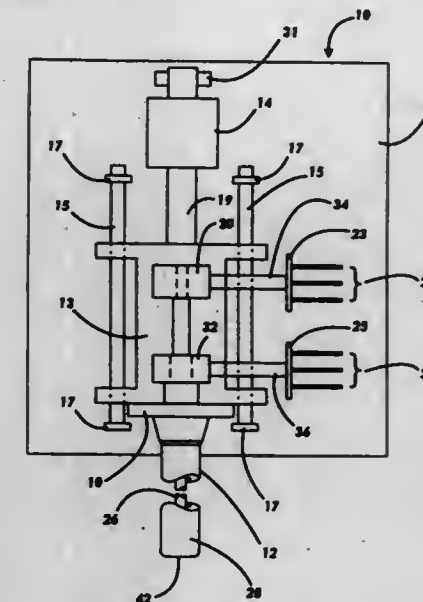
Gregory Wint, Pierrefonds, and Michel Ménard, Pincourt, both of, Canada, assignors to Noranda, Inc., Toronto, Canada

Filed Feb. 28, 1995, Ser. No. 395,469

Int. Cl.<sup>6</sup> E21C 37/16

U.S. Cl. 299—14

14 Claims



- 1. A probe assembly for plasma blasting comprising: a probe comprising coaxial electrodes separated by a first dielectric material; a termination box secured to the probe, the termination box being made of a rigid case containing a second dielectric material and comprising electrical connections between the probe and an energy storage module; and dampening means for dampening the movement of the termination box and the probe after a blast.

5,482,358

**VENTED PLUG FOR A HUBCAP**

Scott M. Kuck, Lincoln, Nebr., assignor to Dual Dynamics, Lincoln, Nebr.

Filed Aug. 25, 1994, Ser. No. 295,599

Int. Cl.<sup>6</sup> B60B 7/00

U.S. Cl. 301—106.1

1 Claim



- 1. A plug for a hubcap having an opening formed therein which removably receives the plug, comprising:



said plug having an insert embedded therein which is comprised of a metal material which is impervious to water and other contaminants but which permits the passage of air there-through to permit the venting of excess pressure from within the hubcap;  
said insert including an inner end, an outer end, and an enlarged body portion positioned therebetween.

5,482,359

# SYSTEM AND METHOD FOR DETERMINING RELATIVE VEHICLE MASS

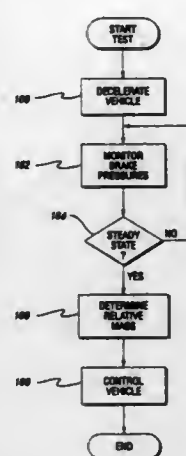
Michael T. Breen, Garden City, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 22, 1994, Ser. No. 232,716

Int. Cl. B60T 8/18

U.S. Cl. 303-9.69

11 Claims



1. For use with a vehicle including an electronic control unit with memory and a plurality of axles, each axle with an associated plurality of braking sites controlled by the electronic control unit, a system for determining a relative vehicle mass during a controlled braking maneuver for the purpose of braking control during subsequent braking maneuvers, the system comprising:

- means for decelerating the vehicle at a predetermined rate during the controlled braking maneuver, the means for decelerating delivering a braking pressure to each of the braking sites on at least one of the axles;
- means for sampling the braking pressure delivered to the braking sites on the at least one of the axles to obtain at least one braking pressure signal;
- means for determining the vehicle mass relative to a previously determined vehicle mass based on the at least one braking pressure signal; and
- means for controlling vehicle braking during subsequent braking maneuvers based on the relative vehicle mass.

5,482,360

# ANTI-LOCK BRAKE CONTROL SYSTEM

Thomas Meier, Le Vaudové, France, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 13, 1994, Ser. No. 322,605

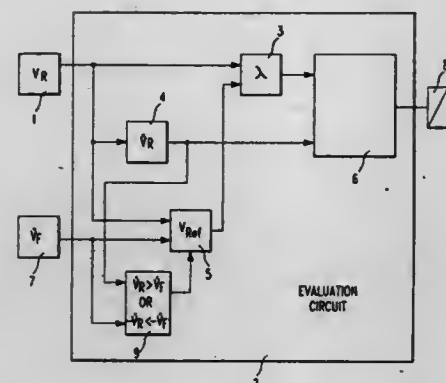
Claims priority, application Germany, Jan. 22, 1993, 43 36 080.7

Int. Cl. B60T 8/32

U.S. Cl. 303-182

6 Claims

1. Antilock brake control system for a vehicle of the type comprising at least one driven wheel, said system comprising a wheel speed sensor at said at least one driven wheel, said wheel speed sensor providing a wheel speed signal  $V_R$ .



means for determining a wheel speed gradient  $\dot{V}_R$  from said wheel speed  $V_R$ ;  
means for sensing a vehicle acceleration  $\dot{V}_F$ ;  
means for comparing  $\dot{V}_R$  to  $\dot{V}_F$  at a given time,  
means for determining a vehicle reference speed  $V_{Ref}$ , said vehicle reference speed  $V_{Ref}$  being determined by said wheel speed  $V_R$  at said given time and said vehicle acceleration  $\dot{V}_F$  when  $\dot{V}_R$  and  $\dot{V}_F$  are positive and  $\dot{V}_R$  exceeds  $\dot{V}_F$ ;  
means for determining slippage of said driven wheel based on said reference speed  $V_{Ref}$  and said wheel speed  $V_R$ , and  
means for controlling brake pressure at said driven wheel based on said slippage at said driven wheel, said means for controlling brake pressure including at least one valve.

5,482,361

# BRAKE SYSTEM WITH ADJUSTABLY VARIABLE FRONT/REAR AXLE BRAKING FORCE DISTRIBUTION

Manfred Burckhardt, Walblingen; Sinan Kazan, Esslingen, and Richard Zimmer, Fellbach, all of, Germany, assignors to Mercedes-Benz AG, Germany

PCT No. PCT/EP93/00003, § 371 Date Oct. 31, 1994, § 102(e) Date Oct. 31, 1994, PCT Pub. No. WO93/12959, PCT Pub. Date Jul. 8, 1993

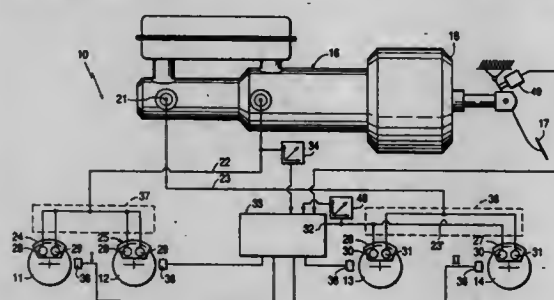
PCT Filed Jan. 4, 1993, Ser. No. 256,248

Claims priority, application Germany, Jan. 3, 1992, 42 00 046.7

Int. Cl. B60T 8/30

U.S. Cl. 303-186

18 Claims



17. A method for providing variable braking force distribution between front and rear axles of a high speed vehicle in which downward aerodynamic forces on the vehicle cause an increase in axle loads as vehicle speed increases, with the increase in axle load being greater at the rear axle than at the front axle, comprising the steps of

generating a brake pressure in front wheel brakes of the vehicle processing at least one signal representative of the vehicle speed and one at least adjustably specifiable magnitude of an actual or assumed friction coefficient to continuously form an optimized braking force distribution factor value in accordance with the following linear relationship

$$DB_{om} = k_1 + k_2 \cdot \mu_B + k_3 \cdot v$$

in which  $k_1$ ,  $k_2$  and  $k_3$  are vehicle-specific constants determined from linear interpolation based on a relationship between  $DB_{om}$  and  $v$  and  $\mu_B$ , where  $DB_{om}$  is determined in accordance with the following relationship

$$DB_{om} = \frac{\phi_{om}}{1 - \phi_{om}}$$

for different values of an optimized rear axle braking force proportion,  $\phi_{om}$ , which has different values determined from a numerical evaluation of the following relationship

$$\phi_{om} = \frac{\psi - K_{ax} \cdot \chi \cdot v^2 / Gg - \mu_B \cdot \chi [1 - v^2 (K_{ax} + K_{ax}) / Gg]}{1 - v^2 (K_{ax} + K_{ax}) / Gg}$$

wherein

$\psi$  represents the rear axle load proportion,  
 $\chi$  represents the height of the vehicle center of gravity in relation to the wheel base,  
 $K_{ax}$  represents the aerodynamic upward or downward force coefficient at the front axle,  
 $K_{ax}$  represents the aerodynamic upward or downward force coefficient at the rear axle,  
 $\mu_B$  represents the coefficient of friction, and  
 $Gg$  represents the vehicle weight, and during a braking operation, generating a signal characteristic of an instantaneous front axle braking force,  $F_{BF}$ , to cause a controllable pressure source to provide a rear axle braking source,  $F_{BR}$ , for rear wheel brakes in accordance with the relationship

$$F_{BR} = DB_{om} \cdot F_{BF}$$

whereby, in the event of a specified defined limiting value of actuation force exerted by a vehicle driver on a brake pedal of the vehicle, the vehicle decelerates with utilization of substantially all frictional force on the braked vehicle wheels.

5,482,362

# ANTI-LOCK BRAKE CONTROL VALVE CONTROL MODULE

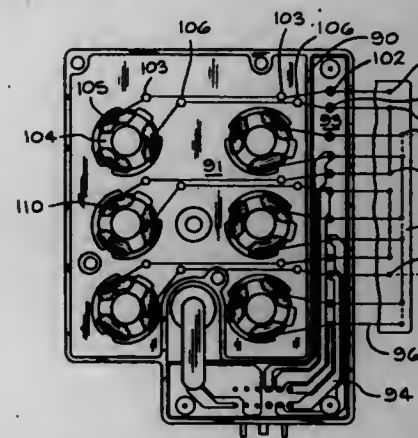
David S. Robinson, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Continuation of Ser. No. 286,584, Aug. 5, 1994, abandoned, which is a continuation of Ser. No. 999,420, Dec. 31, 1992, abandoned. This application Feb. 17, 1995, Ser. No. 390,254

Int. Cl. B60T 8/36

U.S. Cl. 303-119.2

9 Claims



1. A control valve for a vehicle anti-lock brake system comprising:

a valve body including at least one solenoid operated valve having an armature extending from said valve body;

a coil support module removably attached to said valve body, said module including a first portion which receives said armature, and a second portion which carries connector means for electrically connecting said module to other electrical components of the anti-lock brake system, said connector means including conductor members extending into said second portion;

a solenoid coil carried by said first portion of said coil support module for actuating said valve, said solenoid coil surrounding said armature, said solenoid coil having a pair of electrical coil conductors connected thereto;

said coil support module including first and second components which cooperate with one another to define a cavity which in part functions to separate said first and second portions;

said coil conductors extending from said first-portion through said cavity and into said second portion, wherein said solenoid coil includes a winding wound from a piece of wire, said wire including an end extending from said coil to form said coil conductor;

coupling means disposed within said second portion for electrically coupling said coil conductors to said conductor members; and

a potting material disposed in said cavity and sealingly contacting said first and second components and said coil conductors, said first and second components and said potting material cooperating to close said second portion to seal said coupling means from the environment.

5,482,363

# ANTI-LOCK BRAKE SYSTEM

Bernd Grossardt, Bönnigheim, Germany, and Frank Sager, Farmington Hills, Mich., assignors to Robert Bosch GmbH, Stuttgart, Germany

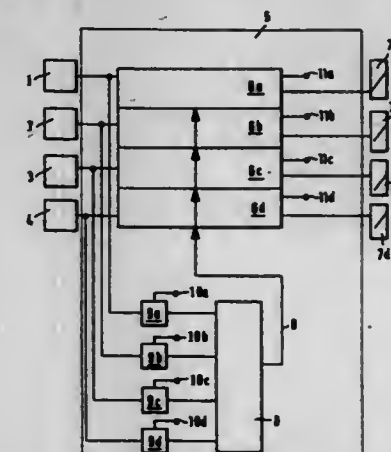
Filed Oct. 25, 1994, Ser. No. 328,706

Claims priority, application Germany, Nov. 19, 1993, 43 39 571.6

Int. Cl. B60T 8/32

U.S. Cl. 303-173

2 Claims



1. Method for controlling brake pressure in a vehicle having wheels and brake pressure control devices at said wheels, said method comprising

- determining the speeds of the wheels and generating respective wheel speed signals,
- forming a reference speed signal based on at least one wheel speed signal;
- generating slip signals based on the wheel speed signals and said reference speed signal,
- producing brake pressure control signals based on said slip signals,
- varying brake pressure at at least one said wheel by feeding said brake pressure control signals to said brake pressure control device at said at least one wheel, and

excluding wheel speed signals of wheels to which no control signals are fed from formation of said reference speed signal during varying of brake pressure at said at least one wheel.

5,482,364

**REPLACEMENT ENDLESS VEHICLE TRACKS**

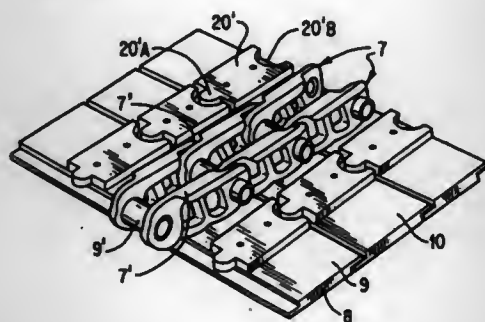
John W. Edwards, Arcadia; Daniel R. Harper, and Quinton B. McNew, both of Ft. Myers, all of Fla., assignors to Edwards, Harper, McNew & Company, Ft. Myers, Fla.

Continuation-in-part of Ser. No. 926,521, Aug. 10, 1992, Pat. No. 5,368,376, which is a continuation-in-part of Ser. No. 749,896, Aug. 26, 1991, abandoned. This application Aug. 16, 1993, Ser. No. 106,569

Int. Cl.<sup>6</sup> B62D 55/18

U.S. Cl. 305—39

21 Claims



1. An endless track for an endless track vehicle, said endless track comprising:
  - at least one metal grouser;
  - a pair of parallel rails, each of said rails comprising a plurality of rail blocks, said metal grouser being fixed to ones of said rail blocks; and
  - at least one roller supporting pad fixed to said metal grouser, said supporting pad engaging with an adjacent supporting pad.

5,482,365

**RUBBER GROUSERED TRACK SHOE**

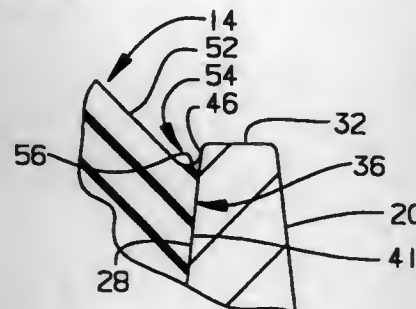
Thomas L. Peterson, Peoria; Larry K. Rhodes, Pekin; Thomas C. Robertson, Creve Coeur, and David L. Skinner, Metamora, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Jul. 13, 1994, Ser. No. 274,529

Int. Cl.<sup>6</sup> B62D 55/275

U.S. Cl. 305—54

6 Claims



1. A rubber grousered track shoe for track-type machines, comprising:
  - an elongated steel shoe portion having a ground engaging side with at least two upstanding, laterally spaced apart steel grouser bars extending outwardly from said ground engaging side in a lengthwise orientation across said shoe, a planar surface, disposed between a first one of said steel grouser bars

and a second one of said steel grouser bars and a protective channel formed by said first and second grouser bars and said planar surface, said first steel grouser bar having a side facing an opposing side of said second steel grouser bar and each steel grouser bar having a tip at its distal end; and

a rubber grouser portion molded in situ on said track shoe between said first and second steel grouser bars, said rubber grouser portion having an inner portion and an outer portion, said inner portion being located within said protective channel and having a first side, a bottom and a second side each contiguous along and bonded to said side of said first steel grouser bar, said planar surface and said side of said second steel grouser bar, respectively, and said outer portion extending above said protective channel and having a first side face, a second side face and a planar ground engaging top face, said top face being oriented parallel to said planar surface of said shoe portion and said side faces extending from said top face toward said inner portion of said rubber grouser portion, each of said side faces being joined to a respective one of said sides of said inner portion at a juncture located below the tip of its adjacent steel grouser bar.

5,482,366

**APPARATUS FOR TREATING DOUGH WITH A BEARINGLY SUPPORTED TOOL CARRIER**

Helmut König, deceased, Graz, Austria, and by Elisabeth König, Administratrix, Ursprungweg 70, Graz, Austria

PCT No. PCT/AT93/00050, § 371 Date Sep. 14, 1994, § 102(e) Date Sep. 14, 1994, PCT Pub. No. WO93/18657, PCT Pub. Date Sep. 30, 1993

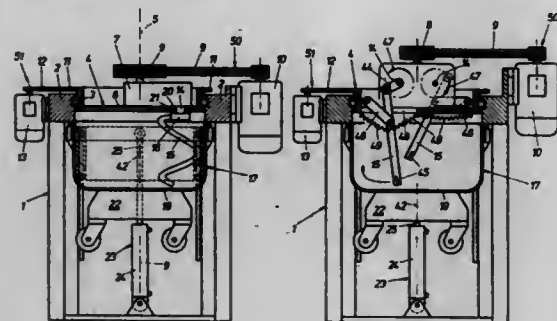
PCT Filed Mar. 16, 1993, Ser. No. 302,823

Claims priority, application Austria, Mar. 16, 1992, 527/92

Int. Cl.<sup>6</sup> A21C 1/02; 1/14

U.S. Cl. 366—97

12 Claims



1. Apparatus for treating dough comprising:
  - a frame having a seat into which a receptacle for receiving dough can be inserted, said-receptacle having an upper opening, an upper rim a circumferential edge defining said opening, and having an axis;
  - lifting means for lifting the seat and the receptacle to an operable position;
  - guide means mounted on the frame for guiding the receptacle in the seat;
  - a tool carrier rotatably mounted on said frame, said tool carrier having an outer periphery;
  - at least one tool carried by the tool carrier for treating dough in the receptacle, said at least one tool extending into the receptacle when the receptacle is in the operable position;
  - tool drive means carried by the frame for driving said at least one tool in a revolving motion, said at least one tool being eccentrically carried by the tool carrier with respect to the axis of the receptacle; and
  - tool carrier drive means for rotating the tool carrier relative to the receptacle around the axis of the receptacle when said receptacle is in the operable position, said tool carrier forming a closure cover for the opening of the receptacle, wherein the frame further comprises a collar against which the edge of the opening of the receptacle is lifted by said lifting

means for reaching the operable position, characterized in that the tool carrier is bearingly supported with the outer periphery thereof on the collar.

5,482,367

**WHISKING DEVICE WITH ROD AND PLURAL TORROIDAL COILS**

Kameel I. F. Khan, and Julia Randell, both of 30 Ethelton Road, London, England

PCT No. PCT/GB93/01258, § 371 Date Oct. 5, 1994, § 102(e) Date Oct. 5, 1994, PCT Pub. No. WO93/25135, PCT Pub. Date Dec. 23, 1993

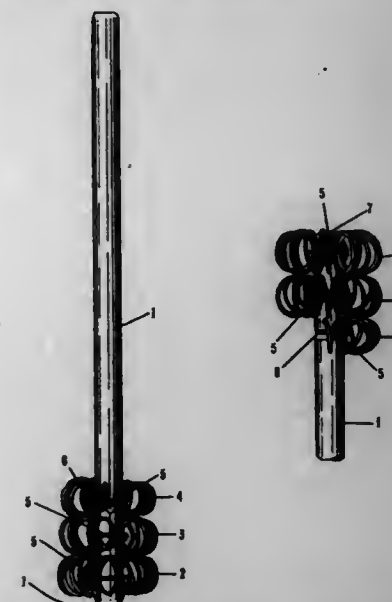
PCT Filed Jun. 14, 1993, Ser. No. 193,120

Claims priority, application United Kingdom, Jun. 12, 1992, 9212565; Mar. 9, 1993, 9304785

Int. Cl.<sup>6</sup> A47J 43/10

U.S. Cl. 366—129

6 Claims



1. A device for manually whisking liquids and semi-liquids, comprising: an elongate rod having a uniform circular cross-section over at least a substantial part of its length and defining an axis, the cross-section having a diameter such that the rod can be comfortably spun at high rotational speed when held between a user's palms, by counterwise linear movement of the palms; agitating means fixed to one end of the rod for aerating a liquid or semi-liquid by forward and backward rotation of the rod; the agitating means comprising a plurality of non-intermeshing torroidal coils of wire having axes which are substantially coaxial with the axis of the rod, said torroidal coils being adjacent each other and spaced along the length of the rod at the one end of the rod, each coil being independently fixed around and abutting the rod by a respective loop of wire which extends around a part of each coil which abuts the rod, each loop of wire having portions that are twisted to each other to tightly hold the coils to the rod.

5,482,368

**CONTINUOUS MIXER OPERABLE TO CONTROL SACCHARIDES CONCENTRATION**

Yoshitaka Nakamura, and Tadashi Inoue, both of Hirakata, Japan, assignors to Nakakin Co., Ltd., Osaka, Japan

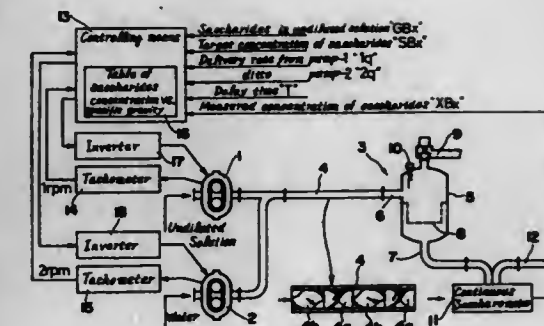
Filed Apr. 10, 1995, Ser. No. 419,172

Int. Cl.<sup>6</sup> B01F 15/04

U.S. Cl. 366—152.2

6 Claims

1. A continuous mixer system for controlling the saccharide concentration of a sweetened liquid product mixture, which comprises



- (i) an undiluted sweetened solution input,
  - (ii) a water input,
  - (iii) a mixer having a product output,
  - (iv) a first positive displacement rotary pump having a speed of rotation for feeding an undiluted sweetened solution through said undiluted sweetened solution input,
  - (v) a second positive displacement rotary pump having a speed of rotation for feeding water through said water input,
  - (vi) a continuous saccharometer for detecting the saccharide concentration of the product mixture discharged through said product output,
  - (vii) a first speed adjuster for adjusting the rotational speed of said first rotary pump,
  - (viii) a second speed adjuster for adjusting the rotational speed of said second rotary pump; and
  - (ix) a controller,
- wherein a target value  $SB_x$  of the saccharide concentration at the product output is preset in the controller, and an actual value  $XB_x$  detected by the saccharometer at the product output is compared in the controller with said target value  $SB_x$ , said first and second speed adjusters being adapted to change said speeds of rotation of said first and said second pumps to reduce any difference found between  $SB_x$  and  $XB_x$ .

5,482,369

**PROCESS FOR HOMOGENIZING ESSENTIALLY IMMISCIBLE LIQUIDS FOR FORMING AN EMULSION**

Adrian Verstaalen, Schiffhorst 208a, D-4600 Dortmund 16, Germany

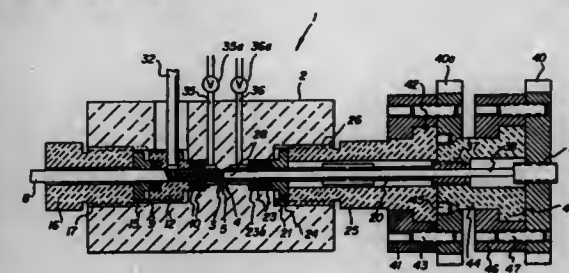
Division of Ser. No. 14,840, Feb. 8, 1993, Pat. No. 5,366,287.

This application Sep. 8, 1994, Ser. No. 302,635

Int. Cl.<sup>6</sup> B01F 3/08

U.S. Cl. 366—162.4

1 Claim



1. Process for homogenizing essentially immiscible liquids for forming an emulsion, which comprises:
  - guiding an inner phase of a liquid towards a mixing region under a given high pressure;
  - guiding an outer phase of a liquid towards the mixing region under a relatively lower pressure than the given high pressure;
  - forming jets of thin, radially flat sheets with the inner and outer phases by guiding each of the phases through a respective narrow, radially disposed slit and thereby accelerating each of the phases;
  - colliding the thin, radially flat sheets of the inner and outer phases in a counter-current for forming a homogenized phase mixture; and



subsequently withdrawing the homogenized phase mixture from the mixing region.

5,482,370

## PAINT CAN COVER ASSEMBLY

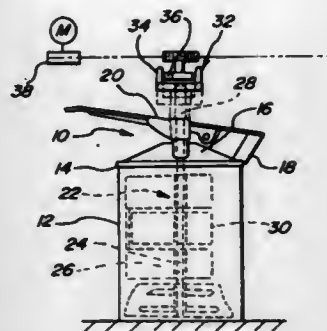
John T. Dedoes, Walled Lake, Mich., assignor to Dedoes Industries, Inc., Walled Lake, Mich.

Filed Jun. 22, 1994, Ser. No. 263,784

Int. Cl.<sup>6</sup> B01F 7/20

U.S. Cl. 366—247

9 Claims



1. A cover assembly for a paint can having an open top and an inwardly extending chime, said cover assembly comprising:
  - a lid dimensioned to overlie the open top of the paint can, said lid having a spout,
  - means for detachably securing said lid to the paint can so that said lid overlies the open top of the paint can,
  - means for stirring the contents of the paint can, said stirring means comprising an elongated shaft, means for rotatably mounting said shaft to said lid so that an upper end of said shaft extends above said lid and a lower end of said shaft extends into an interior of the paint can, and a paddle secured to said lower end of said shaft,
  - a driven member, and
  - means for manually axially adjustably lockingly securing said driven member to said upper end of said shaft,
- wherein said shaft has plurality of axially spaced notches, and wherein said securing means comprises a locking dog carried by said driven member, said locking dog having a detent which is resiliently urged toward said shaft and nestingly received in one of said shaft notches.

5,482,371

## METHOD AND APPARATUS FOR MEASURING THE DEW POINT AND/OR FROST POINT OF A GAS HAVING LOW WATER CONTENT

Junichi Nishizawa, Miyagi; Takahiko Kijima, Hyogo, both of Japan; Edward F. Ezell, Warren, N.J., and Akira Makihara, Chiba, Japan, assignors to Osaka Sanso Kogyo Ltd., Osaka, Japan

Continuation of Ser. No. 992,447, Dec. 17, 1992, abandoned.

This application Aug. 5, 1994, Ser. No. 286,395

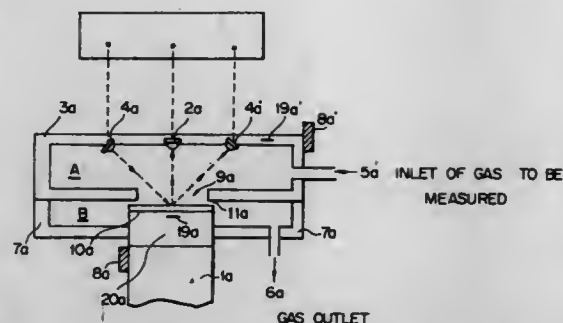
Claims priority, application Japan, Apr. 18, 1991, 3-086905; Apr. 18, 1991, 3-086906; Nov. 30, 1991, 3-357405; Dec. 1, 1991, 3-357406; Dec. 1, 1991, 3-357407

Int. Cl.<sup>6</sup> G01N 25/68; 21/47; 21/55

U.S. Cl. 374—20

8 Claims

1. A method of determining the dew point of a gas containing a very small amount of water using an optical dew point meter, which meter includes a reflector mirror wherein the temperature of the mirror can be varied to any point from room temperature to at least -80° C. a means of contacting said reflector mirror with the gas to be measured, a means of irradiating said reflector mirror with focused rays of light or laser light, and a means of detecting



the change in the intensity of scattered light due to the dew condensed on said reflector mirror, said method comprising the steps of:

- contacting said reflector mirror with the gas to be measured;
- applying said focused rays of light or laser light onto that part of the reflector mirror where it is contacted with said gas;
- gradually reducing the temperature of said reflector mirror, either before or while said reflector mirror and said gas contact each other, thereby condensing dew on said reflector mirror; and
- gradually elevating the temperature of said reflector mirror to a point in the neighborhood of the dew point but which is insufficient to have the dew sublime completely from the mirror surface thereby detecting the temperature at which the scattered light has a maximum intensity and then cooling the reflector mirror to detect the temperature at which the scattered light has a minimum intensity, and designating the temperature at which the scattered light has a maximum intensity as the maximum temperature, designating the temperature at which the scattered light has a minimum intensity as the minimum temperature, and designating said maximum and minimum temperatures as the dew point of the gas of interest.

5,482,372

## FLOW CELL FOR CALORIMETRIC MEASUREMENTS

Pierre Batallard, Kembs-Loeche, France, and Alfredo E. Bruno, Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

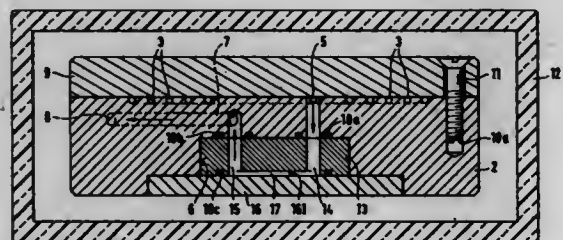
Filed Mar. 11, 1994, Ser. No. 212,668

Claims priority, application European Pat. Off., Mar. 17, 1993, 93810192

Int. Cl.<sup>6</sup> G01K 17/00; G01N 25/20

U.S. Cl. 374—31

19 Claims



3. A flow cell for calorimetric measurements comprising a body with at least one flow channel, which flow channel extends between an inlet opening and an outlet opening, and a thermoelectric detector for monitoring temperature changes, which occur during chemical or biochemical processes in a measuring volume being located below said at least one flow channel in close vicinity to said outlet opening of said at least one flow channel, wherein said outlet opening extends vertically through said body and ends in a recess, which is provided in said body of said flow cell below said at least one channel, said recess being adapted to accommodate said thermoelectric detector and a spacer element, which is

arranged between said body and said thermoelectric detector, said spacer element being provided with central bores, which communicate with said outlet opening, with said measuring volume and with an exit channel, which is provided in said body, and said spacer element having a height such, that a gap between said spacer element and an active surface of said thermoelectric detector defines said measuring volume, and whereby said body of said flow cell has a good thermal conductivity such, that a fluid flowing through said flow channel is thermostatised prior to entering said measuring volume solely by flowing through said flow channel and free of any external thermostatisation means.

5,482,373

## THERMOCHROMATIC INDICATOR FOR BEVERAGE CONTAINERS

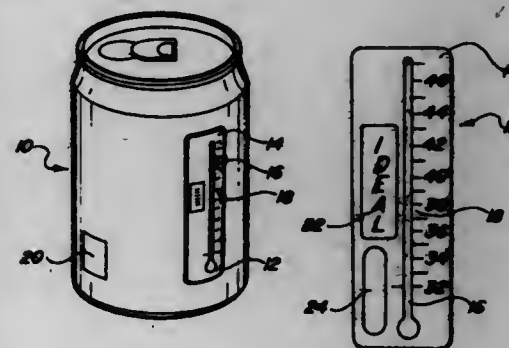
Jill Hutchinson, Waterford, Mich., assignor to Cool-Drink, Inc., Southfield, Mich.

Filed Mar. 16, 1994, Ser. No. 213,106

Int. Cl.<sup>6</sup> G01K 1/14; 11/12; 13/12

U.S. Cl. 374—141

6 Claims



1. A temperature indicator system for a beverage container, said system comprising:
  - a temperature sensing assembly, said temperature sensing assembly being attachable to a beverage container, said temperature sensing assembly including a body, said body including a front side and a back side;
  - an adhesive material, said adhesive material including a front side and a back side, said back side of said adhesive material being fitted to said back side of said body of said assembly;
  - a removable protective backing, said removable protective backing being removably fitted to said front side of said adhesive material;
  - a temperature sensor, said temperature sensor being fitted to said front side of said body of said temperature sensing assembly;
  - a temperature scale, said temperature scale being mounted on said front side of said body of said temperature sensing assembly in close relation to said temperature sensor, whereby the temperature of the beverage contained within said beverage container sensed by said temperature sensor may be read by comparison with said temperature scale;
  - a region for applying and recording a fingerprint, said region being formed on said body; and
  - said body, said temperature sensor, and said temperature scale being composed of flexible components.

5,482,374

## BEACH TOWEL/CARRY BAG

Todd J. Buhoff, Saratoga, Calif., assignor to Innovision, Inc., Saratoga, Calif.

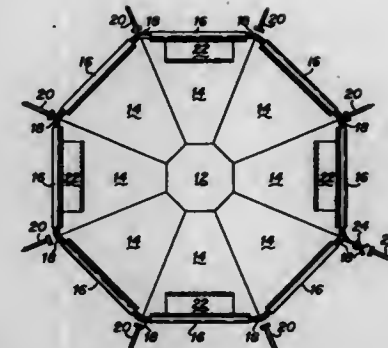
Filed Feb. 28, 1994, Ser. No. 202,914

Int. Cl.<sup>6</sup> B65D 30/10

U.S. Cl. 383—4

3 Claims

1. A beach towel convertible to a reinforced carry bag, comprising:



- (a) a polygonal center panel, said center panel having at least five sides;
- (b) a plurality of trapezoidal panels extending from the center panel, the number of trapezoidal panels being at least equal to the number of sides of the center panel, wherein the shorter of the parallel sides of each trapezoidal panel is joined to the perimeter of the center panel to form a seam and each non-parallel side of each trapezoidal panel is joined to the abutting non-parallel side of the adjacent trapezoidal panel to form a seam, thereby reinforcing the towel; and
- (c) a draw cord around the perimeter of the trapezoidal panels, whereby the towel may be converted to a carry bag when the cord is drawn.

5,482,375

## TUBULAR PLASTIC END STOPS BONDED TO PLASTIC ZIPPER

Dale S. Richardson, Westerville, and Roger W. Smith, Grove City, both of Ohio, assignors to Mobil Oil Corporation, Fairfax, Va.

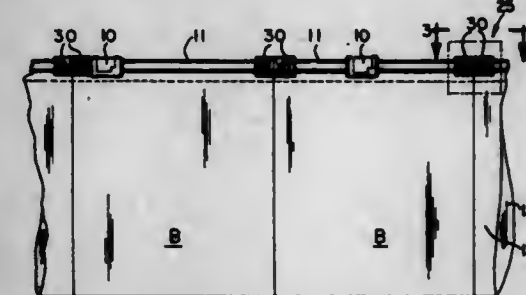
Division of Ser. No. 155,365, Nov. 22, 1993, Pat. No.

5,405,478. This application Nov. 18, 1994, Ser. No. 342,321

Int. Cl.<sup>6</sup> B65D 33/25

U.S. Cl. 383—64

3 Claims



1. In the manufacture of plastic-film bags having a reclosable fastener extending along the mouth of the bag and a slider straddling the fastener for opening and closing the fastener, the fastener comprising a pair of flexible plastic strips on facing sidewalls of the bag and having reclosable interlocking rib and groove profile elements on the respective strips, the improvement in end stops for the slider and in terminating the reclosable fastener comprising:
  - end stop means located at the opposite ends of the profile elements on the reclosable fastener, each of the end stop means comprising a length of slit plastic tubing extending over one end of the reclosable fastener and locked into position on the ends of the profile elements by bonding the tubing in sealed relation with the ends of the profile elements, each end stop including deformations impressed through the wall of the tubing and into the profile elements during bonding, said tubing projecting outwardly from said profile elements and being engageable with the slider for preventing the slider from moving past the ends of the reclosable fastener.

5,482,376

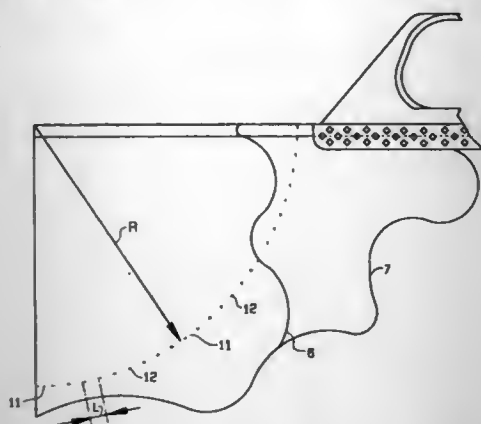
**LOAD CARRYING BAG WITH PERFORATED TEAR LINE OPENING**

Angela L. Moseley; Gay A. Hoag, and George W. Durbin, all of Tomah, Wis., assignors to Union Camp Corporation, Wayne, N.J.

Filed Dec. 15, 1993, Ser. No. 167,757  
Int. Cl.<sup>6</sup> B65D 33/06; 33/16

U.S. Cl. 383—209

26 Claims



1. In a load carrying sealed bag carrying a load of contents and having a top sealed edge, a bottom sealed edge, opposite side sealed edges and overlying front and back faces and constructed of plastic material of a thickness between about 3 and 9 mils and said bag further having a size of at least as big as about 12 inches wide along said top edge and 15 inches along said side edges, the improvement comprising:

- a) a tear line extending along each of the front and back faces of said bag between said top edge and a side edge, each tear line being defined substantially by an arcuate shape defined, in turn, by a line of perforations comprised of uncut and cut segments to define a ratio of uncut to cut segments; said perforations having a ratio of uncut and cut segments along said tear line of between about 80% uncut to 20% cut and 40% uncut to 60% cut.

5,482,377

**RAIL-CONNECTING JIG FOR LINEAR GUIDE**

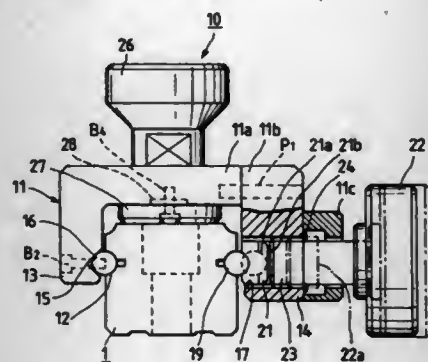
Nobuyuki Osawa, Gunma, Japan, assignor to NSK Ltd., Tokyo, Japan

Filed Oct. 6, 1994, Ser. No. 321,832

Claims priority, application Japan, Jan. 7, 1993, 5-054556 U  
Int. Cl.<sup>6</sup> F16C 29/06

U.S. Cl. 384—45

13 Claims



1. A rail-connecting jig for connecting guide rails including rolling-element rolling grooves in a linear guide, comprising:  
a) a jig body substantially U-shaped in section which is loosely mounted over the guide rails, the jig body including first and

second wings on inner side surfaces thereof which are confronted with the respective rolling-element rolling grooves of the guide rails;

first and second bar-shaped rollers engaging with the respective rolling-element rolling grooves of the guide rails, the first roller being held on an inner side surface of the first wing, and the second roller being arranged in the second wing of the jig body so as to be confronted with the first roller; and a roller-pushing means for moving the second roller in and out of engagement with the guide rails.

5,482,378

**VACUUM MOTOR BEARING PROTECTION SYSTEM**

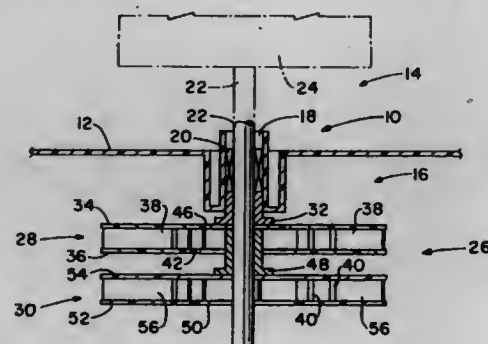
Nick Vona, Jr., Unlontown, and George E. Marsinek, Kent, both of Ohio, assignors to Ametek, Inc., Kent, Ohio

Filed Jun. 22, 1994, Ser. No. 263,823

Int. Cl.<sup>6</sup> F16C 33/72

U.S. Cl. 384—134

20 Claims



1. A vacuum motor bearing protection system, comprising:  
a) a barrier wall;  
a) a motor on one side of said wall;  
a) a shaft extending from said motor, passing through said wall, and rotatable within a bearing; and  
a) a fan received upon said shaft on a side of said wall opposite said motor, said fan comprising a top plate and a bottom plate with arcuate vanes interposed therebetween, said bottom plate having a central opening for drawing air from outside of said fan into said vanes and said top plate having at least one aperture therein for drawing air from an area adjacent said bearing and into said vanes.

5,482,379

**BALL AND SOCKET BEARING ASSEMBLY HAVING REPLACEABLE COMPOSITE STATIONARY BALL**

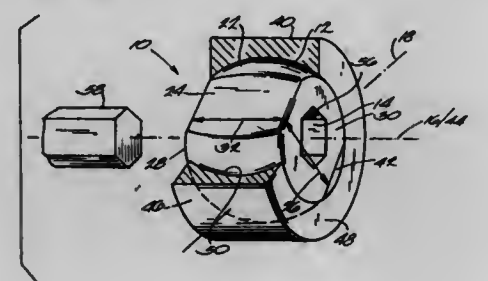
Bernard Harris, Northbrook, and Dennis E. Bozych, Downers Grove, both of Ill., assignors to Rexnord Corporation, Milwaukee, Wis.

Filed Oct. 1, 1993, Ser. No. 131,072

Int. Cl.<sup>6</sup> F16C 23/04

U.S. Cl. 384—208

13 Claims



1. A ball and socket bearing assembly for mounting on a support member, said ball and socket bearing assembly comprising:

a) a ball member including a ball bore having a bore axis, an insertion axis, and an orientation axis, said bore axis, said insertion axis, and said orientation axis being orthogonally arranged relative to each other; an outer spherical bearing surface on said substrate, diametrically opposed truncations on said outer spherical bearing surface, said truncations extending parallel to said bore axis and being spaced apart a first dimension along said orientation axis, and end surfaces spaced apart a second dimension along said bore axis, and said ball member including a filament wound fiberglass substrate having a woven self-lubricating fabric bonded on said spherical bearing surface thereof;

a) one piece outer socket including a socket axis, a socket bore extending axially therethrough, end portions spaced apart on said socket axis, and an annular inner raceway having a concave configuration presenting a maximum diameter between said end portions sufficient to rotatably receive said spherical bearing surface and a minimum socket bore diameter adjacent said end portions that is greater than said first and second dimensions so that coaxial alignment of said insertion and socket axes will allow said ball member to be inserted into said inner raceway of the outer socket for rotation about said orientation axis after insertion to locate said bore axis coaxial with said socket axis and thereby place said ball member in an installed position within said inner raceway; and

an anti-rotation means for securing said installed ball member in non-rotational relation to a support member on which said ball member is mounted.

5,482,380

**DOUBLE TILTING PAD JOURNAL BEARING**

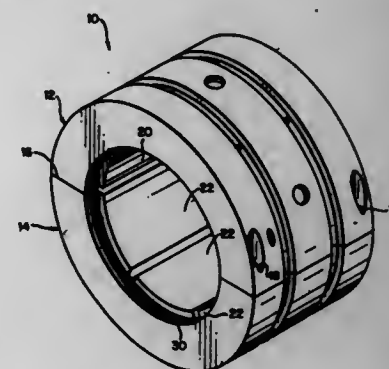
Anthony A. Corraiti, 30 Rennie Rd., Catskill, N.Y. 12414, and Edward A. Dewhurst, 774 Westmoreland Dr., Nakayama, N.Y. 12309

Filed Aug. 24, 1994, Ser. No. 295,137

Int. Cl.<sup>6</sup> F16C 17/03

U.S. Cl. 384—311

17 Claims



1. A double tilting pad journal bearing comprising:  
a) a substantially cylindrical, open ended bearing easing having a longitudinal axis extending therethrough, an interior surface of which supports a plurality of double tilting bearing liner pads for circumferential and axial tilting movement relative to said casing and said axis; said casing formed with at least one annular oil feed groove in an exterior surface thereof communicating with the interior of the bearing easing by a plurality of radially directed feed passages; said interior surface also formed with at least one oil drain annulus in communication with at least one radially oriented drain port.

5,482,381

**ACTUATOR ASSEMBLY HAVING LABYRINTH SEAL**

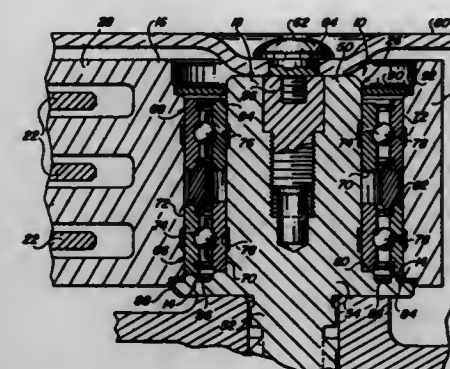
Richard G. Krum, Thousand Oaks; Eldon L. Nelson, Simi Valley; Khosrow Mohajerani, and Michael B. Moir, both of Newbury Park, all of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Jun. 16, 1994, Ser. No. 260,519

Int. Cl.<sup>6</sup> F16C 33/80; G11B 5/55

U.S. Cl. 384—480

17 Claims



1. An actuator assembly for a computer disk drive, comprising:  
a) a pivot shaft fixed relative to a housing for the computer disk drive, the pivot shaft defining a pivot axis for the actuator assembly;  
an actuator generally encircling at least a portion of the pivot shaft, the actuator including an arm assembly which extends toward a stack of data storage disks, and being pivotable about the pivot axis;  
a bearing assembly having upper and lower edges, an inner race fixed to the pivot shaft, and an outer race fixed to the actuator; and  
a labyrinth seal adjacent to an edge of the bearing assembly, including an axially extending ridge disposed in facing relation to an edge of the outer race and separated therefrom by an air gap.

5,482,382

**BALL BEARING**

Takanobu Sato, Odawara; Hirotsuki Takata, and Ryo Goine, both of Yokohama, all of Japan, assignors to NSK Ltd., Tokyo, Japan

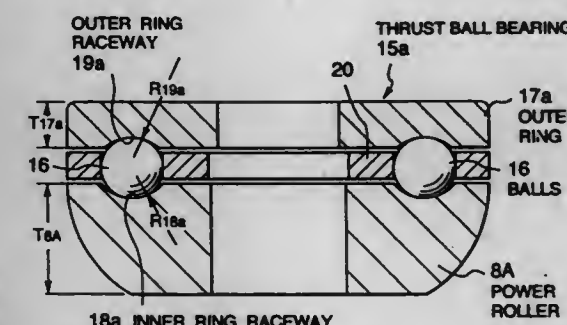
Filed Mar. 8, 1995, Ser. No. 400,747

Claims priority, application Japan, Apr. 8, 1994, 6-070477

Int. Cl.<sup>6</sup> F16C 33/02; 19/10

U.S. Cl. 384—492

12 Claims



1. A ball bearing comprising:  
a) a first raceway ring;  
a) a first raceway having sectionally circular, but annular as a whole, said first raceway ring being formed on one surface of said first raceway ring;  
a) a second raceway ring arranged to be concentric with said first raceway ring;



a second raceway having sectionally circular, but annular as a whole, said second race being formed on one surface of said second raceway ring and being positioned to oppositely face said first raceway; and

a plurality of balls of which rolling surfaces are allowed to abut against said first and second raceways,

said ball bearing being exposed to a stress field in which a stress intensity factor of said first raceway ring becomes greater than that of said second raceway ring during a use of said ball bearing, a fracture toughness of a material forming said first raceway ring being higher than that of a material forming said second raceway ring, and a maximum contact surface pressure between said first raceway and each of said balls being smaller than that between said second raceway and each of said balls.

5,482,383

# BEARING HAVING MULTI-SIDED INNER RING BORE WITH ELASTOMERIC RINGS

Michael A. Gantt, Granby, and John A. Larson, New Hartford, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Dec. 16, 1994, Ser. No. 357,803

Int. Cl.<sup>6</sup> F16C 33/58

U.S. Cl. 384—513

8 Claims



1. A bearing for mounting on a multi-sided shaft, the bearing comprising:
  - an outer race;
  - an inner race coaxial with and rotatable relative to the outer race, said inner race formed with a central bore having a plurality of internal corners which accommodates said multi-sided shaft; and
  - said central bore having at least one circumferential groove in the bore and having an elastomeric ring mounted into said groove, said groove being at such depth that the elastomeric ring is exposed at said internal corners of the central bore whereby when said bearing is mounted said elastomeric material will contact said shaft.

5,482,384

# ANTI-WALLOWING ROTOR MOUNTING SYSTEM

David M. Lyle, McMinnville, Tenn., assignor to MagneTek, Inc., Nashville, Tenn.

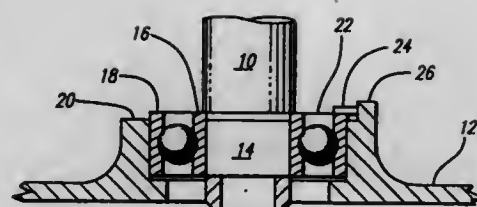
Filed Apr. 18, 1995, Ser. No. 423,778

Int. Cl.<sup>6</sup> F16C 35/06

U.S. Cl. 384—537

4 Claims

1. A rotor mounting system, comprising:
  - a cylindrical bearing assembly with upper and lower surfaces, the bearing assembly including concentric inner and outer races defining between them a pathway for ball bearings, the inner race fitting around one end of a rotor shaft;
  - a housing including a cavity shaped to receive the outer race of the bearing assembly, such that when the outer race is seated



within the cavity, the upper surface of the bearing assembly is exposed above the cavity;

- a first member mounted to the outer race of the bearing assembly extending in a radial direction beyond the diameter of the outer race, such that when the bearing assembly is seated in the cavity, the first member overhangs the housing proximate to the cavity, and such that when the outer race rotates within the cavity, the first member defines a circular path over the housing proximate to the cavity;

- a second member projecting upward from the housing proximate to the cavity, the second member lying in the circular path defined by the rotation of the first member, such that when the rotation of the outer race causes the first member to abut the second member, further rotation of the outer race is prevented.

5,482,385

# ROLLER AND CAGE ASSEMBLY

Yasunori Yokota; Kengo Hidano, and Takashi Yatsu, all of Kanagawa, Japan, assignors to Nippon Thompson Co., Ltd., Tokyo, Japan

Division of Ser. No. 200,658, Feb. 23, 1994. This application

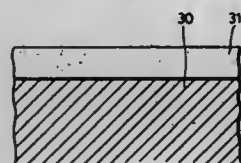
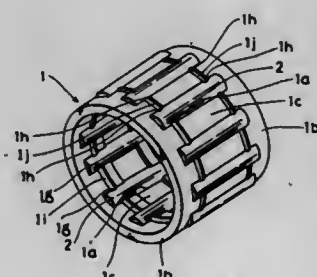
Oct. 12, 1994, Ser. No. 321,611

Claims priority, application Japan, Feb. 25, 1993, 5-012663; Feb. 25, 1993, 5-012666; Feb. 25, 1993, 5-012677; Apr. 1, 1993, 5-021168; Apr. 1, 1993, 5-021169

Int. Cl.<sup>6</sup> F16C 33/56

U.S. Cl. 384—572

2 Claims



1. A roller and cage assembly comprising:
  - a roughly cylindrical cage in which a plurality of pockets are formed in parallel in the axial direction; and
  - rollers that are inserted respectively into each of said pockets, wherein composite plated films are formed on at least a surface of said cage, said composite plated films consisting of fine particles of fluororesin uniformly dispersed in a matrix, said matrix being nickel-phosphorous (Ni-P).

5,482,386

# SELECTION CIRCUIT FOR AN ELECTRO-THERMAL PRINTER WITH A RESISTANCE-TYPE RIBBON

Wolfgang Thiel, and Stephan Günther, both of Berlin, Germany, assignors to Francotyp-Postalia GmbH, Berlin, Germany

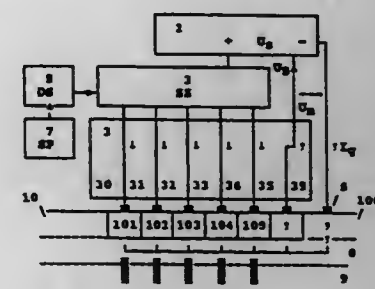
Filed Jun. 25, 1993, Ser. No. 82,747

Claims priority, application Germany, Jun. 26, 1992, 42 21 275.8

Int. Cl.<sup>6</sup> B41J 2/35

U.S. Cl. 400—120.12

21 Claims



1. In an electro-thermal printer including an ETR print unit having a print head with temporarily activated electrodes, a current collector electrode, a switching unit connected to the ETR print unit, a print control unit connected to the switching unit, a memory connected to the print control unit, and a resistance-type inking ribbon being heated for transferring ink particles to a receiving medium to form a print image having pixels, an energy source for supplying energy to the temporarily activated electrodes forming the pixels, the energy source comprising:
  - a constant voltage source having an input for receiving a measured reference voltage, measured as a voltage drop in a non-selective part of a current path formed by the resistance-type ink ribbon; means to preset the constant voltage source to an adjustable constant voltage, the measured voltage is added to the voltage of the constant voltage source, means providing a supply voltage to energize the temporarily activated electrodes, said supply voltage being equal to the sum of the adjustable constant voltage and the measured reference voltage.

# DOT PRINT HEAD AND METHOD OF CONTROL OVER PRINTING THEREWITH

Jiro Tanuma; Hideaki Ishimizu; Akira Hagiwara, and Tadashi Kasai, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 18, 1994, Ser. No. 292,601

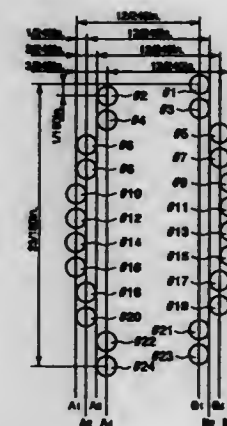
Claims priority, application Japan, Aug. 19, 1993, 5-228300

Int. Cl.<sup>6</sup> B41J 2/255

U.S. Cl. 400—124.28

5 Claims

1. An impact-type dot print head for being moved in a first direction relative to a printing medium, the head having a wire guide and a plurality of printing elements each having a printing wire with a printing tip extending in a second direction generally orthogonal to the first direction and toward the printing medium, the wire guide having a guide element corresponding to each printing wire for guiding the tip of the corresponding printing wire toward the printing medium, the guide elements being organized into a generally oblong ring arrangement and positioned in a plurality of rows, the oblong ring arrangement and each row extending in a third direction generally orthogonal to the first and second directions, at least one row being spaced  $\frac{1}{240}$  inch from an immediately adjacent row, each row being spaced a multiple of  $\frac{1}{240}$  inch from any other row.



5,482,388

# DETENT MECHANISM AND GEAR CHANGEOVER APPARATUS IN A RECORDING APPARATUS

Tsutomu Harada, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

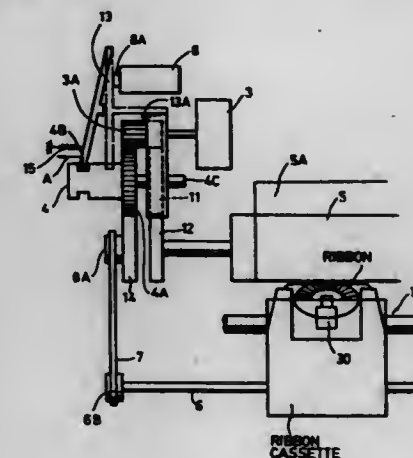
Continuation of Ser. No. 248,539, May 24, 1994, abandoned, which is a continuation of Ser. No. 858,436, Mar. 24, 1992, abandoned, which is a continuation of Ser. No. 569,584, Aug. 20, 1990, abandoned, which is a continuation of Ser. No. 192,162, May 10, 1988, abandoned. This application Dec. 2, 1994, Ser. No. 352,159

Claims priority, application Japan, May 28, 1987, 62-129961

Int. Cl.<sup>6</sup> B41J 23/32

U.S. Cl. 400—185

30 Claims



1. A recording apparatus for recording on a recording medium with an ink ribbon, comprising:
  - recording medium transport means for transporting the recording medium;
  - ink ribbon transport means for transporting the ink ribbon;
  - a motor;
  - a transferable gear;
  - changeover means for selectively moving said transferable gear between a first position at which said gear transmits a driving force from said motor to said recording medium transport means and a second position at which said gear transmits the driving force from said motor to said ink ribbon transport means;
  - detent means for inhibiting transportation of the recording medium, said detent means positionable either for effecting detention and prohibiting movement of the recording medium when the driving force is not transmitted to said recording medium transport means or for releasing detention during transportation of said recording medium when the drive force is transmitted to said recording medium transport means; and

detent release means for releasing said detent means in response to an operation by said changeover means to move said gear to the first position.

5,482,389

# PAPER FEED DRIVEN CUTTER MECHANISM OF AN ELECTRONIC PRINTER

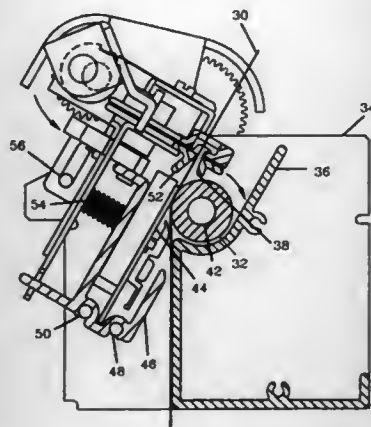
Charles Bickoff, Sharon, and Dominic P. Emello, Belmont, both of Mass., assignors to Westrex International, division of Capitel Circuits, Boston, Mass.

Filed Nov. 25, 1994, Ser. No. 344,864

Int. Cl.<sup>6</sup> B41J 11/66; 11/70

U.S. Cl. 400—621

11 Claims



1. A media cutting device of an electronic printing device comprising:

- a media cutting blade;
- said media cutting blade having a thickness, a plurality of beveled media cutting edges, a pusher bar receiving hole proximate one edge orthogonal to said beveled media cutting edges and a slot proximate a second orthogonal edge to said media beveled cutting edges;
- an upper media cutting blade guide means having a blade receiving recess with a depth exceeding the thickness of said media cutting blade and a media receiving slot orthogonal to said blade receiving recess;
- a lower media cutting blade guide means having a media receiving slot orthogonal to said blade receiving recess;
- said media receiving slot having a forward print media restraining edge;
- said media cutting blade slideably located in said recess of said upper cutting blade guide means and sandwiched between said upper blade guide means and said lower blade guide means;
- a pusher bar having a pair of media cutting blade engagement means, an opposed guiding means, and a crank pin engaging pivot located opposite and parallel to the plane formed by said media cutting blade engagement means;
- said opposed guiding means being a part of said pusher bar and limiting the slidable clearance between said media cutting blade and said upper media cutting blade guide and the lower media cutting blade guide;
- a keeper having an opposed guiding means restraining surface;
- said media cutting blade engagement means insertably engaging said media cutting blade;
- said opposed guiding means slideably restrained by said keeper;
- a crank assembly having a crank pin at a first end pivotally connected to said crank pin engaging pivot, an eccentric crank having a stroke regulating eccentricity, an anti-backup means, and an eccentric drive shaft at a second end;
- said eccentric drive shaft being engaged by a one-way clutch to a media cutting device drive means in a cutting direction and decoupled from the media cutting device drive means in a paper feeding direction;

said electronic printing device having a one-way clutch located in a paper feed mechanism and being coupled to a paper feed drive when in a paper feeding direction and decoupled from the paper feed mechanism when in the cutting direction; and a media cutting blade position sensing means; said media cutting blade position sensing means feeding an electronic signal to an electronic control means.

5,482,390

# PRINTER HAVING DISCHARGE ROLLERS

Kenjiro Murakami, Toshikazu Kotaka, Hiroshi Ishida, Kiyoto Komuro, Yoshiaki Nakayama, Nobuhito Takahashi, and Satoshi Takehana, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

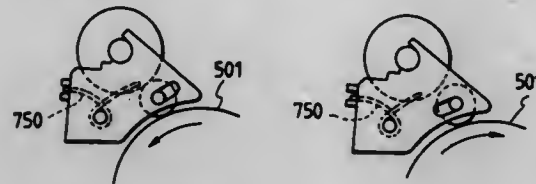
Division of Ser. No. 994,293, Dec. 21, 1992, Pat. No. 5,397,191. This application Dec. 12, 1994, Ser. No. 354,799

Claims priority, application Japan, Dec. 20, 1991, 3-356023; Jan. 29, 1992, 4-13651; Jan. 29, 1992, 4-13655; Mar. 10, 1992, 4-51598; Mar. 10, 1992, 4-51602; Mar. 10, 1992, 4-51604; Apr. 3, 1992, 4-82289; Apr. 7, 1992, 4-85537; Apr. 7, 1992, 4-85538.

Int. Cl.<sup>6</sup> B41J 13/036

U.S. Cl. 400—636.2

3 Claims



1. A printer, comprising:

- a roll-shaped platen;
- a discharge roller for discharging paper that is fed by said platen;
- a transfer roller located between said platen and said discharge roller; and
- a roller holder for rotatably supporting said discharge roller and said transfer roller, said roller holder including an elongated, curved opening for permitting said transfer roller to move in a planetary motion with respect to said platen, said transfer roller directly contacting said platen to move with respect to said platen in the planetary motion, said transfer roller contacting said discharge roller only when said platen rotates in the paper feed direction, said transfer roller transferring a rotating force of said platen to said discharge roller when said transfer roller contacts said discharge roller.

5,482,391

# TICKET ISSUING DEVICE

John C. Cook, Roodepoort, South Africa, assignor to The Republic of South Africa, South Africa

Continuation of Ser. No. 993,709, Dec. 21, 1992, abandoned.

This application Mar. 30, 1994, Ser. No. 219,903

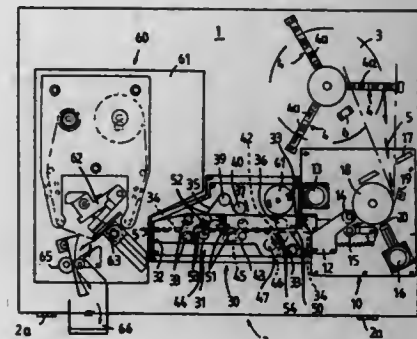
Claims priority, application South Africa, Dec. 19, 1991, 91/9989

Int. Cl.<sup>6</sup> B41J 29/00; B41L 45/00

U.S. Cl. 400—691

12 Claims

- 1. A ticket issuing device comprising:
- ticket roll stock support means for supporting a roll of ticket stock;
- a guillotine station for severing a ticket from the ticket stock;
- a path for the ticket stock to move from the roll past the guillotine station;
- a magnetic ticket encoder station for receiving a severed ticket from the guillotine station and storing data on the ticket;
- a ticket printer station for receiving the ticket having stored data thereon and for printing the ticket;
- and computer electronic control ticket processing means for controlling the operation of the guillotine, encoder and printer stations, wherein:

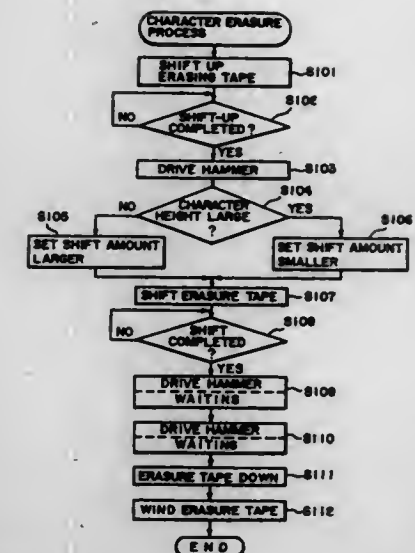


the stations each comprise a separate module composed of construction elements mounted on a corresponding base plate member;

the guillotine module comprises guillotine means for severing a ticket from the ticket stock, and roll stock haul-off means including a guide roller and pinch drive roller for advancing the ticket stock to the guillotine means, and a motor for the operation of each of the guillotine means and the drive roller; the magnetic ticket encoder module includes magnetic encoder means for storing data on a magnetic stripe on the ticket stock, belt ticket drive means moving a ticket along a primary track past the encoder means, and sensor means linked to the electronic control means for controlling the ticket processing operation thereof by transmission of ticket processing signals to the control means;

wherein the primary track connects the guillotine, encoder and printer stations and wherein the sensor means comprises a series of sensors spaced along the primary track for detecting the position of a ticket during its movement along the track, the sensors transmitting ticket processing signals in accordance with a sequence based on the position of the ticket; the belt ticket drive means causes the ticket to advance along the primary track to a first sensor of the sensor means which senses the leading edge of the ticket and initiates the operation of the magnetic encoder; and

the belt ticket drive means advances the ticket beyond the magnetic encoder means to a second sensor of the sensor means for detecting the ticket, and there is provided in the ticket printer station a print drive platen roller initiated by the second sensor.



a mounting section for mounting an erasing member for erasing the image recorded by said hammer mechanism on the recording medium, wherein the erasing member is adapted to be displaced; and means for changing the amount of displacement of said mounting section when said mounting section is displaced a plurality of times to erase the image with the erasing member in response to the kind of ribbon used as the erasing member so as to control the displacement amount of said mounting section to be larger when the ribbon has a higher adhesivity than when the ribbon has a lower adhesivity.

5,482,393

# CORRECTOR

Kazuhiko Sekiguchi, and Yoshihiko Chikugo, both of Tokyo, Japan, assignors to Zebra Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 33,029, Mar. 18, 1993, abandoned.

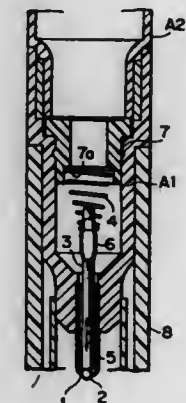
This application Aug. 16, 1994, Ser. No. 292,295

Claims priority, application Japan, Apr. 2, 1992, 4-019746 U; Sep. 18, 1992, 4-249739

Int. Cl.<sup>6</sup> B43K 7/00

U.S. Cl. 401—214

6 Claims



1. An improved corrector for dispensing correction liquid on writing errors, said improved corrector comprising:

- a main body having a tip liquid outlet through which a correction liquid may be dispensed;
- a rotary body provided within said tip liquid outlet, said rotary body being sized and positioned within said tip liquid outlet so as to prevent a correction liquid from being dispensed from said tip liquid outlet when said rotary body is stationary

5,482,392

# RECORDING APPARATUS FOR CHANGING THE AMOUNT OF DISPLACEMENT AND THE TIMING OF DISPLACEMENT OF AN ERASING MEMBER

Shinya Asano, Tokyo, and Tetsuya Kawanabe, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 286,392, Aug. 5, 1994, which is a continuation of Ser. No. 135,127, Oct. 12, 1993, abandoned, which is a continuation of Ser. No. 810,455, Dec. 19, 1991, abandoned, which is a continuation of Ser. No. 438,989, Nov. 20, 1989, abandoned, which is a continuation of Ser. No. 133,781, Dec. 16, 1987, abandoned. This application Feb. 15, 1995, Ser. No. 389,621

Claims priority, application Japan, Dec. 26, 1986, 61-308365; Dec. 26, 1986, 61-308366; Mar. 6, 1987, 62-050145

Int. Cl.<sup>6</sup> B41J 29/36; 35/14

U.S. Cl. 400—697

27 Claims

1. An apparatus for recording an image onto a recording medium to be recorded and capable of erasing the image recorded on the recording medium, said apparatus comprising:

- a hammer mechanism for impacting a ribbon through a character member;



within said tip liquid outlet, said rotary body also being sized and positioned within said tip liquid outlet so as to allow a correction liquid to be dispensed from said tip liquid outlet when said rotary body is rotated within said tip liquid outlet; and

biasing means for biasing said rotary body toward said tip liquid outlet, said biasing means comprising:

an elongated biasing lever axially movable within said main body, said lever having a first end abutting said rotary body, said lever having a second end disposed within said main body inward from said liquid tip outlet; and

a compressed spring member, said spring member firmly engaged with said second end of said lever so as to bias said rotary body toward said tip liquid outlet;

the improvement comprising said second end of said lever having an integral lateral extension which firmly engages with said spring member so as to accurately specify an exact engaging position of said spring member relative to said lever and thereby apply a specific biasing force to said rotary body.

5,482,394

# CONNECTOR EQUIPPED WITH FITTING LEVER AND METHOD OF MOUNTING WINDING SPRING IN IT

Akira Shinchi, and Toshifumi Matsuura, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

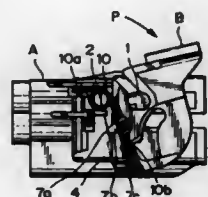
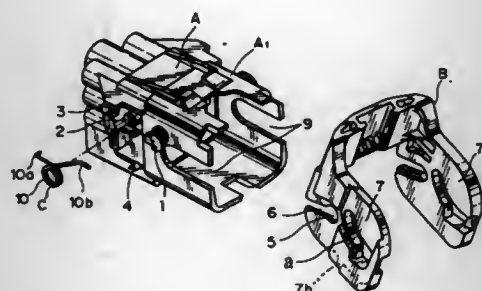
Filed Mar. 14, 1994, Ser. No. 209,905

Claims priority, application Japan, Mar. 17, 1993, 5-057156

Int. Cl.<sup>6</sup> H01R 13/62

U.S. Cl. 403—325

2 Claims



1. A connector comprising:

a fitting lever, a supporting shaft, an attaching shaft, and a provisional locking protrusion, said fitting lever attached so as to be rotatable around said supporting shaft of the connector;

a winding spring for setting an initial position of said fitting lever, said winding spring having a first position with a winding portion fit on said attaching shaft of the connector, one end engaged with the connector and the other end engaged with the fitting lever; and

said provisional locking protrusion locking the other end of the winding spring to the connector in a second position of the winding spring, wherein said fitting lever has a body having a sharp terminal for releasing the engagement of the other end of the winding spring with said locking protrusion whereby the winding spring is moveable from the second position to the first position.

5,482,395

# CLIP CONNECTOR FOR JOINING COLUMNS AND BEAMS TO CONCRETE

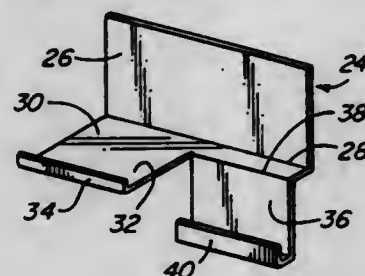
Gino Gasparini, Surrey, Canada, assignor to Menlo Park Enterprises Ltd., Delta, Canada

Filed Dec. 20, 1993, Ser. No. 169,626

Int. Cl.<sup>6</sup> F16B 2/20

U.S. Cl. 403—384

5 Claims



1. A connector assembly for concrete building panels comprising:

a C-shaped steel channel member having a center web and two flat flanges, each of the flanges terminating in an opposing lip, one of the flanges being an adjacent flange and having a plurality of spaced apart apertures therein and

non-corrosive steel connector clips for each of the plurality of apertures, each of the clips having a substantially angular shape with two angle flanges, a first angle flange substantially flat to rest against the center web of the channel member and a second flange divided into a first portion and a second portion, the first portion being flat to rest against the adjacent flange between the center web and the lip of the channel member, the second portion having a bend therein extending the second portion through one of the plurality of apertures in the adjacent flange of the channel member, the extended second portion terminating in a hook shaped end for engaging a reinforcing member in a concrete building panel with the adjacent flange on the surface of the concrete building panel.

5,482,396

# FRAME MOLDING CONNECTOR

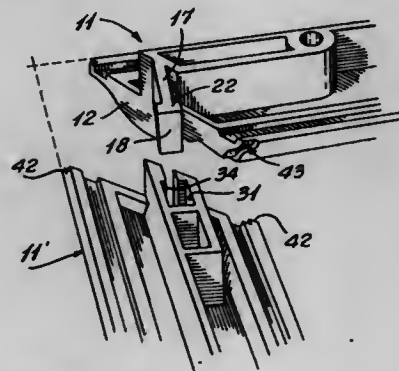
Guy Guillemet, 1441 Daunais Street, Terrebonne, Quebec, Canada

Filed Nov. 23, 1993, Ser. No. 155,836

Int. Cl.<sup>6</sup> F16B 2/00

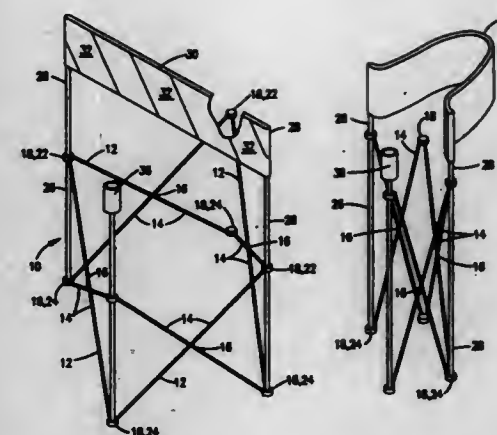
U.S. Cl. 403—401

9 Claims



1. A molding connection assembly for forming a frame comprising a plurality of moldings, each molding having a longitudinal axis and opposed beveled molding ends for interconnecting with beveled molding ends of adjacent moldings, the assembly further comprising male and female connectors, wherein said male connector being monolithically formed on the beveled molding end of one of said moldings, said male connector having a connecting rib

and a securing head, said connecting rib extending transversely to said longitudinal axis of said one molding and said securing head having angulated guide means, said female connector being monolithically formed on a beveled molding end of another of said moldings, said female connector having a rib engaging slot disposed in said beveled molding end thereof, said rib engaging slot extending transverse to said longitudinal axis of said other molding, said rib engaging slot having an enlarged securing cavity in an end thereof for receiving said securing head of the male connector in guiding engagement therein, said rib engaging slot extending from a rear portion of said other molding, said connecting rib being positionable into said rib engaging slot with said securing head received in said securing cavity, said angulated guide means comprising a sloped lower edge of said securing head, said securing cavity having a sloped guide wall adjacent said rib engaging slot for guiding engagement with said sloped edge of said securing head thereby permitting said beveled ends of said two moldings to progressively align with one another as said connecting rib is pushed into said rib engaging slot and to provide a clamping force to interconnect said beveled molding ends in facial abutting relationship.



5,482,397

# TIRE DEFLATOR AND METHOD OF DEFLATING A TIRE

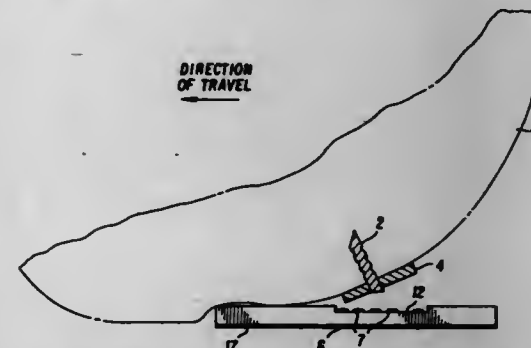
Bert Soleau, Chantilly, Va., assignor to Eagle Research Group, Inc., Arlington, Va.

Filed Feb. 18, 1994, Ser. No. 198,279

Int. Cl.<sup>6</sup> E01F 13/00

U.S. Cl. 404—6

20 Claims



1. A tire deflator for deflating a tire of a moving vehicle, which comprises:

at least one support mechanism;

a spike secured to said at least one support mechanism; and

a base member upon which said at least one support mechanism is detachably mounted such that upon the tire of the moving vehicle being penetrated by the spike, both the spike and support mechanism rotate with the tire and said base member remains positioned in the roadway upon which the vehicle travels.

5,482,398

# COLLAPSIBLE SAFETY SIGNAL AND TRAFFIC BARRICADE

Gerald E. Finke, 413 NE. Cambridge Dr., Lee's Summit, Mo. 64086

Filed Feb. 23, 1995, Ser. No. 393,068

Int. Cl.<sup>6</sup> E01F 13/00

U.S. Cl. 404—6

16 Claims

1. A portable, collapsible safety barricade, comprising:

n sets of "x" linkages, where n is an integer greater than two, each set of linkages comprising two rods of substantially equal length pivoted together at substantially the mid-point of said rods;

2n corner links, one of said corner links being pivotally connected to each end of each of said rods, with each said corner link being pivotally connected to two of said rods from different ones of said sets of linkages, thereby defining n sets of associated upper and lower sets of associated corner links;

a pair of staffs, each staff being elongated with a length greater than that of said rods, each said staff being associated with an individual set of said upper and lower corner links, each said staff having a lower end fixed to said associated lower corner link, and mounted for relative sliding with said associated upper corner link;

a band of flexible material extending between and mounted to upper ends of said staffs, said flexible material at least having areas of high reflectivity;

said barricade being movable between a storage condition in which said rods approach a parallel orientation and an operative condition in which said rods approach a perpendicular orientation and said band is taut.

5,482,399

# FORMATION OF CELLULAR RIGID PAVEMENT

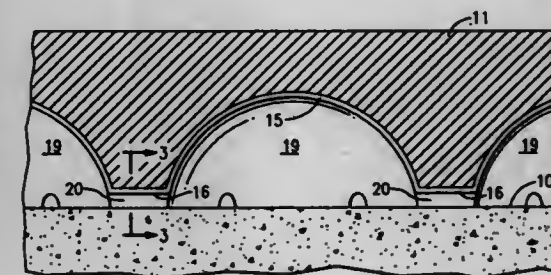
John K. Bright, 12910 W. 24th Pl., Golden, Colo. 80401, and Donald C. Taylor, 13450 W. Ohio Ave., Lakewood, Colo. 80228

Filed Dec. 8, 1993, Ser. No. 163,002

Int. Cl.<sup>6</sup> E01C 7/00

U.S. Cl. 404—17

18 Claims



13. For use in forming a cellular rigid pavement slab over an area to be paved, a panel comprising

a) a multiplicity of substantially uniformly spaced upwardly convex dome form shells arranged in an extended orthogonal matrix, and

b) a lattice of weeps with channelled undersides interconnecting the respective dome form shells and defining openings around the shells,

c) whereby when the panel is covered by the slab the shells create voids and the weeps create drainage passages interconnecting said voids to allow water percolating upwardly or downwardly to drain away.

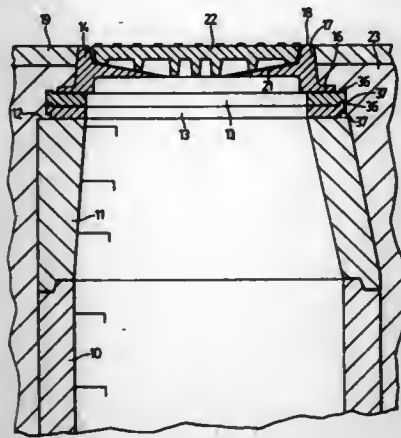
5,482,400

## SEGMENTED ADJUSTMENT RISER

Gregory F. Bavington, Toronto, Canada, assignor to National Rubber Technology Inc., Toronto, Canada  
Filed Oct. 3, 1994, Ser. No. 316,471  
Int. Cl.<sup>6</sup> E02D 29/00

U.S. Cl. 404—25

12 Claims



1. In a supporting structure for supporting a maintenance hole frame, an underground vault structure defining an endless planar upper face, an endless adjustment riser member supported on said vault structure and having a planar lower side for bearing on the said upper face, and having a planar upper side, and a maintenance hole frame supported on said adjustment riser member and having a base flange defining a planar lower face for bearing on said planar upper side of said riser member, wherein the improvement comprises said adjustment riser member comprising a segmented member comprising a plurality of similar elongated one-piece segments, each molded from resilient polymeric material, and each having two opposite ends provided with respective interengaging formations, and placed together end to end to form an endless riser member having planar upper and lower sides, said formations interengaging and resisting lateral and longitudinal displacement of each end of each segment relative to the adjacent end of each adjacent segment.

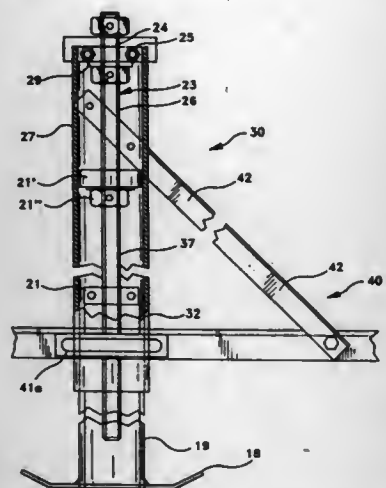
5,482,401

## BOAT-LIFT APPARATUS

Joseph Spisak, 231 Poplar Hill Rd., Binghamton, N.Y. 13901  
Filed Dec. 6, 1993, Ser. No. 161,364  
Int. Cl.<sup>6</sup> B63C 3/06

U.S. Cl. 405—3

8 Claims



1. An adjustable corner assembly for a boat-lift, comprising:

a footing that is placeable upon the bottom of a body of water, and provides support for said adjustable corner assembly;  
a leg member extending upwardly from said footing;  
a frame supported by said leg member;  
a hollow sleeve slidably disposed upon said leg member, said hollow sleeve providing a telescoping of said leg member in order to provide improved lateral support;  
a rotatable worm member disposed inside said hollow sleeve and extending from said hollow sleeve above a level of said body of water, said worm member being rotatably movable within said hollow sleeve;  
a first worm securement member comprising a washer secured to an upper portion of said hollow sleeve for supporting said rotatable worm member for rotation therein;  
a second worm securement member comprising a plate having a threaded hole for receiving said rotatable worm member, said second worm securement member secured to said leg member for supporting said worm member for rotation with respect to said leg member, said rotatable worm member rotatably causing said hollow sleeve to move into relative slidable engagement with respect to said leg member, whereby said corner assembly is caused to change height; and  
a worm support plate disposed between said first and second worm securement members.

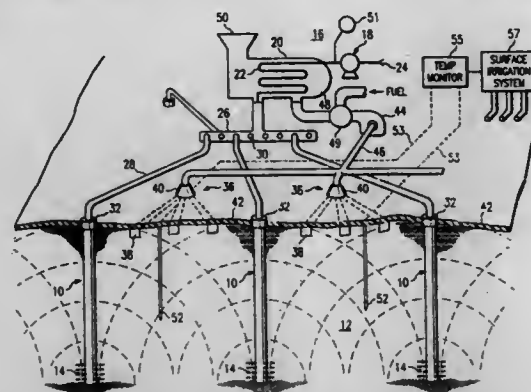
5,482,402

## METHOD AND APPARATUS FOR HEATING SUBSURFACE SOIL FOR DECONTAMINATION

Joseph M. Nelson, Wilmington, Del., assignor to Hrubetz Environmental Services, Inc., Dallas, Tex.  
Division of Ser. No. 667,952, Mar. 12, 1991, Pat. No. 5,261,765, which is a continuation-in-part of Ser. No. 458,084, Feb. 5, 1990, Pat. No. 5,011,329. This application Nov. 15, 1993, Ser. No. 152,856  
Int. Cl.<sup>6</sup> B09B 3/00; F02D 3/11

U.S. Cl. 405—128

41 Claims



1. A method for heating an earth formation for removing contaminants therefrom and for disposing of the contaminants, comprising the steps of:  
forming a bore into the earth at a location to be heated;  
installing a casing in the bore;  
supplying a combustible fuel in said bore so as to be disposed downstream from said casing;  
communicating a continuous flow of gas down said casing and through the surrounding earth formation in a direction away from said casing and into contaminated soil;  
igniting the combustible fuel to heat the gas with the heat of combustion of said fuel so that the heated gas flows through sidewalls of the bore away from the casing and through the formation to provide a continuous movement of heated gas through the contaminated soil in the formation  
vaporizing substantially all of the contaminants in the soil as the heated air passes therethrough;

recovering the vaporized contaminants; and  
disposing of the vaporized contaminants by heating the contaminants to an incinerating temperature to render the vaporized contaminants harmless.

5,482,403

## SEWER CONSTRUCTION AND PIPE ENCASEMENT THEREFOR

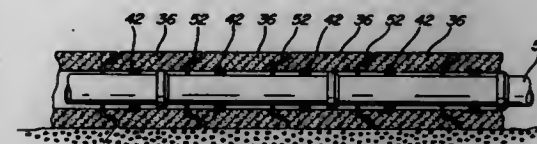
William D. Jones, Warrington, Pa., and Louis A. Esposito, Oxford, Mass., assignors to Hall Mary Rubber Company, Inc., Warminster, Pa.

Filed Jun. 25, 1993, Ser. No. 82,595

Int. Cl.<sup>6</sup> F16L 1/00; 55/00

U.S. Cl. 405—157

10 Claims



1. A pipe encasement for stabilizing an underground cylindrical plastic conduit against lateral shifting due to back filling, settling or flotation, comprising:  
an elongate monolithic casting of concrete having a cylindrical bore communicating between opposed ends of said casting for encircling, with a nominal radial clearance, a lengthwise section of the conduit; and  
annular elastic gasket means secured around the surface of said bore and extending radially inward for contiguously engaging the outer circumference of the conduit for resiliently supporting the conduit spatially in said bore.

5,482,404

## UNDERGROUND PIPE REPLACEMENT TECHNIQUE

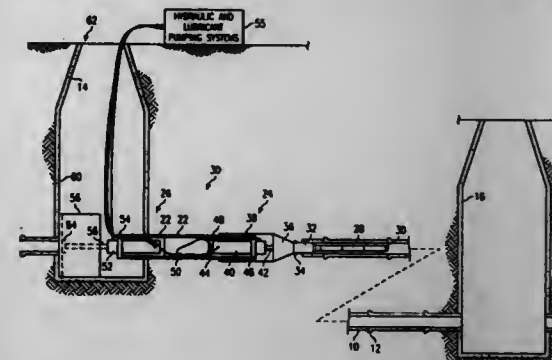
Albert A. Tenbusch, II, 2206 Marble Falls, Carrollton, Tex. 75007

Filed Jul. 27, 1993, Ser. No. 98,454

Int. Cl.<sup>6</sup> F16L 1/00; 55/18

U.S. Cl. 405—184

28 Claims



1. A method for replacing old underground pipes with new pipes, comprising the steps of:  
a) pushing a cone expander into a path of the old underground pipe and using forward motion of the cone expander to form a burrow in the path of the old underground pipe;  
b) interposing sections of the new pipe behind the cone expander so that when the sections of new pipe are pushed, the cone expander is pushed ahead by the movement of the new pipe sections;  
c) pushing the sections of new pipe forward by a force exerted on a rear-most new pipe section to thereby force the cone expander forwardly to form the burrow and at the same time

advance the new pipe sections forwardly in the path of the old pipe, whereby the cone expander and the new pipe sections are moved at the same time; and  
d) when a force exerted on the rear-most new pipe section exceeds a predefined amount, then alternately maintaining the rear-most new pipe section stationary while forcing the cone expander forwardly to form the burrow, and thereafter moving the new pipe sections forwardly while maintaining the cone expander stationary, whereby the burrow is formed and the new pipe sections are advanced alternately.

5,482,405

## COUNTERBALANCING DEVICE FOR DIVERS

Michael Tolkdorf, and Thomas Tolkdorf, both of Hertzlerstrasse 29, W-4300, Essen, Germany  
PCT No. PCT/EP92/00164, § 371 Date Jun. 11, 1993, § 102(e) Date Jun. 11, 1993, PCT Pub. No. WO92/13756, PCT Pub. Date Aug. 20, 1992

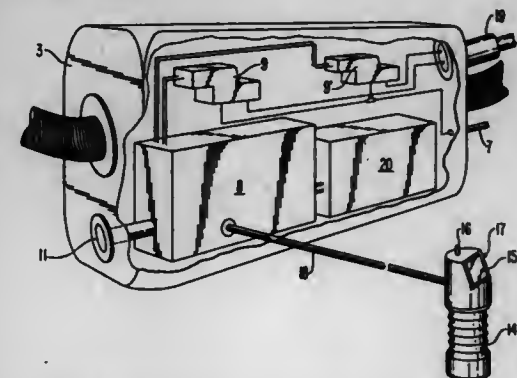
PCT Filed Jan. 25, 1992, Ser. No. 75,458

Claims priority, application Germany, Jan. 30, 1991, 41 02 622.5; Jan. 4, 1992, 42 00 090

Int. Cl.<sup>6</sup> B63C 11/08

U.S. Cl. 405—186

26 Claims



1. A method for operating a counterbalancing device for a diver for automatically diving, surfacing or floating at a predetermined water depth, comprising:  
setting the predetermined water depth on a control element;  
measuring a water depth of the diver with a pressure sensor;  
determining with the use of an electronic control unit one of a rate of descent and a rate of ascent based on a change of the measured water depth over time; and  
controlling, with the electronic control unit, at least one valve for one of filling air into and releasing air from at least one life jacket associated with the diver for controlling the diver's rate of ascent and descent, respectively, as a function of a difference between the determined rate of ascent or descent and a predetermined rate of ascent and descent, respectively, until the predetermined water depth is attained.

5,482,406

## VARIABLE SPRING RATE COMPRESSION ELEMENT AND RISER TENSIONER SYSTEM USING THE SAME

Edward J. Arlt, III, Fort Worth, Tex., assignor to Continental Emsco Company, Garland, Tex.

Filed Apr. 15, 1993, Ser. No. 47,810

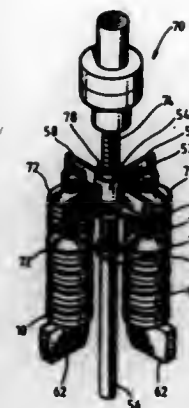
Int. Cl.<sup>6</sup> F02D 21/00

U.S. Cl. 405—195.1

16 Claims

1. A riser tensioner system for applying a tensioning force to a riser and allowing a floating platform to move within a given range along a longitudinal axis of said riser, said system comprising:  
a columnar stack of compression elements having a top compression element and a bottom compression element, said stack of compression elements being deflectable in response





to certain relative movement between said riser and said platform along said longitudinal axis, each of said compression elements having:

an inner flange having an outer coupling portion;  
an outer flange having an inner coupling portion; and  
a deflectable member having an axial spring rate that varies within a given range, said deflectable member coupling said inner flange to said outer flange in an axially spaced apart relationship, said deflectable member having a first end coupled to said outer coupling portion of said inner flange and having a second end coupled to said inner coupling portion of said outer flange.

said top compression element being coupled to said riser and said bottom compression element being coupled to said platform; and

a preload device coupled to said columnar stack of compression elements for compressing said columnar stack of compression elements and placing said columnar stack of compression elements within a selected deflection range, wherein relative axial movement of said inner flanges of said compression elements in said stack toward said respective outer flanges of said compression elements in said stack in response to relative movement between said riser and said platform further compresses said deflectable members of said compression elements in said stack and decreases said axial spring rate of each of said deflectable members such that said tensioning force remains substantially constant throughout said given range.

5,482,407

**HELICAL OUTRIGGER ASSEMBLY SERVING AS AN ANCHOR FOR AN UNDERPINNING DRIVE ASSEMBLY**  
David B. Raaf, Independence, Mo., assignor to Atlas Systems Inc., Independence, Mo.

Filed Jan. 25, 1994, Ser. No. 187,181

Int. Cl.<sup>6</sup> E02D 5/00

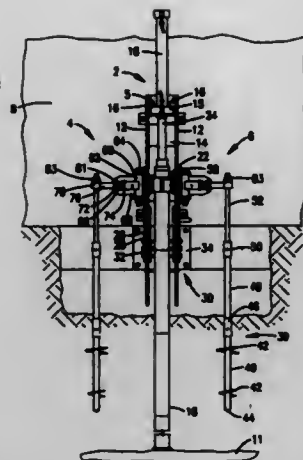
U.S. Cl. 405—230

22 Claims

1. An apparatus for exerting an auxiliary anchoring force upon an underpinning drive assembly, during a pier sinking operation in which said underpinning drive assembly drives piers into the ground to support a structure, said auxiliary anchoring force supplementing a principal anchoring force provided by a dead weight of said structure along a first path, said apparatus comprising:

a pier bracket for supporting said underpinning drive assembly while said piers are being sunk into the ground along said first path, said pier bracket securing said underpinning drive assembly to said structure to use said dead weight as said principal anchoring force along said first path;

anchoring means for being sunk into the ground, said anchoring means providing said auxiliary anchoring force to supplement said dead weight of said structure by providing a predetermined amount of resistance against movement along said first path; and



securing means for releasably fastening said anchoring means to said pier bracket, said securing means including means for providing relative motion between said anchoring means and said pier bracket along a second path, while preventing relative motion therebetween along said first path.

5,482,408

**EMBANKMENT FORMED BY PREFORMED COLLABORATING ASSEMBLABLE ELEMENTS, IN PARTICULAR FOR ROAD OR RAILWAY CONSTRUCTIONS, AND PROCESS**

Pietro Lunardi, Milan, Italy, assignor to Impresa Concarri Prefabbricati di P. Concarri, Parma, Italy

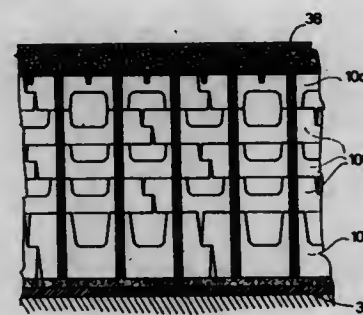
Filed Oct. 18, 1993, Ser. No. 136,945

Claims priority, application Italy, Jan. 30, 1992, MI92A2503

Int. Cl.<sup>6</sup> E02D 29/02

U.S. Cl. 405—286

23 Claims



1. An embankment for road or railway constructions, comprising:

a plurality of pre-formed elements including consolidation means for consolidating said pre-formed elements to each other;

a foundation on top of which said plurality of pre-formed elements are consolidated; and

a top slab for placement on top of said plurality of preformed elements which are consolidated on top of said foundation; wherein said plurality of pre-formed elements define empty spaces therebetween after said embankment is assembled.

5,482,409

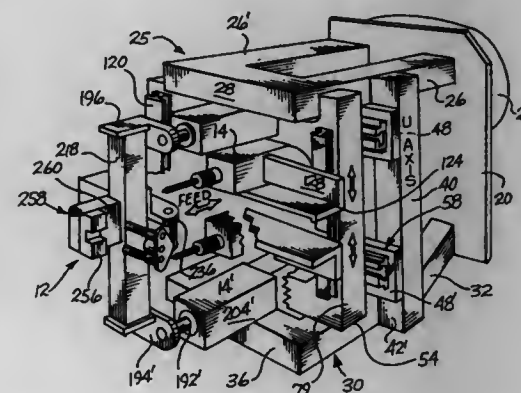
**PART POSITIONING AND DRILLING END EFFECTOR**  
Zenna J. Dunning, Spanaway; Paul E. Nelson; Hlnrich C. Patjens, both of Tacoma; James A. Shofner, Auburn, and David A. Yousko, Renton, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 6, 1993, Ser. No. 2,364

Int. Cl.<sup>6</sup> B23B 35/00; 41/00

U.S. Cl. 408—1 R

17 Claims



1. A method for positioning a workpiece having a curved surface against a panel having a curved surface with the same radius of curvature and drilling at least two coordination holes at predetermined positions in the workpiece and the panel from only one side of said panel, comprising:

positioning an end effector over a part with a clamp on said end effector bracketing said part;

energizing said clamp to grip said part  
moving said end effector to place said part flush against said panel, with said curved surfaces in continuous contact; and  
drilling at least one coordination hole through said part and said panel while pressing said part against said panel with said end effector.

5,482,410

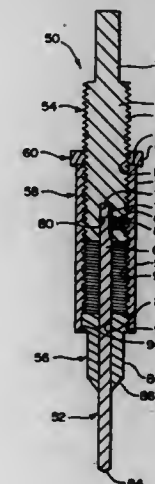
**DRILL AND COUNTERSINK ASSEMBLY AND METHOD**  
Frank J. Chambers, P.O. Box 1767, Ferndale, Wash. 98248

Filed Jan. 10, 1995, Ser. No. 370,663

Int. Cl.<sup>6</sup> B23B 35/00; 51/08

U.S. Cl. 408—1 R

14 Claims



9. A method of utilizing and adjusting a drill bit/countersink assembly, said method comprising:

a. providing a drill bit member having a lower drilling portion, an intermediate shank portion and an upper end mounting portion;

b. fixedly mounting said drill bit member to a drill bit mounting member by inserting at least the upper end mounting portion into a longitudinal center opening of the mounting member, with the lower drill bit portion extending downwardly from the drill bit mounting member, said drill bit mounting member being characterized in that it has an outer cylindrical threaded surface;

c. providing a countersink member comprising:

i. a lower countersink portion having countersink cutting edges at a lower end thereof and a through opening sized and positioned to receive the drill bit member therein in close fitting relationship;

ii. an upper countersink mounting portion having a longitudinal recess with an interiorly facing cylindrical threaded surface matching the threaded outer surface of the drill bit mounting member;

d. inserting the drill bit mounting member with the drill bit member therein into the countersink member and rotating the drill bit mounting member relative to the countersink member so as to thread the drill bit mounting member into the countersink member a desired distance, with the drill bit member extending through the lower countersink portion and being supported laterally thereby;

e. utilizing a releasable locking means to hold said drill bit mounting member and said countersink member in a fixed position relative to one another.

5,482,411

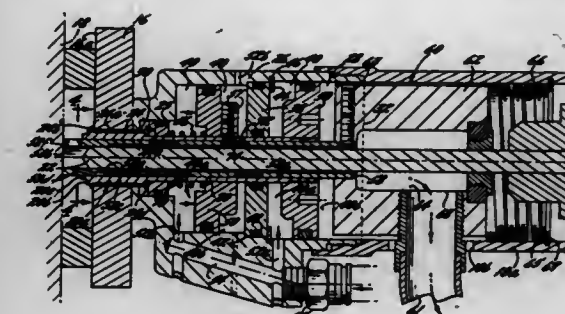
**METHOD AND APPARATUS FOR SECURELY CLAMPING A DRILL MOTOR TO A DRILL PLATE**  
John R. McGlasson, St. Charles, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Dec. 22, 1994, Ser. No. 362,113

Int. Cl.<sup>6</sup> B23B 35/00; 45/14

U.S. Cl. 408—1 R

29 Claims



21. A method of clamping a drill motor to a drill plate with a clamping device having a piston housing defining a piston chamber having first and second ends, at least one annular spacer disposed within the piston housing to divide the piston chamber into a plurality of piston subchambers, a plurality of annular pistons disposed in the piston housing such that each annular piston is disposed in and divide a piston subchamber into forward and rearward portions, a lengthwise extending annular mandrel disposed within the piston housing and having a shaft portion having a first external diameter and a tapered end portion having a second external diameter greater than the first external diameter, and a lengthwise extending collet concentrically disposed about the mandrel and having a plurality of longitudinally extending fingers, wherein the mandrel and the collet are adapted for longitudinal movement in response to longitudinal movement of the plurality of annular pistons, and wherein the spacer, pistons, mandrel and collet are disposed coaxially and define a substantially cylindrical longitudinal bore for receiving a cutting tool, the method comprising the steps of:

urging the plurality of annular pistons of the clamping device forward within the piston housing toward the first end such that the mandrel and collet are longitudinally moved from a retracted position to an extended position wherein the mandrel extends beyond said collet and the plurality of longitudinally extending fingers of the collet overlie the shaft portion of said mandrel such that the mandrel and collet may be extended through an aperture in the drill plate; and

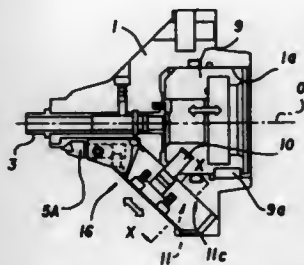
urging the plurality of annular pistons of the clamping device rearward within the piston housing toward the second end such that the mandrel is moved within the collet from the extended position to the retracted position wherein the longitudinally extending fingers of the collet overlie the tapered end portion of said mandrel and correspondingly expand radially to engage the drill plate and to clamp the drill motor to the drill plate.

#### 5,482,412 CUTTING TOOL

Yoshihisa Ueda; Syouji Takiguchi; Akira Kanaboshi, all of Yuuki, and Takehiro Ohnishi, Tottori, all of Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan  
Filed May 12, 1994, Ser. No. 241,859  
Claims priority, application Japan, May 13, 1993, 5-111926  
Int. Cl.<sup>6</sup> B23B 41/06

U.S. Cl. 408—36

1 Claim



#### 1. A cutting tool comprising:

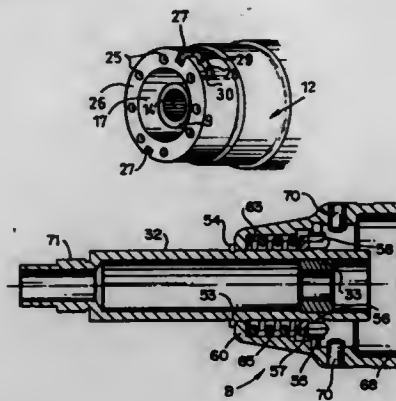
a substantially conical tool body rotatable around an axis; a groove formed along a generatrix dimension of said conical tool body and having first and second side surfaces that are opposite to each other and a bottom surface; a slider having a cutting insert and which is mounted in said groove so as to be slidable therein; and a coupling member which is mounted in said tool body such as to be integrally rotatable with said tool body and which is capable of being advanced and retracted along said axis and which is engaged with said slider so as to cause said slider to slide,

wherein the first side surface of said groove and a side surface of said slider facing said first side surface each have serrations which can be brought into close contact with each other for engagement and which extend along said generatrix dimension, and wherein a wedge member is detachably mounted between the second side surface of said groove and a slider, said wedge member being forced in said groove toward the bottom surface thereof and pressed against said slider, causing said slider to be pressed against said first side wall so as to bring said serrations into engagement with each other; and further comprising an adjusting member provided between said wedge member and the bottom surface of said groove which determines the depth to which said wedge member is forced in said groove so as to adjust the degree to which said slider is pressed against the first side surface of said groove.

5,482,413

#### PNEUMATIC TOOL

Pierre-Yves Argaud, Evian, France, assignor to Etablissements Charles Maitre, Evian Cedex, France  
Filed Apr. 25, 1994, Ser. No. 231,829  
Claims priority, application France, May 6, 1993, 93 05462  
Int. Cl.<sup>6</sup> B23B 45/04; A61C 1/08  
U.S. Cl. 408—124 3 Claims



#### 1. A pneumatic tool comprising:

a motor element, said motor element comprising a body housing a pneumatic motor, said body including:  
(a) means for connecting said body to a compressed air supply hose disposed at one end of said body;  
(b) means for controlling the feed of compressed air to said motor; and  
(c) a head provided with bayonet coupling means, said head having a tubular member for guiding a shaft provided with means for coupling said tubular member to said motor;  
a tool-holder disposed at the other end of said body from said connecting means, said tool-holder being provided at one end with means complementary to said bayonet coupling means of said head, and said tool-holder provided, at the other end, with an angular portion provided with a member adapted to support a tool, said member being connected by a kinematic coupling to said shaft, wherein said tubular element for guiding said shaft is pivotally mounted with respect to said shaft on said complementary bayonet coupling means; and  
means for wedging said tubular member in an angular position, said bayonet coupling means comprising ramps, and said complementary bayonet coupling means comprising pegs cooperating with said ramps, each of said ramps comprising at least two notches with which said pegs cooperate, one of said notches corresponding to a position in which the tubular element can pivot, and the other of said notches corresponding to a position in which said tubular element is wedged.

5,482,414

#### SLIDE COVER APPARATUS FOR MACHINE TOOL

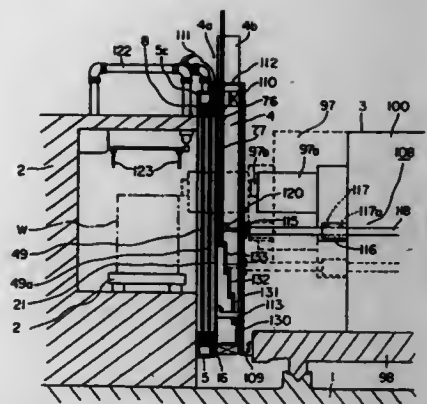
Takehiko Hayashi; Ryuji Mizutani, and Chusi Sugiyama, all of Toyota, Japan, assignors to Toyota Koki Kabushiki Kaisha, Kariya, and Kabushiki Kaisha Nakano Bankin, Toyota, both of Japan

Filed Sep. 21, 1994, Ser. No. 309,463  
Claims priority, application Japan, Sep. 21, 1993, 5-259067  
Int. Cl.<sup>6</sup> B73Q 11/08

U.S. Cl. 409—134

22 Claims

1. A slide cover apparatus for a machine tool having a machining head unit of the type wherein a tool spindle is movable at least in first and second mutually orthogonal directions encompassed within a plane perpendicular to the rotational axis of said tool spindle and a workpiece support unit located before said tool spindle for supporting a workpiece to be machined, said apparatus comprising:



a cover frame fixedly provided in a plane parallel to said plane, said cover frame disposed between said machining head unit and said workpiece support unit with respect to a third direction perpendicular to said plane;  
a first cover assembly including a main board and plural first sub-boards telescopically movable on said cover frame in said first direction, said main board having a rectangular window extending in said second direction;  
a second cover assembly including a center board and plural second sub-boards telescopically movable in said second direction for covering said rectangular window of said main board, said center board having a tool-path hole for permitting said tool spindle to pass therethrough;  
first motion link means for moving said main board to follow the movement of said tool spindle in said first direction; and  
second motion link means for moving said center board to follow the movement of said tool spindle in said second direction;  
wherein said first and second cover assemblies cooperate to partition said machining head unit from said workpiece support unit except for said tool-path hole formed on said center board.

5,482,415

#### SPINDLE HEAD OF METAL-WORKING MACHINE

Vladimir B. Belaga; Levon M. Abramian; Igor L. Fux; Genady S. Chevrenidi, and Sergei G. Popov, all of Tashkent, Uzbekistan, assignors to Maloe predpriyatie "Puler Ko., Ltd.", Moscow, Russian Federation

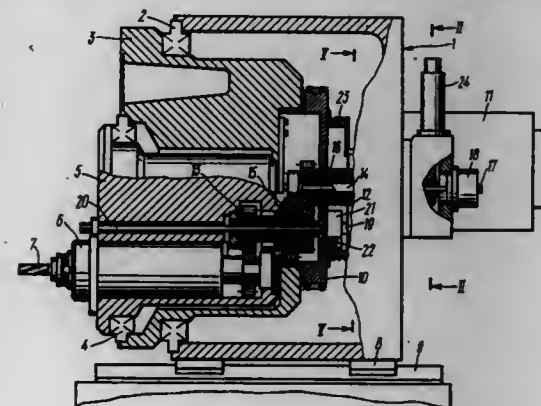
PCT No. PCT/RU92/00067, § 371 Date Jun. 2, 1994, § 102(e)  
Date Jun. 2, 1994, PCT Pub. No. WO93/19877, PCT Pub. Date Oct. 14, 1993

PCT Filed Apr. 2, 1992, Ser. No. 244,599

Int. Cl.<sup>6</sup> B23C 1/02

U.S. Cl. 409—200

3 Claims



1. A spindle head of a metal-working machine, comprising:  
a housing;

5,482,416

#### METAL WORKING MACHINE

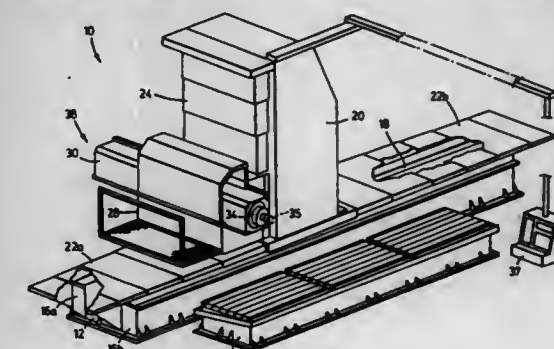
Steve Reko, Oldcastle, Canada, assignor to Reko International Group Inc., Ontario, Canada

Filed Jun. 30, 1994, Ser. No. 268,500

Int. Cl.<sup>6</sup> B23Q 5/40; F16H 27/02

U.S. Cl. 409—238

10 Claims



1. A metal working machine with a moveable tool, comprising:  
a base;



rail means extending along said base;  
 screw means extending along said base;  
 a tool support carried by said rail means, said tool support having means operatively engaging said screw means for translating said tool support on said rail means;  
 a first support for said screw means slidably received on said base to one side of said tool support;  
 a second support for said screw means slidably received on said base to another side of said tool support;  
 said tool support having means at said one side for releasably coupling to said first support and means at said another side for releasably coupling to said second support;  
 means for decoupling said first support from said tool support at a screw means supporting position when said tool support is translating along said rail means and said first support is trailing said tool support; and  
 means for decoupling said second support from said tool support at a screw means supporting position when said tool support is translating along said rail means and said second support is trailing said tool support.

5,482,417

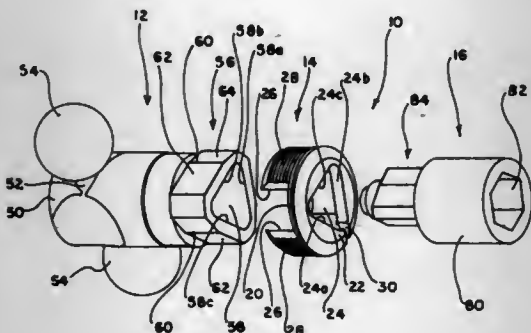
**CAM AND WEDGE-TYPE SELF-LOCKING MECHANISM**  
 Robert A. Erickson, Raleigh, N.C., assignor to Kennametal Inc., Latrobe, Pa.

Filed Oct. 12, 1993, Ser. No. 135,096

Int. Cl.<sup>6</sup> F16B 19/00; 39/284

U.S. Cl. 411—306

18 Claims



1. A self-locking mechanism (10) for fixing a rotatable lock rod (50) within a tool block (122) to secure a tool holder (126) within the tool block (122) by comprising:

- at least one cam surface (60) integral with the lock rod (50);
- a centrally-opened rotating carrier (14) normally held within the tool block (122) and extending around the cam surface (60) of the lock rod (50);
- the rotating carrier (14) having an inwardly facing wedge surface (26) disposed adjacent the cam surface (60) and wherein the wedge surface (26) and the cam surface (60) are so arranged and positioned such that the rotating carrier (14), cam surface (60) and lock rod (50) can be turned in unison as the lock rod (50) is moved between locked and unlocked positions;
- a driver (16) engageable with the lock rod (50) for rotating the same between locked and unlocked positions and for simultaneously turning both the rotating carrier (14) and the cam surface (60) as the lock rod (50) is moved between locked and unlocked positions; and
- wherein the wedge surface (26) of the rotating carrier (14) and the cam surface (60) integral with the lock rod (50) are arranged and positioned with respect to each other such that any tendency of the lock rod (50) to rotate from the locked position causes the cam surface (60) to engage the wedge surface (26) causing a binding action preventing any further unlocking movement of the lock rod (50).

5,482,418

**SELF-DRILLING ANCHOR**

Louis N. Giannuzzi, 59 Dingletown Rd., Greenwich, Conn. 06830

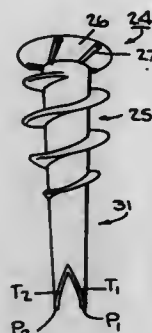
Division of Ser. No. 707,661, May 30, 1991, Pat. No.

5,234,299, which is a continuation-in-part of Ser. No. 396,109, Aug. 21, 1989, Pat. No. 5,039,262, which is a continuation-in-part of Ser. No. 215,307, Jul. 5, 1988, Pat. No. 4,892,429, which is a continuation-in-part of Ser. No. 81,016, Aug. 3, 1987, Pat. No. 4,763,456. This application Jun. 14, 1993, Ser. No. 75,375

Int. Cl.<sup>6</sup> F16B 25/10; 35/06

U.S. Cl. 411—387

1 Claim



1. A self-drilling anchor installable in a wall by means of torque-producing tool, said anchor comprising:

- an externally-threaded shank section adapted to receive the tool for turning the anchor into the wall, the shank having a longitudinal bore for receiving and engaging a fastener to hold an object; and
- drill means having at least two cutting teeth in spaced relation integral with the shank section and extending therefrom to drill a round hole in the wall having a circular bank of uniform diameter which is tapped by the shank section to secure the anchor to the wall, and a longitudinal bore extending axially between the teeth and generally aligned with the bore of the shank section, said drill means being provided with guide means formed by an arcuate outer wall on said teeth adapted to conform to and engage the bank to ensure the circularity of the hole as the anchor is turned into the wall by the tool to drill the hole.

5,482,419

**NAIL WITH OFFSET REINFORCED HEAD**

Herbert E. Leistner, 167 Sweeney Ave., Toronto, Ontario, Canada

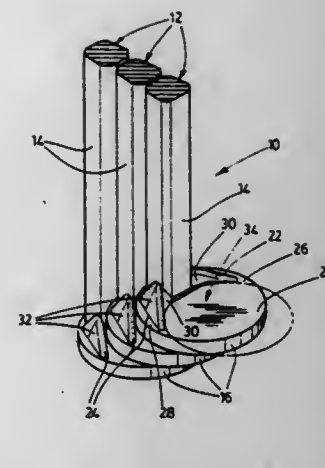
Filed Jul. 27, 1994, Ser. No. 281,165

Int. Cl.<sup>6</sup> F16B 15/00; 15/08

U.S. Cl. 411—442

9 Claims

1. A nail with an offset reinforced head, adapted to be formed into a strip of similar collated nails, comprising:
- a nail shank;
  - a nail head provided integrally on one end of said nail shank and disposed in an offset relationship with said nail shank; said nail head defining a first lower surface which is adapted to overlap an upper surface of a collated nail head, and a second lower surface between said first lower surface and said one end of said nail shank, and,
  - at least one reinforcing ridge member provided integrally on said second lower surface and extending from said one end of said nail shank to an edge portion of said nail head, said at least one reinforcing ridge member and said first lower surface of said nail head defining a recess for receiving an overlapping head portion of a collated nail, whereby said overlapping head portion of said collated nail is adapted to be received in said recess without interference from said at least one ridge member.



5,482,420

**COLLATED SCREW PACKAGE FORMED WITH WELDED WIRES**

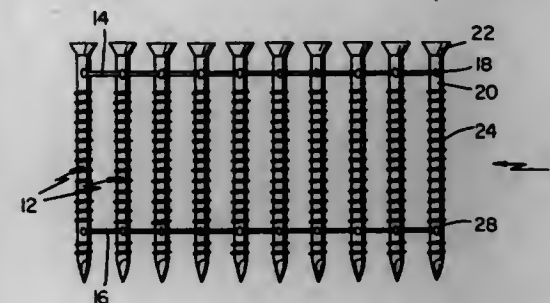
William L. Gabriel, and James E. Doherty, both of Barrington, Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Nov. 10, 1994, Ser. No. 337,936

Int. Cl.<sup>6</sup> F16B 15/08; B65D 85/24

U.S. Cl. 411—442

13 Claims



1. A screw package, comprising at least two screws, each screw having a shank, a threaded portion and at least two unthreaded portions, and at least two wires respectively connected to secure said screws in predetermined positions relative to each other, wherein points of attachment between each screw and each wire respectively occur in said unthreaded portions of the screw.

5,482,422

**PUSH BACK STORAGE RACK**

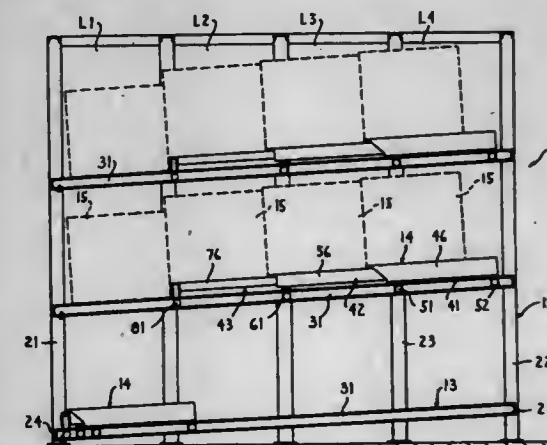
Theodore A. Hammond, 6233 St. Ives Blvd., Orlando, Fla. 32819

Filed Aug. 15, 1994, Ser. No. 290,483

Int. Cl.<sup>6</sup> B65G 1/00

U.S. Cl. 414—276

5 Claims



1. In a storage rack arrangement for permitting a plurality of loads to be disposed closely adjacent in aligned front-to-back relationship longitudinally along a generally horizontally elongated storage bay, said storage rack arrangement including a frame which defines said storage bay and which has a pair of generally parallel support tracks fixedly mounted thereon and disposed adjacent opposite sides of the bay, said support tracks being elongated

5,482,421

**DRUM LIFTER AND TRANSPORTER WITH INTEGRAL FORCE MEASURING DEVICE**

Millard Cummins, Bexley, and Robert S. Korb, Columbus, both of Ohio, assignors to The Thurman Manufacturing Co., Columbus, Ohio

Filed Jun. 21, 1994, Ser. No. 262,819

Int. Cl.<sup>6</sup> B60P 5/00

U.S. Cl. 414—21

7 Claims

1. A combination carrier and force measuring device for a container provided with a circular ring having a circumferential section extending outwardly horizontally essentially entirely around the top portion of said container comprising:
- a carrier body provided with means for moving said carrier body readily on a surface,
  - a pair of supports on said carrier body adapted only to engage said ring thereunder at oppositely disposed points on said outwardly extending circumferential section only of said ring, said oppositely disposed points being on other than a diameter of said ring, said pair of supports being on the same side of said diameter of said ring,
  - means for only vertically raising said supports on said carrier body,

longitudinally along the bay in the front-to-back direction and being slightly downwardly inclined as the support tracks project toward a front of the bay, and a telescoping carriage assembly movably mounted on the support tracks and including at least front and rear carriages which are each adapted to have a load mounted thereon when the front and rear carriages are in an extended position, comprising the improvement wherein:

said rear carriage includes generally parallel side frame elements which are longitudinally elongated, said side frame elements being hollow and being open at front ends thereof; and said front carriage includes a generally rearwardly-opening U-shaped frame defined by a front cross frame member which extends sidewardly of the bay and which adjacent opposite ends is rigidly joined to a pair of generally parallel elongated side frame members which are cantilevered rearwardly and which are slidably telescopically engaged and supported within the hollow side frame elements of the rear carriage.

5,482,423

## GOODS DROP OUT DEVICE

Hirotoishi Tawara, Kasukabe, Japan, assignor to Kao Corporation, Tokyo, Japan

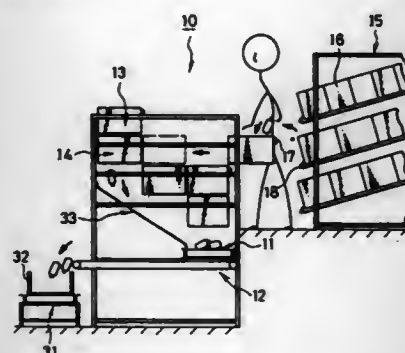
PCT No. PCT/JP92/00962, § 371 Date Mar. 18, 1993, § 102(e) Date Mar. 18, 1993, PCT Pub. No. WO93/02951, PCT Pub. Date Feb. 18, 1993

PCT Filed Jul. 29, 1992, Ser. No. 30,352

Claims priority, application Japan, Aug. 1, 1991, 3-214228; Aug. 1, 1991, 3-214229; Aug. 1, 1991, 3-214230

Int. Cl.<sup>6</sup> B65G 65/23

U.S. Cl. 414-414



1. A goods drop out device comprising:
  - a drop out box defined at least by side walls;
  - a plurality of goods receptacle portions defined by partitioning walls which engage with said side walls of said drop out box, the partitioning walls have selectable insertion positions in said drop out box for modifying an arrangement pattern of said goods receptacle portions defined in said drop out box, and being capable of selectively forming a plurality of arrangement patterns of said goods receptacle portions, each goods receptacle portion having an open bottom;
  - an opening and closing device at the open bottom of each of said goods receptacle portions for normally closing said open bottoms and for dropping out the goods in the goods receptacle portions by an opening operation of said opening and closing device, said opening and closing device including a plurality of smaller opening and closing members corresponding to a minimum interval of said inserted partitioning walls, said smaller opening and closing members being in parallel relationship to each other; and
  - means for opening selected ones of said smaller opening and closing members which at least partly correspond to the bottoms of respective goods receptacle portions containing goods to be dropped out,
  - the insertion position of partitioning walls in said drop out box being determined such that in at least one selected arrangement pattern a single smaller opening and closing member

corresponds to the bottoms of both of adjacent goods receptacle portions defined in said arrangement pattern.

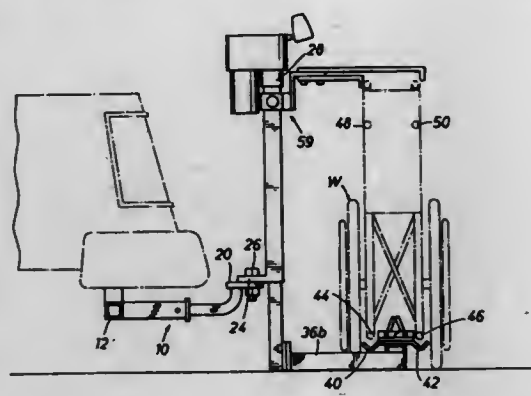
5,482,424

CAR RACK FOR WHEELCHAIRS AND THE LIKE  
David L. Jones, Houston, and George L. Drenner, Jr., Sugarland, both of Tex., assignors to Mobility Plus, Inc., Houston, Tex.

Filed Jan. 30, 1995, Ser. No. 380,658  
Int. Cl.<sup>6</sup> B60P 3/06

U.S. Cl. 414-462

5 Claims



1 Claim

1. A rack for mounting on the rear of a car for carrying a wheelchair, said wheelchair having a seat supporting framework that includes two parallel horizontal frame members close to the ground, said rack comprising
  - a pair of chair support members including two spaced-apart channels that extend horizontally for engaging the two horizontal frame members close to the ground along the respective longitudinal axes of the frame members to support the chair on the rack,
  - an L-shaped lift member having a horizontal arm upon which the support members are mounted and a vertical arm, and means for moving the L-shaped lift member upwardly to raise the chair to a traveling position above the ground and to lower the chair downwardly to a position adjacent the ground for removing the chair from the rack.

5,482,425

## CONVEYOR SHEET CARGO CONTAINER AND METHOD

Victor I. Podd, Jr., 1678 SW. 20th Ave., Boca Raton, Fla. 33486, and Stephen D. Podd, One Lincoln Blvd., Rouses Point, N.Y. 12979

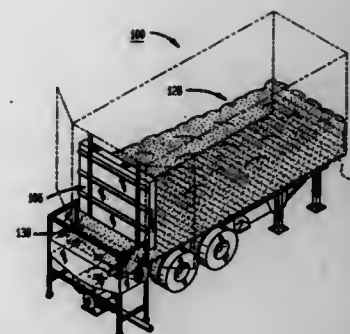
Continuation of Ser. No. 954,346, Sep. 30, 1992, abandoned, which is a continuation-in-part of Ser. No. 732,451, Jul. 18, 1991, abandoned. This application Dec. 30, 1994, Ser. No. 367,676

Int. Cl.<sup>6</sup> B60P 1/38

U.S. Cl. 414-527

20 Claims

1. An unloading system for use with a cargo container, said container having a cargo space defined by a container body with a floor between, a left side wall and a facing opposite right side wall, a ceiling facing the floor between the left side wall and right side wall, a front wall located between the side walls, floor and ceiling, at a front end of the container, and an opening at a rear end of the container formed by portions of the floor, the left side wall and the right side wall, and ceiling located at the rear of the container, the unloading system comprising:
  - a liner with length positioned on said floor, said liner having means to allow the length of the liner to expand;
  - an unloading apparatus comprising;
  - a frame support means;



- pulling means supported by and extending across the support frame to engage the liner;
- drive means supported by the frame and connected to the pulling means to drive the pulling means to pull the liner outward from the cargo container to unload cargo therefrom;
- connecting means releasably connecting the pulling means to the frame support means, and adapted to connect the pulling means to the support frame at any one of a multitude of heights;
- bulkhead means located forward of and adjacent the back opening, means connected to the container body and to the bulkhead means, suspending the bulkhead means inside the container body so that the bulkhead means does not depend upon the floor for support, the bulkhead means including a thin planar bulkhead with reinforcing bars secured thereto inside container body and said bars extending laterally across the bulkhead to engage the container body so that when a cargo is placed inside the container, the bars transfer a load of the cargo from the bulkhead to the container body; and when the liner is pulled outward, the cargo is unloaded the container through an opening in the bulkhead.

5,482,426

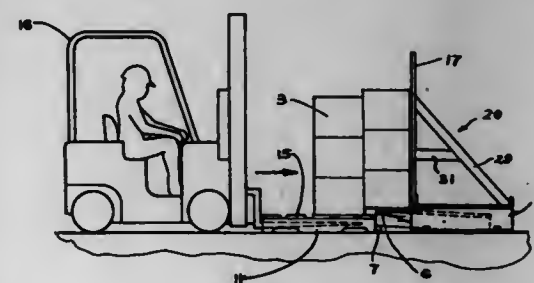
## PALLET CHANGING METHOD

Gary L. White, 1825 Gentian, Grand Rapids, Mich. 49508  
Filed Jul. 13, 1994, Ser. No. 274,601

Int. Cl.<sup>6</sup> B65G 67/00

U.S. Cl. 414-786

3 Claims



1. A method of changing a load supported by a first pallet to a second pallet, wherein each pallet comprises a raised load supporting surface spaced above a floor engaging lower surface, the method comprising:
  - placing the first pallet supporting the load adjacent a stop member rigidly mounted on a floor surface, the stop member having an opening at a lower end sufficient for a pallet to slide under the stop member and extending upwardly therefrom to form an abutting surface for engaging a side of the load on the first pallet, the first pallet being positioned so that it has a rear edge facing the stop member and a front edge on an opposite side facing away from the stop member;
  - placing a spacer member is placed under the front edge of the first pallet to raise the front edge of the first pallet above a

level of the second pallet, the spacer member being moveable inwardly toward the stop member along with the first pallet; placing the second pallet against the front edge of the first pallet; sliding the second pallet toward the stop member while being positioned against the first pallet, such that the first pallet is forced under the stop member while the load is held in place, thus causing the load to be slidably transferred from the first pallet to the second pallet, with the elevation of the front edge of the first pallet by the spacer facilitating sliding transfer of the load, the spacer being moved inwardly to the stop member along with the first pallet to maintain a continued elevation of the front edge of the first pallet with respect to the second pallet as the load is changed from the first to the second pallet.

5,482,427

## HORIZONTAL LOADING APPARATUS

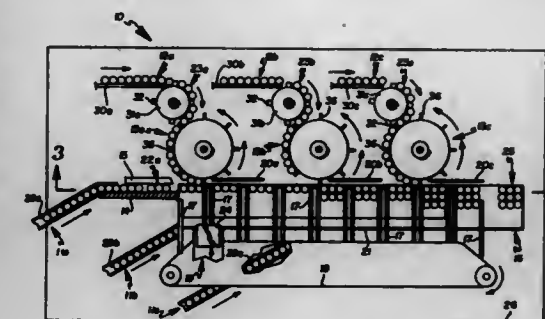
Allen L. Olson, Crosby, Minn., assignor to Riverwood International Corporation, Denver, Colo.

Filed Nov. 19, 1993, Ser. No. 154,947

Int. Cl.<sup>6</sup> B65B 35/54; B65G 57/14

U.S. Cl. 414-789.6

21 Claims



1. An apparatus for forming stacked article groups in a packaging process, comprising:
  - a) a linear conveyance mechanism having an upstream end and a downstream end; and
  - b) a plurality of article input and combining stations, said article input and combining stations being arranged at predetermined intervals along said conveyance mechanism, a first article input and combining station forming a first stacked article subgroup on said conveyance mechanism, each successive article input and combining station adding a successive stacked article subgroup to its preceding stacked article subgroup to form a combined stacked article group, each said article input and combining station including:
    - high and low article input lines and a combining wheel, said combining wheel being disposed tangentially with respect to said conveyance mechanism and further being arranged to receive a high single level article group from said high input line and to transport said high single level article group to a point of intersection with said conveyance mechanism, said low article input line being disposed at a predetermined vertical level and aligned with said conveyance mechanism at a predetermined angle so as to intersect said conveyance mechanism at a position which is located upstream with respect to said intersection point and deposit a low single level article group on said conveyance mechanism, said low article input line including a conveyor and a metering screw, said metering screw being oriented parallel with respect to said conveyance mechanism, and wherein said combining wheel merges said high and low single level article groups to form a respective said stacked article subgroup at said intersection point.



5,482,428

# **APPARATUS AND METHOD FOR SEPARATING STACKED ARTICLES**

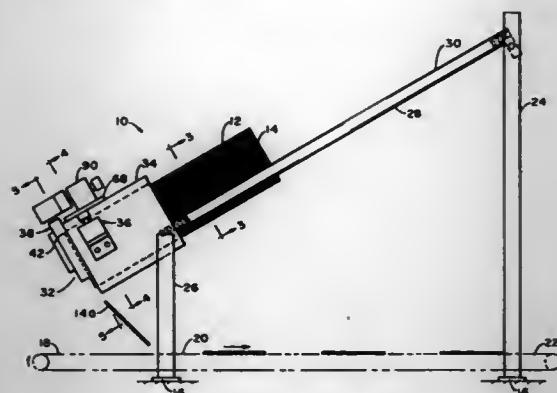
Charles H. Kuhlman, Sidney, Ohio, assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 11, 1994, Ser. No. 288,999

Int. Cl.<sup>6</sup> B65G 59/06

U.S. Cl. 414—798.1

21 Claims



21. A method for separating an axially aligned stack of disks, each disk having opposed side faces and an outer edge extending there between, one from another comprising the steps of indexing said stack of disks into a first location such that the penultimate disk of the stack is in a predetermined location; holding the outer edge of the penultimate disk in the predetermined location; engaging the outer edge of a disk to be separated along a portion of its outer edge by applying sufficient force so as to engage the disk while not effecting separation of the disk from the stack; and while so engaging the disk, effecting the axial displacement of the disk to be separated from the penultimate disk, such that said separated disk freely disengages and falls from the axially aligned stack.

5,482,429

# **FAN BLADE CONTAINMENT ASSEMBLY**

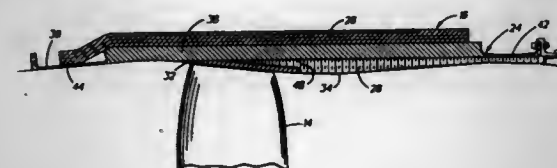
Allan R. Penda, Amston, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 29, 1994, Ser. No. 235,044

Int. Cl.<sup>6</sup> F01D 21/00

U.S. Cl. 415—9

4 Claims



1. A fan blade containment assembly for an aircraft engine, the aircraft engine including an array of fan blades that are rotatable about a longitudinal axis, the fan blade containment assembly including a casing disposed radially outward of and circumferentially about the array of fan blades, the casing having an inner diameter, at least one acoustic panel attached to said inner diameter of said casing downstream of the array of fan blades, the acoustic panels define a flow surface downstream of the array of blades, a portion of said inner diameter of said casing defining a flow surface forward of the array of fan blades, the flow surface being uniform and continuous in the circumferential and axial directions.

5,482,430

# **HIGH PERFORMANCE TURBOMOLECULAR VACUUM PUMPS**

Marabed Hablanian, Wellesley, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

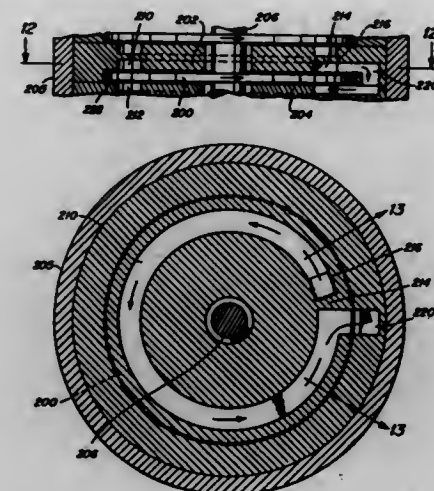
Division of Ser. No. 875,891, Apr. 29, 1992, Pat. No. 5,358,373.

This application Sep. 20, 1994, Ser. No. 309,226

Int. Cl.<sup>6</sup> F01D 1/36

U.S. Cl. 415—90

10 Claims



1. A turbomolecular vacuum pump comprising: a housing having an axis, an inlet port and an exhaust port; a plurality of vacuum pumping stages located within said housing and disposed between said inlet port and said exhaust port, each of said pumping stages including a rotor and a stator; means for rotating said rotors such that gas is pumped from said inlet port to said exhaust port; and one or more of said vacuum pumping stages comprising a molecular drag stage having a rotor comprising a disk with an upper and lower flat surface and a stator comprising means defining at least a pair of channels, each channel of said pair connected in series along said axis in opposed relationship to each respective opposite flat surface of said disk, a conduit between neighboring channels, and a blockage in each of said channels, said blockage being placed so that gas flows in series through said channels.

5,482,431

# **ARRANGEMENT FOR SUPPLYING COOLING AIR TO A TURBINE CASING OF AN AIRCRAFT GAS TURBINE**

Michael C. Taylor, Chellaston, Great Britain, assignor to Bayerische Motoren Werke AG, Munich, Germany

PCT No. PCT/EP93/00238, § 371 Date Aug. 4, 1994, § 102(e) Date Aug. 4, 1994, PCT Pub. No. WO93/15307, PCT Pub. Date Aug. 5, 1993

PCT Filed Feb. 3, 1993, Ser. No. 284,476

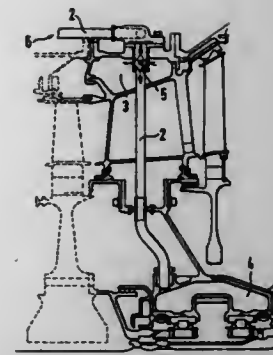
Claims priority, application Germany, Feb. 4, 1992, 92 02 345.6

Int. Cl.<sup>6</sup> F01D 25/12

U.S. Cl. 415—111

5 Claims

1. An arrangement for supplying cooling air to a turbine casing, comprising at least two cooling-air pipes or ducts branching off from a compressor stage, one pipe opening into a wall space of the turbine casing and the other pipe extending through the wall space and opening into a mounting space for turbine bearings, wherein the other cooling-air pipe has at least one air overflow opening located in the wall space.



5,482,432

# **BEARINGLESS AUTOMOTIVE COOLANT PUMP WITH IN-LINE DRIVE**

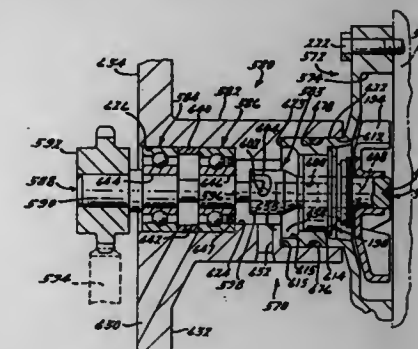
Joseph Paliwoda, West Bloomfield, and Verle Propst, Rochester Hills, both of Mich., assignors to Deco-Grand, Inc., Royal Oak, Mich.

Continuation-in-part of Ser. No. 791,725, Nov. 14, 1991, Pat. No. 5,279,503, which is a continuation-in-part of Ser. No. 549,742, Jul. 9, 1990, abandoned. This application Jan. 18, 1994, Ser. No. 182,974

Int. Cl.<sup>6</sup> F04D 29/10; F04B 35/00

U.S. Cl. 415—168.2

35 Claims



27. An in-line drive bearingless coolant pump system, comprising:

- (1) means for pumping coolant including a pump housing cover having:
  - (a) a first internal bore passing therethrough,
  - (b) a first external shaped surface generally concentrically arranged about at least a portion of the first internal bore;
  - (c) a coolant pump shaft unsupported within the means for pumping coolant upon which the impeller is mounted for rotation which projects through the bore of the pump housing cover, and
  - (d) a flexible shaft seal means for forming a leak-resistant flexible barrier about the shaft and bore to keep coolant from leaking out through the pump housing cover;
- (2) a drive shaft for driving the pump shaft and arranged along a common axis with the pump shaft;
- (3) a drive shaft support housing having a first internal shaped portion sized and shaped to snugly slidably receive and detachably mate with the first external shaped surface of the pump housing cover to align the pump housing cover and housing support structure along the common axis and prevent movement in any direction transverse to the common axis between the pump housing cover and the drive shaft support housing;
- (4) direct drive coupling means for detachably connecting the drive shaft to pump shaft for synchronous rotation in at least a first direction, and

(5) means for sealing the mating surfaces between the pump housing cover and the drive shaft support housing, and wherein the drive shaft support housing includes an internal region within the first internal shaped portion for capturing a small amount of coolant leaking past the flexible shaft seal means, and a coolant overflow hole located near the first internal shaped portion, the overflow hole being arranged for disposing of excess coolant beyond the capacity of the internal region to hold same during normal operation of the coolant pump system.

5,482,433

# **INTEGRAL INNER AND OUTER SHROUDS AND VANES**

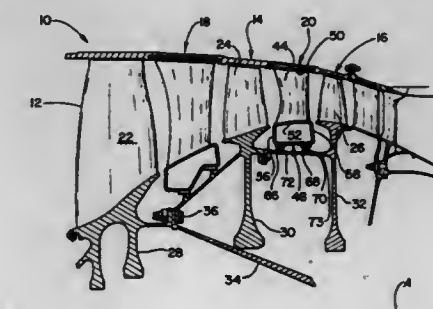
James W. Norris, and Alfred P. Matheny, both of Jupiter, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 155,965, Nov. 19, 1993, abandoned. This application Jan. 13, 1995, Ser. No. 372,718

Int. Cl.<sup>6</sup> F01D 9/04

U.S. Cl. 415—173.7

10 Claims



1. A stator having a row of spaced airfoils for passing engine fluid working medium in a gas turbine engine, an outer case, a plurality of inner shroud arcuate segments mounted end to end to form a ring, a plurality of outer shroud arcuate segments mounted end to end to form another ring concentrically disposed to said ring, at least a pair of airfoils attached to each of said inner shroud arcuate segments and said outer shroud arcuate segments to collectively define said row of spaced airfoils, the outer shroud arcuate segment of each of said pair of airfoils attached to said outer case for collectively supporting said row of spaced airfoils, each of said inner shroud arcuate segments, each of said outer shroud arcuate segments and said pair of airfoils molded from a single piece from a composite material, said inner shroud segment configured into a box-like structure radially extending from the inner end of said pair of airfoils, said box-like structure including a top wall joined to the inner end of said pair of airfoils, a bottom wall, and a pair of opposing parallel side walls, said top wall, said bottom wall and said pair of opposing parallel side walls defining an open ended channel aligned to form an annular shaped passageway in said ring, and means formed on the ends of the open ended channel for interlocking adjacent inner shroud arcuate segments.

5,482,434

# **WAVE PADDLE**

Jonathan M. Heaven, #35 2300 Walkers Line, Burlington, Ontario, Canada

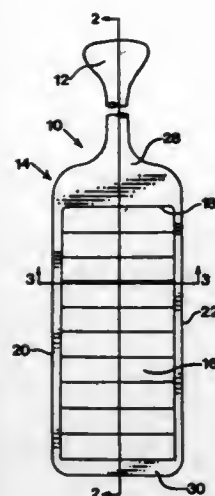
Filed Apr. 3, 1995, Ser. No. 415,619

Int. Cl.<sup>6</sup> A45B 27/00

U.S. Cl. 416—70 R

3 Claims

1. A paddle for propelling a water craft, said paddle comprising of a blade, a straight shaft connected to said blade, a handle on said shaft at the opposite end from said blade, said blade having curved



fin protruding from at least one side of said blade, said curled fins are placed generally latitudinally across to the edge of said blade.

5,482,435

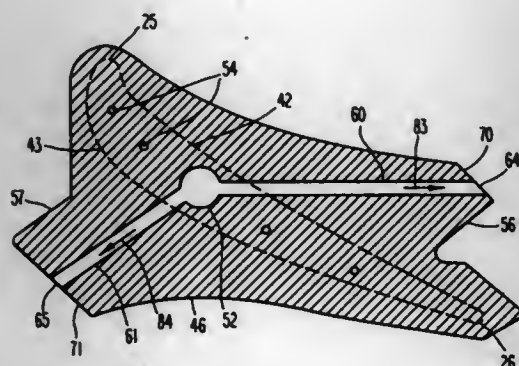
**GAS TURBINE BLADE HAVING A COOLED SHROUD**  
Robert A. Dorris; William E. North, both of Winter Springs, and Anthony J. Malandra, Winter Park, all of Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 26, 1994, Ser. No. 329,609

Int. Cl.<sup>6</sup> F01D 5/18; 5/22

U.S. Cl. 416—97 R

17 Claims



1. A turbine blade, comprising:

- a root portion for affixing said blade to a turbine rotor;
- an airfoil portion extending from said root, a first cooling fluid hole extending substantially radially through said airfoil, said first cooling hole having an inlet for receiving a flow of cooling fluid;
- a shroud projecting outwardly from said airfoil and having a radially inward facing surface, said shroud having a second cooling fluid hole extending therethrough approximately parallel to said radially inward facing surface, said second cooling fluid hole extending from said first cooling fluid hole and in flow communication therewith, whereby at least a first portion of said cooling fluid received by said first cooling fluid hole flows through said second cooling fluid hole; and
- at least one additional cooling fluid hole extending through said shroud approximately parallel to said radially inward facing surface, said at least one additional cooling fluid hole extending from said first cooling fluid hole and in flow communication therewith, whereby a portion of said cooling fluid received by said first fluid cooling hole flows through said at least one additional cooling fluid holes.

5,482,436

# **HIGH SPECIFIC SPEED FAN PROPELLER HAVING AUXILIARY BLADES**

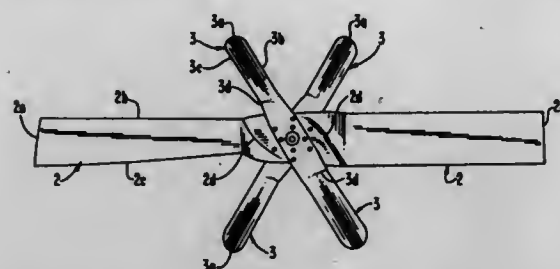
Hoy Bohanon, Sr., Muskogee, Okla., assignor to Acme Engineering & Manufacturing Corp., Muskogee, Okla.

Filed Dec. 30, 1993, Ser. No. 175,622

Int. Cl.<sup>6</sup> F04D 29/32

U.S. Cl. 416—203

7 Claims



1. A high specific speed fan propeller, comprising:  
a hub having attachment means for connecting the propeller to a turning part;  
no more than two main blades attached to the hub and extending radially a first distance therefrom, and  
at least two auxiliary blades attached to the hub and extending radially a second distance therefrom, the first distance being substantially greater than the second distance.

5,482,437

# **METHOD FOR PREVENTING FRETTING AND GALLING IN A POLYGON COUPLING**

Russell A. Houston, Mayfield, and Louis Chiang, Paducah, both of Ky., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

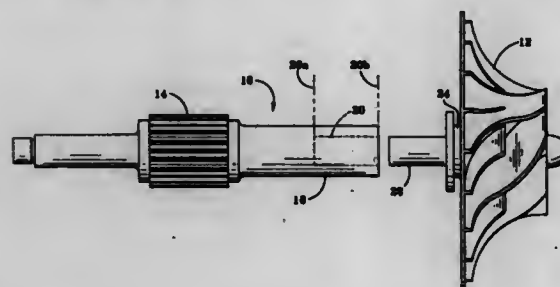
Division of Ser. No. 307,536, Sep. 16, 1994, which is a continuation of Ser. No. 147,225, Nov. 3, 1993. This application

Mar. 17, 1995, Ser. No. 405,667

Int. Cl.<sup>6</sup> F04D 29/20

U.S. Cl. 416—244 A

5 Claims



1. A coupling comprising in combination:  
a first metallic coupling member having a polygonally dimensioned bore defined by an interior bore surface;  
a second metallic coupling member having a mating, polygonally dimensioned stem, which is defined by an exterior stem surface, and which is received by the bore; and  
means for preventing galling between the interior bore surface and the exterior stem surface, the means for preventing galling including a coating of hard chromium deposited on at least one of the polygonal surfaces of the first metallic coupling member and the second metallic coupling member.

5,482,438

# **MAGNETIC DETENT AND POSITION DETECTOR FOR FLUID PUMP MOTOR**

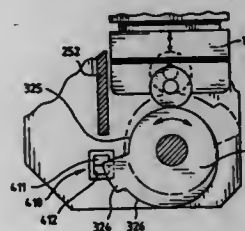
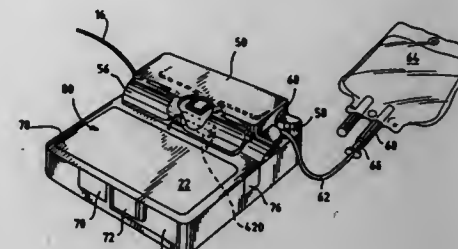
Robert L. Anderson, 1011 Rainbow Way, Boulder, Colo. 80303; Jeffrey P. Castleberry, 967 Utica Cir., Boulder, Colo. 80304, and Steve W. Stracener, P.O. Box 731, Frederick, Colo. 80530

Filed Mar. 9, 1994, Ser. No. 208,343

Int. Cl.<sup>6</sup> F04B 43/09

U.S. Cl. 417—44.1

14 Claims



8. A pump driving mechanism for a medical infusion pump, the pump driving mechanism comprising:  
a pump chamber;  
a plunger means operatively associated with the pump chamber for compressing the pump chamber to expel liquid from the pump chamber;  
a motor having a rotating drive shaft extending therefrom and a motor shaft extending therefrom, the motor shall rotating with each rotation of the motor;  
linking means between the plunger means and the drive shaft for translating rotation of the drive shaft to compression of the pump chamber by the plunger means;  
a magnet attached to a portion of the motor shaft extending from the motor for rotation with the motor shaft; and  
flux gathering means spaced radially from and magnetically coupled to the magnet for biasing the poles of the magnet in a select orientation relative to the flux gathering means with a select stopping torque to stop the plunger means in a select position, whereby the magnetic couple between the magnet and the flux gathering means prevents movement of the plunger in the absence of a torque on the motor shaft in excess of the select stopping torque.

5,482,439

# **POWER BREAKER FOR A COMPRESSOR FOR AUTOMOBILES WITH A CURVED PLUG AND WRINKLED CONTROL DISK**

Chi-Wen Chen, P.O. Box 82-144, Taipei, Taiwan, Prov. of China

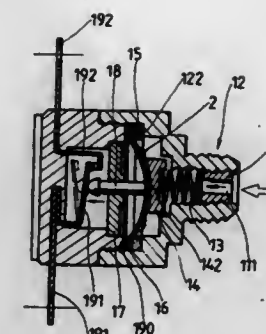
Filed Jan. 9, 1995, Ser. No. 370,413

Int. Cl.<sup>6</sup> F04B 49/06

U.S. Cl. 417—44.8

1 Claim

1. A power breaker for a compressor for automobiles comprising:  
a motor driven compressor fluidly connected to a power breaker, said power breaker comprising:  
a base provided with a first conducting member and a second conducting member, said first conducting member being a resilient member normally in contact with said second con-



- ducting member, said first conducting member and said second conducting member being designed to connect with a power supply;  
a circular plate disposed within said base and having a center hole;  
a resilient disc disposed on said circular plate, said resilient disc including an annular portion on which is fitted a diaphragm;  
a pin inserted through the center hole of said circular plate and having one end bearing against the diaphragm of said resilient disc and another end against said first conducting member;  
a control disc arranged on said resilient disc and having a wrinkled portion at a circumference thereof;  
the resilient disc and wrinkled portion comprising a means for permitting a central portion of the resilient disc to be moved between a first position and a second position;  
a sealing ring disposed on said control disc;  
a plug formed from a solid member with a cavity at one end and a curved recess at another end, the curved recess of said plug being in contact with said control disc;  
a spring mounted in the cavity of said plug;  
a cover engaged with a top of said base and having a threaded hole; and  
an adjusting screw threaded engaged with the threaded hole of said cover;  
said adjusting screw comprising a means for allowing adjustment of a force required to break contact between the first and second conducting members; actuating means providing a force for switching between a first position and a second position such that when the fluid pressure exceeds a design pressure of the power breaker, the second position is achieved, the first position being where the first and second conducting members are in contact with each other, said first position further characterized by a surface of the control disk having a concavity matching a concavity of the curved recess of the plug; the second position being where the first conducting member is displaced from the second conducting member so as to break electrical contact with the power supply, the second position further characterized by a surface of the control disk having a concavity opposite to the concavity of the first position.

5,482,440

# **BLOOD PROCESSING SYSTEMS USING A PERISTALTIC PUMP MODULE WITH VALVE AND SENSING STATION FOR OPERATING A PERISTALTIC PUMP TUBE CASSETTE**

T. Michael Dennehey, 1411 N. Hickory, Arlington Heights, Ill. 60004; Richard I. Brown, 2335 Peach Tree Ln., Northbrook, Ill. 60062, and Warren P. Williamson, 101 Southbend Ct., Loveland, Ohio 45140

Filed Dec. 22, 1993, Ser. No. 173,520

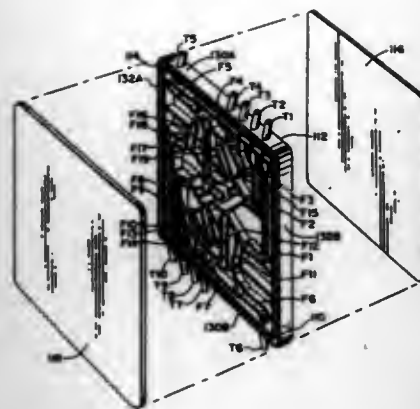
Int. Cl.<sup>6</sup> F04B 43/00

U.S. Cl. 417—63

20 Claims

1. A blood processing assembly comprising  
a separation element for separating blood from a source into a first component and a second component,





- a fluid path for conveying blood between the source and the separation element, the fluid path including an in-line cassette comprising
- a housing having an interior wall that divides the housing into a first interior area and a second interior area, first and second pump ports on the housing,
  - a flexible tubing loop that extends between the first and second pump ports outside the housing for engagement with an external peristaltic pumping element,
  - a liquid port on the housing attachable to a length of tubing that extends outside the housing interior and forms a part of the associated fluid path,
  - liquid passages formed within the first interior area and communicating with the liquid port, the first pump port, and the second pump port, and
  - valve means formed within the second interior area responsive to the application of external force for controlling liquid flow through the liquid passages and, thus, through the associated fluid path,
  - a sensing chamber formed within the second interior area and communicating with at least one liquid passage in the first interior area,
  - a first generally rigid wall that overlies the first interior area and externally seals the liquid passages, and
  - a second generally flexible wall that overlies the second interior area and externally seals the valve means and the sensing chamber, the second wall flexing in response to external forces applied to control fluid passage through the valve means, the second wall also flexing to transmit information regarding liquid pressure present within the at least one liquid passage to an external sensing element.

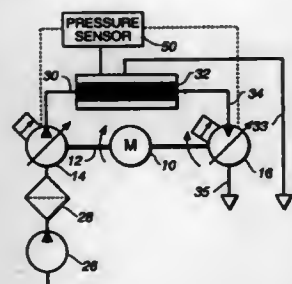
5,482,441

**LIQUID FLOW CONTROL SYSTEM**

Clark Permar, P.O. Box 701, Bolinas, Calif. 94924  
Filed Apr. 18, 1994, Ser. No. 228,884  
Int. Cl.<sup>6</sup> F04B 49/08

U.S. Cl. 417—216

20 Claims



1. Liquid treatment apparatus for providing and controlling a flow of liquid, said apparatus comprising, in combination:

a variable displacement liquid pump having a liquid inlet, a liquid outlet and a rotatable pump element;  
a variable displacement liquid metering pump having a liquid inlet, a liquid outlet and a rotatable metering pump element;  
containment structure defining a liquid flow path between the liquid outlet of said variable displacement liquid pump and the liquid inlet of said variable displacement liquid metering pump for containing liquid received from said variable displacement liquid pump and delivering said liquid to said variable displacement liquid metering pump through said liquid flow path; and  
drive means for simultaneously driving and rotating both said rotatable pump element and said rotatable metering pump element to cause liquid flow within the liquid flow path of said containment structure between the liquid outlet of said variable displacement liquid pump and the liquid inlet of said variable displacement liquid metering pump.

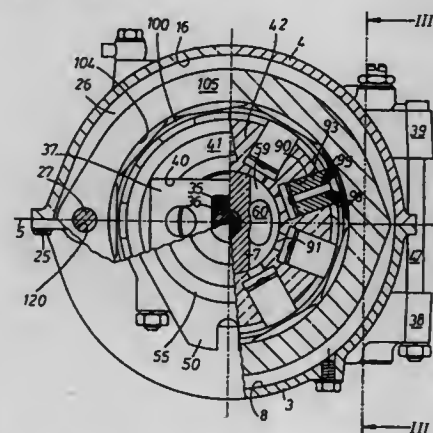
5,482,442

**HYDRAULIC RADIAL PISTON MACHINES**

Arthur A. Blair, and Christian H. Thoma, both of Jersey, Great Britain, assignors to Unipat AG, Glarus, Switzerland  
Filed Feb. 2, 1994, Ser. No. 190,374  
Claims priority, application United Kingdom, Feb. 2, 1993, 9301963; Jun. 18, 1993, 9312574; Dec. 15, 1993, 9325631  
Int. Cl.<sup>6</sup> F04B 27/04

U.S. Cl. 417—220

17 Claims



1. A radial piston hydrostatic machine having a rotary drive-shaft; a housing supporting said drive-shaft and comprising two shells connectable together along a parting plane; a stroking tracking the relative position of which determines the operation and performance of said machine and means for controlling the position of said track-ring, wherein said control means includes actuation support means containing internal fluid channels and wherein said actuation support means is located and retained in said housing by said shells.

5,482,443

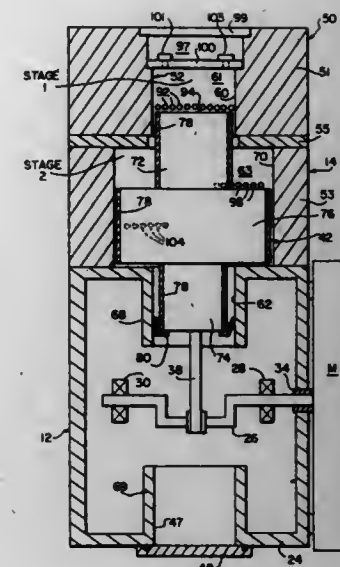
**MULTISTAGE VACUUM PUMP**

Eckhard Bez, North Chelmsford, Mass., assignor to Commonwealth Scientific and Industrial Research Organization, Richmond, Australia, and Fuji Seki Inc., Yokohama, Japan  
Continuation-in-part of Ser. No. 993,860, Dec. 21, 1992, abandoned. This application Sep. 7, 1993, Ser. No. 116,609  
Int. Cl.<sup>6</sup> F04B 25/02; 3/00

U.S. Cl. 417—266

8 Claims

1. A multi-stage vacuum pump comprising housing means, a cylinder disposed in said housing means having opposite end portions of substantially equal diameter and an enlarged diameter central portion, a piston with a substantially hollow interior disposed in said cylinder having a closed end and an end open to said



interior cylindrical end portions adjacent each end having substantially equal diameters and an enlarged diameter intermediate portion, first exhaust valve means disposed in said cylinder adjacent said closed end of said piston to define a first stage pumping chamber between said valve means and said closed end of said piston, said large diameter portion of said piston having an axial extent less than an axial extent of said enlarged diameter portion of said cylinder and defining an annular second stage pumping chamber and an annular third stage pumping chamber on opposite sides of said enlarged diameter portion of said piston, inlet and outlet means disposed in said housing means and passage means interconnecting said inlet and outlet means with said pumping chambers, second and third exhaust valve means disposed in said passage means adjacent said second and third stage pumping chambers and drive means operatively connected to said piston for reciprocating said piston in said cylinder.

5,482,444

**VIBRATION ISOLATING MOUNTING FOR AN ELECTRIC FUEL PUMP**

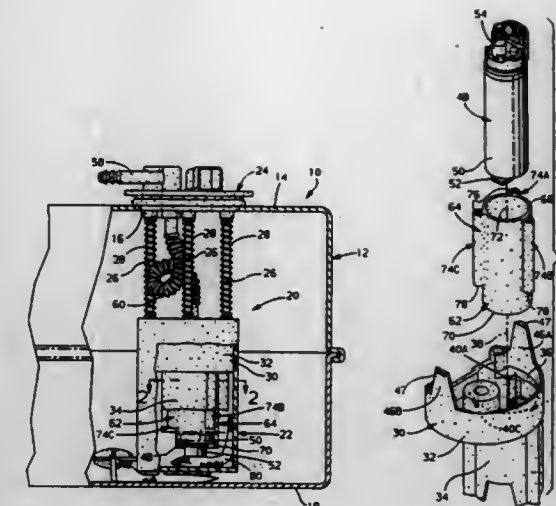
Timothy F. Coha, Burton, and Ulf Sawert, Grand Blanc, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 301,446, Sep. 6, 1994, abandoned. This application Apr. 5, 1995, Ser. No. 417,175  
Int. Cl.<sup>6</sup> F04B 53/16

U.S. Cl. 417—363

8 Claims

1. In a motor vehicle fuel system including a fuel tank and an electric fuel pump having a housing with a longitudinal centerline, a vibration isolating mounting for said fuel pump in said fuel tank comprising:
- a stationary support in said fuel tank,
  - a plurality of elastic tubes each having a tubular wall with a primary resilient flexure mode when said tubular wall is squeezed perpendicular a longitudinal centerline thereof characterized by beam bending of said tubular wall at each of a pair of diametrically opposite nodes of said tubular wall, and
  - means mounting each of said elastic tubes parallel to said longitudinal centerline of said fuel pump housing between said fuel pump housing and said stationary support with said tubular wall of each of said elastic tubes squeezed perpendicular to said longitudinal centerline thereof in said primary flexure mode along the full length of said tubular wall thereby to exert on said fuel pump housing a resultant force directed radially relative to said longitudinal centerline of said fuel pump housing.



said plurality of elastic tubes being arrayed around said fuel pump housing such that said radially directed resultant forces cooperate in suspending said fuel pump housing on said stationary support in radial static equilibrium.

5,482,445

**FREE-PISTON ENGINE HAVING A SLIDABLE RING FOR MOVING THE PISTON**

Peter A. J. Achten, Eindhoven, and Theodorus G. Potma, Kaag, both of, Netherlands, assignors to Innas Free Piston B.V., Breda, Netherlands  
PCT No. PCT/NL92/00211, § 371 Date May 18, 1994, § 102(c) Date May 18, 1994, PCT Pub. No. WO93/10344, PCT Pub. Date May 27, 1993

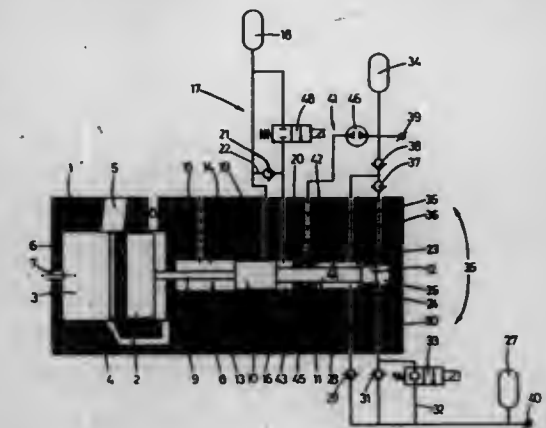
PCT Filed Nov. 19, 1992, Ser. No. 244,186

Claims priority, application Netherlands, Nov. 19, 1991, 9101933

Int. Cl.<sup>6</sup> F04B 17/00; 35/00; F02B 71/00; F02D 39/00

U.S. Cl. 417—362

9 Claims



1. A free-piston engine having a fluid pressure unit, comprising:
- a cylinder; and
  - a piston arranged within the cylinder to form a combustion room, the piston reciprocating within the cylinder between a first position in which the volume of the combustion room is at a maximum and a second position in which the volume of the combustion room is at a minimum, the piston including:
  - a plunger-shaped piston extension cooperating with the fluid pressure unit, the plunger-shaped piston extension including an axial face which is directed such that by fluid pressure loading the axial face, the piston is moved towards the first position;

a ring-shaped element slidably arranged along the plunger-shaped extension, the axial face being formed on the ring-shaped element; and  
a stop adapted for engagement by the ring-shaped element when the ring-shaped element is moved for displacing the piston to the first position.

5,482,446

## AMBULATORY INFUSION PUMP

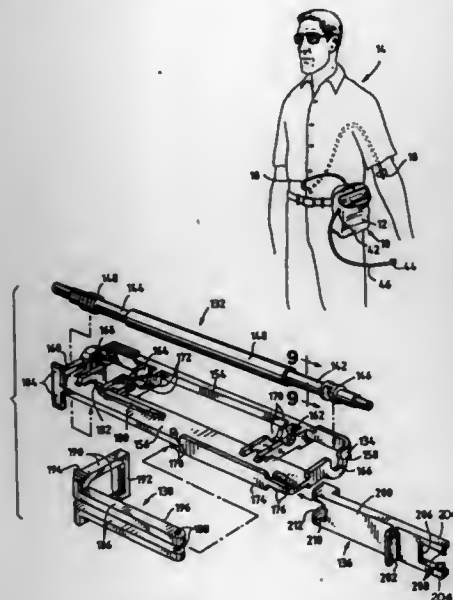
Mark E. Williamson, Wonder Lake; Jerry W. Newbrough, Zion, both of Ill.; Jeffrey P. Castleberry, Boulder, and Steve W. Stracener, Frederick, both of Colo., assignors to Baxter International Inc., Deerfield, Ill.

Filed Mar. 9, 1994, Ser. No. 209,518

Int. Cl.<sup>6</sup> F04B 43/08

U.S. Cl. 417-474

20 Claims



1. A pump chamber cassette for use with a medical infusion pump, the medical infusion pump having a housing defining a pump chamber cassette receptacle, the housing further containing a pump driving mechanism for propelling liquid through the pump chamber cassette, and means for maintaining a pump chamber cassette within the cassette receptacle in an operative position relative the pump driving mechanism, the pump chamber cassette comprising:

- an elastomeric conduit;
- a frame;
- the elastomeric conduit to the frame for holding the elastomeric conduit in a select position relative to the pump driving mechanism of the infusion pump upon placement of the cassette in an operative position relative to the pump driving mechanism;
- an anvil fixedly attached to the frame;
- a pincher attached to the frame with a space between the pincher and the anvil, the elastomeric conduit being received in the space between the pincher and the anvil; and
- biasing means on the frame movable between a first position biasing the pincher against the anvil to occlude a lumen of the elastomeric conduit and a second position for eliminating the bias of the pincher against the anvil so as to not occlude the lumen of the elastomeric conduit.

5,482,447  
PERISTALTIC PUMP WITH RIGID FLUOROPLASTIC TUBING

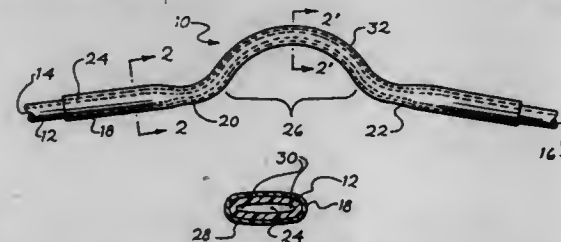
Bengt Sundén, Alvsjö; Bo Forsström, Stockholm, both of, Sweden; Charles E. Soderquist, Barrington, and Steven D. Storckman, Glen Ellyn, both of Ill., assignors to Cole-Parmer Instrument Company, Niles, Ill.

Continuation of Ser. No. 286,884, Aug. 5, 1994. This application May 24, 1995, Ser. No. 448,853

Int. Cl.<sup>6</sup> F04B 43/08; 43/12

U.S. Cl. 417-477.12

30 Claims



1. A peristaltic pump for transporting fluids, said peristaltic pump comprising  
(a) a pump housing containing a pumptube passageway;  
(b) a pumptube having inlet and outlet ends extending outside the pump housing, a pumping section contained within the pumptube passageway, and a fluid passageway extending through the pumptube from the inlet end to the outlet end; and  
(c) a plurality of pressure rollers rotatably mounted within the housing, whereby each roller in turn contacts and compresses the pumping section of the pumptube contained within the pumptube passageway so as to transport fluid from the inlet end to the outlet end of the pumptube;  
wherein at least the pumping section of the pumptube comprises an inner tube contained within an outer tube, wherein the inner tube is a first rigid fluoroplastic tubing and the outer tube is a second rigid fluoroplastic tubing such that the outside diameter of the inner tube and the inner diameter of the outer tube are closely matched, and wherein the pumptube is preformed to fit within pumptube passageway such that the pumptube within the pumping section is flattened into an oval-like shape with an oval-shaped fluid passageway such that the pressure rollers contact and compress the pumping section of the pumptube essentially along the flattened side of the oval-like shape and wherein the pumping section of pumptube returns to its flattened, oval-like shape when not compressed by the pressure rollers.

5,482,448  
POSITIVE DISPLACEMENT PUMP WITH CONCENTRICALLY ARRANGED RECIPROCATING-ROTATING PISTONS

Richard G. Atwater, and Kenneth L. Shaw, both of 112 Smith Ave., both of Rockford, Ill. 61107

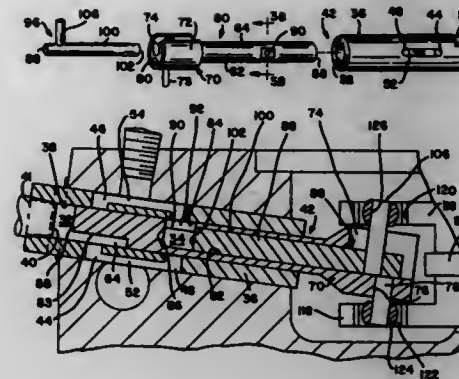
Filed Jun. 10, 1994, Ser. No. 258,092

Int. Cl.<sup>6</sup> F04B 7/04; 39/10

U.S. Cl. 417-492

9 Claims

9. In a valveless positive displacement pump of the type that includes an outer cylinder sleeve having a closed end, and inlet and outlet ports extending through opposite sides of said sleeve, a first piston which includes a chordwise relief extending across an end portion thereof, and wherein a drive mechanism causes said piston to undergo rotating and reciprocating motions so as to draw in and expel fluid through said ports when said relief is respectively in registry with said inlet and outlet ports, the improvement comprising a closed end cylindrical passage formed in said first piston, a second chordwise relief formed in said first piston and spaced axially apart from said first chordwise relief, a passage extending between said second chordwise relief and the interior of said cylindrical passage, and a second inlet port and a second outlet port



an intake opening positioned in each stop, said intake opening adapted to intake gas into each stage and an output opening in each stage, said output opening adapted to release compressed gas from each said stage.

5,482,450

## SCROLL-TYPE COMPRESSOR WITH BACKPRESSURE CHAMBER

Jean-Luc M. Caillat; Roger C. Weatherston, both of Dayton, and James W. Bush, Sidney, all of Ohio, assignors to Cope-land Corporation, Sidney, Ohio

Division of Ser. No. 194,121, Feb. 9, 1994, Pat. No. 5,427,511, which is a division of Ser. No. 998,557, Dec. 30, 1992, abandoned, which is a division of Ser. No. 884,412, May 18, 1992,

Pat. No. 5,219,281, which is a division of Ser. No. 649,001, Jan. 31, 1991, Pat. No. 5,114,322, which is a division of Ser.

No. 387,699, Jul. 31, 1989, Pat. No. 4,992,033, which is a division of Ser. No. 189,485, May 2, 1988, Pat. No. 4,877,382,

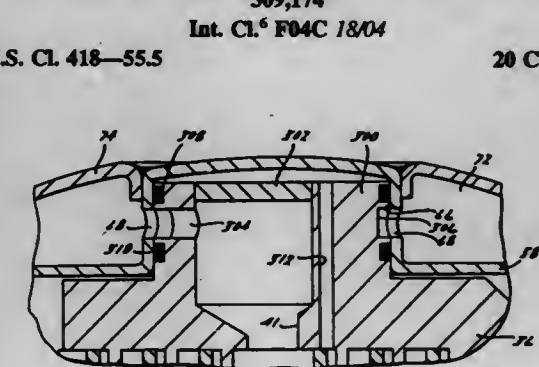
which is a division of Ser. No. 899,003, Aug. 22, 1986, Pat. No. 4,767,293. This application Dec. 21, 1994, Ser. No.

309,174

Int. Cl.<sup>6</sup> F04C 18/04

U.S. Cl. 418-55.5

20 Claims



1. A scroll-type machine for handling a working fluid, said scroll-type machine comprising:

- a shell;
- an orbiting and a non-orbiting scroll member, each scroll member having an end plate and a spiral wrap thereon, said spiral wraps being intermeshed with each other;
- a drive member for causing said orbiting scroll member to engage in relative cyclical orbiting motion with respect to said non-orbiting scroll member, said spiral wraps forming successive fluid pockets which move during normal operation between a radially outer position where said working fluid is at an outer pressure and a central position where said working fluid is at a central pressure.
- a central passage through said end plate of said non-orbiting scroll member for allowing fluid communication between an innermost of said fluid pockets and an access passage through said shell;
- a backpressure chamber disposed adjacent to an outer face of said end plate of said non-orbiting scroll member, said non-orbiting scroll member being mounted for axial compliance with respect to said orbiting scroll member; and
- a biasing passage through said end plate of said non-orbiting scroll member for allowing fluid communication between one of said fluid pockets and said biasing chamber, said biasing passage being in fluid communication with said central passage during only a portion of each of said cycles of orbiting motion.

5,482,449  
NUTATING DISC COMPRESSOR

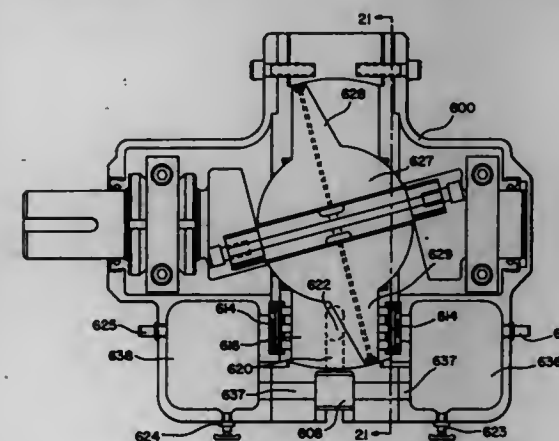
Leonard Meyer, 122 Tanglewood Dr., Elk Grove Village, Ill. 60007

Continuation-in-part of Ser. No. 815,232, Dec. 31, 1991, Pat. No. 5,251,594. This application Jul. 1, 1993, Ser. No. 85,619

Int. Cl.<sup>6</sup> F04C 18/00

U.S. Cl. 418-53

27 Claims



1. A nutating disc compressor comprising:  
a nutating disc having cone-shaped surfaces and a centrally disposed sphere,  
a symmetrical, spherical-segment shaped chamber adapted to contain said disc, said chamber having a central bearing to movably engage said sphere and to allow said disc to nutate within said chamber,  
a crankshaft rotationally disposed on the axis of said disc within said sphere,  
a drive shaft disposed on the axis of said chamber, said drive shaft being eccentrically affixed to said crankshaft whereby the rotation of said drive shaft by an external source of power causes said disc and said centrally disposed sphere to nutate, said disc having at least one gap, said chamber having a stop aligned with each gap to form at least one compression stage in said chamber, said disc having a portion which divides each stage into two sections, and



5,482,451

## APPARATUS FOR THE PREPARATION OF OPTICAL FERRULES

Melvin H. Johnson, Chadds Ford, Pa., and Frank M. Willis, Wenonah, N.J., assignors to E. I. Du Pont de Nemours, Wilmington, Del.

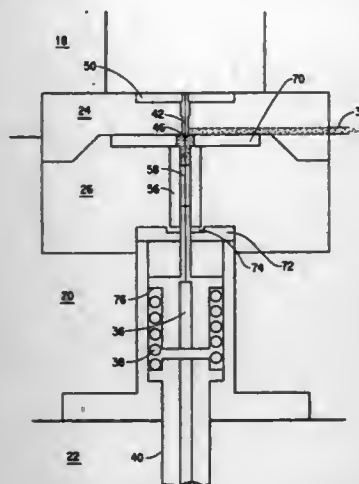
Continuation of Ser. No. 984,796, Dec. 3, 1992, abandoned.

This application May 4, 1994, Ser. No. 238,100

Int. Cl.<sup>6</sup> B29C 45/14; 45/36; 45/40

U.S. Cl. 425—116

9 Claims



1. Apparatus for the preparation of optical ferrule containing a cylindrical member therein comprising:

- (a) guide means having first and second ends and a center line and an aperture formed along the center line, wherein cylindrical member is received along the aperture;
- (b) a sleeve receiving a piston therethrough, said piston having first and second ends and a center line and an aperture formed along the center line, said first end located sufficiently close to said second end of said guide means when the apparatus is in a first position, so that said first end of said piston receives the cylindrical member along the aperture of said piston;
- (c) a pin extending into said sleeve and having a first end in contact with said second end of said piston and having a hole formed therethrough for receiving the cylindrical member and positioning means attached to a second end of said pin;
- (d) biasing means engaging said positioning means, said biasing means exerting a force sufficient to position said piston in (b) in the first position;
- (e) one or more fill gates positioned equidistant from one another and for dispensing polymer at a uniform pressure and flow into a cavity defined by said second end of said guide means, said sleeve and said first end of said piston; and
- (f) containment means configured to secure (a)-(e) in position relative to each other; and further wherein said piston of (b) is movable to a second position as polymer is dispensed through the fill gates (e) to form the optical ferrule within said cavity.

5,482,452

## INJECTION MOLDING UNIT FOR USE IN AN INJECTION MOLDING MACHINE FOR PROCESSING SYNTHETIC MATERIAL

Karl Hehl, Arthur-Hehl-Str. 32, D-72290 Lössburg, Germany

Filed May 26, 1994, Ser. No. 249,849

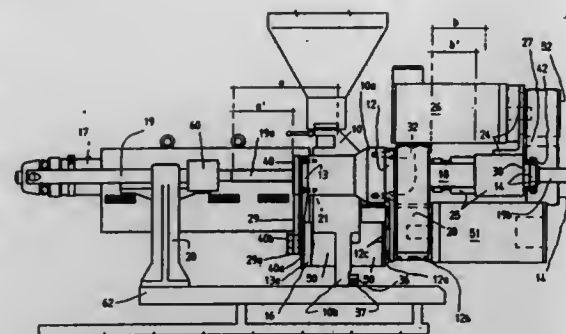
Claims priority, application Germany, May 29, 1993, 43 17 998.3

Int. Cl.<sup>6</sup> B29C 45/80

U.S. Cl. 425—145

25 Claims

1. An injection molding unit for use in an injection molding machine for processing synthetic materials comprising, a carrier block,



- a plasticizing cylinder having a longitudinal center line and mounted in said carrier block so that the longitudinal center line defines an injection axis,
- a mechanical driving unit arranged symmetrically with respect to the injection axis, said mechanical driving unit axially displacing said injection molding unit in a direction of the injection axis,
- a feeding means for feeding the synthetic materials arranged inside said plasticizing cylinder,
- a mechanical injection unit arranged symmetrically with respect to the injection axis and in line with said mechanical driving unit and being adapted to axially drive said feeding means in a direction of the injection axis, and
- an injection bridge connected with said injection unit.

5,482,453

## UTENSIL FOR MOLDING SUSHI RICE FOR USE IN PREPARING NIGIRI-ZUSHI

Yoshio Shimizu, Toyonaka, Japan, assignor to Kabushiki Kaisha Sushitaro, Toyonaka, Japan

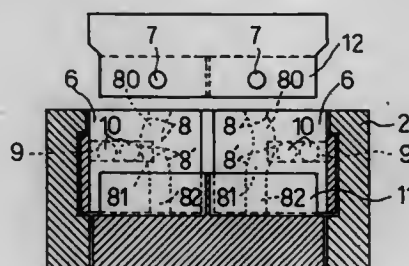
Filed Oct. 18, 1993, Ser. No. 137,469

Claims priority, application Japan, Jan. 19, 1992, 4-072703 U

Int. Cl.<sup>6</sup> A47J 43/20; B29C 33/20

U.S. Cl. 425—330

6 Claims



1. A sushi rice molding utensil for preparing nigiri-zushi, comprising:

- (a) a split mold having:
  - a lower mold member having a plurality of upwardly facing molding cavities which have side openings along at least one side of said lower mold, and
  - an upper mold member having a plurality of downwardly facing molding cavities which have side openings along at least one side of said upper mold member,
 said upper mold member being generally vertically movable relative to said lower mold member such that said downwardly facing molding cavities can be moved into alignment with said upwardly facing molding cavities in a fully closed position,
- (b) an outer frame within which the split mold is removably fittable,

(c) a side mold member which is generally horizontally movable toward said side openings of both said upper and lower molds, said side mold member being fittable within the outer frame,

- (d) at least one cam engagement between (a) one of an angular cam and a pin provided on an end wall of said side mold member and (b) the other of the angular cam and the pin provided on a wall of the upper mold member opposed to said end wall when the upper mold member and said first side mold member are fitted within the outer frame, said at least one cam engagement being sized such that said side mold member is advanced generally horizontally from an outer position to an inner position by about 5 mm towards said side openings of both said upper and lower molds when said upper mold is moved towards said lower mold from a retracted position towards said closed position, and
- (e) wherein a closed volume defined by said aligned upwardly and downwardly facing molding cavities in said closed position and delineated by inner surfaces of said side mold member when in said inner position is about 25% to 35% smaller than an open volume defined by said upwardly facing molding cavities, said inner surfaces of said side mold member in said outer position, and inner surfaces of said outer frame.

5,482,454

## C-TYPE FRAME FOR DIE TIGHTENING UNITS MOUNTED FOR AN INJECTION MOLDING MACHINE

Masaaki Miyahara; Nobuyuki Nakamura, and Kiyoto Takizawa, all of Nagano, Japan, assignors to Nissei Plastic Industrial Co., Ltd., Japan

Continuation of Ser. No. 11,212, Jan. 29, 1993, abandoned.

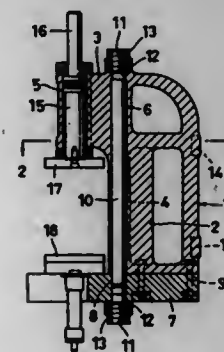
This application Sep. 21, 1994, Ser. No. 309,794

Claims priority, application Japan, Jan. 31, 1992, 4-041985; Jan. 31, 1992, 4-041986

Int. Cl.<sup>6</sup> B29C 45/64

U.S. Cl. 425—547

11 Claims



1. A C-type frame for die tightening units mounted for an injection molding machine for injecting a molten synthetic resin, the C-type frame comprising:

- a one-piece cast main frame; said main frame comprising:
  - a top end, an opposite bottom end, and a pair of holes extending through the main frame from the top end to the bottom end through substantially the entire height of the main frame;
  - an opposing pair of side frame portions, each side frame portion having a corresponding fore upper portion, respective upper frame portions projecting forward of the fore upper portions of said side frame portions, each upper frame portion having a corresponding die tightening cylinder, and a front frame portion extending between the side frame portions,
  - a base board attached to said bottom end of said main frame,
  - a pair of support columns, each support column extending through a respective hole of said main frame so that opposite ends of said each support column extend outwardly from said top end of the main frame and a surface of the base board, respectively, and

tightening means for rigidly securing said main frame to said base board by respective tightening nuts threadably engaged with male threads machined at the opposite ends of each of said support columns, said support columns extending through said respective holes of said main frame and said base board such that when said nuts are tightened a compressive force extends between the opposite ends of each support column to thereby urge the main frame and base board toward one another.

5,482,455

## HAND-HELD ELECTRICALLY POWERED FLAME PRODUCER USING DISPOSABLE FLAMESTRIPS

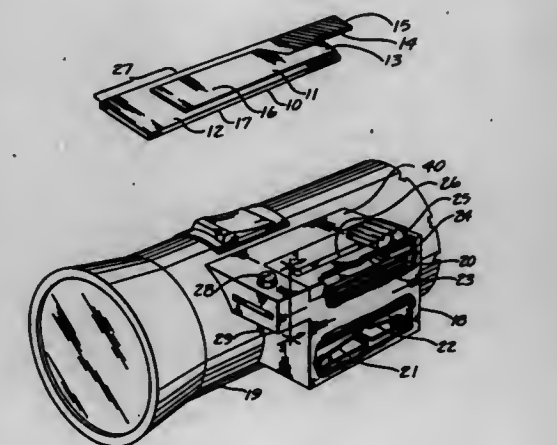
Robert I. Selter, 15223 22nd Pl. W., Lynnwood, Wash. 98037

Filed Oct. 11, 1994, Ser. No. 321,113

Int. Cl.<sup>6</sup> F23D 1/00; F21V 33/00

U.S. Cl. 431—253

12 Claims



1. A hand-held flame producer comprising at least one flamestrip further comprising:

- a base strip of combustible material having a base strip portion saturated with highly combustible material,
  - an electrically conductive strip having first and second ends and a high resistance portion of said length,
  - said electrically conductive strip being laminated onto said base strip with said high resistance portion in close proximity to said base strip portion,
  - whereby application of electrical power to said first and second ends causes said high resistance portion to glow, igniting said combustible material and said base strip portion.
11. A hand-held electrically powered flame producer comprising at least one flamestrip which further comprises:
- an electrically conductive component having an intermediary section having high electrical resistance and first and second ends,
  - a base strip made of combustible material having an end and a notch in said end, said end being saturated with readily combustible material,
  - said electrically conductive component attached to said base strip with said intermediary section straddling said notch and said first and second ends of said electrically conductive component accessible for application of electrical power,
  - whereby when electrical power is applied to said first and second ends of said conductive component said high resistance section glows with such heat as to ignite the readily combustible material with which the tip of the combustible base strip is saturated, producing a prompt, lingering flame usable for firestarting purposes and which, after being expended in this process, is disposable.

5,482,456

## LIGHT FIXTURE CANDLE ADAPTER

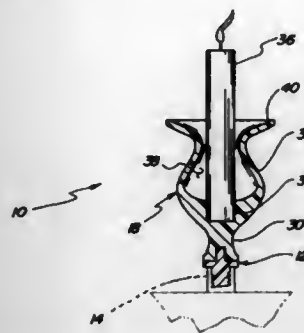
Jack M. Jwayad, and Roberta F. Jwayad, both of 6705 N. Burrage, Portland, Oreg. 97217

Filed Jan. 20, 1995, Ser. No. 376,140

Int. Cl.<sup>6</sup> F23D 3/16

U.S. Cl. 431—297

6 Claims



1. A light fixture candle adapter comprising:  
a mounting means for coupling to a light socket of a light fixture;  
and,  
a candle engaging means removably coupled to the mounting means for receiving and supporting a candle relative to the mounting means and for capturing wax dripping from the candle.

5,482,457

## GAS-OPERATED PREMIXING BURNER

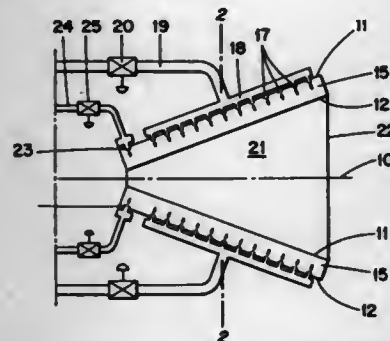
Manfred Aligner, Wetztingen; Robin McMillan, Nussbaumen, and Pirmin Schiessel, Unterehrendingen, all of, Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland  
Filed Sep. 13, 1993, Ser. No. 120,086

Claims priority, application European Pat. Off., Jan. 16, 1992, 92117673

Int. Cl.<sup>6</sup> F23C 5/00

U.S. Cl. 431—350

3 Claims



1. A gas-operated premixing burner for the combustion chamber of a gas turbine, the burner having a pre-mixing space, comprising:  
two conical sections positioned so that the pre-mixing space is conically shaped, the burner having a cone apex positioned on a burner longitudinal axis;  
means for introducing combustion air into the pre-mixing space;  
a plurality of nozzles arranged around the burner axis and directed to introduce a first fuel quantity into the pre-mixing space where the fuel mixes with inflowing combustion air; and  
means for introducing a second fuel quantity comprising additional fuel nozzles located in a region of the cone apex so that at an outlet plane of the burner perpendicular to the axis a fuel concentration in a region of the burner axis is greater than an average fuel concentration across the outlet plane.

5,482,458

## HEAT TREATMENT OF EXPANSIBLE MATERIALS TO FORM LIGHTWEIGHT AGGREGATE

Robin A. Kyffin, Efall Uchaf, Golan, Porthmadog, Gwynedd, Great Britain

PCT No. PCT/GB92/02188, § 371 Date May 23, 1994, § 102(e) Date May 23, 1994, PCT Pub. No. WO93/11084, PCT Pub. Date Jun. 10, 1993

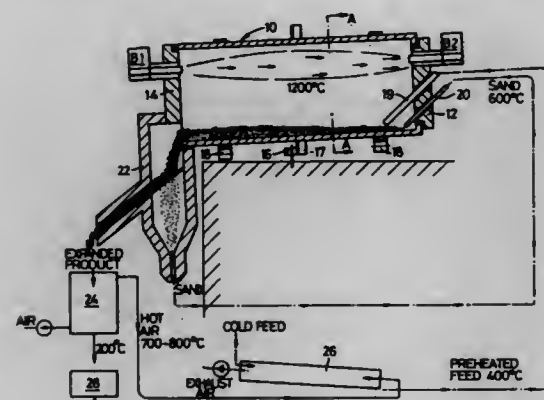
PCT Filed Nov. 26, 1992, Ser. No. 244,046

Claims priority, application United Kingdom, Nov. 29, 1991, 9125423; Jul. 9, 1992, 9214642

Int. Cl.<sup>6</sup> F27B 15/00

U.S. Cl. 432—14

14 Claims



1. A method for heat treating expandable material to form lightweight aggregate in a rotary kiln having a heated interior space of a length, breadth and cross-sectional area defined by a kiln lining, and which is inclined downwardly from a charge end to a discharge end, comprising the steps of:

- providing a kiln having a maximum ratio of said length to said breadth of 5:1;
- heating said interior space by means of at least one burner directed into said interior space from at least one end of said kiln, said interior space being heated thereby to a substantially constant elevated process temperature, said temperature being substantially constant along said length;
- passing expandable material from the charge end to the discharge end along the length of said heated interior space, said material occupying a maximum of 10% of the cross-sectional area at the charge end and being subjected almost immediately to said process temperature upon entering the interior space, with heat being transferred to the material as it moves along said length primarily by radiation from the heated interior space and the kiln lining and by direct contact with the kiln lining, whereby said material is heated to incipient fusion in passing from the charge end to the discharge end, producing gas which is trapped internally, to form said thereby said lightweight aggregate.

5,482,459

## POSTERIOR TOOTH SHADE GUIDE AND METHOD OF SELECTING CHARACTERIZATION FOR A TOOTH PROSTHESIS

Uriel Yarovsky, Woodland Hills, and Daniel Materdomini, Topanga Canyon, Calif., assignors to Dental Illusions, Woodland Hills, Calif.

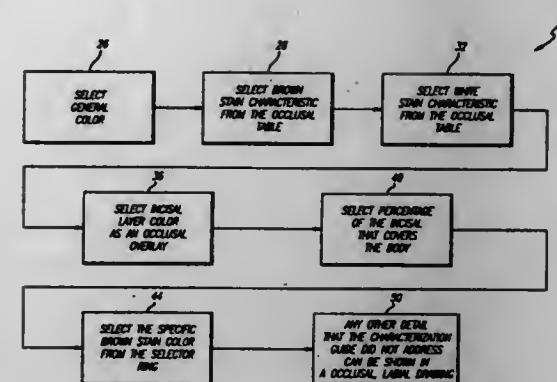
Continuation-in-part of Ser. No. 22,420, May 4, 1994, Pat. No. Des. 357,321, and Ser. No. 22,409, May 4, 1994, Pat. No. Des. 357,320. This application Aug. 26, 1994, Ser. No. 297,251

Int. Cl.<sup>6</sup> A61C 19/10; 5/00

U.S. Cl. 433—26

30 Claims

1. A method for selecting characterizations for a tooth prosthesis, comprising the steps of:



- selecting a general tooth color for the tooth prosthesis from a shade guide;  
selecting a brown stain characteristic for the tooth prosthesis from an occlusal table;  
selecting a white stain characteristic for the tooth prosthesis from the occlusal table; and  
selecting an incisal layer color for the tooth prosthesis as an occlusal overlay.

5,482,460

## DENTAL MODEL ARTICULATOR

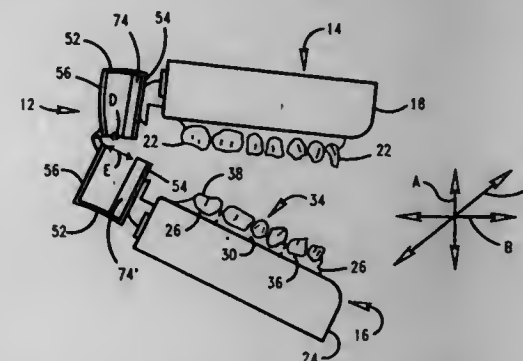
Robert P. Farnor, Jr., Erwin, Tenn., and David G. Scruggs, Somerville, Ala., assignors to American Biotech, Inc., Erwin, Tenn.

Filed Aug. 26, 1993, Ser. No. 112,846

Int. Cl.<sup>6</sup> A61C 11/00

U.S. Cl. 433—57

13 Claims



1. An articulator for supporting a pair of upper and lower dental models in occlusion and for simulating occlusal and masticatory movements of the dental models by application of an external force to the dental models said articulator comprising:

- a first generally U-shaped member having a middle panel and integral front and rear panels spaced apart from one another and extending parallel to one another from opposite sides of said middle panel, said front panel having an elongate channel defined therein, said U-shaped member being resiliently deformable to substantially uniformly resist a force applied thereto so that the front and rear panels flex relative to one another upon application of the force thereto;
- a second generally U-shaped member having a middle panel and integral front and rear panels spaced apart from one another and extending generally parallel from opposite sides of said middle panel of said second U-shaped member, said front panel of said second U-shaped member having an elongate channel defined therein, said second U-shaped members being resiliently deformable to substantially uniformly resist a force applied thereto so that the front and rear panels of said second U-shaped member flex relative to one another upon application of said second mentioned force thereto;

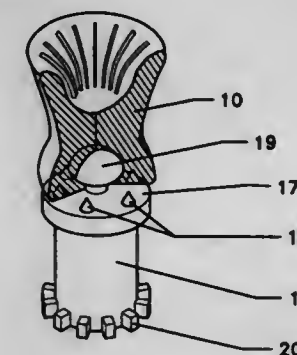
5,482,461

## DISPOSABLE PROPHY ANGLE

Joyce K. Yale, 428 31st St., Hermosa Beach, Calif. 90254  
Continuation of Ser. No. 250,528, Mar. 31, 1994, abandoned.  
This application Apr. 21, 1995, Ser. No. 426,632Int. Cl.<sup>6</sup> A61C 3/06

U.S. Cl. 433—125

10 Claims



1. A prophylaxis right angle comprising an outer body and an inner body having therein a rotor of a driving gear which interacts with a rotor of a driven gear having a slinger disk an attachment knob on said slinger disk, said slinger disk having a center, said slinger disk including a plurality of raised projections extending from the surface of the slinger disk to engage the base portion of a prophy cup when the base opening of a prophy cup receives the attachment knob to cause a prophy cup to rotate with the same rotation of the attachment knob, said raised projections being spaced a distance from said center of said slinger disk.

5,482,462

## DENTAL HANDPIECE

Otto Rosenstatter, Seeham, Austria, assignor to Imtec Innovative Medizintechnik Gesellschaft m.b.H., Hallein, Austria  
Filed Mar. 14, 1994, Ser. No. 204,334

Claims priority, application Austria, Sep. 13, 1991, 1838/91

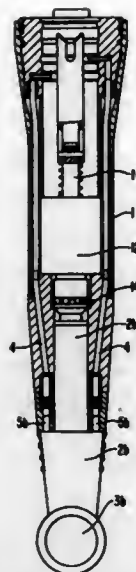
Int. Cl.<sup>6</sup> A61C 1/08; 1/10; 1/12; 17/02

U.S. Cl. 433—126

16 Claims

1. A dental handpiece comprising:  
an end grip member having a configuration to be gripped by an operator during use, said end grip member having a first end





to be connected to a supply and a second end having therein a recess, and said end grip member having extending there-through at least one coolant line to receive coolant when said end grip member is connected to the supply; and at least one tool holder selectively connectable to and detachable from said second end of said end grip member, said tool holder having a first end to carry a tool and a second end having an extension which extends into said recess at said second end of said end grip member when said tool holder is connected thereto, said extension having a portion extending into said coolant line and operable to block coolant passage or open coolant passage through a portion of said coolant line.

5,482,463

## ANTI-SLIPPAGE MECHANISM FOR DENTAL IMPLANT COMPONENTS

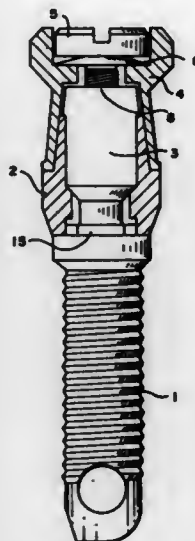
Richard S. Wilson, Jr., 1416 Burmont Ave., Havertown, Pa. 19063; Kenneth C. Wenzel, 11538 February Cir., #402, Silver Spring, Md. 20904, and Barry F. Sukoneck, 935 Remington Rd., Wynnewood, Pa. 19096

Filed Apr. 8, 1994, Ser. No. 224,872

Int. Cl.<sup>6</sup> A61C 8/00

U.S. Cl. 433—173

3 Claims



1. An implant component stack having a specially designed screw joint, said rack comprising:

- a) an implantable fixture, an abutment and a gold cylinder, said cylinder having a circular channel;
- b) a vertical axis coincident and extending through said fixture, abutment and gold cylinder;
- c) a gold prosthesis retaining screw having a grooved head, a non-threaded journal and a threaded section;
- d) a spring washer (made from material selected from the group consisting of titanium and gold alloy) that provides resistance to loosening of said screw joint, uniform pressure around its radius, maintenance of tension and which flattens out when said gold screw is torqued;
- e) said cylinder having a proximal surface and a distal surface, said prosthesis retaining screw head nestling (loosely) in said circular channel adjacent said distal surface, said washer underlying said grooved head and having an outer diameter just smaller than the diameter of said channel and an inner opening just larger than the diameter of said retaining screw; (said inner opening surrounding said retaining screw in the region of said non-threaded journal)
- f) said abutment having a central opening coincident with said axis and a proximal surface and a medial surface, said medial surface underlying said proximal surface of said gold cylinder, said abutment proximal surface including a pair of tapered legs that enclose a channel in alignment with said vertical axis;
- g) an abutment retaining screw extending through said opening in said abutment and having a central threaded cavity for receiving said gold prosthesis retaining screw, a non-threaded journal below said cavity followed by a threaded section;
- h) said fixture having a distal surface and a proximal surface, said proximal surface of said abutment overlying said distal surface of said fixture, a threaded hexagonal fitting on said distal surface of said fixture, said threaded section of said abutment retaining screw fitting into said fixture; wherein said abutment (has) further includes a first region that fits into said gold cylinder and (has) a medial region that has a planar surface extension and between said proximal surface of said gold cylinder and said planar surface extension (in which) a second washer is located.

5,482,464

## DENTAL RESIN SHEET

Shigeru Shimozawa, 3-11-33, Sone Minami-machi 1-chome, Toyonaka, Osaka, and Akira Fujii, 6-611-607, Koyo-cho Naka 6-chome, Higashi-Nada, Kobe, Hyogo, both of, Japan

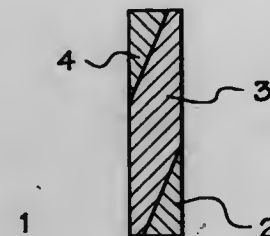
Filed Aug. 11, 1994, Ser. No. 289,019

Claims priority, application Japan, Aug. 12, 1993, 5-222211

Int. Cl.<sup>6</sup> A61C 13/08

U.S. Cl. 433—202.1

5 Claims



1. A dental resin sheet for use in dental surface prosthesis of a tooth or a veneering crown comprising:
  - a uniformly thick sheet made of a light curing resin having a plurality of dental laminated resin layers;
  - a mount; and
  - a light transmitting film,
 wherein the dental resin sheet is attached to the mount on a first surface of the dental sheet until the dental sheet is mated with the tooth, and wherein the light transmitting film is attached to a second surface of the dental sheet.

5,482,465

## DENTAL PIN ASSEMBLY

Stuart J. Filhol, 2 Church Green, Witney, Oxon, OX8 6AW, United Kingdom

PCT No. PCT/GB92/01932, § 371 Date May 23, 1994, § 102(e) Date May 23, 1994, PCT Pub. No. WO93/07827, PCT Pub. Date Apr. 29, 1993

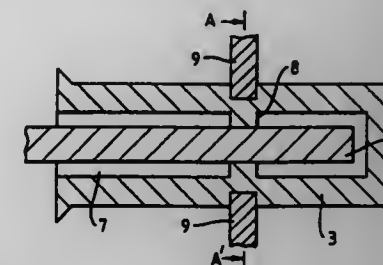
PCT Filed Oct. 21, 1992, Ser. No. 211,914

Claims priority, application United Kingdom, Jan. 21, 1991, 9122295

Int. Cl.<sup>6</sup> A61C 5/04

U.S. Cl. 433—225

19 Claims



1. A dental pin assembly comprising a dental pin holder and a dental pin, wherein the holder comprises a body that defines a longitudinal central bore for receiving the dental pin and the dental pin comprises a dentally acceptable wire having a threaded portion for self-tapping insertion into a tooth having a rolled thread and a first cross section, a shank portion having a smaller cross section than said first cross section and a shearable neck portion interconnecting the threaded and shank portions, wherein the shank portion is permanently secured in the bore by a distorted portion formed on at least one of the shank portion and the holder, said distorted portion engaging said shank portion and said holder with each other.

5,482,467

## ELECTRICAL CONNECTOR

Jean-Marie E. Nolf; Jan L. Vansant, both of Korbek-Lo; Joris I. Franckx, Bonheiden, and Reza Zadno, Overijse, all of, Belgium, assignors to N.V. Raychem S.A., Kessel-Lo, Belgium

Continuation of Ser. No. 915,998, Jul. 30, 1992, abandoned.

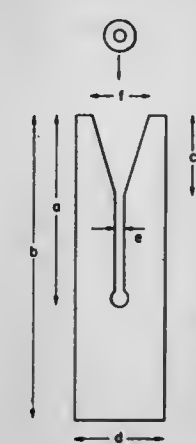
This application Sep. 8, 1994, Ser. No. 303,294

Claims priority, application United Kingdom, Jan. 31, 1990, 9002172

Int. Cl.<sup>6</sup> H01R 4/24

U.S. Cl. 439—161

33 Claims



1. An electrical connector, comprising:
  - (a) an insulation-displacement surface;
  - (b) a retaining surface;
  - (c) a metal that at constant temperature has a recoverable strain of at least 0.8% positioned to control the positions of said displacement surface and said retaining surface relative to one another; and
  - (d) said insulation-displacement surface and said retaining surface being positioned relative to one another such that an electrical conductor having an insulating jacket can be forced between said surfaces to displace the insulating jacket and cause recoverable of said metal.

5,482,466

## FLOSSING TOOL

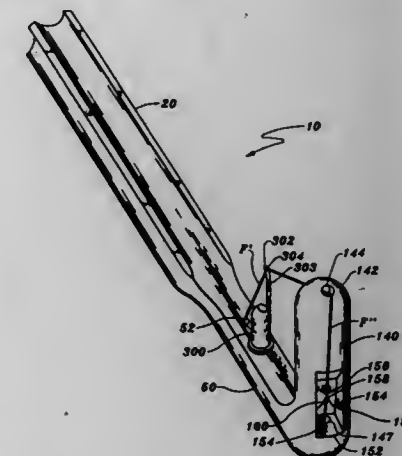
Patrick M. Haynes, P.O. Box 532, Penryn, Calif. 95663

Filed Jul. 9, 1993, Ser. No. 89,699

Int. Cl.<sup>6</sup> A61C 15/00

U.S. Cl. 132—323

27 Claims



1. A flossing instrument for locating and supporting floss in interproximal spaces between teeth of a user, the user having an arch-wire proximate to, yet spaced from the teeth and interproximal spaces, the flossing instrument comprising in combination:
  - a handle adapted to be grasped by a hand of the user,

5,482,468

## PLUG CONTACT

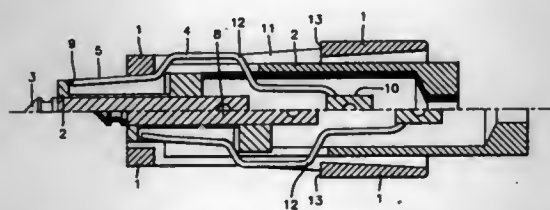
Mauritz Bolin, Dalarö, Sweden, assignor to Ingenjörsskolan Mauritz Bolin AB, Haninge, Sweden  
PCT No. PCT/SE92/00380, § 371 Date Jan. 3, 1994, § 102(e)  
Date Jan. 3, 1994, PCT Pub. No. WO93/01633, PCT Pub. Date Jan. 21, 1993

PCT Filed Jun. 3, 1992, Ser. No. 170,308

Claims priority, application Sweden, Jul. 3, 1991, 9102080  
Int. Cl.<sup>6</sup> H01R 29/00

U.S. Cl. 439—172

5 Claims



1. An electrical connector in the form of a jack-type socket plug including a central contact pin for one conductor and a resilient contact element in the region of an outer surface of the plug for a second conductor, the plug having an axially extended male portion for mating with a female portion which is a part of a current socket for receiving the plug, the male portion comprising two parts having different cross-sectional dimensions so that a larger one of the male parts mate with the female part of one current socket and the other smaller male part mates with the female part of another current socket having different cross-sectional dimensions from the first-mentioned female part, the smaller male part carrying the central contact pin, wherein the smaller male part is movable in the larger male part, but no farther than to permit the central contact pin to remain projecting outwardly axially outside the larger male part, the movement thus enabling the plug to be optionally mated to both dissimilarly dimensioned current sockets, further characterized in that an element is axially fixed on an outer surface of the smaller male part and is displaceable relative to the larger male part, and otherwise connects up to the outer surfaces of both male parts so that, they can resiliently move in from a position outside the respective outside surface to a position flush with said respective surface.

5,482,469

## DUAL MONITOR SELF-CONTAINED SIX PORT DIGITAL SIGNAL CROSS-CONNECT MODULE

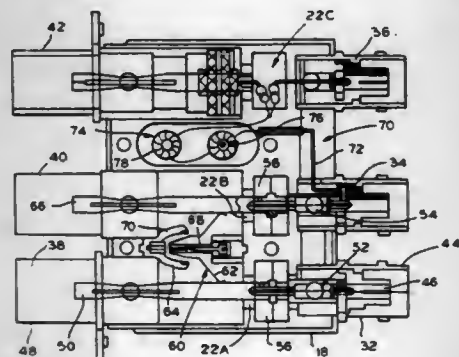
Aurel Seiceanu, Mundelein; Nicholas J. Logisz, Mount Prospect, and Rueben M. Bellke, Westchester, all of Ill., assignors to Trimm, Inc., Libertyville, Ill.

Filed Jul. 21, 1993, Ser. No. 89,513

Int. Cl.<sup>6</sup> H01R 29/00; H01P 1/10

U.S. Cl. 439—188

19 Claims



16. A cross-connect dual monitor switching module adapted for monitoring, testing, maintenance, and installation of electrical signal transmission systems, the module comprising:

a housing including opposite front and rear walls and having separate first, second and third cavities extending therebetween;  
a first input jack port and a first output jack port diametrically aligned in said housing first cavity, each being electrically connected to the other and adapted to receive an electrical plug;  
a second input jack port and a second output jack port diametrically aligned in said housing second cavity, each being electrically connected to the other and adapted to receive an electrical plug;  
a switch means for electrically connecting said first input jack port to said first output jack portion in the absence of an electrical plug being received in either said second input jack port or said second output jack port and for electrically isolating said first input jack port from said first output jack port in response to a plug being received in either said second input jack port or said second output jack port;  
a first monitor jack port and a second monitor jack port diametrically aligned in said housing third cavity, each being adapted to receive an electrical plug; and  
an electrical network electrically connecting said first and second monitor jack ports in parallel to said first output jack port.

5,482,470

## ELECTRICAL CONNECTOR

Keigo Atsumi, and Elji Saijo, both of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Japan

Continuation of Ser. No. 243,985, May 17, 1994, abandoned.

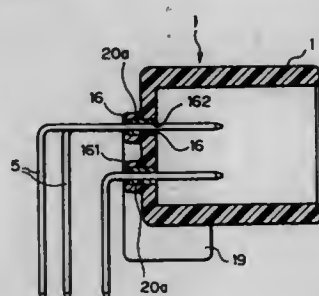
This application Apr. 19, 1995, Ser. No. 426,141

Claims priority, application Japan, May 20, 1993, 5-142988;  
May 20, 1993, 5-142989

Int. Cl.<sup>6</sup> H01R 13/629

U.S. Cl. 439—246

2 Claims



1. An electrical connector comprising a female housing adapted to receive a plurality of female terminals,  
a male housing having a front hood and a rear wall, said front hood facing, and adapted to receive, said female housing, said rear wall having a plurality of stepped holes, said holes being provided with reduced diameter portions and enlarged diameter portions inward of said reduced portions,  
elastic members in said stepped holes and having bores there-through, male terminals attached to said male housing by said reduced portions and extending through said bores, whereby said male terminals are elastically supported by said elastic members, said male terminals adapted to contact said female terminals where said female housing is in said front hood.

5,482,471

## SOCKET APPARATUS FOR IC PACKAGE TESTING

Ikuo Mori, Ohizumi, and Kiyokazu Ikeya, Sunto, both of, Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

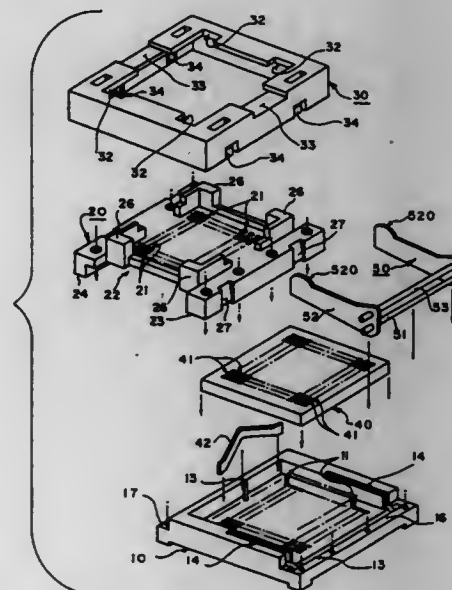
Filed Feb. 16, 1994, Ser. No. 197,437

Claims priority, application Japan, Feb. 24, 1993, 5-060906

Int. Cl.<sup>6</sup> H01R 13/15

U.S. Cl. 439—263

8 Claims



1. A socket comprising a lower block having a top surface and a plurality of contact elements mounting thereon, each contact element having a contact part comprising first and second elongated contact pieces extending upwardly from the top surface for receiving an IC lead of an IC package,

an upper block having a top and bottom surface mounted on the lower block and having IC lead insertion holes extending between the top and bottom surfaces of the upper block and aligned with respective contact elements, a recess being formed between the upper and lower blocks,

a slide block slidably mounted in the recess and movable between first and second extremities, the slide block having a top and bottom surface and having an array of apertures extending between top and bottom surfaces corresponding to the contact elements, the slide block having first and second ends,

a spring member disposed in the lower block placing a force on the slide block urging the slide block toward one of the extremities and a contact opening and closing mechanism formed by a lever positioned opposite said spring member having a base portion which has been journaled along an axis freely rotatable in the socket, the lever having a lever arm extending from the past portion and having a free distal end, a cover member being supported on the free distal end, the lever base portion being journaled on the lower block by means of a first shaft, a second shaft being supported at a location which has been offset for the first shaft on the lever base portion, the slide block being engaged and moved in one direction toward the other extremity by a force transmitted through the rotation of the second shaft about the first shaft as the lever base portion makes a rotation in said one direction and the force is removed by the rotary return of the lever base portion and the second shaft in an opposite direction toward said one extremity, the vertical movement of the cover member being converted into a straight line sliding action of the slide block,

one of the contact pieces of each contact part having a distal free end and in engagement with a surface of the upper block, the other contact piece biased toward the one contact piece when

the slide block is at the one extremity, and being displaced from the one contact piece when the slide block is at the other extremity.

5,482,472

## ELECTRICAL SIGNAL GENERATOR INTERFACE WITH THREE-DIMENSIONAL ELECTRICAL PATHWAY AND TRANSPARENT HEART AND METHOD OF VISUALLY SIMULATING CARDIAC WAVEFORMS IN THREE DIMENSIONS

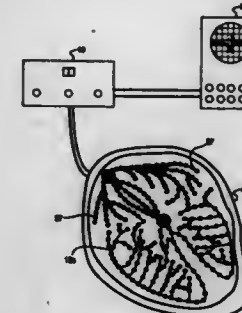
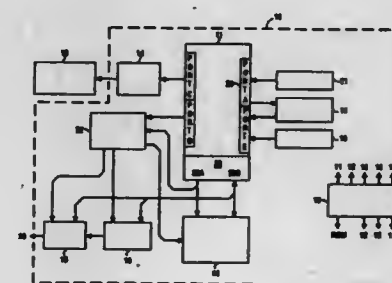
Charles Garoni, San Antonio; Joseph Peters, La Coste; William Butler, Comfort, and Fred J. Dunn, San Antonio, all of Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Nov. 17, 1993, Ser. No. 153,678

Int. Cl.<sup>6</sup> G09B 23/28

U.S. Cl. 434—272

18 Claims



1. Apparatus for simulating electrical impulses in a heart, comprising:

an electrocardial signal generator for generating simulated electrocardial waveforms;  
at least one three-dimensional electrical pathway corresponding to an actual electrocardial pathway within a living heart, said three-dimensional pathway coupled to said electrocardial signal generator; and  
a plurality of three-dimensional light emitters placed along said three-dimensional pathway to visually indicate said simulated electrocardial waveforms along said three-dimensional pathway.

13. A method of visually simulating electrical impulses in a heart, comprising:

providing an electrocardial signal generator;  
selecting an electrocardial signal;  
providing at least one three-dimensional pathway corresponding to an actual electrocardial pathway within a living heart;  
denoting the contours of said three-dimensional pathway by a plurality of three-dimensional light emitters, said three-dimensional light emitters being responsive to said electrocardial signal; and  
transmitting said electrocardial signal to said pathway, thereby causing said three-dimensional light emitters to illuminate in simulation of movement of an actual electrocardial signal in a living heart.



5,482,473

## FLEX CIRCUIT CONNECTOR

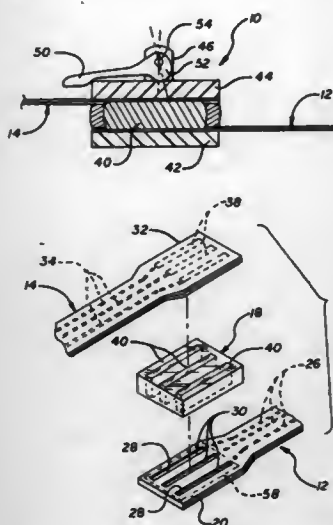
Peter C. Lord, Santa Clarita; William P. Van Antwerp, Brentwood; John J. Mastrototaro, Los Angeles; Paul S. Cheney, II, Beverly Hills, and Nannette M. Schnabel, Valencia, all of Calif., assignors to Minimed Inc., Sylmar, Calif.

Filed May 9, 1994, Ser. No. 239,960

Int. Cl.<sup>6</sup> H01R 9/09

U.S. Cl. 439—67

9 Claims



1. A flex circuit connector for interconnecting a pair of flex circuits each having a proximal end with exposed conductive contact pads thereon, the contact pads of each flex circuit exposed through openings in a layer of the flex circuit, said flex circuit connector comprising:

a zebra terminal block having a body formed from a resilient insulative elastomer to define opposite side faces, and a plurality of conductive strips embedded within said body and having opposite edges exposed at said opposite side faces, said body defining insulative material circumscribing said conductive strips along an uninterrupted line at both of said opposite side faces; and

clamp means for clamping the proximal ends of the flex circuits in face-to-face relation in engagement with said opposite side faces of said body and with said contact pads in conductive engagement with said conductive strips, said body engaging each of said flex circuits in hermetically sealed relation along a line of contact circumscribing the contact pads.

5,482,474

## EDGE-MOUNTABLE CIRCUIT BOARD CONNECTOR

Brent D. Yohn, Newport, and Dennis E. Smith, Elizabethtown, both of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

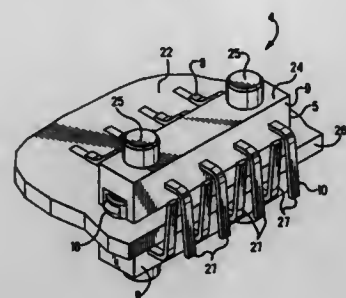
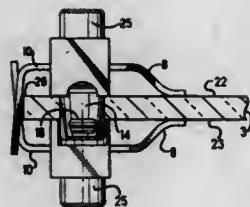
Filed May 17, 1994, Ser. No. 245,174

Int. Cl.<sup>6</sup> H01R 23/70

U.S. Cl. 439—79

16 Claims

1. A first electrical connector comprising: an elongated main body portion provided with a front surface, a rear surface and a bottom surface, and at least one contact member carried through said elongated main body portion forming at least one surface mount lead projecting from said front surface and at least one contact section projecting from said rear surface to become electrically engaged with a corresponding conductive member of another electrical article; the bottom surface of said elongated main body portion having one end provided with a first fastener and having another end provided with a first recess, said first fastener having a leading end being able to project through a first aperture at the edge of the top surface of a circuit board, said fastener including a slot extending from said leading end bifurcating said fastener and



defining a pair of spaced tines at least one of which contains a first latch adjacent said leading end to latch onto the bottom surface of said circuit board, and said latch-containing tine being deflectable toward the other of said tines to permit insertion and withdrawal of said fastener through said first aperture; and

said first recess being of such size and shape as to be able to receive that portion of a second fastener which projects through a second aperture at the edge of the bottom surface of said circuit board and projects over the top surface of said circuit board when said second fastener is affixed to the bottom surface of the circuit board.

5,482,475

## COAXIAL CABLE CONNECTOR

Akira Kawaguchi, Musashimurayama, Japan, assignor to The Whitaker Corporation, Wilmington, Del.

Continuation of Ser. No. 239,146, May 6, 1994, abandoned.

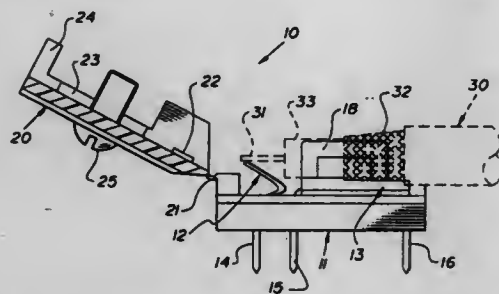
This application May 31, 1995, Ser. No. 456,004

Claims priority, application Japan, Jul. 14, 1993, 5-043475 U

Int. Cl.<sup>6</sup> H01R 4/24

U.S. Cl. 439—394

20 Claims



1. An electrical connector having a cover and a housing, said housing includes a ground contact and a signal contact, said electrical connector being characterized in that:

the housing includes an arch-shaped latch member formed on a side of said housing, and the cover includes a key member for registering with said arch-shaped member when the cover is joined to the housing; and said housing and cover each include a respective hole, said holes are adapted to receive a separable fastening means and said cover includes a tongue member for retaining said separable fastening means, the signal contact comprises a hollow insulation displacement member which internally accommodates a complementarily shaped protrusion on said cover for stuffing a jacketed core

conductor into an insulation displacement slot when the cover is joined to the housing.

5,482,476

## PANEL-MOUNTED ELECTRICAL CONNECTOR

Kaoru Watanabe, and Hajime Kawase, both of Mie, Japan, assignors to Sumitomo Wiring Systems, Ltd., Mie, Japan

Filed Mar. 10, 1994, Ser. No. 208,277

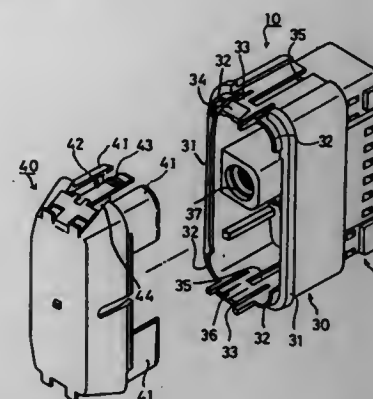
Claims priority, application Japan, Mar. 11, 1993, 5-016909 U

U

Int. Cl.<sup>6</sup> H01R 13/74

U.S. Cl. 439—555

5 Claims

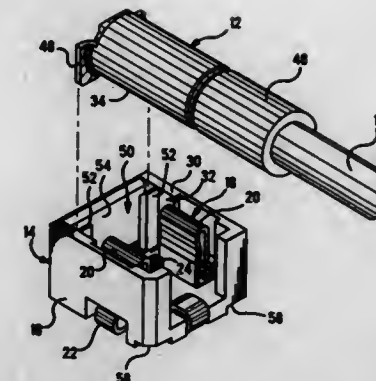


1. An electrical connector comprising:

a) a body having a front opening, and a plurality of terminals supported within said body and capable of being fitted to counterpart terminals, respectively;

b) a pair of locking arms each disposed at the outer periphery of said body and capable of flexing inwardly and outwardly relative to the front opening of the body, each locking arm having an engagement protrusion which will engage an edge defining a mounting hole when the connector is inserted into the mounting hole; and

c) a pair of deformation preventing portions provided to the inside of the locking arms, respectively, a gap being defined between each of said deformation preventing portions and the corresponding locking arm, the gap allowing the corresponding locking arm to flex inwardly while the protrusion of the corresponding locking arm is engaged with the edge defining the mounting hole such that the deformation preventing portions limit deformation of the locking arms by engaging the locking arms, respectively when the locking arms have been flexed inwardly.



wherein said body, pair of arms, and latch are of unitary construction and arranged so that when said locking member is in said locking position securing said cable plug connector and receptacle in said assembled engagement, said arms straddle a portion of said cable plug connector and engage said base of said housing, said latch latching engages one of said side surfaces of said housing, and said body substantially covers said opening in said top surface and holds said cable plug connector and receptacle in said assembled engagement.

5,482,478

## STRUCTURE AC POWER PLUG

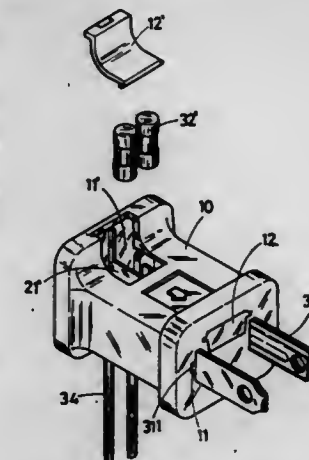
Nan W. Liao, 18, Tzu Yu Road, Hsinchu City, Taiwan, Prov. of China

Filed Aug. 8, 1994, Ser. No. 287,366

Int. Cl.<sup>6</sup> H01R 13/62

U.S. Cl. 439—622

4 Claims



1. An improved AC power plug, comprising:

an outer housing having a cavity defined by a perimeter wall with upper and lower sides and an end wall, said end wall having a pair of spaced first slotted openings formed therethrough and a centrally disposed second slotted opening formed therethrough, each of said first slotted openings having a support surface formed adjacent thereto, said upper side having an access opening formed therethrough, said lower side having centrally disposed third slotted opening formed therethrough and a pair of spaced apertures disposed on opposing sides of said third slotted opening;

a base for insert into said outer housing cavity; said base having bottom wall with upper and lower opposing surfaces, said upper surface having a pair of longitudinally extended barriers disposed adjacent opposing sides of said base and a longitudinally extended partition disposed between said pair of barriers, each of said barriers defining a respective first recess between said barrier and a respective adjacent side wall of said base and a second recess between said barrier and said

5,482,477

## MICRO-MINIATURE COAXIAL CONNECTOR WITH POSITIVE LOCKING MEMBER

George W. Michael, Harrisburg, Pa., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Jun. 28, 1994, Ser. No. 266,921

Int. Cl.<sup>6</sup> H01R 9/05

U.S. Cl. 439—581

8 Claims

1. A positive locking member arrangeable in a locking position for securing a low profile coaxial cable plug connector in assembled engagement with a mating micro-miniature receptacle, said receptacle including a housing having a top surface and an opening therein for receiving said cable plug connector, a base for surface mounting to a substrate, and side surfaces extending from said top to said base, said positive locking member comprising:

(a) a body;

(b) a pair of arms extending from a first end of said body;

(c) a latch extending from a second end of said body opposite said first end,

partition, said bottom wall having a wire access opening formed therethrough adjacent said rear end of said partition, said lower surface having a pair of spaced first locking tabs disposed adjacent a rear end of said base for respective engagement with said pair of spaced apertures and a second locking tab disposed intermediate said pair of first locking tabs for engagement with said third slotted opening;

a cover member slidably disposed between said base and said outer housing through said second slotted opening for covering said access opening and being slidably displaceable therefrom to uncover said access opening;

a pair of fuses, each of said fuses being disposed in a respective one of said second recesses in alignment with said access opening, each of said fuses having contacts on opposing first and second ends thereof;

a pair of longitudinally extending conductor members, each of said conductor members having opposing inner and outer sides and being disposed within a respective one of said first recesses, each conductor member having a contact tab extending from said inner side thereof for electrical coupling with said contact on said first end of a respective fuse, each of said conductor members having a retaining tab extending from said outer side thereof for locking engagement with said outer housing support surface; and

a pair of fuse holding connectors respectively disposed in said second recesses for coupling to a pair of wires, each of said fuse holding connectors having a pair of diverging conductor strips formed thereon for contacting said contact on said second end of a respective fuse, each of said fuses elastically displacing said diverging conductor strips of a respective one of said fuse holding connectors responsive to downward displacement of said fuses by displacement of said cover member to cover said access opening, said diverging conductor strips of each of said fuse holding connectors ejecting a respective one of said fuses for facilitating fuse replacement responsive to displacement of said cover member from said access opening.

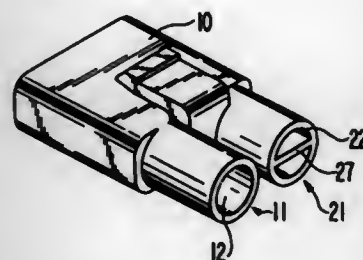
5,482,479

**WATER-RESISTANT ELECTRICAL CONNECTOR PREVENTING TERMINAL MISINSERTION AND MOLD SYSTEM FOR THE MANUFACTURE THEREOF**  
Hiroyuki Hayashi; Eiji Saijo, and Shigekazu Wakata, all of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Mie, Japan

Filed Aug. 25, 1994, Ser. No. 295,460

Claims priority, application Japan, Aug. 26, 1993, 5-235588  
Int. Cl.<sup>6</sup> H01R 13/405

U.S. Cl. 439—736



1. A connector housing of an electrical connector comprising: an outer peripheral wall defining an interior space of the housing, a partition unitary with the outer peripheral wall and dividing said interior space into a plurality of cavities, each of said cavities being open at opposite ends of the housing, at least one of said cavities being entirely open as between said opposite ends of the housing and configured to receive a terminal fixture constituting an electrical circuit, a water-resistant wall unitary with said outer peripheral wall and closing up at least one of the other of said cavities at a location between the opposite ends of the housing so as to form

two separated spaces between said wall and one of the ends of the housing and between said wall and the other of the ends of the housing, and a fin unitary with said outer peripheral wall and located in one of said two separated spaces so as to prevent a terminal from being inserted in said other of said cavities and into contact with said water-resistant wall.

5,482,480

**CONNECTOR TERMINAL**

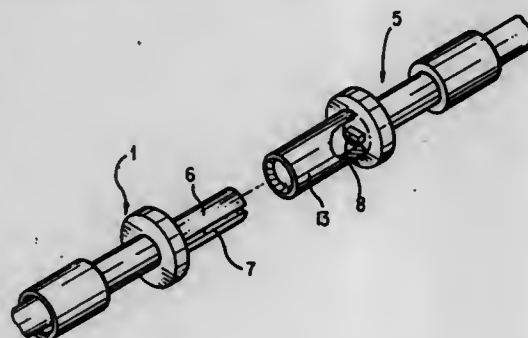
Sho Miyazaki, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Mie, Japan

Filed Mar. 16, 1994, Ser. No. 213,583

Claims priority, application Japan, Mar. 18, 1993, 5-085783  
Int. Cl.<sup>6</sup> H01R 4/50

U.S. Cl. 439—774

25 Claims



1. A connector terminal, comprising:

a first terminal having a tubular portion with an inner diameter, said tubular portion having at least one projection, said projection being blade-like and having a width substantially equal to said inner diameter; and  
a second terminal having a shaft portion insertable in said tubular portion and a slot, wherein said projection enters into said slot to expand said shaft portion from an insertion diameter less than the inner diameter in a first position to an expanded diameter substantially equal to the inner diameter in a second position.

5,482,481

**BUS BAR CONNECTOR**

Hiroshi Takeuchi, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 45,814, Apr. 9, 1993, Pat. No. 5,423,700.

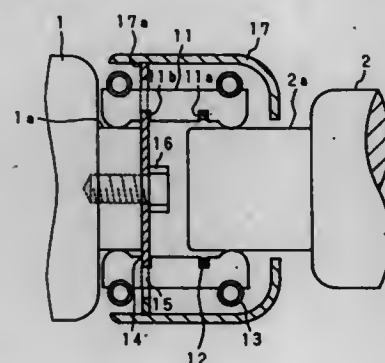
This application Mar. 17, 1995, Ser. No. 406,041

Claims priority, application Japan, Apr. 10, 1992, 4-118306

Int. Cl.<sup>6</sup> H01R 13/18

U.S. Cl. 439—821

4 Claims



1. A bus bar connector comprising:

a contact member including plurality of contact plates which contact first and second conductive units so as to electrically connect the first and second conductive units;  
a circular guide plate fixed to one of the conductive units and having a plurality of grooves into which the plurality of contact plates of the contact member are fitted so as to radially support the plurality of contact plates;  
a shield for covering the contact member and which has an annular groove formed in the inner wall thereof; and  
supporting arms for supporting the shield, which are formed in arc-shapes along a curve of the outer periphery of the guide plate and are fitted in the annular groove of the shield.

5,482,482

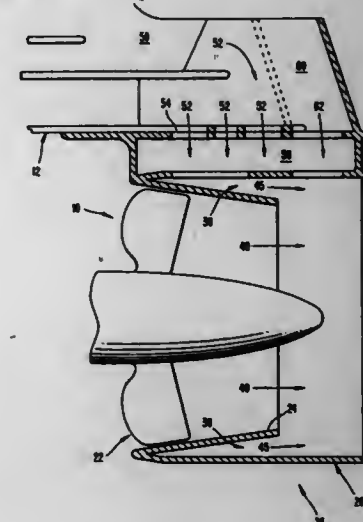
**AIR ENCIRCLING MARINE PROPELLER APPARATUS**  
Grover W. Davis, 3024 Kings Harbor Rd., Panama City, Fla. 32405

Filed Jun. 21, 1994, Ser. No. 262,884

Int. Cl.<sup>6</sup> B63H 1/16

U.S. Cl. 440—67

14 Claims



1. An apparatus for increasing thrust in marine propulsion, comprising:

a first hollow body with an inlet and an outlet, the body radially converging toward the outlet to form a conical space for a stream of water, the body being positioned to guide a stream of water from the inlet to the outlet;  
a second hollow body having a cylindrical shape, disposed to surround the first body to form an annular space around first body; and  
means for introducing air into the annular space to surround the stream of water at least at the outlet of the first body with an annular blanket of air.

5,482,483

**DR. FLUSH (PORTABLE MARINE ENGINE FLUSH SYSTEM)**

George D. Rice, 93 Cross Creek Cir., Statesboro, Ga. 30458

Filed Oct. 18, 1994, Ser. No. 324,691

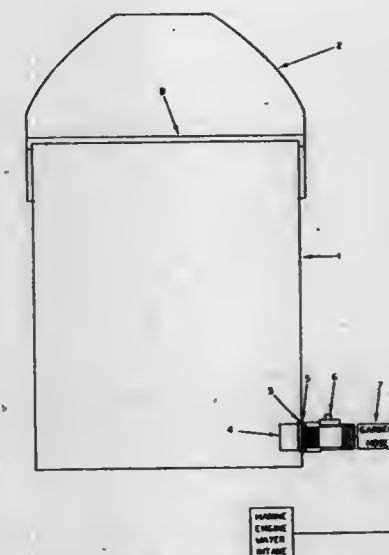
Int. Cl.<sup>6</sup> B63H 20/30

U.S. Cl. 440—88

1 Claim

1. A method for flushing a portable marine engine having an intake and a pump, said method comprising:

a. providing a reservoir with a handle and lid to act as a temporary storage reservoir for a flushing liquid;  
b. providing a hole in a lower side wall of the reservoir;  
c. inserting a male adaptor in the hole provided in the lower side wall of the reservoir;



d. providing a lock nut to hold the adaptor in place;  
e. attaching a shutoff valve to the adaptor;  
f. providing a hose having first and second ends to transport the flushing liquid to the portable marine engine;  
g. closing the shutoff valve;  
h. filling the reservoir with the flushing liquid;  
i. placing the lid on the reservoir;  
j. placing the reservoir which has been filled with the flushing liquid near the marine engine and higher than the pump of the marine engine;  
k. attaching the first end of the hose to the adaptor;  
l. attaching the second end of the hose to the intake of the marine engine; and  
m. removing the lid and opening the shutoff valve to let the liquid flow freely to the marine engine so as to flush the marine engine.

5,482,484

**APPARATUS FOR OFFSHORE SWIVEL REPLACEMENT**  
Sigmund Askestad, Setre, Norway, assignor to Norsk Hydro a.s., Oslo, Norway

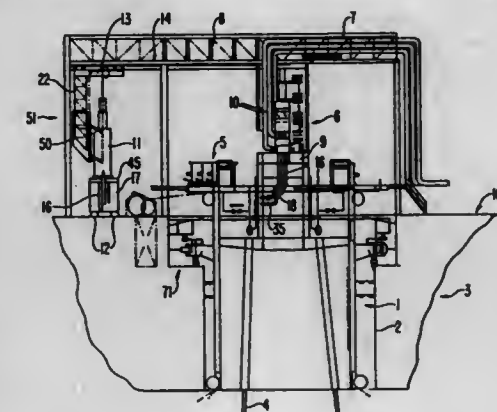
PCT No. PCT/NO93/00045, § 371 Date Oct. 26, 1993, § 102(e) Date Oct. 26, 1993, PCT Pub. No. WO93/18962, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 17, 1993, Ser. No. 137,204

Claims priority, application Norway, Mar. 20, 1992, 921102  
Int. Cl.<sup>6</sup> B63B 22/02

U.S. Cl. 441—5

20 Claims



1. An arrangement, comprising:  
a first operating foundation on a turret located on one of a production ship and an offshore platform;



- at least one swivel;  
 a storage means for storing, supporting and moving said at least one swivel, said storage means comprising a second storing foundation;  
 a swivel lifting and moving means for lifting and moving said swivel off of or replacing said swivel onto said first operating foundation on said turret and said second storing foundation; and  
 a guiding means for accurately guiding and positioning said swivel onto one of said foundations.

5,482,485

**AQUATIC MANEUVERING DEVICE**

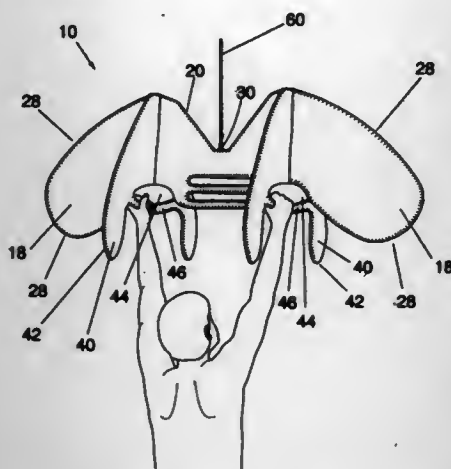
Roger L. Ball, 345 Ball Dr., Tallahassee, Fla. 32312

Filed Aug. 22, 1994, Ser. No. 293,589

Int. Cl.<sup>6</sup> B63B 35/79

U.S. Cl. 441-65

4 Claims



1. An aquatic maneuvering comprising:  
 a) a base member having a center portion, a first end portion to the left of the center portion, a second end portion to the right of the center portion, and a pair of apertures on the back of the center portion defining a hand grip;  
 b) a first fin, with an aperture defining a hand grip located on the first fin's back portion, attached to the base member at a point to the left of the midpoint of the base member, and extending above and below the base member;  
 c) a second fin, with an aperture defining a hand grip located on the second fin's back portion, attached to the base member at a point to the right of the midpoint of the base member, and extending above and below the base member; and  
 wherein the top side of the device is symmetrical to the bottom side of the device.

5,482,486

**PROCESS FOR THE PRODUCTION OF A MICRO TIP ELECTRON SOURCE**

Pierre Vandaine, Seyssins; Brigitte Moutmayeul, Brignoud, and Michel Borel, St. Vincent de Mercuze, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 27, 1994, Ser. No. 266,465

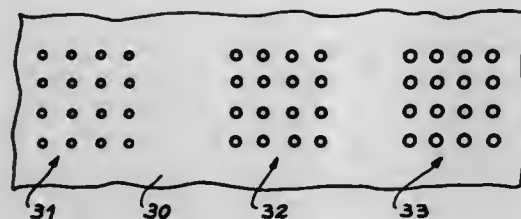
Claims priority, application France, Jul. 12, 1993, 93 08556

Int. Cl.<sup>6</sup> H01J 9/42

U.S. Cl. 445-3

10 Claims

1. An improvement in a method for fabricating a microtip electron source that comprises microtips which are electrically connected to at least one cathode conductor, located in holes that are formed from at least one electron extraction grid, the process of forming the holes comprising the step of masking a first electron



extraction grid with a mask, the improvement in the process comprising the steps of:

- determining deviations from desired shapes, dimensions, and positions, of the shapes, dimensions, and positions of the holes of the first electron extraction grid;  
 modifying the mask so that use of the mask for fabrication of a second electron extraction grid provides shapes, dimensions, and positions of holes in the second electron extraction grid which provide at least one of improved electron emission characteristics and improved reproducibility for the second electron extraction grid relative to the first electron extraction grid.

5,482,487

**MOTIVATIONAL SAVINGS BANK SET INCLUDING TOKEN CURRENCY**

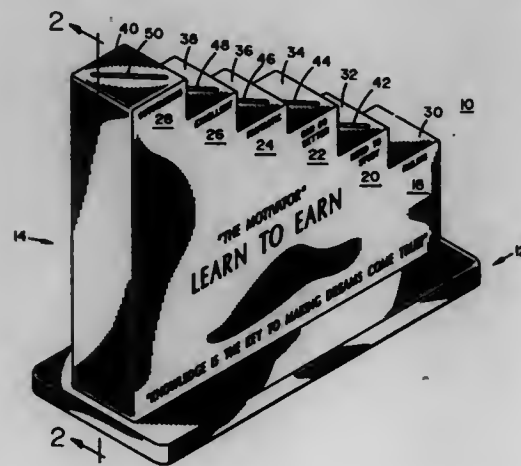
William H. Harris, 10958 Poblado Rd. #3122, San Diego, Calif. 92127

Filed Jul. 12, 1993, Ser. No. 89,347

Int. Cl.<sup>6</sup> A45C 1/12; G09B 19/18; 19/00

U.S. Cl. 446-8

2 Claims



1. A motivational savings bank set, said motivational savings bank set comprising:

- a savings bank, said savings bank comprising:  
 a plurality of separate and discrete chambers;  
 said plurality of chambers being of differing vertical heights;  
 each of said plurality of chambers having indicia provided thereon;  
 said indicia on said chambers indicating differing levels of achievement corresponding to said differing vertical heights of said chambers;  
 a plurality of tokens, each of said tokens having indicia thereon indicating a denomination;  
 said plurality of tokens having denominational indicia thereon comprising imitation money of ascending denominations;  
 said plurality of chambers are aligned substantially in a row in order of ascending height;  
 all but the shortest of said plurality of chambers comprises an associated insertion slot, and wherein the shortest of said plurality of chambers lacks an insertion slot;

- said imitation money of ascending denominations comprises at least two separate and distinct series of imitation money of ascending denominations;  
 said at least two series of imitation money comprises:  
 a first series of imitation paper money of ascending denominations;  
 a series of imitation coin money of ascending denominations;  
 a second series of imitation paper money of ascending denominations; and  
 said second series of imitation paper moneys being separate and distinct from said first series of imitation paper money;  
 said plurality of chambers comprises at least five chambers;  
 a plurality of special award tokens, and wherein said plurality of chambers additionally comprises a sixth chamber;  
 said sixth chamber being greater in height than any of said five chambers;  
 a container member;  
 said plurality of chambers being unitarily formed with said container member, wherein said plurality of chambers arranged in order of ascending height have top surfaces;  
 said insertion slots being located on said top surfaces of said plurality of chambers, and wherein said top surfaces of said plurality of chambers form an ascending staircase top surface of said container member;  
 said container member has a plurality of chamber openings provided on the bottom thereof, and wherein said motivational savings bank additionally comprises a plurality of stopper members for closing said plurality of chamber openings; and  
 said motivational savings bank set additionally comprises tally sheet means for maintaining a record of awards of said imitation money.

5,482,488

**STRAP ON BOUNCEABLE BELL TOY AND METHOD OF USING THE SAME**

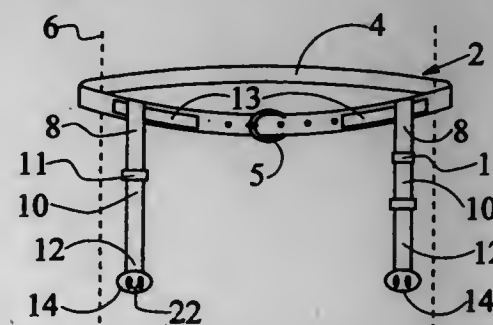
Donna M. Plummer, #151 Rte. 125, Barrington, N.H. 03825

Filed Oct. 20, 1994, Ser. No. 326,469

Int. Cl.<sup>6</sup> A63H 33/00; 5/00

U.S. Cl. 446-28

16 Claims



1. A bounceable bell toy for assisting a user with developing eye and thigh coordination, said toy comprising:  
 a belt member for securing the toy to a desired portion of a user's body;  
 at least two strap supports having first and second opposed ends, the first end of each strap support being secured to the belt member and the second end of each strap support being secured to a protective casing; and  
 a plurality of bell members each comprising an exterior bell casing supporting an interior clapper for striking the bell casing and generating sound, and one of said plurality of bell members being supported within each said protective casing; and  
 a layer of padding being provided between an exterior surface of the exterior bell casing and an inner surface of the protective casing to prevent injury to a thigh of a user while playing with the toy.

5,482,489

**FOLDING ASSEMBLED ARTICLE, SUCH AS A TOY AIRPLANE, WITH LOCKING MEMBER**

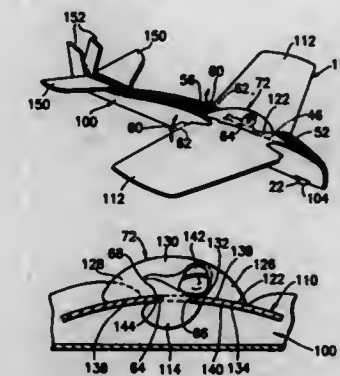
Myron Stone, Weehawken, N.J., assignor to Dipco Products Company, Inc., Hackensack, N.J.

Filed Nov. 4, 1994, Ser. No. 334,149

Int. Cl.<sup>6</sup> A63H 27/00

U.S. Cl. 446-67

10 Claims



1. A folding assembly capable of being folded to a flat configuration and selectively erected to an operating configuration, the assembly comprising:

- a longitudinally extending first member of sheet material folded along a longitudinal line into a pair of juxtaposed side-by-side parts;  
 a pair of curved slots in the first member, the curved slots being located one in each of said parts so as to be juxtaposed with one another in the folded first member;  
 a second member of sheet material passing through the juxtaposed slots and having a fold line located between the side-by-side parts and aligned longitudinally parallel to the longitudinal line in the first member, the fold line dividing the second member into sections, the sections being movable between a first position, wherein the sections are relatively flat and folded into juxtaposition with one another along the fold line in the second member, and a second position wherein the sections extend in generally opposite directions from the fold line therein, and portions of the sections adjacent the slots, including a portion containing the fold line, are curved to conform generally to the curve of the slots;  
 a slot passing through the second member and extending longitudinally along the fold line in the second member; and  
 a third member of sheet material, the third member including a retainer extending through the slot and a longitudinally extending shoulder overlying the second member adjacent the slot such that upon movement of the sections of the second member into the second position thereof, the retainer is engageable with the second member to maintain the shoulder against the second member adjacent the slot and lock the sections of the second member in the second position against inadvertent return toward the first position.

5,482,490

**COLLAPSIBLE DOLL'S HOUSE**

Richard S. Weldon-Ming, 101 Waterfall Ave., Craighall, Johannesburg, Transvaal, South Africa

Filed Dec. 3, 1993, Ser. No. 160,819

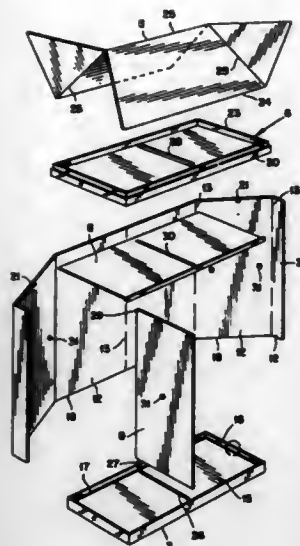
Claims priority, application South Africa, Dec. 4, 1992, 92/9430

Int. Cl.<sup>6</sup> A63H 33/16

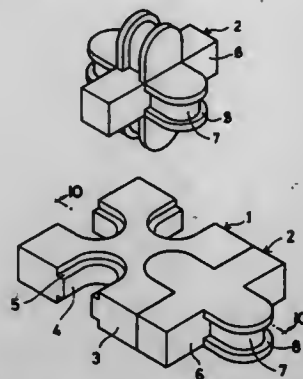
U.S. Cl. 446-75

3 Claims

1. A collapsible doll's house comprising:  
 walls formed from a first one-piece sheet of material which is foldable along a plurality of fold lines to allow the walls to be folded between erected and collapsed configurations,



**5,482,491**  
**BLOCK ASSEMBLY**  
 Hiroshi Kichijyo, Yoshino, Japan, assignor to Yoshitatsu Kabushiki Kaisha, Nara, Japan  
 Filed Apr. 19, 1994, Ser. No. 229,775  
 Claims priority, application Japan, Apr. 20, 1993, 5-092969  
 Int. Cl.<sup>6</sup> A63H 33/08  
 U.S. Cl. 446—112 10 Claims



in the erected configuration, the walls being oriented vertically and having upper and lower ends, the fold lines being oriented vertically, and the walls angled relative to one another about the fold lines,

in the collapsed configuration, the walls being folded about the fold lines to lie upon one another in parallel planes;

a floor having a base panel and an upwardly extending flange formed around an outer periphery of the base panel for locating and supporting lower portions of the walls when the first sheet is in its erected configuration, and a wall locating groove formed in the base panel inwardly of the flange for frictionally receiving the lower ends of the walls;

a ceiling member having a ceiling panel formed of a thin planar material with a downwardly extending flange formed around an outer periphery of the ceiling panel, the ceiling member being mounted on the upper ends of the walls when the first sheet is in its erected configuration, with the downwardly extending flange locating the upper ends of the walls, the ceiling panel having a lower surface with a wall locating groove formed therein inwardly of the flange of the ceiling panel for frictionally receiving the upper ends of the walls, the wall locating groove forming an upwardly extending ridge on an upper side of the ceiling panel, the ridge extending around the periphery of the ceiling panel and forming a roof locating structure;

a roof formed of a second one-piece sheet of material including a plurality of fold lines to define a pair of major roof panels and a pair of end panels, the second sheet being foldable about the fold lines thereof between pitched and collapsed configurations,

in the pitched configuration the roof being supported on the ceiling member and held in position by the roof locating structure thereof, and the major panels and end panels being angled relative to one another about the fold lines of the second sheet,

in the collapsed configuration the major panels and end panels being folded about the fold lines of the first sheet and to lie upon one another in parallel planes; and

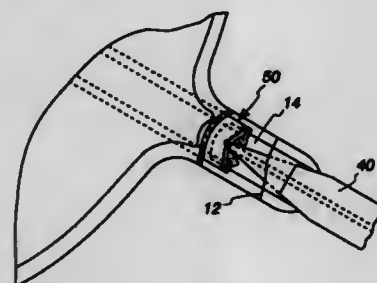
at least one internal dividing partition for dividing the interior of the doll's house into distinct rooms;

the first and second sheets when in their respective collapsed configurations being capable of being stored, together with the partition, on the base panel and within the upwardly extending flange thereof;

the upwardly and downwardly extending flanges of the floor and ceiling member, respectively, being adapted to mate, one within the other, to form a closed box for containing the stored sheets and partition.

1. An assembly of blocks comprising: a plurality of block plates, and a plurality of joint blocks coupling said block plates together, each of said block plates having polygonal top and bottom surfaces, at least three side surfaces each extending between said top and bottom surfaces, and a respective socket in each of said side surfaces, each said socket being constituted by a central recess extending into the block plate from a said side surface and two grooves extending into the block plate at locations above and beneath said central recess, respectively, said two grooves defining shoulders above and beneath said central recess, respectively, the thicknesses of said block plates, as taken between said top and bottom surfaces thereof, respectively, being equal, and the lengths of the side surfaces of said block plates being equal, and each of said joint blocks including a columnar portion having a plurality of side faces, and a respective plug extending from each of at least two of said side faces, each of said plugs having a central portion having a shape complementary to that of a said central recess, and upper and lower flanges disposed above and beneath said central portion, respectively, said flanges having shapes complementary to those of said two grooves, respectively, each of said side faces having a length equal to the length of each of the side surfaces of said block plates and a width equal to the thickness of each of said block plates.

**5,482,492**  
**BALLOONS AND BALLOON VALVES**  
 Charles R. Becker, Chicago, Ill., assignor to M & D Balloons, Inc., Manteno, Ill.  
 Filed Jan. 10, 1994, Ser. No. 179,308  
 Int. Cl.<sup>6</sup> A63H 27/10  
 U.S. Cl. 446—224 7 Claims



1. A balloon comprising:  
 a pair of overlapping balloon film layers joined together so as to form a vessel for containing a pressurized gas;

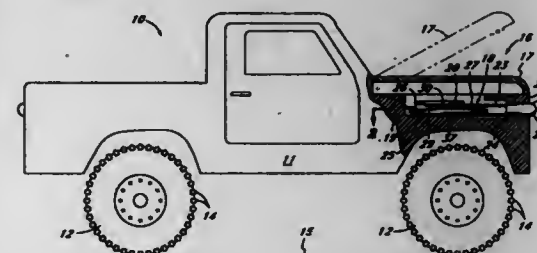
first and second valve layers of flexible valve material disposed between the balloon film layers in at least partially overlapping relationship;

means for joining said first and said second valve layers together to form a double-ended hollow tubular valve having an inlet end communicating outside the balloon and an outlet end in the vessel interior, for passing pressurized gas to the vessel interior;

said valve layers having free ends at the inlet end of the valve, with at least one free end including a free edge divided into at least two unconnected parts, each with a portion of said free edge, to form a layer with at least two adjacent free edge portions at the inlet end of the valve; and

said valve layers being joined to respective balloon film layers adjacent the inlet end of the valve to fix the inlet end of the valve in position.

**5,482,493**  
**TOYS WITH A BATTERY POWERED LIGHT EMITTING DIODE LIGHTED BY MOVEMENT**  
 Carmen C. Rapisarda, 2650 Myrtle Ave. #B-7, Monrovia, Calif. 91016  
 Filed Feb. 22, 1994, Ser. No. 199,586  
 Int. Cl.<sup>6</sup> A63H 17/28  
 U.S. Cl. 446—438 11 Claims



1. An amusement device having an assembly positioned in a toy, said amusement device comprising:

a toy;

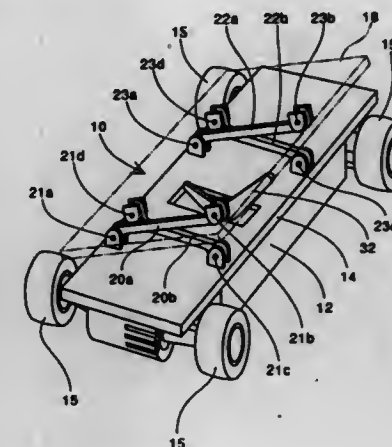
an assembly frame held by said toy, said assembly frame having a floor, a right side and a left side and a front;

a wafer battery held by said assembly frame having an upper face and a lower face and having a positive terminal on one face and a negative terminal on the other face;

a light emitting diode held by said frame having a light emitting portion from which an upper and a lower metallic lead extend in a generally horizontal manner, said upper and lower leads having end termini and a space between them and said light emitting diode being positioned so that the wafer battery is held in said space between the leads so that the upper metallic lead is above the wafer battery and the lower metallic lead is below and in contact with the lower face of the wafer battery; and

a movable weight movably held by said assembly frame so that it can move up and down, said movable weight being positioned so that it is resting on without attachment and supported by said upper metallic lead and its weight is not sufficient to move the upper metallic lead into contact with the upper face of the wafer battery but when the amusement device is moved upwardly, the inertial force on the movable weight, causes the weight to push the upper lead into electrical contact with the upper face of the wafer battery thereby completing a circuit and lighting the light emitting diode.

**5,482,494**  
**TOY VEHICLE HAVING ROLLING OSCILLATORY MOTION**  
 Zenichi Ishimoto, Tokyo, Japan, assignor to Nikko Co., Ltd., Tokyo, Japan  
 Filed May 26, 1994, Ser. No. 249,729  
 Claims priority, application Japan, May 26, 1993, 5-123777  
 Int. Cl.<sup>6</sup> A63H 30/04  
 U.S. Cl. 446—456 18 Claims



1. A toy vehicle comprising:

a body;

a chassis at least having an upper surface; and means provided on said upper surface of said chassis for permitting said body to exhibit a rolling oscillation motion around a horizontal axis, said means comprising:

a plate mounted on an internal surface of said body;

a plurality of connection rods for mechanically and movably connecting said plate to said upper surface of said chassis; and

at least a pushing up member mechanically connected to said chassis and having at least two contacting portions for contacting on a flat bottom surface of said plate at least at two symmetrical positions on opposite sides of a vertical plane containing said horizontal axis so as to permit either of said two contacting portions to push up said bottom surface of said plate wherein said two contacting portions alternatively and continuously push up said bottom surface of said movable plate to permit both said movable plate and said body to show a rolling oscillation motion around said horizontal axis, wherein said pushing up member comprises a V-shaped lever including a base portion pivotally connected to said chassis and two top pushing up portions spaced from each other on opposite sides of said plane.

**5,482,495**  
**APPARATUS FOR POLISHING A SPHERICAL SURFACE**  
 Kiyoshi Mayahara; Mamoru Inoue, both of Hirakata, and Keniti Matsumura, Kakogawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan  
 Filed Sep. 29, 1993, Ser. No. 128,088  
 Int. Cl.<sup>6</sup> B24B 49/00  
 U.S. Cl. 451—5 13 Claims

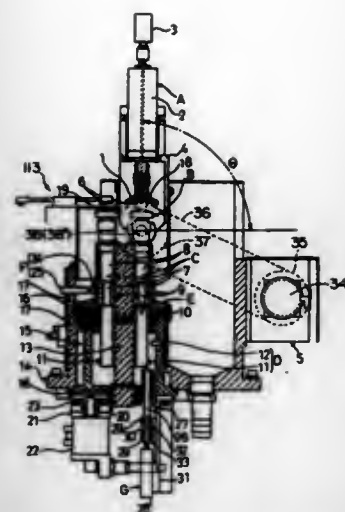
7. An apparatus, comprising:

a polishing device comprising a rotatably driven shaft having a polishing tool held at an end thereof such that said polishing tool is located at a polishing position, said polishing device being pivotable about an axis such that said polishing tool is movable around said polishing position;

a pivoting device connected with said polishing device for pivoting said polishing device about said axis;

a rotary table located adjacent to said polishing position and adjacent to a workpiece replacing position;





a plurality of workpiece holder holding devices each having an axis and each mounted in said rotary table so as to be movable along said axis relative to said rotary table;

a plurality of workpiece holders rotatably mounted on respective said workpiece holder holding devices; and

a workpiece holder pressing device for pressing a workpiece holder at said polishing position toward said polishing tool; wherein said rotary table can rotate said plurality of workpiece holder holding devices having said workpiece holders thereon between said polishing position and said workpiece replacing position; and

wherein each of said workpiece holder holding devices is received in a respective one of said plurality of workpiece holders with at least one bearing therebetween.

5,482,496

# AUTOMATED RANDOM ORBITAL ABRADING SYSTEM AND METHOD

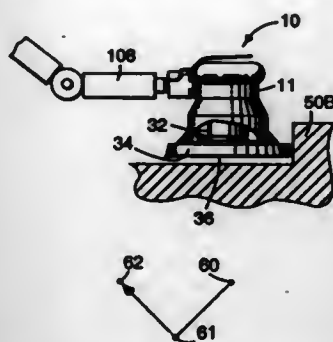
David J. Lanzer, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 57,504, May 6, 1993, Pat. No. 5,377,455, which is a division of Ser. No. 867,982, Apr. 13, 1992, Pat. No. 5,231,803. This application Dec. 28, 1994, Ser. No. 365,728

Int. Cl.<sup>6</sup> B24B 53/00

U.S. Cl. 451-5

22 Claims



1. A method for positioning a back-up pad at a known location within its range of motion, the method for use with an automated random orbital sanding apparatus having an abrading head and a back-up pad attached to the abrading head, the back-up pad being adapted for random orbital movement through a range of motion with respect to the abrading head, the back-up pad releasably carrying an abrasive disc on a major surface thereof, the abrasive disc having an abrasive face and a back face, the method comprising:

- (a) contacting a positioning member with at least one of the abrasive disc and the back-up pad; and
  - (b) reducing relative motion between the abrading head and the positioning member along a predetermined path from a beginning point to an intermediate point and then to an end point while maintaining contact between the positioning member and at least one of the abrasive disc and the back-up pad to urge the back-up pad to a known location within the range of motion;
- wherein said intermediate point is remote from a straight line connecting said beginning point and said end point.

5,482,497

# METHOD AND APPARATUS FOR TEXTURING ZONES OF A MAGNETIC DISK

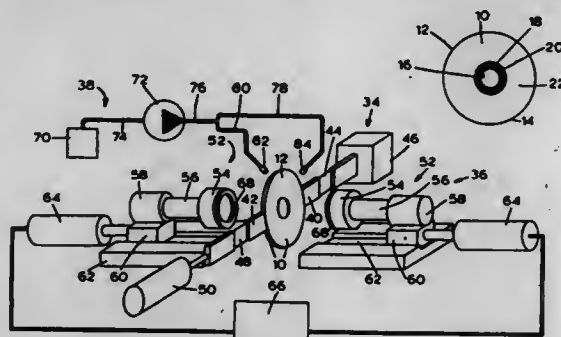
Norman T. Gonnella, and Steven F. Starcke, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 998,277, Dec. 30, 1992, abandoned. This application Dec. 19, 1994, Ser. No. 358,856

Int. Cl.<sup>6</sup> B24B 1/00

U.S. Cl. 451-57

3 Claims



1. A method for texturing a data area and head landing zone of a magnetic surface of a magnetic disk, said method comprising the steps of:
  - polishing a relatively fine texture pattern having a surface elevation upon both the data area and the head landing zone of the disk; and
  - after said polishing step, further abrading only the head landing zone of the disk to make a relatively coarse texture pattern having peaks at substantially the same surface elevation as the relatively fine texture pattern.

5,482,498

# HONING TOOL AND SUPER PRECISION FINISHING METHOD USING THE SAME

Katsutoshi Higashikawa, Aichi, Japan, assignor to Toyo Co., Ltd., Aichi, Japan

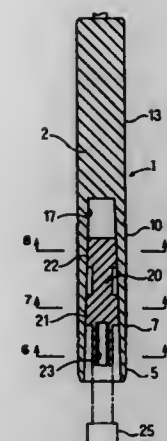
Division of Ser. No. 128,744, Sep. 30, 1993, Pat. No. 5,371,978, which is a continuation of Ser. No. 842,175, Apr. 2, 1992, abandoned. This application Sep. 20, 1994, Ser. No. 309,889

Int. Cl.<sup>6</sup> B24B 9/02

U.S. Cl. 451-61

1 Claim

1. A super precision finishing method for carrying out honing on a working surface to be precision finished with a honing tool having a pilot section, a rough grinding section, a finish grinding section and a correction section, in axial sequence from a top end portion of a honing tool body to a base end portion of said tool body, said method comprising the steps of:
  - axially advancing said honing tool toward an area on said working surface to be precision finished, while rotating and reciprocating said honing tool relative to said working surface to be precision finished,



while so axially advancing said honing tool, fitting said pilot section to said area to be honed and supporting said top end portion of said honing tool for rotating said tool;

with said pilot section so fitted and while continuing said axially advancing of said honing tool and said rotating and reciprocating said honing tool, resiliently urging said rough grinding section and said finish grinding section into resilient engagement with said area to be honed and machining said area to be honed first with said rough grinding section and then with said finish grinding section;

while continuing said axially advancing of said honing tool and said rotating and reciprocating of said honing tool, advancing said correction section of said honing tool through said honed area and correction finishing said honed area for honing straightness of said honed area; and

stopping said axially advancing and said rotating and reciprocating of said honing tool and withdrawing said honing tool from said correction finished honed area.

5,482,499

# SANDING APPARATUS

Hiroshi Satoh, Fuchu, Japan, assignor to Ryobi Limited, Tokyo, Japan

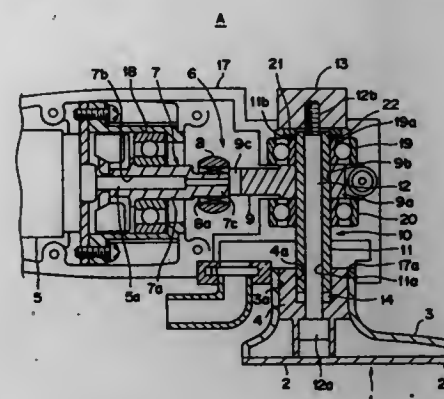
Filed Nov. 14, 1994, Ser. No. 337,775

Claims priority, application Japan, Nov. 18, 1993, 5-289607; Nov. 19, 1993, 5-290674

Int. Cl.<sup>6</sup> B24B 23/04

U.S. Cl. 451-356

14 Claims



1. A sanding apparatus which comprises:
  - a sanding member having on a lower end thereof a flat sanding plate, and being able to oscillate around an axis at right angles to said sanding plate;
  - a drive unit for oscillating said sanding member around said axis;

a motion converting means connected to a rotating output shaft of said drive unit, for converting a rotational motion of said output shaft to an oscillation motion, said motion converting means having an oscillating arm including a first end and a second end; and

a connecting means for connecting said oscillating arm of said motion converting means at said first end thereof with said sanding member, said connecting means comprising a hollow support shaft secured stationarily to said first end of said oscillating arm and at right angles thereto, a fixing mechanism for detachably fixing said sanding member to said hollow support shaft, and a securing angle adjusting mechanism for ensuring a prescribed securing angle of said sanding member to said hollow support shaft, said securing angle adjusting mechanism comprising at least one projection formed on any one of said lower end of said hollow support shaft and an upper portion of said sanding member, and a plurality of recesses formed on any other of said lower end of said hollow support shaft and said upper portion of said sanding member so that said at least one projection can selectively be received into at least one of said plurality of recesses.

5,482,500

# CLAM AND OYSTER OPENER

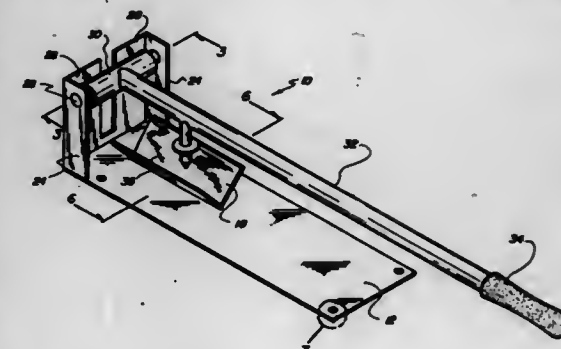
Kevin M. Boettner, Rte. 3, Box 80, Galveston Isle, Tex. 77554, and Joseph J. McHugh, 11365 7th Street E., Isle of Palms, Treasure Isle, Fla. 33706

Filed Dec. 15, 1994, Ser. No. 356,631

Int. Cl.<sup>6</sup> A22C 29/04

U.S. Cl. 452-16

8 Claims



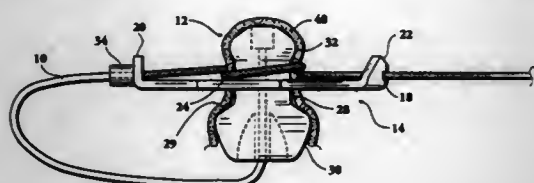
1. A clam and oyster opener comprising:
  - a base plate positionable upon a support surface;
  - a support channel secured to a top surface of the base plate for receiving an object to be opened;
  - a lever arm pivotally mounted relative to the base plate, whereby an individual can grasp and manipulate the lever arm to effect pivotal movement of the lever arm through a vertical plane extending through a longitudinal axis of the support channel; and,
  - an engaging tip secured to the lever arm and positioned so as to extend into the support channel to effect cracking of the object when placed within the support channel, the engaging tip comprising a depending projection fixedly secured to the lever arm, the depending projection including a plurality of spaced transverse slots extending partially therearound and a single longitudinal slot extending into contiguous communication with the spaced transverse slots; an adjustable plate concentrically disposed about the depending projection, the adjustable plate including a radial projection extending radially inward and into one of the transverse slots, whereby the adjustable plate can be rotated so as to position the radial projection into the longitudinal slot to permit an axial movement of the adjustable plate relative to the depending projection to position the radial projection into another one of the transverse slots, the adjustable plate being operable to limit a distance that the engaging tip extends into the object.

5,482,501

**DEER SKINNING APPARATUS**Benjamin D. Frits, 1422 N. Hightower, Stillwater, Okla. 74075  
Filed May 4, 1995, Ser. No. 434,663Int. Cl.<sup>6</sup> A22B 5/16

U.S. Cl. 452—125

14 Claims



1. Apparatus for removing skin from an animal carcass, comprising:
- a cable having a fixed end and a pulling end;
  - a two stage ball having upper and lower lobes for inserting in a pouch formed by loose skin of the animal, said two stage ball lobes being spaced to define a neck region therebetween;
  - a skinner plate having an opening sized to receive said upper lobe and surrounding said pouch and ball in said neck region, said plate being connected to said cable;
  - said cable having a loop that wraps around said pouch and said two stage ball in said neck region, said cable arranged so that it is adjacent to said neck region of said two stage ball prior to being pulled at said pulling end;
  - a skinner plate having an opening which surrounds said pouch, said plate being connected to said cable.

5,482,502

**FLAT FISH FILLETING MACHINE**

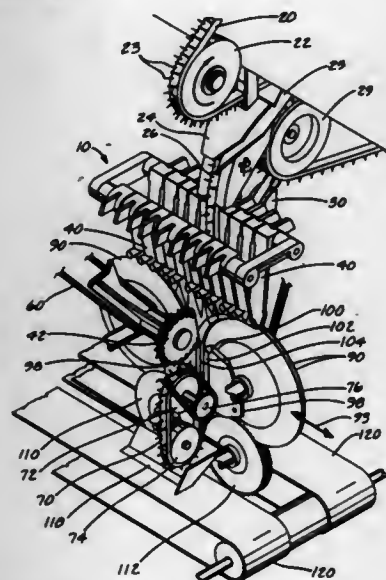
Jens Hjorth, Seattle, Wash., assignor to Royal Seafoods, Inc., Seattle, Wash.

Filed Apr. 25, 1994, Ser. No. 233,595

Int. Cl.<sup>6</sup> A22C 25/16

U.S. Cl. 452—162

7 Claims



1. A machine for cutting the body of a flat fish into fillets, the machine comprising:
- (a) first and second pairs of circular rotating fillet knives positioned in an opposing parallel relationship to cut along opposing surfaces of a flat fish's bones;
  - (b) a pair of circular cutting knives positioned downstream from the fillet knives along a processing path to cut along the backbone of the flat fish, at least one of the cutting knives moving in and out with respect to the backbone approxi-

mately normal to a plane defined by the flat fish's bones, and a plane defined by said first and second pairs of fillet knives, following thickness variations of the backbone while cutting; and

- (c) a pair of circular drive knives positioned downstream from the fillet knives on a processing path to engage the backbone of the flat fish to help move the flat fish along the processing path, the drive knives being positioned in an opposing relationship to the cutting knives.

5,482,503

**APPARATUS FOR WASHING POULTRY CARCASSES**

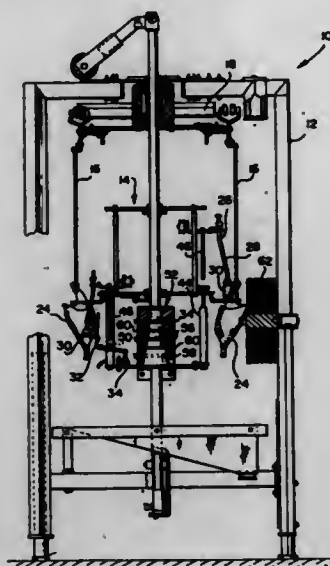
Richard Scott, Naples; David Bleth, Fort Meyers; Gerald Banks, Lehigh Acres; Todd Coppedge, Estero; William DeWitt, Cape Coral; Oliver Hahn, Fort Meyers; Maurice Hunking, Lehigh Acres; Wayne Mullineaux, Alva; Manfred Peters, Fort Meyers; Richard Smith, Lehigh Acres, and Todd Walter, Fort Meyers, all of Fla., assignors to Bander North America Corporation, Fort Meyers, Fla.

Filed Jan. 18, 1995, Ser. No. 374,943

Int. Cl.<sup>6</sup> A22C 21/00

U.S. Cl. 452—173

19 Claims



1. Apparatus for washing poultry carcasses comprising means defining a frame;
- a rotary carousel unit supported on said frame for rotation about a fixed axis;
  - a track passing through the apparatus on which a train of chicken carcasses supported on shackles can transit in tandem travel with the rotation of the carousel from an entry location to an exit location of the apparatus, the carcasses being suspended from the track such that a carcass open cavity faces upwardly; the rotary carousel including for each shackle in transit between the entry and exit locations, components which are fixed to rotate with the rotary carousel and include, an associated wash water actuator, an associated power operated vertical stroking means; a water lance connected to the vertical stroking means to move vertically therewith, the washing lance being such to receive a wash water flow and distribute it in a spray discharge; transit of the carcass carrying train and the rotary carousel being arranged such that at entry location the water lance associated with a given carcass carrying shackle is positioned above the cavity of the carcass carried by the shackle so that with operation of the stroking means to move the water lance downwardly the water lance enters the associated carcass cavity; the water actuator associated with the said shackle being actuatable to a held position by a presence of the carcass on the said shackle, so that in said held position water

can be allowed to flow to the associated water lance from whence it can discharge into the carcass cavity to effect carcass interior washing; and means for controlling operation of the vertical stroking means to stroke it in downward and return upward movements.

5,482,504

Patent Not Issued For This Number

5,482,505

**ARRANGEMENT FOR EXTRACTION OF HARMFUL GASES FROM WORKPLACES**

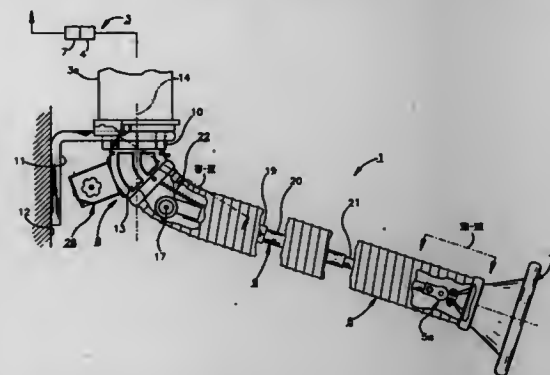
Per N. Hedlund, Helsingborg, Sweden, assignor to AB Ph. Nederman &amp; Co., Helsingborg, Sweden

Filed Jul. 5, 1994, Ser. No. 270,462

Claims priority, application Sweden, Jul. 12, 1993, 9302403

U.S. Cl. 454—65

15 Claims



1. An arrangement for the extraction of harmful gases from workplaces comprising:
- (a) a carrying arm assembly comprising a first arm and a second arm, said arms being slidably connected so that said carrier arm assembly is longitudinally extendable;
  - (b) a flexible and extendable gas hose carried by and extendable with said carrier arm assembly, said gas hose having a gas intake;
  - (c) a horizontal spindle supporting one end of said first arm for pivot movement of the carrier arm assembly on said spindle in an arc VH between a substantially horizontal position H and a substantially vertical position V, said spindle having a front side defined by said arc VH and a rear side opposite said front side;
  - (d) a first tension device comprising a tension spring connected at one end to said first arm at a point remote from said spindle and at the opposite end at a point above said spindle and on the rear side of said spindle, said first tension device resisting said pivot movement of said carrier arm assembly in said arc VH, said tension spring being movable in a plane which is offset from said spindle for unhindered movement of the tension spring in said plane throughout the pivot movement of the carrier arm assembly in said arc VH; and
  - (e) a second tension device comprising
    - (i) a biasing spring means connected to the second of said arms biasing said carrier arm assembly against extension of said assembly, and
    - (ii) adjustment means to adjust the force of said biasing spring means;
- said first and second tension devices permitting setting said gas intake at extended and non-extended vertical and horizontal locations in a sector defined by said spindle and the positions H and V and then retention at said locations.

5,482,506

**AIR-CONDITIONING BLOW-OUT PORT DEVICE AND PROCESS FOR TWO-STAGE INJECTION MOLDING OF THE SAME**

Kazuhiko Tsuda; Hiroyuki Okamoto, and Kazuhiro Hashimoto, Kawagoe, all of Japan, assignors to Moritoku Kabushiki Kaisha, Tokyo, Japan

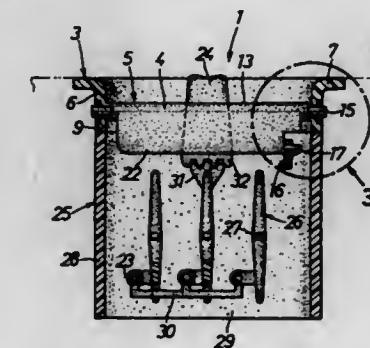
Filed Nov. 29, 1994, Ser. No. 350,125

Claims priority, application Japan, Nov. 30, 1993, 5-299425

Int. Cl.<sup>6</sup> B60H 1/34

U.S. Cl. 454—155

5 Claims



1. An air conditioning blow-out port device comprising: a housing of synthetic resin formed at a primary injection step and having a peripheral wall including opposed wall portions; a plurality of pairs of shaft holes passed through said opposed wall portions in a coaxial arrangement; and a plurality of blades of synthetic resin formed at a second injection step and disposed within said housing and each having a blade body and a pair of support shafts which are projectingly provided coaxially on opposite end faces of said blade body and which are rotatably fitted into said shaft holes, with tip ends of the support shafts projecting from an outer surface of each of said opposed wall portions, wherein said opposed wall portions are provided with a plurality of pairs of bosses, which are located coaxially with the shaft holes to define inlet openings of said shaft holes at sides of inner surfaces of said opposed wall portions and to abut against the opposite end faces of said blade bodies, and said opposed wall portions are also provided with a plurality of pairs of recesses, which are located coaxially with the shaft holes and which open into outer surfaces of said opposed wall portions to surround the inlet openings of the shaft holes at sides of the outer surfaces of the opposed wall portions, wherein said recesses are a sufficient depth to inhibit the formation of a flash on an outer peripheral surface of the support shaft at the secondary injection step and to avoid an increase in thickness of the opposed wall portions due to the provision of said bosses, and wherein said support shafts have a generally constant cross sectional width along the length thereof.

5,482,507

**CLOTHES DRYER VENT**

Johnny B. Priest, 86 Deerwood La., Pinhurst, N.C. 28374

Filed Aug. 1, 1994, Ser. No. 283,357

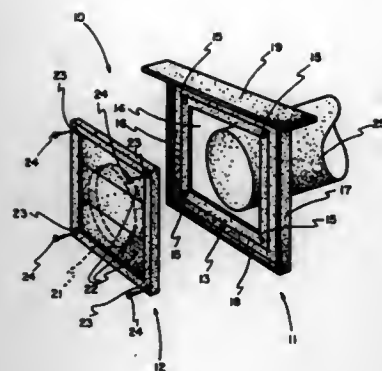
Int. Cl.<sup>6</sup> F24F 13/16

U.S. Cl. 454—359

7 Claims

1. A clothes dryer vent structure for installation in building foundations, and in brick, stone, and stucco, veneer structures comprising: a masonry guide portion including a generally flat area having a central opening therein through which a vent pipe can be passed and having two side edges, a bottom edge and a lintel-like upper edge for installation in said foundation and in brick, stone and stucco veneer structures; and a closure portion including an integrally formed receiving ring for fixedly attaching said vent pipe, said closure portion being mounted on the generally flat area of said masonry guide portion whereby said guide portion can be installed in foundation and in brick, stone and stucco veneer structures when the same is being built and said closure portion can be attached to said guide portion thereafter.





one side only of the radial plane and including a side edge of the flap portion opposite to the trailing edge which is spaced axially of the radial plane.

5,482,509

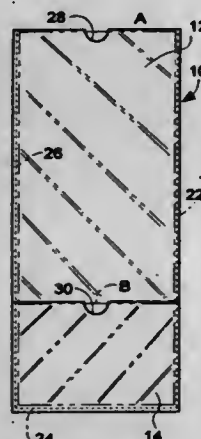
**LOTTERY PLAY SLIP AND LOTTERY TICKET JACKET**  
David L. Dull, 6415 Midnight Pass Rd., C-1, Sarasota, Fla. 34242

Filed May 5, 1995, Ser. No. 435,670

Int. Cl.<sup>6</sup> B42D 15/00

U.S. Cl. 462—64

3 Claims



1. A jacket for viewably holding a lottery play slip and a lottery ticket consisting of:

a first flat pocket sized similar to the lottery play slip and defined by generally coextensive mating rectangular middle and rear panels connected along each common side margin and a common first end margin of said middle and rear panels, the lottery play slip being insertable into said first pocket through a completely open second end thereof;

a second flat pocket sized similar to the lottery ticket, the lottery ticket being smaller in length than the lottery play slip, said second pocket defined by a lower surface of said middle panel and a front panel connected against said middle panel along each common side margin and a common first end margin of said front and middle panels, the lottery ticket being protectively insertable into said second pocket through a completely open second end thereof;

said front and middle panels being transparent for viewing the lottery play slip and the lottery ticket.

5,482,510

**AMUSEMENT DEVICE PASSING WITHIN TUBE**  
Hiroji Ishii, Masanori Tamada, Satoru Yoshida, all of Tokyo, and Isamu Okuzumi, Omiya, all of Japan, assignors to Ishii Iron Works Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1993, Ser. No. 137,905

Claims priority, application Japan, Jan. 23, 1992, 4-307853

Int. Cl.<sup>6</sup> A63F 7/00

U.S. Cl. 472—61

9 Claims

1. An amusement device passing within a tube, said amusement device comprising the following elements:

- a tube having an interior passageway for passing a rider who is a person;
- said interior passageway of said tube having an illuminating device on an inner wall to radiate ultraviolet rays;
- said interior passageway of said tube having a reflecting surface to reflect said ultraviolet rays;
- said reflecting wall surface having a picture which is formed from a fluorescent substance which emits light when contacted with ultraviolet rays;

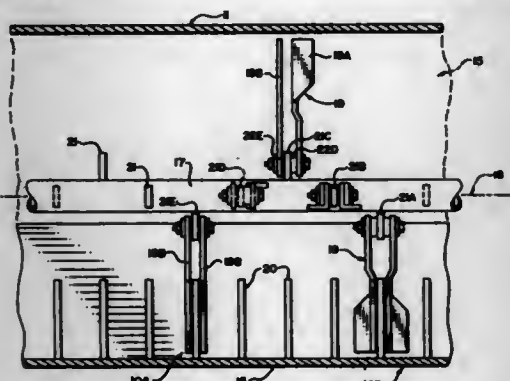
5,482,508  
**APPARATUS FOR CHOPPING AND DISCHARGING STRAW FROM A COMBINE HARVESTER**  
Leo L. Redekop, and Helen E. Redekop, both of Box 178A, R.R.#4, Saskatoon Saskatchewan, Canada

Filed Mar. 31, 1995, Ser. No. 414,735

Int. Cl.<sup>6</sup> A01F 12/40; 29/02

U.S. Cl. 460—112

20 Claims



1. A chopper and discharge apparatus for use with a combine harvester having a combine harvester body, means for discharging separated straw from a rear discharge area of the combine harvester body, and means mounting the apparatus on the combine harvester body at a position adjacent the rear discharge area for receiving straw therefrom, the apparatus comprising:

a housing having a feed opening and a discharge opening, a plurality of stationary blades mounted in the housing in axially spaced positions therealong, the stationary blades lying in parallel radial planes;

a chopping assembly mounted in the housing and comprising a hub member mounted for rotation about a longitudinal axis of the hub member and a plurality of blade members mounted on the hub member for rotation therewith about said axis, each blade member projecting generally outwardly from the hub member substantially in a radial plane of said axis, the blade members being arranged at spaced positions along the length of the hub member such that rotation of the hub member causes each blade member to pass between two of the stationary blades in a cutting action;

the feed opening being arranged to deposit the material onto the chopping assembly in a direction generally inwardly toward the axis and the discharge opening being arranged to allow discharge of the material generally radially outwardly from the chopping assembly;

each of at least some of the blade members defining fan blade members including a first cutting portion which includes a sharpened leading edge lying in a radial plane of the axis and a trailing edge, and a second flap portion bent from the first portion at the trailing edge of the first portion so as to be contiguous with the first portion at the trailing edge and to extend from the trailing edge of the first portion outwardly to



e) said picture, which is formed from a fluorescent substance which emits light when contacted with ultraviolet rays, being drawn so that said picture emits light of different brightness and tone when contacted by reflected ultraviolet rays and direct ultraviolet rays.

5,482,511

**DRIVE MECHANISMS**

Peter J. Kelly, Welwyn Garden City, England, and Robert I. T. Caley, Penrith, Australia, assignors to Xerox Corporation, Stamford, Conn.

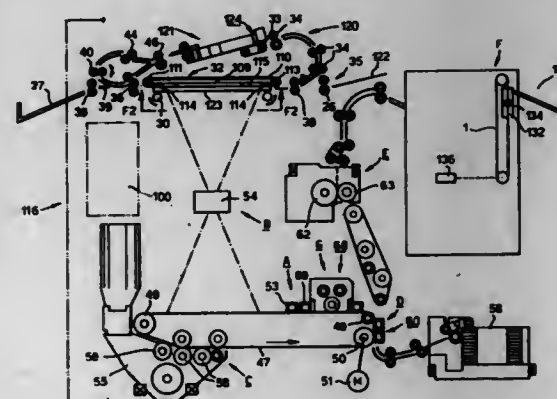
Filed Jan. 19, 1995, Ser. No. 375,012

Claims priority, application United Kingdom, Jan. 20, 1994, 9401082

Int. Cl.<sup>6</sup> F16H 7/00

U.S. Cl. 474—84

6 Claims



1. An electrophotographic printing machine having a finishing station, the finishing station including an output tray coupled to an elevator for adjusting the height of the tray in response to the number of copies produced, the elevator having a drive mechanism comprising:

- a plurality of rotatably supported pulleys, each of said pulleys having a plurality of teeth thereon forming a tooth portion, each of said teeth having a crown portion and a root portion;
- drive belt having lugs formed integral thereon adapted to mesh with said toothed pulleys; and
- a retaining member adjacent at least one of said pulleys, said retaining member being spaced from a selected one of said pulleys so that the distance between said retaining member and the crown of a tooth on the selected one of said pulleys is less than a cross-sectional thickness of said drive belt through one of said lugs, said retaining member extending over at least part of the toothed portion of the selected one of said pulleys.

5,482,512  
**ELECTRO-MECHANICAL HYBRID POWERTRAIN WITH SELF-ENGAGING BRAKES FOR STARTING THE ENGINE**

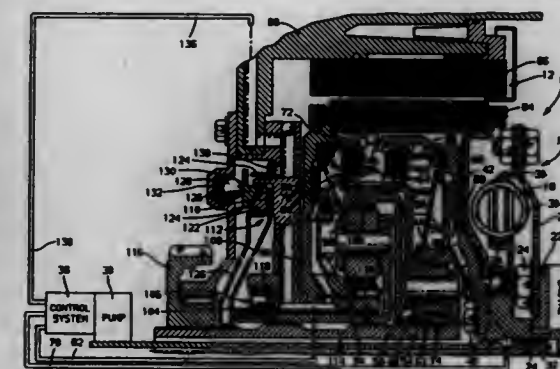
Paul D. Stevenson, Ann Arbor, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 12, 1994, Ser. No. 226,602

Int. Cl.<sup>6</sup> F16H 37/00; B60L 11/14

U.S. Cl. 475—5

4 Claims



1. In combination an electro-mechanical hybrid powertrain comprising:

- an input means for supplying power;
- an electric motor/generator;
- planetary gear means disposed between and interconnecting the input means and the motor/generator comprising at least two planetary gear sets including a first member operatively connected with the input means, a second member operatively connected with the motor/generator and a third member; and
- brake means for providing a reaction in said planetary gear means for permitting said motor/generator to drive said input means during a starting sequence, said brake means comprising self-energizing means operatively connected with said third member of said planetary gear means for engaging said brake means in response to torque being imposed on one member of the planetary gear means and fluid operated piston means for de-activating said self-energizing means for selectively disengaging said brake means.

5,482,513

**ANKLE JOINT WITH DEDICATED TRANSVERSE ROTATOR**

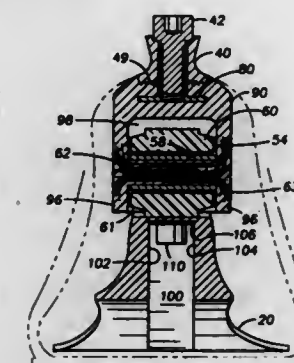
Michael T. Wilson, 3131 Villa La., Missouri City, Tex. 77459

Continuation-in-part of Ser. No. 40,905, Mar. 31, 1993. This application Oct. 12, 1993, Ser. No. 134,384

Int. Cl.<sup>6</sup> A61F 2/66

U.S. Cl. 623—52

16 Claims



1. A lightweight foot prosthesis, comprising:  
a foot;

an ankle joint affixed to said foot and capable of rotation about a transverse axis, said joint comprising a body having a transverse bore therethrough and a shell, said shell including an integral axle extending through said bore such that said shell

is pivotable with respect to said body, said axle and said shell being monolithic; means for connecting said body to said foot; and means for connecting said shell to a leg.

# 5,482,514 PROCESS FOR ENHANCING THE WHITENESS, BRIGHTNESS AND CHROMATICITY OF PAPER MAKING FIBRES

Axel von Raven, Seeshaupt, Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

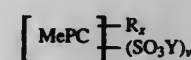
Filed Sep. 9, 1993, Ser. No. 119,463

Claims priority, application Germany, Sep. 14, 1992, 42 30 655.8

Int. Cl.<sup>6</sup> D06L 3/12; D21C 1/00

U.S. Cl. 8—110 17 Claims

1. A process for enhancing the whiteness, brightness and chromaticity of paper-making fibers, which comprises mixing water, paper-making fibers and a photoactivator to form an aqueous suspension, wherein said photoactivator is one or more than one water-soluble phthalocyanine complex of the formula (I)



wherein

MePC is a manganese, zinc or aluminum phthalocyanine ring system,

Y is hydrogen, an alkali metal or ammonium,

v is any number from 1 to 4,

R is fluorine, chlorine, bromine or iodine, and

x is any number from 0 to 8.

5,482,515

# IMINE QUATERNARY SALTS AS BLEACH CATALYSTS

Stephen A. Madison, New City, N.Y., and Janet L. Coope, Cliffside Park, N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

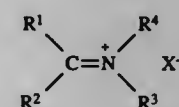
Division of Ser. No. 151,717, Nov. 12, 1993, Pat. No.

5,360,568. This application Jul. 21, 1994, Ser. No. 278,664

Int. Cl.<sup>6</sup> D06L 1/12; 3/02

U.S. Cl. 8—111 10 Claims

1. A method for bleaching a stained substrate, said method comprising contacting said stained substrate in an aqueous medium with a peroxygen compound, a surfactant in an effective amount to clean said substrate and with an oxygen transfer agent whose structure is:



wherein:

R<sup>1</sup> and R<sup>4</sup> are substituted or unsubstituted radicals independently selected from the group consisting of hydrogen, phenyl, aryl, heterocyclic ring, alkyl and cycloalkyl radicals;

R<sup>2</sup> is a substituted or unsubstituted radical selected from the group consisting of hydrogen, phenyl, aryl, heterocyclic ring, alkyl, cycloalkyl, nitro, halo, cyano, alkoxy, keto, carboxylic and carboalkoxy radicals;

R<sup>3</sup> is a substituted or unsubstituted radical selected from the group consisting of phenyl, aryl, heterocyclic ring, alkyl, cycloalkyl, nitro, halo, and cyano radicals;

or R<sup>1</sup> with R<sup>2</sup> and R<sup>2</sup> with R<sup>3</sup> respectively together form a radical selected from the group consisting of cycloalkyl, polycyclo, heterocyclic and aromatic ring systems;

X<sup>-</sup> is a counterion stable in the presence of oxidizing agents; and said peroxygen compound to oxygen transfer agent being present in a molar ratio ranging from 150:1 to 1:2.

## CHEMICAL

5,482,516

# PROCESS FOR BLEACHING TEXTILES

Sherman H. Sheppard, Pinnacle, N.C., assignor to Surry Chemicals, Inc., Mount Airy, N.C.

Continuation of Ser. No. 67,515, May 24, 1993, abandoned.

This application Nov. 4, 1994, Ser. No. 334,453

Int. Cl.<sup>6</sup> D06L 3/02

U.S. Cl. 8—111 5 Claims

1. A silicate-free liquid composition for use in bleaching cellulosic fabrics, said composition consisting essentially of:

- about 2 wt % of hydrogen peroxide;
- about 1 wt % of potassium hydroxide;
- about 1.5 wt % of a magnesium salt stabilizer; and
- the balance water.

5,482,517

# COAL-WATER MIXTURE AND PROCESS FOR PRODUCING SAME

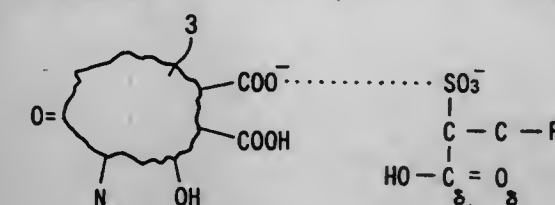
Hideji Ikeda, 27-2, Komagome 3-chome, Toshima-ku, Tokyo, Japan

Filed May 13, 1994, Ser. No. 242,422

Claims priority, application Japan, Apr. 13, 1994, 6-075182

Int. Cl.<sup>6</sup> C10L 9/10

U.S. Cl. 44—280 4 Claims



1. A process for producing a coal-water mixture, which comprises the steps of:

- grinding coal of low stages of metamorphism to produce a coal powder;
- extracting a stabilizer from said coal powder;
- producing a plasticizer composed of a humic acid derivative from brown coal; and
- mixing water and said plasticizer with said coal powder and said stabilizer to produce a coal-water suspension, wherein said plasticizer is produced by means of a mechanical-chemical reaction.

5,482,518

# SYNERGISTIC CETANE IMPROVER COMPOSITION COMPRISING MIXTURE OF ALKYL-NITRATE AND HYDROPEROXIDE QUINONE

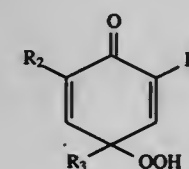
Marc-Andre Poirier, Sarnia, Canada, assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Nov. 18, 1994, Ser. No. 341,711

Int. Cl.<sup>6</sup> C10L 1/22; 1/18

U.S. Cl. 44—312 9 Claims

1. A diesel or middle distillate fraction composition, excluding jet fuel fraction, of improved cetane number comprising said diesel or middle distillate fraction and a combination additive comprising a major amount of an alkyl nitrate wherein said nitrate is a C<sub>4</sub>-C<sub>16</sub> paraffinic nitrate or mixture thereof and less than 50 wt % of a hydroperoxide quinone of the formula





where  $R_1$  and  $R_2$  are tert-butyl and  $R_3$  is methyl and wherein the combination additive is present in an amount in the range 0.05 to 3 wt % based on the diesel or middle distillate fraction.

5,482,519

# POLYEPOXIDE MODIFIED ADDUCTS OR REACTANTS AND OLEAGINOUS COMPOSITIONS CONTAINING SAME

Jacob Emert, Brooklyn, N.Y.; Antonio Gutierrez, Mercerville, and Robert D. Lundberg, Bridgewater, both of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J. Division of Ser. No. 779, Jan. 5, 1993, Pat. No. 5,370,810, which is a division of Ser. No. 758,341, Sep. 9, 1991, Pat. No. 5,217,634, which is a continuation of Ser. No. 291,533, Dec. 29, 1988, abandoned, which is a continuation-in-part of Ser. No. 161,899, Feb. 29, 1988, abandoned. This application Nov. 4, 1994, Ser. No. 334,298

Int. Cl.<sup>6</sup> C10L 1/22

U.S. Cl. 44—331

12 Claims

1. A composition comprising:

- (A) a normally liquid petroleum fuel containing
- (B) 0.001 to 0.5 wt. % of an oil soluble dispersant comprising the reaction products of
  - (i) at least one intermediate adduct consisting essentially of the reaction product of
    - (a) at least one polyepoxide wherein the polyepoxide contains oxirane rings joined by a divalent organic moiety selected from hydrocarbon moieties and substituted hydrocarbon moieties, and
    - (b) at least one polyamine wherein the polyamine contains at least two reactive amino groups selected from primary amino groups and secondary amino groups, and
  - (ii) at least one hydrocarbyl substituted  $C_3$ – $C_{10}$  monocarboxylic or  $C_4$ – $C_{10}$  dicarboxylic acid producing material wherein the hydrocarbyl substituent is derived from olefin polymer having a number average molecular weight of about 500 to about 6,000.

5,482,520

# DERIVATIZED T-BUTYL CALIXARENE ENCAPSULATED CYANURIC ACID

Iftikhar Alam, and Rodney L. D. Sung, both of Fishkill, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 17, 1994, Ser. No. 262,123

Int. Cl.<sup>6</sup> C10L 1/22

U.S. Cl. 44—336

6 Claims

1. A chemical composition comprising a derivatized t-butylcalix[8]arene encapsulated cyanuric acid wherein the t-butyl calix[8]arene encapsulated cyanuric acid is derivatized with at least one  $C_4$ – $C_{50}$  n-alkyl halide, n-alkaryl halide, aryl halide or polyoxyalkylene halide.

5,482,521

# FRICTION MODIFIERS AND ANTIWEAR ADDITIVES FOR FUELS AND LUBRICANTS

Noyes L. Avery, Bryn Mawr, Pa.; Edward G. Barry, Woodbury, N.J.; James T. Carey, Medford, N.J.; Lisa S. Crocker, Belle Mead, N.J.; Flora W. Feng, Stony Brook, N.Y.; John Hiebert, Levittown, Pa.; Andrew G. Horodysky, Cherry Hill, N.J., and Lloyd A. Nelson, Edison, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed May 18, 1994, Ser. No. 245,275

Int. Cl.<sup>6</sup> C10L 1/22; C07D 249/18

U.S. Cl. 44—344

21 Claims

- 1. A compound comprising the reaction product of:
  - (a) at least one nitrogen heterocycle;
  - (b) at least one amine;

- (c) at least one carbonyl compound; and
- (d) at least one carboxyl compound.

5,482,522

# MANNICH CONDENSATION PRODUCTS OF POLY(OXYALKYLENE) HYDROXYAROMATIC ESTERS AND FUEL COMPOSITIONS CONTAINING THE SAME

Richard E. Cherpeck, Cotati, Calif., assignor to Chevron Chemical Company, San Ramon, Calif.

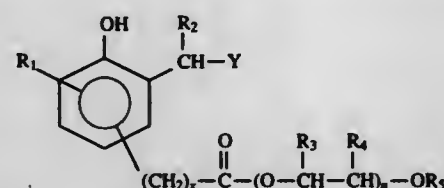
Filed Dec. 30, 1993, Ser. No. 175,700

Int. Cl.<sup>6</sup> C10L 1/18

U.S. Cl. 44—391

38 Claims

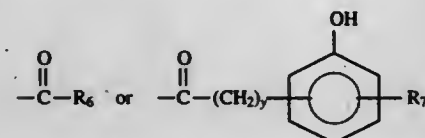
27. A fuel composition comprising a major amount of hydrocarbons boiling in the gasoline or diesel range and an effective deposit-controlling amount of a compound of the formula:



wherein  $R_1$  is hydrogen, hydroxy, lower alkyl having 1 to 6 carbon atoms, or lower alkoxy having 1 to 6 carbon atoms;

$R_2$  is hydrogen or lower alkyl having 1 to 6 carbon atoms;  $R_3$  and  $R_4$  are each independently hydrogen or lower alkyl having 1 to 6 carbon atoms;

$R_5$  is hydrogen, alkyl having 1 to 30 carbon atoms, phenyl, aralkyl or alkaryl having 7 to 36 carbon atoms, or an acyl group having the formula:



wherein  $R_6$  is alkyl having 1 to 30 carbon atoms, phenyl, or aralkyl or alkaryl having 7 to 36 carbon atoms;

$R_7$  is hydrogen, hydroxy, lower alkyl having 1 to 6 carbon atoms, or lower alkoxy having 1 to 6 carbon atoms;  $n$  is an integer from 5 to 100; and  $x$  and  $y$  are each independently an integer from 0 to 10; and

$Y$  is selected from amino, lower alkylamino having 1 through 6 carbon atoms or a polyamine radical having 2 through 12 amine nitrogen atoms and 2 through 40 carbon atoms; wherein the attachment of  $Y$  to the  $—CHR_2—$  linking group is through one of its amine nitrogen atoms.

5,482,523

# MANNICH CONDENSATION PRODUCTS OF POLY(OXYALKYLENE) HYDROXYAROMATIC ETHERS AND FUEL COMPOSITIONS CONTAINING THE SAME

Richard E. Cherpeck, Cotati, Calif., assignor to Chevron Chemical Company, San Ramon, Calif.

Filed Nov. 2, 1994, Ser. No. 333,458

Int. Cl.<sup>6</sup> C10L 1/22; C07C 69/76; 67/02; 215/00

U.S. Cl. 44—391

38 Claims

12. A compound of the formula:

5,482,524

# ATMOSPHERIC PRESSURE, ELEVATED TEMPERATURE GAS DESORPTION APPARATUS

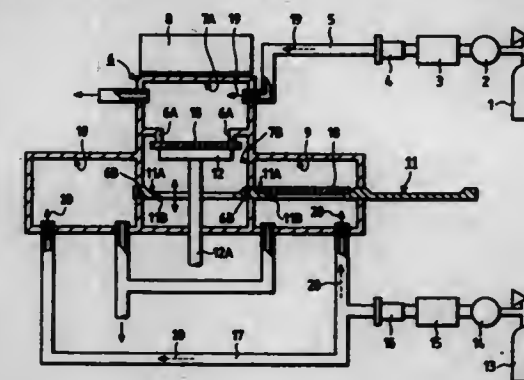
Kazuo Nakano, Sendai; Kazuaki Mizokami, Kodaira; Keiji Hasumi, Iruma; Katsumi Itoh, Tokyo; Michimasa Funabashi; Yasuhiro Mitsui, both of Fuchu; Takashi Irie, Kokubunji; Takeshi Tajima, Tokyo, and Sadao Matsuo, Kanagawa, all of Japan, assignors to Hitachi, Ltd., and Hitachi Tokyo Electronics Co., Ltd., both of Tokyo, Japan

Filed Aug. 3, 1994, Ser. No. 285,421

Claims priority, application Japan, Sep. 16, 1993, 5-229094 Int. Cl.<sup>6</sup> B01D 53/04; 35/18

U.S. Cl. 55—267

12 Claims



1. An atmospheric pressure, elevated temperature gas desorption apparatus for desorbing impurities absorbed in or on a surface of a plate-like solid sample into a carrier gas in a chamber under an atmospheric pressure while increasing the temperature of the solid sample, said apparatus comprising:

- a desorption room provided in the chamber and connected through a pipe to a first gas supply system for supplying the carrier gas, for desorbing impurities absorbed in or on the surface of the solid sample into the carrier gas supplied from the first gas supply system;
- a sample support room provided in the chamber and to be separated from the desorption room by a partition member and the solid sample being brought in close contact with the partition member, for incorporating a sample support for conveying and supporting the solid sample to be brought in close contact with the partition member;
- a heater for heating the solid sample being in close contact with the partition member; and
- a reserve room connected to the sample support room and connected through a supply pipe to a second gas supply system for supplying a purge gas, for reserving the solid sample to be conveyed to the sample support room.

5,482,525

# METHOD OF PRODUCING ELLIPTIC CORE TYPE POLARIZATION-MAINTAINING OPTICAL FIBER

Hiroshi Kajitaka; Kohdo Yamada; Masashi Nakamura; Kazuya Murakami, and Yuetsu Takuma, all of Hitachi, Japan, assignors to Hitachi Cable Limited, Tokyo, Japan

Division of Ser. No. 358,308, May 26, 1989, abandoned. This application May 28, 1993, Ser. No. 68,645

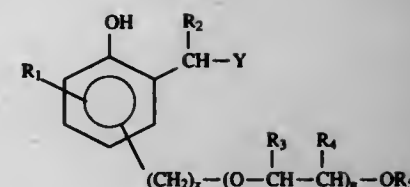
Claims priority, application Japan, May 27, 1988, 63-128498; Dec. 8, 1988, 63-308896

Int. Cl.<sup>6</sup> C03B 37/023

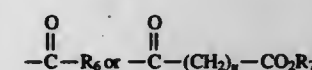
U.S. Cl. 65—398

8 Claims

1. A method of producing an elliptic core type polarization-maintaining optical fiber which comprises the steps of: providing a glass rod comprising a core glass layer containing germanium oxide and a fluorine-containing cladding glass layer surrounding the core glass layer, removing two side surface portions of the glass rod by machining along the axial direction of the glass rod to form a machined rod noncircular in cross section,



wherein  $R_1$  is hydrogen, hydroxy, lower alkyl having 1 to 6 carbon atoms, or lower alkoxy having 1 to 6 carbon atoms;  $R_2$  is hydrogen or lower alkyl having 1 to 6 carbon atoms;  $R_3$  and  $R_4$  are each independently hydrogen or lower alkyl having 1 to 6 carbon atoms;  $R_5$  is hydrogen, alkyl having 1 to 30 carbon atoms, phenyl, aralkyl or alkaryl having 7 to 36 carbon atoms, or an acyl group having the formula:

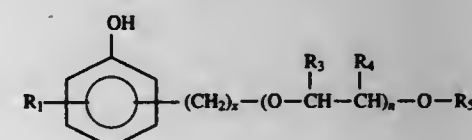


wherein  $R_6$  is alkyl having 1 to 30 carbon atoms, phenyl, or aralkyl or alkaryl having 7 to 36 carbon atoms;  $R_7$  is alkyl having 1 to about 10 carbon atoms; and  $u$  is an integer from 1 to 10;

$n$  is an integer from 5 to 100; and  $x$  is an integer from 0 to 10; and

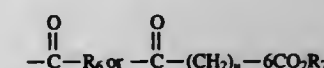
$Y$  is selected from amino, lower alkylamino having 1 through 6 carbon atoms or a polyamine radical having 2 through 12 amine nitrogen atoms and 2 through 40 carbon atoms; wherein the attachment of  $Y$  to the  $—CHR_2—$  linking group is through one of its amine nitrogen atoms.

23. A fuel composition comprising a major amount of hydrocarbons boiling in the gasoline or diesel range and an effective deposit-controlling amount of a composition prepared by the Mannich condensation of a compound of the formula:



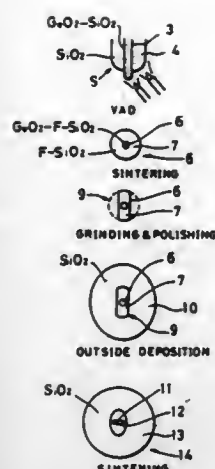
wherein  $R_1$  is hydrogen, hydroxy, lower alkyl having 1 to 6 carbon atoms, or lower alkoxy having 1 to 6 carbon atoms;  $R_2$  is hydrogen or lower alkyl having 1 to 6 carbon atoms;  $R_3$  and  $R_4$  are each independently hydrogen or lower alkyl having 1 to 6 carbon atoms;

$R_5$  is hydrogen, alkyl having 1 to 30 carbon atoms, phenyl, aralkyl or alkaryl having 7 to 36 carbon atoms, or an acyl group having the formula:



wherein  $R_6$  is alkyl having 1 to 30 carbon atoms, phenyl, or aralkyl or alkaryl having 7 to 36 carbon atoms;  $R_7$  is alkyl having 1 to about 10 carbon atoms; and  $u$  is an integer from 1 to 10;

$n$  is an integer from 5 to 100; and  $x$  is an integer from 0 to 10; with an aldehyde having the formula  $HR_2C(O)$ , wherein  $R_2$  is hydrogen or lower alkyl having 1 to 6 carbon atoms, and a nitrogen base selected from ammonia, lower alkylamine having 1 to 6 carbon atoms, a polyamine having 2 to about 12 amine nitrogen atoms and 2 to about 40 carbon atoms and mixtures thereof.



depositing, on the periphery of the machined rod, fine glass particles of a glass composition having a softening point higher than the softening point of the cladding glass layer, sintering the fine glass particles after their deposition on the machined rod to form a support glass layer thereby producing a glass rod of a three-layer structure having a glass core layer elliptical in cross section, a cladding glass layer elliptical in cross-section and the support glass layer, grinding away the support glass layer to completely remove the support glass layer thereby producing a glass rod body circular in cross section, providing a glass layer of the same composition as the cladding glass layer and round in cross section around the periphery of the glass rod body, thereby producing an optical fiber preform with an elliptical core glass layer and a cladding glass layer thereover of a refractive index constant across a transverse section thereof and lower than that of the core glass layer, and drawing the thus obtained optical fiber preform to provide an optical fiber of a single glass layer over an elliptical core glass layer.

5,482,526

# METHOD FOR FORMING A NON-HYGROSCOPIC ZINC-PHOSPHATE COMPOUND AND A ZINC-PHOSPHATE GLASS

Nashir B. Havewala, Corning; Kevin T. Morris, and Robert D. Shoup, both of Hammondsport, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Feb. 17, 1994, Ser. No. 178,417

Int. Cl.<sup>6</sup> C03B 5/16; C01B 15/16; 25/26; C03C 3/17

U.S. Cl. 65—134.1 13 Claims

1. A method for preparing a stable, anhydrous non-hygroscopic zinc phosphate compound comprising the steps of:

- forming an aqueous slurry mixture by intimately mixing a mixture containing phosphoric acid and a zinc-containing compound whereby the so-formed slurry mixture is comprised of a mixture of zinc hydrogen phosphates and exhibits a  $P_2O_5/ZnO$  weight ratio range from between about 1.2 to 2.0; and,
  - heating the so-formed slurry mixture to a temperature and for a time sufficient to achieve both a removal of a sufficient amount of water from the so-formed slurry mixture and a phase transformation of the zinc hydrogen phosphates, whereby the resultant zinc-phosphate material comprises a solid granular mixture of zinc metaphosphates and zinc pyrophosphates; and,
  - cooling the zinc-phosphate material to room temperature.
6. A method for preparing a zinc phosphate glass comprising the steps of:
- forming an aqueous slurry mixture by intimately mixing a mixture containing phosphoric acid and a zinc-containing compound whereby the so-formed slurry mixture is com-

prised of a mixture of zinc hydrogen phosphates and exhibits a  $P_2O_5/ZnO$  weight ratio mixture range between about 1.2 to 2.0;

- heating the so-formed slurry mixture to a temperature and for a time sufficient to achieve both removal of a sufficient amount of water from the so-formed slurry mixture and a phase transformation of the zinc hydrogen phosphates, whereby the resultant zinc-phosphate material comprises a solid granular mixture of zinc metaphosphates and zinc pyrophosphates;
- cooling the resultant zinc-phosphate material to room temperature;
- crushing the zinc-phosphate material to an appropriate particle size;
- providing additional batch materials necessary for the formation of a desired composition of zinc-phosphate glass;
- mixing the zinc-phosphate material with the additional batch materials to form a batch mixture, in a proportion required to form the desired zinc-phosphate glass composition;
- heating the batch mixture to a temperature and for a time sufficient to produce a homogeneous melt; and
- cooling the melt to form a zinc-phosphate glass.

5,482,527

# SPINNER APPARATUS FOR PRODUCING DUAL COMPONENT FIBERS

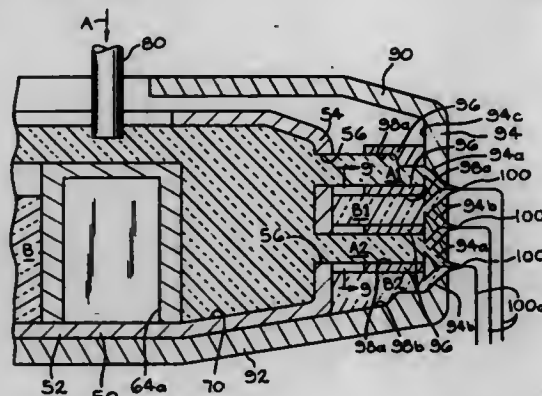
Witold S. Czastkiewicz, Orleans, Canada, assignor to Owens-Corning Fiberglass Technology, Inc., Summit, Ill.

Filed Sep. 20, 1994, Ser. No. 309,236

Int. Cl.<sup>6</sup> C03B 37/023; 37/08

U.S. Cl. 65—502

17 Claims



1. An apparatus for making dual component fibers comprising: a distributor having an outer casing and a divider cup fixedly positioned within said outer casing, said outer casing having a bottom wall and a peripheral wall and including first orifices and second orifices extending through said peripheral wall, said divider cup defining, with said outer casing, at least one first chamber and at least one second chamber, for receiving first and second molten thermoplastic materials, said first orifices communicating with said at least one first chamber and said second orifices communicating with said at least one second chamber; equipment for supplying first and second molten thermoplastic materials to said distributor;
- a rotatable spinner having a peripheral wall and a bottom wall and including first passages and second passages in said spinner peripheral wall; and,
- a rotation mechanism for rotating said distributor and said spinner to centrifuge said first and second thermoplastic materials through said first and second orifices in said peripheral wall of said outer casing and against an inner face of said peripheral wall of said spinner and to centrifuge dual component fibers through said first and second passages in said peripheral wall of said spinner.

5,482,528

# PATHOGENIC WASTE TREATMENT

Edwin C. Angell, and Jess Karr, both of Bakersfield, Calif., assignors to Hondo Chemical, Inc., Bakersfield, Calif.

Division of Ser. No. 922,329, Jul. 30, 1992, Pat. No. 5,422,015.

This application Nov. 15, 1994, Ser. No. 339,805

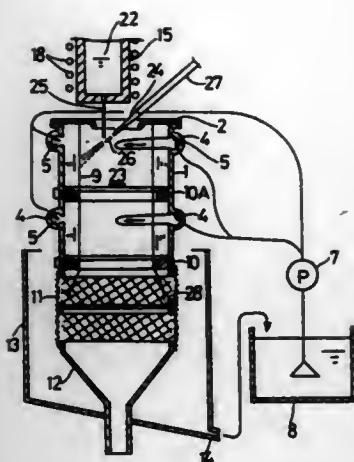
Int. Cl.<sup>6</sup> C02F 11/14; C05F 3/00

U.S. Cl. 71—12

8 Claims







decreasing downward flow velocity of the injected cooling liquid by providing said cooling tubular body with a narrower width at a lower portion of the tubular body than at an upper portion of the tubular body, said narrower width being provided by (a) providing a ring for adjusting the thickness of the cooling liquid layer extending around the inner peripheral surface of the cooling tubular body, (b) providing the ring with an inwardly extending upper surface extending inwardly from the inner peripheral surface such that the cooling liquid is forced to flow over the ring inwardly away from the inner peripheral surface, and (c) providing the ring at a location within said cooling tubular body such that the upper surface of the ring is in between the upper end and the lower end such that the cooling liquid is forced to flow over the ring prior to being discharged from the lower end;

supplying a molten metal to a space inside the cooling liquid layer;

applying a gas jet to the molten metal to divide the molten metal and supply the divided molten metal to the cooling liquid layer; and

discharging the cooling liquid containing a metal powder solidified in the liquid layer from the cooling liquid discharge end of the tubular body to outside.

5,482,533

# METHOD FOR MANUFACTURING FOAM ALUMINUM PRODUCT AND PRODUCT

Toshio Masuda, Ashikaga, and Shigemi Kanbayashi, Gunma Pref, both of, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

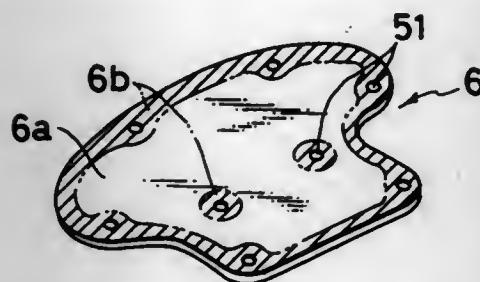
Continuation-in-part of Ser. No. 175,741, Dec. 30, 1993, abandoned. This application Feb. 25, 1994, Ser. No. 202,366

Claims priority, application Japan, Jan. 12, 1993, 19645

Int. Cl.<sup>6</sup> B22D 27/00

U.S. Cl. 75—415

11 Claims



1. A manufacturing method for making a foamed aluminum product, comprising:

placing a plurality of vertical rod members which are fixed at locations in a vessel having a peripheral wall conforming on its inside surface to the outer configuration of the foamed aluminum product, at least some of which rods are located at positions close to an inner wall of said vessel;

pouring a melt of aluminum or an alloy thereof into said vessel; stirring said melt with a viscosity increaser for increasing the viscosity of said melt and a foaming agent for foaming said melt;

cooling said melt to form a block of foamed aluminum or alloy thereof;

removing said block from said vessel; and

slicing said block to a predetermined thickness in a plane vertical to its axial direction to obtain a product of foamed aluminum or aluminum alloy having a plurality of mounting holes surrounded by a high density area at least in a position in the vicinity of the outer edge thereof.

5,482,534

# EXTRACTION OR RECOVERY OF NON-FERROUS METAL VALUES FROM ARSENIC-CONTAINING MATERIALS

Rodney L. Leonard, Wembley Downes, Australia, and John G. Whellock, Denver, Colo., assignors to Sasox Processing Pty. Limited, Australia

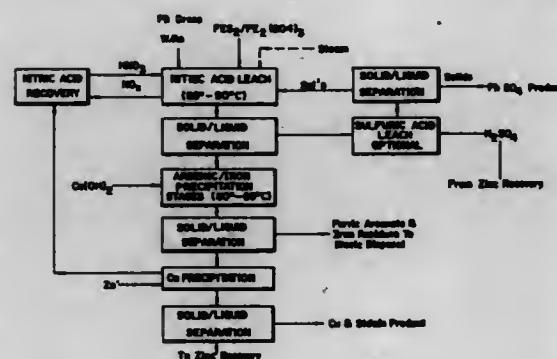
Filed Apr. 20, 1994, Ser. No. 211,916

Claims priority, application Australia, Jan. 25, 1991, PK9105

Int. Cl.<sup>6</sup> C22B 3/44

U.S. Cl. 75—743

18 Claims



1. A process suitable for the extraction or recovery of metal values from arsenic containing feeds having an Fe/As ratio less than 4:1 and including the steps of:

- (a) treating the feed with a nitric acid-containing leachant solution in order to dissolve the desired metals;
- (b) adding a source of iron (III) to the leachant solution to achieve an Fe/As molar ratio of at least 4:1 in the leachant solution whereby to oxidize arsenic (III) in solution to arsenic (V);
- (c) adding sufficient neutralizing agent to the leachant solution to achieve a pH in the range of 4 to 7 in the leachant solution whereby to precipitate arsenic as ferric arsenate;
- (d) separating the ferric arsenate precipitate from the leachant solution; and
- (e) subsequent to step (d), recovering metal values from the leachant solution.

5,482,535

# PROCESS FOR THE RECOVERY OF SILVER BY FLOATATION FROM THE RESIDUE FROM THE WET EXTRACTION OF ZINC

All-Nagi Beyzavi, Frankfurt; Horst Dittmann, Büdingen, and Friedrich Rosenstock, Frankfurt, all of, Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jul. 12, 1994, Ser. No. 274,200

Claims priority, application Germany, Jul. 13, 1993, 43 23 339.2

Int. Cl.<sup>6</sup> C22B 3/04

U.S. Cl. 75—744

3 Claims

1. A process for the recovery of silver, comprising the steps of:
  - (a) subjecting a particulate solids material containing zinc and silver to a neutral wet extraction of zinc and recovering a silver-containing residue from said extraction;
  - (b) subjecting said silver-containing residue to attrition in a rotating drum containing a particulate grinding medium, said drum having a net energy input of 2 to 10 kWh per 1000 kg of a throughput of said drum, and in said drum rubbing silver-containing particles from the particles of said residue; and
  - (c) separating silver-containing particles from said residue subjected to attrition according to step (b) by flotation.

5,482,536

# APPARATUS FOR CONTAINMENT AND SCRUBBING OF TOXIC GAS FROM A LEAKAGE LOCATION AND METHOD THEREFOR

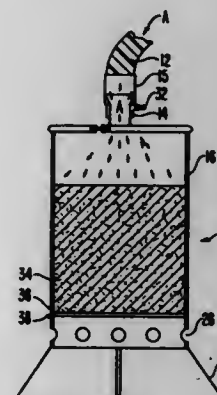
Eugene Y. Ngai, Whitehouse Station, and Lester S. Gerver, Belle Mead, both of N.J., assignors to Solvay Specialty Chemicals, Inc., Fairfield, N.J.

Filed Apr. 12, 1994, Ser. No. 226,318

Int. Cl.<sup>6</sup> B01D 53/04

U.S. Cl. 95—131

20 Claims



1. A method for containing and scrubbing leaked gas flowing from a gas leakage location comprising:
  - providing a gas passageway which is attachable to said gas leakage location at an end of said passageway;
  - providing a gas suction means for drawing leaked gas through said gas passageway;
  - providing a drum attached to said gas passageway at an end opposite said end which is attachable to said gas leakage location, said drum comprising therein a scrubbing media;
 wherein said gas passageway is attached to a gas leakage location and said gas suction means draws said leaked gas through said gas

passageway and through said drum comprising said scrubbing media thereby cleaning said leaked gas to render it safe for environmental release.

5,482,537

# GAS FILTERING APPARATUS

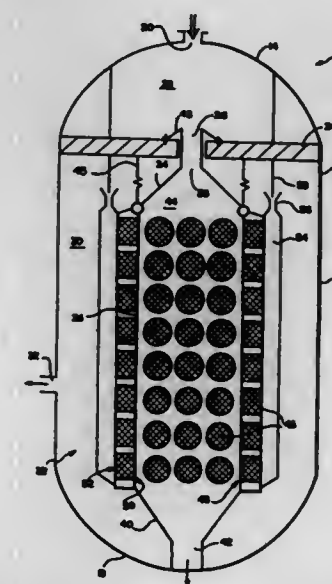
Timo Eriksson, Karhula, Finland, assignor to A. Ahlstrom Corporation, Noormarkku, Finland

Filed May 18, 1994, Ser. No. 246,222

Int. Cl.<sup>6</sup> B01D 29/05; 29/66; 35/18

U.S. Cl. 95—273

21 Claims



1. A method of filtering either atmospheric pressure or superatmospheric pressure gases at a temperature of greater than 400 degrees C. using an upright outer vessel with at least one upright inner vessel within it, and a plurality of monolithic ceramic filter elements mounted in openings disposed in peripheral walls of the inner vessel, comprising the steps of:

- (a) passing particle laden gas at a temperature of greater than 400 degrees C. through the ceramic filter elements to filter the particles from the gas; and
- (b) cooling at least the portions of the inner vessel mounting the ceramic filter elements so that they have a temperature at least about 100 degrees C. lower than the temperature of the gas being filtered.

2. Apparatus for filtering high temperature gases from either pressurized and atmospheric systems, comprising:

a generally upright outer vessel having a top, a bottom and a side wall;

at least one generally upright inner vessel, disposed within said outer vessel, said inner vessel having generally gas-imperious peripheral walls preventing gas from flowing through said walls and dividing the gas volume in said outer vessel into a dirty gas volume and a clean gas volume;

a plurality of monolithic ceramic filter elements mounted in openings disposed in said gas impermeous peripheral walls of said inner vessel, allowing gas to flow through said filter elements from said dirty gas volume to said clean gas volume, to be cleaned; and wherein

at least one of said peripheral walls includes cooling panels formed of cooling tubes.

**5,482,538**  
**PROCESS FOR REMOVING UNDESIRABLE**  
**CONSTITUENTS FROM A GAS**

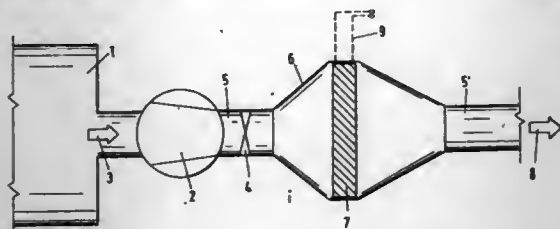
Oliver Becker, Losheim; Sabine Kolz, Grossrosseln, and Herbert Hager, Nalbach, all of, Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Germany  
 Filed Jun. 24, 1994, Ser. No. 267,115

Claims priority, application Germany, Jun. 24, 1993, 43 21 622.6; Jun. 7, 1994, 44 20 224.5

Int. Cl.<sup>6</sup> B01D 35/18

U.S. Cl. 95—12

14 Claims



1. A process for removing undesirable constituents from a gas, comprising the steps of:  
 providing an immovable, non-combustible woven adsorbent element;  
 passing a flow of the gas through the element so that the gas is sharply deflected in the element and so that the constituents are adsorptively added to the element;  
 interrupting the gas flow when the element reaches a maximum load of adsorbed constituents;  
 directly heating the element while the gas flow is interrupted, by applying an electric voltage, to a process temperature of at least 200° C. for removing the adsorbed constituents from where they are adsorbed to the adsorbent element;  
 intermittently supplying a gas flow after the process temperature is reached at intervals that ensure that the temperature of an inlet side of the adsorbent element does not drop below the process temperature and the temperature of an outlet side of the adsorbent element does not exceed a pre-defined maximum value; and  
 discontinuing the heating so that the element cools to an operating temperature at which adsorption occurs.

**5,482,539**  
**MULTIPLE STAGE SEMI-PERMEABLE MEMBRANE**  
**PROCESS AND APPARATUS FOR GAS SEPARATION**

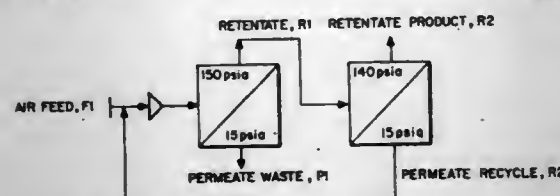
Richard A. Callahan, Burlington, Vt., assignor to Enerflex, Inc., Burlington, Vt.

Continuation-in-part of Ser. No. 124,577, Sep. 22, 1993, abandoned. This application Oct. 11, 1994, Ser. No. 320,273

Int. Cl.<sup>6</sup> B01D 53/22

U.S. Cl. 95—51

11 Claims



1. A membrane process for the production of a desired very high purity permeate gas product from a feed gas mixture containing less than 40 vol % of the desired permeate gas, which process comprises providing in a primary stage a process feed gas mixture to a primary membrane separator unit comprising a membrane having a relatively high intrinsic permeability, to provide an intermediate permeate gas and a retentate gas, and providing the intermediate permeate gas in a secondary stage to a secondary membrane separator unit comprising a membrane having a relatively high selectivity, to produce therefrom the very high purity permeate gas product.

**5,482,540**  
**ELECTROSTATIC PRECIPITATOR FRAME STABILIZER**  
**AND METHOD OF OPERATION**

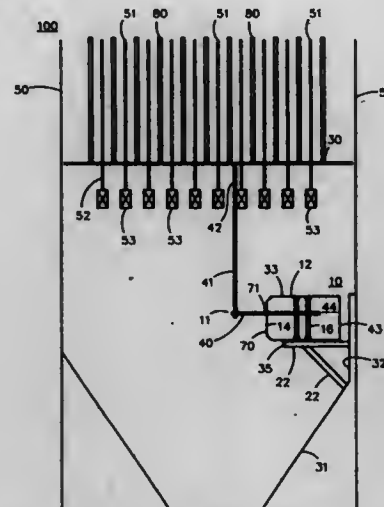
John G. Trinward, Waterville, Me., and John P. Jabar, Jr., Portsmouth, N.H., assignors to Castine Energy Services, Waterville, Me.

Filed Jan. 31, 1994, Ser. No. 188,836

Int. Cl.<sup>6</sup> B03C 3/70

U.S. Cl. 95—57

11 Claims



1. A grid-frame stabilizer for stabilizing a grid frame in an electrostatic precipitator, said grid-frame stabilizer comprising:  
 a. a fixed housing component including means for securing said housing component to an interior of said electrostatic precipitator;  
 b. one or more electrical isolators located within said housing component and connected to an interior region of said housing component;  
 c. a stand-off member attached to said grid frame and to said electrical isolators, wherein a portion of said stand-off member passes through a housing opening of said housing component; and  
 d. a membrane for enclosing said one or more electrical isolators within said housing component, wherein said membrane is positioned over said housing opening, said membrane having a membrane opening through which said stand-off member passes.  
 9. A method of preventing grid-frame swing in a particle precipitator having a grid frame, said method comprising the steps of:  
 a. securing a stand-off member to said grid frame;  
 b. electrically isolating said stand-off member from a fixed housing having a housing opening by connecting said stand-off member to said fixed housing through one or more electrical isolators located within said fixed housing; and  
 c. sealing said fixed housing to prevent particle contamination of said electrical isolators by placing a membrane over said housing opening, said membrane having a membrane opening through which said stand-off member passes.

**5,482,541**  
**SORPTION CARTRIDGE**

Peter Maler-Laxhuber, Unterschleißheim; Andreas Becky; Reinert Engelhardt, both of München, and Gerald Heggl, Inning, all of, Germany, assignors to Zeo-Tech GmbH, Unterschleißheim, Germany

Filed Dec. 21, 1993, Ser. No. 171,110

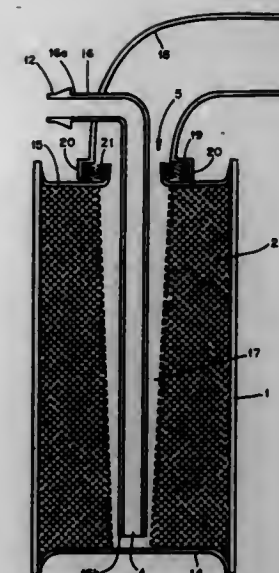
Claims priority, application Germany, Dec. 23, 1992, 42 43 816.0

Int. Cl.<sup>6</sup> B01D 53/04

U.S. Cl. 96—146

10 Claims

1. Adsorption agent cartridge comprising an airtight cartridge cover and an adsorption agent capable of adsorbing operating



medium, the adsorption agent cartridge also including an operating medium line and an inlet opening, the operating medium line being in fluid communication with the inlet opening for accepting an inflow of said operating medium, the adsorption agent cartridge also including a suction tube having an exhaust opening within the adsorption agent, the inlet opening being substantially larger than the exhaust opening, said suction tube providing a conduit through which gases from said adsorption agent cartridge that are not adsorbed by said adsorption agent are expelled from the adsorption agent cartridge, the suction tube being at least partially contained within the operating medium line and being substantially positioned through said inlet opening such that the exhaust opening is distantly located with respect to the inlet opening wherein said exhaust opening and said inlet opening are configured such that the nonadsorbed gases will be expelled from said adsorption agent and said operating medium will substantially remain within said adsorption agent.

**5,482,542**  
**LIQUID VAPOUR SEPARATOR**

Ian A. Ballinger, Wolverhampton, Great Britain, assignor to Dowty Boulton Paul Limited, Wolverhampton, United Kingdom

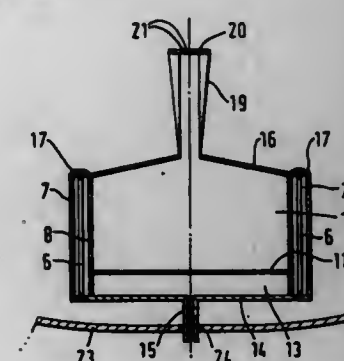
Filed Apr. 13, 1994, Ser. No. 226,892

Claims priority, application United Kingdom, Dec. 24, 1993, 9326401

Int. Cl.<sup>6</sup> B01D 19/00

U.S. Cl. 96—204

9 Claims



1. A liquid vapour separator for use in a fuel tank of a space vessel, comprising first and second liquid-vapour separator walls, a vapour vent and an unvented outlet chamber having an outlet, said first and second liquid-vapour separator walls defining a first trap volume therebetween and arranged such that liquid flows into the

first trap volume through said second liquid-vapour separator wall and flows from the first trap volume to the outlet chamber via said first liquid-vapour separator wall, said vapour vent being located such that vapour within the first trap volume is vented therefrom as liquid flows into the first trap volume, wherein said first liquid-vapour separator wall comprises a plurality of separator plates clamped together with engaging surfaces of adjacent plates formed with liquid-vapour separator passages between said surfaces, said passages being dimensioned so as to inhibit vapour flow whilst preferentially allowing liquid flow.

**5,482,543**  
**MULTIPURPOSE, ECOLOGICAL WATER-PAINT**  
 Donato L. Blevé, Francesco DeFrancesco, and Fernando Claudio, all of Corsano, Italy, assignors to Laboratori Ecobios S.r.l., Corsano, Italy  
 PCT No. PCT/IT92/00159, § 371 Date Jul. 14, 1994, § 102(e)  
 Date Jul. 14, 1994, PCT Pub. No. WO93/14165, PCT Pub. Date Jul. 22, 1993  
 PCT Filed Dec. 7, 1992, Ser. No. 256,616  
 Claims priority, application Italy, Jan. 16, 1992, LE92A0001  
 Int. Cl.<sup>6</sup> C09D 5/00

U.S. Cl. 106—14.05

7 Claims

1. A biological, multi-purpose, water-paint in the form of a milky emulsion with bactericidal, fire-proof, transpiring, isolating, antioxidant, and desalting properties suitable for protecting a surface of manufactured building articles, wood, metals or plastics, which comprises:  
 (a) 10 to 17% pasteurized whole milk or powdered milk;  
 (b) 6 to 8% vinegar containing 6 to 15% acetic acid;  
 (c) 46 to 72% calcium hydroxide;  
 (d) 2 to 16% calcium sulfate or powdered stucco; and  
 (e) 9 to 15% lithopone.

**5,482,544**  
**RUST-PREVENTIVE COMPOSITION**  
 Masaaki Okuda, Takarazuka; Hajime Kondo, Osaka, and Eiichi Fujiwara, Amagasaki, all of, Japan, assignors to Tayca Corporation, Osaka, Japan  
 Filed Jul. 14, 1994, Ser. No. 275,153  
 Claims priority, application Japan, Jul. 15, 1993, 5-198948  
 Int. Cl.<sup>6</sup> C09D 5/08; I/00

U.S. Cl. 106—14.12

5 Claims

1. A rust-preventive composition comprising a layered phosphate having an active hydrogen reacted with ammonia in an amount of 20 to 80 mol % based on the total amount of hydrogen of the layered phosphate, and an amphoteric or basic oxygen-containing compound selected from the group consisting of zinc oxide, and oxides, hydroxides, and carbonates of alkali earth metals, a ratio by weight of the layered phosphate to the amphoteric or basic oxygen-containing compound being 10:1 to 1:10.

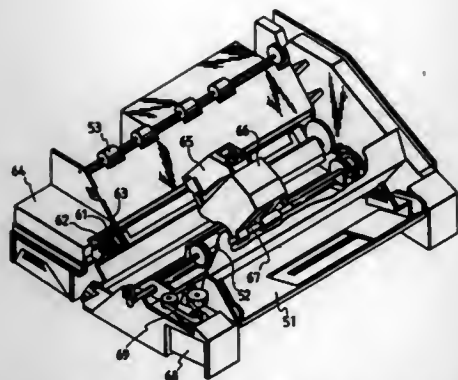
**5,482,545**  
**INK, AND INK-JET RECORDING METHOD AND**  
**INSTRUMENT USING THE SAME**  
 Makoto Aoki, Yokohama; Yoshifumi Hattori, Yamato; Mayumi Yamamoto, Tokyo; Shinichi Tochihara, Hadano; Yoshihisa Takizawa, Machida; Akira Nagashima, Tokyo, and Shinichi Sato, Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
 Filed Dec. 23, 1994, Ser. No. 362,983  
 Claims priority, application Japan, Dec. 28, 1993, 5-348975  
 Int. Cl.<sup>6</sup> C09D 11/02

U.S. Cl. 106—22 K

16 Claims

1. An ink comprising a dye having at least one anionic group, a polyamine selected from the group consisting of a polyamine containing an amino acid group and a polyethyleneimine contain-





ing at least 7 nitrogen atoms in its molecule, and water, wherein the dye is either a metallized azo dye or a nonmetallized azo dye satisfying the following conditions (x) and (y) at the same time:

- (x) no anionic group is situated at an ortho position to the azo bond, and at least one anionic group exists at another position than the ortho position to the azo bond; and
- (y) at least one aromatic residue is bonded to the azo bond, and the aromatic ring of the aromatic residue is a benzene or naphthalene ring, with the proviso that the aromatic rings situated on both sides of the azo bond are not naphthalene rings at the same time if present.

5,482,546

# DYE, INK CONTAINING THE SAME, AND INK-JET RECORDING METHOD AND INSTRUMENT USING THE INK

Tsuyoshi Eida, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

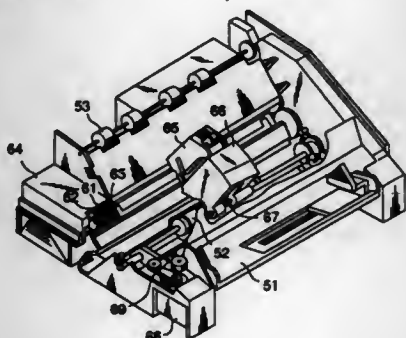
Filed Mar. 28, 1995, Ser. No. 411,964

Claims priority, application Japan, Mar. 30, 1994, 6-082746

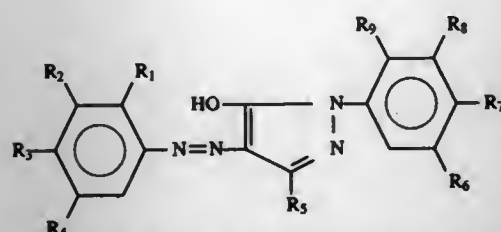
Int. Cl.<sup>6</sup> C09D 11/02

U.S. Cl. 106—22 K

33 Claims

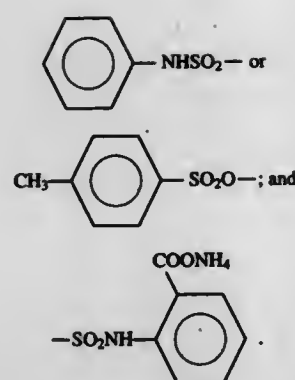


1. A dye represented by the general formula



wherein  $R_1$ ,  $R_2$ ,  $R_3$  and  $R_4$  are independently a radical selected from the Group B or a radical of the formula (i) or (ii),  $R_5$  is  $\text{CH}_3$  or  $\text{COONH}_4$ , and  $R_6$ ,  $R_7$ ,  $R_8$  and  $R_9$  are independently a radical selected from the Group B or a radical of the formula (iii), with the proviso that in a molecule of the dye, the number of  $\text{SO}_3\text{NH}_4$  radicals is 1 and the number of  $\text{COONH}_4$  radicals is 2 or 3:

Group B: H, OH,  $\text{CH}_3$ , Cl,  $\text{COONH}_4$  and  $\text{SO}_3\text{NH}_4$ ;



5,482,547

# SILANE-COATED ORGANIC PIGMENTS

Philippe Bugnon, Essert, and Jean Allaz, Arconciel, both of Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Feb. 3, 1994, Ser. No. 191,572

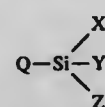
Claims priority, application Switzerland, Feb. 9, 1993, 383/93

Int. Cl.<sup>6</sup> C09B 57/12

U.S. Cl. 106—493

16 Claims

1. A composition comprising
- a) an organic material of high molecular weight in the form of a paint system or of a printing ink composition; and
- b) a pigment composition consisting essentially of an organic pigment whose particle surface is provided with a tenacious coating of alkyl silicate, said coating being fixed by adsorption of an alkyl silicate of formula (IV)



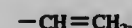
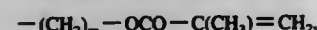
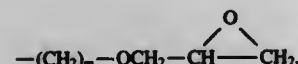
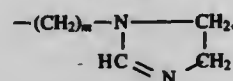
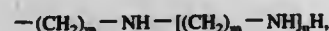
wherein

X is OR or Cl,

Y and Z, each independently of the other, are OR, Cl or methyl,

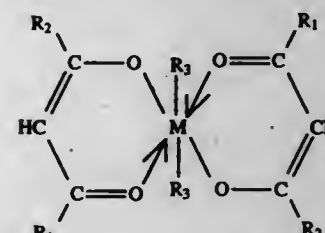
R is methyl or ethyl, and

Q is a group

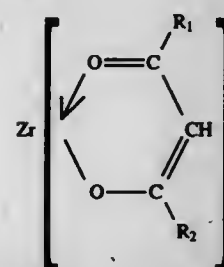


wherein

m is 1 to 6, n is 0, 1 or 2, and p is 6 to 20, on a layer that coats the particle surface and consists essentially of partially hydrolysed organic compounds of elements of group 4A or 4B of the Periodic System selected from the group consisting of chelates of formula



or



wherein

$R_1$  is methyl, ethyl, methoxy or ethoxy,  $R_2$  is methyl or ethyl and  $R_3$  is halogen or  $\text{C}_1\text{--C}_4$ alkoxy, and M is Ti or Sn, and of esters of formula



wherein

$M_1$  is an element of group 4A or 4B of the Periodic System and  $R_4$  is  $\text{C}_1\text{--C}_4$ alkyl, which alkyl silicate is hydrolysed before, during or after adsorption.

5,482,548

# PIGMENT COMPOSITIONS

John A. Stirling, Glasgow; Edward J. Anderson, Kilbarchan, and Carol J. Farnocchi, Erskine, all of Scotland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Oct. 25, 1994, Ser. No. 328,227

Claims priority, application United Kingdom, Jan. 28, 1993, 9322257

Int. Cl.<sup>6</sup> C09B 41/00

U.S. Cl. 106—496

16 Claims

1. A pigment composition comprising a diarylide pigment, a monopropylamine, a dipropylamine and an inorganic compound having active oxide or hydroxide surfaces.

5,482,549

# CEMENT, METHOD OF PREPARING SUCH CEMENT AND METHOD OF MAKING PRODUCTS USING SUCH CEMENT

J. Blaakmeer, Eljden; W. van Loo, Maastricht, and P. R. M. Meekels, Puth, all of Netherlands, assignors to ENCI Nederland B.V., Maastricht, Netherlands

Filed Apr. 4, 1994, Ser. No. 222,688

Claims priority, application Netherlands, Apr. 5, 1993, 93200988

Int. Cl.<sup>6</sup> C04B 35/00; 7/02; 7/14; 7/32

U.S. Cl. 106—606

9 Claims

1. A homogeneous dry particulate cement mixture in ready-to-use form, which comprises ground blast furnace slag, fly ash and the following components in amounts based on the total weight of

the mixture: at least 2 wt. percent portland cement clinker and 2–12 wt. percent sodium silicate (calculated as  $\text{Na}_2\text{O}+\text{SiO}_2$ ), wherein the ground blast furnace slag has a specific surface area of 500–750  $\text{m}^2/\text{kg}$ , the fly ash is ground fly ash having a specific surface area of 500–750  $\text{m}^2/\text{kg}$ , and the ground blast furnace slag and the fly ash are present in a weight ratio in the range of 20/80–70/30.

5,482,550

# STRUCTURAL BUILDING UNIT AND METHOD OF MAKING THE SAME

Mark C. Stratt, 1296 Patricia Ave., Simi Valley, Calif. 93065

Continuation-in-part of Ser. No. 813,713, Dec. 27, 1991, abandoned. This application Nov. 28, 1994, Ser. No. 348,845

Int. Cl.<sup>6</sup> C04B 16/02; 16/08; 38/00

U.S. Cl. 106—677

4 Claims

1. Lightweight structural building units having a 7 day compressive strength of between 1096–3209 PSI, formed from a set solid mixture consisting essentially of about 30% to about 75% by weight Portland cement, about 1% to about 25% by weight ground expanded cellular polystyrene which has been finely ground as to yield a material wherein a single, broad and continuous size distribution of fractured cellular particles is homogeneously distributed throughout the unit to increase air entrainment capacity and provide a plurality of uniform air pockets therein, about 1% to about 35% ground cellulosic fiber, about 2% to about 15% by weight fly ash, about 1% to about 10% by weight silica fume, about 1% to about 15% by weight bentonite, about 25% to about 50% by weight water, about 0% to about 3% by weight air entrainer, about 0% to about 10% paraffin wax emulsion, and about 0% to about 15% by weight rubber emulsion wherein said paraffin wax emulsion increases the strength and reduces the susceptibility to absorb water after drying.

5,482,551

# EXTRUDED FIRE RESISTANT CONSTRUCTION AND BUILDING PRODUCTS

Debra L. Morris, Oxford, and Albert G. Landers, Millersville, both of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Continuation-in-part of Ser. No. 123,107, Sep. 20, 1993, abandoned. This application Oct. 6, 1994, Ser. No. 319,195

Int. Cl.<sup>6</sup> C04B 11/00

U.S. Cl. 106—772

12 Claims

1. An extruded gypsum building product which comprises calcium sulfate dihydrate at an amount in the range of from about 46% up to about 85% by weight, a binder/rheology aid which is a cellulosic binder, said binder/rheology aid being present at an amount in the range of from about 0.5 to about 15% by weight, optionally perlite at an amount in the range of from about 1 to about 35% by weight, wherein said building product has a modulus of rupture of at least about 700 pounds per square inch, and wherein further, the building product was extruded with a composition having a water:calcium sulfate hemihydrate weight ratio in the range of from about 0.5 to about 0.85 and fiber for green strength at an amount in the range of from about 1 to about 20% by dry weight.

5,482,552

# LIQUID METERING AND COATING DEVICE

Hiroyasu Kikukawa, and Hiroshi Kato, both of Okayama, Japan, assignors to Japan GORE-TEX, Inc., Japan

Filed Mar. 17, 1994, Ser. No. 210,204

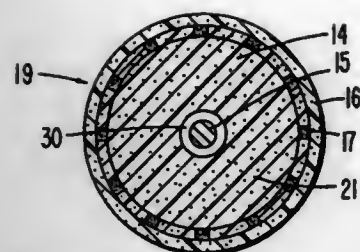
Claims priority, application Japan, Mar. 19, 1993, 5-085376

Int. Cl.<sup>6</sup> B05C 1/00

U.S. Cl. 118—264

12 Claims

1. A liquid metering and coating device comprising



- (a) a porous permeation control material comprising porous polytetrafluoroethylene adhered to the outer surface of  
 (b) a porous open-celled support material of silicone rubber foam containing in its pores  
 (c) a first mixture of silicone oil and cross-linked silicone rubber, wherein portions of said cross-linked silicone rubber of said first mixture are bonded to an internal surface of said silicone rubber support material.

5,482,553

# SYSTEM FOR PIN-POINT APPLICATION OF A REMOVABLE CONFORMAL COATING

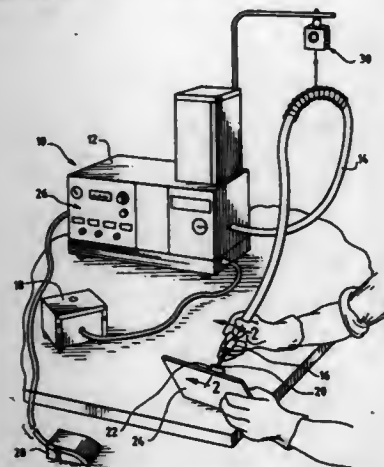
Joe F. Loftin, Plano, Tex.; James E. Roberson, Hermitage, Tenn., and Wayne A. Wood, Brampton, Canada, assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Jun. 2, 1994, Ser. No. 252,910

Int. Cl.<sup>6</sup> B05B 7/16; 15/02

U.S. Cl. 118—302

8 Claims



1. A system for pin-point application of a viscous, hot-melt conformal coating which is applied onto a surface of an article and is readily removable from said surface of said article so as to provide a temporary mask to selected areas of said article, comprising:

material supply means for housing coating material in at least one of granular, flake, chunk, or block form, and for heating said coating material so as to transform said coating material into a substantially viscous form for pumping out of said supply means by a pump member;  
 a heatable hose having first and second opposite ends wherein said first end is operatively connected to said pump member, said hose including a heating element controlled by said supply means and positioned along the length of said hose for maintaining a desired temperature within the interior of said hose; and  
 a pin-point nozzle member connected to said second end of said hose for dispensing said coating material onto localized minute areas of said article, said nozzle member including a valve member positioned within said nozzle member and extending into said second end of said hose so as to conduct heat from said hose to said nozzle member so as to maintain a desired temperature of said coating material at the point of

application, and for providing a precise cut-off of said coating material upon demand.

5,482,554

# DEVICE FOR PRODUCING METALLIC BODIES BY SPRAY COATING

Dieter Perings, Bodesheim; Wilhelm Blum, Jünkerath; Jakob Lenzen, Berndorf, and Siegfert Wagner, Dahlem, all of, Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

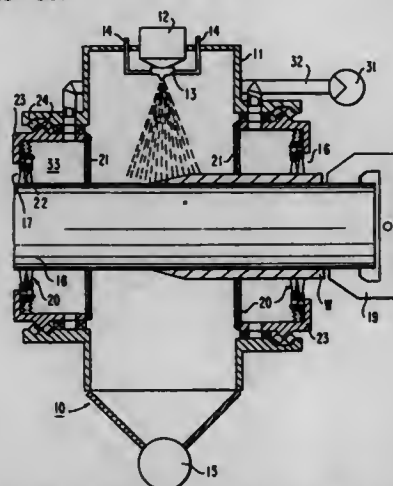
Filed May 13, 1994, Ser. No. 242,315

Claims priority, application Germany, May 13, 1993, 43 16 672.5

Int. Cl.<sup>6</sup> B05B 13/02

U.S. Cl. 118—307

16 Claims



1. A device for producing metallic bodies by spray coating with an atomized molten metal, said device comprising:  
 a housing (11) having an outlet port (15);  
 means (12, 13, 14) at least partially enclosed by the housing for spraying molten metal on a workpiece held within the housing by a workpiece holding device;  
 said housing further comprising opposed through-openings (16, 17) therein and a rotatable ring (23) surrounding each of said through-openings;  
 at least two sealing means disposed at each of said rings for sealing said through openings, said sealing means having an opening therein for permitting the workpiece and the workpiece holding device to pass therethrough and being arranged parallel and at a distance from one another so as to define a space (33) therebetween; and  
 means (31, 32) connected to said space between said sealing means for generating a negative pressure in said space.

5,482,555

# LIQUID-PHASE EPITAXY GROWTH SYSTEM AND METHOD FOR GROWING EPITAXIAL LAYER

Song J. Lee, Suweon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suweon, Rep. of Korea

Division of Ser. No. 752,856, Aug. 30, 1991, Pat. No.

5,334,278. This application Apr. 28, 1994, Ser. No. 234,277

Claims priority, application Rep. of Korea, May 16, 1991, 91-7955

Int. Cl.<sup>6</sup> H01L 21/208; C30B 19/06

U.S. Cl. 118—412

7 Claims

1. A liquid-phase epitaxy growth system comprising an LPE boat consisting of:  
 a slider section having a substrate slot into which a substrate is loaded;  
 a source holder section above said slider section and having a plurality of adjacent source holding wells to be filled with

5,482,557

# DEVICE FOR FORMING DEPOSITED FILM

Masahiro Kanai, Tokyo; Masaaki Hirooka, Toride; Jun-ichi Hanna; Isamu Shimizu, both of Yokohama, and Keiichi Saitoh, Nara, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

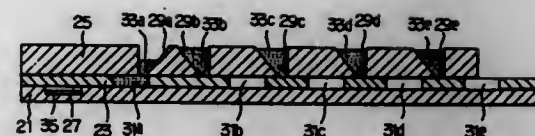
Division of Ser. No. 104,497, Aug. 10, 1993, Pat. No. 5,366,554, which is a continuation of Ser. No. 989,891, Dec. 10, 1992, abandoned, which is a continuation of Ser. No. 860,211, Mar. 27, 1992, abandoned, which is a continuation of Ser. No. 441,224, Nov. 27, 1989, abandoned, which is a continuation of Ser. No. 3,048, Jan. 13, 1987, abandoned. This application Sep. 14, 1994, Ser. No. 305,285

Claims priority, application Japan, Jan. 14, 1986, 61-5979; Jan. 14, 1986, 61-5980; Jan. 14, 1986, 61-5981

Int. Cl.<sup>6</sup> C23C 16/00

U.S. Cl. 118—719

12 Claims



various sources for melt-etching substrate and for growth of epitaxial layers on the substrate; and  
 a contacting well section disposed between said slider section and said source holder section having a plurality of adjacent contacting wells to be filled with solutions of the various sources in which said adjacent contacting wells are separated by predetermined distances, one of the said predetermined distances between adjacent contacting wells being different from the predetermined distance between the remaining contacting adjacent contact wells.

5,482,556

# APPARATUS FOR MOUNTING AND MOVING COATING DISPENSERS

Jeffrey R. Shuttic, Wakeman; Robert J. Holland, Avon, and John F. Carlson, Sheffield Village, all of Ohio, assignors to Nordson Corporation, Westlake, Ohio

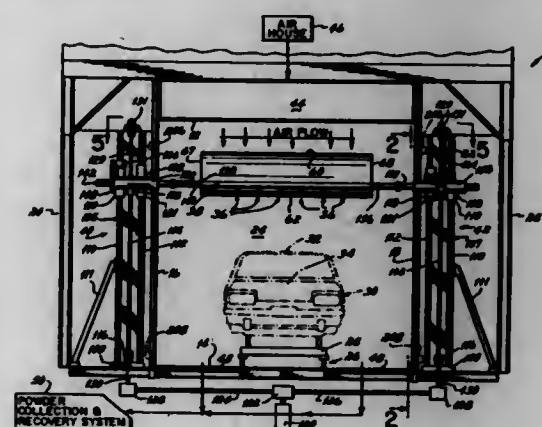
Continuation-in-part of Ser. No. 959,993, Oct. 13, 1992, Pat. No. 5,275,659, which is a continuation of Ser. No. 594,320, Oct. 9, 1990, abandoned. This application Sep. 24, 1993, Ser. No. 126,482

The portion of the term of this patent subsequent to Jan. 4, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> B05B 1/00

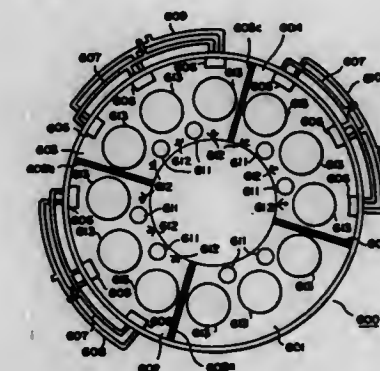
U.S. Cl. 118—621

65 Claims



1. Apparatus for applying coating material onto objects comprising:

a spray booth;  
 a housing formed with an outer surface, said outer surface having a shape which, with said housing located within the interior of the spray booth, promotes substantially laminar flow of air adjacent to and below said housing; and  
 at least one coating dispenser mounted to said housing in position such that with said housing located within the spray booth said at least one coating dispenser is effective to dispense coating material onto objects moving through the interior of the spray booth.



1. An apparatus for forming a deposited film on a substrate by bringing a gaseous starting material for forming the deposited film into contact with a gaseous oxidizing agent having the property of oxidizing said gaseous starting material thereby to form said deposited film comprising:

a plural number of chambers in which to form the deposited film, said chambers arranged in a circular form and being in communication with adjacent chambers through a gas mixing preventing means positioned therebetween, each of said chambers including:

a gas releasing means including a plurality of first orifices for introducing said gaseous starting material to said chamber and a plurality of second orifices for introducing said gaseous oxidizing agent to said chamber, said plurality of first orifices and said plurality of second orifices being positioned alternately to each other in said chamber to create a sufficient reaction mixture between said gaseous starting material and said gaseous oxidizing agent to generate a plurality of precursors including at least one excited precursor in an excited state, wherein said at least one precursor functions as the feeding source for the constituent element of said film;

said gaseous starting material being at least one selected from the group consisting of straight chain silane compounds having the formula  $\text{Si}_m\text{H}_{2m+2}$  where  $m=1$  to  $8$ ,  $\text{SiH}_3\text{SiH}(\text{SiH}_3)\text{SiH}_2\text{SiH}_3$ , and cyclic silane compounds having the formula  $\text{Si}_m\text{H}_{2m}$ , where  $m=3, 4, 5, 6$ ;

said gaseous oxidizing agent being at least one selected from the group consisting of oxygen, ozone, air,  $\text{N}_2\text{O}_4$ ,  $\text{N}_2\text{O}_3$ ,  $\text{NO}_2$ ,  $\text{NO}$ ,  $\text{H}_2\text{O}_2$ ,  $\text{F}_2$ ,  $\text{Cl}_2$ ,  $\text{Br}_2$ ,  $\text{I}_2$ , and  $\text{ClF}$ ;

means for positioning said substrate in each of said plurality of chambers;

means for conveying said substrate;

means for heating said substrate; and

an exhaust opening which communicates with said chamber.



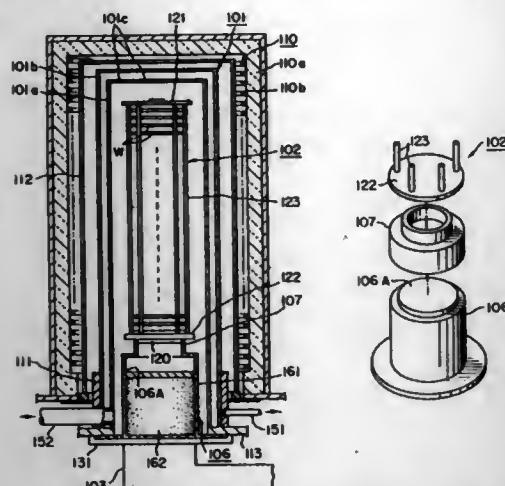
5,482,558

## HEAT TREATMENT BOAT SUPPORT

Shingo Watanabe, Kanagawa; Mitsuo Mizukami, and Hironobu Nishi, both of Sagami-hara, all of Japan, assignors to Tokyo Electron Kabushiki Kaisha, Tokyo, and Tokyo Electron Tohoku Kabushiki, Iwate, both of Japan  
Division of Ser. No. 206,825, Mar. 8, 1994. This application  
Apr. 28, 1995, Ser. No. 430,478  
Claims priority, application Japan, Mar. 18, 1993, 5-85755  
Int. Cl.<sup>6</sup> C23C 16/00; F27B 1/10

U.S. Cl. 118—728

6 Claims



1. A heat treatment boat for mounting a number of disc-shaped objects to be treated at a vertical interval on a plurality of erected support rods for heat treatment in a vertical reaction tube, the heat treatment boat being disposed on an intermediate member with a high radiant heat absorption, and said intermediate member being disposed on a heat insulating unit of a heat insulating material.

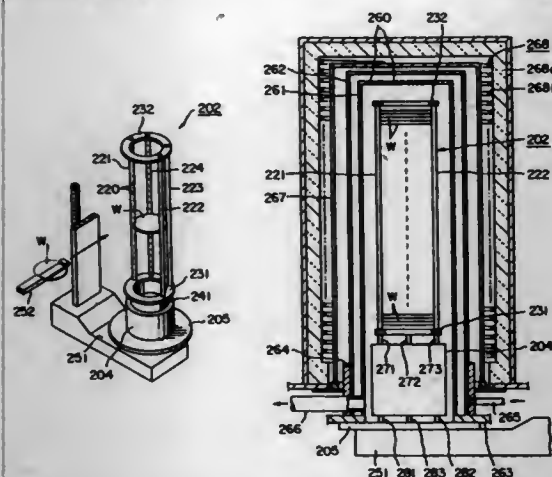
5,482,559

## HEAT TREATMENT BOAT

Masayuki Imai, Kofu, and Takeshi Kurebayashi, Yamanashi, both of Japan, assignors to Tokyo Electron Kabushiki Kaisha, Tokyo, and Tokyo Electron Tohoku Kabushiki, Iwate, both of Japan  
Division of Ser. No. 206,825, Mar. 8, 1994. This application  
Apr. 28, 1995, Ser. No. 430,482  
Claims priority, application Japan, Jan. 21, 1993, 5-287786  
Int. Cl.<sup>6</sup> C23C 16/00; F27D 3/12

U.S. Cl. 118—728

3 Claims



1. A heat treatment boat disposed on a heat insulating unit of a heat insulating material, and mounting a number of disc-shaped objects to be treated at a vertical interval on a plurality of erected

support rods for heat treatment in a vertical heat treatment furnace, the heat treatment boat comprising:  
an annular support member for supporting the lower ends of the support rods; and  
an annular fixation member for positioning the upper ends of the support rods with respect to each other.

5,482,560

BETA-LIMIT DEXTRIN FROM DULL WAXY STARCH  
Robert Ammeraal, Worth, and Robert Friedman, Chicago, both of Ill., assignors to American Maize Technology, Inc., Dimmitt, Tex.

Filed Jul. 27, 1994, Ser. No. 281,408

Int. Cl.<sup>6</sup> C08B 31/00; 37/16; 35/00; C13K 1/06

U.S. Cl. 127—40

13 Claims

1. A flavor carrier comprising a beta-limit dextrin having a DE less than about 1 and a degree of polymerization as determined by a weight average of about 15,000 to about 20,000, said dextrin obtained from a duwx starch, said duwx starch obtained from a starch bearing plant with a dull waxy homozygous genotype.

5,482,561

## METHOD FOR REMOVING ORGANIC DEPOSITS FROM SAND PARTICLES WITH LASER BEAM

Flora Yeung, Agoura Hills, Calif., and Meryl R. Jackson, Carriere, Miss., assignors to Hughes Aircraft Company, Los Angeles, Calif.

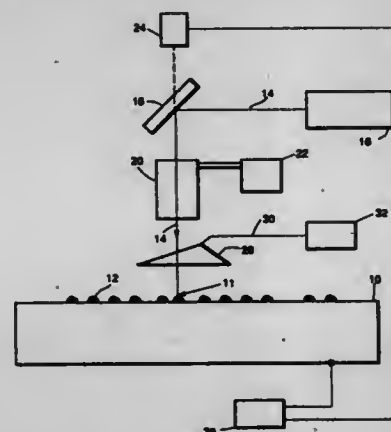
Continuation of Ser. No. 74,650, Jun. 11, 1993, abandoned.

This application Aug. 25, 1994, Ser. No. 296,265

Int. Cl.<sup>6</sup> B08B 6/00; B23K 26/00

U.S. Cl. 134—1

4 Claims



1. A method for removing organic deposits selected from the group consisting of polystyrene, styrene monomer, phenolic residue, aldehydes, and carbonaceous materials, from surfaces of sand particles consisting of the step of exposing said sand particles having said organic deposits to at least one continuous wave laser beam having a wavelength which is selectively absorbed by said organic deposits and which is essentially transmitted by said sand particles, said laser beam being of a sufficient intensity and said organic deposits being exposed to said laser beam for a sufficient time to vaporize or decompose said organic deposits to thereby remove said organic deposits from said surfaces without substantially heating said sand particles.

5,482,562

## METHOD AND AN APPARATUS FOR THE REMOVAL OF FIBROUS MATERIAL FROM A ROTATING SHAFT

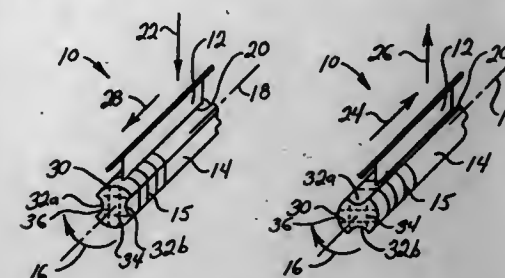
Frank W. Abernathy, 1518 River Bend Rd., Columbus, Ohio 43223

Continuation-in-part of Ser. No. 862,419, Apr. 2, 1992, abandoned. This application Jun. 24, 1994, Ser. No. 265,196

Int. Cl.<sup>6</sup> B08B 7/04; B26D 5/08

U.S. Cl. 134—6

17 Claims



1. A method for removing fibrous material wound around a cylindrical shaft having a central longitudinal axis comprising the steps of:

providing a cutter blade having a forward edge portion extending parallel to the central longitudinal axis of said shaft, said edge portion being spaced from said shaft to define a non-cutting position;

rotating said shaft about the central longitudinal axis thereof; forwardly moving, as said shaft is being rotated, said edge portion of said blade from said non-cutting position to a predetermined distance from said shaft effective to define a cutting position contacting the fibrous material;

laterally moving said edge portion of said blade in said cutting position parallel to the central longitudinal axis of said shaft to cut the fibrous material;

removing the cut fibrous material from said shaft; and rearwardly moving said edge portion of said blade from said shaft to return said edge portion to said non-cutting position.

5. An apparatus for removing fibrous material wound around a cylindrical shaft rotating about a central longitudinal axis thereof, said apparatus comprising:

a cutter blade having a forward edge portion extending parallel to the central longitudinal axis of the shaft, said edge portion being spaced from said shaft to define a non-cutting position; and

a drive assembly coupled to said cutter blade to move said edge portion about a reciprocating locus defined by a forward movement from said non-cutting position to a predetermined distance from the shaft effective to define a cutting position contacting the fibrous material, a lateral movement in said cutting position parallel to the central longitudinal axis of the shaft to cut the fibrous material for its removal from the shaft, and a rearward movement from the shaft to return said edge portion to said non-cutting position.

5,482,563

## METHOD FOR ELECTRICAL ASSEMBLY CLEANING USING A NON-AZEOTROPIC SOLVENT COMPOSITION

Robert C. Pfahl, Jr., Glen Ellyn; James A. Wrezel, Buffalo Grove, and Lawrence R. Hagner, Naperville, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation

5,482,565

## METHOD FOR WASHING BALLS

Bernard Gutterman, Greensboro, N.C.; Duane Acker, Mundelein, Ill.; Richard J. Walter, Arlington Heights, Ill., and Joe L. Solling, Libertyville, Ill., assignors to Discovery Zone, Inc., Chicago, Ill.

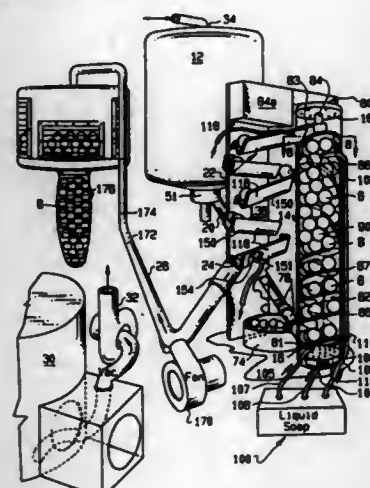
Division of Ser. No. 827,773, Jan. 29, 1992, Pat. No. 5,353,822.

This application Sep. 30, 1994, Ser. No. 316,700

Int. Cl.<sup>6</sup> B08B 1/04

U.S. Cl. 134—25.4

6 Claims



1. A method for washing balls in a cleaning fluid, comprising the steps of:

- providing a housing comprising an elongated chamber suitable for receiving the cleaning fluid, having at a first longitudinal end of said elongated chamber a ball input, and having at a second longitudinal end of said elongated chamber a ball output, and having disposed therebetween first and second screw conveyors where the first and second screw conveyors are within said elongated chamber and rotate in the same direction for conveying said balls from the ball input toward the ball output, the screw conveyors being separately located from each other at the first and second longitudinal ends of said elongated chamber, respectively, to form in said elongated chamber a washing cell free of conveyor flights between said first and second longitudinal ends;
- providing the cleaning fluid for washing the balls in the elongated chamber;
- inputting the balls to be washed into the ball input;
- conveying the balls by the first screw conveyor to the washing cell;
- accumulating the balls conveyed by the first conveyor in the washing cell;
- washing the balls in the cleaning fluid in the washing cell to form washed balls; and
- conveying the washed balls accumulated in the washing cell by the second conveyor to the ball output; and sequentially expelling the washed balls from the ball output.

5,482,566

## METHOD FOR REMOVING ETCHING RESIDUE USING A HYDROXYLAMINE-CONTAINING COMPOSITION

Wai M. Lee, Fremont, Calif., assignor to EKC Technology, Inc., Hayward, Calif.

Division of Ser. No. 911,102, Jul. 9, 1992, Pat. No. 5,334,332, which is a continuation-in-part of Ser. No. 610,044, Nov. 5, 1990, Pat. No. 5,279,771. This application Jul. 14, 1994, Ser. No. 273,143

Int. Cl.<sup>6</sup> B08B 3/08; C11D 3/30; 3/33

U.S. Cl. 134—42

11 Claims

- 1. A method of removing etching residue from a resist-free substrate comprising contacting a substrate having etching residue present thereon with a composition consisting essentially of from

about 5–50 weight % of hydroxylamine and from about 10–80 weight % of at least one alkanolamine which is miscible with said hydroxylamine and a balance of water at a temperature and for a time sufficient to remove said etching residue from said resist-free substrate wherein said resist was removed from said substrate by means other than said composition.

5,482,567

## MULTILAYER FORMING FABRIC

Ednaldo V. Barreto, João Pessoa, Brazil, assignor to Huyck Licensco, Inc., Wilmington, Del.

Filed Dec. 6, 1994, Ser. No. 349,922

Int. Cl.<sup>6</sup> D03D 23/00

U.S. Cl. 139—383 A

18 Claims



1. A papermakers' fabric comprising:

- a top fabric layer including at least one set of warp yarns interwoven with a least one set of weft yarns;
- a bottom fabric layer including at least two sets of weft yarns forming a top and bottom layer of said bottom fabric layer, said at least two sets of weft yarns being interwoven with at least one set of warp yarns; and
- at least one binder yarn interweaving and joining the top fabric layer and the bottom fabric layer.

5,482,568

## MICRO MIRROR PHOTOVOLTAIC CELLS

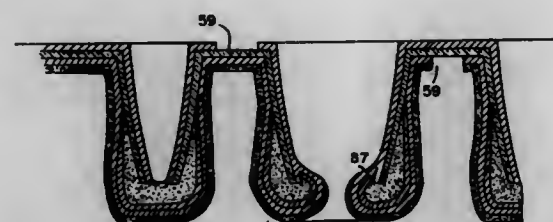
Robert G. Hockaday, 3025 Arizona Ave., Los Alamos, N.M. 87544

Filed Jun. 28, 1994, Ser. No. 266,625

Int. Cl.<sup>6</sup> H01L 31/052; 31/18

U.S. Cl. 136—246

41 Claims



1. An electrical power generator apparatus, comprising:

- a plurality of photon mirror concentrators, wherein each said photon concentrator has an entrance aperture and an exit aperture,
- a plurality of photon converters in proximity to the exit apertures, the mirror concentrators forming first electrodes of the photon converters, an electrically insulating material on back surfaces of the first electrodes, wherein said photon converters convert energy in photons received directly or indirectly from the mirror concentrator to electrical energy.

5,482,569

## ROOF FOR GENERATING ELECTRICITY BY SOLAR LIGHT

Takuro Ihara, Kawasaki, and Osamu Ishikawa, Tokyo, both of Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, and Misawa Homes Co., Ltd., Tokyo, both of Japan

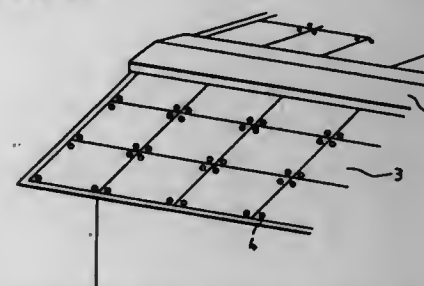
Filed Jul. 27, 1994, Ser. No. 280,882

Claims priority, application Japan, Jul. 28, 1993, 5-185665

Int. Cl.<sup>6</sup> E04D 13/18; H01L 31/045; 31/05; 31/048

U.S. Cl. 136—251

12 Claims



- 1. A roofing material for covering a roof and for generating electricity by solar light, said roofing material comprising: flexible base members each composed of a flexible substrate and thin film solar cells formed thereon; and transparent roof finish members fixed to the flexible base members; wherein the base members are cut from a roll member in which output terminal conductors are exposed at gap portions for cutting the base members.

5,482,570

## PHOTOVOLTAIC CELL

Eric Saurer, Bevaix; Michael Grützel, St-Sulpice, and Tobias Meyer, Féchy, all of Switzerland, assignors to Asulab S.A., Blenne, Switzerland

PCT No. PCT/EP93/01980, § 371 Date Jun. 22, 1994, § 102(e)

Date Jun. 22, 1994, PCT Pub. No. WO94/03930, PCT Pub.

Date Feb. 17, 1994

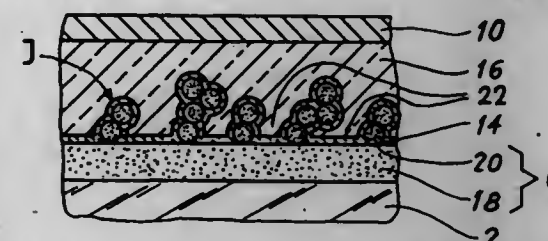
PCT Filed Jul. 24, 1993, Ser. No. 204,395

Claims priority, application France, Jul. 29, 1992, 9209507

Int. Cl.<sup>6</sup> H01L 31/06

U.S. Cl. 136—255

40 Claims



- 1. A photovoltaic cell comprising a substrate having a support face having disposed thereon a first electrode and a second electrode separated from the first electrode by a plurality of layers comprising at least a first layer of a semiconducting material with an active junction at an interface thereof, said active junction having a developed surface area greater than its projected surface area, said first electrode comprising a uniform layer formed of a conducting material and a porous layer formed of conducting colloidal particles, which has a developed surface area greater than its projected surface area and on which the other layers and said second electrode are disposed successively, and said first layer of semiconducting material having a thickness less than or equal to half the width of the pores of said porous layer.

21. A photovoltaic cell comprising a substrate having a support face having disposed thereon a first electrode and a second electrode separated from the first electrode by a plurality of layers comprising at least a first layer of a semiconducting material with an active junction at an interface thereof, said active junction

having a developed surface area greater than its projected surface area, said first layer of semiconducting material comprising a porous layer formed of colloidal particles and having a developed surface area greater than its projected surface area and a uniform layer covering said porous layer and on which the other layers and said second electrode are disposed successively, and said colloidal particles having a diameter smaller than the diffusion length of minority charge carriers created in said porous layer by the absorption of light.

5,482,571

## SOLAR CELL MODULE

Satoru Yamada, Kyoto; Takahiro Mori, Ikoma; Ichiro Kataoka, Kyoto, and Shigenori Itoyama, Nara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

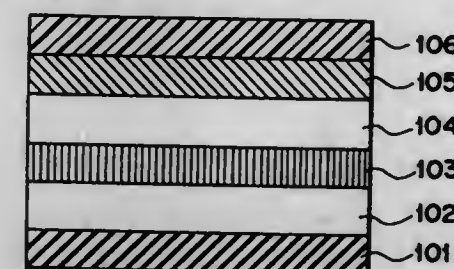
Filed Jun. 9, 1994, Ser. No. 257,287

Claims priority, application Japan, Jun. 14, 1993, 5-142313

Int. Cl.<sup>6</sup> H01L 31/048

U.S. Cl. 136—259

12 Claims



- 1. A solar cell module provided with a photovoltaic element having at least a photoactive semiconductor layer as the photoelectric converting member, comprising a layer of trifluorochloroethylene-vinyl copolymer at least at the outermost surface of the surface covering material at the light entrance side.

5,482,572

METHOD FOR THE PREPARATION OF ALLOYS OF THE RARE EARTH METALS OF THE SE<sub>2</sub>FE<sub>17-x</sub>TM<sub>x</sub>N<sub>y</sub> TYPE

Horst Eggert, Dorsten, and Michael Steinhilber, Essen, both of Germany, assignors to Th. Goldschmidt AG, Essen, Germany

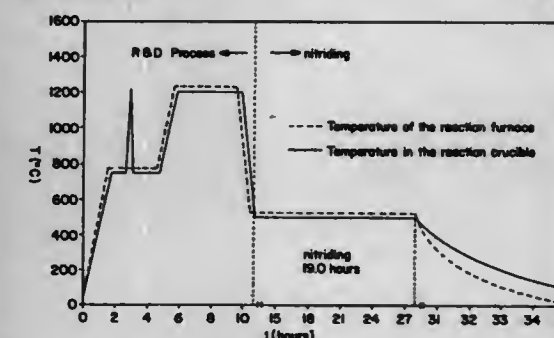
Filed Oct. 21, 1993, Ser. No. 140,777

Claims priority, application Germany, Nov. 5, 1992, 42 37 346.8

Int. Cl.<sup>6</sup> H01F 1/059

U.S. Cl. 148—101

4 Claims



- 1. A method for preparing alloys of Se<sub>2</sub>Fe<sub>17-x</sub>TM<sub>x</sub>N<sub>y</sub>, formula wherein SE stands for a rare earth metal, including Y, or a mixture of these metals, while TM stands for Co, Ni, Cu, Zr, Ga, Hf, Ta, Nb, Ti, Si, Al, V, Mo, Cr, Zn or Sn or a mixture of these metals, x=0 to 10, and y=0 to 5, said alloys having a magnetic anisotropy in the direction of the C axis, comprising the steps of:



- a1) reducing calciothermally a finely divided, homogeneous mixture of components comprising the alloys, at least one of components being present in an oxide form and adjusting the exothermicity of calciothermal reduction by changing the oxide content of the mixture, which corresponds in its composition to the desired alloy, by fulfilling a temperature condition that  $T_M > T_R \geq 0.9 T_M$ , wherein  $T_M$  being the melting temperature in degrees Kelvin of the intermetallic phase and  $T_R$  being the reduction temperature;
- a2) the mixture comprising of components, with the exception of Calcium, having an average particle size of  $\leq 75 \mu\text{m}$ ;
- a3) tempering the reaction product at the end of the exothermic reaction at a temperature, which is at least 0.7 times the melting temperature  $T_M$  of the desired alloy, but is less than the melting temperature  $T_M$ , during a period of time adequate for diffusion of the components; and
- b) subsequently nitriding the reaction product thus obtained with nitrogen or a mixture of nitrogen and hydrogen or  $\text{NH}_3$  in a temperature range between  $473^\circ \text{K}$ . and a temperature below the decomposition temperature of the nitride of formula  $\text{Se}_2\text{Fe}_{17-2}\text{TM}_x\text{N}_y$ .

5,482,573

## MAGNETIC MATERIAL

Shinya Sakurada; Takahiro Hirai, both of Yokohama; Akihiko Tsutai, Kawasaki; Masashi Sahashi, Yokohama; Hideo Nagai, Nagareyama, and Tsutomu Yamashita, Yokohama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

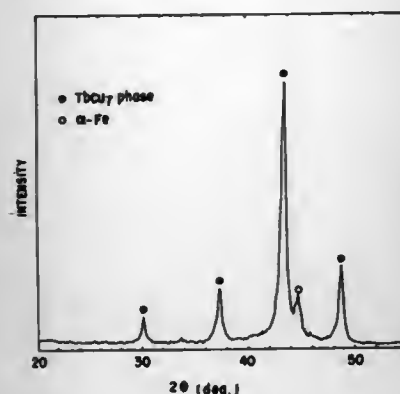
Filed Oct. 16, 1992, Ser. No. 961,821

Claims priority, application Japan, Jan. 16, 1991, 3-266670; Mar. 30, 1992, 4-071959; Jun. 24, 1992, 4-165593

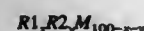
Int. Cl.<sup>6</sup> H01F 1/055

U.S. Cl. 148—301

27 Claims



1. A magnetic material expressed in a general formula:



where R1 is at least one element selected from the rare earth elements, R2 is at least one element selected from elements having an atomic radius in a range of 0.156 to 0.174 nm, M is at least one element selected from Fe and Co and x and y are atomic percent individually defined as  $x \geq 2$ ,  $y \geq 0.01$  and  $4 \leq x+y \leq 20$ , the principal phase of the material having a  $\text{TbCu}_7$  crystal structure and M occupying 90 atomic percent or more in the principal phase of the compound.

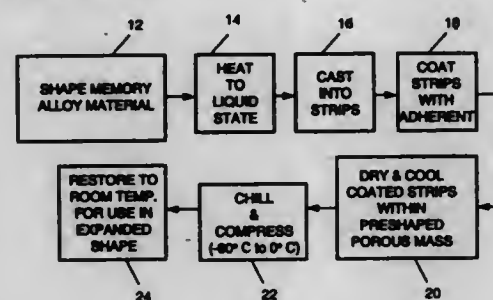
5,482,574  
METHOD OF MAKING COMPOSITE STRUCTURE  
HAVING A POROUS SHAPE-MEMORY COMPONENT  
David Goldstein, Potomac, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1994, Ser. No. 317,451

Int. Cl.<sup>6</sup> C21D 10/00; C22K 1/00

U.S. Cl. 148—517

15 Claims



12. A method of manufacturing a composite structure having a non-porous component lined with a rigidifying porous layer, including the steps of: forming a shape-memory alloy material into elongated strips; gathering the strips into a porous network coating the gathered strips with an adherent substance; solidifying said coated and gathered strips into a solid state shape at a selected temperature; cooling the solid state shape; and compressing the cooled shape to a reduced volumetric condition, from which recovery to a volumetric shape corresponding to said rigidifying porous layer occurs upon restoration of the selected temperature.

5,482,575

FE-RE-B TYPE MAGNETIC POWDER, SINTERED  
MAGNETS AND PREPARATION METHOD THEREOF

Alain Barzani, Allevard, France; Hiroshi Nagata; Masato Sagawa, both of Kyoto, Japan, and Fernand Vial, Meylan, France, assignors to Ugimac SA, St. Pierre D'Allevard, France

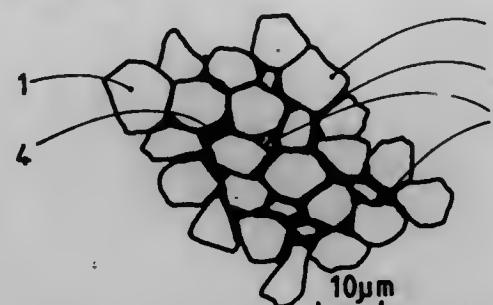
Filed Dec. 2, 1993, Ser. No. 160,652

Claims priority, application France, Dec. 8, 1992, 92 14995; Jul. 7, 1993, 93 08586

Int. Cl.<sup>6</sup> H01F 1/057

U.S. Cl. 148—302

7 Claims



1. Sintered RE-T-B magnet where RE represents at least one rare earth element, T represents at least two transition elements Fe and Co, and B represents boron, optionally containing other minor elements and having a structure consisting essentially of grains of quadratic phase (T1)  $\text{RE}_2\text{T}_2\text{B}$ , a RE rich secondary phase containing at least 10 by weight Co, and optionally other minor phases, the Co being primarily located in the secondary phase, said structure consisting essentially of said grains of said quadratic phase (T1) surrounded by a narrow continuous margin of said secondary phase of a substantially uniform thickness of not more than  $5 \mu\text{m}$ , and having an intergranular porosity of a diameter less than  $2 \mu\text{m}$ .

5,482,576  
RAILWAY-TRACK ELEMENTS AND METHOD OF  
MANUFACTURING THEM  
Wilhelm Heller, Duisburg, and Gerhard Ratz, Langgöns, both of, Germany, assignors to BWG Butzbacher Weichenbau, GmbH, Butzbach, Germany

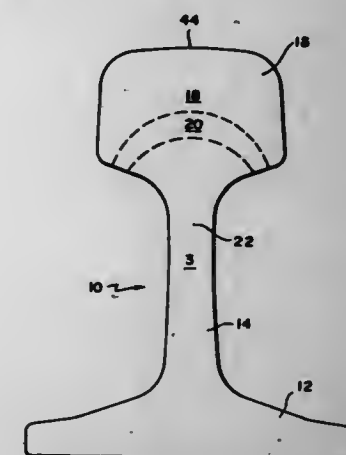
Filed Jul. 8, 1994, Ser. No. 256,148

Claims priority, application Germany, Jan. 11, 1992, 42 00 545.0

Int. Cl.<sup>6</sup> C22C 38/24; C21D 9/04

U.S. Cl. 148—334

17 Claims



1. A railway-track element manufactured from steel, wherein

said steel is a vacuum-treated steel with a guideline analysis of 0.53 to 0.62% C, 0.15 to 0.25% Si, 0.65 to 1.1% Mn, 0.8 to 1.3% Cr, 0.05 to 0.11% Mo, 0.05 to 0.11% V,  $\leq 0.02\%$  P, optionally up to 0.025% Al, optionally up to 0.5% Nb, residual iron, and the usual production-related impurities, with the ratio of Mn to Cr being about  $0.80 \leq \text{Mn}:\text{Cr} \leq 0.85$  and the ratio of Mo to V about 1, said railway-track element is in the form of a rolled-steel rail (10) with pearlitic structure, and said railway-track element in the form of a points section is a rolled rail section as the starting material having at least in the rail head area (18) a martensitic structure from heat treatment.

5,482,577

AMORPHOUS ALLOYS RESISTANT AGAINST HOT  
CORROSION

Koji Hashimoto; Hiroki Habazaki, both of Sendai, Japan; Stanislaw Mrowec, and Marek Danielewski, both of Krakow, Poland, assignors to Koji Hashimoto, Miyagi, and YKK Corporation, Tokyo, both of, Japan

Division of Ser. No. 158,013, Nov. 24, 1993, Pat. No.

5,380,375, which is a division of Ser. No. 44,534, Apr. 7, 1993, abandoned. This application Oct. 25, 1994, Ser. No. 328,418

Claims priority, application Japan, Apr. 7, 1992, 4-85529; Apr. 7, 1992, 4-85530; Nov. 11, 1992, 4-326075

Int. Cl.<sup>6</sup> C22C 45/00; 45/10

U.S. Cl. 148—403

3 Claims

3. An amorphous alloy resistant against hot corrosion, which consists of (1) at most 20 atomic percent of at least one element selected from the group consisting of Fe, Co, Ni and Cu, (2) from at least 25 to less than 70 atomic percent of the sum of at least one element selected from the group consisting of Ti and Zr and at least one element selected from the group consisting of Ta and Nb, (3) at least 9 atomic percent of the sum of at least one element selected from the group consisting of Mo and W and at least one element selected from the group consisting of Ta and Nb, and (4) Cr and at least one element selected from the group consisting of Mo and W in an amount less than 75 atomic percent, with Cr being present in an amount of at least 30 atomic percent.

5,482,578

DIFFUSION COATING PROCESS

Bernard R. Rose, Gloucester, Mass., and John K. Willis, Salem, N.H., assignors to Walbar Inc., Peabody, Mass.

Continuation of Ser. No. 875,375, Apr. 29, 1992, abandoned.

This application Mar. 14, 1994, Ser. No. 212,274

Int. Cl.<sup>6</sup> C21D 9/00; C23C 10/56

U.S. Cl. 148—516

11 Claims

1. Process for increasing the resistance of metal superalloys to oxidation and corrosion at high temperatures comprising the steps of:

- applying to the surface of a nickel superalloy body a thin layer of a platinum-group metal;
- heating the superalloy body to an elevated temperature to diffuse or integrate the platinum-group metal into the surface of the metal superalloy;
- packing the superalloy body into a diffusion coating container filled with a diffusion powder composition containing a source of from about 1% to 15% by weight of aluminum and from about 2% to 6% by weight of chromium powder, said composition being in contact with the surface of said superalloy body into which said platinum-group metal has been diffused or integrated;
- heating said diffusion powder composition in a hydrogen gas atmosphere to an elevated temperature for a sufficient period of time to diffuse both aluminum and chromium into said surfaces; and
- removing said superalloy body from said diffusion coating container and heating it to the solvus temperature of the superalloy body to form a body having oxidation-resistant and corrosion-resistant ductile surfaces having a microstructure comprising an outer zone of a normally brittle aluminate of said platinum-group metal which is ductilized by the solutioning therein of beta chromium.

5,482,579

GAS GENERATOR COMPOSITIONS

Koji Ochi, Aichi; Nobukazu Asano, Handa; Kazunori Matsuda, and Kiyooki Yanase, both of Aichi, all of, Japan, assignors to NOF Corporation, Tokyo, Japan

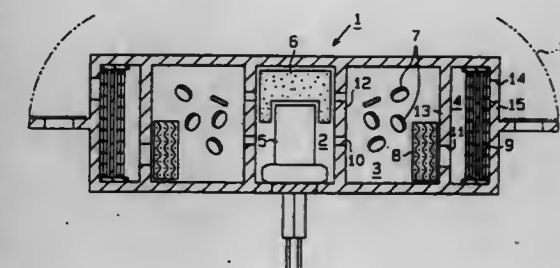
Filed Apr. 14, 1994, Ser. No. 227,725

Claims priority, application Japan, Apr. 15, 1993, 5-088897; Aug. 17, 1993, 5-203414; Aug. 20, 1993, 5-206623

Int. Cl.<sup>6</sup> C06B 29/08

U.S. Cl. 149—83

20 Claims



1. A gas generator composition, comprising:
- a cellulose acetate acting as a deoxidized agent that generates a predetermined composition of gas upon being oxidized;
  - a perchlorate acting as an oxidizing agent, the mixture of said cellulose acetate and said perchlorate being the major ingredient of said gas generator composition; and
  - a metal oxide acting as a combustion temperature controller, said metal oxide being more than 5% by weight and not more than 40% by weight of said gas generator composition.

5,482,580

# JOINING OF METALS USING A BULK AMORPHOUS INTERMEDIATE LAYER

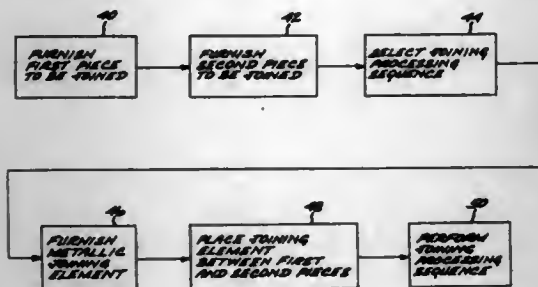
David M. Scruggs, Oceanside; William L. Johnson, Pasadena, both of Calif.; Jimmie B. Bolton, Conroe, Tex., and Atakan Peker, Pasadena, Calif., assignors to Amorphous Alloys Corp., Laguna Niguel, Calif.

Filed Jun. 13, 1994, Ser. No. 258,766

Int. Cl.<sup>6</sup> B23K 35/22; 103/16

U.S. Cl. 148—528

21 Claims



1. A method for joining two pieces of metal together, comprising the steps of:

- furnishing a first piece to be joined, the first piece having a first piece composition;
- furnishing a second piece to be joined, the second piece having a second piece composition;
- selecting a joining processing sequence including a joining temperature, joining time, joining pressure, and cooling rate;
- furnishing a joining element made of a metal having an initial composition and an associated composition that are retained in an amorphous metallic state during the joining processing sequence, the associated composition being related to the initial composition by being the result of surface-contact diffusion into the initial composition of further alloying elements from the group consisting of the first piece composition and the second piece composition during the joining processing sequence;
- placing the joining element between the first piece and the second piece; and
- processing the region of the joining element and the adjacent portions of the first piece and the second piece with the joining processing sequence, the step of processing including the steps of processing being conducted such that alloying elements from the first piece and the second piece interdiffuse into the joining element, and including a step of cooling the joining element and the adjacent portions of the first piece and the second piece at a rate sufficiently great that the joining element initial composition and the joining element associated composition retain an amorphous metallic state after cooling is complete.

5,482,581

# LOW VULNERABILITY PROPELLANT PLASTICIZERS

Joseph V. Urenovitch, Tamaqua, Pa., assignor to ICI Explosives USA Inc., Tamaqua, Pa.

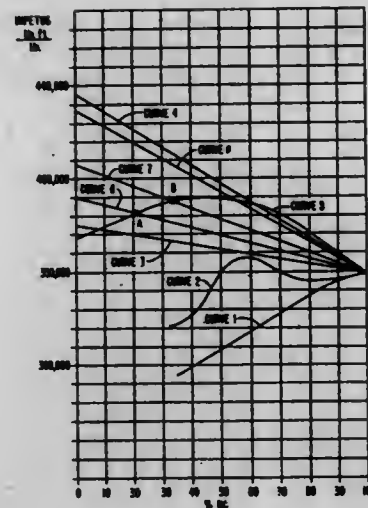
Filed Aug. 25, 1988, Ser. No. 236,461

Int. Cl.<sup>6</sup> C06B 25/34

U.S. Cl. 149—92

9 Claims

1. A composition having a low freezing point, comprising an admixture of two or more compounds from the group consisting of



alkyl nitrate ethyl nitramine ("NENA") and dinitroxydiethyl nitramine ("DINA").

5,482,582

# PROCESS FOR MANUFACTURING A RESIN IMPREGNATED FISHING FLY

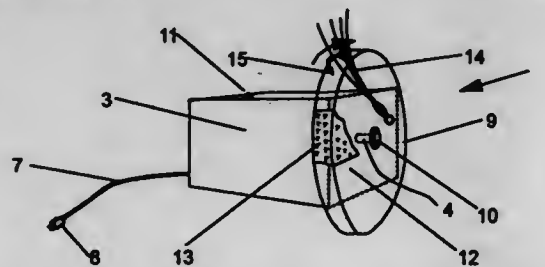
Enrico Puglisi, 249 - 17 37th Ave., Little Neck, N.Y. 11362

Filed Oct. 22, 1993, Ser. No. 142,244

Int. Cl.<sup>6</sup> A01K 85/08; B05D 3/12

U.S. Cl. 156—74

5 Claims



1. A method for manufacturing a resin impregnated fishing fly having a uniform resin coating thereon which comprises resin impregnating a fishing fly having a hook point, placing the hook point of the resin impregnated fishing fly into a resilient surface of a wheel associated with a motor for rotation of the wheel, and operating said motor to rotate the wheel while the hook point of the fishing fly is disposed in the resilient surface of the wheel until the resin is set to touch thereby providing the resin impregnated fishing fly with a uniform resin coating.

5,482,583

# PROCESS AND AGENT FOR ANCHORING SECURING ELEMENTS IN DRILL HOLES

Claudioeter Ihle, Larchenweg, D-7840 Mülheim 14, and Volker Banhardt, Neue Kirchstr. 19, D-7801 Ballrechten-Dottingen, both of, Germany

PCT No. PCT/EP92/00671, § 371 Date Apr. 28, 1994, § 102(e) Date Apr. 28, 1994, PCT Pub. No. WO92/18697, PCT Pub. Date Oct. 29, 1993

PCT Filed Mar. 26, 1992, Ser. No. 137,003

Claims priority, application Germany, Apr. 13, 1991, 41 12 153.8; Nov. 28, 1991, 41 39 069.5

Int. Cl.<sup>6</sup> E21B 33/00; B29C 65/54

U.S. Cl. 156—91

15 Claims

1. A process for anchoring a securing element in a drill hole, comprising:

- a) filling the drill hole to from half to three quarters with a compressible mixture of highly wear-resistant fibers or chips made of metals, polymers and or ceramics with an average length smaller than half the drill hole diameter, introducing both adhesive components of a two-component adhesive, then filling in the residual portion of the required amount of fibers or chips;
- c) then inserting the securing element into the drill hole.

5,482,584

# METHOD FOR MANUFACTURING ROTOR BLADES

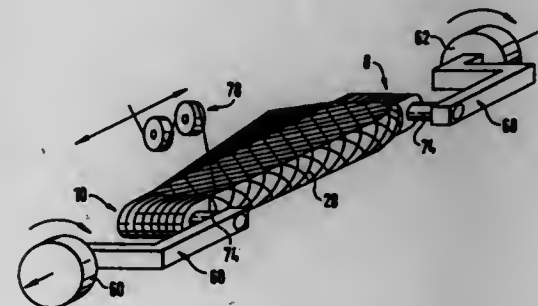
Axel S. Herrmann, Lehrte; Volker Krajencki, and Arno E. R. K. Paboch, both of Braunschweig, all of, Germany, assignors to Deutsche Forschungsanstalt für Luft- und Raumfahrt e.V., Cologne, Germany

Filed Oct. 14, 1994, Ser. No. 323,386

Claims priority, application Germany, Jan. 15, 1993, 43 35 221.9

Int. Cl.<sup>6</sup> B65H 81/00; B64C 27/46

U.S. Cl. 156—172



- 1. A method of making rotor blades made of fibre-reinforced synthetic resin, the method using a winding machine with first and second opposing, aligned grip heads provided with a synchronous drive
- a holder for holding a fastening element non-rotatably in said first grip head,
- means held non-rotatably in said second opposing grip head, for deflecting blade fibres, and
- means for generating a tensile force axially of said grip heads, the method comprising the steps of
- making a holding binding comprising only a relatively small plurality of unidirectional fibre runs between said fastening element and said fibre-deflecting means,
- inserting a blade spar element between said runs of said holding binding,
- applying a tensile stress to said fibres of said holding binding, to such a degree that said blade spar element is held by said runs of said holding binding without sagging,
- applying further binding runs to complete said unidirectional fibre binding,
- applying a cross-binding to said unidirectional fibre binding with rotation of said grip heads,
- attaching front and rear blade profile elements,
- applying an outer cross-binding with rotation of said grip heads, releasing the thus bound rotor blade and lowering it into a first rigid component of a mould defining the profile of a finished blade,
- closing a mould with a second rigid mould component,
- pressing the rotor blade between said mould components and curing said blade in said mould.

5,482,585

# PROCESS FOR OPTICALLY JOINING AN OPTICAL FIBER ARRAY TO AN OPPONENT MEMBER

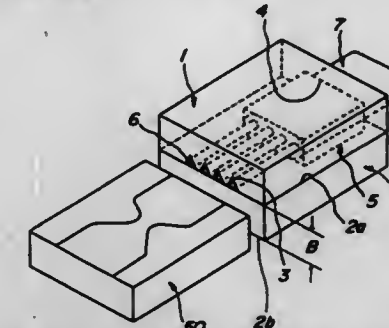
Takashi Ota, Kasugai, and Masashi Fukuyama, Nagoya, both of, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Feb. 4, 1994, Ser. No. 191,536

Claims priority, application Japan, Feb. 12, 1993, 5-024159 Int. Cl.<sup>6</sup> G02B 6/30; 6/40

U.S. Cl. 156—158

10 Claims



- 1. A process for optically joining a plurality of optical fibers to an opponent member, comprising the steps of: providing a V-grooved base plate having a plurality of V-grooves extending along a surface thereof, and a fiber-fixing base plate having first and second opposite major surfaces, said first surface having a flat portion;
- placing a plurality of optical fibers in the V-grooves such that the optical fibers protrude from the V-grooves in a direction perpendicular to a direction of extension of the V-grooves;
- forming an optical fiber array by joining said fiber-fixing base plate to said V-grooved base plate such that said optical fibers lie on said flat portion of said first surface of the fiber-fixing base plate; and
- optically joining the optical fibers of the optical fiber array to an opponent member by utilizing one of said first surface and said second surface of said fiber-fixing base plate as a joining reference surface.

5,482,586

# METHOD OF MANUFACTURING MULTILAYER PRINTED WIRING BOARD

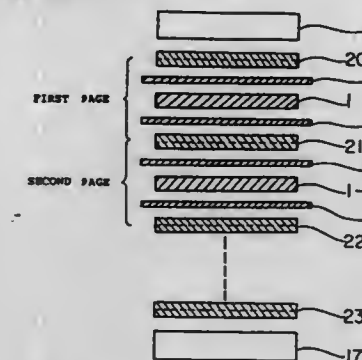
Katsuhiko Fujikake, and Hidetaka Miyama, both of Sayama, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

Continuation of Ser. No. 933,911, Aug. 27, 1992, abandoned, which is a continuation of Ser. No. 582,205, Oct. 1, 1990, abandoned. This application Oct. 29, 1993, Ser. No. 143,388

Claims priority, application Japan, Feb. 23, 1989, 1-44222 Int. Cl.<sup>6</sup> B32B 31/20

U.S. Cl. 156—233

2 Claims



- 1. A method for manufacturing a multilayer heat and pressure laminated printed circuit board assembly comprising the steps of: providing an outer layer composite comprising a first outer layer structure and a second outer layer structure,



said first and second outer layer structures each comprising (1) a copper foil outer layer having inside and outside surfaces and which is suitable for further processing to form an outer wiring pattern for said multilayer heat and pressure laminated printed circuit board assemblage and (2) a protective plastic metal layer having front and back surfaces, the copper foil outer layer and the protective plastic metal layer of each of said first and second outer layer structures being joined together with the front surface of the protective plastic metal layer attached to the outside surface of the copper foil outer layer so as to protect said outside surface,

the back surfaces of the protective plastic metal layers of the structures of the composite being separably joined together to present said composite, said back surfaces of said protective plastic metal layers of said outer layer composite being joined together in such a manner as to allow separation thereof after the outer layer composite has been used in preparing a said multilayer heat and pressure laminated printed circuit board assemblage to thereby present two separated outer layer structures wherein the outside surface of the outer layer of each said separated outer layer structure continues to be protected by a respective protective plastic metal layer;

providing a pair of prepregs and a pair of inner layer laminates, each said inner layer laminate having a wiring pattern on a surface thereof;

stacking said outer layer composite, said prepregs and said inner layer laminates in such a way that the stack comprises a first inner layer laminate at the bottom with its wiring pattern facing upwardly, a first prepreg on top of the wiring pattern of the first inner layer laminate, said outer layer composite on top of said first prepreg with the inside surface of one of its copper foil outer layers facing upwardly and with the inside surface of the other of its copper foil outer layers facing downwardly, a second prepreg on top of said outer layer composite, and a second inner layer laminate with its wiring pattern facing downwardly on top of said second prepreg;

pressing and heating said stack under laminating conditions to thereby bond the inside surfaces of the copper foil outer layers and the wiring patterns of the inner layer laminates to an adjacent prepreg; and thereafter

separating the separably joined back surfaces of the protective plastic metal layers of the stack to thereby present a pair of multilayer heat and pressure laminated printed circuit board assemblies, each having a protected copper foil layer attached to a side thereof.

5,482,587

# METHOD FOR FORMING A LAMINATE HAVING A SMOOTH SURFACE FOR USE IN POLYMER ELECTROLYTE BATTERIES

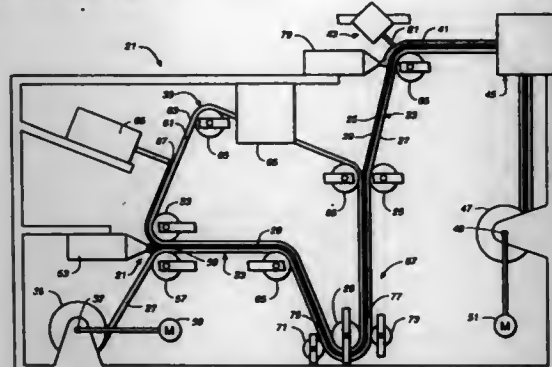
Michael E. McAlavey, San Jose, Calif., assignor to Valence Technology, Inc., San Jose, Calif.

Filed Jun. 16, 1993, Ser. No. 78,940

Int. Cl.<sup>6</sup> B29C 47/34; 47/78

U.S. Cl. 156-243

3 Claims



1. A method of forming a laminate for use in a polymer electrolyte battery, the method comprising the steps of:

applying an uncured, viscous liquid cathode material on a first surface of a constant thickness conductive substrate web; drawing the substrate web on which the uncured cathode material is applied through a first constant width nip defined by a first roller and by a smooth, incompressible endless member having predetermined surface roughness characteristics extending around a portion of a second roller;

compressing the uncured cathode material on the first surface of the substrate web against the endless member such that the uncured cathode material forms a constant thickness uncured cathode layer on the substrate web and such that the uncured cathode material layer attains substantially the same surface roughness characteristics as the endless member, the endless member being formed of a material having relatively small tendency to adhere to the uncured cathode material;

drawing the endless member and the uncured cathode material layer on the substrate web through a second constant width nip defined by a chilled roller and a nip roller;

cooling the endless member and the uncured cathode material layer on the substrate web with the chilled roller to a temperature sufficient to solidify the uncured cathode material layer; redirecting, subsequent to cooling of the uncured cathode material layer and the endless member, at least one of the endless member and the uncured cathode material layer on the substrate web such that the endless member and the uncured cathode material layer separate, the uncured cathode material layer retaining the surface roughness characteristics of the endless member;

applying an uncured polymer electrolyte material on top of the uncured cathode material layer subsequent to separation of the endless member and the uncured cathode material layer;

drawing the uncured cathode material layer on the substrate web and the uncured polymer electrolyte material through a doctor blade assembly to form a constant thickness uncured electrolyte material layer on top of the uncured cathode material layer; and

curing the uncured cathode material layer and the uncured polymer electrolyte material layer together in a curing apparatus.

5,482,588

# METHOD FOR MANUFACTURING ONE-PIECE TAPE TABS FOR USE WITH DISPOSABLE ABSORBENT ARTICLES

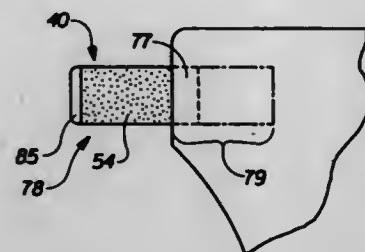
David J. K. Goulet; David W. Cabell; Michael T. Hnber, all of Cincinnati, Ohio, and Karl P. Ronn, Miami, Fla., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 21, 1994, Ser. No. 263,322

Int. Cl.<sup>6</sup> B32B 31/18; 31/22; 31/26

U.S. Cl. 156-264

17 Claims



1. A method for manufacturing a refastenable, one-piece tape tab for a disposable absorbent article, comprising the steps of:

providing a backing substrate; applying a pressure-sensitive adhesive to said backing substrate forming a tape tab stock;

cutting said tape tab stock into individual tape tabs, each said tape tab having a fixed end and a refastenable end;

bonding said fixed end of said tape tab to an absorbent article having a topsheet and a backsheet, said bonding forming an area to which said pressure-sensitive adhesive can be releasably attached; and

mechanically manipulating a portion of said absorbent article adjacent to said fixed end of said tape tab creating a release surface such that said refastenable end of said tape tab can be releasably attached to said release surface.

5,482,589

# METHOD AND APPARATUS FOR MAKING PRE-CUT PRE-PREG TAPE

Shoichi Shin, Shizuoka, and Makoto Kawano, Numazu, both of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1994, Ser. No. 293,316

Claims priority, application Japan, Aug. 25, 1993, 5-210245

Int. Cl.<sup>6</sup> B32B 31/18

U.S. Cl. 156-268

4 Claims



1. A method for making a pre-cut pre-preg tape composed of a pre-cut pre-preg and a mold releasing paper from a pre-preg tape consisting of the pre-preg and the mold releasing paper, which comprises the steps of:

pre-cutting only said pre-preg of said pre-preg tape into predetermined forms by means of a cutting and removing device having a tape feeding mechanism, a cutting mechanism and a removing mechanism;

cutting and dividing unnecessary portions of said pre-preg into predetermined sizes and forms; and

removing each of said divided unnecessary portions in an order determined depending on the sizes and forms of said unnecessary portions and in a determined direction, thereby making said pre-cut pre-preg tape.

5,482,590

# METHOD FOR FORMING A DISPLAY CELL WITH COUNTER-ELECTRODE CONTACT PICK-UP

Bruno Vinouze, Port-Blanc; Jean-Yves Moreno, Sotteville les Rouen, and François Lacroix, Lannion, all of France, assignors to France Telecom Etablissement Autonome De Droit Public, and Sagem, both of Paris, France

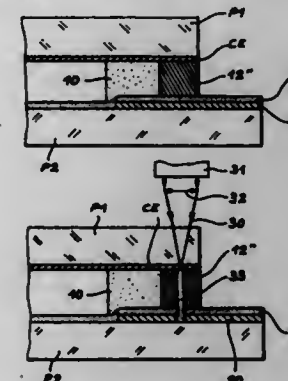
Filed Apr. 8, 1994, Ser. No. 224,977

Claims priority, application France, Apr. 15, 1993, 93 04443; Aug. 10, 1993, 93 09817

Int. Cl.<sup>6</sup> B32B 31/00

U.S. Cl. 156-272.8

2 Claims



1. Method for forming a display cell comprising the steps of: placing a counter-electrode on a first transparent plate;

placing a polymerizable glue cord on the circumference of the counter-electrode;

placing contact blocks on the counter-electrode outside the glue cord;

placing addressing lines and columns and pixel electrodes on a second plate;

forming counter-electrode connection contacts at the periphery of the second plate;

placing a non-conducting passivation film coating on the counter-electrode contacts on the second plate;

wherein the contact blocks contain a glue which cross-links at a temperature greater than the temperature for polymerizing the glue of the cord;

wherein the two plates are assembled and the glue cord is polymerized, the contact blocks are disposed above the counter-electrode contacts but remain separate therefrom by means of the passivation film;

exposing the blocks to a laser beam having sufficient power to calcine the glue of the contact blocks and render the contact blocks conductive over their entire height; and

performing the passivation film above the counter-electrode contacts and partly perforating the counter-electrode contacts with the laser beam.

5,482,591

# LAMINATED SEALS AND METHOD OF PRODUCTION

Ned J. Reo, Scotia, N.Y., assignor to Specialty Silicone Products, Inc., Ballston Spa, N.Y.

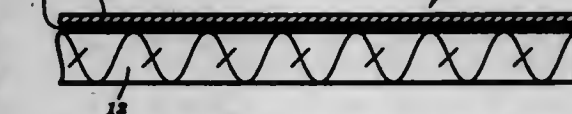
Continuation of Ser. No. 969,429, Oct. 30, 1992, abandoned.

This application Sep. 20, 1994, Ser. No. 309,527

Int. Cl.<sup>6</sup> C09J 5/10

U.S. Cl. 156-306.6

3 Claims



1. Method of producing a gas-tight metal-backed septum of permeable silicone rubber sheet and crack- and crinkle-free metal foil which consists of the steps of bonding one side of a metal foil to one side of a thermoplastic resin sheet, bonding one side of a tightly-woven glass cloth sheet having no sizeable discontinuity to the other side of the thermoplastic resin sheet, and finally bonding one side of a silicone rubber sheet to the other side of the woven glass cloth sheet.

5,482,592

# METHOD AND DEVICE FOR SPLICING NARROW STRIPS

Silvano Boriani, and Alessandro Minarelli, both of Bologna, Italy, assignors to G.D. Società Per Azioni, Bologna, Italy

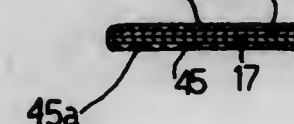
Filed May 24, 1994, Ser. No. 248,335

Claims priority, application Italy, Jun. 4, 1993, BO93A0261

Int. Cl.<sup>6</sup> B65H 21/00

U.S. Cl. 156-505

12 Claims



1. A device for splicing narrow strips, the device comprising a splicing station for splicing a first portion of a first strip and a second portion of a second strip; first feed means for feeding said first and second strip portions, arranged one on top of the other, to

the splicing station; second feed means for feeding an adhesive connecting element to the splicing station; and folding means for folding the adhesive element in a U shape about the superimposed first and second strip portions; said first feed means comprising a gripping device including first and second jaws movable both towards each other to grip said portions of the strips on top of and in unison with each other and in relation to the splicing station for feeding the two strips to the splicing station.

5,482,593

## HIGH SPEED APPLICATOR FOR ADHESIVE TAPE

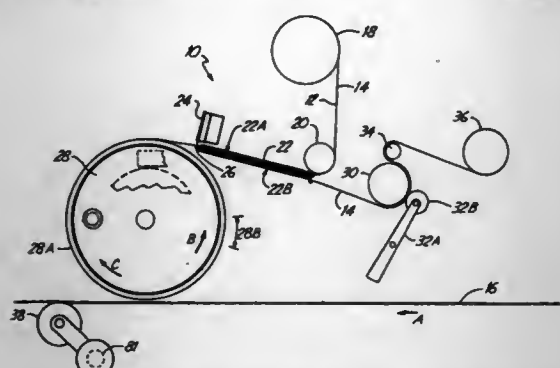
Gary K. Kuhn, Scandia, and Herbert A. McLees, Cottage Grove, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 5, 1994, Ser. No. 222,854

Int. Cl.<sup>6</sup> B32B 31/00

U.S. Cl. 156—521

34 Claims



1. An apparatus for applying adhesive tape to a moving web of material, the apparatus comprising:

- tape dispensing means for supplying the adhesive tape;
- drive means for driving the adhesive tape;
- cutting means moving substantially perpendicular to a direction of the adhesive tape for cutting at least a portion of the adhesive tape into a strip of tape, the strip of tape having a predetermined length;
- a vacuum wheel having a tape receiving portion and a tape free portion, wherein the tape receiving portion receives the strip of tape while the vacuum wheel is moving in a first direction, and wherein the vacuum wheel supplies the strip of tape to the moving web of material while moving in a second direction, opposite to the first direction; and
- applying means for forcing the moving web of material from a base position juxtaposed the vacuum wheel to an applying position in contact with the tape free portion of the vacuum wheel such that the strip of tape is transferred to the web of material.

5,482,594

## LIQUID REMOVAL APPARATUS AND METHOD FOR WOOD PULP

Reijo Salminen, 373 Cove Rd., Bellingham, Whatcom County, Wash. 98226

Continuation-in-part of Ser. No. 748,271, Aug. 21, 1991, abandoned. This application Jun. 11, 1992, Ser. No. 898,944

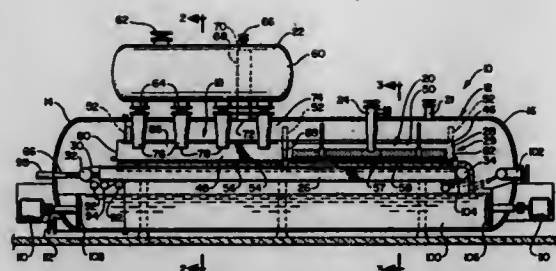
Int. Cl.<sup>6</sup> D21C 9/02

U.S. Cl. 162—60

103 Claims

1. An apparatus for removing liquid from pulp slurry comprising:

- a. a pressure vessel defining a pressure chamber;
- b. means to pressurize said pressure chamber to a pressure level above atmospheric pressure;
- c. a table assembly which has a perforate support surface means for receiving the pulp slurry thereon, said table assembly being arranged to contain said pulp slurry in a processing area



that is located over the support surface means, said support surface means being exposed to pressure in said pressure chamber;

- d. infed means to direct a portion of pulp slurry under pressure into said chamber and onto said surface as a layer, with said layer in said processing area being at a stationary location relative to said support surface;
- e. said table assembly defining a pressure differential chamber below said support surface;
- f. pressure differential means to create a pressure differential between said pressure differential chamber and said pressure chamber with said pulp slurry on said surface means to cause liquid to flow from said pulp slurry to said pressure differential chamber, and also to reduce said pressure differential;
- g. removal means to remove said pulp slurry from said pressure vessel after liquid removal therefrom and after said pressure differential is reduced, while maintaining above atmospheric pressure in said pressure chamber;
- h. said pressure chamber being arranged to extend both above and below said table assembly.

5,482,595

## METHOD FOR IMPROVING RETENTION AND DRAINAGE CHARACTERISTICS IN ALKALINE PAPERMAKING

John C. Harrington, IV, and Michael A. Schuster, both of Jacksonville, Fla., assignors to Betz PaperChem, Inc., Jacksonville, Fla.

Filed Mar. 22, 1994, Ser. No. 215,983

Int. Cl.<sup>6</sup> D21H 21/10

U.S. Cl. 162—168.3

14 Claims

- 1. A method for draining water from an alkaline pulp slurry during the formation of paper in a papermaking operation comprising adding to the pulp slurry an amount sufficient to expedite the drainage of water from the pulp slurry of, in sequential order, from about 1.0 to 15 pounds per ton of alum, from about 0.1 to 5.0 pounds per ton of an ionic poly-acrylamide drainage and retention aid and from about 2.5 to 30 pounds per ton of cationic starch.

5,482,596

## MIXED LIGAND CATALYST FOR PREPARING ARYL-SUBSTITUTED ALIPHATIC CARBOXYLIC ESTERS

Tse-Chong Wu, Baton Rouge, La., assignor to Albemarle Corporation, Richmond, Va.

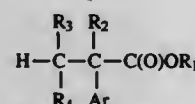
Filed Jan. 27, 1994, Ser. No. 186,933

Int. Cl.<sup>6</sup> C07C 51/10

U.S. Cl. 562—406

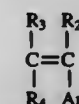
13 Claims

1. A process for preparing an aryl-substituted aliphatic ester having the formula:



where  $R_1$  is alkyl,  $R_2$ ,  $R_3$ , and  $R_4$  are hydrogen, alkyl, cycloalkyl, alkyl-substituted cycloalkyl, aryl either substituted or unsubstituted,

tuted, alkoxy, alkylthio, heteroaryl either substituted or unsubstituted, alkanoyl, aroyl either substituted or unsubstituted, heteroarylcarbonyl either substituted or unsubstituted, trifluoromethyl or halo and Ar is unsubstituted or substituted aryl which comprises treating a compound of the formula:



where Ar,  $R_2$ ,  $R_3$ , and  $R_4$  are as previously defined and a compound of the formula  $R_1OH$  where  $R_1$  is as previously defined with carbon monoxide at a pressure of at least about 1 atmosphere and a temperature from about 25° C. to about 200° C. in the absence of oxygen and in the presence of a catalyst that is i) a mixture of palladium(O) or the salts of palladium or a mixture of palladium(O) and the salts of palladium and the salts of copper and (ii) a ligand mixture comprising a compound of the formula  $(R')_3ZY$  and a compound of the formula  $(R'')_3Z$  where each  $R'$  and  $R''$  are the same or different and are alkyl, aryl or substituted aryl, and Z is any atom that has a Pauling electronegativity of between 1.9 and 2.5 and Y is a member of Group VIA of the Periodic Table of Elements.

5,482,597

## PURIFICATION OF CRUDE (METH)ACRYLIC ACID

Holger Herbst, Frankenthal; Gerhard Nestler, Ludwigshafen, both of Germany; Jerry Darlington, Lake Jackson, Tex., and Hans Marten, Frankenthal, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Nov. 23, 1994, Ser. No. 347,131

Int. Cl.<sup>6</sup> B01D 3/34; C07C 51/44

U.S. Cl. 203—38

16 Claims

- 1. A process for purifying an aldehyde-contaminated (meth)acrylic acid with a hydrazine derivative, which comprises distilling the (meth)acrylic acid from the mixture, wherein the hydrazine derivative used is a dihydrazide of a saturated aliphatic dicarboxylic acid having from 4 to 8 carbon atoms or the salt thereof or both.

5,482,598

## MICRO CHANNEL ELEMENT AND METHOD OF MANUFACTURING THE SAME

Kazuo Isaka, Tokyo; Takayuki Yagi, Yokohama, and Takeshi Miyazaki, Ebina, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

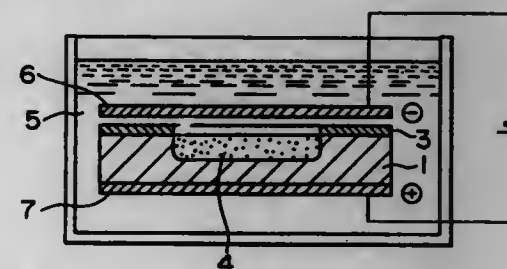
Filed Dec. 3, 1993, Ser. No. 160,857

Claims priority, application Japan, Dec. 8, 1992, 4-328119

Int. Cl.<sup>6</sup> C25F 3/12; 3/30

U.S. Cl. 204—129.55

17 Claims



- 1. A micro channel element comprising: a semiconductor substrate; and a channel formed by imparting porosity to only a portion of said semiconductor substrate in a thickness direction from a surface of said semiconductor substrate so as to allow fluid to flow through said channel in a direction along the surface of said semiconductor substrate.

5,482,599

## PHOTOCHEMICAL METHOD FOR CONVERTING CARBON DIOXIDE GAS TO ORGANIC SUBSTANCES

Masao Watanabe, Saitama, Japan, assignor to Advantest Corporation, Tokyo, Japan

PCT No. PCT/JP93/00799, § 371 Date May 5, 1994, § 102(e) Date May 5, 1994

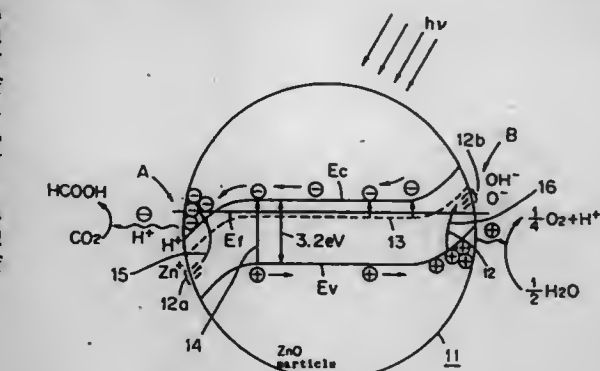
PCT Filed Jun. 15, 1993, Ser. No. 196,113

Claims priority, application Japan, Jun. 17, 1992, 4-158053

Int. Cl.<sup>6</sup> C07C 1/00

U.S. Cl. 204—157.15

4 Claims



- 1. A photochemical method for converting carbon dioxide gas to an organic substance, comprising the steps of: (a) heating metallic oxide particles to activate the surfaces thereof, (b) forming a clathrate hydrate phase of water in contact with the surface activated metallic oxide particles, (c) introducing carbon dioxide gas into the clathrate hydrate phase, and (d) irradiating the surface activated metallic oxide particles with visible light and converting the carbon dioxide gas to the organic substance.

5,482,600

## PROCESS TO IMPROVE COLOR IN ANTIPERSPIRANT SOLUTIONS

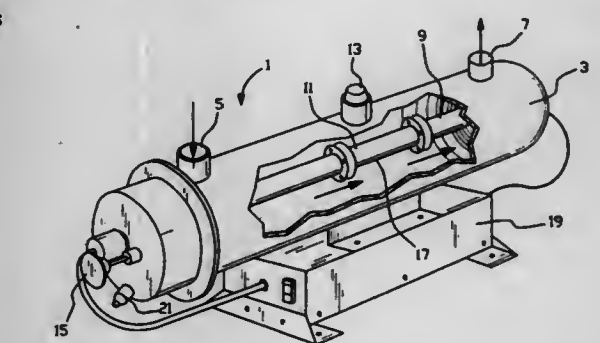
Walter J. Carmody, Port Jervis, and Gary J. Coleman, Deer Park Township, Orange County, both of N.Y., assignors to Somerville Technology Group, Inc., Huguenot, N.Y.

Filed Jun. 10, 1994, Ser. No. 258,430

Int. Cl.<sup>6</sup> A61K 7/34; 7/36; 7/38; B01D 5/00

U.S. Cl. 204—157.15

8 Claims



- 1. A process for reducing color and increasing clearness in an antiperspirant solution, which comprises: treating said solution with ultraviolet light in the wavelength range of about 180 to about 400 nanometers for an exposure time of at least about one minute.



5,482,601

## METHOD AND DEVICE FOR THE PRODUCTION OF CARBON NANOTUBES

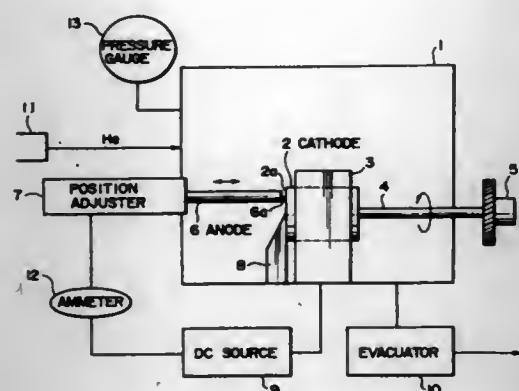
Satoshi Ohshima, Abiko; Motoo Yumura, Isukuba; Yasunori Kuriki, Tsukuba; Kunio Uchida, Tsukuba, and Fumikazu Ikazaki, Tsukuba, all of Japan, assignors to Director-General of Agency of Industrial Science and Technology, Japan

Filed Jan. 13, 1995, Ser. No. 372,130

Claims priority, application Japan, Jan. 28, 1994, 6-026039  
Int. Cl.<sup>6</sup> C01B 31/00

U.S. Cl. 204—173

6 Claims



1. A method of producing carbon nanotubes, comprising the steps of:

- successively positioning an axially extending carbonaceous anode rod having a tip end surface and a cathode having a cathode surface having an area greater than that of said tip end surface in an atmosphere of an inert gas such that said tip end surface successively faces on different portions of said cathode surface while keeping a distance therebetween substantially unchanged and while keeping the axis of said anode rod oriented in the direction normal to each of said portions of said cathode surface;
- impressing a direct current voltage between said anode and said cathode to cause an arc discharge to occur between said tip end surface of said anode rod and each of said portions of said cathode surface and to permit carbonaceous deposits containing carbon nanotubes to accumulate on each of said portions; and
- scraping said carbonaceous deposits from each of said portions.

5,482,602

## BROAD-BEAM ION DEPOSITION COATING METHODS FOR DEPOSITING DIAMOND-LIKE-CARBON COATINGS ON DYNAMIC SURFACES

Clark V. Cooper, Glastonbury, and Charles J. Isabelle, Winsted, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 4, 1993, Ser. No. 148,043

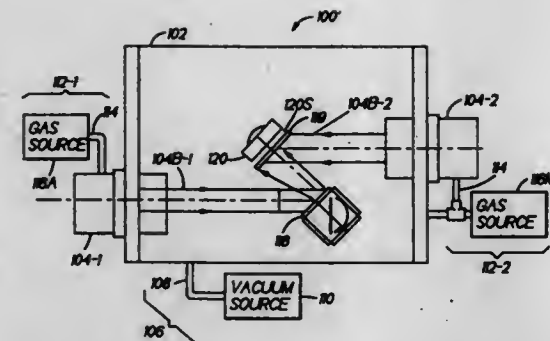
Int. Cl.<sup>6</sup> C23C 14/34

U.S. Cl. 204—192.11

42 Claims

1. A broad-beam ion deposition coating method for depositing a diamond-like-carbon coating indirectly to a dynamic surface of an article subject to adherence difficulties utilizing a broad-beam ion deposition apparatus, the broad-beam ion deposition apparatus including a deposition chamber, a broad-beam ion gun operative to generate an ion beam having a trajectory, vacuum means for evacuating the deposition chamber, gas supply means for supplying gas to the broad-beam ion gun and the deposition chamber, and a target interposable between the broad-beam ion gun and the dynamic surface, comprising the steps of:

- preliminarily conditioning the dynamic surface of the article for broad-beam ion deposition;



- inserting the conditioned article within the deposition chamber wherein the dynamic surface is spatially orientated at a predetermined trajectory angle with respect to the ion beam trajectory;
- evacuating the deposition chamber to a predetermined base pressure utilizing the vacuum means;
- ion sputtering conditioning the dynamic surface of the article for broad-beam ion deposition by
  - providing a sputtering gas to the broad-beam ion gun utilizing the gas supply means,
  - operating the broad-beam ion gun to ionize the sputtering gas to generate a sputtering ion beam having a predetermined beam current density, and
  - accelerating the sputtering ion beam at a predetermined accelerating energy towards the dynamic surface wherein impact of the accelerated sputtering ion beam with the dynamic surface effectuates sputter cleaning thereof.
- depositing an interface layer having a predetermined thickness on the dynamic surface by
  - providing a first gas to the broad-beam ion gun utilizing the gas supply means,
  - operating the broad-beam ion gun to ionize the first gas to generate a first ion beam having a predetermined beam current density, and
  - accelerating the first ion beam towards the target at a predetermined accelerating energy to dislodge atoms therefrom, the dislodged atoms being deposited on the dynamic surface to form the interface layer on the dynamic surface; and
- depositing a diamond-like-carbon coating having a predetermined thickness on the interface layer deposited on the dynamic surface by
  - providing a carbon-based gas to the broad-beam ion gun utilizing the gas supply means,
  - operating the broad-beam ion gun to ionize the carbon-based gas to generate a second ion beam that includes carbon ions, the second ion beam having a predetermined beam current density, and
  - accelerating the second ion beam towards the dynamic surface at a predetermined accelerating energy wherein the carbon ions of the second ion beam are deposited on the interface layer to form the diamond-like-carbon coating for the dynamic surface of the article.

5,482,603

## METHOD OF PRODUCING ELECTROLUMINESCENCE EMITTING FILM

Tomoyuki Kawashima; Harutaka Taniguchi; Hisato Kato, and Kazuyoshi Shibata, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

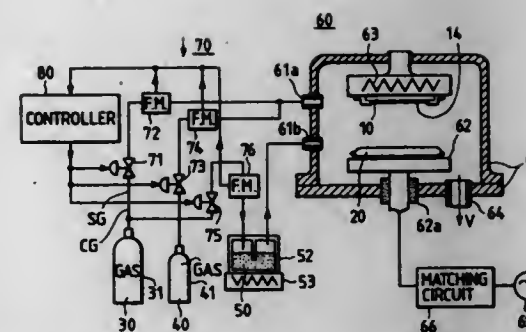
Filed May 3, 1993, Ser. No. 55,104

Claims priority, application Japan, May 7, 1992, 4-113833  
Int. Cl.<sup>6</sup> C23C 14/34

U.S. Cl. 204—192.26

6 Claims

1. A method of producing an electroluminescence emitting film comprising:



sputtering an elemental target in a reactive atmosphere, wherein said target comprises an element to be sulfidized and said reactive atmosphere comprises an inert sputtering gas, a sulfur compound gas and a gasified compound of a rare earth element;

reactively depositing an electroluminescence emitting film including said rare earth and sulfur from said reactive atmosphere.

5,482,604

## OFF-AXIS RADIO FREQUENCY DIODE APPARATUS FOR SPUTTER DEPOSITION OF RLg MIRRORS

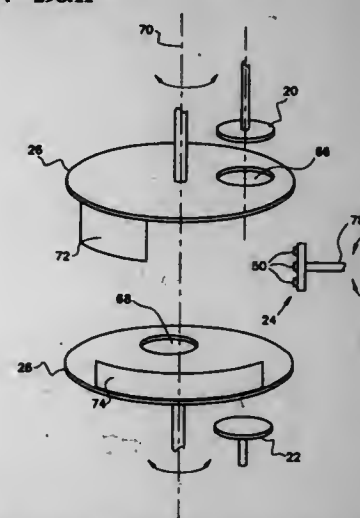
Robert G. Ahonen, Cedar, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 27, 1994, Ser. No. 187,434

Int. Cl.<sup>6</sup> C23C 14/34

U.S. Cl. 204—298.11

14 Claims



1. An off-axis diode sputtering device for use in the construction of mirrors by sputtering alternating layers of material on a substrate, comprising:

- a sputtering chamber capable of maintaining gas at a pressure required to establish a gas discharge, said chamber having a substantially cylindrical outer wall and a first cover and a second cover perpendicular to a central axis of said cylindrical outer wall, said cylindrical outer wall in conjunction with said first cover and said second cover forming said chamber;
- a first cathode assembly disposed within said chamber in close proximity to said first cover, said first cathode assembly and adapted to have a first target material on a first target surface of said first cathode assembly opposite said first cover, said first target surface being perpendicular to said central axis;
- a second cathode assembly disposed within said chamber in close proximity to said second cover of said chamber and adapted to have a second target material on a second target surface of said second cathode assembly, said second target surface being opposite said second cover and parallel to said first target surface;

shutter means comprising a first shutter plate and a second shutter plate both being substantially perpendicular to said central axis and situated between said first cathode assembly and said second cathode assembly and each having openings therein, said shutter means adapted for positioning said openings in front of said first target surface or said second target surface to allow sputtering from the exposed target, wherein said second shutter plate is positioned to block said second cathode assembly when said first cathode assembly is sputtering and said first shutter plate is positioned to block said first cathode assembly when said second cathode assembly is sputtering so as to avoid simultaneously sputtering from both first cathode assembly and second cathode assembly;

a switchable radio frequency source having one output terminal connected to said chamber and a second output terminal switchably connected to either said first cathode assembly or said second cathode assembly; and

substrate handling means for holding a plurality of substrates in an orientation such that the substrate surface to be coated is parallel with said central axis and such that a radial vector normal to said substrate surface perpendicularly intersects said central axis, said substrate handling means for causing the substrates to be rotated about said radial vector.

5,482,605

## PORTABLE ENVIRONMENTAL CLEAN PLATING SYSTEM

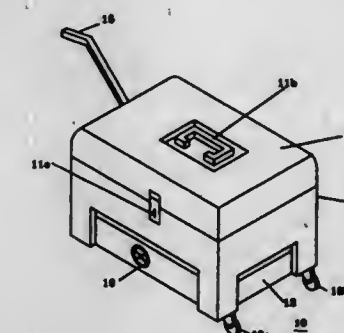
James C. Taylor, 4005 Brookhaven Clnb Dr. #195, Dallas, Tex. 75244

Filed Feb. 9, 1995, Ser. No. 389,280

Int. Cl.<sup>6</sup> C25D 17/06; 17/14

U.S. Cl. 204—224 R

18 Claims



- A portable plating apparatus, comprising:
  - a housing for storing and transporting the plating apparatus;
  - a combination battery/A.C. power supply;
  - a control box for supplying and controlling the power used in plating;
  - a fluid accumulator for collecting used plating fluids during plating; and
  - a grounding plating grid over said fluid accumulator upon which small parts may be plated.

5,482,606

Patent Not Issued For This Number

5,482,607

## FILM FORMING APPARATUS

Hajime Hashimoto, Kazuo Kubota, Daisuke Inoue, and Syuichi Nogawa, all of Kyoto, Japan, assignors to Nissin Electric Co., Ltd., Kyoto, Japan

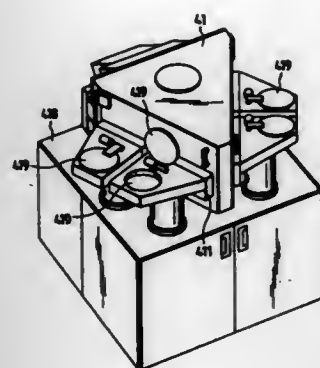
Filed Sep. 20, 1993, Ser. No. 123,225

Claims priority, application Japan, Sep. 21, 1992, 4-277795; Nov. 11, 1992, 4-327340; Nov. 26, 1992, 4-341143; Nov. 26, 1992, 4-341144; Feb. 9, 1993, 5-046003; Apr. 8, 1993, 5-107562

Int. Cl.<sup>6</sup> C23C 14/34

U.S. Cl. 204—298.25

1 Claim



1. A thin-film forming apparatus, comprising:  
a film forming chamber in which a film is formed on a substrate;  
and  
a load lock chamber provided on said film forming chamber through a gate valve, which is used to send said substrate into said film forming chamber,  
wherein, when a volume of said film forming chamber is V1 liters, evacuated to a pressure P1 Torr, P Torr is a required pressure for film formation, and V2 liters is a volume of said load lock chamber, evacuated to a pressure P2 Torr, a relation between said volumes V1 liters and V2 liters satisfies the following expression:

$$(P1 \times V1 + P2 \times V2) / (V1 + V2) \leq 6 \times 10^{-5} \text{ Torr.}$$

5,482,608

## CAPILLARY ELECTROPHORESIS FLOW CONTROL SYSTEM

Catherine A. Keely, Cupertino; Douglass McManigill, Palo Alto, and Robert R. Holloway, Montara, all of Calif., assignors to Hewlett Packard Company, Palo Alto, Calif.

Filed Jan. 19, 1993, Ser. No. 6,353

Int. Cl.<sup>6</sup> C25B 9/00

U.S. Cl. 204—299 R

12 Claims

1. A system for controlling the rate of bulk flow in capillary electrophoresis comprising:

- a) a separation capillary having an inlet end and an outlet end;  
b) upstream liquid containment means in fluid flow communication with said inlet end for introducing a solution to said separation capillary;  
c) downstream liquid containment means in fluid flow communication with said outlet end for receiving a flow of said solution;  
d) voltage means for applying voltage between said inlet end and said outlet end;



- e) forward and reverse bulk flow driver effective for selectively driving the bulk flow in both a forward and reverse direction across the length of said capillary through application of differential pressure selectively in a forward and a reverse bulk flow direction across the length of said separation capillary concurrently with the applied voltage;  
f) in which the internal diameter of the capillary ranges from 0.010 to 0.150 mm and the double-layer thickness ranges from 0.2 to 10 nm, such that a ratio between an internal radius of the capillary and a double-layer thickness is at least 500.

5,482,609

## SOLID ELECTROLYTE GAS SENSOR

Tsuyoshi Kobayashi, and Misa Saitoh, both of Nagano, Japan, assignors to Shinko Electric Industries Co., Ltd., Nagano, Japan

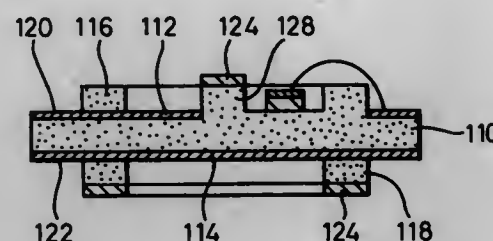
Filed Apr. 26, 1994, Ser. No. 236,021

Claims priority, application Japan, Apr. 27, 1993, 5-100721; May 28, 1993, 5-126944; May 28, 1993, 5-126945

Int. Cl.<sup>6</sup> G01N 27/407

U.S. Cl. 204—412

5 Claims



1. A solid electrolyte gas sensor comprising:  
a base plate of an oxygen ion conductive solid electrolyte on which are disposed a plurality of detecting units for detecting oxygen and other selected gases, each unit comprising a detecting electrode and each unit for detecting one of said other gases further comprising a solid electrolyte conductive to ions of said one of said other gases,  
a reference electrode commonly used in conjunction with all the

detecting units and a conductor portion for external connection, wherein the detecting units are disposed on one side of said base plate, and wherein the reference electrode is disposed on the other side of the base plate.

5,482,610

## CATHODE FOR COATING A SUBSTRATE

Bernd Wolf, Hanau; Juergen Mueller, Frankfurt am Main, and Hans Neudert, Freigericht, all of, Germany, assignors to Leybold Aktiengesellschaft, Hanau, Germany

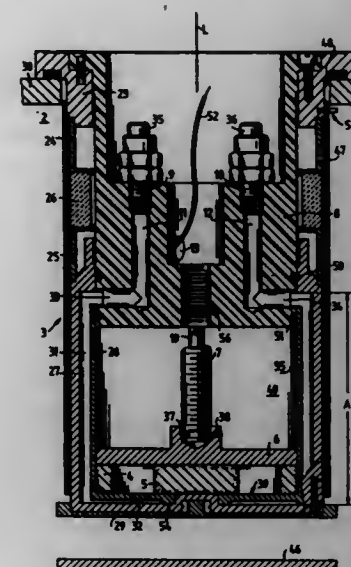
Continuation-in-part of Ser. No. 838,578, Feb. 19, 1992, abandoned. This application Feb. 22, 1993, Ser. No. 20,361

Claims priority, application Germany, Nov. 14, 1991, 41 37 483.5; Dec. 28, 1991, 41 43 135.9

Int. Cl.<sup>6</sup> C23C 14/34

U.S. Cl. 204—298.19

15 Claims



1. Cathode system for coating a substrate, comprising:  
a voltage source;  
an evacuable coating chamber having an outside wall having an opening;  
a cathode connected to said voltage source and disposed in the evacuable coating chamber;  
a target electrically connected to the cathode and which is sputtered and whose sputtered particles deposit themselves on a substrate and  
a process gas brought into the coating chamber;  
the cathode comprising a substantially pot-like housing having a solid bottom and having an outer face fixedly joined to the target and the housing having an open end which is sealingly held in the opening in the outside wall of the coating chamber, the housing having an interior being always exposed to atmospheric pressure, while the target and the outer face of the housing joined to the target and reaching into the coating chamber are exposed to the pressure prevailing in the coating chamber;  
the pot-like housing being of double-walled construction section-wise having inside and outside walls forming a cavity; coolant lines and line connections;  
an insert having cooling passages, and having coolant lines and line connections communicating with the passages and communicating with the cavity, one of the walls of the insert having a radially outer wall portion;  
the interior having an inner wall portion surrounding the outer wall portion of the insert; and  
O-rings sealing the insert against the inside wall of the housing.

5,482,611

## PHYSICAL VAPOR DEPOSITION EMPLOYING ION EXTRACTION FROM A PLASMA

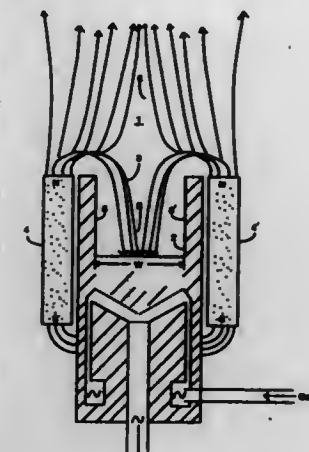
John C. Helmer, 260 S. Bascom Way, Palo Alto, Calif. 94028; Kwok F. Lai, 959 Van Auken Cir., Palo Alto, Calif. 94303, and Robert L. Anderson, 3169 Emerson, Palo Alto, Calif. 94306

Continuation-in-part of Ser. No. 768,498, Sep. 30, 1991, abandoned. This application Oct. 8, 1993, Ser. No. 133,595

Int. Cl.<sup>6</sup> C23C 14/35

U.S. Cl. 204—298.17

29 Claims



1. A sputter magnetron comprising:  
a high intensity plasma inducing means, said high intensity plasma inducing means including:  
i) a sputter cathode, said sputter cathode being a particle confining container having walls and one open side to permit extraction of ions from said container, said walls having an inner surface being of a selected target material, said sputter cathode including means to apply a voltage to said sputter cathode;  
ii) means to provide and maintain electrons in said particle confining container;  
iii) magnetic field generating means for providing a null magnetic field value at a region adjacent to said open side of said sputter cathode container and for providing magnetic field lines which loop through said sputter cathode walls thereby providing forces, in operation, for retaining said electrons adjacent to at least a portion of said sputter cathode walls; and  
b. ion extraction means, wherein said null magnetic field value region comprises a portion of said extraction means, said ion extraction means cooperating, in operation, with ions near said null value region to induce those said ions to exit said cathode container and to follow a path determined by said ion extraction means.

5,482,612

## METHODS AND SYSTEMS FOR SHIELDING IN SPUTTERING CHAMBERS

Frank O. Armstrong, and Brian B. Jeffreys, both of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 967,900, Oct. 27, 1992, abandoned.

This application Aug. 5, 1994, Ser. No. 286,586

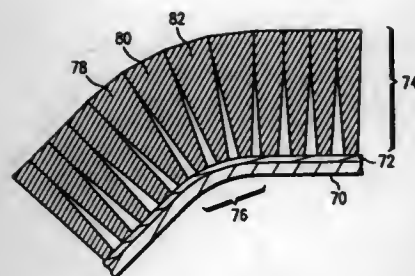
Int. Cl.<sup>6</sup> C23C 14/34

U.S. Cl. 204—298.11

3 Claims

1. A system for depositing a metal film on a surface of a semiconductor substrate, comprising:  
a sputtering system for creating a metal vapor and directing said vapor to the surface of the semiconductor substrate;  
a shield proximate the semiconductor substrate operable to shield portions of the system from the metal vapor; and





said shield comprising radiused deflections operable to prevent shadowing of the surface of the semiconductor substrate from said metal vapor and further operable to disperse forces created by crystalline growth of metal film outwardly from said shield to retard delamination of said metal film from said shield;

said shield comprising stainless steel and an interstitial layer of porous aluminum about 0.040 inches thick to adhere to both said stainless steel of said shield and a metal film created from said metal vapor outwardly from said interstitial layer.

5,482,613

# METHOD AND APPARATUS FOR MAKING A GEL PLATE WITH A POROUS MEMBRANE FOR SEPARATING AND TRANSFERRING MACROMOLECULES BY ELECTROPHORESIS

Jean Boquet, Le-Perray-en-Yvelines, France, assignor to Bertin & Cie, Plaisir, France

PCT No. PCT/FR93/00982, § 371 Date May 31, 1994, § 102(e) Date May 31, 1994, PCT Pub. No. WO94/08701, PCT Pub. Date Apr. 28, 1994

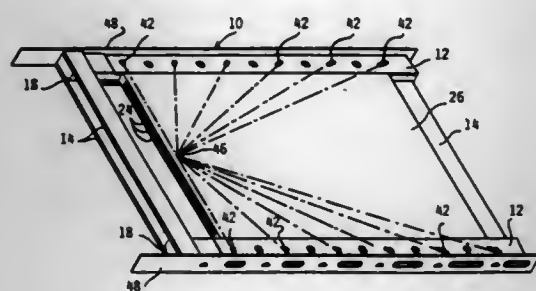
PCT Filed Oct. 5, 1993, Ser. No. 244,528

Claims priority, application France, Jan. 9, 1992, 92 12004

Int. Cl.<sup>6</sup> C25B 9/00

U.S. Cl. 204—299 R

6 Claims



1. Apparatus for making a gel plate with a microporous membrane for separation and transfer of macromolecules by electrophoresis, the apparatus comprising a cassette formed by a rectangular frame and a bottom plate, and pouring means for pouring liquid gel into the interior of the cassette onto the bottom plate, said cassette comprising two opposite longitudinal rails having traction means which cooperate with two opposite longitudinal edges of the membrane for placing the latter under tension in substantially uniform manner, before pouring in the gel, and wherein said pouring means are mounted at one end of the cassette and comprise a channel for the gel opening into the cassette between the bottom plate and the membrane tensioned over the

cassette, said traction means further comprising pushers guided in grooves in said rails and urged toward the outside by springs, said pushers including means for engaging the edges of the membrane.

5,482,614

# ELECTROLUMINESCENCE DISPLAY

Kenichi Kondo, Fujisawa; Takahiro Saida; Shuichi Taya, both of Yokohama; Toyoshi Iida, Tsukuba; Takeshi Sotomura, Tsukuba; Yuko Fujii, Tsukuba; Keiji Sato, Tsukuba; Mamoru Takahashi, Gunma; Sadayasu Yamakawa, and Shunichi Osawa, both of Nagai, all of Japan, assignors to Stanley Electric Co., Ltd., and Japan Metals & Chemicals Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 812,577, Dec. 20, 1991, Pat. No.

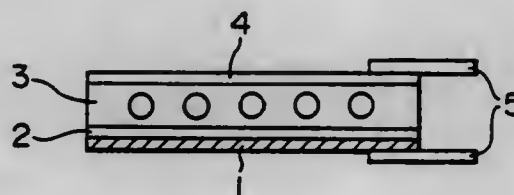
5,359,261. This application Aug. 1, 1994, Ser. No. 283,776

Claims priority, application Japan, Dec. 28, 1990, 2-416782; Jul. 25, 1991, 3-186335; Jan. 11, 1991, 3-263749; Jan. 15, 1991, 3-266485

Int. Cl.<sup>6</sup> C25D 11/16

U.S. Cl. 205—171

24 Claims



1. A process for manufacturing an EL lamp comprising the steps of:  
anodizing an aluminum foil in a substantially neutral electrolyte solution to form a non-porous aluminum oxide layer,  
forming a light emitting EL layer directly on said anodized aluminum foil, and  
forming a transparent electrode layer on said light emitting EL layer.

5,482,615

# NOBLE METAL/ZN-A1203 REFORMING CATALYSTS WITH ENHANCED REFORMING PERFORMANCE (C-2714)

George D. Meltzer, Pittstown, N.J.; Ruben A. Migone, Easton, Pa., and William J. Mykytka, Jersey City, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 289,975, Aug. 12, 1994, abandoned, which is a division of Ser. No. 29,487, Mar. 11, 1993, abandoned. This application Mar. 10, 1995, Ser. No. 402,072

Int. Cl.<sup>6</sup> C10G 35/09; B01J 23/42; 23/60

U.S. Cl. 208—139

3 Claims

1. A catalytic reforming process with enhanced C<sub>5</sub>+ selectivity, under reforming conditions which includes dehydrocyclization of at least a portion of a naphtha feedstream comprising: contacting said naphtha feedstream with a catalyst composition consisting essentially of a halogen and catalytically active amounts of nonalloyed platinum and zinc on an alumina support and in the absence of cobalt and nickel.

5,482,616

# PROCESS FOR HYDROGENATION AND/OR DEHYDROGENATION

Nilanjan Brahma, De Meern; John W. Geus, Bilthoven, and Eugene G. M. Kuipers, Apeldoorn, all of, Netherlands, assignors to Engelhard De Meern B. V., De Meern, Netherlands

Division of Ser. No. 523,883, May 15, 1990, abandoned. This application May 26, 1992, Ser. No. 888,187

Claims priority, application Netherlands, May 18, 1989, 8901239

Int. Cl.<sup>6</sup> C10G 45/00; C07C 5/10

U.S. Cl. 208—143

14 Claims

1. A process for the hydrogenation and/or dehydrogenation of a feedstock containing one or more sulfur containing compounds, comprising

providing a feedstock containing at least one sulfur containing compound; and

carrying out hydrogenation and/or dehydrogenation of said feedstock in the presence of a non-sulfided catalyst having an improved resistance against deactivation by sulfur compounds, said catalyst comprising at least one free metal hydrogenation component, at least one metal-oxide containing component and at least one component acting as a support material, in which at least a part of the hydrogenation component as well as at least part of the metal-oxide containing component are present on said support material as separate particles, the particles of the hydrogenation component and the particles of the metal-oxide containing component being homogeneously distributed in the catalyst.

5,482,617

# DESULFURIZATION OF HYDROCARBON STREAMS

Nick A. Collins, Medford, N.J., and Mohsen N. Harandi, Langhorne, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 28,056, Mar. 8, 1993, abandoned.

This application Aug. 8, 1994, Ser. No. 286,894

The portion of the term of this patent subsequent to Mar. 28, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> C10G 45/12

U.S. Cl. 208—227

25 Claims

1. A process for desulfurizing a hydrocarbon stream including at least 50 ppmw sulfur in the form of organic sulfur compounds, comprising the steps of:

contacting said hydrocarbon stream in the absence of added hydrogen with an acidic catalyst in a single fluidized bed at a temperature of from about 700° F. to about 850° F., a pressure from 0 to 400 psig and a space velocity from 0.1 to 10 hr<sup>-1</sup> WHSV, to convert said organic sulfur compounds to hydrogen sulfide; and

removing said hydrogen sulfide from said hydrocarbon stream.

5,482,618

# FLOW-THROUGH, IN-LINE FILTER HOUSING

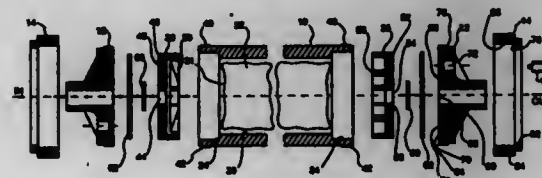
James C. Hall, San Jose, Calif., assignor to Systems Chemistry, Inc., Milpitas, Calif.

Filed Jul. 19, 1994, Ser. No. 276,925

Int. Cl.<sup>6</sup> B01D 35/14

U.S. Cl. 210—85

11 Claims



1. A filter housing comprising:

a cylindrical barrel forming a compartment for receiving a filter element and having first and second annular sealing surface portions respectively formed at each end thereof;

a first disk-shaped body forming a flow diffuser adapted to mate with one end of said barrel and having a first planar surface on one side thereof with a first central orifice passing there-through for receiving an inflow of fluid to be filtered and a third annular sealing surface portion on said first planar surface circumscribing said first central orifice, and flow-diffusing means formed on the side opposite said one side and communicating with said first central orifice for diffusing said input flow such that said flow is evenly distributed over an inlet surface of said filter element;

a second disk-shaped body forming a filter element adaptor for engaging the opposite end of said barrel and having a second planar surface on one side thereof with a second central orifice passing therethrough and a fourth annular sealing surface portion on said second planar surface circumscribing said second central aperture;

first and second annular sealing members of a first diameter; third and fourth annular sealing members of a second diameter less than said first diameter;

a first end cap having a third planar surface formed on one side thereof and first conduit coupling means formed on the opposite side thereof, said third planar surface including a fifth annular sealing surface portion adapted to be sealingly engaged to said first annular sealing surface portion by said first annular sealing member, and

a sixth annular sealing surface portion adapted to be sealingly engaged to said third annular sealing surface portion by said third annular sealing member.

said first end cap having a fluid communicating passageway extending therethrough from said third planar surface to said first conduit coupling means;

a second end cap having a fourth planar surface formed on one side thereof and second conduit coupling means formed on the opposite side thereof said fourth planar surface including a seventh annular sealing surface portion adapted to be sealingly engaged to said second annular sealing surface portion by said second annular sealing member, and

an eighth annular sealing surface portion adapted to be sealingly engaged to said fourth annular sealing surface by said fourth annular sealing member,

said second end cap having a fluid communicating passageway extending therethrough from said fourth planar surface to said second conduit coupling means; and

first fastening means for securing said first end cap to one end of said barrel, and second fastening means for securing said second end cap to the opposite end of said barrel.

5,482,619

# WATER FILTER ASSEMBLY OPERABLE TO PREVENT A JUMP CONDITION

Hong-Jien Chow, No. 27, Avenue 137, Su Yi 5th Lane, Da Ching Street, Taichung, Taiwan, Prov. of China

Continuation-in-part of Ser. No. 52,614, Apr. 27, 1993, abandoned. This application Oct. 28, 1994, Ser. No. 330,960

Int. Cl.<sup>6</sup> B01D 17/12

U.S. Cl. 210—90

1 Claim

1. Apparatus comprising a water filter assembly, the assembly comprising:

a first pressure switch for sensing inlet water pressure of said water filter assembly,

a first filter operative to entrap large waterborne particles and connectable in flow communication with a source of the water,

a first solenoid valve for controlling flow through a water inlet of said water filter assembly, said first pressure switch being disposed before said first solenoid valve in order to sense said inlet water pressure, said first solenoid valve being activated in response to said first pressure switch,







contiguous with said central aperture and with either the inlet or outlet of the housing; and  
lifting means communicable with said retainer ring for movement of said filter cell into and out of the filter housing, wherein a sealing interface is provided between the retainer ring and the inlet or outlet of the housing.

5,482,625

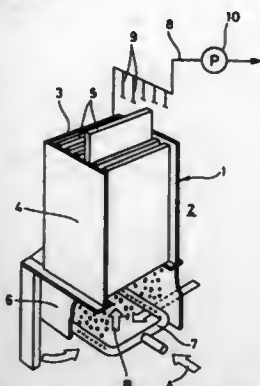
## FILTRATION MEMBRANE MODULE

Kenji Shimizu; Hiroshi Ishida; Yutaka Yamada; Kiyoshi Izumi; Masashi Moro, and Yuji Soeda, all of Osaka, Japan, assignors to Kubota Corporation, Osaka, Japan  
Filed Sep. 20, 1994, Ser. No. 309,246

Claims priority, application Japan, Jan. 7, 1994, 6-000352; Jan. 7, 1994, 6-000353; Apr. 13, 1994, 6-073673  
Int. Cl.<sup>6</sup> B01D 63/00

U.S. Cl. 210—321.84

9 Claims



1. A filtration membrane module submerged with a processed liquid in a processing tank comprising:  
a plurality of flat, rigid membrane cartridges vertically placed in parallel to each other as properly spaced from the adjoining membrane cartridges;  
cleaning stream generating means for supplying a flow parallel to the membrane surfaces of the membrane cartridges which opposes to gaps defined between the membrane cartridges opposite to each other; and  
sucking means for sucking permeated liquid in each membrane cartridge which is communicated with the passage of permeated liquid in each membrane cartridge;  
each membrane cartridge having a membrane supporting plate and a filtration membrane covering the outer surface thereof; and  
the membrane supporting plate supporting the filtration membrane is being made hollow by using a rigid structural member, the inside of the plate forming a passage of permeated liquid, the membrane supporting plate having an opening formed on the surface opposite to the filtration membrane the opening communicating to the passage of permeated liquid.

5,482,626

## ANALYTICAL LIQUID TEST SAMPLE FILTRATION APPARATUS

Brent C. Lohnes, Soda Springs; Terry D. Turner; Kerry M. Klingler, both of Idaho Falls, and Michael L. Clark, Menan, all of Id., assignors to Lockheed Idaho Technologies Company, Idaho Falls, Id.

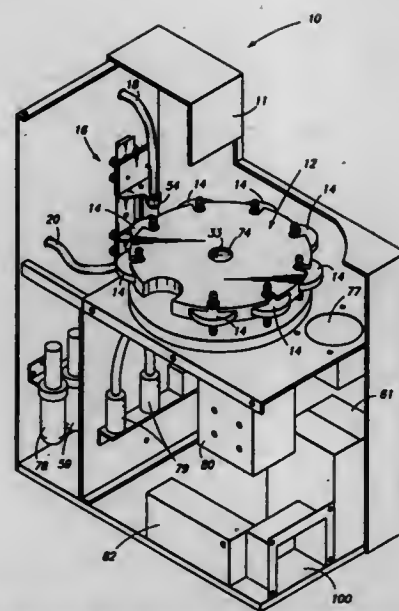
Filed Dec. 20, 1993, Ser. No. 171,132

Int. Cl.<sup>6</sup> G01N 35/02

U.S. Cl. 210—340

29 Claims

1. A liquid test sample filtration apparatus comprising:  
a module configured to hold a plurality of filter elements in spaced relation;  
a filter clamping and fluid injection apparatus positioned relative to the module to engage a filter element thereon, the filter



- clamping and fluid injection apparatus including a pair of first and second opposing engageable members to sealingly engage a filter element on the module therebetween;  
cycling means for moving the filter clamping and fluid injection apparatus and module relative to one another for registering filter elements on the module to the filter clamping and fluid injection apparatus;  
clamping means for moving the filter clamping and fluid injection apparatus into substantial sealing fluid communication relative to a filter element on the module; and  
means for passing fluid through the filter clamping and fluid injection apparatus and a filter clamped relative to the filter injection apparatus.

5,482,627

## SEPARATION METHOD

Henri G. W. Pierson, Tenerife, Spain, assignor to D & C Limited, Monrovia, Liberia

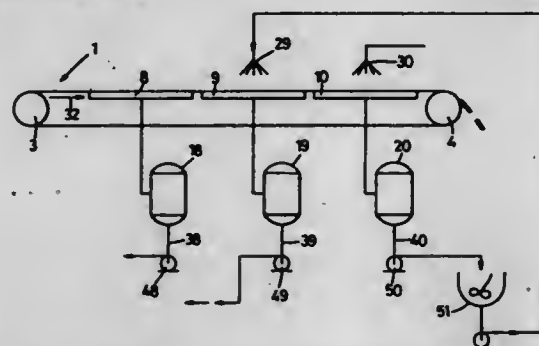
Filed Aug. 31, 1993, Ser. No. 113,754

Claims priority, application United Kingdom, Sep. 9, 1992, 9219062

Int. Cl.<sup>6</sup> B01D 37/02

U.S. Cl. 210—770

19 Claims



1. A method of separating non-compressible solid particles from a mixture of non-compressible solid particles and a first liquid which is water or an aqueous-based solution, which method comprises:

- (i) filtering the mixture to provide a damp filter cake of said solid particles on a filter medium;
- (ii) adding to said damp filter cake, while an said filter medium, a densification aid in the form of a second liquid, different from the first liquid, miscible therewith, and having greater lubricating properties than the first liquid, to lubricate the

- particles and thereby cause closer packing of the particles in the damp cake and displacement of said first liquid from said damp filter cake to form a densified filter cake; and  
(iii) removing the densification aid from the densified filter cake by washing the densified filter cake, while on said filter medium and maintaining said closer packing of said solid particles, with a third liquid miscible with the first and second liquids, to obtain a product substantially free of said densification aid.

5,482,628

## COLUMN FOR LIQUID CHROMATOGRAPHY

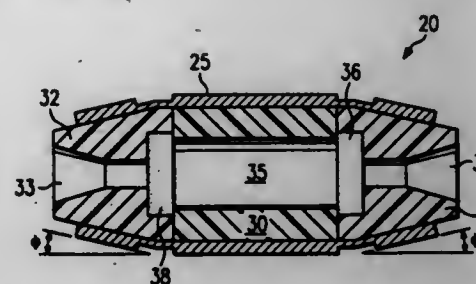
Hans G. Schlick, Anacortes, Wash., assignor to Upchurch Scientific, Inc., Oak Harbor, Wash.

Filed Apr. 15, 1994, Ser. No. 277,853

Int. Cl.<sup>6</sup> B01D 15/08

U.S. Cl. 210—198.2

18 Claims



15. A column for liquid chromatography which comprises:  
an outer metal tube having first and second ends;  
a biocompatible inner tube having a passageway therethrough sized and dimensioned for retaining chromatographic packing material and having first and second ends, wherein said inner tube is located within said outer metal tube and the passageway through said inner tube contains a packing material;  
first and second biocompatible end fittings that allows for connection to a chromatography system each having a passageway therethrough and each having a first and second end, wherein the first end of each of said end fittings abuts an end of said inner tube and the second end of each of said end fittings extends beyond the end of said outer tube, and wherein the first end of each end fitting has a counterbore seat; and  
biocompatible frits located within the seats of the end fittings; and wherein the ends of the outer tube are tapered to extend inward towards the longitudinal axis of the outer tube at an angle sufficient to hold said first and second end fittings in place, thus holding said frits and said inner tube in place within the outer tube and prevent leakage at high operating pressure.

5,482,629

## METHOD AND APPARATUS FOR SEPARATING PARTICLES FROM LIQUIDS

William W. Rippetoe, 12409 S. Memorial Dr., Bixby, Okla. 74008, and David N. Shroff, 2601 W. Iola, Broken Arrow, Okla. 74112

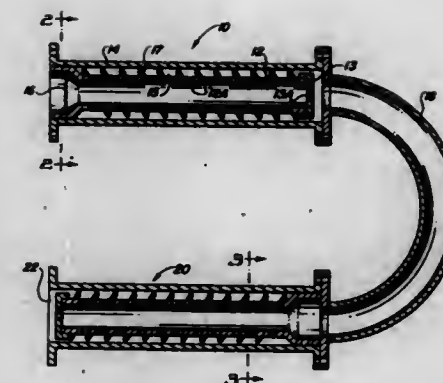
Filed Dec. 7, 1994, Ser. No. 350,849

Int. Cl.<sup>6</sup> B01D 17/04; 35/02; 29/03; 29/31

U.S. Cl. 210—448

9 Claims

1. Apparatus for pre-treating a liquid-based mixture or emulsion containing immiscible particles to enhance the subsequent separation of the particles from the liquid comprising  
a first elongated metal pipe having an entry end and an exit end and a plurality of identical spaced apart holes in wall of the pipe,  
a cap enclosing the exit end of the pipe,



- a second elongated metal pipe having an entry end and an exit end whose inner diameter is greater than the outer diameter of the first pipe and is in axial alignment with and surrounds the first pipe,  
the first and second pipes being made of metal,  
the inner surface of the outer cylinder and the outer surface of the inner cylinder consisting of an exclusively copper-nickel alloy which includes at least 1% nickel and at least 80% copper, end  
means for joining together in axial alignment the entry ends of the first and second pipes whereby the subsequent separation of the particles from the liquid in the liquid-bases mixture or emulsion is enhanced.

5,482,630

## CONTROLLED DENITRIFICATION PROCESS AND SYSTEM

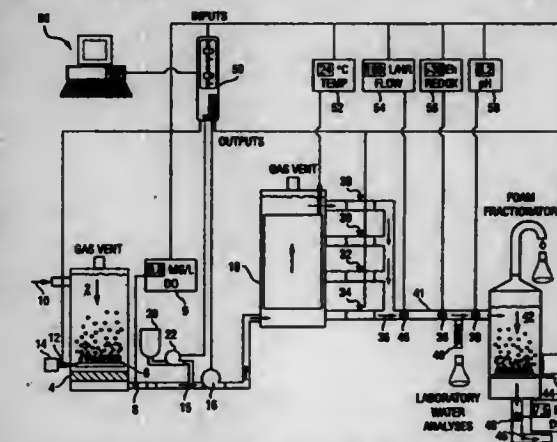
Phillip G. Lee; Phillip E. Turk, and John L. Whitson, all of Galveston, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Jun. 20, 1994, Ser. No. 263,656

Int. Cl.<sup>6</sup> C02F 3/30

U.S. Cl. 210—605

30 Claims



1. A process for the reduction of nitrate to nitrogen in a fluid medium, comprising the steps of:  
providing an anaerobic or partially anaerobic fluid medium containing nitrate and having a variable oxidation-reduction potential;  
exposing the fluid medium to anaerobic bacteria for a process residence time;  
adding a fluid-miscible carbon source to the fluid medium whereby the anaerobic bacteria reduces at least some of the nitrate to nitrogen;  
measuring an oxidation-reduction potential in the fluid medium downstream from the anaerobic bacteria; and  
controlling the addition rate of the carbon source to the fluid medium and controlling the process residence time using the

measured oxidation-reduction potential to achieve a desired level of reduction of the nitrate to nitrogen.

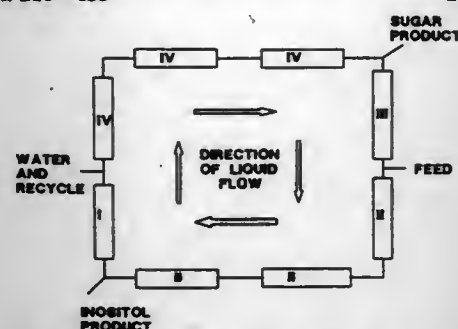
# 5,482,631 SEPARATION OF INOSITOLS FROM SUGARS AND SUGAR ALCOHOLS

Michael Saska, and Moustapha Diack, both of Baton Rouge, La., assignors to Board of Supervisors of Louisiana State University and Agricultural and Mechanical College, Baton Rouge, La.

Filed Oct. 6, 1994, Ser. No. 319,240  
Int. Cl.<sup>6</sup> B01D 15/08

U.S. Cl. 210—635

19 Claims



1. A method for separating an inositol from an aqueous phase comprising the inositol and at least one other component selected from the group consisting of a sugar and a sugar alcohol, the method comprising the steps of passing the aqueous phase over a resin, and collecting that portion of the aqueous phase exiting the resin that contains the inositol; wherein the resin comprises a strong base anion exchange resin in chloride form that has been conditioned with a sufficient concentration of hydroxyl ion that hydroxyl ion resides on the surface of the resin, but such that the hydroxyl ion does not penetrate the interior of the resin.

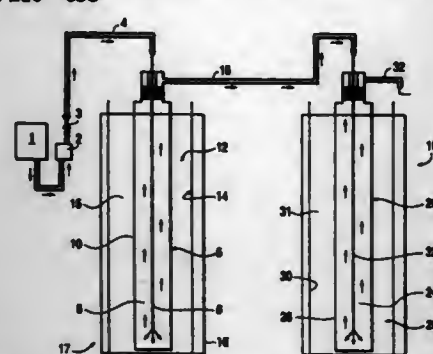
# 5,482,632 EXTRACTING A TARGET ION FROM AN AQUEOUS SOLUTION BY ION EXCHANGE AND ELECTROPOTENTIAL ION TRANSPORT

Henry L. Lomasney, and Richard A. Graves, both of New Orleans, La., assignors to Ionex Corporation, New Orleans

Filed Apr. 28, 1994, Ser. No. 234,458  
Int. Cl.<sup>6</sup> B01D 61/48

U.S. Cl. 210—638

20 Claims



1. A process for extracting at least one target ion from an aqueous solution, comprising:  
A. introducing an aqueous solution containing at least one target ion to a first ion exchange zone containing a first electrode and a first ion exchange medium;  
B. separating, in said first ion exchange zone, said target ion from said aqueous solution by ionic association with said first ion exchange medium to yield a first ion-depleted aqueous solution; and

C. driving said first target ion from said first ion exchange medium into a second zone which contains a second electrode and an electrode buffer solution by means of a first electropotential force between said first and second electrodes, wherein said second zone is separated from said first ion exchange zone by a first hydrophobic barrier which substantially resists fouling, which is permeable to said first target ion when said ion is being driven by said electropotential force and which is water impermeable.

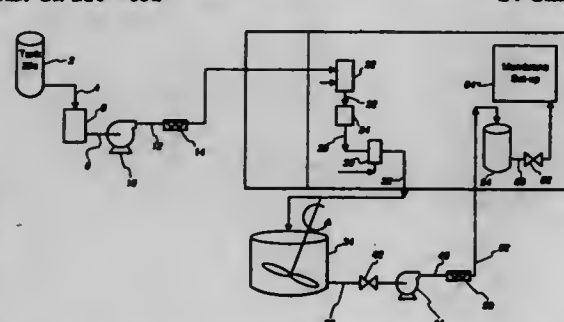
# 5,482,633 PROCESS FOR REMOVING VEGETABLE OIL WAXES BY FAST COOLING VEGETABLE OIL AND USING A POROUS NON-METALLIC INORGANIC FILTER

Harapanahalli S. Muraldihara; Bassam F. Jirjis, both of Plymouth, and Gary F. Seymour, Howard Lake, all of Minn., assignors to Cargill, Incorporated, Minneapolis, Minn.

Filed Oct. 12, 1993, Ser. No. 134,982  
Int. Cl.<sup>6</sup> B01D 61/00

U.S. Cl. 210—651

24 Claims



1. A method for processing a vegetable oil containing wax, the method comprising:  
providing the vegetable oil having a temperature of at least about 220° F.;  
cooling the vegetable oil from a temperature of from about 220° F. to about 60° F. at a rate of at least about 100° F. per hour;  
crystallizing wax in the oil to a cross sectional particle size of between about 0.1 to about 50 microns to provide an oil/crystallized particulate wax blend; and  
cross-flow filtering the oil/wax blend through a porous nonmetallic inorganic filter to separate the particulate wax from the oil to provide a permeate oil having less than about 10 ppm. wax particulate at about 65° F.

# 5,482,634 PURIFICATION OF AQUEOUS REACTION OR WASHING MEDIUM CONTAINING CELLULOSE ETHERS

Yvonne M. Goerlach-Doht, Hamburg; Hans P. Schneider; Juergen Hermanns, both of Stade, all of Germany, and Ulf H. Haugensen, Nakskov, Denmark, assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 13, 1994, Ser. No. 259,319  
Claims priority, application United Kingdom, Jun. 14, 1993, 9312219

Int. Cl.<sup>6</sup> B01D 61/00

U.S. Cl. 210—651

20 Claims

1. A process for purifying an aqueous reaction after removal of crude cellulose ether and/or washing medium containing i) a hot water-insoluble cellulose ether and ii) a hot water-soluble cellulose ether and/or macromolecular cellulose ether by-product, the process consisting of:  
a purification step a) wherein the aqueous medium is heated to or kept at a temperature above the gel point of the hot water-insoluble cellulose ether and gelled cellulose ether is separated from the aqueous medium by means of a solid-bowl centrifuge or a disk separator to leave an aqueous liquor, and

a purification step b) wherein the aqueous liquor is treated by ultrafiltration at a concentration ratio of at least 40.

# 5,482,635 FABRIC CONDITIONER WITH DEODORANT PERFUME COMPOSITION

John M. Behan, Ashford; Christopher F. Clements, Folkestone; John R. Martin, Birkenhead, and Keith D. Perring, Ashford, all of, United Kingdom, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 235,600, Apr. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 89,154, Jul. 8, 1993, abandoned, which is a division of Ser. No. 697,918, May 1, 1991, abandoned, which is a continuation-in-part of Ser. No. 539,636, Jun. 18, 1990, abandoned. This application May 17, 1995, Ser. No. 443,254

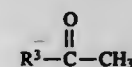
Claims priority, application United Kingdom, Jun. 19, 1989, 8914055; Apr. 30, 1993, 9308953

Int. Cl.<sup>6</sup> D06M 13/35

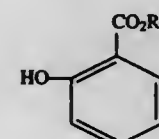
U.S. Cl. 252—8.6

12 Claims

1. A fabric conditioning product comprising  
(i) from 1% to 95% by weight of a fabric softening agent and  
(ii) from 0.01% to 10% by weight of a perfume composition in which at least 30% by weight of the perfume composition is constituted by materials from the following categories:  
at least 7% by weight of the perfume composition of one or more aromatic methyl ketones of general formula



in which R<sup>3</sup> is an aromatic group such that the molecular weight of the ketone is from 170 to 300; and  
at least 3% by weight of the perfume composition of one or more salicylates of general formula



in which R<sup>6</sup> is an aliphatic group, optionally containing not more than one olefinic double bond, and optionally bearing an aromatic substituent group, such that the molecular weight of the salicylate is in the range 190 to 230.

# 5,482,636 PROCESS FOR THE QUATERNIZATION OF TRIETHANOLAMINE FATTY ACID ESTERS AND IMIDAZOLINAMIDES AND THE USE OF THE REACTION MIXTURES IN LAUNDRY SOFTENER COMPOSITIONS

Michael Brock, Schermbeck; Peter Hardt, Monheim; Helmut Klimmek, and Dolf Stockhausen, both of Krefeld, all of Germany, assignors to Huels Aktiengesellschaft, Marl, Germany

Division of Ser. No. 172,276, Dec. 23, 1993. This application Aug. 1, 1994, Ser. No. 283,511

Claims priority, application Germany, Dec. 23, 1992, 42 43 862.4

Int. Cl.<sup>6</sup> D06M 13/322; 13/46; C07D 233/00; C07C 229/00

U.S. Cl. 252—8.8

4 Claims

2. A laundry softener composition comprising an effective laundry softening amount of a reaction mixture obtained by contacting a triethanolamine fatty acid ester or imidazolinamide with a quat-

ernization agent in a reaction medium comprising alkoxyated naturally occurring fats or oils, or mixtures thereof, wherein the reaction medium and resulting quaternized product mixture are substantially free of 2-propanol; and a suitable carrier.

# 5,482,637 ANTI-FRICTION COATING COMPOSITION CONTAINING SOLID LUBRICANTS

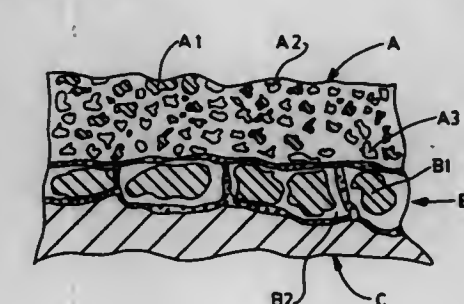
V. Durga N. Rao, Bloomfield Township; Daniel M. Kabat, Oxford, and Brian W. Lizotte, Plymouth, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 88,686, Jul. 6, 1993, Pat. No. 5,363,821. This application Aug. 31, 1994, Ser. No. 298,640

Int. Cl.<sup>6</sup> C10M 125/00

U.S. Cl. 252—29

20 Claims



1. An anti-friction coating composition depositable in a thin film, comprising:

(a) a mixture of (i) solid lubricant crystals that provide a coefficient of friction of 0.06 or less, at least two of which are selected from the group consisting of graphite, MoS<sub>2</sub>, and BN; (ii) a thermoset resin; and (iii) a catalyst for setting resin; and  
(b) an evaporative medium for carrying said mixture during deposition, the ratio of medium to mixture being in the range of 1:5 to 2:1.

# 5,482,638 METAL-FREE DITHIOPHOSPHORIC ACID DERIVATIVES

Thomas Dimmig, Jena; Günter Jäger, Freyburg, and Thomas Petri, Jena, all of Germany, assignors to Rhein Chemie Rheinau GmbH, Mannheim, Germany

Filed Dec. 6, 1993, Ser. No. 165,423

Claims priority, application Germany, Dec. 16, 1992, 42 42 501.8

Int. Cl.<sup>6</sup> C10M 141/08; 141/10

U.S. Cl. 252—46.6

7 Claims

1. Metal-free dithiophosphoric acid derivatives, obtained by reaction of dialkyl, diaryl or mixed alkyl/aryl dithiophosphoric acids with dicyclopentadiene diepoxide.

4. A method of improving the anti-wear properties and the resistance to ageing of a lubricant containing a basic oil using the metal-free dithiophosphoric acid derivatives of claim 1, wherein said metal-free dithiophosphoric acid derivatives are added to the basic oil of the lubricant.



5,482,639

# ICE MELTER WITH COATING OF ALPHA-METHYL GLUCOSINE MIXTURE AND METHOD OF MAKING SAME

Michael J. Archer, Whitefish Bay; Michael S. Adams, and Jeffrey A. Tauri, both of Kenosha, all of Wis., assignors to Vigoro Industries, Inc., Fairview Heights, Ill.

Filed Jun. 8, 1994, Ser. No. 255,431

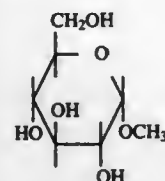
Int. Cl.<sup>6</sup> C09K 3/18; C07K 5/00

U.S. Cl. 252-70

20 Claims

1. A method of making an ice melter composition including a salt combination of potassium chloride, sodium chloride and urea and a trigger comprising the steps of:

(1) heating a solution of alpha-methyl glucoside of the formulation;



- (2) adding urea to heated alpha-methyl glucoside;
- (3) heating alpha methyl glucoside mixture-urea;
- (4) applying the heated alpha methyl glucoside-urea mixture to potassium chloride; and
- (5) adding sodium chloride to the potassium chloride.

5,482,640

# AQUEOUS DISPERSIONS STABILIZED FROM FREEZE/THAW CYCLES

Thomas H. Eberlein, Schuylkill Haven, Pa., assignor to Con-sep, Inc., Bend, Oreg.

PCT No. PCT/US92/03630, § 371 Date Oct. 28, 1995, § 102(e) Date Oct. 28, 1995, PCT Pub. No. WO93/22394, PCT Pub. Date Nov. 11, 1993

PCT Filed Apr. 30, 1992, Ser. No. 331,477

Int. Cl.<sup>6</sup> C09K 5/00; C08L 27/18

U.S. Cl. 252-70

11 Claims

1. A method of stabilizing an aqueous dispersion of particles having an average size of less than one micron, said particles being selected from titanium dioxide and polytetrafluoroethylene, against the harmful effects of freeze/thaw cycles comprising adding a stabilizing agent to said dispersion wherein said stabilizing agent consists essentially of an organic, monofunctional, polar compound having less than five carbon atoms selected from a monohydric alcohol and a monoamine, and wherein said stabilizing agent is present in an amount not exceeding 0.05 molar based upon the water present in said aqueous dispersion.

5,482,641

# STRATIFIED SOLID CAST DETERGENT COMPOSITIONS AND METHODS OF MAKING SAME

Howard Fleisher, 124 Sand Hill Rd., Monmouth Junction, N.J. 08852

Filed Sep. 2, 1993, Ser. No. 115,070

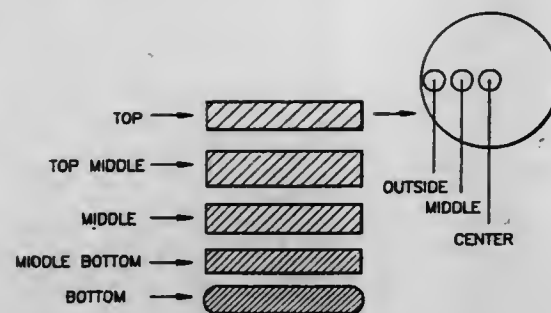
Int. Cl.<sup>6</sup> C11D 11/00; 7/06; 7/10; 17/02

U.S. Cl. 252-90

33 Claims

1. A method of manufacturing a stratified heterogeneous substantially non-uniform, solid cast alkaline detergent method, said method comprising:

- (a) providing a molten alkaline detergent suspension comprising an active alkalinity source and water of hydration;
- (b) adding a granular water conditioning material to said suspension while maintaining the temperature of said suspension in the range of about 130° F. to about 195° F. so that said



suspension is at a viscosity at which said water conditioning material will stratify when it is added to yield a heterogeneous, substantially non-uniform suspension;

(c) casting said suspension into a receptacle; and

(d) cooling said suspension such that it solidifies into a heterogeneous, substantially non-uniform product;

wherein said water of hydration is sufficient to solidify said method upon cooling; and wherein said viscosity allows stratification of said active alkalinity source and said water conditioning material upon cooling of the suspension,

wherein said active alkalinity source provides an average active alkalinity content of about 5% to about 65% by weight throughout said composition and wherein said water conditioning material level is adequate to maintain detergency and threshold water conditioning effect even where minimal conditioner concentrations are present.

5,482,642

# DETERGENT COMPOSITIONS HAVING IMPROVED PERCARBONATE BLEACH STABILITY

Joseph T. H. Agar, Callerton, and David E. Holt, Stannington, both of, England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 2,509, Jan. 4, 1993, abandoned,

which is a continuation of Ser. No. 771,930, Oct. 7, 1991, abandoned. This application Jun. 7, 1994, Ser. No. 255,290

Claims priority, application United Kingdom, Jan. 6, 1991, 9021761

Int. Cl.<sup>6</sup> C11D 3/395; 7/38; 3/08

U.S. Cl. 252-90

10 Claims

1. A solid laundry detergent composition, comprising by weight:

- (a) from about 5% to about 20% of an organic surfactant;
- (b) from about 25% to about 60% of one or more non-phosphate detergent builder salts;
- (c) from about 3% to about 20% of a coated alkali metal percarbonate bleach wherein the coating comprises sodium silicate in an amount from about 2% to 5% by weight of the percarbonate;

wherein the composition:

- i) has a bulk density of at least about 650 g/liter,
- ii) contains less than about 25 ppm total of Iron, Copper and Manganese ions; and
- iii) has an equilibrium relative humidity of not more than about 25% at 32° C.,

whereby the weight percentage of the original percarbonate remaining undecomposed after 28 days storage in closed wax laminate paperboard cartons at 32° C. and 80% Relative Humidity is at least 60%;

wherein the composition comprises, by weight of the composition:

- 1) from about 15% to 25% of a first multi-ingredient component comprising, by weight of the first component: (i) from about 0.75 to 40% anionic surfactant and (ii) from about 60 to 99.25% of organic or inorganic salts; and
- 2) from about 1 to 50% of a second multi-ingredient component comprising a water-soluble surfactant and at least one organic or inorganic salt;

wherein the level of hydratable water-soluble sulfates in the composition is no more than about 1.0% the level of hydratable water-soluble sulfate which is present being in the form of a separately added ingredient;

wherein the first multi-ingredient component comprises a spray-dried powder, and

wherein the second multi-ingredient component comprises an agglomerate of non-spray-dried ingredients.

5,482,643

# SOAP BARS MADE WITH TERNARY SYSTEM OF FATTY ISETHIONATE ESTER, FATTY ACID, AND WATER

John G. Chambers, and Geoffrey Triam, both of Merseyside, Great Britain, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed May 18, 1994, Ser. No. 246,047

Claims priority, application United Kingdom, May 19, 1993, 9310323

Int. Cl.<sup>6</sup> C11D 1/755; 3/20; 3/34; 1/04

U.S. Cl. 252-121

3 Claims

1. A ternary liquid isotropic mixture which is liquid at temperatures of 40°-110° C., said mixture consisting essentially of:

- a) a fatty isethionate ester having a T<sub>c</sub> in excess of 15° C.,
- b) fatty acid in an amount such that the ratio of fatty isethionate ester to fatty acid is not more than 2:1, and,
- c) 2-15% wt. water.

5,482,644

# NONIRRITATING LIQUID DETERGENT COMPOSITIONS

Sach D. Nguyen, 167 Sylvan Dr., San Francisco, Calif. 94132, and Nguyen Dinh-Nguyen, Lövsögsgatan 18, Göteborg, Sweden

Filed Feb. 27, 1995, Ser. No. 394,743

Int. Cl.<sup>6</sup> C11D 9/00; 9/22

U.S. Cl. 252-122

7 Claims

1. An aqueous detergent composition, wherein the ingredients are expressed in parts by weight, that consisting essentially of a fat material selected from the group consisting of coconut oil, palm-kernel oil, babassu oil, and castor oil at 15.02 parts, wherein the fat has a saponification value of 244;

potassium hydroxide at 2.92 parts (for 87.9% KOH) in aqueous solution;

sodium hydroxide at 0.80 parts (for 98.6% NaOH) in aqueous solution;

sodium propionate at 0.10 parts in aqueous solution;

ethylenediamine tetraacetic acid (EDTA) disodium salt at 0.05 part in aqueous solution;

citric acid at 0.20 part in aqueous solution;

butylated hydroxytoluene (BHT) at 0.0014 part in isopropanol;

isopropanol at 4.68 parts; and

purified water at 13.18 parts.

5,482,645

# NON-OZONE DEPLETING CLEANING COMPOSITION FOR DEGREASING AND DEFLUXING PURPOSES

Akihiro Maruyama, Chiba, Japan; Björn Bergenstahl, Sundbyberg, Sweden, and Eric Van de Hoek, Slidrecht, Netherlands, assignors to Purac Blochem B.V., Gorinchem, Netherlands

Filed Apr. 11, 1994, Ser. No. 226,086

Claims priority, application Japan, Apr. 9, 1993, 5-107284; European Pat. Off., Feb. 8, 1994, 94200235

Int. Cl.<sup>6</sup> C11D 3/20; 3/43; 7/26; C23G 5/032

U.S. Cl. 252-170

7 Claims

1. A non-ozone depleting cleaning composition consisting of

a. 70-99% by weight, based on the whole composition of at least one C<sub>8-12</sub> alkyl lactate ester, and

b. 30-1% by weight, based on the whole composition, of at least one emulsifier, selected from the group consisting of polyoxyethylene alkyl ethers; polyoxypropylene ethers; polyoxyethylene alkylphenyl ethers; polyoxyethylene/polyoxypropylene block copolymers; polyoxyethylene sorbitan fatty acid esters; polyoxyethylene fatty acid esters; polyoxyethylene alkyl amides; polyoxyethylene fatty acid amides; polyoxypropylene ethers; sorbitan fatty acid esters; glycerol fatty acid esters; and alkanols having 6-12 carbon atoms.

5,482,646

# POWDER DETERGENT COMPOSITION FOR COLD WATER LAUNDERING OF FABRICS

Louis R. Mazzola, Mahwah, N.J., assignor to Church & Dwight Co., Inc., Princeton, N.J.

Continuation of Ser. No. 27,197, Mar. 5, 1993, abandoned.

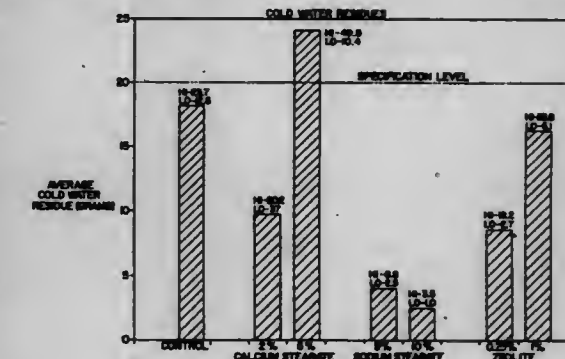
This application May 16, 1994, Ser. No. 243,081

The portion of the term of this patent subsequent to Aug. 21, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> C11D 17/06; 3/10; 9/12; 11/00

U.S. Cl. 252-174.13

5 Claims



1. A laundry detergent composition which is a granulated blend of ingredients comprising (a) between about 40-90 weight percent of a water-soluble inorganic salt detergent builder ingredient wherein at least one third of the inorganic salt detergent builder ingredient is sodium carbonate, and (b) between about 5-40 weight percent of detergent active ingredient which comprises sodium, potassium or ammonium salt of linear C<sub>10</sub>-C<sub>18</sub> alkylbenzenesulfonate, sodium, potassium or ammonium salt of C<sub>10</sub>-C<sub>18</sub> alkyl sulfate or ethoxylated C<sub>10</sub>-C<sub>18</sub> alkyl ether sulfate, or C<sub>12</sub>-C<sub>15</sub> monohydric alcohol ethoxylated with 3-15 ethylene oxide units per molecule or any mixture thereof; and between about 0.7-5 weight percent of a particulate anionic surfactant ingredient coating on the surfaces of the detergent granules, and wherein the anionic surfactant ingredient consists of sodium, potassium or ammonium salt of C<sub>12</sub>-C<sub>22</sub> fatty acid or C<sub>10</sub>-C<sub>18</sub> alkyl sulfate or ethoxylated C<sub>10</sub>-C<sub>18</sub> alkyl ether sulfate or any mixture thereof, and wherein the anionic surfactant ingredient is a particulate solid having an average particle size between about 50-200 microns.

5,482,647

# HIGH SOLUBLE CARBONATE LAUNDRY DETERGENT COMPOSITION CONTAINING AN ACRYLIC TERPOLYMER

Steven A. Bolkan, Hopewell, and Joseph G. Becker, Martinsville, both of N.J., assignors to Church & Dwight Co., Inc., Princeton, N.J.

Filed Sep. 30, 1993, Ser. No. 129,426

Int. Cl.<sup>6</sup> C11D 3/14; 3/20; 3/37

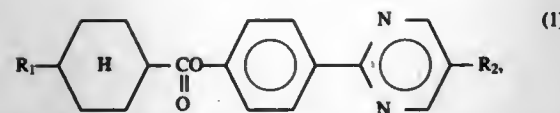
U.S. Cl. 252-174.14

11 Claims

1. A powdered laundry detergent composition comprising an active surfactant, at least about 70 wt. % of sodium carbonate, and

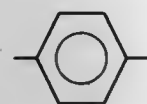




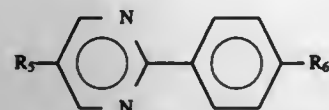


(1)

wherein  $R_1$  denotes an alkyl group having 1-16 carbon atoms;  $R_2$  denotes a substituted or unsubstituted alkyl group, alkoxy group, alkoxycarbonyl group, acyloxy group or alkoxycarbonyloxy group each having 1-16 carbon atoms, the substituent of the substituted  $R_2$  group being alkyl, alkoxy, alkoxycarbonyl, Cl or F; wherein



may have a substituent of CN or F; and at least one mesomorphic compound represented by the formula (5) below:



wherein  $R_5$  denotes an alkyl group or alkoxy group each having 1-16 carbon atoms, and  $R_6$  denotes an alkyl group, alkoxy group, acyloxy group, alkoxycarbonyl group or alkoxycarbonyloxy group each having 1-16 carbon atoms, which may have a substituent of Cl or F; wherein the mesomorphic compound represented by the formula (5) is free from an asymmetric carbon atom and is optically inactive.

5,482,653

## FLUORO-CHLORO-BENZENE DERIVATIVES

David Coates, Merley; Ian C. Sage, Broadstone; Simon Greenfield, Creekmore; Graham Smith, Poole, and David W. Baxter, Wistaton, all of, Great Britain, assignors to Merck Patent Gesellschaft Mit Beschränkter Haftung, Darmstadt, Germany

Continuation of Ser. No. 572,976, Jul. 31, 1990, abandoned.

This application Jun. 24, 1992, Ser. No. 902,801

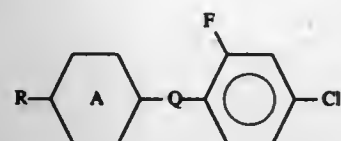
Claims priority, application United Kingdom, May 30, 1989, 8912339; Jun. 12, 1989, 8913441; Jun. 12, 1989, 8913442

Int. Cl.<sup>6</sup> C09K 19/30; 19/12; C07C 19/08

U.S. Cl. 252-299.63

9 Claims

1. A benzene derivative of formula Ib



Ib

wherein  $R$  denotes an alkyl or halogenoalkyl residue of up to 12 C atoms wherein one or two non-adjacent  $\text{CH}_2$  groups may also be replaced by  $-\text{O}-$  and/or  $-\text{HC}=\text{PH}-$ ,  $A$  is a ring of the formula (1)



(1)

$Q$  is 1,4-phenylene.

5,482,654

## SAFETY INDICATOR SYSTEM

Mark G. Luttrell, Memphis, Tenn., and Lyle D. Wescott, Jr., Holly Springs, Miss., assignors to Warnaway Corporation, Memphis, Tenn.

Filed Nov. 9, 1994, Ser. No. 336,472

Int. Cl.<sup>6</sup> B05D 5/06

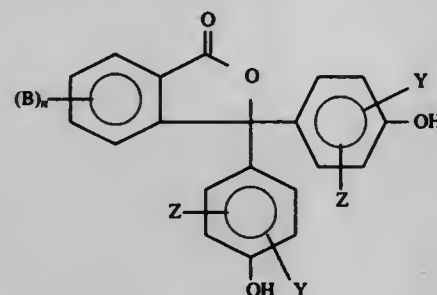
U.S. Cl. 252-408.1

12 Claims

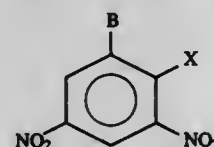
1. A system for use in warning about wet flooring conditions, the system being added to a cleaning composition and containing sufficient basic compound such that when added to the cleaning composition the cleaning composition is highly colored and reverts to its colorless state when the liquid has evaporated, the system comprising and essentially dry indicator composition containing:

(5) from about 50 to about 90 wt. % of basic compound selected from the group consisting of alkali and alkaline earth metal hydroxides, alkali and alkaline earth metal oxides and alkali and alkaline earth metal phosphates; and

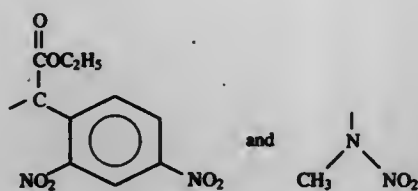
from about 10 to about 50 wt % of a compound selected from the group consisting of a phthalic anhydride derivative of the formula



and a poly-nitrophenolic compound of the formula



wherein  $n$  is an integer selected from 0 to 4, each  $Y$  and each  $Z$  is selected from an alkyl group having 1 to 6 carbon atoms and hydrogen,  $B$  is selected from hydrogen and  $-\text{NO}_2$ , and  $X$  is selected from



whereby an intensely colored solution is formed when the indicator composition is in the presence of an amphoteric liquid.

5,482,655

## ELECTRICALLY CONDUCTIVE THERMOPLASTIC POLYMER FORMULATIONS AND THE USE THEREOF

Thomas Vogel; Jürgen Flinter; Hartmut Bleier, all of Freiburg, Germany, and Patrice Bujard, Courtepin, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Jun. 11, 1993, Ser. No. 75,658

Claims priority, application Switzerland, Jun. 17, 1992, 1906/92

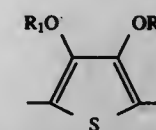
Int. Cl.<sup>6</sup> H01B 1/00; 1/06; 1/12

U.S. Cl. 252-500

61 Claims

1. A formulation comprising

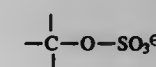
a) at least one polythiophene in oxidised polycationic form and containing structural repeating units of formula I



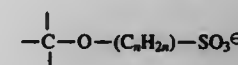
(I)

$R_1$  and  $R_2$ , taken together, are linear  $\text{C}_1$ - $\text{C}_6$ alkylene which is unsubstituted or substituted by  $\text{C}_1$ - $\text{C}_6$ alkyl,  $\text{C}_1$ - $\text{C}_6$ alkoxy, halogen,  $\text{C}_3$ - $\text{C}_6$ cycloalkyl, phenyl, benzyl,  $\text{C}_1$ - $\text{C}_6$ alkylphenyl,  $\text{C}_1$ - $\text{C}_6$ alkoxyphenyl, halophenyl,  $\text{C}_1$ - $\text{C}_6$ alkylbenzyl,  $\text{C}_1$ - $\text{C}_6$ alkoxybenzyl or halobenzyl; and

b) at least one polyanion of a film-forming thermoplastic polymer containing sulfated alcohol groups



and/or sulfonatoalkylated alcohol groups



in structural repeating units, wherein the group  $-(\text{C}_n\text{H}_{2n})-$  is linear or branched  $\text{C}_2$ - $\text{C}_{12}$ alkylene which contains 2 to 5 carbon atoms in the carbon chain and is unsubstituted or substituted by  $\text{C}_1$ - $\text{C}_6$ alkoxy.

5,482,656

## NON-LINEAR OPTICAL DEVICES EMPLOYING A POLYSILANE COMPOSITION AND A POLYSILANE COMPOSITION THEREFOR

Toshiro Hiraoka; Shin-ichi Nakamura, both of Kanagawa; Yoshihiko Nakano, Tokyo; Shinji Murai, Chiba, and Shuzi Hayase, Kanagawa, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

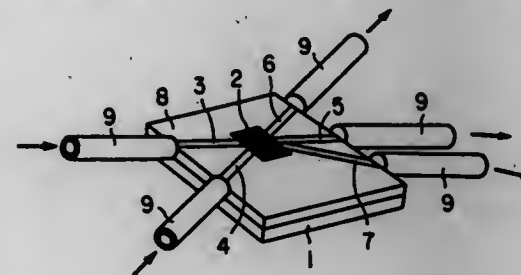
Filed Mar. 4, 1994, Ser. No. 205,628

Claims priority, application Japan, Mar. 4, 1993, 5-044023

Int. Cl.<sup>6</sup> H01B 1/22; 1/20

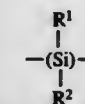
U.S. Cl. 252-514

22 Claims



1. A polysilane composition comprising:

(a) a polysilane having a repeating unit represented by formula (I)



(I)

where  $R^1$  and  $R^2$  independently are selected from the group consisting of a hydrogen atom, a substituted or unsubstituted alkyl group having 1 to 24 carbon atoms, a substituted or unsubstituted aryl group having 6 to 24 carbon atoms, and a substituted or unsubstituted aralkyl group having 7 to 24 carbon atoms,

wherein the weight average molecular weight of said polysilane is 5,000 to 1,000,000; and

(b) particles having a particle size of 10 to 500 Å, selected from the group consisting of conductors wherein the conductors comprises one or more metals or metal alloys.

5,482,657

## HEATER ATTACHMENT FOR EVAPORATIVE COOLER

Peter S. Wright, St. Marys, Australia, assignor to F F Seeley Nominees Pty Ltd., St. Marys, Australia

PCT No. PCT/AU94/00123, § 371 Date Mar. 10, 1995, § 102(e)

Date Mar. 10, 1995, PCT Pub. No. WO94/20797, PCT Pub.

Date Sep. 15, 1994

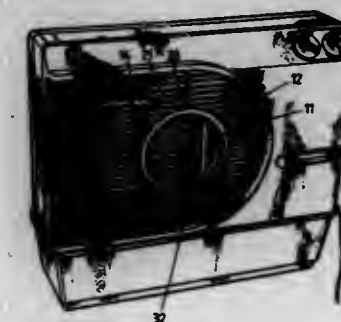
PCT Filed Mar. 11, 1994, Ser. No. 335,737

Claims priority, application Australia, Mar. 12, 1993, PL7801

Int. Cl.<sup>6</sup> B01F 3/04

U.S. Cl. 261-142

8 Claims



1. Improvements in an evaporative cooler of the type having a motor and an axial flow fan assembly with fan blades radiating from a central hub, comprising

securing means securing element mounting means in axial alignment with, and downstream of, said hub, an electrical heating element carried by the mounting means, said heating element having passages for substantially unobstructed inner through-flow of air from an inner area of said fan adjacent said hub, shutter means also downstream of said blades, and shutter control means coupled to said shutter means between an open and closed positions whereby an outer flow of air from an outer area of said fan surrounding said inner area is respectively unobstructed, and obstructed.

5,482,658

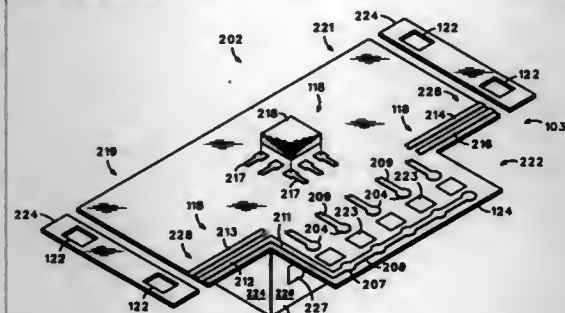
## METHOD OF MAKING AN OPTOELECTRONIC INTERFACE MODULE

Michael S. Lebby, Apache Junction; Christopher K. Y. Chun, Mesa; Shun-Meen Kuo, Chandler, and Kent W. Hansen, Scottsdale, all of Ariz., assignors to Motorola, Schaumburg, Ill.

Filed Aug. 13, 1993, Ser. No. 106,472  
Int. Cl.<sup>6</sup> B29D 11/00

U.S. Cl. 264—1.24

3 Claims



1. A method for joining a flexible circuit film to an optical portion comprising the steps of:
  - providing a flexible circuit film having a plurality of electrical tracings;
  - providing a mold having a cavity capable of accepting the flexible circuit film;
  - placing the flexible circuit film in the mold, the flexible circuit film having a portion of the plurality of electrical tracings extending beyond the cavity of the mold, thereby having the portion of the plurality of the electrical tracings of the flexible circuit film that extends beyond a first optical portion exposed;
  - molding the first optical portion with the flexible circuit film in the cavity of the mold so as to join the flexible circuit film to the first optical portion;
  - providing a second optical portion;
  - joining the first optical portion and the second optical portion with an optical adhesive to form a waveguide having a core region and a cladding region; and
  - forming the portion of the plurality of electrical tracings that extends beyond the first optical portion to a terminal end.

5,482,659

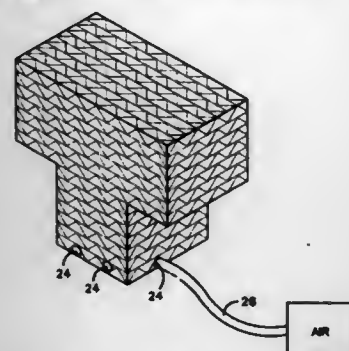
## METHOD OF POST PROCESSING STEREOLITHOGRAPHICALLY PRODUCED OBJECTS

Marc R. Sauerhoefer, Chicopee, Mass., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 22, 1994, Ser. No. 363,105  
Int. Cl.<sup>6</sup> B29C 35/08; 41/02

U.S. Cl. 264—401

3 Claims



1. A method of post processing stereolithographically produced semi-hollow objects comprising the steps of:
  - (a) creating at least two fitting holes in the object to facilitate internal resin evacuation;

- (b) attaching at least one air hose to a fitting hole wherein remaining fitting holes are capped, except at least one fitting hole remains open for resin drainage;
- (c) subjecting the object to air flow for between about 0.5 hours and about 2 hours, at a temperature greater than about 75° F.;
- (d) removing any air hoses and then externally cleaning the object with alcohol;
- (e) removing any caps and submerging the object in a bath of alcohol, wherein the bath is internally agitated; and
- (f) removing the object from the bath and repeating steps (b) through (e) to displace residual resin, wherein total object exposure time to alcohol does not exceed 3 hours.

5,482,660

## METHOD FOR FABRICATING AN INK JET HEAD HAVING IMPROVED DISCHARGE PORT FORMATION FACE

Hajime Yamamoto; Keiichi Mural, both of Yokohama, and Fujihito Ito, Tsurugashima, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

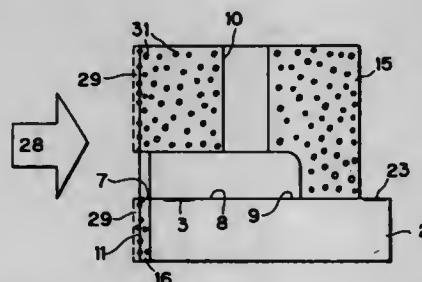
Filed Oct. 30, 1992, Ser. No. 969,354

Claims priority, application Japan, Jan. 31, 1991, 3-286655; Nov. 18, 1991, 3-301871

Int. Cl.<sup>6</sup> B29C 45/00; 71/04

U.S. Cl. 264—474

17 Claims



1. A method for fabricating an ink jet recording head comprising the steps of:
  - (a) forming a ceiling plate having a discharge port surface, said ceiling plate comprising a high molecular resin and an amount of about 5 to 60% of the total weight of the ceiling plate of dispersed water-repellent grains selected from the group consisting of fluoro-oligomers, fluoropolymers and fluorinated graphites, wherein said water-repellent grains are exposed on at least a discharge port peripheral face by irradiating the discharge port peripheral face with an excimer laser;
  - (b) laminating said ceiling plate either during step (a) or after step (a) to a substrate with an ink discharge energy generating device arranged on a surface of said substrate to form at least one ink liquid channel communicating with an ink liquid chamber corresponding to said energy generating device; and
  - (c) forming on said discharge port surface at least one discharge port communicating with said at least one ink liquid channel.

5,482,661

## METHOD FOR MOLDING BONDED PLASTICS MATERIAL

Mario Vismara, Casatenovo, Italy, assignor to Devi S.p.A., Besana Brianza, Italy

Division of Ser. No. 876,384, Apr. 30, 1992, Pat. No. 5,304,050.

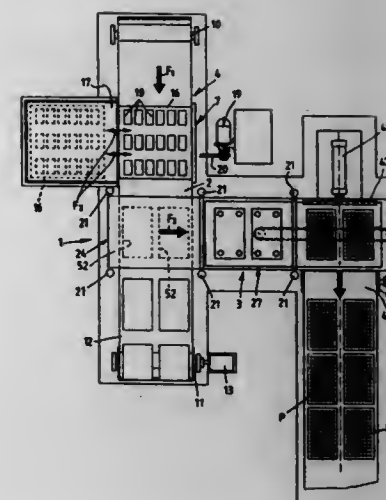
This application Feb. 17, 1994, Ser. No. 197,880

Claims priority, application Italy, May 3, 1991, MI91A1214  
Int. Cl.<sup>6</sup> B29C 44/06; 44/12

U.S. Cl. 264—413

15 Claims

1. A method for continuously forming and molding plastic material to form bonded molded articles comprising:



- providing a preforming station, a molding station and a discharge station in spaced relationship with respect to each other;
- providing a half-mold movably mounted for movement between said preforming and molding stations;
- providing a preforming mold movable between a position spaced from said half-mold and a position in cooperating relationship with said half-mold in said preforming station for forming at least one portion of a plastic sheet material therebetween;
- feeding a plastic sheet material into a preforming position between said half-mold and said preforming mold when said molds are in spaced relationship;
- moving said half-mold and said preforming mold relatively to each other into said cooperating relationship and forming at least one portion of said plastic sheet material therebetween to form at least one rigid plastic preformed element;
- separating said at least one preformed element from said plastic sheet material at said preforming station;
- transferring said at least one preformed element on said half-mold from said preforming station to said molding station;
- providing a molding mold at said molding station for movement between an open position spaced from said half-mold when in said molding station and a molding position in cooperating relationship with said half-mold in said molding station for molding and bonding foamable plastic material onto said at least one preformed element positioned by said half-mold in said molding station;
- moving said half-mold and said molding mold relatively to each other into said molding position to provide at least one mold cavity between said half-mold and said molding mold;
- feeding foamable plastic material into said mold cavity and forming a foamed plastic material in said at least one mold cavity and bonding said foamed plastic material to said at least one preformed element to form at least one final bonded molded article;
- moving said molding mold and said half-mold in said molding station with respect to each other into said open position while retaining said at least one bonded final molded article on said molding mold;
- returning said half-mold from said molding station to said preforming station and simultaneously positioning a table under said molding mold in said molding station;
- depositing said at least one final bonded molded article onto said table from said molding mold;
- transferring said table with said at least one final bonded molded article thereon to said discharge station for discharging said final bonded molded article simultaneously with transferring a succeeding at least one preformed element from said preforming station to said molding station for a next succeeding molding operation; and

transferring scrap material of said plastic sheet material remaining after said separation of said at least one preformed element therefrom to a recovery station prior to returning said half-mold from said molding station to said preforming station.

5,482,662

## CONTROL METHOD FOR INJECTION MOLDING MACHINES

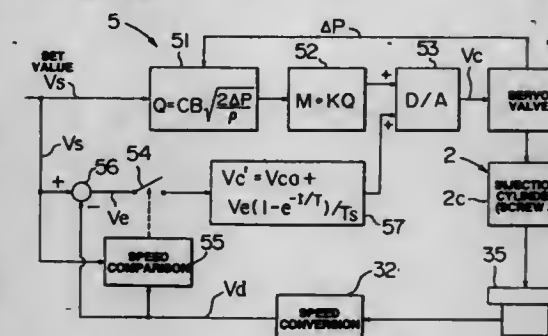
Nobuyuki Nakamura, and Tsuyoshi Arai, both of Nagano, Japan, assignors to Nissei Plastic Industrial Co., Ltd., Nagano, Japan

Filed Nov. 16, 1993, Ser. No. 152,859

Claims priority, application Japan, Nov. 27, 1992, 4-341311  
Int. Cl.<sup>6</sup> B29C 45/76

U.S. Cl. 264—40.1

7 Claims



1. An injection control method for injection molding machines for controlling an injection speed of a screw by controlling an actuator:
  - detecting an intermediate control amount for operating the actuator;
  - determining an instruction value for operating and controlling the actuator by calculation processing by a computer functional unit on the basis of the detected intermediate control amount and a set value of a previously set molding condition of a functional formula and a predetermined constant;
  - detecting a value of the injection speed;
  - operating and controlling the actuator with the instruction value during an operation of the screw until the value of the detected injection speed reaches a previously set target value; and
  - when the detected value of the injection speed reaches a previously set target value, operating and feedback controlling the actuator on the basis of the detected value of the injection speed and said set value.

5,482,663

## CYLINDRICAL BODY AND METHOD AND APPARATUS FOR MAKING SAME

Floyd V. Hammer, Union, Iowa; John A. Rude, Arlington, Tex., and Brian Harper, Iowa Falls, Iowa, assignors to Hammer's Inc., Iowa Falls, Iowa

Filed Oct. 29, 1993, Ser. No. 145,342

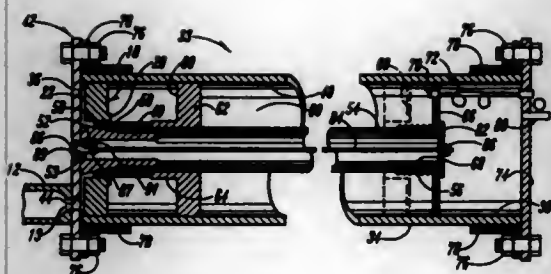
Int. Cl.<sup>6</sup> B29B 17/00; B29C 71/00

U.S. Cl. 264—40.5

5 Claims

1. A method for molding an elongated cylindrical object having an elongated member embedded within a cylindrical plastic body, said method comprising:
  - taking an elongated cylindrical mold having a mold bore extending therethrough;
  - mounting first and second sliding pistons on said elongated member for sliding movement on said elongated member between the opposite ends thereof;
  - suspending said elongated member within said mold bore between first and second spaced apart closure plates with said





first and second sliding pistons on said elongated member, said first and second closure plates closing off said mold bore so as to form a mold cavity therebetween with said elongated member and said first and second pistons within said mold cavity;

positioning said first and second pistons in a first position on said elongated member adjacent said first closure plate;

introducing molten plastic into said mold cavity between said first closure plate and said first and second pistons whereby said first and second pistons will slide on said elongated member toward said second closure plate in response to said introduction of molten plastic;

ceasing introduction of molten plastic to said mold cavity when said first and second pistons are in a second position adjacent said second closure plate.

5,482,664

#### METHOD OF MANUFACTURING A SYNTHETIC RESIN SPECTACLE FRAME COMPONENT

Marc Lamy, Morbier, and Jean-Philippe Caspar, Les Rousses, both of, France, assignors to L'Amey S.A., Morez, France

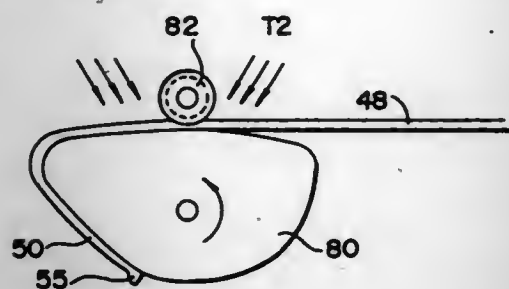
Division of Ser. No. 845,968, Mar. 4, 1992, Pat. No. 5,304,421. This application Dec. 27, 1993, Ser. No. 172,916

Claims priority, application France, Mar. 6, 1991, 91 02882

Int. Cl.<sup>6</sup> B29C 53/60; 70/52

U.S. Cl. 264—103

21 Claims



1. A method of manufacturing a spectacle frame component composed of a fiber-reinforced, synthetic resin, comprising the steps of:

- filling a core of a single tubular braid woven from long reinforcing fibers with an inert filling material to form a filled tubular braid;
- exteriorly impregnating the filled tubular braid with a synthetic resin comprising a bisphenol epoxy comprising 0.1 to 0.8% by volume of a first aliphatic amine hardening agent and 3 to 50% by volume of a second aromatic diamine hardening agent to form an epoxy impregnated tubular braid;
- shaping and stabilizing a cross-section of the epoxy impregnated tubular braid by curing of the synthetic resin with the first hardening agent at a temperature below 100° C. and sufficient to form a stabilized cross-sectional tubular braid; and
- shaping the stabilized cross-sectional epoxy impregnated tubular braid into a three dimensional form and hardening in the three dimensional form by curing of the synthetic resin with the second hardening agent at a temperature above 100° C. and sufficient to form a final shaped three dimensional form.

#### 5,482,665 METHOD/APPARATUS FOR MAKING FIBER-FILLED CUSHION

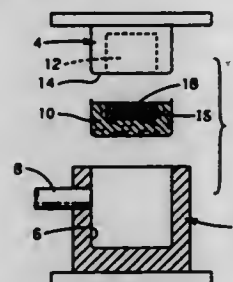
Prem P. Gill, Rochester Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 18, 1994, Ser. No. 214,510

Int. Cl.<sup>6</sup> B29C 35/02; 35/16; 43/20; 43/02

U.S. Cl. 264—113

35 Claims



1. A method of molding a porous, breathable cushion comprising the steps of:

- dispensing a mixture of polymeric matrix fibers having a first melting point and polymeric bonding fibers having a second melting point lower than said first melting point into a mold having a moveable member moveable between a mold-open and a mold-closed position so as to define a cavity conforming substantially to the desired shape of said cushion in the mold-closed position;
  - moving said moveable member to said mold-closed position following said dispensing so as to compress said fibers in said mold cavity to a desired density; and then
  - passing a heated gas through the compressed mixture for a time and at a temperature sufficient to soften said bonding fibers and unite them with said matrix fibers at their points of intersection;
  - passing a cooling gas through the compressed mixture for a time and at a temperature sufficient to bond said bonding fibers to said matrix fibers such that said mixture retains said shape after said mold is opened; and
  - removing said cushion from said cavity.
8. A method according to claim 1 including, after step (b), further compressing a selected portion of said mixture in said cavity to form a depression therein, and, after step (d), dispensing into said depression a second mixture of second polymeric matrix fibers and second polymeric bonding fibers having a melting point which is lower than the melting point of the second matrix fibers, compressing said second mixture in said depression, passing a heated gas through said second mixture for a time and at a temperature sufficient to soften said second bonding fibers and unite them with said second matrix fibers at their points of intersection, and cooling said second mixture sufficiently to bond said second bonding fibers to said second matrix fibers and to said first mixture such that said second mixture retains said shape after said compressing is terminated.

12. Apparatus for molding and bonding a mixture of relatively high-melting point polymeric matrix fibers and relatively low-melting point polymeric bonding fibers together into a compressible, breathable cushion comprising:

- a female mold member comprising a plurality of walls defining a mold cavity, at least one of said walls being gas-permeable;
- at least one injector for dispensing said mixture into said cavity;
- a source of said mixture connected to said injector for supplying said mixture to said injector;
- a male mold member adapted for reciprocal movement into and out of said mold cavity for compressing said mixture in said cavity, said male mold member having a gas-permeable wall for shaping said cushion in said cavity;
- a gas plenum system contiguous said gas-permeable walls for providing gas to said mold cavity for heating and cooling said mixture in said cavity;
- a blower communicating with said plenum system for moving said gas through said system and said mixture; and

g. a heater for heating said gas in said system to a temperature sufficient to soften said low-melting fibers and unite them to said high-melting fibers.

#### 5,482,666 MANUFACTURE OF FIBERBOARD BY INDEPENDENTLY CONTROLLING TEMPERATURE AND MOISTURE CONTENT

Arne Larsson, Karlstad, Sweden, assignor to Sunds Defibrator Industries Aktiebolag, Sweden

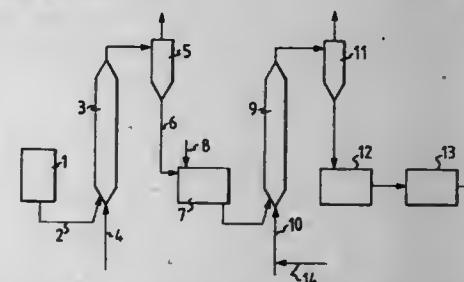
Filed Feb. 7, 1994, Ser. No. 192,490

Claims priority, application Sweden, Sep. 15, 1993, 9302993

Int. Cl.<sup>6</sup> B27N 3/04

U.S. Cl. 264—115

6 Claims



1. A method of manufacturing fiberboard from lignocellulose-containing fibrous material comprising defiberizing said lignocellulose-containing material, drying said defiberized lignocellulose-containing material by contacting said lignocellulose-containing material with a heated drying gas at a first predetermined temperature in a first drying step to produce a partially dried lignocellulose-containing material, mixing said partially dried lignocellulose-containing material with a glue, drying said admixture of said partially dried lignocellulose-containing material and said glue by contacting said admixture with a heated drying gas at a second predetermined temperature in a second drying step, said second predetermined temperature being less than said first predetermined temperature, independently controlling the temperature of said lignocellulose-containing material in said second drying step and controlling said moisture content of said lignocellulose-containing material by the addition of moisture, where necessary, to said heated drying gas at a second predetermined temperature, so as to produce a dried lignocellulose-containing material having a predetermined temperature and moisture content, forming said dried lignocellulose-containing material into a fiber mat, and hot pressing said fiber mat into said fiberboard.

#### 5,482,667 EXTRUSION IMPREGNATION COMPRESSION MOLDING PROCESS

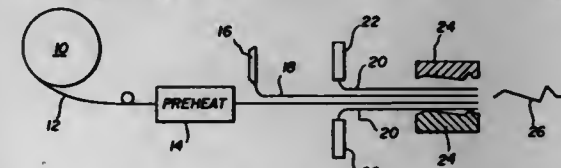
Thomas P. Dunton, Lebanon Springs, N.Y., and Erich O. Teutsch, Richmond, Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Aug. 11, 1993, Ser. No. 106,093

Int. Cl.<sup>6</sup> B29B 11/16; 15/14; B29C 70/52

U.S. Cl. 264—136

11 Claims



1. A continuous process for producing a molded thermoplastic resin fiber reinforced article comprising a fiber mat core and thermoplastic resin wherein the surface of the molded article has a high concentration of thermoplastic resin, which process comprises

the steps of applying a molten first thermoplastic resin onto at least one surface of a heated fiber mat core, passing the combination to an extrusion zone, applying molten second thermoplastic resin to at least one surface of the heated fiber mat core and molten first thermoplastic resin, passing the combination of the molten first thermoplastic resin, molten second thermoplastic resin and fiber mat core to a molding zone, and molding the heated combination under pressure into a molded thermoplastic resin fiber reinforced article having on at least one surface a high concentration of the second thermoplastic resin wherein prior to said molding, a material selected from the group consisting of powdered pigment and a blend of a powdered pigment and a powdered thermoplastic resin is applied to the surface of the combination of the fiber mat core and molten first and second thermoplastic resin.

#### 5,482,668 DELAMINATION RESISTANT SPA METHOD OF MANUFACTURE

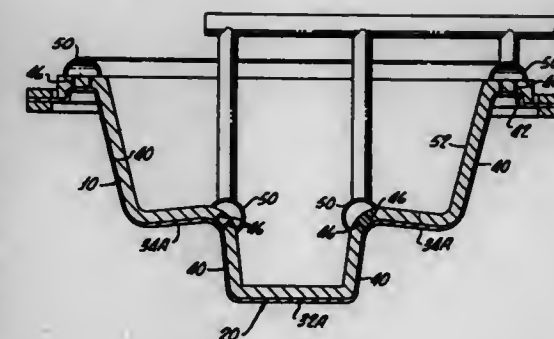
Thomas A. Tabor, Rancho Cucamonga, Calif., assignor to Spa Controls, Hesperia, Calif.

Continuation-in-part of Ser. No. 739,470, Aug. 2, 1991, abandoned. This application Jun. 24, 1992, Ser. No. 903,987

Int. Cl.<sup>6</sup> B29C 51/10

U.S. Cl. 264—512

3 Claims



1. A method for making a delamination resistant spa, said method comprising the steps of:

- disposing a formable sheet over a male form adapted for vacuum-forming the formable sheet;
- heating said formable sheet to a temperature enabling forming of said formable sheet;
- forcing the male form into the heated formable sheet to depress said heated formable sheet;
- vacuum-forming the depressed formable sheet with one side of the formable sheet coming into intimate contact with the male form;
- cooling the vacuum-formed sheet; and
- coating an opposite side of the cooled vacuum formed sheet with a urethane foam.

#### 5,482,669 PULSATING GAS-ASSISTED INJECTION MOLDING METHOD AND APPARATUS

Suresh D. Shah, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

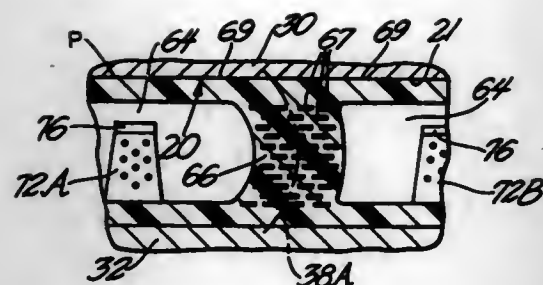
Filed May 23, 1994, Ser. No. 247,375

Int. Cl.<sup>6</sup> B29C 44/02; 45/00

U.S. Cl. 264—572

3 Claims

1. A method of pulsating gas-assisted injection molding a hollow tubular plastic part comprising the steps of:



injecting a molten plastic into a mold cavity in an amount less than the volume of the mold cavity and in separate molten plastic flows that flow along the mold cavity and ultimately join together in a solidifying fusion welding phase at an interface,

injecting a gas under pressure into the center of the molten plastic in an amount to form a central void in the molten plastic extending to opposite sides of the interface and leaving a voidless solidifying fusion weld section encompassing the interface, and

alternately venting and injecting additional gas but at a higher pressure at opposite sides of the weld section to effect shifting thereof in opposite directions to force intermingling of the plastic molecules therein and across the interface to thereby enhance the strength of the fusion weld section on solidification.

5,482,670

## CEMENTED CARBIDE

Joonpyo Hong, 201 Rose Brier Dr., Rochester Hills, Mich. 48309-1124

Filed May 20, 1994, Ser. No. 247,085

Int. Cl.<sup>6</sup> C22C 32/00; B22F 1/00

U.S. Cl. 419-15

9 Claims

2. A method for making a carbide composite comprising:
  - i) choosing a binder material from the powdered metals including cobalt, nickel, and iron, alloys of said powder metals, mixtures of said powdered metals and alloys of said powdered metals;
  - ii) choosing a carbide powder mixture from one or more powdered carbides of carbide forming metals, and solid solution carbide powders of said carbide forming metals, and said carbide forming metals and alloys with appropriate amount of carbon or carbon producing materials;
  - iii) mixing and milling said binder material with said carbide powder mixture thereby forming a resultant mixture;
  - iv) forming a green compact with the resultant mixture;
  - v) sintering the green compact;

provided that;

a) the carbide forming metals include tungsten, tantalum, molybdenum, vanadium, niobium, zirconium, hafnium, a sufficient amount of binder material is added to the carbide powder mixture to facilitate sintering and a significant amount of the binder material evaporates during sintering thereby resulting in a sintered carbide composite containing less binder material than said resultant mixture; and wherein the amount of binder material present in the sintered carbide composite is less than about 1% by weight of said carbide composite, and the amount of binder material added to said carbide powder mixture is less than about 2% by weight of said resultant mixture.

# 5,482,671 METHOD OF MANUFACTURING INTERLOCKING PARTS

Wilfried Weber, Schopfloch-Unterfilgen, Germany, assignor to Fischerwerke, Artur Fischer GmbH & Co. KG, Waldachtal, Germany

Filed Sep. 23, 1994, Ser. No. 311,430

Claims priority, application Germany, Sep. 28, 1993, 43 32 971.3

Int. Cl.<sup>6</sup> B22F 7/02

U.S. Cl. 419-36

3 Claims

1. A method for manufacturing interlocking parts wherein at least one of said parts is produced by powder injection molding, said method comprising the steps of:

- a) powder injection molding a first part (2);
- b) applying a separation layer (5) made of plastic material onto the first part (2);
- c) after said applying of step b), powder injection molding another (11) of said parts onto the separation layer (5); and
- d) after said powder injection molding step c), performing a binder-removing and sintering process to remove the separation layer (5) to produce said interlocking parts; wherein the separation layer (5) is formed on said first part (2) with a thickness corresponding at least to an amount of contraction experienced by said other part (11) after said performing step d).

5,482,672

# PROCESS FOR EXTRUDING TANTALUM AND/OR NIOBIUM

Ira Friedman, 10 Bingham Hill Cir., Rumson, N.J. 07760, and Christer Aslund, Bravallavagen 11 644 36, Torshälla, Sweden

Filed Feb. 9, 1995, Ser. No. 386,065

Int. Cl.<sup>6</sup> B22F 3/12; 3/16

U.S. Cl. 419-42

20 Claims



1. A process comprising the steps of cold isostatically pressing a charge of powdered metal selected from the group consisting of tantalum and niobium to a density sufficient to form a billet with sufficient strength to be handled;

placing the billet in a first metal container; thereafter sealing the container; placing the container in a second metal container with an annular gap defined between said containers; filling said gap with a metal powder having a spherical shape; thereafter sealing said second container; thereafter cold isostatically pressing said second container and encapsulated billet at a predetermined pressure of at least 200 Mpa; heating the compressed second container and encapsulated compact; and extruding the heated capsule and encapsulated compact to form an extruded product.

5,482,673

# METHOD FOR PREPARING CERAMIC COMPOSITE

Kathleen B. Alexander, Oak Ridge; Terry N. Tieg, Lenoir City; Paul F. Becher, Oak Ridge, and Shirley B. Waters, Knoxville, all of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed May 27, 1994, Ser. No. 250,266

Int. Cl.<sup>6</sup> B22F 3/12

U.S. Cl. 419-48

1 Claim

1. A process for the preparation of a ceramic composite comprising alumina particulates, titanium carbide particulates, and a ductile binder of nickel aluminide comprising:

Step 1. blending powders of said alumina particulates, said titanium carbide particulates and said ductile binder of nickel aluminide to form a mixture, said titanium carbide particulates content is about 25 vol % of said ceramic composite and said ductile binder of nickel aluminide content is about 10 vol % of said ceramic composite; and

Step 2. consolidating said mixture of Step 1. under a temperature and pressure sufficient to produce a densified ceramic composite having a fracture toughness equal to or greater than 7 MPa m<sup>1/2</sup>, a hardness equal to or greater than 18 GPa, and said ductile binder of nickel aluminide being isotropically distributed throughout said densified ceramic composite.

5,482,674

# FREE-MACHINING AUSTENITIC STAINLESS STEEL

Theodore Kosa; John H. Magee, Jr., both of Reading; James W. Martin, Sinking Spring, and Ronald P. Ney, Sr., Reading, all of Pa., assignors to CRS Holdings, Inc., Wilmington, Del.

Filed Jul. 7, 1994, Ser. No. 271,199

Int. Cl.<sup>6</sup> C22C 38/40; 38/60

U.S. Cl. 420-42

13 Claims

1. An austenitic, stainless steel alloy having a good combination of machinability and a low magnetic permeability consisting essentially of, in weight percent, about

C	0.035 max
Mn	1.0-2.0
Si	1.0 max
P	0.2 max
S	0.15-0.45
Cr	16.0-20.0
Ni	9.2-12.0
Mo	1.5 max
Cu	0.79-2.0
N	0.035 max
Se	0.1 max

the balance essentially iron.

5,482,675

# CAST STEEL COMPOSITION FOR RAILWAY COMPONENTS

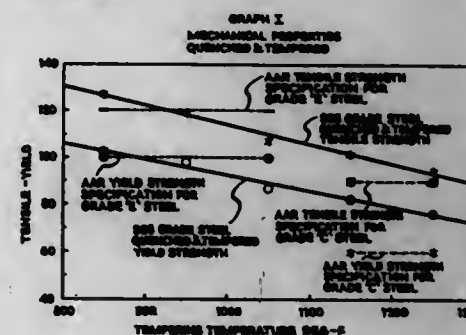
Hugh V. Shotwell, Hammond, Ind.; Earl K. Weber, Wheaton, Ill., and Sung C. Liu, Highland, Ind., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Aug. 18, 1994, Ser. No. 292,511

Int. Cl.<sup>6</sup> C22C 38/22

U.S. Cl. 420-105

11 Claims



1. A high-strength, fine-grained cast steel alloy with improved weldability for railway vehicle components with low hot-cracking sensitivity, said alloy consisting of 0.15% to 0.21% C, 0.90% to 1.30% Mn, 0.35% to 0.65% Si, 0.25% to 0.60% Cr, 0.10% to 0.30% Mo, a maximum of 0.025% of P, a maximum of 0.025% S and the balance being Fe with residual impurities.

5,482,676

# VISUALIZATION SYSTEM FOR RETRIEVAL, IDENTIFICATION, AND POSITIONING OF BIOLOGICAL SAMPLES FOR SUBSEQUENT MICROSCOPIC EXAMINATION

Gerald W. Camlener, 26700 Hurlingham Rd., Beachwood, Ohio 44122

Continuation of Ser. No. 120,337, Sep. 14, 1993, abandoned, which is a continuation of Ser. No. 974,071, Nov. 10, 1992, Pat. No. 5,290,706. This application Jul. 18, 1994, Ser. No. 276,593

Int. Cl.<sup>6</sup> A01N 1/02

U.S. Cl. 422-61

17 Claims

1. A kit for maintaining and/or transporting a biological sample which consists of a male receptacle means, a female closure means, a fixative medium, and a visualization-effective amount of a dye that (i) colors said sample in a manner in which said sample can be readily identified from among the other contents of said medium; and (ii) does not interfere with the subsequent processing of said sample at the processing laboratory;

wherein said fixative medium and said dye are contained in the male receptacle means, and the fixative medium consists essentially of a fixative-effective amount of an aqueous solution of formaldehyde or a C<sub>2-6</sub> dialdehyde except for glutaraldehyde or a mixture thereof.

5,482,677

# THERMALLY DESORBABLE PASSIVE DOSIMETER

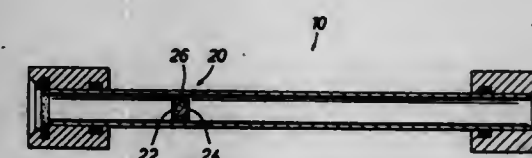
Chaoliang Yao, Missouri City, and Dennis C. Krueger, Richmond, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 14, 1993, Ser. No. 62,085

Int. Cl.<sup>6</sup> G01N 1/22; 7/04

U.S. Cl. 422-88

8 Claims



1. A passive dosimeter adapted for thermal desorption analysis comprising:

a hollow dosimeter tube into which gases can diffuse; a thermally desorbable sorbent material compressed into a wafer, said sorbent material weighing between about 3 and about 10 milligrams; a piece of wire gauze on each side of said wafer, said pieces of wire gauze compacted into an integral body with said sorbent material to form an integrated sorbent material pellet; said integrated sorbent material pellet positioned transversely within transversely said hollow dosimeter tube.

5,482,678

# ORGANIC CHEMICAL SENSOR

Fred C. Sittler, Victoria, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Continuation of Ser. No. 66,900, May 25, 1993, abandoned.

This application Nov. 10, 1994, Ser. No. 337,135

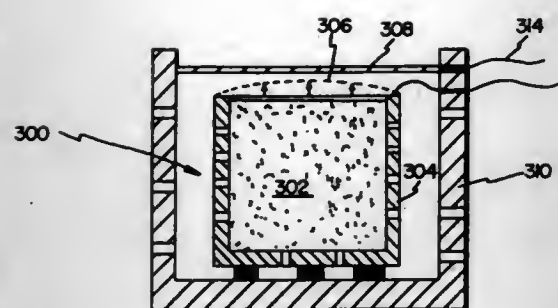
Int. Cl.<sup>6</sup> G01N 19/10; G01B 7/16; G01M 3/04

U.S. Cl. 422-90

7 Claims

1. An organic chemical sensor for sensing at least one of an organic gas, liquid and vapor, comprising: a container having a deflectable portion; an electrically non-conductive material disposed in the container, the material exposed to at least one of the organic gas, liquid and vapor and formed of a substance varying a first of





its dimensions in the presence of at least one of the organic gas, liquid and vapor so as to deflect the deflectable portion; and  
a sensor operably coupled at the deflectable portion for detecting deflection and having an output varying as a function of the deflection.

5,482,679

# DEVICE FOR DETERMINING THE WOBBE INDEX OF A GAS MIXTURE

Kees Dijkstra, and Hermanus M. Verbeek, both of Groningen, Netherlands, assignors to N.V. Nederlandse Gasunie, Netherlands

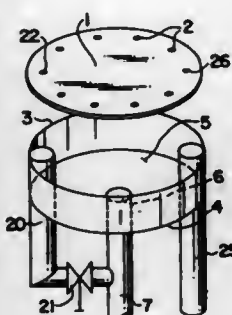
Filed Jun. 8, 1994, Ser. No. 257,675

Claims priority, application Netherlands, Jun. 8, 1993, 9300984

Int. Cl.<sup>6</sup> G01N 31/12

U.S. Cl. 422-94

4 Claims



1. A Wobbe index meter for use in determining the Wobbe index of a first gas mixture, comprising  
a combustion chamber,  
a mixing chamber,  
a feed system for supplying a first gas mixture and an oxidation gas to the mixing chamber, said feed system including:  
means operatively coupled to the mixing chamber for supplying the first gas mixture to the mixing chamber via a first number of openings, and  
means operatively coupled to the mixing chamber for supplying an oxidation gas to the mixing chamber via a second number of openings,  
means for keeping a constant ratio between a quantity of first gas mixture and a quantity of oxidation gas supplied to the mixing chamber,  
means for burning in said combustion chamber a second gas mixture formed in the mixing chamber, and  
means operatively coupled to the combustion chamber for determining the oxygen content of a combustion gas therein obtained after combustion,  
wherein the ratio of the diameters of the openings for the supply of the first gas mixture and the oxidation gas to the mixing chamber are predetermined to ensure that the Reynolds numbers of the first gas mixture and the oxidation gas flowing through the openings are equal, and wherein the number of openings is pre-determined by the desired ratio of the flow rates of first gas mixture and the oxidation gas whereby, the

determined oxygen content of the combustion gas can be used to directly determine the Wobbe index of the first gas mixture.

5,482,680

# ELECTROCHEMICAL FUEL CELL ASSEMBLY WITH INTEGRAL SELECTIVE OXIDIZER

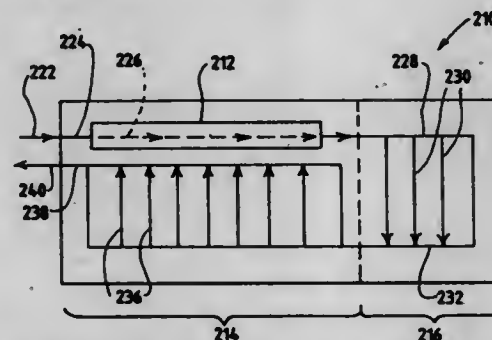
David P. Wilkinson, Vancouver; Henry H. Voss, West Vancouver; James Dudley, Port Moody; Gordon J. Lamont, Vancouver, and Vesna Basura, Burnaby, all of Canada, assignors to Ballard Power Systems, Inc., North Vancouver, Canada

Continuation-in-part of Ser. No. 959,070, Oct. 9, 1992, Pat. No. 5,316,747. This application Sep. 24, 1993, Ser. No. 126,602 The portion of the term of this patent subsequent to May 31, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> H01M 8/04

U.S. Cl. 422-177

18 Claims



1. An apparatus for selectively oxidizing carbon monoxide to carbon dioxide, said carbon monoxide present in a fuel stream introduced to an electrochemical fuel cell stack, the apparatus comprising:  
an electrochemical fuel cell stack, said stack comprising a plurality of fuel cells, said stack further comprising a fuel inlet and a fuel outlet, said fuel cells comprising a plurality of electrochemically active areas containing electrocatalyst and a plurality of non-electrochemically active areas;  
a passageway within said fuel stack, said passageway for directing a fuel stream within said stack between said fuel inlet and said fuel outlet, said fuel stream comprising carbon monoxide, carbon dioxide, and hydrogen;  
means for containing a quantity of catalyst within at least a portion of said passageway, said catalyst promoting oxidation of carbon monoxide to carbon dioxide in the presence of oxygen, said at least a portion of said passageway located within said plurality of non-electrochemically active areas.

5,482,681

# CATALYTIC CONVERTER FOR MOTOR VEHICLES

Robert L. Sager, Jr., Grass Lake, Mich., assignor to Tennessee Gas Pipeline Company, Deerfield, Ill.

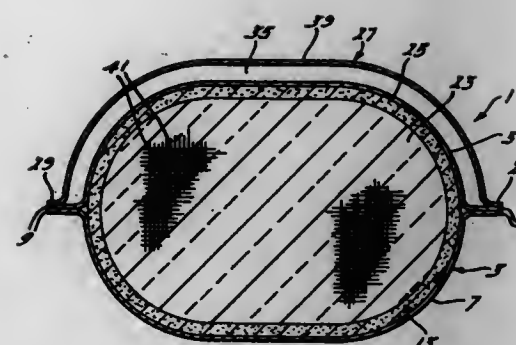
Continuation of Ser. No. 175,150, Mar. 30, 1988, abandoned, which is a continuation-in-part of Ser. No. 778,023, Sep. 20, 1985, abandoned. This application Sep. 3, 1991, Ser. No. 754,042

Int. Cl.<sup>6</sup> B01D 50/00; F28D 21/00

U.S. Cl. 422-180

11 Claims

1. A motor vehicle exhaust gas system aftermarket catalytic converter suitable as a replacement for a variety of original equipment ("O.E.") catalytic converters, said aftermarket catalytic converter comprising a clamshell housing comprised of upper and lower halves each about 10 inches long and having a peripheral rim including semicircular rim sections at opposite ends and longitudinal rim sections extending between said semicircular rim sections, said longitudinal rim sections being welded together and said halves being shaped to jointly form a housing having a



- (c) a microprocessor programmed to store a first predetermined reference time period, and a predetermined subatmospheric pressure that is below the saturation pressure of the liquid;
- (d) a pressure sensing means for sensing the pressure in said enclosure, electrically interconnected to said microprocessor;
- (e) said microprocessor further programmed to measure a time period in which the enclosure pressure is reduced from the starting pressure to the stored predetermined subatmospheric pressure;
- (f) said microprocessor further programmed to compare the measured time period with the stored predetermined reference time period, wherein a difference between the measured time period and the stored predetermined reference time period provides a detection of the presence of liquid in said enclosure.

5,482,684

### VESSEL USEFUL FOR MONITORING PLASMA STERILIZING PROCESSES

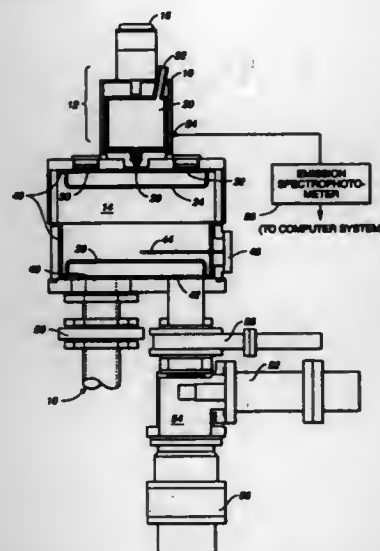
Phillip A. Martens, Fremont, Calif., and Ross A. Caputo, Long Grove, Ill., assignors to Abtox, Inc., Mundelein, Ill.

Filed May 3, 1994, Ser. No. 237,268

Int. Cl.<sup>6</sup> G01D 11/26; A61L 2/00; C12Q 1/18; C12M 1/34

U.S. Cl. 422-119

20 Claims



1. A vessel, useful for evaluating the performance of an indicator under sterilization conditions, comprising:

a chamber defining a volume, the volume adapted to receive a biological and/or chemical indicator, the chamber of sufficient construction uniformly to distribute a cycle of a sterilizing species in the volume within a predetermined time;

a plasma generator adapted to generate a plasma upstream of the chamber and in communication with the chamber, the plasma containing a plurality of atomic and/or molecular species;

pumping means for continuously flowing plasma through the chamber during a plasma sterilizing cycle while maintaining a reduced pressure in the chamber; and

a monitor operatively associated with the vessel and capable of determining a concentration of selected species in the plasma when a plasma sterilizing cycle constituted entirely or in part by the plasma is flowing through the volume.

5,482,685

### DEODORIZING APPARATUS

Tatsuo Fujita, Osaka; Syuzo Tokumitsu, Kawanishi; Hirofumi Nishida, Osaka; Tadashi Suzuki, Kashiba; Yukiyoichi Ono, Hirakata; Tetsuo Terashima, Neyagawa; Takeshi Tomizawa, Ikoma; Jiro Suzuki, Nara; Syuji Asada, Youkaichi, and Yukiyoichi Nishikori, Oumihachiman, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

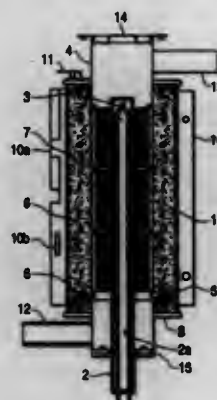
Filed Apr. 11, 1994, Ser. No. 225,808

Claims priority, application Japan, Apr. 12, 1993, 5-084257; Jul. 30, 1993, 5-189673

Int. Cl.<sup>6</sup> F01N 3/10

U.S. Cl. 422-174

2 Claims



1. A deodorizing apparatus for oxidizing malodorous gas comprising:
- an inlet;
- an outlet; and
- a gas passage at right angles to a direction of the inlet and the outlet for communicating between said inlet and said outlet, said gas passage including:
- a catalyst positioned within said gas passage,
- a heater positioned within said catalyst, said heater having a portion for heating said catalyst and a portion for heating the gas passage, and
- a temperature sensor for detecting the temperature of said heater, said sensor positioned within said heater,
- wherein malodorous gas fed to said inlet and through said gas passage including said catalyst is oxidized and hence, deodorized when said catalyst is heated by said heater to a predetermined temperature as detected by said temperature sensor, and
- wherein said heater is constructed and arranged so that the heating output per unit area in a portion of said heater adjacent to said outlet of said gas passage is set larger than the heating output per unit area in other portions of said heater.

5,482,686

### CATALYTIC CONVERTER

Alan R. Lebold, 2526 Danielle Dr., Niagara Falls, Niagara County, N.Y. 14304, and John D. Ten Eyck, 1458 Ridge Rd., Lewiston, Niagara County, N.Y. 14092

Division of Ser. No. 977,390, Nov. 17, 1992, Pat. No. 5,384,188. This application Nov. 18, 1994, Ser. No. 341,777

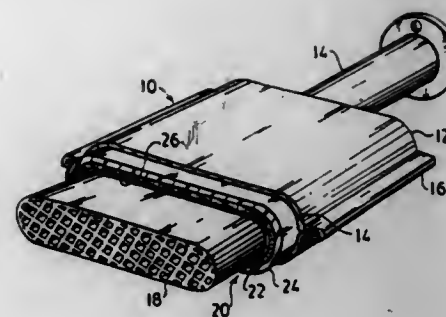
Int. Cl.<sup>6</sup> B01D 53/34; F01N 3/28

U.S. Cl. 422-179

9 Claims

1. A catalytic converter for treating exhaust gas from an internal combustion engine which comprises a housing, a catalyst-carrying ceramic monolith within said housing, and a flexible, resilient, thermal/mechanical shock-resisting mat separating said monolith from said housing, said mat comprising

- (a) about 15 wt % to about 45 wt % fiber;
- (b) about 3 wt % to about 9 wt % binder;
- (c) about 20 wt % to about 60 wt % unexpanded vermiculite; and



- (d) about 10 wt % to about 30 wt % expandable graphite.

5,482,687

### SEPARATION OF SODIUM-22 FROM IRRADIATED TARGETS

Wayne A. Taylor, and David Jamriska, both of Los Alamos, N.M., assignors to The Regents of the University of California, Oakland, Calif.

Filed Jan. 31, 1995, Ser. No. 381,672

Int. Cl.<sup>6</sup> C01G 57/00

U.S. Cl. 423-2

10 Claims

1. A process for selective separation of sodium-22 from an irradiated target comprising:
- dissolving an irradiated target to form a first solution;
- contacting said first solution with hydrated antimony pentoxide to selectively separate sodium-22 from said solution;
- separating said antimony pentoxide including said separated sodium-22 from said first solution;
- dissolving said antimony pentoxide including said separated sodium-22 in mineral acid to form a second solution; and,
- separating said antimony from said sodium-22 in said second solution.

5,482,688

### PLUTONIUM DISSOLUTION PROCESS

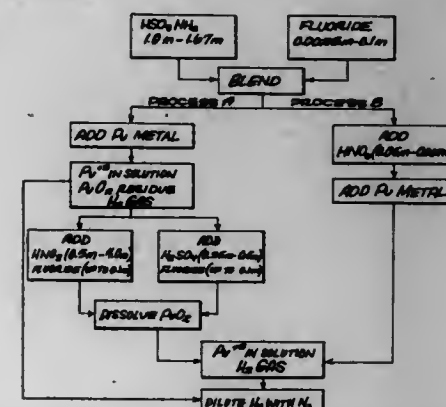
Michael A. Vest, Oak Park, Ill.; Samuel D. Fink, Aiken, S.C.; David G. Karraker, Aiken, S.C.; Edwin N. Moore, Aiken, S.C., and H. Perry Holcomb, North Augusta, S.C., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 7, 1994, Ser. No. 193,380

Int. Cl.<sup>6</sup> B01F 1/00

U.S. Cl. 423-20

18 Claims



1. A process for dissolving plutonium metal, said process comprising the steps of:

making a mixture of sulfuric acid and a fluoride ion, said mixture containing said sulfuric acid in a concentration between approximately 1.0M and 1.67M, said mixture con-

taining said fluoride ion in a concentration between approximately 0.0025M and 0.1M;

heating said mixture;

exposing said plutonium metal to said mixture whereby at least a first portion of said plutonium dissolves in said mixture and a second portion of said plutonium reacts with said mixture to form plutonium oxide; and

dissolving said plutonium oxide in an acid.

5,482,689

### PROCESS FOR THE ACCELERATED PRODUCTION OF RED LEAD OXIDE

Reinhard Marx, Bad Harzburg, Germany, assignor to Heubach & Lindgens GmbH & Co. KG., Germany

PCT No. PCT/EP90/01094, § 371 Date Mar. 5, 1991, § 102(e) Date Mar. 5, 1991, PCT Pub. No. WO91/00848, PCT Pub. Date Jan. 24, 1991

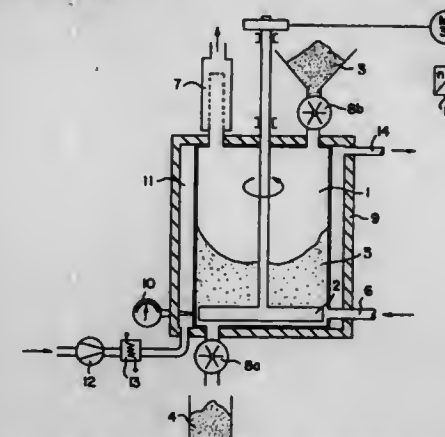
PCT Filed Jul. 6, 1990, Ser. No. 655,450

Claims priority, application Germany, Jul. 10, 1989, 39 22 654.9

Int. Cl.<sup>6</sup> C01G 21/02

U.S. Cl. 423-619

11 Claims



1. A process for the accelerated production of Pb<sub>3</sub>O<sub>4</sub>, which comprises oxidizing PbO in a stirrer reactor, said PbO being kept in suspension like a fluidized bed by a stirrer, drawing off from the fully oxidized Pb<sub>3</sub>O<sub>4</sub> a quarter to half of the reactor contents and replacing the drawn off contents with new PbO.

5,482,690

### LOW-RESIDUE HIGH-EXTRACTION PRODUCTION OF SODIUM DICHROMATE

Karl-Christoph Scherhag, Bergisch Gladbach, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 139,256, Oct. 20, 1993, abandoned.

This application Jan. 6, 1995, Ser. No. 369,854

Claims priority, application Germany, Jan. 27, 1992, 42 36 202.4

Int. Cl.<sup>6</sup> C22B 34/32; C01G 37/00; 37/14

U.S. Cl. 423-61

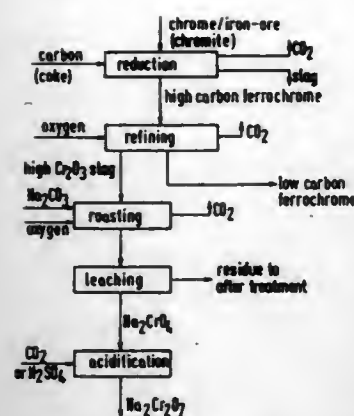
1 Claim

1. A process for the low-waste, high extraction production of sodium dichromate from chromite, consisting essentially of the following steps:

a) reducing chromite to form a melted ferrochromium alloy as one phase and a first slag phase, separating said first slag phase from the melted ferrochromium alloy phase and removing said first slag phase from the process;

b) oxidizing the melted ferrochromium alloy with oxygen or an oxygen-containing gas to form a low-carbon ferrochromium melt and a second slag, said second slag being rich in chromium oxide, and then separating said ferrochromium melt from said second slag, and removing said ferrochromium melt from the process;





- subjecting said second slag from step b) to oxidizing digestion with sodium-based alkaline digesting agent, leaching agent and oxygen, to convert the chromium oxide in said second slag to sodium chromate;
- leaching said sodium chromate from said second slag with water to form an aqueous solution of sodium chromate and at the same time, reducing the sodium chromate content of said second slag;
- acidifying said sodium chromate solution to convert the sodium chromate to sodium dichromate and
- recycling a part of said second slag, which has had its sodium chromate content reduced in step d), to step c) to be part or all of said leaching agent, and discarding the remainder of said second slag with reduced sodium chromate content, as a waste product.

5,482,691

#### PROCESS FOR THE PRODUCTION OF INTERMEDIATES USEFUL IN THE PROCESSING OF ILMENITE AND RELATED MINERALS

Thomas A. O'Donnell, Burwood; John Besida, Yarraville; Teresa K. H. Pong, Coburg, and David G. Wood, St. Kilda, all of, Australia, assignors to The University of Melbourne, Victoria, Australia

Division of Ser. No. 107,787, Oct. 22, 1993, Pat. No. 5,397,375.

This application Jan. 23, 1995, Ser. No. 377,103

Claims priority, application Australia, Feb. 21, 1991, PK4721/91

Int. Cl.<sup>6</sup> C22B 5/00

U.S. Cl. 423-69

18 Claims

1. A process for the production of intermediates useful in the processing of ilmenite and related minerals comprising:

- dissolving a metal fluoride compound in an organic solvent;
- adding an ammonium fluoride to the metal fluoride compound dissolved in the organic solvent in step a) to precipitate an ammonium fluorometallate from the organic solvent; and
- dissolving the ammonium fluorometallate from step b) in water and adding an alkali fluoride to produce an alkali fluorometallate and an ammonium fluoride.

5,482,692

#### SELECTIVE CATALYTIC REDUCTION OF NITROGEN OXIDES USING A FERROCENE IMPREGNATED ZEOLITE CATALYST

Costandi A. Audeh, Princeton, N.J.; Sanjay B. Sharma, Langhorne, Pa., and David S. Shihabi, Pennington, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jul. 7, 1994, Ser. No. 271,694

Int. Cl.<sup>6</sup> C01B 21/04

U.S. Cl. 423-239.2

18 Claims

1. A method for selective catalytic reduction, prior to discharge, of an exhaust gas contaminated with NO<sub>x</sub> comprising:

- impregnating an intermediate pore size zeolite powder with ferrocene in a solvent under conditions effective to deposit an iron concentration on the zeolite sufficient to allow a conversion of at least 27 weight percent of the total nitrogen compounds present in the exhaust gas at a temperature of 250° C. after the impregnated zeolite produced thereby has been steamed at 850° C. using 20 weight percent steam for 6 hours;
- incorporating the zeolite with a matrix;
- calcining the impregnated zeolite and the matrix to thereby produce a calcined catalyst;
- adding ammonia to an exhaust gas comprising nitrogen oxides, thereby forming a mixture of the exhaust gas and the ammonia;
- contacting the gas mixture with said calcined catalyst at conditions effective to substantially convert the NO<sub>x</sub> and the ammonia to innocuous compounds, the conditions comprising a temperature less than 455° C.

5,482,693

#### PROCESS FOR PREPARING WATER SOLUBLE POLYALUMINOSILICATES

John D. Rushmere, Wilmington, Del., and Robert H. Moffett, Landenberg, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 14, 1994, Ser. No. 212,744

Int. Cl.<sup>6</sup> C01B 33/26

U.S. Cl. 423-328.1

7 Claims

1. A process for producing water soluble polyparticulate polyaluminosilicate microgels having mole ratios of alumina:silica of between 1:25 and 1:1500 comprising the steps of:

- acidifying an aqueous solution of an alkali metal silicate containing 0.1-6% by weight of SiO<sub>2</sub> to a pH of 2-10.5 by adding an aqueous acidic solution containing sufficient aluminum salt to provide said mole ratios and thereby forming a microgel; and
- diluting the product of step (a) with water prior to gelation to a SiO<sub>2</sub> content of ≤2% by weight.

5,482,694

#### REGENERATION OF CYANIDE BY OXIDATION OF THIOCYANATE

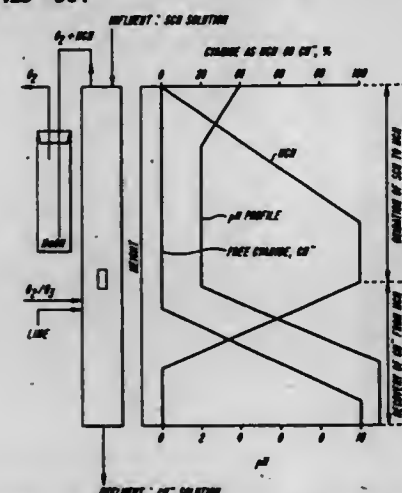
Javier Jara, Montreal; Heriberto Soto, and Fabiola Nava, both of Metallurgy, all of, Canada, assignors to Canadian Liquid Air Ltd.-Air Liquide Canada Ltée., Quebec, Canada

Filed Aug. 19, 1994, Ser. No. 293,170

Int. Cl.<sup>6</sup> C01C 3/00

U.S. Cl. 423-364

33 Claims



1. A method of producing cyanide (CN<sup>-</sup>) from a composition comprising thiocyanate comprising contacting the composition with an oxidizing gas containing ozone while the pH of the

composition is sufficiently low to assure HCN as the predominant species in the composition relative to CN<sup>-</sup>, and wherein the pH of the composition resulting from the oxidizing gas contacting step is raised to a pH above 7.0 to convert the HCN to CN<sup>-</sup>.

5,482,695

#### CARBON COMPOSITION PRODUCTION PROCESS

Viktor A. Guschin, Iskitim; Alexandr A. Zakharov, Krasnoyarsk; Alexei I. Lyamkin, Krasnoyarsk, and Anatoly M. Staver, pr. Mira, d.3, kv.14, 660067, Krasnoyarsk, all of, U.S.S.R., assignors to Anatoly Mikhailovich Staver, Krasnoyarsk, Russian Federation

PCT No. PCT/SU91/00135, § 371 Date Jul. 22, 1993, § 102(e) Date Jul. 22, 1993, PCT Pub. No. WO93/01129, PCT Pub. Date Jan. 21, 1993

PCT Filed Jul. 3, 1991, Ser. No. 94,095

Int. Cl.<sup>6</sup> C01B 31/06

U.S. Cl. 423-446

3 Claims

1. A process for producing a carbon composition containing diamond and graphite, comprising diamond particles being 40-120 Å in size; graphite particles being 200-1000 Å in size; the ratio between both being diamond being 18%-38% by weight; graphite being 62%-82% by weight; said process comprising the step of detonating a carbon-containing explosive featuring a negative oxygen balance in a cooling medium containing a neutral gas, and containing also carbon dioxide gas in an amount of 40-60% by volume, with its free oxygen content not in excess of 2% of the amount of the cooling medium.

5,482,696

#### METHOD FOR THE PURIFICATION AND/OR ELECTROLYSIS OF AN AQUEOUS POTASSIUM CHLORIDE SOLUTION

Rüdiger Hönigsmid-Grossich; Peter Schmittinger, both of Niederkassel; Ingo Stahl, Vellmar, and Karl R. Wambach-Sommerhoff, Bad Hersfeld, all of, Germany, assignors to Huels Aktiengesellschaft, Marl, Germany

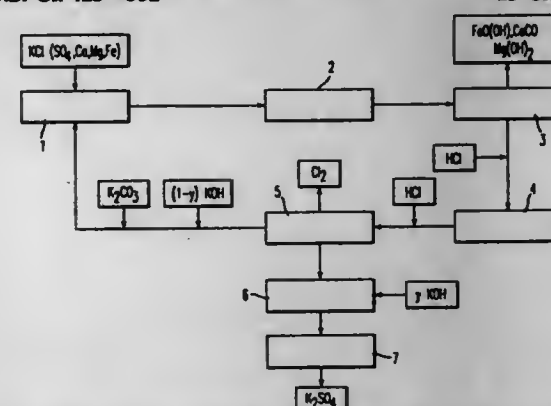
Filed Jul. 22, 1994, Ser. No. 279,005

Claims priority, application Germany, Aug. 4, 1993, 43 26 128.0

Int. Cl.<sup>6</sup> C25B 15/08

U.S. Cl. 423-552

13 Claims



1. A method of purifying an aqueous potassium chloride solution containing sulphate ions as impurities, comprising precipitating said sulphate ions from said solution as potassium sulphate, a potassium sulphate-containing salt mixture, a potassium sulphate-containing compound, or a mixture thereof, said precipitating comprising one of groups (a), (b) and (c):

- increasing the concentration of hydroxide ion, carbonate ion, or both, in said solution;

- increasing either the concentration of hydrogen carbonate ion or the concentration of both hydrogen carbonate and carbonate ion in said solution; or
- adding potassium sulphate seed crystals to said solution.

5,482,697

#### METHOD OF MAKING V<sub>6</sub>O<sub>13-x</sub> [0<X≤2.0]

M. Yazid Saidi, San Jose, Calif., assignor to Valence Technology, Inc., Henderson, Nev.

Filed Jan. 19, 1994, Ser. No. 184,089

Int. Cl.<sup>6</sup> C01B 13/32

U.S. Cl. 423-592

8 Claims

1. A method of making V<sub>6</sub>O<sub>13-x</sub> wherein 0<X≤2.0 comprising the steps of: in a stirred aqueous medium contained in a reaction vessel, slowly contacting V<sub>6</sub>O<sub>13</sub> with at least a nominal stoichiometric amount of hydrogen peroxide to form the product V<sub>6</sub>O<sub>13-x</sub> wherein 0<X≤2.0; and drying said product.

5,482,698

#### DETECTION AND THERAPY OF LESIONS WITH BIOTIN/AVIDIN POLYMER CONJUGATES

Gary L. Griffiths, Morristown, N.J., assignor to Immunomedics, Inc., Morris Plains, N.J.

Filed Apr. 22, 1993, Ser. No. 51,144

Int. Cl.<sup>6</sup> A61K 41/00; 51/10; 31/74; 31/415

U.S. Cl. 424-141

43 Claims

1. An improvement in a method of detecting or treating lesions in a subject, the method comprising the steps of (a) parenterally injecting a subject with a targeting composition comprised of (i) a biotin-protein conjugate or (ii) an avidin-protein conjugate, wherein the protein of said conjugate binds to a marker substance produced by or associated with the targeted lesion, and allowing said conjugate to accrete at the targeted lesion; (b) then parenterally injecting a clearing composition comprised of (i) avidin, when said targeting composition is a biotin-protein conjugate, or (ii) biotin, when said targeting composition is an avidin-protein conjugate, and allowing said clearing composition to substantially clear said targeting composition from non-targeted sites and to bind to said targeting composition accreted at the targeted lesion; and (c) parenterally injecting a detection or therapeutic composition comprised of a conjugate of (i) avidin and a detection or therapeutic agent when said clearing composition is biotin, or (ii) biotin and a detection or therapeutic agent when said clearing agent is avidin, and allowing said detection or therapeutic composition to accrete at the targeted lesion thereby treating the lesion when said agent is a therapeutic agent, or if said agent is a detection agent, (d) detecting said agent accreted at the lesion, thereby detecting the lesion; wherein the improvement is that at least one of the compositions of step (a) or (b) further comprises a polymer comprising multiple avidin or biotin binding sites, thereby providing an increased number of binding sites to which a subsequently administered composition of step (b) or (c) binds, thereby amplifying the amount of said detection or therapeutic agent at the targeted lesion.

5,482,699

**MULTINUCLEAR COMPLEXES FOR X-RAY IMAGING**  
Torsten Almen, Malmö, Sweden; Arne Berg, Blommenholm, Norway; C. Allen Chang, Palo Alto; Michael Droegge, Livermore, both of Calif.; Harald Dugstad, Oslo, Norway; Jere D. Fellman, Livermore; Sook-Hui Kim, Mountain View, both of Calif.; Jo Klaveness, Oslo, Norway; Scott M. Rocklage, Los Gatos, Calif.; Pål Rongved, Hellvik, Norway; Brent Segal, Sunnyvale, and Alan D. Watson, Campbell, both of Calif., assignors to Nycomed Salutar Inc., Sunnyvale, Calif.

PCT No. PCT/EP92/00698, § 371 Date Sep. 24, 1993, § 102(e) Date Nov. 24, 1993, PCT Pub. No. WO92/17215, PCT Pub. Date Oct. 15, 1992

PCT Filed Mar. 27, 1992, Ser. No. 122,461

Claims priority, application United Kingdom, Mar. 27, 1991, 9106579; Sep. 26, 1991, 9120507

The portion of the term of this patent subsequent to Oct. 17, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> A61K 49/04

U.S. Cl. 424—9.42

27 Claims

1. A sterile X-ray contrast medium comprising a physiologically tolerable multinuclear complex of formula I



(where  $M_n B_u A_v$  is a multinuclear entity; each M which may be the same or different is a contrast enhancing metal atom covalently bonded to at least one atom B where u is non-zero; each B which may be the same or different is a non-metal bridging atom covalently bonded to at least two metal atoms M and optionally to further atoms; each A which may be the same or different is a non-metal non-bridging atom covalently bonded to a metal atom M; each L which may be the same or different is a ligand co-ordinately bonded to at least one metal atom M; n is a positive integer of value 2 or greater at least one metal atom M being tungsten or a lanthanide where n represents 2; u is zero or a positive integer, u being at least 2 unless n is at least 5 or at least one M is a lanthanide; x is a positive integer; and v and w are independently zero or positive integers; with the provisos that where n is 2 or 3 and no M is a lanthanide either at least one B is other than oxygen or sulphur or w is a positive integer and at least one L is a multidentate ligand other than EDTA) or a physiologically tolerable salt thereof, together with at least one pharmaceutical carrier or excipient.

5,482,700

**SUBSTITUTED POLYAMINO, POLYCARBOXY COMPLEXING AGENT DIMERS FOR MRI AND X-RAY CONTRAST**

Julius Deutsch; Heinz Gries; Erich Klieger; Ulrich Niedballa, all of Berlin; Franz-Josef Renneke, Bergkamen; Juergen Conrad, and Wolfgang Muetzel, both of Berlin, all of Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

Continuation of Ser. No. 66,646, May 25, 1993, abandoned, which is a continuation of Ser. No. 715,713, Jun. 18, 1991, abandoned, which is a continuation of Ser. No. 430,442, Oct. 2, 1989, abandoned. This application Jul. 1, 1994, Ser. No. 269,504

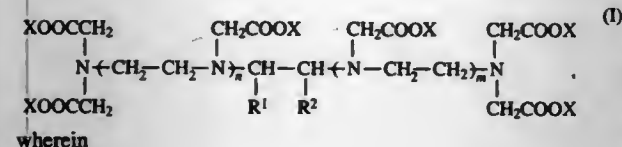
Claims priority, application Germany, Mar. 31, 1987, 37 10 730.5

Int. Cl.<sup>6</sup> A61B 5/055

U.S. Cl. 424—9.364

14 Claims

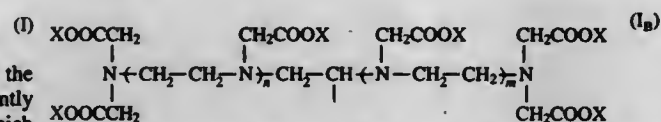
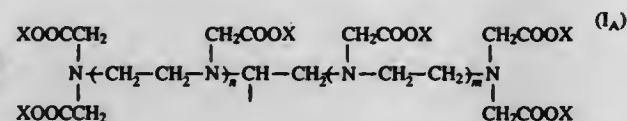
1. A compound of general formula I



n and m, in each case are the numbers 0, 1, 2, 3, and 4 and n+m is 1-4;

x stands for a hydrogen atom and/or a metal ion equivalent of an element of atomic numbers 21-29, 42, 44 of 57-83, wherein at least two of the substituents X mean a nonradioactive metal ion equivalent;

R<sup>1</sup> and R<sup>2</sup>, being different are in each case a hydrogen atom or a straight-chain or branched, saturated or unsaturated C<sub>1</sub>-C<sub>20</sub>-alkylene group, said alkylene group optionally containing imino, phenylenoxy, phenylenimino, amido, hydrazido, ester group(s), oxygen, sulfur and/or-nitrogen atom(s) and is optionally substituted by hydroxy, mercapto, imino, epoxy, oxo, thioxo and/or amino group(s), said alkylene group exhibiting at the end either a moiety of general formula I<sub>A</sub> or I<sub>B</sub>



wherein at least one of R<sup>1</sup> and R<sup>2</sup> is said alkylene group having at the end thereof a moiety of formula I<sub>A</sub> or formula I<sub>B</sub>; or

a salt of said compound with at least one inorganic and/or organic base or amino acid.

5,482,701

**MICROPOROUS ALKALI METAL BICARBONATE**  
Anthony E. Winston, East Brunswick, N.J., assignor to Church & Dwight Co., Inc., Princeton, N.J.

Filed May 3, 1993, Ser. No. 56,485

Int. Cl.<sup>6</sup> A61K 7/32

U.S. Cl. 424—65

5 Claims



1. Microporous alkali metal bicarbonate powder comprising particles having an average particle size between about 0.1-50 microns, a surface area between about 5-20 square meters per gram, an average pore size between about 10-500 nanometers, and a total pore volume between about 0.1-2 cubic centimeters per gram; and wherein the particles consist of agglomerated crystallites.

5,482,702

**HYDROPHILIC POLYMER-COATED MICROCRYSTALLITES OF BICARBONATE SALT**  
Richard T. Murphy, Belle Mead, and M. Stephen Lajole, Basking Ridge, both of N.J., assignors to Church & Dwight Co., Inc., Princeton, N.J.

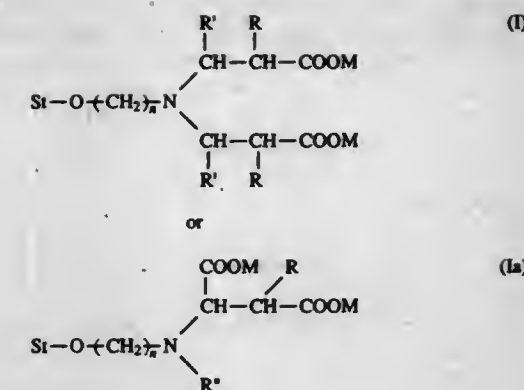
Continuation-in-part of Ser. No. 219,873, Mar. 30, 1994, Pat. No. 5,417,963, which is a continuation-in-part of Ser. No. 53,836, Apr. 27, 1993, Pat. No. 5,376,362. This application Jan. 10, 1995, Ser. No. 370,854

Int. Cl.<sup>6</sup> A61K 7/34; 7/38

U.S. Cl. 424—65

14 Claims

1. A powder composition which is composed of particles having an average particle size between about 5-50 microns, and an average dimensional axial ratio between about 1-2.5 to 1; wherein the particles comprise a hydrophilic polymer surface coating having an encapsulated core matrix content of at least two crystallites of water-soluble inorganic compound selected from alkali metal bicarbonate and ammonium bicarbonate, and wherein the encapsulated bicarbonate crystallites have a particle size distribution substantially in the range between about 0.2-42 microns.



wherein

St-O represents a starch molecule;

R is H or CH<sub>3</sub>;

R<sup>1</sup> is H, CH<sub>3</sub> or COOH;

M is a cation selected from the group consisting of hydrogen, alkali metal, alkaline earth metal and ammonium;

n is 2 or 3; and

R<sup>2</sup> is H or alkyl of 1 to 18 carbon atoms.

5,482,703

**HAIR CONDITIONING COMPOSITIONS**  
Keith D. Pings, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 560,260, Jul. 25, 1990, abandoned, which is a continuation of Ser. No. 433,408, Nov. 3, 1989, abandoned, which is a continuation of Ser. No. 589,975, Mar. 15, 1984, abandoned. This application Oct. 12, 1993, Ser. No. 134,130

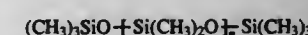
Int. Cl.<sup>6</sup> A61K 7/075

U.S. Cl. 454—70.12

16 Claims

1. A conditioning composition, useful on human hair, comprising:

(a) from about 0.1% to about 10% of non-volatile polydimethyl siloxane having the following formula



wherein n is from 20 to 7,000;

(b) a vehicle for the non-volatile polydimethyl siloxane which consists of:

(A) from about 0.1% to about 10% of a lipid material; and  
(B) from about 0.05% to about 5% of a cationic surfactant material;

(c) from about 0.1% to about 2.0% of a substantially non-depositing anti-resoiling agent consisting of a dimethicone copolyol; and

(d) the balance of water.

5,482,704

**COSMETIC COMPOSITIONS CONTAINING AMINO-MULTICARBOXYLATE MODIFIED STARCH**  
Robert W. Sweger, Bound Brook; John J. Tsai, Belle Mead; Joseph Pasapane, Morristown, all of N.J., and Karen A. Bernard, Gaithersburg, Md., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Filed Jun. 28, 1994, Ser. No. 267,984

Int. Cl.<sup>6</sup> A61K 7/06; 7/48

U.S. Cl. 424—70.13

16 Claims

1. A cosmetic skin care or hair care composition comprising a cosmetic vehicle and from about 0.1 to about 20% by weight of an amino multicarboxylate starch derivative having the following structure:

5,482,705

**COLD-WATER (FRESH OR SALT) AND NO-WATER SHAVING LOTION**

Carl R. Hoffmann, Jr., 7490 Lake Hazel Rd., Boise, Id. 83709, and Morton H. Katz, 100 Westview Rd., Spring Valley, N.Y. 10977

Filed Jun. 18, 1993, Ser. No. 79,672

Int. Cl.<sup>6</sup> A61K 7/15

U.S. Cl. 424—73

1 Claim

1. A cold-water (fresh or salt) and no-water shaving lotion, comprising the following formula measured by weight and having a neutral pH:

	approximately	
Beeswax, White,	0.1-0.5	
Methylparaben	0.1-0.2	
Carbomer-940,	0.1-1.0	
Glycerol Stearate,	1.0-4.5	
Isopropyl Palmitate,	0.25-5.0	
Benzyl Alcohol	0.01-0.05	
Cetyl Alcohol	0.1-5.0	
BHT,	0.003-0.006	
Concentrated	0.001-0.003	
Hydrochloric Acid,		
Butylparaben,	0.01-0.02	
Sorbitan Stearate,	0.1-1.0	
Propylene Glycol	2.0-5.0	
Propylparaben	0.01-0.1	
Sodium Stearate	1.0-3.5	
FD&C Red #40,	0.001-0.002	
Myristyl Myristate	2.0-5.0	
FD&C Yellow #5,	0.001-0.002	
Stearyl Alcohol,	0.1-2.5	
Polysorbate-61,	0.3-3.0	
FD&C Blue #1,	0.001-0.01	
Sodium Oleate,	0.3-0.6	
Purified Water,	63.0-92.5	







ologically acceptable salt or solvate thereof in conjunction with an effective amount of dexamethasone or a physiologically acceptable salt or ester thereof.

5,482,717

## RESORBABLE BONE WAX

Johann-Friedrich Fues, Grevenbroich, and Wolfgang Ritter, Haan, both of, Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf, Germany

Continuation of Ser. No. 842,823, Feb. 27, 1992, Pat. No. 5,308,623, which is a continuation of Ser. No. 385,138, Jul. 25, 1989, Pat. No. 5,143,730. This application Mar. 10, 1994, Ser. No. 209,322

Claims priority, application Germany, Jul. 25, 1988, 38 25 211.2

The portion of the term of this patent subsequent to Sep. 1, 2009, has been disclaimed.

Int. Cl.<sup>6</sup> A61F 2/28; 2/02

U.S. Cl. 424—426

22 Claims

1. A resorbable, body compatible, viscous to solid wax for mechanical staunching of blood on hard body tissue, comprising: at least one oligomer formed by the esterification of at least one acid selected from the group consisting of glycolic acid and lactic acid or the at least one oligomer chain terminated with at least one compound selected from the group consisting of monohydroxyl alcohols, polyhydroxyl alcohols, and the corresponding carboxylic acids, the at least one oligomer being neutralized with a body-compatible salt forming compound; and at least on body-compatible salt of an organic or inorganic acid homogeneously distributed in the wax, wherein, the body compatible salt comprises at least one salt selected from the group consisting of alkaline earth metal salts of fatty acids containing from about 12 to 18 carbon atoms, alkali metal salts of glycolic acid, alkaline earth metal salts of glycolic acid, aluminum salts of glycolic acid, alkali metal salts of lactic acid, alkaline earth metal salts of lactic acid, aluminum salts of lactic acid, calcium phosphate, calcium phosphate which in exchange for calcium or phosphate ions contains at least one member selected from the group consisting of carbonate, fluoride and magnesium in the crystal lattice, calcined calcium phosphate, hydroxyl apatite, ground heterologous bone, and calcium sulfate.

5,482,718

## COLON-TARGETED DELIVERY SYSTEM

Narvrit H. Shah, Clifton; Wantanee Phuapradit, Kearny, and Aruna Rallickar, Clifton, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 23, 1994, Ser. No. 217,344

Int. Cl.<sup>6</sup> A61K 9/30; 9/32; 9/36

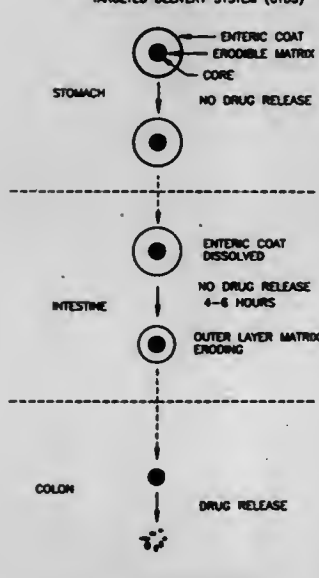
U.S. Cl. 424—480

5 Claims

1. A tablet suitable for a single oral administration being formed from the following:

- 1) an inner core comprising 10–45% by weight of the tablet which comprises a biologically active compound and a pharmaceutically acceptable carrier;
- 2) an erodible polymer layer which encases said inner core wherein said erodible polymer layer is 30–85% by weight of the tablet and has a thickness from about 2.0 mm to about 3.5 mm and comprises a pharmaceutically acceptable cellulose ether having a viscosity of 3–100 cps at a concentration of 2% w/w in water; and
- 3) an enteric layer which encases said erodible polymer layer and core wherein said enteric layer is 5–25% by weight of the tablet and has a thickness from about 50  $\mu$ m to about 300  $\mu$ m.

## SCHEMATIC PRESENTATION OF THE COLON TARGETED DELIVERY SYSTEM (CTDS)



5,482,719

## DRUG DELIVERY SYSTEMS

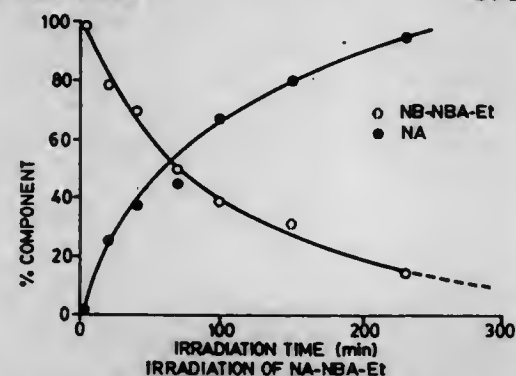
James E. Gullet, 31 Sagebrush Lane, Don Mills, Ontario, Canada, and Hamid Bakhtiyari, 29 Rowe Court, Markham, Ontario, Canada

Filed Oct. 30, 1992, Ser. No. 971,996

Int. Cl.<sup>6</sup> A61K 9/14

U.S. Cl. 424—486

24 Claims



1. A macromolecular complex of a therapeutically effective amount of a therapeutic substance and a biologically acceptable polymer, covalently chemically bonded thereto through the intermediary of a photolabile covalent chemical bond, said complex being effectively therapeutically inert and biologically acceptable for administration to a mammal, the complex being capable upon incidence of radiation of appropriately chosen characteristics to release the therapeutic substance therefrom in a therapeutically active form.

5,482,720

## ENCAPSULATED CO-MICRONIZED BICARBONATE SALT COMPOSITIONS

Richard T. Murphy, Belle Mead, and Wolfgang R. Bergmann, Princeton, both of N.J., assignors to Church & Dwight Co., Inc., Princeton, N.J.

Filed Oct. 11, 1994, Ser. No. 320,864

Int. Cl.<sup>6</sup> A01N 59/00; A61K 9/14

U.S. Cl. 424—489

23 Claims

1. An encapsulated co-micronized bicarbonate salt powder composition comprising (1) discrete particles of at least one crystalline compound ingredient selected from alkali metal and ammonium bicarbonates, and (2) between about 10–50 weight percent of

discrete particles of at least one crystalline inorganic compound ingredient having a Mohs hardness value between about 3–7; wherein the crystalline ingredients of the composition have an average particle size in the range between about 0.1–30 microns as obtained by mill co-micronization of the crystalline ingredients; and wherein the crystalline particles have a polymer surface coating.

5,482,721

## MOLD HAVING VENT PASSAGEWAYS TO OBVIATE TRIMMING OF FLASH

Leslie E. Clark, Maple; Craig A. Hunter, Milton; Robert B. Magee, Caledon East; Gerry V. Weterling, Georgetown, and Wilfred W. T. Cheng, Oakville, all of, Canada, assignors to Woodbridge Foam Corporation, Mississauga, Canada

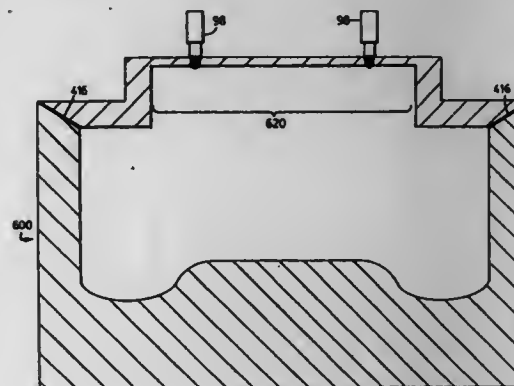
Division of Ser. No. 939,704, Sep. 2, 1992, Pat. No. 5,356,580.

This application Mar. 31, 1994, Ser. No. 220,927

Int. Cl.<sup>6</sup> B29C 33/10; 33/40; 44/58

U.S. Cl. 425—4 R

16 Claims



8. A mold for producing foamed articles, comprising: an upper mold and a lower mold which define a mold cavity; at least one first vent disposed in said upper mold and in communication with the mold cavity, said first vent having a vent passageway with an entrance and an exit; an obstruction disposed in said first vent passageway, said obstruction and said first vent passageway combining to form at least one opening having an elongated shape which allows movement of a liquid foam polymeric composition expanding in the mold cavity to pass from the mold cavity into the first vent passageway entrance but prevents the liquid foam polymeric composition from exiting the first vent passageway exit to cause at least partial curing of the liquid foam polymeric composition in the at least one opening between the first vent passageway and the obstruction; driving means for driving the obstruction axially within said first vent passageway to expel the at least partially cured liquid foamed polymeric composition from said at least one opening; at least one second vent disposed on a part line between said upper mold and said lower mold and in communication with the mold cavity, the second vent having a second vent passageway with an entrance and an exit, the second vent passageway being elongated with a width substantially greater than a thickness orthogonal to the width to cause the liquid foam polymeric composition expanding inside the mold cavity to enter the second vent passageway entrance but to not exit from the second vent passageway exit to cause at least partial curing of the liquid foam polymeric composition within the second vent passageway.

5,482,722

## CONFECTIONS COMPRISING A PROTEINACEOUS CHEWABLE BASE

Richard B. Cook, Chelmsford, Mass., assignor to Opta Food Ingredients, Inc., Bedford, Mass.

Filed Sep. 26, 1994, Ser. No. 311,930

Int. Cl.<sup>6</sup> A23G 3/30

U.S. Cl. 426—3

59 Claims

1. A proteinaceous chewable base, comprising prolamine having a texturizing agent entrapped therein, produced by solubilizing prolamine and then co-precipitating prolamine with a texturizing agent.

5,482,723

## LACTIC ACID BACTERIA, ANTIBACTERIAL SUBSTANCE PRODUCED BY THE BACTERIA, FERMENTED MILK STARTER CONTAINING THE BACTERIA, AND PROCESS FOR PRODUCING FERMENTED MILK BY USING THE STARTER

Masahiro Sasaki, Higashimurayama; Satoshi Ishii; Yoshihiko Yamauchi, both of Sapporo; Katsushi Kitamura, Yamanashi; Shuji Toyoda, and Kenkichi Ahiko, both of Sapporo, all of, Japan, assignors to Snow Brand Milk Products Co., Ltd., Hokkaido, Japan

Continuation of Ser. No. 658,031, Feb. 22, 1991, abandoned.

This application Dec. 7, 1992, Ser. No. 987,082

Claims priority, application Japan, Feb. 23, 1990, 2-44067; Jan. 26, 1991, 3-041443

Int. Cl.<sup>6</sup> A23C 23/00

U.S. Cl. 426—43

8 Claims

1. A process for reducing the rise in acidity which occurs during storage or transportation of a fermented milk product produced by inoculating milk with a fermented milk starter containing a lactic acid producing bacteria, which comprises concurrently inoculating the milk with a fermented milk starter comprising *Streptococcus Salivarius* subsp. *thermophilus* SBT 1277 (FERM BP-3234) or a radiation or chemically transformed variant thereof in an amount sufficient to inhibit the growth of gram-positive bacteria in the fermented milk product which give rise to acidity during storage or distribution thereof; and thereafter concurrently culturing the fermentation milk starter.

5,482,724

## PIZZA TRAY

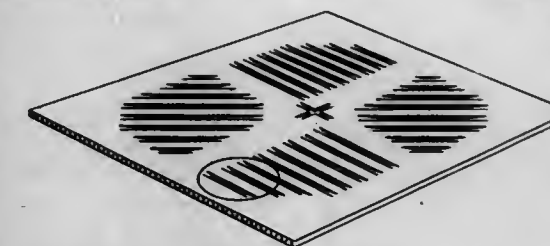
Alfred Morici, San Jose, and Marl' A. Dudley, Carmel by the Sea, both of Calif., assignors to Morici, Dudley Associates, Carmel By the Sea, Calif.

Filed Oct. 12, 1993, Ser. No. 134,603

Int. Cl.<sup>6</sup> B65D 81/26

U.S. Cl. 426—124

14 Claims



1. A tray for supporting pizza comprising: a generally flat support member having upper and lower spaced, planar surfaces and a corrugated inner portion disposed intermediate and engaging said upper and lower surfaces for forming a space intermediate said upper and lower surfaces and for supporting said upper surface and a pizza disposed thereon; a coating disposed on the upper surface of said support member and engaging the pizza for drawing off juices and liquids



exuded by the pizza and for redirecting heat emanating from the pizza upward back into the pizza and a plurality of spaced elongated slots disposed in and extending through the upper surface and into the space intermediate the upper and lower surfaces of said support member for permitting said juices and liquids to flow into the space intermediate said upper and lower surfaces of said support member for maintaining the pizza dry and crisp wherein each of said slots includes first and second facing edges angled downwardly to facilitate drawing off the juices and liquids from the pizza and for trapping the juices and liquids in the space intermediate the upper and lower surfaces said support member, and wherein each of said slots further includes an intermediate member formed from said upper surface and disposed between said first and second facing edges of the slot and forming first and second drain channels with said first and second facing edges, respectively.

5,482,725

# ALIMENTARY PASTE FOOD PRODUCT AND METHODS OF MANUFACTURE

Romano Cavicchiolo, 45 Chemin Planta, CH 1223 Cologny, Switzerland

PCT No. PCT/CH90/00143, § 371 Date Feb. 4, 1994, § 102(c) Date Feb. 4, 1994, PCT Pub. No. WO93/25089, PCT Pub. Date Dec. 23, 1993

PCT Filed Jun. 7, 1993, Ser. No. 193,041

Claims priority, application Switzerland, Jun. 11, 1992, 1844/92

Int. Cl.<sup>6</sup> A21C 11/00; A23L 1/16

U.S. Cl. 426—143

10 Claims

1. An alimentary paste food product comprising an arrangement of parallel hollow elongate lengths of tubes of alimentary paste having a substantially circular cross-section, said tubes being connected to one another by outgrowing flanges of alimentary paste to form a substantially hexagonal structure, the arrangement having a substantially planar upper and lower surface, the lower surface being closed by a plate of alimentary paste of the same form as the arrangement, the tubes being intended to be filled with a sauce.

5,482,726

# METHOD FOR REDUCING CONTAMINATION OF SHELLFISH

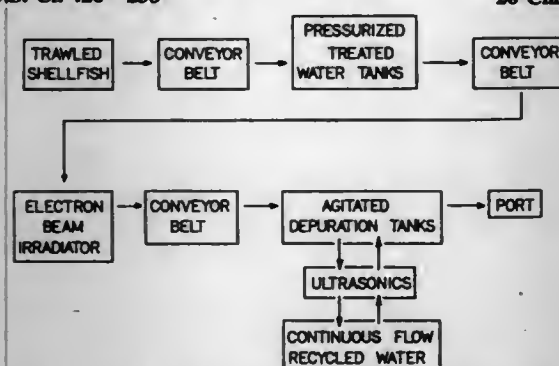
William L. Robinson, Jr., Baltimore, Md., assignor to US Harvest Technologies Corporation, Md.

Filed Jul. 14, 1992, Ser. No. 912,410

Int. Cl.<sup>6</sup> A23B 4/00

U.S. Cl. 426—238

26 Claims



1. A method for reducing contamination of shellfish via the dissociation of living bacteria and depuration comprising: the step of transporting shellfish into a suitable environment for initial, macroscopic cleansing; the step of initial, macroscopic cleansing of said shellfish; the step of transporting the initially cleansed shellfish to a suitable environment for irradiation;

the step of irradiating a predetermined maximum amount of said initially cleansed shellfish whereby said quantity of shellfish is exposed to a controlled source of radiation thereby microscopically cleansing said shellfish through the disassociation of bacteria by the energy transmitted by said irradiation; the step of transporting the initially cleansed, irradiated shellfish into a suitable aqueous environment for depuration of said shellfish;

the step of purging said initially cleansed, irradiated shellfish in an appropriate aqueous environment wherein ultrasonic waves are maintained thereby accelerating depuration of said shellfish through stimulus of shellfish metabolic processes and the facilitation of the precipitation of disassociated bacteria and other organic contaminants by the action of cavitation caused by the relative pressure differentials within said aqueous environment produced by the maintenance of ultrasonic waves.

5,482,727

# METHOD FOR IMPROVING THE COLOR OF CONTAINERIZED GREEN VEGETABLES

Luke F. LaBorde, and Joachim H. von Elbe, both of Madison, Wis., assignors to Friday Canning Corporation, New Richmond, Wis.

Filed Jul. 21, 1994, Ser. No. 279,241

Int. Cl.<sup>6</sup> A23L 1/272

U.S. Cl. 426—270

20 Claims

1. A method for improving the color of containerized green vegetables, comprising the steps of:

- blanching the vegetables for at least 10 minutes at a temperature between about 60° and about 100° C.;
- packing the blanched vegetables into a container along with an aqueous packing solution containing zinc or copper ions;
- sealing said container; and
- subjecting said containerized vegetables and packing solution to a sterilization process.

5,482,728

# ICE CREAM CONFECTION

Uwe Tapfer, Clarendon Hills, and Malcolm Austin, Naperville, both of Ill., assignors to Dove International - Division, Mars, Incorporated, Burr Ridge, Ill.

Filed Mar. 2, 1994, Ser. No. 204,875

Int. Cl.<sup>6</sup> A23G 9/02

U.S. Cl. 426—565

14 Claims

1. A robust ice cream confection comprising particles having a sweetener core encapsulated in a butterfat coating and a proteinaceous phase containing ice crystals.

5,482,729

# CONTINUOUS PROCESS FOR MANUFACTURING ANIMAL FEED BLOCKS

Russell G. McKenzie, 500 Amos; Robert P. Hunt, 101 Sequoyah, and Clinton H. Jones, 2302 Central, all of, Poteau, Okla. 74953

Filed Jun. 16, 1994, Ser. No. 260,875

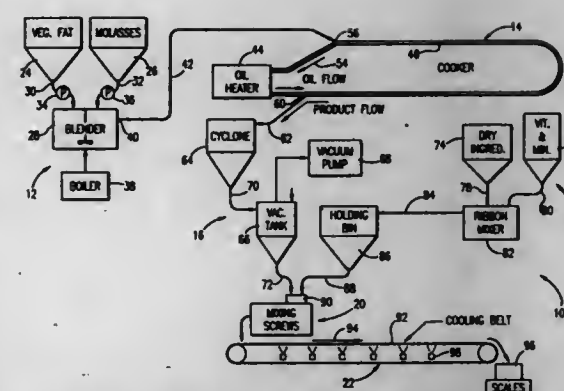
Int. Cl.<sup>6</sup> A23K 1/02; 1/18

U.S. Cl. 426—635

14 Claims

1. A continuous process for the manufacture of an animal feed supplement, comprising the steps of:

- continuously preparing a preblend including respective amounts of molasses and vegetable fat;
- continuously directing said preblend into and through an elongated cooking zone defined by an impermeate conduit surrounded by an outermost pipe carrying a heated cooking fluid in heat exchanging relationship in said pipe, and cooking said preblend in said conduit;



continuously passing said preblend into and through a moisture-removal zone located downstream from said cooking zone wherein part of the moisture of the preblend is removed; continuously adding dry components including proteinaceous ingredients to said preblend and forming a substantially homogeneous and flowable feed supplement; and continuously cooling and packaging said feed supplement into quantities of desired size.

5,482,730

# PROCESS FOR PREPARING A MEAT-BASED FOOD PRODUCT AND THE MEAT-BASED FOOD PRODUCT

Manfred Duve, Ebbetalstrasse 15, D-58840 Plettenberg, Germany

Filed Jul. 8, 1994, Ser. No. 272,140

Int. Cl.<sup>6</sup> A23L 1/317

U.S. Cl. 426—646

8 Claims

1. A process for preparing a meat-based food product, comprising the steps of:

- pre-mincing meat in a meat grinder, the meat being selected from the group consisting of lean beef, pork and a finely mincing the meat in a cutter at a first speed;
- adding crushed ice to cool the minced meat and break down protein in the meat;
- adding fat pork meat to the cooled meat;
- filling the cooled meat into molds;
- scalding the cooled meat in said molds with steam in a cooking furnace at about 70° C. to 75° C.;
- cooling the scalded meat so that it is firm;
- cutting the firm, molded and cooled meat into French fry size pieces; and then
- heating and rotating the meat pieces in a hot-air furnace.

5,482,731

# METHOD FOR BONDING A CALCIUM PHOSPHATE COATING TO STAINLESS STEELS AND COBALT BASE ALLOYS FOR BIOACTIVE FIXATION OF ARTIFICIAL IMPLANTS

Gregorio Vargas-Gutierrez; Manuel Mendez-Nonell; Juan Mendez-Nonell, and Armando Salinas-Rodriguez, all of Saltillo, Mexico, assignors to Centro de Investigacion y de Estudios Avanzados Del IPN, Mexico

Filed Apr. 29, 1994, Ser. No. 235,271

Int. Cl.<sup>6</sup> A61F 2/28

U.S. Cl. 427—227

12 Claims

1. A method for bonding a calcium phosphate coating to stainless steel and cobalt base alloys for bioactive fixation of artificial implants, consisting essentially of the following successive steps: applying a single layer of titanium or its alloys on a stainless steel or cobalt base alloy substrate to produce an intermediate layer; a first heat treatment to ensure interdiffusion of the titanium or its alloys into the substrate; applying a single layer of said calcium phosphate coating on said intermediate layer; a second heat treatment to ensure the interdiffusion of the calcium phosphate coating

into the intermediate layer; and finally subjecting the substrate with said calcium phosphate coating to a hydrothermal treatment.

5,482,732

# DENTAL PORCELAIN SHADING METHOD

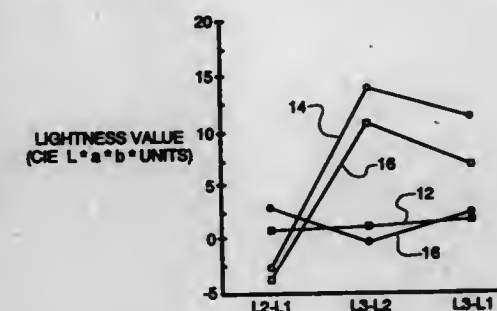
Carolyn M. Kramer, Moorestown, N.J., assignor to Dentsply Research & Development Corp., Milford, Del.

Filed Jun. 9, 1994, Ser. No. 257,411

Int. Cl.<sup>6</sup> A61C 13/083; B05D 3/02; 7/14

U.S. Cl. 427—229

4 Claims



1. A method of making a porcelain dental prosthesis, having a substantially monotonic change in lightness value between layers for a most opaque ceramic layer underlying a less opaque ceramic layer positioned beneath a least opaque porcelain layer, comprising:

- providing a first powder enclosed by a first labeled container and having a first opacity (O<sub>1</sub>) and first lightness value (L<sub>1</sub>) when formed into said least opaque porcelain layer, a second powder enclosed by a second labeled container having a second opacity (O<sub>2</sub>) and a second lightness value (L<sub>2</sub>) when formed into said less opaque ceramic layer, and a third powder enclosed by a third labeled container having a third opacity (O<sub>3</sub>) and a third lightness value (L<sub>3</sub>) when formed into said most opaque ceramic layer, said least opaque, more opaque and most opaque layers each not being thicker than 0.8 mm, said third opacity (O<sub>3</sub>) being greater than said second opacity (O<sub>2</sub>), said second opacity (O<sub>2</sub>) being greater than said first opacity (O<sub>1</sub>), said third lightness value (L<sub>3</sub>) being greater than said second lightness value (L<sub>2</sub>) and said second lightness value (L<sub>2</sub>) being greater than said first lightness value (L<sub>1</sub>);
- forming said third powder into said most opaque ceramic layer on a substrate, forming a second powder into said less opaque ceramic layer on said most opaque ceramic layer, forming said first powder into said least opaque ceramic layer on said less opaque ceramic layer.

5,482,733

# METHOD FOR CONTROLLING AND/OR ELIMINATING HARMFUL LAWN GRASS INSECTS USING NON-POLLUTIVE SUBSTANCE

Toshiyuki Abe, Tokyo; Masayoshi Hatsukade, Shizuoka, and Naomichi Nakashima, Tokyo, all of, Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 1, 1994, Ser. No. 283,551

Claims priority, application Japan, Aug. 2, 1993, 5-208179

Int. Cl.<sup>6</sup> A01N 25/16; 31/14

U.S. Cl. 427—4

4 Claims

1. A method for killing lawn grass insects which consists essentially of:

- foaming an aqueous surfactant composition having a total content of active components present of from 0.2 to 50% by weight and consisting essentially of at least one surfactant selected from an anionic sulfonate, a higher fatty acid containing from 8 to 30 carbon atoms and a salt of the higher

fatty acid; a thickener and optionally one or more non-polluting components selected from the group consisting of sequestrants, pH buffers, fertilizers, attractants and perfumes; and  
applying the foam onto the surface of lawn grass in a thickness of from 0.3 mm to 5 cm at a time within 2 hours prior to sundown, wherein said foam disappears prior to sunrise.

5,482,734

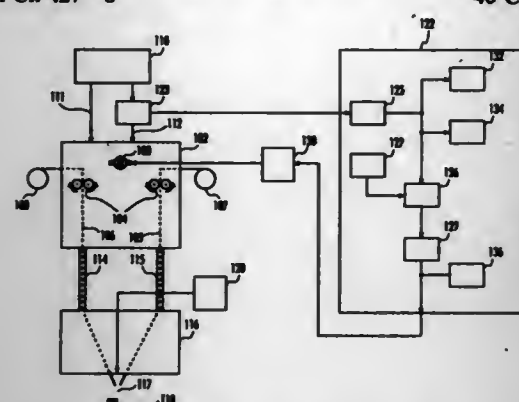
# METHOD AND APPARATUS FOR CONTROLLING AN ELECTRIC ARC SPRAYING PROCESS

Warren E. Herwig, Oshkosh, and John Vollrath, Appleton, both of Wis., assignors to The Miller Group, Ltd., Appleton, Wis.

Filed May 20, 1994, Ser. No. 246,833  
Int. Cl.<sup>6</sup> B05D 1/08

U.S. Cl. 427-8

40 Claims



1. A method of arc spraying a pair of wires comprising: feeding the wires to an arc at a controllable rate; providing electrical current to the arc through the wires; monitoring a parameter of the arc; and controlling the rate of wire feeding over a range of nonzero speeds in response to the parameter.

5,482,735

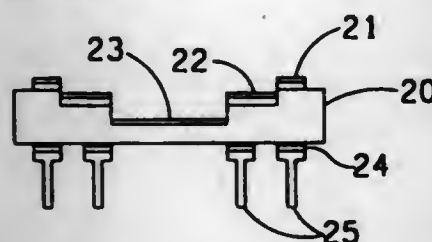
# METHOD FOR MAKING MULTI-LAYER CERAMIC PACKAGES

Nobuaki Miyauchi, and Takatoshi Irie, both of San Diego, Calif., assignors to Kyocera America, Inc., San Diego, Calif.  
Division of Ser. No. 739,599, Jul. 29, 1991, Pat. No. 5,345,038.  
This application Sep. 2, 1994, Ser. No. 300,314

Int. Cl.<sup>6</sup> B05D 5/12

U.S. Cl. 427-58

9 Claims



1. A method of making a multi-layer ceramic package having a ceramic substrate, metallic wire bonding areas, die attach area, and external bonding pads, the method comprising the steps of:  
a. plating the wire bonding areas, die attach area, and external bonding pads with an intermediate metal layer;  
b. coating the plated wire bonding areas, die attach area, and external bonding pads with an outer metal layer; and  
c. brazing contact pins to the outer metal layer coated on the external bonding pads on the ceramic substrate.

5,482,736

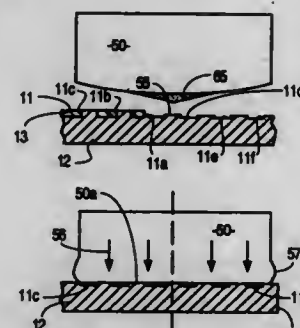
# METHOD FOR APPLYING FLUX TO BALL GRID ARRAY PACKAGE

Thomas P. Glenn, Phoenix, Ariz., and Roy D. Hollaway, Metro Manila, Philippines, assignors to Amkor Electronics, Inc., Chandler, Ariz.

Filed Aug. 4, 1994, Ser. No. 286,153  
Int. Cl.<sup>6</sup> B05D 1/28; B23K 3/00

U.S. Cl. 427-96

13 Claims



1. A method of applying flux into a series of spaced depressions in an essentially flat electrically insulative substrate selectively coated with an apertured solder mask, the mask apertures exposing contact metallizations on said substrate, and forming a series of spaced depressions in alignment with portions of said metallizations, said depressions being adapted after flux application to receive solder in said depressions comprising:

providing a compressible transfer pad including a bottom surface having a central flux pick-up area;  
providing a source of liquid flux;  
transferring a predetermined amount of flux from the source onto said transfer pad bottom surface central pick-up area;  
placing the flux-containing transfer pad in juxtaposition to the solder mask and the series of depressions;  
moving the central flux pick-up area of the transfer pad and the solder mask into contact with each other to force flux from said transfer pad into a first depression;  
moving one of the transfer pad and the solder mask against one another with sufficient pressure to compress said transfer pad bottom surface and to force remaining flux on said central flux pickup area of the transfer pad into successive depressions of said series of spaced depressions spaced from the first depression; and

after said series of spaced depressions have been substantially filled with flux, separating the transfer pad from the mask to permit deposition of solder into said flux-containing depressions.

5,482,737

# METHOD OF WATERPROOFING RIGID STRUCTURAL MATERIALS

John H. Gaveske, Shakopee, Minn., assignor to Poly Wall International, Minn.

Continuation of Ser. No. 982,851, Nov. 30, 1992, abandoned.  
This application Jun. 10, 1994, Ser. No. 258,562

Int. Cl.<sup>6</sup> B05D 1/02

U.S. Cl. 427-140

8 Claims

1. A method of waterproofing a masonry structural unit comprising:  
(a) applying to at least one surface of the structural unit a liquid coating composition having a solids content of 35 wt-% to 65 wt-%, said composition comprising:  
(i) an aromatic hydrocarbon solvent;  
(ii) a styrene-containing, polymeric binder resin dissolved in 180 to 350 phr of the aromatic hydrocarbon solvent, said binder resin including a styrene polymer selected from the group consisting of styrene homopolymer, copolymer of styrene and rubber diene, copolymer of styrene and acry-

lonitrile, and copolymer of styrene and an olefin, wherein the styrene polymer constitutes at least 85 wt-% of the binder resin;  
(b) rolling or brushing the applied liquid coating composition on the masonry structural unit; and  
(c) drying the rolled or brushed liquid coating composition on the structural unit to form a continuous film;  
wherein the continuous film adheres strongly to the structure unit to form a coating on the structural unit and has an average water vapor permeability of less than about  $1 \times 10^{-2}$  perms-inch.

5,482,738

# WET-CHEMICAL METALLIZATION PROCESS

Otwin Imhof, Nuertingen, and Holger Kistrup, Esslingen, both of, Germany, assignors to Deutsche Automobilgesellschaft mbH, Germany

Filed Dec. 16, 1993, Ser. No. 166,989

Claims priority, application Germany, Dec. 16, 1993, 42 42 443.7

Int. Cl.<sup>6</sup> B05D 3/10

U.S. Cl. 427-305

5 Claims

1. A wet-chemical metallization process for electrically non-conductive, previously chemically activated plastic substrate sheets, comprising sheets of nonwoven, needlefelt or open-pore foamed materials, including the steps of bringing the chemically activated substrate sheets into contact with a metallizing solution containing water, separating the metallizing solution from the substrate sheets by the influence of one of gravity and centrifugal force, and rinsing the metallized substrate sheets with rinsing water to remove adhering residues of the metallizing solution, wherein the separated metallizing solution and a flow off from the rinsing step after use thereof are each collected separately and subjected to a treatment for reuse, the treatment of the collected, used metallizing solution consisting of setting the solution to an approximately neutral pH and distilling the neutralized solution to separate the water from the metallizing solution for use as a second rinsing water, and the treatment of said flow off from the first rinsing step consisting of adding the chemical metallizing components to prepare a reusable metallizing solution.

5,482,739

# SILICON NITRIDE DEPOSITION

H. Peter W. Hey, San Jose, and David W. Carlson, Santa Clara, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

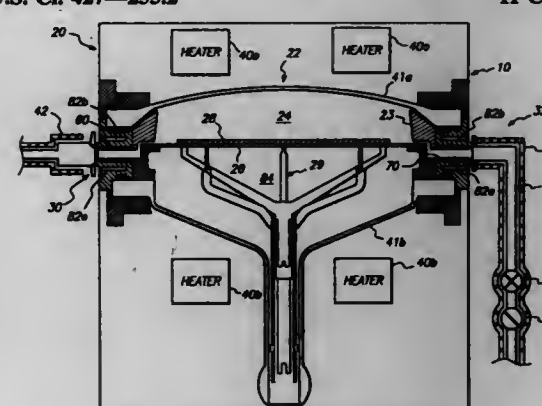
Continuation of Ser. No. 100,651, Jul. 30, 1993, abandoned.

This application Jan. 30, 1995, Ser. No. 381,004

Int. Cl.<sup>6</sup> C23C 16/34

U.S. Cl. 427-255.2

11 Claims



1. A process for depositing silicon nitride on a substrate in a deposition chamber having a surrounding wall that defines a deposition zone, the process comprising the steps of:  
(a) placing the substrate in the deposition zone;

(b) introducing a process gas comprising a silicon containing gas and a nitrogen containing gas into the deposition zone through an inlet gas conduit;  
(c) heating the substrate to a temperature  $T_s$ , the temperature  $T_s$  being sufficiently high to cause the process gas to deposit the silicon nitride on the substrate, with the resultant formation of process gas byproducts;  
(d) exhausting the process gas byproducts through an exhaust gas conduit; and  
(e) heating at least one of the inlet and exhaust gas conduits to a temperature  $T_h$  within the range  $\Delta T_h$ , wherein all the temperatures  $T_h$  in the range  $\Delta T_h$  are sufficiently higher than  $t_c$ , the temperature at which the process gas condenses in the inlet and exhaust gas conduits, that substantially no condensate deposits in the gas conduits, and wherein all temperatures  $T_h$  are sufficiently lower than the deposition temperature  $T_s$  that substantially no silicon nitride deposits in the gas conduits.

5,482,740

# SUSTAINED RELEASE BACTERICIDAL CANNULA

Anthony J. Conway; Phillip J. Conway, both of Chatfield, and Richard D. Fryar, Jr., Rochester, all of Minn., assignors to Rochester Medical Corporation, Stewartville, Minn.

Division of Ser. No. 809,281, Dec. 19, 1991, Pat. No.

5,261,896, which is a continuation-in-part of Ser. No. 489,462, Mar. 6, 1990, abandoned, which is a continuation-in-part of Ser. No. 487,422, Mar. 1, 1990, Pat. No. 5,098,379, which is a continuation-in-part of Ser. No. 462,832, Jan. 10, 1990, Pat. No. 5,137,671. This application Nov. 8, 1993, Ser. No. 148,995  
Int. Cl.<sup>6</sup> B05D 1/18; B32B 27/18; A61K 31/345; A61L 29/00

U.S. Cl. 427-2.28

16 Claims



1. A method for making a sustained release bactericidal cannula, the cannula being made from a tube, the tube having an inner surface, defining an inner lumen passing through the tube, and an uncured silicone rubber outer surface, said method comprising the steps of:

(a) providing an antibacterial agent containing mixture including uncured silicone rubber and particles of a solid antibacterial agent, wherein the antibacterial agent is a nitrofurantoin compound having a solubility in water of 0.2% by weight or less and wherein the mixture has a different composition from that of the uncured silicone rubber outer surface;  
(b) coating at least a portion of the outer surface of the tube with the antibacterial agent containing mixture to form an uncured nitrofurantoin containing silicone rubber outer layer; and  
(c) curing the silicone rubber of both the uncured silicone rubber outer surface and the uncured nitrofurantoin containing silicone rubber outer layer to form a cured antibacterial agent containing silicone rubber outer layer bonded to the silicone rubber outer surface;  
wherein the step of providing includes providing an antibacterial agent containing mixture containing a sufficient amount of the nitrofurantoin compound that the cured antibacterial agent containing silicone rubber outer layer contains about 10 to about 60 percent by weight of the nitrofurantoin compound.



5,482,741

## SURFACE-TREATED CHARGE CONTROL AGENTS, AND METHOD FOR PRODUCING THE SAME

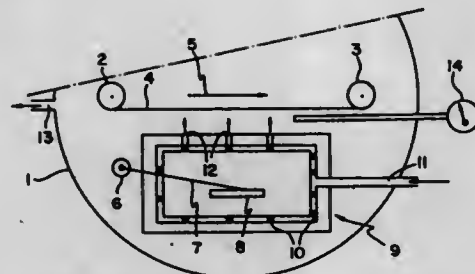
Kock-Yee Law, Penfield, and Ihor W. Tarnawskyj, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 6, 1994, Ser. No. 268,550  
Int. Cl.<sup>6</sup> B05D 7/00

U.S. Cl. 427—215

11 Claims

1. A process for preparing a charge control agent composition comprising solution coating a charge control agent onto flow aid particles until said charge control agent is adsorbed onto said flow aid particles, said solution coating process comprising the steps of: dissolving said charge control agent in at least one solvent, wherein said charge control agent has a retention time in said solvent, as determined using thin layer chromatography, of less than about 0.5; adding said flow aid particles to the solvent and forming a suspension of said flow aid particles in said solvent.



c) depositing onto at least one surface of the substrate by condensation from said oxidizing atmosphere containing vaporized aluminum, a coating of gain agglomerates comprising a porous matrix of aluminum oxide containing metallic aluminum crystallites arranged randomly within the grains, at a rate of between 0.03 and 0.2 micrometers per second; and  
d) removing the coated substrate from the chamber and performing a chemical or electrochemical stabilization treatment on the coated substrate.

5,482,742

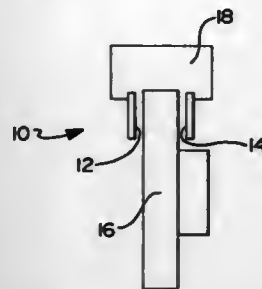
## METHOD FOR REDUCING GREEN ROUGHNESS OF A BRAKE SYSTEM DURING WEAR-IN PERIOD

Minoru Takamiya, Novi; Toshiro Miyazaki, and Yosuke Sasaki, both of W. Bloomfield, all of Mich., assignors to Akebono Brake Systems Engineering Center, Inc., Farmington Hills, Mich.

Filed Jul. 22, 1993, Ser. No. 96,476  
Int. Cl.<sup>6</sup> B05D 5/08

U.S. Cl. 427—156

11 Claims

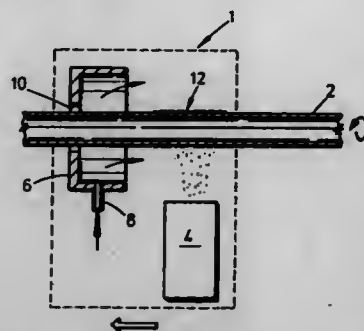


1. A method of reducing green roughness between mating parts of a multi-component vehicular braking system during brake application, comprising:  
coating at least one of the parts of the brake system with a boundary layer material transferable from the at least one part to a mating part during brake application, the coating consisting essentially of an alkyl resin having a filler and a boundary layer lubricant admixed therewith.

5,482,744  
PRODUCTION OF HEAT TRANSFER ELEMENT  
Stephen F. Pearson, Bearsden, United Kingdom, assignor to Star Fabrication Limited, United KingdomFiled Feb. 22, 1994, Ser. No. 199,475  
Int. Cl.<sup>6</sup> B06D 1/08

U.S. Cl. 427—455

9 Claims



1. A process for the production of a heat transfer element for boiling a liquid which comprises:  
spraying a substrate with molten metal particles; and  
concurrently spraying the substrate with liquid carbon dioxide; to form a heat transfer element having a matrix of metal particles attached to the substrate.

5,482,745

## SPRAY COATING PROCESS AND APPARATUS

Salome J. Coellar; Robert J. Radawski, both of Fort Wayne; Michael R. Barth, Auburn; Jack V. Jerrald, Fort Wayne; John A. Keyes, Kendallville, and Earl V. Gleason, Fort Wayne, all of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Nov. 29, 1993, Ser. No. 158,423  
Int. Cl.<sup>6</sup> B05D 1/02

U.S. Cl. 427—421

15 Claims

5,482,743

## MANUFACTURING A PLATE FOR AN ELECTRODE OF AN ELECTROLYTIC CONDENSER

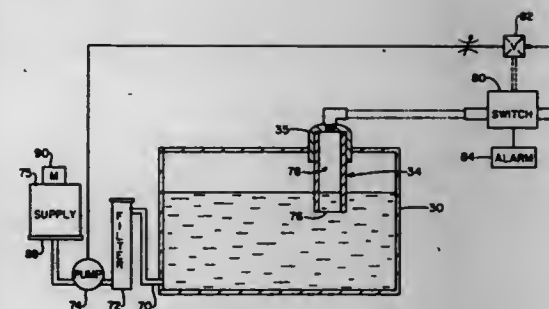
Francis Allegret, Goncelin; Mohamed Benmalek, St. Martin d'Hères, and Emmanuel Gariel, Corenc, all of France, assignors to Satma, Goncelin, France

Division of Ser. No. 17,491, Feb. 12, 1993, Pat. No. 5,431,971.  
This application Jan. 20, 1995, Ser. No. 375,666Int. Cl.<sup>6</sup> C23C 16/00

U.S. Cl. 427—566

5 Claims

1. A process for producing an electrode plate for an electrolytic condenser, comprising the steps of:  
a) introducing a fixed or movable substrate into a chamber;  
b) introducing into the chamber an oxidizing atmosphere and vaporized aluminum, under a pressure of 0.8 to 2.3 Pa in a deposit zone;



(4) controlling operation of said doors covering said inlet and outlet openings such that at least one of said doors is closed at all times to substantially prevent movement of air into or out of said coating chamber to maintain any excess coating material in a reusable state by preventing exposure thereof to air, and  
(5) collecting excess coating material supplied into said chamber in a bottom reservoir coupled to a recirculation system, and controlling recirculation of excess coating material back to means to supply said coating material such that said excess coating material is maintained within said reservoir between minimum and maximum levels above an outlet opening in said bottom reservoir.

acrylate or methacrylate or a dialkyl fumarate or maleate, wherein the alkyl groups contain from 1 to 8 carbon atoms, and

b) from 90 to 10 parts of a second poly(vinyl alcohol) polymer which is a poly(vinyl alcohol) homopolymer, or a poly(vinyl alcohol) copolymer containing less than 7 weight percent units derived from an alkyl acrylate or methacrylate or dialkyl fumarate or maleate, wherein the alkyl groups contain from 1 to 8 carbon atoms, or blends of such second poly(vinyl alcohol) polymers;  
b) weaving the yarn to produce woven textile material;  
c) desizing the woven textile material with an aqueous caustic solution having a concentration between 0.001 and 10 weight percent caustic material in water, and  
d) optionally washing the caustic desized woven textile material with water.

5,482,748

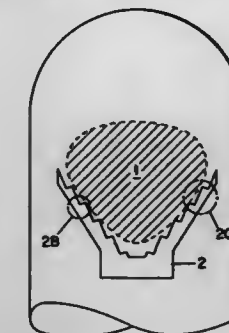
## METHOD FOR DIAMOND COATING BY MICROWAVE PLASMA

Staffan Soderberg, Huddinge; Hamid Shahani, Solna, and Mats Sjostrand, Kista, all of Sweden, assignors to Sandvik AB, Sandviken, Sweden

Continuation of Ser. No. 929,380, Aug. 14, 1992, abandoned.  
This application May 31, 1994, Ser. No. 251,661Claims priority, application Sweden, Aug. 16, 1991, 9102378  
Int. Cl.<sup>6</sup> H05H 1/46

U.S. Cl. 427—577

18 Claims

5,482,746  
PHOSPHATING SOLUTION FOR METAL SUBSTRATES  
Gianfranco Liberti, Abingdon; Kevin Brown, Feltham, and Laurence Castle, Crawley, all of England, assignors to Brent Chemicals International Plc., Buckinghamshire, EnglandFiled Apr. 7, 1993, Ser. No. 43,576  
Claims priority, application United Kingdom, Apr. 8, 1992, 9207725

U.S. Cl. 427—379

18 Claims

1. A method for coating a metal surface by a coil coating process, the metal surface comprising predominantly galvanized metal and/or steel, the method comprising in a first step contacting the metal surface with an aqueous composition by immersion, the composition comprising silica, phosphoric acid and a divalent metal ion, the composition having a free phosphoric acid content of at least 0.02 moles/liter and being substantially free of chromium and of any oxy metal anions in which the metal has a valency of at least 5, the composition including boric acid in an amount from 0.02 to 0.7 moles/liter, and subsequently curing the coated metal substrate with no intermediate rinsing stage and in a second step applying a second coating layer which is curable to form a fixed layer.

1. A method for diamond coating by microwave plasma, the method comprising a step of coating surfaces of components with diamond by forming a microwave plasma excited gas mixture into a plasma ball and contacting the components with the plasma ball, said coating step being performed in a reactor equipped with a bowl-shaped substrate table with a concave inner surface, the concave inner surface including ledges supporting the components to be coated and the components being arranged such that the outer surface of the plasma ball conforms to the surfaces to be coated.

5,482,747

## POLY(VINYL ALCOHOL) POLYMER BLEND TEXTILE SIZES WITH IMPROVED ABILITY TO BE DESIZED

Richard A. Hayes, Wilmington, Del., and George D. Robinson, Matthews, N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 202,620, Feb. 28, 1994, Pat. No. 5,436,293. This application May 19, 1995, Ser. No. 444,591  
Int. Cl.<sup>6</sup> B05D 3/02; 3/04; 3/10

U.S. Cl. 427—341

4 Claims

1. An improved process for producing woven textiles, comprising:  
a) sizing yarn to be woven with an aqueous solution of a blend of poly(vinyl alcohol) polymers, which comprises:  
a) from 10 to 90 parts of a first poly(vinyl alcohol) polymer which is a poly(vinyl alcohol) copolymer containing from about 7 to 15 weight percent units derived from an alkyl

5,482,749  
PRETREATMENT PROCESS FOR TREATING ALUMINUM-BEARING SURFACES OF DEPOSITION CHAMBER PRIOR TO DEPOSITION OF TUNGSTEN SILICIDE COATING ON SUBSTRATE THEREIN

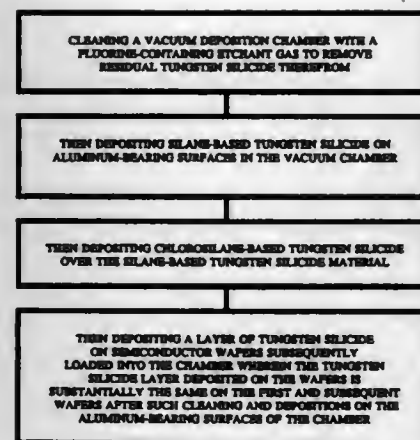
Susan Telford, Cupertino, Calif.; Michio Aruga, Inba, Japan, and Mei Chang, Cupertino, Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation of Ser. No. 138,179, Oct. 14, 1993, abandoned, which is a continuation-in-part of Ser. No. 83,420, Jun. 28, 1993, abandoned. This application Dec. 23, 1994, Ser. No. 364,022

U.S. Cl. 427—578

25 Claims

1. A process for pretreating a vacuum deposition chamber having internal aluminum-bearing surfaces after a prior cleaning step which comprises the steps of:



- forming a first tungsten silicide deposit on said aluminum-bearing surfaces in the chamber by flowing into the chamber gases comprising a gaseous source of tungsten and a silane gas; and
- then forming a second tungsten silicide deposit over said first tungsten silicide deposit by flowing into said chamber gases comprising a gaseous source of tungsten and a chlorosilane gas.

5,482,750

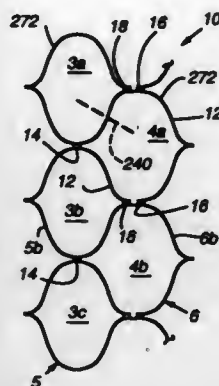
#### MULTIPLE CELL HONEYCOMB INSULATING PANEL AND METHOD OF HANGING

Wendell B. Colson, Boulder; Terry Akins, Louisville, both of Colo.; Cees M. Jansen, Woudrichem, Netherlands; Paul G. Swiszc, Boulder, and James M. Anthony, Denver, both of Colo., assignors to Hunter Douglas Inc., Upper Saddle River, N.J.

Continuation-in-part of Ser. No. 635,198, Jan. 2, 1991, abandoned. This application Jun. 27, 1991, Ser. No. 720,163  
Int. Cl.<sup>6</sup> B32B 3/12

U.S. Cl. 428—12

34 Claims



1. An expandable and contractible honeycomb panel having a front wall and a rear wall including a plurality of parallel laterally adjacent rows of elongated tubular cells extending in common directions normal to the relative lateral positioning of said rows with the tubular cells of each row being offset relative to the tubular cells of each adjacent row of tubular cells, said cells being constructed of a foldable, creasable and drapable material in the form of superposed material strips, each strip including a center web extending longitudinally of the material strip and opposite side longitudinally marginal zones folded inwardly into lapped relation with corresponding marginal portions of said center web, the free edge of at least one of said marginal zones being bonded to an associated opposing marginal portion of said center web and each said material strip including at least two laterally spaced and

longitudinally extending bond lines along which said material strip is bonded to opposing marginal zones of at least one adjacent strip, said material strips each forming one cell in one of said rows of cells and at least approximately three-quarters of one cell in another row of cells whereby the portion of each cell, which forms part of said front or said rear wall, is formed from the same material strip.

5,482,751

#### FIBROUS PRODUCT AND METHOD THEREOF WITH THERMOPLASTIC POLYMERIC IMPREGNANT

Robert J. Rossi, Spartanburg, S.C., assignor to Spartan Felt Company, Inc., Spartanburg, S.C.

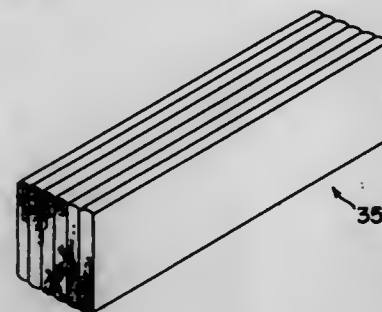
Continuation of Ser. No. 4,955, Jan. 15, 1993, abandoned.

This application Feb. 27, 1995, Ser. No. 394,557

Int. Cl.<sup>6</sup> B32B 5/10

U.S. Cl. 428—37

4 Claims



- An improved article of manufacture, said article of manufacture comprising:
  - a fibrous structure of spiral wound layers, said structure having an initial shrinkage of not more than about 2%, each said layer having first and second sides, one of said first and second sides having a surface such that fibers are protruding therefrom and wherein the surface fibers contact an adjacent layer, said layers of said structure having fiber to fiber contact therebetween without being mechanically or adhesively secured together; and
  - said structure being impregnated with a thermoplastic polymeric impregnant.

5,482,752

#### DECORATIVE MATERIAL HAVING A COLORED STICKY ELEMENT DISPOSED THEREON FORMING AT LEAST A PORTION OF A DECORATION

Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.

Division of Ser. No. 894,705, Jun. 3, 1992, Pat. No. 5,347,789, which is a continuation-in-part of Ser. No. 707,417, May 28, 1991, abandoned, which is a continuation of Ser. No. 502,358, Mar. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 391,463, Aug. 9, 1989, abandoned, which is a continuation-in-part of Ser. No. 249,761, Sep. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 219,083, Jul. 13, 1988, Pat. No. 4,897,031, which is a continuation of Ser. No. 4,275, Jan. 5, 1987, Pat. No. 4,773,182, which is a continuation of Ser. No. 613,080, May 22, 1984, abandoned.

This application Jul. 11, 1994, Ser. No. 273,061

Int. Cl.<sup>6</sup> B32B 3/30; 27/20

U.S. Cl. 428—40

17 Claims

- A decorative material, comprising:
  - a sheet of material having an upper surface, a lower surface, and an outer periphery, a colored sticky element being disposed upon at least a portion of at least one surface of the sheet of material, the colored sticky element comprising at least a portion of a decoration on the sheet of material, the colored

5,482,754

#### MULTI-LAYER RUBBER MAT

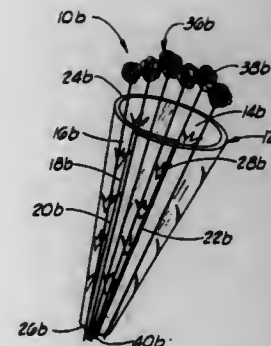
Carol A. Crook, 1717 Ashley Dr., Virginia Beach, Va. 23454

Filed Jul. 29, 1994, Ser. No. 282,235

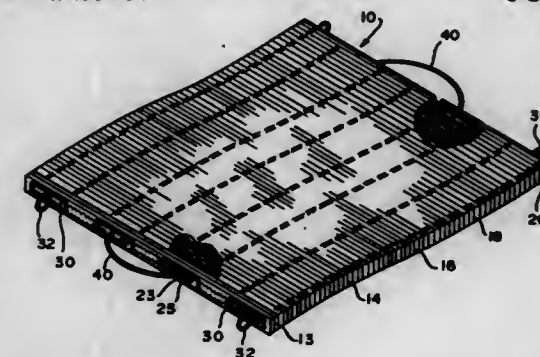
Int. Cl.<sup>6</sup> B32B 3/10

U.S. Cl. 428—54

6 Claims



sticky element blending with the decoration thereby hiding the bonding characteristics of the colored sticky element.



- A blasting mat comprising:
  - strips of material having top and bottom sides and edge portions; said strips being flexible in all planes and laid together whereby the top side of one abuts the bottom side of another; said strips being at least 4 1/2" thick and 1 1/4" wide; said laid together strips forming a continuous non-open surface and threadedly held together to form a closed barrier surface to contain flying objects; and
  - said strips being thin flat strips of compressed truck tire threads laid together to form a mat from 2' to 10' in width and threaded through apertures therein to provide a continuous barrier surface whereby no open spaces occur between said strips thereby containing flying material such as rock.

5,482,753

#### FORM/LABEL COMBINATION

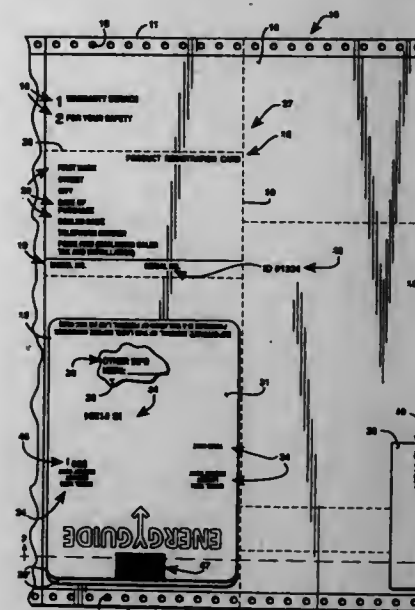
Joseph Langan, Cheektowaga, and Khaled Khatib, Youngstown, both of N.Y., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Filed May 24, 1993, Ser. No. 65,782

Int. Cl.<sup>6</sup> A61F 13/02

U.S. Cl. 428—42

20 Claims



- A business form comprising:
  - a paper substrate having top and bottom surfaces; static printing on said top surface;
  - a release material spot coating on said top surface, covering a first portion of said top surface of a size less than the entire top surface;
  - a removable label with repositional adhesive applied over said release material spot coating, with the repositional adhesive of said removable label contacting said spot coating; and
  - a permanent piggyback label with permanent adhesive applied to a second portion of said top surface, adjacent but spaced from said first portion.

5,482,755

#### READILY ATTACHABLE AND DETACHABLE COVERINGS FOR SURFACES

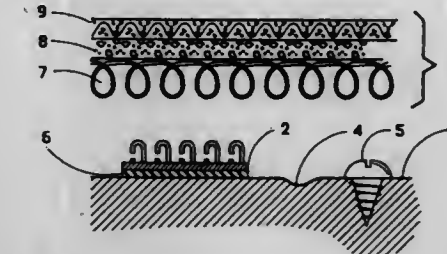
James H. Manning, 43 Butte des Mort Ct., Appleton, Wis. 54914

Filed Apr. 28, 1994, Ser. No. 234,122

Int. Cl.<sup>6</sup> B32B 3/02; 3/06

U.S. Cl. 428—95

7 Claims



- A readily attachable and detachable covering for large surface areas comprising:
  - a flexible laminated surface covering material; and
  - attachment means including a multiplicity of hook members, said hook members being substantially permanently securable to locations on a surface to be covered by said flexible laminated surface covering material, so as to serve as local attachment means for said flexible laminated surface covering material; said flexible laminated surface covering material comprising: 1) an outside loop layer, said loop layer being structured so as to serve as field attachment means for said hook members; 2) a resilient open cell foam layer joined to the loop layer at the surface opposite the surface securable to the hook members; and 3) a dimensionally stable non woven fabric layer joined to the foam layer at the surface opposite the surface joined to the loop layer; wherein the layers of said flexible laminated surface covering material cooperate with each other so that the flexible laminated surface covering



material is drawn taught over the surface to be covered and the loop layer is engaged with the multiplicity of hook members so that the flexible laminated surface covering material lies evenly over the surface to be covered, the flexible laminated surface covering material being dimensionally stable in directions parallel to the surface being covered and being resiliently accommodating in a direction perpendicular to the surface being covered.

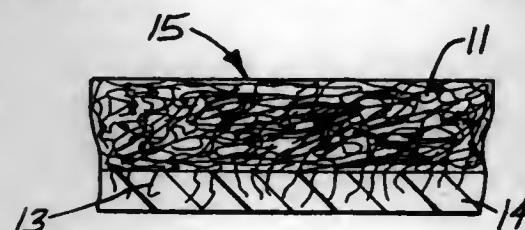
5,482,756

# NONWOVEN SURFACE FINISHING ARTICLES REINFORCING WITH A POLYMER BACKING

Jeffrey L. Berger, Prairie du Chien, and Gary M. Fariss, Stillwater, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 52,816, Apr. 23, 1993, abandoned, which is a continuation of Ser. No. 779,149, Oct. 21, 1991, abandoned, which is a continuation of Ser. No. 501,661, Mar. 29, 1990, abandoned. This application Jul. 22, 1994, Ser. No. 279,065

Int. Cl.<sup>6</sup> B32B 5/06; 5/22; A47K 7/02; B05C 17/02  
U.S. Cl. 428—36.2 17 Claims



1. A surface treating article which is useful as a rotatable disc or an endless belt comprising:

- (a) a nonwoven three-dimensional layer comprising an open, lofty web of crimped synthetic fibers which are adhesively bonded substantially at points of mutual contact with a binder material, the binder material comprising a plurality of abrasive particles, the nonwoven layer having a Shore A durometer ranging from about 25 to 85; and
- (b) a continuous reinforcing polymeric layer having a thickness of about 175 to 1750 micrometers attached to and encapsulating one major surface of the nonwoven layer with fibers from the nonwoven layer extending into and terminating in said polymeric layer to provide a surface which has substantially no fibers protruding therefrom, said polymeric layer providing greater resistance to friction-generated heat during abrasive or polishing application than said one major surface of said nonwoven layer.

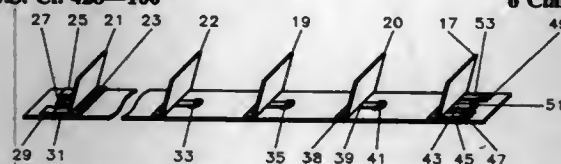
5,482,757

# TARPAULIN PROTECTOR

Martin P. Zutten, and Beverly J. Zutten, both of 8521 SW. 45th St., Topeka, Kans. 66610

Filed Mar. 5, 1993, Ser. No. 28,800  
Int. Cl.<sup>6</sup> B60P 7/04

U.S. Cl. 428—100 6 Claims



2. A tarpaulin protector for use in shipping comprised of:
  - a. Elongated webbing having two opposing ends;
  - b. A plurality of longitudinally spaced-apart, hook-receiving means attached to the webbing;
  - c. A plurality of retractable covering means, each of said covering means attached to the webbing covers one of said hook-

receiving means that can be retracted to allow access to the hook-receiving means;  
d. Releasable end connecting means attached to each end of the webbing so as to allow the two ends to releasably connect together.

5,482,758

Patent Not Issued For This Number

5,482,759

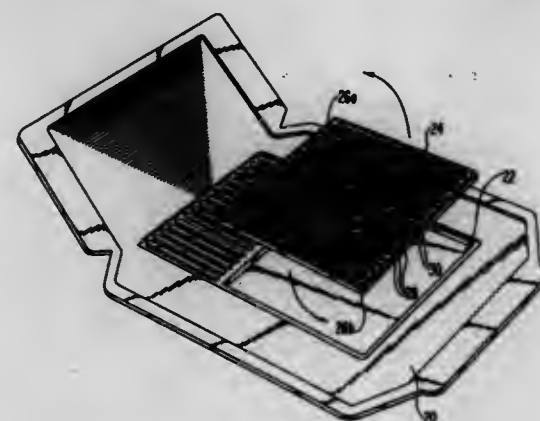
# REVERSIBLE AUTOMOBILE FLOOR MAT

Mario Primeau, St-Léonard, Canada, assignor to Promotions Atlantiques Inc., Longueuil, Canada

PCT No. PCT/CA92/00471, § 371 Date Jul. 6, 1994, § 102(e) Date Jul. 6, 1994, PCT Pub. No. WO93/08040, PCT Pub. Date Apr. 29, 1993

PCT Filed Oct. 21, 1992, Ser. No. 211,715  
Claims priority, application Canada, Jan. 23, 1991, 2054042  
Int. Cl.<sup>6</sup> B32B 3/28

U.S. Cl. 428—167 4 Claims



1. The combination of:
  - (a) an automobile floor mat (20) comprising a substantially centrally disposed, downwardly recessed, flat bottomed area (22); and
  - (b) a reversible portion (24) detachably mounted in said recessed area (22),
 said reversible portion (24) being sized to fit into said recessed area (22) and be detachably held therein by retaining means (32,36) forming part of said reversible portion and said mat, said reversible portion having two opposite sides (26a, 26b), at least one of said two opposite sides being shaped as a pan (26a) and comprising a plurality of spaced apart ridges (30), the space between adjacent ridges within said pan forming a groove for collecting contaminants.

5,482,760

# LIGHT-TRANSMITTING FILM AND METHOD FOR FORMING IMAGES USING THE SAME

Tatsuo Takeuchi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 782,331, Oct. 24, 1991, abandoned. This application Jan. 30, 1995, Ser. No. 380,338  
Claims priority, application Japan, Jan. 26, 1990, 2-286959; Jan. 26, 1990, 2-286960

Int. Cl.<sup>6</sup> B32B 9/00 15 Claims

1. A light-transmitting transparent film, comprising:

5,482,762

# MAGNETIC RECORDING MEDIUM

Setuko Kawahara; Yasushi Nakano; Yuji Shimizu, and Shoji Sugitani, all of Hino, Japan, assignors to Konica Corporation, Japan

Continuation of Ser. No. 718,654, Jun. 21, 1991, abandoned.

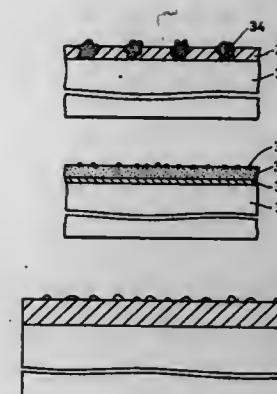
This application Jul. 29, 1993, Ser. No. 99,252

Claims priority, application Japan, Jun. 27, 1990, 2-171220

Int. Cl.<sup>6</sup> G11B 5/66; B32B 7/02; 5/16

U.S. Cl. 428—212 6 Claims

1. A magnetic recording medium having a support and superimposed thereon a 1st magnetic layer and a 2nd magnetic layer each of which contains ferromagnetic powder and a binder in this sequence, wherein said recording medium has a surface fatty acid content of 0.38 to 2.53 micrograms per square centimeter and the 1st magnetic layer contains a binder and a ferromagnetic powder of Co-containing FeOx wherein x represents 1.33 to 1.43.



- a first transparent resin layer which is a base film, said base film including, a heat resistant resin film with a maximum operating temperature of at least 100° C.; and
- a second transparent resin layer, the surface of which is a roughened surface which can be smoothed out by heating and pressure and thereby dispersion of incident light can be prevented, wherein the roughness (R<sub>z</sub>) is 0.1 to 10 μm and said second transparent resin has a free surface.

5,482,763

# LIGHT WEIGHT TEAR RESISTANT FABRIC

Donald E. Shaffer, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 30, 1995, Ser. No. 380,531

Int. Cl.<sup>6</sup> B32B 5/08; 25/10; D03D 1/00; 15/00

U.S. Cl. 428—229 10 Claims



■ COTTON YARN ■ COTTON FILL  
■ REINFORCING YARN

1. A light weight tear resistant fabric comprising a background fabric woven from yarns and meta-aramid reinforcing yarns having a tensile strength that is at least 1.5 times and an elongation that is at least 2 times that of the yarns of the background fabric and being of comparable denier to that of the yarns of the background fabric wherein the number of reinforcing yarn ends per inch (2.54cm) is less than 15% of the number of yarn ends per inch (2.54cm) of the background fabric and the resulting reinforced fabric having a tear resistance that is at least 50% greater than that of the background fabric when measured by the Elmendorf Tear Strength Test.

5,482,761

# LAYERED, ABSORBENT STRUCTURE

Gianfranco Palumbo, Pescara, and Giovanni Carlucci, Chieti, both of, Italy, assignors to The Procter & Gamble Company, Cincinnati, Ohio

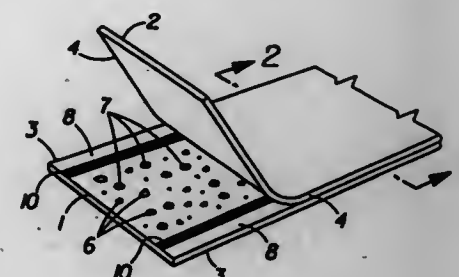
PCT No. PCT/US93/06128, § 371 Date Apr. 17, 1995, § 102(e) Date Apr. 17, 1995, PCT Pub. No. WO94/01069, PCT Pub. Date Jan. 20, 1994

PCT Filed Jun. 25, 1993, Ser. No. 360,765

Claims priority, application Italy, Jul. 3, 1992, TO92A0566

Int. Cl.<sup>6</sup> A61F 13/16; B32B 3/00

U.S. Cl. 428—198 24 Claims



1. A layered, absorbent structure, characterized in that it comprises, in combination, first and second layers (1, 2) of fibrous material and an intermediate layer (5) comprising a hydrogelling, absorbent material (3) distributed between the first and second fibrous layers (1, 2), at least one of the first and second layers (1, 2) being permeable to liquids, and the intermediate layer (5) also comprising a thermoplastic material (7) which bonds at least the first and second fibrous layers (1, 2) together, with the intermediate layer (5) between them, forming discrete, spaced-apart bond points (9).

5,482,764

# METHOD FOR IMPROVING THE BLEACH RESISTANCE OF DYED TEXTILE FIBER AND PRODUCT MADE THEREBY

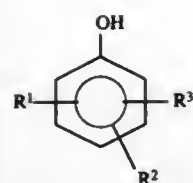
Daniel T. McBride, Chesnee, and Carey N. Barry, Jr., Roebuck, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Feb. 2, 1994, Ser. No. 190,760

Int. Cl.<sup>6</sup> B32B 3/02

U.S. Cl. 428—96 20 Claims

16. A bleach resistant carpet having polyamide or polyester fibers product of the process comprising the steps of:
  - (a) applying to the fibers a solution or dispersion of a compound of the formula:



where  $R^1$  and  $R^2$  are independently selected from the group consisting of H,  $\text{CO}_2\text{R}^4$ ,  $\text{SO}_3\text{H}$ ,  $\text{PO}_3\text{H}$ ,  $\text{CON}(\text{R}^4)_2$ , OH,  $\text{C}_1\text{-C}_4$  alkyl,  $\text{C}_1\text{-C}_4$  alkoxy, and halo, where  $\text{R}^4$  is H or  $\text{C}_1\text{-C}_4$  alkyl;  $\text{R}^3$  is selected from the group consisting of H,  $\text{C}_1\text{-C}_4$  alkyl,  $\text{C}_1\text{-C}_4$  alkenyl,  $\text{C}_1\text{-C}_4$  alkylphenyl and phenyl, any of which may be substituted with up to two groups from  $\text{R}^2$ ; and salts of such compounds, in a solvent selected from the group consisting of water and  $\text{C}_1\text{-C}_4$  alcohol; and  
(b) drying said fiber to evaporate said solvent and deposit a non-volatile coating of said phenolic compound on a surface of said fiber.

5,482,765

# NONWOVEN FABRIC LAMINATE WITH ENHANCED BARRIER PROPERTIES

Stephen S. Bradley, Roswell; David C. Strack, Canton; Randall D. Lowery, Norcross; Deborah J. Zemlock, and Mary K. Lawson, both Alpharetta, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 5, 1994, Ser. No. 223,210  
Int. Cl.<sup>6</sup> D04H 3/03

U.S. Cl. 428—286

14 Claims

1. A nonwoven laminate comprising:  
a first layer of a nonwoven web having a basis weight between 5 and 70 gsm and comprising continuous filaments having an average diameter of greater than 10 microns and being prepared from a thermoplastic polymer;  
a second layer of a nonwoven web having a basis weight between 5 and 70 gsm and comprising filaments having an average diameter of less than 10 microns and being prepared from a mixture of a thermoplastic polyolefin, from about 5 to about 15 weight percent polybutylene, and a fluorocarbon compound in an amount from about 0.1 to 2.0 weight percent to impart low surface tension liquid repellency;  
a third layer of a nonwoven web having a basis weight between 5 and 70 gsm and comprising continuous filaments having an average diameter of greater than 10 microns and being prepared from a thermoplastic polymer;  
wherein said layers are thermally bonded to form a laminate having a ratio of hydrohead to said second layer basis weight of greater than 115 cm/osy, a ratio of resistance to blood penetration to said second layer basis weight of greater than 1 psi/osy, and a ratio of WVTR to hydrohead of less than 75 g/m<sup>2</sup>/day per cm.

5,482,766

# DEEP-DRAWABLE FILM

Thambirajah Mathavan, Munich, and Eberhardt Dous, Steinebach, both of, Germany, assignors to Alkor GmbH Kunststoffe, Munich, Germany

Filed Jun. 21, 1994, Ser. No. 267,592  
Claims priority, application Germany, Jun. 21, 1993, 43 20 474.0; Sep. 7, 1993, 43 20 201.7

Int. Cl.<sup>6</sup> B32B 5/14

U.S. Cl. 428—308.4

21 Claims

1. A deep-drawable laminated film, comprising:  
a polyolefin-containing bottom film which (based on 100 parts by weight of polymer in the film) comprises:  
(d) from about 1 to 60% by weight of at least one partially crosslinked EPDM;



(e) from about 12 to 30% by weight of a propylene homopolymer, copolymer or graft polymer with or without reactive groups;  
(f) from about 77 to 9.5% by weight of at least one polymer and/or ionomer containing reactive groups and based on ethylene and methacrylic acid or acrylic acid, at least some of the acid groups containing a metal ion or being neutralized by metal ions; and  
(g) from about 10 to 0.5% by weight of at least one polymeric crosslinking agent which contains reactive groups and comprises more than about 51% by weight (based on 100 parts by weight of (g)) of ethylene or other olefin groups and from about 1 to 49% by weight of acrylate and/or methacrylate groups and reactive groups, the reactive groups being selected from epoxy, isocyanate, ketone, aldehyde, silane, alkyl halide and/or anhydride groups; and  
at least one polyolefin-containing top film, which differs qualitatively and/or quantitatively from the composition of the bottom film, comprising (based on 100 parts by weight of plastic of the top film)  
(a) from about 20 to 80 parts by weight of at least one crosslinked PP-EPDM (alloy or blend of propylene homo- and/or copolymer and crosslinked or partially crosslinked ethylene-propylene-diene copolymer) and  
(b) from about 80 to 20 parts by weight of an uncrosslinked propylene block copolymer or a heterophase propylene block polymer having an elastomer content of from about 35 to 75% by weight (based on 100 parts by weight of the uncrosslinked heterophase propylene block copolymer or propylene block polymer) in the block or in the chain, from about 15 to 1% by weight of (b) being replaced with the same amount by weight of a polymer and/or ionomer (c) containing reactive groups and being based on ethylene and methacrylic acid and/or acrylic acid, at least some of the acid groups containing metal ions or being neutralized by metal ions.

5,482,767

# LIGHT-TRANSMITTING LAMINATED PANEL AND METHOD OF IMPROVING ITS IMPACT RESISTANCE

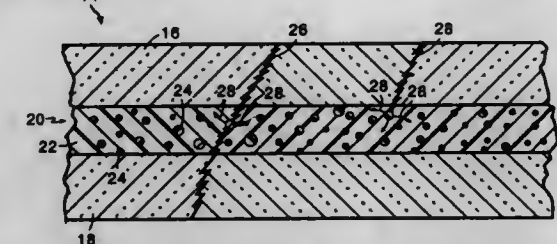
Aristotelis Karagiannis, Northampton, and Peter D. LaPorte, South Hadley, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 29, 1994, Ser. No. 324,181

Int. Cl.<sup>6</sup> B32B 5/16; 17/10

U.S. Cl. 428—327

10 Claims



1. A light-transmitting laminated panel having increased resistance to impact-induced rupture sequentially comprising:  
a) a glass layer;  
b) an optically clear layer comprising a plasticized polyvinyl butyral matrix containing discrete particles of crosslinked polyvinyl butyral integrally randomly dispersed throughout the matrix in sufficient quantity to enhance the impact-resistance of the panel and which in size are visually indistinguishable from the matrix polyvinyl butyral;  
c) another glass layer;

said laminated panel at a specific pummel adhesion having greater mean break height than that of a laminated panel containing layers a), b) and c) but without the impact-resistant enhancing particles of crosslinked polyvinyl butyral in layer b).

5,482,768

# SURFACE-TREATED SUBSTRATE AND PROCESS FOR ITS PRODUCTION

Takeshi Kawasaki, Kazuya Hiratsuka, Takashige Yoneda, Tsuneo Wakabayashi, and Fumiaki Gunji, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

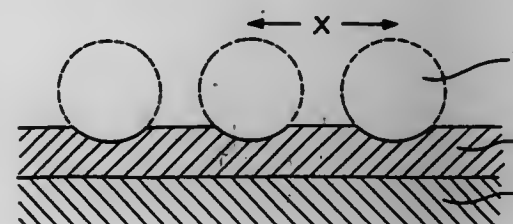
Filed May 13, 1994, Ser. No. 242,675

Claims priority, application Japan, May 14, 1993, 5-136580

Int. Cl.<sup>6</sup> B32B 17/06; C09K 3/18

U.S. Cl. 428—327

16 Claims



1. A surface-treated substrate consisting essentially of a substrate having at least two treated surface layers wherein the first layer constituting the outermost layer among the treated surface layers is a layer formed by treating with a treating agent containing a compound (I) capable of forming a surface having a contact angle of at least 70° against water, and the second layer constituting an underlayer in contact with the outermost layer is a film layer of a heat resistant polymer formed by treating with a treating agent containing a compound (II) capable of forming a film of a heat resistant polymer and fine particles having an average particle size of from 1 to 1,000 nm of a polymer, to form a film and heating the film to thermally decompose the fine particles of a polymer.

5,482,769

# CROSS-LINKED FILM

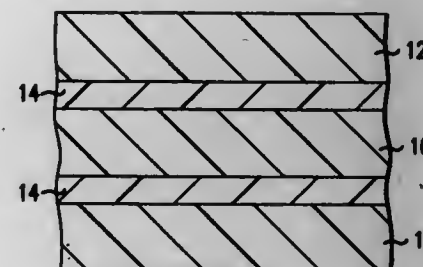
Henry G. Schirmer, Spartanburg, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

Filed Jun. 1, 1994, Ser. No. 252,300

Int. Cl.<sup>6</sup> B32B 27/08

U.S. Cl. 428—335

10 Claims



1. A cross-linkable film comprising  
a) two outer layers comprising a polyolefin or a styrene polymer or copolymer; and  
b) a layer intermediate the outer layers comprising a blend of a polyolefin, a diene polymer and a transition metal catalyst, wherein the film cross-links in the presence of oxygen.

5,482,770

# HIGHLY ORIENTED MULTILAYER FILM

Solomon Bekele, Taylors, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

Continuation-in-part of Ser. No. 970,896, Nov. 3, 1992. This application Mar. 22, 1994, Ser. No. 216,201

Int. Cl.<sup>6</sup> B32B 5/16

U.S. Cl. 428—339

23 Claims



1. An oriented multilayer film, comprising:  
(A) a barrier layer having a thickness of from about 0.01 to 0.75 mils, said barrier layer comprising EVOH having an ethylene content of from about 34 to 60 weight percent;  
(B) at least one orientation-compatible polymeric layer having a modulus of at least about 4x10<sup>4</sup> psi;  
wherein said multilayer film has:  
an orientation ratio of at least 9 at a temperature of from about 165° F. to 212° F. and an oxygen permeability at 0% relative humidity of from about 0.1 and 6 cm<sup>3</sup>-mil/day-m<sup>2</sup>-atm;  
a total thickness of said at least one orientation-compatible layer is from about 0.49 to 4.5 mils; and  
wherein the barrier layer occupies from about 2–15 volume percent of the oriented multilayer film, and the multilayer film has a thickness of from about 0.5–5 mils.

5,482,771

# MOISUTRE BARRIER FILM

Gautam P. Shah, Simpsonville, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

Continuation-in-part of Ser. No. 947,244, Sep. 18, 1992, abandoned. This application Sep. 10, 1993, Ser. No. 116,798

Int. Cl.<sup>6</sup> B32B 7/12

U.S. Cl. 428—349

1 Claim



1. A thermoplastic heat shrinkable multi-layer film comprising:  
(a) a core layer comprising a material selected from the group consisting of:  
i) ethylene alpha olefin copolymer,  
ii) ethylene propylene copolymer,  
iii) rubber modified EPC, and  
iv) ethylene propylene butene terpolymer;  
(b) two intermediate layers, on opposite surfaces of the core layer, comprising a blend of propylene polymer or copolymer, and a hydrocarbon resin; and  
(c) two outer layers comprising a polymeric material selected from the group consisting of:  
i) propylene polymer,  
ii) propylene copolymer,  
iii) ethylene alpha olefin copolymer,  
iv) ionomer,  
v) polybutene, and  
vi) blends thereof.



5,482,772

**POLYMERIC STRANDS INCLUDING A PROPYLENE POLYMER COMPOSITION AND NONWOVEN FABRIC AND ARTICLES MADE THEREWITH**

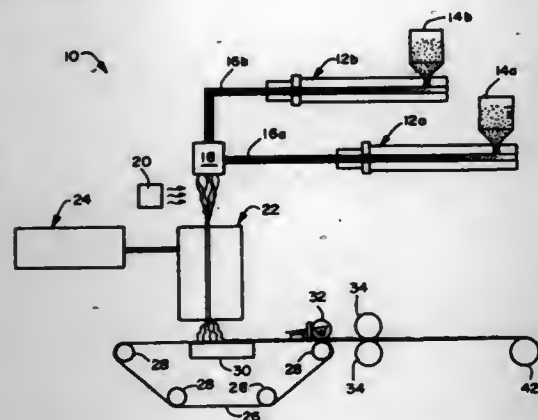
David C. Strack, Canton; Tracy N. Wilson, Woodstock, and Donald V. Willits, Fairburn, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 28, 1992, Ser. No. 997,406

Int. Cl.<sup>6</sup> B32B 49/00

U.S. Cl. 428—357

16 Claims



1. A nonwoven fabric comprising polymeric strands, said polymeric strands comprising a first polymeric component which comprises a blend of:

- (a) a melt-extrudable polyolefin, and
- (b) a polypropylene composition comprising:
  - (i) a first polymer which is a propylene polymer comprising greater than 85% by weight of propylene and having an isotactic index greater than 85;
  - (ii) a second polymer which is a polymer comprising ethylene and being insoluble in xylene at about 23° C.; and
  - (iii) a third polymer which is an amorphous copolymer of ethylene and propylene, the amorphous copolymer being soluble in xylene at about 23° C.

5,482,773

**ACTIVATED CARBON-CONTAINING FIBRIDS**

Thomas L. Bair, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 160,630, Dec. 2, 1993, abandoned, which is a continuation of Ser. No. 724,211, Jul. 1, 1991, abandoned. This application Mar. 9, 1995, Ser. No. 401,326

Int. Cl.<sup>6</sup> B32B 9/00; D02G 3/00; B01D 15/04; C02F 1/42

U.S. Cl. 428—368

7 Claims

1. A non-shedding sheet structure consisting essentially of aramid fibrids, activated carbon particles having a surface area of at least 500 m<sup>2</sup>/g, and from about 2% to 50% by weight fiber floc wherein the activated carbon particles are encapsulated within the fibrids, by the process steps of: dispersing in a mixture containing a solvent and dissolved aramid polymer, carbon particles such that the weight ratio of carbon to polymer in the mixture is from 1:1 to 6:1 and introducing the mixture under vigorous stirring into a liquid which extracts the solvent and causes the polymer to precipitate as fibrid structures encapsulating the activated carbon particles such that the activated carbon particles retain 85 to 95% of their absorbent capacity per gram of carbon compared to that of a control as measured by the adsorption and retention of carbon tetrachloride vapor.

5,482,774

**COMPOSITE PREPEG AND TENNIS RACKETS USING THE SAME**

Kenichi Miyamoto, Akashi, and Haruyoshi Minamiguchi, Nishinomiya, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan

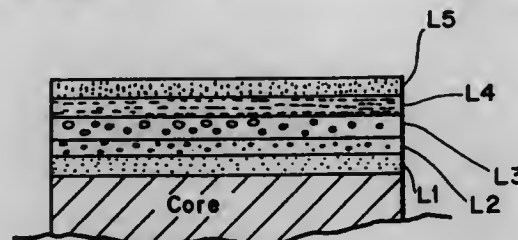
Division of Ser. No. 338,216, Nov. 4, 1994, which is a continuation of Ser. No. 618,607, Nov. 27, 1990, abandoned. This application Apr. 6, 1995, Ser. No. 418,028

Claims priority, application Japan, Nov. 28, 1989, 1-308231

Int. Cl.<sup>6</sup> B32B 1/00; A63B 49/10; 49/12

U.S. Cl. 428—374

3 Claims



1. A tennis racket comprising a circular frame member constituting a ball hitting area and a shaft member connecting with said circular frame member, said frame and shaft members having a plurality of layers structured such that at least one layer is formed from a composite prepreg, said composite prepreg comprising a thermosetting resin and reinforcing fibers embedded therein, wherein said reinforcing fibers are a combination of (a) aromatic polyamide fibers, polyester fibers, or a mixture of aromatic polyamide fibers and polyester fibers and (b) carbon fibers, said fibers (a) are formed into a plurality of first yarn strands and said fibers (b) are formed into a plurality of second yarn strands, a ratio between a diameter of said second yarn strands and a diameter of said first yarn strand is in the range of 2 to 3/4, and said first yarn strands and said second yarn strands are arranged substantially in a plurality of sequential units of said first and second yarn strands therein.

5,482,775

**SILICON COMPOSITION AND ELASTIC ROLLER USING THE COMPOSITION**

Toshiyuki Miyabayashi, Okaya, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 472,875, Jan. 31, 1990, abandoned.

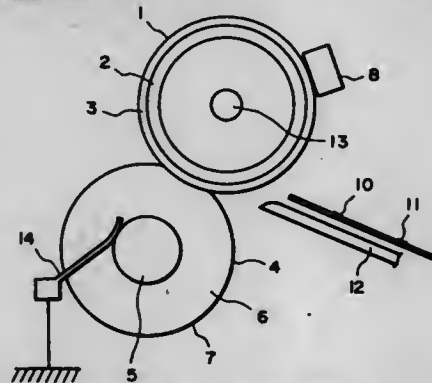
This application Sep. 24, 1993, Ser. No. 126,006

Claims priority, application Japan, Feb. 2, 1989, 64-025276; Sep. 14, 1989, 64-238954

Int. Cl.<sup>6</sup> B32B 9/00; 25/20

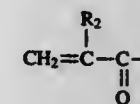
U.S. Cl. 428—391

10 Claims



1. An elastic roller having a surface layer of a solid silicone rubber composition, said solid silicone rubber composition having been prepared by reacting a silicone composition mixture comprising (A) a vinyl group-containing organopolysiloxane, (B) an organohydrogenpolysiloxane, and (C) an unsaturated ester compound

having (i) a perfluoroalkyl group containing 1–20 carbon atoms, (ii) a vinyl group represented by the formula



wherein  $\text{R}_2$  is hydrogen or methyl and (iii) a polyoxyethylene group having 5–30 ethylene oxide units, said mixture having been reacted in the presence of a platinum-based catalyst.

5,482,776

**VISCOSE RAYON FIBER HAVING SUPERIOR APPEARANCE**

Kazunari Nishiyama, and Koichi Konomoto, both of Noboka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 858,428, Mar. 24, 1992, abandoned, which is a continuation of Ser. No. 414,665, Sep. 29, 1989, abandoned. This application Mar. 25, 1994, Ser. No. 218,304

Claims priority, application Japan, Jan. 5, 1988, 63-249981; May 2, 1989, 1-112165

Int. Cl.<sup>6</sup> D02G 3/00

U.S. Cl. 428—400

5 Claims



1. A viscose rayon fiber having superior appearance characterized in that a number of microfibrillar stripes are arranged over all of the surface of the viscose rayon fiber and the number of stripes is one or more per 1 μm<sup>2</sup>.

5,482,777

**MAGNETIC RECORDING MEDIA AND COMPOSITION CONTAINING A SPECIFIED POLYURETHANE BINDER**

Masahiro Yamakawa, Kawasaki, and Katsuya Nakamura, Tokyo, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 634,723, Dec. 27, 1990, abandoned.

This application Jun. 15, 1993, Ser. No. 76,703

Claims priority, application Japan, Dec. 27, 1989, 1-339096; Feb. 2, 1990, 2-23778; Feb. 2, 1990, 2-23780; Nov. 28, 1990, 2-323235

Int. Cl.<sup>6</sup> G11B 5/00

U.S. Cl. 428—425.9

21 Claims

1. A magnetic recording composition comprising a binder, and a magnetic powder dispersed therein, wherein the binder comprises 10–90% by weight of a polyurethane resin and at least one other polymeric binder, said polyurethane resin being formed by the reaction of diisocyanate, monomeric polyol and polymeric linear diol in amounts of diisocyanate and monomeric polyol to provide an NCO/OH equivalent ratio of 1.2/1 to 2/1, said monomeric polyol being selected from the group consisting of trimethylolpropane, trimethylethane, glycerol, pentaerythritol and triethanolamine, said polyurethane resin comprising, on average, 2.3 isocyanate groups per molecule, and having a number average molecular weight of at least 2,000 but no more than about 6,000, and said

polyurethane containing less than 20% of a molecular weight fraction with a molecular weight of no more than 1,000; and, said at least one other polymeric binder having at least one functional group substituted from the group consisting of —SO<sub>2</sub>M, —SO<sub>3</sub>M, —SO<sub>2</sub>M, —COOM, —NH<sub>2</sub>, —N<sup>+</sup>R<sup>1</sup>, —OH, a phosphoric acid group and a phosphoric acid ester group, wherein R<sup>1</sup> represents an alkyl group, an allyl group, an alkenyl group or an alkoxy group, and M represents a hydrogen atom or an alkali metal.

5,482,778

**METHOD OF MAKING METAL MATRIX COMPOSITE WITH THE USE OF A BARRIER**

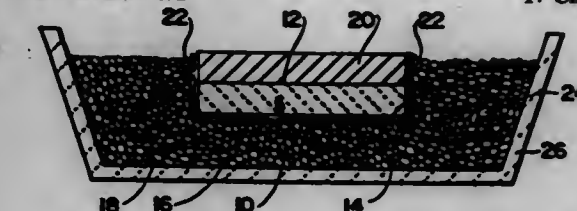
Michael K. Aghajanian, Bel Air, Md., and Terry D. Claar, Newark, Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation of Ser. No. 934,823, Aug. 24, 1992, Pat. No. 5,277,989, which is a continuation of Ser. No. 657,286, Feb. 19, 1991, Pat. No. 5,141,819, which is a continuation of Ser. No. 415,088, Sep. 29, 1989, abandoned, which is a continuation of Ser. No. 141,642, Jan. 7, 1988, Pat. No. 4,935,055. This application Jan. 10, 1994, Ser. No. 179,463

Int. Cl.<sup>6</sup> C04B 35/00

U.S. Cl. 428—472

17 Claims



1. A lay-up for producing a metal matrix composite body, comprising:

- (a) a permeable mass consisting essentially of at least one substantially non-reactive filler material;
- (b) a gas-permeable barrier means for defining at least a portion of at least one surface boundary of said permeable mass, said barrier means contacting said permeable mass; and
- (c) at least one body of a matrix metal comprising aluminum and at least about one percent by weight of magnesium, said at least one matrix metal body contacting said permeable mass at a contacting zone such that said barrier means is at least partially spaced from said contacting zone.

5,482,779

**LABEL AND PROCESS FOR MANUFACTURING A LABEL**

Volker Bausewein, and Dieter Ludebühl, both of Rothenberg, Germany, assignors to Eselte Meto International Produktions GmbH, Hirschhorn, Germany

Filed Jan. 5, 1994, Ser. No. 177,594

Claims priority, application Germany, Jan. 9, 1993, 43 00 411.3

Int. Cl.<sup>6</sup> B41M 5/10

U.S. Cl. 428—488.4

20 Claims



1. A self-adhesive label, such as a price tag label, for being adhered to, and removed from a product, said label comprising: a first material, said first material having a first side and a second side, said first side of said first material for the printing of information thereon;

a second material, said second material being disposed adjacent said second side of said first material, said second material comprising:

a sheet material, said sheet material having a first side and a second side, said first side of said sheet material being disposed towards said second side of said first material, and said second side of said sheet material being disposed away from said first material;

a first adhesive disposed on said first side of said sheet material for bonding said sheet material to said first material;

a second adhesive disposed on said second side of said sheet material for bonding said sheet material to a product;

said second adhesive having a first adhesive strength for bonding of said second adhesive to a product;

said second adhesive having a second adhesive strength for bonding of said second adhesive to said second side of said sheet material; and

said second adhesive strength for bonding of said sheet material and said second adhesive being greater than said first adhesive strength for bonding of said second adhesive and a product for maintaining at least a substantial portion of said second adhesive on said sheet material upon removal of said label from a product.

5,482,780

#### POLYPROPYLENE FILM WITH COLD SEAL RELEASE AND COLD SEAL RECEPTIVE SURFACES

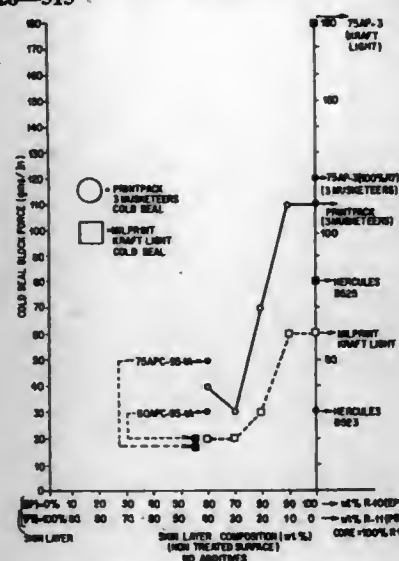
Andrew F. Wilkie, Haverhill, and Michael D. Butler, North Andover, both of Mass., assignors to Borden, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 224,229, Apr. 7, 1994. This application May 23, 1994, Ser. No. 247,830

Int. Cl.<sup>6</sup> B32B 27/08

U.S. Cl. 428—515

17 Claims



1. A coextruded biaxially oriented polypropylene packaging film comprising:

A. a 70 to 150 gauge core layer fabricated of isotactic polypropylene homopolymer;

B. said core layer having on one side thereof:

a 2 to 10 gauge cold seal release layer comprising a blend of (a) about 25% to 80% by weight of an ethylene-propylene random copolymer containing about 2% to 8% of ethylene (b) 20% to 75% by weight of an ethylene-butylene copolymer containing about 0.5% to 6% by weight of ethylene and about 94 to 99.5% of butylene and (c) a non-migratory slip agent in an amount sufficient to decrease the coefficient of friction of the release layer; and

C. said core layer having on the other side thereof a 1 to 10 gauge cold seal receptive skin layer fabricated of an ethylene-

propylene random copolymer containing from about 2% to 8% of ethylene and 92 to 98% of propylene, said cold seal receptive skin layer having an outer surface which has been surface modified to make it more receptive to a cold seal cohesive composition.

5,482,781

#### PROCESS FOR RESTRENGTHENING DAMAGED PAPER AND PRODUCT PRODUCED THEREBY

Jürgen Wittekind, and Karl-Heinz Scherer, both of Frankfurt, Germany, assignors to Battelle Ingenieurtechnik GmbH, Eschborn, Germany

Continuation of Ser. No. 99,044, Jul. 29, 1993, abandoned.

This application Nov. 10, 1994, Ser. No. 337,571

Claims priority, application Germany, Aug. 4, 1992, 42 24 780.8

Int. Cl.<sup>6</sup> B32B 29/00; 35/00

U.S. Cl. 428—537.5

8 Claims

1. A process for restrengthening damaged paper which comprises treating the damaged paper with an isocyanate compound and hexamethyldisiloxane solvent in at least a solution form.

5,482,782

#### SLIDING-CONTACT MATERIAL EXCELLENT IN CORROSION RESISTANCE AND WEAR RESISTANCE, AND METHOD OF MANUFACTURING THE SAME

Tadashi Tanaka; Masaaki Sakamoto; Koichi Yamamoto; Tsukimitsu Higuchi, and Kouki Ozaki, all of Nagoya, Japan, assignors to Daido Metal Company Ltd., Nagoya, Japan

Filed Nov. 29, 1994, Ser. No. 350,013

Claims priority, application Japan, Dec. 28, 1993, 5-336533

Int. Cl.<sup>6</sup> B22F 5/00

U.S. Cl. 428—553

9 Claims

1. A sliding-contact material excellent in corrosion resistance and wear resistance, comprising a backing steel plate optionally plated with Cu, and a layer of sintered copper alloy formed on one of the surfaces of the backing steel plate, wherein said sintered copper alloy consists essentially of 4 to 20 wt % Sn, 1 to 10 wt % Ni, 0.05 to 1 wt % B, and balance of Cu and incidental impurities, and said sintered copper alloy has a Vickers hardness not less than Hv 100 and is essentially devoid of P.

5,482,783

#### VANE RAIL STOCK FOR AIR TURNING ASSEMBLY

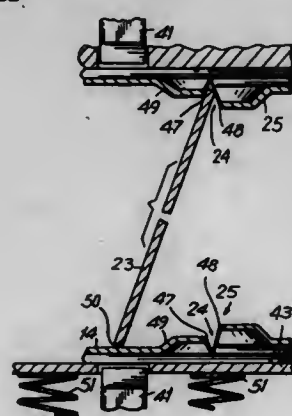
John E. Lyons, Levittown, and Joseph Magrane, Farmingdale, both of N.Y., assignors to Duro Dyne Corporation, Farmingdale, N.Y.

Filed Apr. 29, 1991, Ser. No. 692,990

Int. Cl.<sup>6</sup> F15D 1/04

U.S. Cl. 428—582

2 Claims



1. In a sheet metal vane rail stock material for the reception of air turning vanes of the type which comprises an elongate, generally planar metal strip having a plurality of longitudinally spaced vane edge receiving protuberances deflected from the plane of said strip, the protuberances being located along a common line perpendicular to the longitudinal axis of said strip, the protuberances including a slot or slots formed therein, said slots being angularly oriented relative to the longitudinal center line of said strip, whereby projections of said slots intersect and define an obtuse angle having an apex located substantially at said center line, the improvement which comprises said strip being resilient and said slots of said protuberances being defined by a lead wall and a trailing wall, said trailing wall being spaced further from the plane of said strip than said lead wall, said protuberances including an incline portion sloping away from the plane of said strip toward and terminating generally at said lead wall, whereby an edge portion of an air turning vane advanced along said strip in the direction from said lead wall toward said trailing wall will coact with said incline portion and deflect said strip away from said edge portion until said edge portion is blocked from further movement in said direction by said trailing wall and enters said slot or slots.

5,482,784

#### PRINTED CIRCUIT INNER-LAYER COPPER FOIL AND PROCESS FOR PRODUCING THE SAME

Muneharu Ohara, Hasuda, and Masakazu Mitsuhashi, Kitadachi, both of Japan, assignors to Mitsui Mining and Smelting Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1994, Ser. No. 359,871

Claims priority, application Japan, Dec. 24, 1993, 5-345893

Int. Cl.<sup>6</sup> C25D 7/06; B32B 15/20

U.S. Cl. 428—607

3 Claims



1. A printed circuit inner-layer copper foil having inverted tear drop-shaped fine nodules formed on both surfaces thereof each having surface roughness  $R_z=1$  to  $8 \mu\text{m}$ , the nodules having a length of 0.6 to  $1.0 \mu\text{m}$  and a maximum diameter of 0.2 to  $0.8 \mu\text{m}$ .

5,482,785

#### MAGNETIC RECORDING MEDIUM HAVING AN INTERMEDIATE LAYER COMPRISING UNIFORM SIZE GLOBULES OF AG SN PERITECTIC ALLOY

Nader Mahvan; Atef H. Eltoukhy, both of Santa Clara; Edward Teng, Sunnyvale, and Hung-Chang W. Huang, San Jose, all of Calif., assignors to StorMedia, Inc., Santa Clara, Calif.

Division of Ser. No. 959,986, Oct. 13, 1992. This application

Nov. 29, 1994, Ser. No. 346,474

Int. Cl.<sup>6</sup> G11B 5/00

U.S. Cl. 428—611

4 Claims

1. Thin film magnetic recording media having enhanced magnetic and textured properties, said media comprising:

a substrate;

a seed layer, comprising substantially uniformly sized but mutually dispersed globules of a substantially homogenous and peritectic alloy formed on said substrate by sputter deposition



from a substantially homogenous target, comprising a substantially homogenous and peritectic alloy;

a magnetic recording layer sputter coated over said substantially uniformly sized globules of said substantially peritectic alloy seed layer, while

substantially maintaining the homogeneity of said peritectic alloy in its sputtering transition from said sputtering target to said substrate and while said magnetic recording layer is formed;

the presence of said substantially homogenous and peritectic seed layer

providing said substantially uniform sizing of said dispersed globules of peritectic alloy,

inducing a substantially uniform surface roughness for said sputter coated magnetic recording layer,

orienting the crystal orientation of said magnetic recording layer such that the axis of easy magnetization generally lies in the film plane of said media, and

substantially reducing the magnetic variation in the film plane of said magnetic, recording layer; and

the thickness of said seed layer being formed within a range of about fifty (50) to one hundred (100) angstroms, with said seed layer thickness

substantially minimizing modulation properties of said magnetic recording layer, and

substantially, nearly equalizing coercivity of said magnetic recording layer as measured tangentially along the recording trace and as measured orthogonally of said tangential measurement; and

said media having substantially uniform sizing of said globules obtained in response to

the peritectic character of said peritectic alloy forming said seed layer, and

said substantial maintenance of homogeneity of said peritectic alloy;

said peritectic alloy comprising about seventy five (75) percent, by weight, silver and about twenty five (25) percent by weight tin;

the homogeneity of said peritectic alloy globules resulting, during equilibrium solidification of said peritectic alloy globules on said substrate, from reaction of solid and liquid components of said alloy prior solidification of said globules, to form a single, homogenous, peritectic alloy; and

said dispersed globules of peritectic alloy being substantially free of reaction with said magnetic recording layer and manifesting a generally uniform, globular configuration array underlying said magnetic recording layer.

5,482,786

Patent Not Issued For This Number



5,482,787

# ORGANIC COMPOSITE COATED STEEL STRIP HAVING IMPROVED CORROSION RESISTANCE AND SPOT WELDABILITY

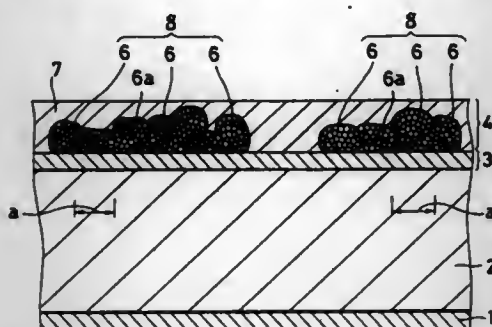
Shigeko Sujita, and Nobuyuki Morito, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Japan  
Continuation of Ser. No. 865,916, Apr. 9, 1992, abandoned.

This application Oct. 12, 1993, Ser. No. 135,311

Claims priority, application Japan, Apr. 12, 1991, 3-108359  
Int. Cl.<sup>6</sup> B32B 15/08

U.S. Cl. 428—623

5 Claims



1. An organic composite coated steel strip having improved corrosion resistance and spot weldability, comprising a zinc or zinc base alloy plated steel substrate, a chromate layer on the substrate containing up to 70% by weight of  $\text{Cr}^{6+}$  based on the total chromium quantity, said chromate layer being coated in a weight of 5 to 500  $\text{mg}/\text{m}^2$  in terms of elemental chromium, and an organic composite layer on said chromate layer mainly comprising silica and an organic high molecular weight resin, wherein
  - (a) said silica has an average primary particle size of 5 to 30 nm,
  - (b) said silica is agglomerated in said organic composite layer into plate shaped secondary agglomerates having an outer surface, an average thickness of 0.2 to 2  $\mu\text{m}$  and an average diameter of 5 to 300  $\mu\text{m}$ , said silica containing silanol groups which are not in direct contact with surrounding organic high molecular weight molecules of said resin to hold zinc corrosion products upon exposure to a corrosive environment, and
  - (c) said organic composite layer being coated to a dry weight of 0.1 to 3  $\text{g}/\text{m}^2$ .

5,482,788

# ARTICLE HAVING A PROTECTIVE COATING SIMULATING BRASS

Stephen R. Moysan, III, Douglassville, and Rolin W. Sugg, Reading, both of Pa., assignors to Baldwin Hardware Corporation, Reading, Pa.

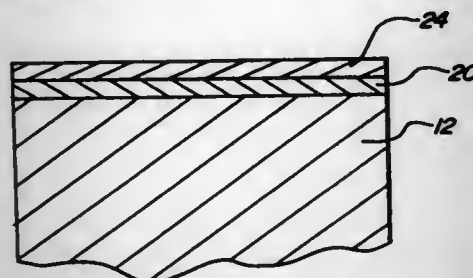
Filed Nov. 30, 1994, Ser. No. 346,801

The portion of the term of this patent subsequent to May 9, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> B32B 15/04; C25D 3/56

U.S. Cl. 428—627

19 Claims



1. An article comprising a metallic substrate having disposed on at least a portion of its surface a coating simulating brass comprising:

metallic layer comprised of substantially amorphous nickel-tungsten-boron alloy containing at least about 0.05 weight percent boron; and a top layer comprised of zirconium compound or titanium compound.

5,482,789

# NICKEL BASE SUPERALLOY AND ARTICLE

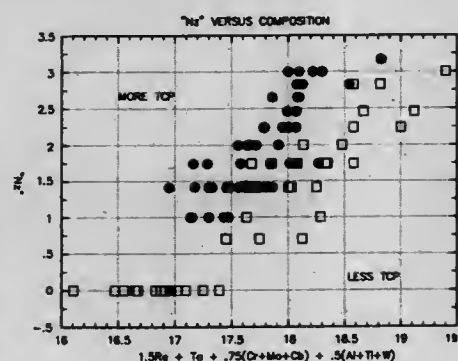
Kevin S. O'Hara, Boxford, Mass.; William S. Walston, Maineville, Ohio; Earl W. Ross, Cincinnati, Ohio, and Ramgopal Darolia, W. Chester, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jan. 3, 1994, Ser. No. 176,613

Int. Cl.<sup>6</sup> C22C 19/05; B32B 15/00

U.S. Cl. 428—652

9 Claims



1. A nickel base superalloy single crystal article having an improved combination of stress rupture life and microstructural stability and which minimizes the detrimental formation of topologically close packed phases in the superalloy microstructure at elevated temperatures, the superalloy single crystal article characterized by a specific combination of Ru with a first group of elements consisting of Mo, Cr and Cb in a first range defined by their sum in atomic percent, and a second group of elements consisting of Al, Ti and W in a second range defined by their sum in atomic percent, the composition of the superalloy article consisting essentially of, in atomic percent:
  - about 0.25–4.0% (about 0.4–6.5 weight %) Ru, in combination with about 1.5–1.95% (about 4.5–5.75 weight %) Re, about 2.0–3.7% (about 5.8–10.7 weight %) Ta, about 4.0–16.0% (about 4.25–17.0 weight %) Co, about 0–0.16% (about 0–0.05 weight %) Hf, about 0–0.03% (about 0–0.06 weight %) C, 0–0.05% (about 0–0.01 weight %) B, about 0–0.03% (about 0–0.02 weight %) Y, 0.6–1.25% (about 0.9–2.0 weight %) Mo, about 1.5–7.2% (about 1.25–6.0 weight %) Cr, about 0–0.7% (about 0–1.0 weight %) Cb, 12.0–15.0% (about 5.0–6.6 weight %) Al, about 0–1.3% (about 0–1.0 weight %) Ti, about 1.0–2.5% (about 3.0–7.5 weight %) W, wherein the sum of the first range, defined by the first group of elements consisting of Mo+Cr+Cb, is about 1.5–8.0%, and wherein the sum of the second range, defined by the second group of elements consisting of Al+Ti+W, is about 13.5–17.2%, the balance Ni and incidental impurities.

5,482,790

# FUEL CELL POWER GENERATION SYSTEM

Shuji Yamada; Motoya Kanda, both of Yokoyama; Hiroyasu Yoshizawa, Omiya, and Atsuo Sonai, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

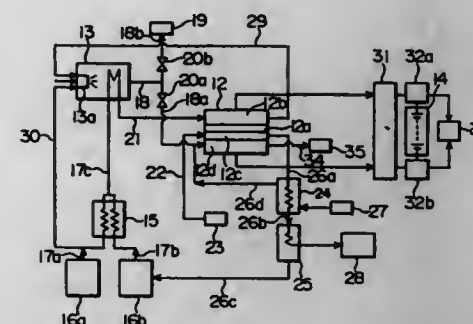
Continuation of Ser. No. 106,978, Aug. 16, 1993, Pat. No. 5,434,015. This application May 1, 1995, Ser. No. 431,970

Claims priority, application Japan, Sep. 8, 1992, 4-239588; Apr. 2, 1993, 5-76761

Int. Cl.<sup>6</sup> H01M 16/00

U.S. Cl. 429—9

16 Claims



1. A fuel cell power generation system comprising:
  - a reforming unit for heating and decomposing a raw material composed of a liquid fuel and water as main components using combustion gas to produce hydrogen gas;
  - a fuel cell for continuously supplying electric power to a load, said fuel cell comprising an electrolytic layer, a fuel electrode disposed along one main surface of said electrolytic layer, and an oxygen electrode disposed along another main surface of said electrolytic layer, wherein said fuel electrode takes said hydrogen gas produced in said reforming unit and said oxygen electrode takes oxygen so as to generate electric energy;
  - a secondary cell for supplying a quantity of electric energy required for operating said load at least during an initial time until the generation of electric energy is started with said fuel cell or at a time when the magnitude of said load varies; and means for shifting the power source of electric energy to be supplied to said load from said fuel cell to said secondary cell or from said secondary cell to said fuel cell,
 wherein said electrolytic layer of said fuel cell is composed of a film of high molecular weight material having ionic electrical conductivity, and said secondary cell is a secondary lithium cell consisting of a nonaqueous solution based material or a solid electrolyte based material as an electrolyte, said secondary cell disposed in thermal-coupled relation with other components of the power generation system such as to operate reliably in a working temperature ranging from 40° to 100° C.

5,482,791

# FUEL CELL/GAS TURBINE COMBINED POWER GENERATION SYSTEM AND METHOD FOR OPERATING THE SAME

Hiroshi Shingai, and Hideo Nishigaki, both of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan  
Filed Jan. 26, 1994, Ser. No. 186,512

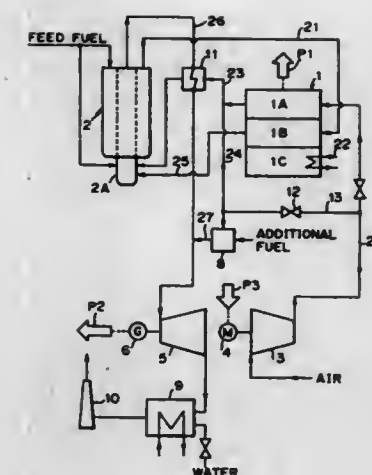
Claims priority, application Japan, Jan. 28, 1993, 5-012058; May 7, 1993, 5-105767

Int. Cl.<sup>6</sup> H01M 16/00

U.S. Cl. 429—23

33 Claims

1. A fuel cell/gas turbine combined power generation system comprising:
  - a high pressure fuel cell which generates power with a reformed fuel gas and pressurized air as reactant gases;
  - a reformer which feeds said reformed fuel gas to said fuel cell;
  - an air compressor which feeds said pressurized air to said fuel cell;



an auxiliary burner which burns additional fuel added thereto with off gas from said fuel cell to form a combustion gas; a gas turbine which obtains power from a working fluid comprising said combustion gas from said auxiliary burner; and a generator driven by an axial output power of said gas turbine.

5,482,792

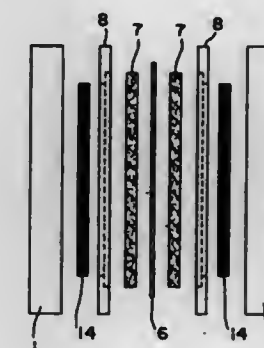
# ELECTROCHEMICAL CELL PROVIDED WITH ION EXCHANGE MEMBRANES AND BIPOLAR METAL PLATES

Giuseppe Falta, Novara, and Claudio Mantegazza, Saronno, both of Italy, assignors to De Nora Permelec S.p.A., Italy  
Filed Apr. 13, 1994, Ser. No. 227,006

Claims priority, application Italy, Apr. 30, 1993, MI93A0857  
Int. Cl.<sup>6</sup> H01M 8/00; 2/20

U.S. Cl. 429—30

22 Claims



1. A fuel cell comprising pressure plates (17), bipolar plates (1) or end plates (18) made of metals, or metal alloys, provided with holes (2) for feeding the gaseous reactants and removing the products and the residual reactants, current collectors (14) permeable to gas flow, electrocatalytic porous electrodes (7), ion exchange membranes (6) and gasket-frames (8) characterized in that said collectors (14) consist of a porous electroconductive material having residual deformability and resiliency under compression and are provided with a multiplicity of limited area contact points  
said electrodes are not bonded to the ion exchange membranes before assembling the fuel cell  
said metals or metal alloys of the bipolar plates and end plates are made of metals or metal alloys capable of forming a protective oxide.

5,482,793

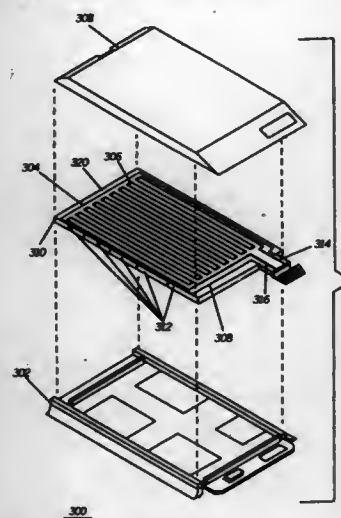
## ASSEMBLY HAVING IMPROVED THERMAL SENSING CAPABILITY

Arthur G. Burns; Jose M. Fernandez, and Robert D. Kreisinger, all of Plantation, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 4, 1993, Ser. No. 131,234  
Int. Cl.<sup>6</sup> H01M 10/50

U.S. Cl. 429—62

2 Claims



1. A battery assembly, comprising:  
a battery having a major surface; and  
a battery housing which supports the battery, the battery housing having a temperature sensing trace located in thermal proximity to the major surface of the battery, said temperature sensing trace being etched onto the battery housing.

5,482,794

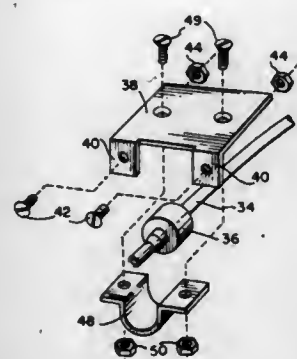
## SINGLE POINT BATTERY WATERING SYSTEM WITH INLET MOUNTING BRACKET

Dennis Mead, 9 Meetinghouse Rd., Keene, N.H. 03431; Edward C. Ackroyd, 78 Thompson Lake Rd., East Berne, N.Y. 12059, and Thomas J. Gemmell, R.R. 2 Box 143-E, Peterborough, N.H. 03458

Filed Feb. 21, 1995, Ser. No. 391,014  
Int. Cl.<sup>6</sup> H01M 2/36

U.S. Cl. 429—73

3 Claims



1. A single point watering system for a battery having a plurality of cells, comprising a continuous tube interconnecting said cells of the battery, a battery casing having at least one end wall having a portion thereof extending above an upper surface of said cells, bracket means secured to said portion of said end wall and overlying at least one cell of the battery wherein said single point watering system is provided with an inlet fitting on said tube and clamping means are provided for securing said inlet fitting to said bracket means.

5,482,795

## SOLID ELECTROLYTE UTILIZING A POLYMERIC MATRIX OBTAINED BY THE POLYMERIZATION OF A SUBSTITUTED ALLYLIC CHLOROFORMATE

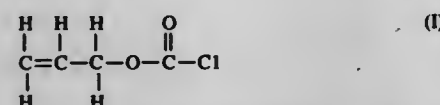
Benjamin Chaloner-Gill, 520 Mansion Ct., #303, Santa Clara, Calif. 95054

Filed May 25, 1994, Ser. No. 249,002  
Int. Cl.<sup>6</sup> H01M 2/16; 6/18

U.S. Cl. 429—192

41 Claims

20. An electrolytic cell which comprises:  
(i) an anode comprising a compatible anodic material,  
(ii) a cathode comprising a compatible cathodic material, and  
(iii) interposed therebetween a single phase, solid, solvent-containing electrolyte which comprises a solid polymeric matrix, an inorganic ion salt, and a solvent,  
wherein said solid polymeric matrix was obtained by polymerizing a substituted allylic chloroformate formed by the reaction of an allylic chloroformate of formula (I):



and an aliphatic reactant selected from the group consisting of monohydroxy alcohols having 1 to 11 carbon atoms or the sodium salts thereof, dihydroxy alcohols having 2 to 50 carbon atoms or the sodium salts thereof, primary monoamines having 1 to 7 carbon atoms or the sodium salts thereof, and secondary diamines having 2 to 12 carbon atoms or the sodium salts thereof, and mixtures of two or more of the foregoing.

5,482,796

ELECTROCHEMICAL CELL COMPRISING GAMMA MNO<sub>2</sub> CATHODE HAVING FILAMENTARY PROTRUSIONS

Enoch I. Wang, Attleboro; Lifun Lin, Lincoln, both of Mass., and William L. Bowden, Nashua, N.H., assignors to Duracell Inc., Bethel, Conn.

Division of Ser. No. 122,966, Sep. 20, 1993, Pat. No. 5,348,726, which is a division of Ser. No. 952,034, Sep. 28, 1992, Pat. No. 5,277,890. This application May 3, 1994, Ser. No. 237,434

Int. Cl.<sup>6</sup> H01M 4/50

U.S. Cl. 429—194

15 Claims



1. An electrochemical cell having MnO<sub>2</sub> cathode active material in said cell, wherein the MnO<sub>2</sub> material comprises particles the surfaces of which comprise gamma MnO<sub>2</sub> having filamentary protrusions radiating outwardly from the particles, said filamentary protrusions being visible at a magnification of between about 200 and 2000 times actual size and not visible at a magnification of less than about 200 times actual size.

5,482,797

## NONAQUEOUS SECONDARY BATTERY

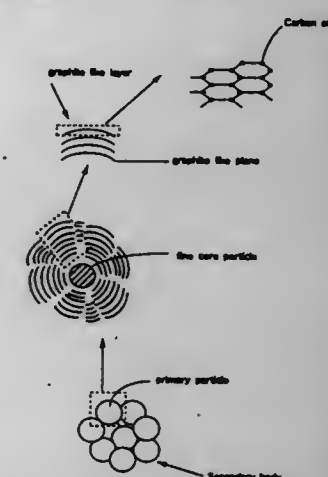
Kazuo Yamada; Hideaki Tanaka, both of Nara; Tetsuya Yoneda, Nabari; Takehito Mitate, Yamatotakada, and Hiroyuki Kitayama, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 14, 1994, Ser. No. 196,032

Claims priority, application Japan, Feb. 16, 1993, 5-026596  
Int. Cl.<sup>6</sup> H01M 4/02

U.S. Cl. 429—218

7 Claims



1. A nonaqueous secondary battery comprising a cathode, an anode and a nonaqueous electrolyte disposed and sealed between the cathode and the anode wherein the anode is made of a carbon material as its active material, in which the carbon material comprises fine core particle of a metal or an alloy thereof, and a carbon layer which is arranged and stacked in an onion-like shell configuration centering on each fine core particle,  
at least part of the carbon layer having a crystal structure in which graphite-like layers are stacked and the fine core particles having an average diameter of about 10 to 150 nm.

5,482,798

## ALKALINE MANGANESE BATTERY

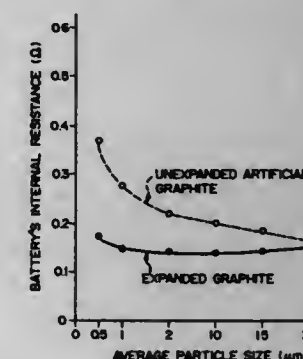
Yuji Mototani, Yawata; Junichi Asaoka, Ikoma, and Hitoshi Tanaka, Sapporo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 20, 1995, Ser. No. 406,595

Claims priority, application Japan, Mar. 28, 1994, 6-057335  
Int. Cl.<sup>6</sup> H01M 4/50

U.S. Cl. 429—224

4 Claims



1. An alkali-manganese battery having a positive electrode active material which comprises primarily manganese dioxide and electroconductive carbon material, said electroconductive carbon material comprising expanded graphite particles having an average particle size in the range from 0.5 to 15 μm.

5,482,799

## PHASE SHIFT MASK AND MANUFACTURING METHOD THEREOF

Akihiko Isao; Susumu Kawada, both of Saitama, and Nobuyuki Yoshioka, Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha; Dainippon Printing Co., Ltd., both of Tokyo, and Ulvac Coating Corporation, Saitama, all of Japan

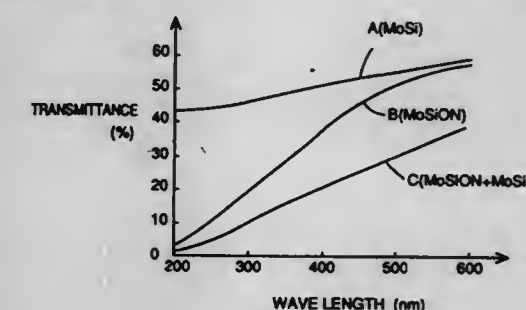
Filed Oct. 5, 1994, Ser. No. 318,156

Claims priority, application Japan, Jan. 8, 1993, 5-253198;  
Sep. 7, 1994, 6-214002

Int. Cl.<sup>6</sup> G03F 9/00

U.S. Cl. 430—5

7 Claims



1. A phase shift mask, comprising:  
a substrate transmitting exposure light; and  
a phase shifter portion formed in a predetermined region on said substrate for converting a phase angle of said transmitted exposure light by approximately 180° and having a transmittance of 3–20% of said transmitted exposure light,  
wherein said phase shifter portion includes a monolayer film formed of an approximately homogeneous material, and a transmitting film whose transmittance is less dependent on a wavelength when used in combination with said monolayer film.

5,482,800

## EXPOSURE MASK FOR FABRICATING MICROLENSSES

George Gal, Palo Alto, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.  
Division of Ser. No. 982,514, Nov. 27, 1992, Pat. No. 5,310,623. This application Sep. 1, 1993, Ser. No. 115,888

Int. Cl.<sup>6</sup> G03F 1/14

U.S. Cl. 430—5

2 Claims



1. An exposure mask constructed to produce in a photoresist material a replica of a microlens having a single valued asymmetric surface, using a single exposure mask, said exposure mask comprising:  
a layer of mask material which blocks transmission of light through the material,  
a plurality of precisely located and sized light transmitting openings in the mask material and formed with sufficiently small specific opening sizes and located at a sufficiently large number of specific locations, correlated to related locations on the single valued asymmetric surface of the microlens to be formed.



produced in a photoresist material so that, after exposure of the photoresist material to light transmitted through the openings and after processing the exposed photoresist material, photoresist material replica having the single valued asymmetric surface can be obtained and wherein the light transmitting openings are located to produce a step function discontinuity in the surface of the microlens photoresist material replica.

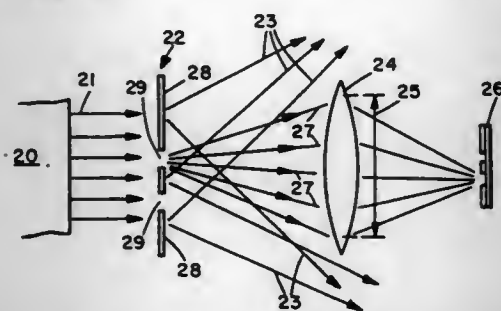
5,482,801

**HIGH POWER PHASE MASKS FOR IMAGING SYSTEMS**  
Adlai H. Smith, San Diego, and Robert O. Hunter, Jr., Rancho Santa Fe, both of Calif., assignors to Litel Instruments, San Diego, Calif.

Division of Ser. No. 833,939, Feb. 10, 1992, Pat. No. 5,328,785. This application Apr. 20, 1994, Ser. No. 230,183  
Int. Cl.<sup>6</sup> G03F 9/00

U.S. Cl. 430—5

2 Claims



1. A phase mask for modulating the light of a high power laser to transfer a desired pattern from the mask onto a workpiece through a projection lens having numerical aperture sufficient to gather light deflected from said phase mask at an angle less than a collection angle, said projection lens having a conjugate image registered to a workpiece for processing of said workpiece, said mask comprising:

- a phase mask comprising a refractive plate for transmitting light over the entire active surface of said plate with a fluence of greater than 1 Joule per square centimeter;
- a first transmissive region in said phase mask having the profile of an object to be projected onto a workpiece;
- means for diffracting light in said first transmissive region at an angle equal to or less than said collection angle for dispersing diffracted light through said projection lens and producing said profile of said object from said first transmissive region at said workpiece;
- a second transmissive region in said phase mask for permitting light to pass through at a second and greater angle than said collection angle to prevent collection of said light by said projection lens for preventing an image of said second transmissive region on said workpiece.

5,482,802

**MATERIAL REMOVAL WITH FOCUSED PARTICLE BEAMS**

George K. Celler, New Providence; Lloyd R. Harriott, Gillette, and Ratnajl R. Kola, Berkeley Heights, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

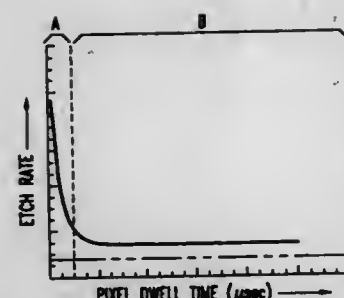
Filed Nov. 24, 1993, Ser. No. 157,590

Int. Cl.<sup>6</sup> G03F 9/00

U.S. Cl. 430—5

15 Claims

1. A process for locally etching at least a portion of a material disposed on a substrate comprising:
- providing a first material on a substrate having a first etch rate by an activated reaction gas;
  - providing a second material disposed over at least a portion of said first material, said second material having a second etch



rate by said reaction gas, said second etch rate being substantially greater than said first etch rate;

flowing a reaction gas adjacent a portion to be removed of said second material, said reaction gas being chemically reactive with at least said second material to form volatile reaction products when activated by a focused particle beam; and

irradiating said portion with a focused particle beam to initiate a chemical reaction between said portion and said reaction gas, removing said portion of the second material.

5,482,803

**PROCESS FOR PREPARING FILTER**

Kazuya Ishiwata, Yokosuka, and Toshifumi Yoshioka, Hadano, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 5, 1993, Ser. No. 13,796

Claims priority, application Japan, Feb. 7, 1992, 4-055990; Feb. 17, 1992, 4-0 1529

Int. Cl.<sup>6</sup> G03F 9/00

U.S. Cl. 430—7

11 Claims

1. A process for preparing a photosensitive resin filter composed mainly of at least one of a polyimide resin or a polyamide resin, comprising the sequential steps of:
- a) applying said resin to a substrate surface;
  - b) subjecting the applied resin to light exposure and development by photolithography;
  - c) irradiating the substrate surface with an ultraviolet ray having an irradiation energy within the range of 2 to 20 J/cm<sup>2</sup> in an oxygen-containing atmosphere so as to remove development residue remaining on the substrate surface; and
  - d) baking said resin.

5,482,804

**RESIN COMPOSITION FOR COLOR FILTER**

Hisato Itoh; Akio Karasawa, and Kenichi Sugimoto, all of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Mar. 30, 1993, Ser. No. 38,091

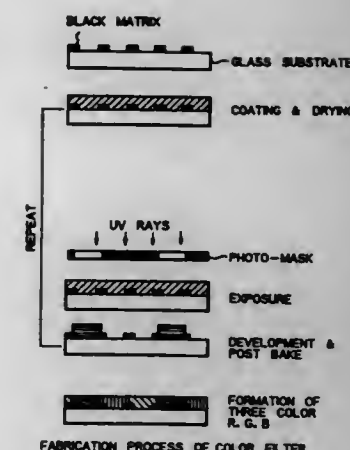
Claims priority, application Japan, Mar. 31, 1992, 4-076572

Int. Cl.<sup>6</sup> G03F 9/00

U.S. Cl. 430—7

15 Claims

1. A photo-setting resin composition which comprises a water soluble photo-setting resin precursor and an oil soluble-dyestuff with dye particles having a diameter of 0.1 μm or more contained within said photo-setting precursor, wherein upon cure, the cured photo-setting resin composition is uniformly colored by the dye-stuff, is free from any depolarization effect and is compatible with



the dyestuff so that dye particles having a diameter of 0.1 μm or more are not present.

5,482,805

**MAGNETIC TONER COMPOSITIONS WITH ALUMINUM OXIDE, STRONTIUM TITANATE AND POLYVINYLIDENE FLUORIDE**

Michael L. Grande, Palmyra; Bernard Grushkin, Pittsford; Eugene F. Young, Rochester; Douglas A. Lundy, and Joseph R. E. Matalovich, both of Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 31, 1994, Ser. No. 331,441

Int. Cl.<sup>6</sup> G03G 9/083; 9/09; 9/097

U.S. Cl. 430—106

43 Claims

1. A toner consisting essentially of resin particles, magnetite pigment, carbon black pigment, rhodamine charge additive, wax, and a surface mixture of aluminum oxide, strontium titanate and polyvinylidene fluoride; and wherein said resin particles are present in an amount of from about 50 to about 90 weight percent, said magnetite is present in an amount of from about 25 to about 40 percent, said carbon black is present in an amount of from about 1 to about 5 weight percent, said wax is present in an amount of from about 3 to about 15 weight percent, and said aluminum oxide, strontium titanate and polyvinylidene fluoride are each present in an amount of from about 0.5 to about 2 weight percent.

5,482,806

**DEVELOPER COMPOSITION FOR ELECTROSTATIC LATENT IMAGE COMPRISING TONER AND CARRIER COATED WITH INORGANIC OXIDE PARTICLES**

Chiaki Suzuki; Tetsu Torigoe; Yoshihiko Iida; Takachi Kimura, and Takayoshi Aoki, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 13, 1991, Ser. No. 759,435

Claims priority, application Japan, Sep. 17, 1990, 2-243775

Int. Cl.<sup>6</sup> G03G 9/083; 9/107

U.S. Cl. 430—106.6

6 Claims

1. A dry developer composition for an electrostatic latent image comprising a mixture of a magnetic powder-dispersed carrier comprising a binder resin having dispersed therein a magnetic powder and a toner having adhered thereto inorganic oxide fine particles, wherein prior to mixing said carrier with said toner at least part of said carrier has adhered to the surface thereof inorganic oxide fine particles.

5,482,807

**POSITIVELY-CHARGEABLE TONER**

Mitsuo Aoki; Takahisa Kato, both of Numazu; Masanori Suzuki, Shizuoka, and Tomoe Hagiwara, Fuji, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 20, 1994, Ser. No. 246,960

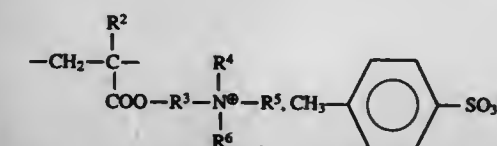
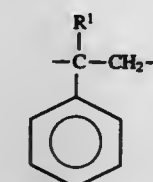
Claims priority, application Japan, May 21, 1993, 5-119821; Jan. 15, 1993, 5-258254

Int. Cl.<sup>6</sup> G03G 9/097

U.S. Cl. 430—110

8 Claims

1. A positively-chargeable toner which comprises (a) a binder resin, (b) a coloring agent, and (c) a quaternary-ammonium-base containing copolymer with a weight-average molecular weight of 5,000 to 25,000, comprising a repeat unit of formula (I) in an amount by weight of 98.0 to 99.5, and a repeat unit of formula (II) in an amount by weight of 2.0 to 0.5, when the total amount by weight of the repeat unit of formula (I) and the repeat unit of formula (II) is 100:



wherein R<sup>1</sup> is a hydrogen atom or a methyl group; R<sup>2</sup> is a hydrogen atom or a methyl group; R<sup>3</sup> is an alkylene group, and R<sup>4</sup>, R<sup>5</sup> and R<sup>6</sup> are an alkyl group.

5,482,808

**ELECTROSTATIC IMAGE DEVELOPER**

Kunio Kondo, and Yujiro Fukuda, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Mar. 24, 1994, Ser. No. 217,512

Claims priority, application Japan, Mar. 25, 1993, 5-066366; Jun. 17, 1993, 5-145302

Int. Cl.<sup>6</sup> G03G 9/113

U.S. Cl. 430—111

6 Claims

1. An electrostatic image developer comprising a toner containing a polyester binder resin and a coloring pigment as major components; wherein said toner has an average particle size of 9 μm or less, or contains at least 0.1% by weight of fine toner particles having a particle size of 4 μm or less; said toner being surface-modified with 0.1 to 10% by weight of a fluoropolymer fine particle having an average particle size smaller than that of said toner, based on the amount of said toner; and said surface modification being carried out in such a way that the ratio of the surface area of said fluoropolymer fine particle to that of said toner may be 10<sup>-3</sup> to 10<sup>-1</sup>.

5,482,809

**LIQUID TONERS FROM SOLUBLE POLYMERIC DISPERSANTS WITH REACTIVE GROUPS**

S. Prabhakara Rao, Ramsey, and Valdis Mikelsons, Mendota Heights, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 16, 1994, Ser. No. 260,696

Int. Cl.<sup>6</sup> G03G 9/13

U.S. Cl. 430—114

53 Claims

1. A liquid toner composition for electrostatic imaging comprising a colorant and a polymer that forms clear, single phase solu-

tions with carrier liquid, said polymer derived from at least one monomer selected from the group consisting of isobornyl acrylate and isobornyl methacrylate containing 1 to 5% by weight of said polymer of chelating units, which chelating units complex charge agents.

5,482,810

# PROCESS FOR THE PRODUCTION OF AN ELECTROPHOTOGRAPHIC LITHOGRAPHIC PRINTING PLATE PRECURSOR

Takao Nakayama; Shigeyuki Dan; Ryosuke Iwashita, and Saburo Umehara, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, and Tomoe-gawa Paper Co., Ltd., Tokyo, both of Japan

Filed Nov. 12, 1993, Ser. No. 151,001

Claims priority, application Japan, Nov. 13, 1992, 4-303635 Int. Cl.<sup>6</sup> G03G 13/26

U.S. Cl. 430—130

8 Claims

1. A process for the production of an electrophotographic lithographic printing plate precursor having at least a photoconductive layer on a support, comprising coating a composition for a photoconductive layer comprising, as predominant components, a photoconductive material and a resin binder onto the support and then drying the coated composition with a drying air whose humidity is controlled to provide an absolute humidity of 5 to 70 g/kg, dried air.

5,482,811

# METHOD OF MAKING HYDROXYGALLIUM PHTHALOCYANINE TYPE V PHOTOCONDUCTIVE IMAGING MEMBERS

Barkev Keoshkerian, Thornhill; George Liebermann; Cheng-Kuo Hsiao, both of Mississauga; James D. Mayo, Toronto; Dasarao K. Murti, Mississauga, and Sandra J. Gardner, Willowdale, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 31, 1994, Ser. No. 332,304

Int. Cl.<sup>6</sup> G03G 5/06; 5/047

U.S. Cl. 430—135

4 Claims

1. A process for the preparation of a layered photoconductive imaging member consisting essentially of hydrolyzing a gallium phthalocyanine precursor pigment by dissolving said gallium phthalocyanine in a strong acid and then reprecipitating the resulting dissolved pigment in basic aqueous media; removing any ionic species formed by washing with water; concentrating the resulting aqueous slurry comprised of water and hydroxygallium phthalocyanine to a wet cake; removing water from said slurry by azeotropic distillation with an organic solvent; and subjecting said resulting hydroxygallium phthalocyanine pigment slurry to mixing with the addition of a second solvent to cause the formation of hydroxygallium phthalocyanine type V; providing a supporting substrate and depositing thereover a photogenerating layer of said hydroxygallium phthalocyanine type V and a charge transport layer.

5,482,812

# WAX CONTAINING TONER AGGREGATION PROCESSES

Michael A. Hopper, Toronto; Raj D. Patel, Oakville; Grazyna E. Kmiecik-Lawrynowicz, Burlington; Stephan V. Drappel, Toronto, and Paul J. Gerroir, Oakville, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 23, 1994, Ser. No. 344,060

Int. Cl.<sup>6</sup> G03G 9/087

U.S. Cl. 430—137

31 Claims

1. A process for the preparation of toner compositions or toner particles comprising:

- (i) providing an aqueous pigment dispersion comprised of a pigment, an ionic surfactant and optionally a charge control agent;
- (ii) providing a wax dispersion comprised of wax, and a dispersant selected from the group consisting of nonionic surfactant, ionic surfactant and mixtures thereof;
- (iii) shearing a mixture of the wax dispersion and the pigment dispersion with a latex or emulsion blend comprised of resin, a counterionic surfactant with a charge polarity of opposite sign to that of said ionic surfactant and a nonionic surfactant;
- (iv) heating the above sheared blend below about the glass transition temperature (T<sub>g</sub>) of the resin to form electrostatically bound toner size aggregates with a narrow particle size distribution;
- (v) adding additional ionic surfactant to the aggregated suspension of (iv) to ensure that no, or minimal additional particle growth of the electrostatically bound toner size aggregates occurs on further increasing the temperature to coalesce the aggregates into toner particles (vi);
- (vi) heating the mixture of (v) above about or at the T<sub>g</sub> of the resin; and optionally
- (vii) separating the toner particles from the aqueous slurry by filtration and thereafter optionally washing.

5,482,813

# RADIOLOGICAL IMAGE FORMING METHOD

Ito Tadashi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 27, 1994, Ser. No. 281,078

Claims priority, application Japan, Jul. 28, 1993, 5-185999

Int. Cl.<sup>6</sup> G03C 5/16

U.S. Cl. 430—139

3 Claims

1. A method for forming a radiological image using a silver halide photographic material comprising a transparent support having at least one silver halide emulsion layer on one side thereof and a backing layer on the opposite side to the silver halide emulsion layer, and a radiographic intensifying screen, wherein said radiographic intensifying screen has such characteristics that the absorbed dose is at least 25% of X-rays having an X-ray energy of 80 Kv, and the contrast transfer function (CTF) is at least 0.79 at a spatial frequency of 1 line/mm and at least 0.36 at a wherein said backing layer comprises a colored antihalation layer and said backing layer is coated with gelatin.

5,482,814

# THERMAL DEVELOPING PHOTSENSITIVE MEMBER AND IMAGE FORMING METHOD USING THE THERMAL DEVELOPING PHOTSENSITIVE MEMBER

Takehiko Ooi; Tetsuro Fukui, both of Yokohama; Motokazu Kobayashi, Kawasaki; Kazunori Ueno, Tokyo; Kenji Kagami, Atsugi; Masao Suzuki, Tokyo, and Katsuya Nishino, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 15, 1994, Ser. No. 275,275

Claims priority, application Japan, Jul. 15, 1993, 5-175584; Jul. 19, 1993, 5-178221; Sep. 28, 1993, 5-241478

Int. Cl.<sup>6</sup> G03C 1/498; 1/26

U.S. Cl. 430—203

6 Claims

1. A heat developing photosensitive member comprising: a photosensitive layer containing at least an organic silver salt, a reducing agent, a photosensitive silver halide or a photosensitive silver halide forming agent and a sensitizing dye; and a supporting member for supporting said photosensitive layer thereon, wherein said sensitizing dye is a merocyanine dye having a structure represented by formula I as follows:

5,482,816

# RADIATION-SENSITIVE COMPOSITION

(1) Makoto Murata; Mikio Yamachika; Yoshiji Yumoto, and Takao Miura, all of Yokkaichi, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Division of Ser. No. 941,264, Sep. 4, 1992, Pat. No. 5,332,650.

This application Jun. 21, 1994, Ser. No. 263,421

Claims priority, application Japan, Sep. 6, 1991, 3-254225

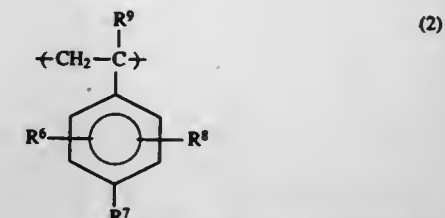
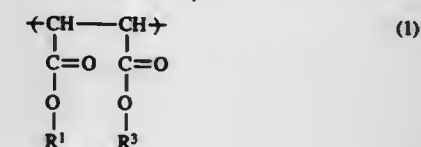
The portion of the term of this patent subsequent to Jul. 26, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> G03F 7/004; 7/023; G03C 1/52

U.S. Cl. 430—270.14

12 Claims

1. A radiation sensitive composition comprising: (A) a polymer having a recurring unit represented by formula (1) and at least one recurring unit represented by formula (2):



wherein R<sup>1</sup> represents a substituted methyl group or a substituted ethyl group; R<sup>3</sup> represents an aryl group, an aralkyl group, a substituted methyl group or a substituted ethyl group; R<sup>6</sup>, R<sup>7</sup> and R<sup>8</sup> may be the same or different and each represents a hydrogen atom, a halogen atom, a hydroxyl group, an amino group, an alkyl group or an alkoxy group; and R<sup>9</sup> represents a hydrogen atom or a methyl group, and

(B) at least one radiation-sensitive acid-forming agent selected from the group consisting of an onium salt, a halogen-containing compound, a sulfone compound, a sulfonic acid compound and a nitrobenzyl compound.

5,482,817

# MID AND DEEP-UV ANTIREFLECTION COATINGS AND METHODS FOR USE THEREOF

Robert R. Dichlora, Middletown; Christopher F. Lyons, LaGrangeville; Ratnasabapathy Sooriyakumaran, Fishkill; Gary T. Spinillo, Wappingers Falls; Kevin M. Welsh, Fishkill, and Robert L. Wood, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

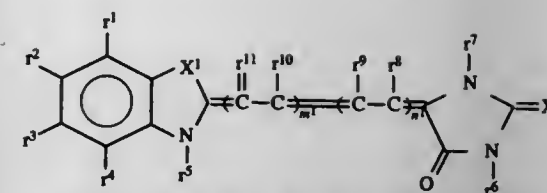
Division of Ser. No. 17,938, Feb. 16, 1993, Pat. No. 5,401,614, which is a division of Ser. No. 55,400, May 3, 1993, Pat. No. 5,380,621, which is a division of Ser. No. 845,404, Mar. 3, 1992, abandoned. This application Sep. 29, 1994, Ser. No. 315,318

Int. Cl.<sup>6</sup> G03C 5/00

U.S. Cl. 430—271.1

9 Claims

1. An antireflective coating composition for use with chemically amplified photoresist compositions comprising a polymer selected from the group consisting of poly(vinylnaphthalenes), poly(acenaphthalenes) and poly(vinylbiphenyls), which is highly absorbent to mid and/or deep UV radiation, which is substantially inert



wherein r<sup>1</sup>, r<sup>2</sup>, r<sup>3</sup> and r<sup>4</sup> are each hydrogen, halogen, alkyl, alkoxy, alkenyl, aralkyl, hydroxyl, aryl, carboxyl, alkoxy-carbonyl, cyano, trifluoromethyl, amino, acylamide, acyl, acyloxy, alkoxy-carbonyl, amino or carboalkoxy, r<sup>1</sup> and r<sup>2</sup>, r<sup>2</sup> and r<sup>3</sup> and r<sup>4</sup> are combined with each other to form a six-membered ring, r<sup>5</sup>, r<sup>6</sup> and r<sup>7</sup> are each alkyl, alkenyl, aryl or aralkyl, r<sup>8</sup>, r<sup>9</sup>, r<sup>10</sup> and r<sup>11</sup> are each hydrogen, halogen, alkyl, alkoxy, aryl or amino, r<sup>8</sup> and r<sup>9</sup>, r<sup>10</sup> and r<sup>11</sup>, r<sup>8</sup> and r<sup>10</sup> or r<sup>9</sup> and r<sup>11</sup> are optionally combined with each other to form a ring, X<sup>1</sup> is sulfur of selenium, X<sup>2</sup> is oxygen, sulfur, or selenium and m<sup>1</sup> and n<sup>1</sup> are each an integer from 0 to 3 and are not zero simultaneously.

5,482,815

# SILVER HALIDE PHOTOGRAPHIC PHOTSENSITIVE MATERIAL

Kunihiko Nakagawa; Shoji Akaiwa; Seichi Sumi, and Kenichi Nishi, all of Tokyo, Japan, assignors to Mitsubishi Paper Mills Limited, Japan

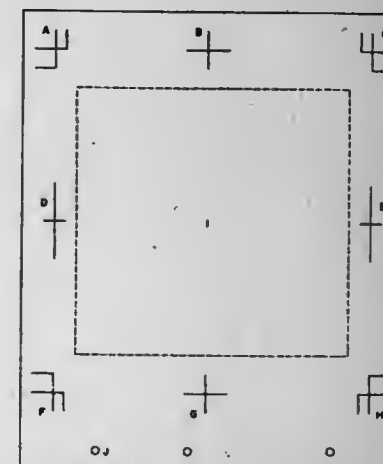
Filed Feb. 18, 1994, Ser. No. 198,308

Claims priority, application Japan, Feb. 22, 1993, 5-031555; Apr. 30, 1993, 5-103903; Apr. 30, 1993, 5-103904; May 13, 1993, 5-111884

Int. Cl.<sup>6</sup> G03C 1/06

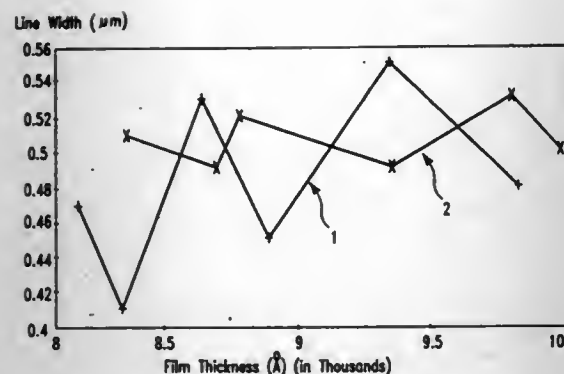
U.S. Cl. 430—264

11 Claims



1. A silver halide photographic photosensitive material comprising a support and, provided thereon, at least one hydrophilic colloid layer including a photosensitive layer wherein the photosensitive layer comprises monodispersed silver halide grains having an average grain size of 0.2 micron or less and comprising at least 90 mol % of silver chloride, the photosensitive layer or a hydrophilic colloid layer provided on the same side of the support as the side on which the photosensitive layer is provided contains a hydrazine derivative, a hydrophilic colloid layer provided above the photosensitive layer contains a water-dispersible fine particle polymer, the photosensitive layer contains substantially no water-dispersible fine particle polymer, and amount of the water-dispersible fine particle polymer contained in the hydrophilic colloid layer is 1 g/m<sup>2</sup> or less and is 5% by weight or more based on the weight of gelatin contained in the hydrophilic colloid layer.





to contact reactions with a chemically amplified photoresist composition, and which is insoluble in the developer for the chemically amplified photoresist composition.

5,482,818

#### METHOD AND APPARATUS FOR PATTERNING AN IMAGING MEMBER

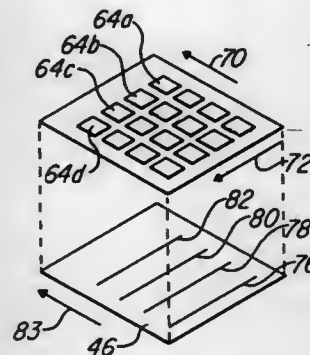
William E. Nelson, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 47,254, Apr. 14, 1993, Pat. No. 5,330,878, which is a continuation of Ser. No. 742,133, Aug. 8, 1991, abandoned. This application May 16, 1994, Ser. No. 242,926

Int. Cl.<sup>6</sup> G03F 7/20

U.S. Cl. 430—394

4 Claims



1. A method of exposing an imaging member comprising:
  - a. loading a data set into a first row of spatial light modulator elements, said first row of spatial light modulator elements generating a first image representing said data set;
  - b. exposing a first portion of an imaging member to said first image generated by said first row of spatial light modulator elements;
  - c. moving said imaging member relative to said first row of spatial light modulator elements;
  - d. transferring said data set from said first row of said spatial light modulator elements to a second row of spatial light modulator elements, such that said second row of spatial light modulator elements generates a second image representing said data set; and
  - e. exposing said first portion of said imaging member to said second image.

#### 5,482,819 PHOTOLITHOGRAPHIC PROCESS FOR REDUCING REPEATED DEFECTS

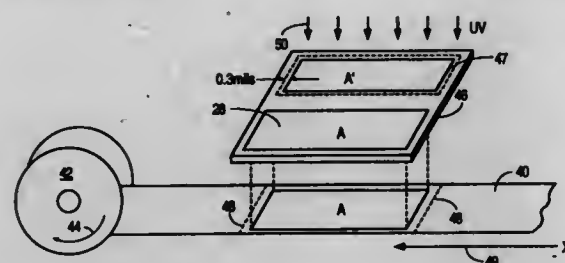
Eddy Tjhia, Sunnyvale; Chi Lin, Milpitas, and Anjali Anagol-Subbarao, San Jose, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 4, 1994, Ser. No. 223,255

Int. Cl.<sup>6</sup> G03F 7/20

U.S. Cl. 430—394

13 Claims



1. A photolithographic method comprising the steps of:
  - providing a target having a surface which is to be selectively patterned by masked radiation;
  - positioning a mask in a first position with respect to said surface, said mask having a first mask pattern having first features and having a second mask pattern having second features substantially identical to said first features but adjusted in size by a first amount, positioning said mask in said first position causing said first mask pattern to be imaged on said surface;
  - energizing a source of said radiation to radiate said surface through said first mask pattern for a period of time to form a first exposure pattern on said surface;
  - positioning said mask in a second position with respect to said surface such that said second mask pattern is aligned with said first exposure pattern on said surface; and
  - energizing said source of said radiation to radiate said surface through said second mask pattern for a period of time so as to double-expose said surface where a second exposure pattern from said second mask pattern overlaps said first exposure pattern, wherein said target remains stationary during and between said steps of positioning said mask in said first position and positioning said mask in said second position.

5,482,820

#### SILVER HALIDE PHOTOGRAPHIC ELEMENTS CONTAINING BIOCIDES

Luigi Cellone, Albisola Marina, and Franco Leoncini, Genova, both of Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 3, 1995, Ser. No. 382,898

Claims priority, application European Pat. Off., Mar. 15, 1994, 94103953.9

Int. Cl.<sup>6</sup> G03C 1/37

U.S. Cl. 430—523

14 Claims

1. A light-sensitive silver halide photographic element comprising hydrophilic colloid layers coated on a support, wherein at least one of said hydrophilic colloid layers is a silver halide emulsion layer, and wherein at least one of said hydrophilic colloid layers comprises a dihalogenonitriloacylamino compound in combination with a phenolic biocide.

#### 5,482,821 PHOTOGRAPHIC ELEMENT CONTAINING AN AZOPYRAZOLONE MASKING-COUPLER EXHIBITING IMPROVED KEEPING

Daniel L. Kapp, and Janet N. Younathan, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

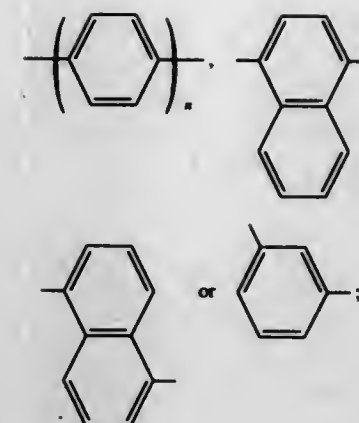
Filed Sep. 30, 1993, Ser. No. 129,840

Int. Cl.<sup>6</sup> G03C 7/333; 7/38; 7/384

U.S. Cl. 430—549

12 Claims

1. A photographic element comprising a light sensitive silver halide layer containing (1) an image dye-forming bicyclic azole coupler which is a 1H-pyrazolo[3,2-c][1,2,4]-triazole having bonded to the coupling site a group other than hydrogen which is cleavable during the development process; (2) an azopyrazolone masking coupler; and (3) a stabilizing coupler which is a pyrazolin-5-one having bonded to the coupling site only hydrogen atoms.



#### 5,482,822 INFRARED-ABSORPTIVE COMPOUND AND OPTICAL RECORDING MEDIUM MAKING USE OF THE SAME

Chieko Mihara, Isehara; Hiroyuki Sugata, Yamato; Tsuboshi Santo, Yokohama, and Miki Tamura, Isehara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

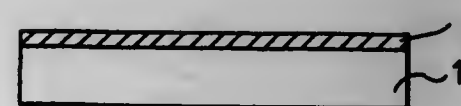
Filed May 11, 1993, Ser. No. 59,853

Claims priority, application Japan, May 12, 1992, 4-145046

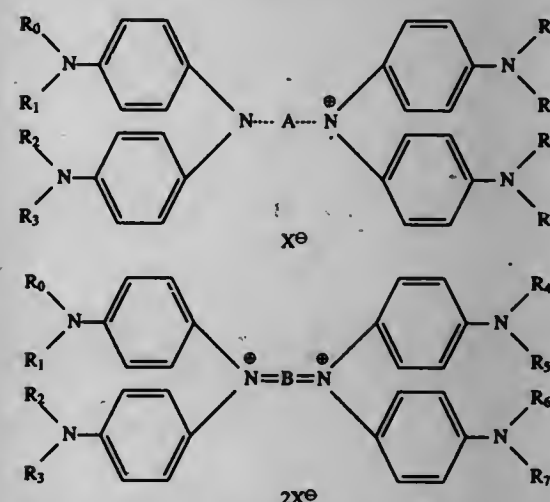
Int. Cl.<sup>6</sup> G11B 11/00

U.S. Cl. 430—270.14

7 Claims

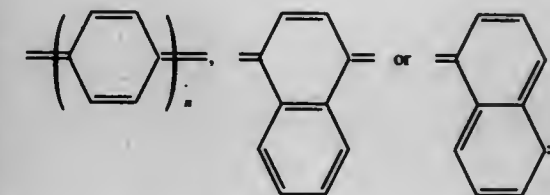


1. An optical recording medium comprising a recording layer formed on a substrate containing an infrared-absorptive compound represented by the following formula (I) or (II)



wherein  $R_0$  to  $R_7$  each represent (a) a hydrogen atom or a monovalent organic residual group, at least one of  $R_0$  to  $R_7$  being a monovalent organic residual group having a fluorine atom, or (b) a group of atoms necessary for at least one of combinations  $R_0$  and  $R_1$ ,  $R_2$  and  $R_3$ ,  $R_4$  and  $R_5$ , and  $R_6$  and  $R_7$ , to form together with a nitrogen atom a substituted 5-membered ring having a fluorine atom, a substituted 6-membered ring having a fluorine atom or a substituted 7-membered ring having a fluorine atom, other combinations each being a hydrogen atom or a monovalent organic residual group;  $X^\ominus$  represents an anionic residual group; in formula (I), "A" represents

and in formula (II), "B" represents



wherein n represents an integer of 1 or 2.

5,482,823

#### SILVER HALIDE PHOTOGRAPHIC EMULSION

Yoshihiro Haga; Tetsuya Suzuki, and Yasuo Taima, all of Hino, Japan, assignors to Konica Corporation, Japan

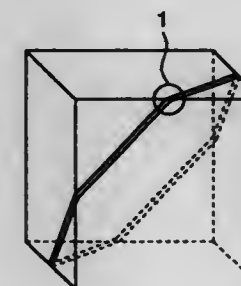
Filed Sep. 23, 1994, Ser. No. 311,536

Claims priority, application Japan, Sep. 29, 1993, 5-243060; May 17, 1994, 6-102796

Int. Cl.<sup>6</sup> G03C 1/035; 1/09

U.S. Cl. 430—567

5 Claims



1. A silver halide photographic emulsion, wherein said silver halide emulsion contains silver halide grains having an average iodide content of less than 3 mol %, said silver halide grains comprising monodispersed core/shell type silver halide grains having two twin planes parallel to each other and said core/shell type grains being substantially roundish hexahedral or tetradecahedral crystals.

5,482,824

## SILVER HALIDE PHOTOGRAPHIC MATERIAL AND SILVER HALIDE EMULSION

Tadashi Ogawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 645,928, Jan. 25, 1991, Pat. No. 5,258,272.

This application Jul. 22, 1993, Ser. No. 95,832

Claims priority, application Japan, Jan. 25, 1990, 2-15772

Int. Cl.<sup>6</sup> G03C 1/035

U.S. Cl. 430—567

14 Claims

1. A silver halide photographic material having at least one silver halide emulsion layer on a support, wherein the silver halide emulsion of the emulsion layer is a high-silver chloride emulsion having a silver chloride content of about 95 mol % or more, wherein at least about 30% by number or by weight of the silver halide grains in the silver halide emulsion are those having one twin plane in the crystal and the crystal planes of the surface of each grain consist essentially of (100) planes and the grains having one twin plane have a silver bromide-localized phase having a higher silver bromide content only in the part of intersection of the twin plane and the surface of the grain as compared with other areas of the grains.

5,482,825

## SILVER HALIDE EMULSIONS CONTAINING FUSED DIHYDROPYRIMIDINES

Roger Lok; Carl R. Preddy, and Xin Wen, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

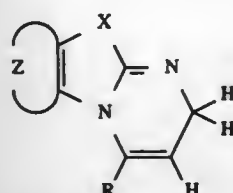
Filed Dec. 23, 1994, Ser. No. 362,726

Int. Cl.<sup>6</sup> G03C 1/07; 1/08; 1/34

U.S. Cl. 430—567

22 Claims

12. A silver halide emulsion made by the method comprising precipitating and chemically sensitizing the emulsion and adding to the emulsion a fused dihydropyrimidine compound represented by the following formula:



wherein X is O, S or Se;

R is a substituted or unsubstituted alkyl or aryl group; and

Z contains the atoms necessary to form an aromatic group, a heteroaromatic group or a heterocyclic group.

5,482,826

## METHOD FOR FORMING SILVER HALIDE GRAINS AND A METHOD FOR PRODUCING A SILVER HALIDE PHOTOGRAPHIC MATERIAL

Hisashi Okamura; Hiroshi Kawamoto, and Makoto Kikuchi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 16, 1994, Ser. No. 197,181

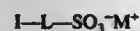
Claims priority, application Japan, Feb. 16, 1993, 5-048695; Feb. 25, 1993, 5-059419

Int. Cl.<sup>6</sup> G03C 1/015

U.S. Cl. 430—569

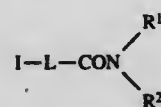
25 Claims

1. A method for forming silver halide grains, which comprises introducing into 50 to 100% of the total number of silver halide grains 10 or more dislocation lines onto fringes of said silver halide grains by using at least one iodide-ion-releasing compound represented by the following formula (I) or (II):



formula (I)

wherein L represents a divalent organic group, and M<sup>+</sup> represents a hydrogen ion or a monovalent cation,



formula (II)

wherein L represents a divalent organic group, and R<sup>1</sup> and R<sup>2</sup> each independently represents a hydrogen atom, an alkyl group, an aralkyl group, or an aryl group, or R<sup>1</sup> and R<sup>2</sup> bond together to form a ring.

5,482,827

## HARDENED SILVER HALIDE PHOTOGRAPHIC ELEMENTS

Mauro Beslo, and Giuseppe Rocca, both of Vado Ligure, Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 3, 1995, Ser. No. 367,580

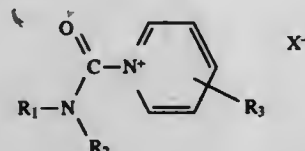
Claims priority, application European Pat. Off., Feb. 8, 1994, 94101873

Int. Cl.<sup>6</sup> G03C 1/09; 1/30

U.S. Cl. 430—603

10 Claims

1. A negative-acting light-sensitive silver halide photographic element comprising a support bearing at least one light-sensitive gelatin-containing silver bromide or iodobromide emulsion layer and at least one non light-sensitive gelatin-containing layer, wherein the silver bromide or iodobromide emulsion is chemically sensitized with sulfur and gold in the presence of a sulfonic acid compound and all gelatin present in said photographic element is hardened with a carbamoylpyridinium salt compound having the following formula:



wherein

R<sub>1</sub> and R<sub>2</sub>, which may be the same or different, each represents an alkyl group, an aryl group, or an aralkyl group, or R<sub>1</sub> and R<sub>2</sub> together represent the atoms required to complete a heterocyclic ring.

R<sub>3</sub> represents an alkylsulfonate group or a sulfonate group, and X<sup>-</sup> represents an anion.

5,482,828

## SYNTHETIC MEDIA COMPOSITIONS AND METHODS FOR INACTIVATING BACTERIA AND VIRUSES IN BLOOD PREPARATIONS WITH 8-METHOXYPSORALEN

Lily Lin; Lawrence Corash, both of Berkeley; Stephen Isaacs, Orinda, and George Cimino, Richmond, all of Calif., assignors to Steritech, Inc., Concord, Calif.

Continuation of Ser. No. 926,477, Aug. 7, 1992, abandoned, which is a continuation of Ser. No. 844,790, Mar. 2, 1992, Pat. No. 5,288,605. This application Mar. 7, 1994, Ser. No. 207,798. The portion of the term of this patent subsequent to Feb. 22, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> A01N 1/02; A61K 41/00; A61M 37/00

U.S. Cl. 435—2

20 Claims

1. A method of inactivating bacteria in blood preparations, comprising:

- providing, in any order, i) 8-methoxypsoralen; ii) photoactivating means for photoactivating 8-methoxypsoralen; and iii) a platelet preparation suspected of being contaminated with bacteria in a synthetic media;

5,482,830

## DEVICES AND METHODS FOR DETECTION OF AN ANALYTE BASED UPON LIGHT INTERFERENCE

Gregory R. Bogart, Berthoud; Garret R. Moddel, Boulder; Diana M. Maul, Thornton, and Jeffrey B. Etter, Boulder, all of Colo., assignors to Biostar, Inc., Boulder, Colo.

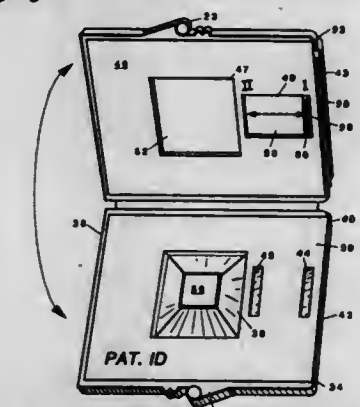
Continuation-in-part of Ser. No. 923,304, Jul. 31, 1992, abandoned, and a continuation-in-part of Ser. No. 873,097, Apr. 24, 1992, abandoned, and a continuation-in-part of Ser. No. 653,064, Feb. 11, 1991, abandoned, and a continuation-in-part of Ser. No. 653,052, Feb. 11, 1991, abandoned, and a continuation-in-part of Ser. No. 260,317, Oct. 20, 1988, abandoned, and a continuation-in-part of Ser. No. 917,121, Jul. 31, 1992, abandoned, which is a continuation-in-part of Ser. No. 408,296, Sep. 18, 1989, abandoned, said Ser. No. 873,097 is a continuation-in-part of Ser. No. 408,291, Sep. 18, 1989, abandoned, said Ser. No. 260,317 is a continuation-in-part of Ser. No. 832,682, Feb. 25, 1986, abandoned. This application Jun. 10, 1993, Ser. No. 76,320

The portion of the term of this patent subsequent to Nov. 25, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> G01N 33/544; C12Q 1/00

U.S. Cl. 435—5

24 Claims



1. An optical assay device for an analyte comprising:

a substrate consisting of one or more layers having an optically active surface exhibiting a first color in response to light impinging thereon, and exhibiting a second color comprising an intensity of at least one wavelength of light different from said first color, in response to said light when said analyte is present on an attachment layer,

said attachment layer selected from the group consisting of a polymeric silane, polymeric siloxane, a dendrimer, and film forming latexes, provided on an uppermost surface of said substrate and,

a layer of non-specific protein, provided on said attachment layer, present in an amount that allows said analyte to bind to said attachment layer and which improves signal generation when a specific secondary reagent binds to said analyte present on the attachment layer of the device.

5,482,831

## WASH COMPOSITION CONTAINING SIGNAL STOP REAGENT, TEST KIT AND METHOD OF USE WITH PEROXIDASE-LABELED SPECIFIC BINDING LIGAND

Gary L. Snodgrass, Batavia; Lisa D. Sprague, Holcomb; Harold C. Warren, III, Rush; Douglas R. Jones, Fairport, and Thomas R. Kinsel, Rochester, all of N.Y., assignors to Johnson &amp; Johnson Clinical Diagnostics, Inc., Rochester, N.Y.

Division of Ser. No. 773,065, Oct. 8, 1991, Pat. No. 5,252,457.

This application Jan. 7, 1993, Ser. No. 72,022

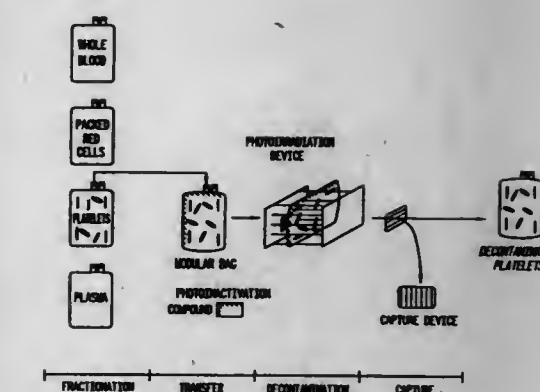
Int. Cl.<sup>6</sup> C12Q 1/68; 1/70; G01N 33/53; B65D 69/00

U.S. Cl. 435—5

5 Claims

1. A diagnostic test kit comprising, separately packaged:

(a) a buffered composition having a pH in the range of from about 6.5 to 7.5, consisting essentially of from 0.5 to 10



b) adding said 8-methoxypsoralen to said platelet preparation at a final concentration of between approximately 3 and 30 ug/ml; and

c) photoactivating said 8-methoxypsoralen, so that said 8-methoxypsoralen binds covalently to the nucleic acid of a portion of said bacteria, without causing significant damage to said platelet preparation.

5,482,829

## COMPOSITION AND METHOD FOR ENRICHMENT OF WHITE BLOOD CELLS FROM WHOLE HUMAN BLOOD

Lawrence Kass, Hinckley, Ohio, and Leonard Spolter, Granada Hills, Calif., assignors to International Remote Imaging Systems, Inc., Chatsworth, Calif.

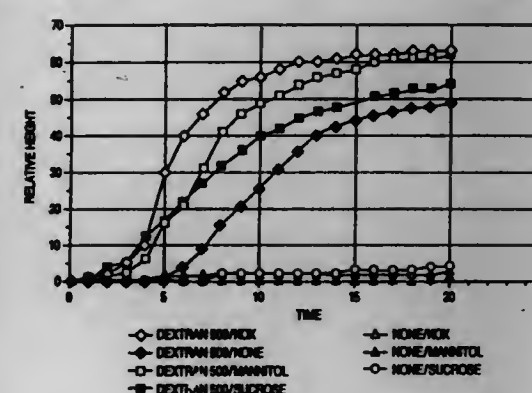
Division of Ser. No. 52,504, Apr. 26, 1993, Pat. No. 5,397,479.

This application Dec. 21, 1994, Ser. No. 361,104

Int. Cl.<sup>6</sup> C02F 1/54; 1/56

U.S. Cl. 435—2

25 Claims



1. A composition for separating blood cells from a solution containing said cells, comprising a settling solution which comprises dextran having a molecular weight greater than about 40,000 and a settling rate enhancer member selected from the group consisting of potassium oxalate, potassium malonate, mannitol and sucrose, wherein the amounts of said dextran and said settling rate enhancer are sufficient to increase red blood cell sedimentation rate compared with the rate which is measured for either the dextran or enhancer alone and wherein said enhancer does not adversely affect the morphology and function of white blood cells.

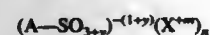


weight percent of a nonionic or anionic surfactant, and at least 0.001 weight percent of a compound having the structure (I):



or an equivalent salt thereof, wherein R is aryl of 6 to 10 carbon atoms in the aromatic nucleus, and R' is hydroxy or amino,

said surfactant being a nonionic surfactant selected from the group consisting of alkylolamides, polyoxyalkylene alkyl or alkyl aryl esters, polyoxyethylene and polyoxypropylene polyols, polyoxyalkylene fatty acidsesters, polyoxyalkylene alkylamines, polyhydric alcohol type surfactants and condensation products of an alkylphenol and ethylene oxide, or an anionic surfactant selected from the group consisting of carboxylate and sulfonate salts, sulfate ester salts, phosphate ester salts, and compounds represented by the structure (III):



wherein A is a hydrocarbon having a molecular weight of at least 180,  $X^{m+}$  is hydrogen or a monovalent or divalent cation, m is 1 or 2, y is 0 or 1, and n is 1 or 2 provided that m and n are not both 2, and

(b) a water soluble, peroxidase-labeled specific binding species.

5,482,832

#### HYBRIDIZATION ASSAYS USING ENZYME-LINKED PROBES

Peter F. Lens, Den Bosch, and Tim Klevits, Vught, both of Netherlands, assignors to Akzo Nobel N.V., Arnhem, Netherlands

Continuation of Ser. No. 910,860, Jul. 8, 1992, abandoned.

This application Oct. 7, 1994, Ser. No. 320,203

Int. Cl.<sup>6</sup> C12Q 1/70; 1/68; C12P 19/34

U.S. Cl. 435—5

7 Claims

1. A method for detecting nucleic acid in a sample, in which the nucleic acid is hybridized to a labelled oligonucleotide, comprising: adding an enzyme labelled nucleic acid complementary to at least part of the nucleic acid to be detected to the sample, hybridizing the labelled nucleic acid with the nucleic acid to be detected to form a duplex nucleic acid, separating the duplex nucleic acid from the unhybridized labelled nucleic acid by gel electrophoresis and detecting the hybridized labelled nucleic acid on the electrophoresis gel, wherein enzyme label is horseradish peroxidase and wherein detection takes place by staining enzyme labelled nucleic acid in the gel with an appropriate enzyme substrate.

5,482,833

#### TEST TO DETERMINE PREDISPOSITION OR SUSCEPTIBILITY TO DNA ASSOCIATED DISEASES

Ronald W. Pero, New York, and Daniel G. Miller, Scarsdale, both of N.Y., assignors to Preventive Medicine Institute, New York, N.Y.

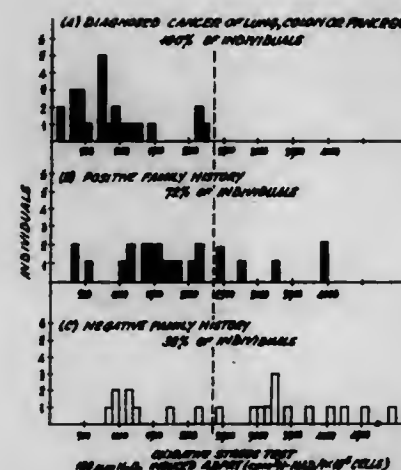
Continuation of Ser. No. 869,823, Apr. 15, 1992, abandoned, which is a continuation of Ser. No. 333,841, Apr. 3, 1989, abandoned, which is a continuation of Ser. No. 820,203, Jan. 17, 1986, abandoned. This application Apr. 26, 1995, Ser. No. 430,326

Int. Cl.<sup>6</sup> C12Q 1/68; A61K 48/00; 49/00

U.S. Cl. 435—6

23 Claims

1. A method for identifying an individual with a predisposition to diseases associated with the activity of DNA repair enzymes which comprises stressing cells of said individual to produce stressed cells containing damaged DNA, thereby to cause induced activity of adenosine diphosphate ribosyl transferase (ADPRT) in the stressed cells, determining a value for the induced activity of the ADPRT in the stressed cells, and comparing the value so determined with a reference value of the activity of ADPRT to ascertain whether said value so determined is higher or lower than



said reference value, a determined value lower than said reference value identifying said individual as having said predisposition.

5,482,834

#### EVALUATION OF NUCLEIC ACIDS IN A BIOLOGICAL SAMPLE HYBRIDIZATION IN A SOLUTION OF CHAOTROPIC SALT SOLUBILIZED CELLS

David H. Gillespie, Glenmore, Pa., assignor to Hahnemann University, Philadelphia, Pa.

Continuation of Ser. No. 299,150, Dec. 30, 1988, abandoned, which is a continuation-in-part of Ser. No. 859,003, May 2, 1986, abandoned, which is a continuation-in-part of Ser. No. 594,308, Mar. 28, 1984, abandoned, which is a continuation-in-part of Ser. No. 378,711, May 17, 1982, Pat. No. 4,483,920.

This application Jan. 19, 1993, Ser. No. 6,190

Int. Cl.<sup>6</sup> C12Q 1/68; C12N 11/00; 15/00; C07H 21/00

U.S. Cl. 435—6

16 Claims

1. A method for detecting the presence of or quantitating an amount of RNA containing a specific nucleotide sequence of differing nucleotides in a biological sample comprising cells containing said RNA, comprising the steps of:

(a) solubilizing the cells of the sample and said RNA contained therein by contacting said biological sample with a chaotropic salt selected from the group consisting of guanidine thiocyanate, alkali metal perchlorates, alkali metal iodides, alkali metal trifluoroacetates, alkali metal trichloroacetates, and alkali metal thiocyanates, whereby a solution of solubilized cells and RNA is produced;

(b) incubating the solution of the solubilized cells and RNA produced in (a) at a temperature in the range of 20° C. to 40° C. with at least one nucleic acid probe in solution, said at least one nucleic acid probe being complementary and sequence specific to said specific nucleotide sequence of differing nucleotides of the solubilized RNA under conditions which cause molecular hybridization between said at least one nucleic acid probe in solution and said solubilized RNA, said molecular hybridization occurring in the absence of formamide; and

(c) detecting said molecular hybridization occurring in (b).

6. A method for detecting the presence of or quantitating the amount of DNA in a biological sample comprising cells, comprising the steps of

(a) solubilizing the cells of the sample and the DNA contained therein by contacting said biological sample with a chaotropic salt selected from the group consisting of guanidine thiocyanate, alkali metal perchlorates, alkali metal iodides, alkali metal trifluoroacetates, alkali metal trichloroacetates, and alkali metal thiocyanates, whereby a solution of solubilized cells and DNA is produced;

(b) heating the solution of the solubilized cells and DNA produced in (a) to a temperature of at least 45° C. and maintaining the temperature for a period of time sufficient to denature

the DNA thereby producing a solution of solubilized cells and single-stranded DNA;

(c) incubating the solution of the solubilized cells and single-stranded DNA produced in (b) at a temperature in the range of 20° C. to 40° C. with at least one nucleic acid probe in solution, said at least one nucleic acid probe being complementary to at least a portion of said solubilized single-stranded DNA under conditions which cause molecular hybridization between said at least one nucleic acid probe in solution and said solubilized single-stranded DNA, said molecular hybridization occurring in the absence of formamide; and

(d) detecting said molecular hybridization occurring in (c).

5,482,835

#### METHODS OF TESTING IN YEAST CELLS FOR AGONISTS AND ANTAGONISTS OF MAMMALIAN G-PROTEIN COUPLED RECEPTORS

Klim King, Durham, N.C.; Henrik G. Dohlman, Berkeley, Calif.; Marc G. Caron, and Robert J. Lefkowitz, both of Durham, N.C., assignors to Duke University, Durham, N.C.

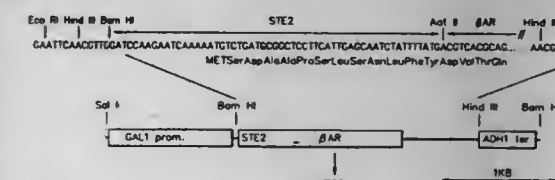
Continuation of Ser. No. 581,714, Sep. 13, 1990, abandoned.

This application Jun. 3, 1993, Ser. No. 71,355

Int. Cl.<sup>6</sup> C12N 1/16; 15/11; 15/12; C12Q 1/02; 1/68; G01N 33/566

U.S. Cl. 435—6

19 Claims



1. A method of testing a compound for the ability to affect the rate of dissociation of  $G\alpha$  from  $G\beta\gamma$  in a cell, comprising:

providing a transformed yeast cell containing a first heterologous DNA sequence which codes for a mammalian G protein coupled receptor and a second heterologous DNA sequence which codes for a mammalian  $G\alpha$ , wherein said first and second heterologous DNA sequences are expressed, at least under the conditions of testing, in said cell, wherein said cell does not express the endogenous  $G\alpha$ , wherein said cell expresses  $G\beta\gamma$ , wherein said mammalian  $G\alpha$  and said  $G\beta\gamma$  can complex to form a functional G protein, and wherein said mammalian G protein coupled receptor, when activated by said compound, can operatively associate with said G protein to increase the rate of dissociation of  $G\alpha$  from  $G\beta\gamma$  in said G protein;

contacting said compound with said cell; and

detecting the rate of dissociation of  $G\alpha$  from  $G\beta\gamma$  in said cell.

5,482,836

#### DNA PURIFICATION BY TRIPLEX-AFFINITY CAPTURE AND AFFINITY CAPTURE ELECTROPHORESIS

Charles R. Cantor, Boston, Mass.; Takashi Ito, Chiba, Japan, and Cassandra L. Smith, Boston, Mass., assignors to The Regents of the University of California, Oakland, Calif.

Filed Jan. 14, 1993, Ser. No. 4,552

Int. Cl.<sup>6</sup> C12Q 1/68; C12P 19/34; C07H 17/00; C12N 15/00

U.S. Cl. 435—6

27 Claims

1. A method for purifying intact a particular double stranded DNA present in a sample comprising the steps of:

(a) contacting the sample with an oligonucleotide coupled either directly or indirectly to a first recognition molecule of a specific molecular recognition system to form a triple-helix between the particular double stranded DNA and the coupled oligonucleotide, said oligonucleotide being an oligodeoxyribonucleotide or an oligoribonucleotide;

(b) contacting the reaction medium obtained in step (a) with a solid carrier to which is either directly or indirectly fixed a second recognition molecule of the molecular recognition system, the second recognition molecule specifically binding to the first recognition molecule;

(c) separating the reaction medium from the solid phase in step (b);

(d) separating the particular double stranded DNA from the oligonucleotide by treating the separated solid phase of step (c) with an alkaline reagent that breaks the bonds between the oligonucleotide and the particular double stranded DNA but conserves the double strandedness of the particular double stranded DNA, said reagent having a pH that is about 8.0 to about 10.0 if said oligonucleotide is an oligodeoxyribonucleotide or a pH that is no greater than about 8.5 if said oligonucleotide is an oligoribonucleotide; and

(e) recovering the particular double stranded DNA.

5,482,837

#### METHODS OF IDENTIFYING LYMPHOCYTES WITH MUTATOR PHENOTYPES

Richard J. Albertini, Underhill Center, Vt., assignor to University of Vermont, Burlington, Vt.

Filed Jan. 14, 1994, Ser. No. 182,416

Int. Cl.<sup>6</sup> C12Q 1/68; C12N 15/00

U.S. Cl. 435—6

4 Claims

1. A method for identifying lymphocytes with a somatic mutator phenotype, comprising the steps of:

a) isolating at least two groups of lymphocytes, each group bearing a different selectable marker; and

b) determining whether any two groups contain a cell from the same clonally amplified set, the presence of which indicates the somatic mutator phenotype.

5,482,838

#### TRYPSIN-SENSITIVE AGENT ABLE TO REDUCE PAI-1 AND $\beta$ APP EXPRESSION IN SENESCENT CELLS AND INCREASE THE ABILITY OF FIBROBLASTS TO DIVIDE IN CULTURE

Michael D. West, Belmont, Calif., assignor to Geron Corporation, Menlo Park, Calif.

Filed Feb. 8, 1993, Ser. No. 14,838

Int. Cl.<sup>6</sup> C12P 21/02; C07K 3/00

U.S. Cl. 435—70.3

1 Claim

1. Purified trypsin-sensitive agent GE 1428, wherein said agent reduces PAI-1 expression in senescent human lung fibroblasts and  $\beta$ APP expression in senescent human brain astrocytes, and increases the ability of human forearm fibroblasts to divide in culture, and wherein said agent is isolated from culture medium wherein said culture medium contains growing fibroblasts or U937 promyelocytic cells, and wherein said agent has a MW of 3.5–4.5 kD.





expressed at sufficient levels to confer upon said Gram-positive bacterium transformant the ability to produce ethanol as a fermentation product.

5,482,847

# ESTERASE GENES, ESTERASE, RECOMBINANT PLASMIDS AND TRANSFORMANTS CONTAINING THE RECOMBINANT PLASMID AND METHODS OF PRODUCING OPTICALLY ACTIVE CARBOXYLIC ACIDS AND THEIR ENANTIOMERIC ESTERS USING SAID TRANSFORMANTS

Eiji Ozaki; Akihiro Sakimae, both of Otake, and Ryoza Numazawa, Nagoya, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Japan

Division of Ser. No. 882,329, May 13, 1992, Pat. No.

5,308,765. This application Jan. 14, 1994, Ser. No. 183,213

Claims priority, application Japan, May 15, 1991, 3-110628; May 15, 1991, 3-110629; Sep. 27, 1991, 3-249923; Jan. 15, 1991, 3-266136

Int. Cl.<sup>6</sup> C12N 9/16; C07K 14/21

U.S. Cl. 435—196

1 Claim

1. An isolated and purified esterase comprising the amino acid sequence described in SEQ ID No. 2.

5,482,848

# MATRIX-DEGRADING METALLOPROTEINASE

Robert B. Dickson, Silver Spring, Md., and Yuenian E. Shi, Roslyn Heights, N.Y., assignors to Georgetown University, Washington, D.C.

Continuation-in-part of Ser. No. 936,512, Aug. 28, 1992, abandoned. This application Feb. 22, 1994, Ser. No. 199,792

Int. Cl.<sup>6</sup> C12N 9/50; 9/96

U.S. Cl. 435—219

6 Claims

1. A matrix-degrading proteinase having an average molecular weight of about 80 kDa, purified to homogeneity, which is active in the presence of Ca<sup>2+</sup>, Mg<sup>2+</sup> and Mn<sup>2+</sup>, is active over a pH range of 7.5 to 9.5, and degrades gelatin and type IV collagen.

5,482,849

# SUBTILISIN MUTANTS

Sven Branner, Lyngby; Sven Hastrup, Copenhagen; Nina Eriksen, Frederiksberg; Poul Lindegaard, Copenhagen; Ole H. Olsen, Broenshoej, all of Denmark; Eric Casteleijn, Capelle, Netherlands; Maarten R. Egmond, Linschoten, Netherlands; Johan Haverkamp, Bergschenhoek, Netherlands; Wouter Musters, Maassluis, Netherlands, and Jakob de Vlieg, Rotterdam, Netherlands, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Filed Dec. 20, 1991, Ser. No. 811,502

Claims priority, application European Pat. Off., Dec. 21, 1990, 90610077; United Kingdom, Dec. 21, 1990, 9027836

Int. Cl.<sup>6</sup> C12N 9/54; 9/56; 9/50; 15/57

U.S. Cl. 435—222

45 Claims

1. A modified subtilisin comprising a mutation in an amino acid sequence of a subtilisin at a position numbered according to the amino acid sequence of the mature subtilisin BPN', wherein the mutation is selected from the group consisting of:

- a histidine at position 17 substituted by a glutamine,
- a histidine at position 39 substituted by a serine,
- a glutamic acid at position 54 substituted with an aspartic acid,
- a histidine at position 120 substituted with an asparagine,
- a tyrosine at position 167 substituted with a glutamic acid,
- a tyrosine at position 167 substituted with a phenylalanine,
- a tyrosine at position 171 substituted with a phenylalanine,
- a tyrosine at position 171 substituted with a valine,
- a tyrosine at position 192 substituted with a glutamic acid,

- a tyrosine at position 192 substituted with a phenylalanine,
- a tyrosine at position 209 substituted with a phenylalanine,
- a tyrosine at position 214 substituted with a phenylalanine,
- a histidine at position 226 substituted with a serine, and
- a tyrosine at position 263 substituted with a phenylalanine.

5,482,850

# METHOD FOR IDENTIFYING ANTI-PARASITIC COMPOUNDS

Clotilde K. S. Carlow, Cambridge, and Antony Page, Beverly, both of Mass., assignors to New England Biolabs, Inc., Beverly, Mass.

Filed Oct. 29, 1993, Ser. No. 145,995

Int. Cl.<sup>6</sup> A61K 38/16; C07K 14/435; C12N 9/90

U.S. Cl. 435—233

2 Claims

1. A substantially pure protein endogenous to *Brugia malayi* having a molecular weight of about 73 kDa, wherein said protein possesses peptidyl-propyl cis-trans isomerase activity and contains a histidine rather than a tryptophan amino acid in the Cyclosporin A binding domain.

5,482,851

# NUCLEIC ACID ENCODING TGF- $\beta$ AND ITS USES

Rik M. A. Derynck, So. San Francisco, and David V. Goeddel, Hillsborough, both of Calif., assignors to Genentech, Inc., S. San Francisco, Calif.

Continuation of Ser. No. 845,893, Mar. 4, 1992, Pat. No.

5,284,763, which is a continuation of Ser. No. 389,929, Aug. 4, 1989, Pat. No. 5,168,051, which is a continuation of Ser. No.

25,423, Mar. 13, 1987, Pat. No. 4,886,747, which is a

continuation-in-part of Ser. No. 715,142, Mar. 22, 1985, abandoned. This application Nov. 5, 1993, Ser. No. 147,364

Int. Cl.<sup>6</sup> C12N 15/06; A61K 38/18

U.S. Cl. 435—240.1

2 Claims

1. A composition comprising human TGF- $\beta$  and Chinese hamster ovary cells.

5,482,852

# BIOLOGICALLY SAFE PLANT TRANSFORMATION SYSTEM

John I. Yoder, Winters, and Michael W. Lassner, Davis, both of Calif., assignors to Regents of the University of California, Oakland, Calif.

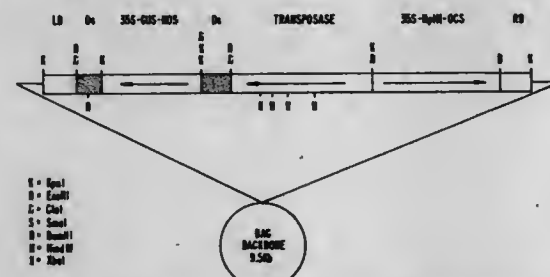
Continuation-in-part of Ser. No. 555,271, Jul. 19, 1990, Pat.

No. 5,225,341. This application Jun. 15, 1993, Ser. No. 77,787

Int. Cl.<sup>6</sup> C12N 15/63; 15/82; A01H 4/00

U.S. Cl. 435—172.3

9 Claims



1. A method for producing a transgenic plant that contains a gene of interest and is free of foreign ancillary nucleic acids, which foreign ancillary nucleic acid comprises a plant transposon element and those sequences within the transposon element, the method comprising:

- transforming a plant with the gene of interest by introduction of the gene on a DNA construct comprising the transposon element, wherein the gene is outside the transposon element;

- introducing a transposase gene into the plant;
- crossing the transformed plant through self-crossing or with another plant to obtain F<sub>1</sub> or more removed generation progeny; and
- selecting those progeny that carry the gene of interest and are free of the ancillary nucleic acids.

5,482,853

# POSITION-SPECIFIC INSERTION VECTORS AND METHOD OF USING SAME

Suzanne B. Sandmeyer, Corona del Mar, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Continuation of Ser. No. 895,333, Jun. 8, 1992, Pat. No.

5,292,662, which is a continuation of Ser. No. 276,201, Nov. 23, 1988, abandoned. This application Sep. 28, 1993, Ser. No.

128,483

The portion of the term of this patent subsequent to Mar. 8, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> C12N 15/63; 15/86; 7/01; 5/10

U.S. Cl. 435—172.3

17 Claims

1. A helper virus comprising a recombinant nucleic acid sequence encoding a polypeptide having the biological activity of *S. cerevisiae* Ty3 position-specific endonuclease, wherein said biological activity is the catalysis of position-specific integration of a nucleic acid sequence.

5,482,854

# GROWTH ENVIRONMENT ASSEMBLY AND METHOD OF USE THEREOF

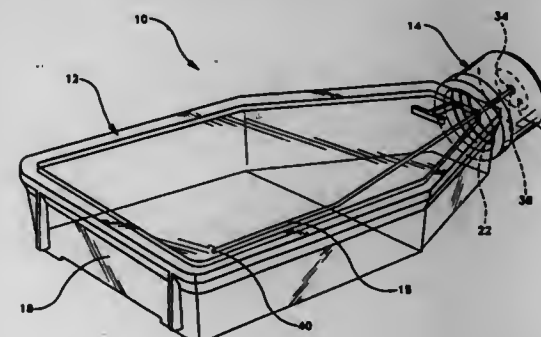
Robert K. O'Leary, Morris Plains, and Paul J. LaRocca, Ringwood, both of N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Oct. 6, 1994, Ser. No. 319,348

Int. Cl.<sup>6</sup> C12M 3/00; 1/24

U.S. Cl. 435—283.1

4 Claims



1. An assembly for treating living and non-living biological environments comprising:

- a vessel comprising a chamber and a neck connected to said chamber having an opening for introducing cells and culture fluids into said chamber;
- a closure for covering said opening in said neck comprising means for removably mounting said closure to said neck; and
- at least one tubular membrane for delivering fluids into said vessel through said closure wherein said tubular membranes comprise an open end, a closed end and a hollow cavity.

5,482,855

# TASTE SENSING SYSTEM USING ARTIFICIAL LIPID MEMBRANES

Kaoru Yamafuji, 1-6-21, Kusagae, Chuo-ku; Kiyoshi Toko, 1-25-2, Miwada, Higashi-ku, and Kenshi Hayashi, 2412 Oozatajiri, Nishi-ku, all of Fukuoka-shi, Fukuoka-ken, Japan, assignors to Amritsu Corporation, Tokyo; Kaoru Yamafuji, Fukuoka; Kiyoshi Toko, Fukuoka, and Kenshi Hayashi, Fukuoka, all of Japan

Continuation of Ser. No. 555,163, Jul. 19, 1990, abandoned.

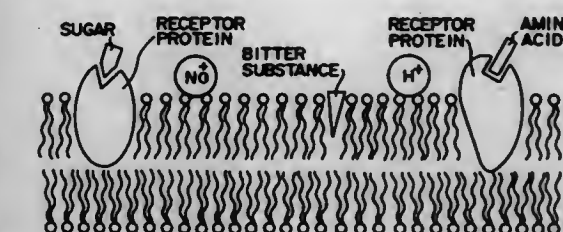
This application Mar. 8, 1993, Ser. No. 28,683

Claims priority, application Japan, Jul. 24, 1989, 1-190819

Int. Cl.<sup>6</sup> C12M 1/34; G01N 27/00

U.S. Cl. 435—287.1

14 Claims



1. A taste sensor which is capable of determining qualitative changes in a sample having a known sense of taste, said taste sensor comprising:

- a lipid membrane for reacting with the sample to induce a change in electrical characteristics corresponding to the qualitative changes in the sample, said lipid membrane including:
  - lipid molecules having a hydrophobic portion in which an atomic array extends in the longitudinal direction and a hydrophilic portion present at a portion of said atomic array extending in the longitudinal direction; and
  - a membrane-forming material mixed with said lipid molecules and having a matrix structure for supporting said lipid molecules on a surface thereof, said membrane-forming material being made of a polymer,
- at least some of said lipid molecules being supported in the matrix structure of said membrane-forming material such that said hydrophilic portion is arranged on the surface, and
- said change in the electrical characteristics being induced in accordance with a change in electrical characteristics of said lipid membrane, when the sample reacts with said lipid molecules arranged at least essentially on the surface of said lipid membrane;
- signal input means for inputting a signal in accordance with said change in the electrical characteristics induced by said lipid membrane; and
- signal processing means for processing the signal input by said signal input means, thereby determining the qualitative changes in the sample having the known sense of taste.

5,482,856

# PRODUCTION OF CHIMERIC ANTIBODIES BY HOMOLOGOUS RECOMBINATION

H. Perry Fell, Jr., Redmond; Kim R. Folger-Bruce, and Susan M. Yarnold, both of Seattle, all of Wash., assignors to Oncogen Inc., Seattle, Wash.

Division of Ser. No. 468,035, Jan. 22, 1990, Pat. No. 5,202,238, which is a continuation-in-part of Ser. No. 243,873, Sep. 14, 1983, Pat. No. 5,204,244, which is a continuation-in-part of

Ser. No. 113,800, Oct. 27, 1987, abandoned. This application Apr. 12, 1993, Ser. No. 45,945

Int. Cl.<sup>6</sup> C12N 15/00; 5/00

U.S. Cl. 435—320.1

15 Claims

1. A target vector for vivo homologous recombination comprising

- (i) a replacement gene to modify a portion of a genomic sequence of an immunoglobulin gene of a lymphoid cell which replacement gene encodes an immunoglobulin region, enzyme, toxin, hormone, growth factor or linker, and
- (ii) a target sequence homologous to a nucleic acid sequence which occurs in the genomic DNA of the lymphoid cell and is adjacent to the immunoglobulin gene sequence to be modified, wherein transfection of the vector into the lymphoid cell results in the modification of the immunoglobulin gene sequence by the replacement gene via site-specific homologous recombination in vivo.

5,482,857

# METHOD FOR REPRODUCING DOUGLAS-FIR BY SOMATIC EMBRYOGENESIS

Pramod K. Gupta, Federal Way, Wash., and Gerald S. Pullman, Alpharetta, Ga., assignors to Weyerhaeuser Company, Tacoma, Wash.

Continuation-in-part of Ser. No. 814,976, Dec. 23, 1991, Pat. No. 5,294,549, which is a continuation-in-part of Ser. No. 705,681, May 24, 1991, Pat. No. 5,236,841, which is a continuation-in-part of Ser. No. 499,151, Mar. 26, 1990, Pat. No. 5,036,007, which is a continuation-in-part of Ser. No. 321,035, Mar. 9, 1989, Pat. No. 4,957,866, and Ser. No. 426,331, Oct. 23, 1989, Pat. No. 5,034,326. This application Feb. 25, 1994, Ser. No. 201,873

Int. Cl.<sup>6</sup> A01H 4/00; 7/00; C12N 5/01

U.S. Cl. 435—240.45

12 Claims



1. A method of culturing singulated Douglas-fir somatic embryos by tissue culture in the absence of exogenous abscisic acid which comprises:

- placing an explant on an initiation culture medium containing an auxin and cytokinin and growing a culture containing early stage embryos;
- transferring the early stage embryos to a maintenance culture medium having a reduced level of auxin and cytokinin to further multiply and increase development of the early stage embryos; and then
- transferring the embryos to a cotyledonary embryo development medium lacking exogenous abscisic acid and having a plant hormone adsorbent sufficient to singulate any clumped embryos and cause further development of the early stage embryos into cotyledonary embryos.

# POLYPEPTIDE LINKERS FOR PRODUCTION OF BIOSYNTHETIC PROTEINS

James S. Huston, Chestnut Hill, and Hermann Oppermann, Medway, both of Mass., assignors to Creative BioMolecules, Inc., Hopkinton, Mass.

Continuation of Ser. No. 955,399, Oct. 1, 1992, Pat. No. 5,258,498, which is a continuation of Ser. No. 342,449, Jan. 23, 1989, abandoned, which is a continuation-in-part of Ser. No. 52,800, May 21, 1987, abandoned. This application Oct. 19, 1993, Ser. No. 139,171

The portion of the term of this patent subsequent to Feb. 25, 2009, has been disclaimed.

Int. Cl.<sup>6</sup> C12N 1/21; 5/10; 15/09

U.S. Cl. 435—252.33

7 Claims

1. A host cell harboring and capable of expressing a DNA encoding a biosynthetic single chain polypeptide, said single chain polypeptide comprising:

- a linking sequence connecting first and second non-naturally peptide-bonded, biologically active polypeptide domains to form a single polypeptide chain comprising at least two biologically active domains, connected by said linking sequence, said linking sequence comprising hydrophilic, peptide-bonded amino acids comprising at least 10 amino acid residues, said linking sequence being cysteine-free, having a flexible unstructured polypeptide configuration essentially free of secondary structure in aqueous solution, having a plurality of glycine or serine residues and defining a polypeptide of a length sufficient to span the distance between the C-terminal end of the first domain and the N-terminal end of the second domain.

5,482,859

# METHOD AND DEVICE FOR FEEDING GASEOUS SUBSTANCES INTO LIQUID MEDIA

Edmund Biller, Schmalzerstrasse 8, Raubling/Reichenhart, Germany, and Eberhard Bock, Herwigredder 110a, Hamburg 56, Germany

PCT No. PCT/DE91/00608, § 371 Date Mar. 29, 1993, § 102(e) Date Mar. 29, 1993, PCT Pub. No. WO92/03534, PCT Pub. Date Mar. 5, 1992

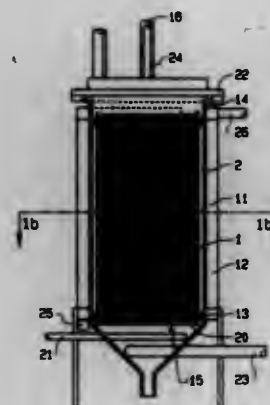
PCT Filed Feb. 25, 1993, Ser. No. 984,438

Claims priority, application Germany, Aug. 28, 1990, 40 27 126.9

Int. Cl.<sup>6</sup> C12S 5/00; C12M 1/12; 1/04

U.S. Cl. 435—266

14 Claims



1. The method of feeding and conversion of a gaseous substance into a liquid media consisting of a watery suspension of microorganisms chosen from the group of microorganisms of the genera *Pseudomonas*, *Alkaligenes*, *Nocardia*, *Methylomonas* or of methylotrophic or nitrifying bacteria, comprising the steps of:

- a) filling a number of hollow membrane bodies with said liquid media, said membrane bodies being of gas-permeable material and having a first end, a second end and an outer surface extending between said ends;
  - b) placing a plurality of said hollow bodies in side-by-side parallel spaced relation with respect to each other; and
  - c) feeding a gaseous substance capable of said conversion into said liquid media simultaneously along the outer surfaces of each of said hollow bodies from one end thereof to the other.
5. Device for feeding gaseous substances along a predetermined direction of flow and into liquid aqueous media, comprising
- a) a plurality of hollow membrane bodies (1) constructed of gas-permeable material with each of said bodies having a first end and a second end defining a border of said body and a central section having an outer surface located inwardly of said border and with each of said bodies containing said liquid media, said bodies being arranged in side-by-side parallel spaced relation with respect to each other and parallel to said direction of flow of said gaseous substances; and
  - b) means for directing said gaseous substances simultaneously along said outer surface of each of said membrane bodies from the first end thereof to the second end thereof.

5,482,860

# APPARATUS FOR CONTINUOUSLY REMOVING OXYGEN FROM FLUID STREAMS

James C. Copeland, Ashland, Ohio, and Howard L. Adler, Oak Ridge, Tenn., assignors to Oxyrase, Inc., Ashland, Ohio

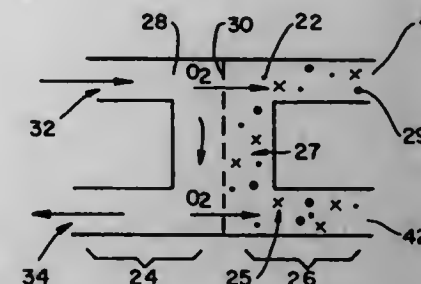
Division of Ser. No. 319,748, Mar. 7, 1989, Pat. No. 5,240,843.

This application Apr. 20, 1993, Ser. No. 49,995

Int. Cl.<sup>6</sup> C12M 1/40

U.S. Cl. 435—293.1

12 Claims



1. An apparatus for removing oxygen from a fluid stream comprising:

- a) a flow-through reactor chamber containing a hydrogen donating substance and oxygen scavenging cell membrane fragments having an electron transport system which reduces oxygen to water, wherein said fragments are derived from bacterial cytoplasmic membranes and are immobilized in the reactor chamber in a manner which allows free contact between said fragments and the fluid stream flowing there-through;
- b) means for introducing a fluid stream containing oxygen into said flow-through reactor chamber; and
- c) means for removing said fluid stream containing the deoxygenated water from the flow-through reactor chamber.

5,482,861

# AUTOMATED CONTINUOUS AND RANDOM ACCESS ANALYTICAL SYSTEM

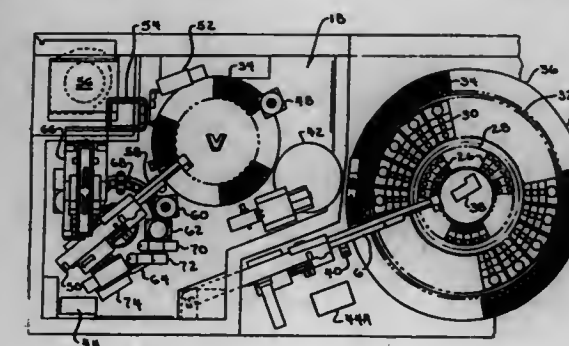
Frederic L. Clark, Plano; Gilbert Clift, Mesquite; Kendall B. Hendrick, Southlake; William J. Kanewski, III, Dallas, all of Tex.; Peter A. Lagocki, Park Ridge, Ill.; Richard R. Martin, Irving, Tex.; James E. Mitchell, Lake Barrington, Ill.; Larry W. Moore, Plano, Tex.; Charles D. Pennington, Lake Zurich, Ill.; Edna S. Walker, Chicago, Ill.; B. Jane Smith, Vernon Hills, Ill.; Apparao Tayi, Grayslake, Ill.; James A. Vaught, Euless, Tex., and David A. Yost, Poolesville, Md., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 45,432, Jun. 30, 1993, abandoned, which is a division of Ser. No. 859,218, Mar. 27, 1992, abandoned. This application Apr. 4, 1994, Ser. No. 222,520

Int. Cl.<sup>6</sup> G01N 35/02

U.S. Cl. 436—48

60 Claims



1. A method of operating an automated, continuous, and random access analytical system capable of simultaneously effecting multiple assays of a plurality of liquid samples, said method comprising the steps of:

- a. placing said samples onto said system;
- b. scheduling various assays of said plurality of liquid samples;
- c. preparing at least one unit dose disposable for each sample placed onto said system by (i) transferring an aliquot of said sample to a first well located in a reaction vessel having a plurality of separate and independent wells capable of receiving liquids; (ii) transferring to a second well located in said reaction vessel at least one reagent that is necessary for affecting said scheduled assay of said sample, such that reaction between said aliquot and said at least one reagent does not occur;
- d. transferring said reaction vessel containing said at least one unit dose disposable to a processing workstation;
- e. transferring at least one of said aliquot of said liquid sample or said at least one reagent in a well in said reaction vessel to a well in said reaction vessel to combine said aliquot and said at least one reagent to form a reaction mixture necessary for performing one of said assays scheduled in step b;
- f. repeating step c., step d., and step e. at least one time to form at least one reaction mixture in addition to the reaction mixture formed in step c.;
- g. independently incubating each of the aforementioned reaction mixtures simultaneously; and
- h. analyzing said incubated reaction mixtures independently and individually by at least two different assays that have been scheduled previously in step b.



# 5,482,862 METHODS FOR THE ON-LINE ANALYSIS OF FLUID STREAMS

Mark A. LaPack, Terry J. Nestrick, and James C. Tou, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

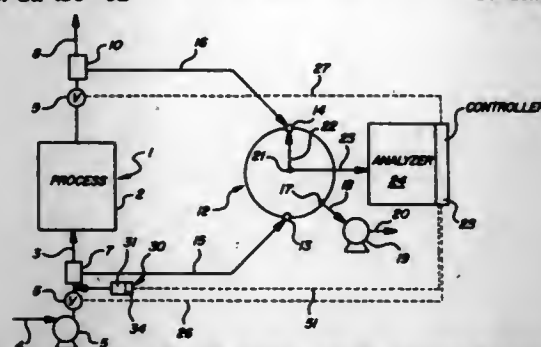
Continuation of Ser. No. 680,462, Apr. 4, 1991, abandoned.

This application Nov. 10, 1994, Ser. No. 337,125

Int. Cl.<sup>6</sup> G01N 35/08

U.S. Cl. 436—52

18 Claims



1. A method of analyzing on-line a stream of liquid flowing through, and beyond a treatment zone in which said liquid is subjected to treatment to remove therefrom at least a portion of a compound of interest that is at least partially immiscible with said liquid, said method comprising dispensing a quantity of said compound of interest into said stream so as to uniformly disperse said compound of interest into said stream at a point upstream from said zone; extracting from said stream downstream from said point and upstream from said zone a first sample of said compound of interest; treating said stream and the remainder of said compound of interest in said zone; discharging said stream and any remaining portion of said compound of interest from said zone; extracting from said stream downstream from said zone a second sample of said compound of interest; and analyzing the extracted first and second samples to determine the effect of the treatment in said zone on said compound of interest.

5,482,863

# APPARATUS FOR SUSPENDING PARTICLES

Rolf Knobel, Rotkreuz, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

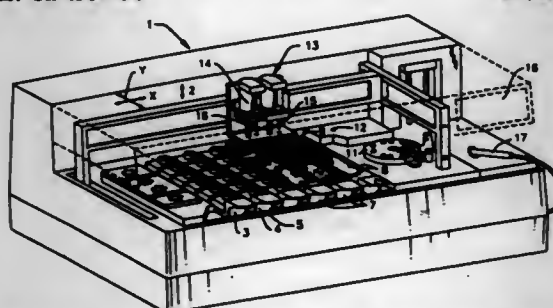
Filed Sep. 7, 1994, Ser. No. 301,828

Claims priority, application Switzerland, Sep. 17, 1993, 2800/93

Int. Cl.<sup>6</sup> G01N 35/08

U.S. Cl. 436—54

8 Claims



5. An analytical device for suspending particles in a reaction vessel having an inner wall and a central longitudinal axis, which comprises:

- a processing station into which a reaction vessel can be disposed;
- a pipetting device having conveying means for moving a pipetting needle in three directions at right angles to one another, and
- programmable means for controlling the position of the pipetting needle relative to the processing station so as to

cause the pipetting needle to dispense predetermined volumes of liquid at a location between the inner wall and the central longitudinal axis of the reaction vessel when disposed at the processing station, the position of the pipetting needle relative to the reactor vessel remaining unchanged at each location while liquid is being dispensed into the reaction vessel when disposed at the processing station.

5,482,864

# METHOD FOR SUSPENDING PARTICLES

Rolf Knobel, Rotkreuz, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 301,828, Sep. 7, 1994. This application

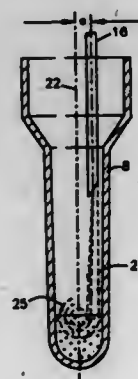
Apr. 24, 1995, Ser. No. 427,548

Claims priority, application Switzerland, Sep. 17, 1993, 2800/93

Int. Cl.<sup>6</sup> G01N 35/08

U.S. Cl. 436—54

9 Claims



1. A method of suspending particles in a reaction vessel having a central longitudinal axis by introducing a volume of a liquid into the reaction vessel via a pipetting needle movable by a conveying device, which comprises:

- the conveying device moving the pipetting needle to a first position located at a first predetermined distance from the central longitudinal axis of the reaction vessel;
- the pipetting needle introducing a first predetermined volume of liquid into the reaction vessel to form a first vortex within the reaction vessel, the position of the pipetting needle remaining unchanged while the liquid is being introduced;
- the conveying device moving the pipetting needle, after dispensing of said first predetermined volume of liquid, to a second position located at a second predetermined distance from the central longitudinal axis of the reaction vessel; and
- the pipetting needle introducing a second predetermined volume of liquid into the reaction vessel to form a second vortex within the reaction vessel which rotates in the opposite direction to the direction of rotation of the first vortex.

5,482,865

# APPARATUS AND METHOD FOR PREPARING OXYGEN-15 LABELED WATER H<sub>2</sub>[<sup>15</sup>O] IN AN INJECTABLE FORM FOR USE IN POSITRON EMISSION TOMOGRAPHY

Richard A. Ferrieri, Patchogue; David J. Schlyer, Bellport, and David Alexoff, Westhampton, all of N.Y., assignors to Associated Universities, Inc., Washington, D.C.

Filed Jun. 10, 1994, Ser. No. 258,053

Int. Cl.<sup>6</sup> G01N 37/00

U.S. Cl. 436—56

16 Claims

8. A method for preparing H<sub>2</sub>[<sup>15</sup>O] for use in Positron Emission Tomography, comprising the steps of:

5,482,867

# SPATIALLY-ADDRESSABLE IMMOBILIZATION OF ANTI-LIGANDS ON SURFACES

Ronald W. Barrett, Sunnyvale, Calif.; Michael C. Pirrung, Durham, N.C.; Lubert Stryer, Stanford, Calif.; Christopher P. Holmes, Sunnyvale, Calif., and Steven A. Sundberg, San Francisco, Calif., assignors to Affymax Technologies N.V., Netherlands

Division of Ser. No. 612,671, Nov. 13, 1990, Pat. No. 5,252,743, which is a continuation-in-part of Ser. No. 435,316, Nov. 13, 1989, abandoned. This application Apr. 23, 1993, Ser. No. 54,121

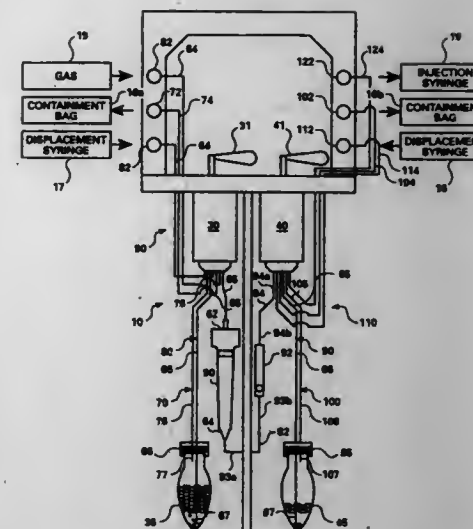
Int. Cl.<sup>6</sup> G01N 33/543;33/552

U.S. Cl. 436—518

16 Claims

1. A method for forming predefined regions on a surface of a solid support, the predefined regions capable of selectively immobilizing an anti-ligand, the method comprising:

- attaching to the surface a caged biotin analog having a low affinity for (i) the anti-ligand or (ii) a specific binding substance capable of binding an anti-ligand, said caged biotin analog comprising a photolabile chemical protecting group, which chemical protecting group is removable by irradiation to convert said caged biotin analog to a biotin analog capable of non-covalently immobilizing (i) the anti-ligand or (ii) the specific binding substance by an interaction having an affinity constant of 10<sup>7</sup> or stronger; and
- selectively irradiating a predefined region of the surface to convert the caged biotin analogs in the predefined region to the biotin analog capable of non-covalently immobilizing (i) the anti-ligand or (ii) the specific binding substance.



receiving and directing a gas containing H<sub>2</sub>[<sup>15</sup>O] and at least one impurity into sterile water to trap the H<sub>2</sub>[<sup>15</sup>O] and the at least one impurity in the sterile water; displacing the sterile water containing the trapped H<sub>2</sub>[<sup>15</sup>O] and the at least one impurity through an ion resin to remove the at least one impurity from the sterile water; and combining the sterile water containing H<sub>2</sub>[<sup>15</sup>O] with a saline solution to produce an injectable solution.

5,482,868

Patent Not Issued For This Number

5,482,869

# GETTERING OF UNWANTED METAL IMPURITY INTRODUCED INTO SEMICONDUCTOR SUBSTRATE DURING TRENCH FORMATION

Yusuke Kobayashi, Yokosuka, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

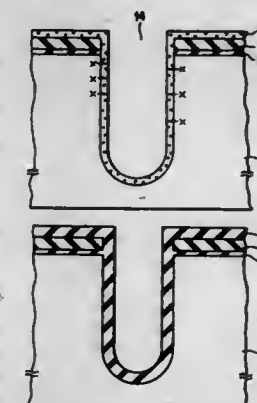
Filed Mar. 1, 1994, Ser. No. 203,943

Claims priority, application Japan, Mar. 1, 1993, 5-039947

Int. Cl.<sup>6</sup> H01L 21/306

U.S. Cl. 437—12

11 Claims



1. A method of making a semiconductor device comprising the steps of:  
forming a trench in a first conductivity-type semiconductor substrate;  
lining an inner wall of said trench with a semiconductor layer;  
annealing said semiconductor substrate to subject an unwanted metal impurity contained in said semiconductor substrate to gettering into said semiconductor layer;

5,482,866

# METHOD FOR QUANTITATION OF CALCIUM AND MAGNESIUM AND THE NOVEL REAGENT COMPOSITIONS

James B. Denton, Montclair; Diane J. Dixon, and Richard A. Kaufman, both of Belleville, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 996,361, Dec. 23, 1992, abandoned, which is a continuation of Ser. No. 765,225, Sep. 25, 1991, abandoned, which is a continuation of Ser. No. 451,386, Dec. 15, 1989, abandoned. This application Jul. 28, 1994, Ser. No. 281,808

Int. Cl.<sup>6</sup> G01N 33/84

U.S. Cl. 436—79

13 Claims

1. A method for the determination of magnesium in an analytical sample comprising the steps of:

- mixing the sample with a first reagent comprised of chlorophosphonazo III ("CPZ3") and a chelating agent selected from the group consisting of ethyleneglycol bis (2-aminoethylether)-N,N,N',N'-tetracetic acid ("EGTA") and 1,2 bis (2-aminophenoxy) ethane-N,N,N',N'-tetracetic acid ("BAPTA") ("Reagent 1"),
- measuring the absorbance of the sample,
- adding a second reagent comprising EDTA ("Reagent 2") to the reaction mixture,
- measuring the absorbance of the sample, whereby the difference in absorbance is proportional to the quantity of magnesium in the sample.

oxidizing entirely said semiconductor layer to form an insulating layer;  
forming a capacitor in said trench; and  
connecting an electrode of said capacitor to a source/drain region of a MOSFET.

5,482,870

# METHODS FOR MANUFACTURING LOW LEAKAGE CURRENT OFFSET-GATE THIN FILM TRANSISTOR

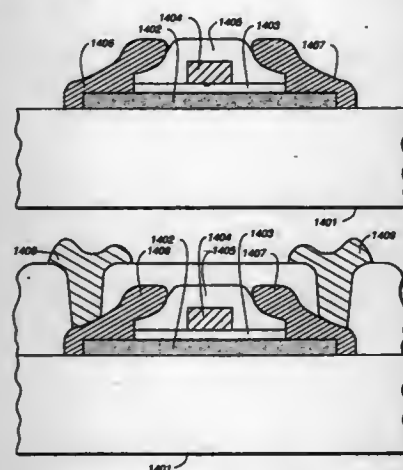
Satoshi Inoue, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Division of Ser. No. 984,825, Dec. 3, 1992, which is a division of Ser. No. 708,154, May 31, 1991, Pat. No. 5,208,476. This application Jan. 18, 1994, Ser. No. 184,619

Claims priority, application Japan, Jun. 8, 1990, 2-150151 Int. Cl.<sup>6</sup> H01L 21/266; 21/84

U.S. Cl. 437—21

12 Claims



5. A method of manufacturing a thin film transistor, having a source region, a drain region and a gate electrode, comprising the steps of:

- forming a thin silicon film on an insulating substrate;
- forming, in turn a gate insulation layer and a gate electrode on said first thin silicon film;
- forming an insulation layer on top of said gate electrode and said gate insulation layer;
- selectively etching said insulation layer and said gate insulation layer so that a portion of said thin silicon film on each side of said gate electrode is exposed as an exposed portion; and
- forming a source region and a drain region by depositing a doped silicon layer on and covering each said exposed portion of said first thin silicon film, wherein said gate electrode does not overlap said source region and drain region.

5,482,871

# METHOD FOR FORMING A MESA-ISOLATED SOI TRANSISTOR HAVING A SPLIT-PROCESS POLYSILICON GATE

Gordon P. Pollack, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

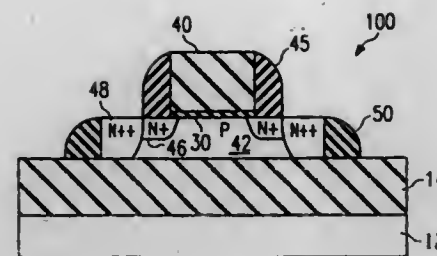
Filed Apr. 15, 1994, Ser. No. 228,043

Int. Cl.<sup>6</sup> H01L 21/265

U.S. Cl. 437—21

10 Claims

1. A method for forming a mesa-isolated SOI transistor having improved gate oxide integrity, comprising the steps of:  
forming an SOI etch mask on an SOI layer, the SOI etch mask comprising a gate oxide layer covered by a polysilicon layer, the polysilicon layer covered by a Si<sub>3</sub>N<sub>4</sub> layer, the SOI etch mask further comprising a first SiO<sub>2</sub> sidewall spacer on sidewalls of said polysilicon layer;



forming an SOI mesa from the SOI layer by etching using the SOI etch mask;  
removing the first SiO<sub>2</sub> sidewall spacer from the SOI etch mask;  
doping the exposed edges of the SOI mesa to establish a threshold voltage adjust implant in the SOI mesa;  
removing the Si<sub>3</sub>N<sub>4</sub> layer;  
depositing additional polysilicon on the polysilicon layer and SOI mesa to form a gate electrode layer;  
doping the gate electrode layer;  
etching the gate electrode layer to form a gate electrode;  
forming a drain region in the SOI mesa by introducing a dopant;  
forming a second SiO<sub>2</sub> sidewall spacer on sidewalls of the gate electrode;  
forming a source/drain region in the SOI mesa by introducing additional dopants using the second SiO<sub>2</sub> sidewall spacer as a mask to yield a mesa-isolated SOI transistor comprising the gate electrode and the source/drain region; and  
annealing the mesa-isolated SOI transistor.

5,482,872

# METHOD OF FORMING ISOLATION REGION IN A COMPOUND SEMICONDUCTOR SUBSTRATE

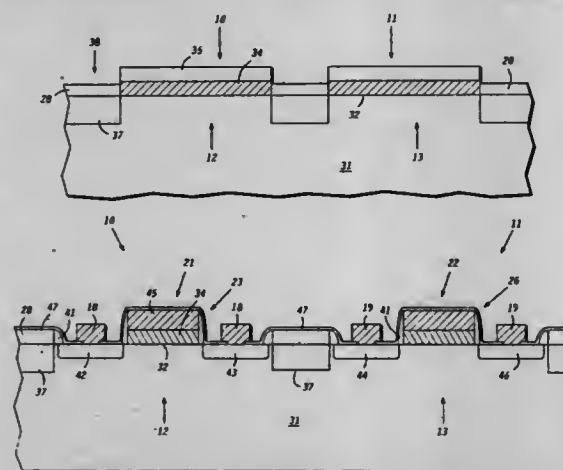
Schyi-yi Wu, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 31, 1994, Ser. No. 188,985

Int. Cl.<sup>6</sup> H01L 21/266

U.S. Cl. 437—22

10 Claims



1. A method for forming an isolation region in a compound semiconductor substrate, comprising the steps of:  
providing the compound semiconductor substrate having a major surface;  
covering a portion of the major surface with a surface protection material by depositing a layer of metal on the major surface, the layer of metal serving as the surface protection material;  
forming the isolation region in the compound semiconductor substrate, the isolation region surrounding an active region of the compound semiconductor substrate and extending from the major surface into the compound semiconductor substrate a first distance, wherein the step of forming the isolation region further includes the steps of:

patterning the layer of metal to form at least one metal island, the region of the compound semiconductor substrate below the at least one metal island serving as the active region of the compound semiconductor substrate;  
forming an insulating material on the major surface, the insulating material surrounding the at least one metal island;  
forming an isolation implant block mask on the layer of metal; and  
implanting an impurity material through the insulating material on the major surface into a portion of the compound semiconductor substrate, the regions containing the impurity material serving as the isolation region;  
forming a control electrode in contact with a first portion of the active region after the step of forming the isolation region, the control electrode having first and second sides;  
forming a first dopant region in a second portion of the active region and a second dopant region in a third portion of the active region, the first dopant region adjacent the first side of the control electrode and the second dopant region adjacent the second side of the control electrode; and  
contacting a portion of the first dopant region with a first electrode and a portion of the second dopant region with a second electrode.

5,482,873

# METHOD FOR FABRICATING A BIPOLAR POWER TRANSISTOR

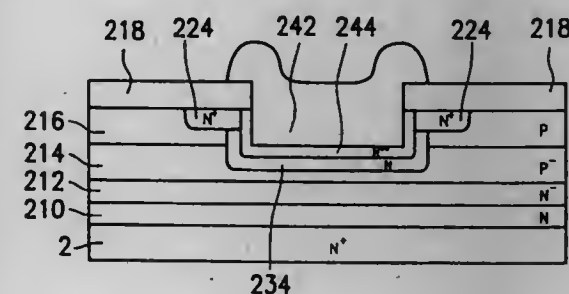
Sheng-Hsing Yang, Hsinchu, Taiwan, Prov. of China, assignor to United Microelectronics Corporation, Hsinchu, Taiwan, Prov. of China

Filed Apr. 14, 1995, Ser. No. 422,572

Int. Cl.<sup>6</sup> H01L 21/8222

U.S. Cl. 437—31

6 Claims



1. A method for fabricating a bipolar power transistor which is made on a first type of heavily doped substrate serving as a collector of said bipolar power transistor, the method comprising the following steps of:

- forming a first type of doped layer, a first type of lightly doped layer, a second type of lightly doped layer, a second type of doped layer and a barrier layer on said first type of heavily doped substrate sequentially;
- forming an opening on a position of said barrier layer;
- using the barrier layer as a mask, a first type of dopant being doped into said second type of doped layer by said opening and being driven in to form a first type of heavily doped region under said barrier layer;
- using said barrier layer as a mask, forming a recession thereon by etching said second type of doped layer through said opening, said recession extending to said second type of lightly doped layer through said second type of doped layer;
- doping a first type of dopant into said second type of doped layer and said second type of lightly doped layer in said recession to form a first type of doped region, said first type of doped region surrounding said recession and being adjacent to said first type of heavily doped region; and

forming a conductive layer in said recession, and doping a first type of dopant into said conductive layer, whereby said first type of dopant is diffused in said first type of heavily doped region and said first type of doped region to form a first type of diffused region serving as an emitter of said bipolar power transistor, wherein the doping concentration of said first type of diffused region is greater than that of said first type of heavily doped region.

5,482,874

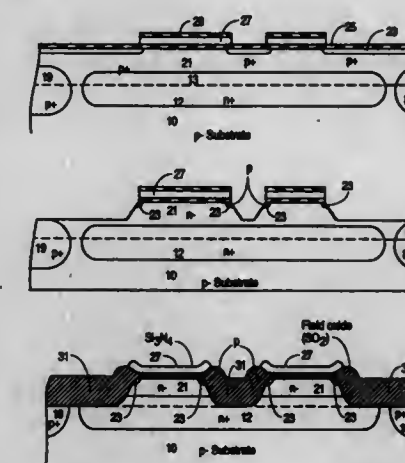
# INVERSION IMPLANT ISOLATION PROCESS

George E. Ganschow, Trabuco Canyon, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.  
Division of Ser. No. 44,560, Apr. 7, 1993, Pat. No. 5,289,024, which is a continuation of Ser. No. 821,256, Jan. 10, 1992, abandoned, which is a continuation of Ser. No. 564,013, Aug. 7, 1990, abandoned. This application Nov. 19, 1993, Ser. No. 154,891

Int. Cl.<sup>6</sup> H01L 21/265; H01R 21/22

U.S. Cl. 437—31

14 Claims



1. A method for forming a base and an emitter in a bipolar transistor, the base having a first conductivity type, and the emitter having a second conductivity type opposite the first conductivity type, the method comprising the steps of, in sequence:

- forming a mask over a base region of a substrate, the mask including an opening exposing a portion of the substrate where a field oxide region is to be formed;
- implanting dopants of the first conductivity type into the exposed portion of the substrate where the field oxide region is to be formed;
- diffusing the dopants from the implant laterally under a portion of the mask into the base region;
- etching the exposed portion of the substrate where the field oxide region is to be formed, leaving the laterally diffused dopants beneath the mask as a diffusion compensation region;
- forming the field oxide region in the exposed portion of the substrate;
- wherein the diffusion compensation region abuts a sidewall of the field oxide region;
- forming the base in the base region, the base having a dopant concentration lower than the diffusion compensation region, the base laterally contacting the diffusion compensation region;
- forming the emitter above the base; and



forming a sidewall oxide region above the diffusion compensation region, wherein the emitter abuts the sidewall oxide region above the diffusion compensation region.

5,482,875

# METHOD FOR FORMING A LINEAR HETEROJUNCTION FIELD EFFECT TRANSISTOR

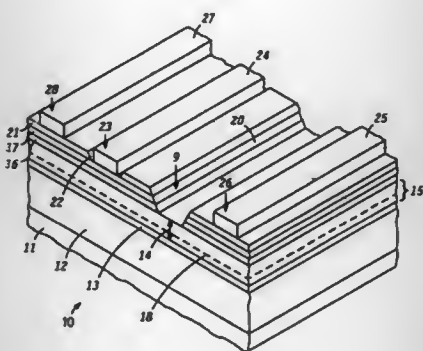
Rimantas L. Vaitkus, Paradise Valley; Saled N. Tehrani, Scottsdale; Vijay K. Nair, Mesa, and Herbert Goronkin, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 932,526, Aug. 20, 1992, Pat. No. 5,304,825. This application Apr. 18, 1994, Ser. No. 229,266

Int. Cl.<sup>6</sup> H01L 21/335

U.S. Cl. 437—40

19 Claims



1. A method for setting a drain saturation current in a field effect transistor having an asymmetric channel restriction means adjacent a drain side of the gate electrode and absent from a source side of the gate electrode comprising the steps of:

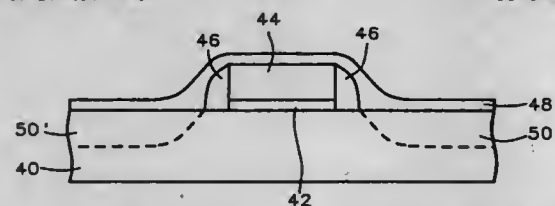
- providing a semi-insulating semiconductor substrate;
- forming a buffer layer on the semi-insulating semiconductor substrate, the buffer layer being a non-intentionally doped semiconductor material;
- forming a semiconductor channel layer on the buffer layer;
- forming a semiconductor barrier layer on the semiconductor channel layer;
- forming a semiconductor ohmic contact layer on the semiconductor barrier layer;
- providing a semiconductor impurity material in a first portion of the semiconductor ohmic contact layer, the semiconductor impurity material extending from a first major surface of the semiconductor ohmic contact layer into a first portion of the semiconductor barrier layer;
- forming a cavity in a gate region of the semiconductor ohmic layer, the cavity spaced from the first portion of the semiconductor ohmic contact layer thereby exposing a portion of a first major surface of the semiconductor barrier layer, the semiconductor impurity material and the cavity serving as the asymmetric channel restriction means and cooperating with the channel layer to limit a flow of drain current;
- forming the gate electrode of the field effect transistor on a portion of the first major surface of the semiconductor barrier layer, the gate electrode electrically separated from the semiconductor channel layer by a Schottky barrier;
- forming the drain electrode of the field effect transistor in a drain region of the semiconductor ohmic contact layer, the drain electrode ohmically coupled to the semiconductor channel layer and laterally spaced from the semiconductor impurity material wherein the semiconductor impurity material is between the gate electrode and the drain electrode; and
- forming the source electrode of the field effect transistor in a source region of the ohmic contact layer, the source electrode ohmically coupled to the semiconductor channel layer.

## 5,482,876 FIELD EFFECT TRANSISTOR WITHOUT SPACER MASK EDGE DEFECTS

Yong-Fen Hsieh; Shu-Ying Lu, and Wen-Ching Tsal, all of Hsinchu, Taiwan, Prov. of China, assignors to United Microelectronics Corporation, Hsinchu, Taiwan, Prov. of China  
Filed May 25, 1995, Ser. No. 450,266  
Int. Cl.<sup>6</sup> H01L 21/265

U.S. Cl. 437—40

18 Claims



1. A method for forming a field effect transistor not susceptible to mask edge defects at its gate spacer oxide edges comprising: providing a (100) silicon semiconductor substrate having formed thereupon a gate electrode aligned over a gate oxide; forming a pair of gate spacer oxides covering a pair of opposite edges of the gate oxide and the gate electrode; forming a screen oxide layer over the surface of the semiconductor substrate, the gate electrode and the pair of gate spacer oxides;

the upper surface of the screen oxide layer having an angle of elevation not exceeding 54.44 degrees with respect to the semiconductor substrate;

the screen oxide layer smoothly flowing from a pair of higher thickness regions at the junctures of the gate spacer oxides and the semiconductor substrate to a pair of lower thickness regions over the semiconductor substrate;

providing an ion implant to a prescribed penetration depth through the screen oxide layer into the semiconductor substrate adjoining the gate spacer oxides to form a pair of amorphous source/drain electrodes;

the prescribed penetration depth being greater in depth than the thickness of the screen oxide layer over the semiconductor substrate and no greater in depth than the thickness of the screen oxide layer at the junctures of the semiconductor substrate and the gate spacer oxides; and annealing the amorphous source/drain electrodes.

5,482,877

## METHOD FOR MAKING A SEMICONDUCTOR DEVICE HAVING A SILICON-ON-INSULATOR STRUCTURE

Taepok Rhee, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

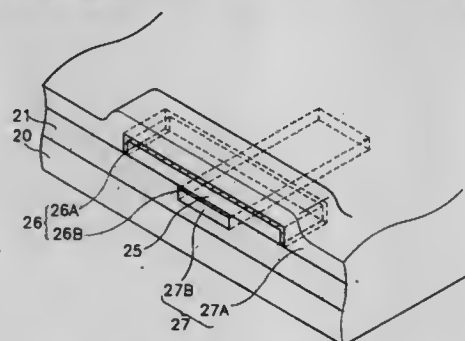
Filed Feb. 16, 1994, Ser. No. 197,480

Claims priority, application Rep. of Korea, Feb. 17, 1993, 93-2208

Int. Cl.<sup>6</sup> H01L 21/786

U.S. Cl. 437—40 RG

4 Claims



1. A method for making a semiconductor device having a silicon-on-insulator, gate-all-around structure comprising the steps of:

forming a pad oxide on a wafer which includes a lower silicon substrate, a buried insulator layer, and an upper silicon layer; forming an oxynitride region on a portion of said buried insulator layer; forming an active silicon layer to intersect said oxynitride region; forming a cavity by wet-etching said exposed oxynitride region; forming a gate insulating layer on the surface of the exposed active silicon layer; depositing polysilicon to fill said cavity surrounding said active silicon layer; removing a portion of said polysilicon to form a gate electrode; and forming source and drain regions on said active silicon layer separated by said gate electrode.

dopant region aligned to the second side of the gate structure, wherein a portion of the second dopant region extends below another portion of the gate structure; forming first and second electrodes, the first electrode in contact with the second dopant region and the second electrode in contact with the third dopant region; and forming a third electrode in contact with a portion of the gate structure.

5,482,879

## PROCESS OF FABRICATING SPLIT GATE FLASH MEMORY CELL

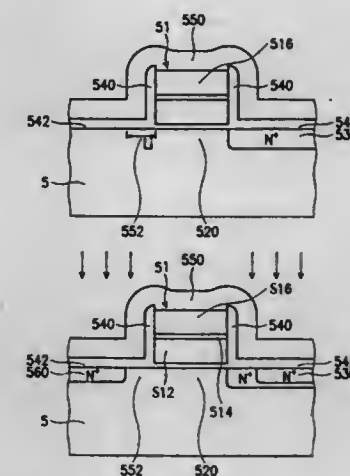
Gary Hong, Hsinchu, Taiwan, Prov. of China, assignor to United Microelectronics Corporation, Hsinchu, Taiwan, Prov. of China

Filed May 12, 1995, Ser. No. 439,917

Int. Cl.<sup>6</sup> H01L 21/8247

U.S. Cl. 437—43

14 Claims



5,482,878

## METHOD FOR FABRICATING INSULATED GATE FIELD EFFECT TRANSISTOR HAVING SUBTHRESHOLD SWING

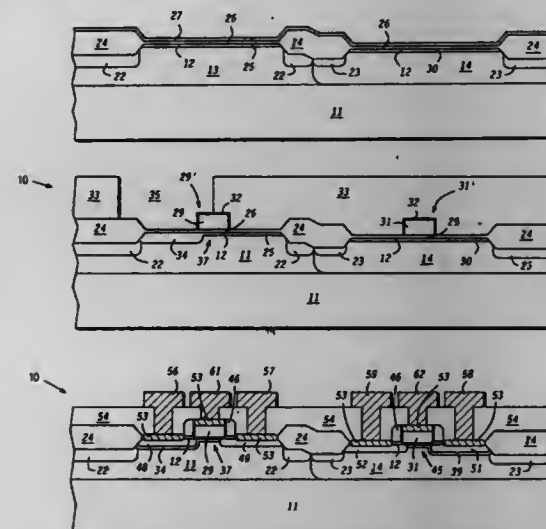
Vida I. Burger; Michael H. Kaneshiro, both of Phoenix; Diann Dow, Chandler; Kevin M. Klein, Tempe; Michael P. Masquellier, and E. James Prendergast, both of Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 4, 1994, Ser. No. 223,393

Int. Cl.<sup>6</sup> H01L 21/265

U.S. Cl. 437—41

17 Claims



1. A method for fabricating an insulated gate field effect transistor which operates at a voltage less than 3.5 volts and has a subthreshold swing, comprising the steps of:

- providing a semiconductor material of a first conductivity type having a major surface;
- forming a dopant layer of the first conductivity type in a first region of the semiconductor material;
- forming a gate structure having first and second sides on a portion of the major surface of the first region after forming the dopant layer of the first conductivity type, wherein the gate structure is over a portion of the dopant layer which extends at least from a portion of the semiconductor material aligned to the first side of the gate structure to a portion of the semiconductor material aligned to a second side of the gate structure;
- forming a first dopant region of the first conductivity type in the semiconductor material, the first dopant region aligned to the first side of the gate structure, wherein a portion of the first dopant region extends below the gate structure and is contiguous with the portion of the dopant layer below a portion of the gate structure;
- forming second and third dopant regions of a second conductivity type in the semiconductor material, the second dopant region contained within the first dopant region and the third

1. A method for forming a split-gate EEPROM cell including a memory transistor and an isolation transistor, comprising the steps of:

- (a) forming a stacked-gate structure for said memory transistor on a face of a substrate, said stacked-gate structure including a tunnel insulating layer, a floating gate layer, an inter-level dielectric layer and a first control gate layer;
- (b) forming, at one side of said stacked-gate structure, a diffused drain region into said substrate with one edge of said drain region aligned with the edge of said stacked-gate structure at said one side;
- (c) forming sidewall insulating layers on the sidewalls of said stacked-gate structure, and forming a gate-insulating layer for said isolation transistor on said substrate;
- (d) forming a second control gate layer can formally overlying said first control gate layer, said sidewall-insulating layers and said gate insulating layer, where said second control gate layer has a first thickness overlying the gate insulating and first control gate layers, and a second greater thickness than said first thickness on the sidewall insulating layers, said thickness being measured in a direction perpendicular to the upper surface of the substrate said second control gate layer connecting with said first control gate layer to form a common control gate for said memory and isolation transistors; and
- (e) forming, at another side of said stacked-gate structure opposite to said one side, a diffused source region in said substrate with one edge of said source region aligned with the second control gate layer at a point where the thickness of said second control gate layer changes from the second to the first thickness of said second control gate layer, which is formed on the sidewall insulating layer located at said another side of said stacked-gate structure.

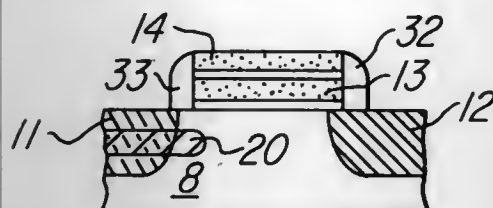
5,482,880

## NON-VOLATILE MEMORY CELL AND FABRICATION METHOD

Cetin Kaya, and David Liu, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.  
Division of Ser. No. 753,252, Aug. 30, 1991. This application May 24, 1993, Ser. No. 66,816  
The portion of the term of this patent subsequent to Nov. 23, 2010, has been disclaimed.  
Int. Cl.<sup>6</sup> H01L 21/8247

U.S. Cl. 437—43

14 Claims



1. A method of forming a non-volatile memory cell structure comprising the steps of:

- forming a floating gate over and insulated from channel region disposed in a semiconductor region;
- forming a control gate over and insulated from said floating gate;
- implanting heavily doped source and drain regions within said semiconductor region and abutting a surface thereof, said source and drain regions separated by said channel region;
- implanting a lightly doped region in said channel region at least partially beneath said floating gate and adjoining said source region, said lightly doped region spaced from the surface of said substrate, said lightly doped region being less lightly doped than said heavily doped regions.

5,482,881

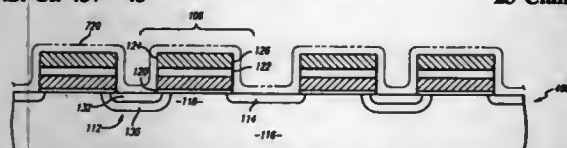
## METHOD OF MAKING FLASH EEPROM MEMORY WITH REDUCED COLUMN LEAKAGE CURRENT

Jian Chen; Yuan Tang, both of San Jose; Scott Luning, Menlo Park, and Salvatore F. Cagnina, Los Altos, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.  
Filed Mar. 14, 1995, Ser. No. 403,460

Int. Cl.<sup>6</sup> H01L 21/8247

U.S. Cl. 437—43

23 Claims



1. In a method for forming a memory device including an array of cells, where:

- each cell comprises first and second first conductivity type semiconductor regions, a channel semiconductor region of a second conductivity type, and a selectively chargeable gate structure including a tunnel dielectric overlying the channel region, the first conductivity type being of opposite type than the second conductivity type,
- the first and second regions define a controlled current path through the channel region which tends to be rendered conductive in response to a voltage level at a predetermined relationship to a gate threshold level being applied to the control gate,
- selectively charging the gate structure raises the gate threshold level, such that conduction of the cell in response to application to the control gate of a predetermined voltage is indicative of the logical state of the cell, and
- the cell is dischargeable by tunneling of electrons from the gate structure through the tunnel dielectric to the first semiconductor region to remove the charge on the gate structure,

and the array is formed by the steps of:

- forming the cell gate structures overlying predetermined portions of an array semiconductor region of the second conductivity type corresponding to the channel regions of the cells, and
  - forming the first and second first conductivity type regions of the cells in predetermined portions of the array semiconductor region adjacent to the channel regions,
- the improvement wherein, the step of forming the first and second regions of the cells comprises the steps of:
- after forming the gate structures, implanting a first dose of a first conductivity type dopant in the first region; and
  - after implanting the first dose of the first conductivity type dopant in the first region, implanting a second dose of first conductivity type dopant in both the first and second regions.

5,482,882

## METHOD FOR FORMING MOST CAPACITOR USING POLYSILICON ISLANDS

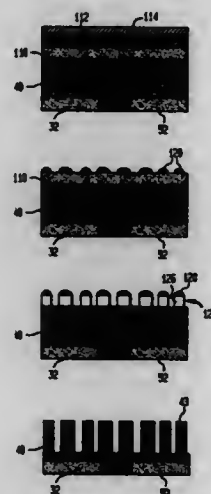
Water Lur, Taipei; Pin-Iuh Chen, Jong-Lih, and Jinn-Yuan Wu, Guo Keng Shiang, all of, Taiwan, Prov. of China, assignors to United Microelectronics Corporation, Hsin-Chu, Taiwan, Prov. of China

Filed Mar. 18, 1994, Ser. No. 214,592

Int. Cl.<sup>6</sup> H01L 27/00; 21/70

U.S. Cl. 437—52

14 Claims



1. A method for making a capacitor for use in a DRAM cell, comprising the steps of:

- (a) forming a conductive polysilicon electrode layer on a silicon substrate;
- (b) forming an insulating layer on the conductive polysilicon electrode layer;
- (c) forming a second polysilicon layer on the insulating layer;
- (d) forming a transition metal layer on the second polysilicon layer;
- (e) applying a thermal treatment to form a silicide having unreacted polysilicon islands at the interface of the transition metal and insulating layers;
- (f) removing the silicide, thereby leaving said unreacted polysilicon islands on the surface of said insulating layer;
- (g) using the unreacted polysilicon islands as a mask, etching the insulating layer to form two-level islands, each island comprising a polysilicon island on top of an island of insulating material and
- (h) using the two-level islands as a mask, etching said conductive polysilicon electrode layer to form pillars therein.

5,482,883

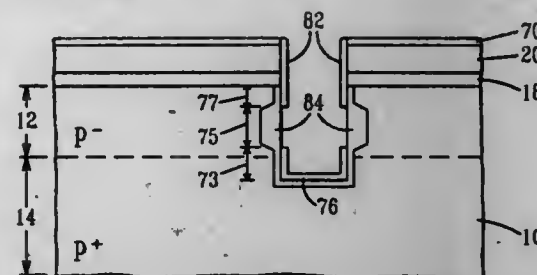
## METHOD FOR FABRICATING LOW LEAKAGE SUBSTRATE PLATE TRENCH DRAM CELLS AND DEVICES FORMED THEREBY

Thekkemadathil V. Rajeevakumar, Scarsdale, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.  
Division of Ser. No. 160,537, Dec. 1, 1993, Pat. No. 5,406,515.  
This application Nov. 10, 1994, Ser. No. 337,570

Int. Cl.<sup>6</sup> H01L 21/8242

U.S. Cl. 437—52

24 Claims



12. A method of forming an insulating ring around a trench of a DRAM cell comprising the steps of:

- (a) providing a substrate having a lightly doped upper portion of one conductivity type overlying a heavily doped lower portion of the same conductivity type;
- (b) forming a protective layer on a surface of said upper portion of the substrate;
- (c) etching a trench to a first depth into said upper portion of said substrate at a first region;
- (d) forming an oxide layer on all surface of said trench below said substrate surface; and
- (e) selectively exposing an annular portion of said upper portion of said substrate by removing a portion of said oxide layer and forming an insulating ring within said exposed annular portion of said upper portion of said substrate, spaced from said substrate surface and surrounding a portion of the trench, said insulating ring being continuous with said trench on all sides and not within said trench.

5,482,884

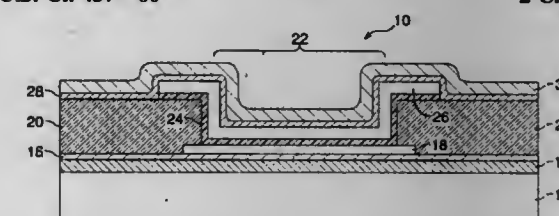
## LOW-TEMPERATURE PROCESS METAL-TO-METAL ANTIFUSE EMPLOYING SILICON LINK

John L. McCollum, Saratoga, and Abdul R. Forouhi, San Jose, both of Calif., assignors to Actel Corporation, Sunnyvale, Calif.

Division of Ser. No. 992,055, Dec. 17, 1992, Pat. No. 5,373,169. This application Aug. 9, 1994, Ser. No. 287,724  
Int. Cl.<sup>6</sup> H01L 21/70

U.S. Cl. 437—60

2 Claims



1. A process for fabricating a metal-to-metal antifuse on an insulating layer disposed on a semiconductor or other microcircuit structure including the steps of:

- forming a first metal layer on said insulating layer;
- forming a lower barrier layer over said first metal layer;
- forming a first heavily-doped amorphous silicon layer over said lower barrier layer;
- forming an inter-metal dielectric layer over said first heavily-doped amorphous silicon layer;
- forming an antifuse aperture in said inter-metal dielectric layer to expose a portion of an upper surface of said first heavily-doped amorphous silicon layer;

- forming a dielectric antifuse layer over said portion of said upper surface of said first heavily-doped amorphous silicon layer in said antifuse aperture;
- forming a second heavily-doped amorphous silicon layer over said dielectric antifuse layer;
- forming an upper barrier layer over said second heavily-doped amorphous silicon layer; and
- forming a second metal layer over said upper barrier layer.

5,482,885

## METHOD FOR FORMING MOST CAPACITOR USING POLY SPACER TECHNIQUE

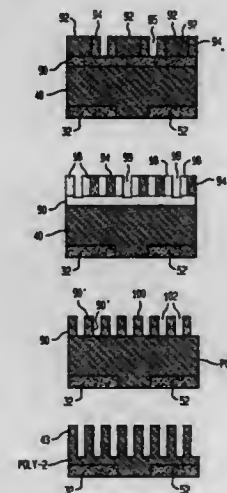
Water Lur, Taipei, and Cheng-Hen Huang, Hsin-Chu, both of, Taiwan, Prov. of China, assignors to United Microelectronics Corp., Hsin-Chu, Taiwan, Prov. of China

Filed Mar. 18, 1994, Ser. No. 214,595

Int. Cl.<sup>6</sup> H01L 21/70; 27/00

U.S. Cl. 437—60

1 Claim



1. A method for forming a capacitor for use in a DRAM cell, comprising the steps of:

- (a) forming a conductive polysilicon electrode layer on a substrate;
- (b) forming an oxide layer on the polysilicon electrode layer;
- (c) forming oxide spaces on said oxide layer, comprising the steps of:
  - (i) forming spaced apart nitride regions on said oxide layer;
  - (ii) forming polysilicon spacers on the side walls of said nitride regions;
  - (iii) removing said nitride regions; and
  - (iv) forming said oxide spaces on the side walls of said polysilicon spacers and removing said polysilicon spacers;
- (d) etching said oxide spaces and said oxide layer to form oxide lines on said polysilicon electrode layer;
- (e) using said oxide lines as a mask, etching said polysilicon electrode layer to form pillars therein;
- (f) forming a dielectric layer on said polysilicon electrode layer; and
- (g) forming a second polysilicon electrode layer on said dielectric layer.



5,482,886

**METHOD FOR FABRICATING DYNAMIC RANDOM ACCESS MEMORY CAPACITOR**

Cheoul S. Park, and Dong Y. Keum, both of Kyongki-do, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Kyongki-Do, Rep. of Korea

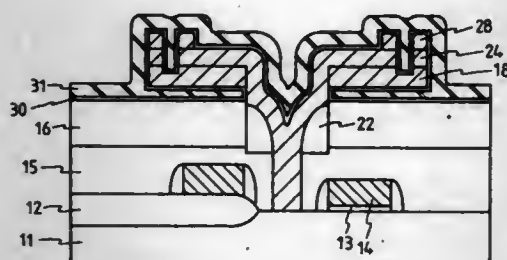
Filed Aug. 29, 1994, Ser. No. 297,420

Claims priority, application Rep. of Korea, Aug. 30, 1993, 1993-17002

Int. Cl.<sup>6</sup> H01L 21/8242

U.S. Cl. 437—60

6 Claims



1. A method for fabricating a dynamic random access memory capacitor, comprising the steps of:

- sequentially forming an interlayer insulating film, a planarizing layer, a first insulating film, a first conduction layer and a second insulating film over a semiconductor substrate including a field oxide film, a gate oxide film and gates;
- sequentially removing portions of the second insulating film, first conduction layer, first insulating film and the planarizing layer disposed over a region of the semiconductor substrate whereby said interlayer insulating film is exposed, thereby forming a primary contact hole;
- forming a first insulating spacer on an inner side wall of the primary contact hole, partially removing the interlayer insulating film by using the first insulating spacer as a mask to form a secondary contact hole, and completely removing the second insulating film to expose the first conduction layer;
- forming a second conduction layer over the entire exposed surface of the resulting structure to cover the exposed first conduction layer and the first insulating spacer and fill the secondary contact hole, forming a third insulating film over the second conduction layer, and forming a fourth insulating film over the third insulating film, the fourth insulating film being made of a material exhibiting a slower etch rate than said third insulating film;
- sequentially removing portions of the fourth insulating film and third insulating film disposed over the primary contact hole and wet etching to selectively remove exposed portions of said third insulating film, thereby forming a pattern of the fourth insulating film and a pattern of the third insulating film disposed beneath the fourth insulating film pattern and having an undercut portion;
- coating a third conduction layer over the entire exposed surface of the resulting structure such that the third conduction layer has a stepped portion filling the undercut portion of the third insulating film pattern by both the fourth insulating film pattern and the third insulating film pattern, and then forming a second insulating spacer on a side surface of the stepped portion of the third conduction layer;
- sequentially removing exposed portions of the third, second and first conduction layers by an anisotropic etch process under a condition that the second insulating spacer and fourth insulating layer are used as masks, thereby isolating a capacitor while a portion of the first conduction layer exposed between the fourth insulating layer and the second insulating spacer is not removed; and
- removing the second insulating spacer, the fourth insulating film pattern and the third insulating film pattern, and sequentially forming a fifth insulating film over exposed surfaces of said conduction and planarizing layers and forming a plate electrode over said fifth insulating film.

5,482,887

**METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE WITH A PASSIVATED SIDE**

Geert J. Dulkenken, and Roelvinus M. M. Fonville, both of Stadskanaal, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

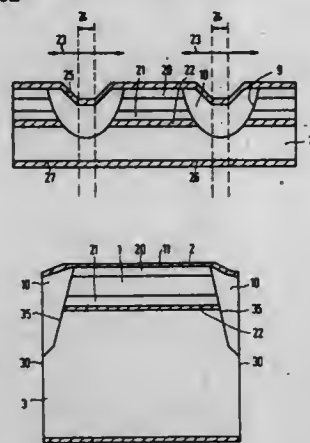
Filed Dec. 22, 1993, Ser. No. 173,295

Claims priority, application European Pat. Off., Dec. 23, 1992, 92204064

Int. Cl.<sup>6</sup> H01L 21/301

U.S. Cl. 437—62

8 Claims



1. A method of manufacturing semiconductor devices each having a passivated semiconductor body provided with an electrode and fastened on an electrically conducting support body, in which a slice of semiconductor material is fastened on a surface of an electrically conducting auxiliary slice and mesa structures are formed in the slice of semiconductor material by forming grooves in the slice of semiconductor material, after which a layer of insulating material is provided on the walls of the grooves, an electrically conducting layer is applied over the entire resulting structure of the slice of semiconductor material comprising mesa structures and grooves, the auxiliary slice comprising the mesa structures is then split up at the areas of the insulated grooves into separate semiconductor bodies each fastened on its own support body, and this electrically conducting layer is split up into separate electrodes, which lie both on the upper side of a mesa structure and on the layer of insulating material, during splitting-up of the auxiliary slice comprising the mesa structures.

5,482,888

**METHOD OF MANUFACTURING A LOW RESISTANCE, HIGH BREAKDOWN VOLTAGE, POWER MOSFET**

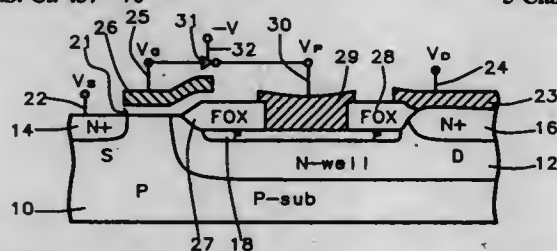
Ching-Hsiang Hsu; Ta-chi Kuo; Nai J. Yeh, all of Hsin-Chu, and Su Lu, Tahsi Taoyuan, all of, Taiwan, Prov. of China, assignors to United Microelectronics Corporation, Hsinchu, Taiwan, Prov. of China

Filed Aug. 12, 1994, Ser. No. 289,630

Int. Cl.<sup>6</sup> H01L 21/265; 21/76

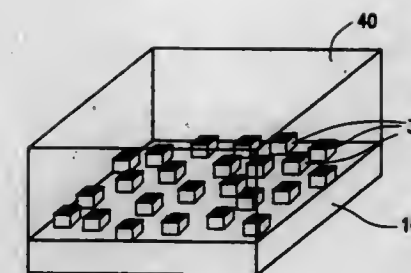
U.S. Cl. 437—70

5 Claims



1. A method of manufacture of a power metal oxide semiconductor field effect transistor device with a lightly doped silicon substrate comprising:  
forming an N-well mask upon said substrate with an N-well opening therein,

forming a N-well by implanting N ions to form an N-well in said substrate,  
forming a field implant mask upon said substrate with an N-well opening therein,  
forming a counterdoped field implant region in at least one island in said N-well by ion implanting P ions to form said island,  
forming a field oxide layer over said island and driving in said field implant dopant in said island,  
forming a gate oxide on said device,  
forming a gate electrode layer on said gate oxide layer,  
patterning said gate electrode layer and said gate oxide layer to form a gate electrode, and  
performing a self-aligned source/drain implant into source/drain regions of said device using said gate electrode and said field oxide layer as a mask.



5,482,889  
**METHOD FOR PRODUCING OF SEMICONDUCTOR DEVICE HAVING OF CHANNEL STOPPER UNDER FIELD INSULATING LAYER**

Hiroaki Yokoyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

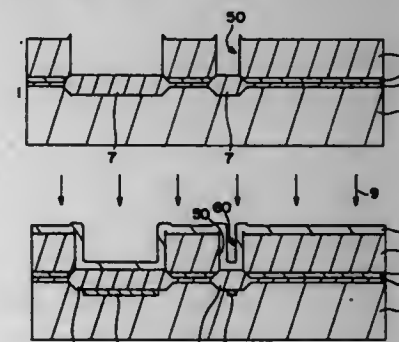
Filed Apr. 19, 1995, Ser. No. 424,636

Claims priority, application Japan, Apr. 20, 1994, 6-081590

Int. Cl.<sup>6</sup> H01L 21/76

U.S. Cl. 437—70

10 Claims



1. A method for forming a semiconductor device comprising the steps of:  
providing a semiconductor substrate having an element formation portion and an element isolation portion;  
covering said element formation portion of said semiconductor substrate with a mask layer having a top layer made of an oxidation-resist layer;  
selectively oxidizing said semiconductor substrate by using said mask layer as a mask to form a field oxide layer on said element isolation portion of said semiconductor substrate;  
forming a film on an entire surface of said field oxide layer; and  
selectively implanting impurities into said semiconductor substrate to form a channel stopper region under said field oxide layer while leaving said film.

5,482,890

**METHOD OF FABRICATING QUANTUM DOT STRUCTURES**

Der-Cheng Liu, Taipei Hsien, and Chien-Ping Lee, Hsinchu, both of, Taiwan, Prov. of China, assignors to National Science Council, Taipei, Taiwan, Prov. of China

Filed Oct. 14, 1994, Ser. No. 324,117

Int. Cl.<sup>6</sup> H01L 21/203

U.S. Cl. 437—107

17 Claims

1. A method of fabricating quantum dot structures and devices comprising the steps of:  
(i) forming a quantum well layer on a substrate;

- forming a masking layer on the quantum well layer to thereby produce a plurality of dot-shaped mask regions which protect underlying portions of the quantum well layer;
- using thermal etching to evaporate portions of the quantum well layer that are not protected by the dot-shaped mask regions of the masking layer so as to form a plurality of quantum dots; and
- after thermal etching, forming on the plurality of quantum dots a layer of material having an energy gap that is greater than the energy gap of the quantum well layer.

5,482,891

**VCSEL WITH AN INTEGRATED HEAT SINK AND METHOD OF MAKING**

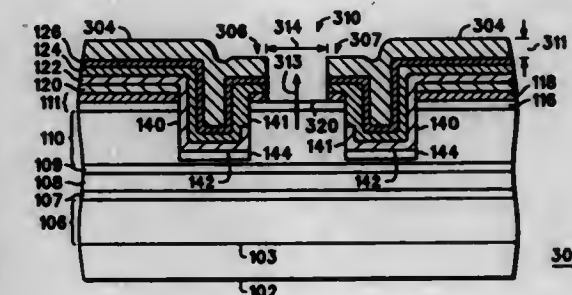
Chan-Long Shieh, Paradise Valley; John Lungo, Mesa, and Michael S. Lebby, Apache Junction, all of Ariz., assignors to Motorola, Schaumburg, Ill.

Filed Mar. 17, 1995, Ser. No. 407,062

Int. Cl.<sup>6</sup> H01L 21/20

U.S. Cl. 437—129

16 Claims



1. A method for making a VCSEL with an integrated heat sink comprising the steps of:

- providing a substrate having a surface with a first stack of distributed Bragg reflectors, a first cladding region, an active region, a second cladding region, a second stack of distributed Bragg reflectors, and a contact region;
- forming a mesa with a surface and a trench, wherein said trench extends from said contact region into a portion of said second stack of distributed Bragg reflectors, and wherein said trench is adjacent to a portion of said mesa;
- forming a first dielectric layer overlying said substrate and covering a portion of said trench with a portion of said contact region being exposed;
- forming a conductive layer overlying said substrate;
- forming a seed layer having a pattern, said pattern of said seed layer having an opening on said mesa exposing a portion of said conductive layer; and
- plating a metal selectively on said seed layer generating a layer on said seed layer for removal of heat, thereby generating an integrated heat sink.

5,482,892

# METHOD OF PRODUCING WHITE PHOSPHORUS FOR MOLECULAR BEAM EPITAXY

Fernando F. Briones, Madrid, Spain, assignor to Riber S.A., Rueil Malmaison, France

Division of Ser. No. 181,802, Jan. 14, 1994, Pat. No. 5,431,735.

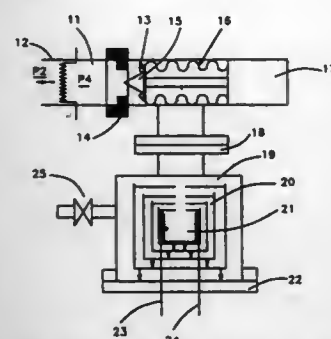
This application Mar. 15, 1995, Ser. No. 403,975

Claims priority, application Spain, Jan. 14, 1993, 9300063

Int. Cl.<sup>6</sup> H01L 21/20

U.S. Cl. 437—133

26 Claims



1. A method of generating a phosphorous beam for molecular beam epitaxy comprising:

- evaporating red phosphorous under vacuum and at an effective sublimation temperature;
- condensing the vapor produced in a) at a temperature below said sublimation temperature in order to form accumulation of white phosphorous; and
- valving vapor from said white phosphorous to a high-temperature phosphorous cracker to produce a phosphorus beam rich in diatomic phosphorus.

5,482,893

# METHOD FOR PRODUCING SEMICONDUCTOR DEVICE HAVING ALIGNMENT MARK

Takahiko Okabe, Isehara; Genzo Monma, Tokyo, and Hiroshi Yuzurihara, Isehara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 722,107, Jun. 27, 1991, abandoned.

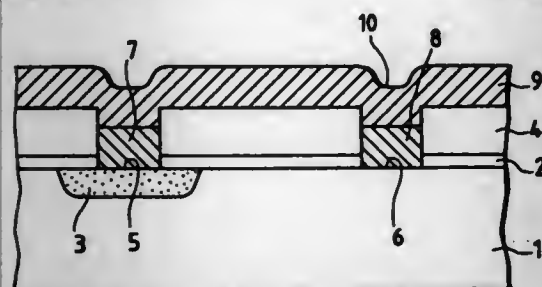
This application Jan. 19, 1994, Ser. No. 183,254

Claims priority, application Japan, Jun. 29, 1990, 2-169948; Jun. 29, 1990, 2-169949

Int. Cl.<sup>6</sup> H01L 21/441

U.S. Cl. 437—192

2 Claims



1. A method for producing a semiconductor device comprising: a first step for forming an insulative film on a substrate with a conductive or semiconductive surface;
- a second step for forming, in the insulative film, an opening through which the conductive or semiconductive surface is exposed and a concave section for use as an alignment mark;
- a third step for depositing a conductor selectively in the opening, within a first chamber, so that the surface of the conductor and the surface of the insulative film are on the same level;
- a fourth step for forming a conductive film on the concave section to cover the concave section, the insulative film and the deposited conductor; and

a fifth step for performing alignment using the concave section covered with the conductive film and patterning a portion of the conductive film, so as to form a wiring electrically connecting the surface of the conductive or semiconductive surface to the patterned portion of the conductive film through the deposited conductor,

wherein in the third and fourth steps, following the selective deposition of the conductor within the first chamber, without exposing the substrate to atmosphere, the substrate is moved into a second chamber, and the conductive film is formed non-selectively within the second chamber, wherein said second step comprises the step of forming a concave section comprising an aperture larger than the opening, wherein the bottom of the concave section comprises a part of the conductive or semiconductive surface.

5,482,894

# METHOD OF FABRICATING A SELF-ALIGNED CONTACT USING ORGANIC DIELECTRIC MATERIALS

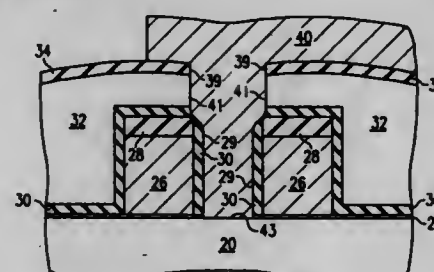
Robert H. Havemann, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 23, 1994, Ser. No. 294,290

Int. Cl.<sup>6</sup> H01L 21/44

U.S. Cl. 437—195

11 Claims



1. A method of fabricating a self-aligned contact on a semiconductor device comprising:

- providing two separated conductors on a substrate;
- forming a conformal dielectric layer over said conductors and said substrate, thereby creating an insulated gap having a first width between said conductors;
- depositing an organic-containing dielectric layer over said conductors and said substrate to a depth sufficient to completely cover said conductors and fill said insulated gap;
- depositing an inorganic cap layer over said organic-containing dielectric layer;
- etching a cap window through said cap layer, said cap window substantially vertically aligned with said gap and having a second width greater than said first width; and
- etching a contact window through said organic-containing dielectric layer, using said cap window as a mask for said contact window, and using an etchant which does not substantially affect said conformal dielectric layer, whereby a lower portion of said contact window is laterally confined to said insulated gap, and whereby said conformal dielectric layer is left substantially intact by said etching steps.

5,482,895

# METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES HAVING SILICIDE ELECTRODES

Hiroshi Hayashi, and Atsuo Fushida, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 25, 1994, Ser. No. 295,537

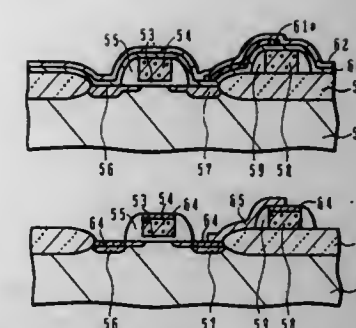
Claims priority, application Japan, Aug. 26, 1993, 5-211279

Int. Cl.<sup>6</sup> H01L 21/44

U.S. Cl. 437—200

11 Claims

1. A method of manufacturing a semiconductor device comprising the steps of:



selectively oxidizing the surface of a silicon semiconductor substrate to form a local oxide film to at least partially define a silicon surface;

depositing a cobalt film covering said silicon surface and said local oxide film;

depositing a silicon film on said cobalt film;

patterning said silicon film to form a silicon film pattern over said silicon surface and said local oxide film;

forming a TiN film over said cobalt film;

heating said substrate to progress a silicidation reaction between said cobalt film and said silicon surface and between said cobalt film and said silicon film pattern; and

removing the remaining TiN film and an unreacted portion of said cobalt film.

5,482,896

# LIGHT EMITTING DEVICE COMPRISING AN ORGANIC LED ARRAY ON AN ULTRA THIN SUBSTRATE AND PROCESS FOR FORMING SAME

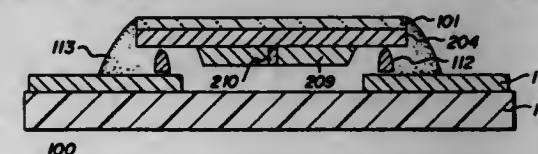
Ching W. Tang, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 18, 1993, Ser. No. 154,368

Int. Cl.<sup>6</sup> H01L 21/60

U.S. Cl. 437—209

20 Claims



1. A process for forming a light-emitting device that comprises an organic LED array containing a plurality of light emitting pixels having a pitch; a plurality of light transmissive first electrode elements located on a common electrically insulative transparent substrate, each first electrode element being laterally spaced and electrically insulated from an adjacent first electrode element; an organic electroluminescent medium located on a supporting surface formed by the substrate and every first electrode element; and a second electrode element located on said organic electroluminescent medium, said pixels each including a first electrode element and a second electrode element, which comprises the following steps:

- releasably laminating to an ultra thin electrically insulating transparent substrate a relatively thick rigid temporary support wherein the ultra thin electrically insulating transparent substrate has a thickness less than the pitch of said pixels;
- forming said organic LED array on said ultra thin substrate;
- forming on a relatively thick rigid permanent support an electrical conductor patterned in conformity with said first and second electrode elements located on said ultra thin substrate;
- forming an array of electrically conductive malleable bonding bumps on said patterned electrical conductor located on said permanent support;
- aligning said first and second electrode elements located on said ultra thin substrate in correct registration with said patterned conductor located on said permanent support;
- contacting said bonding bumps on said conductor with said first electrode and second electrode elements;

- forming a physical and electrical connection between said bonding bumps and said first electrode and second electrode elements; and
- delaminating said temporary support from said ultra thin transparent substrate.

5,482,897

# INTEGRATED CIRCUIT WITH ON-CHIP GROUND PLANE

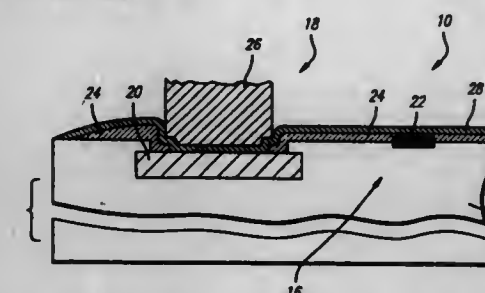
Brian J. Lynch, Milpitas, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Jul. 19, 1994, Ser. No. 277,344

Int. Cl.<sup>6</sup> H01L 21/60

U.S. Cl. 437—209

9 Claims



1. A method of making an integrated circuit, said method comprising the steps of: providing an integrated circuit with a substrate having a plurality of fine-dimension integrated circuit elements, a plurality of electrical contact pads, and a passivating layer covering said circuit elements while exposing said contact pads; sputtering a barrier metal layer and then a conductor metal layer over the entire surface of the passivating layer including also onto the exposed contact pads; photolithographically patterning a ground plane structure connecting with selected ones of said contact pads which are ground-potential contact pads; and removing a selected portion of the barrier metal and conductor metal layers where the ground plane structure is not desired; wherein said step of removing a selected portion of the barrier metal and conductor metal layers includes removing a portion of said layers around each one of said plural contact pads which is not a ground-potential contact pad.

5,482,898

# METHOD FOR FORMING A SEMICONDUCTOR DEVICE HAVING A THERMAL DISSIPATOR AND ELECTROMAGNETIC SHIELDING

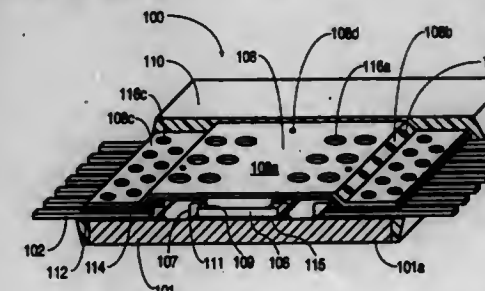
Robert C. Marrs, Scottsdale, Ariz., assignor to Amkor Electronics, Inc., Chandler, Ariz.

Division of Ser. No. 48,888, Apr. 12, 1993, abandoned. This application Mar. 27, 1995, Ser. No. 411,010

Int. Cl.<sup>6</sup> H01L 21/60

U.S. Cl. 437—216

19 Claims



1. A method for forming an integrated circuit, comprising the steps of:



attaching a first surface of a semiconductor die to a die attach pad of a leadframe;  
electrically connecting bond pads formed on a second surface of the semiconductor die, the second surface being opposite the first surface, to an inner portion of each of selected package leads of the leadframe;  
providing a mold having a mold cavity;  
placing a thermal induction plate inside the mold cavity, the thermal induction plate having a size and shape such that when placed in the mold cavity, a first planar section of the thermal induction plate self-aligns to a desired position in the mold cavity;  
placing the semiconductor die as attached to the die attach pad, and inner portions of the package leads within the mold cavity such that the second surface of the semiconductor die is proximate to the first planar section of the thermal induction plate and an integral second planar section of the thermal induction plate is proximate to and electrically isolated from said the inner portions of the package leads; and  
encapsulating the semiconductor die as attached to the die attach pad, the thermal induction plate, and inner portions of the package leads in a package.

5,482,899

# LEVELING BLOCK FOR SEMICONDUCTOR DEMOUNTER

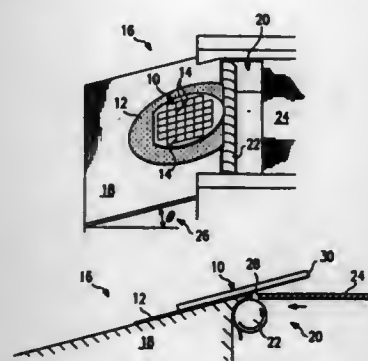
Robert G. McKenna, Houston, and Michael G. Baxter, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 21, 1994, Ser. No. 216,195

Int. Cl.<sup>6</sup> H01L 21/304; B32B 31/18

U.S. Cl. 437—225

2 Claims



1. A method for preventing breakage of a semiconductor wafer that has not been entirely sawed while removing tape from the back surface of said wafer comprising:

providing a substantially level surface leading into a tape removal apparatus said surface capable of supporting said wafer during tape removal; and

removing said tape from said back surface of said wafer by resting said wafer on said substantially level surface and feeding the edge of said tape into said tape removal apparatus thereby allowing said tape removal apparatus to remove said tape in a direction substantially perpendicular direction to the bottom surface of wafer 10, thereby reducing bending stress on wafer 10, and wherein no contact is made with the front surface of said wafer.

5,482,900

# METHOD FOR FORMING A METALLURGY SYSTEM HAVING A DIELECTRIC LAYER THAT IS PLANAR AND VOID FREE

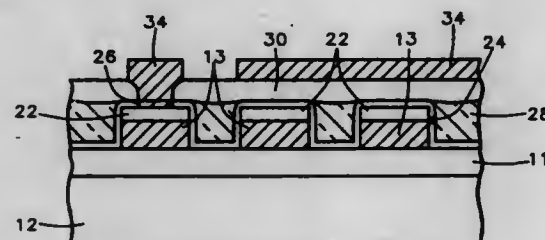
Ming-Tzong Yang, Hsin Chu, Taiwan, Prov. of China, assignor to United MicroElectronics Corporation, Hsinchu, Taiwan, Prov. of China

Filed Sep. 16, 1994, Ser. No. 307,233

Int. Cl.<sup>6</sup> H01L 21/465

U.S. Cl. 437—228

10 Claims



1. A method of fabricating a metallurgy pattern and an overlying insulating layer having a planar surface on a semiconductor substrate comprising:

providing a semiconductor substrate with a surface dielectric layer,

depositing a blanket metal layer on said surface dielectric layer by chemical vapor deposition techniques at a temperature between 150° and 1000° C. and at pressure between 1×10<sup>-3</sup> mtorr to 1 torr,

depositing a blanket insulating layer of material over the blanket metal layer,

depositing, exposing and developing a photoresist layer on the blanket layer of insulating material that defines a metallurgy pattern, and exposes areas of the underlying blanket insulating layer,

removing by reactive ion etching the exposed areas of the blanket insulating layer at a power of 200 to 5000 watts in a reactive plasma selected from the group consisting of CH<sub>3</sub>F, CF<sub>4</sub>, and C<sub>2</sub>F<sub>6</sub>, leaving exposed areas of blanket metal layer, removing by reactive ion etching the exposed areas of blanket metal layer at a power of 200 to 5000 watts in a reactive plasma selected from the group consisting of CH<sub>3</sub>F, CF<sub>4</sub>, and C<sub>2</sub>F<sub>6</sub>,

depositing over the metallurgy pattern a conformal silicon oxide layer having a thickness which does not fill or close any spaces between within said metallurgy pattern using chemical vapor techniques,

depositing a planarizing layer of insulating material over said conformal silicon oxide layer and etching the planarizing layer with a reactive plasma etch to at least uncover the conformal silicon oxide layer over the metallurgy pattern, and depositing a top surface conformal silicon oxide layer using chemical vapor deposition techniques, and etching via openings to the metallurgy pattern.

5,482,901

# AMBER PHOTOCHROMIC GLASSES

David W. Morgan, and Brent M. Wedding, both of Corning, N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Jul. 15, 1994, Ser. No. 275,773

Int. Cl.<sup>6</sup> C03C 4/06

U.S. Cl. 501—13

10 Claims

1. A photochromic glass having an amber color in both the darkened and faded states and having an original transmittance of 60–75%, a darkened transmittance that is less than 30% at 25° C. and less than 40% at 40° C., a faded transmittance equal to the darkened transmittance plus at least 25% and a value of at least 50%, a dominant wavelength between 575 and 585 nm, the glass containing silver halide crystals, having a Na<sub>2</sub>O content of at least 1% in at least a surface layer, or containing as additives 1–6 ppm

Pd, or a combination of 2–10 ppm Au and up to 0.9% Er<sub>2</sub>O<sub>3</sub> and being surface-reduced by thermally treating in a reducing atmosphere.

5,482,902

# BROWN-PHOTOCHROMIC GLASSES

Thomas C. Claunch, Harrodsburg, Ky.; Thomas G. Havens, Painted Post, and David J. Kerko, Corning, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Dec. 21, 1994, Ser. No. 361,059

The portion of the term of this patent subsequent to Oct. 26, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> C03C 4/06

U.S. Cl. 501—13

7 Claims

1. A composition for a photochromic glass which is essentially colorless in the undarkened state consisting essentially, expressed in terms of weight percent, of

SiO <sub>2</sub>	54–58	TiO <sub>2</sub>	0–2	PbO	0–0.8
B <sub>2</sub> O <sub>3</sub>	18–22	ZrO <sub>2</sub>	2–4.5	Sb <sub>2</sub> O <sub>3</sub>	0–0.2
Al <sub>2</sub> O <sub>3</sub>	7–8	Ag	0.155–0.175	Er <sub>2</sub> O <sub>3</sub>	0–0.5
Li <sub>2</sub> O	3.75–4.5	Cl	0.3–0.4	Au	0–5 ppm
Na <sub>2</sub> O	0–1	Br	0.08–0.11	Pd	0.8–1.2 ppm
K <sub>2</sub> O	5.5–7.5	CuO	0.0065–0.01		

wherein the mole ratio Li<sub>2</sub>O:Na<sub>2</sub>O≥9:1, said glass at a thickness of 2 mm exhibiting a coloration in the fully darkened state corresponding to the chromaticity coordinates, in accordance with the 1931 C.I.E. trichromatic colorimetric system, falling within area UKLI in the appended drawing.

5,482,903

# ALUMINUM NITRIDE BODY UTILIZING A VITREOUS SINTERING ADDITIVE

Peter R. Duncombe, Peekskill; Subhash L. Shinde, Croton-on-Hudson, and Takeshi Takamori, Mahopac, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1993, Ser. No. 173,293

Int. Cl.<sup>6</sup> C04B 35/581; 35/582

U.S. Cl. 501—32

7 Claims

1. An unsintered aluminum nitride body comprising:  
(a) 1 to 5 weight percent of a vitreous solid powder of boron oxide, alumina, and calcium oxide in the proportions of (1) boron oxide between 5 and 20 weight percent, (2) alumina between 20 and 45 weight percent, and (3) calcium oxide between 45 and 65 weight percent; and  
(b) aluminum nitride powder as the balance of the aluminum nitride body.

5,482,904

# HEAT-INSULATING REFRACTORY MATERIAL

Hideaki Kawabe; Shozou Hagiwara; Koji Kuga, and Setsunori Hamaguchi, all of Kitakyushu, Japan, assignors to Krosaki Corporation, Fukuoka, Japan

PCT No. PCT/JP94/00349, § 371 Date Oct. 31, 1994, § 102(e) Date Oct. 31, 1994, PCT Pub. No. WO94/20435, PCT Pub. Date Sep. 15, 1994

PCT Filed Mar. 3, 1993, Ser. No. 325,293

Claims priority, application Japan, Mar. 10, 1993, 5-049560; Dec. 27, 1993, 5-331074

Int. Cl.<sup>6</sup> C04B 38/00; 38/10

U.S. Cl. 501—84

3 Claims

1. A heat-insulating refractory material comprising:  
a mixture containing 2–50 wt % of a foaming raw material selected from the group consisting of shirasu, vermiculite,

obsidian, perlite, pitch stone, expanded shale, and fly ash, said foaming raw being foamed by heat at a temperature from 400° to 1500° C. and 50–98 wt % of a refractory powder, and a liquid binder which is added to said mixture in an amount of 20–250 wt % on the basis of the weight of said mixture.

5,482,905

# ALUMINUM NITRIDE SINTERED BODY AND METHOD OF PRODUCING THE SAME

Seiji Nakahata; Takahiro Matsuura; Konichi Sogabe, and Akira Yamakawa, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

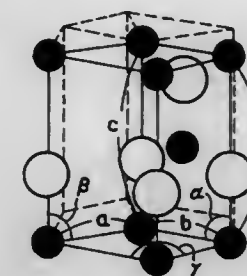
Filed Jan. 5, 1994, Ser. No. 178,642

Claims priority, application Japan, Feb. 5, 1993, 5-042270

Int. Cl.<sup>6</sup> C04B 35/58

U.S. Cl. 501—9.6

4 Claims



1. An aluminum nitride sintered body comprising aluminum nitride crystals belonging to a Wurtzite hexagonal crystal system wherein three axes a, b, and c of a unit lattice of the crystal are defined whereby a ratio b/a of the lengths of axes b and a is 1.000 near a center of the crystal grain, and lies within a range of 0.997 to 1.003 in a vicinity of a grain boundary phase, said sintered body containing at least one compound selected from the group consisting of Ti, V, and Co.

5,482,906

# ADSORPTION MATERIAL COMPRISING ACTIVATED CARBON FIBER AND POLYTETRAFLUOROETHYLENE

Naoki Sakai; Tetsuro Shigel, and Takayuki Tanaka, all of Shizuoka, Japan, assignors to Toho Tayon Co., Ltd., Tokyo, Japan

Filed Jun. 13, 1994, Ser. No. 259,061

Claims priority, application Japan, Dec. 28, 1993, 5-353479

Int. Cl.<sup>6</sup> B01J 20/26; 20/02

U.S. Cl. 502—402

28 Claims

1. An adsorption material comprising milled activated carbon fiber bound together by fibrils of a polytetrafluoroethylene resin, wherein said adsorption material is produced by mixing the milled activated carbon fiber and fibrillating polytetrafluoroethylene resin particles, and then applying compressive shear stress to the mixture to fibrillate the polytetrafluoroethylene resin particles to thereby bind the activated carbon fiber by the polytetrafluoroethylene resin fibrils which are melt-adhered to the activated carbon fibers, wherein the average fiber diameter of said activated carbon fiber is from 2 to 50 μm, wherein the length of the activated carbon fiber is at least 10 μm, and

wherein the content of activated carbon fibers, having a ratio of the length of the activated carbon fiber measured by a laser light scattering technique to the average diameter of the activated carbon fiber of not less than 3, is at least 20 wt % based on the total amount of activated carbon fiber contained in the adsorption material.

5,482,907

**CERAMIC COMPOSITE CONTAINING A SPINEL PHASE AND AN OXIDE PHASE AND THE PREPARATION THEREOF**

Wei-Hsing Tuan, and Ming-Cherng Lin, both of Taipei, Taiwan, Prov. of China, assignors to National Science Council, Taipei, Taiwan, Prov. of China

Filed May 26, 1994, Ser. No. 249,860

Int. Cl.<sup>6</sup> C04B 35/443; 35/117; 35/12; 35/26

U.S. Cl. 501—120

3 Claims

1. A ceramic composite, which comprises:  
1-99 weight % of a spinel phase; and  
99-1 weight % of an oxide phase,

wherein the oxide phase consists essentially of an A<sub>2</sub>O<sub>3</sub> oxide and a DO oxide; and the spinel phase comprises a BA<sub>2</sub>O<sub>4</sub> spinel, a DA<sub>2</sub>O<sub>4</sub> spinel, and a (B<sub>x</sub>D<sub>1-x</sub>)A<sub>2</sub>O<sub>4</sub> spinel; wherein A is a three-valence metal ion, wherein B is different from D and both B and D are two-valence metal ions; and wherein 0 < x < 1.

5,482,908

**HIGHLY ACTIVE DOUBLE METAL CYANIDE CATALYSTS**

Bi Le-Khac, West Chester, Pa., assignor to ARCO Chemical Technology, L.P., Greenville, Del.

Filed Sep. 8, 1994, Ser. No. 302,296

Int. Cl.<sup>6</sup> B01J 31/00

U.S. Cl. 502—156

30 Claims

1. A solid double metal cyanide (DMC) catalyst useful for epoxide polymerization, said catalyst comprising:

(a) a double metal cyanide compound;  
(b) an organic complexing agent; and  
(c) from about 5 to about 80 wt. %, based on the amount of catalyst, of a polyether having a number average molecular weight greater than about 500.

5,482,909

**CMS/SIO<sub>2</sub>/AL<sub>2</sub>O<sub>3</sub> CATALYSTS FOR IMPROVED SELECTIVITY IN THE SYNTHESIS OF AMINES FROM METHANOL AND/OR DIMETHYL ETHER AND AMMONIA**

Henry C. Foley, Newark; George C. Sonnichsen; Loren D. Brake, both of Wilmington; Ravindra K. Mariwala, Newark, all of Del., and Davis S. Lafyatis, Gent, Belgium, assignors to University of Delaware, Newark, and E. I. Du Pont de Nemours & Co., Inc., Wilmington, both of Del.

Division of Ser. No. 100,463, Jul. 30, 1993, Pat. No. 5,354,893.

This application Jul. 21, 1994, Ser. No. 278,644

Int. Cl.<sup>6</sup> B41J 21/18

U.S. Cl. 502—182

6 Claims

1. A catalyst material which consists of: a) carbon molecular sieve material which is permeable to monomethylamine and dimethylamine but not easily permeable to trimethylamine, b) silica, and c) alumina, wherein said silica and alumina are present as a core material and said carbon molecular sieve material is present as a coating on at least a portion of said core material.

5,482,910

**PROCESS FOR PREPARING A HYDROCARBON CONVERSION CATALYST**

Maureen L. Bricker, Buffalo Grove; Thomas K. McBride, Jr., Arlington Heights, and Karl Z. Steigleder, Glen Ellyn, all of Ill., assignors to UOP, Des Plaines, Ill.

Filed Jul. 5, 1994, Ser. No. 270,351

Int. Cl.<sup>6</sup> B01J 23/00

U.S. Cl. 502—300

20 Claims

1. A process for preparing a catalyst comprising a Group VIII metal and a promoter metal dispersed on a solid refractory oxide support, the process comprising:

a) mixing a first and a second aqueous solution to give a mixed solution, the first solution containing a chelating agent and at least one promoter metal salt, said first solution having been heated to a temperature from about 80° C. to about its boiling point, the second solution containing at least one Group VIII metal compound;

b) ageing the mixed solution for a time of about 5 minutes to about 4 hours at a temperature of about 40° C. to about 100° C.;

c) impregnating said aged mixed solution onto a solid refractory oxide support to give an impregnated solid support;

d) calcining the impregnated solid support at a temperature of about 300° C. to about 850° C. for a time of about 10 minutes to about 8 hours to give a calcined catalyst; and

e) reducing the calcined catalyst at a temperature of about 300° C. to about 850° C. for a time of about 30 minutes to about 8 hours, thereby providing said catalyst.

5,482,911

**THERMOSENSITIVE RECORDING MATERIAL**

Katsunori Hiroishi, Numazu; Norio Kurisu, Susono, and Hideo Aihara, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 21, 1994, Ser. No. 309,464

Int. Cl.<sup>6</sup> B41M 5/40

U.S. Cl. 503—200

3 Claims

1. A thermosensitive recording material comprising a support and a thermosensitive coloring-layer formed on said support, capable of inducing color development by the application of heat thereto, with the stiffness of said thermosensitive recording material in the lengthwise direction thereof in accordance with JIS-P-8125 being less than  $0.45 \exp^{0.012x}$  (gf-cm) wherein x represents the thickness (μm) of said recording material measured in accordance with JIS-P-8118, provided that said lengthwise direction of said recording material is (i) a machine direction in which cellulose fiber contained in a natural material for use in said support is oriented, or (ii) a plane direction of said recording material when a synthetic material is used for said support.

5,482,912

**THERMOSENSITIVE RECORDING MATERIAL AND PHTHALIC ACID DERIVATIVES FOR USE IN THE SAME**

Hiromi Furuya, Shimizu; Keishi Taniguchi, Susono, and Hideo Suzuki, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 25, 1994, Ser. No. 201,993

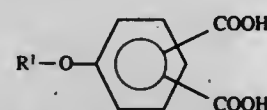
Claims priority, application Japan, Feb. 26, 1993, 5-062772; May 24, 1993, 5-121745; Jun. 17, 1993, 5-171160; Dec. 14, 1993, 5-342419; Feb. 21, 1994, 6-046439

Int. Cl.<sup>6</sup> B41M 5/26; 5/40

U.S. Cl. 503—207

9 Claims

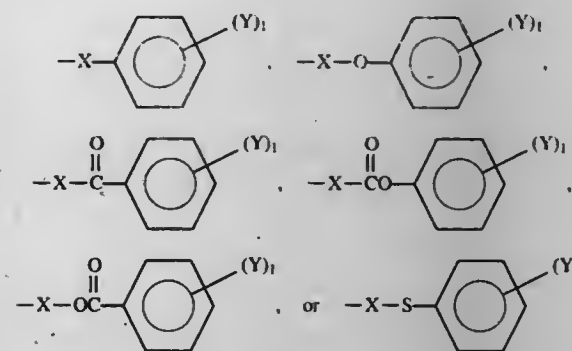
1. A thermosensitive recording material comprising a support and a thermosensitive recording layer formed on said support, comprising a leuco dye and a color developer capable of inducing color formation in said leuco dye upon application of heat thereto, said color developer comprising at least one compound selected from the group consisting of compounds represented by formulas (I) to (IV);



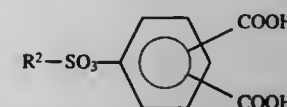
(I)

wherein R<sup>1</sup> is a saturated or unsaturated chain hydrocarbon group having 1 to 10 carbon atoms which may be branched, a chain hydrocarbon group having 1 to 10 carbon atoms which may be substituted by hydroxyl group or interrupted by an ether linkage or

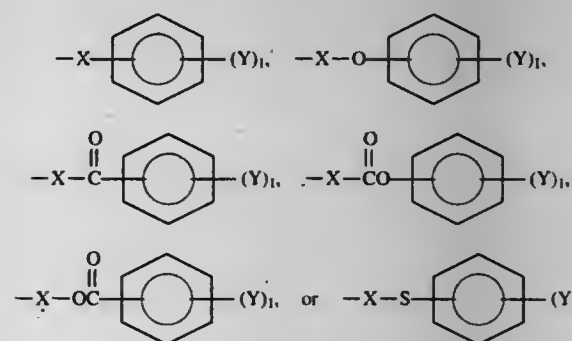
carbonyl group, an aryl group selected from the group consisting of phenyl group and naphthyl group, which may have a substituent selected from the group consisting of an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms, nitro group or a halogen,



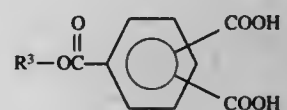
in which X is a saturated or unsaturated bivalent hydrocarbon group having 1 to 10 carbon atoms, or a bivalent hydrocarbon group having 1 to 10 carbon atoms which may be substituted by hydroxyl group or interrupted by an ether linkage or carbonyl group; and Y is an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms, nitro group or a halogen; and l is an integer of 0 to 5;



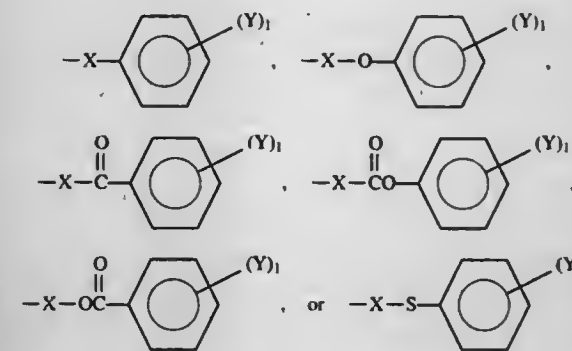
wherein R<sup>2</sup> is a saturated or unsaturated chain hydrocarbon group having 1 to 10 carbon atoms which may be branched, a chain hydrocarbon group having 1 to 10 carbon atoms which may be substituted by hydroxyl group or interrupted by an ether linkage or carbonyl group, an aryl group selected from the group consisting of phenyl group and naphthyl group, which may have a substituent selected from the group consisting of an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms, nitro group or a halogen,



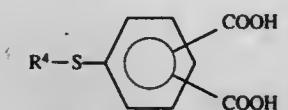
in which X is a saturated or unsaturated bivalent hydrocarbon group having 1 to 10 carbon atoms, or a bivalent hydrocarbon group having 1 to 10 carbon atoms which may be substituted by hydroxyl group or interrupted by an ether linkage or carbonyl group; and Y is an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms, nitro group or a halogen; and l is an integer of 0 to 5;



wherein R<sup>3</sup> is a saturated or unsaturated chain hydrocarbon group having 1 to 10 carbon atoms which may be branched, a chain hydrocarbon group having 1 to 10 carbon atoms which may be substituted by hydroxyl group or interrupted by an ether linkage or carbonyl group, an aryl group selected from the group consisting of phenyl group and naphthyl group, which may have a substituent selected from the group consisting of an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms, nitro group or a halogen,

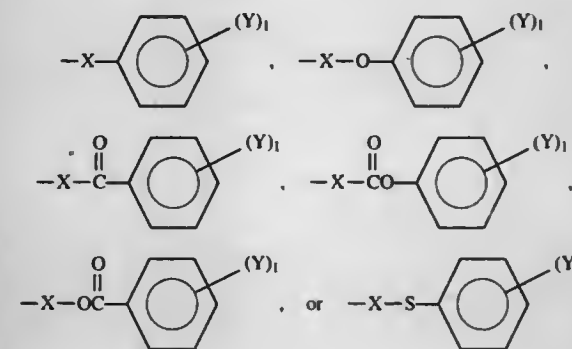


in which X is a saturated or unsaturated bivalent hydrocarbon group having 1 to 10 carbon atoms, or a bivalent hydrocarbon group having 1 to 10 carbon atoms which may be substituted by hydroxyl group or interrupted by an ether linkage or carbonyl group; and Y is an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms, nitro group or a halogen; and l is an integer of 0 to 5; and



(IV)

wherein R<sup>4</sup> is a saturated or unsaturated chain hydrocarbon group having 1 to 10 carbon atoms which may be branched, a chain hydrocarbon group having 1 to 10 carbon atoms which may be substituted by hydroxyl group or interrupted by an ether linkage or carbonyl group, an aryl group selected from the group consisting of phenyl group and naphthyl group, which may have a substituent selected from the group consisting of an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms, nitro group or a halogen,



in which X is a saturated or unsaturated bivalent hydrocarbon group having 1 to 10 carbon atoms, or a bivalent hydrocarbon group having 1 to 10 carbon atoms which may be substituted by hydroxyl group or interrupted by an ether linkage or carbonyl group; and Y is an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms, nitro group or a halogen; and l is an integer of 0 to 5.



5,482,913

## RECORDING SHEET

Toshimi Satake; Tomoaki Nagai; Toshiyuki Takano, and Akio Sekine, all of Tokyo, Japan, assignors to Nippon Paper Industries, Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1993, Ser. No. 166,815

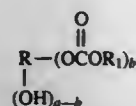
Claims priority, application Japan, Dec. 17, 1992, 4-336472

Int. Cl. 6 B41M 5/30

U.S. Cl. 503—210

19 Claims

1. A recording sheet comprising an opaque recording layer containing a color developer of Formula (I) with at least one of phenolic hydroxyl groups having a color-developing function blocked by an O-substituted oxycarbonyl group  $-(C=O)OR_1$ , and a metal salt of an organic acid or a metal salt of an inorganic acid or a leuco dye reacting with said color developer to develop a color:



wherein R denotes a  $C_6$  to  $C_{30}$ -aromatic group,  $R_1$  is a  $C_1$  to  $C_{18}$ -alkyl group,  $C_3$  to  $C_{15}$ -cycloalkyl group,  $C_1$  to  $C_{12}$ -halogenated alkyl group,  $C_1$  to  $C_{12}$ -silylalkyl group, vinyl group, allyl group,  $C_7$  to  $C_{18}$ -aryl alkyl group,  $C_{13}$  to  $C_{25}$ -diphenylmethyl group,  $C_{19}$  to  $C_{35}$ -triphenylmethyl group,  $C_6$  to  $C_{20}$ -aryl group, or  $C_{10}$  to  $C_{20}$ -naphthyl group, and a and b are each integers from 1 to 3, and  $a \geq b$ .

5,482,914

## HYDROPHOBIC ADSORBENTS AND THEIR USE FOR THE ADSORPTION OF LIPOPROTEINS

Peter Merle, Marburg, Germany, assignor to Behringwerke Aktiengesellschaft, Marburg, Germany

Filed Jan. 6, 1994, Ser. No. 177,947

Claims priority, application Germany, Jan. 9, 1993, 43 00 412.1

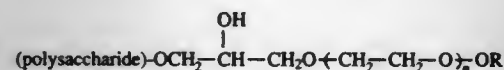
Int. Cl. 6 B01J 20/22

U.S. Cl. 502—404

12 Claims

1. An adsorbent for the removal of lipoproteins from human or animal body fluids, which comprises a polysaccharide support which is suitable for chromatography, wherein said polysaccharide support comprises the chemical reaction product of the polysaccharide (itself) with a glycidyl ether of a nonionic polyoxyethylene detergent.

2. An adsorbent as claimed in claim 1 having the formula I

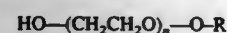


where

n is an integer from 2 to 30 and

R is an alkyl radical having 4–20 carbon atoms or a phenyl radical or a phenylalkyl radical, where the phenylalkyl radical has 1–16 carbon atoms.

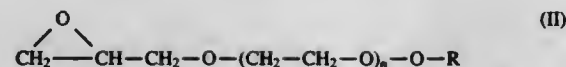
6. A process for the preparation of an adsorbent of the formula I in claim 2, which comprises reacting a detergent of the formula III



where

n is an integer from 2 to 30 and

R is an alkyl radical having 4–20 carbon atoms, a phenyl radical or a phenylalkyl radical, where the phenylalkyl radical has 1–16 carbon atoms; with epichlorohydrin to give a glycidyl ether of the formula II



and reacting this glycidyl ether in the presence of a Lewis acid with a polysaccharide support to give a compound of the formula I.

5,482,915

## TRANSITION METAL SALT IMPREGNATED CARBON

Timothy C. Golden, Allentown; Andrew W. Wang, Slatington, both of Pa., and James F. Sciple, Paducah, Ky., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 20, 1993, Ser. No. 123,952

Int. Cl. 6 B01J 20/20

U.S. Cl. 502—417

12 Claims

1. A process for preparing an activated carbon impregnated with a transition metal salt with enhanced microporosity, comprising:

- impregnating a transition metal salt on a thermally generated pre-char carbon so as to impart approximately 0.5 to 15 weight percent of said transition metal salt on to said pre-char carbon based upon said pre-char carbon after impregnating said transition metal salt; and
- pyrolyzing said carbon at a temperature in the range of at least approximately 800° C. to produce a transition metal salt impregnated activated carbon.

5,482,916

## THIA DIAZOLE DERIVATIVES AND HERBICIDE COMPOSITIONS CONTAINING SAME

Yasuaki Hanasaki; Kazuaki Tsukuda; Hiroyuki Watanabe; Kenji Tsuzuki; Mitsuyuki Murakami, and Noritoshi Niimi, all of Shinnanyo, Japan, assignors to Tosoh Corporation, Yamaguchi, Japan

Continuation of Ser. No. 633,348, Dec. 27, 1990, abandoned, which is a continuation-in-part of Ser. No. 570,638, Aug. 22, 1990, abandoned. This application Mar. 5, 1993, Ser. No. 27,579

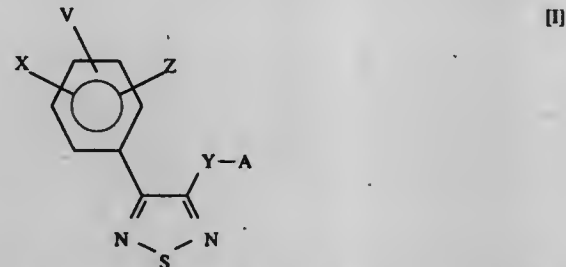
Claims priority, application Japan, Aug. 22, 1989, 1-215489; Jan. 30, 1989, 1-279725; Nov. 22, 1989, 1-302258; Dec. 25, 1989, 1-332875

Int. Cl. 6 C07D 285/10; A01N 43/832

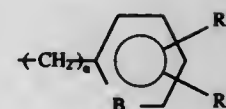
U.S. Cl. 504—261

17 Claims

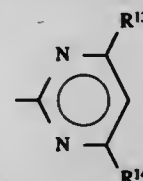
1. A method of inhibiting the growth of weeds in an area infested therewith comprising applying to said area, optionally with an agriculturally acceptable carrier, a herbicidally effective amount of a thiadiazole derivative represented by the formula [I]



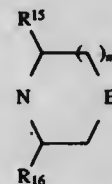
[wherein Y represents oxygen or sulfur; X represents hydrogen, halogen, lower alkyl, lower haloalkyl, lower alkoxy, hydroxy or nitro; V and Z, the same or different, represent halogen, lower alkyl, lower haloalkyl, lower alkoxy, hydroxy or nitro; A represents hydrogen, lower alkyl, lower alkenyl, lower alkynyl, alkoxyalkyl which may be substituted with alkoxy, alkylthioalkyl,  $-\text{SO}_2\text{R}^1$  (wherein  $\text{R}^1$  represents lower alkyl which may be substituted with halogen, phenyl which may be substituted with lower alkyl, or amino which is substituted with lower alkyl),



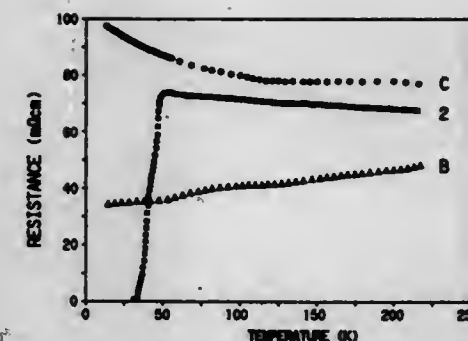
(wherein n represents 0 or 1, B represents CH or nitrogen,  $\text{R}^2$  and  $\text{R}^3$  the same or different represent hydrogen, halogen, lower alkoxy, nitro or lower alkyl which may be substituted with halogen),  $-\text{SiR}^4\text{R}^5\text{R}^6$  (wherein  $\text{R}^4$ ,  $\text{R}^5$  and  $\text{R}^6$ , the same or different represent lower alkyl),  $-\text{CHR}^7\text{COR}^8$  (wherein  $\text{R}^7$  represents hydrogen or lower alkyl,  $\text{R}^8$  represents hydroxy or amino which may be substituted with lower alkyl and/or with phenyl),  $-\text{C}(=\text{W})\text{OR}^9$  (wherein W represents oxygen or sulfur,  $\text{R}^9$  represents alkyl which may be substituted with halogen; alkoxyalkyl, benzyl, phenyl, tetrahydrofurfuryl or alkylideneamino),  $-\text{COR}^{10}$  (wherein  $\text{R}^{10}$  represents lower alkyl; cycloalkyl; or phenyl which may be substituted with halogen, lower alkyl, lower haloalkyl, lower alkoxy, nitro or with cyano;  $-\text{C}(=\text{W})\text{NR}^{11}\text{R}^{12}$  (wherein W represents oxygen or sulfur,  $\text{R}^{11}$  and  $\text{R}^{12}$ , the same or different, represent hydrogen, lower alkyl, cycloalkyl, lower alkoxy, alkoxyalkyl, phenyl which may be substituted with alkoxy,



(wherein  $\text{R}^{13}$  and  $\text{R}^{14}$ , the same or different represent hydrogen, halogen, lower alkyl or lower alkoxy), or  $\text{R}^{11}$  and  $\text{R}^{12}$  cooperatively form



(wherein  $\text{E}^1$  represents  $-\text{CH}_2-$  or oxygen, m represents 0 or 1,  $\text{R}^{15}$  and  $\text{R}^{16}$ , the same or different represent hydrogen or lower alkyl).



5,482,918

## METHOD FOR PRODUCING MICROCOMPOSITE POWDERS USING A SOAP SOLUTION

Michael A. Maginnis, Coker, and David A. Robinson, Mobile, both of Ala., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Feb. 7, 1994, Ser. No. 192,534

Int. Cl. 6 H01B 12/00; H01L 39/12

U.S. Cl. 505—440

9 Claims

1. A method for producing a microcomposite powder, comprising the steps of:

- preparing a first solution consisting of an organic solvent and an ammonium soap prepared by reacting an ammonium hydroxide with a carboxylic acid;
- adding an inorganic silver salt to said first solution to form a metallorganic precursor thereby producing a resultant solution;
- suspending a ceramic material in particle form in said resultant solution while stirring;
- adding a second solution consisting of a weak polyprotic acid and an organic solvent to said resultant solution while stirring to form a resultant mixture;
- allowing said resultant mixture to set until said resultant mixture gels and precipitates around particles of said ceramic material in said resultant mixture;
- thereafter filtering, rinsing and drying said resultant mixture to produce a silver precursor having ceramic material particles embedded in a silver gel/precipitate; and
- calcining said silver precursor to convert said silver gel/precipitate to a metallic phase and thereby forming a microcomposite powder containing ceramic material particles coated with a metallic phase.

5,482,919

## SUPERCONDUCTING ROTOR

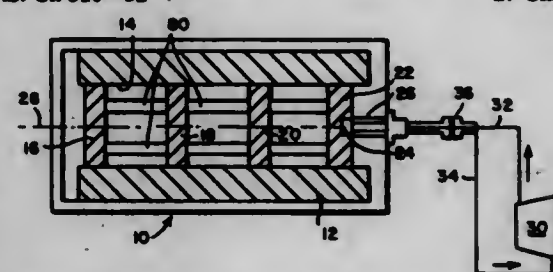
Chandrasekhar H. Joshi, Bedford, Mass., assignor to American Superconductor Corporation, Westborough, Mass.

Filed Sep. 15, 1993, Ser. No. 122,007

Int. Cl. 6 H02K 9/00; F25B 9/00

U.S. Cl. 310—52

27 Claims



1. Superconducting rotor system comprising: a rotor including at least one field coil made of a superconductor material having a superconducting transition temperature; and

5,482,917

## TI-M-CU-O-F SUPERCONDUCTORS

Munirpallam A. Subramanian, New Castle, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 21, 1993, Ser. No. 124,908

Int. Cl. 6 H01B 12/00; H01L 39/12

U.S. Cl. 505—123

8 Claims

1. A superconducting composition having the nominal formula  $\text{TiM}_2\text{CuO}_{3-x}\text{F}_x$  wherein M is Ba, Sr or a mixture thereof, x is from about 0.10 to about 0.65 when M is Ba, x is from about 0.35 to about 0.75 when M is Sr, and when M is a mixture of Ba and Sr, the lower limit of x increases from about 0.10 to about 0.35 and the upper limit of x increases from about 0.65 to about 0.75 as the amount of Sr in M increases from 0 to 100%.

a cryocooler system including a cold head mounted for rotation with the rotor, the cold head in heat transfer relation with the coil to cool the coil to a temperature below its transition temperature and comprising a piston/regenerator adapted to allow passage of a working fluid at a mass flow rate which is substantially uniform over the cross-section of the piston/regenerator during operation of the system.

5,482,920

### TRIAZINYL COMPOUNDS WITH HERBICIDAL ACTIVITY

Christoph Lüthy, Münchenstein, Switzerland, assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.

PCT No. PCT/EP93/01393, § 371 Date Feb. 15, 1994, § 102(e)

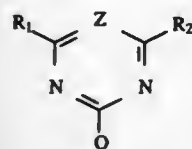
Date Feb. 15, 1994, PCT Pub. No. WO93/25540, PCT Pub. Date Dec. 22, 1993

PCT Filed Jun. 3, 1993, Ser. No. 193,198

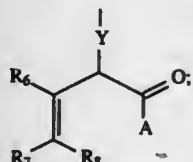
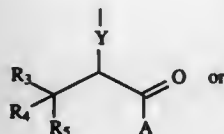
Claims priority, application Switzerland, Jun. 17, 1992, 1907/92

Int. Cl. C07D 251/46; 251/30; 403/12; A01N 43/66 U.S. Cl. 504-227 18 Claims

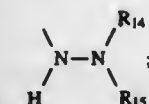
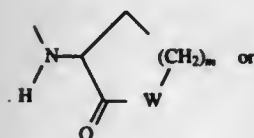
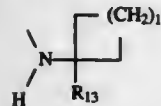
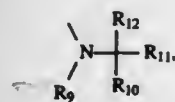
1. A pyrimidinyl- or triazinyl- or pyrimidinylthio- or triazinylthio-propionic acid derivative of formula I



wherein Q is



A is a group



Y is oxygen or sulfur;

Z is nitrogen;

R<sub>1</sub> is methyl, ethyl, cyclopropyl, methoxy, ethoxy, difluoromethoxy, methylthio, ethylthio, methylamino, ethylamino, dimethylamino or diethylamino;

R<sub>2</sub> is methyl, fluorine, chlorine, methoxy, ethoxy or difluoromethoxy;

R<sub>3</sub> is hydrogen, C<sub>1-6</sub>alkyl, C<sub>3-6</sub>cycloalkyl, C<sub>1-6</sub>alkyl mono-substituted by chlorine or mono- to hexa-substituted by fluorine; phenyl, thienyl, or phenyl or thienyl mono- or di-substituted by fluorine, chlorine, methyl or by methoxy;

R<sub>4</sub> is hydrogen, C<sub>1-3</sub>alkyl or, together with R<sub>3</sub>, —(CH<sub>2</sub>)<sub>n</sub>—;

R<sub>5</sub> is hydrogen, methyl, fluorine, chlorine, bromine, C<sub>1-6</sub>alkoxy, C<sub>3-6</sub>alkenyl, C<sub>3-6</sub>alkynyl, C<sub>3-6</sub>cycloalkyl-C<sub>1-2</sub>alkoxy, C<sub>4-6</sub>cycloalkoxy, C<sub>1-4</sub>alkoxy mono-substituted by cyano, phenyl, C<sub>1-2</sub>alkoxy or chlorine or mono- to hexa-substituted by fluorine; C<sub>1-6</sub>alkylthio or cyano;

R<sub>6</sub> is hydrogen, C<sub>1-6</sub>alkyl, phenyl or, together with R<sub>7</sub>, —(CH<sub>2</sub>)<sub>p</sub>—, —CH=CH—CH=CH—, —N=CH—CH=CH— or —S—CH=CH—;

R<sub>7</sub> is hydrogen or methyl;

R<sub>8</sub> is hydrogen or methyl;

R<sub>9</sub> is hydrogen, methyl or, together with R<sub>11</sub>, —(CH<sub>2</sub>)<sub>q</sub>—, —CH<sub>2</sub>CH(OH)CH<sub>2</sub>—, —CH<sub>2</sub>SCH<sub>2</sub>— or —CH<sub>2</sub>CH<sub>2</sub>SCH<sub>2</sub>—;

R<sub>10</sub> and R<sub>13</sub> are each independently of the other hydroxymethyl, formyl, cyano, phosphono, phosphino, methylphosphino or a group COX,

R<sub>11</sub> is hydrogen, C<sub>1-4</sub>alkyl, trifluoromethyl, or C<sub>1-4</sub>alkyl substituted by hydroxy, C<sub>1-4</sub>alkoxy, mercapto, C<sub>1-4</sub>alkylmerapto, vinyl, phenyl, 4-hydroxyphenyl, 4-imidazolyl, 3-indolyl, carboxy, C<sub>1-4</sub>alkoxycarbonyl, 2-propenyloxycarbonyl, cyano, carbamoyl, methylphosphino or by methylsulfoximino; ethyl-, vinyl, phenyl, or vinyl or phenyl substituted by chlorine, methyl or by methoxy;

R<sub>12</sub> is hydrogen or methyl;

R<sub>14</sub> is hydrogen or methyl;

(Q<sub>1</sub>) R<sub>15</sub> is hydrogen, C<sub>1-6</sub>alkyl, phenyl, or phenyl mono- or di-substituted by fluorine, chlorine, bromine, iodine, C<sub>1-4</sub>alkyl, trifluoromethyl, C<sub>1-3</sub>alkoxy, difluoroalkoxy, cyano, nitro or by C<sub>1-4</sub>alkoxycarbonyl; pyridyl, or pyridyl mono- or di-substituted by fluorine, chlorine, methyl, methoxy or by trifluoromethyl; or,

(Q<sub>2</sub>) R<sub>14</sub> and R<sub>15</sub> together are —C(O)—CH<sub>2</sub>—CH<sub>2</sub>—, —(CH<sub>2</sub>)<sub>4</sub>— or —(CH<sub>2</sub>)<sub>2</sub>O(CH<sub>2</sub>)— and form a ring with the nitrogen atom to which they are linked;

l is 0, 1, 2 or 3;

m is 0, 1, 2 or 3;

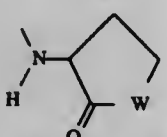
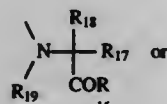
n is 2, 3, 4 or 5;

p is 3 or 4;

q is 2 or 3;

W is oxygen, sulfur, NH or —NH—O—;

(A<sub>1</sub>) X is hydroxy, C<sub>1-4</sub>alkoxy, C<sub>3-4</sub>alkenyl, benzyloxy, amino, C<sub>1-4</sub>alkylamino, C<sub>2-4</sub>-dialkylamino or a group



R<sub>16</sub> is hydroxy, C<sub>1-4</sub>alkoxy, 2-propenyloxy, benzyloxy, amino or a further amino acid group (X<sub>1</sub>);

R<sub>17</sub> is hydrogen, C<sub>1-4</sub>alkyl or benzyl;

R<sub>18</sub> is hydrogen or methyl;

R<sub>19</sub> is hydrogen or, together with R<sub>17</sub>, —(CH<sub>2</sub>)<sub>2</sub>—; or a salt of such a compound of formula I having a free carboxy group; with the proviso that

Y is sulfur when R<sub>1</sub> and R<sub>2</sub> are methoxy, Q is Q<sub>1</sub>, R<sub>3</sub> and R<sub>4</sub> are methyl, R<sub>5</sub> is hydrogen, A the group A<sub>4</sub>, and R<sub>14</sub> and R<sub>15</sub> are simultaneously either hydrogen or methyl.

5,482,921

### HYDANTOIN COMPOUNDS

Karl Seckinger, Riegel, Germany; Karlheinz Milzner, Basel, Switzerland; Fred Kuhn, Well, Germany, and Sasank S. Mohanty, Baden, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 808,247, Dec. 12, 1991, abandoned.

This application Dec. 2, 1992, Ser. No. 984,716

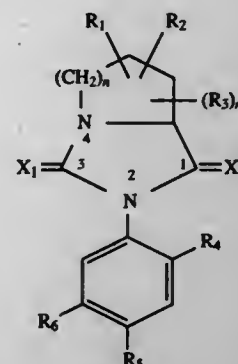
Claims priority, application United Kingdom, Dec. 18, 1990, 9027426; Jun. 4, 1991, 9111973

Int. Cl. C07D 471/04; A01N 43/60

U.S. Cl. 504-246

16 Claims

1. A compound of the formula (I)



wherein

R<sub>1</sub> is H, C<sub>1-4</sub>alkyl, C<sub>2-4</sub>alkenyl or halo;

R<sub>2</sub> is H or halo;

R<sub>3</sub> is OH, oxo, or halo;

R<sub>4</sub> is H or halo;

R<sub>5</sub> is halo, cyano or C<sub>1-4</sub>alkyl;

R<sub>6</sub> is halo; NO<sub>2</sub>; NH<sub>2</sub>; CN; C<sub>2-6</sub>alkynyl; C<sub>2-6</sub>alkenyl; C<sub>2-6</sub>alkynyl; S(C<sub>1-4</sub>alkylene)<sub>2</sub>; optionally substituted by CN; C<sub>1-4</sub>alkyl, optionally substituted with one or more groups selected from halo and CN; C<sub>2-6</sub>alkenyl, optionally substituted by one or more halo; C<sub>2-6</sub>alkoxycarbonyl; C<sub>1-4</sub>alkyl, whereby the carbon atom of the alkyl group alpha to the alkoxycarbonyl group may be substituted with one or more C<sub>2-6</sub>alkoxycarbonyl group or a cyano group; C<sub>2-6</sub>alkoxycarbonyloxy; C<sub>2-6</sub>alkoxycarbonyl; C<sub>1-4</sub>alkoxy; C<sub>1-4</sub>alkyl; C<sub>2-6</sub>alkoxycarbonyl; C<sub>2-6</sub>alkenyl, whereby the alkyl group is optionally substituted by halogen; C<sub>1-4</sub>alkylthio; C<sub>1-4</sub>alkyl; C<sub>1-4</sub>alkylsulfonyl; C<sub>1-4</sub>alkylsulfonyloxy; OCH(SR<sub>6</sub>)COOR<sub>6</sub>; NR<sub>10</sub>R<sub>11</sub>; COOR<sub>12</sub>; C(O)NR<sub>13</sub>R<sub>13</sub>; C(O)R<sub>14</sub>; R<sub>15</sub>; CR<sub>14</sub>(OC<sub>1-2</sub>alkyl)<sub>2</sub> or CR<sub>14</sub>(SC<sub>1-2</sub>alkyl)<sub>2</sub>; CR<sub>14</sub>=NOR<sub>13</sub>; thienyl; C<sub>1-4</sub>alkoxy, wherein the thienyl is optionally halo substituted; or C<sub>1-4</sub>alkoxy; C<sub>1-4</sub>alkoxycarbonyl;

or R<sub>5</sub> and R<sub>6</sub> join together to form a 5- or 6-membered ring, one to three of said ring atoms optionally selected from oxygen, nitrogen and sulfur and together with the phenyl ring to which they are attached form a bicyclic ring optionally being substituted with one or more groups selected from C<sub>2-6</sub>alkynyl, halo, oxo, C<sub>1-4</sub>alkylene-R<sub>16</sub>, C<sub>2-6</sub>alkenyl and C<sub>1-6</sub>alkyl which is itself optionally substituted by C<sub>2-6</sub>alkoxycarbonyl, C<sub>1-4</sub>alkoxy or CN;

R<sub>7</sub> is H; C<sub>1-4</sub>alkyl, C<sub>2-6</sub>alkenyl, C<sub>2-6</sub>alkynyl, or C<sub>3-6</sub>cycloalkyl, which hydrocarbonyl is unsubstituted or substituted by one or more halo or by CN; cyclopentanonyl; phenyl optionally substituted by O-C<sub>1-4</sub>alkylene-COOR<sub>8</sub>; C<sub>2-6</sub>alkanoyl; C<sub>2-6</sub>alkoxycarbonyl wherein the alkoxy is optionally substituted by C<sub>1-4</sub>alkylthio; C(O)NR<sub>8</sub>R<sub>8</sub>; C(=NOR<sub>8</sub>)COOR<sub>8</sub>; P(O)(OR<sub>8</sub>)OR<sub>8</sub>; R<sub>15</sub>; C(O)R<sub>15</sub>; cyclopentaoxycarbonyl; or phenoxy;

R<sub>8</sub> and R<sub>9</sub> independently are C<sub>1-4</sub>alkyl;

R<sub>9</sub> is C<sub>1-4</sub>alkyl optionally substituted by one or more halo;

R<sub>10</sub> is H or C<sub>1-4</sub>alkyl;

R<sub>11</sub> is H; C<sub>1-4</sub>alkyl, optionally substituted by P(O)(OR<sub>8</sub>)R<sub>8</sub>; C<sub>2-6</sub>alkanoyl; C<sub>2-6</sub>alkoxycarbonyl; or C<sub>2-6</sub>alkoxycarbonyl; C<sub>1-4</sub>alkyl;

R<sub>12</sub> is H; C<sub>1-6</sub>alkyl; phenyl; an aromatic 5- or 6-membered ring comprising 1 to 3 heteroatoms selected from oxygen, sulphur and nitrogen N=C<sub>2-6</sub>alkylidene; or C<sub>1-4</sub>alkyl substituted by one or more groups selected from C<sub>1-10</sub>alkyl, cycloalkyl, C<sub>2-10</sub>alkenyl, cycloalkenyl, C<sub>2-10</sub>alkynyl, NR<sub>10</sub>R<sub>11</sub>, C<sub>1-4</sub>alkylthio, CN, phenyl, an aromatic 5- or 6-membered ring comprising 1 to 3 heteroatoms selected from oxygen, sulphur and nitrogen, C<sub>2-6</sub>alkanoyl, halo, C<sub>1-4</sub>alkoxy, tri(C<sub>1-4</sub>alkyl)silyloxy, tri(C<sub>1-4</sub>alkyl)silyl, C<sub>2-6</sub>alkoxycarbonyl, P(O)(OR<sub>8</sub>)OR<sub>8</sub>, C<sub>2-6</sub>alkanoyloxy, and di(C<sub>1-4</sub>alkyl)aminocarbonyloxy in which both alkyl groups may be tied together to form a saturated 5- to 6-membered heteroring one to three of the heteroatoms optionally selected from O, S and N, and any N-heteroatom optionally substituted with a hydrogen or a C<sub>1-4</sub>alkyl group;

R<sub>13</sub> is H or C<sub>1-4</sub>alkyl; and

R<sub>15</sub> is H, C<sub>1-4</sub>alkyl, C<sub>1-4</sub>alkoxy, phenyl, CHO, C<sub>2-6</sub>alkanoyl, C<sub>1-4</sub>alkylsulfonyl, C<sub>2-6</sub>alkoxycarbonyl; C<sub>1-4</sub>alkyl or C<sub>2-6</sub>alkoxycarbonyl; C<sub>1-4</sub>alkoxy; or

R<sub>13</sub> and R<sub>15</sub> together form a 5- to 6-membered heteroring optionally containing one or two heteroatoms selected from O, S and N, and any N-heteroatom optionally substituted by C<sub>1-4</sub>alkyl;

R<sub>14</sub> is H or C<sub>1-4</sub>alkyl;

R<sub>15</sub> is a heterocyclic ring having 5 or 6 ring atoms, one to three of said ring atom being selected from oxygen, sulfur and nitrogen, which ring is optionally substituted with one or more groups selected from C<sub>1-4</sub>alkyl and C<sub>2-6</sub>alkoxycarbonyl;

R<sub>16</sub> is tetrahydropyran-2-yl, 5,6-dihydro-2H-thiopyran-2-yl, pyridin-2-yl, pyrazin-2-yl, oxazol-2-yl, or oxadiazol-2-yl all of which are optionally substituted with C<sub>1-4</sub>alkyl;

X<sub>1</sub> and X<sub>2</sub> are independently O or S;

k is 0 or 1; and

n and m are independently 1 or 2.

5,482,922

### HERBICIDAL COMPOSITION EXHIBITING SYNERGISTIC ACTIVITY

Ryo Sato, Tokyo, and Masako Kataoka, Minoo, both of Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

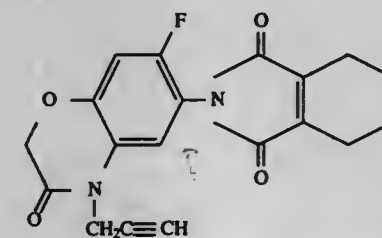
Division of Ser. No. 867,077, Apr. 14, 1992, Pat. No. 5,238,901, which is a continuation of Ser. No. 336,085, Apr. 11, 1989, abandoned. This application Apr. 12, 1993, Ser. No. 47,052

Claims priority, application Japan, Apr. 12, 1988, 63-89563 Int. Cl. A01N 37/22; 43/38; 43/84

U.S. Cl. 504-130

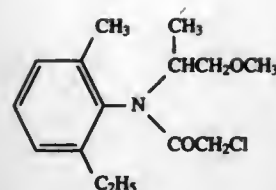
19 Claims

1. A herbicidal composition which comprises a herbicidally effective amount of the combination of (a) 2-(7-fluoro-3,4-dihydro-3-oxo-4-(2-propenyl)-2H-1,4-benzoxazin-6-yl)-4,5,6,7-tetrahydro-1H-indol-1,3(2H)-dione of the formula:



and (b) 2-chloro-6'-ethyl-N-(2-methoxy-1-methylethyl) acetotoluidide of the formula:





as the active ingredients, and an inert carrier or diluent, wherein the weight proportion of the components (a) and (b) is from 1:5 to 60.

5,482,923

### HEPARIN NEUTRALIZATION WITH PLATELET FACTOR 4 FRAGMENTS

Theodore E. Malone, Wakefield, Mass., assignor to Repligen Corporation, Cambridge, Mass.

Continuation of Ser. No. 902,509, Jun. 23, 1992, Pat. No. 5,204,321, which is a continuation of Ser. No. 480,873, Feb. 16, 1990, abandoned. This application Apr. 16, 1993, Ser. No. 48,812

Int. Cl.<sup>6</sup> A61K 38/36; 38/08

U.S. Cl. 514—2

18 Claims

1. A method for preventing heparin inhibition of coagulation in a mammal having an undesirably high level of circulating heparin following administration of heparin in connection with a medical procedure, said method comprising administering to said mammal a heparin neutralizing amount of a purified heparin binding fragment of PF4 or of recombinant PF4, wherein said heparin binding fragment contains amino acids 61 to 66 of PF4 and neutralizes heparin in vitro.

5,482,924

### PROTEINACEOUS COMPOSITIONS HAVING AN ACTIVITY ON ERYTHROPOIESIS

Julien Royet, Caluire; Sylvie Arnaud; Guy Mouchroud, both of Villeurbanne, and Jean P. Blanchet, Caluire, all of, France, assignors to Centre National de La Recherche, Paris, France

Continuation of Ser. No. 695,733, May 6, 1991, abandoned.

This application Dec. 9, 1992, Ser. No. 987,604

Int. Cl.<sup>6</sup> A61K 38/16; C07K 1/16; 1/30; 1/447

U.S. Cl. 514—8

9 Claims

1. Proteinaceous compositions precipitated from bone marrow supernatant or kidney cell lysates which, in combination with erythropoietin, stimulate erythropoiesis said proteinaceous compositions comprising proteins having the following properties:

they have been precipitated from a biological material selected from the group consisting of the supernatant of a culture of the mouse bone marrow cell line deposited at the CNCM under number L1062 on Mar. 20, 1991 and kidney cell lysates, by bringing said supernatant or lysates to a final aqueous ammonium sulphate concentration of about 30 to 40% (w/v),

they are adsorbed by bound lectin having an affinity for glycoproteins in a phosphate buffer saline (PBS), pH 7.4, in vitro, they effect an increase in the number of small bursts having fifteen or fewer erythroid sub-colonies, and in vivo they stimulate mature erythroid burst-forming-unit proliferation, thus increasing the colony forming unit erythroid number.

5,482,925

### COMPLEXES OF NITRIC OXIDE WITH CARDIOVASCULAR AMINES AS DUAL ACTING CARDIOVASCULAR AGENTS

Thomas C. Hutsell, North Oaks, Minn., assignor to Comedicus Incorporated, Long Lake, Minn.

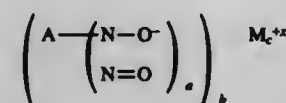
Filed Mar. 17, 1994, Ser. No. 210,043

Int. Cl.<sup>6</sup> A61K 38/08; 38/16; 38/17; 38/31

U.S. Cl. 514—11

8 Claims

1. A compound of the formula



wherein:

A is a cardiovascular amine moiety derived from a compound selected from the group consisting of angiotensin, heparin and hirudin;

M<sup>+</sup> is a pharmaceutically acceptable cation, wherein x is the valence of the cation;

a is at least one;

b and c are the smallest integers that result in a neutral compound, and wherein the compound under physiological conditions is capable of releasing NO and a cardiovascular amine of the formula AH.

5,482,926

### GROWTH FACTOR IGF-II

Peter D. Gluckman, Auckland, and David J. Mellor, Palmerston North, both of, New Zealand, assignors to Pharmacia AB, Sweden

PCT No. PCT/SE93/00503, § 371 Date Feb. 17, 1994, § 102(e) Date Feb. 17, 1994, PCT Pub. No. WO93/25227, PCT Pub. Date Dec. 23, 1993

PCT Filed Jun. 7, 1993, Ser. No. 190,168

Claims priority, application New Zealand, Jun. 8, 1992, 243071

Int. Cl.<sup>6</sup> A61K 38/00; C07K 13/00

U.S. Cl. 514—12

22 Claims

1. Composition for the treatment of nutritional or gastrointestinal disorders or for promoting human or animal neonatal growth comprising human or animal IGF-II in a therapeutical effective amount together with a pharmaceutically acceptable carrier or diluent, wherein said carrier or diluent is for oral or gastric administration and wherein said carrier or diluent comprises natural milk or colorstrum.

5,482,927

### CONTROLLED RELEASED MICROPARTICULATE DELIVERY SYSTEM FOR PROTEINS

Manoj Maniar, and Abraham J. Domb, both of Baltimore, Md., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 658,069, Feb. 20, 1991, abandoned.

This application Feb. 23, 1994, Ser. No. 200,370

Int. Cl.<sup>6</sup> A61K 9/16; 38/27

U.S. Cl. 514—12

18 Claims

1. A solid injectable microparticle consisting essentially of at least one fatty acid anhydride dimer, or at least one fatty acid and at least one fatty acid anhydride dimer, having dispersed within the microparticle a substance selected from the group consisting of a biologically active protein and a peptide.

5,482,928

### BIOCIDAL PROTEINS

Miguel De Bolle, Leuven; Willem F. Broekaert, Dilbeek; Bruno P. A. Cammue, Aalsberg, all of, Belgium; Sarah B. Rees, Bracknell, United Kingdom, and Jozef Vanderleyden, Heverlee, Belgium, assignors to Imperial Chemical Industries PLC, London, England

PCT No. PCT/GB92/00423, § 371 Date Dec. 20, 1993, § 102(e) Date Dec. 20, 1993, PCT Pub. No. WO92/15691, PCT Pub. Date Sep. 17, 1992

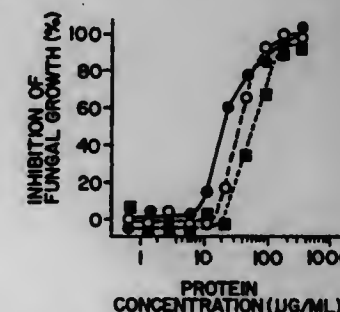
PCT Filed Mar. 10, 1992, Ser. No. 117,080

Claims priority, application United Kingdom, Mar. 11, 1991, 9105052; Mar. 19, 1991, 9105684

Int. Cl.<sup>6</sup> A61K 38/16; C07K 14/415

U.S. Cl. 514—12

5 Claims



1. An antimicrobial protein selected from the group consisting of the pure protein Mj-AMP1 having SEQ ID NO: 1 and the pure protein Mj-AMP2 having SEQ ID NO:2.

5,482,929

### COMPOSITION OF STABILIZED FIBROBLAST GROWTH FACTOR

Kazuhiro Fukunaga; Shigeki Hijioka; Kimihiro Ishimura; Yoshiro Ohtani; Kunio Kimura; Masahiro Fujii, and Yoshiyuki Hata, all of Tokyo, Japan, assignors to Kaken Pharmaceutical Co., Ltd., Japan

Filed Dec. 23, 1992, Ser. No. 996,392

Claims priority, application Japan, Dec. 26, 1991, 3-357821

Int. Cl.<sup>6</sup> C07K 7/00; A61K 38/16

U.S. Cl. 514—12

8 Claims

1. A composition of a stabilized fibroblast growth factor, which contains a complex wherein a fibroblast growth factor is adsorbed on the aluminum salt of cyclodextrin sulfate composed of a member selected from the group consisting of an aluminum salt of β-cyclodextrin, an aluminum salt of β-cyclodextrin, an aluminum salt of hydroxypropyl-α-cyclodextrin, an aluminum salt of hydroxypropyl-β-cyclodextrin, an aluminum salt of hydroxypropyl-γ-cyclodextrin, an aluminum salt of hydroxyethyl-α-cyclodextrin, an aluminum salt of hydroxyethyl-β-cyclodextrin, an aluminum salt of hydroxyethyl-γ-cyclodextrin; and

wherein the number of aluminum ions per cyclodextrin sulfate is at least two.

5,482,930

### ANTI-INFLAMMATORY COMPOSITION AND METHOD WITH DES-TYR DYNORPHIN AND ANALOGUES

Edward T. Wei, Berkeley, Calif., and Holly A. Thomas, Wilmette, Ill., assignors to The Regents of the University of California, Oakland, Calif.

Filed Jun. 9, 1993, Ser. No. 74,210

Int. Cl.<sup>6</sup> A61K 38/00; C07K 7/00; 7/06; 7/08

U.S. Cl. 514—13

10 Claims

1. An anti-inflammatory composition comprising: an amidated peptide or salt thereof having the sequence Ac-R-R-I-R-P-K-L-NH<sub>2</sub> (SEQ ID NO:3), or

Ac-R-R-I-R-P-K-I-NH<sub>2</sub>

in a concentration sufficient to provide about 0.1 to about 5 mg/kg patient body weight when administered by intravenous, intradermal, or subcutaneous injection to a patient, the peptide being in a pharmaceutically acceptable carrier.

5,482,931

### STABILIZED PHARMACEUTICAL PEPTIDE COMPOSITIONS

Alan Harris, and Birgitta Tennhammar-Ekman, both of Malmö, Sweden, assignors to Ferring AB, Malmö, Sweden

Filed Jun. 29, 1993, Ser. No. 84,563

Int. Cl.<sup>6</sup> A61K 38/00; C07K 14/00; 7/16

U.S. Cl. 514—15

22 Claims

1. A stable, aqueous composition for administration to a patient of at least one biologically active peptide, consisting essentially of:

a) said biologically active peptide selected from the group consisting of oxytocin, vasopressin, an oxytocin analog, an oxytocin derivative, a vasopressin analog, and a vasopressin derivative;

b) a buffering agent;

c) a quaternary amine preservative or disinfectant; and

d) an osmotic pressure-controlling agent.

5,482,932

### ALGINATE GELS TO THE FORM OF FIBROUS PASTES USEFUL AS WOUND DRESSINGS

Joseph Thompson, Coventry, United Kingdom, assignor to Courtaulds Fibres (Holdings) Limited, London, United Kingdom

Filed Sep. 7, 1993, Ser. No. 116,791

Claims priority, application United Kingdom, Sep. 4, 1992, 9218749

Int. Cl.<sup>6</sup> A61K 31/715; 9/70; A61L 15/00; C08B 37/04

U.S. Cl. 514—54

12 Claims

1. An alginate gel in the form of a moldable water-soluble fibrous paste, having an alginate content expressed as alginic acid in the range of 2 to 11 percent by weight, said alginate containing mannuronic and guluronic acid units in a mannuronic acid: guluronic acid ratio in the range of about 55:45 to about 75:25, said paste produced by the process comprising treating water insoluble or water swellable alginate fiber with an aqueous solution of a solubilizing salt.

5,482,933

### PHOSPHONOMETHYL-IMIDAZO[1,2-A]PYRIMIDINE-2-CARBOXYLIC ACID COMPOUNDS FOR TREATMENT OF NEUROTOXIC INJURY

Alexis A. Cordi, Suresnes, France, and Eric T. Sun, San Diego, Calif., assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 982,819, Nov. 30, 1992, Pat. No.

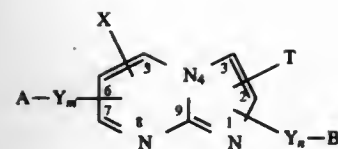
5,302,586, which is a continuation-in-part of Ser. No. 810,242, Dec. 19, 1991, abandoned. This application Oct. 21, 1993, Ser. No. 140,370

Int. Cl.<sup>6</sup> A61K 31/675; 31/505

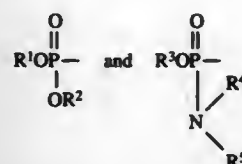
U.S. Cl. 514—81

11 Claims

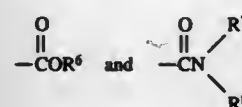
1. A method for treating neurotoxic injury resulting from ischemia, which method comprises treating a subject susceptible to neurotoxic injury with a therapeutically effective amount of an antagonist compound of Formula I:



wherein A is selected from

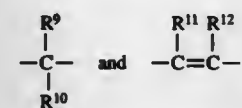


wherein B is selected from



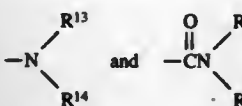
wherein each of R<sup>1</sup> through R<sup>8</sup> is independently selected from hydrido, alkyl, allyl, cycloalkyl, cycloalkylalkyl, phenyl and benzyl;

wherein each of Y<sub>m</sub> and Y<sub>n</sub> is a spacer group independently selected from one or more groups of the formula



with the proviso that the total number of carbon atoms in each of Y<sub>m</sub> or Y<sub>n</sub> cannot exceed twenty carbon atoms; wherein each of R<sup>9</sup> and R<sup>10</sup> is independently selected from hydrido, alkyl, cycloalkyl, halo, haloalkyl, phenyl, benzyl, hydroxy, hydroxyalkyl, alkoxy, phenoxy, alkoxyalkyl, benzyloxy, cyano and alkanoyl; wherein each of R<sup>11</sup> and R<sup>12</sup> is independently selected from hydrido, alkyl, haloalkyl, phenyl, hydroxyalkyl and alkoxyalkyl; wherein each of m and n is a number independently selected from zero to four, inclusive;

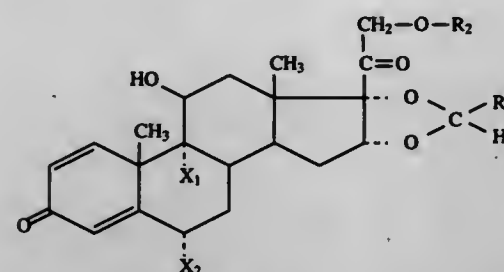
wherein X is one or more groups attachable at one or more of the 5-, 6- and 7-ring positions of the imidazo [1,2-a]pyrimidine ring system; wherein each X and T is independently selected from hydrido, halo, alkyl, cycloalkyl, cycloalkylalkyl, haloalkyl, alkenyl having two to about twenty carbon atoms and having one carbon-carbon double bond, alkynyl having two to about twenty carbon atoms and having one carbon-carbon triple bond, phenyl, benzyl, hydroxy, hydroxyalkyl, alkoxy, phenoxy, alkoxyalkyl, benzyloxy, cyano, alkanoyl, alkylthio and arylthio.



wherein each of R<sup>13</sup>, R<sup>14</sup>, R<sup>15</sup> and R<sup>16</sup> is independently selected from hydrido, alkyl and phenyl; or a pharmaceutically-acceptable salt thereof.

5,482,934  
PREGNA-1,4-DIENE-3,20-DIONE-16-17-ACETAL-21  
ESTERS, PROCESS FOR THEIR PREPARATION,  
COMPOSITION, AND METHODS FOR THE  
TREATMENT OF INFLAMMATORY CONDITIONS  
Jose Calatayud; Jose R. Conde, and Manuel Luna, all of  
Madrid, Spain, assignors to Especialidades Latinas Medica-  
mentos Universales, S.A. (Elmu, S.A.), Madrid, Spain  
Continuation of Ser. No. 578,942, Sep. 7, 1990, abandoned.  
This application Jul. 20, 1994, Ser. No. 278,112  
Int. Cl.<sup>6</sup> A61K 31/58; C07J 71/00  
U.S. Cl. 514-174 12 Claims

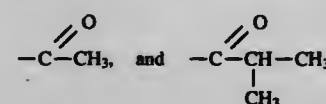
1. A compound of the formula



in the form of an R epimer, an S epimer, or a stereoisomeric mixture of the R and S epimers in terms of the orientation of the substituents on the carbon atom at position 22, wherein:

R<sub>1</sub> is cyclohexyl,

R<sub>2</sub> is a member selected from the group consisting of



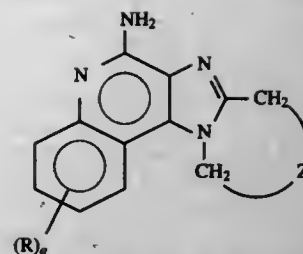
and wherein X<sub>1</sub> and X<sub>2</sub> may be the same or different and each is a member selected from the group consisting of hydrogen and fluorine.

5,482,935  
ANTI-ATHEROSCLEROTIC USE OF 17 ALPHA-  
DIHYDROEQUILIN  
Steven J. Adelman, Hatfield, Pa., and Kurt E. Steiner,  
Lawrenceville, N.J., assignors to American Home Product  
Corporation, Madison, N.J.  
Continuation-in-part of Ser. No. 777, Jan. 5, 1993, aban-  
doned. This application Dec. 1, 1993, Ser. No. 157,661  
Int. Cl.<sup>6</sup> A61K 31/56  
U.S. Cl. 514-182 9 Claims

1. A method for the treatment of atherosclerosis which comprises administering to a patient in need of anti-atherosclerotic treatment, an effective amount of 17 alpha-dihydroequilin, a C<sub>2</sub>-C<sub>6</sub> alkanoyloxy ester thereof or a pharmaceutically acceptable salt of it's sulfate or phosphate ester, in the absence of naturally occurring estrogenic steroids.

5,482,936  
IMIDAZO[4,5-C]QUINOLINE AMINES  
Kyle J. Lindstrom, Houlton, Wis., assignor to Minnesota Min-  
ing and Manufacturing Company, St. Paul, Minn.  
Filed Jan. 12, 1995, Ser. No. 371,845  
Int. Cl.<sup>6</sup> C07D 471/14; 498/14; A61K 31/47; 31/535  
U.S. Cl. 514-183 12 Claims

1. A compound of Formula II



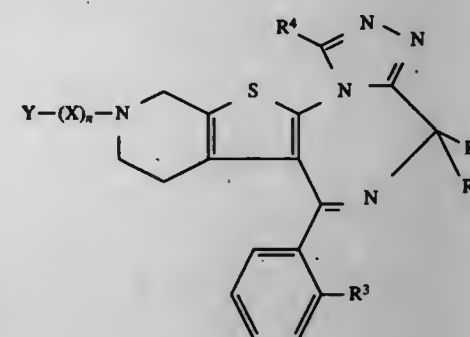
wherein Z is selected from the group consisting of:

—(CH<sub>2</sub>)<sub>n</sub>— wherein n is 1 to 4;  
—(CH<sub>2</sub>)<sub>a</sub>—C(R<sub>1</sub>,R<sub>2</sub>)(CH<sub>2</sub>)<sub>b</sub>—, wherein a and b are integers and a+b is 0 to 3, R<sub>1</sub> is hydrogen or alkyl of 1 to 4 carbon atoms, and R<sub>2</sub> is selected from the group consisting of alkyl of 1 to 4 carbon atoms, hydroxy, —OR<sub>3</sub> wherein R<sub>3</sub> is alkyl of 1 to 4 carbon atoms, and —NR<sub>4</sub>R<sub>5</sub> wherein R<sub>4</sub> and R<sub>5</sub> are independently hydrogen or alkyl of 1 to 4 carbon atoms; and  
—(CH<sub>2</sub>)<sub>a</sub>—(Y)—(CH<sub>2</sub>)<sub>b</sub>— wherein a and b are integers and a+b is 0 to 3, and Y is O, S, or —NR<sub>5</sub>— wherein R<sub>5</sub> is hydrogen or alkyl of 1 to 4 carbon atoms;  
and wherein q is 0 or 1 and R is selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, and halogen,  
and pharmaceutically acceptable salts thereof.

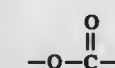
12. A method of inducing interferon biosynthesis in an animal, comprising the step of administering to said animal a compound according to claim 1 in an amount effective to induce said interferon biosynthesis.

5,482,937  
1,4-DIAZEPINE DERIVATIVE AND ITS  
PHARMACEUTICAL USE  
Kazuo Okano; Shuhei Miyazawa; Richard S. J. Clark; Shinya Abe; Tetsuya Kawahara; Naoyuki Shimomura; Osamu Asano; Hiroyuki Yoshimura; Mitsuaki Miyamoto; Yoshimori Sakuma; Kenzo Muramoto; Hiroshi Obaishi; Kouichi Harada; Hajime Tsunoda; Satoshi Katayama; Kouji Yamada; Shigeru Souda; Yoshimasa Machida; Kouichi Katayama, and Isao Yamatsu, all of Ibaraki, Japan, assignors to Eisai Co., Ltd., Tokyo, Japan  
Division of Ser. No. 751,632, Aug. 26, 1991, Pat. No. 5,382,579, which is a continuation of Ser. No. 506,928, Apr. 10, 1990, abandoned, which is a continuation-in-part of Ser. No. 421,929, Oct. 16, 1989, abandoned. This application Oct. 6, 1994, Ser. No. 318,971  
Claims priority, application Japan, Jan. 31, 1988, 63-275460; Nov. 24, 1988, 63-297068; Dec. 16, 1988, 63-318016; Dec. 28, 1988, 63-331622  
Int. Cl.<sup>6</sup> C07D 495/22; A61K 31/55  
U.S. Cl. 514-219 16 Claims

1. A triazolo-1,4-diazepine compound or pharmacologically acceptable salt thereof, having the formula:

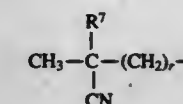


wherein R<sup>1</sup> and R<sup>2</sup> are the same or different and represent a hydrogen atom or a lower alkyl group, R<sup>3</sup> represents a hydrogen atom or a halogen atom, R<sup>4</sup> represents a hydrogen atom or a lower alkyl group, X represents a group of the formula,



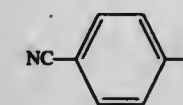
n is 1, and Y represents

(1) a cycloalkyl group,  
(2) a cycloalkylalkyl,  
(3) an alkynyl group,  
(4) a group of the formula,

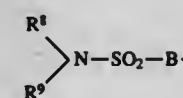


in which R<sup>7</sup> is hydrogen or methyl and r is zero, 1 or 2,

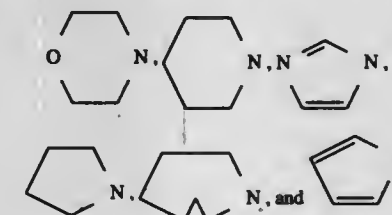
(5) a group of the formula, NC—(CH<sub>2</sub>)<sub>p</sub>—, wherein p is an integer of from 1 to 6,  
(6) a group of the formula A—(CH<sub>2</sub>)<sub>q</sub>— wherein A represents a group selected from a pyridyl group, a pyranil group and a morpholino group and q is an integer of from 0 to 6,  
(7) an alkynyl group having from 1 to 6 carbon atoms wherein a phenyl group or a cycloalkyl group is joined to any carbon atom,  
(8) a group of the formula



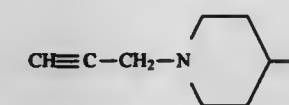
(9) a group of the formula,



wherein R<sup>8</sup> and R<sup>9</sup> are the same or different and represent a hydrogen atom, a lower alkyl group, a pyridylmethyl group or a cycloalkyl group or R<sup>8</sup> and R<sup>9</sup> may be joined along with the nitrogen atom to form a ring selected from the group consisting of

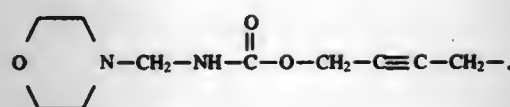


and B represents a phenylene group or a lower alkylene group having from 1 to 3 carbon atoms,  
(10) a group of the formula,

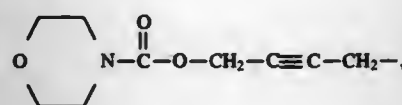




(11) a group of the formula,

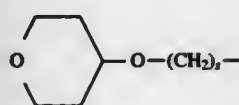


(12) a group of the formula,



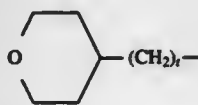
(16) a cycloalkylalkenyl group.

(17)



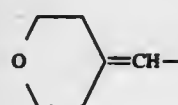
in which s is 1 or 2,

(18)



in which t is 1 or 2,

(19)



(20) an arylalkyl,

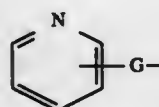
(21) an arylalkenyl,

(22)



in which R<sup>10</sup> is hydrogen or phenyl, R<sup>11</sup> is hydrogen or a lower alkyl, E is an alkenylene and u is zero or 1 with the proviso that R<sup>10</sup> and R<sup>11</sup> are not both hydrogen at the same time or

(23)



in which G is an alkenylene or -J-(CH<sub>2</sub>)<sub>k</sub>-, wherein J is oxygen or sulfur, and k is zero, 1 or 2.

14. A method for treating a disease against which anti-PAF activity is effective, which comprises administering to a patient in need thereof a pharmacologically effective amount of the compound or the salt thereof as defined in claim 1.

# 5,482,938 AZABICYCLO AND AZACYCLO OXIME AND AMINE CHOLINERGIC AGENTS AND METHODS OF TREATMENT

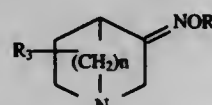
David J. Lauffer, Saline, Mich.; Walter H. Moos, Emeryville, Calif.; Michael R. Pavia, Ann Arbor, Mich.; Halle Teede, Ypsilanti, Mich., and Anthony J. Thomas, Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J. Division of Ser. No. 778,412, Oct. 16, 1991, Pat. No. 5,306,718, which is a continuation-in-part of Ser. No. 641,478, Jan. 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 591,647, Oct. 2, 1990, abandoned, which is a continuation-in-part of Ser. No. 488,916, Mar. 6, 1990, abandoned. This application Feb. 1, 1994, Ser. No. 189,620

Int. Cl.<sup>6</sup> A61K 31/535; C07D 453/02; 413/00

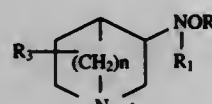
U.S. Cl. 514-233.2

15 Claims

1. A compound of Formula I or II its enantiomer, its geometric isomer or a pharmaceutically acceptable salt thereof:



I



II

wherein n is two;

wherein R<sub>1</sub> is hydrogen or straight or branched lower alkyl having from 1 to 4 carbon atoms;

wherein R<sub>3</sub> is hydrogen, a straight or branched lower alkyl group having from 1 to 6 carbon atoms, hydroxy, a straight or branched lower alkoxy group having from 1 to 4 carbon atoms, acyloxy group wherein the acyl moiety has from 2 to 5 carbon atoms, or the group -(CH<sub>2</sub>)<sub>q</sub>-NR<sub>11</sub>R<sub>12</sub> wherein q is zero or 1 to 4 and each of R<sub>11</sub> and R<sub>12</sub> is the same or different and is hydrogen or a straight or branched lower alkyl group having from 1 to 4 carbon atoms; or cycloalkyl having from 3 to 6 carbon atoms; and wherein R is

(a) hydrogen;

(b) a straight or branched hydrocarbon chain having from 1 to 20 carbon atoms which is saturated or which is unsaturated and contains from 1 to 4 double and/or triple bonds;

(c) phenyl or phenyl substituted with 1 to 3 substituents selected from chlorine, bromine, fluorine, trifluoromethyl, hydroxy, trifluoromethoxy, straight or branched alkoxy having from 1 to 4 carbon atoms, straight or branched alkyl having from 1 to 4 carbon atoms, nitro, -NR<sub>4</sub>R<sub>5</sub> wherein each of R<sub>4</sub> and R<sub>5</sub> is hydrogen or a straight or branched alkyl group having from 1 to 4 carbon atoms;

(d) cycloalkyl having from 3 to 8 carbon atoms or a cycloalkenyl group having from 4 to 8 carbon atoms;

(e) a straight or branched hydrocarbon chain having from 1 to 20 carbon atoms which is saturated or which is unsaturated and contains from 1 to 4 double and/or triple bonds, and the terminal carbon of the hydrocarbon chain is substituted with a group selected from:

(i) a cycloalkyl group having from 3 to 8 carbon atoms or a cycloalkenyl group having from 4 to 8 carbon atoms;

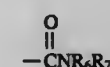
(ii) an aromatic group selected from phenoxy, phenyl, 2- or 3-thienyl, 2- or 3-furanyl, 2- or 3-pyrrolyl, 2-, 3-, or 4-pyridinyl, 3- or 5-(1,2,4)-thiadiazolyl, 3-(1,2,5)-thiadiazolyl, 2-(1,3,4)-thiadiazolyl, 2-triazinyl, 3- or 5-(1,2,4)-oxadiazolyl, 2-(1,3,4)-oxadiazolyl, 3-(1,2,5)-oxadiazolyl, 3- or 5-thiadiazolyl, 2- or 5-pyrimidinyl, 3- or 4-pyridazinyl, 2-, 4-, or 5-thiazolyl, 2-, 4-, or 5-oxazolyl, or 2-pyrazinyl wherein the aromatic group is unsubstituted or is substituted with 1 or 2 substituents selected from straight or branched, alkyl having from 1 to 4 carbon atoms, straight or branched alkoxy having from 1 to 4 carbon atoms, chlorine, fluorine, bromine, trifluoromethyl, nitro,

hydroxy, trifluoromethoxy, or NR<sub>4</sub>R<sub>5</sub> wherein R<sub>4</sub> and R<sub>5</sub> have the meanings defined above,

(iii) -NR<sub>6</sub>R<sub>7</sub>,

wherein each of R<sub>6</sub> and R<sub>7</sub> is hydrogen, alkyl having from 1 to 4 carbon atoms, phenyl or benzyl, or -NR<sub>6</sub>R<sub>7</sub> taken together form a pyrrolidino, piperidino, piperazino, or morpholino ring;

(iv)



wherein R<sub>6</sub> and R<sub>7</sub> have the meanings defined above;

(v)



wherein R<sub>8</sub> is a straight or branched alkyl group having from 1 to 6 carbon atoms;

(vi) CN;

(vii) -CO<sub>2</sub>R<sub>9</sub>,

wherein R<sub>9</sub> is hydrogen, a straight or branched hydrocarbon group having from 1 to 6 carbon atoms which is saturated or which is unsaturated and contains 1 or 2 double and/or triple bonds, or benzyl;

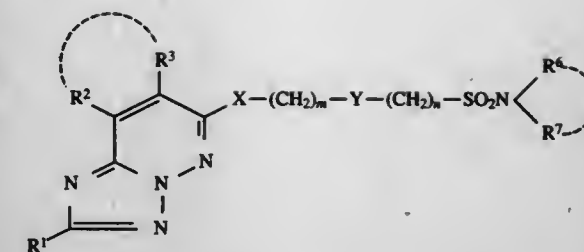
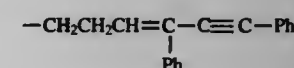
(viii) XR<sub>10</sub>

wherein X is oxygen or sulfur, and R<sub>10</sub> is a straight or branched hydrocarbon chain having from 1 to 6 carbon atoms which is saturated or which is unsaturated and contains 1 or 2 double and/or triple bonds and is unsubstituted or is substituted with an alkoxy group having from 1 to 4 carbon atoms;

(ix) biphenyl;

(f) the group -CH<sub>2</sub>CH<sub>2</sub>CH=C(Ph)<sub>2</sub>; or

(g) the group



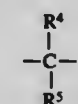
wherein

R<sup>1</sup> stands for (i) a hydrogen atom, (ii) a C<sub>1-6</sub> alkyl group which may be substituted with one to four substituents selected from the group consisting of a hydroxy, amino, carboxyl, nitro, mono- or di-C<sub>1-6</sub> alkylamino, C<sub>1-6</sub> alkoxy, C<sub>1-6</sub> alkyl-carbonyloxy and halogen or (iii) a halogen atom;

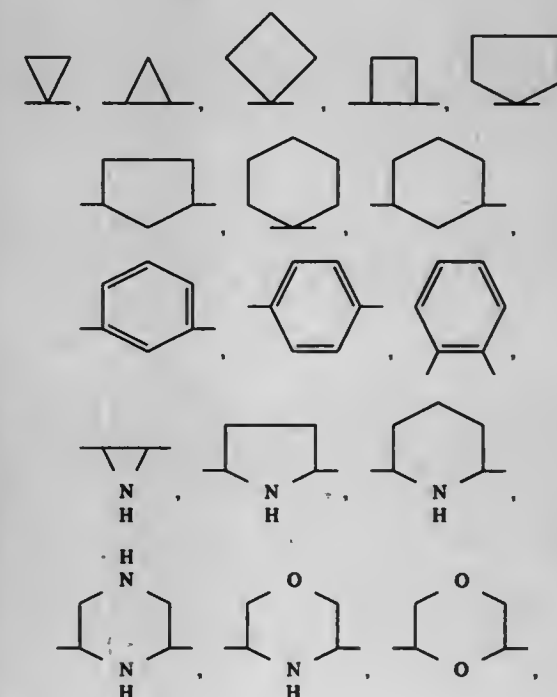
R<sup>2</sup> is hydrogen and R<sup>3</sup> is a C<sub>3-5</sub> branched alkyl group which may be substituted with one to four substituents selected from the group consisting of a hydroxy, amino, carboxyl, nitro, mono- or di-C<sub>1-6</sub> alkylamino, C<sub>1-6</sub> alkoxy, C<sub>1-6</sub> alkyl-carbonyloxy and halogen;

X stands for an oxygen atom or S(O)<sub>p</sub>, wherein p is a whole number of from 0 to 2;

Y stands for (i) a group of the formula:



wherein R<sup>4</sup> and R<sup>5</sup> independently stand for a hydrogen atom or a C<sub>1-6</sub> alkyl group which may be substituted with one to four substituents selected from the group consisting of a hydroxy, amino, carboxyl, nitro, mono- or di-C<sub>1-6</sub> alkylamino, C<sub>1-6</sub> alkoxy, C<sub>1-6</sub> alkyl-carbonyloxy and halogen or (ii) a divalent homocyclic or heterocyclic ring selected from the group consisting of



5,482,939

# TRIAZOLOPYRIDAZINE COMPOUNDS, THEIR PRODUCTION AND USE

Akio Miyake, Hirakata; Yasuhiko Kawano, Suita, and Yasuko Ashida, Takatsuki, all of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 32,296, Mar. 17, 1993, Pat. No. 5,389,633. This application Sep. 16, 1994, Ser. No. 306,423

Claims priority, application Japan, Mar. 18, 1992, 4-061780; Aug. 18, 1992, 4-218904; Feb. 1, 1993, 5-014560

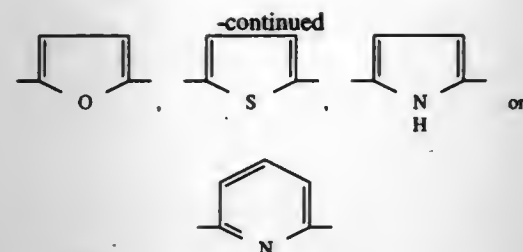
The portion of the term of this patent subsequent to Feb. 15, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> A61K 31/50; 31/535; C07D 487/04; 487/12

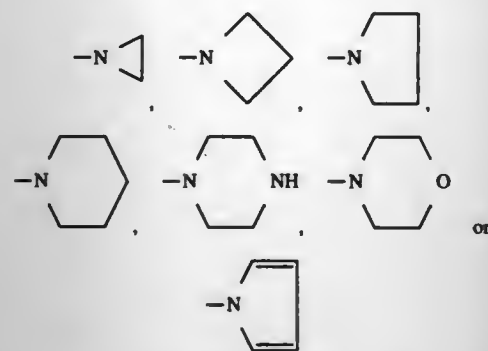
U.S. Cl. 514-248

8 Claims

1. A compound of the formula:



which may be substituted with 1 to 5 substituents selected from the group consisting of a  $C_{1-6}$  alkyl group which may be substituted with 1 to 4 substituents selected from the group consisting of hydroxy, amino, mono- or di- $C_{1-6}$  alkylamino,  $C_{1-6}$  alkoxy,  $C_{1-6}$  alkyl-carbonyloxy and halogen, an amino group which may be substituted with 1 or 2 substituents selected from the group consisting of  $C_{1-6}$  alkyl,  $C_{1-6}$  acyl, pyrrolidino, morpholino, piperidino and piperazino, a hydroxy, a carboxyl, a nitro, a  $C_{1-6}$  alkoxy, and a halogen;  $R^6$  and  $R^7$  each stands for (i) a hydrogen, (ii) a  $C_{1-6}$  alkyl group which may be substituted with one to four substituents selected from the group consisting of a hydroxy, amino, carboxyl, amino, carboxyl, nitro, mono- or di- $C_{1-6}$  alkylamino,  $C_{1-6}$  alkoxy,  $C_{1-6}$  alkyl-carbonyloxy and halogen, (iii) a  $C_{3-6}$  cycloalkyl group which may be substituted with one to four substituents selected from the group consisting of a hydroxy, amino, carboxyl, nitro, mono- or di- $C_{1-6}$  alkylamino,  $C_{1-6}$  alkoxy,  $C_{1-6}$  alkyl-carbonyloxy and halogen, (iv) a  $C_{6-14}$  aryl group which may be substituted with one to five substituents selected from the group consisting of a  $C_{1-6}$  alkyl which may be substituted with one to four substituents selected from the group consisting of hydroxy, amino, mono- or di- $C_{1-6}$  alkylamino,  $C_{1-6}$  alkoxy and halogen, an amino which can be substituted with one or two substituents selected from the group consisting of  $C_{1-6}$  alkyl, pyrrolidino, morpholino, piperidino and piperazino, an acetamido, a hydroxy, a carboxyl, a nitro, a  $C_{1-6}$  alkoxy, a  $C_{1-6}$  alkyl-carbonyloxy and a halogen, or (v)  $R^6$  and  $R^7$  taken together with the adjacent nitrogen atom form a nitrogen-containing heterocyclic ring selected from the group consisting of

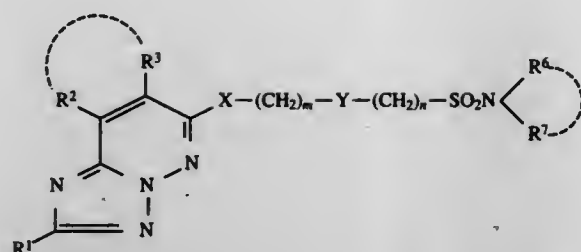


which may be substituted with 1 to 5 substituents selected from the group consisting of a  $C_{1-6}$  alkyl group which may be substituted with 1 to 4 substituents selected from the group consisting of hydroxy, amino, mono- or di- $C_{1-6}$  alkylamino,  $C_{1-6}$  alkoxy,  $C_{1-6}$  alkyl-carbonyloxy, and halogen, an amino group which may be substituted with 1 or 2 substituents selected from the group consisting of  $C_{1-6}$  alkyl,  $C_{1-6}$  acyl, pyrrolidino, morpholino, piperidino and piperazino, a hydroxy, a carboxyl, a nitro, a  $C_{1-6}$  alkoxy and a halogen;

$m$  stands for a whole number of from 0 to 4;

$n$  stands for a whole number of from 0 to 4; or a pharmaceutically acceptable salt thereof.

5. A compound of the formula:



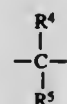
wherein

$R^1$  stands for (i) a hydrogen atom, (ii) a  $C_{1-6}$  alkyl group which may be substituted with one to four substituents selected from the group consisting of a hydroxy, amino, carboxyl, nitro, mono- or di- $C_{1-6}$  alkylamino,  $C_{1-6}$  alkoxy,  $C_{1-6}$  alkyl-carbonyloxy and halogen or (iii) a halogen atom;

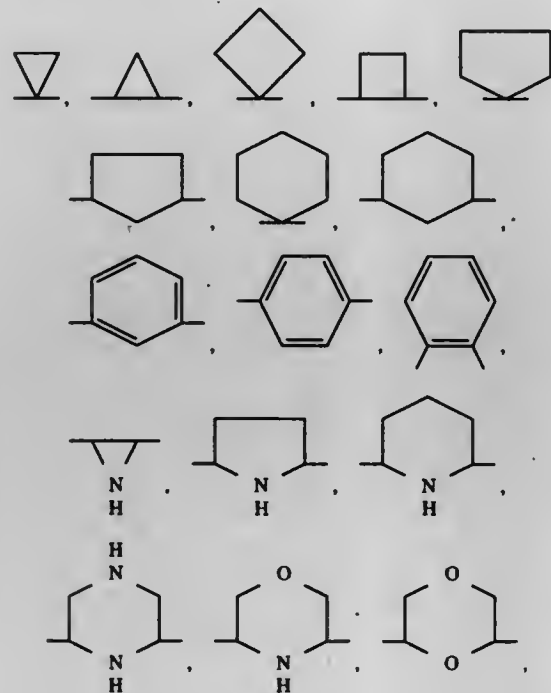
$R^2$  is hydrogen and  $R^3$  is a  $C_{3-6}$  cycloalkyl group which may be substituted with one to four substituents selected from the group consisting of a hydroxy, amino, carboxyl, nitro, mono- or di- $C_{1-6}$  alkylamino,  $C_{1-6}$  alkoxy,  $C_{1-6}$  alkyl-carbonyloxy and halogen;

$X$  stands for an oxygen atom or  $S(O)_p$ , wherein  $p$  is a whole number of from 0 to 2;

$Y$  stands for (i) a group of the formula:



wherein  $R^4$  and  $R^5$  independently stand for a hydrogen atom or a  $C_{1-6}$  alkyl group which may be substituted with one to four substituents selected from the group consisting of a hydroxy, amino, carboxyl, nitro, mono- or di- $C_{1-6}$  alkylamino,  $C_{1-6}$  alkoxy,  $C_{1-6}$  alkyl-carbonyloxy and halogen or (ii) a divalent homocyclic or heterocyclic ring selected from the group consisting of



5,482,940

# USE OF ARYL- AND HETEROARYL PIPERAZINYL CARBOXAMIDES IN THE TREATMENT OF VARIOUS CENTRAL NERVOUS SYSTEM DISORDERS

Magid A.-M. Abou-Gharbia, Glen Mills; John P. Yardley, Gulph Mills; Wayne E. Childers, Jr., Yardley, and John A. Moyer, New Hope, all of Pa., assignors to American Home Products Corporation, Madison, N.J.

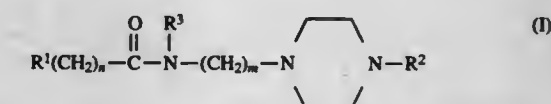
Division of Ser. No. 848,782, Mar. 10, 1993, Pat. No. 5,278,160, which is a division of Ser. No. 689,409, Apr. 22, 1991, Pat. No. 5,106,849, which is a continuation-in-part of Ser. No. 493,179, Mar. 14, 1990, Pat. No. 5,010,078, which is a continuation-in-part of Ser. No. 335,075, Apr. 19, 1989, abandoned, which is a continuation-in-part of Ser. No. 297,460, Jan. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 197,890, May 24, 1988, abandoned. This application Apr. 15, 1993, Ser. No. 48,088

Int. Cl.<sup>6</sup> A61K 31/495; 31/50

U.S. Cl. 514-252

7 Claims

1. A method of reducing excess weight which comprises administering to a patient suffering from excess weight an effective dosage of a piperazine having the formula (I)



wherein  $R^1$  is 1-adamantyl, 3-methyl-1-adamantyl, 3-noradamantyl, unsubstituted or substituted-2-indolyl, 3-indolyl, 2-benzofuranyl or 3-benzofuranyl wherein the substituents are selected from lower alkyl, lower alkoxy and halo;  $R^2$  is unsubstituted or substituted phenyl, benzyl, or pyrimidinyl wherein the substituents are selected from lower alkyl, lower alkoxy, trifluoromethyl and halo;  $R^3$  is H or lower alkyl of 1 to 3 carbon atoms;  $n$  is the integer 0 or 1; and  $m$  is the integer from 2 to 5 and the pharmaceutically acceptable salts thereof.

5,482,941

# QUINAZOLINONE ANTIANGINAL AGENTS

Nicholas K. Terrett, Sandwich, United Kingdom, assignor to Pfizer Inc., New York, N.Y.

PCT No. PCT/EP92/02746, § 371 Date May 6, 1994, § 102(e) Date May 6, 1994, PCT Pub. No. WO93/12095, PCT Pub. Date Jun. 24, 1993

PCT Filed Nov. 27, 1992, Ser. No. 232,284

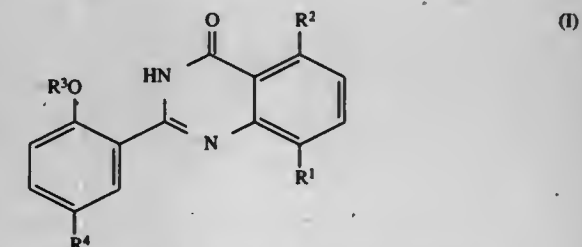
Claims priority, application United Kingdom, Dec. 11, 1991, 9126260

Int. Cl.<sup>6</sup> C07D 239/91; 413/41; A61K 31/505; 31/535

U.S. Cl. 514-253

6 Claims

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein

$R^1$  is H,  $C_{1-4}$  alkyl,  $C_{1-4}$  alkoxy or  $CONR^2R^3$ ;

$R^2$  is H or  $C_{1-4}$  alkyl;

$R^3$  is  $C_{2-4}$  alkyl;

$R^4$  is H,  $C_{2-4}$  alkanoyl, (hydroxy)  $C_{2-4}$  alkyl,

$CH=CHCO_2R^5$ ,  $CH=CHCONR^6R^7$ ,  $CH_2CH_2CO_2R^8$ ,

$CH_2CH_2CONR^9R^{10}$ ,  $SO_2NR^9R^{10}$ ,  $SO_2NH(CH_2)_mNR^9R^{10}$  or imi-

which may be substituted with 1 to 5 substituents selected from the group consisting of a  $C_{1-6}$  alkyl group which may be substituted with 1 to 4 substituents selected from the group consisting of hydroxy, amino, mono- or di- $C_{1-6}$  alkylamino,  $C_{1-6}$  alkoxy,  $C_{1-6}$  alkyl-carbonyloxy, and halogen, an amino group which may be substituted with 1 or 2 substituents selected from the group consisting of  $C_{1-6}$  alkyl,  $C_{1-6}$  acyl, pyrrolidino, morpholino, piperidino and piperazino, a hydroxy, a carboxyl, a nitro, a  $C_{1-6}$  alkoxy and a halogen;

$m$  stands for a whole number of from 0 to 4;

$n$  stands for a whole number of from 0 to 4; or

a pharmaceutically acceptable salt thereof.



dazolyl, wherein said C<sub>2</sub>-C<sub>4</sub> alkanoyl and said (hydroxy) C<sub>2</sub>-C<sub>4</sub> alkyl are each independently optionally substituted with NR<sup>7</sup>R<sup>8</sup>;

R<sup>5</sup> and R<sup>6</sup> are each independently H or C<sub>1</sub>-C<sub>4</sub> alkyl;

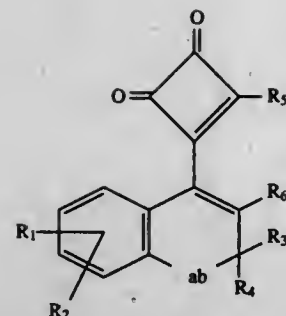
R<sup>7</sup> and R<sup>8</sup> are each independently H or C<sub>1</sub>-C<sub>4</sub> alkyl, or together with the nitrogen atom to which they are attached form a pyrrolidino, piperidino, morpholino or 4-(NR<sup>10</sup>)-1-piperazinyl group wherein any of said groups is optionally substituted with CONR<sup>5</sup> R<sup>6</sup>;

R<sup>9</sup> is H or C<sub>1</sub>-C<sub>4</sub> alkyl;

R<sup>10</sup> is H, C<sub>1</sub>-C<sub>3</sub> alkyl or (hydroxy)C<sub>2</sub>-C<sub>3</sub> alkyl;

n is 2, 3 or 4; and

with the proviso that R<sup>4</sup> is not H when R<sup>1</sup> is H, C<sub>1</sub>-C<sub>4</sub> alkyl or C<sub>1</sub>-C<sub>4</sub> alkoxy.



wherein:

R<sub>1</sub> and R<sub>2</sub>, independent from each other, are selected from the following: C<sub>1-6</sub> perfluoroalkoxy, C<sub>1-6</sub> perfluoroalkyl, C<sub>1-6</sub> alkyl, C<sub>1-6</sub> alkoxy, hydroxyl, C<sub>1-6</sub> alkoxy-carbonyl, nitro, cyano, halogen, C<sub>1-6</sub> alkylsulfonamido, C<sub>1-6</sub> perfluoroalkyl-sulfonamido, amino, C<sub>1-6</sub> acylamino, C<sub>1-6</sub> perfluoroacylamino, mono or di-C<sub>1-12</sub> alkylamino, C<sub>1-6</sub> alkylsulfonyl, C<sub>6-10</sub> arylsulfonyl, carboxyl, C<sub>1-12</sub> mono or di-alkylaminocarbonyl, or hydrogen;

a and b together form an —O— linkage, C=O, or a direct bond; R<sub>3</sub> and R<sub>4</sub>, independent from each other, are H or C<sub>1-6</sub> alkyl, optionally substituted by fluorine;

R<sub>5</sub> is amino or C<sub>1-12</sub> mono alkylamine;

R<sub>6</sub> is H, C<sub>1-6</sub> perfluoroalkyl, C<sub>1-6</sub> alkyl, C<sub>6-10</sub> aryl, or mono or bicyclic heteroaryl containing 1-3 heteroatoms selected from N, O, or S; or a pharmaceutically acceptable salt thereof.

5,482,942

**(3,4-DIOXOCYCLOBUTEN-1-YL)CHROMENE, INDENE, AND DIHYDRONAPHTHALENE DERIVATIVES AS SMOOTH MUSCLE RELAXANTS**

Richard M. Soll, Lawrenceville, N.J., and Paul J. Dollings, Newtown, Pa., assignors to American Home Products Corporation, Madison, N.J.

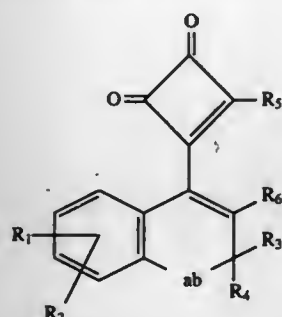
Filed Jun. 28, 1994, Ser. No. 267,691

Int. Cl.<sup>6</sup> A61K 31/495;31/415;31/35; C07D 241/02;211/82;407/02;311/74; C07C 229/40

U.S. Cl. 514—254

5 Claims

1. A compound according to the formula below:



wherein:

R<sub>1</sub> and R<sub>2</sub>, independent from each other, are selected from the following: C<sub>1-6</sub> perfluoroalkoxy, C<sub>1-6</sub> perfluoroalkyl, C<sub>1-6</sub> alkyl, C<sub>1-6</sub> alkoxy, hydroxyl, C<sub>1-6</sub> alkoxy-carbonyl, nitro, cyano, halogen, C<sub>1-6</sub> alkylsulfonamido, C<sub>1-6</sub> perfluoroalkyl-sulfonamido, amino, C<sub>1-6</sub> acylamino, C<sub>1-6</sub> perfluoroacylamino, mono or di-C<sub>1-12</sub> alkylamino, C<sub>1-6</sub> alkylsulfonyl, C<sub>6-10</sub> arylsulfonyl, carboxyl, C<sub>1-12</sub> mono or di-alkylaminocarbonyl, or hydrogen;

a and b together form an —O— linkage, C=O, or a direct bond; R<sub>3</sub> and R<sub>4</sub>, independent from each other, are H or C<sub>1-6</sub> alkyl, optionally substituted by fluorine;

R<sub>5</sub> is amino or C<sub>1-12</sub> mono alkylamine;

R<sub>6</sub> is H, C<sub>1-6</sub> perfluoroalkyl, C<sub>1-6</sub> alkyl, C<sub>6-10</sub> aryl, or mono or bicyclic heteroaryl containing 1-3 heteroatoms selected from N, O, or S; or a pharmaceutically acceptable salt thereof.

5. A pharmaceutical composition for the treatment of diseases and disorders attributed to smooth muscle contraction which comprises a pharmaceutically acceptable carrier and a therapeutically effective amount of a compound of the formula:

**(6-FLUORO-1,2-BENZISOXAZOL-3-YL)-1-PIPERIDINYL-ALKYL-(2,9-DISUBSTITUTED-4H-PYRIDO[1,2-A]PYRIMIDIN-4-ONE) DERIVATIVES**

Ludo E. J. Kennis, Turnhout; Jan Vandenberk, Beerse, and Albertus H. M. T. Van Heertum, Vosselaar, all of, Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Filed Mar. 28, 1991, Ser. No. 676,681

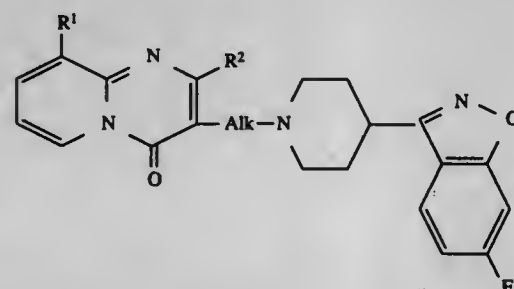
Claims priority, application United Kingdom, Apr. 19, 1990, 9008850

Int. Cl.<sup>6</sup> A61K 31/505; C07D 471/04

U.S. Cl. 514—258

4 Claims

1. A compound of the formula:



a pharmaceutically acceptable acid addition salt and the stereochemically isomeric forms thereof, wherein:

Alk represents 1,2-ethanediyl [C<sub>1-4</sub>alkanediyl];

R<sup>1</sup> represents C<sub>1-4</sub>alkyl; and

R<sup>2</sup> represents hydrogen or C<sub>1-4</sub>alkyl.

**5,482,944  
PYRIMIDONES AND IMIDAZOLINONES FOR TREATMENT OF SHOCK**

Eric R. Pettipher, Norwich, and Victoria L. Cohan, Groton, both of Conn., assignors to Pfizer Inc., New York, N.Y.

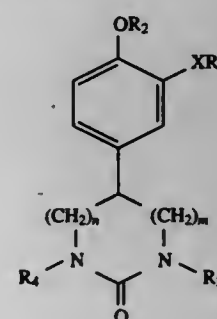
Filed Jul. 13, 1993, Ser. No. 91,693

Int. Cl.<sup>6</sup> A61K 31/505;31/415

U.S. Cl. 514—274

2 Claims

1. A method for the treatment of septic shock, hemorrhagic shock, rheumatoid arthritis, insulin resistance in type 2 diabetes, adult respiratory distress syndrome, post-renal dialysis syndrome, and graft versus host disease after bone marrow transplantation, which comprises administering to a subject in need of such treatment a compound of the formula



or a pharmaceutically acceptable acid addition salt of said compound having a basic nitrogen atom, wherein

X is O or NH;

m is 0, 1 or 2;

n is 0, 1 or 2;

m and n is 1 or 2;

R<sub>1</sub> is C<sub>7-11</sub> tricycloalkyl or C<sub>7-11</sub> bicycloalkyl;

R<sub>2</sub> is methyl or ethyl;

R<sub>3</sub> is hydrogen, C<sub>1-3</sub> alkyl, C<sub>2-3</sub> alkenyl, benzyl or phenethyl; and

R<sub>4</sub> is hydrogen, C<sub>1-3</sub> alkyl or C<sub>2-3</sub> alkanoyl; with the proviso that when m+n is 1 then m is 0 and n is 1, and with the proviso that when m+n is 2 then R<sub>3</sub> and R<sub>4</sub> are each hydrogen, in an amount sufficient for said treatment.

**5,482,946  
MEDICAMENT INHALATION DEVICE AND FORMULATION**

Andrew R. Clark, Loughborough, and John L. Hart, Bramcote, both of, Great Britain, assignors to Fisons plc, Ipswich, England

Division of Ser. No. 897,246, Jun. 11, 1992, Pat. No. 5,341,800, which is a division of Ser. No. 759,711, Sep. 12, 1991, Pat. No. 5,176,132, which is a continuation of Ser. No. 531,254, May 31, 1990, abandoned. This application Aug. 22, 1994, Ser. No. 294,138

Claims priority, application United Kingdom, May 31, 1989, 8912503; Jun. 10, 1989, 8913392

Int. Cl.<sup>6</sup> A61K 9/14;31/135;31/195;31/35

U.S. Cl. 514—291

5 Claims

1. A tightly compacted body of powdered inhalation medicament for administration from an inhalation device, comprising:

a loose powder including an active ingredient having a particle size of from 1 to 10 μm compressed to form said tightly compacted body;

the degree of compression being sufficient to impart said tightly compacted body with structural integrity such that a plurality of unit doses of medicament can be metered therefrom by abrasion.

5,482,947

**RETROVIRAL PROTEASE INHIBITORS**

John J. Talley, 1510 Amisk Ct.; Daniel P. Getman, 66 Sunnyhill Ct., both of Chesterfield, Mo. 63017; Gary A. DeCrescenzo, 536 Schrader Farm Dr., St. Peters, Mo. 63376; Ko-Chung Lin, 12790 Polo Parc Dr., St. Louis, all of Mo. 63146; Michael L. Vazquez, 233 Saratoga Ct., Gurnee, Ill. 60031; Richard A. Mueller, 562 Stonegate Ter., Glenview, Ill. 60022; Kathryn L. Reed, 7301-104 Brookmont Dr., Raleigh, N.C. 27613; Robert M. Heintz, 603 Nancy Pl., Ballwin, Mo. 63021; Michael Clare, 5154 W. Brown St., Skokie, Ill. 60077; John N. Freskos, 7572 York, Clayton, Mo. 63105, and Eric T. Sun, 1647 Johnson Dr., Apartment 433, Buffalo Grove, Ill. 60089

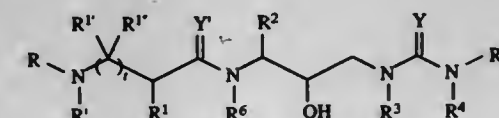
Continuation of Ser. No. 886,558, May 20, 1992, abandoned, which is a continuation-in-part of Ser. No. 789,646, Nov. 14, 1991, abandoned, which is a continuation-in-part of Ser. No. 615,210, Nov. 19, 1990, abandoned. This application Nov. 15, 1993, Ser. No. 152,934

Int. Cl.<sup>6</sup> A61K 31/47;31/17; C07D 215/48

U.S. Cl. 514—311

18 Claims

1. Method of inhibiting a retroviral protease comprising administering an effective amount of a compound represented by the formula



or a pharmaceutically acceptable salt, prodrug or ester thereof wherein

t represents O or 1;

Y and Y' each independently represent O or S;

R represents hydrogen, alkoxy-carbonyl, aralkoxy-carbonyl, alkanoyl, aroyl, aryloxy-alkanoyl, heterocyclyl-carbonyl, heterocyclyl-alkanoyl, heteroaryloxy, heteroalkanoxy, alkyl, aralkyl, 3-carboxypropionyl, methylloxaloyl, bromoacetyl, trifluoroacetyl, methoxyacetyl, hydroxyacetyl, hydroxypropionyl, aminocarbonyl, N-alkylaminocarbonyl, N- mono- or N,N-disubstituted aminoalkanoxy radicals wherein said substituents are alkyl, aryl, aralkyl, cycloalkyl, heteroalkyl, heterocycloalkyl, hydroxyethyl or methoxyethyl radicals, or in the case of a disubstituted aminoalkanoxy radical, said substituents along with the nitrogen atom to which they are

5,482,945

**INNOVATIVE TECHNIQUE FOR IMMUNOSUPPRESSION INVOLVING ADMINISTRATION OF RAPAMYCIN LOADED FORMED BLOOD ELEMENTS**

Jay J. Armstrong, Bensalem, Pa., and Surendra N. Sehgal, Princeton, N.J., assignors to American Home Products Corporation, Madison, N.J.

Filed Dec. 22, 1992, Ser. No. 998,065

Int. Cl.<sup>6</sup> A61K 31/44

U.S. Cl. 514—291

7 Claims

1. A pharmaceutical composition for intravenous or intraarterial administration of rapamycin which consists of rapamycin-loaded formed blood elements suspended in blood plasma or a physiological substitute therefore.

attached form heterocyclyl or heteroaryl radicals, with the proviso that said heteroaryl radical is other than a quaternary nitrogen containing heteroaryl radical;

R' represents hydrogen, alkyl or aralkyl radicals; or R and R' together with the nitrogen to which they are attached form heterocycloalkyl or heteroaryl radicals, with the proviso that said heteroaryl radical is other than a quaternary nitrogen containing heteroaryl radical;

R<sup>1</sup> represents hydrogen, —CF<sub>3</sub>, —CH(CF<sub>3</sub>)<sub>2</sub>, —CH<sub>2</sub>SO<sub>2</sub>NH<sub>2</sub>, —CO<sub>2</sub>CH<sub>3</sub>, —CONHCH<sub>3</sub>, —CON(CH<sub>3</sub>)<sub>2</sub>, —CH<sub>2</sub>C(O)NHCH<sub>3</sub>, —CH<sub>2</sub>C(O)N(CH<sub>3</sub>)<sub>2</sub>, —CONH<sub>2</sub>, —C(CH<sub>3</sub>)<sub>2</sub>(SCH<sub>3</sub>)<sub>2</sub>, —C(CH<sub>3</sub>)<sub>2</sub>(S(O)CH<sub>3</sub>)<sub>2</sub>, —C(CH<sub>3</sub>)<sub>2</sub>(S(O)<sub>2</sub>CH<sub>3</sub>)<sub>2</sub>, alkyl, haloalkyl, alkenyl or alkynyl radicals, or the side chain of the amino acid asparagine, S-methyl cysteine or the corresponding sulfoxide or sulfone derivatives thereof, leucine, isoleucine, allo-isoleucine, tert-leucine, phenylalanine, ornithine, alanine, histidine, norleucine, glutamine, valine, threonine, serine, aspartic acid, beta-cyano alanine or allothreonine;

R<sup>1</sup> represents hydrogen or alkyl radicals;

R<sup>1</sup> represents hydrogen, —CO<sub>2</sub>CH<sub>3</sub>, —CONH<sub>2</sub> or alkyl radicals; or R<sup>1</sup> together with R<sup>1</sup> and the carbon atoms to which they are attached represent a cycloalkyl radical;

R<sup>2</sup> represents alkyl, cycloalkylalkyl or aralkyl radicals, each of which is optionally substituted with —OR<sup>2</sup>, —SR<sup>2</sup> or halogen radicals, wherein R<sup>2</sup> represents hydrogen or alkyl radicals;

R<sup>3</sup> represents alkyl, alkenyl, hydroxyalkyl, alkoxyalkyl, cycloalkyl, cycloalkylalkyl, heterocycloalkylalkyl, aryl, aralkyl or heteroaralkyl radicals;

R<sup>4</sup> represents alkyl, alkenyl, alkynyl, hydroxyalkyl, alkoxyalkyl, cycloalkyl, cycloalkylalkyl, heterocycloalkylalkyl, aryl or aralkyl radicals;

R<sup>5</sup> represents hydrogen or alkyl radicals; or R<sup>4</sup> and R<sup>5</sup> together with the nitrogen atom to which they are bonded represent a heterocycloalkyl radical; and

R<sup>6</sup> represents hydrogen or alkyl radicals; and

wherein alkyl, alone or in combination, means a straight-chain or branched-chain alkyl radical containing from 1 to 8 carbon atoms; alkenyl, alone or in combination, means a straight-chain or branched-chain hydrocarbon radical having one or more double bonds and containing from 2 to 8 carbon atoms; alkynyl, alone or in combination, means a straight-chain hydrocarbon radical having one or more triple bonds and containing from 2 to 10 carbon atoms; cycloalkyl, alone or in combination, means a cyclic alkyl radical which contains from 3 to 8 carbon atoms; aryl, alone or in combination, means a phenyl or naphthyl radical which is optionally substituted with one or more alkyl, alkoxy, halogen, hydroxy, amino or nitro radicals; heterocyclyl or heterocycloalkyl, alone or in combination, means a saturated or partially unsaturated monocyclic, bicyclic or tricyclic heterocycle which contains one or more nitrogen, oxygen or sulfur heteroatoms, which is optionally substituted on one or more carbon atoms by halogen, alkyl, alkoxy or oxo, or on a secondary nitrogen atom by alkyl, aralkoxycarbonyl, alkanoyl, phenyl or phenylalkyl, or on a tertiary nitrogen atom by oxido; and heteroaryl, alone or in combination, means an aromatic heterocyclyl.

5,482,948

**PYRIDYL DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS COMPRISING THESE COMPOUNDS**  
Rainer Soyka; Thomas Müller, and Johannes Weisenberger, all of Biberach, Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Germany

Continuation of Ser. No. 989,681, Dec. 14, 1992, abandoned. This application Jul. 5, 1994, Ser. No. 270,615

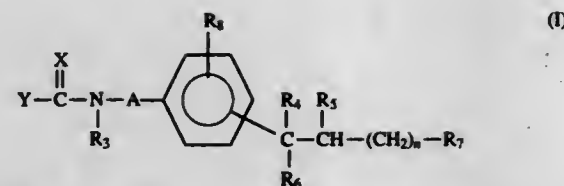
Claims priority, application Germany, Dec. 14, 1991, 41 41 377.6; May 21, 1992, 42 16 829.5; May 18, 1992, 42 16 364.1

Int. Cl.<sup>6</sup> A61K 31/44; C07D 401/10; 213/16; 211/14

U.S. Cl. 514—318

45 Claims

1. A pyridyl derivative of formula



wherein

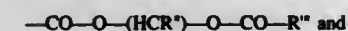
n represents the number 2, 3, 4 or 5,

A denotes a carbon-nitrogen bond or a straight-chained C<sub>1-4</sub> alkylene group optionally substituted by one or two alkyl groups,

X denotes a nitromethylene group, a cyanomethylene group optionally substituted by an R<sub>9</sub> group, or a group of the formula =N—R<sub>10</sub>,

wherein

R<sub>9</sub> denotes a cyano group, an aminocarbonyl group, an alkylaminocarbonyl group, a dialkylaminocarbonyl group, a group of the formula



wherein

R<sup>1</sup> denotes a straight-chained or branched C<sub>1-6</sub>-alkyl group, a C<sub>5-7</sub>-cycloalkyl group, a benzyl, 1-phenylethyl, 2-phenylethyl, 3-phenylpropyl, methoxymethyl or cinnamyl group,

R<sup>2</sup> denotes a hydrogen atom or a methyl group and

R<sup>3</sup> denotes a straight-chained or branched C<sub>1-6</sub>-alkyl group, a C<sub>5-7</sub>-cycloalkyl group, a phenyl, benzyl, 1-phenylethyl, 2-phenylethyl or 3-phenylpropyl group,

or when Y denotes an R<sub>1</sub>NR<sub>2</sub>— group, R<sub>9</sub> may also represent a carboxy group, and

R<sub>10</sub> denotes a cyano, alkanesulphonyl, phenylsulphonyl, phenylalkanesulphonyl, aminosulphonyl, alkylaminosulphonyl, dialkylaminosulphonyl, phenylcarbonyl, aminocarbonyl, alkylaminocarbonyl or dialkylaminocarbonyl group,

Y denotes an alkoxy group, a phenoxy group, an alkylthio group, a phenylthio group or a group of the formula —R<sub>1</sub>NR<sub>2</sub>

wherein

R<sub>1</sub> denotes a hydrogen atom,

a straight-chained or branched C<sub>1-10</sub>-alkyl group which may be substituted in the 2-, 3- or 4-position by a hydroxy, amino, alkylamino or dialkylamino group,

a C<sub>1-4</sub>-alkyl group which is substituted by a phenyl or pyridyl group and which may additionally be substituted in the 2-, 3- or 4-position by a hydroxy group,

a C<sub>3-4</sub>-cycloalkyl group,

a C<sub>3-6</sub>-cycloalkyl group in which an ethylene bridge may be replaced by an o-phenylene group,

a C<sub>6-8</sub>-bicycloalkyl group optionally substituted by 1, 2 or 3 alkyl groups, exonorbornyl, adamantyl, alkoxy or trimethylsilylalkyl group,

R<sub>2</sub> denotes a hydrogen atom, a straight-chained alkyl group or R<sub>1</sub> and R<sub>2</sub> together with the nitrogen atom between them denote a cyclic C<sub>4-6</sub>-alkyleneimino group which may be substituted by one or two alkyl groups or by a phenyl group,

R<sub>3</sub> denotes a hydrogen atom or a C<sub>1-3</sub>-alkyl group,

R<sub>4</sub> and R<sub>5</sub> each denote a hydrogen atom or together represent a carbon-carbon bond,

R<sub>6</sub> denotes a pyridyl group optionally substituted in the 3- or 4-position by an alkyl group,

R<sub>7</sub> denotes a cyano group, a tetrazolyl group, carboxy, an aminocarbonyl group, an alkylaminocarbonyl group, a dialkylaminocarbonyl group, a group of the formulae



wherein

R<sup>1</sup> denotes a straight-chained or branched C<sub>1-6</sub>-alkyl group, a C<sub>5-7</sub>-cycloalkyl group, a benzyl, 1-phenylethyl, 2-phenylethyl, 3-phenylpropyl, methoxymethyl or cinnamyl group,

R<sup>2</sup> denotes a hydrogen atom or a methyl group and

R<sup>3</sup> denotes a straight-chained or branched C<sub>1-6</sub>-alkyl group, a C<sub>5-7</sub>-cycloalkyl group, a phenyl, benzyl, 1-phenylethyl, 2-phenylethyl or 3-phenylpropyl group,

or, when Y denotes an R<sub>1</sub>NR<sub>2</sub>— group, R<sub>7</sub> may also represent a carboxy group,

R<sub>8</sub> denotes a hydrogen atom, a fluorine atom, a chlorine atom, a bromine atom, an iodine atom, an alkyl, alkoxy or trifluoromethyl group, whilst all the above-mentioned alkyl and alkoxy moieties, unless otherwise stated, may contain one to three carbon atoms,

and all the above-mentioned phenyl nuclei, unless otherwise stated, may be mono- or disubstituted by fluorine, chlorine or bromine atoms or by alkyl, hydroxy, alkoxy, phenyl, nitro, amino, alkylamino, dialkylamino, alkanoylamino, cyano, carboxy, alkoxy carbonyl, aminocarbonyl, alkylaminocarbonyl, di-alkylaminocarbonyl, trifluoromethyl, alkanoyl, aminosulphonyl, alkylaminosulphonyl or dialkylaminosulphonyl groups, and the substituents may be identical or different, the enantiomers thereof, the cis- and trans-isomers thereof, where R<sub>4</sub> and R<sub>5</sub> together denote a carbon-carbon bond, and the salts thereof.

5,482,949

# SULFONATE DERIVATIVES OF 3-AROYL-BENZO[B]THIOPHENES

Larry J. Black; Henry U. Bryant, both of Indianapolis, and George J. Cullinan, Trafalgar, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

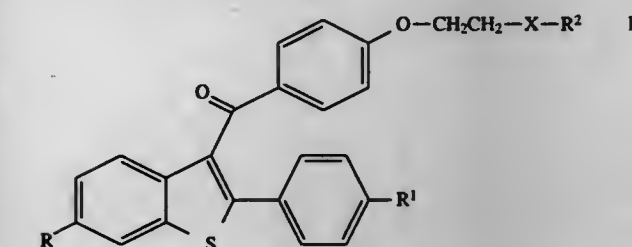
Filed Mar. 19, 1993, Ser. No. 35,121

Int. Cl.<sup>6</sup> A61K 31/445; C07D 409/10

U.S. Cl. 514—324

35 Claims

1. A compound selected from the formula



where

X is a bond or —CH<sub>2</sub>—;

R<sup>2</sup> is a heterocyclic ring selected from pyrrolidino, piperidino or hexamethyleneimino;

R is OH or —OSO<sub>2</sub>—(CH<sub>2</sub>)<sub>n</sub>—CH<sub>3</sub>;

R<sup>1</sup> is hydrogen, OH, fluoro, chloro, or —OSO<sub>2</sub>—(CH<sub>2</sub>)<sub>n</sub>—CH<sub>3</sub>;

each n is independently 3, 4 or 5; or its pharmaceutically acceptable salt or solvate; provided that at least one of R and R<sup>1</sup> is —OSO<sub>2</sub>—(CH<sub>2</sub>)<sub>n</sub>—CH<sub>3</sub>.

5,482,950

# METHODS FOR LOWERING SERUM CHOLESTEROL

Henry U. Bryant, and Timothy A. Grese, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 15, 1993, Ser. No. 138,823

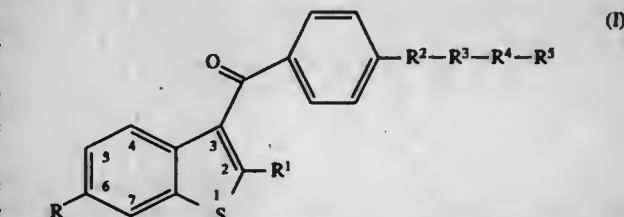
Int. Cl.<sup>6</sup> A61K 31/40; 31/445

U.S. Cl. 514—324

13 Claims

1. A method of lowering serum cholesterol levels comprising administering to a human in need of treatment a serum cholesterol

lowering amount of a compound having the formula



wherein R is hydrogen; hydroxy; C<sub>1-6</sub> alkoxy; a group of the formula —O—C(O)—R<sup>2</sup>, wherein R<sup>2</sup> is hydrogen, C<sub>1-6</sub> alkyl optionally substituted with amino, halo, carbonyl, C<sub>1-6</sub> alkoxy carbonyl, C<sub>1-7</sub> alkanoyloxy, carbamoyl and/or aryl; or R<sup>2</sup> is C<sub>1-6</sub> alkenyl optionally substituted with aryl; or R<sup>2</sup> is a C<sub>3-7</sub> cycloalkyl; or R<sup>2</sup> is aryl optionally substituted with hydroxy, C<sub>1-6</sub> alkyl, C<sub>1-6</sub> alkoxy, and/or halo; or R<sup>2</sup> is —O—aryl, said aryl optionally substituted with hydroxy C<sub>1-6</sub> alkyl, C<sub>1-6</sub> alkoxy, and/or halo,

or R is a group of the formula —O—SO<sub>2</sub>—R<sup>2</sup> wherein R<sup>2</sup> may be C<sub>1-6</sub> alkyl or aryl optionally substituted with C<sub>1-6</sub> alkyl;

or R is carbamoyloxy wherein the nitrogen may be substituted once or twice with C<sub>1-6</sub> alkyl;

or R is a group of the formula —O—C(O)R<sup>2</sup>—O—(C<sub>1-6</sub> alkyl) wherein R<sup>2</sup> is a bond or C<sub>1-6</sub> alkanediyl;

R<sup>1</sup> is halo, C<sub>1-6</sub> alkyl, C<sub>1-7</sub> alkyl substituted with C<sub>1-6</sub> alkyl, substituted or unsubstituted C<sub>3-7</sub> cycloalkyl, or substituted or unsubstituted C<sub>3-7</sub> cycloalkenyl;

R<sup>2</sup> is O or CH<sub>2</sub>;

R<sup>3</sup> is CH<sub>2</sub> or (CH<sub>2</sub>)<sub>2</sub>;

R<sup>4</sup> is



or a bond; and

R<sup>5</sup> is a pyrrolidinyl or piperidinyl; or a pharmaceutically acceptable salt or solvate thereof.

5,482,951

# TRIAZOLE DERIVATIVES AS WELL AS INSECTICIDE AND ACARICIDE

Masami Ozaki; Atsuhiko Ikeda; Reiji Honami; Takashi Yumita; Naokazu Minoguchi; Hiroyuki Yano; Norihiko Izawa, and Tadayoshi Hirano, all of Shizuoka, Japan, assignors to Kumiai Chemical Industry Co., Ltd., and Ihara Chemical Industry Co., Ltd., both of Tokyo, Japan

Continuation-in-part of Ser. No. 956,984, Oct. 6, 1992, Pat. No. 5,318,959. This application Dec. 23, 1993, Ser. No. 172,191

Claims priority, application Japan, May 29, 1992, 4-161759

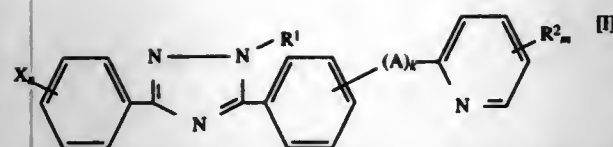
Int. Cl.<sup>6</sup> A61K 31/41; 31/44; C07D 213/16; 249/08

U.S. Cl. 514—340

9 Claims

1. A triazole derivative having the following general formula [I]:





(wherein  $R^1$  is an alkyl ( $C_1-C_6$ ) group,  $X$  is a hydrogen atom, a halogen atom, an alkyl ( $C_1-C_6$ ) group, an alkoxy ( $C_1-C_6$ ) group, an alkylthio ( $C_1-C_6$ ) group, a nitro group, a cyano group or trifluoromethyl group,  $n$  is an integer of 1-5 provided that when  $n$  is 2 or more,  $X$  may be an optional combination of same or different atoms or groups,  $A$  is an oxygen atom, a sulfur atom, an alkylene ( $C_1-C_4$ ) group, an alkyleneoxy ( $C_1-C_4$ ) group, an oxyalkylene ( $C_1-C_4$ ) group or an alkyleneoxy( $C_1-C_4$ )alkylene ( $C_1-C_4$ ) group,  $k$  is 0 or 1,  $R^2$  is a hydrogen atom, a halogen atom, an alkyl ( $C_1-C_6$ ) group, an alkoxy ( $C_1-C_6$ ) group, trifluoromethyl group or trifluoromethoxy group, and  $m$  is an integer of 1-5 provided that when  $m$  is 2 or more,  $R^2$  may be an optional combination of same or different atoms or groups).

5,482,952

Patent Not Issued For This Number

5,482,953

#### 2,4-AND 2,5-BISTETRAZOLYLPIRIDINES AND THE USE THEREOF AS PHARMACEUTICALS

Gerrit Schubert, Kerkheim; Ekkehard Baader, Königstein; Martin Bickel, Bad Homburg, and Volmar Günzler-Pukall, Marburg, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 829,295, Feb. 3, 1992, abandoned.

This application Jan. 21, 1994, Ser. No. 183,786

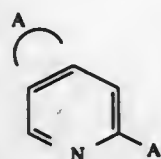
Claims priority, application Germany, Feb. 5, 1991, 41 03 372.8

Int. Cl.<sup>6</sup> A61K 31/44

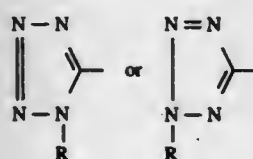
U.S. Cl. 514-340

1 Claim

1. A method for inhibiting proline hydroxylase and lysine hydroxylase by administration to a host of an effective amount of a compound of formula I



where A is



and where R is H or an unsubstituted ( $C_1-C_6$ )alkyl or a physiologically tolerated salt of said compound of formula I.

5,482,954

#### SIGNAL TRANSDUCTION INHIBITOR TRIAZOLE AND DIAZOLE COMPOUNDS

Elise C. Kohn, Olney; Lance A. Lietta, Potomac, and Christian C. Felder, Bethesda, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Division of Ser. No. 985,402, Dec. 4, 1992, Pat. No. 5,359,078, which is a continuation-in-part of Ser. No. 355,744, May 19, 1989, Pat. No. 5,132,315, and Ser. No. 944,009, Sep. 11, 1992, abandoned, which is a continuation of Ser. No. 637,145, Jan. 3, 1991, abandoned, and a continuation-in-part of Ser. No. 894,891, Jun. 8, 1992, abandoned. This application Jul. 1, 1994, Ser. No. 270,181

Int. Cl.<sup>6</sup> A61K 31/41; 31/415; C07D 249/06

U.S. Cl. 514-359

8 Claims

1. A method for treating diseases involving aberrant signal transduction pathways in a subject, comprising administering to said subject an anti-signal transduction effective amount of a compound of formula:



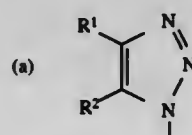
wherein:

$p$  is an integer of from 0 to 4;

$Ar^{11}$  and  $Ar^{12}$  are each aromatic moieties independently selected from the group consisting of phenyl, naphthyl, and substituted versions thereof in which the substituents are members selected from the group consisting of halogen, nitro, carboxyl and alkoxy;

$X$  is a linking moiety selected from the group consisting of O, S,  $SO_2$ , CO, CHCN, straight chain alkyl, alkoxy, and alkoxyalkyl; and

$Y$  is a nitrogen-containing heterocyclic moiety selected from the group consisting of: radicals of the formulas



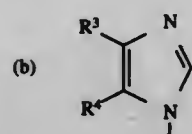
(IV)

wherein:

$R^1$  is a member selected from the group consisting of hydrogen,  $-CONH_2$ ,  $-CONHR^5$ ,  $-CO_2H$ ,  $-CO_2R^5$ , and  $-SO_2NH_2$ ;

$R^2$  is a member selected from the group consisting of hydrogen,  $-NHCOC_2H_5$ , and  $-NH_2$ ; and

$R^3$  is lower alkyl of from 1 to 6 carbon atoms; with the proviso that when  $R^2$  is  $-NH_2$ ,  $R^1$  is  $-CO_2H$ ;



(V)

wherein:

$R^3$  is a member selected from the group consisting of hydrogen,  $-CONH_2$ ,  $-CONHR^5$ ,  $-CN$ ,  $-CONHNH_2$ ,  $-C(=NH)NH_2$ ,  $-CONHOH$ ,  $-CO_2H$ ,  $-CO_2R^5$ , and  $-SO_2NH_2$ ;

$R^4$  is a member selected from the group consisting of hydrogen,  $-NH_2$ ,  $-NHR^5$ ,  $-N(R^5)_2$ ,  $-NHCOR^5$ ,  $-NHCHO$ ,  $-NHC(=NH)R^5$ ,  $-NHCH(=NH)$ ,  $-NHCONH_2$ , and  $-NHC(=NH)NH_2$ ; and

$R^5$  is lower alkyl of from 1 to 6 carbon atoms; and

(c) 1,2,4-triazolyl, pyrazinyl and substituted versions thereof.

5,482,955

#### CYCLOPROPYL-ETHYL-AZOLES

Manfred Jautelat, Burscheid; Stefan Dutzmann, Hilden; Klaus Stenzel, Düsseldorf, and Heinz-Wilhelm Dehne, Bonn, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 4, 1995, Ser. No. 416,416

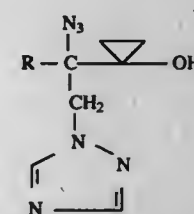
Claims priority, application Germany, Apr. 11, 1994, 44 12 358.2

Int. Cl.<sup>6</sup> A01N 43/653; C07D 249/08

U.S. Cl. 514-383

5 Claims

1. A cyclopropyl-ethyl-azole of the formula



in which

$R$  represents straight-chain or branched alkyl having 1 to 8 carbon atoms, straight-chain or branched alkenyl having 2 to 8 carbon atoms, Straight-chain or branched alkynyl having 2 to 8 carbon atoms, or cycloalkyl having 3 to 7 carbon atoms, wherein each of these cycloalkyl radicals is optionally monosubstituted to trisubstituted by identical or different alkyl substituents having 1 to 4 carbon atoms, or

phenyl which can be monosubstituted to trisubstituted by identical or different substituents selected from the group consisting of halogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, alkylthio having 1 to 4 carbon atoms, halogenoalkyl having 1 to 2 carbon atoms and 1 to 5 identical or different halogen atoms, halogenoalkoxy having 1 to 2 carbon atoms and 1 to 5 identical or different halogen atoms, halogenoalkylthio having 1 to 2 carbon atoms and 1 to 5 identical or different halogen atoms, cycloalkyl having 3 to 7 carbon atoms, phenyl, phenoxy, alkoxycarbonyl having 1 to 4 carbon atoms in the alkoxy moiety, alkoximinoalkyl having 1 to 4 carbon atoms in the alkoxy moiety and 1 to 4 carbon atoms in the alkyl moiety nitro and cyano, or

phenylalkyl having 1 to 4 carbon atoms in the straight-chain or branched alkyl moiety, wherein the phenyl moiety is optionally monosubstituted to trisubstituted by identical or different substituents selected from the group consisting of halogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, alkylthio having 1 to 4 carbon atoms, halogenoalkyl having 1 to 2 carbon atoms and 1 to 5 identical or different halogen atoms, halogenoalkoxy having 1 to 2 carbon atoms and 1 to 5 identical or different halogen atoms, halogenoalkylthio having 1 to 2 carbon atoms and 1 to 5 identical or different halogen atoms, cycloalkyl having 3 to 7 carbon atoms, phenyl, phenoxy, alkoxycarbonyl having 1 to 4 carbon atoms in the alkoxy moiety, alkoximinoalkyl having 1 to 4 carbon atoms in the alkoxy moiety and 1 to 4 carbon atoms in the alkyl moiety, nitro and cyano, or

phenylalkenyl having 2 to 4 carbon atoms in the straight-chain or branched alkenyl moiety, wherein the phenyl moiety is optionally monosubstituted to trisubstituted by identical or different substituents selected from the group consisting of halogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, alkylthio having 1 to 4 carbon atoms, halogenoalkyl having 1 to 2 carbon atoms and 1 to 5 identical or different halogen atoms, halogenoalkoxy having 1 to 2 carbon atoms and 1 to 5 identical or different halogen atoms, halogenoalkylthio having 1 to 2 carbon atoms and 1 to 5 identical or different halogen atoms, cycloalkyl having 3 to 7 carbon atoms, phenyl, phenoxy, alkoxycarbonyl having 1 to 4 carbon atoms in the alkoxy moiety, alkoximinoalkyl having 1 to 4 carbon atoms in the alkoxy moiety and 1 to 4 carbon atoms in the alkyl moiety, nitro and cyano, or

alkoximinoalkyl having 1 to 4 carbon atoms in the alkoxy moiety and 1 to 4 carbon atoms in the alkyl moiety, nitro and cyano,

or an addition product thereof with an acid or metal salt.

5,482,956

#### METHOD OF TREATING PARASTIC PROTOZOA WITH SUBSTITUTED BENZIMIDAZOLES

Winfried Lunkenheimer, Wuppertal; Bernd Baasner, Bergisch Gladbach; Folker Lieb, Leverkusen, and Axel Haberkorn, Wuppertal, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 29, 1993, Ser. No. 146,634

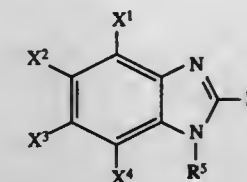
Claims priority, application Germany, Nov. 6, 1992, 42 37 617.3

Int. Cl.<sup>6</sup> A61K 31/415

U.S. Cl. 514-394

19 Claims

1. A method of treating parasitic protozoa in an animal or insect, said method comprises administering an effective amount of a compound of the formula

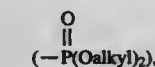


(I)

in which

$X^1$ ,  $X^2$ ,  $X^3$  and  $X^4$  independently of one another in each case represent hydrogen, halogen or cyano, or represent in each case optionally substituted alkyl, alkoxy, alkylthio, alkylsulphonyl, alkylsulphonyl or cycloalkyl, or represent optionally substituted, fused dioxyalkylene, or represent hydroxycarbonyl, alkylcarbonyl, alkoxycarbonyl or cycloalkyloxycarbonyl, or represent in each case optionally substituted amino or aminocarbonyl, or represent in each case optionally substituted aryl, aryloxy, arylthio, arylsulphonyl, arylsulphonyl, arylsulphonyloxy, arylcarbonyl, arylloxycarbonyl, arylazo or arylthiomethylsulphonyl, but wherein at least one of the substituents  $X^1$ ,  $X^2$ ,  $X^3$  and  $X^4$  is other than hydrogen and halogen,  $R^3$  represents fluoroalkyl and

$R^5$  represents alkyl which is mono- or polysubstituted by identical or different substituents from the group comprising OH, CN,  $NH_2$ , cycloalkyl, alkenyl, alkynyl, alkoxy, halogenoalkoxy, alkylthio, halogenoalkylthio, alkenoxy, alkinoxy, aminocarbonyl, optionally substituted alkoxycarbonyl (alkO-CO-), optionally substituted alkoxycarbonyloxy (alkOCOO-), optionally substituted (het-)aryl, optionally substituted (het-)aryloxy, optionally substituted (het-)arylthio, optionally substituted (het-)arylsulphonyl, dialkoxylphosphonyl



optionally substituted alkylcarbonyl (-CO-alkyl), optionally substituted (het-)arylcarbonyl (-CO-aryl), optionally substituted (het-)aryloxycarbonyl (arylO-CO-), optionally substituted (het-)arylcarbonyloxy (arylCOO-), aminosulphonyl (-SO<sub>2</sub>NH<sub>2</sub>), optionally substituted mono- or dialkylaminosulphonyl, acylated amino or monoalkylamino or optionally substituted dialkylamino, or  $R^5$  furthermore represents optionally substituted alkoxycarbonyl, optionally substituted (het-)aryloxycarbonyl, (het-)arylsulphonyl, (het-)arylamino, optionally substituted alkoxycarbonyloxy (arylNH-CO-NH-COO-) or -SO<sub>2</sub>-NR<sup>1</sup>R<sup>2</sup>, wherein  $R^1$  and  $R^2$  represents H or

alkyl which is optionally substituted by one or more of the radicals mentioned above for R<sup>5</sup>, to an animal or insect in need thereof.

5,482,957

# **AZOLE DERIVATIVES, PROCESS FOR THEIR PREPARATION AND THEIR USE**

Adalbert Wagner, Hattersheim; Heinrich Englert, Hofheim am Taunus; Heinz-Werner Kleemann, Bad Homburg; Hermann Gerhards, Hofheim am Taunus; Bernward Schölkens, Kelkheim/Taunus; Reinhard Becker, Wiesbaden; Wolfgang Linz, Mainz, all of Germany; Jean-Paul Vevert, Pantin, and John-Claude Calle, Angers, both of France, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany. Continuation of Ser. No. 806,634, Dec. 13, 1991, abandoned.

This application Apr. 28, 1994, Ser. No. 234,591

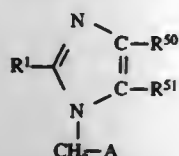
Claims priority, application Germany, Jan. 4, 1991, 41 00 109.5; Mar. 26, 1991, 41 09 949.4; Jun. 27, 1991, 41 21 229.0

Int. Cl. A61K 31/41; C07D 233/66

U.S. Cl. 514-398

17 Claims

1. A compound of the formula (I)



wherein the symbols have the following meanings:

R<sup>1</sup> is (C<sub>2</sub>-C<sub>10</sub>)-alkyl, (C<sub>3</sub>-C<sub>10</sub>)-alkenyl, or (C<sub>3</sub>-C<sub>6</sub>)-cycloalkyl;

R<sup>50</sup> and R<sup>51</sup> are each independently selected from —S(O)—, R<sup>19</sup>, —CO—R<sup>8</sup>, and —O—R<sup>6</sup>;

each R<sup>5</sup> is independently hydrogen or (C<sub>1</sub>-C<sub>6</sub>)-alkyl;

each R<sup>6</sup> is independently

(1) hydrogen;

(2) (C<sub>1</sub>-C<sub>6</sub>)-alkyl, which is optionally substituted by 1 to 3 identical or different radicals selected from the group consisting of (CC<sub>6</sub>)-alkoxy, hydroxy, carboxy, and (C<sub>1</sub>-C<sub>4</sub>)-alkoxycarbonyl; (C<sub>2</sub>-C<sub>4</sub>)-alkenyl, which is optionally substituted by phenyl; or (C<sub>3</sub>-C<sub>6</sub>)-alkynyl;

(3) (C<sub>3</sub>-C<sub>6</sub>)-cycloalkyl, (C<sub>3</sub>-C<sub>6</sub>)-cycloalkyl-(C<sub>1</sub>-C<sub>3</sub>)-alkyl;

(4) (C<sub>6</sub>-C<sub>12</sub>)-aryl;

(5) (C<sub>6</sub>-C<sub>10</sub>)-aryl-(C<sub>1</sub>-C<sub>4</sub>)-alkyl, which is optionally substituted by 1 or 2 identical or different radicals selected from the group consisting of trifluoromethyl, methoxy, halogen, and —NR<sup>11</sup>R<sup>12</sup>;

(6) (C<sub>1</sub>-C<sub>9</sub>)-heteroaryl, which is optionally partially or completely hydrogenated;

(7) (C<sub>2</sub>-C<sub>10</sub>)-alkenyl;

(8) (C<sub>6</sub>-C<sub>12</sub>)-aryl or (C<sub>1</sub>-C<sub>9</sub>)-heteroaryl substituted by 1 or 2 identical or different radicals selected from the group consisting of halogen, hydroxy, methoxy, nitro, cyano, trifluoromethyl, —NR<sup>11</sup>R<sup>12</sup>, or

(9) (C<sub>1</sub>-C<sub>9</sub>)-heteroaryl-(C<sub>1</sub>-C<sub>3</sub>)-alkyl, where the heteroaryl moiety is optionally partially or completely hydrogenated;

each R<sup>8</sup> is independently hydrogen or —OR<sup>6</sup>;

R<sup>9</sup> is hydrogen, (C<sub>1</sub>-C<sub>6</sub>)-alkyl, (C<sub>3</sub>-C<sub>6</sub>)-cycloalkyl or (C<sub>2</sub>-C<sub>4</sub>)-alkenyl;

R<sup>11</sup> and R<sup>12</sup> are, independently of one another, hydrogen or (C<sub>1</sub>-C<sub>4</sub>)-alkyl;

A is a biphenyl radical which is substituted by a radical R<sup>15</sup>;

R<sup>15</sup> is —SO<sub>2</sub>—NH—CO—NR<sup>6</sup>R<sup>9</sup>, —SO<sub>2</sub>—NH—COOR<sup>6</sup>, —SO<sub>2</sub>—NH—COR, or —SO<sub>2</sub>—NH—SO<sub>2</sub>—NR<sup>6</sup>R<sup>9</sup>;

each R<sup>15</sup> is independently (C<sub>1</sub>-C<sub>6</sub>)-alkyl, in which one to all of the hydrogen atoms is optionally substituted by fluorine; (C<sub>3</sub>-C<sub>6</sub>)-cycloalkyl; phenyl; or benzyl;

R is zero, 1, or 2; and wherein (C<sub>1</sub>-C<sub>9</sub>)-heteroaryl and (C<sub>1</sub>-C<sub>9</sub>)-heteroaryl- recited above are independently selected from the group consisting of furanyl, thienyl, pyrrolyl, imidazolyl, pyrazolyl, triazolyl, tetrazolyl, oxazolyl, isoxazolyl, thiazolyl, isothiazolyl, pyridyl, pyrazinyl, pyrimidinyl, pyradiazinyl,

indolyl, indazolyl, quinolyl, isoquinolyl, phthalazinyl, quinoxalyl, quinazolinyl, and cinnolyl; or a physiologically tolerable salt thereof.

5,482,958

# **METHOD FOR TREATING ENDOMETRIOSIS**

Henry U. Bryant, and Jeffrey A. Dodge, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 330,755, Oct. 28, 1994, which is a division of Ser. No. 198,456, Feb. 18, 1994, Pat. No. 5,407,955. This

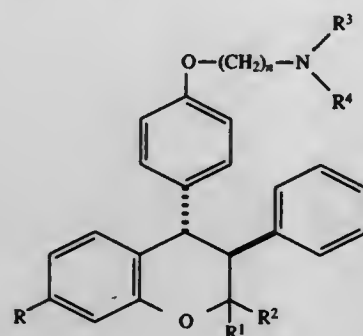
application Apr. 10, 1995, Ser. No. 419,312

Int. Cl. A61K 31/54; A01N 43/36

U.S. Cl. 514-408

4 Claims

1. A method for inhibiting endometriosis comprising administering to a woman in need of treatment an effective amount of a compound of formula I



wherein

R is C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy, halo, or trifluoromethyl;

R<sup>1</sup> and R<sup>2</sup> each are the same or different C<sub>1</sub>-C<sub>6</sub> alkyl group;

n is an integer from 2 to 6; and

R<sup>3</sup> and R<sup>4</sup> each are independently C<sub>1</sub>-C<sub>4</sub> alkyl, or combine to form a substituent selected from the group consisting of pyrrolidino, morpholino, piperidino, piperazino, 4-(C<sub>1</sub>-C<sub>6</sub> alkyl)piperazino, and 4-phenyl-piperazino;

or a pharmaceutically acceptable salt thereof.

5,482,959

# **METHOD FOR DELAYING AIDS IN AN HIV INFECTED INDIVIDUAL BY ADMINISTRATION OF SUBSTITUTED AZASPIRANE COMPOUNDS**

Allison M. Badger, Bryn Mawr, Pa., assignor to SmithKline Beecham Corporation, Philadelphia, Pa.

PCT No. PCT/US93/00730, § 371 Date Jul. 21, 1994, § 102(e)

Date Jul. 21, 1994, PCT Pub. No. WO93/14760, PCT Pub. Date Aug. 5, 1995

PCT Filed Jan. 27, 1993, Ser. No. 256,708

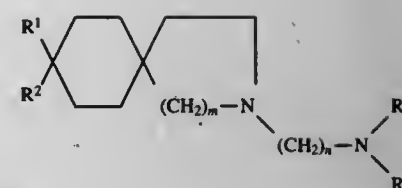
Claims priority, application United Kingdom, Jan. 28, 1992, 9201803

Int. Cl. A61K 31/405; 31/445; C07D 213/00

U.S. Cl. 514-409

7 Claims

1. A method for preventing or delaying the occurrence of acquired immunodeficiency syndrome (AIDS) in human immunodeficiency virus (HIV) seropositive humans which comprises administering to such human an effective therefor amount of a compound of the formula



wherein:

n is 3-7;

m is 1 or 2;

R<sup>1</sup> and R<sup>2</sup> are the same or different and are selected from hydrogen or straight or branched chain alkyl, provided that the total number of carbon atoms contained by R<sup>1</sup> and R<sup>2</sup> when taken together is 5-10; or R<sup>1</sup> and R<sup>2</sup> together form a cyclic alkyl group having 3-7 carbon atoms;

R<sup>3</sup> and R<sup>4</sup> are the same or different and are selected from hydrogen or straight chain alkyl having 1-3 carbon atoms; or R<sup>3</sup> and R<sup>4</sup> are joined together with the nitrogen to form a heterocyclic group having 5-8 atoms;

or a pharmaceutically acceptable salt or hydrate or solvate thereof.

5,482,960

# **NONPEPTIDE ENDOTHELIN ANTAGONISTS**

Kent A. Berryman, Ann Arbor; Amy M. Bunker, Ypsilanti; Annette M. Doherty, Ann Arbor, and Jeremy J. Edmunds, Ypsilanti, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

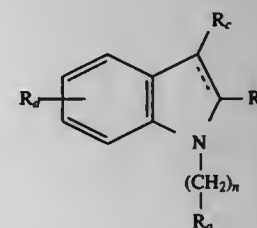
Filed Nov. 14, 1994, Ser. No. 339,381

Int. Cl. A61K 31/40; C07D 209/04

U.S. Cl. 514-414

20 Claims

1. A compound of the formula



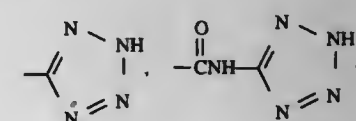
wherein

--- denotes an optional bond;

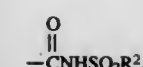
n is 0-4;

R<sub>a</sub> is phenyl, in which the phenyl group is substituted by methylenedioxy and further unsubstituted or substituted by one or more substituents selected from the group consisting of halogen, alkyl of 1-6 carbon atoms, OR, NRR<sup>1</sup>, SR, NO<sub>2</sub>, N<sub>3</sub>, COR, CO<sub>2</sub>R, CONRR<sup>1</sup>, SO<sub>2</sub>NRR<sup>1</sup>, SO<sub>2</sub>R, CN, CF<sub>3</sub>, CF<sub>2</sub>CF<sub>3</sub>, CHO, OCOCH<sub>3</sub>, B(OH)<sub>2</sub>, phenyl, NH(CH<sub>2</sub>)<sub>m</sub>CO<sub>2</sub>R, S(CH<sub>2</sub>)<sub>m</sub>CO<sub>2</sub>R, O(CH<sub>2</sub>)<sub>m</sub>CO<sub>2</sub>R, O(CH<sub>2</sub>)<sub>m</sub>OR, NH(CH<sub>2</sub>)<sub>m</sub>OR and S(CH<sub>2</sub>)<sub>m</sub>OR, in which m is 1, 2 or 3, and R and R<sup>1</sup> are each independently hydrogen, alkyl of 1-4 carbon atoms, phenyl or benzyl;

R<sub>b</sub> is hydrogen, CO<sub>2</sub>R<sup>2</sup>,



SO<sub>3</sub>R, PO<sub>3</sub>H, B(OH)<sub>2</sub>, CONR<sup>1</sup>R<sup>2</sup>, SO<sub>2</sub>NR<sup>1</sup>R<sup>2</sup>, or



in which R and R<sup>1</sup> are as defined above and R<sup>2</sup> is hydrogen, alkyl of 1-6 carbon atoms, CF<sub>3</sub>, —CF<sub>2</sub>CF<sub>3</sub>, phenyl or benzyl in which phenyl or the phenyl portion of the benzyl group is unsubstituted or substituted by one or more substituents as defined in R<sub>a</sub> above;

R<sub>c</sub> is S(O)<sub>p</sub>-phenyl, in which p is 0, 1 or 2, and phenyl is unsubstituted or substituted by one or more substituents selected from the group consisting of halogen, OR, NNR<sup>1</sup>, SR, NO<sub>2</sub>, N<sub>3</sub>, COR, CO<sub>2</sub>R, CONRR<sup>1</sup>, SO<sub>2</sub>NRR<sup>1</sup>, SO<sub>2</sub>R, CN, CF<sub>3</sub>, CF<sub>2</sub>CF<sub>3</sub>, CHO, OCOCH<sub>3</sub>, B(OH)<sub>2</sub>, methylenedioxy, NH(CH<sub>2</sub>)<sub>m</sub>CO<sub>2</sub>R, S(CH<sub>2</sub>)<sub>m</sub>CO<sub>2</sub>R, O(CH<sub>2</sub>)<sub>m</sub>CO<sub>2</sub>R, O(CH<sub>2</sub>)<sub>m</sub>OR, NH(CH<sub>2</sub>)<sub>m</sub>OR and S(CH<sub>2</sub>)<sub>m</sub>OR, in which m, R and R<sup>1</sup> are as defined above, and

R<sub>d</sub> is one to four independent substituents selected from hydrogen, alkyl of 1-7 carbon atoms, alkenyl of 2-7 carbon atoms, alkynyl of 2-7 carbon atom, cycloalkyl, phenyl, C(O)-phenyl, X(CH<sub>2</sub>)<sub>n</sub>-phenyl, X-(CH<sub>2</sub>)<sub>n</sub>-naphthyl, in which X is 0, NH or S(O)<sub>p</sub>, methylenedioxy, OR, NNR<sup>1</sup>, SR, NO<sub>2</sub>, N<sub>3</sub>, COR, CO<sub>2</sub>R, CONRR<sup>1</sup>, SO<sub>2</sub>R, SO<sub>2</sub>R, CN, CF<sub>3</sub>, CF<sub>2</sub>CF<sub>3</sub>, CHO, OCOCH<sub>3</sub>, B(OH)<sub>2</sub>, phenyl, NH(CH<sub>2</sub>)<sub>m</sub>CO<sub>2</sub>R, S(CH<sub>2</sub>)<sub>m</sub>CO<sub>2</sub>R, O(CH<sub>2</sub>)<sub>m</sub>CO<sub>2</sub>R, O(CH<sub>2</sub>)<sub>m</sub>OR, NH(CH<sub>2</sub>)<sub>m</sub>OR, S(CH<sub>2</sub>)<sub>m</sub>OR, in which m is 1, 2 or 3 and R and R<sup>1</sup> are each independently hydrogen, alkyl of 1-4 carbon atoms, phenyl or benzyl and where n and p are as defined above and phenyl is unsubstituted or substituted as defined in R<sub>c</sub> above, or a pharmaceutically acceptable acid addition or base salt thereof.

5,482,961

# **SOFT β-ADRENERGIC BLOCKING AGENTS**

Nicholas S. Bodor, 6219 SW. 93rd Ave., Gainesville, Fla. 32608

Division of Ser. No. 997,248, Dec. 28, 1992, Pat. No.

5,334,601, which is a division of Ser. No. 822,127, Jan. 17,

1992, Pat. No. 5,202,347, which is a division of Ser. No.

692,260, Apr. 26, 1991, Pat. No. 5,135,926, which is a continu-

ation of Ser. No. 286,879, Dec. 20, 1988, abandoned, which is

a division of Ser. No. 922,462, Oct. 23, 1986, Pat. No.

4,829,086, which is a continuation of Ser. No. 741,846, Jun. 6,

1985, abandoned, which is a continuation-in-part of Ser. No.

589,359, Mar. 14, 1984, abandoned. This application May 6,

1994, Ser. No. 239,414

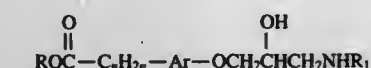
Claims priority, application Canada, Mar. 13, 1985, 476391

Int. Cl. A61K 31/40; 31/215; C07C 235/34; C07D 209/43

U.S. Cl. 514-415

11 Claims

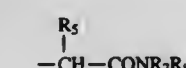
1. A compound of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein:

n is one;

R is



wherein R<sub>5</sub> is hydrogen or C<sub>1</sub>-C<sub>7</sub> alkyl and R<sub>7</sub> and R<sub>8</sub>, which can be the same or different, are each hydrogen, C<sub>1</sub>-C<sub>7</sub> alkyl, C<sub>3</sub>-C<sub>12</sub> cycloalkyl, phenyl or benzyl, or R<sub>7</sub> and R<sub>8</sub> are combined such that —NR<sub>7</sub>R<sub>8</sub> represents the residue of a saturated monocyclic secondary amine having 5 to 7 ring atoms, optionally having another hetero atom, which can be —O—,



—S— or —N—, in addition to the indicated nitrogen atom, and optionally bearing one or more phenyl, benzyl or methyl substituents;

R<sub>1</sub> is C<sub>1</sub>–C<sub>7</sub> alkyl; and

Ar is a divalent fused ring system having two or three rings and at least one benzene nucleus, and optionally having one or two hetero ring atoms selected from the group consisting of N, O and S.

5,482,962

# INSECTICIDAL N,N'-DISUBSTITUTED-N-N'-DIACYLHYDRAZINES

Robert E. Hormann, Philadelphia, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

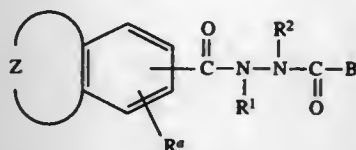
Filed Jul. 22, 1994, Ser. No. 279,132

Int. Cl.<sup>6</sup> A01N 43/38; 43/80; 43/74; 43/12; C07D 209/08; 327/04; 261/20; 275/06

U.S. Cl. 514—415

9 Claims

1. An insecticidal compound having the formula



wherein

R<sup>1</sup> is cyano or a hydrogen atom (H);

R<sup>2</sup> is a branched (C<sub>3</sub>–C<sub>10</sub>) alkyl or a (C<sub>1</sub>–C<sub>4</sub>) straight chain alkyl substituted with one or two of the same or different (C<sub>3</sub>–C<sub>6</sub>) cycloalkyl;

B is phenyl, naphthyl, or phenyl or naphthyl substituted with one to three of the same or different substituents selected from the group consisting of halo, cyano, nitro, hydroxy, mercapto, thiocyanato, (C<sub>1</sub>–C<sub>4</sub>) alkyl, (C<sub>1</sub>–C<sub>4</sub>) alkoxy, halo(C<sub>1</sub>–C<sub>2</sub>) alkyl, halo(C<sub>1</sub>–C<sub>2</sub>) alkoxy, (C<sub>1</sub>–C<sub>4</sub>) alkylthio, (C<sub>1</sub>–C<sub>4</sub>) alkylsulfinyl, (C<sub>1</sub>–C<sub>4</sub>) alkylsulfonyl, carboxy, formyl, (C<sub>1</sub>–C<sub>4</sub>) alkylcarbonyl, (C<sub>1</sub>–C<sub>4</sub>) alkoxycarbonyl, (C<sub>1</sub>–C<sub>4</sub>) alkanoyloxy, amino, (C<sub>1</sub>–C<sub>4</sub>) alkylamino, di(C<sub>1</sub>–C<sub>4</sub>) alkylamino having independently the stated number of carbon atoms in each alkyl group, carbamoyl, (C<sub>1</sub>–C<sub>4</sub>) alkylcarbamoyl, di(C<sub>1</sub>–C<sub>4</sub>) alkylcarbamoyl having independently the stated number of carbon atoms in each alkyl group, cyano(C<sub>1</sub>–C<sub>4</sub>) alkyl, (C<sub>1</sub>–C<sub>4</sub>) alkoxy(C<sub>1</sub>–C<sub>4</sub>) alkyl, (C<sub>2</sub>–C<sub>6</sub>) alkenyl, (C<sub>4</sub>–C<sub>6</sub>) alkadienyl, (C<sub>2</sub>–C<sub>6</sub>) alkynyl, (C<sub>1</sub>–C<sub>4</sub>) alkylidithionate, (C<sub>1</sub>–C<sub>4</sub>) alkylcarbonylthio, tri(C<sub>1</sub>–C<sub>4</sub>) alkylsilyl having independently the stated number of carbon atoms in each alkyl group, phenyl, phenyl substituted with one to two of the same or different substituents selected from the group consisting of halo, cyano, nitro, hydroxy, (C<sub>1</sub>–C<sub>4</sub>) alkyl, (C<sub>1</sub>–C<sub>4</sub>) alkoxy, halo(C<sub>1</sub>–C<sub>2</sub>) alkyl, halo(C<sub>1</sub>–C<sub>2</sub>) alkoxy, (C<sub>1</sub>–C<sub>4</sub>) alkylthio, (C<sub>1</sub>–C<sub>4</sub>) alkylsulfinyl, (C<sub>1</sub>–C<sub>4</sub>) alkylsulfonyl, carboxy, formyl, (C<sub>1</sub>–C<sub>4</sub>) alkylcarbonyl, (C<sub>1</sub>–C<sub>4</sub>) alkoxycarbonyl, (C<sub>1</sub>–C<sub>4</sub>) alkanoyloxy, amino, (C<sub>1</sub>–C<sub>4</sub>) alkylamino and di(C<sub>1</sub>–C<sub>4</sub>) alkylamino having independently the stated number of carbon atoms in each alkyl group, phenoxy, phenoxy substituted with one to two of the same or different substituents selected from the group consisting of halo, cyano, nitro, hydroxy, (C<sub>1</sub>–C<sub>4</sub>) alkyl, (C<sub>1</sub>–C<sub>4</sub>) alkoxy, halo(C<sub>1</sub>–C<sub>2</sub>) alkyl, halo(C<sub>1</sub>–C<sub>2</sub>) alkoxy, (C<sub>1</sub>–C<sub>4</sub>) alkylthio, (C<sub>1</sub>–C<sub>4</sub>) alkylsulfinyl, (C<sub>1</sub>–C<sub>4</sub>) alkylsulfonyl, carboxy, formyl, (C<sub>1</sub>–C<sub>4</sub>) alkylcarbonyl, (C<sub>1</sub>–C<sub>4</sub>) alkoxycarbonyl, (C<sub>1</sub>–C<sub>4</sub>) alkanoyloxy, amino, (C<sub>1</sub>–C<sub>4</sub>) alkylamino and di(C<sub>1</sub>–C<sub>4</sub>) alkylamino having independently the stated number of carbon atoms in each alkyl group, benzoyl, benzoyl substituted with one to two of the same or different substituents selected from the group consisting of halo, cyano, nitro, hydroxy, (C<sub>1</sub>–C<sub>4</sub>) alkyl, (C<sub>1</sub>–C<sub>4</sub>) alkoxy,

halo(C<sub>1</sub>–C<sub>2</sub>) alkyl, halo(C<sub>1</sub>–C<sub>2</sub>) alkoxy, (C<sub>1</sub>–C<sub>4</sub>) alkylthio, (C<sub>1</sub>–C<sub>4</sub>) alkylsulfinyl, (C<sub>1</sub>–C<sub>4</sub>) alkylsulfonyl, carboxy, formyl, (C<sub>1</sub>–C<sub>4</sub>) alkylcarbonyl, (C<sub>1</sub>–C<sub>4</sub>) alkoxycarbonyl, (C<sub>1</sub>–C<sub>4</sub>) alkanoyloxy, amino, (C<sub>1</sub>–C<sub>4</sub>) alkylamino and di(C<sub>1</sub>–C<sub>4</sub>) alkylamino having independently the stated number of carbon atoms in each alkyl group, phenoxy, phenoxy substituted with one to two of the same or different substituents selected from the group consisting of halo, cyano, nitro, hydroxy, (C<sub>1</sub>–C<sub>4</sub>) alkyl, (C<sub>1</sub>–C<sub>4</sub>) alkoxy, halo(C<sub>1</sub>–C<sub>2</sub>) alkyl, halo(C<sub>1</sub>–C<sub>2</sub>) alkoxy, (C<sub>1</sub>–C<sub>4</sub>) alkylthio, (C<sub>1</sub>–C<sub>4</sub>) alkylsulfinyl, (C<sub>1</sub>–C<sub>4</sub>) alkylsulfonyl, carboxy, formyl, (C<sub>1</sub>–C<sub>4</sub>) alkylcarbonyl, (C<sub>1</sub>–C<sub>4</sub>) alkoxycarbonyl, (C<sub>1</sub>–C<sub>4</sub>) alkanoyloxy, amino, (C<sub>1</sub>–C<sub>4</sub>) alkylamino and di(C<sub>1</sub>–C<sub>4</sub>) alkylamino having independently the stated number of carbon atoms in each alkyl group, phenylthio, phenylthio substituted with one to two of the same or different substituents selected from the group consisting of halo, cyano, nitro, hydroxy, (C<sub>1</sub>–C<sub>4</sub>) alkyl, (C<sub>1</sub>–C<sub>4</sub>) alkoxy, halo(C<sub>1</sub>–C<sub>2</sub>) alkyl, halo(C<sub>1</sub>–C<sub>2</sub>) alkoxy, (C<sub>1</sub>–C<sub>4</sub>) alkylthio, (C<sub>1</sub>–C<sub>4</sub>) alkylsulfinyl, (C<sub>1</sub>–C<sub>4</sub>) alkylsulfonyl, carboxy, formyl, (C<sub>1</sub>–C<sub>4</sub>) alkylcarbonyl, (C<sub>1</sub>–C<sub>4</sub>) alkoxycarbonyl, (C<sub>1</sub>–C<sub>4</sub>) alkanoyloxy, amino, (C<sub>1</sub>–C<sub>4</sub>) alkylamino and di(C<sub>1</sub>–C<sub>4</sub>) alkylamino having independently the stated number of carbon atoms in each alkyl group, phenyl(C<sub>1</sub>–C<sub>4</sub>) alkyl, phenyl(C<sub>1</sub>–C<sub>4</sub>) alkyl substituted on the phenyl ring with one to two of the same or different substituents selected from the group consisting of halo, cyano, nitro, hydroxy, (C<sub>1</sub>–C<sub>4</sub>) alkyl, (C<sub>1</sub>–C<sub>4</sub>) alkoxy, halo(C<sub>1</sub>–C<sub>2</sub>) alkyl, halo(C<sub>1</sub>–C<sub>2</sub>) alkoxy, (C<sub>1</sub>–C<sub>4</sub>) alkylthio, (C<sub>1</sub>–C<sub>4</sub>) alkylsulfinyl, (C<sub>1</sub>–C<sub>4</sub>) alkylsulfonyl, carboxy, formyl, (C<sub>1</sub>–C<sub>4</sub>) alkylcarbonyl, (C<sub>1</sub>–C<sub>4</sub>) alkoxycarbonyl, (C<sub>1</sub>–C<sub>4</sub>) alkanoyloxy, amino, (C<sub>1</sub>–C<sub>4</sub>) alkylamino and di(C<sub>1</sub>–C<sub>4</sub>) alkylamino having independently the stated number of carbon atoms in each alkyl group, when two adjacent positions on a phenyl ring are substituted with alkoxy groups, these groups may be joined to form a 5 or 6 membered dioxolane (methyleneedioxy) or dioxane (1,2-ethylenedioxy) heterocyclic ring;

R<sup>a</sup> is H, (C<sub>1</sub>–C<sub>4</sub>) alkyl, (C<sub>2</sub>–C<sub>4</sub>) alkenyl, (C<sub>1</sub>–C<sub>4</sub>) alkoxy, halo, cyano, nitro, halo(C<sub>1</sub>–C<sub>2</sub>) alkyl, halo(C<sub>1</sub>–C<sub>2</sub>) alkoxy, (C<sub>1</sub>–C<sub>4</sub>) alkoxy(C<sub>1</sub>–C<sub>4</sub>) alkyl, (C<sub>1</sub>–C<sub>4</sub>) alkoxycarbonyl, (C<sub>1</sub>–C<sub>4</sub>) alkylaminocarbonyl, di(C<sub>1</sub>–C<sub>4</sub>) alkylaminocarbonyl wherein the alkyl groups may be the same or different, cyclopropyl or cyclopropyl substituted with 1–4 of the same or different halo or (C<sub>1</sub>–C<sub>4</sub>) alkyl, cyclopropyl(C<sub>1</sub>–C<sub>2</sub>) alkyl or cyclopropyl(C<sub>1</sub>–C<sub>2</sub>) alkyl substituted on the cyclopropyl ring with 1–4 of the same or different halo or (C<sub>1</sub>–C<sub>4</sub>) alkyl;

Z forms a 5-membered ring together with the carbon atoms to which it is attached and is selected from the group consisting of CR<sup>b</sup>R<sup>c</sup>–S(O)<sub>n</sub>–NR<sup>d</sup>, CR<sup>b</sup>R<sup>c</sup>–CR<sup>b</sup>R<sup>c</sup>–S(O)<sub>n</sub> wherein n is 1 or 2, CR<sup>b</sup>R<sup>c</sup>–CR<sup>b</sup>R<sup>c</sup>–NR<sup>d</sup>, CR<sup>b</sup>R<sup>c</sup>–NR<sup>d</sup>–O, CR<sup>b</sup>R<sup>c</sup>–NR<sup>d</sup>–S(O)<sub>n</sub>, CR<sup>b</sup>R<sup>c</sup>–CR<sup>b</sup>R<sup>c</sup>–S(O)<sub>n</sub> wherein n is 1 or 2, CR<sup>b</sup>–CR<sup>b</sup>–NR<sup>d</sup>, CR<sup>b</sup>–N–NR<sup>d</sup>, CR<sup>b</sup>–N–O, CR<sup>b</sup>–N–CR<sup>b</sup>R<sup>c</sup>, CR<sup>b</sup>–N–S(O)<sub>n</sub>, CR<sup>b</sup>R<sup>c</sup>–NR<sup>d</sup>–CR<sup>b</sup>R<sup>c</sup>, CR<sup>b</sup>R<sup>c</sup>–O–NR<sup>d</sup>, CR<sup>b</sup>R<sup>c</sup>–S(O)<sub>n</sub>–NR<sup>d</sup>, S–CR<sup>b</sup>R<sup>c</sup>–O, S–CR<sup>b</sup>R<sup>c</sup>–S, S–CR<sup>b</sup>R<sup>c</sup>–NR<sup>d</sup>, NR<sup>d</sup>–CR<sup>b</sup>R<sup>c</sup>–O, O–CR<sup>b</sup>R<sup>c</sup>–S, O–CR<sup>b</sup>R<sup>c</sup>–NR<sup>d</sup>, NR<sup>d</sup>–CR<sup>b</sup>R<sup>c</sup>–S, NR<sup>d</sup>–CR<sup>b</sup>R<sup>c</sup>–NR<sup>d</sup>, N=CR<sup>b</sup>–O, N=CR<sup>b</sup>–NR<sup>d</sup>, CR<sup>b</sup>R<sup>c</sup>–N=N, NR<sup>d</sup>–NR<sup>d</sup>–S(O)<sub>n</sub>, CR<sup>b</sup>R<sup>c</sup>–S(O)<sub>n</sub>–CR<sup>b</sup>R<sup>c</sup> wherein n is 1 or 2, CR<sup>b</sup>–CR<sup>b</sup>–CR<sup>b</sup>R<sup>c</sup>, N=CR<sup>b</sup>–CR<sup>b</sup>R<sup>c</sup>, N=N–O, CR<sup>b</sup>R<sup>c</sup>–S–S, CR<sup>b</sup>R<sup>c</sup>–NR<sup>d</sup>–NR<sup>d</sup>, S(O)<sub>m</sub>–O–CR<sup>b</sup>R<sup>c</sup>, NR<sup>d</sup>–S(O)<sub>m</sub>–S, NR<sup>d</sup>–S(O)<sub>m</sub>–O, NR<sup>d</sup>–N=N, CR<sup>b</sup>R<sup>c</sup>–S(O)<sub>m</sub>–O and NR<sup>d</sup>–S(O)<sub>m</sub>–NR<sup>d</sup> wherein R<sup>b</sup> and R<sup>c</sup> are each independently H, (C<sub>1</sub>–C<sub>4</sub>) alkyl, halo or together with the carbon to which they are attached form carbonyl (C=O) or methylene (=CH<sub>2</sub>), R<sup>d</sup> and R<sup>e</sup> are each independently H or (C<sub>1</sub>–C<sub>4</sub>) alkyl, R<sup>f</sup> and R<sup>g</sup> are each independently (C<sub>1</sub>–C<sub>4</sub>) alkyl, m is 1 or 2 and n is 0, 1 or 2; and

the agronomically acceptable salts thereof.

5,482,963

# PHARMACEUTICAL AGENTS USEFUL AS LEUKOTRIENE ANTAGONISTS

James J. Holohan, Macclesfield; Teuan J. Edwards, Congleton, both of, England; Robert J. Timko, West Chester; Randy J. Bradway, Downingtown, both of Pa., and Ariene Clements, Turnersville, N.J., assignors to Zeneca Limited, London, England

Continuation of Ser. No. 805,421, Dec. 11, 1991, Pat. No. 5,319,097. This application Sep. 3, 1993, Ser. No. 116,781

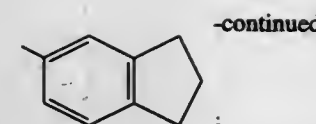
Claims priority, application United Kingdom, Dec. 12, 1990, 9027014; Jnl. 12, 1991, 9115107

Int. Cl.<sup>6</sup> A61K 31/40; C07D 209/12

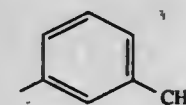
U.S. Cl. 514—415

8 Claims

1. A pharmaceutical composition, which comprises, as active ingredient, an amorphous physical form of N-[4-[5-(cyclopentylloxycarbonyl)amino-1-methylindol-3-yl-methyl]-3-methoxybenzoyl]-2-methylbenzenesulphonamide, which is substantially free of other physical forms and has an infra-red spectrum (0.5% in KBr) having sharp peaks at 1690, 1530, 1490, 1420, 1155, 1060, 862 and 550 cm<sup>-1</sup>, and polyvinylpyrrolidone.



X is O or S; and isomers thereof; or a pharmaceutically acceptable salt thereof, provided that when R is —CH<sub>2</sub>–Phenyl, R<sup>1</sup> is other than



5,482,965

# COMPOSITIONS AND METHOD COMPRISING AMINOALCOHOL DERIVATIVES AS MEMBRANE PENETRATION ENHANCERS FOR PHYSIOLOGICAL ACTIVE AGENTS

Vithal J. Rajadhyaksha, 27436 Esquina, Mission Viejo, Calif. 92691

Continuation of Ser. No. 672,020, Mar. 19, 1991, abandoned.

This application Sep. 3, 1993, Ser. No. 115,772

Int. Cl.<sup>6</sup> A61K 31/27; 31/335; 31/22; 31/225; 31/23; 31/16

U.S. Cl. 514—452

26 Claims

1. A composition for enhancing absorption of a topically administered formulation through dermal or mucosal tissue, for local or systemic application, comprising an admixture of an effective amount of a physiologically active agent and a non-toxic, effective amount of a membrane penetration enhancing agent of formula I,

5,482,964

# SUBSTITUTED PHENOXYHYDROXYPROPYL AMINES AS CENTRAL NERVOUS SYSTEM AGENTS

Sheryl J. Hays, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

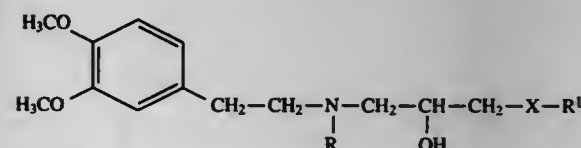
Filed Oct. 11, 1994, Ser. No. 321,291

Int. Cl.<sup>6</sup> A61K 31/135; C07C 217/60; 323/32; 323/38

U.S. Cl. 514—415

7 Claims

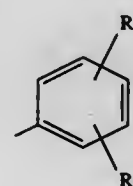
1. A compound of Formula I



wherein

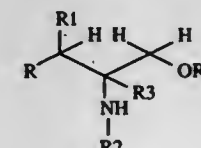
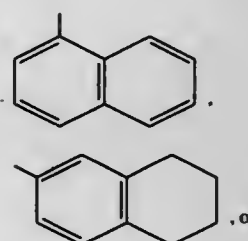
R is alkyl, arylalkyl, cyclohexylmethyl, or indol-3-ylmethyl;

R<sup>1</sup> is



wherein

R<sup>2</sup> and R<sup>3</sup> are each the same or different and each is alkyl, benzyloxy, cycloalkyl, halogen, or trifluoromethyl.



wherein

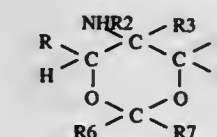
R is selected from H, and an aliphatic hydrocarbon group with from about 1 to about 20 carbon atoms, optionally containing a heteroatom in the hydrocarbon chain;

R<sup>1</sup> is selected from H, OH or O–CO–RS, where R<sup>5</sup> is an aliphatic hydrocarbon group with from about 1 to about 18 carbon atoms;

R<sup>2</sup> is selected from H, a lower aliphatic hydrocarbon group, acyl, hydroxyacyl or alkoxylacyl group with from up to about 40 carbon atoms;

R<sup>3</sup> is selected from H, an aliphatic hydrocarbon group with up to about 16 carbon atoms, unsubstituted or substituted with hydroxy, acyloxy or alkylthio, or an aryl or alkyl group; and R<sup>4</sup> is H or an acyl group with from about 2 to about 18 carbon atoms; or

R, R<sup>2</sup> and R<sup>3</sup> are as defined above, and R<sup>1</sup> and R<sup>4</sup> together form compounds having a 1,3-dioxane ring, of the structure



wherein, R<sup>6</sup> and R<sup>7</sup> are selected from H, an aliphatic hydrocarbon

group unsubstituted or substituted with hydroxy, acyloxy, or carbalkoxy, or an aryl group, or they may combine to form a carbonyl group,

or a physiologically acceptable salt thereof.

5,482,966

## OXIME DERIVATIVES

Thomas G. C. Bird, Witry-Les-Reims, and Patrick Pie, Reims, both of, France, assignors to Zeneca Limited, London, England, and Zeneca Pharma S.A., Cergy Cedex, France  
Division of Ser. No. 14,564, Feb. 8, 1993, Pat. No. 5,332,757.

This application Jun. 13, 1994, Ser. No. 240,464

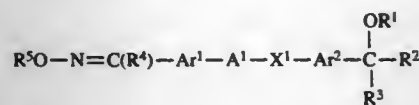
Claims priority, application European Pat. Off., Feb. 7, 1992, 92400318; Jan. 9, 1992, 92402764

Int. Cl.<sup>6</sup> A61K 31/35; 31/34; C07D 309/10; 307/20

U.S. Cl. 514—456

16 Claims

1. An oxime derivative of the formula I



wherein

R<sup>5</sup> is hydrogen, (1-4C)alkyl, (3-4C)alkenyl, (3-4C)alkynyl, (2-5C)alkanoyl, halogeno-(2-4C)alkyl, hydroxy-(2-4C)alkyl, (1-4C)alkoxy-(2-4C)alkyl, carbamoyl, N-(1-4C)alkylcarbamoyl, N,N-di-(1-4C)alkylcarbamoyl, amino-(2-4C)alkyl, (1-4C)alkylamino-(2-4C)alkyl, di-(1-4C)alkylamino-(2-4C)alkyl, (1-4C)alkylthio-(2-4C)alkyl, (1-4C)alkylsulphonyl-(2-4C)alkyl, (1-4C)alkylsulphonyl-(2-4C)alkyl, cyano-(1-4C)alkyl, carboxy-(1-4C)alkyl, (1-4C)alkoxycarbonyl-(1-4C)alkyl, carbamoyl-(1-4C)alkyl, N-(1-4C)alkylcarbamoyl-(1-4C)alkyl, N,N-di-(1-4C)alkylcarbamoyl-(1-4C)alkyl, (2-5C)alkanoyl-(2-4C)alkyl, (2-5C)alkanoyl-(1-4C)alkyl, phenyl-(1-4C)alkyl, heteroaryl-(1-4C)alkyl or heteroarylthio-(2-4C)alkyl and wherein each phenyl or heteroaryl group may optionally bear one or two substituents selected from halogeno, cyano, trifluoromethyl, carboxy, (1-4C)alkyl, (1-4C)alkoxy, (1-4C)alkoxycarbonyl, carboxy-(1-4C)alkyl and (1-4C)alkoxycarbonyl-(1-4C)alkyl;

and wherein said heteroaryl group in R<sup>5</sup> is a 5-membered or 6-membered heterocyclic moiety containing up to four nitrogen heteroatoms and said 6-membered heterocyclic moiety optionally containing a further heteroatom selected from oxygen and sulphur;

Ar<sup>1</sup> is phenylene or a 6-membered heteroaryl diradical containing one or two nitrogen heteroatoms which may optionally bear one or two substituents selected from halogeno, cyano, trifluoromethyl, hydroxy, amino, (1-4C)alkyl, (1-4C)alkoxy, phenyl-(1-4C)alkoxy, (1-4C)alkylamino and di-(1-4C)alkylamino;

R<sup>4</sup> is linked to Ar<sup>1</sup> ortho to the —N=C(R<sup>4</sup>)— group and defines an ethylene, propylene, 1-methylpropylene or vinylene group, a group of the formula



wherein X<sup>3</sup> is oxy or thio, or a group of the formula



wherein n is 1 or 2, X<sup>3</sup> is oxy, thio, sulphonyl, sulphonyl, imino or (1-4C)alkylimino, and one of the —CH<sub>2</sub>— groups may optionally be replaced by a —CH(Me)— or —C(Me)<sub>2</sub>— group;

A<sup>1</sup> is a direct link to X<sup>1</sup>, or A<sup>1</sup> is (1-4C) alkylene;

X<sup>1</sup> is oxy, thio, sulphonyl or sulphonyl;

Ar<sup>2</sup> is phenylene, pyridinediyl, pyrimidinediyl, thiophenediyl, furandiyl, thiazolelediyl, oxazolelediyl, thiazolelediyl, or oxazolelediyl which may optionally bear one or two substituents

selected from halogeno, cyano, trifluoromethyl, hydroxy, amino, (1-4C)alkyl, (1-4C)alkoxy, (1-4C)alkylamino and di-(1-4C)alkylamino;

R<sup>1</sup> is (1-4C)alkyl, (3-4C)alkenyl or (3-4C)alkynyl; and R<sup>2</sup> and R<sup>3</sup> together form a group of the formula —A<sup>2</sup>—X<sup>2</sup>—A<sup>3</sup>— which together with the carbon atom to which A<sup>2</sup> and A<sup>3</sup> are attached define a ring having 5 or 6 ring atoms, wherein each of A<sup>2</sup> and A<sup>3</sup> is independently (1-3C)alkylene and X<sup>2</sup> is oxy, and which ring may optionally bear one or two substituents selected from hydroxy, (1-4C)alkyl and (1-4C)alkoxy;

or a pharmaceutically-acceptable salt thereof.

5,482,967

## CONDENSED HETEROCYCLIC COMPOUNDS, THEIR PRODUCTION AND USE

Hideaki Natsugari, Ashiya; Hitoshi Ikeda, Higashiosaka; Take-noori Ishimaru, Toyonaka, and Takayuki Doi, Izumi, all of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 2, 1993, Ser. No. 114,841

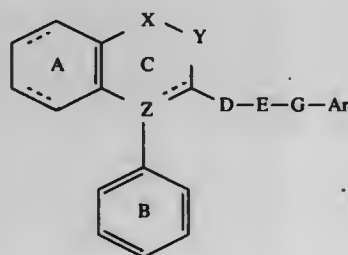
Claims priority, application Japan, Sep. 4, 1992, 4-237481; Apr. 28, 1993, 5-103328

Int. Cl.<sup>6</sup> A61K 31/35; C07D 311/12

U.S. Cl. 514—457

54 Claims

1. A compound represented by the general formula:



wherein ring A may be substituted by one to four substituents selected from the group consisting of (i) a halogen, (ii) an optionally halogenated C<sub>1-6</sub> alkyl, (iii) an optionally halogenated C<sub>1-6</sub> alkoxy, (iv) an optionally halogenated C<sub>1-6</sub> alkylthio, (v) a C<sub>1-7</sub> alkylamino, (vi) a C<sub>1-3</sub> acyloxy, (vii) a hydroxyl, (viii) a nitro (ix) a cyano, (x) an amino, (xi) a mono- or di-C<sub>1-4</sub> alkylamino, (xii) a pyrrolidino, (xiii) a piperidino, (xiv) a morpholino, (xv) a carboxyl, (xvi) a C<sub>1-4</sub> alkyl-carbonylamino, (xvii) a C<sub>1-4</sub> alkyl-carbonyl, (xx) a carbamoyl, (xxi) a mono- or di-C<sub>1-4</sub> alkylcarbamoyl and (xxii) a C<sub>1-6</sub> alkylsulfonyl;

ring B represents a benzene ring which may be substituted by one to four substituents selected from the group consisting of (i) a halogen, (ii) an optionally halogenated C<sub>1-6</sub> alkoxy, (iv) an optionally halogenated C<sub>1-6</sub> alkylthio, (v) a C<sub>1-7</sub> alkylamino, (vi) a C<sub>1-3</sub> acyloxy, (vii) a hydroxyl, (viii) a nitro, (ix) a cyano, (x) an amino, (xi) a mono- or di-C<sub>1-4</sub> alkylamino, (xii) a pyrrolidino, (xiii) a piperidino, (xiv) a morpholino, (xv) a carboxyl, (xvi) a C<sub>1-4</sub> alkyl-carbonylamino, (xvii) a C<sub>1-4</sub> alkyl-carbonyl, (xx) a carbamoyl, (xxi) a mono- or di-C<sub>1-4</sub> alkylcarbamoyl and (xxii) a C<sub>1-6</sub> alkylsulfonyl;

—X—Y— represents —O—CO— or —CO—O—;

— represents one of a single and double bond;

(1) when — adjacent to Z is a single bond, Z represents CR<sup>4</sup> (R<sup>4</sup> represents a hydrogen atom, hydroxyl group or a C<sub>1-6</sub> alkyl, C<sub>2-6</sub> alkenyl, C<sub>2-6</sub> alkynyl, C<sub>3-8</sub> cycloalkyl or C<sub>6-14</sub> aryl group which may be substituted by one to four substituents selected from the group consisting of (i) a halogen, (ii) a C<sub>3-6</sub> cycloalkyl, (iii) a C<sub>6-10</sub> aryl, (iv) an amino which may have a substituent selected from C<sub>1-4</sub> alkyl, a C<sub>2-4</sub> alkenyl, C<sub>3-6</sub> cycloalkyl or C<sub>6-10</sub> aryl, (v) a hydroxyl, (vi) a C<sub>1-4</sub> alkoxy which may have one to three halogen atoms, (vii) a C<sub>1-4</sub> acyl, (viii) a C<sub>1-4</sub> alkyl or a C<sub>7-11</sub> aralkyl, (ix) a cyano, (x) a

carboxyl which may be protected by a C<sub>1-4</sub> alkyl or a C<sub>7-11</sub> aralkyl, (xi) a carbamoyl, (xii) a mercapto, (xiii) a C<sub>1-4</sub> alkylthio, (xiv) a sulfo and (xv) a C<sub>1-4</sub> alkylsulfonyl, or (2)

when — is adjacent to Z is a double bond, Z represents a carbon atom;

D represents a C<sub>1-3</sub> alkylene group which may be substituted by an oxo group or a thioxo group;

E represents a —NR<sup>5</sup>— (R<sup>5</sup> represents a hydrogen atom or a C<sub>1-6</sub> alkyl, C<sub>2-6</sub> alkenyl, C<sub>2-6</sub> alkynyl, C<sub>3-8</sub> cycloalkyl or C<sub>6-14</sub> aryl group which may be substituted by one to four substituents selected from the group consisting of (i) a halogen, (ii) a C<sub>3-6</sub> cycloalkyl, (iii) a C<sub>6-10</sub> aryl, (iv) an amino which may have a substituent selected from C<sub>1-4</sub> alkyl, a C<sub>2-4</sub> alkenyl, C<sub>3-6</sub> cycloalkyl or C<sub>6-10</sub> aryl, (v) a hydroxyl, (vi) a C<sub>1-4</sub> alkoxy which may have one to three halogen atoms, (vii) a C<sub>1-4</sub> acyl, (viii) a C<sub>1-4</sub> acyloxy, (ix) a cyano, (x) a carboxyl which may be protected by a C<sub>1-4</sub> acyloxy, (xi) a carbamoyl, (xii) a mercapto, (xiii) a C<sub>1-4</sub> alkylthio, (xiv) a sulfo and (xv) a C<sub>1-4</sub> alkylsulfonyl, —O— or —S(O)<sub>n</sub>— (n is 0, 1 or 2)

G represents a bond or a C<sub>1-3</sub> group;

Ar represents a C<sub>6-10</sub> aryl group which may be substituted by one to five substituents selected from the group consisting of (i) a C<sub>1-4</sub> alkyl which may be substituted by one to three halogen atoms, (ii) a C<sub>1-4</sub> alkyl substituted by an amino, (iii) a C<sub>1-4</sub> alkyl substituted by a mono- or di-C<sub>1-4</sub> alkylamino, (iv) a C<sub>1-4</sub> alkyl substituted by a carboxyl, (v) a C<sub>1-4</sub> alkyl substituted by a hydroxyl, (vi) a C<sub>1-4</sub> alkyl substituted by a C<sub>1-4</sub> alkoxy-carbonyl, (vii) a C<sub>1-4</sub> alkyl substituted by a C<sub>1-4</sub> alkoxy-carbonyl, (viii) a C<sub>3-6</sub> cycloalkyl, (ix) a halogen, (x) a nitro, (xi) a cyano, (xii) a hydroxyl, (xiii) a C<sub>1-4</sub> alkoxy which may be substituted by one to three halogen atoms, (xiv) a C<sub>1-4</sub> alkylthio which may be substituted by one to three halogen atoms, (xv) an amino, (xvi) a mono- or di-C<sub>1-4</sub> alkylamino, (xvii) a pyrrolidino, (xviii) a piperidino, (xix) a morpholino, (xx) a C<sub>1-4</sub> alkylcarbamoyl, (xxi) an aminocarbonyloxy, (xxii) a mono- or di-C<sub>1-4</sub> alkylaminocarbonyloxy, (xxiii) C<sub>1-4</sub> alkylsulfonylamino, (xxiv) a C<sub>1-4</sub> alkoxy-carbonyl, (xxv) a benzyloxycarbonyl, (xxvi) a carboxyl, (xxvii) a C<sub>1-6</sub> alkylcarbamoyl, (xxviii) a C<sub>3-6</sub> cycloalkyl-carbonyl, (xxix) a carbamoyl, (xxx) a mono- or di-C<sub>1-4</sub> alkylcarbamoyl, (xxxii) a C<sub>1-6</sub> alkylsulfonyl and (xxxiii) a furyl, thienyl, oxazolyl, isoxazolyl, thiazolyl, isothiazolyl, imidazolyl, pyrazolyl, 1,2,3-oxadiazolyl, 1,2,4-oxadiazolyl, 1,3,4-oxadiazolyl, furazanyl, 1,2,3-thiadiazolyl, 1,2,4-thiadiazolyl, 1,3,4-thiadiazolyl, 1,2,3-triazolyl, 1,2,4-triazolyl, tetrazolyl, pyridyl, pyridazinyl, pyrimidinyl, pyrazinyl or triazinyl which may be substituted by one to three substituents selected from the group consisting of a C<sub>1-4</sub> alkyl which may have one to three halogen atoms, a C<sub>3-6</sub> cycloalkyl, a halogen, a hydroxyl, a C<sub>1-4</sub> alkoxy which may have one to three halogen atoms, a C<sub>1-4</sub> alkylthio which may have one to three halogen atoms, an amino, a mono- or di-C<sub>1-4</sub> alkylamino, a C<sub>1-4</sub> alkoxy-carbonyl, a carboxyl and a C<sub>1-6</sub> alkyl-carbonyl; or a pharmaceutically acceptable salt thereof, provided that when D represents —CO— and E represents —NR<sup>5</sup>—, either G represents a C<sub>1-3</sub> alkylene group and AR represents a substituted aryl group, or G represents a bond and R<sup>5</sup> represents a hydrocarbon group.

5,482,968

## NAPHTHALENYMETHYL CYCLOALKENONE ACETIC ACIDS AND ANALOGS THEREOF USEFUL AS ALDOSE REDUCTASE INHIBITORS

Michael S. Malamas, Jamison, Pa., assignor to American Home Products Corporation, Madison, N.J.

Division of Ser. No. 167,376, Dec. 14, 1993, Pat. No.

5,399,588. This application Dec. 20, 1994, Ser. No. 359,774

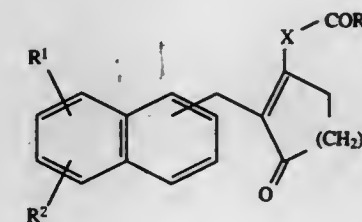
Int. Cl.<sup>6</sup> A61K 31/27; 31/19

U.S. Cl. 514—481

2 Claims

1. A method of treating or inhibiting neuropathy, nephropathy, retinopathy, cataracts and vascular disease associated with chronic hyperglycemia in a mammal having diabetes which comprises

administering to said mammal thereto an effective amount of a compound having the formula:



wherein:

R<sup>1</sup>, R<sup>2</sup> are independently hydrogen, C<sub>1</sub>–C<sub>8</sub> alkyl, halogen, C<sub>1</sub>–C<sub>8</sub> alkoxy, or trifluoromethyl;

R<sup>3</sup> is —OH or —NHCO<sub>2</sub>CH<sub>3</sub>;

X is —CH<sub>2</sub>— or —OCH<sub>2</sub>—;

n is 1 or 2;

or a pharmaceutically acceptable salt thereof.

5,482,969

## CERTAIN N-(4-BENZOYL-2-PHENYL)-3-TRIFLUORO-2-HYDROXY-PROPANAMIDE DERIVATIVES

James R. Empfield, Bear; Cyrus J. Ohmacht, Wilmington; Keith Russell, Newark; Diane A. Trainor, and Paul J. Warwick, Jr., both of Wilmington, all of Del., assignors to Zeneca Limited, London, United Kingdom

Filed Mar. 11, 1994, Ser. No. 212,460

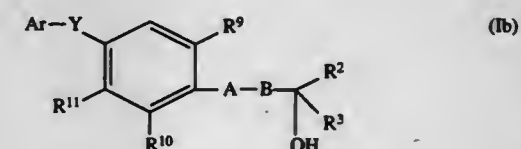
Claims priority, application United Kingdom, Mar. 15, 1993, 9305295

Int. Cl.<sup>6</sup> C07C 51/255; 233/01; 237/20; A61K 31/16

U.S. Cl. 514—522

8 Claims

1. A compound formula Ib:



wherein

Ar is phenyl, optionally substituted with a substituent selected from (1-4C)alkyl;

Y is carbonyl;

A-B is —NHC(=O)—;

R<sup>9</sup> is selected from the group consisting of (1-4C)haloalkyl, (1-4C)alkoxy, (2-4C)alkenyl, cyano, nitro, halo, trifluoromethyl, trifluoromethylthio, trifluoromethoxy, and hydroxy;

R<sup>10</sup> is hydrogen;

R<sup>11</sup> is selected from hydrogen, halo, methyl, hydroxy, methoxy, and cyano; and

R<sup>2</sup> and R<sup>3</sup> are independently (1-3C)alkyl substituted by from 0 to 2k+1 atoms selected from fluoro and chloro wherein k is the number of carbon atoms in the said (1-3C)alkyl, provided that R<sup>2</sup> and R<sup>3</sup> are not both methyl; or

R<sup>2</sup> and R<sup>3</sup>, together with the carbon atom to which they are attached, form a 3–5 membered cycloalkyl ring optionally substituted by from 0 to 2m–2 fluorine atoms wherein m is the number of carbon atoms in said ring; or a pharmaceutically acceptable salt of said compound; provided said compound is not N-(4-Benzoyl-2,6-dimethylphenyl)-3,3,3-trifluoro-2-hydroxy-2-methylpropanamide.



5,482,970

## TRANSDERMAL ANTIANDROGENIC COMPOSITIONS AND MODULATED PROCESS

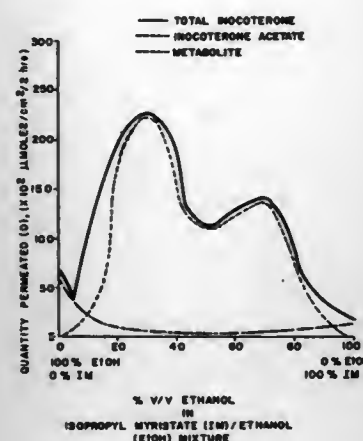
Kwon H. Kim, Bridgewater; Barry Koplowitz, Somerville, and Norman L. Henderson, Gladstone, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.  
Continuation of Ser. No. 859,745, Mar. 30, 1992, abandoned.

This application Sep. 17, 1993, Ser. No. 123,412

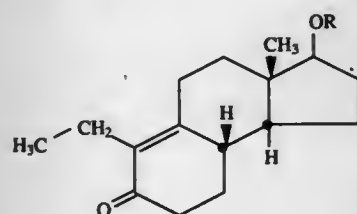
Int. Cl.<sup>6</sup> A01N 37/10

U.S. Cl. 514—532

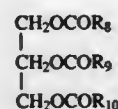
47 Claims



1. A composition consisting essentially of an antiandrogenic tricyclic compound of the formula



wherein R is COR<sub>1</sub> wherein R<sub>1</sub> is loweralkyl of 1 to 6 carbon atoms, a metabolism modulator selected from the group consisting of a compound of the formula R<sub>3</sub>CO<sub>2</sub>R<sub>6</sub> wherein R<sub>3</sub> and R<sub>6</sub> are independently alkyl or alkenyl having a total of 3 to 35 carbon atoms, a compound of the formula R<sub>7</sub>(CO<sub>2</sub>R<sub>6</sub>)<sub>2</sub> wherein R<sub>6</sub> is as defined above and R<sub>7</sub> is alkyl or alkenyl having a total of 5 to 46 atoms, and a compound of the formula



wherein R<sub>8</sub>, R<sub>9</sub>, and R<sub>10</sub> are independently alkyl or alkenyl having a total of 3 to 54 carbon atoms; or mixtures thereof, and a polar organic solvent selected from the group consisting of a compound of the formula R<sub>2</sub>OH wherein R<sub>2</sub> is alkyl of 2 to 12 carbon atoms or alkenyl of 3 to 12 carbon atoms; or a compound of the formula



wherein R<sub>3</sub> and R<sub>4</sub> are independently alkyl of 1 to 6 carbon atoms, or mixtures thereof.

BETA<sub>2</sub>-ADRENERGIC AGENTS AND THEIR USE IN PHARMACEUTICAL COMPOSITIONS

Joseph W. Epstein; Gary H. Birnberg, both of Monroe, and Feng L. Qing, Pearl River, all of N.Y., assignors to American Cyanamid Company, Pearl River, N.Y.

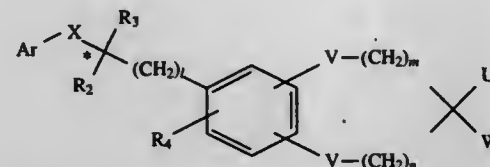
Filed Oct. 1, 1993, Ser. No. 130,601

Int. Cl.<sup>6</sup> A61K 31/335; C07D 317/46

U.S. Cl. 514—465

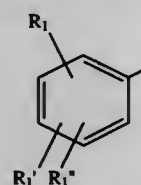
17 Claims

1. A compound of the formula:



wherein:

Ar is naphth-(1 or 2)-yl which is substituted with hydrogen, straight or branched (C<sub>1</sub>-C<sub>6</sub>)alkyl, bromine, chlorine, fluorine, iodine, (C<sub>1</sub>-C<sub>6</sub>)alkoxy, difluoromethyl, trifluoromethyl, trifluoromethoxy, or difluoromethoxy, 1,2,3,4-tetrahydro-(5 or 6)-naphthyl which is substituted with hydrogen, straight or branched (C<sub>1</sub>-C<sub>6</sub>)alkyl, bromine, chlorine, fluorine, iodine, (C<sub>1</sub>-C<sub>6</sub>)alkoxy, difluoromethyl, or trifluoromethyl, indanyl; or



wherein R<sub>1</sub>, R<sub>1'</sub>, and R<sub>1''</sub> are independently straight or branched chain (C<sub>1</sub>-C<sub>6</sub>)alkyl, hydrogen, bromine, chlorine, fluorine, iodine, (C<sub>1</sub>-C<sub>6</sub>)alkoxy, difluoromethyl, trifluoromethyl, nitro, hydroxy, (C<sub>1</sub>-C<sub>6</sub>)hydroxyalkyl, —NR<sub>3</sub>R<sub>6</sub> wherein R<sub>3</sub> and R<sub>6</sub> are independently hydrogen, straight and branched (C<sub>1</sub>-C<sub>6</sub>)alkyl, substituted phenyl, or substituted phenyl (C<sub>1</sub>-C<sub>6</sub>)alkyl, —SR<sub>7</sub>, wherein R<sub>7</sub> is hydrogen or straight or branched (C<sub>1</sub>-C<sub>6</sub>)alkyl, carboxy or (C<sub>1</sub>-C<sub>6</sub>)alkoxycarbonyl;

R<sub>2</sub> and R<sub>3</sub> are hydrogen or (C<sub>1</sub>-C<sub>4</sub>)alkyl;

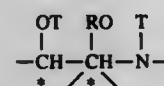
m and n are integers from 0-1;

l is an integer of 0, 2 or 3;

V is oxygen and each V is ortho to the other V;

W and U are independently hydrogen, hydroxy, —CO<sub>2</sub>R<sub>8</sub> or —OCH<sub>2</sub>CO<sub>2</sub>R<sub>8</sub> wherein R<sub>8</sub> is hydrogen or straight or branched (C<sub>1</sub>-C<sub>10</sub>)alkyl; —CONR<sub>9</sub>R<sub>10</sub> or —OCH<sub>2</sub>CONR<sub>9</sub>R<sub>10</sub> wherein R<sub>9</sub> and R<sub>10</sub> are hydrogen, straight or branched (C<sub>1</sub>-C<sub>10</sub>)alkyl, substituted benzyl, substituted phenyl, a heterocycle selected from the group consisting of pyridylmethyl, thienyl, furfuryl, furyl, pyrazolyl, imidazolyl, isothiazolyl, isoxazolyl, tetrazolyl, thiazolyl, 1,2,4-triazinyl and 1,2,4-triazolyl, a saccharide residue or a peptide; cyano, cyano(C<sub>1</sub>-C<sub>6</sub>)alkyl, chlorine, bromine, halo(C<sub>1</sub>-C<sub>6</sub>)alkyl, hydroxy(C<sub>1</sub>-C<sub>6</sub>)alkyl, hydroxymethylcarbonyl, SH, SO<sub>3</sub>H, S(O)CH<sub>3</sub>, SO<sub>2</sub>CH<sub>3</sub>, —CH<sub>2</sub>SO<sub>3</sub>H, —CH<sub>2</sub>SR<sub>11</sub>, —CH<sub>2</sub>S(O)R<sub>11</sub> wherein R<sub>11</sub> is (C<sub>1</sub>-C<sub>4</sub>)alkyl, tetrazol-5-yl, or U and W taken together with the carbon atom to which they are attached are carbonyl;

X is a divalent radical:

wherein R<sub>9</sub> is (C<sub>1</sub>-C<sub>3</sub>)alkyl;T is hydrogen, (C<sub>1</sub>-C<sub>4</sub>)alkyl or (C<sub>1</sub>-C<sub>4</sub>)acyl;

and the pharmaceutically acceptable salts and esters, the enantiomers, the racemic mixtures and diastereomeric mixtures thereof.

5,482,972

## SUBSTITUTED AMINO ACID AMIDES

Thomas Seltz, and Heinz-Wilhelm Dehne, both of Monheim, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 8,280, Jan. 25, 1993, abandoned.

This application Apr. 28, 1994, Ser. No. 234,437

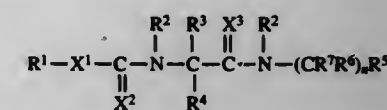
Claims priority, application Germany, Feb. 4, 1992, 42 63 084.6

Int. Cl.<sup>6</sup> A61K 31/27; C07C 333/04

U.S. Cl. 514—487

15 Claims

1. An amino acid amine of the formula



in which

R<sup>1</sup> represents alkyl having 2 to 5 carbon atoms,  
R<sup>2</sup> represents hydrogen, alkyl or cycloalkyl,  
R<sup>3</sup> represents alkyl having 1 to 6 carbon atoms,  
R<sup>4</sup> represents hydrogen,  
R<sup>5</sup> represents phenyl optionally substituted by at least one member selected from the group consisting of fluorine, chlorine, or alkyl or alkoxy having 1 to 3 carbon atoms,  
R<sup>6</sup> represents hydrogen,  
R<sup>7</sup> represents alkyl having 1 to 4 carbon atoms,  
X<sup>1</sup> represents sulphur,  
X<sup>2</sup> represents oxygen,  
X<sup>3</sup> represents oxygen, and  
n represents 1, 2 or 3.

5,482,973

## SUPPOSITORY PREPARATION

Yoichi Sawayanagi, Tokyo, and Yutaka Kawamura, Narita, both of Japan, assignors to Dojin Iyaku-Kako Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 885,351, May 19, 1992, abandoned.

This application Oct. 15, 1993, Ser. No. 136,616

Claims priority, application Japan, May 24, 1991, 3-120019

Int. Cl.<sup>6</sup> A61K 31/19; 31/22; 31/225

U.S. Cl. 514—570

4 Claims

1. A suppository preparation consisting essentially of pranoprofen and a base component, wherein the pranoprofen concentration is 2.5–10% by weight and is present in an amount of 25–225 mg per one suppository, said base component selected from the group consisting of fatty acid monoglyceride, fatty acid diglyceride, fatty acid triglyceride, polyethylene glycol and mixtures thereof.

5,482,974

## SELECTED FUNGICIDES FOR THE CONTROL OF TAKE-ALL DISEASE OF PLANTS

Denais P. Phillion; Karey A. Van Sant, both of St. Charles, and Daniel M. Walker, St. Louis, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

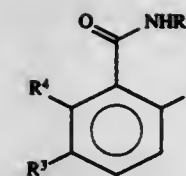
Filed Mar. 8, 1994, Ser. No. 207,506

Int. Cl.<sup>6</sup> A01N 37/18; 33/06; C07C 233/65

U.S. Cl. 514—619

12 Claims

1. A compound of the formula (I)

wherein R<sup>2</sup> is ethyl, iso-propyl, propyl or allyl;

A is N(CH<sub>3</sub>)<sub>1-n</sub>H<sub>n</sub>R<sup>3</sup> or OR<sup>6</sup> wherein n is 0 or 1, R<sup>3</sup> is (CH<sub>3</sub>)<sub>m</sub>(CH<sub>2</sub>CH<sub>2</sub>)<sub>3-m</sub>C, 1-methyl-1-cyclohexyl, 1-methyl-1-cyclohexyl or 2,3-dimethyl-2-butyl wherein m is 0, 1, 2 or 3 and R<sup>6</sup> is independently R<sup>5</sup> or 2,3,3-trimethyl-2-butyl;

R<sup>3</sup> is H or independently R<sup>4</sup>; andR<sup>4</sup> is halo or CH<sub>3</sub>;

with the proviso that when A is N(CH<sub>3</sub>)<sub>1-n</sub>H<sub>n</sub>R<sup>3</sup> where n is 0 or 1, if R<sup>3</sup> is H and R<sup>5</sup> is 1-methyl-1-cyclohexyl or (CH<sub>3</sub>)<sub>m</sub>(CH<sub>2</sub>CH<sub>2</sub>)<sub>3-m</sub>C, where m is 0 or 3, or if R<sup>3</sup> is halo and R<sup>5</sup> is (CH<sub>3</sub>)<sub>m</sub>(CH<sub>2</sub>CH<sub>2</sub>)<sub>3-m</sub>C, where m is 3, then R<sup>2</sup> cannot be ethyl;

and with the proviso that when A is OR<sup>6</sup> then m is equal to or less than 2, and if R<sup>3</sup> is H or halo and R<sup>2</sup> is ethyl or isopropyl, then R<sup>6</sup> is (CH<sub>3</sub>)<sub>m</sub>(CH<sub>2</sub>CH<sub>2</sub>)<sub>3-m</sub>C where m is 1; or an agromonic salt thereof.

5,482,975

## ADENOSINE DIPHOSPHORIBOSE POLYMERASE BINDING NITROSO AROMATIC COMPOUNDS USEFUL AS RETROVIRAL INACTIVATING AGENTS, ANTI-RETROVIRAL AGENTS AND ANTI-TUMOR AGENTS

Ernest Kun, Mill Valley, and Jerome Mendeleyev, San Francisco, both of Calif., assignors to Octamer, Inc., Mill Valley, Calif.

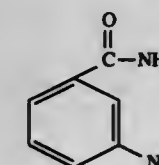
Continuation-in-part of Ser. No. 893,429, Jan. 4, 1992, abandoned, which is a continuation-in-part of Ser. No. 780,809, Oct. 22, 1991, abandoned. This application Feb. 24, 1993, Ser. No. 21,830

Int. Cl.<sup>6</sup> A61K 31/165; C07C 233/65

U.S. Cl. 514—619

2 Claims

1. A compound having the formula:



5,482,976

Patent Not Issued For This Number

5,482,977

## FOAMABLE BRANCHED POLYESTERS

Richard L. McConnell, Kingsport, and Kishan C. Khemani, Johnson City, both of Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Filed May 8, 1995, Ser. No. 438,120

Int. Cl.<sup>6</sup> C08J 9/08; 9/10

U.S. Cl. 521—81

16 Claims

1. A process for preparing a foamed article of a branched polyester comprising the steps of:  
(a) preparing a polyester comprising

- (1) repeat units from about 75 to 100 mol % of a dibasic acid having from about 6 to about 40 carbon atoms and 0 to about 25 mol % of a modifying dibasic acid, and
- (2) repeat units from about 75 to 100 mol % of a glycol having from about 2 to about 10 carbon atoms, 0 to about 25 mol % of a modifying glycol and 0 to about 25 mol % of a modifying compound selected from the group comprising amino alcohols, diamines and lactams, said mol % based on 100 mol % of (1) and 100 mol % of (2);
- (b) preparing an ethylene copolymer comprising repeat units of ethylene and of a comonomer selected from the group comprising acrylic acid, methacrylic acid, alkyl acrylate, alkyl methacrylate and vinyl alcohol;
- (c) drying the polyester and ethylene copolymer;
- (d) forming a melt comprising about 80 to about 99.9 wt % of the dried polyester and about 0.1 to about 20 wt % of the dried ethylene copolymer;
- (e) cooling and transforming the melt into solid particulates;
- (f) solid state polycondensing the particulates until a branched polyester having an I.V. of at least about 0.70 is obtained;
- (g) melting the branched polyester particulates;
- (h) adding a blowing agent to the branched polyester melt; and
- (i) extruding the composition of step (h) through a die.

5,482,978

**EXPANDABLE CONDUCTIVE SILICONE RUBBER COMPOSITION AND CONDUCTIVE SPONGE ROLL**  
Masaharu Takahashi, and Tomiyoshi Tsuchida, both of Usui, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1995, Ser. No. 429,876

Claims priority, application Japan, Apr. 27, 1994, 6-112245

Int. Cl.<sup>6</sup> C07C 303/00; 307/00; C08J 9/02

U.S. Cl. 521-82

11 Claims

1. An expandable conductive silicone rubber composition comprising

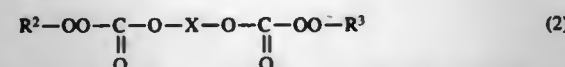
(A) an organopolysiloxane of the following general formula (1):



wherein  $R^1$ , which may be identical or different, is a substituted or unsubstituted monovalent hydrocarbon group, at least two alkenyl groups being contained per molecule, and letter a is a positive number of 1.90 to 2.05.

(B) conductive carbon black,

(C) an organic peroxide of the following general formula (2):

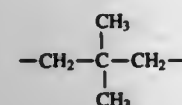


wherein each of  $R^2$  and  $R^3$  which may be identical or different is a monovalent hydrocarbon group having 3 to 10 carbon atoms or a group of the following formula (3):



wherein  $R^4$  is a methyl, ethyl or phenyl group,

X is a group of the following formula (4), (5) or (6):



wherein n is an integer of 2 to 8 and m is an integer of 1 to 4,

(D) an organohydrogenpolysiloxane,

(E) a platinum catalyst, and  
(F) a blowing agent.

5,482,979

**COMPOUNDS CONTAINING TERTIARY AMINO GROUPS, A PROCESS FOR THEIR PRODUCTION AND THEIR USE AS CATALYSTS**

Josef Sanders, Leverkusen; Ulrich Liman, Langenfeld, and Klaus König, Odenthal, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jun. 8, 1994, Ser. No. 255,524

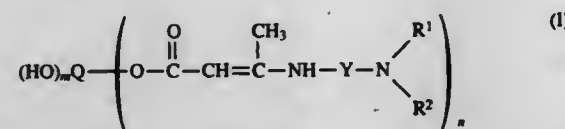
Claims priority, application Germany, Jun. 16, 1993, 43 19 948.8

Int. Cl.<sup>6</sup> C08G 18/18; C07C 229/02

U.S. Cl. 521-129

6 Claims

1. A compound containing a tertiary amino group which corresponds to the following Formula (I):



in which

Q represents a residue obtained by removal of one or more hydroxyl groups from an (m+n)-functional alcohol having a molecular weight of from about 106 to about 6,000,

Y represents a difunctional aliphatic hydrocarbon radical containing from 2 to 6 carbon atoms with at least two carbon atoms being arranged between the two nitrogen atoms,

$R^1$  and  $R^2$  which may be the same or different, each represents an alkyl radical which radicals may together with the nitrogen atom and, optionally, other optionally alkyl-substituted hetero atoms form a saturated heterocyclic ring,

m represents a number from 0 to 7 and

n represents a number from 1 to 8,

with the proviso that the sum m+n is a number from 1 to 8.

5,482,980

**METHODS FOR PREPARING FLEXIBLE, OPEN-CELLED, POLYESTER AND POLYETHER URETHANE FOAMS AND FOAMS PREPARED THEREBY**

Michael P. Pcolinsky, Hazleton, Pa., assignor to PMC, Inc., Sun Valley, Calif.

Filed Jul. 14, 1994, Ser. No. 275,122

Int. Cl.<sup>6</sup> C08J 9/36

U.S. Cl. 521-130

43 Claims

1. A method for preparing a flexible, open-celled, polyurethane foam comprising reacting at least one isocyanate and at least one saturated polyester polyol in a reaction mixture in the presence of at least one catalyst and about 7 phR to about 25 phR of an epoxidized soybean oil, wherein said reaction mixture is essentially free of polyether polyols, wherein said foam has a permeability of at least 1 ft<sup>3</sup>/min.

5,482,981

**OPTICALLY CLEAR POLYMER COMPOSITIONS CONTAINING AN INTERPENETRANT**

Syed H. Askari, Santa Clara, and Hermann H. Neidlinger, San Jose, both of Calif., assignors to Pilkington Barnes Hind, Inc., Sunnyvale, Calif.

Filed Nov. 9, 1994, Ser. No. 338,744

Int. Cl.<sup>6</sup> C08J 3/00; C08K 3/20; C08L 27/12; C08F 8/00

U.S. Cl. 523-106

17 Claims

1. An optically clear xerogel polymer composition comprising: a polymer comprising hydroxyl functional groups blocked with a removable blocking group, and

at least about 1.5 weight percent of an interpenetrant based on the total weight of the xerogel polymer composition wherein said interpenetrant is selected, from the group consisting of siloxane polyurethane, cellulose acetate butyrate, cellulose, hydroxyethyl cellulose, hydroxypropyl cellulose, hydroxyethyl hydroxypropyl, cellulose, mixtures thereof and interpenetrants selected from the group consisting of siloxane, polyurethane, cellulose acetate butyrate, cellulose, hydroxyethyl cellulose, hydroxypropyl cellulose, hydroxyethyl hydroxypropyl, cellulose, comprising a polymerizable group selected from the group consisting of vinyl groups, epoxide groups and isocyanate groups

wherein said composition has a sufficient optical clarity to permit the passage of at least 80% of visible light through a 0.1 millimeter (mm) thick sample of the composition.

5,482,982

**POLYMER COMPOSITIONS**

P. R. Lakshmanan, Houston, and Amir Tayebianpour, League City, both of Tex., assignors to IGI Baychem, Inc., Houston, Tex.

Division of Ser. No. 155,187, Nov. 22, 1993, Pat. No.

5,397,843. This application Oct. 13, 1994, Ser. No. 322,200

Int. Cl.<sup>6</sup> C08L 95/00; 23/20; 23/10; 23/08

U.S. Cl. 524-68

7 Claims

1. A bitumen blend composition comprising an admixture of:

(1) a blended copolymer, said blended copolymer comprising from about 2.5% to about 80% by weight of a first component comprising an at least partially crystalline ethylene-alphaolefin copolymer, said alphaolefin having four or more carbons and said copolymer having a specific density of less than 0.90 g/cm and from about 20% to about 97.5% by weight of a second component selected from the group consisting of amorphous propylene homopolymer, amorphous propylene-alphaolefin copolymer and admixtures thereof, said blended copolymer containing less than 10% by weight of a crystalline propylene polymer; and

(2) bitumen.

5,482,983

**FLAMEPROOFED THERMOPLASTIC MOLDING MATERIALS**

Petra Balerweck, Schifferstadt; Brigitte Gareiss, Ludwigshafen; Christoph Plachetta, Limburgerhof, and Hans-Peter Beringer, Carlsberg, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation of Ser. No. 814,634, Dec. 30, 1991, abandoned.

This application Jan. 31, 1995, Ser. No. 381,273

Claims priority, application Germany, Jan. 12, 1991, 41 00 740.9

Int. Cl.<sup>6</sup> C08K 3/32

U.S. Cl. 524-80

6 Claims

1. A flameproofed thermoplastic molding material consisting essentially of

- A) from 10 to 98.45% by weight of a thermoplastic polyamide,
- B) from 1 to 30% by weight of phosphorus,
- C) from 0.5 to 30% by weight of an elastomeric polymer,
- D) from 0.05 to 15% by weight of a polyethylene having a density of from 0.94 to 0.98 g/cm<sup>3</sup> or of a polypropylene having an average molecular weight  $M_w$  of from 100,000 to 2,000,000 or a mixture thereof and
- E) from 0 to 60% by weight of a fibrous or particulate filler.

5,482,984

**SYNTHETIC POLYMER COMPOSITIONS CONTAINING CHARGE TRANSFER COMPLEXES, THEIR PREPARATION AND THE USE THEREOF**

Peter Chetcuti, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.

Division of Ser. No. 7,426, Jan. 22, 1993, Pat. No. 5,378,744.

This application Sep. 22, 1994, Ser. No. 310,443

Claims priority, application Switzerland, Jan. 29, 1992, 242/92

Int. Cl.<sup>6</sup> C08K 5/45; 5/3415; 5/3417

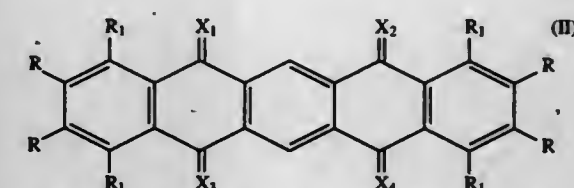
U.S. Cl. 524-83

20 Claims

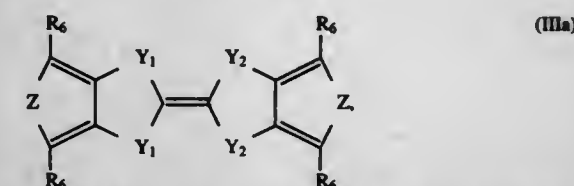
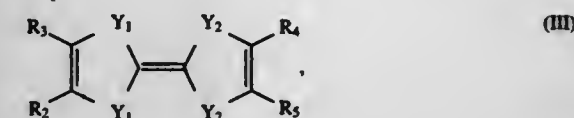
1. A process for the preparation of a electrically-conductive polymer composition which polymer composition comprises (a) a thermosetting, thermoplastic or structurally crosslinked polymer and (b) a charge transfer complex of formula I in the form of a network of crystal needles in the polymer matrix



wherein A is a compound of formula II or a mixture of compounds of formula II



wherein the R substituents are identical and are H or C<sub>1</sub>-C<sub>4</sub> alkyl, the adjacent R substituents, taken together, are -(CH<sub>2</sub>)<sub>3</sub>- or -(CH<sub>2</sub>)<sub>4</sub>-;  $R_1$  is H or C<sub>1</sub>-C<sub>4</sub> alkyl; and  $X_1$  is =N-CN, and  $X_2$ ,  $X_3$  and  $X_4$  are =O or =N-CN, and B is a compound of formula III or IIIa



wherein  $R_2$ ,  $R_3$ ,  $R_4$  and  $R_5$  are each independently of one another H, linear or branched C<sub>1</sub>-C<sub>18</sub> alkyl-(Z<sub>1</sub>)<sub>n</sub>-, phenyl-(Z<sub>1</sub>)<sub>n</sub>- or benzyl-(Z<sub>1</sub>)<sub>n</sub>- which are unsubstituted or substituted by C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy or C<sub>1</sub>-C<sub>4</sub> alkylthio,  $R_2$  and  $R_3$  as well as  $R_4$  and  $R_5$  are together, each independently of the other, trimethylene, tetramethylene, -Z<sub>2</sub>-(CH<sub>2</sub>)<sub>2</sub>-Z<sub>2</sub>-, -Z<sub>2</sub>-(CH<sub>2</sub>)<sub>3</sub>-, -Z<sub>1</sub>-CH=CH-Z<sub>1</sub>- or -CH=CH-CH=CH-, each unsubstituted or substituted by C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy or C<sub>1</sub>-C<sub>4</sub> alkylthio, n is 0 or 1,  $Y_1$  and  $Y_2$  are each independently of the other -S- or -Se-,  $Z_1$  is -S- or -Se-,  $Z_2$  is -O-, -S- or -Se-, Z is -S-, -Se- or NR<sub>7</sub>, and  $R_7$  is H, C<sub>1</sub>-C<sub>6</sub> alkyl, phenyl or benzyl, and  $R_6$  is H, C<sub>1</sub>-C<sub>4</sub> alkyl, phenyl or benzyl, which process comprises:

- (a) blending a CT complex of formula I into a thermoplastic polymer,
- (b) blending a CT complex of formula I with at least one component of a thermosetting or structurally crosslinkable polymer and then polymerising the blend to a thermosetting or structurally crosslinked polymer, or
- (c) dissolving either a compound of formula II or a fulvalene derivative of formula III or IIIa and a thermoplastic polymer or at least one component of a thermosetting or structurally crosslinkable polymer in an organic solvent to form a first solution, dissolving the other of either a fulvalene derivative



of formula III or IIIa or a compound of formula II in an organic solvent to form a second solution, mixing the first and second solutions, and removing the organic solvent to yield either the electrically-conductive polymer composition or a curable mixture, which curable mixture is then cured to yield the electrically-conductive polymer composition.

5,482,985

# HALOGEN-FREE FLAMEPROOFED THERMOPLASTIC POLYAMIDE MOLDING MATERIALS

Petra Balerweck, Boehl-Iggelheim; Brigitte Gareiss, Ludwigshafen; Karlheinz Ulmerich, Lambshelm; Michael Gall, Mannheim, and Manfred Koetting, Mutterstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation of Ser. No. 207,094, Mar. 8, 1994, abandoned.

This application Mar. 24, 1995, Ser. No. 409,961

Claims priority, application Germany, Mar. 11, 1993, 43 07 682.3

Int. Cl.<sup>6</sup> C08K 5/34; 3/22

U.S. Cl. 524—101

7 Claims

1. A flameproofed thermoplastic molding material containing
  - A) from 40 to 98% by weight of a thermoplastic polyamide,
  - B) from 0.5 to 30% by weight of melamine cyanurate,
  - C) from 0.5 to 50% by weight of magnesium hydroxide,
  - D) from 1 to 50% by weight of a fibrous or particulate filler or of a mixture thereof which differs from B) and C) and
  - E) from 0 to 30% by weight of conventional additives or processing assistants.

5,482,986

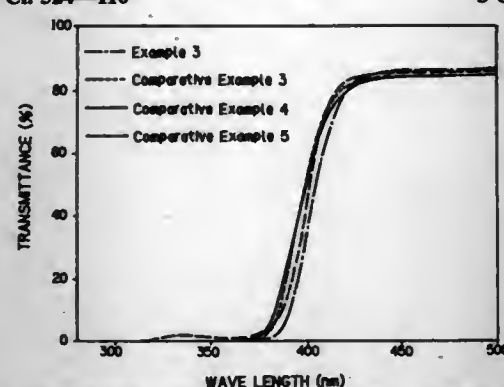
BENZOPYRAN COMPOUND AND USE OF THE SAME  
Akira Ogiso, Fukuoka; Tsutami Misawa, Kanagawa; Rihoko Imai, Tokyo, and Hisato Itoh, Fukuoka, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan  
Filed Jul. 11, 1994, Ser. No. 272,829

Claims priority, application Japan, Jul. 22, 1993, 5-181098

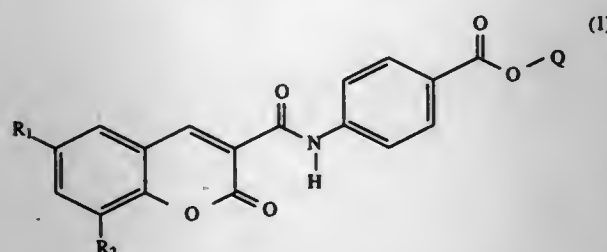
Int. Cl.<sup>6</sup> C08K 5/15

U.S. Cl. 524—110

8 Claims



1. A thermoplastic resin composition obtained by adding at least one 2H-1-benzopyran-2-on compound represented by the formula 1:



wherein R<sub>1</sub> and R<sub>2</sub> are individually a hydrogen atom or a halogen atom, and Q is a 1-8 carbon alkyl group which may be substituted with halogen atom and/or alkoxy group, or a hydrogen atom, to a thermoplastic resin in an effective amount for cutting off ultraviolet rays.

5,482,987

# SELF-LUBRICATING THERMOPLASTIC POLYMER COMPOSITION

Alex Forschirm, Parsippany, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Feb. 28, 1995, Ser. No. 396,048

Int. Cl.<sup>6</sup> C08K 5/20

U.S. Cl. 524—230

15 Claims

1. A self-lubricating composition suitable for use in the fabrication of shaped articles having slidable surfaces, comprising: (a) from about 70 to about 99.5 weight percent of a thermoplastic polymer; (b) from about 30 to about 0.5 weight percent of a lubricating system, comprising: (i) at least about 60 to about 70 weight percent of a very high molecular weight polyethylene, exhibiting a molecular weight of at least about 500,000, a density of about 0.94 g/cm<sup>3</sup>, and a mold flow index (MFI) of from about 0.4 to about 2.2 g/10 min.; (ii) at least about 20 to about 30 weight percent of a high density polyethylene homopolymer or copolymer, characterized as exhibiting a density of about 0.95 g/cm<sup>3</sup>, and a MFI of about 3.0 g/10 min.; (iii) at least about 0.05 weight percent of an acid metal salt; (iv) at least about 0.05 weight percent of a low molecular weight, non-polar polyethylene wax, exhibiting a molecular weight of from about 5,000 to about 10,000; (v) at least about 0.05 weight percent of a fatty acid amide wax; and (vi) at least about 0.05 weight percent of phenolic antioxidant/phosphite costabilizer, based on the total weight of the lubricating system, (c) at least about 0.08 weight percent of calcium ricinoleate or calcium hydroxystearate; (d) at least about 0.2 weight percent of a hindered phenol; (e) at least about 0.2 weight percent of oxymethylene copolymer, crosslinked with diepoxide; and (f) at least about 0.01 weight percent of N,N'-ethylene bis-stearamide, based on the total weight of the composition.

5,482,988

# HOT-MELT SILICONE PRESSURE SENSITIVE ADHESIVE WITH SILOXYLATED POLYETHER WAXES AS ADDITIVES

Katherine L. Ullman, Sanford; Randall P. Sweet, and Loren D. Durfee, both of Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 14, 1994, Ser. No. 181,508

Int. Cl.<sup>6</sup> C08K 5/24

U.S. Cl. 524—266

14 Claims

1. A hot-melt silicone pressure sensitive adhesive composition, comprising
  - a silicone pressure sensitive adhesive selected from the group consisting of a mixture of (i) a hydroxyl-functional organopolysiloxane resin comprising R<sub>2</sub>SiO<sub>1/2</sub> siloxane units and SiO<sub>4/2</sub>, wherein R is selected from a monovalent radical selected from the group consisting of hydrocarbon and halogenated hydrocarbon radicals having 1 to 20 carbon atoms and (ii) a hydroxyl-terminated diorganopolysiloxane polymer containing repeat units of R<sub>2</sub>SiO<sub>2/2</sub> siloxy units wherein R is independently selected from a monovalent radical selected from the group consisting of hydrocarbon and halogenated hydrocarbon radicals having 1 to 20 carbon atoms; and a condensed product of (i) and (ii);
  - the silicone pressure sensitive adhesive exhibiting tackiness and adhesiveness; the silicone pressure sensitive adhesive being blended with
  - (iii) from about 1 to 20 weight percent, based on the total weight of (i) and (ii) of a siloxylated polyether wax.

5,482,989

# CALCIUM PYROBORATE AS A MICROBICIDE FOR PLASTICS

Mark S. Koskineniemi, Memphis, Tenn., assignor to Buckman Laboratories International, Inc., Memphis, Tenn.

Filed Aug. 19, 1994, Ser. No. 293,217

Int. Cl.<sup>6</sup> C08K 3/38

U.S. Cl. 524—404

21 Claims

1. A plastic article formed from a plastic comprising a plastic premix and a microbicidally effective amount of calcium pyroborate.

5,482,990

# FLAME RETARDANT COMPOSITIONS

Jinder Jow, Branchburg, and David Gomolka, Manalapan, both of N.J., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Jan. 17, 1995, Ser. No. 373,591

Int. Cl.<sup>6</sup> C08K 3/22

U.S. Cl. 524—436

9 Claims

1. A composition comprising:
  - (a) one or more crosslinked ethylene/vinyl acetate copolymers, each copolymer having a vinyl acetate content in the range of about 10 to about 40 percent by weight based on the weight of the copolymer and an average melt index in the range of about 1 to about 50 grams per 10 minutes; and, for each 100 parts by weight of component (a),
  - (b) as a coupling agent, about 5 to about 85 parts by weight of a terpolymer of ethylene, an acrylic acid ester, and an anhydride of an unsaturated diacid containing about 0.5 to about 5 parts by weight of the anhydride per 100 parts by weight of terpolymer; and
  - (c) about 135 to about 370 parts by weight of a hydrated inorganic flame retardant filler.

5,482,991

# FLUOROALKYL SILOXANE/VINYL COPOLYMER DISPERSIONS AND PRESSURE-SENSITIVE ADHESIVES HAVING IMPROVED SOLVENT RESISTANCE PREPARED THEREFROM

Ramesh C. Kumar, Maplewood; Albert I. Everaerts, Oakdale, both of Minn., and Yvan A. Bogaert, Gent, Belgium, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 947,141, Sep. 18, 1992, Pat. No. 5,349,004.

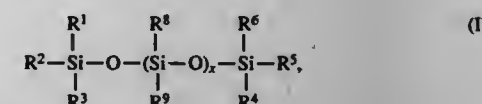
This application Sep. 16, 1994, Ser. No. 307,936

Int. Cl.<sup>6</sup> C08L 83/00

U.S. Cl. 524—506

7 Claims

1. An adhesive comprising a cured adhesive composition, wherein the adhesive composition comprises:
  - a dispersion comprising the polymerization product of a mixture comprising:
    - (a) about 5 to about 40 parts by weight of a fluoroalkyl siloxane of the formula



wherein:

- R<sup>9</sup> is independently selected from the group consisting of —CH<sub>2</sub>CH<sub>2</sub>R<sub>7</sub> and —R<sup>7</sup>,
- R<sub>7</sub> is a fluoroalkyl group independently selected from the group consisting of C<sub>m</sub>F<sub>2m-1</sub> and C<sub>n</sub>F<sub>(2n+1)-H<sub>q</sub>,</sub>
- m is an integer ranging from about 1 to about 20;
- n is an integer ranging from about 1 to about 20;
- q is an integer ranging from about 0 to about 2n;
- x is an integer of about 11 or greater;

the fluoroalkylsiloxane comprises 10 or greater —CH<sub>2</sub>CH<sub>2</sub>R<sub>7</sub> groups;

the fluoroalkylsiloxane comprises at least 1 R<sup>7</sup> group; wherein R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, and R<sup>8</sup> are each independently selected from the group consisting of alkyl groups comprising about 1 to about 12 carbon atoms, aralkyl, alkaryl, alkoxy, alkylamino, hydroxyl, fluoroalkyl, and hydrogen; and R<sup>7</sup> is an organic group having at least two carbon atoms wherein at least 1 olefinic moiety is contained within R<sup>7</sup>;

wherein the ratio of R<sup>7</sup> to —CH<sub>2</sub>CH<sub>2</sub>R<sub>7</sub> is such that the mole percent of the olefinic moiety content contributed by R<sup>7</sup> of the fluoroalkyl siloxane is between about 0.1 and about 4;

(b) about 60 to about 95 parts by weight of free radically polymerizable monomer, wherein the free-radically polymerizable monomer comprises:

- (i) about 1 to about 20 percent by weight of free radically polymerizable polar monomer; and
- (ii) about 80 to about 99 percent by weight of free radically polymerizable non-polar monomer;

wherein the weight percentages of (i) and (ii) are based upon the total weight of (i) plus (ii); and wherein the total weight of (a) plus (b) equals 100 parts by weight total;

(c) about 0.1 to about 1 part by weight of a free radical initiator based upon 100 parts by weight total of (a) plus (b);

(d) about 2 to about 10 parts by weight of a stabilizer based upon 100 parts by weight of total of (a) plus (b) wherein said stabilizer has a number average molecular weight ranging from about 8000 to about 25,000 and wherein said stabilizer is selected from the group consisting of:

- (i) a copolymer comprising (A) about 40 to about 60 parts by weight of monomer selected from the group consisting of vinyl esters of C<sub>1</sub> to C<sub>8</sub> monocarboxylic acids and C<sub>1</sub> to C<sub>12</sub> alkyl (meth)acrylates, and (B) about 60 to about 40 parts by weight of monomer selected from the group consisting of N-vinylpyrrolidone, acrylamide, N,N-dimethylacrylamide, N-vinylcaprolactam, and mixtures thereof wherein said copolymer stabilizer comprises 100 parts by weight total of the monomers of (i)(A) plus (i)(B); and (C) about 0.5 to about 5 weight percent of a chain transfer agent based upon the weight of the monomers of (i)(A) plus (i)(B);

- (ii) a macromonomer comprising the reaction product of the copolymer of (d)(i) wherein said chain transfer agent selected provides said copolymer with at least one functional group selected from the group consisting of —NH<sub>2</sub>, —COOH, —OH, and combinations thereof, with an endcapping agent selected from the group consisting of isocyanatoethyl methacrylate, alpha, alpha-dimethyl-metacrylate, benzylisocyanate, vinyl azlactone, para(chloromethyl) styrene, glycidyl methacrylate, and mixtures thereof, wherein at least about 95% of the functional groups selected from the group consisting of —NH<sub>2</sub>, —COOH, —OH, and combinations thereof, of the copolymer are reacted with the endcapping agent; and
- (iii) mixtures thereof; and

(e) about 30 to about 95 percent by weight of an organic solvent based upon the total weight of (a) plus (b) plus (c) plus (d) plus (e).

5,482,992

# ROOM TEMPERATURE QUICK CURABLE ORGANOPOLYSILOXANE COMPOSITION EXCELLENT IN WATER RESISTANCE

Tsuneo Kimura; Kei Miyoshi, and Masatoshi Arai, all of Matsuda, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1994, Ser. No. 328,515

Claims priority, application Japan, Jan. 26, 1993, 5-289922

Int. Cl.<sup>6</sup> C08J 3/00; C08K 3/20; C08L 83/00; C08G 77/00

U.S. Cl. 524—588

10 Claims

1. A room temperature quick curable composition, comprising



- (A) a diorganopolysiloxane or a polyoxyalkylene polymer wherein both ends of the molecular chain are blocked with a hydrolyzable silyl group and that has a viscosity of 25 to 1,000,000 centistokes at 25° C.,
- (B) a carbonyl compound having at least two carbonyl groups in the molecule, with one carbonyl group being in the beta position relative to the other carbonyl group, and
- (C) an organic compound having at least one NH<sub>2</sub> group in the molecule, with said components (B) and (C) being selected such that said carbonyl group in the beta position and the NH<sub>2</sub> group are reactive with each other.

5,482,993

# RUBBER COMPOSITION SUITABLE FOR GRIPS OF ARTICLES AND GRIP MADE THEREOF

Hideori Hiraoka, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Continuation of Ser. No. 63,545, May 19, 1993, abandoned.

This application Feb. 9, 1995, Ser. No. 386,181

Claims priority, application Japan, May 20, 1992, 4-154484

Int. Cl.<sup>6</sup> C08L 23/16; 9/00; C08F 132/04

U.S. Cl. 524—189

12 Claims

1. A rubber composition suitable for use in grips of articles, which comprises (1) a rubber component, said rubber component being a blend of an ethylene-propylene-diene rubber and a natural rubber wherein the ratio of ethylene-propylene-diene rubber to the natural rubber is from 30:70 to 80:20 by weight, (2) 2 to 40 parts by weight of a trans-polyoctenamer per 100 parts by weight of said blend, and (3) 5 to 80 parts by weight of a filler containing a hydrated aluminum silicate powder per 100 parts by weight of said rubber component.

5,482,994

# SILICONE/ORGANIC COPOLYMER EMULSIONS FROM PREFORMED ORGANIC EMULSIONS

Donald T. Liles; David L. Murray; Donald R. Weyenberg; Arthur J. Tselepis, all of Midland, and Anthony Revis, Freeland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed May 23, 1994, Ser. No. 247,802

Int. Cl.<sup>6</sup> C08K 3/34

U.S. Cl. 524—789

27 Claims

1. A method of forming a polymer latex, comprising the steps of: (I) providing a preformed emulsion polymer which is made from an organic monomer, a surfactant, an initiator and water, and (II) contacting said preformed emulsion polymer with an unsaturated alkoxy silane and additional initiator.

5,482,995

# GRAFTED BLOCK COPOLYMERS, PROCESS FOR THEIR MANUFACTURE AND USE OF THESE COPOLYMERS

Nicolas Krantz, Bernay, France, assignor to Elf Atochem S.A., France

Continuation of Ser. No. 173,701, Dec. 27, 1993, abandoned, which is a continuation of Ser. No. 424,351, Oct. 19, 1989, abandoned. This application Jan. 5, 1995, Ser. No. 369,863

Int. Cl.<sup>6</sup> C08F 283/02; 283/04; 283/06

U.S. Cl. 525—41

8 Claims

1. A grafted block copolymer which is a thermoplastic elastomer consisting essentially of a backbone and grafts of a polymerized monomer bonded thereto, wherein the backbone is a polyetheretheramide block copolymer and wherein said monomer is a member selected from the group consisting of vinyl chloride, vinylidene chloride, chlorotrifluoroethylene, alkyl (meth)acrylates, styrene,  $\alpha$ -methylstyrene, vinyl acetate, and mixtures thereof.

8. A grafted block copolymer which is a thermoplastic elastomer consisting essentially of a backbone and grafts of a polymerized monomer bonded thereto,

wherein the backbone comprises sequentially distributed flexible blocks of a polyether and rigid blocks selected from a polyamide, a polyester, or mixtures thereof and wherein said monomer is chlorotrifluoroethylene.

5,482,996

# PROTEIN-CONTAINING POLYMERS AND A METHOD OF SYNTHESIS OF PROTEIN-CONTAINING POLYMERS IN ORGANIC SOLVENTS

Alan J. Russell, Wexford, and Eric J. Beckman, Edgewood, both of Pa., assignors to University of Pittsburgh, Pittsburgh, Pa.

Filed Dec. 8, 1993, Ser. No. 165,712

Int. Cl.<sup>6</sup> C08L 89/00; C08G 63/48

U.S. Cl. 525—54.1

35 Claims

1. A water-insoluble copolymer comprising a biologically active protein attached to an organic-soluble comonomer via a spacer group, the spacer group having a number average molecular weight of at least 200, the spacer group being attached to the biologically active protein prior to polymerization with the comonomer to create a protein/spacer group conjugate, the spacer group being selected to prevent precipitation of the protein/spacer group out of an organic solvent in which the polymerization takes place, while maintaining the biological activity and the stability of the protein during polymerization of the protein/spacer group with the comonomer in the organic solvent.

5,482,997

# POLYAMIDE COMPOSITIONS

Wilhelmus A. M. Debets, Slittard, and Herman A. J. Schepers, Stein, both of, Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Continuation of Ser. No. 758,472, Sep. 6, 1991, abandoned,

which is a continuation of Ser. No. 369,501, Jun. 22, 1989,

abandoned. This application Feb. 14, 1994, Ser. No. 195,056

Claims priority, application Netherlands, Jun. 23, 1988, 8801593

Int. Cl.<sup>6</sup> C08L 77/00

U.S. Cl. 525—66

20 Claims

1. A polyamide composition which consists of (a) more than 45 wt. % polyamide, (b) 10–30 wt. % of an elastomer containing functional groups reactive with said polyamide, wherein the elastomer containing reactive groups is obtained by grafting a monomer onto at least one rubbery ethylene polymer, wherein said monomer is a compound selected from the class consisting of compounds having at least one functional group selected from the group consisting of a carboxyl group, an anhydride group, a sulphonic acid group and an acid chloride group, (c) 5–20 wt. % of a statistical styrene-maleic anhydride copolymer or a styrene-maleic anhydride-maleimide terpolymer obtained by replacing a portion of the maleic anhydride groups in a statistical styrene-maleic anhydride copolymer with maleimide groups, wherein maleic anhydride is present in an amount of 8–35 wt. % and (c) has a molecular weight of 50,000 to 500,000, wherein the amounts of components (a), (b), and (c) are based on the total of (a), (b), and (c); and, optionally (d), at least one additive selected from the group consisting of stabilizers, fillers, lubricants, mold release agents, colorants, softeners, and pigments.

5,482,998

# THERMOPLASTIC MOLDING MATERIALS BASED ON PARTLY AROMATIC COPOLYAMIDES AND POLYOLEFINS

Klaus Muehlbach, Gruenstadt; Petra Balerweck, Schlifferstadt; Wolfgang F. Mueller, Neustadt; Gerd Blinne, Bobenheim, and Gerhard Ramlow, Weinheim, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation of Ser. No. 900,472, Jun. 18, 1992, abandoned.

This application Aug. 8, 1994, Ser. No. 287,524

Claims priority, application Germany, Jun. 18, 1991, 41 20 007.1

Int. Cl.<sup>6</sup> C08L 77/10; 23/26

U.S. Cl. 525—66

9 Claims

1. A thermoplastic molding material containing

A) 4–94% by weight of a partly aromatic, semicrystalline copolyamide having a triamine content of less than 0.5% by weight and composed of

(A<sub>1</sub>) 20–90% by weight of units derived from terephthalic acid and hexamethylenediamine,

(A<sub>2</sub>) 0–50% by weight of units derived from  $\epsilon$ -caprolactam,

(A<sub>3</sub>) 0–80% by weight of units derived from adipic acid and hexamethylenediamine and

(A<sub>4</sub>) 0–40% by weight of further polyamide-forming monomers, the amount of components (A<sub>2</sub>) or (A<sub>3</sub>) or (A<sub>4</sub>) or of mixtures thereof being not less than 10% by weight,

B) 4–94% by weight of a polyolefin homo- or copolymer or a mixture thereof,

C) 2–20% by weight of a compatibility agent.

D) 0–20% by weight of a toughening polymer, if desired

E) 0–60% by weight of other additives and processing assistants.

5,482,999

# POLYMER MIXTURE WHICH COMPRISES A POLYPHENYLENE ETHER AND A STYRENE-CONTAINING POLYMER OR COPOLYMER, AS WELL AS PRODUCTS FORMED THEREFROM

Sarah E. Morgan, Evansville, Ind.; Charles F. Pratt, Brasschaat, Belgium; Cinzia A. R. di Fede, Putte, and Julia A. J. M. Verdult-van Aert, Huybergen, both of, Netherlands, assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 901,333, Jun. 19, 1992, abandoned.

This application Jan. 24, 1994, Ser. No. 185,724

Claims priority, application European Pat. Off., Jun. 19, 1991, 91110065

Int. Cl.<sup>6</sup> C08L 25/04; 71/12

U.S. Cl. 525—68

5 Claims

1. A polymer mixture which comprises a polyphenylene ether resin and a polystyrene-containing polymer or copolymer, characterized in that at least part of the polyphenylene ether resin is modified with reactive groups of a first type and that at least part of the polystyrene-containing polymer or copolymer is modified with reactive groups of a second type which are capable of reacting with the reactive groups of the first type;

wherein the polyphenylene ether resin is modified with acid groups or derivatives thereof;

wherein the polystyrene-containing polymer or copolymer is a polystyrene homopolymer, a rubber modified polystyrene, a high impact polystyrene, or a styrene-acrylonitrile copolymer; and

wherein the polystyrene-containing polymer or copolymer is modified with an oxazoline group or an epoxy group.

5,483,000

# VULCANIZABLE RUBBER COMPOSITION

Isamu Kaneko, Yamato, and Hiroki Kamiya, Yokohama, both of, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Continuation of Ser. No. 150,769, Nov. 12, 1993, abandoned, which is a continuation of Ser. No. 789,927, Nov. 12, 1991, abandoned. This application Mar. 13, 1995, Ser. No. 402,982

Claims priority, application Japan, Nov. 16, 1990, 2-308614; Nov. 16, 1990, 2-308617; Feb. 6, 1991, 3-036759; Jun. 7, 1991, 3-163720

Int. Cl.<sup>6</sup> C08L 27/12

U.S. Cl. 525—102

11 Claims

1. A vulcanizable rubber composition comprising:

(A) 100 parts by weight of a fluororubber polymer containing at least 10 mol % of vinylidene fluoride as co-monomer constituting a fluororubber polymer;

(B) from 0.1 to 300 parts by weight of an organic silicon compound having an amino group and alkenyl group; and

(C) an organic peroxide vulcanizing agent in an amount sufficient to vulcanize Component (A).

5,483,001

# THERMOPLASTIC COMPOSITIONS BASED ON ETHYLENE POLYMER AND POLYESTER

Marius Hert, Verneuil-en-Hallate, France, assignor to Norsolor, Paris, France

Continuation of Ser. No. 45,301, Apr. 12, 1993, abandoned,

which is a continuation of Ser. No. 543,793, Oct. 1, 1990,

abandoned. This application Oct. 25, 1994, Ser. No. 328,543

Claims priority, application France, Mar. 30, 1988, 88 04193

Int. Cl.<sup>6</sup> C08L 67/02; 35/00; 37/00

U.S. Cl. 525—166

15 Claims

1. Thermoplastic composition comprising at least 40% by weight and not more than 70% by weight of a crosslinked polymer phase which is a blend of

a) at least one copolymer of 96 to 55% by weight of ethylene, of 3 to 30% by weight of at least one alkyl or cycloalkyl acrylate or methacrylate in which the alkyl or cycloalkyl group contains from 1 to 10 carbon atoms, and of 1 to 15% by weight of at least one unsaturated epoxide,

b) at least one copolymer comprising from 84 to 55% of ethylene by weight, from 15 to 39% by weight of at least one alkyl or cycloalkyl acrylate or methacrylate in which the alkyl or cycloalkyl group contains from 1 to 10 carbon atoms, and from 1 to 6% by weight of at least one anhydride of an unsaturated dicarboxylic acid, copolymers (a) and (b) being crosslinked with

c) at least one compound capable of accelerating the reaction between the epoxy functional group present in the copolymer (a) and the anhydride functional group present in the copolymer (b), in an amount effective to accelerate the reaction between said epoxy functional group and said anhydride functional group,

with at least 30% by weight but not more than 60% by weight of at least one saturated polyester, the respective proportions of copolymers (a) and (b) in the said crosslinked polymer phase being such that the weight ratio (a)/(b) is between 0.1 and 10, said thermoplastic composition having

a tensile strength (according to ASTM standard D-638) of at least 14 MPa,

an elongation at break in the transverse direction (according to ASTM standard D-638) of at least 100% a torsional elasticity modulus (according to ISO standard 537) of at least 5 MPa, a dimensional stability at 150° C. (according to ASTM standard D-1204) not exceeding 10%, and

a notched Izod impact strength (according to ASTM standard D-256) of at least 1000 J/m (100 Kg\*cm/cm).



5,483,002

# PROPYLENE POLYMERS HAVING LOW-TEMPERATURE IMPACT STRENGTH

Stephan Seelert, Frankenthal; Franz Langhauser, Bad Dürkheim; Jürgen Kerth, Carlsberg; Patrik Müller, Kaiserlautern; David Fischer, Gönheim, and Günther Schweier, Friedelsheim, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Sep. 9, 1994, Ser. No. 303,717

Claims priority, application Germany, Sep. 10, 1993, 43 30 661.5

Int. Cl.<sup>6</sup> C08L 23/12

U.S. Cl. 525—240

7 Claims

1. A propylene polymer containing
  - A) a semicrystalline propylene homopolymer having a melting point of 125 to 165° C. and a glass transition temperature which is greater than -10° C. and
  - B) a semicrystalline propylene homopolymer having a melting point below 130° C. and a glass transition temperature which is less than or equal to -10° C. or a non-crystallizing propylene homopolymer having a glass transition temperature which is less than or equal to -10° C.

5,483,003

# THERMOPLASTICALLY PROCESSIBLE ELASTOMERS WITH IMPROVED OPTICAL PROPERTIES

Werner Siol, Darmstadt, and Klaus Koralewski, Riedstadt, both of, Germany, assignors to Roehm GmbH Chemische Fabrik, Darmstadt, Germany

Filed Mar. 18, 1994, Ser. No. 214,491

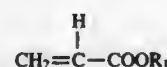
Claims priority, application Germany, Mar. 26, 1993, 43 09 853.3

Int. Cl.<sup>6</sup> C08L 33/10; 33/08

U.S. Cl. 525—309

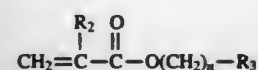
3 Claims

1. A thermoplastically processible elastomer composition comprising 40–100 wt. % of a comb polymer of improved optical properties, said polymer having a molecular weight greater than 50,000 Daltons, said comb polymer comprising a main chain having macromonomer side chains pendant therefrom, said macromonomer containing a terminal unit with a radically polymerizable group, said group constituting a monomer unit of said main chain, said comb polymer main chain comprising:
  - (A) 5–50 wt. % of a hydrophobic macromonomer consisting essentially of polymerized methyl methacrylate or a polymerized copolymer of methyl methacrylate with comonomers chosen from other (meth)acrylic acid esters and styrenes, wherein said macromonomer contains a terminal unit with a radically polymerizable group, and has a glass transition temperature  $T_g$  of at least 60° C., a molecular weight in the range 500–100,000 Dalton, and an index of refraction in the range  $n_D = 1.48–1.50$ ;
  - (B) 5–90 wt. %, based on the total weight of said comb polymer, of monomers or monomer mixtures of formula I:



where  $R_1$  is a  $C_1$ – $C_{12}$ -alkyl group; and

- (C) 5–50 wt. %, based on the total weight of said comb polymer, of a phenyl group-containing radically polymerizable monomer of formula III,



where  $R_2$  represents hydrogen or methyl,  $R_3$  represents a phenyl group or a phenyl group substituted by one or two  $C_1$ – $C_4$  alkyl groups and  $n$  represents 0, 1, 2, or 3.

5,483,004

# ACRYLATE COPOLYMER AND PROCESS FOR THE PRODUCTION THEREOF

Peter Hoffmann, Senden, and Michael Brünneemann, Münster, both of, Germany, assignors to BASF Lacke + Farben AG, Münster-Hiltrup, Germany

PCT No. PCT/EP92/02259, § 371 Date Mar. 30, 1994, § 102(e) Date Mar. 30, 1994, PCT Pub. No. WO93/07190, PCT Pub. Date Apr. 15, 1993

PCT Filed Sep. 30, 1992, Ser. No. 211,407

Claims priority, application Germany, Jan. 9, 1991, 41 33 420.5

Int. Cl.<sup>6</sup> C08F 226/06; 220/60

U.S. Cl. 525—326.7

22 Claims

1. Acrylate copolymer containing functionalities selected from the group consisting of amino groups, carboxyl groups, hydroxyl groups and mixtures thereof, obtained by copolymerizing in an organic solvent at temperatures between 80° and 150° C., using polymerization initiators and using at least one ethylenically unsaturated monomer having a tertiary amino group, characterized in that the acrylate copolymer is produced by
  - A) free-radical solution polymerization, using polymerization initiators at temperatures from 80° to 150° C., of
    - a<sub>1</sub>) 1 to 20% by weight of vinylimidazole and/or dimethylaminopropylmethacrylamide,
    - a<sub>2</sub>) one or more monomers containing hydroxyl groups, wherein the monomers are present in an amount up to 50% by weight,
    - a<sub>3</sub>) 0 to 50% by weight of one or more monomers containing carboxyl groups, and
    - a<sub>4</sub>) 30 to 85% by weight of at least one further ethylenically unsaturated copolymerizable monomer, the total of the proportions by weight of the components a<sub>1</sub> to a<sub>4</sub> always being 100% by weight; and
  - B) reacting the acrylate copolymer obtained in stage (A) with carboxylic acid anhydrides, wherein the quantity of carboxylic acid anhydrides employed is selected to provide the resulting copolymer with the desired acid number.

5,483,005

# PREPARATION OF POLYMERS WITH NLO-ACTIVE SIDE GROUPS AND THE USE THEREOF

Karl-Heinz Etzbach, Frankenthal, and Stefan Beckmann, Mannheim, both of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Nov. 4, 1993, Ser. No. 145,601

Claims priority, application Germany, Nov. 7, 1992, 42 37 639.4

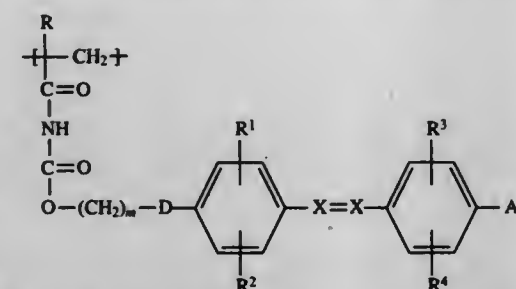
The portion of the term of this patent subsequent to Jan. 24, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> C08F 26/02

U.S. Cl. 525—328.2

8 Claims

1. A polymer comprising repeating units of the formula (II)

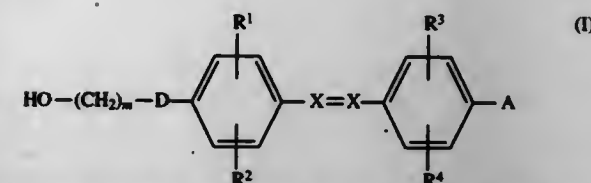


and having a molecular weight of from 5000 to 500,000, where D is an electron donor,

A is an electron acceptor,  $R^1$ ,  $R^2$ ,  $R^3$ , and  $R^4$  can be identical or different and are each H, alkyl of 1 to 6 carbons, cycloalkyl of 5 or 6 carbons, alkoxy of

1 to 4 carbons or  $R^3$  and  $R^4$  are each CN,  $\text{NO}_2$  or CHO or  $R^1$  and  $R^2$ , or  $R^3$  and  $R^4$ , together form a fused-on ring, X is CH and/or N

m is an integer from 2 to 11, which has been prepared by reacting polymers of (meth)acryloyl isocyanate in solution with D- $\alpha$ -hydroxyalkyl chromophores of the formula (I)



optionally wherein the reaction of the alcohols of the formula (I) with the polymers of (meth)acryloyl isocyanate is carried out so that isocyanate functionalities are still present in the polymer after said reaction.

5,483,006

# NITROSAMINE-FREE CURING OF CHLOROPRENE/SULFUR COPOLYMERS

Christian Ruepping, Petit-Lancy/GE, Switzerland, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del. PCT No. PCT/US93/01275, § 371 Date Aug. 18, 1994, § 102(e) Date Aug. 18, 1994, PCT Pub. No. WO93/17073, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 12, 1993, Ser. No. 284,657

Claims priority, application Germany, Feb. 22, 1992, 42 05 419.2

Int. Cl.<sup>6</sup> C08F 8/30

U.S. Cl. 525—331.1

8 Claims

1. A process for curing a chloroprene/sulfur copolymer, said copolymer having been peptized in an alkaline dispersion by a xanthogen disulfide peptizing agent, which comprises curing said copolymer in the presence of N-cyclohexyl-2-benzothiazyl-sulfenamide or mercaptobenzothiazole disulfide as an accelerator and in the absence of nitrosamine forming additives.

5,483,007

# CYCLIC PROCESS FOR ACTIVATION, USE AND RECOVERY OF PHASE-TRANSFER CATALYSTS

Kim L. Johnson, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 22, 1993, Ser. No. 51,479

Int. Cl.<sup>6</sup> B01J 31/40; C08G 65/32

U.S. Cl. 525—403

13 Claims

1. A process for making 3,6-dioxadecyl thiocyanate by phase transfer catalysis comprising the steps of:

(a) reacting 3,6-dioxadecyl chloride with a nucleophile in a liquid organic phase in which no water is added thereto, said nucleophile being derived by:

- (1) metathesis of a water-miscible, thermally stable, cationic phase transfer catalyst selected from the group consisting of quaternary ammonium salts and pyridinium salts with an amount of sodium thiocyanate nucleophilic precursor, said phase transfer catalyst having less than 16 carbon atoms per nitrogen atom, and a cationic portion with at least 10 carbon atoms per nitrogen atom, and said amount of nucleophilic precursor being in excess of the stoichiometric amount required to displace the leaving groups of the 3,6-dioxadecyl chloride;
- (2) followed by activation of the product of step (a) (1) by separating water from the product;
- (b) extracting the 3,6-dioxadecyl thiocyanate from the product of step (a) with extracting agent comprising water, thereby forming;

- (1) an aqueous phase comprising the phase transfer catalyst and a by-product salt, and
- (2) an organic phase comprising the 3,6-dioxadecyl thiocyanate;

- (c) separating phases (b) (1) and (b) (2) to recover the organic phase comprising the 3,6-dioxadecyl thiocyanate;
- (d) treating the separated aqueous phase resulting from step (c) with a partially water-miscible alcohol having 4 to 6 carbon atoms and salting agent, the phase transfer catalyst being more soluble in said alcohol and salting agent than it is in an aqueous solution of the salting agent, thereby forming:

- (1) an alcohol phase comprising the phase transfer catalyst and water, and
- (2) an aqueous phase comprising the by-product salt and salting agent;

- (e) separating phases (d) (1) and (d) (2);
- (f) mixing the separated alcohol phase from step (d) with a replenishing amount of said nucleophilic precursor in order to metathesize the phase transfer catalyst with said nucleophilic precursor;

- (g) separating the water and alcohol from the mixture of step (f) thereby forming the nucleophile;
- (h) recycling the so-formed nucleophile of step (g) to step (a); and, if necessary in order to obtain an effective amount of said nucleophile to promote the conversion of the 3,6-dioxadecyl chloride to the 3,6-dioxadecyl thiocyanate, adding nucleophile derived by the process of steps (a) (1) and (a) (2);

- (i) recycling the separated alcohol from step (g) to step (d); and
- (j) repeating steps (a) through (i) to make a desired amount of said 3,6-dioxadecyl thiocyanate.

5,483,008

# POLYETHER HAVING HETEROFUNCTIONAL GROUPS AT BOTH ENDS, PROCESS FOR THE PREPARATION THEREOF AND POLYMERIZATION INITIATOR THEREFOR

Yasuhisa Sakurai, Tokyo; Tetsuo Okano, Ichikawa; Masayuki Yokoyama, Matsudo; Kazunori Kataoka, Kashiwa; Yukio Nagasaki, Kashiwa; Nobuyuki Ohnaka, Kashiwa, and Masao Kato, Tsukuba, all of, Japan, assignors to Research Development Corporation of Japan, Japan

Filed Feb. 5, 1993, Ser. No. 14,285

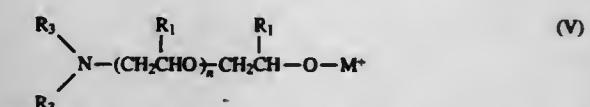
Claims priority, application Japan, Feb. 7, 1992, 4-023015; Jan. 22, 1993, 5-009168

Int. Cl.<sup>6</sup> C08G 65/10; 65/26; 65/32

U.S. Cl. 525—408

30 Claims

25. A process for preparing a polyethylene alkoxide metal salt suitable for preparing a polymerized polyether having two different terminal groups, said metal salt have the structure of formula (V):



wherein  $R_1$  is selected from the group consisting of hydrogen, alkyl groups, aryl groups, and aralkyl groups,  $\text{M}^+$  is an alkali metal ion,

$R_3$  is trialkylsilyl or both  $R_3$  groups taken in combination with the nitrogen atom bonded thereto form a phthalimide group, and

$n$  is 5 to 10,000, comprising: polymerizing an epoxy compound represented by the following formula (IV):

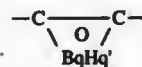






group consisting of saturated aliphatic, unsaturated aliphatic, aromatic, fluorocarbon moieties and mixtures thereof;

(4)



represents a carboranyl group;

(5) q and q' are integers from 3 to 16;

(6) x and x' represent integers greater than or equal to zero;

(7) A is selected from the group consisting of O, an aliphatic bridge, an aryl bridge and mixtures thereof;

(8) E is selected from the group consisting of O, an aliphatic bridge, an aryl bridge and mixtures thereof; and

(9) wherein E and A may be the same or different.

## ELECTRICAL

5,483,018

AUTOMATIC ARRANGEMENT APPARATUS INCLUDING  
SELECTED BACKING PART PRODUCTION

Eiichi Aoki, Hamamatsu, and Kazunori Maruyama, Tokyo,  
both of, Japan, assignors to Yamaha Corporation, Japan

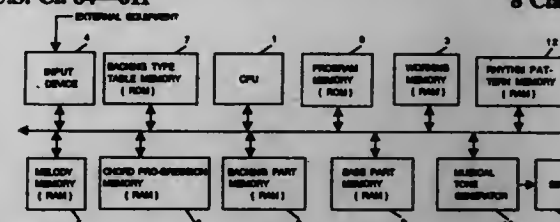
Filed Mar. 22, 1994, Ser. No. 215,788

Claims priority, application Japan, Mar. 23, 1993, 5-064341

Int. Cl.<sup>6</sup> G10H 1/38; 1/42; 1/46

U.S. Cl. 84-611

8 Claims



1. An automatic arrangement apparatus, comprising:

first input means for applying performance data of a basic performance part for arrangement to a musical tune to be arranged;

second input means for applying arrangement condition data indicative of a desired performance for arrangement to the musical tune, wherein the arrangement condition data includes at least one of performance style data, loudness of musical tone data and musical feeling data;

first performance data production means for producing first performance data with an algorithm suitable for expression of a desired rhythmic feeling based on the performance data of the basic performance part;

second performance data production means for producing second performance data with an algorithm suitable for expression of a non-rhythmic feeling different from the rhythmic feeling based on the performance data of the basic performance parts; and

selection means for selecting either said first or second performance data in accordance with the arrangement condition data as selected performance data of a performance backing part.

5,483,019

UTILITY STRUCTURE HAVING A UTILITY POLE AND A  
CLOSURE APPARATUS

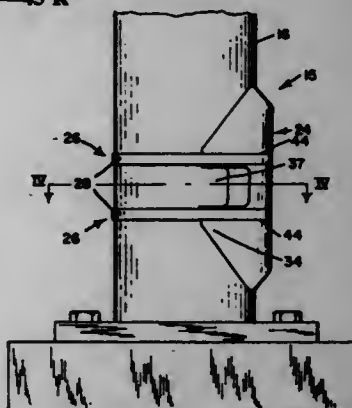
Paul T. Tourigny, Leominster, Mass., assignor to Angel Guard  
Products, Inc., Worcester, Mass.

Filed Sep. 13, 1993, Ser. No. 120,479

Int. Cl.<sup>6</sup> H02G 7/20

U.S. Cl. 174-45 R

2 Claims



1. A utility structure comprising:

(a) a utility pole having an outer cylindrical surface, an interior chamber and an access port to the chamber;

(b) a removable cover which has a closed position when mounted on the outer cylindrical surface of said utility pole for closing said access port;

(c) a metal strap for surrounding said utility pole and engaging said cover in said closed position;

(d) locking means for securing said strap in a tight band against the utility pole and said cover for fixedly maintaining said cover in said closed position; and

(e) said removable cover comprising:

(1) a central wall portion which is adapted to lie in front of said access port when said cover is in said closed position on said utility pole;

(2) a pair of opposite side wall portions each of said side wall portions having a concave curved inner surface which extends along a radial curve which is generated from a vertical axis, each of said side wall portions having a substantially straight outer surface which is substantially tangential to said radial curve and to the cylindrical outer surface of said utility pole, the inner and outer surfaces of each of said side wall portions extending from said central wall portion and converging toward a free end, so that when said cover is in said closed position on the utility pole, the cylindrical surface of the utility pole is closely engaged by said concave curved inner surfaces at opposite sides of the access port of the utility pole so that there is a minimum gap between the strap and said outer surface of the utility pole between the points where the strap extends from the cover to the outer cylindrical surface of said utility pole, said central and side wall portions of said cover defining a continuous outer surface which has a substantially horizontal groove for receiving said strap so that the portion of said strap which engages said cover lies entirely within said groove.

5,483,020

## TWIN-AX CABLE

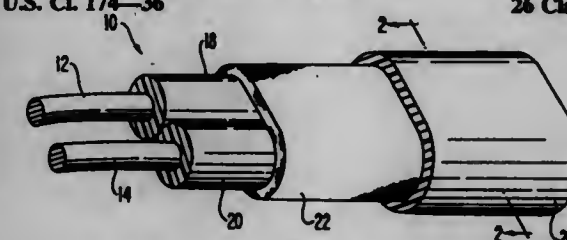
William G. Hardie, and Craig R. Theorin, both of Landenberg,  
Pa., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Apr. 12, 1994, Ser. No. 226,747

Int. Cl.<sup>6</sup> H01B 7/34

U.S. Cl. 174-36

26 Claims



1. A high speed data transmission cable having a length comprising:

a first electrical conductor;

a second electrical conductor, said second conductor extending substantially parallel with respect to said first conductor; insulation disposed at least between said first and second conductors at least electrically insulating said first conductor from said second conductor, said insulation comprising a foamed polymer; and

a plurality of electrically conductive strands interwoven to form a shield surrounding said first conductor, said second conductor and said insulation, said insulation further electrically insulating said strands from said conductors;

wherein the cable is constructed of materials and configured to maintain said first and second conductors in substantially parallel relation over the length of the cable; and

wherein differential signals transmitted by way of said first and second conductors experience low skew between said first and second conductors.

5,483,021

## FLAT CABLE

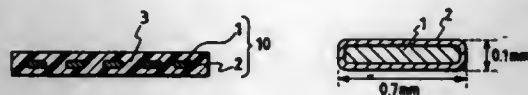
Haruo Saen, and Ryuzo Suzuki, both of Tochigi, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan  
Filed Apr. 4, 1994, Ser. No. 222,306

Claims priority, application Japan, Apr. 6, 1993, 5-078397;  
Jul. 26, 1993, 5-183994

Int. Cl.<sup>6</sup> H10B 7/08

U.S. Cl. 174-117 FF

8 Claims



1. A laminated flat cable comprising:  
a plurality of flat conductors,  
wherein each of said flat conductors is uniformly coated with an anticorrosion plating having a predetermined thickness over an entire periphery thereof.

5,483,022

## IMPLANTABLE CONDUCTOR COIL FORMED FROM CABLED COMPOSITE WIRE

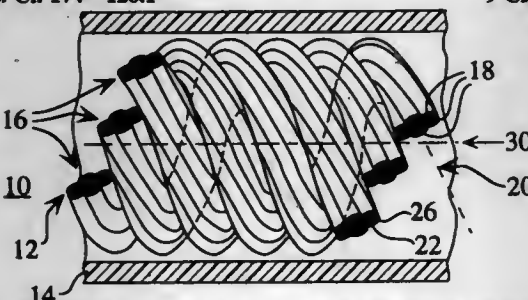
Craig E. Mar, Fremont, Calif., assignor to Ventritex, Inc., Sunnyvale, Calif.

Filed Apr. 12, 1994, Ser. No. 226,180

Int. Cl.<sup>6</sup> H01B 5/10

U.S. Cl. 174-128.1

9 Claims



1. A biomedical conductor device, for at least partial insertion in a human or animal body, comprising:  
at least one helical coil formed from at least one electrical cable, said cable being formed from a plurality of wires twisted in a ropelike configuration with at least a part of said wires being helically wound around a central axis of said cable so that the wires belonging to said cable are held together and are movable with respect to each other within certain limits; and  
each of said wires comprising a core of a first material, said core being surrounded by a covering of a second material over the length of said core, wherein all adjacent wires belonging to the same cable are in uninsulated contact with each other.

5,483,023

## HIGH VOLTAGE BUSHING FLANGE AND FLANGE TO INSULATOR JOINT

Gary R. Barnes, Delanson, N.Y., assignor to General Electric Co., Schenectady, N.Y.

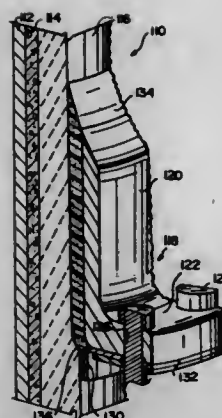
Filed Mar. 22, 1994, Ser. No. 215,836

Int. Cl.<sup>6</sup> H01B 17/26

U.S. Cl. 174-152 R

16 Claims

1. A high voltage bushing assembly comprising:  
an insulator sleeve adapted to fit over a conductor, an annular metal flange mounted on said sleeve, said mounting flange consisting of an axial portion and a radial portion located at one end of said axial portion, said axial portion joined to said sleeve by an adhesive layer, the composition and thickness of which is sufficient to decouple the relatively high thermal expansion of the sleeve from the relatively low thermal



- expansion of the mounting flange, said axial portion having a free end remote from said one end, said free end chamfered radially inwardly in a direction away from said radial portion; and  
an annular copper ferrule extending between said insulator sleeve and an underside of said radial portion.

5,483,024

## HIGH DENSITY SEMICONDUCTOR PACKAGE

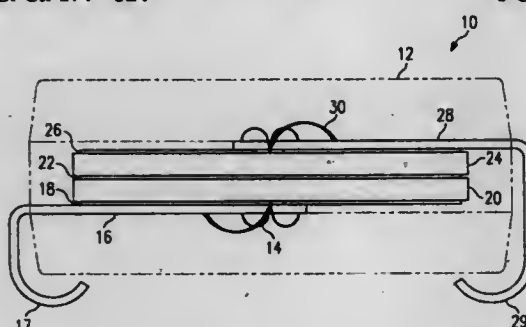
Ernest J. Russell, Richmond; Daniel A. Bandoun; Duy-Loan T. Le, both of Missouri City, and James Wallace, Sugar Land, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 8, 1993, Ser. No. 134,035

Int. Cl.<sup>6</sup> H01L 23/02

U.S. Cl. 174-524

6 Claims



1. A method for providing a semiconductor integrated circuit device having two semiconductor chips and two lead frames, said method comprising the steps of:  
providing a first and second lead frame, each lead frame having a plurality of leads;  
providing a first and second semiconductor chip, each semiconductor chip having a plurality of electrical interface points;  
electrically connecting each of the electrical interface points on the respective semiconductor chip to a corresponding lead on the respective lead frame;  
positioning the semiconductor chips and the lead frames such that the first and second semiconductor chips are side by side and sandwiched between the first and second lead frames;  
encapsulating the first and second semiconductor chips and a portion of each of the first and second lead frames in a package, wherein the remaining portion of the leads of the lead frames protrude from the package.

5,483,025

## UNITARY MICRO-FLEXURE STRUCTURE

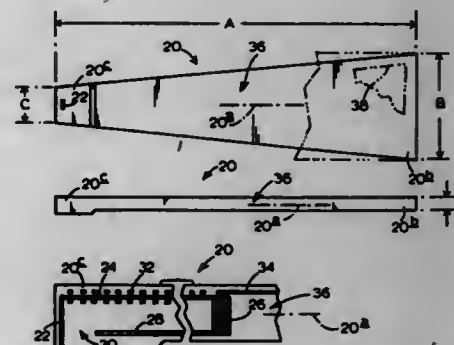
Harold J. Hamilton, Santa Clara, and Timothy W. Martin, Los Altos, both of Calif., assignors to Censtor Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 441,716, Nov. 27, 1989, Pat. No. 5,041,932, and a continuation of Ser. No. 990,005, Dec. 10, 1992, abandoned, which is a division of Ser. No. 746,916, Aug. 19, 1991, abandoned. This application May 15, 1995, Ser. No. 441,254

Int. Cl.<sup>6</sup> H05K 1/18

U.S. Cl. 174-254

12 Claims



1. A unitary micro-flexure structure comprising  
an elongate, spring-like flexure body having a plurality of  
adjoined solid layers including an integral electrical conductor  
structure extending lengthwise, and an end portion holding a  
magnetic pole structure.

5,483,026

## ROTARY SEISMIC SHEAR-WAVE SOURCE

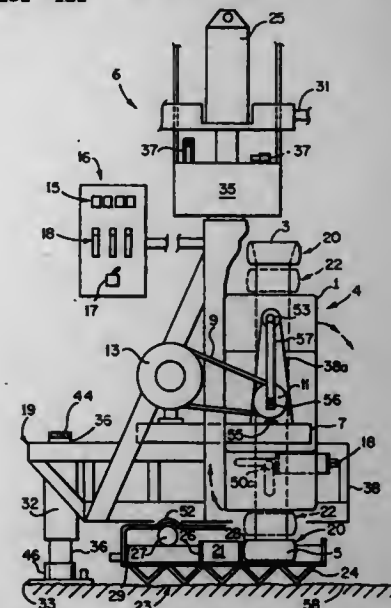
Wilfred P. Hasbrouck; Donald B. Hoover, both of Arvada; John C. West, Lakewood, and Dennis F. Capron, Arvada, all of Colo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Feb. 24, 1994, Ser. No. 201,449

Int. Cl.<sup>6</sup> G01V 1/04

U.S. Cl. 181-121

18 Claims



1. An apparatus for generating seismic waves in a ground comprising:  
a striker platform including a horizontal-impact assembly and a vertical-impact assembly both of which are engageable with the ground;

a rotator assembly mounted on the striker platform, the rotator assembly comprising a flywheel positioned for rotation in a vertical plane and two balanced hammers mounted on the flywheel and extending from opposite sides of the flywheel for selectively impacting the horizontal-impact assembly or the vertical-impact assembly; and  
a means for rotating the flywheel.

5,483,027

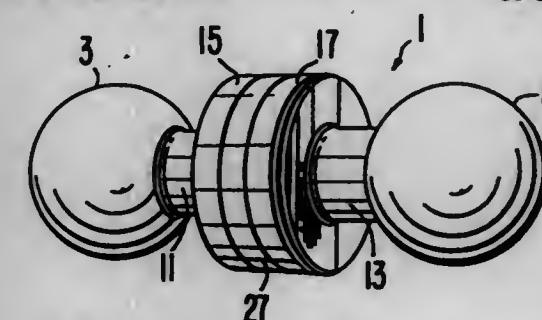
## EARPLUG WITH FORM-FITTING FLUID CHAMBERS

Ward B. Krause, 10518 N. River Dr., Spotsylvania, Va. 22553  
Filed Aug. 24, 1994, Ser. No. 294,946

Int. Cl.<sup>6</sup> A61B 7/02

U.S. Cl. 181-135

30 Claims



1. An ear protective device comprising:  
an outer body defining two resiliently expansible and collapsible fluid chambers;  
a quantity of fluid sealed within said outer body;  
an elongated relatively rigid core member extending within said outer body and serving to facilitate insertion of at least one of said fluid chambers into an ear canal;  
a passageway defined between said two fluid chambers for selectively placing said fluid chambers in fluid communication with each other;  
a two-way pressure responsive valve adjacent said passageway operative to close off said passageway and thereby isolate said fluid chambers from each other so as to maintain an equilibrium condition with one of said chambers expanded and the other of said chambers substantially collapsed, said valve being further operative to temporarily open said passageway when an expanded one of said fluid chambers is squeezed, thereby collapsing said expanded chamber and allowing the fluid therein to pass into and expand the other chamber.

5,483,028

## ACOUSTICAL BARRIER WITH DECOUPLER

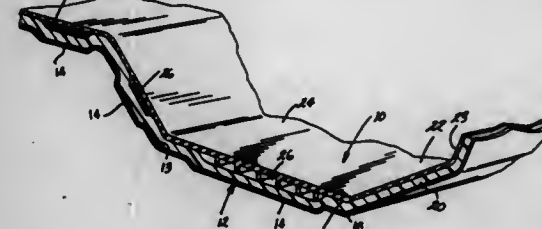
Matthew J. Holwerda, Hudsonville, Mich., assignor to Cascade Engineering, Inc., Grand Rapids, Mich.

Filed Nov. 14, 1994, Ser. No. 338,437

Int. Cl.<sup>6</sup> F16F 7/00

U.S. Cl. 181-207

16 Claims



1. An acoustical barrier adapted to mount to a barrier wall having at least one indentation, the acoustical barrier comprising:  
a mass layer having a molded construction and sound dampening characteristics, the mass layer having an upper surface,



which is relatively planar, and a lower surface, which is generally planar with at least one area of spaced projections; and

a decoupling layer of relatively uniform thickness having an inner surface in facing relationship to the lower surface of the mass layer and the at least one area of spaced projections forcing the decoupling layer away from the lower surface of the mass layer to form a protrusion on an outer surface of the decoupling layer, and the protrusion is adapted to conform to the at least one indentation of the barrier wall.

5,483,029

# METHOD OF OPERATION OF MOTOR MULTIPLE SWITCHES AND CIRCUITRY

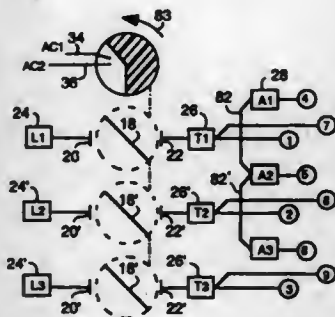
Lynn C. Lundquist, 10833 NE. Russell, Portland, Ore. 97220, and John D. Morris, 5800 N. Princeton St., Portland, Ore. 97203

Filed Dec. 18, 1992, Ser. No. 993,127

Int. Cl.<sup>6</sup> H01H 9/00

U.S. Cl. 200—1 R

21 Claims



1. A method of operating within a single enclosure immediately affixed to an electric motor, a terminal housing for field selectable motor tap connections and a power line disconnecting device, said method of operation comprising:

- a first step wherein external power supply lines feeding said electric motor are terminated onto two or more incoming line lug members on a power supply side of a disconnecting means, and further, wherein each of said incoming line lug members on said power supply side is electrically conductive with a respective line terminal member;
- a second step wherein electrical power connection taps of said electric motor are terminated onto two or more terminal lug members on a load side of said disconnecting means, and further, wherein each of said terminal lug members on said load side is electrically conductive with a respective rigid terminal member;
- a third step wherein a mechanically coupled rotary switching device causes to operate in unison two or more conductive members which are electrically isolated from each other, each of said conductive members being interposed between one of said connection terminals on said power supply side and one of said electrically common connection terminals on said load side;
- a fourth step wherein said rotary switching device is selectively and manually manipulated to close or open an electrical circuit between any electrically common pair of said electrically isolated connection terminal members on said power supply side with said respective electrically isolated motor terminal members on said load side; and
- a fifth step wherein space is provided within said single enclosure to accommodate and terminate on one or more motor terminal lugs said field selectable motor tap wires which are extraneous to the function of said rotary switching device but are requisite to the electrical connection of said electric motor.

## 5,483,030 GROUP OPERATED CIRCUIT DISCONNECT APPARATUS FOR OVERHEAD ELECTRIC POWER LINES

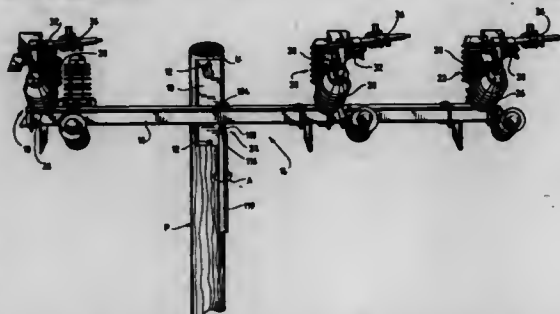
Ronald P. Bridges, 851 Rock Ledge Rd., Heber Springs, Ark. 72543

Filed May 10, 1994, Ser. No. 240,237

Int. Cl.<sup>6</sup> H01H 33/12; 9/38; 31/00

U.S. Cl. 218—12

37 Claims



13. A group operated electric circuit disconnect apparatus for a plurality of overhead electric power distribution lines carried on poles, comprising:

- a base;
- means for mounting the base to a pole; and
- at least two disconnect switches mounted on the base, at least one of said disconnect switches having a pair of spaced apart terminals, a conductive blade pivoted to one of said terminals, and jaw means conductively associated with the other of said terminals for selectively receiving said conductive blade to alternately connect and disconnect said terminals, said jaw means comprising a first pair of electrical contacts for receiving said conductive blade therebetween, backup springs adjacent outer surfaces of said first contacts for urging said first contacts toward each other, and a second pair of electrical contacts for making electrical contact with said conductive blade without the blade making electrical contact with said first pair of contacts.

14. The disconnect apparatus of claim 13 in which said second pair of contacts engage said switch blade at a location spaced from a location where said first pair of contacts engage said switch blade whereby arcing between said second pair of contacts and said switch blade does not prevent a conduction of current between said first pair of contacts and said switch blade.

5,483,031

## GAS-INSULATED DISCONNECTOR PROVIDED WITH STRUCTURE FOR SUPPRESSING METAL PARTICLES CONTAMINATION

Setsuyuki Matsuda, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1993, Ser. No. 147,487

Claims priority, application Japan, Nov. 5, 1992, 4-295714

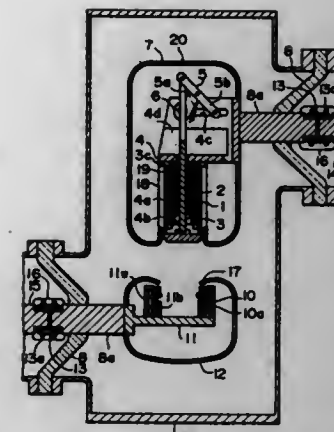
Int. Cl.<sup>6</sup> H01H 33/88

U.S. Cl. 218—48

13 Claims

1. A gas-insulated switchgear for disconnecting an electrical connection between a first outside conductor and a second outside conductor, said gas-insulated switchgear comprising:

- a housing filled with an insulating gas;
- a fixed contact disposed within said housing and electrically coupled to said first outside conductor;
- a shield substantially surrounding said fixed contact;
- an electrically conducting support member disposed within said housing and electrically coupled to said second outside conductor;
- a sliding contact secured on and electrically coupled to said support member;
- a cup-shaped movable contact in sliding contact with said sliding contact at an inner side surface thereof, said movable contact being engageable with said fixed contact;



link means operatively coupled to said movable contact, for moving said movable contact between a first position electrically in contact with said fixed contact and a second position separated from said fixed contact across a gap filled with said insulating gas; and

a particle remover disposed within said shield near said fixed contact for removing particles from an outer surface of said movable contact.

5,483,032

## HIGH VOLTAGE LOAD INTERRUPTER WITH SAFETY SYSTEM

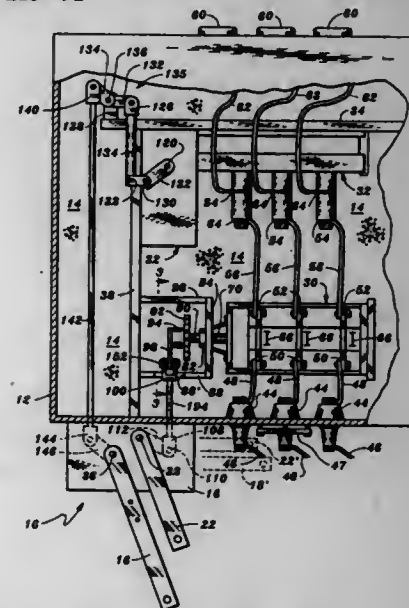
Frank C. Trayer, 25690 La Lanne Ct., and John P. Trayer, 25851 Vinedo Ln., both of Los Altos Hills, Calif. 94022

Filed Mar. 30, 1994, Ser. No. 220,727

Int. Cl.<sup>6</sup> H01H 33/42; 33/53; 33/66; 33/68

U.S. Cl. 218—91

4 Claims



1. A high-voltage load interrupter, comprising:
  - a tank containing a body of insulating oil;
  - an oil switch fixedly positioned in said tank and contained in said body of insulating oil;
  - a vacuum switch fixedly positioned in said tank;
  - a first stub shaft pivotably mounted in a first fluid-tight bearing which is itself fluid-tightly mounted in a wall of said tank;
  - a second stub shaft pivotably mounted in a second fluid-tight bearing which is itself fluid-tightly mounted in said wall of said tank;
  - a first switch operating handle affixed to the outer end of said first stub shaft and located outside of said tank;

a second switch operating handle affixed to the outer end of said second stub shaft and located outside of said tank;

first coupling means for coupling the inner end of said first stub shaft to said oil switch, whereby said oil switch may be operated between its open and closed positions by manipulating said first switch operating handle;

second coupling means for coupling the inner end of said second stub shaft to said vacuum switch, whereby said vacuum switch may be operated between its open and closed positions by manipulating said second switch operating handle;

said first and second switch operating handles being so juxtaposed when both are in their switch-closed positions that part of said second switch operating handle lies in the path of movement of part of said first switch operating handle and thus said first switch operating handle cannot be moved to its oil switch open position without moving said part of said second switch operating handle out of the path of said first switch operating handle.

5,483,033

## APPARATUS AND METHOD FOR SEQUENTIALLY REGISTERING TOOL MODULES FOR A WELDING OPERATION OF A TUBE

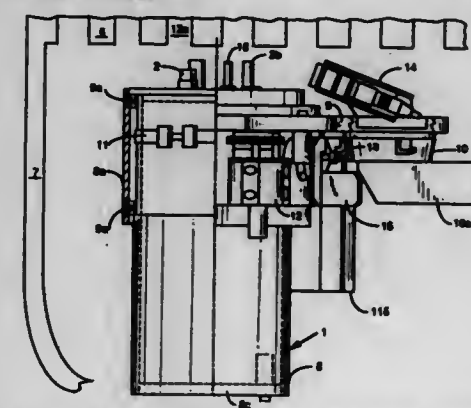
William E. Pirl, Penn Township, Westmoreland County, and Kurt K. Lichtenfels, Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 8, 1993, Ser. No. 133,428

Int. Cl.<sup>6</sup> B23K 26/08

U.S. Cl. 219—121.64

9 Claims



8. A method for remotely performing a welding operation of a sleeve within a lower portion of a damaged tube in a tubesheet area of a nuclear steam generator, the steps comprising:
  - employing frame means attached to a remotely operated robotic arm,
  - employing rotatable carousel means carried by said frame means which supports an alignment module with hydraulically operated pin means and several tool modules for a welding operation,
  - positioning said carousel means within said frame means and positioning said frame means by said robotic arm to dispose said pin means of said alignment module in the vicinity of said damaged tube to be worked on,
  - manually and remotely controlling and operating said pin means of said alignment module so as to insert said pin means of said alignment module into said damaged tube to be welded to obtain alignment of said carousel and therefor alignment of said tool modules relative to the same said damaged tube presently being worked on,
  - removing said pin means from said same damaged tube after said alignment of said carousel and said tool modules with said same damaged tube, and
  - after said removal of said pin means from said same damaged tube and said alignment of said carousel, sequentially rotating said carousel at a predetermined speed and automatically interrupting said rotation for the sequential operation of each of said tool modules relative to said same damaged tube for





contact with, said rear wall (340, 342), (ii) perpendicular to said first surface of said sheet of thin material, and contiguous therewith, and (iii) parallel with said vane, said slotted wall being located between said rear wall and said first surface of said sheet of thin material, said slotted wall defining at least first, second, and third spaced-apart, mutually parallel slots, each of which slots extends across said slotted wall from said rear wall to a location contiguous with said sheet of thin material, (c) first, second, and third movable gates, each of said first, second and third movable gates being dimensioned to fit through a corresponding one of said first, second, and third slots, and, when inserted into its slot, to extend from said slotted wall to be contiguous with said vane, and (d) control means coupled to said first, second, and third gates, for controlling said gates so that two of said gates are always in the inserted condition, to thereby define a chamber between (a) said sheet of thin material and said second sheet, (b) said vane, (c) said rear wall, (d) said slotted wall, and (e) said two of said gates, which chamber tends to retard the flow of gas between the interior and the exterior thereof; and

a gas source coupled to said chamber, for tending to flood said chamber with said gas, whereby said first sides of said sheet of thin material, and of said second sheet, and said butt region therebetween, which are adjacent to said welding means, are exposed to said gas.

5,483,040

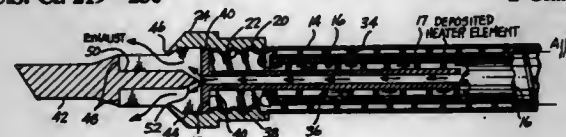
## ELECTRICALLY HEATED HOT GAS SOLDERING INSTRUMENT

William S. Fortune, 29866 Cuthbert Rd., Malibu, Calif. 90265  
Filed Feb. 5, 1993, Ser. No. 14,361

Int. Cl.<sup>6</sup> B23K 3/02; H05B 3/00; F24H 1/10

U.S. Cl. 219—230

2 Claims



1. A hot gas heated soldering tip for an electrically powered hand held soldering tool comprising:

a metal body having an axial length and a front, working end including a solder contacting surface and a rear, heat take up end, said body being formed with axial-radial slots extending from its said rear end forwardly thereof to a point at least midway along its length, said slots providing a plurality of elongate heat absorbing surfaces of the character to absorb thermal energy in a heat exchange relation with hot gas impressed upon said rear end of said body and flowing therefrom along said slots,

said body comprising a front portion terminated by said solder contacting surface of said working end, a mid portion of increased diameter, and a rear portion terminated by said heat take up end and having a further enlarged diameter portion forming a retaining shoulder, said slots extending from said rear end and at least partially through said mid portion.

5,483,041

## THERMOCOUPLE FOR A HORIZONTAL DIFFUSION FURNACE

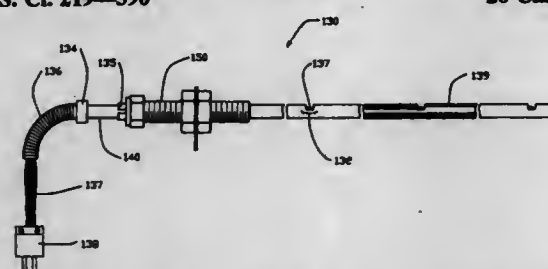
Kevin B. Peck, Soulsbyville, and Ronald E. Erickson, Jamestown, both of Calif., assignors to Thermtec, Inc., Sonoma, Calif.

Division of Ser. No. 898,552, Jun. 15, 1992. This application  
Apr. 21, 1994, Ser. No. 230,706

Int. Cl.<sup>6</sup> F27B 5/14

U.S. Cl. 219—390

26 Claims



10. An apparatus for measuring thermal energy in a high temperature horizontal diffusion furnace having a radio frequency interference energy field, comprising:

- a plurality of wire leads;
- a first layer surrounding a substantial portion of each wire lead allowing for a small exposure of each wire lead to thermal energy; and
- a second layer covering at least a portion of the first layer to form a conductive shield in order to minimize the effect of the radio frequency interference energy field.

5,483,042

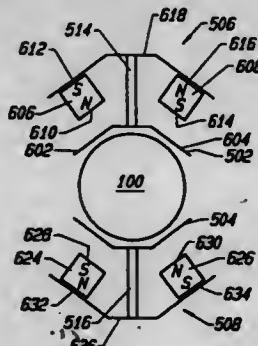
## MAGNETIC SEPARATOR

Robert A. Sprenger, Felton, and Ray C. Raffa, San Jose, both of Calif., assignors to Nordson Corporation, Westlake, Ohio  
Continuation-in-part of Ser. No. 832,987, Feb. 10, 1992, which is a continuation-in-part of Ser. No. 621,231, Nov. 30, 1990, abandoned, which is a continuation-in-part of Ser. No. 532,945, Jun. 4, 1990, abandoned. This application Nov. 20, 1992, Ser. No. 984,174

Int. Cl.<sup>6</sup> H05B 6/22

U.S. Cl. 219—647

60 Claims



1. Apparatus for spacing a plurality of substantially plate-like workpieces in face-to-face relationship along a substantially horizontal row, which workpieces are influenced by magnetic forces, said apparatus comprising a plurality of magnetic elements, each extending longitudinally along said row and being substantially horizontally oriented and disposed at different angular positions around said row, each particular one of said magnetic elements being disposed and oriented to prevent each given one of said workpieces from pivoting about a distal edge of said given workpiece due to the combined magnetic attraction of said given workpiece by all of said magnetic elements other than said particular magnetic element, said magnetic elements operating to space said workpieces apart along said row.

5,483,043

## INDUCTION HEATING OF POLYMER MATRIX COMPOSITES IN A MOLD PRESS

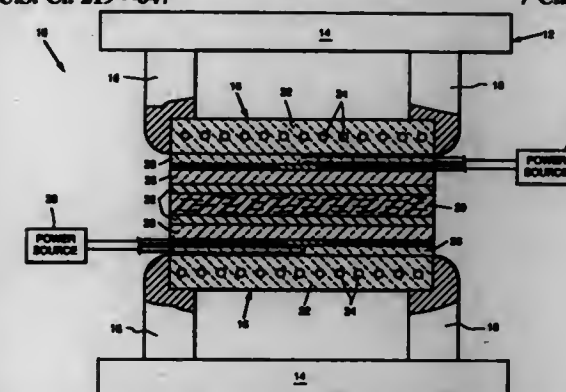
Philip C. Sturman, Jr., Rexford, N.Y., and Robert A. Gray, Cincinnati, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 29, 1993, Ser. No. 160,712

Int. Cl.<sup>6</sup> H05B 6/10

U.S. Cl. 219—647

7 Claims



1. An apparatus for heating a polymer matrix composite workpiece having electrically conductive fibers, said apparatus comprising:

- a mold having first and second cores positioned to receive said workpiece therebetween; and
- an induction heating element attached to a surface of said first core, said induction heating element comprising an induction coil encapsulated in a layer of non-electrically conductive material.

5,483,044

## MICROWAVE HEATING WITH HOT AND COLD AIR STREAMS

Nigel Thorneworth, Normandy, and Aubrey B. Jelly, Guildford, both of, England, assignors to Merrychef Limited, Hampshire, United Kingdom

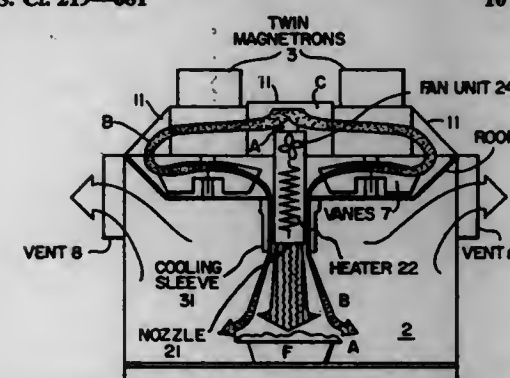
Filed Jun. 17, 1994, Ser. No. 261,547

Claims priority, application United Kingdom, Jun. 25, 1993, 9313171

Int. Cl.<sup>6</sup> H05B 6/80; 11/00

U.S. Cl. 219—681

10 Claims



1. Apparatus having a microwave oven cavity, said apparatus comprising:

- at least one microwave means for providing microwave energy in said microwave oven cavity
- at least one first supply means for downwardly supplying in said microwave oven cavity a column of hot air, downwardly directed to the region of an item to be heated by said microwave energy in said cavity; and at least one second supply means for downwardly supplying in said microwave oven cavity a downwardly directed column of cool air relative to said downwardly directed column of hot air,

said at least one second supply means being sufficiently surrounding and spaced apart from said at least first supply means such that said downwardly directed column of cool air is circumjacent said downwardly directed column of hot air so that said column of hot air is localized in said region by means of said column of downwardly directed cool air.

5,483,045

## MICROWAVE POWER SYSTEM AND METHOD WITH EXPOSURE PROTECTION

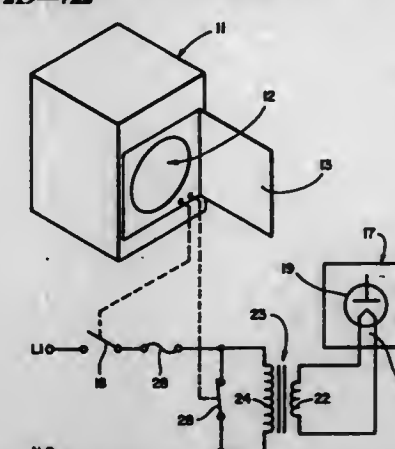
John E. Gerling, Medford, Oreg., assignor to Electric Power Research Institute, Palo Alto, Calif.

Filed Jun. 9, 1994, Ser. No. 257,067

Int. Cl.<sup>6</sup> H05B 6/68

U.S. Cl. 219—722

7 Claims



1. In a system for supplying microwave power to a cavity having a closure which can be opened to provide access to the interior of the cavity: a microwave generator having a separate low power filament circuit for delivering only filament current for the generator, an overcurrent protector through which only filament current normally passes for interrupting delivery of filament current to the generator in the event that the current through the protector exceeds a predetermined level, and means responsive to opening of the closure for applying a current in excess of the predetermined level to the overcurrent protector to cause an interruption in the delivery of microwave power to the cavity.

5,483,046

Patent Not Issued For This Number

5,483,047

## AUTOMATED TELLER MACHINE

Natarajan Ramachandran, Uniontown; Gerald T. Sedlock, North Canton; Kim R. Lewis, Stow; Charles D. Price, III, Salem, and Richard C. Lute, Jr., Mogadore, all of Ohio, assignors to Inter Bold, North Canton, Ohio

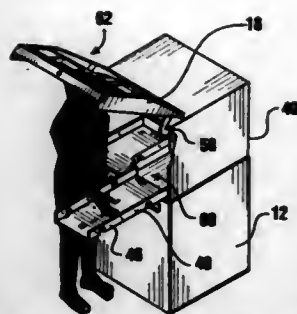
Filed Mar. 15, 1994, Ser. No. 213,404

Int. Cl.<sup>6</sup> G07F 9/00

U.S. Cl. 235—379

26 Claims

1. An automated teller machine comprising:  
a generally rectangular enclosure having a pair of spaced side walls and a top wall, said enclosure having a front opening and a rear opening defined by said walls;  
a permanent cover for generally closing a first one of said openings;  
a service door for selectively opening and closing said other of said openings; and



first and second independently movable component holding trays in said enclosure, said trays arranged in side by side relation in said enclosure between said side walls, each said tray selectively movably extendable out of said enclosure through either said front or rear opening associated with said service door when said service door is in the open position.

5,483,048

#### APPARATUS AND METHOD FOR READING AND WRITING VALUE DATA IN A CARD

Yuji Kobayashi, Saitama, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Continuation of Ser. No. 605,838, Oct. 30, 1990, abandoned.

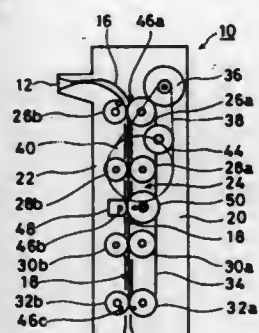
This application Nov. 12, 1992, Ser. No. 975,904

Claims priority, application Japan, Nov. 1, 1989, 1-286610; Nov. 7, 1989, 1-289211; Dec. 14, 1989, 1-325431

Int. Cl.<sup>6</sup> G06K 5/00

U.S. Cl. 235—380

11 Claims



1. A card handling apparatus, comprising:  
a card entering portion;  
reading means for reading data recorded in a card which is entered through said card entering portion;  
writing means for writing data in a card which is entered through said card entering portion;  
first means for controlling said writing means to write inspection data representative of invalidity of a card in a predetermined area of said card after the data is read by said reading means;  
second means for controlling said reading means to read the data from said predetermined area of said card after said inspection data is written by said writing means;  
judging means for outputting a signal representing that an abnormality has developed in said writing means when data read by said reading means under control of said second means from said predetermined area does not have a predetermined relationship with said inspection data; and  
third means for controlling said writing means to write renewal data in said card in response to said judging means failing to output said signal.

#### 5,483,049 COUPON EXCHANGING AND CHECK WRITING SYSTEM

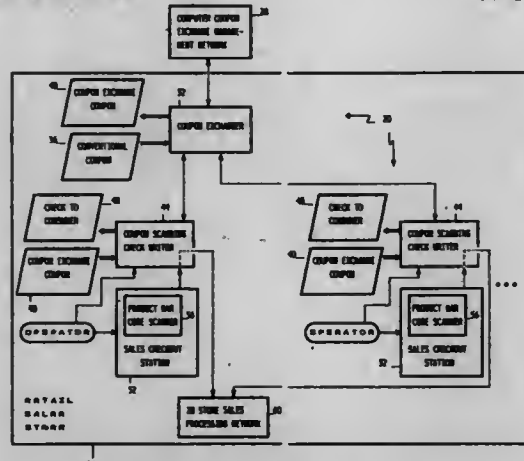
Everett E. Schulze, Jr., Aurora, Colo., assignor to In-Store Media Systems, Inc., Aurora, Colo.

Filed Feb. 7, 1994, Ser. No. 192,639

Int. Cl.<sup>6</sup> G06K 15/00

U.S. Cl. 235—383

37 Claims



1. A method related to coupons, comprising:  
providing at least a first conventional coupon that includes product information related to a first product;  
inputting said first conventional coupon to an apparatus used in outputting at least one exchange coupon;  
controlling whether an exchange coupon should be outputted by said apparatus using said inputted first conventional coupon;  
outputting by said apparatus at least a first exchange coupon that includes product information related to a second product, different from said first product, said apparatus being responsive to receiving said first conventional coupon wherein outputting of said first exchange coupon depends upon at least receipt of said first conventional coupon;  
purchasing said second product;  
ascertaining that said second product was purchased;  
redeeming, after said outputting step, said first exchange coupon and not redeeming said first conventional coupon based on said step of purchasing said second product.

5,483,050

#### MAGNETIC MEDIUM PROCESSING APPARATUS

Kazuo Fukasawa, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

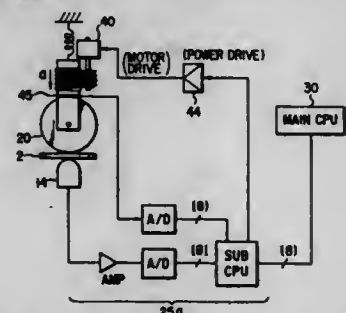
Filed Sep. 16, 1994, Ser. No. 306,958

Claims priority, application Japan, Sep. 16, 1993, 5-229961; Aug. 2, 1994, 6-181427

Int. Cl.<sup>6</sup> G06K 7/08

U.S. Cl. 235—449

13 Claims



1. An automatic checking apparatus for checking magnetic data stored in a magnetic card, comprising:  
transfer means for transferring the magnetic card;

a magnetic head for reading the magnetic data stored in the magnetic card transferred by the transfer means, and outputting a magnetic signal indicative of the read magnetic data;  
press means opposed to the magnetic head for pressing the magnetic card against the magnetic head;  
judging means for judging, on a basis of the magnetic signal from the magnetic head, whether or not the magnetic data satisfies conditions for passage through the automatic checking apparatus;  
first detecting means for detecting those peak values of the magnetic signal from the magnetic head, respectively;  
second detecting means for detecting changes in the peak values detected by the first detecting means; and  
moving means for moving the press means toward the magnetic head on a basis of the changes detected by the second detecting means.

5,483,051

#### LASER BAR CODE READER MEASURING PHASE OF THE PULSE LASER TO DETERMINE THE DISTANCE

Paolo Marchi, Imola, Italy, assignor to Datalogic S.p.A., Lippo Di Calderara Di Reno, Italy

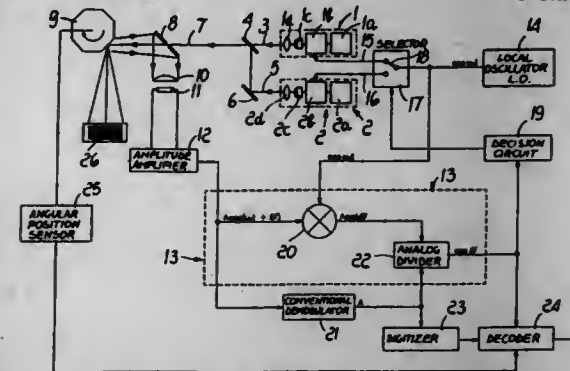
Filed Oct. 24, 1994, Ser. No. 327,749

Claims priority, application Italy, Nov. 4, 1993, B093A0440

Int. Cl.<sup>6</sup> G06K 7/10

U.S. Cl. 235—462

6 Claims



1. Laser scanner for reading characters printed with different reflectance values, particularly bar codes, comprising:  
at least two laser beam source units, each one provided with optical means for focusing the beam of one unit onto a near region and the beam of the other unit onto a distant region, said optical means being such that the beam generated by each unit coincides, in terms of direction and position, with the beam generated by the other unit, said near and distant regions forming said reading area and overlapping in an intermediate region;  
optical scanning means for periodically directing the coincident beam onto a reading area that contains said code;  
optical receiving means for collecting the light that returns from the scanning of the code and for providing an optical signal;  
sensor means for converting the optical signal into an electric signal;  
amplifier means connected to said sensor means and suitable to provide, in output, an amplitude signal that is proportional to the light received by the sensor means;  
two independent power supply and modulation circuits, each one coupled to one of said laser units and having an input for a modulating signal of preset frequency;  
a local oscillator for generating said modulating signal of preset frequency;  
a selector for sending said modulating signal to one or the other of said power supply circuits so that it emits a signal modulated at the frequency of said local oscillator;  
a phase demodulator for measuring the phase difference between the signal received from said amplifier means and the signal of said local oscillator, the result of this phase demodulation

being a signal that indicates the distance between the reading field scanned by the laser beam at that exact instant and said scanner;  
comparator means for comparing said distance signal to a reference signal that is equivalent to the distance of said intermediate region from said scanner and for providing signals suitable to activate, in real time, said selector into the position for activating the laser unit that is focused on the region containing the code;  
amplitude demodulation means connected to said amplifier means and providing a signal that is equivalent to the code that has been read;  
digitizer means connected to said amplitude demodulation means and providing pulses the duration of which matches the symbols of the code that has been read;  
decoder means connected to said digitizer means and to said phase demodulator and providing data that are equivalent to the content of the code that has been read and to its distance from the scanner.

5,483,052

#### SYSTEM FOR READING, STORING AND USING BAR-ENCODED DATA FROM A CODED BUSINESS CARD OR OTHER PRINTED MATERIAL

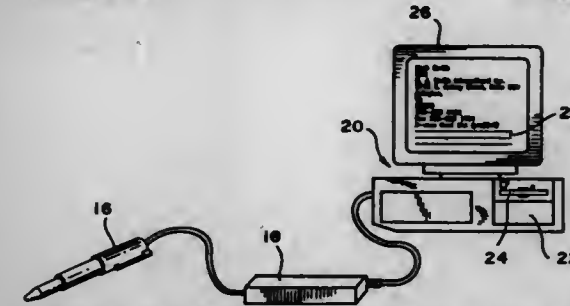
Herbert J. Smith, III, 9090 Eaton Park Rd., Great Falls, Va. 22066, and Thomas G. White, Jr., 2309 Popkins La., Alexandria, Va. 22306

Filed Dec. 7, 1993, Ser. No. 162,626

Int. Cl.<sup>6</sup> G06K 7/10

U.S. Cl. 235—472

11 Claims



1. A system for reading and storing data from a business card, comprising:  
a) a business card having printed business data and a bar code containing said business data, said data being divided into discrete fields;  
b) a portable bar code reader adapted to read said bar code;  
c) a computer coupled to said reader for storing and manipulating said data with respect to said fields and providing an output report;  
d) said reader including means for storing and downloading the read data to said computer;  
e) said reader is pen-shaped having a removable cap; and  
f) said cap including said storage and downloading means.

5,483,053

#### VARIABLE RESOLUTION COLOR IMAGE SCANNER HAVING AN EXPOSURE DELAY BETWEEN SUCCESSIVE LINEAR PHOTOSENSORS DETECTING DIFFERENT COLORS

Dan S. Johnson, Greeley, and Wayne G. Phillips, Loveland, both of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 27, 1994, Ser. No. 312,594

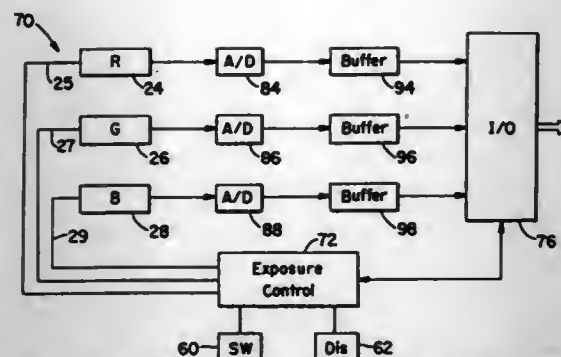
Int. Cl.<sup>6</sup> G01J 3/50

U.S. Cl. 250—226

10 Claims

1. A method of scanning an object at a predetermined resolution along a scanning direction with color scanner apparatus having M





linear photosensors positioned in parallel, spaced-apart relation, each of the M linear photosensors having a width and being characterized by a single master linear photosensor and (M-1) slave linear photosensors, each of the linear photosensors being exposed for an exposure time, comprising the steps of:

- calculating an exposure delay time for each of the (M-1) slave linear photosensors;
- at a start scan time, exposing the master linear photosensor for the exposure time; and
- exposing each of the (M-1) slave linear photosensors for the exposure time, the exposure time for each of the (M-1) slave linear photosensors being delayed from the start scan time by the exposure delay time calculated for each of the respective (M-1) slave linear photosensors.

5,483,054

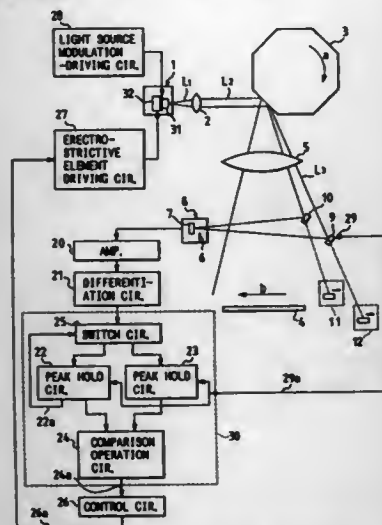
**CONVERGING POSITION DETECTING APPARATUS WITH A SINGLE PHOTODETECTING ELEMENT**  
Masaki Hachisuga, Saitama, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1994, Ser. No. 220,505

Claims priority, application Japan, Apr. 1, 1993, 5-096454  
Int. Cl.<sup>6</sup> H01J 40/14

U.S. Cl. 250—235

7 Claims



1. A converging position detecting apparatus in a scanning optical apparatus which scans a scanning surface by a light beam emitted from a light source and converged onto the scanning surface, comprising:

- photodetecting means having only a single photodetecting element located outside a scanning region of the laser beam for the scanning surface, for detecting the light beam; and
  - light deflecting means located outside the scanning region, for directing the light beam to the photodetecting means along two optical paths;
- the photodetecting means and the light deflecting means being so arranged that lengths of the two optical paths are equal to

respective lengths of two imaginary optical paths to predetermined positions spaced from the scanning surface in opposite directions perpendicular to the scanning surface, whereby the output of the photodetecting means controls the converging position of the scanning beam.

5,483,055

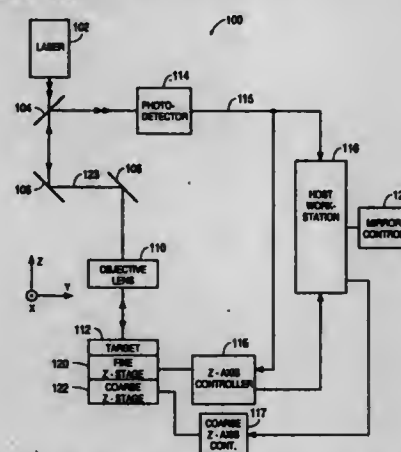
**METHOD AND APPARATUS FOR PERFORMING AN AUTOMATIC FOCUS OPERATION FOR A MICROSCOPE**  
Timothy V. Thompson, 1220 N. Bascom Ave., #8, San Jose, Calif. 95128; Christopher R. Fairlay, 809 Harding Ave., San Jose, Calif. 95126, and Ken K. Lee, 1326 Morton Ave., Los Altos, Calif. 94024

Filed Jan. 18, 1994, Ser. No. 183,536

Int. Cl.<sup>6</sup> G01J 1/20

U.S. Cl. 250—201.3

23 Claims



1. A method for automatically focusing a microscope, comprising the steps of:
- continuously moving a target relative to a lens of the microscope, the target being moved in a first direction through a first distance;
- continuously generating an electronic focus signal during movement of the target, the magnitude of the electronic focus signal being a function of the magnitude of light reflected from a surface of the target through an optical path of the microscope;
- comparing the absolute value of the magnitude of the electronic focus signal to a threshold value; and
- stopping the movement of the target when the absolute value of the magnitude of the electronic focus signal exceeds the threshold value.

5,483,056

**METHOD OF PROJECTING EXPOSURE WITH A FOCUS DETECTION MECHANISM FOR DETECTING FIRST AND SECOND AMOUNTS OF DEFOCUS**

Yuji Imai, Ohmiya, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Oct. 7, 1994, Ser. No. 319,634

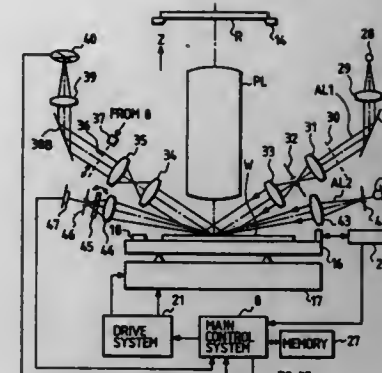
Claims priority, application Japan, Jan. 12, 1993, 5-254019

Int. Cl.<sup>6</sup> G01J 1/20

U.S. Cl. 250—201.4

39 Claims

1. An exposure method of detecting, by a focus detection mechanism, the amount of difference of a measuring point on a substrate in the axial direction of a projection optical system, with reference to the focal plane of said projection optical system, and moving said substrate to a predetermined height by a Z-stage loaded with said substrate and movable in the axial direction of said projection optical system, based on the detected value of said focus detection mechanism, thereby exposing a shot area on said substrate to the projected image of a pattern on a mask, comprising:



- a first detection step for detecting, by said focus detection mechanism, a first amount of defocus which is the amount of difference, in the axial direction of said projection optical system, between the focal plane of said projection optical system and a predetermined measuring point in said shot area;
- a second detection step for detecting, by said focus detection mechanism, a second amount of defocus which is the amount of difference, in the axial direction of said projection optical system between the focal plane of said projection optical system and the surface of an area, within said shot area, where the projected image of the pattern of said mask has the narrowest line width;
- a calculation step for calculating the offset which is the difference between said first and second amounts of defocus; and
- a determination step for determining the detection value of said focus detection mechanism by correcting the first amount of defocus with said offset.

5,483,057

**GLASS COLOR SENSOR UNIT**

Michael Gross; Norbert Stelte, both of Überlingen; Dietmar Schmidt, Uhldingen-Mühlhofen, and Hans Kordulla, Owingen, all of Germany, assignors to Bodenseewerk Geratetechnik GmbH, Überlingen/Bodensee, Germany

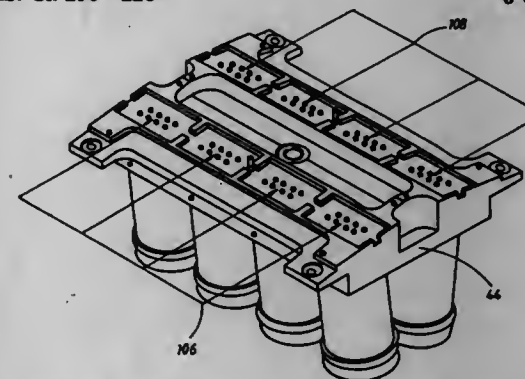
Filed Jul. 1, 1994, Ser. No. 269,510

Claims priority, application Germany, Jul. 9, 1993, 43 22 865.8

Int. Cl.<sup>6</sup> G01J 3/50; H01J 5/16; 40/14

U.S. Cl. 250—226

6 Claims



1. A sensor unit for measuring the color of glass moving past in a conveying plane on a conveying path, comprising:
- a set of first substantially cylindrical tubes defining respective lengthwise axes,
- a set of second substantially cylindrical tubes defining respective lengthwise axes,
- each first tube forming a pair with an associated second tube, the axes of said first and second tubes of each pair intersecting and forming an angle, said intersecting axes defining a longitudinal plane,

a plurality of said pairs being arranged side by side transversely to said longitudinal planes, each of said tubes holding an optical lens system, one filter and being aligned with a group of photoelectric detectors, said photoelectric detectors of said group being arranged in two staggered rows transverse to said longitudinal plane, the transmission characteristics of said filters in said first tubes being different from the transmission characteristics of the filters in said second tubes, the optical systems and photoelectric detectors of said first and second tubes of each pair being arranged to image each detector of said first tube substantially at the same location as an associated detector of said second tube, whereby, in turn, said same location is imaged on both detectors, said axes of all pairs of tubes intersecting on a straight line transverse to said longitudinal planes and lying in a plane, said images of said detectors being formed in said plane along said straight line.

5,483,058

**HIGH ANGULAR SENSITIVITY, ABSOLUTE ROTARY ENCODING DEVICE WITH POLYGONAL MIRROR AND STAND-ALONE DIFFRACTION GRATINGS**

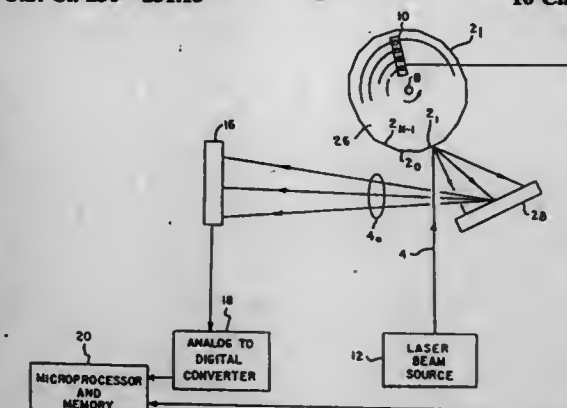
Douglas B. Leviton, Dunkirk, Md., assignor to The United States of America as represented by the Administrator, National Aeronautics & Space Administration, Washington, D.C.

Filed Oct. 18, 1993, Ser. No. 137,706

Int. Cl.<sup>6</sup> G01D 5/34

U.S. Cl. 250—231.13

16 Claims



1. A device for encoding the angular displacement of a rotating shaft about its axis of rotation comprising:

- a polygonal mirror having a plurality of facets thereon affixed to said shaft;
- a monochromatic light beam directed towards said facets;
- said facets of said polygonal mirror each reflecting said light beam to a stand alone low line density diffraction grating to diffract said monochromatic light beam into a plurality of diffracted light beams such that a plurality of light spots are created on a position sensitive detector means;
- an analog-to-digital converter means connected to said detector means for reading the position of said spots on said detector means;
- processing and memory means connected to said analog-to-digital converter means to hold and manipulate data provided by said analog-to-digital converter means on the position of said spots and to compute the angular displacement of said shaft about its axis of rotation based upon the data from said analog-to-digital converter means.

5,483,059

# SIGNAL PROCESSING METHOD USING COMPARATOR LEVEL ADJUSTMENT IN A DISPLACEMENT MEASURING DEVICE

Masahiko Igaki, Tokyo; Kenichi Kataoka, Yokohama, and Katsuhiko Fujii, Ebina, all of Japan; assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 127,348, Sep. 28, 1993, abandoned.

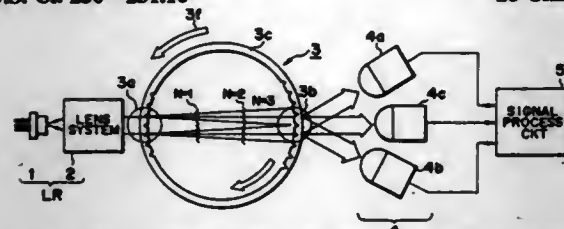
This application Sep. 20, 1994, Ser. No. 308,965

Claims priority, application Japan, Sep. 30, 1992, 4-286854

Int. Cl.<sup>6</sup> G01D 5/34

U.S. Cl. 250-231.16

28 Claims



1. A signal processing method for measuring relative displacement information to a measuring object, by utilizing a first scale and a second scale of which at least one is mounted on said measured article, irradiating a light beam onto said first scale, receiving the light beam which is subjected to optical modulation by said first scale, then introduced into said second scale and subjected to optical modulation therein, with plural photodetectors, and detecting said relative displacement information of the measured object from thus obtained signals, comprising steps of:

measurement of relative displacement information to said measured object by output signals respectively obtained from said plural photodetectors, wherein said measurement is conducted by the comparison of each of the output signals from said plural photodetectors with a comparison level; and determination of the comparison level, said determination being conducted, based on the sum of the signals from said plural photodetectors.

5,483,060

# OPTICAL POSITION SENSOR AND ISOLATION SENSOR USING THIS POSITION SENSOR

Wataru Sugura, Anjo, and Katsuteru Miwa, Kariya, both of Japan; assignors to Nippondenso Co., Ltd., Kariya, Japan

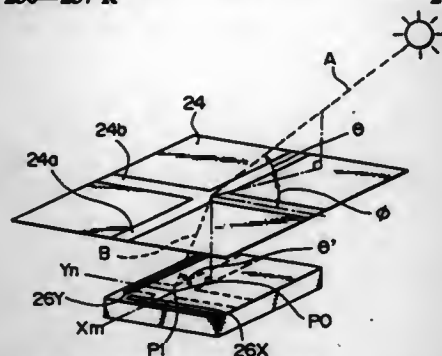
Filed Aug. 17, 1993, Ser. No. 107,319

Claims priority, application Japan, Aug. 19, 1992, 4-220301; Jul. 8, 1993, 5-169290

Int. Cl.<sup>6</sup> G01B 11/26

U.S. Cl. 250-237 R

27 Claims



1. An optical position sensor comprising:  
a light shading plate having a first slit and a second slit, as light introduction ports, defined therein, said first slit and said second slit intersecting each other; and  
a light reception portion including a first unidimensional light reception sensor and a second unidimensional light reception sensor, said first and second unidimensional light reception sensors being disposed so as to oppose said light shading plate with a predetermined gap therebetween, said first and second

unidimensional light reception sensors including a plurality of photo-electric conversion devices, said first unidimensional light reception sensor being disposed so as to cross only said first slit and said second unidimensional light reception sensor being disposed so as to cross only said second slit.

5,483,061

# GAMMA RAY SCINTILLATION DETECTOR APPARATUS AND METHOD FOR REDUCING SHOCK INDUCED NOISE

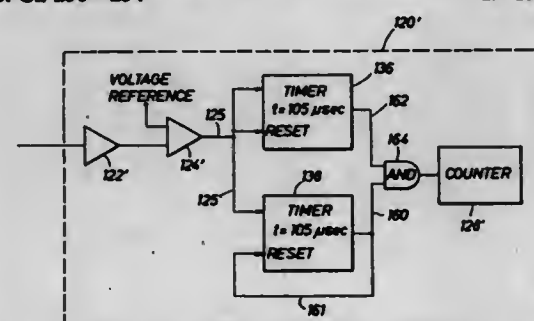
William R. Sloan, Missouri City, Tex., assignor to Schlumberger Technology Corporation, Sugar Land, Tex.

Filed Sep. 7, 1994, Ser. No. 303,109

Int. Cl.<sup>6</sup> G01V 5/12

U.S. Cl. 250-254

19 Claims



1. Apparatus for distinguishing pulses resulting from gamma rays of a gamma ray detector from shock induced pulses of said detector comprising,

means for identifying detector pulses that occur within a predetermined time interval from an immediately adjacent occurring previous pulse as shock induced pulses, and means for identifying detector pulses that occur after said predetermined time interval from an immediately adjacent occurring previous pulse as a gamma ray induced pulse.

5,483,062

# PHOTON DETECTOR BASED UPON AN ACTIVATED LANTHANIDE BERYLLATE SCINTILLATOR

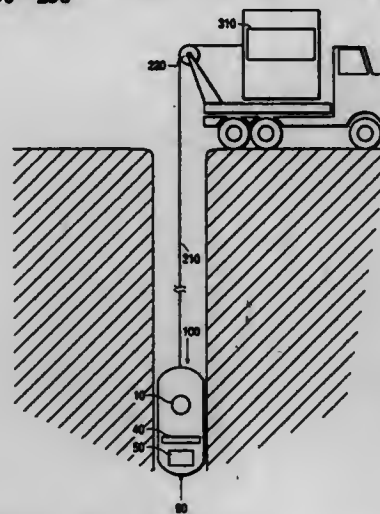
John B. Cairr, Mapleton, and Manuel Berroondo, Orem, both of Utah; assignors to Merrill Corporation, Salt Lake City, Utah

Filed Jan. 21, 1994, Ser. No. 184,147

Int. Cl.<sup>6</sup> G01V 5/04; G01T 1/02

U.S. Cl. 250-256

27 Claims



1. A gamma ray detector comprising:  
an activated lanthanide beryllate crystal scintillator to detect gamma rays.

5,483,063

# ZERO-SPACED EPITHERMAL NEUTRON MOISTURE DETECTION SYSTEM

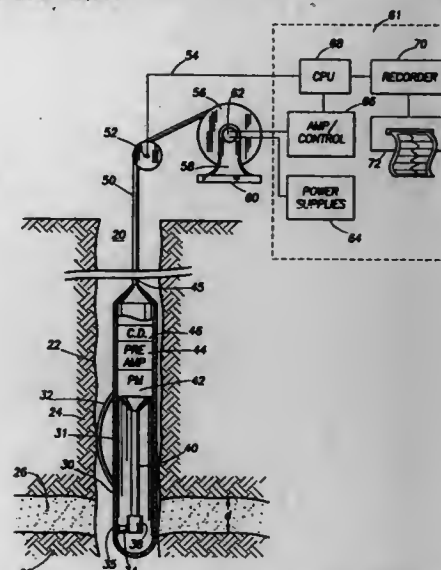
Hugh E. Hall, Jr., Huntsville, and Dan M. Arnold, Katy, both of Tex., assignors to Physics, Inc., Huntsville, Tex.

Filed May 26, 1994, Ser. No. 249,810

Int. Cl.<sup>6</sup> G01T 5/10

U.S. Cl. 250-269.4

18 Claims



1. An apparatus for measuring the moisture content of material, comprising:

- (a) a probe;
- (b) a source of neutrons contained within said probe;
- (c) an epithermal neutron detector contained within said probe with said epithermal neutron detector being positioned sufficiently close to said neutron source such that the source to detector spacing is effectively zero and the response of said epithermal neutron detector increases with moisture content of said material;
- (d) means for supplying power to said epithermal neutron detector;
- (e) means for recording the response of said epithermal neutron detector; and
- (f) means for converting said response of said epithermal neutron detector to said moisture content of said material.

5,483,064

# POSITIONING MECHANISM AND METHOD FOR PROVIDING COAXIAL ALIGNMENT OF A PROBE AND A SCANNING MEANS IN SCANNING TUNNELING AND SCANNING FORCE MICROSCOPY

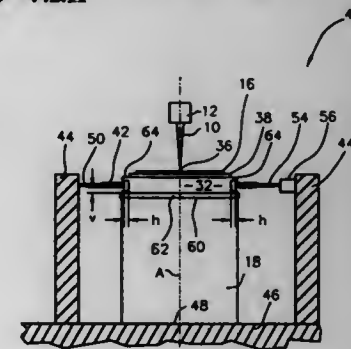
Erie M. Frey, and Norman E. Ragan, Jr., both of Tucson, Ariz., assignors to Wyko Corporation, Tucson, Ariz.

Filed Jan. 21, 1994, Ser. No. 184,482

Int. Cl.<sup>6</sup> G21K 5/10; H01J 37/00

U.S. Cl. 250-442.11

12 Claims



1. A scanning microscope for scanning a sample having a surface disposed substantially perpendicular to a tip of a probe to generate a signal indicative of a property of the sample as a function of planar coordinates along the surface of the sample, comprising:

- (a) a rigid support structure
- (b) scanning means having a fixed end mounted on said support structure and a free end movable along a plane substantially perpendicular to a main axis of the scanning means in response to control signals applied to the scanning means;
- (c) a probe having a tip fixedly disposed in coaxial alignment with said main axis of the scanning means, said tip with a point on the surface of the sample precisely aligned with said tip to produce a signal indicative of said property of the sample at said point, thereby providing a map of such property as a function of position on the surface of the sample;
- (d) a stand-off slidably mounted on said free end of the scanning means, said stand-off comprising a bottom surface slidably connected to the free end of the scanning means and a top surface comprising means for receiving said sample fixedly mounted thereon; and
- (e) sample-positioner means mounted on said support structure and comprising means for slidably moving said stand-off over said free end of the scanning means in order to position the sample to a desired location for scanning, said sample-positioner means also comprising means for disengaging the stand-off after positioning of the sample and providing a sufficient gap between the stand-off and the sample-positioner means to prevent contact and resulting interference therebetween during scanning.

5,483,065

# ELECTRON BEAM MICROANALYZER

Masao Sato, and Yukio Takeuchi, both of Chiba, Japan; assignors to Seiko Instruments Inc., Chiba, Japan

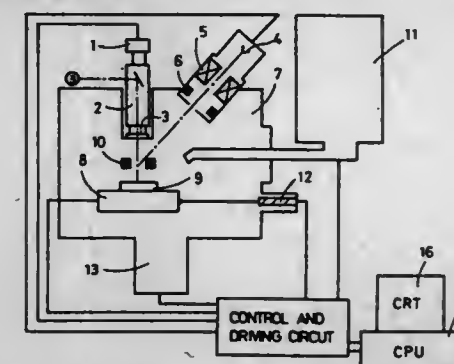
Filed Oct. 12, 1994, Ser. No. 321,676

Claims priority, application Japan, Jan. 12, 1993, 5-254483

Int. Cl.<sup>6</sup> H01J 37/252

U.S. Cl. 250-310

6 Claims



1. An electron beam microanalyzer comprising:  
an electron beam irradiation device having an electron gun for generating an electron beam to irradiate a sample, and an electron lens for concentrating the electron beam at a surface of the sample;  
an optical microscope for observing the sample within a vacuum sample chamber, said microscope having an optical axis; and  
an energy dispersion type x-ray analyzer for analyzing x-rays generated by irradiating the sample with said electron beam; wherein said electron beam irradiation device has an electron beam axis which is oblique to the sample surface, and said electron beam microanalyzer further comprises an electron beam deflecting system for deflecting the electron beam from said electron beam irradiation device into an axis which is aligned with the optical axis at the sample surface.



5,483,066

## POLARIZATION DIVERSE INFRARED OBJECT RECOGNITION SYSTEM AND METHOD

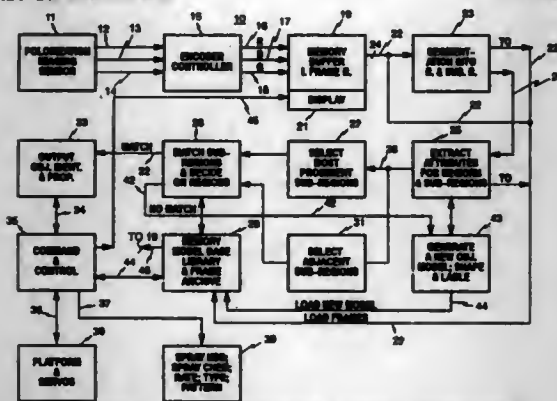
Farooz A. Sadjadi, Minneapolis, and Stephen M. Sohn, Shoreview, both of Minn., assignors to Loral Corporation, New York, N.Y.

Filed Jun. 8, 1994, Ser. No. 257,255

Int. Cl.<sup>6</sup> G01J 5/58

U.S. Cl. 250—338.1

13 Claims



1. An automatic object recognition system, comprising: a polarization-sensitive infrared sensor for sensing an area containing selective objects to be recognized and identified, said infrared sensor generating a set of output signals representative different polarization features, memory buffer and storage means coupled to the output of said polarization sensitive sensor for storing digital data indicative of polarization features of pixels of an image area being sensed, segmentation means for computing the polarization difference (PD) between said pixels in said image area and generating a new image of said area, means for extracting attributes of regions and subregions of objects sensed in said new image of said area, means for comparing prominent subregions of said objects with models stored in a model based reference library to determine a best match, command control means coupled to said means for comparing prominent subregions for generating signals indicative of a match or no match with models stored in said model based reference library, and utilization means controllable by said command control means upon a match with a stored model.

5,483,067

## PYROELECTRIC INFRARED DETECTOR AND METHOD OF FABRICATING THE SAME

Satoru Fujii, Takatsuki; Ryoichi Takayama, Suita; Yoshihiro Tomita, Osaka; Masayuki Okano, Kobe, and Hideo Torii, Higashi Osaka, all of Japan, assignors to Matsuhita Electric Industrial Co., Ltd., Japan

Division of Ser. No. 135,415, Oct. 13, 1993, Pat. No. 5,413,667.

This application Jan. 17, 1995, Ser. No. 373,103

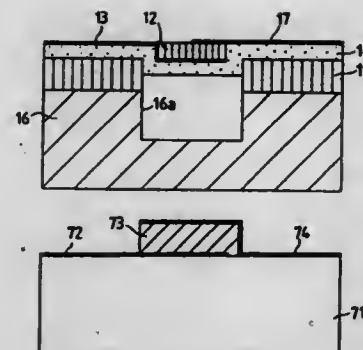
Claims priority, application Japan, Nov. 4, 1992, 4-294811; Mar. 12, 1993, 5-51944

Int. Cl.<sup>6</sup> G01J 5/02

U.S. Cl. 250—338.3

8 Claims

1. A pyroelectric infrared detector comprising: a substrate having a recess; a pyroelectric portion substantially aligning with the recess and having an area smaller than an area of the recess; means for supporting the pyroelectric portion on the substrate, the supporting means including a resin film located between the substrate and the pyroelectric portion, wherein the recess faces the resin film; and first and second electrodes connected to first and second surfaces of the pyroelectric portion respectively.



5,483,068

## USE OF IR (THERMAL) IMAGING FOR DETERMINING CELL DIAGNOSTICS

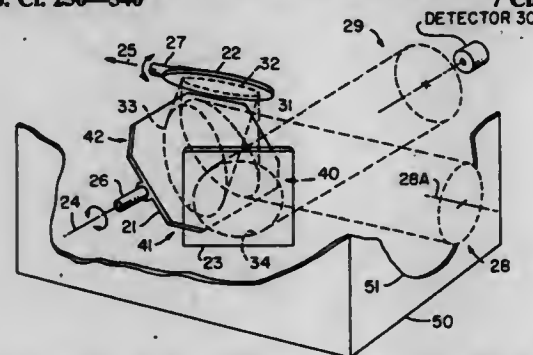
Russell D. Moulton, 6316 Felder Dr., San Jose, Calif. 95123, and Benjamin Chaloner-Gill, 520 Mansion Ct., #303, Santa Clara, Calif. 95054

Filed Jan. 7, 1994, Ser. No. 178,943

Int. Cl.<sup>6</sup> G01J 5/00; G01N 25/72; H01M 10/48

U.S. Cl. 250—340

7 Claims



1. A method for determining when an electrochemical cell or battery is faulty comprising scanning and detecting variations in the intensity level of infrared radiation emitted from an exterior major surface of the battery or cell, coextensive with a major surface of an electrode of such cell, said scanning and detecting conducted by sensing infrared energy in a range of about 2 to about 12  $\mu$ m (microns) emitted from the exterior surface.

5,483,069

## VALIDATION APPARATUS FOR FLAT PAPER OBJECT

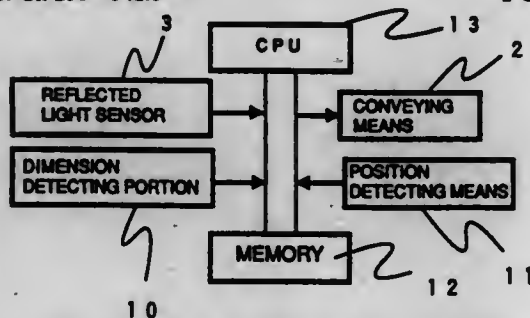
Shinichi Kofune, and Kenya Kawabe, both of Kanagawa, Japan, assignors to Toyo Communication Equipment Co., Ltd., Kanagawa, Japan

Filed Dec. 27, 1993, Ser. No. 174,527

Int. Cl.<sup>6</sup> G01N 21/55

U.S. Cl. 250—341.8

1 Claim



1. A multi-currency bill validating apparatus comprising:

- a pattern reading means for reading a pattern on bank bills and for generating data corresponding to said pattern, said pattern reading means comprising:

light emitting means for generating a beam of visible light and emitting said visible light onto the surface of said bank bills; and a light detecting means for detecting reflected light from said bank bills;

- a conveying means for transferring said bank bills to a predetermined position;
- an outer dimension detecting means for detecting an outer dimension of said bank bills, said outer dimension detecting means comprising a light emitting means, a light detecting means and a position detecting means;
- a memory means for storing data in which a plurality of currency data is classified into a plurality of groups by outer dimensions of said bank bills;
- a means for selecting data corresponding to a group of the same outer dimensions from said memory means based on the data detected by said outer dimension detecting means; and
- a means for comparing only the selected data with the data read by the pattern reading means for validating said bank bills.

5,483,071

## TWO-DIMENSIONAL RADIATION DETECTOR

Shiro Oikawa, Shiga; Takayuki Takemoto, Kyoto; Tutomu Katou, Hatano; Shiro Suzuki, Yokosuka, and Kenkichi Tanaka, Tama, all of Japan, assignors to Shimadzu Corp., Kyoto, and Nippon Hoso Kyokai, Tokyo, both of Japan

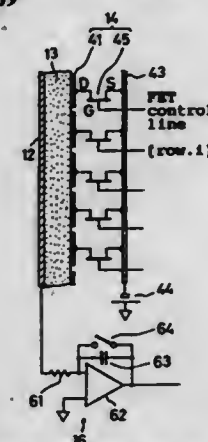
Filed Jun. 28, 1994, Ser. No. 266,606

Claims priority, application Japan, Jun. 30, 1993, 5-188755

Int. Cl.<sup>6</sup> H01L 31/0264; G01T 1/202; 1/24

U.S. Cl. 250—370.09

9 Claims



1. A two-dimensional radiation detector for obtaining a radiographic image as converted into electric signals, said detector comprising:

a scintillator for converting said radiographic image into an optical image;

a photoconductive film for converting said optical image into an image based on electric charges;

a translucent electrode film and a scan switch layer formed on opposite surfaces of said photoconductive film; and

a drive circuit connected to said scan switch layer; wherein said scan switch layer includes:

a plurality of conductors arranged in matrix form and in contact with said photoconductive film;

a conductor to which a bias voltage is applied;

a plurality of switching elements interposed between said conductors arranged in matrix form and said conductor to which said bias voltage is applied; and

row conductors for applying a drive signal from said drive circuits to said switching elements;

said translucent electrode film including column conductors corresponding to columns of said conductors arranged in matrix form, each of said column conductors being connected to a signal reading line.

5,483,070

## SCINTILLATION COUNTER

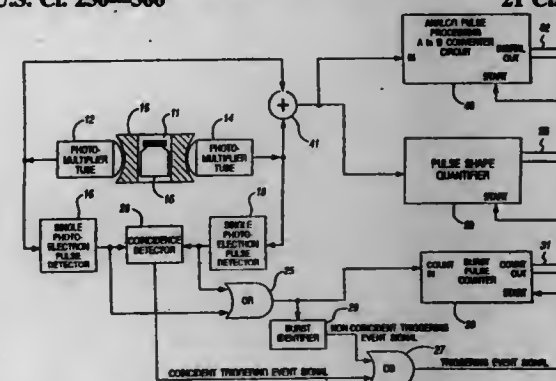
Robert J. Valenta, West Chicago, Ill., assignor to Packard Instrument Company, Downers Grove, Ill.

Filed Aug. 2, 1994, Ser. No. 284,938

Int. Cl.<sup>6</sup> G01T 1/202

U.S. Cl. 250—366

21 Claims



1. A scintillation measurement system for measuring optical events produced by a scintillator in response to the radioactive decay of a constituent or constituents of a sample to be measured, said system comprising:

means for supporting the sample in a sample well,

a bismuth germanate scintillation crystal located adjacent the sample well,

a plurality of photodetectors located outside the bismuth germanate crystal for detecting optical events occurring in the sample well or in the bismuth germanate crystal and converting said optical events into electrical pulses, and

pulse analyzing means for receiving the electrical pulses from said photodetectors and determining whether such pulses represent alpha, beta or gamma events.

5,483,072

## AUTOMATIC POSITION CONTROL SYSTEM FOR X-RAY MACHINES

Robert P. Coe, Dix Hills, N.Y., assignor to Bennett X-Ray Technologies, Coplague, N.Y.

Filed Aug. 4, 1994, Ser. No. 286,484

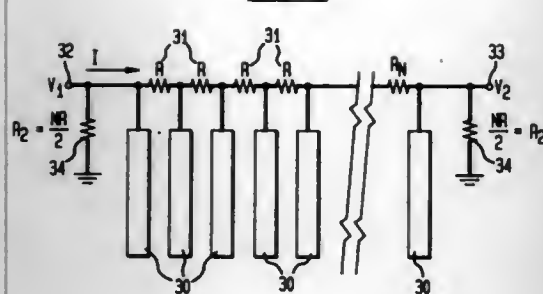
Int. Cl.<sup>6</sup> G01T 1/185

U.S. Cl. 250—385.1

4 Claims

1. An x-ray sensor comprising an ionization chamber
- a first element separated by a gas from a second element mounted inside said ionization chamber,
- said first element comprising a plurality of sensing strips separated by resistors, and
- a first and a second terminal each terminated by a terminating resistor, wherein an output voltage obtained between said first and second terminals represents the position of an incident narrow x-ray beam.

ELEMENT #1



5,483,073

# METHOD OF ILLUMINATING AN OBJECT WITH A FOCUSED ELECTRON BEAM AND AN ELECTRON-OPTICAL ILLUMINATING SYSTEM THEREFOR

Gerd Benner, Aalen, Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Germany

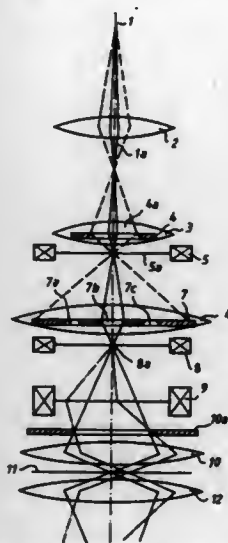
Filed Dec. 22, 1993, Ser. No. 172,122

Claims priority, application Germany, Dec. 22, 1992, 42 43 489.0

Int. Cl.<sup>6</sup> H01J 37/147

U.S. Cl. 250—311

15 Claims



7. An electron-optical illuminating system defining an optical axis, said system comprising:

- an electron source for supplying an electron beam defining a crossover on said optical axis;
- said electron beam having a focus diameter and an illuminating aperture;
- a three-stage condenser having first, second and third imaging lens stages arranged on said optical axis;
- an objective having an input image plane and an output image plane and being arranged on said axis downstream of said image lens stages;
- said third imaging lens stage being disposed downstream of said first and second imaging lens stages and defining both a main plane and an input image plane;
- a multiple diaphragm having a plurality of off-axis apertures of different sizes;

first excitation means connected to said first and second imaging lens stages for generating a first intermediate image of said crossover in said input image plane with a variable imaging scale while adjusting said focus diameter and so as to direct said electron beam to at least one of said off-axis apertures thereby cropping said electron beam to adjust said illuminating aperture of said electron beam independently of the adjustment of said focus diameter;

second excitation means connected to said third imaging lens stage for imaging said intermediate image of said crossover into said input image plane of said objective;

said multiple diaphragm being disposed in the immediate vicinity of said main plane so as to cause said electron beam transmitted through said at least one of said off-axis apertures to be deflected back to said optical axis by only said third imaging lens stage; and,

third excitation means for energizing said objective so as to cause said objective to coact with said first, second and third imaging lens stages to cause said crossover to be imaged demagnified on an object.

5,483,074

# FLOOD BEAM ELECTRON GUN

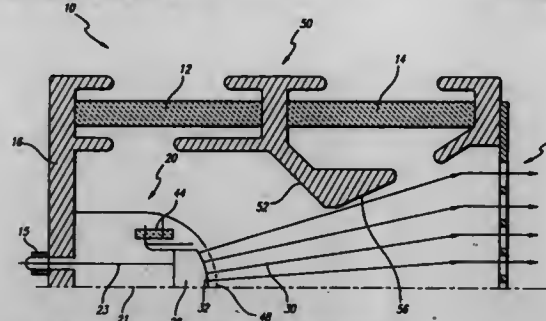
Richard B. True, Sunnyvale, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jan. 11, 1995, Ser. No. 371,286

Int. Cl.<sup>6</sup> H01J 37/063

U.S. Cl. 250—423 R

21 Claims



1. A flood beam electron gun comprising:
  - an electron emitter having a rounded emitting surface providing a substantially conical electron beam;
  - a control grid spaced from and disposed substantially parallel to said emitting surface, said control grid having a plurality of holes disposed in a first pattern providing an array of individual electron beams from said conical electron beam of said cathode;
  - an intermediate electrode spaced from said cathode and said control grid, said intermediate electrode having an aperture therethrough providing a substantially parallel flow of said array of individual electron beams;
  - a target grid spaced from said intermediate electrode and opposite from said emitter and control grid, said target grid having a plurality of holes disposed in a second pattern that is proportional to and substantially larger than said first pattern, each of said individual electron beams passing through respective ones of said plurality of holes in registration thereof; and
  - a vacuum barrier provided on a downstream side of said target grid, said individual electron beams passing through said vacuum barrier.

5,483,075

# ROTARY SCANNING APPARATUS

Douglas H. Smith, Los Altos, and Charles R. Connell, Redwood City, both of Calif., assignors to Perkin-Elmer Corporation, Norwalk, Conn.

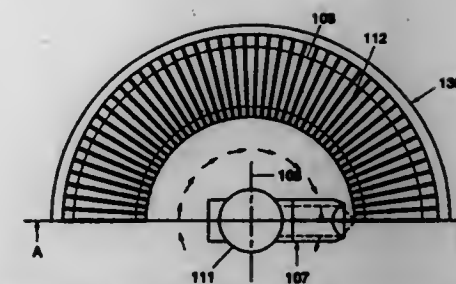
Filed Nov. 1, 1994, Ser. No. 332,674

Int. Cl.<sup>6</sup> G01N 21/64

U.S. Cl. 250—458.1

18 Claims

1. A rotary scanning apparatus comprising:
  - a plurality of separation lanes disposed in a nonplanar array;
  - an optical detection system for detecting radiation emanating from the separation lanes, the optical detection system comprising:
    - collection optics for collecting and focusing the radiation;



a detector for measuring the intensity of the radiation; and,

a rotary scanner for providing relative movement between the collection optics and the separation lanes.

5,483,076

# AUTORADIOGRAPHY CASSETTE

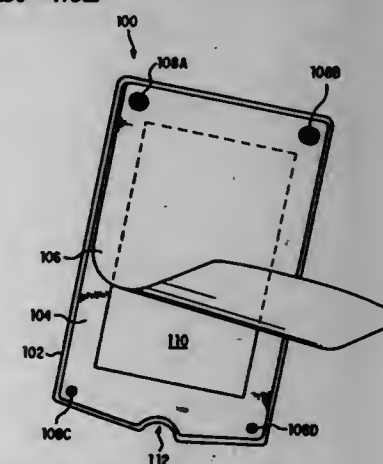
Robert W. Flesher, Baltimore; Michael DeManche, Germantown, both of Md., and Michael W. Schuette, Vienna, Va., assignors to Life Technologies, Inc., Gaithersburg, Md.

Continuation-in-part of Ser. No. 133,258, Oct. 8, 1993, abandoned. This application Aug. 5, 1994, Ser. No. 286,434

Int. Cl.<sup>6</sup> G03B 42/00; 42/04

U.S. Cl. 250—475.2

4 Claims



1. An autoradiography cassette comprising:
  - a substantially flat base plate defining a first plane;
  - a first flexible magnetic sheet;
 means for attaching said first magnetic sheet to said base plate such that said first magnetic sheet is permitted to move relative to said base plate in said first plane, wherein said means for attaching includes a plurality of rivets, a plurality of first holes in said base plate and a plurality of second holes in said first magnetic sheet, each rivet extending through a corresponding first hole and a corresponding second hole to secure said first magnetic sheet to said base plate, and wherein a medial portion of said rivets have a diameter substantially smaller than said second holes such that said first magnetic sheet is permitted to move relative to said base plate in said first plane; and
  - a second flexible magnetic sheet positioned above said first magnetic sheet to magnetically couple with said first magnetic sheet.

5,483,077

# SYSTEM AND METHOD FOR MAGNETIC SCANNING, ACCELERATING, AND IMPLANTING OF AN ION BEAM

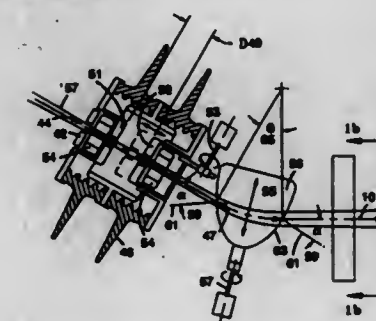
Hilton F. Glavish, Incline Village, Nev., assignor to Nissin Electric Co., Ltd., Japan

Division of Ser. No. 106,351, Aug. 12, 1993, Pat. No. 5,393,984, which is a division of Ser. No. 843,391, Feb. 28, 1992, Pat. No. 5,311,028, which is a continuation-in-part of Ser. No. 575,498, Aug. 29, 1990, Pat. No. 5,132,544. This application Feb. 3, 1995, Ser. No. 383,422

Int. Cl.<sup>6</sup> H01J 37/317

U.S. Cl. 250—492.2

16 Claims



1. An electrostatic system for accelerating and focusing a previously produced high perveance beam of atomic or molecular ions comprising

- a set of acceleration electrodes of said electrostatic accelerating system having a slotted aperture, said electrodes adapted to supply electrostatic energy to accelerate said ion beam in the direction corresponding to the potential difference across said electrodes, and
- a suppressor electrode for maintaining electrons within said beam, said electrode having a slotted aperture and being located at the exit port of the electrostatic accelerating system.

5,483,078

# INK PENETROMETER HAVING FIBER OPTIC CABLES AND STATIONARY INK PADDLE

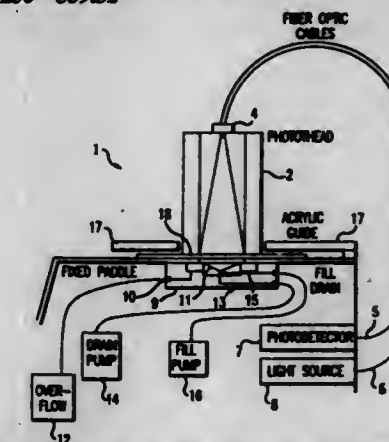
Raymond A. Hermann, Stamford, and Peter L. Fagan, Redding, both of Conn., assignors to Cytec Technology Corp., Wilmington, Del.

Filed Apr. 14, 1994, Ser. No. 227,848

Int. Cl.<sup>6</sup> G01N 21/86

U.S. Cl. 250—559.32

20 Claims



1. A penetrometer for measuring the rate of penetration of a fluid through a sample, said penetrometer comprising:
  - means for applying fluid to a first surface of said sample;
  - means for optically detecting the penetration of said fluid to, or proximate to, a second surface of said sample; and
  - timing means, coupled to said means for applying and said means for optically detecting, for measuring the time between



the application of said fluid to said first surface and the optical detection of said fluid on, or proximate to, said second surface;

wherein said means for applying fluid remains in a fixed position with respect to said sample.

5,483,079

# APPARATUS FOR DETECTING AN IN-FOCUS POSITION OF A SUBSTRATE SURFACE HAVING A MOVABLE LIGHT INTERCEPTING MEMBER AND A THICKNESS DETECTOR

Yasuo Yonezawa, Zushi, Japan, assignor to Nikon Corporation, Tokyo, Japan

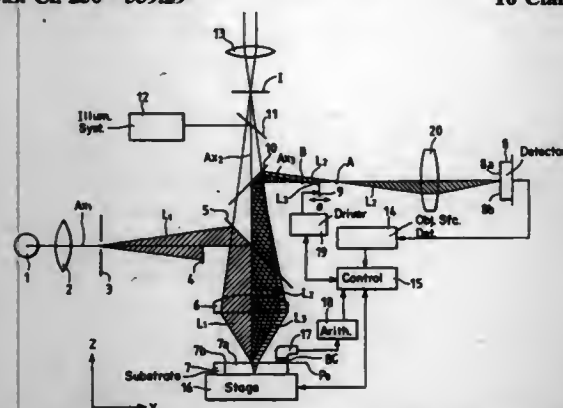
Continuation of Ser. No. 120,060, Sep. 13, 1993, abandoned.

This application Mar. 13, 1995, Ser. No. 402,559

Claims priority, application Japan, Nov. 24, 1992, 4-312546 Int. Cl.<sup>6</sup> G01N 21/36

U.S. Cl. 250—559.29

16 Claims



1. A position detecting apparatus for detecting a matching state of a position of a light-transmissive object with respect to a fiducial object plane of an objective optical system, said apparatus comprising:

an illumination system for projecting light to said object through a first part of said objective optical system at one side of a plane including an optical axis of said objective optical system;

a detector for photoelectrically detecting light reflected from a front surface of said object through a second part of said objective optical system at an opposite side of said plane; and

a light intercepting member movable along the optical axis of said objective optical system on a light path between said objective optical system and said detector, for preventing light reflected from a rear surface of said object, through said second part, from reaching said detector.

5,483,080

# METHOD AND DEVICE FOR MEASURING AND CONTROLLING CELL DENSITY IN MICROBIOLOGICAL CULTURE

Lisa A. Tam, 3618 Vermont St., Long Beach, Calif. 90814

Continuation of Ser. No. 947,045, Sep. 18, 1992, abandoned.

This application Jul. 26, 1994, Ser. No. 281,523

Int. Cl.<sup>6</sup> G01N 1/506

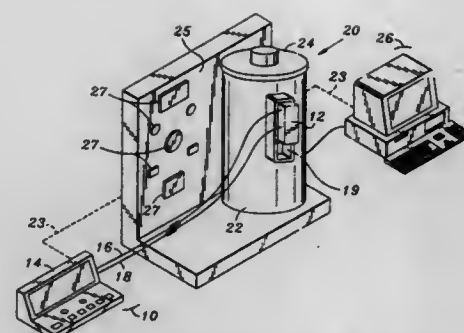
U.S. Cl. 250—574

27 Claims

1. A reflectometric method for measuring the cell density of a culture of microorganisms in a liquid medium so as to facilitate adjustment of process variables which affect cell density, said method comprising the steps of:

a) providing a reflectometric measuring device having at least one radiation source and at least one radiation sensor, and wherein one of said radiation source and radiation sensor is singular in number;

b) positioning said device such that said at least one radiation source will cast radiation into said culture and said at least



one radiation sensor will receive and sense reflected radiation which has emanated from said at least one radiation source and which has been reflected from said culture;

c) determining the reflectivity of said culture on the basis of the relative amount of reflected radiation sensed by said at least one radiation sensor;

d) corresponding the reflectivity of said culture to a current cell density measurement and determining whether said current cell density measurement is within a predetermined range; and

e) if said current cell density measurement is outside of said predetermined range, adjusting at least one process variable as necessary to cause said cell density to move into said predetermined range.

5,483,081

# METHOD FOR DETECTING LIGHT EMITTED BY TWO SURFACES OF A STIMULABLE PHOSPHOR SHEET

Yuichi Hosoi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

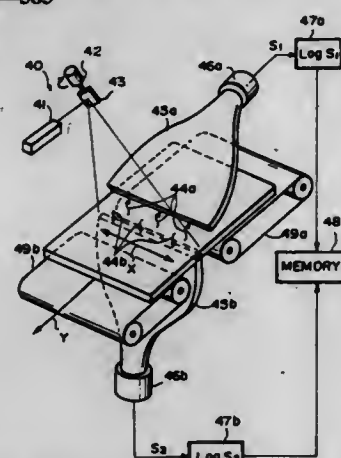
Filed Oct. 19, 1993, Ser. No. 137,759

Claims priority, application Japan, Jan. 19, 1992, 4-280285; Jan. 19, 1992, 4-280286

Int. Cl.<sup>6</sup> G01N 23/04

U.S. Cl. 250—585

10 Claims



1. A method for detecting light emitted by two surfaces of a stimutable phosphor sheet, comprising the steps of:

i) obtaining a stimutable phosphor sheet, which has been exposed to radiation carrying radiation image information and on which a radiation image has thereby been stored, the stimutable phosphor sheet comprising:

a) a stimutable phosphor layer, and

b) a colored layer, which is located on one side of the stimutable phosphor layer and contains a coloring agent, the coloring agent being capable of selectively absorbing stimulating rays, which cause the stimutable phosphor layer to emit light in proportion to the amount of energy stored thereon during its exposure to the radiation,

ii) scanning the stimutable phosphor sheet with the stimulating rays from the side opposite to the colored layer, and

iii) photoelectrically detecting the light, which is emitted by the two surfaces of the stimutable phosphor sheet during the scanning of the stimutable phosphor sheet with the stimulating rays, from the two surfaces of the stimutable phosphor sheet, an image signal representing the radiation image being thereby obtained.

5. A method for detecting light emitted by two surfaces of a stimutable phosphor sheet, comprising the steps of:

i) obtaining a stimutable phosphor sheet, which has been exposed to radiation carrying radiation image information and on which a radiation image has thereby been stored, the stimutable phosphor sheet comprising:

a) a stimutable phosphor layer, and

b) an optical layer, which is located on one side of the stimutable phosphor layer, the optical layer being capable of transmitting only light impinging thereupon from a direction which is normal thereto,

ii) scanning the stimutable phosphor sheet with stimulating rays from the side opposite to the optical layer, the stimulating rays causing the stimutable phosphor layer to emit light in proportion to the amount of energy stored thereon during its exposure to the radiation, and

iii) photoelectrically detecting a first light, which is emitted by the surface of the stimutable phosphor sheet on which the optical layer is located using a first photodetection apparatus, and photoelectrically detecting a second light which is emitted by a second surface of the stimutable phosphor sheet opposite the first surface using a second photodetection apparatus, said detecting of the first and second lights occurring during the scanning of the stimutable phosphor sheet with the stimulating rays, wherein said optical layer prevents the stimulating rays from reflecting from the first photodetector apparatus and re-entering said stimutable phosphor layer, and obtaining an image signal representing the radiation image from the detected first and second lights.

5,483,082

# THIN FILM TRANSISTOR MATRIX DEVICE

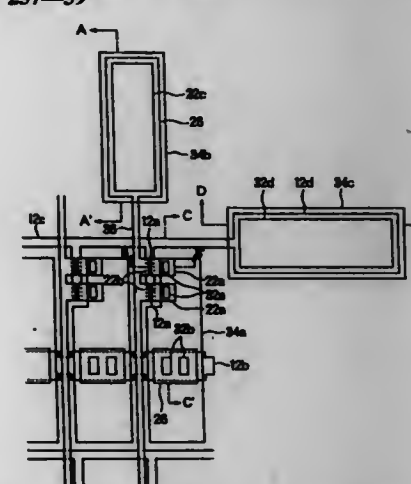
Hideaki Takizawa; Yasuhiro Nasu; Kazuhiro Watanabe; Shiro Hirota; Kazuo Nonaka; Seli Sato, and Teiji Majima, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 28, 1993, Ser. No. 174,030

Claims priority, application Japan, Dec. 28, 1992, 4-348260 Int. Cl.<sup>6</sup> H01L 27/12; 29/78

U.S. Cl. 257—59

6 Claims



1. A thin film transistor matrix device comprising:

a transparent insulating substrate;

a thin film transistor unit including a gate electrode formed on the transparent insulating substrate; a semiconductor active layer formed on the gate electrode through a gate insulating

film; a source electrode and a drain electrode formed opposed to each other on the semiconductor active layer respectively through a semiconductor contact layer; and a passivation film covering the source electrode and the drain electrode;

a picture element unit including a picture element electrode formed in connection with the source electrode of the thin film transistor unit; and

a storage capacitance unit connected to the picture element electrode of the picture element unit,

the storage capacitance unit including a storage capacitance electrode formed on the transparent insulating substrate and formed of a metal layer of the same material as the gate electrode; a dielectric film formed on the storage capacitance electrode and formed of an insulating film common with the gate insulating film and a non-doped semiconductor layer of the same material as the semiconductor active layer; and a counter electrode formed on the dielectric film and formed of a doped semiconductor layer of the same material as the semiconductor contact layer and a metal layer of the same material as the source electrode and the drain electrode, the counter electrode being connected to the picture element electrode.

5,483,083

# SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Satoshi Meguro, Hino; Kiyofumi Uchibori, Hachioji; Norio Suzuki, Koganei; Makoto Motoyoshi, Hachioji; Atsuyoshi Kolke, Kokubunji; Toshiaki Yamana, Hachioji; Yoshio Sakai, Shirohama; Toru Kaga, Urawa; Naotaka Hashimoto; Takashi Hashimoto, both of Hachioji; Shigeru Honjou, Kodaira, and Osamu Minato, Hino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 837,689, Feb. 19, 1992, Pat. No.

5,194,749, which is a continuation of Ser. No. 625,682, Dec.

12, 1990, abandoned, which is a continuation of Ser. No.

274,490, Nov. 22, 1988, abandoned. This application Mar. 9,

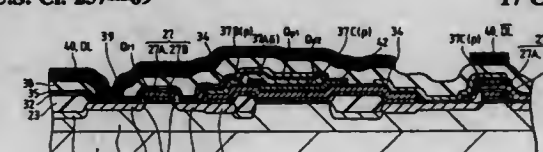
1993, Ser. No. 28,128

Claims priority, application Japan, Nov. 30, 1987, 62-305465; Dec. 23, 1987, 62-324094; Feb. 9, 1988, 63-26641

Int. Cl.<sup>6</sup> H01L 27/11

U.S. Cl. 257—69

17 Claims



1. A semiconductor device comprising:

a semiconductor substrate;

a plurality of memory cells of a static random access memory, each of said memory cells including cross-coupled first and second inverter circuits, each of said first and second inverter circuits having an n-channel drive MISFET and a p-channel load MISFET coupled in series with each other, each said drive MISFET comprising a first insulating film formed over a main surface of said semiconductor substrate, a gate electrode formed over said first insulating film, and source and drain regions formed in said semiconductor substrate;

a second insulating film formed over said drive MISFETs so as to cover said main surface;

a wiring line formed on said second insulating film and electrically connected with source regions of said drive MISFETs;

a third insulating film formed over said wiring line and said second insulating film so as to cover said main surface;

gate electrodes corresponding to said load MISFETs,

wherein said gate electrodes of said load MISFETs of said first and second inverter circuits are formed over said third insulating film and are electrically connected with said drain regions of said drive MISFETs of said second and first inverter circuits, respectively;

first semiconductor strips formed over said third insulating film and electrically connected with said drain regions of said drive MISFETs,  
wherein source and drain regions and a channel region of each of said load MISFETs are formed in respective ones of said first semiconductor strips; and  
a fourth insulating film formed between said gate electrodes of said load MISFETs and said first semiconductor strips.

5,483,084

# DIAMOND COVERED MEMBER AND PROCESS FOR PRODUCING THE SAME

Kelji Hirabayashi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

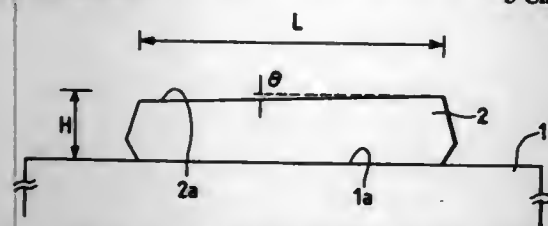
Filed Mar. 9, 1994, Ser. No. 207,627

Claims priority, application Japan, Mar. 10, 1993, 5-049525

Int. Cl.<sup>6</sup> H01L 29/16; 29/20; B05D 3/06

U.S. Cl. 257-77

8 Claims



1. A diamond covered member having a diamond crystal layer on a surface of a substrate, the diamond crystal layer comprising a polycrystalline film having a {111} orientation plane and surface roughness without polishing (Rmax) of no more than 0.2  $\mu\text{m}$ .

5,483,085

# ELECTRO-OPTIC INTEGRATED CIRCUIT WITH DIODE DECODER

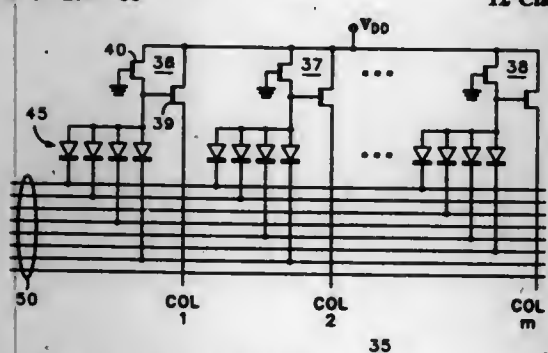
Paige M. Holm, Phoenix; George W. Rhyne, Scottsdale, both of Ariz., and Thomas J. Walczak, Woodstock, Ill., assignors to Motorola, Schaumburg, Ill.

Filed May 9, 1994, Ser. No. 239,626

Int. Cl.<sup>6</sup> H01L 33/00

U.S. Cl. 257-88

12 Claims



1. An integrated circuit comprising:

- a substrate;
- an addressable array of semiconductor devices formed on the substrate, each device having two terminals with all of the devices being connected in rows and columns;
- a column decoder formed on the substrate and including a plurality of switching circuits equal in number to the number of columns in the array, each of the columns having a different one of the plurality of switching circuits connected thereto for activating the column upon activation of the switching circuit;
- a plurality of address lines formed on the substrate and each address line including an external connection pad, and

a plurality of sets of diodes formed on the substrate and connected to the address lines and the switching circuits so that each set of diodes has a unique code produced by a combination of diodes in that set and the address lines to which the diodes in that set are connected.

5,483,086

# FOUR LAYER SEMICONDUCTOR SURGE PROTECTOR HAVING PLURAL SHORT-CIRCUTTED JUNCTIONS

Kolchi Ohta, Hanno, Japan, assignor to Shindengen Electric Manufacturing Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 388,892, Feb. 14, 1995, abandoned,

which is a continuation of Ser. No. 224,131, Apr. 6, 1994,

abandoned, which is a continuation of Ser. No. 49,423, Apr.

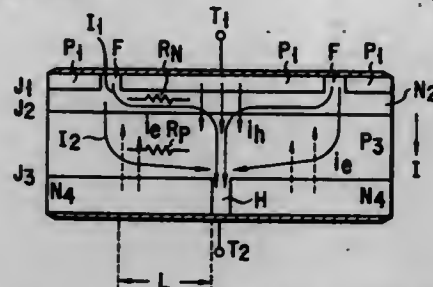
20, 1993, abandoned. This application Jun. 6, 1995, Ser. No.

469,423

Int. Cl.<sup>6</sup> H01L 29/74; 31/111

U.S. Cl. 257-111

20 Claims



16. A semiconductor overvoltage protector comprising:
- a first semiconductor layer of a first conductivity type;
  - a second semiconductor layer of a second conductivity type provided on a first surface of said first semiconductor layer;
  - a third semiconductor layer of a said first conductivity type formed in a surface region of said second semiconductor layer, the third semiconductor layer having a first exposed portion connected to said second semiconductor layer;
  - a fourth semiconductor layer of said second conductivity type formed in a second surface region of said first semiconductor layer, the fourth semiconductor layer having a second exposed portion connected to said first semiconductor layer, said first exposed portion and said second exposed portion being arranged so as not to lap each other in a lateral or horizontal direction;
  - a first electrode provided over said third semiconductor layer; and
  - a second electrode provided over said fourth semiconductor layer,

wherein when breakdown of a PN junction between said first and second semiconductor layers occurs, a first current component flows from said first exposed portion to said second exposed portion through a lateral effective resistance of said second semiconductor layer and a second current component flows from said first exposed portion to said second exposed portion through a lateral effective resistance of said first semiconductor layer, thereby to promote minority carrier injections from said third and fourth semiconductor layers, such as to achieve increased holding current and reduced breakover current characteristics.

5,483,087

# BIDIRECTIONAL THYRISTOR WITH MOS TURN-OFF CAPABILITY WITH A SINGLE GATE

Janardhanan S. Ajit, Redondo Beach, Calif., assignor to International Rectifier Corporation, El Segundo, Calif.

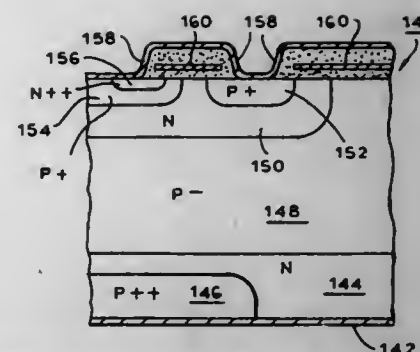
Filed Jul. 8, 1994, Ser. No. 272,769

Int. Cl.<sup>6</sup> H01L 29/74

U.S. Cl. 257-120

22 Claims

1. AMOS gate controlled bidirectional thyristor, comprising:



- a wafer of semiconductor material having first and second spaced, parallel planar surfaces, at least a portion of the thickness of said wafer which extends from said first planar surface comprising a relatively lightly doped substrate of a first conductivity type for receiving junctions, at least a portion of the thickness of said wafer which extends from said second surface comprising a base region of a second conductivity type which is opposite to said first conductivity type;
- at least one well region of said second conductivity type formed in said relatively lightly doped substrate and extending from said first semiconductor surface to a first depth beneath said first semiconductor surface;
- at least one body region of said first conductivity type formed in said well region and extending from said first semiconductor surface to a second depth beneath said semiconductor surface which is shallower than said first depth, said body region being radially inwardly spaced along said first semiconductor surface from said well region thereby to define a first channel region along said first semiconductor surface between said body region and said relatively lightly doped substrate;
- at least one source region of said second conductivity type formed in said body region and extending from said first semiconductor surface to a third depth beneath said semiconductor surface which is shallower than said second depth, said source region being radially inwardly spaced along said first semiconductor surface from said well region thereby to define a second channel region along said first semiconductor surface between said source region and said well region;
- first electrode means disposed on said first semiconductor surface and connected to said body region and said source region;
- gate insulation layer means on said first surface disposed at least on said channel regions;
- gate electrode means on said gate insulation layer means and overlying said channel regions;
- at least one relatively highly doped region of said first conductivity type formed in said base region of second conductivity type and extending from said second semiconductor surface;
- second electrode means disposed on said second semiconductor surface and connected to said relatively highly doped region of said first conductivity type and to said base region.

5,483,088

# COMPOUNDS AND INFRARED DEVICES INCLUDING $\text{In}_{1-x}\text{TL}_x\text{Q}$ , WHERE Q IS $\text{As}_{1-y}\text{P}_y$ AND $0 \leq y \leq 1$

An-Ban Chen, Auburn, Ala.; Arden Sher, San Carlos, and Mark von Schilfgarde, Palo Alto, both of Calif., assignors to S.R.I. International, Menlo Park, Calif.

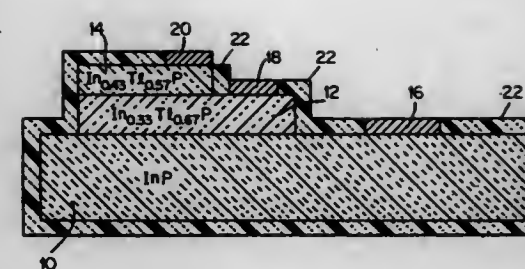
Filed Aug. 12, 1994, Ser. No. 289,391

Int. Cl.<sup>6</sup> H01L 29/05

U.S. Cl. 257-189

25 Claims

1. An infrared detector or emitter device comprising a substrate, and a semiconductor layer of  $\text{In}_{1-x}\text{TL}_x\text{Q}$  carried by the substrate, where Q is selected from the group consisting essentially of  $\text{As}_{1-y}\text{P}_y$ , and  $0 < x < 1$ ,  $0 \leq y \leq 1$ .



5,483,089

# ELECTRICALLY ISOLATED MESFET

Shinichi Terazono, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

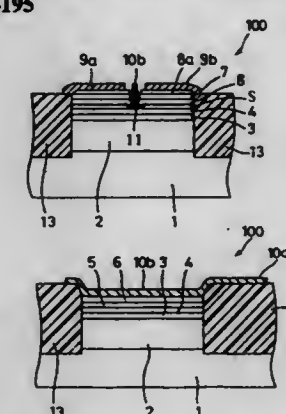
Filed Feb. 25, 1993, Ser. No. 22,309

Claims priority, application Japan, Aug. 11, 1992, 4-236556

Int. Cl.<sup>6</sup> H01L 29/80; 29/06; 23/48; 29/417

U.S. Cl. 257-195

6 Claims



1. An electrically isolated MESFET comprising:
- a compound semiconductor substrate;
  - a plurality of compound semiconductor layers disposed on the compound semiconductor substrate wherein each of the compound semiconductor layers has a respective conductivity and the compound semiconductor layer most remote from the compound semiconductor substrate has the highest conductivity of the compound semiconductor layers;
  - an electrically isolating region in the compound semiconductor layers surrounding and electrically isolating a MESFET region of the compound semiconductor layers from the compound semiconductor layers outside the electrically isolating region;
  - a recess penetrating the compound semiconductor layer most remote from the compound semiconductor substrate and at least the compound semiconductor layer adjacent the compound semiconductor layer most remote from the compound semiconductor substrate, the recess dividing the compound semiconductor substrate into mutually separated first and second parts;
  - a gate electrode disposed in the recess, contacting and forming a Schottky barrier with one of the compound semiconductor layers; and
  - source and drain electrodes respectively disposed on and contacting the first and second parts of the compound semiconductor layer most remote from the compound semiconductor substrate wherein the gate electrode is separated from the compound semiconductor substrate by less than 200 nanometers.



5,483,090

# SOLID-STATE IMAGE PICKUP DEVICE AND METHOD FOR MANUFACTURING SUCH DEVICE

Izaya Kitamura, Anpachi; Yoshiki Nakamura, Chita; Masakazu Inami, Motosu, and Yoshihiro Okada, Hashima, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

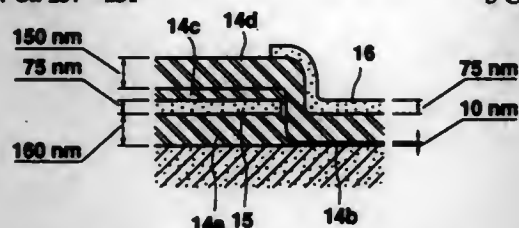
Filed Apr. 7, 1994, Ser. No. 225,004

Claims priority, application Japan, Apr. 9, 1993, 5-083343; Apr. 9, 1993, 5-083344; Apr. 9, 1993, 5-083346; Apr. 14, 1993, 5-067372; Feb. 28, 1994, 6-030324

Int. Cl.<sup>6</sup> H01L 27/148; 29/768

U.S. Cl. 257—231

8 Claims



1. A solid-state image pickup device for accumulating information charges, generated in response to light incident on a semiconductor substrate, in a potential well formed in a portion adjacent to a surface of the substrate by function of a plurality of transfer electrodes arranged on the substrate, said device manufactured by the steps of:

- forming an insulating layer on the semiconductor substrate on which a plurality of channel separating regions are formed in parallel to each other for preventing the information charges from moving;
- forming a plurality of first transfer electrodes extending in the direction crossing said channel separating regions in parallel to each other with a predetermined space therebetween, said first transfer electrodes having a thickness in the range of approximately 50 nm–100 nm;
- forming a first insulating layer of a material by slightly oxidizing the surface of said first transfer electrodes and the exposed surface of said semiconductor substrate;
- forming a second insulating layer by chemical vapor deposition of the same material as said first insulating layer on said first insulating layer; and
- forming a plurality of second transfer electrodes to cover the space between said first transfer electrodes on said second insulating layer, said second transfer electrodes having a thickness in the range of approximately 50 nm–100 nm.

5,483,091

# CHARGE-COUPLED DEVICE ARRAY FOR SPECTROSCOPIC DETECTION

John S. West, Yardley, Pa.; Raymond W. Simpson, Hamilton Square; Samuel C. Khoo, Lawrenceville; Yair Talmi, Princeton; Raymond A. Nadolny, Trenton, all of N.J., and Morley M. Blouke, Portland, Oreg., assignors to Scientific Imaging Technologies, Inc., Beaverton, Oreg., and Princeton Instruments, Inc., Trenton, N.J.

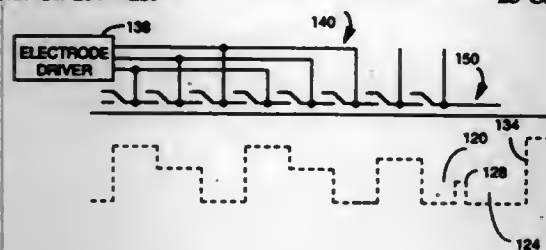
Continuation of Ser. No. 189,577, Jan. 31, 1994, abandoned.

This application Mar. 14, 1995, Ser. No. 404,946

Int. Cl.<sup>6</sup> H01L 27/148; 29/768

U.S. Cl. 257—239

23 Claims



1. A CCD comprising a sensing array and a readout register extending adjacent an edge of the sensing array, wherein the readout register has a first edge that is nearer the sensing array and a second edge that is farther from the sensing array, and the readout register is bounded along its second edge by a potential barrier of a first height and has first and second rows of transfer cells between its first and second edges, the first row being between the sensing array and the second row, whereby charge shifted from the sensing array into the readout register enters the first row of transfer cells, and the transfer cells of the first row are of lower capacity than the transfer cells of the second row and are separated from the transfer cells of the second row by a potential barrier of a second height that is less than said first height.

5,483,092

# SEMICONDUCTOR DEVICE HAVING A VIA-HOLE WITH A VOID AREA FOR REDUCED CRACKING

Katsuya Kosaki, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 200,485, Feb. 23, 1994, abandoned.

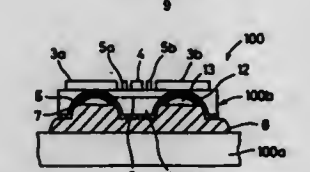
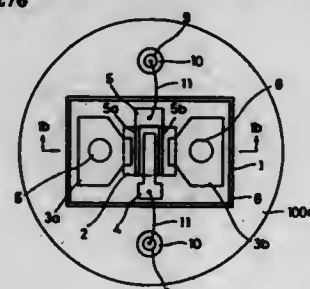
This application May 19, 1995, Ser. No. 444,520

Claims priority, application Japan, Jun. 24, 1993, 5-153111

Int. Cl.<sup>6</sup> H01L 29/80; 31/112

U.S. Cl. 257—276

4 Claims



1. A semi-conductor device comprising:

a conductive pad; and

a semi-conductor chip including:

- a semi-conductor substrate having opposite front and rear surfaces;
- a first electrode disposed on the front surface;
- a dome-shaped via-hole having an opening at the rear surface of said substrate, an internal surface, a bottom opposite the opening and in contact with said first electrode, and a depth x from the rear surface of said substrate to said first electrode;
- a second electrode covering the rear surface of said substrate and the internal surface of the via-hole and contacting said first electrode;
- a metal layer disposed on only a part of said second electrode in the via-hole, said metal layer maintaining its shape at a die-bonding temperature and being poorly wetted by solder, the metal layer extending no farther from the front surface of said substrate than a distance d that is less than x; and
- solder mounting said semi-conductor chip to said conductive pad with a void space free of solder between a part of the internal surface of the via-hole and said solder, the void space having a maximum distance, measured perpendicular to the front surface of said substrate, from the bottom of the via-hole to the solder, equal to the distance d, and represented by

$$d = \frac{x E_2 \{ \Delta T (\alpha_1 - \alpha_2) y \} - (1/E_1)}{1 + E_2 \{ \Delta T (\alpha_1 - \alpha_2) y \} - (1/E_1)}$$

where y is rupture stress of said semi-conductor substrate,  $E_1$  is Young's modulus of said semi-conductor substrate,  $E_2$  is Young's modulus of said solder,  $\alpha_1$  is the linear thermal expansion coefficient of said semiconductor substrate,  $\alpha_2$  is the linear thermal coefficient of said solder, and  $\Delta T$  is a difference between the die-bonding temperature for mounting said semi-conductor substrate on said conductive pad and room temperature.

5,483,093

# INPUT PROTECTION DEVICE FOR ELECTRONIC DEVICE

Koichi Murakami, Yokosuka City, Japan, assignor to Nissan Motor Co., Ltd., Yokohama City, Japan

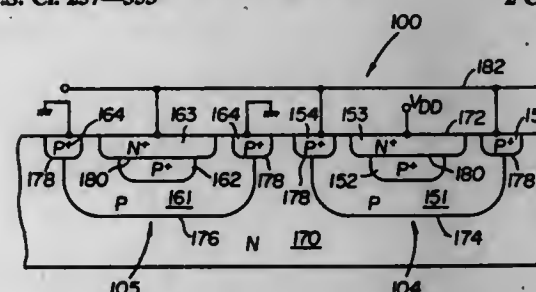
Division of Ser. No. 911,689, Jul. 13, 1992, abandoned. This application Dec. 6, 1993, Ser. No. 162,544

Claims priority, application Japan, Jul. 11, 1991, 3-197038

Int. Cl.<sup>6</sup> H01L 29/90

U.S. Cl. 257—355

2 Claims



1. In an input protection device adapted to be connected between a switch and an electronic device and circuited between a power supply and ground, the input protection device including a current limiting resistor having one end connected to the switch and an opposite end:

- a semiconductor substrate (170) of one conductive type, said semiconductor substrate having a surface;
- a first well region (151) extending into said semiconductor substrate from said surface and forming a first PN junction with the surrounding portions of said semiconductor substrate;
- a second region (152) of the same type as and of higher impurity concentration than the remainder of said first well region (151) extending into said surface within said first well region (151);
- a third region (153) of the same type as and of higher impurity concentration than the remainder of said semiconductor substrate extending into said surface within said first well region (151) and forming a second PN junction with said second region (152);
- a fourth region (154) of the same type as and of higher impurity concentration than the remainder of said first well region (151) extending into said surface at one end of said first well region and forming a third PN junction with the portions of said semiconductor substrate adjacent said first well region;
- a fifth well region (161) extending into said semiconductor substrate from said surface and forming a fourth PN junction with the surrounding portions of said semiconductor substrate (170);
- a sixth region (162) of the same type as and of higher impurity concentration than the remainder of said fifth well region (161) extending into said surface within said fifth well region;
- a seventh region (163) of the same type as and of higher impurity concentration than the remainder of said semiconductor substrate (170) extending into said surface within said

5,483,094

# ELECTRICALLY PROGRAMMABLE READ-ONLY MEMORY CELL

Umesh Sharma, and Hisao Kawasaki, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

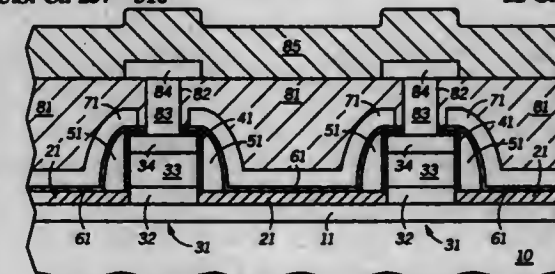
Division of Ser. No. 124,171, Sep. 20, 1993, Pat. No. 5,382,540.

This application Sep. 26, 1994, Ser. No. 312,371

Int. Cl.<sup>6</sup> H01L 29/68; 21/265

U.S. Cl. 257—316

22 Claims



1. An electrically programmable read-only memory cell comprising:

- a substrate having a first conductivity type and a primary surface;
- a first doped region having a second conductivity type that is opposite the first conductivity type, wherein the first doped region lies adjacent to the primary surface of the substrate;
- a pillar including a semiconductor material and overlying the first doped region and extending therefrom, wherein the pillar includes:
  - a central region having the first conductivity type, wherein all of the central region overlies the first doped region; and
  - a second doped region lying on the central region, wherein the second doped region has the second conductivity type;
- a first dielectric layer lying adjacent to a side of the pillar;
- a spacer lying adjacent to the first dielectric layer, wherein the spacer acts as a floating gate;
- a second dielectric layer lying adjacent to the spacer, wherein the second dielectric layer includes an opening that overlies the second doped region;
- a conductive member that lies adjacent to the second dielectric layer; and
- an interconnect that is electrically connected to the second doped region.

5,483,095

# OPTICAL SEMICONDUCTOR DEVICE

Hitoshi Kagawa, and Koji Yamashita, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1994, Ser. No. 308,254

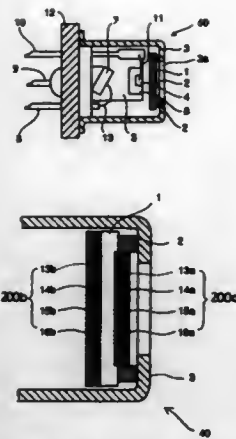
Claims priority, application Japan, Sep. 29, 1993, 5-242363

Int. Cl.<sup>6</sup> H01L 33/00; 32/12

U.S. Cl. 257—431

3 Claims

- 1. An optical semiconductor device comprising:
  - one of a light responsive semiconductor element, a light emitting semiconductor element, and a light responsive and light emitting semiconductor element;
  - a package hermetically sealing the semiconductor element, the package comprising a package body and a window compris-



ing a silicon body having front and rear surfaces that selectively transmits light incident on the semiconductor element and emitted from the semiconductor element;

a non-reflection film disposed on each of the front and rear surfaces of the silicon body, each of the non-reflection films comprising:

a first  $\text{SiO}_2$  layer produced by oxidizing a surface of the window and having a thickness of  $\lambda/2n_1$  where  $\lambda$  is the wavelength of light passing through the window, and  $n_1$  is the refractive index of  $\text{SiO}_2$ ;

a first  $\text{Al}_2\text{O}_3$  layer disposed on the first  $\text{SiO}_2$  layer and having a thickness of  $\lambda/4n_2$  where  $n_2$  is the refractive index of  $\text{Al}_2\text{O}_3$ ;

a second  $\text{SiO}_2$  layer disposed on the first  $\text{Al}_2\text{O}_3$  layer and having a thickness of  $\lambda/4n_1$ ; and

a second  $\text{Al}_2\text{O}_3$  layer disposed on the second  $\text{SiO}_2$  layer and having a thickness of  $\lambda/4n_2$ ; and

a solder connecting the window to the package body, the solder forming a eutectic alloy with silicon.

#### 5,483,096 PHOTO SENSOR

Kentaro Kuhara, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan

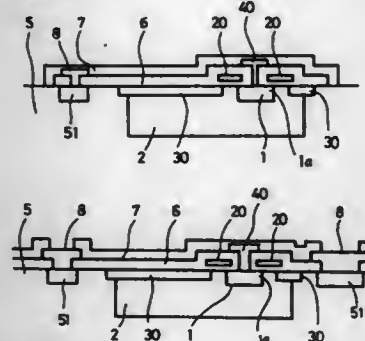
Continuation of Ser. No. 967,783, Oct. 28, 1992, abandoned.

This application May 27, 1994, Ser. No. 250,340

Claims priority, application Japan, Nov. 7, 1991, 3-291788; Nov. 7, 1991, 3-291789

Int. Cl.<sup>6</sup> H01L 31/08; 27/14; 23/48; 29/41

U.S. Cl. 257—462



1. A photosensor comprising:

a semiconductor substrate;

a bipolar phototransistor formed in a surface portion of the semiconductor substrate, the bipolar phototransistor having an emitter region, a base region, and a collector region which constitutes the semiconductor substrate, the emitter region being formed in a first surface portion of the base region, and the base region being formed in a surface portion of the collector region;

a region of high impurity concentration formed in a second surface portion of the base region and spaced from the emitter region formed in the first surface portion of the base region, the emitter region being surrounded by the region of high impurity concentration, and the region of high impurity concentration having the same conductivity type as that of the base region and a higher concentration than that of the base region;

a silicon dioxide film formed on the bipolar phototransistor, the silicon dioxide film having an upper surface and a sidewall surface; and

an electrode formed in the silicon dioxide film over a peripheral part of the emitter region, the peripheral part of the emitter region being formed in a third surface portion of the base region and between the region of high impurity concentration and the emitter region, and the emitter region being surrounded by the electrode which is maintained at a constant potential or a floating potential.

5,483,097

#### DEVICE PROTECTING LAYER

Hiroshi Ohtsuki, Kasugai; Fumio Ohara, Okazaki, and Shoji Toyoshima, Kohnan, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

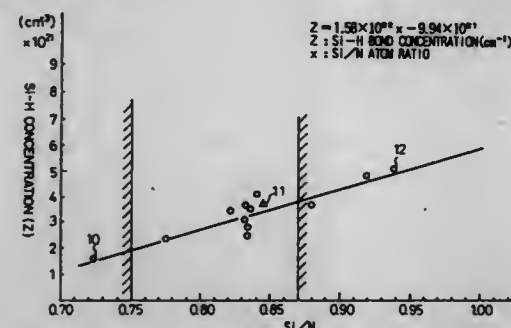
Filed Jan. 13, 1994, Ser. No. 181,111

Claims priority, application Japan, Jan. 14, 1992, 5-021821; Dec. 1, 1993, 5-338849

Int. Cl.<sup>6</sup> H01L 29/34

U.S. Cl. 257—632

7 Claims



1. A device protecting film made of hydrogen-containing silicon nitride, wherein a hydrogen bond concentration  $Y$  ( $\text{cm}^{-3}$ ) and a ratio  $\text{Si}/\text{N}$  of silicon to nitrogen,  $X$  satisfy the following formula:

$$.01 \times 10^{22} X + \alpha < Y < .01 \times 10^{22} X + \beta, \text{ where } \alpha = 9 \times 10^{21}, \beta = 5.9 \times 10^{21}; (1)$$

and in said hydrogen bond concentration  $Y$  ( $\text{cm}^{-3}$ ), the hydrogen-silicon bond concentration  $Z$  ( $\text{cm}^{-3}$ ) satisfies the following formula with respect to said  $\text{Si}/\text{N}$  ratio  $X$ :

$$.58 \times 10^{22} X - \delta < Z < .58 \times 10^{22} X + \delta, \text{ where } \gamma = 6 \times 10^{21}, \delta = 9.2 \times 10^{21} (2)$$

wherein said hydrogen bond concentration ( $Y$ ) and hydrogen-silicon bond concentration ( $Z$ ) serve to reduce the internal stress of said protective film.

5,483,098

#### DROP-IN HEAT SINK PACKAGE WITH WINDOW FRAME FLAG

Bennett A. Joiner, Jr., Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 871,776, Apr. 21, 1992, abandoned.

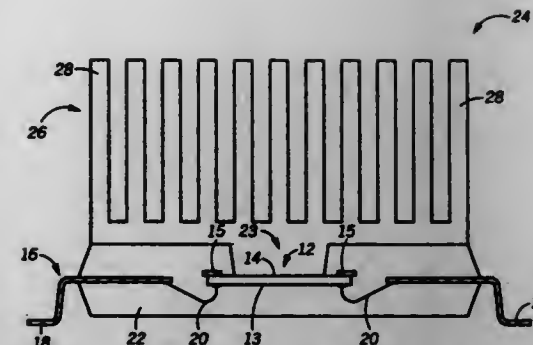
This application Oct. 18, 1994, Ser. No. 326,160

Int. Cl.<sup>6</sup> H01L 23/495

U.S. Cl. 257—676

20 Claims

1. The semiconductor device comprising:



a semiconductor die having an active surface, an inactive surface, and a periphery, wherein the semiconductor die has a plurality of bonding pads on the active surface;

a leadframe having a plurality of leads and a mounting surface with a die opening, the die opening being smaller than the semiconductor die, a first portion of the inactive surface of the semiconductor die being directly bonded to the mounting surface of the leadframe above the die opening thereby exposing a second portion of the inactive surface of the semiconductor die, whereby an interfacial area between the inactive surface of the semiconductor die and the mounting surface of the leadframe is limited to the first portion of the inactive surface;

a plurality of conductive wires electrically coupling the plurality of bonding pads on the active surface of the semiconductor die to the plurality of leads of the leadframe; and

a molded package body around the periphery, over the active surface, and over the first portion of the inactive surface of the semiconductor die, the wires, and the leadframe, wherein the package body has an opening molded therein so that the second portion of the inactive surface of the semiconductor die remains uncovered, wherein said opening has a tapered sidewall to allow insertion of a heat spreader without external pressure.

5,483,100

#### INTEGRATED CIRCUIT PACKAGE WITH VIA INTERCONNECTIONS FORMED IN A SUBSTRATE

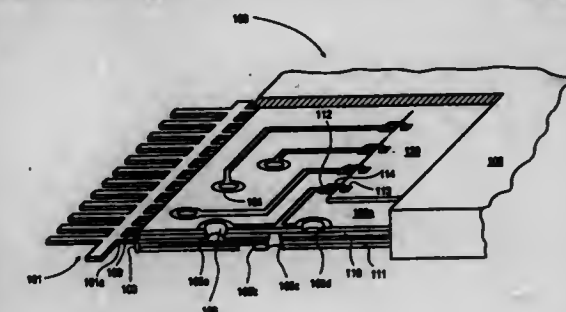
Robert C. Marra, Scottsdale, Ariz., and Tadashi Hirakawa, Osaka, Japan, assignors to Amkor Electronics, Inc., Chandler, Ariz., and Teijin Limited, Osaka, Japan

Filed Jun. 2, 1992, Ser. No. 893,518

Int. Cl.<sup>6</sup> H01L 23/053; 23/12; 23/495

U.S. Cl. 257—700

11 Claims



1. An encapsulated integrated circuit, comprising:  
 a substrate having a first surface and a second surface opposite the first surface and including a dielectric layer;  
 a plurality of electrically conductive vias in the substrate;  
 a plurality of electrically conductive leads attached to the first surface of the substrate;  
 a plurality of bond pads, on the second surface of the substrate, for connection to an integrated circuit;  
 a plurality of electrically conductive traces extending on the second surface from the bond pads;  
 one of the electrically conductive vias extending from one of the traces through the dielectric layers to one of the plurality of leads; and  
 a plastic material encapsulating the substrate and an inner portion of the leads with an outer portion of the leads remaining exposed outside the plastic material.

5,483,099

#### STANDARDIZED POWER AND GROUND DESIGN FOR PIN GRID ARRAY PACKAGES

Siva Natarajan, Gilbert; Udy Shrivastava, Tempe; William M. Stu, Paradise Valley, and Mark J. Palmer, Phoenix, all of Ariz., assignors to Intel Corporation, Santa Clara, Calif.

Filed Aug. 31, 1994, Ser. No. 298,925

Int. Cl.<sup>6</sup> H01L 23/52; 23/48; 23/02

U.S. Cl. 257—691

18 Claims

1. An electronic package that can be mounted to an external device, comprising:

an integrated circuit;

a housing that encapsulates said integrated circuit, said housing having a bottom outer surface;

a plurality of pins that extend from said bottom outer surface of said housing and are electrically coupled to said integrated circuit; and

a conductive ring electrically coupled to said integrated circuit and located at said bottom outer surface of said housing so that said package is electrically coupled to the external device through said pins and by pressing said conductive ring onto the external device.



5,483,101

## MULTILAYER PRINTED CIRCUIT BOARD

Tadanori Shimoto, and Koji Matsui, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

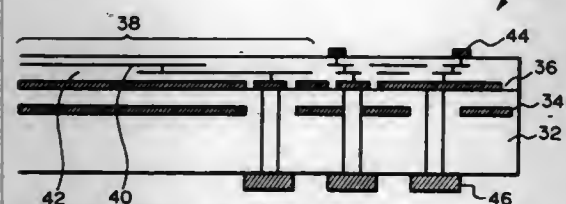
Filed Dec. 5, 1994, Ser. No. 341,202

Claims priority, application Japan, Dec. 10, 1993, 5-310512

Int. Cl.<sup>6</sup> H01L 23/12

U.S. Cl. 257-701

8 Claims



1. A semiconductor package comprising: a printed circuit board comprising a glass cloth impregnated with resin resistive to heat; a ground layer formed on a surface of said printed circuit board and provided with a plate structure, said ground layer etched according to a pattern; a thin film laminate wiring comprising a copper thin film conductor formed on said ground layer, and benzocyclobutene resin; and a copper foil power source layer disposed in said printed circuit board and provided with a plate structure.

5,483,102

## EMPLOYING ON DIE TEMPERATURE SENSORS AND FAN-HEATSINK FAILURE SIGNALS TO CONTROL POWER DISSIPATION

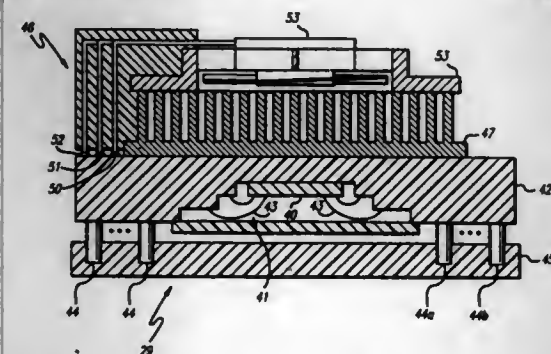
James R. Neal, Cameron Park; Peter F. Brown, Orangevale; Louis W. Agatstein, El Dorado Hills, all of Calif., and Michael Gutman, Zichron-Ya'acov, Israel, assignors to Intel Corporation, Santa Clara, Calif.

Filed May 12, 1994, Ser. No. 241,777

Int. Cl.<sup>6</sup> G06F 15/20

U.S. Cl. 257-712

22 Claims



1. Employed within a semiconductor device having a fan element disposed thereon, an integrated circuit for reducing a clocking frequency of an internal clock signal used by core circuitry within the semiconductor device, said integrated circuit comprising:

multiplexing means for transmitting one of a plurality of input clock signals to said core circuitry as said internal clock signal, said plurality of input clock signals including at least a first input clock signal having a first clock frequency and a second input clock signal having a second clock frequency, wherein said first clock frequency is substantially greater than said second clock frequency; and

logic means for selecting said internal clock signal, said logic means is coupled to said multiplexing means through a select line, wherein said logic means selects said first input clock signal to be said internal clock signal if said select line is inactive.

5,483,103

## MEANS FOR CLAMPING A SEMI-CONDUCTOR TO A SUPPORT

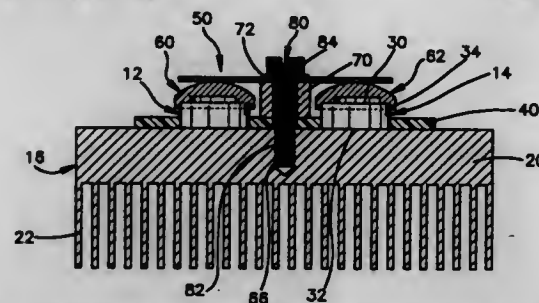
Joseph D. Blickhan; David K. Bonds; Robert J. Crockett; James E. Mazurek, and Dennis J. Mills, all of Quincy, Ill., assignors to Harris Corporation, Melbourne, Fla.

Filed Feb. 24, 1994, Ser. No. 201,612

Int. Cl.<sup>6</sup> H01L 23/34

U.S. Cl. 257-718

9 Claims



1. Apparatus for resiliently clamping semi-conductor means to a heat sink for receiving heat from said semi-conduction means and having an upper surface and wherein said semi-conductor means includes a housing having upper and lower spaced-apart relatively flat surfaces interconnected by an upstanding wall and comprising: leveller means having an upper dome-shaped contact surface and a lower surface having a first recess formed therein, said first recess being shaped and being of sufficient size to receive the upper portion of a said housing including the upper surface thereof and a portion of the height of said upstanding wall while the lower surface of said housing is located on the upper surface of a said heat sink; an elongated flat spring overlying and resiliently biased toward and engaging said dome-shaped contact surface of said leveller means for resiliently biasing said semi-conductor means against said heat sink; fastening means for securing said spring to said heat sink such that said spring exerts a resilient force against the dome-shaped contact surface of said leveller to resiliently clamp said semi-conductor means against said upper surface of said heat sink; and wherein said first recess includes a second recess formed therein to define a shoulder therebetween which overlies the upstanding wall of said housing so that clamping resilient forces exerted by said spring are directed to said upstanding wall of said housing.

5,483,104

## SELF-ALIGNING CONTACT AND INTERCONNECT STRUCTURE

Norman Godinho, Los Altos Hills; Tsu-Wei F. Lee, Monte Sereno; Hsiang-Wen Chen, Cupertino; Richard F. Motta, Los Altos; Juine-Kai Tsang, Palo Alto; Joseph Tzou, Belmont; Jai-Man Balk, San Jose, and Ting-Pwu Yen, Fremont, all of Calif., assignors to Paradigm Technology, Inc., San Jose, Calif.

Division of Ser. No. 743,008, Aug. 9, 1991, abandoned, which is a continuation of Ser. No. 555,559, Jul. 19, 1990, Pat. No. 5,124,774, which is a continuation-in-part of Ser. No. 464,496, Jan. 12, 1990, Pat. No. 5,166,771. This application Sep. 28, 1992, Ser. No. 953,410

The portion of the term of this patent subsequent to Jun. 23, 2009, has been disclaimed.  
Int. Cl.<sup>6</sup> H01L 23/48; 27/02

U.S. Cl. 257-758

10 Claims

1. A semiconductor structure comprising: a transistor T1 having main current-carrying electrodes S1 and D1 and having a control electrode G1 extending up higher than said electrode S1, said control electrode G1 having a sidewall SWL1 adjacent said electrode S1 and further having a top;

5,483,106

## SEMICONDUCTOR DEVICE FOR SENSING STRAIN ON A SUBSTRATE

Masashi Echigo, Kariya; Yoshitaka Nagayama, Nukata; Takushi Maeda, Obo; Toshitaka Yamada, Okazaki, and Masahiko Kitano, Nukata, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

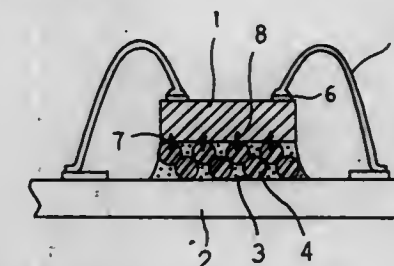
Filed Jul. 29, 1994, Ser. No. 282,006

Claims priority, application Japan, Jul. 30, 1993, 5-189711

Int. Cl.<sup>6</sup> H01L 23/48; 23/29; 23/50

U.S. Cl. 257-783

9 Claims



1. A semiconductor device comprising: a substrate; a sensor element for sensing strain and outputting signals; and an adhesive for fixing said sensor element on said substrate, said adhesive comprising: a base adhesive made of flexible resin with an elastic modulus of 500 MPa or less; and a compounding resin bead with an elastic modulus of 20 GPa or less, and a particle size thereof being within a range from 5 μm to 100 μm, wherein said sensor element is fixed on said substrate such that a film thickness of said adhesive is within a range from 5 μm to 100 μm and such that the particle size of said resin bead is maintained.

5,483,105

## MODULE INPUT-OUTPUT PAD HAVING STEPPED SET-BACK

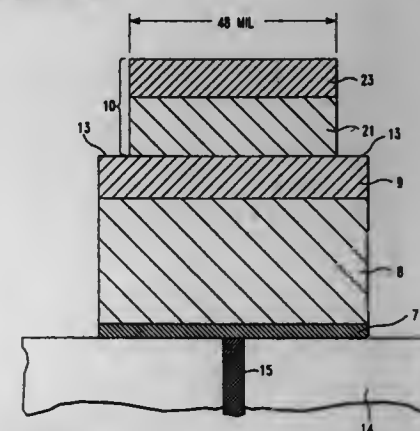
Suryanarayana Raja, Hopewell Junction; Eric D. Perfecto, Poughkeepsie; William H. Price, Cortlandt Manor; Sampath Purushothaman, Yorktown Heights; Srinivasa N. Reddy, LaGrangeville, all of N.Y.; Vivek M. Sura, Pune, Ind., and George E. White, Fishkill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 25, 1994, Ser. No. 233,025

Int. Cl.<sup>6</sup> H01L 23/48; 23/52; 29/40

U.S. Cl. 257-779

9 Claims



1. In combination, a ceramic substrate; a brazing alloy; a conductive pin; and a conductive layered pad for braze bonding said pin to said substrate, said pad comprising a first bonding layer bonded to said substrate, a cushion layer a braze barrier layer; and a second bonding layer said pin being brazed to said second bonding layer, said second bonding layer being a smaller width than said braze barrier layer so as to form a stepped set back, said braze barrier layer being oxidized sufficiently to be non-wettable by said brazing alloy.

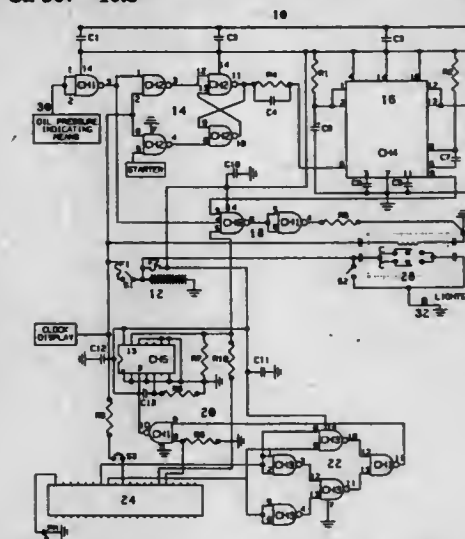
5,483,107

## AUTOMATIC DEFENSIVE DRIVING ILLUMINATION SYSTEM

Wilmer R. Xander, 274 Panoramic Dr., Camdenton, Mo. 65020  
Continuation-in-part of Ser. No. 782,561, Oct. 25, 1991, abandoned. This application Jul. 23, 1993, Ser. No. 97,085Int. Cl.<sup>6</sup> B60Q 1/04

U.S. Cl. 307-10.8

16 Claims



14. A fail safe method of automatically illuminating headlights, taillights, side markers and other lights of a vehicle normally activated with the headlight switch in which the steps comprise:

determining if an engine in a vehicle is running using an engine running determining means, said engine running determining means having an output;  
 determining when a starter for said engine is not engaged with a starter engaged determining means, said starter engaged determining means having an output;  
 determining when the ignition for said engine is on with an ignition on determining means, said ignition on determining means having an output;  
 generating a delayed signal with a delayed signal generator means when activated by outputs of said engine running determining means, said starter engaged determining means and ignition on determining means;  
 means for combining outputs with a combining output means of said delayed signal generator means, and said engine running determining means to provide an output signal when all inputs are present; and  
 activating an illumination means by said output of said combining output means to illuminate said lights on said vehicle.

5,483,108

# UNINTERRUPTED DISTRIBUTED STORAGE SUPPLY SYSTEM

Jacques Girard, Verrieres Le Buison, and Didier Marquet, Malakoff, both of, France, assignors to France Telecom Etablissement Autonome de Droit Public, Paris, France

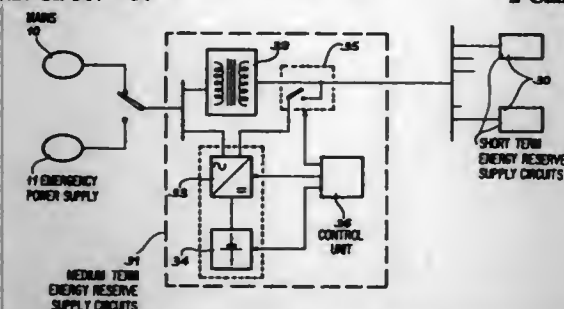
Filed Jun. 25, 1993, Ser. No. 81,110

Claims priority, application France, Jun. 29, 1992, 9207961

Int. Cl.<sup>6</sup> H02J 4/00

U.S. Cl. 307-64

2 Claims



1. An uninterrupted, distributed storage supply system for sensitive operating systems supplied from a public electric energy distribution mains or an emergency power supply producing an equivalent voltage, comprising:

- a short term energy reserve supply circuit including a rectifying and filtering circuit having an input connected to an input of the short term energy reserve supply circuit and having an output, a conversion circuit having an input connected to the output of the rectifying and filtering circuit and having an output, a filtering circuit having an input connected to the output of the conversion circuit and having an output connectable to any of said operating systems, an emergency chain connected to the input of the filtering circuit including a storage circuit for storing electrical energy, a regulating circuit connected to the storage circuit for regulating the amount of electrical energy outputted to the input of the filtering circuit, a charging circuit for charging the storage circuits, and a control/checking circuit for controlling the emergency chain to output electrical energy from the storage circuit to the filtering circuit for driving any of said operating systems for supplying energy to said operating systems;
- a medium term energy reserve supply circuit for supplying energy to said operating systems;
- wherein, said short term energy supply circuit supplying energy to said operating systems during a first time when the energy from the mains is initially interrupted;
- wherein, said medium term energy supply circuit supplying energy to said operating systems during a second time, longer than the first time, and the short term energy supply circuit no longer supplies energy to the operating systems;

wherein, said medium term energy supply circuit has a reaction delay shorter than the autonomy delay of the short term energy reserve supply circuit so that when the medium term energy supply circuit supplies energy to the operating systems a switching noise is reduced.

5,483,109

# ANTI-FUEL SLOSH CIRCUIT

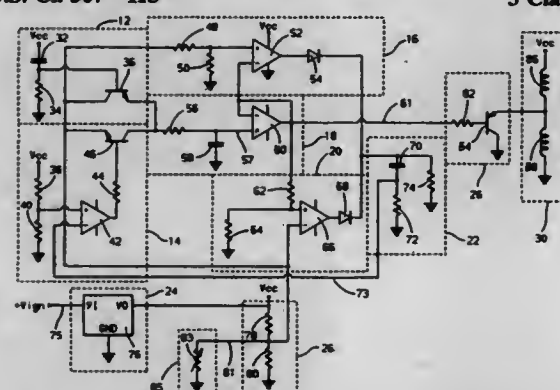
Jerome E. Gholston, Noblesville, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.

Filed Jul. 6, 1993, Ser. No. 86,586

Int. Cl.<sup>6</sup> G01F 23/00; H01H 35/18

U.S. Cl. 307-118

3 Claims



1. An apparatus comprising:

- a liquid level sender providing a sender output signal that varies with a measure of the level of a liquid and that varies with a slosh of the liquid;
- a main control circuit for selectively coupling and decoupling the sender output signal to a process circuit;
- the process circuit providing a process output signal to drive a liquid level indicator;

first monitor circuit for monitoring the process output signal and the sender output signal and for providing a first monitor output signal if the sender output signal is greater than the process output signal by more than a first predetermined constant amount;

second monitor circuit for monitoring the process output signal and the sender output signal and for providing a second monitor output signal if the sender output signal is less than the process output signal by more than a second predetermined constant amount;

a timer circuit for receiving the first and second monitor output signals and for producing an output control signal for a predetermined period of time in response to either of the first and second monitor output signals;

means within the main control circuit for decoupling the sender output signal from the process circuit in response to the control signal; and

means within the process circuit for delaying the sender output signal to produce a time delayed sender output signal, for retaining a sample of the time delayed sender output signal, and for driving the liquid level indicator with the retained sample of the time delayed sender output signal when the sender output signal is decoupled from the process circuit and for driving the liquid level indicator with the time delayed sender output signal when the sender output signal is coupled to the process circuit.

5,483,110

# SIGNAL TRANSMISSION METHOD, SIGNAL TRANSMISSION CIRCUIT AND INFORMATION PROCESSING SYSTEM USING SAME

Kazuo Koide, Iruma; Masao Mizukami, Yokohama; Satoshi Hososaka, Higashiyama, and Junya Kudoh, Tokyo, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

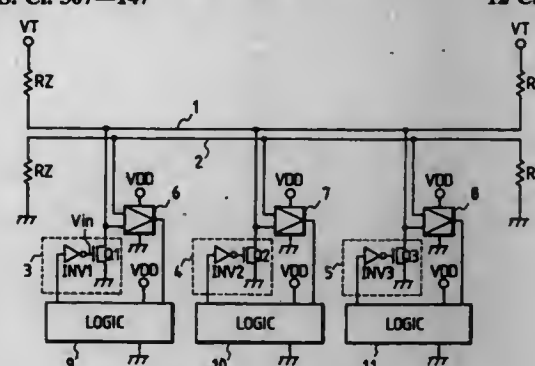
Filed Feb. 28, 1994, Ser. No. 202,382

Claims priority, application Japan, Mar. 19, 1993, 5-085428; Sep. 9, 1993, 5-248740; Nov. 29, 1993, 5-323291

Int. Cl.<sup>6</sup> H01B 11/12

U.S. Cl. 307-147

12 Claims



1. A signal transmission circuit comprising:

- a first signal transmission path supplied with terminal end voltage through a terminal end resistor for transmitting a data signal;
- a second signal transmission path supplied with reference potential through a terminal end resistor and installed traveling in parallel to said first signal transmission path; and
- a first logic circuit connected to said first and second signal transmission paths and including a first input circuit having prescribed offset voltage, wherein said first input circuit includes a first input stage circuit having a first transistor supplied with the reference potential of said second signal transmission path and a second transistor supplied with the data signal transmitted from said first signal path, said first transistor and said second transistor carrying out differential operation by the offset voltage.

5,483,111

# METHOD AND APPARATUS FOR ELIMINATION OF THE EXIT-EDGE EFFECT IN HIGH SPEED LINEAR INDUCTION MACHINES FOR MAGLEV PROPULSION SYSTEMS

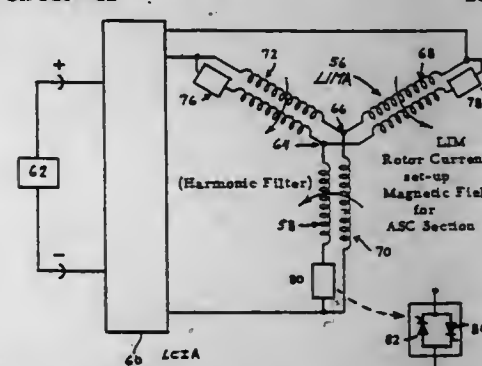
Stephen B. Kuznetsov, Rockville, Md., assignor to Power Superconductor Applications Corp., Pittsburgh, Pa.

Filed Mar. 23, 1994, Ser. No. 217,443

Int. Cl.<sup>6</sup> H02K 41/00

U.S. Cl. 310-12

21 Claims



1. An alternating current linear electrical machine having a first winding and a second winding both of electrically conductive material and supported for relative motion with a flux-permeable

gap between them, one winding being arranged to create and maintain along the gap at least one transient to different electrical and/or magnetic field conditions across the gap, without requiring a change in the frequency of the alternating current applied to the machine, the arrangement being such that in operation with said relative motion of the windings the transient to different conditions results in a change of effective field speed along said gap and the first and second windings there interact to produce in the one winding negative reactive volt amperes.

5,483,112

# ROTOR END TURN VENTILATION STRUCTURE

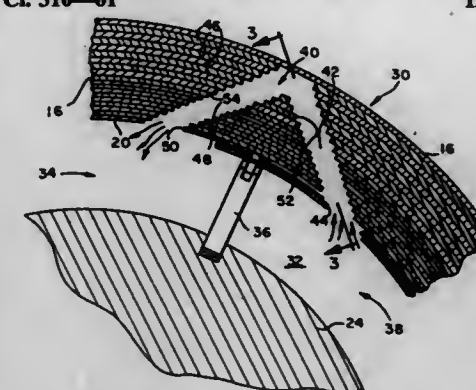
Kathleen M. Bisell, Oviedo, Fla.; Cliff A. Welborn, Fort Payne, Ala.; Albert C. Sismour, Jr., Casselberry, and Lon W. Montgomery, Winter Springs, both of Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 30, 1993, Ser. No. 176,343

Int. Cl.<sup>6</sup> H02K 1/32; 3/24

U.S. Cl. 310-61

12 Claims



1. An improved rotor end winding assembly for an electrodynamic apparatus such as an electrical generator, comprising: a rotor shaft;

- a stack of a plurality of conductive straps, said stack of straps having an end turn portion, said stack of straps including a top strap, a bottom strap and a number of intermediate straps that are stacked between said top strap and said bottom strap;
- a space defined between said rotor shaft and said bottom strap, said space being divided into at a high pressure zone and a low pressure zone by a zone block; and
- a coolant passage defined in said stack, said coolant passage comprising: an inlet hole defined in said bottom strap adjacent to said high pressure zone;
- a number of ascending holes defined, respectively, in a number of said intermediate straps to define an ascending passage that leads toward said top strap and in the direction of said zone block and low pressure zone;
- an outlet hole defined in said bottom strap adjacent to said low pressure zone; and
- a number of descending holes that define a descending passage which is in communication with said ascending passage at a first end and with said outlet hole at a second end whereby coolant will flow from said high pressure zone to said low pressure zone to efficiently cool said stack of straps.



5,483,113

**ELECTRIC MOTOR FOR DRIVING A MAGNETIC DISK**  
Katsunori Sakuragi; Hideshi Fukutani, and Akihiko Matsuo,  
all of Yonago, Japan, assignors to Matsushita Electric Indus-  
trial Co., Ltd., Kadoma, Japan

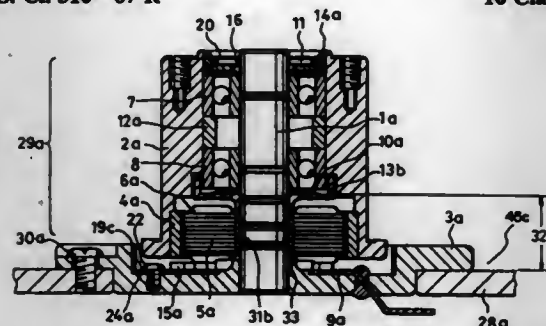
Filed Jun. 7, 1993, Ser. No. 72,749

Claims priority, application Japan, Jun. 9, 1992, 4-039277;  
Jun. 18, 1992, 4-159202; Dec. 22, 1992, 4-341895

Int. Cl.<sup>6</sup> H02K 7/00

U.S. Cl. 310—67 R

16 Claims



1. An electric motor for driving a magnetic disk, comprising:  
a bracket secured to and fixed on a magnetic disk driving unit;  
a stationary shaft fixed on said bracket and extending axially to  
a region where said magnetic disk is accommodated;  
a hub for carrying and rotating said magnetic disk;  
at least one bearing supported by said stationary shaft, for  
rotatably holding said hub;  
a rotor magnet provided on an inner circumference of said hub,  
for generating a rotational force on said hub;  
a stator core with a plurality of coils provided on said stationary  
shaft at a position which confronts to said rotor magnet; and  
a cylindrical shielding plate provided on an inner circumference  
of a cylindrical recess formed on said bracket.

5,483,114

**HYSTERESIS COUPLING**

Christoph Feener, Rifferswil, Switzerland, assignor to Landis  
& Gyr Business Support AG, Zug, Switzerland

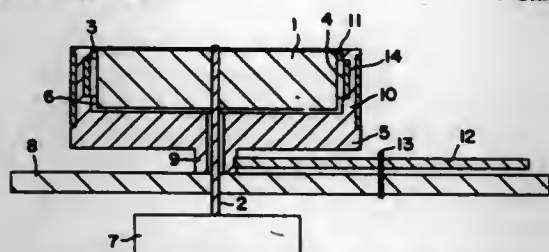
Filed Jan. 3, 1994, Ser. No. 176,713

Claims priority, application Switzerland, Jan. 7, 1993, 45/93

Int. Cl.<sup>6</sup> H02K 7/10; 49/04; 49/10

U.S. Cl. 310—75 D

7 Claims



1. A hysteresis coupling for transferring a predetermined torque  
of a drive to an output device, comprising:  
a magnetic cylinder made of a permanently magnetic material  
and fixedly connected to the drive by a common axis,  
a thrust ring made of a hysteresis material and fixedly connected  
to a thrust ring holder, said thrust ring and thrust ring holder  
separated from said magnetic cylinder by an air gap, and  
a non-magnetic material of high density surrounding said thrust  
ring and fixedly connected to said thrust ring holder, said  
non-magnetic material increasing the moment of inertia of  
said thrust ring holder and rotating freely on said common  
axis.

5,483,115

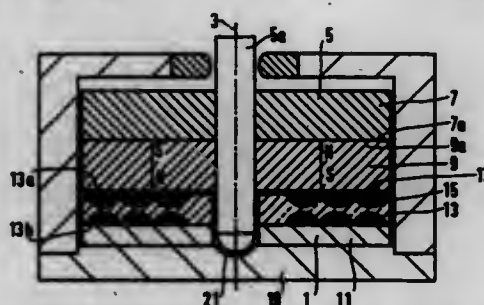
**ELECTRICAL MACHINE WITH DIRECTLY BONDED  
MAGNETIC PARTS**

Jan Haisma; Evert M. H. Kamerbeek; Gijbertus A. C. M.  
Sperlings, and Peter W. De Haas, all of Eindhoven, Nether-  
lands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 25,692, Mar. 3, 1993, abandoned.  
This application Aug. 2, 1994, Ser. No. 284,714Claims priority, application Netherlands, Mar. 20, 1992,  
9200515Int. Cl.<sup>6</sup> H02K 21/12; 21/26

U.S. Cl. 310—156

21 Claims



1. An electrical machine comprising a first section and a second  
section which is movable relative to the first section, at least one of  
said sections comprising a soft-magnetic part and a hard-magnetic  
part, which parts are interconnected, characterized in that:  
a surface of the soft-magnetic part and a surface of the hard-  
magnetic part, each having a surface roughness height of  
about less than or equal to two nanometers, are fixed inti-  
mately to one another such that a direct bond is formed  
without requiring an additional bonding material disposed  
between the surfaces of the two magnetic parts.

5,483,116

**ROTOR FOR A ROTATING ELECTRIC MACHINE**

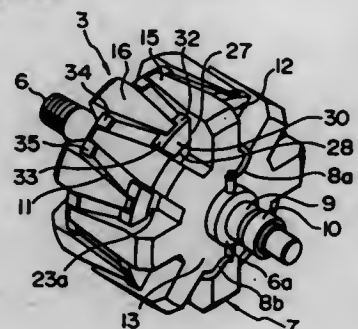
Shin Kusase, Oba; Atsushi Umeda, Anjo; Saburo Hukaya,  
Kariya; Noriyasu Inomata, Toyota; Hiroshi Irie, Nagoya,  
and Hiroshi Ishida, Anjo, all of Japan, assignors to Nippon-  
denso Co., Ltd., Kariya, Japan

Filed Aug. 30, 1994, Ser. No. 297,838

Claims priority, application Japan, Aug. 30, 1993, 5-214253;  
Jul. 5, 1994, 6-153679Int. Cl.<sup>6</sup> H02K 1/22

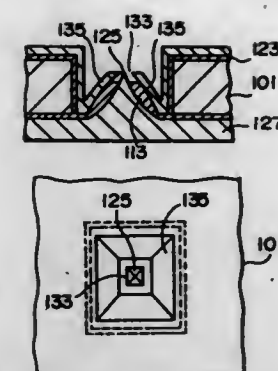
U.S. Cl. 310—263

23 Claims



1. A rotor of a rotating electric machine comprising:  
a shaft;  
pole cores including a plurality of claw-like magnetic poles  
formed on an outer periphery thereof, said claw-like magnetic  
poles adapted to engage with each other and rotate integrally  
with a rotation of said shaft;  
a plurality of permanent magnets each of which is disposed  
between two circumferentially adjacent ones of said plurality  
of claw-like magnetic poles and each of which is magnetized  
in a direction that diminishes magnetic flux leakage between

said circumferentially adjacent ones of said plurality of claw-  
like magnetic poles; and  
a resin-made magnet holding member fit between circumferen-  
tial side faces of said plurality of claw-like magnetic poles to  
hold said plurality of permanent magnets, said resin-made  
magnet holding member being shaded so as to travel at least  
circumferentially at axial ends of said claw-like magnetic  
poles covering said axial ends.



5,483,117

**DEVICE FOR NON-THERMAL EXCITATION AND  
IONIZATION OF VAPORS AND GASES**

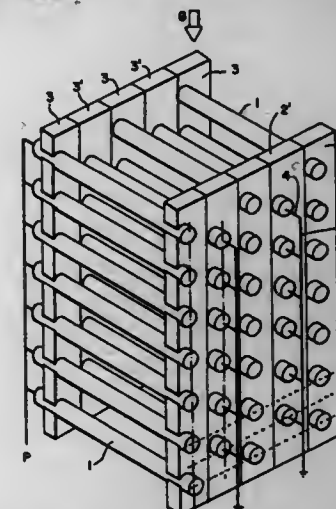
Ernst Rohrer, Boden, CH-9470 Buchs, Switzerland

Filed Feb. 17, 1994, Ser. No. 198,115

Claims priority, application Switzerland, Feb. 19, 1993, 529/  
93Int. Cl.<sup>6</sup> H01J 1/02; H01T 23/00

U.S. Cl. 313—306

10 Claims



1. A device for the excitation of vapors and gases by electric  
fields between electrodes consisting of a plurality of parallel,  
rod-shaped electrode elements, each of said electrode elements  
being enclosed in a protective casing and wherein gaps are formed  
between said protective casing for passage of said vapors and gases  
and wherein said electrode elements are arranged in modules, each  
module comprising a plurality of parallel electrode elements  
arranged in a plane and at least one elongate support means for  
holding all said electrode elements of said module.

5,483,118

**FIELD EMISSION COLD CATHODE AND METHOD FOR  
PRODUCTION THEREOF**

Masayuki Nakamoto, Yokohama, and Tomio Ono, Yamato,  
both of Japan, assignors to Kabushiki Kaisha Toshiba,  
Kanagawa, Japan

Filed Mar. 14, 1994, Ser. No. 209,928

Claims priority, application Japan, Mar. 15, 1993, 5-054018

Int. Cl.<sup>6</sup> H01J 19/24

U.S. Cl. 313—309

5 Claims

1. A field emission cold cathode designed to emit electrons  
through minute emitters of a projecting structure, comprising:  
a substrate possessing a first main surface on one side thereof and a  
second main surface on the other side thereof and an insulation  
layer formed between the substrate and an emitter layer, and  
between the emitter layer and a gate electrode layer and having  
windows formed on the second main surface, said emitter layer  
formed on said first main surface side of said substrate and having  
emitters disposed at the positions of said windows, and said gate  
electrode layer formed on said second main surface side of said

substrate and having openings so formed as to enclose the periph-  
ery of at least a tip of each of said emitters without contact.

5,483,119

**ILLUMINATION DEVICES AND METHODS OF  
FORMING SAME**

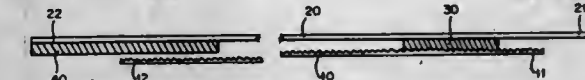
Walter A. Johanson, 250 E. Fifth St., #401, St. Paul, Minn.  
55101

Filed Jun. 15, 1993, Ser. No. 77,415

Int. Cl.<sup>6</sup> H01J 1/62

U.S. Cl. 313—498

16 Claims



1. A light tube comprising:  
a sheet of optical light film comprising a first longitudinal edge  
portion and a second longitudinal edge portion, said first sheet  
having sufficient flexibility to allow said first longitudinal  
edge portion to be disposed in a position proximate said  
second longitudinal edge portion;  
a second sheet comprising a first longitudinal edge, a second  
longitudinal edge, and a first contact region remote from said  
first longitudinal edge;  
means for maintaining said optical light film in a tube configu-  
ration comprising a first connector having at least one adhe-  
sive portion, said first connector connected to said optional  
light film at a position remote from said first longitudinal edge  
portion and to said second sheet at a position remote from  
said first longitudinal edge thereby defining a slot; and  
a second connector comprising at least one adhesive portion,  
wherein said second connector is connected to at least two  
separate sections of said second sheet.

5,483,120

**ELECTROLUMINESCENT DEVICE HAVING IMPROVED  
ELECTRODE TERMINALS**

Hiroki Murakami, Kanagawa, Japan, assignor to Fuji Xerox  
Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 774,918, Oct. 11, 1991, abandoned.

This application Oct. 6, 1993, Ser. No. 132,232

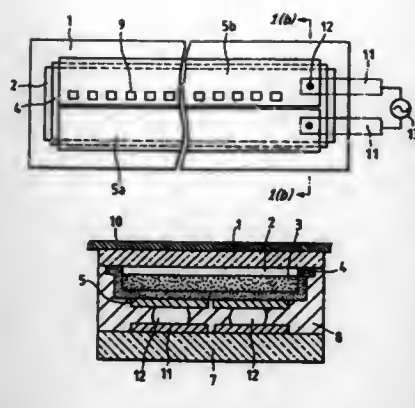
Claims priority, application Japan, Dec. 18, 1990, 2-411344

Int. Cl.<sup>6</sup> H01J 1/54; H01R 9/24; G09G 3/10

U.S. Cl. 313—506

8 Claims

1. An electroluminescent device comprising:  
a first insulative substrate;  
a first electrode formed over the first insulative substrate;  
an electroluminescent layer formed over the first electrode;  
a pair of second electrodes formed over the electroluminescent  
layer in opposed relation to the first electrode; and  
terminals supported independently of the pair of second elec-  
trodes for connecting the pair of second electrodes to respec-  
tive terminals of a voltage supply.



5,483,121

**HOLLOW CATHODE DISCHARGE TUBE**

Hiroshi Okagaki, Mito; Takayuki Kameya, Ohmiya; Hiroshi Ishizaki, Urawa, and Kazuya Abe, Sashima, all of Japan, assignors to Koto Electric Co., Ltd., Urawa, Japan

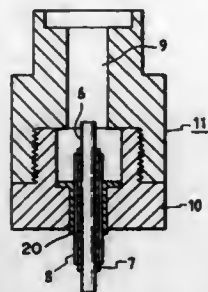
Filed Apr. 22, 1993, Ser. No. 51,208

Claims priority, application Japan, Apr. 24, 1992, 4-106503

Int. Cl.<sup>6</sup> H01J 61/09

U.S. Cl. 313-618

7 Claims



1. A hollow cathode discharge tube of the type having a thermion emitting electrode in combination with a hollow cathode and an anode in a bulb comprising:

- a hollow spaced cathode having a first hollow spaced small diameter portion, a second hollow spaced large diameter portion the first and second portions connected together with the first portion having an open end portion and the second portion having a closed end portion;
- an anode extending through said closed end portion;
- an insulator surrounding a part of said anode; and
- a first auxiliary electrode for emitting thermions insulated from said cathode and anode and extending into the hollow space of the cathode.

5,483,122

**TWO-BEAM PARTICLE ACCELERATION METHOD AND APPARATUS**

Yaroslav S. Derbenev, Ann Arbor, Mich.; Yue-Ying Lau, Potosi, Md., and Ronald M. Gilgenbach, Ann Arbor, Mich., assignors to Regents of the University of Michigan, Ann Arbor, Mich.

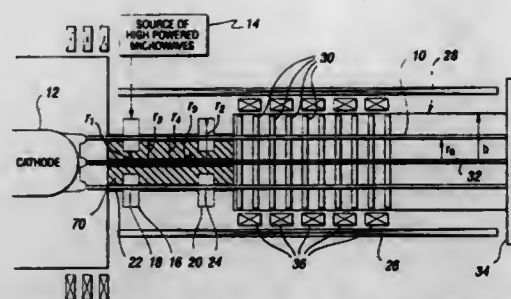
Filed Feb. 18, 1994, Ser. No. 198,474

Int. Cl.<sup>6</sup> H05H 7/06

U.S. Cl. 315-5.140

20 Claims

11. A two-beam particle acceleration apparatus comprising:
  - a first generator for generating a high power intense relativistic driver beam of particles;
  - a second generator for generating a secondary beam of particles;
  - a modulator positioned relative to the first generator for modulating current of the driver beam of particles at a predetermined frequency to produce a modulated driver beam of particles;
  - an accelerator positioned relative to the first and second generator and having a center line wherein the modulated driver



beam of particles and the secondary beam of particles are copropagated in the same direction through the accelerator so that the modulated driver beam is located substantially along a radius,  $r_0$ , with respect to the center line; and

a controller positioned relative to the accelerator for adjusting the radius,  $r_0$ , of the modulated driver beam of particles in the accelerator so that the modulated driver beam of particles accelerates the secondary beam of particles continuously in a controlled fashion.

5,483,123

**HIGH IMPEDANCE ANODE STRUCTURE FOR INJECTION LOCKED MAGNETRON**

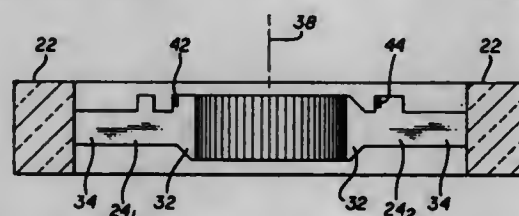
Christopher M. Walker, Montoursville, Pa., and Geoffrey Thornber, Aptos, Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Apr. 30, 1993, Ser. No. 55,823

Int. Cl.<sup>6</sup> H01J 23/18; 23/22

U.S. Cl. 315-39.73

12 Claims



1. A high impedance anode circuit for a magnetron, comprising:
  - a plurality of first radial vanes disposed in and extending from an anode ring;
  - a plurality of second radial vanes, interdigitating with said first vanes, and disposed in and extending from said anode ring to define a vane structure;
  - a first strap interconnecting said plurality of first vanes;
  - a second strap interconnecting said plurality of second vanes, said first and second straps each having a respective rectangular cross-section with corresponding parallel facing surfaces;
  - said plurality of first and second vanes each having a respective high inductance portion adjacent said anode ring and a respective high capacitance portion extending from said high inductance portion, said high inductance portion being longer than said high capacitance portion so that said circuit provides a high single cavity impedance.

5,483,124

**NEON ILLUMINATION SYSTEM**

Ali Kaviani, Sicklerville, N.J., assignor to Spencer Gifts, Inc., Pleasantville, N.J.

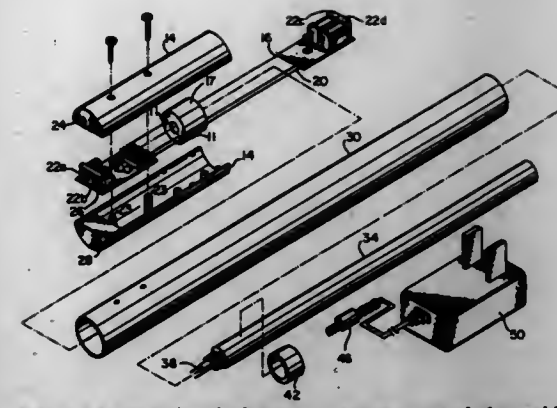
Filed Apr. 26, 1994, Ser. No. 233,492

Int. Cl.<sup>6</sup> H05B 37/00

U.S. Cl. 315-86

11 Claims

1. An assembly of elongated illumination sources, comprising:
  - first and second sources of illumination each requiring converted electrical energy to provide said illumination;



first and second electrical energy converters coupled to said first and second sources of illumination respectively for receiving low voltage DC energy and converting said low voltage DC energy to first and second supplies of said converted electrical energy;

first and second connectors electrically coupled to said first and second electrical energy converters, respectively, for receiving said low voltage DC energy and applying said low voltage DC energy to said first and second converters;

a single source of low voltage DC energy for applying said low voltage DC energy to a selected one of said first and second connectors to provide an energized connector and a remaining connector;

third and fourth connectors disposed upon said first and second sources of illumination, respectively, wherein said first connector is directly electrically coupled in parallel with said third electrical connector within said first source of illumination and said second electrical connector is directly electrically coupled in parallel with said fourth electrical connector within said second source of illumination; and

an electrical connecting line external to said first and second sources of illumination electrically coupled to said remaining connector and to a selected one of said second and fourth electrical connectors thereby energizing both said first and said second sources of illumination.

5,483,125

**BALLAST CIRCUIT FOR A GAS DISCHARGE LAMP HAVING A CATHODE PRE-HEAT ARRANGEMENT**

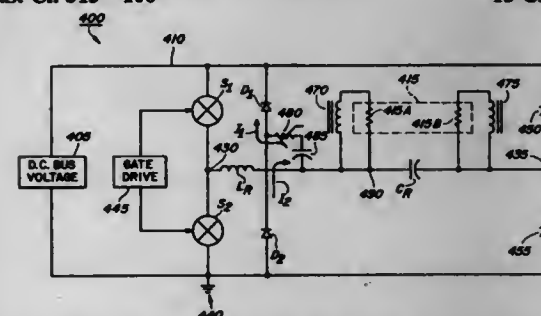
David J. Kachmarik, North Olmsted; Louis R. Nerone, Brecksville; Michael M. Secen, Mentor, and Kurt W. Haas, Chesterland, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 6, 1993, Ser. No. 161,844

Int. Cl.<sup>6</sup> H05B 39/04

U.S. Cl. 315-106

13 Claims



1. A ballast circuit for a gas discharge lamp of the type having a pair of resistively heated cathodes that are heated both during a cathode pre-heat period prior to lamp turn-on, and during steady state lamp operation, said ballast circuit comprising:

- (a) a source of d.c. bus voltage with respect to ground;
- (b) a converter, responsive to said d.c. bus voltage, for supplying bidirectional current to a resonant load circuit;

(c) said resonant load circuit including the gas discharge lamp, a resonant capacitor coupled between said lamp cathodes such that its voltage varies with lamp voltage, and a resonant inductor serially coupled to said resonant capacitor and cooperating therewith to set a magnitude, and resonant frequency, of the bidirectional lamp current;

(d) means for powering the resistively heated lamp cathodes, to thereby heat said cathodes; and

(e) a circuit for maintaining the lamp voltage during a cathode pre-heat period below a predetermined level so as to prevent lamp turn-on during said period, said circuit including:

(i) a constant voltage circuit coupled to a first cathode of said lamp and effective so as to hold said first cathode at a substantially constant voltage;

(ii) a clamping circuit coupled to a second cathode of said lamp and effective so as to clamp said second cathode to a voltage below said predetermined level, said clamping circuit including a positive temperature coefficient (PTC) device coupled to said second cathode of said lamp, and serially connected by a positively poled clamping diode to said bus conductor, and serially connected by a negatively poled clamping diode to said ground; and

(f) wherein said means for powering the resistively heated lamp cathodes comprises, for each cathode, a respective inductor winding mutually coupled to said resonant inductor, and forming a serial circuit with such cathode.

5,483,126

**METHOD OF CONTROLLING THE COLOR TEMPERATURE IN A SODIUM HIGH-PRESSURE DISCHARGE LAMP, AND APPARATUS TO CARRY OUT THE METHOD**

Michael Boenigk; Klaus Guenther, both of Berlin; Hans-Georg Kloss, Hohen Neuendorf, and Teja Tehmann, Berlin, all of Germany, assignors to Patent-Treuhand-Gesellschaft F. Elektrische Gluehlampen mbH, Munich, Germany

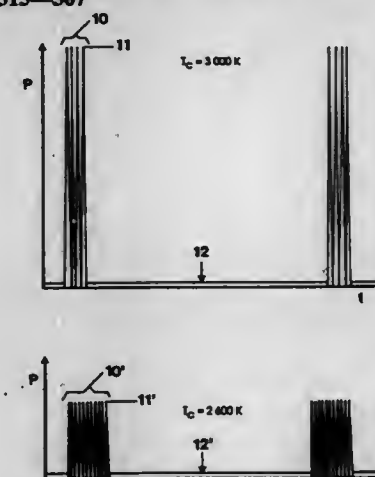
Filed Jan. 18, 1994, Ser. No. 182,597

Claims priority, application Germany, Jan. 19, 1993, 43 01 256.6

Int. Cl.<sup>6</sup> H05B 41/36

U.S. Cl. 315-307

19 Claims



1. In the combination of a sodium high-pressure discharge lamp with

a controllable electrical energy supply apparatus coupled to and energizing said lamp,

a method to control the color temperature of light emitted from the lamp without essentially affecting the color rendition index and the omitted light output of the lamp,

comprising the steps of

controlling the controllable electrical energy supply apparatus

(1) to supply lamp operating energy to the lamp in pulse form; and



selectively controlling the instantaneous pulse power supplied to the lamp by said electrical energy supply apparatus (1) to vary the color temperature of the emitted radiation, selectively, based on said selective control.

5,483,127

# VARIABLE ARC ELECTRONIC BALLAST WITH CONTINUOUS CATHODE HEATING

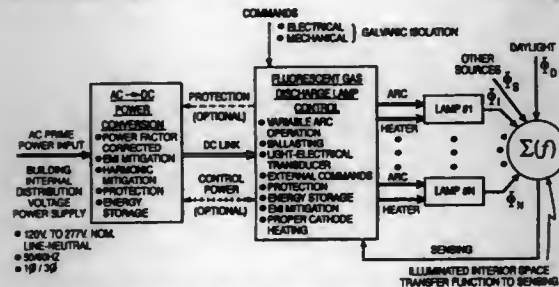
Don. F. Widmayer, Bethesda, and Alex W. Chio, Rockville, all of Md., assignors to Don Widmayer & Associates, Inc., Bethesda, Md.

Filed Jan. 19, 1994, Ser. No. 183,368

Int. Cl.<sup>6</sup> H05B 37/02

U.S. Cl. 315—307

17 Claims



1. A power conversion and control system for providing variable arc control of a lighting system comprising at least one lamp unit comprising at least one fluorescent gas discharge lamp including electrodes to be heated during the operation of the lamp, said system being powered from a commercial AC power source, and said system comprising means for converting AC power from said AC power source into converted DC power, a first DC to AC power converting means for converting said converted DC power into AC power for providing a variable arc drive for said lamps, sensor means for sensing a parameter related to the arc current flowing in said lamps and for producing a corresponding output, and a second, separate DC to AC power converting means for converting said converted DC power into AC power for supplying said first power converting means and for, responsive to the output of said sensing means, providing, at all times that the lamp is ignited, a heating voltage for said electrodes of a continuously variable value proportional to said parameter such that as the arc current flow decreases, the heating voltage for said electrodes increases.

5,483,128

# MULTI-MODE, HYBRID-TYPE CRT AND ELECTRON GUN THEREOF WITH SELECTABLE DIFFERENT SIZED GRID APERTURES

Hsing-Yao Chen, Barrington, Ill., assignor to Chunghwa Picture Tubes, Ltd., Taoyuan, Taiwan, Prov. of China

Filed Sep. 6, 1994, Ser. No. 301,342

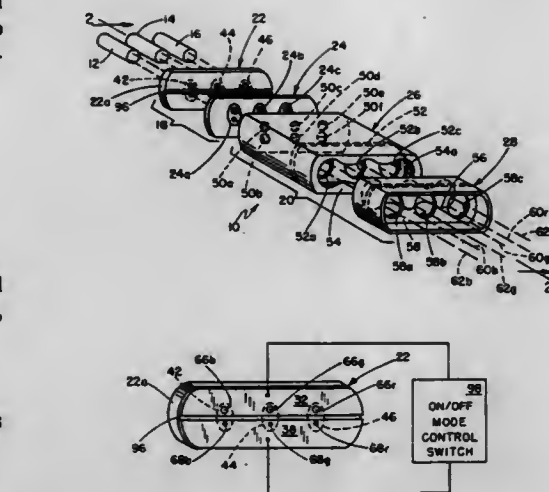
Int. Cl.<sup>6</sup> H01J 29/58

U.S. Cl. 315—382

27 Claims

1. An electron gun for use in a multi-mode cathode ray tube (CRT) including a display screen whereon a video image is formed by sweeping an electron beam over a plurality of vertically spaced, horizontal scan lines in a raster-like manner, said electron gun comprising:

- cathode means for providing energetic electrons;
- a beam forming region (BFR) including first and second spaced, charged grids disposed adjacent said cathode means and further including:
- first beam forming means for forming said energetic electrons into a first beam having a cross-section  $A_1$  when the CRT is used as a television receiver; and



second beam forming means for forming said energetic electrons into a second beam having a cross-section  $A_2$  when the CRT is used as a high resolution video monitor, where  $A_1 > A_2$ ;

said BFR further including a G1 control grid and a G2 screen grid respectively having first and second pairs of beam passing apertures, and wherein each of said pairs of beam passing apertures includes a first aperture having a diameter  $D_1$  and a second aperture having a diameter  $D_2$ , and wherein the first apertures of said pairs of aperture form said first beam and said second apertures of said pairs of apertures form said second beam, with  $D_1 > D_2$ .

switch means coupled to said first and second beam forming means for allowing a user to select either a television receiver mode of operation or a high resolution video monitor mode of operation; and

lens means disposed intermediate said BFR and the CRT's display screen for focusing either said first beam or said second beam on the display screen.

5,483,129

# SYNCHROTRON RADIATION LIGHT-SOURCE APPARATUS AND METHOD OF MANUFACTURING SAME

Yuichi Yamamoto, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

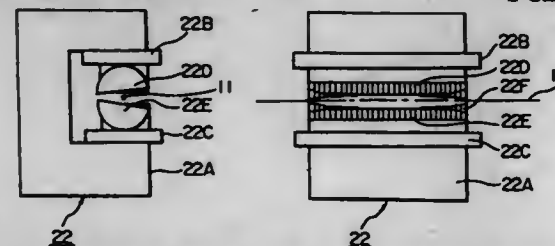
Filed Jul. 27, 1993, Ser. No. 96,994

Claims priority, application Japan, Jul. 28, 1992, 4-201062

Int. Cl.<sup>6</sup> H05H 7/04; 13/04

U.S. Cl. 315—503

2 Claims



1. A synchrotron radiation light source apparatus for emitting synchrotron radiation by deflecting the orbit of an electron beam with a bending electro-magnet producing a negative magnetic field gradient gradually increasing after gradually decreasing along the orbit of the electron beam, said bending electro-magnet including a pair of magnetic poles facing each other with the orbit of the electron beam passing through a gap between said magnetic poles, the gap between said magnetic poles becoming gradually narrower toward a direction pointing inside the orbit and gradually wider toward a direction pointing outside of the orbit at locations where the orbit enters and exits the gap between said magnetic poles, the

gap being constant along the orbit between said magnetic poles and wherein each of said magnetic poles includes a plurality of semi-circular plates arranged in pairs of opposing plates with an angle formed between respective edges of each pair of said opposed plates, the angles between edges of pairs of said opposed plates varying along the orbit between said magnetic poles.

5,483,130

# STRUCTURE FOR ACCELERATING HEAVY IONS WITH UNIFORMLY SPACED QUADRUPOLE FOCUSING (USQF)

Vladimir A. Andreev, Moscow, Russian Federation, assignor to Axelerator, Inc., Irvine, Calif., and Institute for Theoretical and Experimental Physics, Moscow, Russian Federation

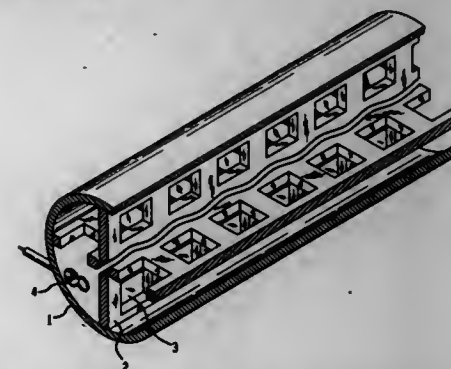
Filed Sep. 9, 1993, Ser. No. 118,523

Claims priority, application U.S.S.R., Sep. 9, 1992, 4165749

Int. Cl.<sup>6</sup> H01J 23/00

U.S. Cl. 315—505

5 Claims



1. An accelerating apparatus for accelerating heavy ions inside a case defining a channel and including four electrodes therein and a means for injecting HF power into said case, said apparatus comprising:

window means in each of said four electrodes, said window means comprising at least two windows each having a height  $b$  and a width  $W$ , and wherein each window is separated from its nearest neighbor window in each electrode by an edge-to-edge distance  $a$  and further wherein adjacent electrodes are perpendicular to each other and further wherein said windows in adjacent electrodes are offset from each other by a distance  $(W+a)/2$ .

5,483,131

# SELF-STARTING SWINGING APPARATUS

Reijiro Ito, Tokyo, Japan, assignor to Kokusai Display Kogyo Co., Ltd., Tokyo, Japan

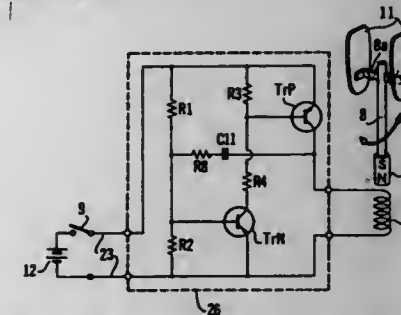
Filed Sep. 21, 1993, Ser. No. 124,607

Claims priority, application Japan, Sep. 22, 1992, 4-294695

Int. Cl.<sup>6</sup> H02P 1/16

U.S. Cl. 318—130

2 Claims



1. A self-starting oscillating ornamental and advertising display apparatus including a swinging portion and a stationary portion, comprising:

a free-running oscillation circuit including a PNP transistor and an NPN transistor, the base of each one of said transistors being connected to the collector of the other of said transistors, a capacitor for setting a time constant being used to connect the base of one transistor to the collector of the other transistor;

a power source connected to said free-running oscillation circuit; a driving coil connected to the collector of the transistor having said capacitor connected thereto, as a load on that transistor; and

a permanent magnet having a relatively repulsive or attractive magnetic pole arrangement of the same polarity or of a different polarity from that of a magnetic pole in a magnetic field which is generated in said driving coil when an electric current is fed to said driving coil from said free-running oscillation circuit, said permanent magnet being relatively movable with respect to said driving coil and capable of performing a relative swinging motion under the action of an arbitrary restoring force, one of said permanent magnet and said driving coil being fixed to said swinging portion and the other being fixed to said stationary portion in a position deviated from a neutral point of a swing motion of the swinging portion;

wherein said power source comprises an electrolytic capacitor for supplying in the form of a short-time discharge current an electric energy necessary for driving said permanent magnet to said driving coil, and a solar battery connected to said electrolytic capacitor for supplying a charging current to compensate for the electric charge lost by said short-time discharge current during an unenergized period of said driving coil.

5,483,132

# CONTROL DEVICE FOR MOTOR-DRIVEN TELESCOPIC ANTENNA

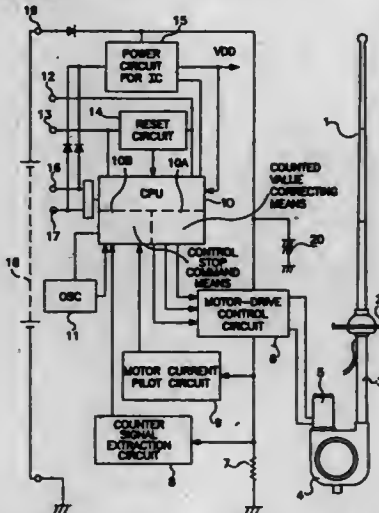
Koji Arata, Yokohama; Kazufumi Sato, and Yuji Maeda, both of Tokyo, all of Japan, assignors to Harada Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 7, 1993, Ser. No. 133,638

Int. Cl.<sup>6</sup> H02P 1/22

U.S. Cl. 318—282

3 Claims



1. A control device for an electrically driven telescopic antenna comprising:

- an antenna element accommodated in an antenna element accommodation tube so that said antenna element can be freely retracted into and extended out from said accommodation tube;
- an antenna element extending and retracting mechanism electrically operated by a driving force of a DC motor so that said antenna element is extended out from said accommodation tube during use and retracted into said accommodation tube during non-use;



- a motor drive control circuit which causes said DC motor to rotate in a forward or reverse direction in said extending and retracting mechanism;
- a counting signal extracting circuit which detects an altered waveform of a rectified current which is generated when said DC motor is rotated in a forward or reverse direction by said motor drive control circuit, said extracting circuit then extracting pulse signals from said altered waveform;
- a control stop command means which counts said pulse signals extracted by said counting signal extracting circuit, said control stop command means then sending a control stop command to said motor drive control circuit when a value counted by said control stop command means reaches a certain preset value;
- a motor current monitoring circuit which monitors a current flowing to said motor, said monitoring circuit outputting information on a completion of an extension/retraction operation of said antenna element when a value of said current exceeds a prescribed value; and
- a counted-value correcting means which corrects said value counted by said control stop command means in response to said information on a completion of extension/retraction operation which is outputted by said motor current monitoring circuit when said information is outputted by said motor current monitoring circuit before a value counted by said control stop command means reaches said certain preset value.

5,483,133

# CONTROL SYSTEM FOR OPENING OR CLOSING AN OPENING-CLOSING MEMBER

Yasuhiro Takabe; Koji Ueda, and Toshihiro Hara, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

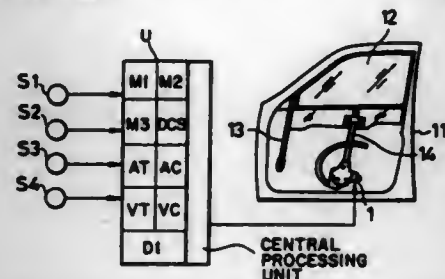
Filed Mar. 25, 1994, Ser. No. 217,654

Claims priority, application Japan, Mar. 25, 1993, 5-090646

Int. Cl. G05B 5/00

U.S. Cl. 318-466

13 Claims



1. A control system for opening or closing an opening-closing member, comprising:

- a driving means for driving said opening-closing member;
- a first detecting means for detecting a driving acceleration of said driving means and generating a first signal indicative of the driving acceleration;
- a second detecting means for detecting a driving voltage of said driving means and generating a second signal indicative of the driving voltage;
- a first memory means for receiving said signals and for storing a correlation between said driving acceleration and said driving voltage based on said signals;
- a second memory means for storing a previous driving voltage supplied to said driving means;
- an acceleration threshold determining means for determining an acceleration threshold as a function of said previous driving voltage stored by said second memory means, a current driving voltage detected by said second detecting means and said correlation stored by said first memory means; and
- a decision means for deciding whether said opening-closing member has encountered a foreign material as a function of

said driving acceleration detected by said first detecting means and said acceleration threshold.

5,483,134

# RIBBON SENSING DEVICE FOR BAG TYER

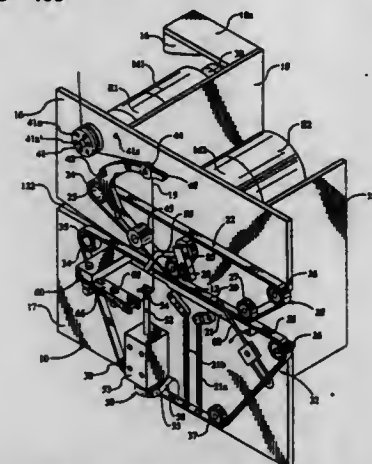
Jimmy R. Frazier, Norman; John D. Richardson, Oklahoma City, and Greg P. Coxsey, Norman, all of Okla., assignors to Burford Corporation, Maysville, Okla.

Filed Sep. 30, 1993, Ser. No. 129,284

Int. Cl. G05B 5/00

U.S. Cl. 318-468

10 Claims



1. Bag neck tying apparatus comprising:
  - a pulley having index points;
  - a proximity switch mounted adjacent said pulley to indicate movement of said index points on said pulley;
  - a source of ribbon for dispensing a strand of ribbon having a free end and a central portion, said central portion of ribbon extending around said pulley;
  - a holder-shear assembly for holding the free end of said ribbon;
  - a needle assembly for engaging and positioning said central portion of said ribbon adjacent said holder-shear assembly;
  - a twister assembly having a hook adjacent said holder-shear assembly;
  - an electric motor having a drive shaft connected for actuating said holder-shear assembly; and
  - a control circuit connected to said proximity switch and said motor for controlling movement of said holder-shear assembly, said control circuit being configured to prevent movement of said holder-shear assembly if movement of index points on said pulley do not indicate that a sufficient amount of ribbon has been dispensed from said source of ribbon.

5,483,135

# ADAPTIVE SYSTEM AND METHOD FOR CONTROLLING VEHICLE WINDOW OPERATION

Daniel R. Parks, Farmington, Mich., assignor to Ford Motor Company, Dearborn, Mich.

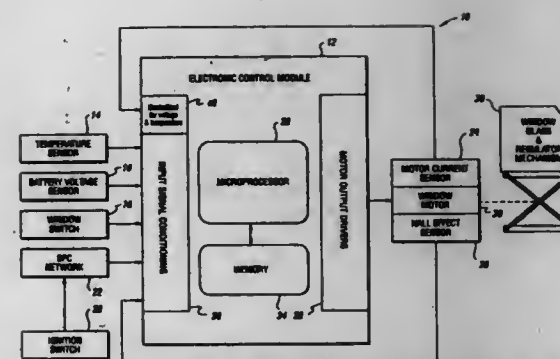
Filed Jun. 6, 1994, Ser. No. 254,723

Int. Cl. H02P 1/18

U.S. Cl. 318-469

20 Claims

1. An adaptive system for controlling a vehicle window having an open position, a closed position, and an electric motor, the system comprising:
  - means for detecting a motor stall;
  - a position counter having a count representing a window position;
  - means for setting, independent of a dedicated motor actuation input signal, a first historical limit equal to the count when the window is driven by the motor toward the closed position and a motor stall is detected;



- means for setting, independent of a dedicated motor actuation input signal, the first historical limit equal to the difference between the first historical limit and the count, and the count equal to a second historical limit, respectively, when the window is driven by the motor toward the open position and a motor stall is detected;
- means for generating an error signal when the count exceeds the first historical limit by a selected amount and the window is driven by the motor toward the closed position, the error signal operative to reverse operation of the motor such that the first historical limit and the count may be reset by the means for setting the first historical limit and the count;
- means for generating a first control signal operative to halt operation of the motor when the count equals the first historical limit; and
- means for generating a second control signal operative to halt operation of the motor when the count equals the second historical limit.

5,483,136

# EMI FILTER AND METHOD

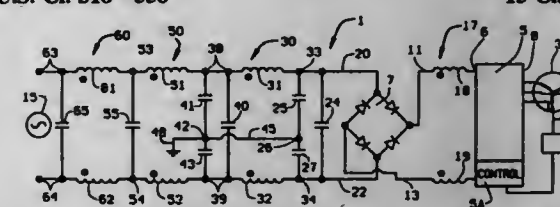
Joseph G. Marcinkiewicz, Bellefontaine Neighbors, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed May 27, 1994, Ser. No. 250,158

Int. Cl. H03H 7/00

U.S. Cl. 318-558

15 Claims



1. In a control system for a dynamoelectric machine including a stator assembly having a plurality of windings, a rotor assembly mounted for rotation with respect to said stator assembly, an inverter operatively connected to said windings to supply the electrical energy to said windings in a predetermined manner, a bridge rectifier electrically connected to a source of power, said bridge rectifier defining on its output side first and second rails, said inverter being operatively connected between said first and second rails on its input side and to said dynamoelectric machine at its output side, the improvement comprising an electromagnetic interference filter for reducing electromagnetic interference associated with said control system and said dynamoelectric machine, said filter including a lossy core inductor having magnetically coupled first and second coils, one each of said first and second coils being serially connected in one each of said first and second rails on the output side of said rectifiers; and a fourth order filter having 0.5 degree equiripple approximation to linear phase operatively connected on the input side of said bridge rectifier.
11. A method of designing an EMI filter for a control of an inverter operated dynamoelectric machine including a source of dc voltage, said voltage source having an input side and an output side, the output side defining first and second rails, and an inverter

- having a first side connected between said rails and a second side connected to said dynamoelectric machine comprising the steps of:
  - inserting a lossy core inductor having first and second coils on the output side of said source of voltage, between said source and said inverter;
  - determining the impedance of said lossy core inductor;
  - designing an EMI filter using the impedance so determined as the source impedance; and
  - inserting said EMI filter on the input side of said source of dc voltage.

5,483,137

# CONTROL DEVICE

Rainer Fey, Schweinfurt, and Albert Thein, Hassfurt, both of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

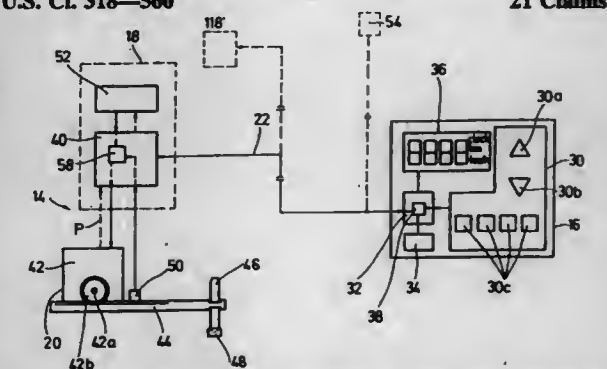
Filed Mar. 15, 1993, Ser. No. 31,526

Claims priority, application Germany, Apr. 13, 1992, 42 12 319.4

Int. Cl. H02P 17/00; F16H 9/00

U.S. Cl. 318-560

21 Claims





5,483,138

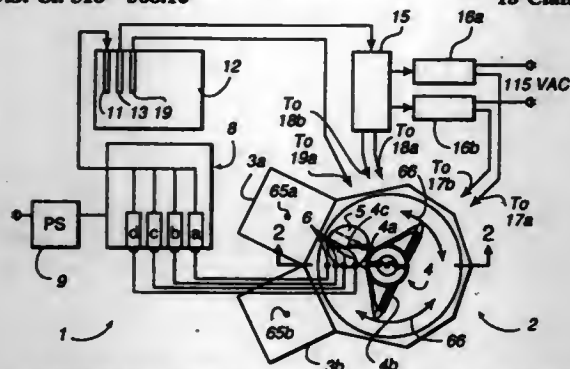
# SYSTEM AND METHOD FOR AUTOMATED POSITIONING OF A SUBSTRATE IN A PROCESSING CHAMBER

Simon Shmookler, San Francisco; Andrew G. Weinberg, San Jose, and Martin J. McGrath, Sunnyvale, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif. Continuation of Ser. No. 975,197, Nov. 12, 1992, abandoned. This application Apr. 21, 1994, Ser. No. 249,095

Int. Cl. G05B 11/01

U.S. Cl. 318-568.16

18 Claims



1. A system for accurately positioning an object at a preselected location comprising:

- object transfer means including a moveable support for carrying said object along a predetermined arcuate path between a first location and the preselected location, the position of said moveable support being known at all times;
- an array of sensors, at least two of which are disposed along an axis generally transverse to said arcuate path, said sensors being operative to detect a plurality of positions on the perimeter of the object as it is carried by the moveable support along said arcuate path and moved therethrough, to generate signals from which the position of said object relative to the signals from which the position of said object relative to the known position of said moveable support can be determined;
- detecting means to determine the relative position of the centerpoint of said object and the centerpoint of said object support; and
- moving means responsive to the signals and operative to position the object support so that the centerpoint of the object is moved to said preselected position.

5,483,139

# MOTOR START, REVERSE AND PROTECTION SYSTEM WITHOUT A STARTING CAPACITOR

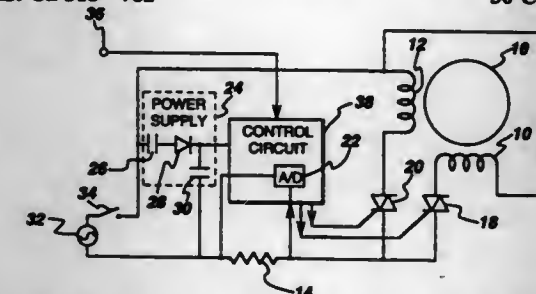
Kenneth B. Welles, II, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 14, 1994, Ser. No. 209,588

Int. Cl. H02P 1/00

U.S. Cl. 318-782

30 Claims



1. A single phase induction motor without a starting capacitor, the motor comprising:

- a start winding;
- a run winding coupled in parallel with said start winding;
- a start switch;
- a run switch;

a control circuit for selectively supplying unphase-shifted line voltage to said start and run windings by controlling said start and run switches, said start switch being coupled between said start winding and said control circuit and said run switch being coupled between said run winding and said control circuit; and

a current sensor coupled to said control circuit and said start and run switches for measuring current values in said start and run windings and supplying said current values to said control circuit.

5,483,140

# THYRISTOR BASED DC LINK CURRENT SOURCE POWER CONVERSION SYSTEM FOR MOTOR DRIVEN OPERATION

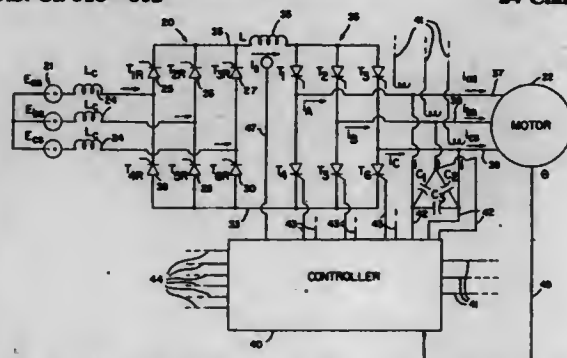
Herbert L. Hess, Meridian, Id., and Deepakraj M. Divan, Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Oct. 1, 1993, Ser. No. 130,642

Int. Cl. H02P 5/34

U.S. Cl. 318-802

24 Claims



1. A power conversion system for three phase motor drive operation, comprising:

- DC link lines to which DC input current can be applied;
- a three phase inverter connected across the DC link lines, the inverter formed of at least six gate controlled thyristors which require reverse voltage commutation to turn off connected in a bridge configuration with three sets of two thyristors connected in series between the DC link lines, and having three output lines, each one of the output lines connected between the series connected thyristors in a respective one of the sets;
- capacitors connected across the three output lines of the inverter;
- a motor connected to the output lines of the inverter;
- control means, connected to the inverter thyristors, for providing firing signals to the thyristors in a first mode to provide a switching cycle at a switching frequency which is higher than a desired fundamental frequency in each of the three phase output lines, the switching cycle having three time periods wherein in each time period a different pair of thyristors from different sets of thyristors are triggered to conduct, the on-time of each of the pairs of thyristors selected to provide an increase or decrease of the average phase voltage output on the output lines to provide time varying average phase voltages at the desired fundamental frequency while providing a zero crossing for each phase voltage in each switching cycle to provide commutation of the inverter thyristors, the control means receiving a signal indicative of the position and speed of the motor, and the control means further including means for determining when the motor has reached a selected intermediate speed, and thereafter applying control signals to the thyristors of the inverter in a second mode to provide a switching cycle for the thyristors having four time periods at a switching frequency higher than a desired fundamental frequency, and for switching the thyristors to provide a six step three phase output on the output lines at a fundamental frequency cycle with a different firing sequence for pairs of thyristors within each switching cycle.

5,483,141

# METHOD AND APPARATUS FOR CONTROLLING REFRIGERATOR CYCLE

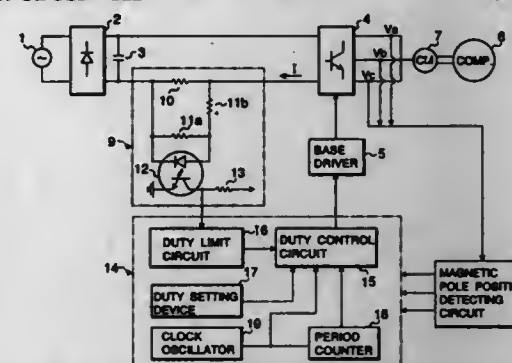
Michika Uesugi, Fuji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 2, 1993, Ser. No. 160,147

Claims priority, application Japan, Dec. 3, 1992, 4-323527 Int. Cl. H02P 5/28

U.S. Cl. 318-811

6 Claims



1. A method of controlling a refrigeration cycle during which revolution speed of a compressor is controlled by an electronically commutated, brushless DC motor composed of a PWM-controlled inverter and a permanent-magnet AC motor to change a refrigeration capacity thereof, which comprises the steps of:

- detecting instantaneous current value flowing through switching elements of the inverter; and
- when the detected instantaneous current value reaches a predetermined level at a point in time between a designated rise time point and a designated fall time point of a PWM control pulse, setting a command value of the PWM control pulse to zero.

5,483,142

# PRECHARGE CIRCUIT HAVING MICROPROCESSOR-BASED FIRING ANGLE CONTROL CIRCUITRY

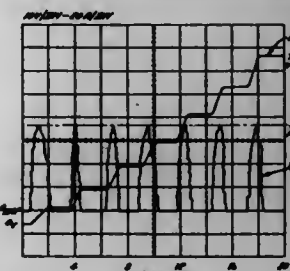
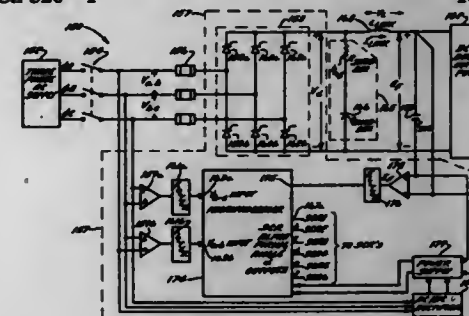
Gary Skibinski, Milwaukee, and Thomas Gilmore, Wauwatosa, both of Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Sep. 22, 1993, Ser. No. 124,893

Int. Cl. H02J 1/00; H02M 5/42

U.S. Cl. 320-1

16 Claims



1. A circuit comprising:

- a capacitor;

- a source of charge;
- an inductor coupled to said capacitor;
- voltage measuring means for taking a voltage measurement of said capacitor;
- voltage measuring means for taking a voltage measurement of said source of charge; and
- a capacitor precharge subcircuit for precharging said capacitor, said precharge subcircuit including

- (1) a switching device for transferring a charge from said source of charge to said inductor and to said capacitor, and
- (2) a microprocessor, said microprocessor defining

- (a) means for determining a first point in time at which a charge transfer from said source of charge to said inductor and to said capacitor is to be initiated, said first point in time being based on said capacitor voltage measurement, said source of charge voltage measurement and a reference parameter based on a desired peak current,
- (b) means for determining a second point in time at which said charge transfer from said source of charge to said inductor and to said capacitor is to be terminated, said second point in time being based on said capacitor voltage measurement and said source of charge voltage measurement, and
- (c) means for controlling said switching device at said first and second points in time.

5,483,143

# COMPOSITE CORE DESIGNED FOR INDUCTIVE COUPLED TRANSFORMER PROBES

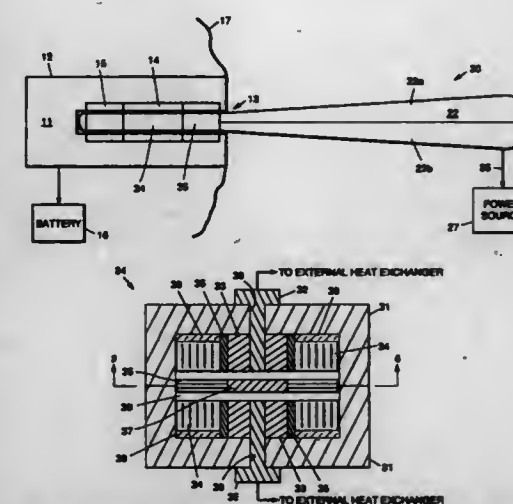
John T. Hall, Woodland Hills; William Quon, Alhambra, and Herbert J. Tanzer, Topanga, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 29, 1994, Ser. No. 237,495

Int. Cl. H01M 10/46; H01F 27/02

U.S. Cl. 320-2

7 Claims



1. In an inductive charging apparatus for use in charging a battery, which apparatus comprises a charge probe that is insertable into a charge port that is coupled to the battery, and wherein the charge port comprises a housing, an opening into which the charge probe is inserted, and a secondary core surrounded by secondary windings, wherein said charge probe comprises:

- a housing;
- a primary magnetic core disposed in the housing that comprises:
  - first and second magnetic core halves comprising high loss magnetic material that are disposed adjacent to each other and that contact each other at predetermined surfaces;
  - first and second magnetic center posts comprising low loss magnetic material disposed adjacent the first and second magnetic core halves;





from said main power supply to said heating element when said control signal is in said first state.

5,483,150

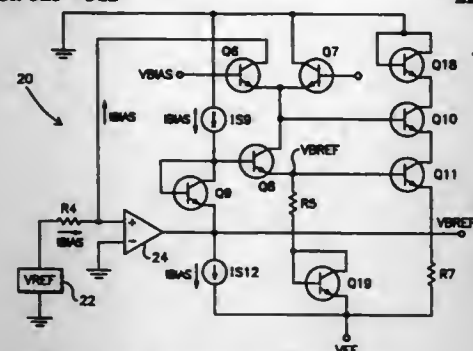
**TRANSISTOR CURRENT SWITCH ARRAY FOR DIGITAL-TO-ANALOG CONVERTER (DAC) INCLUDING BIAS CURRENT COMPENSATION FOR INDIVIDUAL TRANSISTOR CURRENT GAIN AND THERMALLY INDUCED BASE-EMITTER VOLTAGE DROP VARIATION**  
Phillip L. Elliott, Fort Collins, Colo.; Dwight D. Birdsall, Norwalk, Calif.; Lloyd F. Linder, Agora Hills, Calif., and Kelvin T. Tran, Carson, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 5, 1993, Ser. No. 17,200

Int. Cl. G05F 3/08

U.S. Cl. 323-312

22 Claims



1. A transistor bias voltage source, comprising:  
a main transistor having a predetermined design current gain; reference voltage means for producing a predetermined reference voltage which causes a main bias current to flow through the main transistor;  
a regulating transistor for regulating said main bias current; feedback amplifier means for sensing said main bias current and generating a variable bias voltage which causes the regulating transistor to regulate said main bias current to a predetermined value; and  
compensation means for substantially canceling at least one of a deviation of the actual current gain of the main transistor from said design current gain and a thermally variable voltage drop in the regulating transistor.

5,483,151

**VARIABLE CURRENT SOURCE FOR VARIABLY CONTROLLING AN OUTPUT CURRENT IN ACCORDANCE WITH A CONTROL VOLTAGE**  
Hiromitsu Yamashita, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1994, Ser. No. 312,624

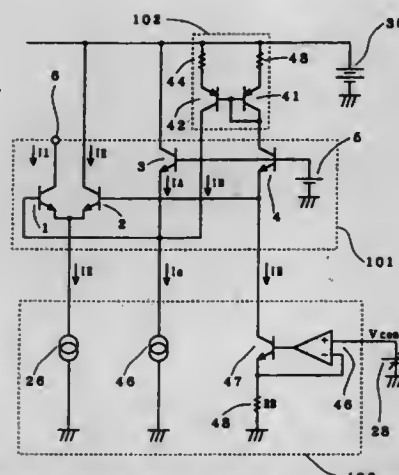
Int. Cl. G05F 3/04; 3/16; H03K 3/01

U.S. Cl. 323-312

13 Claims

1. A variable current source for variably controlling an output current in accordance with a control voltage which is externally supplied, comprising:

- a differential amplifier which is formed by first and second transistors each having one electrode connected to each other at a common point, said output current being a current which flows through another electrode of either one of said first and second transistors;
- a third transistor having one electrode connected to a control electrode of said first transistor, another electrode connected to a power source and a control electrode to receive a constant voltage;
- a fourth transistor having one electrode connected to a control electrode of said second transistor and a control electrode to receive said constant voltage;



- first reference current supply means which is connected to said common point, said first reference current supply means supplying a first reference current from said common point of said first and second transistors to a ground level;
- second reference current supply means which is connected to said one electrode of said third transistor, said second reference current supply means supplying a second reference current from said one electrode of said third transistor to said ground level;
- control current supply means which is connected to said one electrode of said fourth transistor, said control current supply means internally including voltage/current conversion means, said control current supply means receiving said control voltage so that said voltage/current conversion means converts said control voltage by linear voltage/current conversion into a control current, said control current supply means supplying said control current from said one electrode of said fourth transistor to said ground level; and
- a current mirror circuit for supplying a third reference current having the same current amount as said control current from a power source level to said one electrode of said third transistor.

5,483,152

**WIDE RANGE POWER SUPPLY FOR INTEGRATED CIRCUITS**

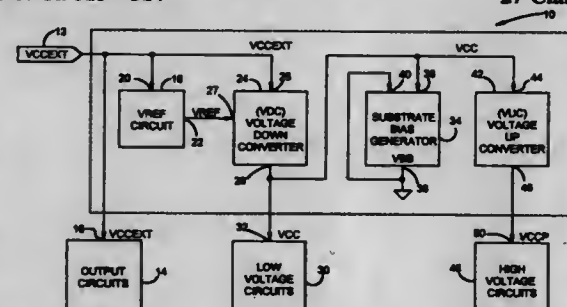
Kim C. Hardee, and Michael V. Cordoba, both of Colorado Springs, Colo., assignors to United Memories, Inc., Colorado Springs, Colo., and Nippon Steel Semiconductor Corp., Chiba, Japan

Filed Jan. 12, 1993, Ser. No. 3,450

Int. Cl. G05F 3/16

U.S. Cl. 323-314

27 Claims



1. In an integrated circuit, a power supply circuit for receiving a supply voltage applied to the integrated circuit and for providing at least first and second supply voltages for use by other circuits on said integrated circuit, and a substrate bias voltage for biasing the substrate of the integrated circuit, comprising:  
an input coupled to receive the supply voltage;  
a reference generator circuit coupled to receive said supply voltage from said input and to generate a reference voltage;

- a first voltage converter circuit having a first input coupled to receive said reference voltage from said reference generator circuit, a second input coupled to receive said supply voltage, and a first output, the first converter circuit generating a first output voltage at said first output, said first output being substantially independent of variations in said supply voltage;
- a second voltage converter circuit having an input coupled to receive said first output voltage and having a second output, said second converter circuit generating a second output voltage at said second output; and
- a substrate bias generator circuit having an input coupled to receive said first output voltage to generate a negative voltage for biasing a substrate of the integrated circuit.

5,483,153

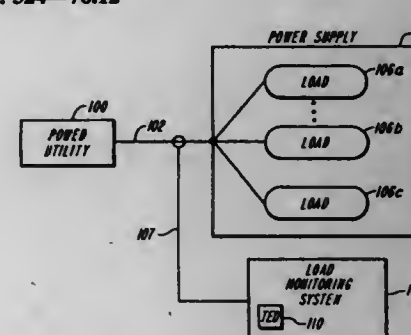
**TRANSIENT EVENT DETECTOR FOR USE IN NONINTRUSIVE LOAD MONITORING SYSTEMS**  
Steven B. Leeb, Belmont, and James L. Kirtley, Jr., Brookline, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 24, 1994, Ser. No. 217,488

Int. Cl. G01R 21/06

U.S. Cl. 324-76.12

34 Claims



1. A transient event detector for use in a nonintrusive electrical load monitoring system at a monitored site having at least one electrical load, said detector comprising:  
data acquisition means for acquiring and storing start-up power transient pattern data associated with each electrical load being monitored, said power transient data corresponding to approximate envelopes of harmonic content of observed current or voltage waveforms produced by said at least one electrical load;  
monitoring means for continuously monitoring total power load pattern data at said site, said total power load pattern data corresponding to an aggregation of said envelopes of harmonic content; and  
processing means for corresponding time varying sections of said transient pattern data to time varying sections of said total power load pattern data in order to identify each electrical load.

5,483,154

**APPARATUS FOR DETECTING SIGNAL FREQUENCY AND CONTROLLING INDICATING DEVICE**  
Shyi-Hon Chen, Taipei, Taiwan, Prov. of China, assignor to Acer Peripherals Incorporated, Taiwan, Prov. of China

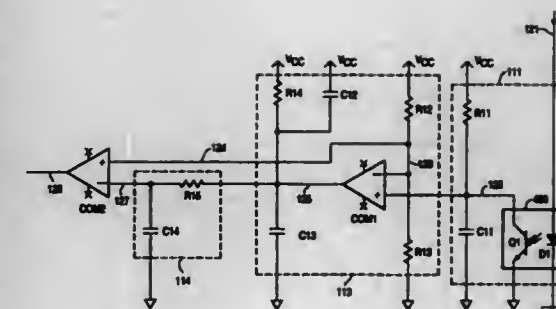
Filed Oct. 5, 1993, Ser. No. 132,149

Int. Cl. H03K 9/06

U.S. Cl. 324-76.66

6 Claims

1. A method for discriminating the frequency of an input signal comprising the steps of:  
comparing the voltage of the first signal with the voltage of a first reference signal to generate a first transition signal;  
shaping said first transition signal to form a sawtooth wave;



- maintaining a relationship, between the integral of said sawtooth wave respect to a second reference signal, independent of the power source;
- thereafter, filtering said first transition signal to obtain a second transition signal, said second transition signal representing the DC component of said first transition signal; and
- thereafter, comparing the voltage of said second transition signal with the voltage of said second reference signal to generate a binary output signal, said binary output signal having a first state when the voltage of said second transition signal exceeds the voltage of said second reference signal, and a second state when the voltage of said second transition signal does not exceed the voltage of said second reference signal.

5,483,155

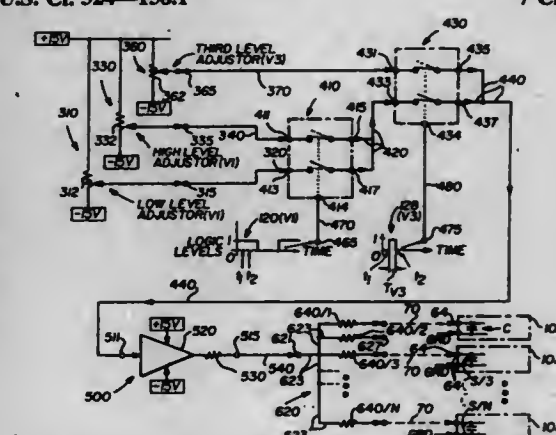
**TEST SYSTEM AND METHOD FOR DYNAMIC TESTING OF A PLURALITY OF PACKAGED SAME-TYPE CHARGE COUPLED DEVICE IMAGE SENSORS**

Ram Kannegundla, Rochester, and Russell J. Taras, W. Henrietta, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 979,713, Nov. 20, 1992, abandoned. This application Sep. 15, 1994, Ser. No. 306,348  
Int. Cl. G01R 31/28

U.S. Cl. 324-158.1

7 Claims



1. A test system for dynamic testing at the same time a plurality of packaged same-type charge coupled device (CCD) image sensors with each CCD image sensor of the plurality requiring for an acceptable imaging performance during the testing thereof certain ones of at least two-level clocked control signals at input terminals dedicated therefor and presenting an input capacitance thereto, certain other ones of DC bias control signals at input terminals dedicated therefor, and a ground reference at an input terminal dedicated therefor, each CCD image sensor providing at least one output signal at an output terminal dedicated therefor, the output signal indicative of the imaging performance during the dynamic testing, the test system comprising:  
a control signal level adjustor assembly including control signal level adjustors each of which is dedicated to selectively pro-

viding at an output terminal thereof a selected level-adjusted control signal for each particular one of the certain required control signals;

a control signal selector assembly including at least one control signal selector switch dedicated to selectably generating at an output terminal thereof a particular one of the certain clocked control signals having one of the at least two levels determined by one of the level-adjusted control signals applied to a first input terminal thereof and having another one of the levels determined by another one of the level-adjusted control signals applied to a second input terminal thereof, and having clocked control signal cycles determined by the selector switch connecting its output terminal to the first input terminal and alternatively to the second input terminal in response to a timing logic signal applied to a control terminal of the selector switch;

a clock driver including a clock driver amplifier which has an input terminal thereof connected to the output terminal of the at least one control signal selector switch and providing at an output terminal thereof the level-adjusted clocked control signal, the clock driver amplifier having a defined output source resistance and frequency response;

an isolation network assembly including a plurality of identical isolation networks having a common input terminal connected to the output terminal of the clock driver, and each one of the plurality of isolation networks having a separate output terminal connected to the corresponding dedicated input terminal of each one of the plurality of CCD image sensors to be dynamically tested; and

means for sampling the output signal of each one of the plurality of packaged CCD image sensors during the dynamic testing of the plurality.

5,483,156

### MAGNETIC FIELD ALTERNATION DETECTING APPARATUS

Toshihiko Nishihara, Yokohama, Japan, assignor to Fuji Koki Manufacturing Co., Ltd., Tokyo, Japan

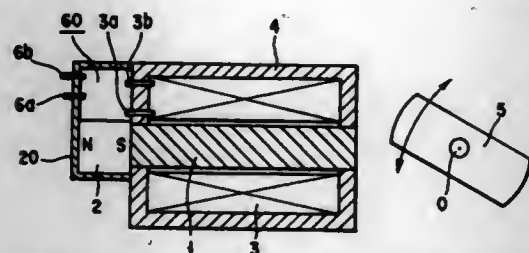
Filed Jun. 17, 1993, Ser. No. 77,516

Claims priority, application Japan, Sep. 22, 1992, 4-253277

Int. Cl.<sup>6</sup> G01P 3/48

U.S. Cl. 324-173

11 Claims



1. A magnetic field alternation detecting apparatus, comprising: an electromagnet including a coil wound around a core attached with a magnet, the electromagnet forming a predetermined magnetic field;

an analog-to-digital converter arranged adjacent to said electromagnet and converting an analog signal into a digital signal; a first pair of output terminals receiving analog data obtained as an electromotive voltage indicating a change in magnetic flux linking said coil on the basis of a magnetic field distribution disturbed by periodic approaching of a magnetic member which is present near a first end portion of said core and makes a predetermined motion,

wherein the first pair of output terminals are arranged at a second end portion of said core, and are connected to input terminals of said analog-to-digital converter; and

a second pair of output terminals arranged at output terminals of said analog-to-digital converter; wherein said analog-to-digital converter comprises a predetermined type of transistor,

wherein said first pair of output terminals are connected to at least one control terminal of said transistor, and wherein said second pair of output terminals are connected to at least one main current terminal of said transistor.

5,483,157

### ROTARY SENSOR HAVING A STAY AND MOLDED BODY

Yoshiteru Nakatake, Kazuya Karino, and Kazuo Yuhl, all of Miyazaki, Japan, assignors to Honda Lock Mfg. Co. Ltd., Miyazaki, Japan

Continuation of Ser. No. 37,229, Mar. 26, 1993, abandoned.

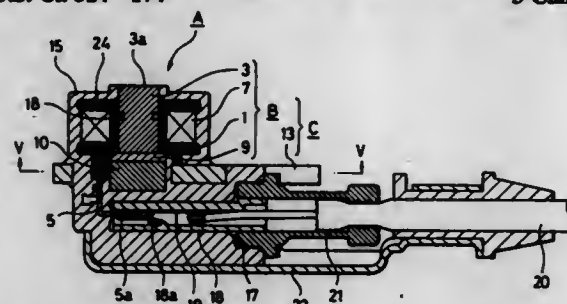
This application Mar. 21, 1995, Ser. No. 408,134

Claims priority, application Japan, Apr. 18, 1992, 4-037541

Int. Cl.<sup>6</sup> G01P 3/44; G01R 33/038

U.S. Cl. 324-174

3 Claims



1. A rotary sensor comprising:

a bobbin unit including

a cylindrical bobbin with a reeled coil,

a pole piece set in said bobbin,

a magnet disposed at the end of said pole piece, and

a terminal connected to said coil,

a stay supporting said bobbin unit, said stay comprising an engagement aperture passing through the stay and formed with engaging key convexes;

wherein said bobbin unit further comprises key elements passing into said engagement aperture and engaging said engaging key convexes to prevent relative movement of the bobbin with respect to the stay; and

an in situ molded resin body uniting said stay with said bobbin unit, wherein said resin body is at least partially interposed between said bobbin unit and said stay within said engagement aperture to lock said bobbin with respect to said stay.

5,483,158

### METHOD AND APPARATUS FOR TUNING MRI RF COILS

John van Heteren, San Francisco, and Mitsuki Arakawa, Hillsborough, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Oct. 21, 1993, Ser. No. 139,178

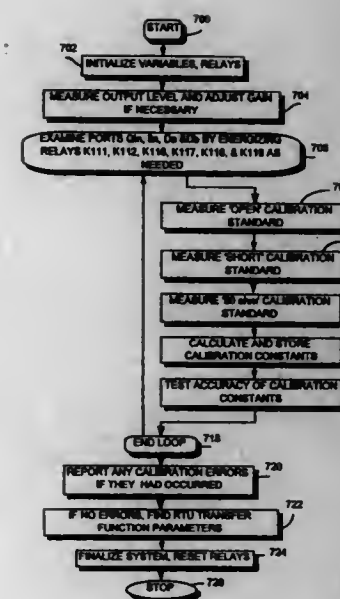
Int. Cl.<sup>6</sup> G01R 33/28

U.S. Cl. 324-318

4 Claims

2. A magnetic resonance imaging (MRI) system comprising: a generator for generating a tuning signal; an RF coil loadable with an object-to-be-imaged for receiving the tuning signal and for returning a reflected signal; a calibration unit having a plurality of selectable loads not including the RF coil, each of the loads being selectively connectable to the tuning signal generating means for yielding a returned signal;

a tuning controller selectively connectable to the calibration unit for receiving the returned signals from the loads of the calibration unit and calculating calibration constants for use in correcting reflected signals received from the RF coil.



5,483,159

### QUADRATURE COIL SYSTEM FOR USE IN A MAGNETIC RESONANCE APPARATUS

Teunis R. Van Heelsbergen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 33,701, Mar. 16, 1993, abandoned.

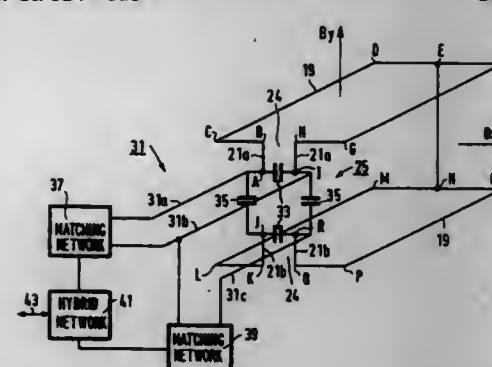
This application May 9, 1994, Ser. No. 240,192

Claims priority, application European Pat. Off., Apr. 9, 1992, 92201017

Int. Cl.<sup>6</sup> G01R 33/28

U.S. Cl. 324-318

16 Claims



1. A quadrature coil system for use in a magnetic resonance apparatus, comprising:

first and second electric main conductors situated at a distance from one another in a first plane and a second plane, respectively, and each of which is formed as a loop with an opening having free ends at the sides of each of the openings, said main conductors having mainly the same orientation;

first and second connection conductors, each of which constitutes an electric connection between the corresponding free ends of the main conductors, situated at corresponding sides of the opening, of the first and second main conductors;

electric connection means connected to said first and second main conductors so that there are formed first and second sets of turns which are suitable to generate and receive first and second magnetic fields, respectively, which are mutually orthogonally directed, characterized in that there is provided at least one third connection conductor which constitutes an electric connection between a first connection point on the first main conductor, situated between the two free ends, and a second connection point on the second main conductor, each of the first and second connection conductors being comprised of substantially equal first and second connection con-

ductor portions, the first connection conductor portions being connected to the free ends of the first main conductor and the second connection conductor portions being connected to the free ends of the second main conductor, the four free ends of the first and second connection conductor portions being electrically connected, via an electric connection network, to one another and to the electric connection means.

5,483,160

### EDDY CURRENT TESTING SYSTEM WITH SCANNING PROBE HEAD HAVING PARALLEL AND NORMAL SENSING COILS

James A. Gulliver, Wantage; Christopher C. Holt, Abingdon; Kenneth D. Boness, Blewbury, and Martin R. Anderson, deceased, late of Culham Station, all of, England, assignors to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 892,739, Jun. 1, 1992, abandoned, which is a continuation of Ser. No. 704,398, May 23, 1991, abandoned, which is a continuation of Ser. No. 431,638, Nov. 6, 1989, Pat. No. 5,019,777. This application Feb. 28, 1994, Ser. No. 202,889

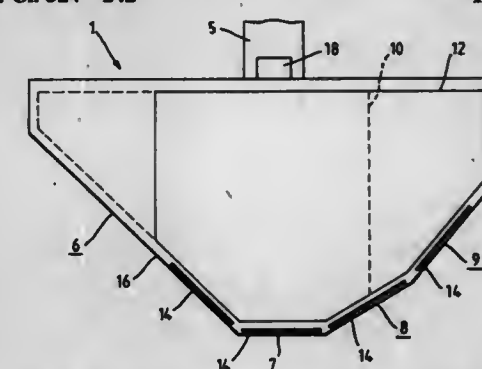
Claims priority, application United Kingdom, Nov. 7, 1988, 8825977

The portion of the term of this patent subsequent to May 28, 2008, has been disclaimed.

Int. Cl.<sup>6</sup> G01N 27/90; G01R 33/12

U.S. Cl. 324-242

12 Claims



1. An eddy current testing system including a probe head for scanning in a pre-determined direction and orientation over a surface of a body under test, said probe head having mounted thereon an exciting coil positioned with its axis parallel to the predetermined direction of scan of the probe head for creating eddy currents in the body under test, said eddy currents circulating transverse to the direction of scan of the probe head, the exciting coil being located exterior, relative to the probe head center, to at least one eddy current sensing first coil having its coil axis substantially parallel to that of the exciting coil and at least one eddy current sensing second coil with its coil axis substantially normal to that of the exciting coil and such that in use the said coil axis of each said second coil is substantially normal to the surface of the body under test, means for generating driving signals and applying them to the exciting coil, data acquisition means for receiving output signals from the first and second sensing coils and producing data signals related thereto, means for processing the data signals to produce defect signals indicative of the presence of surface breaking defects and means for displaying the defect signals.



5,483,161

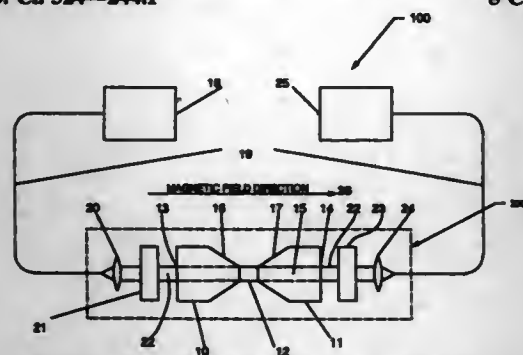
**FARADAY EFFECT CONTINUOUS CIRCUIT FLUX CONCENTRATING MAGNETIC FIELD SENSOR**  
Merritt N. Deeter; Gordon W. Day, both of Boulder, Colo.; Marc A. Manheimer, Greenbelt, and Thomas J. Beahn, Derwood, both of Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Dec. 11, 1992, Ser. No. 989,990

Int. Cl.<sup>6</sup> G01R 33/032; 33/02

U.S. Cl. 324-244.1

8 Claims



1. A magneto-optic magnetic field sensor comprising: a high-permeability magnetic flux concentrator; a high-permeability magneto-optic material located in physical contact with said magnetic concentrator and providing a continuous path of high-permeability between the magneto-optic material and the magnetic flux concentrator; said magnetic concentrator further comprising a cross-sectional area substantially greater than the cross-sectional area of said magneto-optic material; an optical detector; a sensing beam of light; and said magnetic flux concentrator further including a channel therethrough allowing the sensing beam of light to transmit through the channel and simultaneously through the magneto-optic material, and then to the optical detector.

5,483,162

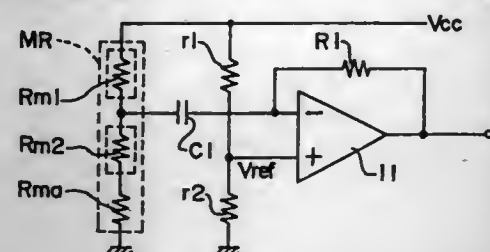
**MAGNETIC DETECTOR FOR A FREQUENCY GENERATOR RESPONSIVE TO MOTOR ROTATION**  
Isao Ushikoshi, and Hayato Naito, both of Komagane, Japan, assignors to Sankyo Salki Mfg. Co., Ltd., Nagano, Japan  
Filed Oct. 28, 1992, Ser. No. 967,749

Claims priority, application Japan, Jan. 30, 1991, 3-097310 U; Jan. 31, 1991, 3-098137 U

Int. Cl.<sup>6</sup> G01R 33/06; G01B 7/14; H03K 17/90; 19/18

U.S. Cl. 324-252

6 Claims



1. A magnetic detector comprising: two magnetic resistance elements having a predetermined resistance ratio connected serially between a power source and ground, said power source being subject to a noise level which may have a common mode effect on the detector; an output terminal connected to a common node of the two magnetic resistance elements for providing an output voltage; said output voltage from the output terminal being supplied to one of two input terminals of an operational amplifier; a resistance voltage divider disposed between said power source and

ground for supplying a divided voltage to the other input terminal of said amplifier; and resistance means for modifying the resistance ratio between the two magnetic resistance elements so as to make the DC component of said output voltage equal to said divided voltage; whereby common mode noise level effects of the power source on the detector are substantially eliminated.

5,483,163

**MRI COIL USING INDUCTIVELY COUPLED INDIVIDUALLY TUNED ELEMENTS ARRANGED AS FREE-PIVOTING COMPONENTS**

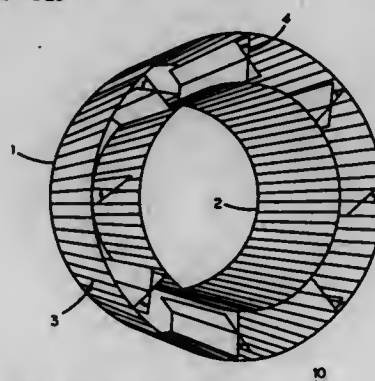
Han Wen, Kensington, Md.; Andrew S. Chesnick, Fairfield, Pa., and Robert S. Balaban, Bethesda, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Aug. 12, 1993, Ser. No. 104,849

Int. Cl.<sup>6</sup> G01R 33/28

U.S. Cl. 324-318

10 Claims



1. An MRI transceiver coil comprising: (a) a pair of concentric cylinders; (b) a plurality of resonant elements, radially mounted between said cylinders, said resonant elements each comprising a circuit board having an inductive element and a series of capacitances, each said circuit board having a longitudinal axis arranged in parallel to longitudinal axis of said concentric cylinders; first means for holding said resonant elements and second means for holding said resonant elements, said first and second means for holding being arranged at opposite ends of said pair of concentric cylinders and between said concentric cylinder; an axel for each said resonant element, each said axel being pivotally held in first and second means for holding; and means for freely pivotally mounting each said axel to said first and second means for holding for each said resonant elements so that each said resonant element is separate from said other resonant elements, wherein said resonant elements are inductively coupled to other resonant elements.

5,483,164

**WATER QUALITY SENSOR APPARATUS**

Adrian J. Moss, Aldershot; John Hewinson; Peter Walton, both of Poole; Brian J. Birch, Chelveston; Clare L. Ball, Rushden; Andrew W. James, West End; John K. Atkinson, Romsey, and Przemyslaw R. Sluda, Southampton, all of, England, assignors to Siemens Plessey Controls Limited, Dorset, England

Filed Sep. 28, 1994, Ser. No. 314,495

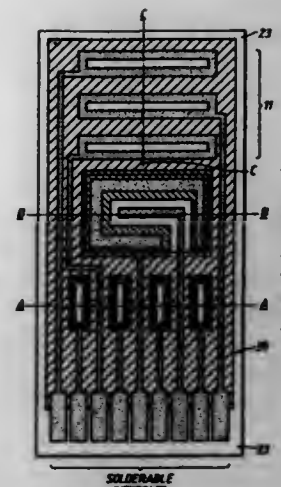
Claims priority, application United Kingdom, Nov. 2, 1993, 9322563; Dec. 1, 1993, 9324663

Int. Cl.<sup>6</sup> G01N 27/00; 27/27

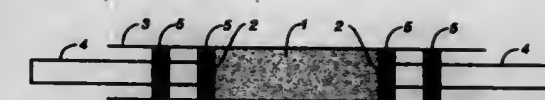
U.S. Cl. 324-425

15 Claims

1. Water quality sensor apparatus comprising a substrate on which a plurality of sensors are supported in spaced apart relation-



ship, each sensor being responsive to a different water characteristic and each sensor comprising a sensor region which, in use, is arranged to be contiguous with water the characteristics of which are to be sensed, which sensor regions are electrically connected to connector means via conductors supported on the substrate, the conductors and the connector means being arranged non-contiguously with the water in use of the apparatus.



- a generally longitudinal chamber having substantially the same thickness throughout its length;
- a pair of electrodes, each comprising:
  - a rod-shaped support having an active surface on at least a portion of one end of the support; and
  - means for holding the electrode in place in the chamber, wherein the active surface and holding means of one electrode are in one end of the chamber and the active surface and holding means of the other electrode are in the other end of the chamber, and further wherein the holding means positions those ends of the electrodes which contain the active surface so as to define a volume in the chamber for holding a material to be tested and such that the active surfaces are in contact with the material.

5,483,167

**COMPUTER CONTROLLED GROUND DETECTING METHOD FOR INVERTER UNIT AND APPARATUS THEREFOR**

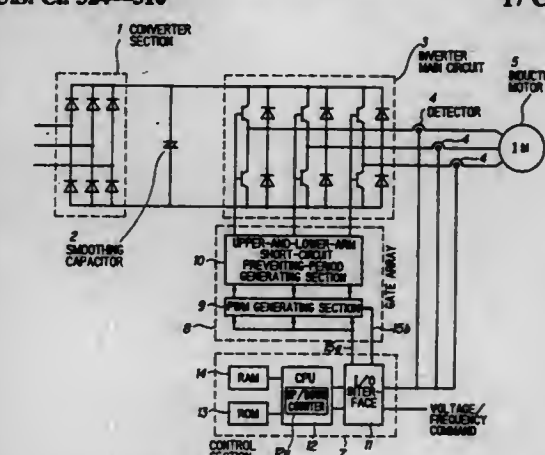
Nobuhiro Mikami, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1992, Ser. No. 941,801

Int. Cl.<sup>6</sup> G01R 31/02; H02H 7/122

U.S. Cl. 324-510

17 Claims



**BATTERY SYSTEM AND METHOD FOR DETERMINING A BATTERY CONDITION**

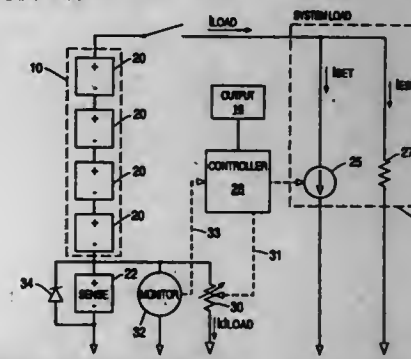
David B. Cameron, Seattle; Daniel Powers, Bainbridge Island; Thomas Lyster, Bothell, and Carlton Morgan, Bainbridge Island, all of Wash., assignors to Heartstream, Inc., Seattle, Wash.

Filed Jan. 14, 1994, Ser. No. 182,605

Int. Cl.<sup>6</sup> G01N 27/27

U.S. Cl. 324-427

31 Claims



1. A battery system comprising: a main battery providing current to a main load and a battery capacity indicator the battery capacity indicator comprising: a sense cell; means for affecting a parameter of the sense cell related to the remaining capacity of the main battery, the battery system further comprising a circuit connecting the sense cell in series with the main battery.

5,483,166

**ELECTROCHEMICAL TEST CELL FOR CONDUCTIVITY AND TRANSPORT MEASUREMENTS**

Ib L. Olsen, Bloemegren 159, 5220 Odense, Denmark

Filed Apr. 2, 1993, Ser. No. 42,315

Int. Cl.<sup>6</sup> G01N 27/07

U.S. Cl. 324-450

22 Claims

1. A test cell for measuring conductivity and transport properties of a material comprising:

1. A ground detecting method for an inverter unit which converts direct current to alternating current, the method comprising the steps of:

- detecting a voltage corresponding to output current of said inverter unit;
- computing a voltage indicative of a zero-phase current on the basis of said output current;
- generating an accumulated value by:
  - adding a first value whenever said voltage indicative of said zero-phase current exceeds a predetermined voltage corresponding to ground current level; and
  - subtracting a second value from said accumulated value, when said voltage indicative of said zero-phase current is lower than said predetermined voltage corresponding to said ground current level; and
- judging a ground condition when said accumulated value reaches a predetermined value.

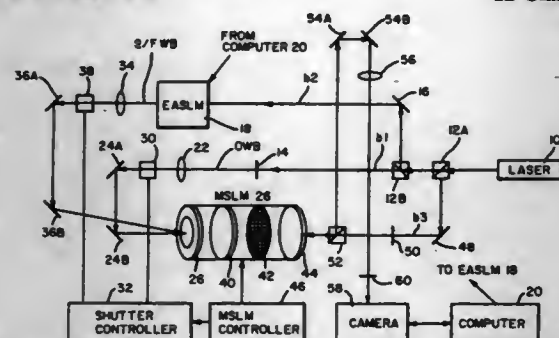
5,483,168

**OPTICAL POTENTIAL FIELD MAPPING SYSTEM**  
Max B. Reid, San Francisco, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 1, 1993, Ser. No. 24,133  
Int. Cl.<sup>6</sup> G02B 27/64

U.S. Cl. 324—525

12 Claims



1. An optical potential field mapping system for producing a potential field map of a physical region, said system comprising:
  - imaging means for generating images of the physical region, said imaging means including a spatial light modulating means for modulating the images based on a video command signal and a write command signal;
  - processing means for processing at least two of the images to produce the potential field map of the physical region, said processing means including a recording means for storing the images, and a first control means for generating the write command signal and the video command signal for use by the imaging means, the video command signal including at least one of an obstacle pattern signal, a goal pattern signal, and a feedback pattern signal;
  - said first control means including inverting means for generating inverted images using the stored images; threshold means for removing noise from the inverted images to generate a feedback pattern; comparison means for comparing at least two stored images to determine a change therebetween, mapping means for creating a potential field map based on output from the comparison means; feedback writing means for generating a feedback pattern signal based on the feedback pattern; obstacle writing means for generating an obstacle pattern signal; goal writing means for generating a goal pattern signal;
  - said mapping means including averaging means for averaging at least two of the stored images to create the potential field map;
  - said processing means including second control means for outputting to the spatial light modulating means a first control signal and a second control signal;
  - said spatial light modulating means including means for forming, in response to the first control signal, an image corresponding to the video of an electron depletion writing mode and electron deposition writing mode based on the writing command signal;
  - beam emitting means for emitting a main beam;
  - said imaging means including converting means for producing a goal/feedback writing beam and an obstacle writing beam based on the main beam, and spatial light modulating means for generating the images using at least one of the obstacle writing beam and the goal/feedback writing beam;
  - said converting means including beam splitting means for splitting the main beam into at least a first beam and a second beam, obstacle pattern means for modulating the first beam to generate the obstacle writing beam, modulating means for modulating the second beam to generate the goal/feedback writing beam; and
  - the spatial light modulating means including means for electron depletion writing an obstacle pattern in the image based on the obstacle writing beam, and for electron deposition writing

at least one of the goal pattern and feedback pattern in the image based on the goal/feedback writing beam.

5,483,169

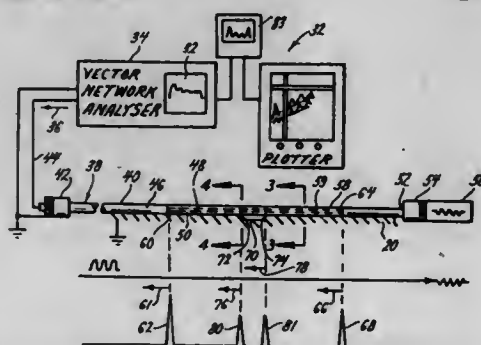
**RF IMAGING OF LOW OBSERVABLE COATINGS USING A WIRE-OVER-GROUND-PLANE TRANSMISSION LINE**  
Ronald R. Despain, Temecula, Calif.; Don J. Dougherty, Ames, Iowa; Jack Nachamkin, Poway, Calif.; Robert Schappelle, San Diego, Calif.; Jon M. Stinson, San Diego, Calif., and Vanessa M. Weslow, Escondido, Calif., assignors to McDonnell Douglas Corporation, Huntington Beach, Calif.

Filed Jul. 30, 1994, Ser. No. 100,464

Int. Cl.<sup>6</sup> G01R 31/11

U.S. Cl. 324—534

21 Claims



1. A testing device for defects in a relatively conductive structure that affect RF energy impinging thereon including:
  - a RF probe having:
    - an input portion with a predetermined characteristic impedance;
    - a conductor extending from said input portion including:
      - means to insulatively space said conductor from the relatively conductive structure that is to be tested for defects, wherein a wire-over-ground-plane transmission line is formed by said conductor and the relatively conductive structure; and
      - a termination portion connected to said conductor opposite from said input portion.

5,483,170

**INTEGRATED CIRCUIT FAULT TESTING IMPLEMENTING VOLTAGE SUPPLY RAIL PULSING AND CORRESPONDING INSTANTANEOUS CURRENT RESPONSE ANALYSIS**

Jeffrey S. Beasley, Las Cruces, N.M.; Hema Ramamurthy, Austin, Tex.; Jaime Ramirez-Angulo, and Mark R. DeYong, both of Las Cruces, N.M., assignors to New Mexico State University Technology Transfer Corp., Las Cruces, N.M.

Filed Aug. 24, 1993, Ser. No. 110,868

Int. Cl.<sup>6</sup> G01R 31/00

U.S. Cl. 324—537

16 Claims

1. A method of detecting faults in an integrated circuit, the method comprising the steps of:
  - a) applying a preselected common fixed DC bias voltage to selected integrated circuit inputs;
  - b) pulsing the voltage supply rails of the integrated circuit between a preselected minimum and maximum voltage; and
  - c) analyzing an instantaneous rail current generated by pulsing the voltage supply rails and thereby determining whether defects exist in the integrated circuit.

5,483,172

**RADIO FREQUENCY MEASURING APPARATUS**  
David J. Radford, 6 Cobblestone Lane, Pinetown Natal, South Africa

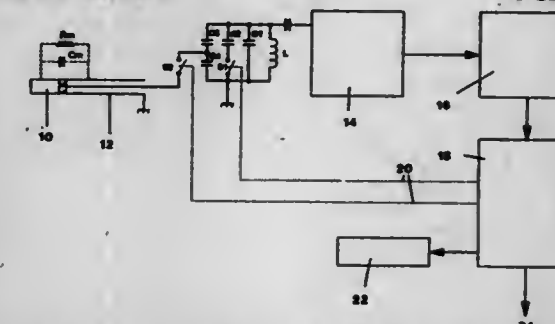
Filed Jun. 22, 1993, Ser. No. 79,801

Claims priority, application South Africa, Jun. 22, 1992, 92/4569A

Int. Cl.<sup>6</sup> G01R 27/26

U.S. Cl. 324—693

6 Claims



1. A device for measuring a composition of a material comprising:
  - a pair of electrodes immersed in the material to be measured which are switchably coupled to the tank circuit of a variable frequency oscillator operating at radio frequencies through means for reducing damping of the tank circuit;
  - additional capacitance or inductance switchably introduced to modify the frequency of the tank circuit to thereby form two frequencies which are measured with the electrodes connected to the oscillator, whereby errors due to oscillator drift are minimized by intermittently taking a succession of frequency measurements followed by reference frequencies with the electrodes disconnected from the oscillator, a time difference between frequency measurements being of the order of seconds; and
  - means for computing the differences between the measured and reference frequencies and using these differences to derive at least one signal representative of the composition of the material being measured.

5,483,171

**DETERMINATION OF WATER CUT AND GAS-FRACTION IN OIL/WATER/GAS STREAMS**

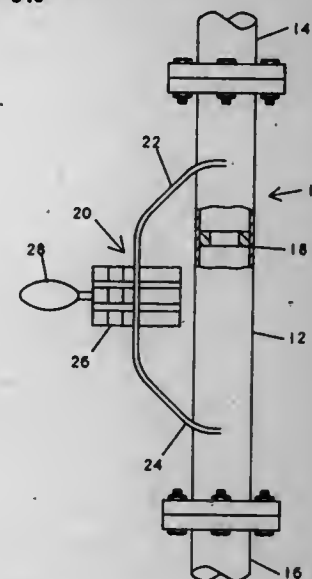
Gregory J. Hatton, Kingwood; David A. Helms, and John D. Marrelli, both of Houston, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 7, 1994, Ser. No. 301,942

Int. Cl.<sup>6</sup> G01N 22/04

U.S. Cl. 324—640

3 Claims



1. A method for determining the water cut and gas fraction of grossly homogeneous oil/water/gas streams, comprising the steps of:
  - repetitively, at a rate of several times per second taking a large number of discrete small volume samples from said stream; and
  - measuring the microwave frequency dielectric properties of each sample whereby fluctuations in these measurements indicate the presence of relatively small volume nonhomogeneous regions in grossly homogeneous streams to thereby obtain accurate oil, water and gas fractions.

5,483,173

**CURRENT MEASURING STRUCTURE FOR TESTING INTEGRATED CIRCUITS**

Franco Pellegrini, Corsico, Italy, assignor to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

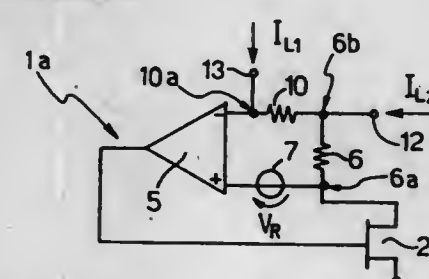
Filed Sep. 30, 1993, Ser. No. 129,424

Claims priority, application European Pat. Off., Sep. 30, 1992, 92830543

Int. Cl.<sup>6</sup> G01R 31/00

U.S. Cl. 324—765

18 Claims



1. A circuit for testing a current limiting loop in a power device, the circuit comprising:
  - an integrated current sensing resistance, coupled to the power device, for receiving a current flowing through the power device, and for providing first and second current paths through the sensing resistance for the current, the first and second current paths respectively having first and second resistances;



a current measuring device coupled across the current sensing resistance for determining whether the current exceeds a threshold, and for outputting an electrical signal when the threshold is exceeded; and.

5,483,174

# TEMPORARY CONNECTION OF SEMICONDUCTOR DIE USING OPTICAL ALIGNMENT TECHNIQUES

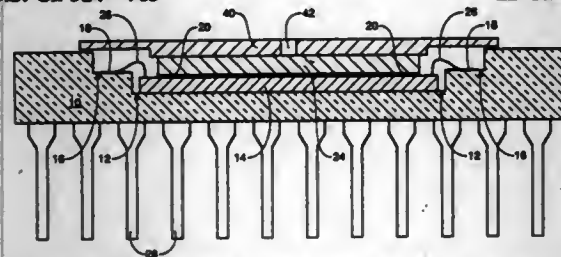
David R. Hembree, Boise, and Warren M. Farnworth, Nampa, both of Id., assignors to Micron Technology, Inc., Boise, Id. Continuation of Ser. No. 896,297, Jun. 10, 1992, Pat. No. 5,424,652. This application Feb. 3, 1994, Ser. No. 192,391

The portion of the term of this patent subsequent to Jun. 13, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> G01R 31/28

U.S. Cl. 324—765

22 Claims



1. A method for testing a semiconductor integrated circuit device in die form, comprising:

- providing first and second plates;
- providing a die receiving location on one of the first and second plates;
- providing a plurality of electrical leads on one of the first and second plates;
- providing an interconnect, having a plurality of circuit traces formed thereon, the circuit traces connected to contacts adapted to establish electrical communication with contact locations on the die;
- attaching the die to one of the first and second plates and using flip chip optical alignment to align the contacts on the interconnect with the contact locations on the die to establish said electrical communication between said contacts and said contact locations;
- establishing electrical communication between the electrical leads and the contacts;
- performing burn-in and characterization tests on the die while the die is positioned at the die receiving location; and
- separating said die from said interconnect and removing said die from said die receiving location.

5,483,175

# METHOD FOR CIRCUITS CONNECTION FOR WAFER LEVEL BURNING AND TESTING OF INDIVIDUAL DIES ON SEMICONDUCTOR WAFER

Aftab Ahmad, Boise; Larren G. Weber, Caldwell, and Robert S. Green, Boise, all of Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 96,643, Jul. 23, 1993, which is a continuation of Ser. No. 866,621, Apr. 10, 1992. This application Mar. 9, 1994, Ser. No. 209,665

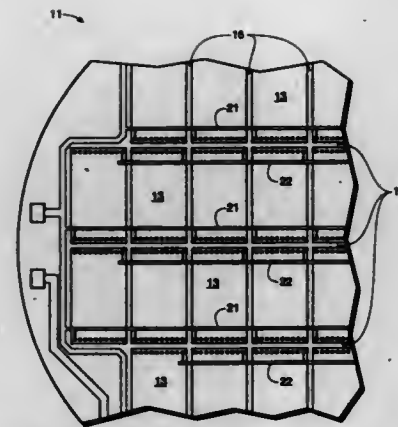
Int. Cl.<sup>6</sup> G01R 31/28; H01L 21/66

U.S. Cl. 324—766

4 Claims

1. A method for testing integrated circuit devices contained on a semiconductor wafer comprising:

- forming the wafer with built in test circuitry for testing the integrated circuit devices and test enable nodes for enabling the test circuitry;
- forming a conductive grid upon the wafer including conductive traces electrically connected to power and ground connections and to the test enable nodes;



- forming the conductive traces such that at least a portion of the conductive traces can be removed to sever an electrical connection with the test enable nodes while leaving the wafer beneath said portion substantially intact; and
- removing said portion of the conductive traces by chemical mechanical planarization thereby permitting the integrated circuit devices to be operated without enabling the test circuitry.

5,483,176

# LOW POWER MODULE

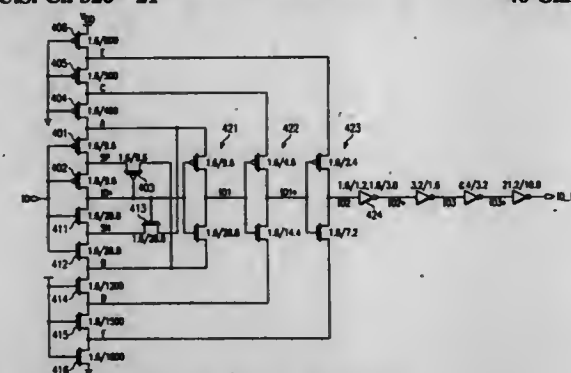
Louis Rodriguez, Austin; Clark R. Williams, Plano, and Bradley M. Harrington, Carrollton, all of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 728,229, Jul. 10, 1991, abandoned. This application Feb. 9, 1993, Ser. No. 15,506

Int. Cl.<sup>6</sup> H03K 19/094

U.S. Cl. 326—21

46 Claims



1. A low power input buffer, comprising:

- an input node, an output node, a power supply node, and a ground node, said power supply node adapted to be electrically coupled to a power supply selected from the group consisting of a battery-powered power supply or a signal powered power supply;
- a first inverter having a signal input and an output and a second inverter having a signal input and an output, the signal input of said first inverter electrically coupled to said input node, the output of said first inverter electrically coupled to the signal input of said second inverter, and the output of said second inverter electrically coupled to said output node;
- said first inverter with power input electrically coupled through a first resistor to said power supply node; and
- said second inverter with power input electrically coupled to said power supply node.

5,483,177

# INTEGRATED CIRCUIT HAVING A NOISE-REDUCING OUTPUT STAGE WITH MUTUALLY-DELAYED ACTIVATION CIRCUIT

Henricus A. L. Van Lieverloo, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

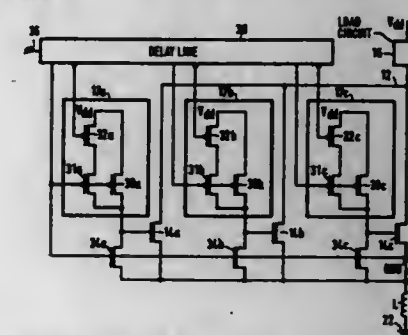
Filed Jun. 21, 1994, Ser. No. 263,114

Claims priority, application European Pat. Off., Jun. 22, 1993, 93201794

Int. Cl.<sup>6</sup> H03K 17/284

U.S. Cl. 326—27

10 Claims



1. An integrated circuit, comprising:  
an output stage which is organized in as series of at least two output transistors whose main current channels are connected parallel to one another between a supply terminal and an output of the output stage; and  
a control circuit which is arranged to start, in response to a variation in an input signal on an input, a charging of respective control electrodes of the output transistors in a mutually delayed fashion in the order of the series;  
characterized in that the control circuit comprises switching means for reducing a charging rate for a first one of the output transistors between the starting of the charging of the first output transistor and the starting of a second output transistor which directly succeeds the first output transistor in the series, in order to make a maximum time derivative of a current through the output, reached between the starting of the first and the second output transistors, smaller than it would have been without said switching back.

5,483,178

# PROGRAMMABLE LOGIC DEVICE WITH LOGIC BLOCK OUTPUTS COUPLED TO ADJACENT LOGIC BLOCK OUTPUT MULTIPLEXERS

John C. Costello, San Jose, and Rakesh H. Patel, Santa Clara, both of Calif., assignors to Altera Corporation, San Jose, Calif.

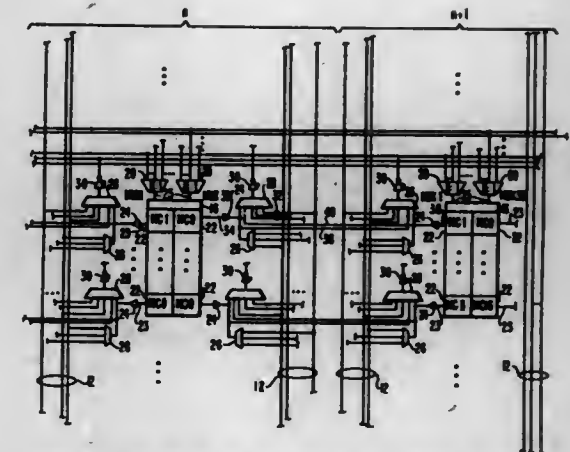
Continuation-in-part of Ser. No. 38,787, Mar. 29, 1993, Pat. No. 5,371,422. This application Mar. 4, 1994, Ser. No. 207,012

Int. Cl.<sup>6</sup> H03K 19/177

U.S. Cl. 326—41

15 Claims

1. A programmable logic device comprising:  
a plurality of rows and columns of logic array blocks, each logic array block having at least one input terminal for receiving input signals and at least one output terminal, each logic array block being programmable to produce output signals at the output terminal that are a selected logic function of the input signals;  
a plurality of intercolumn conductors, each connected to a respective one of the output terminals and extending between adjacent columns of said logic array blocks;  
a plurality of horizontal conductors in each row;  
a horizontal output programmable logic circuit in each column and row for programmably connecting the horizontal conductors in each row to: (a) the output terminal of the logic array block in the same column as the horizontal output programmable logic circuit, and (b) the intercolumn conductor connected to the output terminal of the logic array block in a



- column adjacent to the column that contains the horizontal output programmable logic circuit;
- a plurality of vertical conductors in each column; and
- a vertical output programmable logic circuit adjacent to each logic array block for programmably connecting the logic array block output terminals to the vertical conductors, wherein each horizontal output programmable logic circuit comprises a multiplexer having a multiplexer output terminal connected to one of the horizontal conductors, a first multiplexer input terminal connected to one of the vertical conductors in the same column as the multiplexer, a second multiplexer input terminal connected to one of the logic array block output terminals in the same column as the multiplexer, and a third multiplexer input terminal connected to one of the intercolumn conductors that is connected to a logic array block output terminal in a column adjacent to the column containing the multiplexer.

5,483,179

# DATA OUTPUT DRIVERS WITH PULL-UP DEVICES

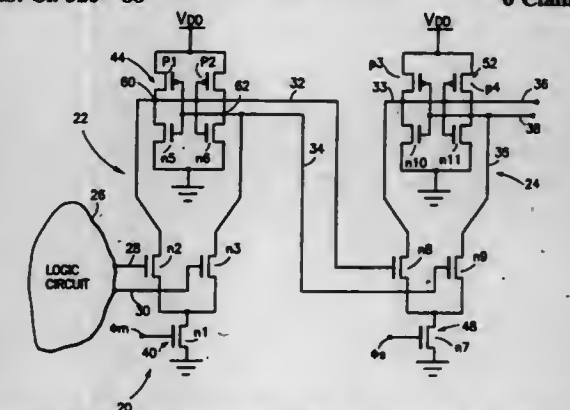
Sang H. Dhong, Mahopac; Toshiaki Kiriha, Wappingers Falls, and Matthew R. Wordeman, Mahopac, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 20, 1994, Ser. No. 230,265

Int. Cl.<sup>6</sup> H01L 25/00

U.S. Cl. 326—88

6 Claims



1. An apparatus for controlling the voltage across an NMOS pull-up transistor comprising:  
a source node which may be exposed to a voltage;  
a gate node which may be exposed to a voltage; and  
control means for regulating a voltage applied to said gate node, wherein a differential in voltage between said source node and said gate node is limited to a desired level;  
said control means being configured to continually apply a higher voltage, of the same polarity as the voltage applied to said gate node, than ground voltage;

wherein the higher voltage is a voltage higher than ground either approximately  $V_{DD}$  or  $V_{DD}$  plus a boost capacitor voltage.

5,483,180

## DATA AND CLOCK RECOVERY CIRCUIT

Sang-Hoon Chal, Hanbit Apt. 136-1503, Eeun-dong, Yusong-ku; Mun-Yang Park, Hanul Apt. 105-806, Sinsung-dong, Yusong-ku; Myung-Shin Kwak, Hanbit Apt. 108-1602, Eeun-dong, Yusong-ku, and Hae-Wook Chul, Joogong Apt. 3-204, Doryong-dong, Yusong-ku, all of Daejeon, Rep. of Korea

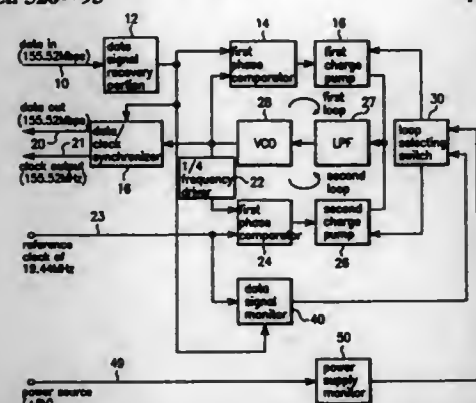
Filed Nov. 22, 1994, Ser. No. 346,206

Claims priority, application Rep. of Korea, Dec. 14, 1993, 93-27623

Int. Cl.<sup>6</sup> H03K 5/13

U.S. Cl. 326—93

4 Claims



1. A data and clock recovery circuit for restoring data signals distorted during transmission over the communication line and providing a synchronizing clock required for multiplex communication device, said circuit comprising:

- a main oscillation loop for maintaining its operating frequency by using input data signals transmitted from the communication line;
- a self oscillation loop for operating during restoration of power after a power outage or during data transmission discontinuance by using a reference clock of the circuit;
- a loop selecting switch connected to the main and self oscillation loops, for selecting the main oscillation loop during normal operation of the circuit and selecting the self oscillation loop during restoration of power after a power outage or during data transmission discontinuance;
- a data signal monitor connected to an input of the loop selecting switch, for monitoring the input data signals from the communication line so as to detect shortage of the communication line; and
- a power supply monitor connected to another input of the loop selecting switch, for monitoring the restoration of power after a power outage.

5,483,181

## DYNAMIC LOGIC CIRCUIT WITH REDUCED CHARGE LEAKAGE

Godfrey P. D'Souza, Santa Clara, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Dec. 16, 1994, Ser. No. 357,033

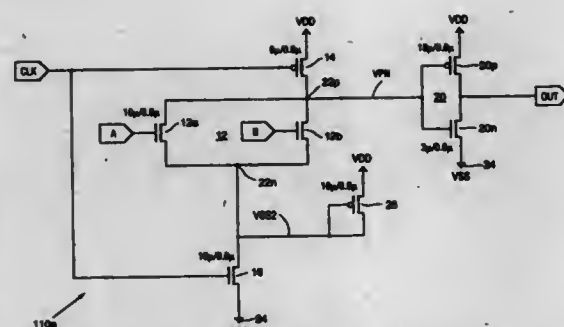
Int. Cl.<sup>6</sup> H03K 19/096

U.S. Cl. 326—98

33 Claims

1. An apparatus including a dynamic logic circuit with reduced charge leakage, said logic circuit comprising:

- a reference node for having a reference voltage associated therewith;
- a precharge node for receiving a plurality of electrical charges and precharging to a precharged state having a precharge



voltage associated therewith and for outputting said plurality of electrical charges and discharging to a discharged state having a discharge voltage associated therewith;

- a precharge circuit, coupled to said precharge node, for selectively providing said plurality of electrical charges to said precharge node;
- a logic circuit, coupled to said precharge node, for receiving a logic signal and in accordance therewith providing a conduction path for said plurality of electrical charges outputted from said precharge node; and
- a discharge circuit, coupled to said logic circuit and said reference node, for selectively discharging to said reference node said plurality of electrical charges outputted from said precharge node via said logic circuit conduction path, wherein said discharge voltage is intermediate to said precharge and reference voltages.

5,483,182

## METHOD AND APPARATUS FOR A DC-DC CONVERTER AN CURRENT LIMITING THEREOF

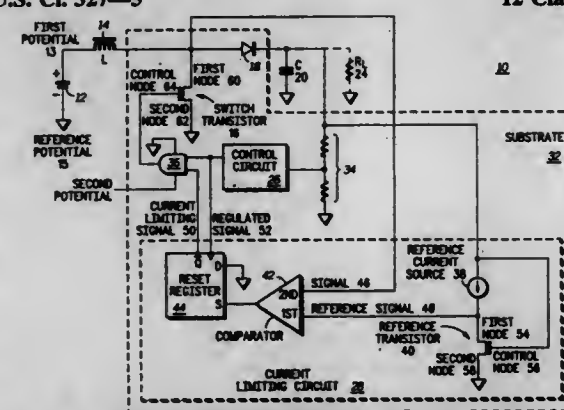
Mathew A. Rybicki, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 6, 1995, Ser. No. 399,003

Int. Cl.<sup>6</sup> H03K 5/22

U.S. Cl. 327—5

12 Claims



1. An on-chip current limiting circuit comprising:

- a reference transistor that is deposited on a substrate, wherein the reference transistor has a first reference node and a second reference node, wherein the reference transistor is scaled and electrically matched to a current controlling transistor deposited on the substrate, wherein the current controlling transistor has a first node and a second node, and wherein the second node and the second reference node are coupled to a reference potential;
- a reference current source deposited on the substrate, wherein the reference current source is operably coupled to the reference transistor at the first reference node, and wherein the reference current source produces a reference current; and
- a comparator deposited on the substrate, wherein the comparator has a first input and a second input, wherein the first input is operably coupled to receive a reference signal from the first reference node and the second input is connected to receive a

signal from the first node, and wherein, when the signal compares unfavorably to the reference signal, the comparator generates a current limiting signal such that current through the current controlling transistor is limited based on the reference current.

5,483,183

## BIPOLAR CURRENT SENSE AMPLIFIER

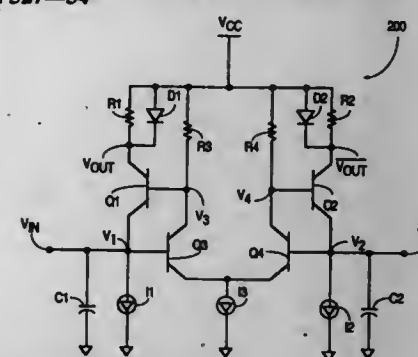
Richard C. Li; Chau-Chin Wu, and Tu-Ke Tien, all of Cupertino, Calif., assignors to Integrated Device Technology, Inc., San Jose, Calif.

Filed Feb. 10, 1994, Ser. No. 194,773

Int. Cl.<sup>6</sup> G01R 19/00; H03F 3/45

U.S. Cl. 327—54

9 Claims



1. A sense amplifier comprising:

- a first and a second input node;
- a first and a second output node;
- a first, a second, and a third current source, wherein the third current source supplies a current which is less than a current supplied by the first current source;
- a first, a second, a third, and a fourth resistive load;
- a first amplifying switch having a first current carrying terminal coupled to the first resistive load and to the first output node, a second current carrying terminal coupled to the first current source and to the first input node, and a control terminal;
- a second amplifying switch having a first current carrying terminal coupled to the second resistive load and to the second output node, a second current carrying terminal coupled to the second current source and to the second input node, and a control terminal;
- a third amplifying switch having a control terminal coupled to the first input node, a first current carrying terminal coupled to the third current source, and a second current carrying terminal coupled to the third resistive load and to the control terminal of the first amplifying switch; and
- a fourth amplifying switch having a control terminal coupled to the second input node, a first current carrying terminal coupled to the third current source, and a second current carrying terminal coupled to the fourth resistive load and to the control terminal of the second amplifying switch.

5,483,184

## PROGRAMMABLE CMOS BUS AND TRANSMISSION LINE RECEIVER

James R. Kuo, Cupertino, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 8, 1993, Ser. No. 73,927

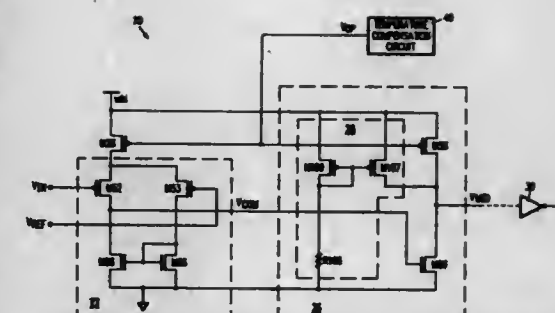
Int. Cl.<sup>6</sup> G06G 7/10; H03F 1/30; H03K 5/153; H03H 17/02

U.S. Cl. 327—83

19 Claims

1. A receiver for providing binary signals from a transmission line to a data system, the receiver comprising:

- a differential comparator that compares a reference voltage to an input voltage and that provides a comparator output signal in response to the comparison, the comparator output signal indicating whether the input voltage is greater or less than the reference voltage; and



a first current source coupled to the differential comparator that provides current to the differential comparator, the first current source providing substantially the same amount of current to the differential comparator whether the input voltage is greater or less than the reference voltage, the first current source having a positive temperature coefficient so that when temperature increases the current provided by the first current source increases.

5,483,185

## METHOD AND APPARATUS FOR DYNAMICALLY SWITCHING BETWEEN ASYNCHRONOUS SIGNALS WITHOUT GENERATING GLITCHES

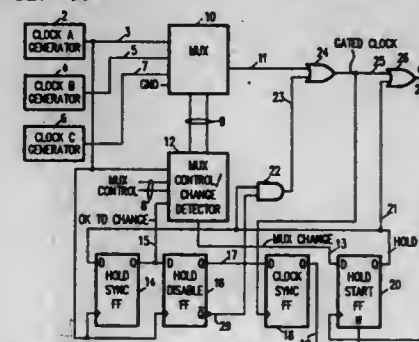
Mike Scriber, North Plains, and Jim Warren, Hillsboro, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jun. 9, 1994, Ser. No. 257,721

Int. Cl.<sup>6</sup> H03L 7/00; H03K 3/64

U.S. Cl. 327—99

13 Claims



1. A clock switching circuit comprising:

- a clock A;
- a clock B;
- a multiplexer (10) connected to said clock A and said clock B;
- said multiplexer (10) having a MUX output (11);
- a MUX control input (8);
- said MUX control input being a clock encoding of a selection between clock A and clock B as the output of said multiplexer;
- a MUX change signal (13);
- a MUX control change detector (12) connected to said multiplexer and to said MUX control input (8);
- said MUX control change detector (12) having MUX SELECT outputs;
- said MUX control change detector (12) including logic for decoding said MUX control input (8) and for asserting said MUX change signal (13) upon a condition that a change is to occur from one to another of clock A and clock B at the output of said multiplexer;
- a Hold Start flip-flop (20);
- a Hold Sync flip-flop (14) connected to and set by a hold output (21) of said Hold Start flip-flop;
- said Hold Sync flip-flop being connected to and clocked by said clock A;
- said Hold Sync flip-flop (14) having an OK TO CHANGE output (15) connected to said MUX control change detector (12);



said OK TO CHANGE output (15) preventing an assertion of said MUX select outputs upon a condition that said Hold Sync flip-flop (14) is set;

a Hold Disable flip-flop (16) connected to said OK TO CHANGE output (15) of said Hold Sync flip-flop;

said Hold Disable flip-flop being connected to and clocked by said clock A;

a Clock Sync flip-flop (18) connected to and set by a hold disable output (17) of said Hold Disable flip-flop;

a reset input of said Hold Start flip-flop (20) being connected to a clock sync output (19) of said Clock Sync flip-flop;

an AND logic (22) connected to said hold output (21) and to a not hold disable output (29) of said Hold Disable flip-flop;

an OR logic (24) connected to said MUX output (11) and to an output (23) of said AND logic (22);

said OR logic (24) having a gated clock output (25); and,

an OR logic (26) connected to said hold output (21) and to said gated clock output (25);

said OR logic (26) having a clock output (28);

said Clock Sync flip-flop being clocked by said gated clock output (25);

said hold start flip-flop being set by said MUX change signal (13) and clocked by said clock output (28);

said hold start flip-flop being reset upon a condition that said clock sync flip-flop is set.

5,483,186

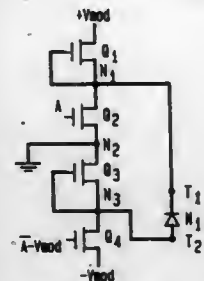
**PUSH-PULL OPTICAL MODULATOR DRIVER CIRCUIT**  
David A. B. Miller, Fair Haven, and Ted K. Woodward, Lin-  
croft, both of N.J., assignors to AT&T Corp., Murray Hill,  
N.J.

Filed May 5, 1994, Ser. No. 238,562

Int. Cl.<sup>6</sup> H03K 3/00

U.S. Cl. 327-108

22 Claims



1. A push-pull driver circuit for driving an optical modulator, comprising:

- a first switch means for connection to a first reference voltage and controlled by a first input signal applied thereto, said first input signal having one of a high and a low value;
- a second switch means for connection to a second reference voltage and controlled by a second input signal applied thereto, said second input signal having the other of a high and a low value relative to the value of said first input signal, said second switch means being connected to said first switch means for forming a junction that is maintained at a third reference voltage; and

at least a first optical modulator having first and second terminals said optical modulator producing a modulating function when a drive voltage in a range defined between a maximum value and a minimum value is applied to said first and second terminals;

wherein said first terminal is connected to said first switch means for applying a first portion of said drive voltage to said first terminal so that said first switch means selectively applies a selected one of said first and said third reference voltages to said first terminal selected on the basis of whether said first input signal applied to said first switch means is a high value or a low value; and

wherein said second terminal is connected to said second switch means for applying a second portion of said drive voltage to

said second terminal so that said second switch means selectively applies a selected one of said second and said third reference voltages to said second terminal selected on the basis of whether said second input signal applied to said second switch means is a high value or a low value, so that the maximum value of the drive voltage is greater in magnitude than the magnitudes of each of said first reference voltage and said second reference voltage.

5,483,187

**POWER-ON RESET CIRCUIT**

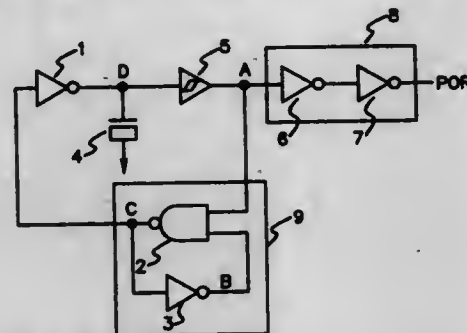
Hyun S. Jang, Bubaleub, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Rep. of Korea  
Filed Mar. 15, 1994, Ser. No. 213,154

Claims priority, application Rep. of Korea, Mar. 15, 1993, 1993-3785

Int. Cl.<sup>6</sup> H03K 17/284

U.S. Cl. 327-143

7 Claims



2. A power-on reset circuit comprising:

capacitance means for being charged to a desired voltage and then being discharged;

Schmitt triggering means for discriminating the voltage discharged from the capacitance means, the Schmitt triggering means transitioning instantaneously its output to first state when the discharged voltage reaches a predetermined level to output a reset signal, and then transitioning its output to second state again after the lapse of a predetermined time period to maintain a constant voltage;

state latch means for receiving the output of the Schmitt triggering means, the state latch means including a NAND gate having one input terminal connected to an output terminal of the Schmitt triggering means, and an inverter having an input terminal connected to an output terminal of the NAND gate and an output terminal connected to another input terminal of the NAND gate, the state latch means being transitioned by the output of the Schmitt triggering means after the lapse of a predetermined time period from generation of the reset signal, and then remaining at the transitioned state; and

inverting means for inverting an output voltage of the state latch means and applying the inverted output voltage to the capacitance means.

5,483,188

**GIL EDGE RATE CONTROL CIRCUIT**

Tim Frodsham, Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

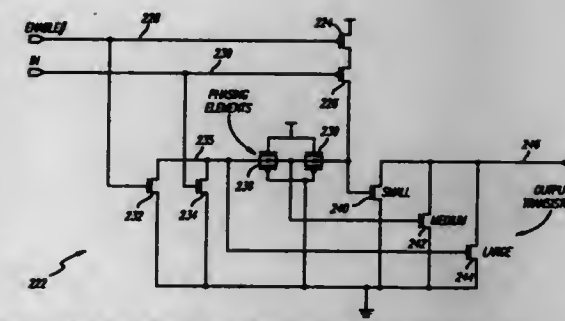
Filed Sep. 27, 1994, Ser. No. 312,646

Int. Cl.<sup>6</sup> H03K 5/12; 17/04

U.S. Cl. 327-170

42 Claims

1. In a phased-output driver having a pre-driver with complementary pull-down and pull-up components, a set of delay elements, and a set of output devices, wherein said pull-down components are connected through said delay elements to said output devices for sequentially activating said output devices and said pull-up components are connected through said delay elements to



said output devices for sequentially deactivating said output devices, an improvement comprising:

connecting said pull-down components to said output devices through said delay elements for activating said output devices in a first predetermined order, said output devices comprising transistors of differing sizes and said pull-down pre-driver components being connected through said delay elements for activating said output transistors in order from smallest to largest; and

connecting said pull-up components to said output devices through said delay elements for deactivating said output devices in a second predetermined order, said pull-down pre-driver components are connected through said delay elements for activating said output transistors in order from largest to smallest.

5,483,189

**INPUT/OUTPUT ADAPTED TO OPERATE WITH LOW AND HIGH VOLTAGES**

Paolo Cordini, Giorgio Pedrazzini, both of Pavia, and Domenico Rossi, Civate, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

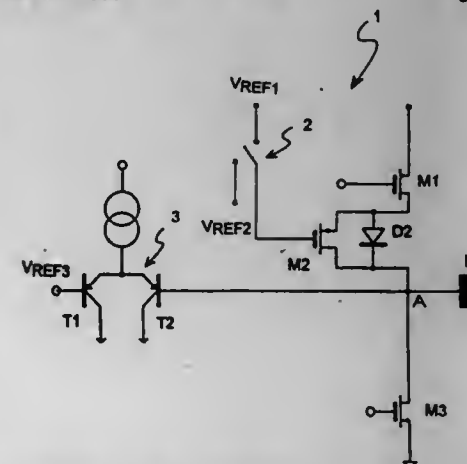
Filed Oct. 31, 1994, Ser. No. 332,831

Claims priority, application European Pat. Off., Jan. 29, 1993, 93830438

Int. Cl.<sup>6</sup> H03K 5/153

U.S. Cl. 327-333

33 Claims



1. An integrated circuit, comprising:

a first transistor, having current-carrying terminals operatively connected in series between an output terminal and a first power supply connection;

a second transistor, having current-carrying terminals operatively connected to be interposed between said output terminal and said first transistor, said first and second transistors being of opposite conductivity types;

a third transistor, connected between said output terminal and a second power supply connection which is less positive than said first power supply connection; and

selection circuitry operatively connected to selectively apply

a first constant voltage to turn on said second transistor to enable push-pull operation of said first and third transistors to drive said output node, or

a second constant voltage to turn off said second transistor to enable open-collector operation of said third transistor to drive said output node.

5,483,190

**FLOATING VOLTAGE CONTROLLED THERMISTOR/PLATINUM PROBE EMULATOR**

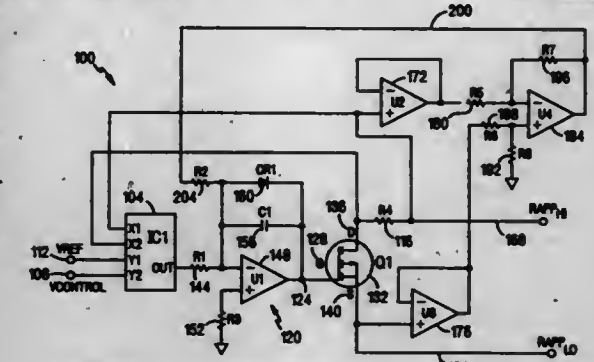
Kevin G. McGivern, Lakeville, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 1, 1994, Ser. No. 347,960

Int. Cl.<sup>6</sup> G06F 5/00

U.S. Cl. 327-334

17 Claims



1. Apparatus for providing a controlled resistance of a predetermined value, comprising:

a. means for providing a fixed resistance of a predetermined value;

b. means for providing a variable resistance connected with the means for providing the fixed resistance, the value of the controlled resistance value being a function of the value of the fixed resistance and a value of the variable resistance; and

c. means, responsive to a control signal indicative of a desired value for the controlled resistance, for controlling the value of the variable resistance depending on a value of the control signal, the control signal having a voltage value that varies depending upon a desired value for the controlled resistance, the means for controlling comprising means for multiplying any difference between the voltage value of the control signal and a reference voltage of a predetermined value by a voltage across the means for providing a fixed resistance and for providing a product signal indicative thereof, the means for controlling further comprising means for integrating the product signal and for providing an integrated product signal indicative thereof, the means for providing a variable resistance being connected to the integrated product signal for providing the value of the variable resistance in dependence thereon.

5,483,191

**APPARATUS FOR BIASING A FET WITH A SINGLE VOLTAGE SUPPLY**

James R. Blodgett, Derry, N.H., assignor to AT&T Corp., Murray Hill, N.J.

Filed Sep. 23, 1994, Ser. No. 311,224

Int. Cl.<sup>6</sup> H03L 5/00; H03K 17/14

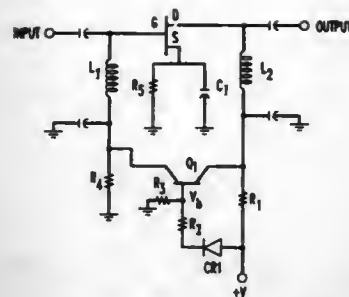
U.S. Cl. 327-362

6 Claims

1. An apparatus for processing an electric signal, said apparatus comprising:

a field effect transistor having a gate lead, a drain lead and a source lead, wherein said gate lead is an input and said drain lead is an output;

a bipolar transistor having a base lead, a collector lead and an emitter lead;



- a first choke  $L_2$  having a first lead and a second lead, said first lead of said first choke being connected to said gate lead and said second lead of said first choke being connected to said collector lead;
- a second choke  $L_2$  having a first lead and a second lead, said first lead of said second choke being connected to said drain lead and said second lead of said second choke being connected to said emitter lead;
- a first resistor  $R_1$  having a first lead and a second lead, said first lead of said first resistor being connected to said emitter lead and said second lead of said first resistor being connected to a voltage source;
- a second resistor  $R_2$  having a first lead and a second lead, said first lead of said second resistor being connected to said base lead and said second lead of said second resistor being connected to said voltage source;
- a third resistor  $R_3$  having a first lead and a second lead, said first lead of said third resistor being connected to said base lead and said second lead of said third resistor being connected to ground;
- a fourth resistor  $R_4$  having a first lead and a second lead, said first lead of said fourth resistor being connected to said collector lead and said second lead of said fourth resistor being connected to ground;
- a fifth resistor  $R_5$  having a first lead and a second lead, said first lead of said fifth resistor being connected to said source lead and said second lead of said fifth resistor being connected to ground; and
- a first capacitor  $C_1$  having a first lead and a second lead, said first lead of said first capacitor being connected to said source lead and said second lead of said first capacitor being connected to ground.

5,483,192

## GATE POWER SUPPLY CIRCUIT

Hiromichi Tai, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

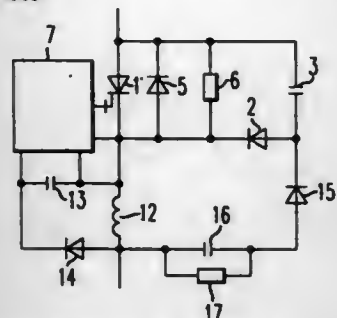
Filed Sep. 7, 1993, Ser. No. 116,970

Claims priority, application Japan, Sep. 17, 1992, 4-246991

Int. Cl.<sup>6</sup> H03K 17/60; 17/73; H02H 7/122; H02M 5/42

U.S. Cl. 327-440

11 Claims



1. A gate power supply circuit, comprising: a switching device; gate drive circuit means connected to said switching device for generating a gate signal to be supplied to a gate of said switching device;

- a series circuit of a snubber capacitor and a snubber diode connected in parallel with said switching device;
  - an inductor, a first terminal of which being connected to a connection point of said switching device and said snubber diode;
  - a series circuit of power disposing means and a first diode, connected between a series connection point of said snubber capacitor and said snubber diode and a second terminal of said inductor; and
  - a series circuit of a power supplying capacitor and a second diode, connected in parallel with said inductor;
- said gate drive circuit means being connected to said power supplying capacitor to receive energy stored in said power supplying capacitor as power source for said gate drive circuit means.

5,483,193

## CIRCUIT FOR DEMODULATING FSK SIGNALS

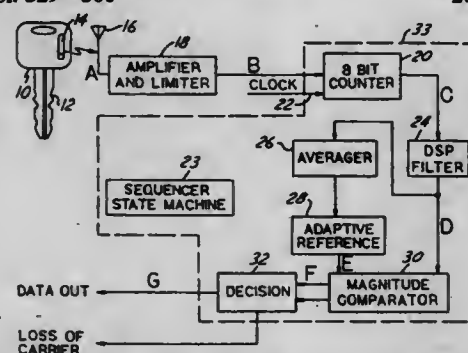
John F. Kennedy, Dearborn; Scott O. Campbell; Lawrence P. Kirk, both of Canton, all of Mich.; David P. Laude, Colorado Springs, and Luke A. Perkins, Security, both of Colo., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 24, 1995, Ser. No. 409,397

Int. Cl.<sup>6</sup> H03D 3/00; H04L 27/00

U.S. Cl. 329-300

20 Claims



1. A circuit for demodulating an FSK signal having a first frequency with a corresponding first period and a second frequency with a corresponding second period, said FSK signal having a preamble with a period corresponding to a selected one of said first period or said second period and a coded signal portion which alternates between said first and second periods, said circuit comprising:

- receiving means receiving said FSK signal;
- clock means for generating a clock signal having a third frequency corresponding to a third period substantially shorter than said first period and said second period;
- counter means connected to said clock means and said receiving means for generating a count corresponding to a number of third periods of said clock signal during a period of said FSK signal;
- averaging means coupled to said counter means for calculating an adaptive reference count by averaging a predetermined number of counts during said preamble, said reference count representing either the high or low logic level;
- comparing means for comparing said count occurring during said coded signal portion with said adaptive reference count;
- output means providing a digital level output signal based whether said count is within a predetermined range from said adaptive reference count, said predetermined range corresponding to either a valid low logic or a valid high logic.

5,483,194

## DIFFERENTIAL CURRENT MODE AMPLIFIER DEVICE

Pierre Genest, Butry Sur Oise, France, assignor to Alcatel Mobile Communication France, Paris, France

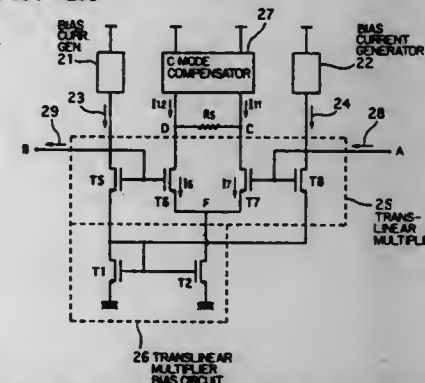
Filed Oct. 28, 1994, Ser. No. 331,286

Claims priority, application France, Nov. 2, 1993, 93 13000

Int. Cl.<sup>6</sup> H03F 3/45

U.S. Cl. 330-253

15 Claims



1. Differential current mode amplifier device comprising: means for generating a common mode bias current; a translinear multiplier receiving at two inputs said common mode bias current and a differential mode current to be amplified and delivering at two outputs an amplified differential mode current; means for biasing said translinear multiplier in a manner dependent on said bias current received by said translinear multiplier; and means for compensating the common mode current at said outputs of said translinear multiplier.

5,483,195

## SECOND GENERATION LOW NOISE MICROWAVE VOLTAGE CONTROLLED OSCILLATOR

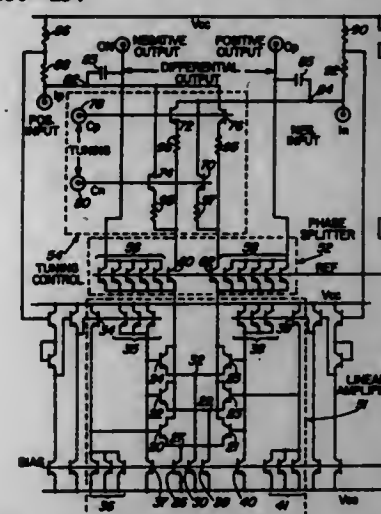
Anthony K. D. Brown, Kanata, Canada, assignor to Northern Telecom Limited, Quebec, Canada

Filed Oct. 20, 1994, Ser. No. 327,155

Int. Cl.<sup>6</sup> H03F 3/45; H03B 5/02

U.S. Cl. 330-254

12 Claims



1. A linear amplifier having variable delay means, said amplifier comprising: first, second and third bipolar differential pairs; first, second and third constant current sources connected to said first, second and third differential pairs respectively; differential current outputs generated by said differential pairs; gain linearizing offset provided by ratioed input emitter followers and associated current mirrors, a linear phase splitter

- receiving said differential current outputs and providing main current output and components of in-phase and 180° out-of-phase current; and
- a logarithmic tuning control for combining said components of in-phase and 180° out-of-phase current in inverse ratios to provide d.c. feedback current.

5,483,196

## AMPLIFIER ARCHITECTURE AND APPLICATION THEREOF TO A BAND-GAP VOLTAGE GENERATOR

Serge Ramet, Grenoble, France, assignor to SGS-Thomson Microelectronics S.A., Pouilly, France

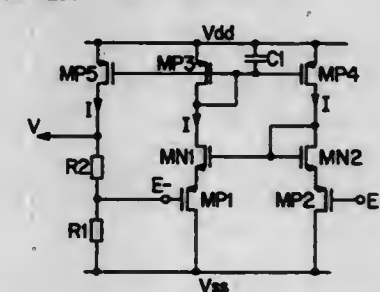
Filed Apr. 8, 1994, Ser. No. 225,374

Claims priority, application France, Apr. 9, 1993, 93 04547

Int. Cl.<sup>6</sup> H03F 3/45

U.S. Cl. 330-257

35 Claims



1. A differential amplifier having an inverting input, a non-inverting input, and an output, and comprising, in series, between first and second supply voltages: successively first, second, and third transistors of a first type, a second type, and the first type, respectively, the first transistor being an input transistor of a first current mirror, the second transistor being an output transistor of a second current mirror, a control electrode of the third transistor forming an inverting input of the amplifier, wherein a first circuit path connects the second and third transistors; successively fourth, fifth, and sixth transistors of the first, the second, and the first type, respectively, the fourth transistor being an output transistor of the first current mirror, the fifth transistor being an input transistor of the second current mirror, a control electrode of the sixth transistor forming a non-inverting input of the amplifier, wherein a second circuit path connects the fifth and sixth transistors; wherein an amplifier output current is provided by a seventh transistor of the first type that is an output transistor of the first current mirror; and wherein the first circuit path is substantially the same as the second circuit path.

5,483,197

## POWER AMPLIFIER CIRCUIT FOR AUDIO SIGNAL AND AUDIO DEVICE USING THE SAME

Kei Nishioke, Masanori Fujisawa, and Katsumi Kusaba, all of Kyoto, Japan, assignors to Rohm Co., Ltd., Kyoto, Japan

Filed Sep. 26, 1994, Ser. No. 313,921

Claims priority, application Japan, Sep. 28, 1993, 5-264319;

Jan. 4, 1993, 5-271256

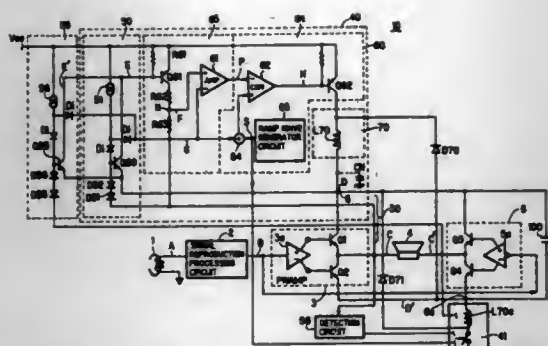
Int. Cl.<sup>6</sup> H03F 3/30

U.S. Cl. 330-273

19 Claims

1. A power amplifier circuit comprising: a first push-pull output stage amplifier for amplifying an audio signal; a second push-pull output stage amplifier for amplifying the audio signal; a switching circuit including a ramp wave generator circuit oscillating at a frequency in a range from 50 kHz to 800 kHz, a comparator having one input supplied with an output of said





ramp wave generator circuit and another input supplied with a control signal and a switching transistor for ON/OFF switching of power supplied from a power source line in accordance with an output of said comparator for feeding power to one of said first output stage amplifier and said second output stage amplifier;

a smoothing circuit having a coil provided between the feed power output of said switching circuit and a terminal of one of said first output stage amplifier and said second output stage amplifier for receiving a feed power and having a diode for forming a circulating path for supplying one of said first output stage amplifier and said second output stage amplifier with a current of said coil in a period when said switching transistor is in an OFF state;

a control circuit including a control voltage value generator circuit for generating a voltage value corresponding to the voltage difference between a voltage signal of the feed power and a selected voltage of one of a first output signal of said first output stage amplifier and a second output signal of said second output stage amplifier and supplying the voltage value to said another input of said comparator as the control signal to control the comparator output for controlling a switching period of said switching transistor such that the voltage difference between a voltage of one of said first output signal and said second output signal and the voltage of the feed power becomes substantially constant; and

a capacitor adapted to be charged by a portion of a current flowing from said smoothing circuit when said switching circuit is in an OFF state and generating a discharge current to be added to an output current of one of the output of the first output stage amplifier and the output of the second output stage amplifier when said switching circuit is in an ON state.

5,483,198

#### METHOD AND APPARATUS FOR CONTROLLING AMPLIFIER POWER

Christopher J. Nunn, Winchester, England, assignor to AT&T Wireless Communications Products, Ltd., Hampshire, England

Filed Oct. 25, 1994, Ser. No. 325,327

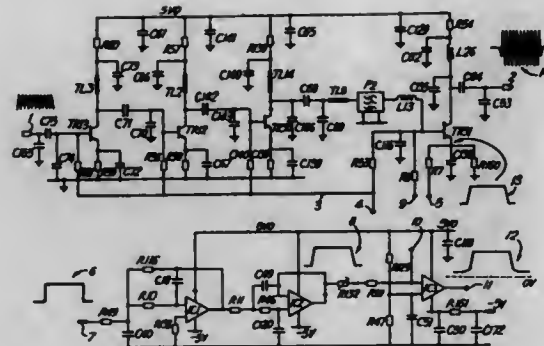
Claims priority, application United Kingdom, Jul. 1, 1992, 9213996

Int. Cl.<sup>6</sup> H03G 3/30

U.S. Cl. 330—279

18 Claims

1. A method for controlling the output power of an amplifier comprising a number of cascaded transistor amplifier stages, said method comprising deriving a feedback signal directly proportional to the flow of dc current through one of the transistor amplifier stages, comparing this feedback signal with a control signal having a desired envelope shape to produce an error signal, and using said error signal to control the gain of at least some of the stages of the amplifier in such a way that the envelope shape of the amplifier output signal corresponds to that of the control signal.



5,483,199

#### METHOD AND APPARATUS FOR COMPENSATING THERMAL TIME CONSTANTS IN AN ELECTRONIC AMPLIFIER

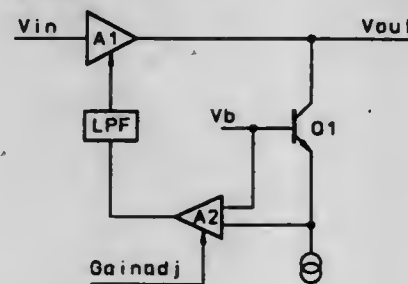
Knud L. Knudsen, Menlo Park, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 21, 1994, Ser. No. 327,087

Int. Cl.<sup>6</sup> H03F 1/30

U.S. Cl. 330—289

8 Claims



1. A method for substantially compensating an output signal of a wide band electronic amplifier having an undesirable signal dependent thermally generated offset voltage, comprising:

providing a thermal offset voltage generator having a signal dependent thermally generated offset voltage similar to that of the wide band amplifier;

coupling an input of the thermal offset voltage generator with an output of the wide band amplifier so as to generate a compensating signal; and

injecting the compensating signal into the wide band amplifier so as to substantially compensate an output signal of the wide band amplifier for the undesirable signal dependent thermally generated offset voltage.

5,483,200

#### LIGHT-RECEIVING AND AMPLIFYING DEVICE CAPABLE OF SWITCHING BETWEEN GAIN LEVELS AT HIGH SPEED AND OBTAINING A SUFFICIENT SIGNAL-TO-NOISE RATIO OVER A WIDE RANGE IN QUANTITY OF INCIDENT LIGHT

Naonori Okabayashi, Sakurai, Koichi Hanafusa, and Masaya Ohnishi, both of Kitakatsuragi, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 8, 1994, Ser. No. 257,741

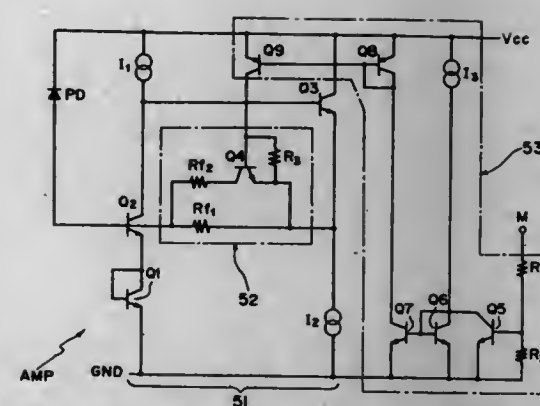
Claims priority, application Japan, Jun. 8, 1993, 5-137610; Jun. 8, 1993, 5-137612; Aug. 24, 1993, 5-209350; Dec. 10, 1993, 5-310229

Int. Cl.<sup>6</sup> H03F 3/08; H03G 3/12

U.S. Cl. 330—308

12 Claims

1. A light-receiving and amplifying device having a photodiode and an amplifier circuit which amplifies a photocurrent from the photodiode through current-to-voltage conversion of the photocurrent, the light-receiving and amplifying device comprising:



a gain switching circuit which switches the amplifier circuit between two or more gain levels, said gain switching circuit including at least one set of a resistor and a switching element connected in series across an input and an output of the amplifier circuit, said switching element including a control terminal, and

a gain selection circuit for selecting one of said two or more gain levels in response to an external selection signal, said gain selection circuit including a current mirror circuit which is responsive to the external selection signal and connected directly to the control terminal of said switching element, whereby the amplifier circuit is prevented from being saturated over a wide range of light quantity incident on the photodiode and signal to noise ratio is increased.

5,483,201

#### SYNCHRONIZATION CIRCUIT USING A HIGH SPEED DIGITAL SLIP COUNTER

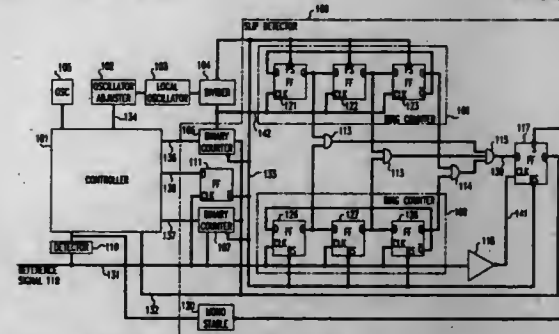
James R. Bortoloni, Boulder, Colo., assignor to AT&T Corp., Murray Hill, N.J.

Filed Sep. 30, 1993, Ser. No. 129,537

Int. Cl.<sup>6</sup> H03L 7/00

U.S. Cl. 331—1 A

8 Claims



1. An apparatus for detecting a difference in frequency between an oscillator and a reference signal, comprising:

means for controlling a starting of a first ring counter for counting at a frequency of the oscillator and of a second ring counter for counting at a frequency of the reference signal;

means for generating a signal when count of the first ring counter differs from count of the second ring counter by a predetermined amount;

the controlling means responsive to the signal from the generating means for calculating a difference in frequency between the oscillator and the reference signal;

the controlling means comprises means for processing under control of a stored program;

means for timing; and

the processing means for starting the timing means when starting the counting means and responsive to the signal from the generating means for reading the timing means to calculate the difference.

#### 5,483,202 COMPENSATED PHASE LOCKED LOOP FOR GENERATING A CONTROLLED OUTPUT CLOCK SIGNAL

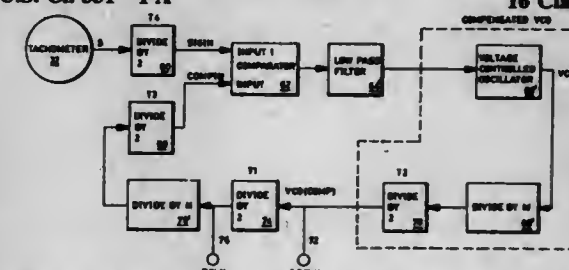
Edwin K. Shenk, Westford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 31, 1994, Ser. No. 299,481

Int. Cl.<sup>6</sup> H03L 7/18

U.S. Cl. 331—1 A

16 Claims



16. A method for generating a controlled output clock signal which is frequency and phase referenced to an input signal, said method comprising

comparing said input signal to a feedback signal and generating an error signal representative to a phase difference between said input signal and said feedback signal;

generating a digital pulse train with a frequency which is varied in response to said error signal;

altering a frequency of said digital pulse train by a programmable amount to produce an intermediate clock signal;

reducing a frequency of the intermediate clock signal to produce said controlled output clock signal and thereby decreasing error propagation; and

modifying the controlled output clock signal to produce said feedback signal having a frequency substantially similar to said input signal.

5,483,203

#### FREQUENCY SYNTHESIZER HAVING MODULATION DEVIATION CORRECTION VIA PRESTEERING STIMULUS

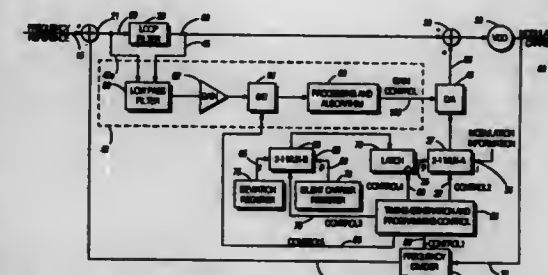
Alan P. Rottinghaus, Barrington, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 1, 1994, Ser. No. 332,973

Int. Cl.<sup>6</sup> H03C 3/09; H03L 7/189

U.S. Cl. 331—10

10 Claims



8. In a phase locked loop (PLL) frequency synthesizer having a voltage controlled oscillator (VCO), a digital to analog converter (DAC) for receiving a presteering voltage step and a feedback system, a method for detecting and aligning frequency deviation, said method comprising the steps of:

injecting a presteering voltage step signal into the loop by:

selectively switching from a first register content to a second register content; and

utilizing the second register content to generate the presteering voltage step;

examining a slope of the feedback system transient to determine whether the presteering voltage step is appropriate in size and shape; and

adjusting the DAC gain as a function of the feedback system transient, such that the DAC automatically and continuously aligns the frequency deviation of said frequency synthesizer during frequency presteering.

### 5,483,204 CLOCK CIRCUIT

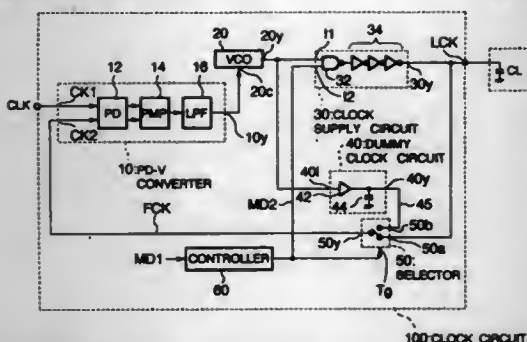
Satoru Tanoi, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1995, Ser. No. 368,798

Claims priority, application Japan, Jan. 7, 1994, 6-000517  
Int. Cl.<sup>6</sup> H03L 7/00; 7/06

U.S. Cl. 331—14

18 Claims



1. A clock circuit for supplying an output clock signal to a logic circuit, comprising:

- a phase difference-to-voltage converter having a first input terminal for receiving a basic clock signal and a second input terminal for receiving a feedback clock signal, and outputting a voltage signal corresponding to a phase difference between said basic clock signal and said feedback clock signal;
- a voltage-controlled phase controller controlled by the voltage signal from said phase difference-to-voltage converter and outputting a first clock signal;
- a clock supply circuit connected to receive said first clock signal, and supplying a second clock signal, as said output clock signal, through its output terminal to said logic circuit;
- a dummy clock circuit having a dummy capacitance circuit, connected to receive said first clock signal, and outputting a third clock signal through its output terminal; and
- a selector selectively connecting the output terminal of the clock supply circuit or the output terminal of the dummy clock circuit with the second input terminal of said phase difference-to-voltage converter in accordance with a control signal, to thereby output the second or third clock signal as said feedback clock signal.

### 5,483,205 LOW POWER OSCILLATOR

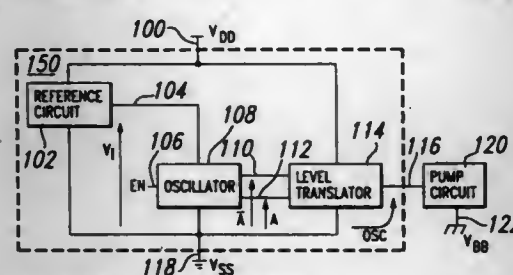
J. Patrick Kawamura, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 9, 1995, Ser. No. 369,945

Int. Cl.<sup>6</sup> H03B 5/24; H03K 5/003

U.S. Cl. 331—74

35 Claims



1. An oscillator circuit comprising:

- a reference circuit, responsive to a first voltage, for producing a second voltage;
- an oscillator, responsive to the second voltage, for producing a first output signal having a magnitude less than a magnitude of the first voltage; and
- a level translator responsive to the first output signal for producing a second output signal having a magnitude greater than the magnitude of the first output signal.

### 5,483,206 VOLTAGE-CONTROLLED MICROWAVE OSCILLATOR WITH MICRO-STRIPLINE FILTER

Gerhard Lohninger, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

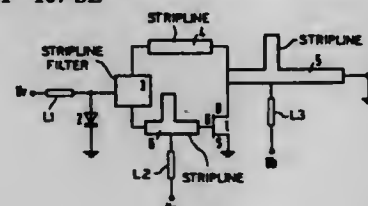
Filed Nov. 24, 1993, Ser. No. 156,823

Claims priority, application European Pat. Off., Dec. 1, 1992, 92120501

Int. Cl.<sup>6</sup> H03B 7/14; H01P 1/203

U.S. Cl. 331—107 SL

11 Claims



1. A voltage-controlled microwave oscillator having a field effect transistor as an amplifier and having a varactor diode as a frequency-determining element, comprising:
- the varactor diode preceded by a tunable micro stripline filter;
  - a source electrode of the field effect transistor directly connected to ground for forming a parallel feedback with the micro stripline filter; and
  - said tunable micro stripline filter having first, second and third striplines, said first stripline located between said second and third striplines.

### 5,483,207 ADIABATIC MOS OSCILLATORS

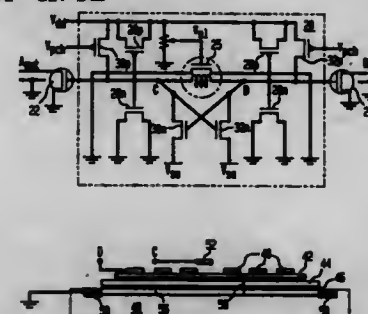
Thaddeus J. Gabara, Murray Hill, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Dec. 30, 1994, Ser. No. 367,525

Int. Cl.<sup>6</sup> H01L 27/04; H03B 5/12

U.S. Cl. 331—117 FE

3 Claims



1. An electrically-tunable inductor element, said element comprising:
- an inductor element; and
  - a transistor having a charge inversion area electro-magnetically linked to said inductor element, whereby the inductance of

said inductor element can be varied by varying the voltage applied to the transistor gate.

### 5,483,208 RADIO FREQUENCY CHOKE AND TAP

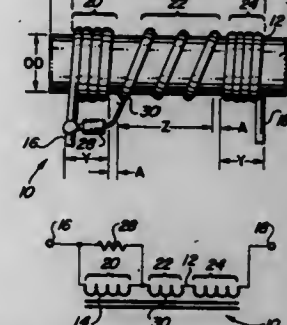
Bart F. Sprlester, Duluth, Ga., assignor to Scientific-Atlanta, Inc., Norcross, Ga.

Filed Aug. 26, 1994, Ser. No. 297,724

Int. Cl.<sup>6</sup> H03H 7/01; 7/46

U.S. Cl. 333—131

17 Claims



1. A Radio Frequency Choke comprising:
- an elongated core material;
  - a conductor wound upon said core material and having a first lead and a second lead, said conductor having a first, second and third successive winding group disposed between said first and said second lead, each winding group having a plurality of windings wound on said core material in series with one another, said first winding group having the same number of windings as the third winding group; and
  - said winding groups having a spacing between a last turn of one winding group and a first turn of an adjacent winding group; and
  - a resistor connected between one of the windings in said first winding group and one of said windings in said second winding group.

### 5,483,209 RECEPTION BAND SWITCHING CIRCUIT WITH VARIABLE ATTENUATION CONTROL

Akira Takayama, Soma, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 126,451, Sep. 22, 1993, abandoned.

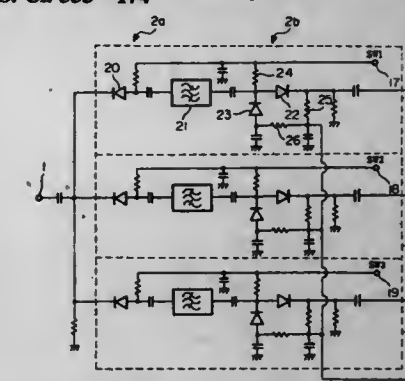
This application Nov. 18, 1994, Ser. No. 342,396

Claims priority, application Japan, Jan. 1, 1992, 4-68719 U

Int. Cl.<sup>6</sup> H04B 1/18; H03H 7/12

U.S. Cl. 333—174

3 Claims



1. A reception band filter circuit with variable attenuation control for filtering a selected frequency band from a reception signal in response to a switching signal, the switching circuit comprising:

a plurality of band pass filters connected in parallel between an input node and an output node, each band pass filter including an input terminal and an output terminal;

a plurality of switching circuits, each switching circuit including a switch device connected between the input node and the input terminal of one of the band pass filters such that reception signals applied to the input node must pass through the switch device to be received by said one of the band pass filters, each switching circuit also being connected to the output terminal of said one of the band pass filters; and

a plurality of gain control circuits connected to receive a common gain control signal, each gain control circuit being connected between the output terminal of an associated one of the band pass filters and the output node;

wherein each gain control circuit comprises a diode having a cathode connected to the output terminal of said one band pass filter, and an anode connected to ground through a capacitor, the anode also being connected to receive the common gain control signal.

### 5,483,210 MECHANICAL GUIDANCE SYSTEM FOR SWITCHER INTERRUPTER AND METHOD FOR ASSEMBLING THE SAME

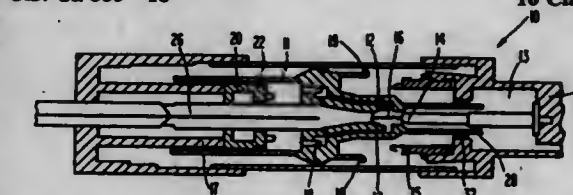
Tomas B. Otterberg, Murrysville, Pa., and Markus Vestner, Buesingen, Switzerland, assignors to ABB Power T&D Company Inc., Raleigh, N.C.

Filed Apr. 8, 1994, Ser. No. 225,238

Int. Cl.<sup>6</sup> H01H 73/00

U.S. Cl. 335—18

16 Claims



1. A guidance system for use in an interrupter having a movable contact system, a stationary contact system and a contact support, said movable contact system capable of moving along said contact support to form an interface with said stationary contact system, the guidance system comprising:
- a first guide means for guiding said movable contact system along said contact support; and
  - a second guide means for guiding said movable contact system relative to said stationary contact system so that said interface between said movable contact system and said stationary contact system remains stable.

### 5,483,211 TWO-POLE COMPARTMENTALIZED GROUND FAULT MINIATURE CIRCUIT BREAKER WITH A SINGLE CENTRAL ELECTRONICS COMPARTMENT

Melvin A. Carrods, Beaver, Pa.; Robert D. Bradley, Lawrenceville, Ga.; Michael J. Whipple, Oakdale, and Garry B. Theodore, Beaver Falls, both of Pa., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 23, 1994, Ser. No. 264,571

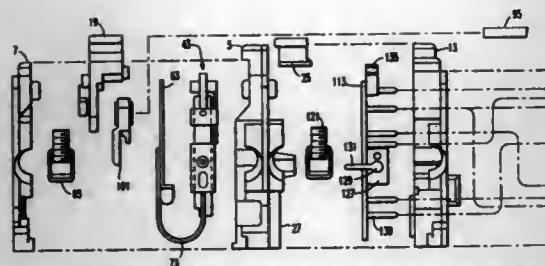
Int. Cl.<sup>6</sup> H01M 73/00

U.S. Cl. 335—18

8 Claims

1. A two pole circuit breaker comprising:
- first and second sets of separable contacts forming rest and second poles;
  - operating means comprising first and second thermal-magnetic operating mechanisms for operating said first and second sets of electrical contacts respectively, and electronic trip means responsive to currents flowing through said first and second poles for operating said operating mechanisms in response to





predetermined current conditions to open said first and second sets of separable contacts; and

a molded housing having first and second compartments on opposite sides of a third compartment, said first set of separable contacts and said first thermal-magnetic operating mechanism being mounted in said first compartment, said second set of separable contacts and said second thermal-magnetic operating mechanism being mounted in said second compartment, said electronic trip means being mounted in said third compartment.

#### 5,483,212 OVERLOAD RELAY TO BE COMBINED WITH CONTACTORS

Klaus Lankuttis, Bonn, and Gerhard Rossmann, Karlsruhe, both of, Germany, assignors to Klöckner-Moeller GmbH, Bonn, Germany

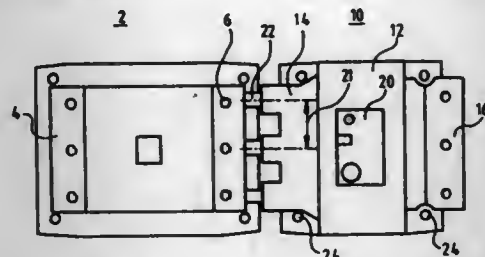
Filed Oct. 14, 1993, Ser. No. 137,574

Claims priority, application Germany, Jan. 14, 1992, 42 34 619.3

Int. Cl.<sup>6</sup> H01H 67/02

U.S. Cl. 335—132

20 Claims



1. An overload relay and contactor in combination, said overload relay for being interfaced with an electrical load, at least a portion of said combination for being mounted on a mounting plate, said combination comprising:

- said overload relay comprising a base unit, a first terminal block and a second terminal block;
- said base unit being disposed between said first terminal block and said second terminal block;
- said first terminal block being selectively detachable and attachable with said base unit;
- said second terminal block being selectively detachable and attachable with said base unit;
- means for connecting said first terminal block with said base unit;
- means for connecting said second terminal block with said base unit;
- said first terminal block being disposed adjacent said contactor and being selectively attachable and detachable with said contactor;
- said second terminal block being configured for being connected with the electrical load and for being selectively attachable and detachable with the electrical load;
- means disposed on said first terminal block for connecting said first terminal block with said contactor;
- means disposed on said second terminal block for connecting said second terminal block with the electrical load;

said means connecting said first terminal block with said contactor comprising first phase connector means;

said means for connecting said second terminal block with the electrical load comprising second phase connector means; and

said base unit comprising overload protection means;

said overload protection means comprising means for protecting the electrical load from an overload;

said base unit comprising a housing; and

said overload protection means being disposed within said housing.

5,483,213

#### TERMINAL BLOCK WITH TERMINAL-LOCKING SLOT

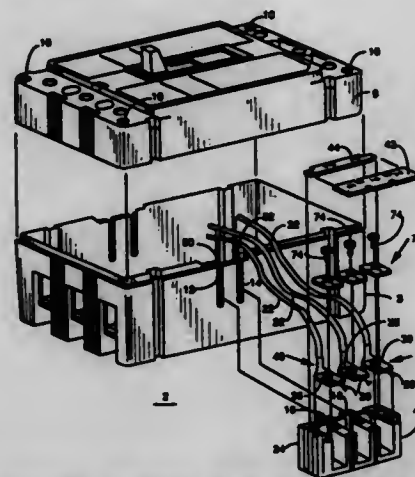
Robert W. Mueller, Imperial, and Arthur D. Carothers, Beaver Falls, both of Pa., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 27, 1994, Ser. No. 250,123

Int. Cl.<sup>6</sup> H01N 67/02

U.S. Cl. 335—132

20 Claims



1. A termination apparatus for an electrical switching device having internal wiring and accepting external wiring, said apparatus comprising:

- block means for at least one wiring termination, said block means having, for each of the at least one wiring termination, a first wiring channel for accepting the external wiring, a second wiring channel for the internal wiring, and partition means for partially separating the first wiring channel and the second wiring channel; and
- termination means including, for each of the at least one wiring termination, first means for terminating the external wiring within the first wiring channel, second means for terminating the internal wiring within the second wiring channel, and means for interconnecting the external wiring with the internal wiring, the partition means of said block means including slot means for engaging said termination means after the internal wiring has been terminated to the second means for terminating the internal wiring.

5,483,214

#### ARMATURE POSITION SENSOR FOR A RELAY

G. Stephen Ferreira, Carpinteria; Richard L. Kutin, Camarillo, and Lanny V. Griffin, Davis, all of Calif., assignors to Klovac Corporation, Carpinteria, Calif.

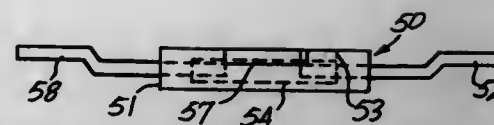
Filed Apr. 26, 1994, Ser. No. 233,627

Int. Cl.<sup>6</sup> H01H 9/00

U.S. Cl. 335—205

9 Claims

1. An armature position sensor for use with a solenoid-actuated sealed relay having fixed and movable contacts, a ferromagnetic base and an armature movably mounted in the base and connected to the movable contact, a coil in the base and surrounding the



armature to move the armature from a first position to a second position to close the fixed and movable contacts when the coil is activated, and a dielectric housing sealed to the base to form a sealed chamber which contains the armature, movable contact, and fixed-contact surfaces which mate with the movable contact when the armature is in the second position, the sensor comprising:

- a permanent magnet adapted to be positioned against an exterior surface of the base to be adjacent the armature when the coil is not activated;
- a ferromagnetic yoke adapted to be secured to the base and magnet to form a magnetic-circuit flux path from the magnet through the armature, base and yoke, a field of the magnet being substantially confined to the flux path when the armature is in the first position, and being altered to form a fringing field adjacent the magnet when the armature is moved to the second position to close the relay contacts; and
- a magnetically actuated switch positioned adjacent the magnet in the fringing field, and actuated by the fringing field when the armature is in the second position.

5,483,215

#### CURRENT TRANSFORMER FOR LINES

Johannes Miles, Korperich, Germany, assignor to Dipl.-Ing. H. Horstmann GmbH, Heiligenhaus, Germany

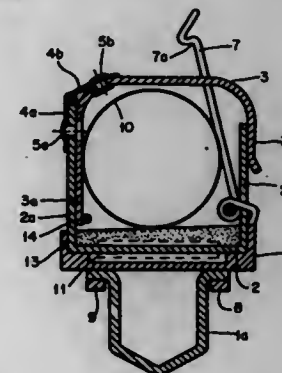
Filed Sep. 13, 1994, Ser. No. 306,498

Claims priority, application Germany, Sep. 15, 1993, 43 31 265.9

Int. Cl.<sup>6</sup> H01F 27/26; 27/30

U.S. Cl. 336—176

8 Claims



1. A current transformer for rails, cables and open-wire lines, comprising:

- a housing;
- an induction coil contained within said housing;
- a U-shaped iron yoke enclosed within said induction coil, each portion of said U-shaped iron yoke being a leg;
- a U-shaped ground iron being swivel-mounted on one leg of said U-shaped iron yoke, said U-shaped ground iron being supported at a brake point;
- spring means being anchored within said housing; and
- a conductor capable of moving said U-shaped ground iron, when the current transformer is mounted, into a closing position and is maintained in said closed position by said spring means.

5,483,216

#### FIXING ASSEMBLY OF A TEMPERATURE RESPONSIVE ELEMENT AND ITS FIXING METHOD

Yasukazu Mizutani, Nagoya; Shigemasa Sato, Tokai; Hideki Koseki, Aichi; Ryuhel Tanigaki, and Takayuki Ito, both of Nishi-kuwajima, all of, Japan, assignors to Ubukata Industries Co., Ltd., Nagoya, and Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, both of, Japan

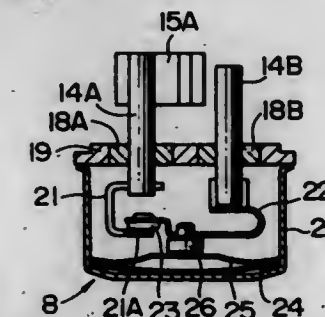
Filed May 20, 1993, Ser. No. 65,115

Claims priority, application Japan, May 21, 1992, 4-155940

Int. Cl.<sup>6</sup> H01H 37/52

U.S. Cl. 337—370

8 Claims



1. A fixing assembly of a temperature responsive element, comprising:

- a plug;
- a lead terminal pin penetrating said plug and fixed to said plug in an airtight manner;
- means for thermally and electrically insulating said lead terminal pin hole said plug;
- a compressor vessel including a lid closing said vessel and a cover disposed outside of said lid, said vessel defining a path for a cooling medium, said path being disposed between said cover and said lid, said cover having a through hole providing communication from outside said vessel to said path for cooling medium;
- a temperature responsive element;
- a temperature responsive element housing including an airtight metal container with pressure resistance characteristics, said temperature responsive element being disposed in said temperature responsive element housing, said temperature responsive element having a conductive terminal pin extending from said temperature responsive element within said temperature responsive element housing, through said temperature responsive element housing, to outside of said temperature responsive element housing, a connection, connecting said conductive terminal pin being to said lead connector pin, said plug being fixed to said cover to close said through hole, connection between said connector pin and said conductive terminal pin positioning said temperature responsive element housing, with said temperature responsive element therein, at a location in said path for cooling medium, disposed spaced from said cover and spaced from said lid.

5,483,217

#### ELECTRONIC CIRCUIT DEVICE

Takashi Nagasaka, Anjo; Mitsuhiro Saitou, Obu; Takahisa Koyasu, Chita; Hiroyuki Ban, Haze; Yuji Otani, Okazaki; Kengo Oka, Nukata, and Kyoko Nagasaka, Matsumoto, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 15, 1993, Ser. No. 91,718

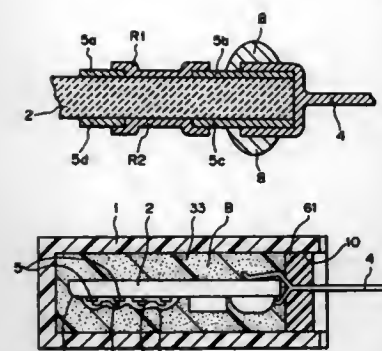
Claims priority, application Japan, Jul. 15, 1992, 4-188418; Jul. 23, 1992, 4-196991; Jul. 24, 1992, 4-198498; Jul. 24, 1992, 4-198511

Int. Cl.<sup>6</sup> H01C 1/02

U.S. Cl. 338—252

9 Claims

- 1. An electric circuit device comprising:
- a circuit board having a rectangular configuration;
- a circuit arranged on said circuit board and including



first and second resistors that are secured to said circuit board, wherein said first and said second resistors are separately secured to a front surface and a back surface of said circuit board, respectively, said first and second resistors being secured at an equal distance in said lengthwise direction of said circuit board from a short side; a molded resin portion secured to said surfaces of said circuit board to cover said circuit; and leads that are secured at the ends on one side thereof to said circuit board and are outwardly protruding at the ends on the other side thereof penetrating through said molded resin portion, wherein said first and second resistors are arranged at positions where changes in the resistances of said resistors as a result of stress is cancelled in said output of said circuit, and wherein, when resistance values of said first and said second resistors are set at  $r_1$  and  $r_2$ , respectively, an output of a circuit having said first and second resistors, has any functional value with  $(r_1 \times r_2)$  or  $(r_1 + r_2)$  as a variable.

5,483,218

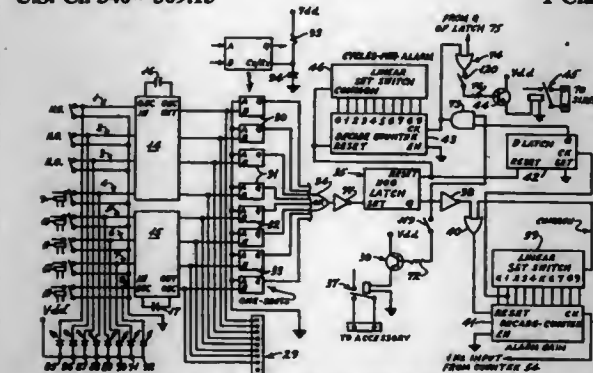
## ELECTRONIC SYSTEM FOR ACTIVATING A MECHANICAL FIRE SIREN

Michael J. Roosa, 59 First St., Wurtsboro, N.Y. 12790  
Continuation of Ser. No. 996,664, Dec. 24, 1992, abandoned.  
This application Dec. 29, 1994, Ser. No. 366,264

Int. Cl. G08B 29/00

U.S. Cl. 340-309.15

1 Claim



1. A device for activating and cycling a mechanical fire siren, said device comprising:  
a plurality of input means for producing first signals when a predetermined event occurs, wherein each input means is connected between two terminals of an energy source which is either derived by said device or by an external power source;  
a delay means, connected to said plurality of input means, for delaying said first signals for a predetermined period of time and producing a delayed version of said first signal;  
an activation circuit means, connected to said delay means to receive said delayed version of said first signal, for producing an output pulse whenever any one of said input means pro-

duces said first signal, said activation circuit means ignores the length of time that any one of said input means produces said first signal so that should any of said plurality of input means become disabled or seized, the activation circuit means will still produce said output pulse should another first signal be detected from any one of the other input means;  
a latching means, connected to activation circuit means, for latch and holding said output pulse until a reset signal is received;  
a cycles per alarm means for controlling the number of siren cycles pre alarm, where the number of cycles per alarm is adjustable;  
a siren gain circuit means for controlling the gain time of the siren according to a gain time clock signal;  
a 24 hour clock circuit having a seven segment display for displaying hours and minutes, wherein said 24 hour clock provides the gain time clock signal to said siren gain circuit means;  
a test circuit means, connected to said 24 hour clock, for proving a test signal at a predetermine time each day;  
a relay attached to said siren for controlling the supply of power to the siren;  
a control means, connected to said relay, said test circuit means, said activation circuit means, said siren gain circuit means, said cycle per alarm means and said latching means, for energizing said relay thereby causing the mechanical fire siren to sound when the output pulse is received from said latching means and for sending a reset signal to said latching means after the mechanical fire siren has completed a predetermined number of cycles, and for energizing said relay when said test signal is received from said test circuit means thereby causing said mechanical fire siren to be triggered for one cycle.

5,483,219

## ALARM SIGNAL GENERATION DEVICE FOR A VEHICLE

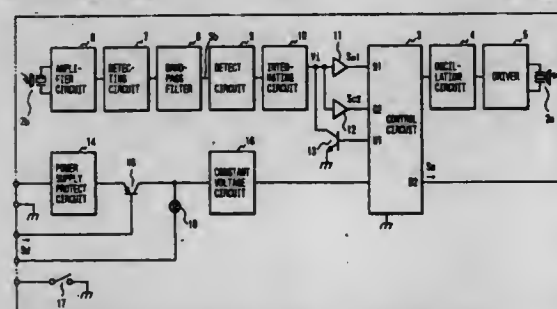
Hisashi Aoki, Sadao Kokubu, Yoshiyuki Mizuno, and Takashi Mizuno, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan  
Continuation of Ser. No. 149,341, Nov. 9, 1993, abandoned.  
This application Jan. 7, 1994, Ser. No. 178,561

Claims priority, application Japan, Nov. 10, 1992, 4-299935

Int. Cl. B60R 25/10

U.S. Cl. 340-426

3 Claims



1. An alarm signal generation device comprising:  
a supersonic sensor including a supersonic transmitter for radiating supersonic waves and a supersonic receiver for receiving the radiated supersonic waves;  
an integrating circuit for integrating a beat frequency signal corresponding to a difference between the frequencies of the radiated and received supersonic waves to thereby to generate a voltage signal; and  
a control circuit for generating an alarm signal when the voltage signal reaches a reference level, the control circuit driving said supersonic sensor intermittently in response to the voltage signal when said voltage signal reaches an auxiliary level lower than said reference level and invalidating said voltage signal for an invalidation time period in a beginning time period for each intermittent driving of said supersonic sensor.

5,483,220

## DETECTING A DEFLATED TIRE BY COMPARING ANGULAR VELOCITY DATA OF ALL WHEELS, A DATA TABLE, AND THE DIRECTLY-MEASURED PRESSURE OF A SINGLE TIRE

Yoshikazu Kushimoto, Kakogawa, and Minao Yanase, Kobe, both of, Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan

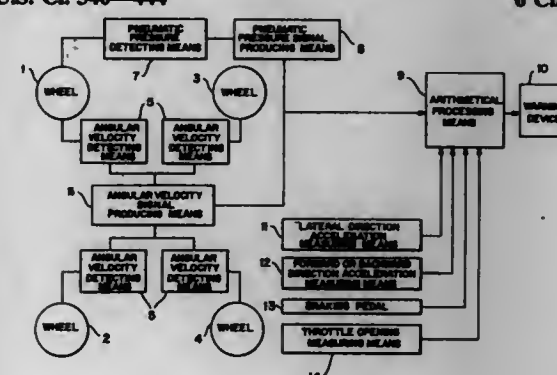
Filed Dec. 21, 1993, Ser. No. 170,775

Claims priority, application Japan, Dec. 24, 1992, 4-344104; Dec. 28, 1992, 4-347669

Int. Cl. B60C 23/02

U.S. Cl. 340-444

6 Claims



1. A device for detecting a deflation condition of a tire mounted on a wheel of a vehicle comprising:  
angular velocity detecting means for detecting an angular velocity of each wheel,  
angular velocity signal producing means for producing signals proportional to the detected angular velocities,  
pneumatic pressure detecting means for directly detecting the pneumatic pressure of only one wheel of the vehicle, defined as the detected wheel,  
pneumatic pressure signal producing means for producing a signal proportional to the obtained pneumatic pressure,  
arithmetic processing means for arithmetically processing the signals from the angular velocity signal producing means and the pneumatic pressure signal producing means, wherein, with respect to the detected wheel, the arithmetic processing means operates a device which warns of a deflation condition of the detected wheel when the difference between the detected pneumatic pressure and a predetermined normal pneumatic pressure is not less than 0.3 kgf/cm<sup>2</sup>; and  
wherein with respect to the other wheels, when the detected pneumatic pressure is normal, the arithmetic processing means obtains ratios of respective angular velocities of each of the other wheels to an angular velocity of the detected wheel,  
compares the obtained ratios with ratios in a table of wheel angular velocity ratios under normal conditions on the basis of the angular velocity of the detected wheel,  
compares the angular velocity of each of the other wheels and an average value of angular velocities of all the wheels, and operates a device which warns of the deflation condition of one of the other wheels when the difference between the compared ratios ranges from 0.05% to 0.60% or when the difference between the angular velocity of one of the other wheels and an average value of angular velocities of all the wheels ranges from 0.05% to 0.60%.

5,483,221

## SEAT BELT USAGE INDICATING SYSTEM

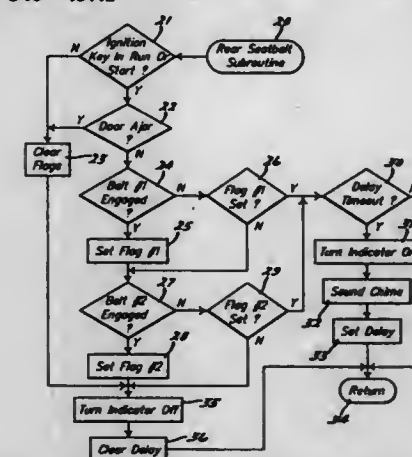
Douglas R. Mutter, Dearborn Heights; Peter Langer, Troy, and Payal Agarwal, Farmington Hills, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 12, 1993, Ser. No. 150,315

Int. Cl. B60R 22/00

U.S. Cl. 340-457.1

10 Claims



1. A monitoring and reminder system for a manual seat restraint in a vehicle, wherein said manual seat restraint is manually engaged and disengaged by a vehicle occupant, comprising:  
a restraint sensor generating a restraint signal indicative of an engaged state or a nonengaged state of said manual seat restraint;  
a vehicle sensor generating an in-use signal when said vehicle is in use;  
an annunciator for producing a reminder; and  
an electronic control coupled to receive said restraint signal and said in-use signal and coupled to said annunciator to produce said reminder if said in-use signal is present and said restraint signal changes from indicating that said manual seat restraint is in said engaged state to indicating that said manual seat restraint is in said nonengaged state, wherein said electronic control includes a delay timer and wherein said reminder is generated periodically until said restraint signal again indicates that said manual seat restraint is in said engaged state.

5,483,222

## MULTIPLE SENSOR APPARATUS AND METHOD

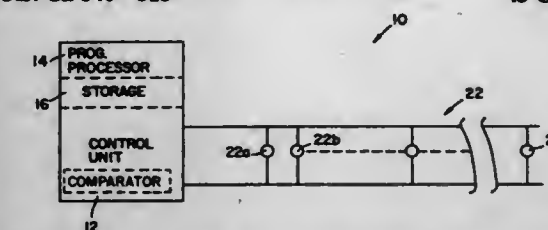
Lee D. Tice, Bartlett, Ill., assignor to Pittway Corporation, Chicago, Ill.

Filed Nov. 15, 1993, Ser. No. 153,130

Int. Cl. G08B 19/00

U.S. Cl. 340-518

43 Claims



1. A method of detecting a predetermined condition using a plurality of spaced apart ambient condition detectors comprising:  
providing a plurality of spaced apart ambient condition detectors;  
providing a control unit;  
providing a communications link between the detectors and the control unit;  
sensing ambient conditions associated with at least some members of the plurality and producing an indicium of each sensed condition;



collecting the indicia at the control unit;  
forming a group of selected indicia at the control unit;  
processing the group at the control unit, including raising each member of the group to a predetermined, respective exponent and summing exponentially raised indicia to form a result; and  
comparing the result to two or more predetermined, different, threshold values to detect the presence of two or more predetermined conditions.

5,483,223

# PERSONAL SECURITY SYSTEM WITH END-TO-END TEST

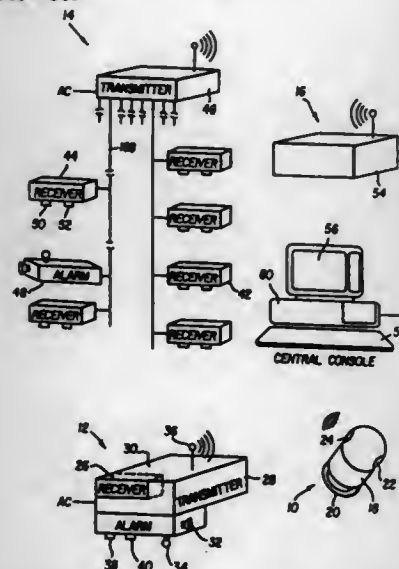
Daniel F. Pedtke, Palmyra, N.Y., assignor to Detection Systems, Inc., Fairport, N.Y.

Continuation of Ser. No. 126,841, Sep. 20, 1993, Pat. No. 5,467,874, which is a continuation-in-part of Ser. No. 835,847, Dec. 18, 1992, abandoned. This application Feb. 13, 1995, Ser. No. 387,953

Int. Cl.<sup>6</sup> G08B 1/08

U.S. Cl. 340-539

5 Claims



1. A security system for use by multiple subscribers and comprising:

- a portable transmitter having first and second modes of operation for transmitting in said first mode an emergency signal and for transmitting in said second mode a modified emergency signal to indicate a test;
- a central station including subscriber information;
- a transceiver for receiving emergency and modified signals from said portable transmitter and for communicating with said central station, said transceiver having a) a first mode of operation responding to successful receipt of emergency signals from said portable transmitter and successful communication regarding said emergency signals with said central station, and b) a second mode of operation responding to successful receipt of modified signals from said portable transmitter and successful communication regarding said modified signals with said central station, said transceiver in said first mode issuing an alarm signal and in said second mode issuing a test signal discernible as a test from the vicinity of the transceiver.

5,483,224

# SECURITY SYSTEM AND METHOD FOR MONITORING SECURITY IN THE VICINITY OF A LOCATION PERIMETER

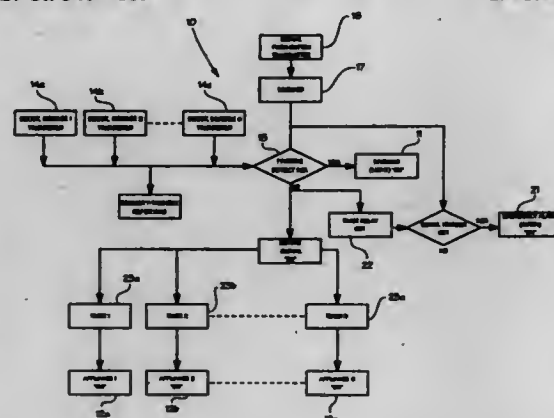
Kathleen V. Rankin, Greensboro, and Kurt W. Niederer, Charlotte, both of N.C., assignors to Kitty Rankin, Inc., Greensboro, N.C.

Filed Sep. 22, 1994, Ser. No. 310,573

Int. Cl.<sup>6</sup> G08B 1/08

U.S. Cl. 340-539

19 Claims



1. A personal security system for periodic interrogation by an authorized user of the system for monitoring security in the vicinity of a location perimeter to permit the system user to determine a potential violation of security before entering the location perimeter, said personal security system comprising:

- (a) detection means positioned in a detecting relation to the location perimeter for detecting a condition indicating a potential violation of security in the vicinity of the perimeter, said detection means having a normal, negative state indicative of no violation of security and a positive state indicative of a potential violation of security;
- (b) storage means electrically connected to said detection means for storing information indicating whether the detection means is in the positive or negative state;
- (c) signal receiving means electrically connected to said storage means;
- (d) signal transmitting means for being operated by the system user, and activated from outside the location perimeter for transmitting a system interrogation control signal to said signal receiving means for interrogating the security system to determine the state of said detection means;
- (e) indicator means electrically connected to said storage means for indicating to a position outside the location perimeter and to the system user the current positive or negative state of the detection means; and
- (f) indicator activation means electrically connected to said indicator means and responsive to the system interrogation control signal received by said signal receiving means from said signal transmitting means, such that:
  - (1) for the negative state of said detection means, said indicator activation means communicates to the position outside the location perimeter and to the system user the negative state of the detection means indicating no violation of security; and
  - (2) for the positive state of said detection means, said indicator activation means communicates to the position outside the location perimeter and to the system user the positive state of the detection means indicating a potential violation of security.

5,483,225

# STRUCTURE OF A SHOCK DEVICE OF A SHOCK SENSOR OF A BURGLAR ALARM

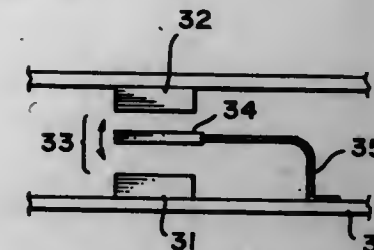
Shih-Ming Hwang, 17811 Sky Park Cir., Suite D & E, Irvine, Calif. 92714

Filed Jan. 25, 1995, Ser. No. 377,941

Int. Cl.<sup>6</sup> G08B 13/02

U.S. Cl. 340-566

7 Claims



1. A shock device for a shock sensor for a burglar alarm, including inductance coil means in which an oscillating electric potential is induced in response to a changing magnetic flux for generating an electric signal, magnet means for generating a magnetic field, a magnetically soft material, and a support means for the magnetically soft material, wherein the magnetically soft material is independently fixed to the support means and mounted such that it penetrates the magnetic field generated by the magnet means, so that when vibrations cause the magnetically soft material to move to and fro relative to the inductance coil means and the magnet means and alter the magnetic flux, a corresponding oscillating electric potential is induced in the inductance coil means and an electric signal responsive to movement of the soft magnetic material is thereby generated in the inductance means.

5,483,226

# ULTRASONIC DETECTOR, DETECTION METHOD FOR LIQUID MEDIA AND ULTRASONIC TRANSMITTER CONTROL METHOD

Jean-Baptiste Menut, 40 Avenue Henri Golay, CH 1219 Châtelaine, Geneva, Switzerland

PCT No. PCT/CH92/00065, § 371 Date Dec. 3, 1992, § 102(e) Date Dec. 3, 1992, PCT Pub. No. WO92/18835, PCT Pub. Date Oct. 29, 1992

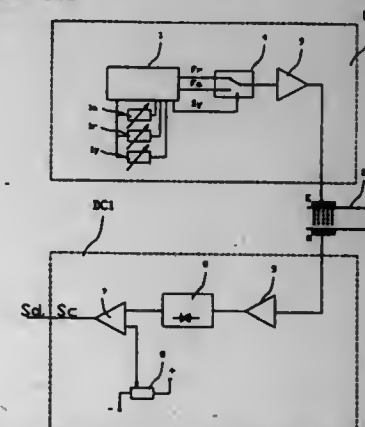
PCT Filed Apr. 8, 1992, Ser. No. 949,801

Claims priority, application Switzerland, Apr. 11, 1991, 1078/91

Int. Cl.<sup>6</sup> G08B 21/00

U.S. Cl. 340-621

10 Claims



1. An ultrasonic detector for sensing liquid media including a transmitter and a receiver, said ultrasonic detector comprising:

- (a) a transmitter (E) mounted on a support (2), a principal face of a piezoelectric plate forming said transmitter, said transmitter being directly attached to a bearing surface on said support so as to provide a solid mechanical and acoustic connection,

thereby establishing acoustic coupling and enabling said principal face to ensure both the transmission of detection waves through said liquid media and the transmission of control waves along a secondary acoustic path within said support, said transmitter being connected to an excitation circuit (EC; EC2; EC8) which is provided with a frequency generator (1) configured to deliver two excitation frequencies (Fa, Fr), said transmitter controlling the operation of said ultrasonic detector by alternately subjecting the transmitter to a high axial resonance frequency (Fa) for the transmission of said detection waves through the liquid medium to be detected and further subjecting said transmitter to a low radial resonance frequency (Fr) for the transmission of said control waves along said secondary acoustic path; and

(b) a receiver (R) mounted on said support, said receiver being directly attached to a bearing surface on said support so as to provide a solid mechanical and acoustic connection, thereby establishing acoustic coupling and enabling said receiver to ensure both the reception of said detection waves through a linear acoustic path within said liquid media and the reception of said control waves along the secondary acoustic path within said support, said receiver being connected to a detection circuit (DC1; DC2; DC8) provided with at least one comparator circuit (7; 87a, 87b) configured to deliver a detection signal (Sd) during time intervals when said detection waves are transmitted to said receiver along said linear acoustic path and to further deliver a control signal (Sc) during other time intervals when said control waves are transmitted to said receiver along said secondary acoustic path.

5,483,227

# LIQUID LEVEL CONTROLLER

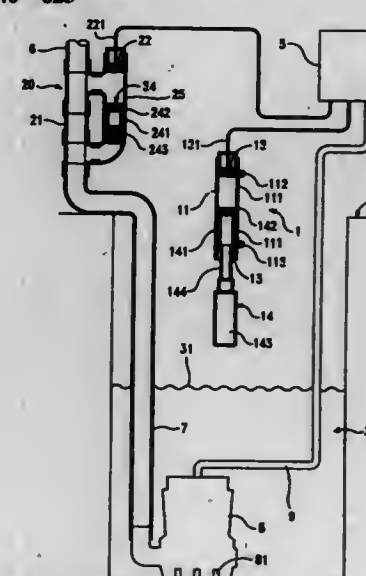
Teh-Chuan Kuo, and Kao-Ching Wu, both of No. 68-9, Fan Shu Rd., Ta Li Li, Tou Cheng Town, Yi Lan Hsien, Taiwan, Prov. of China

Filed Mar. 7, 1994, Ser. No. 206,646

Int. Cl.<sup>6</sup> G08B 21/00

U.S. Cl. 340-623

4 Claims



1. A liquid level controller comprising:

- a control circuit;
- a control box covering said control circuit;
- a sump pump having a third electric wire connected to said control circuit; and
- a liquid level indicating means comprising: a high level indicating device, said high level indicating device having a first pipe body, a first magnetic switch, and a floating element, said first pipe body having an inner flange on inner wall where near bottom thereof, said first pipe body of said high level indicating device having an air hole on the side thereof, said

first magnetic switch located on the top of said first pipe body of said high level indicating device and connected to said control circuit with a first electric wire, said floating element of said high level indicating device formed into a first enclosure, said first enclosure having a first magnet at inner top thereof, said first enclosure of said floating element including an upper part, a lower part and a neck part, said upper part of said high level indicating device retained between said first magnetic switch and said inner flange, and the outside diameter of said lower part is bigger than the inside diameter of said inner flange, said lower part of said floating element disposed outside said first pipe body;

an impulse indicating device, said impulse indicating device having a second pipe body, a second magnetic switch, and an impulse element, said second pipe body of said impulse indicating device having a connecting pipe connected to the side thereof, the bottom of said connecting pipe is connected to said sump pump through a delivery pipe, said second magnetic switch located on the top of said second pipe body of said impulse indicating device and connected to said control circuit with a second electric wire, said impulse element of said impulse indicating device formed into a second enclosure, said second enclosure having a second magnet at inner top thereof, said impulse element of the impulse indicating device having a weight means at the bottom thereof.

5,483,228

## SAFETY INDICATING DEVICE FOR FLASHLIGHTS

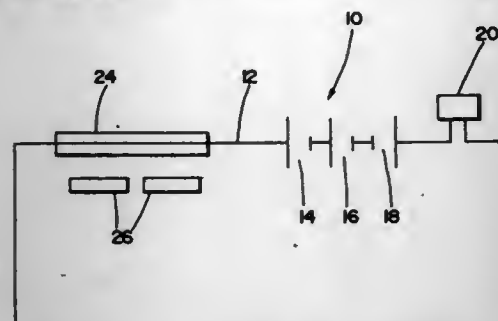
John C. Bailey, Columbia Station, and Timothy D. Foley, Brook Park, both of Ohio, assignors to Eveready Battery Company, Inc., Del.

Filed Jan. 31, 1994, Ser. No. 188,868

Int. Cl.<sup>6</sup> G08B 17/10

U.S. Cl. 340—632

6 Claims



1. A safety device for monitoring gas buildup in a confined interior space of a flashlight container containing a plurality of electrochemical cells, said gas buildup being due to gases venting from said cells into said confined space of said flashlight container, comprising a catalytic gas recombination material in said confined space of said flashlight container that will facilitate an exothermic reaction between a gas to be monitored and at least one other reactant material; a heat-sensitive conductive element disposed adjacent to the catalytic gas recombination material; an electrical circuit comprising power means; and wherein said heat-sensitive conductive element is connected as a switch means in said circuit so that when a buildup of a predetermined level of gas to be monitored is reached in said confined space of said flashlight container, the exothermic reaction of the reactant with the gas on the surface of the catalytic gas combination material will produce heat that will be detected by the heat-sensitive conductive element and be sufficient to change the heat-sensitive conductive element in the circuit to disconnect the circuit and thereby limit gas buildup in said confined space.

5,483,229

## INPUT-OUTPUT UNIT

Hiroshi Tamura, Yoshiyuki Kamata, and Mitsuaki Fujimori, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

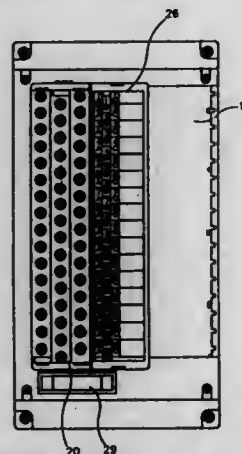
Filed Jan. 3, 1994, Ser. No. 176,923

Claims priority, application Japan, Feb. 18, 1993, 5-029236; Feb. 22, 1993, 5-031824; Feb. 26, 1993, 5-038021

Int. Cl.<sup>6</sup> G08B 23/00

U.S. Cl. 340—693

7 Claims



1. An input-output unit for communicating between an industrial control equipment and field devices controlled thereby, said unit comprising:

a card accommodating chamber (10) connected to said industrial control equipment and provided with a row of slots (12) which receives input-output cards (50) which perform conversion between signals handled by the industrial control equipment and signals handle by the field devices, wherein each slot comprises an upper groove and a lower groove, and wherein each of said input-output cards is held by a corresponding pair of upper groove and lower groove;

a terminal block (20), provided with at least two terminals per slot; said terminal to which respective signal wires connected to the field devices are connected and to which are respective connected said input-output cards; and

a case (30) comprising a front face on which the card accommodating chamber is exposed and the terminal block is mounted with the terminals and slots mounted in direct correspondence.

5,483,230

## BUS SYSTEM

Karl Mueller, Rottwell-Neufra, Germany, assignor to Marquardt GmbH, Rietheim-Wellheim, Germany

Filed Oct. 22, 1993, Ser. No. 139,741

Claims priority, application Germany, Jan. 23, 1992, 42 35 775.6; Nov. 9, 1992, 42 37 789.7; Jul. 3, 1993, 43 22 249.8

Int. Cl.<sup>6</sup> H04Q 1/18

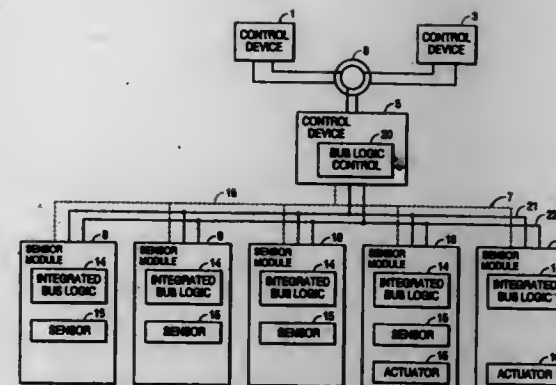
U.S. Cl. 340—825.06

24 Claims

1. A bus system for a plurality of sensor modules, comprising: at least one bus for interconnecting the plurality of sensor modules and for carrying signals between the plurality of sensor modules;

switching control devices, a first one of the switching control devices being a bus master device for the at least one bus and having bus logic control for controlling the transmission of signals over the at least one bus;

a superordinate main bus for connecting the switching control devices together and for transmitting signals between the switching control devices, the at least one bus being thereby connected with the superordinate main bus by the first one of the switching control devices which is the bus master device for the at least one bus;



wherein binary switching signals transmitted over the at least one bus are at least one of:

(a) detected by the sensor modules, and

(b) processed by the sensor modules;

wherein the sensor modules contain integrated bus logic for converting the binary switching signals into bus signals and for converting bus signals into binary switching signals; wherein the at least one bus has a single common data line to which the sensor modules are connected for serial data transmission;

wherein the at least one bus operates bidirectionally in transmitting and receiving directions during half-duplex operation; wherein the single common data line is driven by the first one of the switching control devices which acts as the bus master device, independently of the superordinate main bus;

wherein the bus logic control in the first one of the switching control devices which acts as the bus master device controls the timing of data transmission in both transmitting and receiving directions; and

wherein the at least one bus provides a supply voltage to the sensor modules.

5,483,231

## REMOTE-CONTROL SIGNAL RECEIVER FOR LIMITING RECEIPT OF DATA DURING A BLANKING PERIOD

Toru Sasabe, Minon, Japan, assignor to Matsushita Electric Industrial Company, Ltd., Osaka, Japan

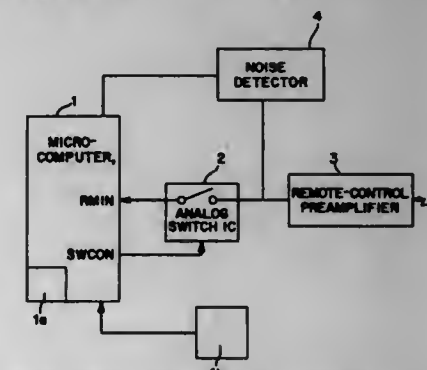
Filed May 20, 1993, Ser. No. 65,167

Claims priority, application Japan, May 22, 1992, 4-130405

Int. Cl.<sup>6</sup> G08C 19/16; H04Q 7/00

U.S. Cl. 340—825.57

10 Claims



1. A remote-control signal receiver, comprising:

input means to input a remote-control signal, said remote-control signal including a blank period and pulse data train which is started with a leader pulse and is repeated at a predetermined frequency to form a plurality of data trains; data incorporating means for receiving remote control data which is included in said blank period and pulse data train; setting means by which a blank period started from a final pulse of said data-train included in remote-control signal and ended

with a leader-pulse of succeeding data train inputted by said input means are set; and limiting means to limit receipt of pulse data trains by said data incorporating means during the blank period set by said setting means.

5,483,232

## METHOD AND APPARATUS FOR PREDICTING PEAK VOLTAGE OF A CABLE CONVEYED TOOL

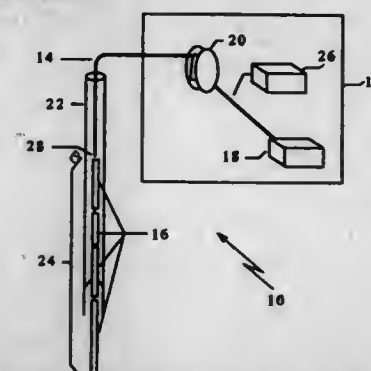
Lloyd D. Clark, Jr., Austin; Terry L. Mayhugh, Round Rock; Terry L. Mayhugh, Jr., Austin; Jimmy E. Neeley, Palacios, and Guy Vachon, Austin, all of Tex., assignors to Schlumberger Technology Corporation, Austin, Tex.

Filed Aug. 3, 1994, Ser. No. 285,314

Int. Cl.<sup>6</sup> G01V 1/00

U.S. Cl. 340—853.1

18 Claims



1. A method for predicting the peak voltage at the load end of a transmission cable, the cable having a load end and a power supply end, comprising the steps of:

sampling the current and voltage of an AC waveform proximate the supply end of the cable to obtain a plurality of current and voltage samples representing respective current and voltage waveforms;

approximating a current pulse width function of said current waveform at the cable power supply end, where the leading edge of said current waveform at the power supply end is clipped and a second curve fit to approximate said current pulse width function; and

predicting an approximate remote end peak voltage by multiplying a peak voltage sample by the current pulse width function.

5,483,233

## ANALOGUE TELEMETRY SYSTEM AND METHOD FOR FAULT DETECTION IN OPTICAL TRANSMISSION SYSTEMS

Martin J. Pettitt, Clayton, Australia, and Anagnostis Hadjiliftou, Harlow, United Kingdom, assignors to Northern Telecom Limited, Montreal, Canada

Continuation of Ser. No. 715,338, Jun. 14, 1991, abandoned.

This application Nov. 12, 1993, Ser. No. 152,243

Claims priority, application United Kingdom, Jun. 16, 1990, 9013513

Int. Cl.<sup>6</sup> G08C 19/16

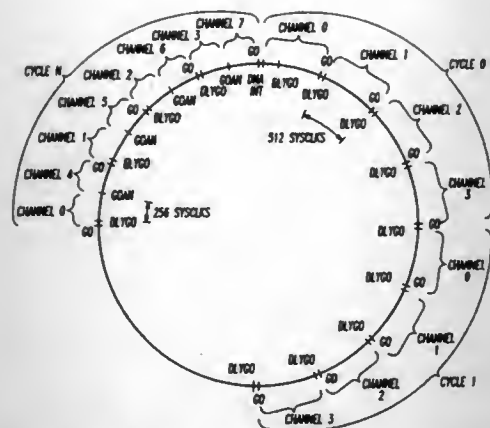
U.S. Cl. 340—870.26

7 Claims

1. An analogue telemetry system for use with an optical transmission system including a transmitter terminal having an optical output, a plurality of concatenated optical fibre amplifiers, each having a respective optical pump source comprising a laser, and a receiver terminal, all interconnected by optical fibre, each optical fibre amplifier including an optical amplifier fibre with an automatic gain control (AGC) loop therearound, the respective optical pump source being included in the respective AGC loop, wherein in the AGC Loop spontaneous emission from the optical amplifier is detected and employed to drive the respective laser pump source







cycle samples all N inputs at a second predetermined substantially fixed sampling rate in a predetermined pattern in order to maintain said first predetermined substantially fixed sampling rate of said first N/2 analog inputs, where M is a finite integer greater than one.

5,483,240

#### RADAR TERRAIN BOUNCE JAMMING DETECTION USING GROUND CLUTTER TRACKING

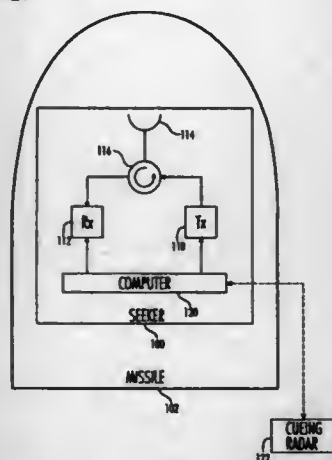
Yuan S. Hsu, Rolling Hills Est., and Andy G. Laquer, Tustin, both of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Sep. 28, 1994, Ser. No. 314,028

Int. Cl.<sup>6</sup> G01S 7/36

U.S. Cl. 342—17

11 Claims



1. A radar system for detecting and recognizing jamming signals transmitted by a target, the radar system being provided with a cue range defining a range to the target, wherein the radar system has a corresponding horizon, the radar system comprising:

means for measuring a jammer angle defined between the radar horizon and a line between the target and the radar system;

means for calculating a ground range corresponding to the measured jammer angle; and

means for comparing the calculated ground range with the cue range, wherein if the ground range is less than the cue range, the jammer signals are classified as terrain bounce jamming signals.

#### 5,483,241 PRECISION LOCATION OF AIRCRAFT USING RANGING

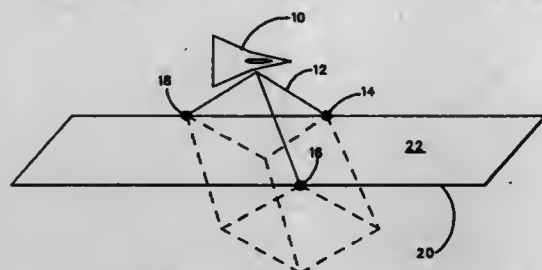
Douglas K. Wainio, Placentia; Henry F. Williams, Temecula, both of Calif., and Daniel E. Castleberry, Cedar Rapids, Iowa, assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed May 9, 1994, Ser. No. 239,795

Int. Cl.<sup>6</sup> G01S 13/72; 13/76; 13/91; 13/93

U.S. Cl. 342—29

14 Claims



1. An apparatus for displaying the location of an aircraft with respect to a runway, wherein:

- (i) the runway has at least three radar targets near it; and
- (ii) each target has a known location, in three dimensions, with respect to the runway;

the apparatus comprising:

- (a) a radar on the aircraft, the radar being constructed to:
  - (i) measure the distance from the aircraft to each of at least three of the radar targets; and
  - (ii) produce an identification of each such target;
- (b) a computer, the computer being constructed to:
  - (i) receive target identifications and distance measurements from the radar; and
  - (ii) calculate, from the target identifications and distance measurements, the location of the aircraft with respect to the runway in three dimensions; and
- (c) a display constructed to receive the location, in three dimensions, from the computer and to display the location to an operator.

5,483,242

#### METHOD FOR MEASURING THE DISTANCE AND VELOCITY OF OBJECTS

Nicolas Grein, Kandel, and Hermann Winner, Karlsruhe, both of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

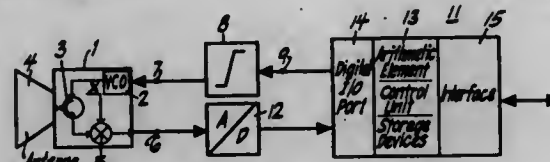
Filed Dec. 14, 1993, Ser. No. 166,781

Claims priority, application Germany, Dec. 17, 1992, 42 42 700.2

Int. Cl.<sup>6</sup> G01S 13/58; 13/53

U.S. Cl. 342—111

5 Claims



1. A method for measuring the distance  $S_i$  and the velocity  $V_{r,i}$  of objects employing electromagnetic waves, comprising the steps of:

- a) modulating a frequency of an emitted signal;
- b) receiving signals during at least one rise and at least one drop in the frequency of the emitted signal;
- c) mixing the signals received in step (b) with the emitted signal to form intermediate-frequency signals;
- d) spectrally analyzing the intermediate-frequency signals resulting from the mixing to determine frequencies corresponding to spectral lines; and
- e) calculating the distance  $S_i$  and the velocity  $V_{r,i}$  of at least one of the objects from the frequencies of the spectral lines of the

intermediate-frequency signals during at least one rise and at least one drop in the frequency of the emitted signal, wherein the intermediate-frequency signals are spectrally analyzed within a frequency range of approximately 0 to 300 kHz.

5,483,243

#### RAMP-WEIGHTED CORRELATION WITH OVERSAMPLING

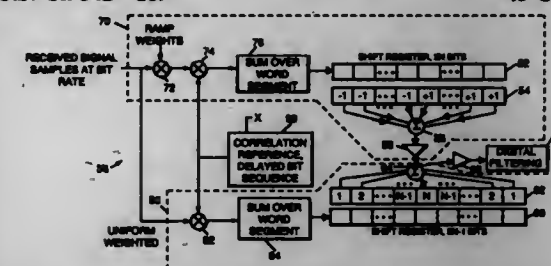
Gary A. Gramlich, Oro Valley; Roy H. Makino, Tucson; Dennis W. Morel, Tucson; Daniel J. Urbanski, Tucson, and John R. Karobonik, Tucson, all of Ariz., assignors to Hughes Missile Systems Company, Los Angeles, Calif.

Filed Jul. 15, 1994, Ser. No. 276,015

Int. Cl.<sup>6</sup> G01S 13/00; G06F 17/15

U.S. Cl. 342—189

45 Claims



1. A method for performing correlation of a succession of received digital words in a serial bit stream with a reference digital word of bit length L having a reference word period, comprising the following steps:

- providing a set of ramp weights  $W(k)$ , where  $k=1$  to  $L/N$ , where  $N$  is a number of word segments comprising said received digital word, each word segment having  $L/N$  bits;
- forming a ramp-weighted sum over each of said N word segments, said sum comprising the sum of a product of a reference word bit with a product of a corresponding received bit comprising said segment with a ramp weight  $W(k)$ ;
- forming a uniformly-weighted sum over each of said N word segments, said sum comprising the sum of a product of a reference word bit with a corresponding received word bit comprising said segment; and
- forming a digital correlator output signal at a rate equal to the word segment rate, each output signal comprising a triangular-weighted sum of scaled versions of said ramp-weighted sums and said uniformly-weighted sums over a plurality of preceding word segments covering a predetermined plurality of received words,

whereby degradation of said correlator performance caused by Doppler shift modulation on said received signals is reduced.

5,483,244

#### METHOD AND APPARATUS OF DETERMINING LOCATION OF AN UNAUTHORIZED COMMUNICATION UNIT

Gary W. Grube, Palatine, and Timothy W. Markison, Hoffman Estates, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 5, 1994, Ser. No. 222,984

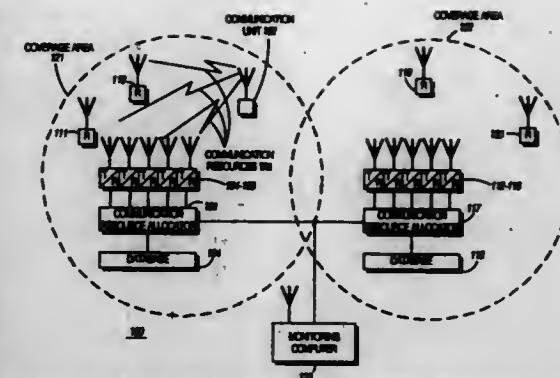
Int. Cl.<sup>6</sup> G01S 3/02

U.S. Cl. 342—463

8 Claims

1. In a wireless communication system, a method for determining location of an unauthorized communication unit, the method comprises the steps of:

- a) receiving, by a first RF receiver of a plurality of RF receivers, an inbound signaling word from a communication unit, the inbound signaling word including an identification of the communication unit and a service request;
- b) determining whether the identification code of the communication unit is unauthorized;



when the identification code of the communication unit is unauthorized:

- c) determining a site location of the communication unit;
- d) transmitting a communication resource assignment to the communication unit and at least a second RF receiver of the plurality of RF receivers in response to the service request, the at least a second RF receiver being proximate to the site location of the communication unit;
- e) receiving, by the at least a second RF receiver, a subsequent RF transmission from the communication unit via a communication resource identified in the communication resource assignment; and
- f) determining a geographic location of the communication unit based on the subsequent RF transmission.

5,483,245

#### ILS SIGNAL ANALYSIS DEVICE AND METHOD

Jean-Marc Ruinet, Denec, France, assignor to Kollmorgen Artus, Avrille, France

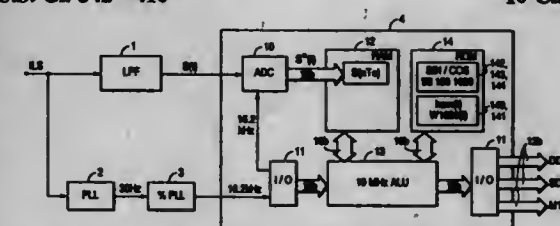
Filed Aug. 24, 1993, Ser. No. 110,932

Claims priority, application France, Aug. 26, 1992, 92 10290

Int. Cl.<sup>6</sup> G01S 1/16

U.S. Cl. 342—410

10 Claims



1. Instrument landing system (ILS) signal analysis device including an analog/digital converter receiving the composite signal to be analysed and delivering a succession of values which can be processed in digital form, characterized in that in order to undertake the determination of the modulation factor for the identification signal contained in the ILS signal, it includes a digital filter using a weighting function whose equation is given by the following relation:

$$W(r) = 2 \frac{\sin k' \theta}{\theta} [\alpha + (1 - \alpha) \cos \theta] \text{ with } \theta = \frac{2\pi r}{T}$$

and which carries out an extraction of this signal for identification of the ILS signal delivered by the converter, where T represents the duration of observation of the signal to be analysed and  $k'$  and  $\alpha$  are specified numerical coefficients.



5,483,246

## OMNIDIRECTIONAL EDGE FED TRANSMISSION LINE ANTENNA

Kenneth C. Barnett, Delray Beach; Lorenzo A. Ponce De Leon, Lake Worth; Charles R. McMurray, Boynton Beach, and Nadim M. Halabl, Sunrise, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 3, 1994, Ser. No. 317,057

Int. Cl.<sup>6</sup> H01Q 1/36

U.S. Cl. 343—700 MS

28 Claims



1. An omnidirectional antenna, comprising:

a ground plane; and

a resonator, comprising

a dielectric substrate having a top conductive plate and a bottom conductive plate, wherein said top conductive plate is shorted to said bottom conductive plate at a first end of said dielectric substrate and open at a second end of said dielectric substrate,

a resonator feed, having a location between said first and second ends of said dielectric substrate,

a first resonator ground being connected to said bottom conductive plate and having a location which is distal to said first end of said dielectric substrate, and

a second resonator ground being connected to said top conductive plate and to said bottom conductive plate and having a location which is proximal to said first end of said dielectric substrate,

wherein said first resonator ground being connected to said ground plane for suppressing undesirable resonator resonance, and said second resonator ground being connected to said ground plane for controlling a radiation pattern of said resonator to produce a substantially omnidirectional antenna beam pattern.

5,483,247

## METHOD AND APPARATUS FOR ELIMINATING RESONANCE IN A VEHICLE ANTENNA SYSTEM

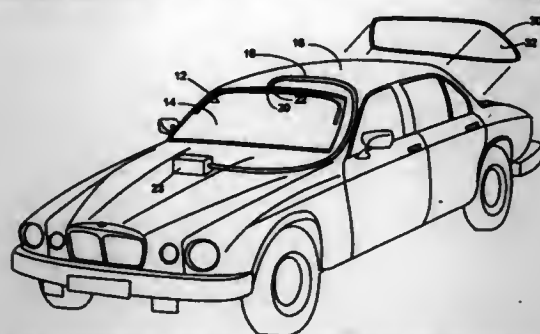
Andrew Adrian, Ypsilanti; Bruce R. Jones, Romulus, and George F. Tannery, IV, Ypsilanti, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 20, 1994, Ser. No. 359,484

Int. Cl.<sup>6</sup> H01Q 1/32

U.S. Cl. 343—713

5 Claims



1. In combination with a motor vehicle having an electrically conductive body which defines multiple window openings, a communication system for receiving electromagnetically radiated signals within a predetermined frequency band comprising, in combination,

a radio receiver adapted to receive and utilize said signals mounted in said vehicle,

a conformal antenna element integral with a glazing panel mounted in a first window opening of the motor vehicle,

electrically connected to said radio receiver and adapted to be electromagnetically coupled to said signals,

a transparent second glazing panel composed of a non-conductive material positioned in a second window opening, said second window opening being dimensioned to be normally resonant at one or more frequencies within said frequency band, and said second glazing panel being spaced from and electromagnetically coupled to said conformal antenna, and

a layer of transparent material applied over a substantial portion of the surface of said second glazing panel, said material being sufficiently conductive to alter the electromagnetic characteristics of said second window opening to substantially reduce the extent to which said second window opening parasitically alters the effective directional pattern of said conformal antenna.

5,483,248

## CONTINUOUS TRANSVERSE STUB ELEMENT DEVICES FOR FLAT PLATE ANTENNA ARRAYS

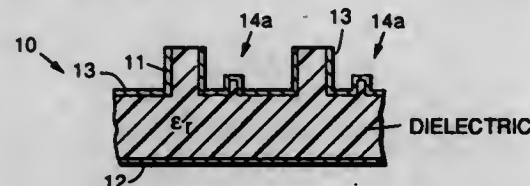
William W. Milroy, Playa del Rey, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 10, 1993, Ser. No. 104,466

Int. Cl.<sup>6</sup> H01Q 13/00

U.S. Cl. 343—785

152 Claims



1. An antenna array employing continuous transverse stubs as radiating elements, said antenna array comprising:

a planar rectangular sheet of dielectric material having two parallel broad surfaces separated by a predetermined distance;

a plurality of elongated raised relatively thin rectangular dielectric members integral with said sheet of dielectric material and extending transversely across one of the broad surfaces of said sheet of dielectric material, said plurality of thin rectangular dielectric members being evenly spaced from each other and regularly disposed along said sheet of dielectric material;

a thin conducting layer disposed on the exterior of said sheet of dielectric material and on the exterior of said plurality of thin rectangular dielectric members to define a parallel plate waveguide having a plurality of continuous transverse stubs disposed on one plate thereof, the surfaces of said plurality of thin rectangular dielectric members distal from said sheet of dielectric material being free from said conductive coating so as to define a plurality of radiating elements, one narrow side of said sheet of dielectric material being free from said conductive coating so as to define a feed for the antenna array; and

a plurality of non-radiating matching elements disposed between the continuous transverse stubs, wherein the non-radiating matching elements comprise depressions in the parallel-plate waveguide.

5,483,249

## TUNABLE CIRCUIT BOARD ANTENNA

John F. Kennedy, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 130,936, Oct. 4, 1993, abandoned.

This application Jul. 19, 1995, Ser. No. 503,961

Int. Cl.<sup>6</sup> H01Q 1/38

U.S. Cl. 343—846

4 Claims

1. A frequency tunable closed cavity antenna for receiving a RF signal comprising:

5,483,251

## ABRIDGMENT OF TEXT-BASED DISPLAY INFORMATION

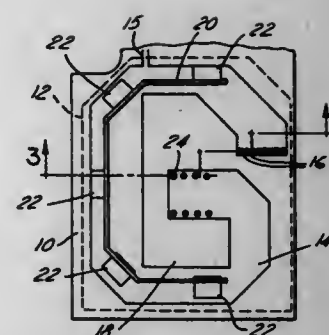
Nuri R. Dagdeviren, Red Bank, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Dec. 31, 1992, Ser. No. 999,428

Int. Cl.<sup>6</sup> G09G 3/20; G08B 5/22

U.S. Cl. 345—56

12 Claims



a dielectric layer having a first side and a second side; an electrically conductive ground plane disposed on said first side;

an elongated electrically conductive stub located on said second side having a first end, a second end, and a length said stub substantially enclosing a predetermined area on said second side of said dielectric layer, said first end and second end having a predetermined distance therebetween, said distance being shorter than said length, said first end electrically connected to said ground plane, said stub, said dielectric layer and ground plane forming a resonant cavity having a resonant frequency; and

a plurality of tuning holes in said dielectric layer between said electrically conductive ground plane and said second end of said electrically conductive stub closing said resonant cavity, said tuning holes being selectively filled with conductive material to obtain a predetermined resonant frequency of the resonant cavity.

5,483,250

## PROJECTION DISPLAY SYSTEM FOR A LAPTOP COMPUTER OR A NOTEBOOK COMPUTER

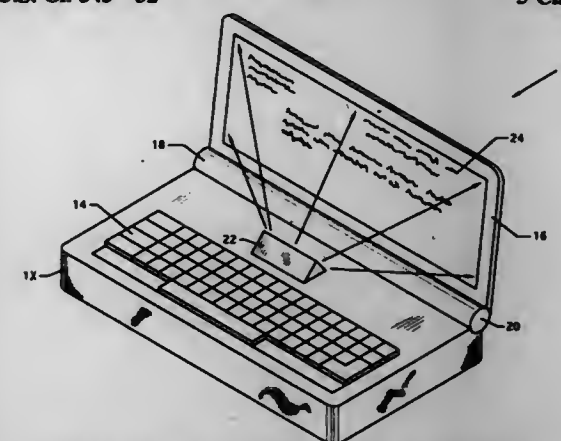
Gregory E. Herrick, Minneapolis, Minn., assignor to Zeos International, Inc., New Brighton, Minn.

Filed Apr. 25, 1991, Ser. No. 691,531

Int. Cl.<sup>6</sup> G09G 3/20

U.S. Cl. 345—32

5 Claims



1. A laptop computer or notebook computer comprising:

- a housing with a hinged display screen for displaying video images;
- a processing means in said housing;
- means for inputting information into said processing means; and,
- video projection means connected to said processing means and mounted on the housing for projecting processed information onto a front of the screen for visual viewing of said processed information.

5,483,252

## DRIVING APPARATUS OF PLASMA DISPLAY PANEL

Tetsuya Shigeta, Koufu, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

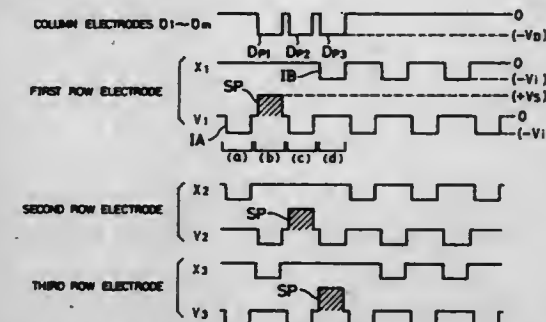
Filed Mar. 9, 1994, Ser. No. 207,743

Claims priority, application Japan, Mar. 12, 1993, 5-052357; Jan. 13, 1993, 5-255529

Int. Cl.<sup>6</sup> G09G 3/28

U.S. Cl. 345—67

5 Claims



1. A driving apparatus of a plasma display panel of an AC discharge type matrix system comprised of a plurality of row electrode pairs arranged so that every two rows make a pair and a plurality of column electrodes arranged in the direction which crosses perpendicularly to the row electrode pairs, comprising:

pixel data pulse generating means for applying a pixel data pulse train having pixel data pulses of a predetermined polarity to said column electrodes in accordance with pixel data; and

electrode driving means for adding, to a maintenance pulse train, scan pulses of a polarity opposite to said predetermined polarity in intervals between maintenance pulses of a same polarity as said predetermined polarity, said scan pulses being generated at timings to coexist with each of said pixel data

pulses, and for applying said maintenance pulse train with said scan pulses added thereto to said row electrode pairs.

5,483,253

# PORTABLE INFORMATION PROCESSING APPARATUS AND LIQUID CRYSTAL DISPLAY DEVICE

Yuzi Suganuma; Shigeru Matsvoka; Keiji Kamio; Yoshihiro Kashiwa, all of Hitachi; Seizi Nogami, Mito; Kouichi Saito, Kitaibaraki; Isao Yamazaki, Hitachi; Hideochika Kigoshi, Kitaibaraki; Naofumi Aoyama; Toru Watanabe, both of Mobara, and Yoshihiro Nozaki, Chiba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

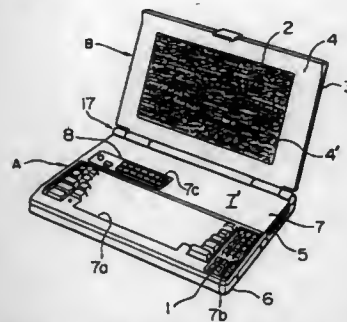
Filed Jul. 16, 1992, Ser. No. 914,548

Claims priority, application Japan, Jul. 17, 1991, 3-176528; Aug. 29, 1991, 3-218252

Int. Cl.<sup>6</sup> G06F 15/20

U.S. Cl. 345—87

30 Claims



1. A portable information processing apparatus, comprising: a main body supporting keyboard means, a control circuit board for controlling said apparatus and drive means for driving an external storage means; and display support means pivotally connected to said main body and supporting liquid crystal display means; said main body including a lower part having a bottom wall and an upper part having a top wall, said drive means being interposed between said bottom wall and said top wall; said control circuit board being disposed between said bottom wall and said keyboard means so that said control circuit board does not substantially overlap with said drive means, wherein said keyboard means includes an information entry keyboard, and wherein control circuit means is disposed between said information entry keyboard and said control circuit board, and a stack of said bottom wall, and said control circuit board, said control circuit means and said information entry keyboard has a height substantially the same as a height of a portion of said top wall covering said drive device.

5,483,254

# 3D VIDEO DISPLAY DEVICES

Robert Powell, Isle of Wight, Great Britain, assignor to Dimensional Displays Inc., Wilmington, Del.

Filed Dec. 28, 1993, Ser. No. 174,235

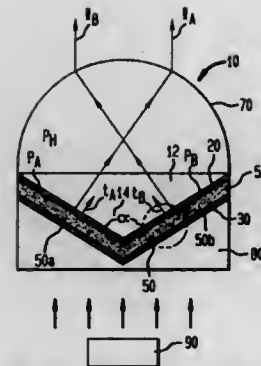
Int. Cl.<sup>6</sup> G09G 3/36

U.S. Cl. 345—87

17 Claims

1. A device for forming and displaying stereoscopic images comprising:

- a non-planar upper substrate having an outer surface and an inner surface, said upper substrate comprising a plurality of alternating raised and depressed regions, said upper substrate being light transmissive;
- a non-planar lower substrate having an outer surface and an inner surface, said lower substrate comprising a shape substantially corresponding to said upper substrate, said upper and lower substrates being arranged to form a plurality of shaped cavities therebetween having different angular orientations



tations and said inner surfaces of said upper and lower substrates confronting one another and bounding said shaped cavities;

a light control material disposed within said shaped cavities, said light control material having a light transmissive property controllable in response to an electrical potential applied thereto; and

control means for controlling said light transmissive property of said light control material individually for each of said different angular orientations to selectively direct light from a light source through at least said light control material and said upper substrate at predetermined viewing angles corresponding to said different angular orientations of said shaped cavities to thereby form and display stereoscopic images.

5,483,255

# DISPLAY CONTROLLER FOR LIQUID CRYSTAL PANEL STRUCTURE

Takaji Numao, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

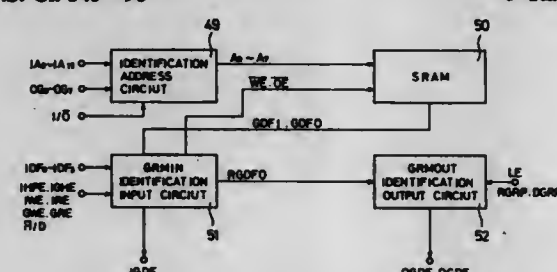
Filed Nov. 5, 1992, Ser. No. 972,043

Claims priority, application Japan, Nov. 7, 1991, 3-291699; Sep. 7, 1992, 4-238619

Int. Cl.<sup>6</sup> G09G 3/36

U.S. Cl. 345—98

5 Claims



1. A display controller for a liquid crystal panel structure, said panel structure including a liquid crystal provided in spaces between a plurality of scanning electrodes and a plurality of signal electrodes crossing over each other, and pixels formed of liquid crystal cells provided by overcrossings of the scanning and signal electrodes for displaying various images by changes of states of pixels,

said display controller comprising:

display data storage means for storing data on a state of a pixel as display data for each pixel;

identity/non-identity data storage means for storing data, as identity/non-identity discerning data, on whether a difference takes place between a pixel state to be displayed and a pixel state presently displayed for each pixel group which includes a plurality of pixels;

identification data storage means for storing data, as identification data, on whether a pixel is included whose state to be displayed differs from a state presently displayed for each scanning electrode group which includes a plurality of scanning electrodes;

wherein said identification data storage means includes two memory parts:

data erasing memory part for storing data for rewriting a data value stored in the identity/non-identity data storing means to a data value indicating no change in display, and data selecting memory part for storing data for determining which scanning electrode group is scanned in a subsequent process; and

further wherein said identification data storage means is a line-memory having a two-bit structure.

5,483,256

# LCD DRIVING ANALOG NONLINEAR OPERATION CIRCUIT PRODUCING A COMPOSITE DRIVE VOLTAGE OF FUNCTION VOLTAGES OF DIFFERENTIAL AMPLIFIERS

Susumu Ohi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

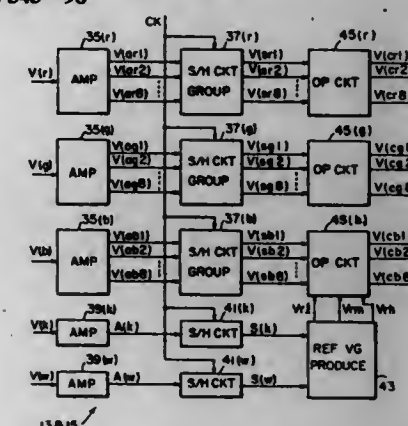
Division of Ser. No. 177,762, Jan. 4, 1994. This application Feb. 27, 1995, Ser. No. 395,145

Claims priority, application Japan, Jan. 5, 1993, 5-168

Int. Cl.<sup>6</sup> G09G 3/36

U.S. Cl. 345—98

3 Claims



1. A driving circuit for a liquid crystal display device having a luminance versus drive voltage characteristic curve approximated by a nonlinear curve generated by a concatenation of first through N-th linear function curves, where N represents an integer which is equal at least to three, said driving circuit comprising an analog nonlinear operation circuit which comprises first through N-th operation amplifier circuits for generating first through N-th function voltages in one-to-one correspondence to said first through said N-th linear function curves and composing means for composing said first through N-th function voltages into a composite driving signal of said drive voltage;

said first through said N-th operation amplifier circuits having first through N-th primary input terminals supplied in common with an input video signal and first through N-th secondary input terminals supplied with first through N-th reference voltages to produce first through N-th amplifier output signals representative of said first through said N-th function voltages;

said composing means composing said first through said N-th amplifier output signals into a gamma compensated video signal for use as said composite driving signal;

N being equal to three, said input video signal comprising red, green and blue component signals and being variable between black and white levels through an intermediate level, said white, said intermediate, and said black levels defining low, middle, and high reference voltages as said first through said third reference voltages, said liquid crystal display device being driven by said gamma compensated video signal and by a clock sequence of pixel clocks of predetermined frequency, said driving circuit comprising: red, green, and blue amplifier circuits for amplifying and level shifting said red, said green, and said blue component

signals into red, green, and blue output signals and for dividing each of said red, said green, and said blue output signals by a predetermined number to produce first through M-th red, green and blue divided signals, where M represents said predetermined number;

red, green, and blue sample and hold circuit groups, each consisting of first through M-th sample and hold circuits including an m-th sample and hold circuit, where m is successively variable from 1 up to M, both inclusive, the m-th sample and hold circuits of said red, said green, and said blue sample and hold circuit groups being supplied with said clock sequence to hold m-th samples of said red, said green, and said blue divided signals during M pixel clocks to produce m-th red, green, and blue held video signals;

a voltage producing unit responsive to said black and said white levels and to said clock sequence for producing in correspondence to said black level, to an intermediate level between said black and said white levels, and to said white level low, middle, and high reference voltages as said first through said N-th reference voltages, and

red, green, and blue analog operation circuits, each as a combination of said first through said N-th operation amplifier circuits and said composing means, responsive to said low, said middle, and said high reference voltages for nonlinearly processing said first through said M-th red, green, and blue held video signals cyclically into said gamma compensated signal.

5,483,257

# BACKGROUND PICTURE DISPLAY APPARATUS AND EXTERNAL STORAGE UNIT USED THEREFOR

Masahiro Otake, Kyoto; Toyofumi Takahashi, Tokyo; Satoshi Nishiumi, Kyoto, and Michitaka Miyoshi, Tokyo, all of Japan, assignors to Nintendo Co. Ltd., Kyoto, and Ricoh Co., Ltd., Tokyo, both of Japan

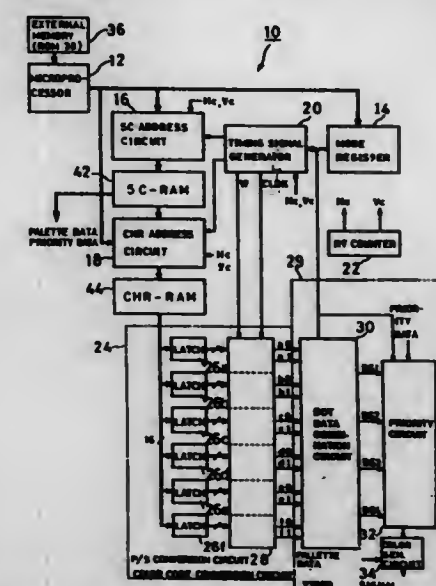
Continuation of Ser. No. 792,206, Nov. 13, 1991, Pat. No. 5,371,512. This application Oct. 31, 1994, Ser. No. 331,814

Claims priority, application Japan, Nov. 19, 1990, 2-315003

Int. Cl.<sup>6</sup> G09G 3/00

U.S. Cl. 345—114

7 Claims



1. A method of displaying a background picture on a raster scan type display wherein the background picture includes N characters and M characters each having a predetermined number of dots respectively arranged in a horizontal direction and a vertical direction to represent one background screen and wherein a plurality of background screens constitute one scene, the method including:





1. An electro-optic device comprising a first substrate carrying an electro-optic display having a first array of display elements and conductors for addressing display elements to enable the display to display an image, a second substrate carrying a second array of elements addressable by conductors and photosensitive elements associated with the conductors for supplying, when illuminated, signals along the conductors for accessing the elements of the second array, the second substrate being provided opposite the first substrate so that the photosensitive elements are associated with selected ones of the display elements for enabling the selected display elements to illuminate the photosensitive elements allowing access of the elements of the second array to be controlled by the display.

5,483,264

# APPARATUS FOR FLATTENING THERMOSENSITIVE RECORDING PAPER OF A FACSIMILE MACHINE

Seok J. Jeong, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

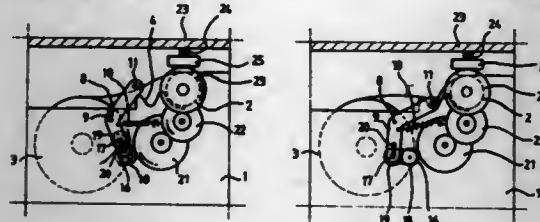
Filed Dec. 21, 1993, Ser. No. 170,953

Claims priority, application Rep. of Korea, Dec. 21, 1992, 1992-25936

Int. Cl.<sup>6</sup> G03G 15/00

U.S. Cl. 346—136

5 Claims



1. An apparatus for flattening thermosensitive recording paper of a facsimile machine which is capable of sending and receiving facsimile signals comprising:

- a housing;
- a recording head;
- means for accommodating a roll of thermosensitive recording paper within said housing, said paper having a direction of initial wind;
- a lever rotatably connected to the housing;
- lever rotating means for causing the lever to be rotated to a first position when the facsimile machine is receiving a facsimile signal and to an opposite position when the facsimile machine is not receiving a facsimile signal;
- thermosensitive recording paper flattening means interlocked with the lever for exerting a flattening force in an opposite direction to the direction of initial wind on the thermosensitive recording paper when the lever is in said first position and releasing the flattening force when the lever is in said opposite position;
- a motor having a shaft and being operably associated with said lever rotating means; and
- a groove positioned between the thermosensitive recording paper accommodating means and the recording head, whereby during reception of said signal, the paper is pressed within the groove so as to flatten the paper.

## 5,483,265 MINIMIZATION OF MISSING DROPLETS IN A THERMAL INK JET PRINTER BY DROP VOLUME CONTROL

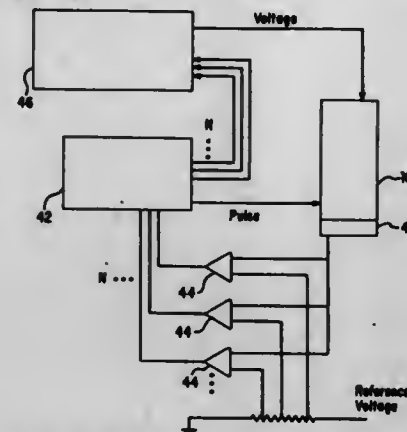
Gary A. Kneezel; Joseph J. Wysocki, both of Webster; Joseph F. Stephany, Williamson; Thomas E. Watrobaki, Penfield; Richard V. LaDonna, Fairport; Dale R. Ims, Webster; Ivan Rezanka, Pittsford, and W. Conrad Richards, Marion, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 3, 1994, Ser. No. 176,389

Int. Cl.<sup>6</sup> B41J 2/05

U.S. Cl. 347—14

25 Claims



1. A method of inhibiting air entering nozzles in an ink jet printhead, which causes missing ink droplets, during printing by an ink jet printhead with a heater at elevated temperatures comprising the steps of:

- sensing a temperature of the printhead; and
- controlling ink droplet size to minimize air entering the printhead nozzles by controlling pulsing conditions of power applied to the printhead responsive to the sensed temperature by increasing voltage supplied to the printhead at increased sensed temperatures.

## 5,483,266 INK JET RECORDING APPARATUS WITH TWO STORAGE MODES

Fumihara Nakamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

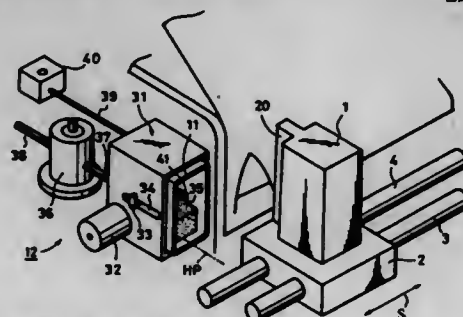
Filed May 28, 1992, Ser. No. 889,285

Claims priority, application Japan, May 31, 1991, 3-156252

Int. Cl.<sup>6</sup> B41J 2/165

U.S. Cl. 347—23

29 Claims



1. An ink jet apparatus comprising:

- a cap member for sealing an ejection nozzle of a recording head for varying duration non-recording periods during which ink is not ejected from the ejection nozzle for recording, wherein said cap member has disposed in the interior thereof a body for retaining ink;
- introducing means for introducing ink to said body for retention thereby of variable amounts of ink during different non-recording periods; and

control means for operating said introducing means to introduce ink to said body, wherein said control means controls an amount of ink retained by said body in accordance with a duration of each of the different non-recording periods to follow operation of said introducing means.

5,483,267

## INK JET RECORDING APPARATUS

Masaharu Nemura; Tomohiro Aoki, both of Yokohama; Yasushi Murayama, Tokyo; Takashi Uchida, Yokohama; Tohru Kobayashi, Tokyo; Masatoshi Ikkanal, Kawasaki; Tatsuo Mitomi, and Yasuyuki Takanaka, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 873,013, Apr. 24, 1992, abandoned.

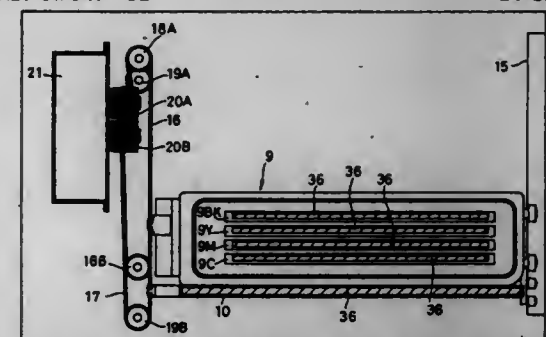
This application Dec. 5, 1994, Ser. No. 352,717

Claims priority, application Japan, Apr. 26, 1991, 3-097218

Int. Cl.<sup>6</sup> B41J 2/165

U.S. Cl. 347—32

14 Claims



1. An ink jet recording apparatus for recording information by ejecting an ink fluid onto a recording medium, comprising:

- a recording head having an orifice for ejecting said ink fluid from said orifice;
- head moving means for moving said recording head apart from and close to said recording position;
- a head drive means for driving said recording head to eject said ink fluid;
- a capping means for capping said orifice of said recording head, said capping means being installed so as to be able to move relative to said recording head;
- a first moving means for relatively moving said capping means and said recording head;
- an ink receiving means for receiving said ink fluid ejected from said recording head;
- a second moving means for moving said ink receiving means and said recording head and for enabling this movement to be independent of movement which is due to said first transport means; and
- a control means for controlling said first moving means, said second moving means and said head drive means so as to permit said recording head to eject said ink fluid toward said ink receiving means while there is relative movement between said recording head, said capping means and said ink receiving means, wherein said control means controls said first moving means, said second moving means and said head drive means so as to drive said recording head to eject said ink fluid toward said ink receiving means while moving said ink receiving means in a designated direction after moving said recording head from a recording position, and next so as to move said recording head apart from and close to said recording position in a series moving operation when said recording head ejecting said ink fluid toward said ink receiving means and concurrently so as to drive said recording head to eject said ink fluid toward said ink receiving means while moving said ink receiving means in a direction, which is opposite to said designated direction.

5,483,268

## METHOD FOR DRIVING INK JET PRINT HEAD

Hisayoshi Fujimoto, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

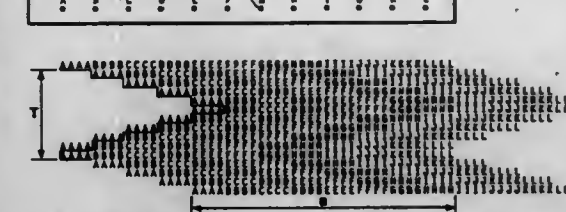
Filed Apr. 12, 1993, Ser. No. 46,084

Claims priority, application Japan, Apr. 17, 1992, 4-097881; Apr. 30, 1992, 4-110580

Int. Cl.<sup>6</sup> B41J 23/00

U.S. Cl. 347—37

18 Claims



1. A method for driving an ink jet print head to print on successive lines on a medium, the ink jet print head having a number of nozzles, each of which prints up to a certain print dot number of dots in a single line on the medium, the ink jet print head being movable in a first direction and in a second direction which is opposite the first direction, wherein a feeding mechanism moves the medium relative to the print head in a third direction perpendicular to the first and second directions so that the ink jet print head faces a selected line, the method comprising the steps of:

- (a) moving the ink jet print head one dot at a time for the print dot number in the first direction along a first line on the medium;
- (b) selectively printing dots on the medium during step (a);
- (c) before moving the ink jet print head in the second direction, moving the medium relative to the print head in the third direction so that the print head faces a next line;
- (d) before moving the print head in the second direction, moving the ink jet print head one dot at a time for the print dot number in the first direction along the next line; and
- (e) selectively printing dots on the medium during step (d) in the first direction along the next line.

5,483,269

## PROCESS FOR THE PREPARATION OF AN IMAGE FORMING ELEMENT AND RELATED PRINTING DEVICE

Johannes G. V. van Stiphout, Beek en Donk; Cornelis A. M. Huyzer; Edwin J. Buis, both of Venlo, and Hans E. Opbroek, Baarlo, all of Netherlands, assignors to Océ - Nederland, B.V., Venlo, Netherlands

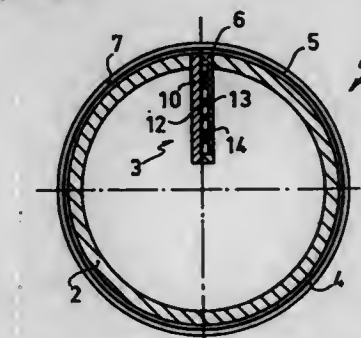
Filed Oct. 26, 1993, Ser. No. 141,217

Claims priority, application Netherlands, Jan. 30, 1992, 9201892

Int. Cl.<sup>6</sup> B41J 2/06; G01D 15/06

U.S. Cl. 347—55

7 Claims



1. A process for manufacturing an image-forming element comprising:



providing a cylinder having a wall with an outer peripheral surface, said wall of said cylinder having one or more elongated openings therein, said one or more openings having a longitudinal direction extending substantially in an axial direction of said cylinder,

fitting in each of said one or more elongated openings a control element, each control element comprising at least one support, electronic control components and electrode paths which are insulated from one another, first ends of said electrode paths being connected to said electronic control components situated within said cylinder and second ends of said electrode paths being situated at the outer periphery of said cylinder, and

forming over each of said second ends of said electrode paths an image-forming electrode which extends in a peripheral direction about said cylinder and which is insulated from other image forming electrodes, each image forming electrode being connected through one of said electrode paths with said electronic control components, thereby enabling said electronic control components to selectively energize said image forming electrodes in accordance with an image pattern to be registered.

5,483,270

## SUBSTRATE FOR INK JET HEAD

Yasutomo Watanabe, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 768,253, Oct. 22, 1991, abandoned.

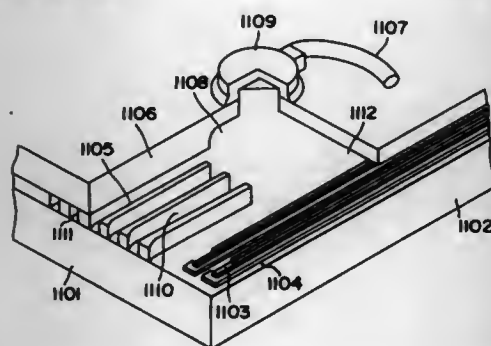
This application Jun. 2, 1994, Ser. No. 253,225

Claims priority, application Japan, Feb. 26, 1990, 2-042528; Feb. 26, 1990, 2-042529

Int. Cl.<sup>6</sup> B41J 2/05

U.S. Cl. 347-56

19 Claims



1. A substrate for an ink jet head, said substrate comprising:
  - a pair of first wiring electrode layers having a first pattern and being disposed on a base member through a first electrode contact layer; and
  - a pair of second wiring electrode layers having a second pattern which is similar to that of said first pattern, said pair of second wiring electrode layers being disposed on said pair of first wiring electrode layers through a second electrode contact layer comprised of an electroconductive material so that said pair of second wiring electrode layers covers said pair of first wiring electrode layers through said second electrode contact layer, wherein said first electrode contact layer contains a heat generating resistor layer for generating heat upon application of a voltage through said pair of first wiring electrode layers and said pair of second wiring electrode layers.

5,483,271

## ELECTROSTATIC LATENT IMAGE FORMING APPARATUS HAVING A PLURALITY OF PHOTOELECTRIC CONVERTERS

Tadayoshi Ohno; Koji Tanimoto; Mamoru Mizuguchi, all of Kawasaki, and Shigeru Fujiwara, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

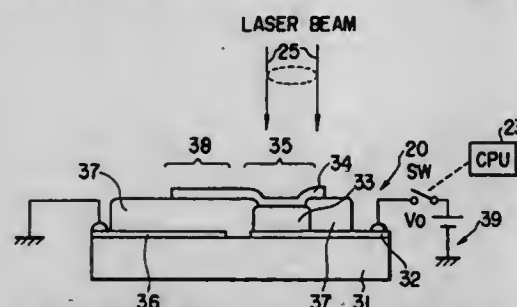
Filed Dec. 31, 1992, Ser. No. 998,953

Claims priority, application Japan, Jan. 8, 1992, 4-001373 The portion of the term of this patent subsequent to Jan. 4, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> G01D 15/14

U.S. Cl. 347-129

10 Claims



1. A latent image forming body for forming a latent image corresponding to an image, comprising:
  - a plurality of photoelectric converters including a plurality of electrodes for obtaining a potential by performing photoelectric conversion of a light beam, each of the plurality of photoelectric converters including:
    - a first electroconductive supporting member applied with a voltage from an electric power source;
    - a photoconductive layer mounted on said first supporting member and having an electroconductive state changed in accordance with an incident light beam;
    - a second electroconductive supporting member connected to ground;
    - an insulation layer mounted on said second supporting member, said insulation layer being applied with the voltage from said electric source in accordance with the electroconductive state of said photoconductive layer; and
    - at least one of the plurality of electrodes mounted on said photoconductive layer and said insulation layer to transmit the incident light to said photoconductive layer for holding an electric potential obtained between said photoconductive layer and said insulation layer; and
    - a supporting body for supporting said plurality of photoelectric converters, said plurality of photoelectric converters being arranged such that said plurality of electrodes are closely arranged two-dimensionally with respect to each other for forming an electrostatic latent image in the plurality of electrodes of said plurality of photoelectric converters.

5,483,272

## IMAGE FORMING APPARATUS AND METHOD FOR OBTAINING SMOOTH CHARGING, EXPOSURE AND DEVELOPMENT

Hisashi Mukatake; Ryushi Imoo; Hidemasa Aiba; Akira Satoh; Masahiro Nagata, and Hiroyoshi Tode, all of Tokyo, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Continuation-in-part of Ser. No. 797,322, Nov. 25, 1991. This application Feb. 10, 1993, Ser. No. 16,038

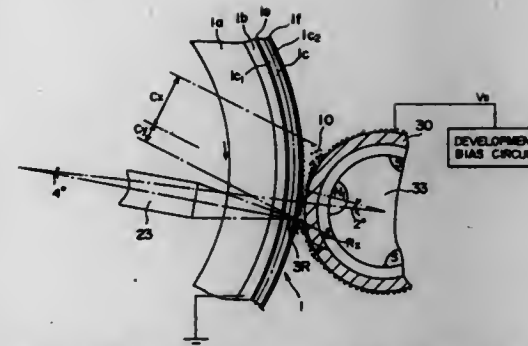
Claims priority, application Japan, Feb. 28, 1992, 4-078227; Feb. 28, 1992, 4-078229; Mar. 31, 1992, 4-104008; Mar. 31, 1992, 4-104013; Nov. 30, 1992, 4-343503

Int. Cl.<sup>6</sup> G01D 15/14

U.S. Cl. 347-129

22 Claims

1. An image forming apparatus, comprising:



- a moveable photosensitive member defining a first side and a second side and comprising an endless transparent support member, a transparent conductive layer, and a photoconductive layer,
- exposure means disposed on the first side of the photosensitive member for exposing the photosensitive member to image information,
- a toner holder for holding a developer disposed on the second side of the photosensitive member,
- a brushing contact region defined between the photosensitive member and the toner holder for enabling charging of the photosensitive member and exposure of the photosensitive member,
- wherein movement of the photosensitive member relative to the brushing contact region is controlled in accordance with the equations:

$$C+R<T \text{ and } C>R,$$

where

C represents the time required to attain a predetermined charging potential on the photosensitive member in the brushing contact region,

R represents the time required to attenuate the predetermined charging potential by exposure to a latent image potential, and T represents the time required for a section of the photosensitive member to pass the toner brushing region, wherein the photosensitive member defines a resistance and a potential, wherein the developer defines a resistance, and wherein the resistance of the developer satisfies the equation:

$$Rt < (Vc/Vs - Vc)Rh$$

where

Rt represents the resistance of the developer when a developable voltage Vc is applied to the developer,

Vs represents a development bias voltage applied to the developer holder,

Vc represents a development bias voltage minus the potential of the photosensitive member when inverse development is started, and

Rh represents the resistance of the photosensitive member.

5,483,273

## DRIVE CONTROL APPARATUS FOR THERMAL HEAD

Hisayoshi Fujimoto; Masatoshi Nakanishi, and Kunio Motoyama, all of Kyoto, Japan, assignors to Rohm Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 168,401, Dec. 17, 1993, abandoned, which is a continuation of Ser. No. 836,808, Feb. 19, 1992, abandoned. This application Dec. 28, 1994, Ser. No. 365,163

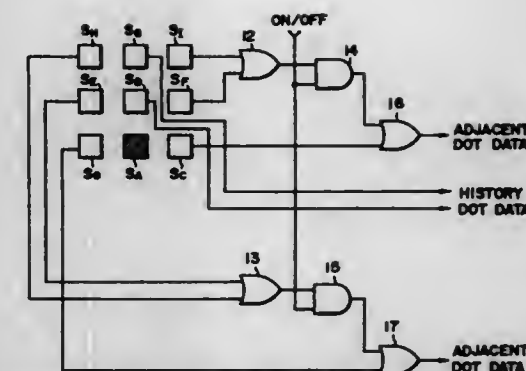
Claims priority, application Japan, Feb. 26, 1991, 3-030978; Mar. 6, 1991, 3-039952; Apr. 3, 1991, 3-070993

Int. Cl.<sup>6</sup> B41J 2/36

U.S. Cl. 347-195

20 Claims

1. A drive control apparatus for a thermal head for carrying out drive control based on print information of a plurality of aligned heater elements, comprising:



a processor means for carrying out processing of print information based only on the following information:

- (a) history information of a present heater element to be driven, said history information of said present heater element is information of a preceding and two times before print information of the present heater element;
  - (b) print information of adjacent heater elements adjacent to the present heater element; and
  - (c) history information of preceding and two times before print information of the adjacent heater elements;
- switching means for enabling and disabling processing of the history information of the adjacent heater elements within the processor means based on whether said thermal head is used for low speed printing or high speed printing;

controller means for controlling application energy of the present heater element according to the print information processed by the processor means;

- a first shift register for storing present time print information of the heater elements;
- a second shift register for storing preceding time print history information of the heater elements;
- a third shift register for storing two times before print history information of the heater elements; and
- a history processor for inputting the print history information of the present heater element to be processed and the print information and the print history information of the adjacent heater elements from the first, second and third shift registers and carrying out a history processing of the present heater element based on the input information.

5,483,274

## THERMAL HEAD AND THERMAL TRANSFER APPARATUS

Nobuhiro Inoue; Akira Nakano; Yukio Tsuda; Katsunari Sasaki, all of Tokyo; Toshiro Nose, Sagami, and Masayoshi Aihara, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 616,245, Nov. 20, 1990, abandoned.

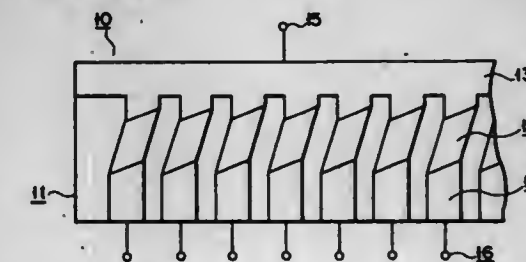
This application Feb. 2, 1993, Ser. No. 13,167

Claims priority, application Japan, Nov. 24, 1989, 1-303067; Nov. 24, 1989, 1-303068; Mar. 19, 1990, 2-66957

Int. Cl.<sup>6</sup> B41J 2/335

U.S. Cl. 347-206

4 Claims



1. A thermal head for a thermal recording apparatus, comprising:

means for recording a continuous line of elliptic dots on a recording sheet, said means including a plurality of heat generation resistors arranged one-dimensionally along a given direction, each of the heat generation resistors formed to have a parallelogram shape including four sides and two diagonal lines and configured such that the four sides of the parallelogram shape have directions crossing the given direction and such that two diagonal lines extending between opposing corners of the parallelogram shape have directions crossing the given direction; and

a plurality of drive electrodes respectively connected to said heat generation resistors;

wherein an ink film and the recording sheet for thermal recording, which are stacked on one another, are brought into contact with said heat generation resistors and moved in a direction orthogonal to the given direction along which said heat generation resistors are arranged and, during this movement, ink coated on the ink film is melted by said heat generation resistors to allow an image to be transferred to the recording sheet.

5,483,275

#### THERMAL PRINTER WITH MEANS FOR REDUCING COLOR SHIFTS

Kazuhiko Higashi; Kiyoshi Takakuwa; Kazuaki Arimoto; Kenichi Naruki, all of Hiroshima; Hiroshi Fukumoto, Hyogo; Terumi Kuwada, and Keisuke Oda, both of Hiroshima, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 4, 1992, Ser. No. 941,153

Claims priority, application Japan, Sep. 5, 1991, 3-226101; Jun. 19, 1992, 4-161123

Int. Cl.<sup>6</sup> B41J 11/42

U.S. Cl. 347—218

1 Claim

MEDIA	TIMES OF PRINTING	NON-PRINTING				PRINTING			
		DIVISIONAL BLOCKS				DIVISIONAL BLOCKS			
TYPE 1	1	0	0	0	0	7	7	7	5
	2	0	0	0	0	7	7	7	6
	3	0	0	0	0	7	7	7	5
	4	0	0	0	0	7	7	7	6
TYPE 3	1	0	0	0	0	10	0	0	7
	2	0	0	0	0	10	0	0	7
	3	0	0	0	0	10	0	0	7
	4	0	0	0	0	10	0	0	7

1. A thermal printer comprising:

memory means for storing a correction for cancelling variations in a paper feed caused by a previously determined uneven paper feed;

first calculation means for calculating an uneven paper feed in each of several lines to be printed;

second calculation means for calculating a correction corresponding to the uneven paper feed calculated by said first calculation means; and

means for controlling the paper feed in each of the several lines according to the correction calculated by said second calculation means and to the correction stored in said memory means.

5,483,276

#### COMPLIANCE INCENTIVES FOR AUDIENCE MONITORING/RECORDING DEVICES

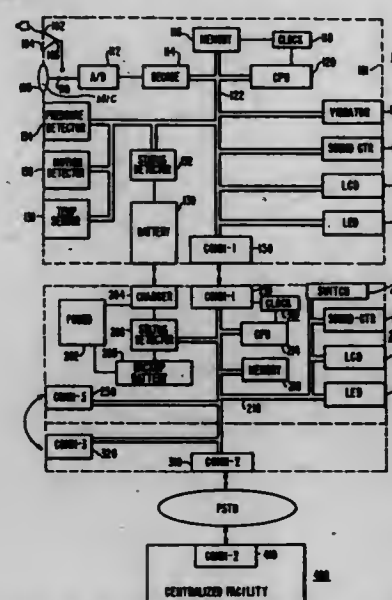
Jon R. Brooks, Silver Spring; James M. Jensen, Columbia; Roberta M. McConochie, Annapolis; Susan V. Osborn, Columbia, all of Md.; Amy E. Pearl, Washington, D.C.; Carole M. Schmidt, New Carrollton, Md.; Ann B. Seller, Annapolis, Md.; Carol P. Stowell, Chevy Chase, Md.; Thomas W. White, Annapolis, Md., and Wylie Wong, Silver Spring, Md., assignors to The Arbitron Company, Columbia, Md.

Filed Aug. 2, 1993, Ser. No. 101,558

Int. Cl.<sup>6</sup> H04N 7/16

U.S. Cl. 348—2

66 Claims



1. A system for promoting use by an audience member of a portable broadcast exposure monitoring and/or recording device in accordance with a predetermined usage criterion, comprising: means for providing a sense signal indicating whether the device is being carried with the person of the audience member; means for providing a time signal corresponding with the sense signal;

data storage means included with the device for storing the sense signal and the corresponding time signal; and indication means for providing an indication to the audience member based on the sense signal and the corresponding time signal of whether the audience member's usage of the device has been in accordance with the predetermined usage criterion.

5,483,277

#### SIMPLIFIED SET-TOP CONVERTER FOR BROADBAND SWITCHED NETWORK

Alain Granger, Raleigh, N.C., assignor to Alcatel Network Systems, Richardson, Tex.

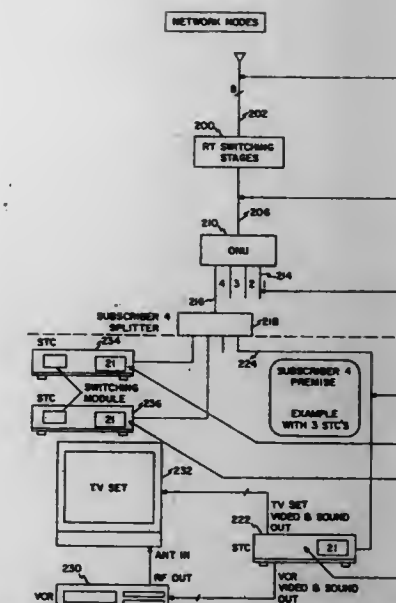
Filed Dec. 15, 1992, Ser. No. 990,456

Int. Cl.<sup>6</sup> H04N 7/16

U.S. Cl. 348—6

12 Claims

1. A method, comprising the steps of: providing, in response to subscriber program selection signals from a plurality of subscribers, corresponding program signals in a same plurality of fixed-frequency frequency division multiplexed (FDM) channels to each of the plurality of subscribers; and dedicating a same one of the same plurality of fixed-frequency frequency division multiplexed (FDM) channels as a dedicated subscriber video recorder channel for each of the plurality of subscribers to provide respective subscriber video



recorder output signals for recording on an associated subscriber video recording device by each of the plurality of subscribers.

5,483,278

#### SYSTEM AND METHOD FOR FINDING A MOVIE OF INTEREST IN A LARGE MOVIE DATABASE

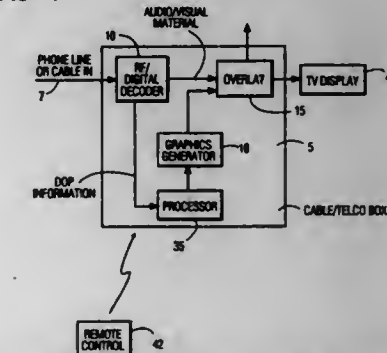
Hugo J. Strubbe, Yorktown Heights, and Ijsbrand J. Aalbersberg, Mt. Kisco, both of N.Y., assignors to Philips Electronics North America Corporation, New York, N.Y.

Continuation of Ser. No. 70,130, Jun. 1, 1993, which is a continuation-in-part of Ser. No. 889,201, May 27, 1992, Pat. No. 5,223,924. This application Sep. 28, 1993, Ser. No. 128,513 The portion of the term of this patent subsequent to Jun. 29, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> H04N 7/10

U.S. Cl. 348—7

5 Claims



1. A method for providing a personalized entertainment program database for use with a program selection systems, wherein said system provides an electronic information database comprising a plurality of summary records from which a user can make a choice, said method comprising the steps of:

- receiving and storing said summary records;
- displaying a selected record from said summary records;
- indicating preference or dislike for said selected record;
- storing said selected record with its indicated preference or dislike;
- deriving first search information from said selected record;
- correlating said first search information with each of said summary records so as to select second selected records from said summary records;
- storing said second selected records so as to form a personalized information database;

- displaying a further selected record from said personalized information database; and
- repeating steps c) through h) until said displayed selected record is chosen by the user.

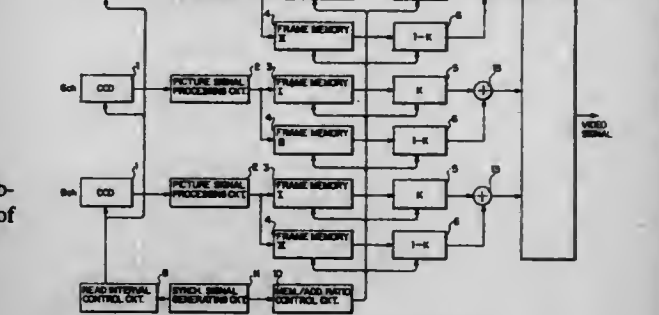
5,483,279

#### HIGH SENSITIVITY CAMERA DEVICE

Kenji Ishii, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 17, 1995, Ser. No. 405,954

Claims priority, application Japan, Mar. 17, 1994, 6-047545 Int. Cl.<sup>6</sup> H04N 5/228



1. A high sensitivity camera device comprising: an image pickup element; a read interval control circuit for controlling a time interval of reading a signal charge stored in said image pickup element; two frame memories for alternately recording output signals read from said image pickup element for every period of said time interval; and arithmetic circuits for adding, for every frame, output signals from said two frame memories in a ratio in response to the charge read time interval for said image pickup element.

5,483,280

#### ARRANGEMENT FOR CONTROLLING AN IRIS TO REGULATE LIGHT IN AN OPTICAL SYSTEM

Yoshikazu Takahashi; Toshiaki Isogawa, both of Kanagawa; Yutaka Satoh, Tokyo, and Shuji Shimizu, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

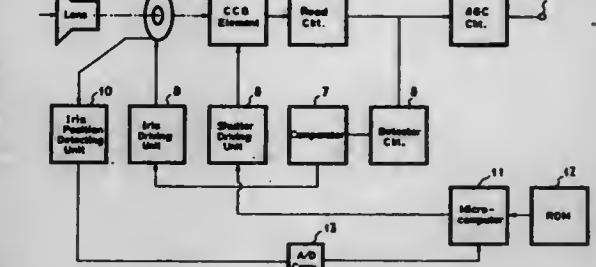
Continuation of Ser. No. 028810, Mar. 19, 1993, abandoned. This application Oct. 11, 1994, Ser. No. 320,376

Claims priority, application Japan, Mar. 11, 1992, 4-052776

Int. Cl.<sup>6</sup> H04N 5/238

U.S. Cl. 348—296

6 Claims



1. An apparatus for controlling an amount of light in an optical system comprising:

- a lens;
- an image pickup element;
- an iris operatively positioned between the image pickup element and the lens and configured for adjusting the amount of light transmitted from the lens to the image pickup element;



ment, by assuming different aperture values, said aperture values varying inversely relative to apertures assumed by the iris;

- (d) first detector means operatively coupled to the iris for detecting an aperture value of the iris and for detecting closure of said iris to an aperture larger than an aperture at which a diffraction phenomenon occurs;
- (e) electronic shutter means for controlling exposure of the image pickup element to the light transmitted from the lens to the image pickup element;
- (f) second detector means for detecting the amount of light to which the image pickup element is exposed;
- (g) shutter driving means operatively associated with the electronic shutter means for controlling an amount of time during which said image pickup element is exposed to said light (shutter speed);
- (h) iris driving means operatively coupled to said iris and said second detector for directly driving said iris in response to the amount of light to which said image pickup unit (element) is exposed;
- (i) a memory in which are stored data identifying the aperture value of said iris at which said diffraction phenomenon occurs;
- (j) control means operatively coupled to said first detector means, said memory and said shutter driving means and configured for indirectly controlling said iris by controlling said electronic shutter means so that the aperture value of said iris can be prevented from being increased after reaching a value short of a value at which a diffraction phenomenon occurs, said control means being configured to compare the aperture value detected by the first detecting means with the data stored in the memory and controlling the shutter driving means in response to the comparison as well as a hysteresis range within which the iris and electronic shutter would otherwise be driven in oscillating fashion.

5,483,281

# SIGNAL PROCESSING DEVICE FOR A TWO-DIMENSIONAL SOLID-STATE IMAGING ELEMENT

Toshiaki Seto, Kamakura, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

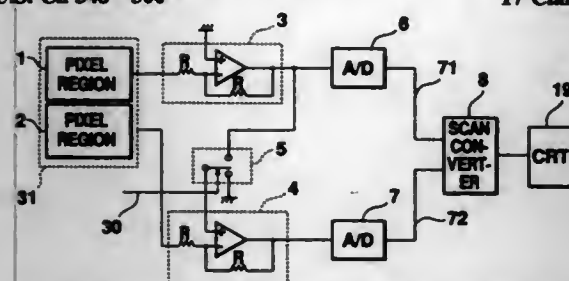
Filed Sep. 23, 1993, Ser. No. 125,588

Claims priority, application Japan, Sep. 29, 1992, 4-259604; Aug. 31, 1993, 5-216128

Int. Cl.<sup>6</sup> H04N 5/335

U.S. Cl. 348—300

17 Claims



1. A signal processing device for a two-dimensional solid-state imaging element which is composed by mutually coupling first and second solid-state imaging elements in field integration mode in a vertical scanning direction, said device comprising:

- a first amplifier connected to an output terminal of said first solid-state imaging element;
- a multiplexer for receiving and selectively outputting one of an output of said first amplifier and a predetermined level in response to a controlling signal provided at a predetermined timing;
- a second amplifier connected to an output terminal of said second solid-state imaging element to combine an output of said second solid-state imaging element and an output of said multiplexer;

a scan converter for converting the outputs of said first amplifier and said second amplifier into a format to be displayed on a display.

5,483,282

# METHOD FOR DRIVING A LINEAR IMAGE SENSOR

Junji Nakanishi, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 984,083, Dec. 1, 1992, Pat. No. 5,326,997.

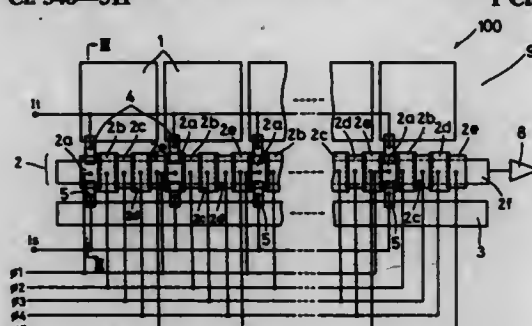
This application Jul. 1, 1994, Ser. No. 269,761

Claims priority, application Japan, Jun. 18, 1992, 4-186218

Int. Cl.<sup>6</sup> H01L 29/78; 27/14; H04N 5/30; 3/14

U.S. Cl. 348—311

1 Claim



1. A method for driving a linear image sensor in which signal charges from an array of photodetectors are transferred by a charge transfer circuit and drained through said charge transfer circuit comprising:

- providing a CCD including at least four CCD transfer gates for each photodetector; and
- applying at least four phase driving clocks to said CCD transfer gates for transferring signal charges produced by said photodetectors along said CCD and, while transferring signal charges through CCD transfer gates along said CCD,
- turning on (i) a respective charge drain gate disposed between each photodetector and a corresponding one of said CCD transfer gates and (ii) a shutter gate disposed between the corresponding CCD transfer gate and a charge drain circuit while the CCD transfer gates adjacent to and on opposite sides of the corresponding CCD transfer gate are turned off to drain signal charges from each photodetector into said charge drain circuit.

5,483,283

# THREE LEVEL HIGH SPEED CLOCK DRIVER FOR AN IMAGE SENSOR

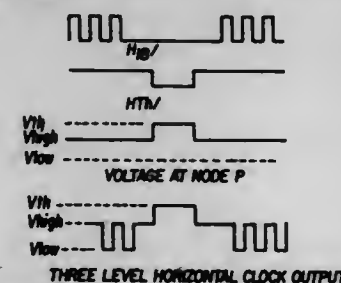
Ram Kannegundla, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 23, 1994, Ser. No. 247,725

Int. Cl.<sup>6</sup> H04N 5/335; H03K 4/24

U.S. Cl. 348—312

2 Claims



1. A high speed clock driver circuit for use with an area image sensor comprising:

- a) first and second horizontal shift registers;

- b) means for producing vertical transfer signals for causing the transfer of a line of pixels from the image sensor in parallel into the first horizontal shift register;
- c) means for producing two inverted horizontal high speed clock driver signals with one of such signals having a third level, such inverted horizontal signals being used for transfer of pixels from the respective first and second shift horizontal registers; and
- d) means responsive to the third level of one of the horizontal high speed clock driver signal and the vertical transfer signals for enabling the transfer, in parallel, of pixels from the first register into the second horizontal shift register.

5,483,284

# ELECTRONIC STILL PHOTOGRAPHIC ADAPTOR MOUNTABLE SINGLE-LENS REFLEX CAMERA

Yasuaki Ishiguro, Fujimi, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 845,265, Mar. 3, 1992, abandoned.

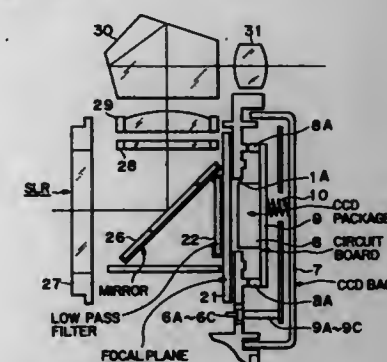
This application Jan. 19, 1994, Ser. No. 183,243

Claims priority, application Japan, Mar. 4, 1991, 3-037453

Int. Cl.<sup>6</sup> H04N 5/225

U.S. Cl. 348—335

13 Claims



- 1. A single-lens reflex camera having: a mirror movable between a non-photographic position where light from a subject is transmitted to a finder optical system and a photographic position where the light is transmitted to a film plane; a focal-plane shutter normally closed to prevent the light from reaching the film plane, and moved to open so as to allow the light to reach the film plane; a removable, ordinary photograph back panel; said camera being provided for electronic still photography with an electronic still photographic adaptor substituted for said back panel and having image pick-up means located near the film plane when set thereon, and with an optical low-pass filter mountable between said focal-plane shutter and said mirror to cut off a high frequency component in space frequencies of light; further comprising,
- first detection means for detecting mounting of said electronic still photographic adaptor;
- second detection means for detecting mounting of said optical low-pass filter; and
- control means for inhibiting opening of said focal-plane shutter when either of said first and second detection means detects no mounting, but for allowing opening of the shutter when both detection means detect the respective mountings.

5,483,285

# MOVIE CAMERA SYSTEM HAVING VIEW FINDING AND PROJECTING OPERATIONS AND METHOD

Jae C. Lim, Incheon-si; Myung K. Yeo, Kyungki-do; Yong T. Lim, Seoul; Nam S. Lee, Kyungki-do; Jin W. Seo, Seoul, and Dae S. Shim, Incheon-si, all of, Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

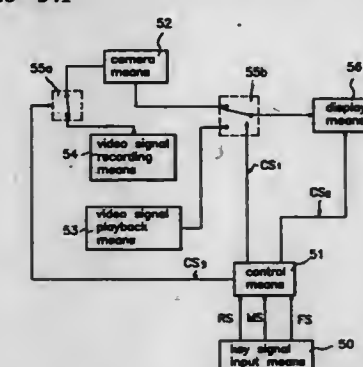
Filed Apr. 16, 1993, Ser. No. 47,440

Claims priority, application Rep. of Korea, Apr. 17, 1992, 6432/1992; Nov. 16, 1992, 21486/1992; Feb. 18, 1993, 2246/1993

Int. Cl.<sup>6</sup> H04N 5/30

U.S. Cl. 348—341

6 Claims



6. In a movie camera system having a view finder, a camera section, a display means, and a VCR section, the display means including a liquid crystal display (LCD) panel, a method of displaying an image corresponding to a video signal from the camera section or a video signal from the VCR section on the LCD panel of the display means, comprising the steps of:

- generating a first control signal in response to a mode select signal input to the movie camera system, said first control signal selects either the video signal output by the camera section or the video signal output by the VCR section;
- generating a second control signal in response to a function select signal input to the movie camera system for selecting either a projecting function or a view finding function;
- selecting one of the video signal from the camera section and the video signal from the VCR section in response to the first control signal;
- processing the selected video signal so that the corresponding image can be displayed on the LCD panel of the view finder; inverting the processed video signal when the second control signal indicates the projecting function; and
- view finding the image corresponding to the processed video signal on the LCD panel or projecting the image corresponding to the inverted video signal on an external screen through the LCD panel in response to the second control signal.

5,483,286

# MOTION COMPENSATING APPARATUS

Seong I. Kim, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Jul. 21, 1993, Ser. No. 95,396

Claims priority, application Rep. of Korea, Jul. 23, 1992, 1992-13198

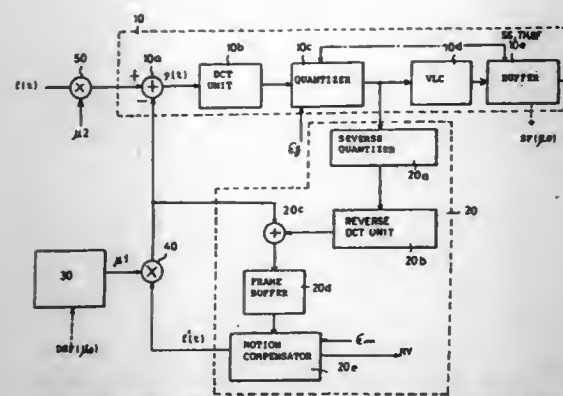
Int. Cl.<sup>6</sup> H04N 7/50

U.S. Cl. 348—402

4 Claims

- 1. A motion compensating apparatus comprising:
- encoding means for transforming, quantizing, compressing and transmitting a difference frame signal representative of a difference between a video signal of a present input frame and a motion compensated video signal of a reference frame, said encoding means outputting a displaced frame (DF) scaling factor  $\mu$  having a value which varies according to an output buffer state of said encoding means;
- motion compensating means for restoring the transformed and quantized video signal from said encoding means, estimating a motion of the video signal of the present input frame in units





of blocks their on the basis of the restored video signal to obtain a motion vector based on the estimated motion and compensating a video signal of the reference frame on the basis of the obtained motion vector;

displaced frame (DF) scaling factor generating means for adaptively changing the value of the DF scaling factor  $\mu$  to generate a first DF scaling factor centered around 1 as the DF scaling factor  $\mu$  is varied according to the output buffer state of said encoding means, and wherein said DF scaling factor generating means includes:

random number generator for substituting the values for the DF scaling factor  $\mu$  from said encoding means so as to approach the averages of  $1/1-\mu$  and  $\mu/1-\mu$  to 0 and generating a resultant DF scaling factor in accordance therewith; and

DF scaling factor generator means for centering the value of the DF scaling factor from said random number generator means around 1 and outputting the first DF scaling factor in accordance therewith;

first multiplying means for multiplying the motion compensated video signal from said motion compensating means by the first DF scaling factor from said DF scaling factor generating means, and

adding means for differencing the video signal of the present input frame with the multiplied motion compensated video signal from said first multiplying means to obtain said difference frame signal.

5,483,287

#### METHOD FOR FORMING TRANSPORT CELLS FOR CONVEYING COMPRESSED VIDEO DATA

Robert J. Siracusa, Lawrenceville, N.J., assignor to General Electric Company, Schenectady, N.Y.

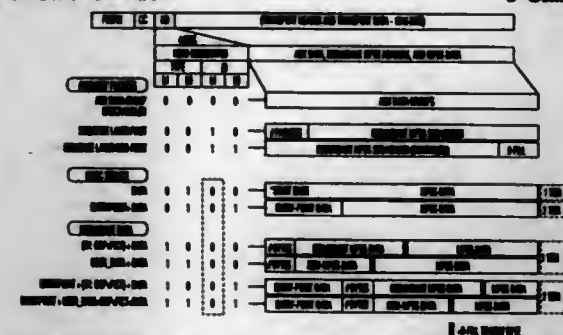
Continuation of Ser. No. 85,364, Jul. 2, 1993, Pat. No. 5,365,272, which is a division of Ser. No. 901,045, Jun. 19, 1992, Pat. No. 5,289,276. This application Aug. 3, 1994, Ser. No. 285,361

The portion of the term of this patent subsequent to Nov. 15, 2011, has been disclaimed.

Int. Cl. H04N 7/015; 7/26; 7/00

U.S. Cl. 348-426

5 Claims



1. In a digital video transmission system for transmitting MPEG compressed video signal including layered data having headers

containing data descriptive of respective layers, a method for segmenting said compressed video signal into transport cells, comprising:

providing said compressed video signal;

dividing said compressed video signal into payloads of no greater than a predetermined number of bits;

forming a first data field (SCID) of N-bits, for identifying the service to which the transport cell is to be applied, where N is an integer such that  $2^N$  is greater than 4000;

forming a second data field (CC) of 4-bits for including a continuity count which is service specific and which increments in successive transport cells of like service;

forming a third data field (P) of 1-bit for including a priority flag which indicates the priority of associated payloads;

forming a sixth data field (BB) of 1-bit for including a flag indicating if an associated payload includes a predetermined signal boundary;

forming a fourth data field (CF, CS) of 2-bits for including scrambling information;

forming a fifth data field (TYPE) of 2-bits for including a payload type identifier which indicates one of a plurality of alternative payload formats; and

forming a transport cell including the concatenation of said first, second, third, fourth, and fifth and sixth data fields and one of said payloads.

5,483,288

#### INTERPOLATING COMPONENT GENERATOR FOR SCANNING LINE INTERPOLATOR USING INTRA-FIELD AND INTER-FIELD PSEUDO MEDIAN FILTERS

Sung H. Hong, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

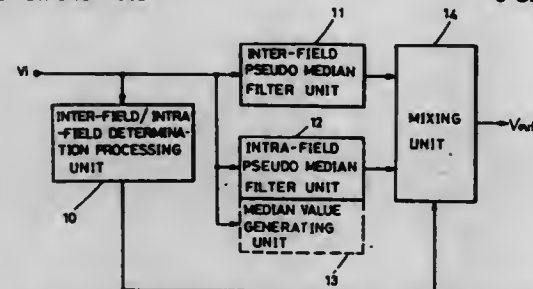
Filed Oct. 18, 1993, Ser. No. 138,600

Claims priority, application Rep. of Korea, Jan. 28, 1992, 19942/1992

Int. Cl. H04N 7/01; 11/20

U.S. Cl. 348-448

6 Claims



1. An interpolating component generator for a scanning line interpolator for an input image signal comprising:

an inter-field/intra-field determination unit for determining an intra-field variation and an inter-field variation from said input image signal and providing an output signal based on said inter-field variation and said intra-field variation;

an inter-field pseudo median filter unit for generating an inter-field pixel value to be used in interpolation by use of current field information and previous field information, of said input image signal, said inter-field pseudo median filter unit combining values for three or more pixels of said input image signal;

an intra-field pseudo median filter unit for generating an intra-field pixel value to be used in interpolation by use of current field information of the input image signal, said intra-field pseudo median filter unit combining values for three or more pixels of said input image signal; and

a mixing unit for mixing the inter-field pixel value and said intra-field pixel value according to said output signal from said inter-field/intra-field determination unit and thereby outputting a pixel value to be finally used in interpolation, wherein said mixing unit is adapted to select, as a pixel to be used in interpolation, a value obtained by summing output

signals from said intra-field and inter-field pseudo median filter units, according to said output signal from said inter-field/intra-field determination unit.

5,483,289

#### DATA SLICING CIRCUIT AND METHOD

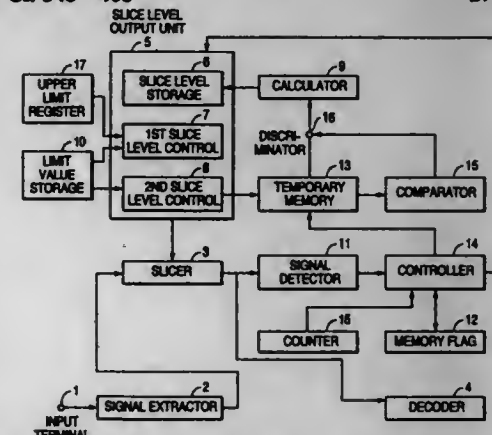
Masakazu Urade; Hisao Kobayashi, both of Schaumburg, Ill.; Yukihiko Yagi, Kyoto, Japan; Katsuhiko Hashimoto, Nagaokakyo, Japan, and Sachiko Nishii, Kyoto, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 22, 1993, Ser. No. 171,744

Int. Cl. H04N 7/08

U.S. Cl. 348-468

27 Claims



1. A data slicing circuit comprising:

a data slicer for receiving an analog first input, an analog second input, comparing said first input with said second input, and generating a digital output based on said comparison of said first input and said second input;

a slice level output device coupled to said data slicer and capable of outputting a slice level output to said data slicer's second input; and

a calculator coupled to said slice level output device for calculating a desired slice level and providing said desired slice level to said slice level output device;

said calculator receiving a minimum slice level and a maximum slice level and calculating said desired slice level as being between said minimum slice level and said maximum slice level.

5,483,290

#### VIDEO CAMERA APPARATUS INCLUDING PROGRAMMABLE TIMING GENERATION CIRCUIT

Hiroyasu Ohtsubo, Yokohama, and Kazuhiro Koshio, Chigasaki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 783,995, Oct. 29, 1991, Pat. No. 5,287,171.

This application Oct. 6, 1993, Ser. No. 132,309

Claims priority, application Japan, Jan. 31, 1990, 2-297202; Nov. 5, 1990, 2-297299

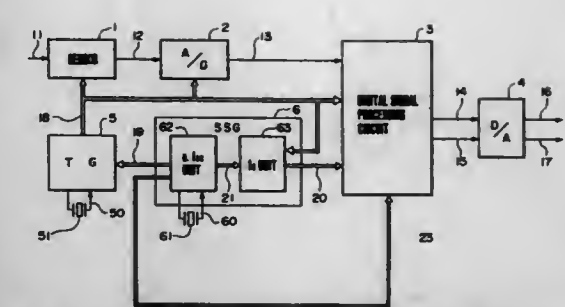
Int. Cl. H04N 5/06; 9/475

U.S. Cl. 348-516

10 Claims

8. A video camera apparatus in which an output signal from a solid state image sensor is converted into a corresponding digital signal at a horizontal reading cycle of the output signal, and the digital signal is digitally processed with a first predetermined clock (fs) synchronous with the reading cycle to provide a luminance signal and a color signal, said video camera comprising:

a first sync signal generating unit for inputting a predetermined clock of a frequency depending on color television method used and for generating a horizontal sync signal and a vertical sync signal;



a programmable timing generating circuit including:

count means, in synchronism with said horizontal sync signal, for inputting said first clock to output a count value,

latching means for latching a timing data of a sync signal,

pulse generating means for inputting said count value of said count means and said timing data latched by said latching means and for generating said horizontal sync signal by comparing said count value and said timing data, and

sync signal generating means for inputting and synthesizing said vertical sync signal output from said first sync signal generating means and said horizontal signal output from said pulse generating means to generate a sync signal for a color television signal;

timing generating means for inputting said horizontal sync signal and said vertical sync signal from said first sync signal generating means and further for inputting a predetermined reference signal to generate said first clock and a drive signal for driving said solid-state imaging device;

a microcomputer including an input terminal for preliminarily inputting said timing data stored in an external memory means, and for controlling timing of a phase change of a sync signal of said color television by inputting said timing data from said memory means through said input terminal and providing said timing data to said latching means of said programmable timing generating circuit.

9. A video camera apparatus, comprising:

a solid-state image sensor;

an analog to digital converting circuit for converting an analog output signal of said solid-state image sensor into a digital signal;

digital signal processing circuit for processing said digital signal into a luminance signal and color signal;

a first programmable timing generating circuit having a first counter for inputting a reference signal in synchronism with a horizontal read cycle of said output signal of said solid state image sensor to output a first count value;

first memory means for storing a drive signal for driving said solid state image sensor and first timing data for determining phase shift of a control signal including a clock in synchronism with the horizontal read cycle of said output signal of said solid-state image sensor;

first pulse generating means for inputting said first count value and said first timing data to generate said drive signal which varies with timing determined by said first timing data and said control signal including said clock in synchronism with the horizontal read cycle of said output signal of said solid-state image sensor;

a second programmable timing generating circuit having a second counter for inputting said clock synchronism with the horizontal read cycle of said output signal of said solid-state image sensor from said first programmable timing generating circuit to output a second count value;

second store means for storing a second timing data for determining phase shift timing of a synchronizing signal of a desired color television method;

a second pulse generating circuit for inputting said second count value and said second timing data to generate a synchronizing signal which varies with timing determined by said second timing data; and

data supplying means for supplying timing data including said first timing data and said second timing data to said first memory means and said second memory means respectively,







5,483,295

**ADAPTIVE CLAMPING CIRCUIT FOR VIDEO SIGNAL RECEIVING DEVICE**

Jun-Gon Kim, Seoul, and Kee-Seok Lee, Suwon, both of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

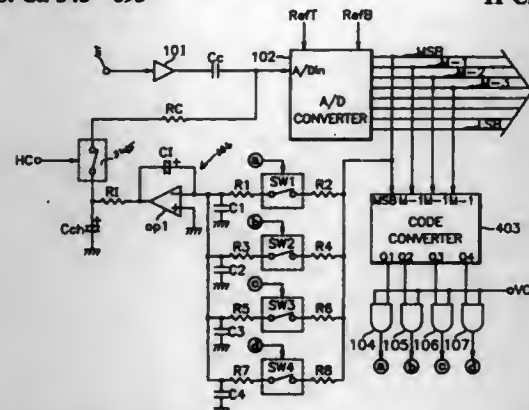
Filed May 12, 1994, Ser. No. 241,716

Claims priority, application Rep. of Korea, Aug. 19, 1993, 16075/1993

Int. Cl.<sup>6</sup> H04N 5/18

U.S. Cl. 348—695

11 Claims



1. An adaptive clamping circuit for a video signal processing device, comprising:

control signal generating means for generating a control signal controlling speed of clamping operation of an input signal provided to said video signal processing device;

variable response signal generating means for generating a variable response gain signal which enables said input signal to be adaptively clamped, by selecting one of N time constants as a selected time constant for transmission of a most significant bit (MSB) signal, where N is an integer greater than 2, said selected time constant being adaptively changed in response to said control signal of said control signal generating means; and

clamping means for generating a direct current signal responsive to an output of said variable response signal generating means and for applying the direct current signal to said input signal.

5,483,296

**HIGH RESOLUTION IMAGE STORAGE WHEREBY IMAGE IS DIVIDED AND STORED AS PLURAL GROUPS OF HORIZONTALLY AND VERTICALLY**

Brian Nonweiler, Newbury, England, assignor to Quantel Limited, Newbury, England

Continuation of Ser. No. 962,306, Oct. 16, 1992, abandoned.

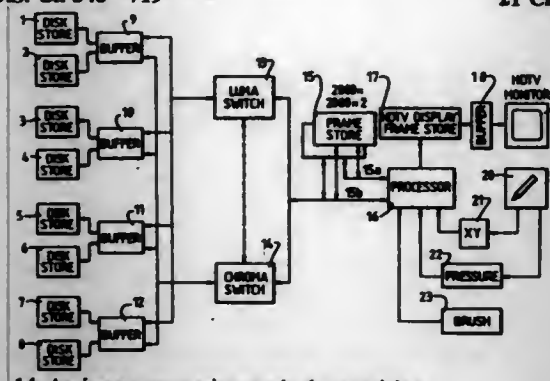
This application Apr. 24, 1995, Ser. No. 427,492

Claims priority, application United Kingdom, Jan. 18, 1991, 9122215

Int. Cl.<sup>6</sup> H04N 9/74; 5/222

U.S. Cl. 348—719

21 Claims



14. An image processing method comprising:

storing in a memory digital data representing at least one entire image frame as a plurality of data groups each defining a respective interleavable reduced resolution representation of substantially the entire image frame;

storing in a manipulation frame store data representing substantially the entire image frame in a manipulation frame store; transferring data between the memory and the manipulation frame store by dividing the image frame data into said data groups when the data is transferred to the memory and interleaving groups of data from the memory when the data is transferred from the memory;

processing data in the manipulation frame store to create manipulated data representing a manipulated version of substantially the entire image frame; and transferring to a display store processed data presenting said manipulated version of the image for display.

5,483,297

**SOUND CARRIER DETECTING CIRCUIT**

Jang H. Song, Anyang, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea

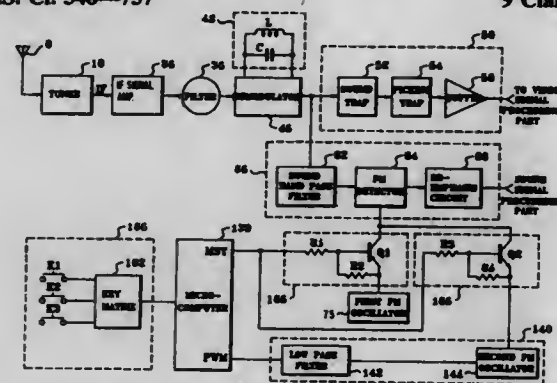
Filed Aug. 9, 1994, Ser. No. 294,781

Claims priority, application Rep. of Korea, Aug. 20, 1993, 93-16138

Int. Cl.<sup>6</sup> H04N 5/60; 5/62

U.S. Cl. 348—737

9 Claims



1. A sound carrier detecting circuit comprising:

key input means provided with at least one key for selecting tuning states;

a microprocessor for outputting pulse width modulating signals and manual sound tuning signals in accordance with the selected tuning state of said key input means;

variable oscillating means for conveying the pulse width modulating signals into de component signals that, in turn, generate variable frequency signals in accordance with a level of the de component signals;

frequency modulating and oscillating means for oscillating and thereby outputting set frequency signals at a frequency set in accordance with a relevant broadcasting method; and

switching means for selectively supplying the variable frequency signals of said variable oscillating means and the set frequency signals of said frequency modulating and oscillating means to a frequency modulating and detecting part under control of the manual sound tuning signals.

5,483,298

**CIRCUIT ARRANGEMENT FOR DEMODULATING THE SOUND SIGNALS IN A TELEVISION SIGNAL IN ACCORDANCE WITH AT LEAST TWO DIFFERENT TRANSMISSION STANDARDS**

Joachim Brilka, and Wolfgang Weltersbach, both of Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

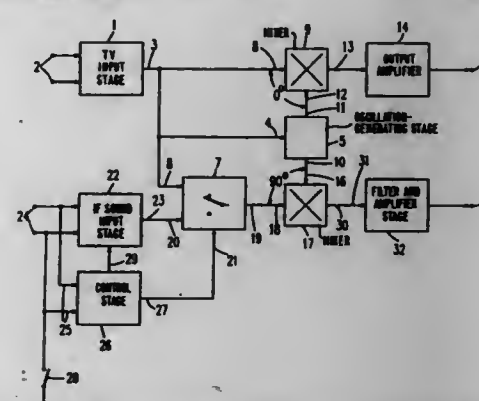
Filed May 5, 1994, Ser. No. 239,014

Claims priority, application Germany, May 7, 1993, 43 15 128.0

Int. Cl.<sup>6</sup> H04N 5/60; 5/44; 7/08; 7/093

U.S. Cl. 348—738

18 Claims



1. A circuit arrangement for demodulating sound signals in a television signal, comprising:

an oscillation-generating stage which derives a first oscillation signal from an IF television signal modulated on a first intermediate-frequency carrier having a frequency which corresponds to a frequency of an intermediate-frequency picture carrier in the IF television signal and encloses a phase angle of at least substantially 90° with the intermediate-frequency picture carrier;

a first mixer stage having a first input for receiving the first oscillation signal; and

a switching device for optionally applying the IF television signal or an IF sound signal modulated on a second intermediate-frequency carrier to a second input of the first mixer stage.

5,483,299

**IMAGE DISPLAYING APPARATUS WITH IMAGE DISPLAYING FUNCTION**

Nobuo Minoura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

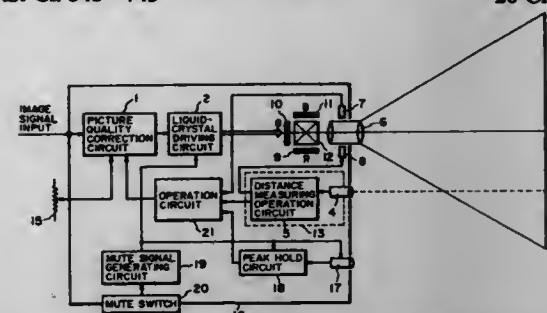
Continuation of Ser. No. 60,688, May 10, 1993, abandoned, which is a continuation of Ser. No. 687,226, Apr. 18, 1991, abandoned. This application Feb. 24, 1994, Ser. No. 201,137

Claims priority, application Japan, May 8, 1990, 2-116728; Jul. 3, 1990, 2-17442; Nov. 19, 1990, 2-313597

Int. Cl.<sup>6</sup> H04N 5/74

U.S. Cl. 348—745

26 Claims



15. An image display apparatus for displaying an image corresponding to an image signal comprising:

(a) image forming means for receiving the image signal and forming the image corresponding to the received image signal;

(b) optical projecting means for projecting the image formed by said image forming means, onto a screen with a desired size of the image;

(c) distance detecting means for detecting the distance from said image projecting means to the screen, controlling a focusing action of said optical projecting means according to the detected distance and generating a distance information signal indicative of the detected distance;

(d) magnification ratio detecting means for detecting a magnification ratio of the image projected onto the screen by said optical projecting means and generating a magnification ratio information signal indicative of the detected magnification ratio of the image; and

(e) outline emphasis processing means for calculating the size of the image projected onto screen by said optical projecting means, according to said distance information signal generated by said distance detecting means and said magnification ratio information signal generated by said magnification ratio detecting means and for emphasizing a portion of the image signal applied to said image forming means, according to the result of the calculation, said portion of the image signal corresponding to an outline section of the image.

26. An image display apparatus for displaying an image corresponding to an image signal, comprising:

(a) image forming means for receiving the image signal and forming the image corresponding to the received image signal;

(b) optical projecting means for projecting the image formed by said image forming means onto a screen with a desired size;

(c) brightness detecting means for detecting the brightness of the image projected onto the screen by said optical projecting means and for generating a brightness information signal indicative of the detected brightness;

(d) distance detecting means for detecting the distance from said optical projecting means to the screen, controlling a focusing action of said optical projecting means according to the detected distance and generating a distance information signal indicative of the detected distance;

(e) magnification ratio detecting means for detecting a magnification ratio of the image projected onto the screen by said optical projecting means and for generating a magnification ratio information signal indicative of the detected magnification ratio;

(f) adjusting control signal generating means for calculating a size of the image projected onto the screen by said optical projecting means, according to said distance information signal generated by said distance detecting means and said magnification ratio information signal generated by said magnification ratio detecting means, for emphasizing a portion of the image signal applied to said image forming means, which portion corresponds to an outline section of the image, according to the result of the calculation and said brightness information signal generated by said brightness detecting means, and for generating an adjusting control signal to adjust the contrast of the image corresponding to the image signal applied to said image forming means; and

(g) image adjusting processing means for adjusting the image formed by said image forming means, according to said adjusting control signal generated by said adjusting control signal generating means.



5,483,300

## OUTPUT CIRCUIT

Kyoung-geun Lee, Ansan, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea  
Filed Jun. 23, 1994, Ser. No. 264,331

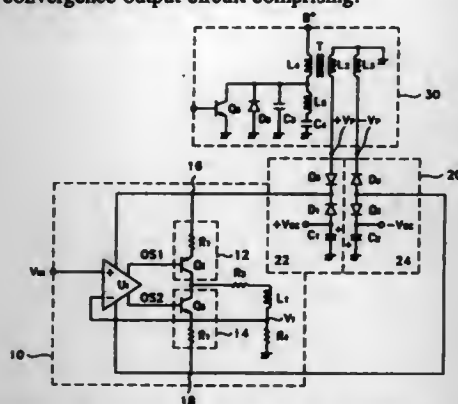
Claims priority, application Rep. of Korea, Jun. 23, 1993, 93-11521

Int. Cl.<sup>6</sup> H04N 17/04

U.S. Cl. 348-745

11 Claims

1. A convergence output circuit comprising:



an amplifier for amplifying an input video signal;  
a first current supplying circuit which produces a positive current in response to a first output signal of said amplifier;  
a second current supplying circuit which produces a negative current in response to a second output signal of said amplifier;  
a convergence coil, having one end connected to a connection point between said first current supplying circuit and said second current supplying circuit, for receiving said positive current and said negative current;  
a feedback resistor connected between said convergence coil and ground for supplying a feedback signal to said amplifier;  
a positive power source voltage supplying circuit which supplies a first voltage to said first current supplying circuit during a blanking period of said input video signal and which supplies a second voltage, lower than said first voltage, to said first current supplying circuit during a scanning period of said input video signal, both said first voltage and said second voltage being positive; and  
a negative power source voltage supplying circuit which supplies a third voltage to said second current supplying circuit during said blanking period of said input video signal and which supplies a fourth voltage to said second current supplying circuit during said scanning period of said input video signal, both said third voltage and said fourth voltage being negative.

5,483,301

## OPTICAL DEVICE

Adrian M. Clarke, 1143 N. 60th Dr., Phoenix, Ariz. 85043

Filed May 26, 1992, Ser. No. 887,873

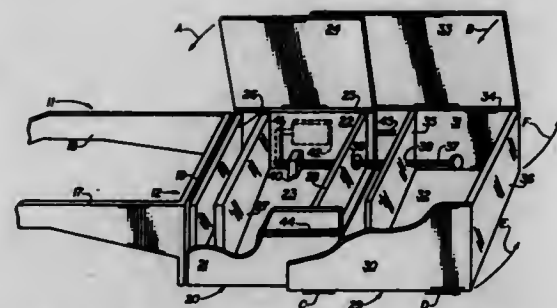
Int. Cl.<sup>6</sup> G02C 7/08; G02B 25/00

U.S. Cl. 351-41

5 Claims

1. An optical device including

- a pair of lenses;
- a frame for receiving each of said pair of lenses;
- attachment means for securing said frame on a user's head with each of said pair of lenses positioned over one of the user's eyes;
- a first housing (20);
- an eyepiece lens (26) mounted in said first housing;
- a second housing (29) mounted on said first housing and movable between at least two operative positions,
  - a first operative position with said second housing a selected distance away from said frame, and



- a second operative position with said second housing positioned a greater distance away from said frame than said selected distance;
- an objective lens (36) mounted in said second housing and optically associated with said eyepiece lens;
  - means for pivotally attaching said first housing to said frame directly above said pair of lenses in said frame for movement between at least two operative positions,
    - a first operative position with said eyepiece lens closely adjacent at least one of said pair of lenses, and
    - a second operative position with said housing and said eyepiece lens moved outwardly away from said pair of lenses; and,
  - at least one intermediate lens (28, 35) mounted on one of said first and second housings to receive light from said objective lens and direct the light received from said objective lens along a path of travel toward said eyepiece lens.

5,483,302

## ELASTIC SPECTACLE HINGE

Etienne Jaffelin, Les Roussees, France, assignor to Chevasus S.A., Morez, France

Filed Apr. 21, 1994, Ser. No. 230,925

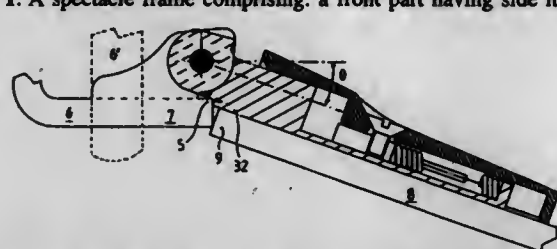
Claims priority, application France, May 4, 1993, 93 05543

Int. Cl.<sup>6</sup> G02C 5/16; 5/22

U.S. Cl. 351-113

19 Claims

1. A spectacle frame comprising: a front part having side lugs;



side arms pivotally connected to said side lugs; an elastic hinge comprising a front-hinge element fixed to one of said side lugs; a side-hinge element connected by elastic biasing means to one of said side arms, said one of said side arms having an end with an outer edge bearing against a fixed heel extending from a member selected from a group consisting of said one of said side lugs and a said front-hinge element, wherein said side-hinge element comprises, in a face directed towards said side arm, a planar recessed edge forming with a joining plane of said fixed heel and said bearing end of said one end of said side arms, when the latter is in the open position, an angle equal to a desired maximum angle of rotation ( $\theta$ ), after which said planar recessed edge comes to bear against an abutment-forming inside angled edge of said heel, wherein said heel and said planar recessed edge of said side-hinge element extends beyond an axis of said hinge by a distanced greater than about 3 millimeters.

5,483,303

## SPECTACLES HAVING ADJUSTABLE TEMPLES AND EAR ENGAGING MEMBERS

Richard Hirschman, Albertson, N.Y., assignor to Hudson Optical Corporation, Bohemia, N.Y.

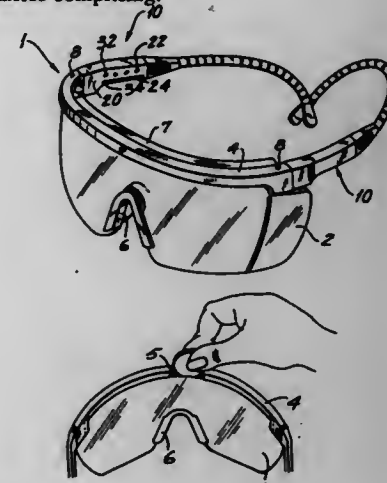
Filed May 23, 1994, Ser. No. 247,265

Int. Cl.<sup>6</sup> G02C 5/20

U.S. Cl. 351-118

15 Claims

1. Spectacles comprising:



- a frame;
- an eye shield located in said frame; and
- a pair of temples attached to said frame, each of said temples including:
  - an outer housing attached to said frame;
  - an inner sleeve slidably located within said outer housing;
  - an adjustable ear engaging member attached to said inner sleeve; and
  - an indicator for indicating a location of said inner sleeve relative to said outer housing; wherein said indicator comprises an elongated slot formed in a bottom portion of said outer housing and a stop member located on said inner sleeve to be visible through said elongated slot and to provide an indication of a location of said inner sleeve relative to said outer housing.

5,483,304

## MULTIFOCAL CONTACT LENS

Menachem Porat, Kibbutz Hanita, Israel, assignor to Hanita Lenses, Israel

Continuation-in-part of Ser. No. 919,807, Jul. 24, 1992, abandoned. This application Aug. 4, 1993, Ser. No. 101,952

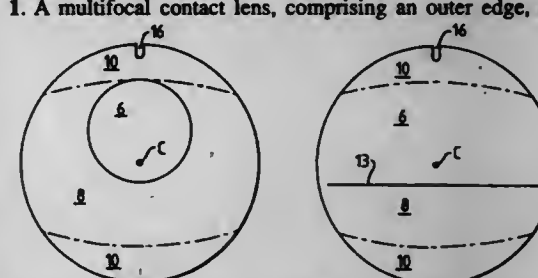
Claims priority, application Israel, Jul. 26, 1991, 98971

Int. Cl.<sup>6</sup> G02C 7/04

U.S. Cl. 351-161

10 Claims

1. A multifocal contact lens, comprising an outer edge, a rear



surface configured to float on a tear film covering the user's cornea and a front surface comprised of at least two contiguous surface segments, an upper surface segment optically configured to serve for distance vision and a lower surface segment optically configured to serve for near vision, characterized in that, in at least one peripheral zone of said lens there is provided at least one recess constituting a preferred escape aperture for parts of said tear film

displaced when said contact lens slides down the user's cornea, said escape aperture being located in said peripheral zone of said rear surface and opening onto said outer edge of said lens, to the effect of substantially preventing rotation of said contact lens during lens translation, as well as of optimizing said translation.

5,483,305

## EYE EXAMINING APPARATUS

Yoshimi Kohayakawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1994, Ser. No. 184,046

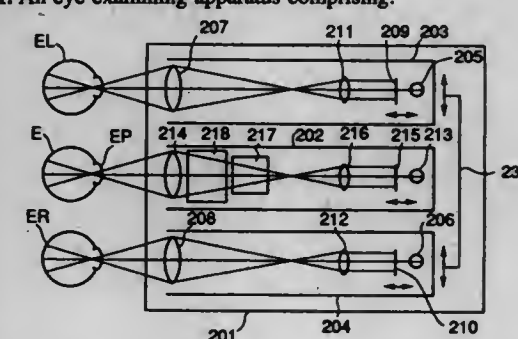
Claims priority, application Japan, Jan. 25, 1993, 5-029873; Apr. 21, 1993, 5-117795

Int. Cl.<sup>6</sup> A61B 3/02

U.S. Cl. 351-243

13 Claims

1. An eye examining apparatus comprising:



a plurality of visual target projecting systems for projecting visual targets onto left and right eyes;  
a visual target unit for an eye to be examined, and adapted to be projected onto the eye to be examined by one of said plurality of visual target projecting systems, said visual target unit having a first visual target mark for optometry; and  
a visual target for an other eye adapted to be projected onto the other eye examined by another one of said plurality of visual target projecting systems, said visual target for the other eye being provided with a second visual target mark that is the same as said first visual target mark for optometry except that the second visual target mark is non-directional, wherein said plurality of visual target projecting systems project said visual target unit and said visual target onto the left and right eyes simultaneously.

5,483,306

## SOUNDTRACK INTERFACE FOR MOTION PICTURE PROJECTOR

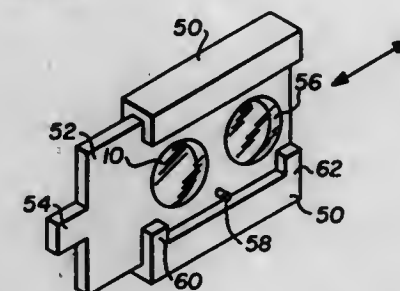
Nestor M. Rodriguez, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 17, 1994, Ser. No. 245,109

Int. Cl.<sup>6</sup> G03B 31/02

U.S. Cl. 354-10

4 Claims



1. A soundtrack interface for a motion picture projector having an optical soundtrack sensing system including a light source and a

photo detector, and a sound amplifier connected to the soundtrack sensing system, comprising:

- a) an infrared filter;
- b) means for moving said infrared filter into the optical path between the light source and the photo detector when a film having a dye only soundtrack is to be projected, and for moving said infrared filter out of said optical path when a film having a silver soundtrack is to be projected;
- c) a preamplifier; and
- d) means for switching said preamplifier into a circuit between the photo detector and the sound amplifier when a film having a dye only soundtrack is to be projected and out of said circuit when a film having a silver soundtrack is to be projected.

5,483,307

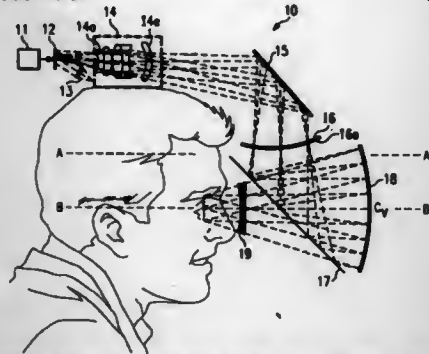
**WIDE FIELD OF VIEW HEAD-MOUNTED DISPLAY**  
Douglas W. Anderson, Richardson, Tex., assignor to Texas Instruments, Inc., Dallas, Tex.

Filed Sep. 29, 1994, Ser. No. 314,977

Int. Cl. G02B 27/10

U.S. Cl. 353-98

13 Claims



1. A display to be worn on the head of a viewer, comprising:
  - a spatial light modulator for generating images as a beam of light;
  - a projection lens for receiving the beam of light from said spatial light modulator and for projecting that beam of light to a projection screen;
  - a projection screen for receiving the beam of light from said projection lens and for providing said images on its output surface, said projection screen being both transmissive and diffusive of said beam of light;
  - a beam splitter in the path of the beam of light from said projection screen;
  - a reflector for receiving the beam of light reflected from said beam splitter and for reflecting said light to the viewer, such that said image appears to be distant with respect to said viewer;
  - an eyepiece in the path of said beam of light from said reflector to said viewer's eyes, said eyepiece having a negative lens.

5,483,308

**APPARATUS AND METHOD FOR DISPLAYING FLOOR, CEILING, AND WALL COVERINGS**

Ray Youngker, 2472 Hitching Post, Allison Park, Pa. 15101, and Henry J. Oles, P.O. Drawer 1745, San Marcos, Tex. 78667

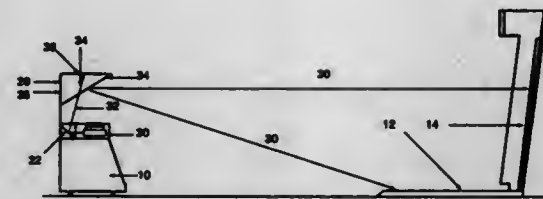
Filed Aug. 30, 1994, Ser. No. 298,059

Int. Cl. G03B 21/28

U.S. Cl. 353-99

12 Claims

5. An apparatus for displaying floor, ceiling, and wall coverings, comprising:
  - projecting means for projecting an image using light;
  - beamsplitting means for directing the light to a retroreflective screen mounted vertically in front of said beamsplitting means and a retroreflective screen mounted horizontally in front of said beamsplitting means;



said retroreflective screens reflect the light containing said image back to said beamsplitting means; and the reflected image being viewable through said beamsplitting means when viewing said reflected image from a position behind said beamsplitting means.

5,483,309

**SLIDE PROJECTOR**

Bernd Phillips, Untergruppenbach, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

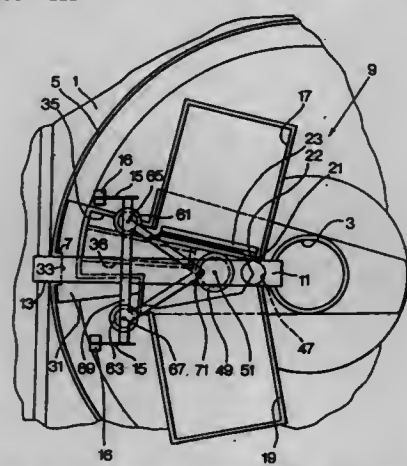
Filed Nov. 15, 1994, Ser. No. 339,851

Claims priority, application Germany, Nov. 15, 1993, 43 38 924.4

Int. Cl. G03B 23/02

U.S. Cl. 353-111

11 Claims



1. A slide projector comprising a chute (37) having a chute opening for feeding a slide (21, 24) to be projected to a projection gate, a projector drive for actuating a movable arm for ejecting a slide in the chute (37) out of said chute, a stack loader (9) adapted to be mounted above the opening of the chute and having a first and second storage chamber (17 and 19) each said chamber being capable of holding a stack of slides which are in contact with one another, and a feeding device (27, 28) for pushing the stack of slides in at least one of the storage chambers relative to the opening of the chute (37) and into a position in which the end slide (21, 24) of the stack is movable out of said storage chamber as the slide to be projected and into the chute (37) and in which a projected slide is movable out of the chute (37) by the arm and into the other storage chamber, is characterized in that:
  - the stack loader (9) includes a slide receiving member (31) having at least a first and a second slide compartment (35, 36) open on the underside, which is movable relative to the chute (37) and by the projector drive in order to align the opening in the bottom of one of the slide compartments (35, 36) with the opening of the chute (37), and that transport means (47, 49, 61, 63) are provided which are controllable in response to the movement of the receiving member (31), by which said transport means the end slide (21, 24) to be projected of the stack in a selected storage chamber (17, 19) can be inserted into the one slide compartment (35, 36) and a slide in the other slide compartment (35, 36) can be removed from said compartment and returned as the end slide to the stack in the other storage chamber (17, 19).

5,483,310

**FILM CARTRIDGE AND A CAMERA EMPLOYING THE FILM CARTRIDGE**

Junichi Tanii; Takahisa Shimada; Masaaki Chikasaki; Sadafusa Tsuji, and Yoshinobu Kudo, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

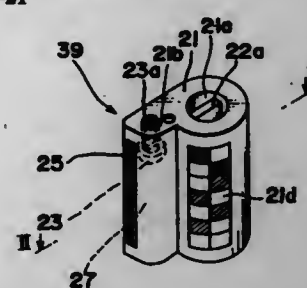
Continuation of Ser. No. 38,660, Mar. 29, 1993, abandoned, which is a division of Ser. No. 946,552, Sep. 17, 1992, Pat. No. 5,220,371, which is a continuation of Ser. No. 865,741, Apr. 8, 1992, abandoned, which is a continuation of Ser. No. 701,340, May 9, 1991, abandoned, which is a continuation of Ser. No. 389,869, Aug. 4, 1989, abandoned. This application Dec. 28, 1994, Ser. No. 365,331

Claims priority, application Japan, Aug. 5, 1988, 63-196817; Jan. 22, 1988, 63-266543; Jan. 25, 1988, 63-269205; Jan. 25, 1988, 63-269206

Int. Cl. G03B 7/00

U.S. Cl. 354-21

52 Claims



1. A camera for using a film cartridge which includes a shaft set in a first predetermined rotary phase when film in the film cartridge is unused, said camera comprising:
  - means for rotating the shaft of the film cartridge to rewind used film into the film cartridge; and
  - means for setting the shaft of the film cartridge in a second predetermined rotary phase after rewinding of the film by said rotating means is finished.

5,483,311

**PROJECTION EXPOSURE APPARATUS**

Yasuyuki Sakakibara, Ichikawa; Susumu Makinouchi, Zama; Nobutaka Magome, and Naomasa Shiraishi, both of Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 986,630, Dec. 17, 1992, Pat. No. 5,343,270, which is a continuation-in-part of Ser. No. 946,013, Sep. 15, 1992, abandoned, which is a continuation of Ser. No. 820,244, Jan. 14, 1992, abandoned, which is a continuation-in-part of Ser. No. 709,278, Jun. 3, 1991, abandoned. This application May 27, 1994, Ser. No. 249,988

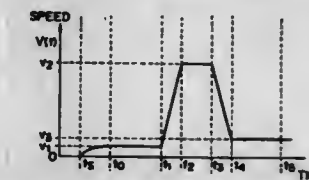
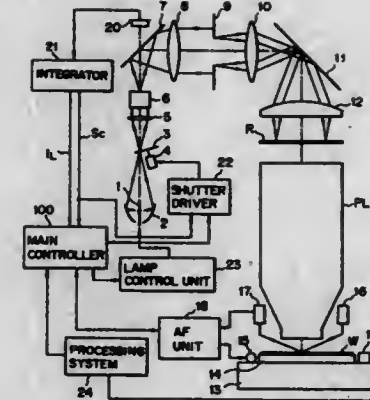
Claims priority, application Japan, Jan. 30, 1990, 2-293162; Sep. 11, 1991, 3-231530; Dec. 12, 1991, 3-328907

Int. Cl. G03B 27/42

U.S. Cl. 355-53

19 Claims

1. A method for fabricating a circuit device on a substrate by using a projection exposure apparatus, the method comprising the steps of:
  - (a) disposing said substrate under a projection optical system of said exposure apparatus;
  - (b) exposing said substrate with a pattern image of said circuit device projected by said projection optical system for a predetermined exposure time period; and
  - (c) changing a positional relationship of said substrate and a best imaging plane of said projected pattern image along an optical axis of said projection optical system with a predetermined velocity characteristic during said exposure time period, said velocity characteristic being determined so that the velocity during a mid portion of said exposure time period is a substantially constant large velocity and the velocity during each



of start and end portions of said exposure time period is much smaller than said large velocity.

5,483,312

**MECHANISM FOR POSITIONING A MAGNETIC HEAD RELATIVE TO A MAGNETIC SURFACE ON A PHOTOGRAPHIC FILM**

Shigeru Wada, Kishiwada, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

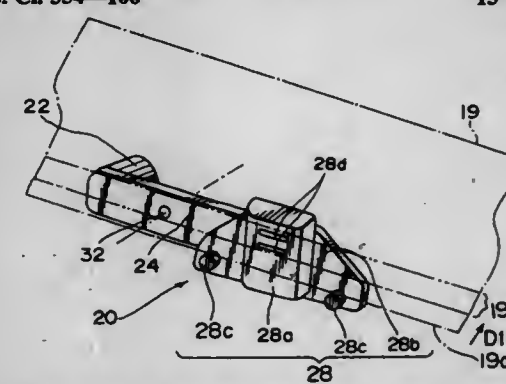
Filed Jul. 26, 1993, Ser. No. 95,544

Claims priority, application Japan, Jul. 29, 1992, 4-202214

Int. Cl. G03B 17/24

U.S. Cl. 354-106

13 Claims



1. A mechanism, for positioning a magnetic head relative to a magnetic surface of a film, for use in an apparatus in which the film is used, comprising:
  - a magnetic head assembly having a magnetic head for reading and/or writing magnetic information with respect to the magnetic surface of the film and a positioning member which positions the magnetic head relative to the magnetic surface of the film by contacting an edge extending longitudinally of the film;
  - a balancer;
  - a bias member which biases the positioning member towards the edge of the film; and
  - a lever which is mounted by a pivot on a frame of the apparatus such that said lever is rotatable about said pivot but incapable of translational movement in a direction transverse to a longitudinal direction.



itudinal direction of said lever, wherein the magnetic head assembly is mounted on the lever at one end thereof relative to the pivot whereas the balancer is mounted on the lever at the other end thereof, and wherein the pivot is positioned in the vicinity of a center of gravity of a total system including the magnetic head assembly, the lever and the balancer.

5,483,313

# CAMERA HAVING BUILT-IN MAGNETIC RECORDING AND REPRODUCING APPARATUS INCLUDING A NOVEL RECORD/PLAYBACK HEAD

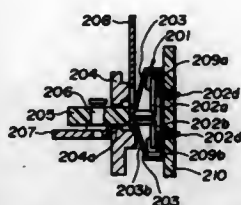
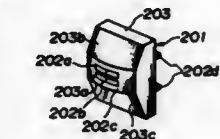
Masaki Nagao, Tokyo, and Masaki Tokui, Kanagawa, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan Division of Ser. No. 98,022, Jul. 28, 1993. This application Apr. 28, 1994, Ser. No. 233,936

Claims priority, application Japan, Jul. 31, 1992, 4-205464; Aug. 26, 1992, 4-227558; Aug. 26, 1992, 4-227561

Int. Cl.<sup>6</sup> G03B 17/24

U.S. Cl. 354-106

8 Claims



6. A camera using photographic film containing a magnetic information recording portion, magnetic means pressing against the magnetic information recording portion when the film is transported, and having a magnetic head for magnetically recording or reproducing data, comprising:

a cover case housing the magnetic head and having an opening surrounding and exposing a portion of the magnetic head having an air gap to permit engagement of said portion with said magnetic information recording portion for reproducing or recording;

the magnetic head being tapered in a direction separating from the film so that all surface portions of the cover case surrounding the opening and facing the film are inclined in a direction away from a photographic picture plane of the film.

5,483,314

# FILM CARTRIDGE LOADING APPARATUS FOR CAMERA

Joel S. Lawther, Rochester, and Donald P. McGinn, Palmyra, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 1, 1994, Ser. No. 205,001

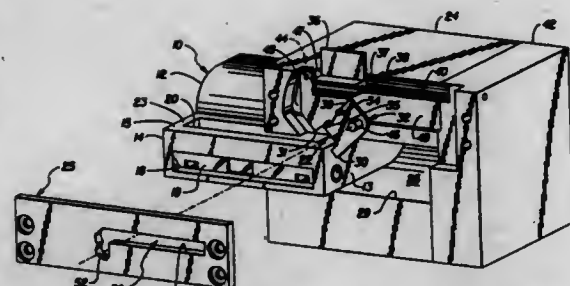
Int. Cl.<sup>6</sup> G03B 19/10; 17/26; 17/02

U.S. Cl. 354-174

18 Claims

1. A camera having a loading chamber for receiving a film cartridge of the type having positive engagement means formed therein comprising:

a loading chamber for receiving said film cartridge loaded manually through an end opening thereof; and positive insertion means operable upon partial manual loading of the cartridge through said end opening into engagement with said positive engagement means for positively pulling and seating said film cartridge fully into said loading chamber to assure the user that said film cartridge is loaded properly in said loading chamber, said film cartridge further including an elongated cartridge shell for retaining a photographic filmstrip



and said positive engagement means further including an elongated retention slot formed in said cartridge shell along the length thereof.

5,483,315

# APPARATUS FOR WET PROCESSING PHOTOGRAPHIC SHEETS

Wilfried Hehn, Munich, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Munich, Germany

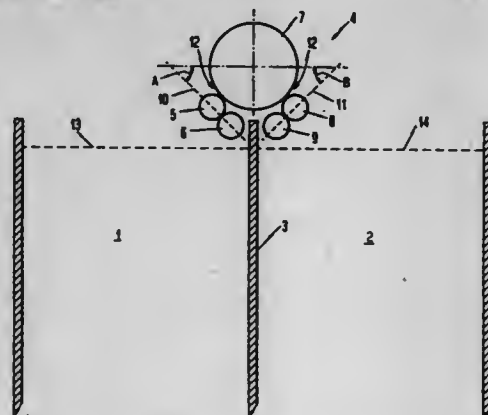
Filed Apr. 8, 1994, Ser. No. 225,465

Claims priority, application Germany, Apr. 8, 1993, 43 11 642.6

Int. Cl.<sup>6</sup> G03D 3/08

U.S. Cl. 354-320

9 Claims



1. An apparatus for processing sheet-like emulsion carders, comprising:

a first processing container;

a second processing container next to said first container;

a pair of first rollers arranged to withdraw a sheet-like emulsion carder from said first container, said first rollers having first axes which define a first plane inclined to the horizontal;

a pair of second rollers arranged to feed the carder into said second container, said second rollers having second axes which define a second plane inclined to the horizontal, and said first rollers cooperating with said second rollers to define a space; and

an additional roller arranged to direct a leading end of the carder from said first rollers to said second rollers, at least a portion of said additional roller being located in said space, said first rollers have first diameters and said second rollers have second diameters, said additional roller having an additional diameter, which is greater than at least one of said first and second diameters.

5,483,316

# FILM CHIP TRANSPORT ASSEMBLY FOR FILM PROCESSING ASSEMBLY

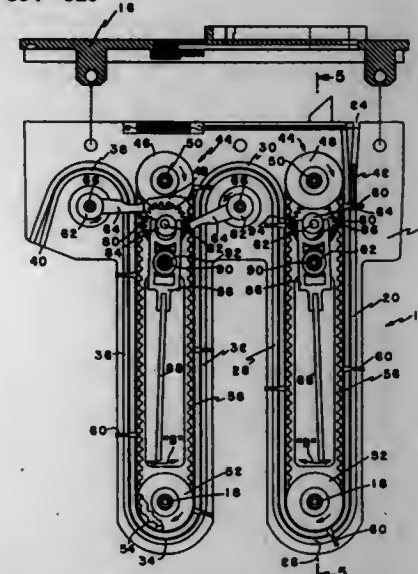
Ernest Zwettler, Temecula, Calif., assignor to Air Techniques, Inc., Hicksville, N.Y.

Filed Jul. 8, 1994, Ser. No. 272,139

Int. Cl.<sup>6</sup> G03D 3/08; 3/04

U.S. Cl. 354-320

3 Claims



1. A film chip transport assembly for a film chip processor comprising:

a channel formed by spaced wall members having lower curved portions and upper curved portions; a groove formed in opposing surfaces of said spaced wall members forming a transport path through said channel for a vertically-oriented film chip;

an endless belt member vertically disposed above each lower curved portion and including outwardly-extending pin members extending into said channel;

an upper lifter mounted for rotation about an axis substantially at the center of each upper curved portion of said channel, said upper lifter timed to rotate to a pin member on said endless belt member to transport said film chip through a respective upper curved portion of said channel;

a gear associated with each upper lifter;

a gear associated with each endless belt member;

a power gear coupled to engage said gears; and

a stirring assembly including a paddle member vertically-disposed in a space defined by said endless belt member.

5,483,317

# FILM DEVELOPING DEVICE

Toru Tanibata, Wakayama, Japan, assignor to Noritsu Koki Co., Ltd., Japan

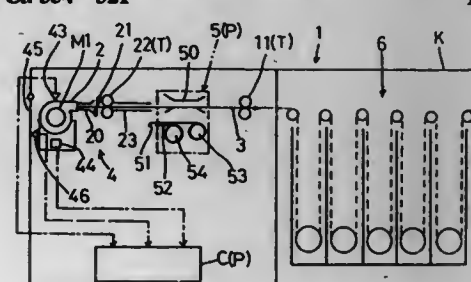
Filed Apr. 25, 1994, Ser. No. 232,939

Claims priority, application Japan, May 10, 1993, 5-108095

Int. Cl.<sup>6</sup> G03D 3/08

U.S. Cl. 354-321

12 Claims



1. A film developing apparatus comprising:

a film holder holding a film;

a loading section for receiving said film holder;

a developing section for developing said film;

film transport means for transporting said film protruding from a film feed opening of said film holder to said developing section;

film drawing means for drawing a leader of said film in said film holder mounted in said loading section, out through said film feed opening; and

a film guide for guiding the film drawn from said film holder; wherein said film drawing means includes upper and lower leader pinch plates for together pinching the film therebetween to draw the film from said film holder, drive means for driving said upper leader pinch plate from the outside of said film holder to the inside thereof, further drive means for driving said lower leader pinch plate from the outside of said film holder to the inside thereof, and a control unit for controlling various components, said control unit being capable of selectively providing a state where said film guide is positioned at a height where the film is to be transported and a further state where said upper and lower leader pinch plates are positioned at said height.

5,483,318

# FOCUS DETECTING PHOTOELECTRIC CONVERTING APPARATUS FOR A CAMERA

Masataka Hamada, Osakayama; Kazuhiko Yukawa, Wakayama; Tokuji Ishida, Daito; Toshio Norita, Yokohama, and Hiroshi Ueda, Habikino, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 956,461, Oct. 2, 1992, abandoned, which is a continuation of Ser. No. 581,886, Sep. 13, 1990, abandoned. This application Jun. 3, 1994, Ser. No. 253,598

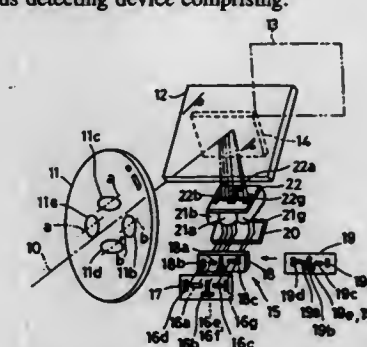
Claims priority, application Japan, Sep. 13, 1989, 1-237768

Int. Cl.<sup>6</sup> G03B 13/36

U.S. Cl. 354-402

29 Claims

1. A focus detecting device comprising:



(a) a line sensor, disposed on a substrate, including a continuous row of storage type photoelectric converting elements which operate as a plurality of blocks, each of said blocks contains part of the photoelectric converting elements, (b) focus detecting means for performing focus detection with respect to said blocks based on the output of said photoelectric converting elements,

(c) light receiving means having a plurality of light receiving sensors, each light receiving sensor being provided on the same substrate as the line sensor near the corresponding

block, an output of each light receiving sensor is processed independently so as to detect the amount of incident light of the corresponding block, and

(d) storage controlling means for controlling the storage amount of charge to said line sensor based on the output of said light receiving means.

5,483,319

### CAMERA CAPABLE OF PHOTOGRAPHING WITH FLASH

Hiroshi Sakamoto, Kawasaki; Nobuyoshi Haguda, Yokohama; Hideki Matsui, Fujisawa, and Ryotaro Takayanagi, Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 102,760, Aug. 6, 1993, abandoned.

This application Feb. 21, 1995, Ser. No. 391,471

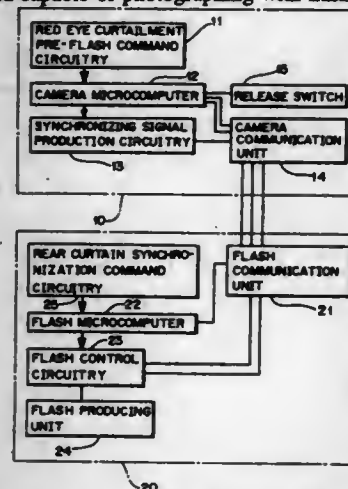
Claims priority, application Japan, Aug. 25, 1992, 4-226029; Sep. 14, 1992, 4-064130 U

Int. Cl.<sup>6</sup> G03B 7/00

U.S. Cl. 354—415

8 Claims

1. A camera capable of photographing with flash comprising:



- a red eye phenomenon reduction emission means for performing a pre-light emission to curtail red eye;
- a pre-light emission command means for commanding the pre-light emission;
- a pre-light emission control means for controlling said red eye phenomenon reduction emission means so that pre-light emission is performed prior to a shutter release when commanding the pre-light emission;
- a rear synchronized photography command means for commanding rear synchronized photography;
- a primary flash control means for controlling flash so that when the rear synchronized photography is commanded, in response to the shutter release, a primary flash is performed with a first timing, and when there is no command for rear synchronized photography, the primary flash is performed with a second timing which is faster than the first timing in response to the shutter release; and
- a setting means for establishing a high speed which is faster than a specified shutter speed, when a command is given for both the pre-light emission and the rear synchronized photography.

5,483,320

### EXPOSURE CONTROL APPARATUS FOR CAMERA

Hiroshi Aoki, Tokyo; Hiroshi Wakabayashi, Yokohama; Dalki Tsukahara, Hiratsuka, and Hidenori Miyamoto, Urayasu, all of Japan, assignors to Nikon Corporation, Tokyo, Japan  
Continuation of Ser. No. 131,596, Oct. 5, 1993, abandoned, which is a division of Ser. No. 946,774, Sep. 18, 1992, Pat. No. 5,258,805, which is a continuation of Ser. No. 784,914, Oct. 30, 1991, abandoned, which is a division of Ser. No. 644,232, Jan. 22, 1991, Pat. No. 5,086,314, which is a continuation-in-part of Ser. No. 525,832, May 21, 1990, abandoned. This application Aug. 10, 1994, Ser. No. 288,163

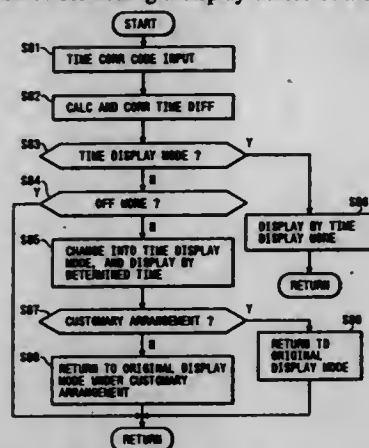
Claims priority, application Japan, May 25, 1989, 1-131894; Dec. 21, 1989, 1-332300; Jan. 22, 1990, 2-10539; Jan. 22, 1990, 2-10540; Jan. 26, 1990, 2-15076; Apr. 19, 1990, 2-101815

Int. Cl.<sup>6</sup> G03B 17/18

U.S. Cl. 354—475

25 Claims

1. A method of controlling a display device of a camera in date



and time display modes in which date information and time information are displayed, respectively, comprising:  
supplying calendar information including date information and time information;  
supplying time-difference information;  
correcting said calendar information on the basis of said time-difference information; and  
causing the display device to change from a currently selected one of said display modes to the other in response to the correcting of said calendar information.

5,483,321

### ELECTROGRAPHIC ELEMENT HAVING A COMBINED DIELECTRIC/ADHESIVE LAYER AND PROCESS FOR USE IN MAKING AN IMAGE

Douglas A. Cahill, Belchertown; Donald A. Brault, Granby; Richard S. Himmelwright, Wilbraham, and Dene H. Taylor, Holyoke, all of Mass., assignors to Rexam Graphics, South Hadley, Mass.

Continuation-in-part of Ser. No. 115,563, Sep. 3, 1993, Pat. No. 5,363,179, which is a continuation-in-part of Ser. No. 42,278, Apr. 2, 1993, abandoned. This application Mar. 29, 1994, Ser. No. 219,395

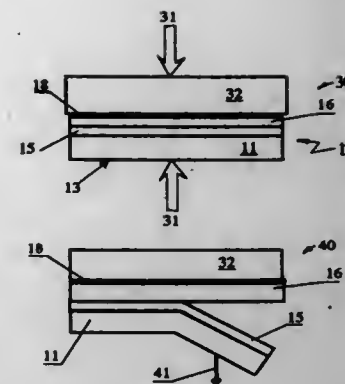
Int. Cl.<sup>6</sup> G03G 5/00; B44C 1/00

U.S. Cl. 355—200

42 Claims

1. An electrographic element for generating an image on a substrate, comprising:

- a) a conductive base having a front and a back side,
- b) a release layer on said front side,
- c) a single, substantially tack-free at ambient temperature, charge receptive combined transparent dielectric and adhesive layer on said release layer for accepting a charge deposited electrographically on its surface to form a latent image and whose adhesive properties are activated at a temperature which is above the ambient temperature of the electrographic element.



5,483,322

### DEVELOPING UNIT FOR AN ELECTROPHOTOGRAPHIC APPARATUS

Yukio Otome; Kouji Doi; Youichi Takeuchi; Koutaro Yamada; Yoshio Ogura, and Hiroshi Ueno, all of Ibaraki, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1994, Ser. No. 269,078

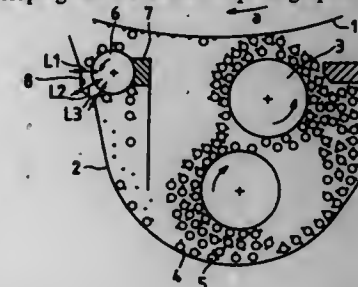
Claims priority, application Japan, Jun. 30, 1993, 5-162368

Int. Cl.<sup>6</sup> G03G 21/00

U.S. Cl. 355—215

3 Claims

1. A developing unit for an electrophotographic apparatus, com-



prising:

- a photosensitive body for forming a latent image thereon;
- a developing roll utilizing a two-component developer containing toner and carrier to develop the latent image formed on said photosensitive body;
- a recovery roll provided downstream of said developing roll, for recovering carrier from a surface of said photosensitive body, said recovery roll being rotated in a direction opposite to a direction of rotation of said photosensitive body;
- at least one recess formed in an inner surface of said developing unit which is confronted with an outer cylindrical surface of said recovery roll, in such a manner that air pressure formed in said recess prevents said developer from scattering out of said developing unit; and
- a scraping member abutting the outer cylindrical surface of said recovery roll at a location substantially opposite said recess.

5,483,323

### ELECTROPHOTOGRAPHIC APPARATUS UTILIZING A HOLLOW ROLLER CHARGING MECHANISM

Masanori Matsuda; Eiji Gotoh, and Akinori Nishida, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed May 31, 1994, Ser. No. 251,314

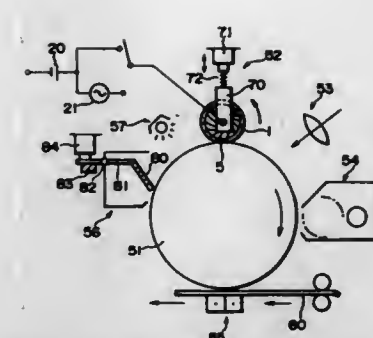
Claims priority, application Japan, May 31, 1993, 5-129271; Jun. 30, 1993, 5-162204

Int. Cl.<sup>6</sup> G03G 15/02

U.S. Cl. 355—219

4 Claims

1. In an electrophotographic apparatus comprising a movable, electrically chargeable, photosensitive material and, in the following order, a main electrical charging apparatus, an image-exposing mechanism, a developing mechanism, a transfer mechanism and a



cleaning member, said order being along a direction of movement of said photosensitive material, wherein said main electrical charging apparatus comprises a rotatable, flexible, hollow, electrically conducting roller and a rotatable, electrically conducting brush roller disposed within said hollow roller and concentric therewith, said hollow roller and said brush roller being rotatable relative to each other, said hollow roller being contactable with said photosensitive material, the improvement comprising:

said brush roller including a shaft supporting said brush roller for rotational movement, said hollow roller comprising an endless, flexible, electrically conducting sheet having a first end portion and a second end portion, each of said first and second end portions fixed on a respective roller flange, each of said roller flanges being disposed on said shaft supporting said brush roller for independent rotation thereabout;  
an elastic member is provided on each said roller flanges between a respective end portion of said endless, flexible, electrically conducting sheet and its respective roller flange so as to be covered by a respective portion of said endless, flexible, electrically conducting sheet, each said elastic member elastically forcing said respective covering portion of said endless, flexible, electrically conductive sheet against said photosensitive material when said photosensitive material is contacted by said hollow roller wherein movement of said photosensitive material causes rotation of said hollow roller.

5,483,324

### CHARGING DEVICE FOR AN IMAGE FORMING APPARATUS

Kazuo Otsuka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

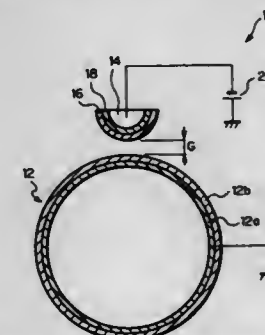
Filed Jul. 6, 1994, Ser. No. 267,206

Claims priority, application Japan, Jul. 6, 1993, 5-166733

Int. Cl.<sup>6</sup> G03G 15/02

U.S. Cl. 355—219

12 Claims



1. A charging device for charging an image carrier on which an electrostatic latent image is to be formed, comprising:  
a charging member facing said image carrier and spaced apart from said image carrier by a predetermined gap, said predetermined gap being within a range from 0.15 to 3.5 mm; and  
a power source for applying a predetermined voltage to said charging member,



wherein said charging member includes a conductive support and a conductive fibrous support affixed to a surface of said conductive support which faces said image carrier, said conductive fibrous support comprising one of a nonwoven fabric treated for electric conduction and a regularly woven webbing, and wherein said conductive fibrous support has an electric resistance within a range from  $10^1 \Omega\text{cm}$  to  $10^{10} \Omega\text{cm}$ .

5,483,325

# FRAME FOR MOUNTING PLURAL SHEETLIKE SMALL ORIGINALS FOR SIMULTANEOUS SCANNING/COPYING

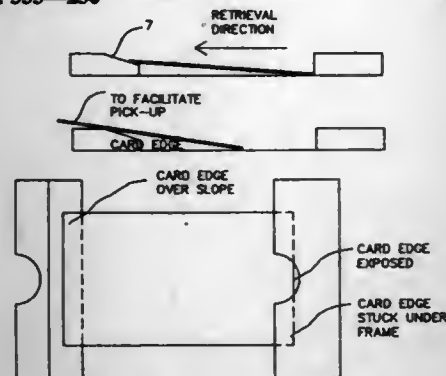
Chandra Bodapati, and Kamalarathnam Cherkure, both of c/o CypherTech, 250 E. Caribbean Dr., Sunnyvale, Calif. 94089

Filed Apr. 15, 1994, Ser. No. 228,276

Int. Cl. G03G 21/00

U.S. Cl. 355-230

8 Claims



1. An accessory frame for a copying device having a hold down cover and original setting glass platen wherein the platen is selected from a group comprising of electrophoto and electronic flatbed types each facilitating copying of plural sheet-like small originals, said accessory frame comprising:

- a sheet element having plural predetermined apertures wherein the edges of the apertures are configured to slope inwards and form a slope ending in a sharp edge and wherein the sheet element has a level under surface;
- means to easily locate and remove said small originals;
- an electrostatically active film for removably adhering said accessory frame steadfastly on the glass platen wherein the film is permanently attached to the under surface of the sheet element; and,
- an appropriate adhesive suitable for said electrostatically active film to permanently attach the film to the under surface of the sheet element.

5,483,326

# DEVELOPER CARRYING ROLLER HAVING A SURFACE LAYER WITH CONTOURED FINISH

Ronald T. Kosmider, Fairport, N.Y., assignor to R. T. Kosmider, Inc., Fairport, N.Y.

Filed Mar. 16, 1994, Ser. No. 214,683

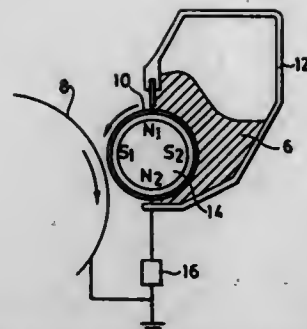
Int. Cl. G03G 15/06

U.S. Cl. 355-245

31 Claims

1. A developer carrying device for transferring a powdery developer in a developing apparatus from a supply of the powdery developer to a latent image bearing member, comprising:

- a developer carrying member for carrying the developer from the supply to a developing zone where the latent image bearing member passes; wherein the developer carrying member has a surface cut with a diamond to form a surface layer having surface finish defined by an Ra less than approximately 0.2 micro inches, an Rmax



of less than approximately 1.2 micro inches and an S value of less than approximately 35.5 micro inches; and wherein the surface layer is impacted with substantially spherical particles having a diameter of approximately 30 microns to form a contoured surface having an Ra of approximately 0.45 to 0.97 micro inches, an Rmax of approximately 3.8 to 4.7 micro inches and an S value of approximately 21.5 to 48.5 micro inches for transferring the developer from the supply to the developing zone.

5,483,327

# TONER FOR DEVELOPING ELECTROSTATIC IMAGE, FORMING APPARATUS AND PROCESS CARTRIDGE

Masaaki Taya, Kawasaki; Takaaki Kohtaki, Yokohama; Makoto Unno, Tokyo, and Tadaaki Doujo, Ebina, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan Division of Ser. No. 228,269, Apr. 15, 1994, Pat. No. 5,439,770.

This application Mar. 6, 1995, Ser. No. 398,791

Claims priority, application Japan, Apr. 20, 1993, 5-093181

Int. Cl. G03G 15/06

U.S. Cl. 355-245

48 Claims

1. An image forming apparatus, comprising: an electrostatic

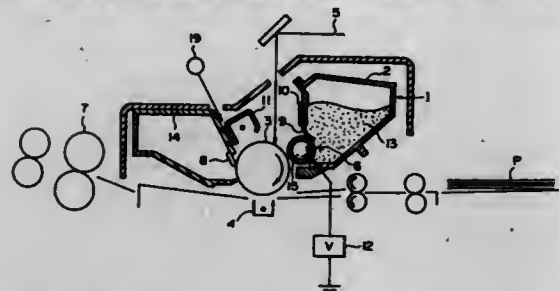
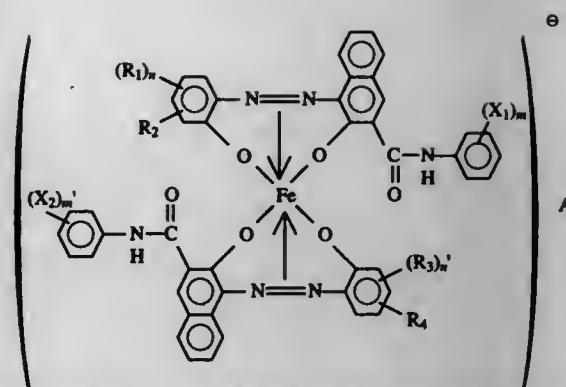


image-bearing member for holding an electrostatic image thereon, and a developing apparatus for developing the electrostatic image; said developing apparatus including a developer container for storing a developer and a developer-carrying member for carrying thereon and conveying the developer from the developer container to a developing region confronting the electrostatic image-bearing member;

wherein said developer contains a toner comprising at least a binder resin and a charge control agent; the binder resin having an acid value of 5-50; the charge control agent comprising an iron complex represented by the following formula:



wherein X<sub>1</sub> and X<sub>2</sub> independently denote hydrogen atom, lower alkyl group, lower alkoxy group, nitro group or halogen atom; m and m' denote an integer of 1-3; R<sub>1</sub> and R<sub>2</sub> independently denote hydrogen atom, C<sub>1-18</sub> alkyl or alkenyl, sulfonamide, mesyl, sulfonic acid group, carboxy ester group, hydroxy, C<sub>1-18</sub> alkoxy, acetyl-amino, benzoylamino or halogen atom; n and n' denote an integer of 1-3; R<sub>3</sub> and R<sub>4</sub> denote hydrogen atom or nitro group; and A<sup>⊖</sup> denotes hydrogen ion, sodium ion, potassium ion or ammonium ion;

the toner having a weight-average particle size (D<sub>w</sub>) of 4-9 μm and including toner particles having a particle size of 5 μm or smaller at 3-90% by number, toner particles having a particle size of 6.35-10.08 μm at 1-80% by number and toner particles having a particle size of 12.7 μm or larger at a percentage by volume of at most 2.0%, wherein the toner particles having a particle size of 5.0 μm or smaller are contained at N % by number and at V % by volume satisfying a relationship:

$$N/V = -0.05N + k,$$

wherein k is a positive number in the range of 3.0-7.5. 7.5.

5,483,328

# TONER SUPPLY CONTROL SYSTEM AND METHOD

Noriko Kawasaki; Akihiko Uematsu, and Katsumi Sugimoto, all of Kawasaki, Japan, assignors to Fujitsu, Ltd., Kawasaki, Japan

Continuation of Ser. No. 974,214, Nov. 10, 1992, abandoned.

This application Jun. 10, 1994, Ser. No. 258,603

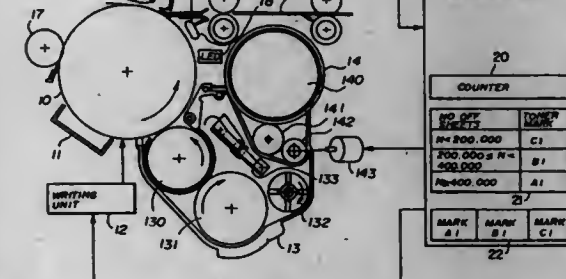
Claims priority, application Japan, Nov. 11, 1991, 3-294465

Int. Cl. G03G 21/00

U.S. Cl. 355-246

17 Claims

1. A toner supply control system for a printing device compris-



ing:

electrostatic image carrying means for carrying a latent image; toner supply means for supplying a two-component toner containing toner particles and carrier particles; storage means for storing information concerning a plurality of toner supply control marks; first control means, for generating a control signal based on a condition of the two component toner;

toner mark selector means, coupled to said storage means, for selecting a mark from the plurality of toner supply control marks based on said control signal; toner supply control mark forming means for forming the selected mark of said plurality of toner supply control marks on the electrostatic image carrying means; detector means for optically reading said formed selected mark and generating a detection signal; and second control means, coupled to said toner supply means and said detector means, for controlling the toner supply means based on said detection signal.

5,483,329

# CARRIER FOR DEVELOPER AND METHOD OF ELECTROPHOTOGRAPHICALLY FORMING VISUAL IMAGE USING SAME

Masumi Asanase, and Tutomu Saitoh, both of Kumagaya, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Aug. 22, 1994, Ser. No. 292,957

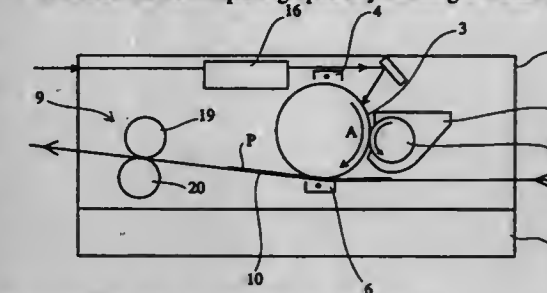
Claims priority, application Japan, Aug. 24, 1993, 5-209073

Int. Cl. G03G 15/06; 15/24

U.S. Cl. 355-269

8 Claims

1. A method of electrophotographically forming a visual image



on a recording sheet, comprising the steps of:

- forming an electrostatic latent image on an image-bearing member;
- developing said electrostatic latent image by contacting said image bearing member with a magnetic brush of a developer to form a toner image, said developer including a toner and a carrier, whereby said carrier is composed of iron particles having non-spherical shapes, an average size of 10-50 μm, and particle sizes of less than 10 μm in proportion of 0.01-60 weight % based on a total amount of said carrier, and wherein said carrier also includes a resin layer formed on a surface of each of said iron particles; and
- transferring said toner image to a recording sheet, wherein any residual toner remaining on said image-bearing member after the above transferring step (c) is removed in the developing step (b).

5,483,330

# IMAGE TRANSFER UNIT OF IMAGE FORMATION APPARATUS

Hironori Ogiyama, Tokyo, and Hiroyoshi Haga, Kawaguchi, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 23, 1992, Ser. No. 966,009

Claims priority, application Japan, Jan. 24, 1991, 3-278054;

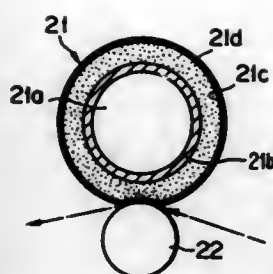
Nov. 5, 1991, 3-288812; Jul. 29, 1992, 4-201677

Int. Cl. G03G 15/14

U.S. Cl. 355-277

5 Claims

3. An image transfer unit comprising an image bearing member upon which a toner image is to be formed, and an image transfer member which holds a transfer sheet to which said toner image is to be transferred as said transfer sheet is fed between said image bearing member and said image transfer member, said image bearing member having an elastic layer with which said image transfer member is in pressure contact to form an arc-shaped



concave portion in said elastic layer of said image bearing member, such that said arc-shaped concave portion is provided in said elastic layer when at least a portion of said transfer sheet is fed between said image bearing member and said image transfer member;

wherein an outer diameter of said image transfer roller decreases at opposite ends thereof from an internal area thereof at which said image bearing member is in contact, and wherein said internal area corresponds to an area within a chargeable region of said image bearing member.

5,483,331

# TEXTURED CONTACT ROLLERS AND THE METHOD OF USING THEM FOR IMPROVING ELECTRICAL CONTACT WITH A FUSER BELT FUSING

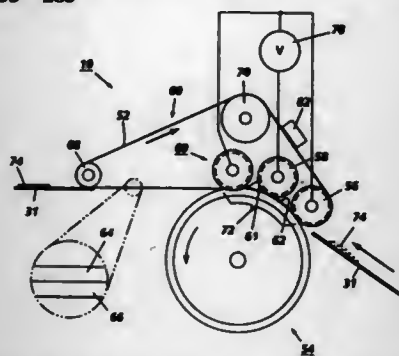
William H. Wayman, Ontario, and Rasin Moser, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 16, 1993, Ser. No. 168,835

Int. Cl.<sup>6</sup> G03G 15/20

U.S. Cl. 355—285

16 Claims



1. A heat and pressure fuser for fusing toner images onto substrates, said fuser comprising:

- an electrically resistive belt;
- a plurality of electrically conductive rollers for supporting said belt for movement in an endless path;
- a pressure roll cooperating with some of said rollers to form an extended fusing zone therebetween;
- means for electrically biasing some of said rollers for effecting heating a segment or segments of said belt in said extended fusing zone;
- means for applying release agent material to an outer surface of said belt; and
- means for effecting good electrical contact between said some of said rollers and said belt in the presence of release agent material.

5,483,332

# DISPLACEMENT INFORMATION DETECTING APPARATUS AND DOPPLER VELOCIMETER APPARATUS

Makoto Takamiya, Tokyo; Jun Ashiwa; Hidejiro Kadowaki, both of Yokohama, and Yasuhiko Ishida, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 59,851, May 11, 1993, abandoned.

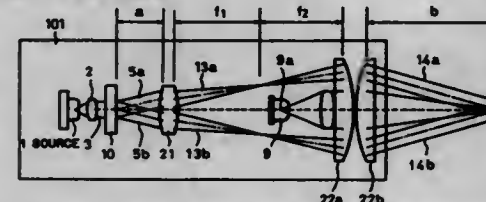
This application Apr. 10, 1995, Ser. No. 419,746

Claims priority, application Japan, May 15, 1992, 4-123595

Int. Cl.<sup>6</sup> G01P 3/36

U.S. Cl. 356—28.5

30 Claims



1. A displacement information detecting apparatus comprising:
  - a light source for producing light;
  - a diffraction grating for diffracting light received from said light source;
  - a first lens system and a second lens system for transmitting the diffracted light from said diffraction grating to irradiate a portion of a movable object to be examined, said first lens system and said second lens system having the same focal length  $F$  and being spaced apart from each other along an optical axis of said lens systems by an interval twice the focal length  $F$ , and being arranged so that an interval between said diffraction grating and said first lens system is different from an interval between said second lens system and the irradiated portion, and so that spherical aberration caused by a portion of said first lens system through which the diffracted light from said diffraction grating travels is substantially offset by spherical aberration caused by a portion of said second lens system through which the diffracted light from said first lens system travels; and
  - a light receiving device for receiving light from the portion of the object irradiated with the diffracted light which has been transmitted through said first lens system and said second lens system, and for producing information related to displacement of the irradiated portion of the object.

5,483,333

# METHOD AND APPARATUS FOR DETERMINING THE EXACT POSITION OF A TARGET USING A RECEIVING DEVICE COMPRISING A LINEAR ACTIVE PART FORMED FROM A VARIETY OF DISCRETE RADIATION-SENSITIVE ELEMENTS

Paul Dancer, 42100 Saint Etienne, France, assignor to Technomed Medical Systems, Vaulx-en-Velin, France

PCT No. PCT/FR92/00798, § 371 Date Apr. 26, 1994, § 102(e) Date Apr. 26, 1994, PCT Pub. No. WO93/04380, PCT Pub. Date Mar. 4, 1993

PCT Filed Aug. 18, 1992, Ser. No. 196,150

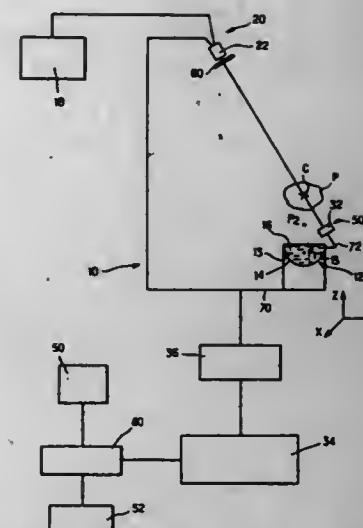
Claims priority, application France, Aug. 21, 1991, 91 10498; Apr. 30, 1992, 92 05413

Int. Cl.<sup>6</sup> G01B 11/26; G06F 15/00

U.S. Cl. 356—152.1

55 Claims

1. A method for determining the exact position of a target (C) relative to a reference point (O) for use in the treatment of target (C), comprising the steps of:
  - placing an emission device having a radiation source and a known position relative to the reference point (O) on a side of said target (C), for irradiating a zone containing said target (C);
  - placing, on a side of said target (C) opposite the side having said emission device, a receiver in the form of a bar comprising a linear active part formed from a multiplicity of discrete



1. Apparatus for analyzing energy emanating from a source having a focal plane, which comprises:
  - means at said focal plane for converting said energy from the source into modulated spectral components simultaneously distributed according to frequency along a flat field; and
  - means for detecting and demodulating said spectral components.

5,483,334

# SYSTEM FOR GENERATING THE SAME INSTANTANEOUS PRESSURE BETWEEN TWO TANKS

François Couillard, Yverres, and Didier Frot, Choisy le Roi, both of France, assignors to Institut Français du Pétrole, Ruell-Malmaison, France

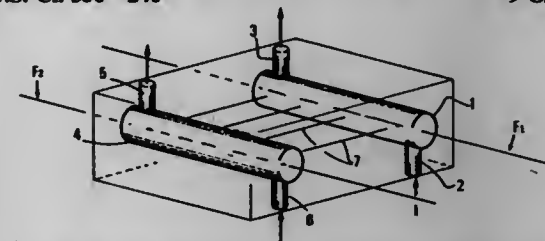
Filed Jul. 19, 1994, Ser. No. 277,019

Claims priority, application France, Jul. 19, 1993, 93 08935

Int. Cl.<sup>6</sup> G01N 21/33; 21/45

U.S. Cl. 356—246

9 Claims



1. A media analysis system for determining properties of different media and for generating the same instantaneous pressure between two tanks, each filled with a given medium, said system comprising a first tank containing a medium to be analyzed and including at least one inlet channel and at least one outlet channel for allowing passage of the medium therethrough, a second tank containing a reference medium and including at least one outlet channel for discharge of the reference medium, means for opening and closing said channels, and at least one linking capillary extending between and connected to the first tank and to the second tank for transmitting instantaneously a pressure variation in the medium to be analyzed from the first tank to the reference medium in the second tank, whereby variations in the analysis of the medium to be analyzed due to pressure variations in the first tank are avoided.

5,483,335

# MULTIPLEX SPECTROSCOPY

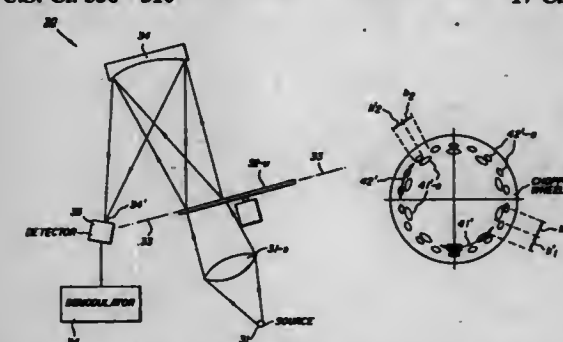
Reginald Tobias, 822 Langen Rd., Lancaster, Mass. 01523

Continuation-in-part of Ser. No. 33,339, Mar. 18, 1993. This application Apr. 5, 1994, Ser. No. 223,225

Int. Cl.<sup>6</sup> G01J 3/02; 3/42

U.S. Cl. 356—310

17 Claims



1. Apparatus for analyzing energy emanating from a source having a focal plane, which comprises:
  - means at said focal plane for converting said energy from the source into modulated spectral components simultaneously distributed according to frequency along a flat field; and
  - means for detecting and demodulating said spectral components.

5,483,336

# SELF CORRECTING STEREOSCOPIC AUTO-RANGEFINDER

Angus J. Tocher, Calgary, Canada, assignor to VX Optonics, Calgary, Canada

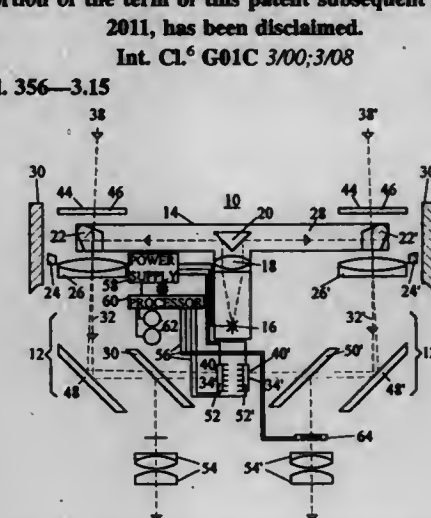
Continuation-in-part of Ser. No. 968,969, Oct. 30, 1992, Pat. No. 5,280,332. This application Nov. 16, 1993, Ser. No. 153,344

The portion of the term of this patent subsequent to Jan. 18, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> G01C 3/00; 3/08

U.S. Cl. 356—3.15

6 Claims



1. A self correcting stereoscopic auto-ranging device comprising: spatial referencing means, for producing first and second channel marker beams of radiation having a mutual and laterally stable angular relationship; first and second channel entrance windows, for receiving said first and second channel marker beams of radiation from said spatial referencing means, and for receiving first and second channel target beams of radiation from a target object of interest;



first and second channel objective lenses, for forming first and second channel marker images and first and second channel target images respectively from said first and second channel marker beams, and said first and second channel target beams; first channel photodetector means, for sensing said first channel marker images, and said first channel target images; second channel photodetector means, for sensing said second channel marker images, and said second channel target images;

correlation means, for measuring mark separations between said first and second channel photodetector means, of said first and second channel reference marker images, and for measuring target image separations between said first and second channel photodetector means, of said first and second channel target images;

calculation means, for the determination of at least one calibration constant of a target with a known angle of parallax, whereby the difference between a mark separation and a target scene separation of a first target of known angle of parallax results in a calibration constant of a particular separation value, which when used with the difference of a mark separation and a target scene separation of a second target, will result in a separation value then used to calculate the angle of parallax of said second target.

5,483,337

# SPECTROMETER WITH SELECTABLE RADIATION FROM INDUCTION PLASMA LIGHT SOURCE

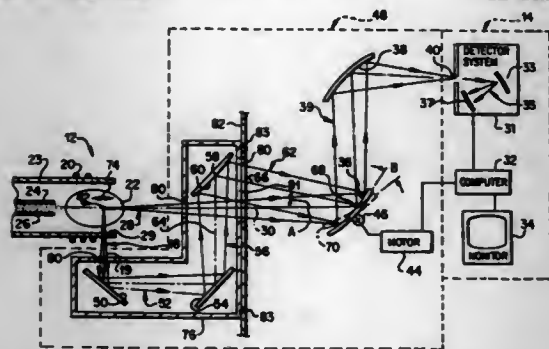
Thomas W. Barnard, 36 Kramer La., Weston, Conn. 06883; Michael I. Crockett, 7 White Oak Farm Rd., Newtown, Conn. 06470, and Michael W. Hucks, 30 Flint Ridge Rd., Monroe, Conn. 06468

Filed Oct. 19, 1994, Ser. No. 325,735

Int. Cl. G01J 3/30; G01N 21/73

U.S. Cl. 356—316

12 Claims



1. An atomic emission spectrometer comprising an induction coupled plasma generator for effecting light radiation and having a longitudinal axis, detector means with an entrance aperture for detecting the radiation relative to spectral wavelength, and an optical apparatus arranged cooperatively with the plasma generator and the detector means to pass radiation emitted from the plasma generator through the aperture to the detector means, wherein the radiation includes axial radiation emitted from the plasma generator along the longitudinal axis and radial radiation emitted from the plasma generator generally normal to the longitudinal axis, and the optical apparatus comprises optical selection means for selectively passing either the axial radiation or the radial radiation through the aperture to the detector means.

# METHOD AND APPARATUS FOR EVALUATING STRUCTURAL WEAKNESS IN POLYMER MATRIX COMPOSITES

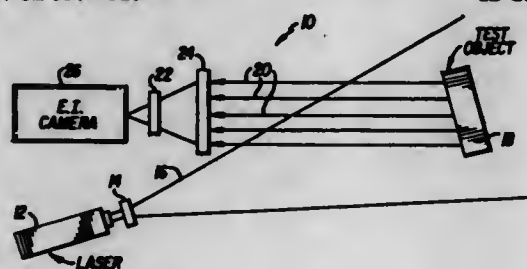
Eric A. Wachter, Oak Ridge, and Walter G. Fisher, Knoxville, both of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed May 26, 1994, Ser. No. 248,802

Int. Cl. G01N 21/64; 21/88

U.S. Cl. 356—318

12 Claims



1. A method for detecting structural weakness in Polymer Matrix Composite (PMC) items comprising the steps of: generating a beam of laser light; illuminating the PMC item with the beam of laser light; collecting fluorescence emitted by the PMC item; imaging the collected fluorescence; and analyzing said imaged fluorescence to detect areas of structural weakness in the PMC item.

5,483,339

# SPECTROPHOTOMETER AND RADIOMETRIC MEASUREMENT APPARATUS

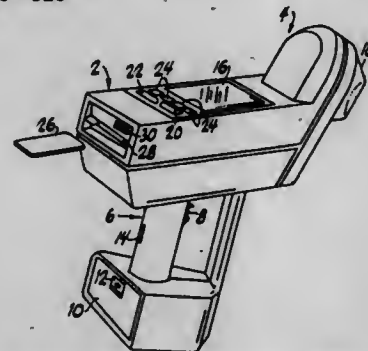
Harold Van Aken, Walkkill; Alan Kravetz; Kenneth Garde, both of New Windsor; William Weber, Walkkill, and Joseph Corrado, Newburgh, all of N.Y., assignors to Killmorgen Corporation, Simsbury, Conn.

Continuation of Ser. No. 74,007, Jun. 9, 1993, Pat. No. 5,319,437, which is a continuation of Ser. No. 736,723, Jul. 26, 1991, abandoned. This application May 4, 1994, Ser. No. 237,636

Int. Cl. G01J 3/42; 3/50

U.S. Cl. 356—326

12 Claims



1. A spectrophotometric and radiometric measurement apparatus, comprising: at least one key for input of instructions by a user; an illuminator for illuminating a sample; means for enabling and disabling operation of said illuminator in response to said instructions; a spectral analyzer for separating light reflected and emanated from said sample into spectral components and producing a signal corresponding to the level of each spectral component; and a processor for executing said instructions and analyzing said signal.

5,483,340

# SAGNAC LOOP INTERFEROMETER

Roderick P. Webb, and Alan W. O'Neill, both of Suffolk, England, assignors to British Telecommunications plc, London, England

PCT No. PCT/GB91/01467, § 371 Date Mar. 30, 1993, § 102(e) Date Mar. 30, 1993, PCT Pub. No. WO92/04655, PCT Pub. Date Mar. 19, 1992

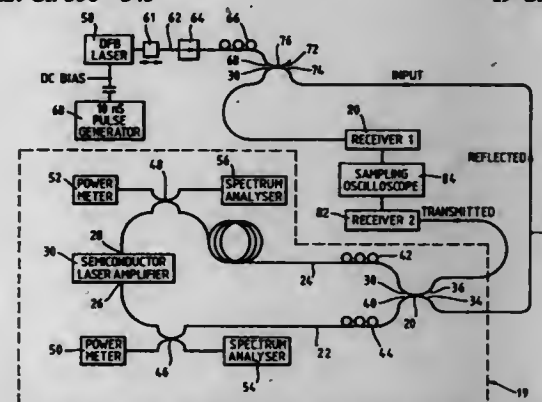
PCT Filed Aug. 30, 1991, Ser. No. 39,081

Claims priority, application United Kingdom, Aug. 31, 1990, 9019010

Int. Cl. G01B 9/02

U.S. Cl. 356—345

19 Claims



1. A Sagnac loop interferometer comprising a four port optical coupler having a first and a second input port and a first and a second output port and an optical coupling means coupling the first and second output ports, characterised in that said optical coupling means includes a non-linear semiconductor laser optical amplifier and means for providing that counterpropagating portions of an optical signal introduced into said optical coupler have different intensities upon reaching said optical amplifier.

5,483,341

# CAVITY DISPERSING MEASURING METHOD AND MEASURING APPARATUS THEREOF

Kazunori Naganuma, Kokubunji, Japan, assignor to Nippon Telegraph & Telephone Corporation, Tokyo, Japan

Continuation of Ser. No. 288,502, Aug. 10, 1994, abandoned.

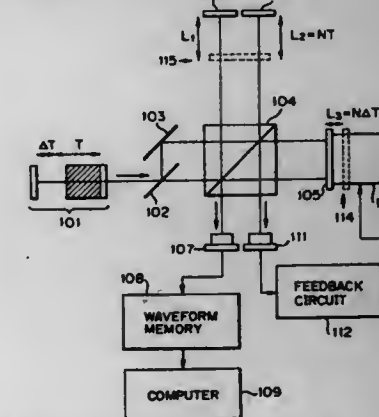
This application May 23, 1995, Ser. No. 447,497

Claims priority, application Japan, Aug. 11, 1993, 5-199648

Int. Cl. G01B 9/02

U.S. Cl. 356—345

10 Claims



1. A method for measuring cavity dispersion, comprising the steps of: dividing a light beam emitted from a laser cavity under measurement into first, second, third, and fourth light beams; propagating said first light beam and said second light beam along a first optical path and a second optical path respec-

tively, and superimposing two light beams with each other which have passed through said first and second optical paths respectively to cause said two light beams to interfere with each other, thereby producing a first interference light beam; propagating said third light beam and said fourth light beam along a third optical path whose optical path length is variable and a fourth optical path whose path length is fixed respectively, and superimposing two light beams with each other which have passed through said third and fourth optical paths respectively to cause said two light beams to interfere with each other, thereby producing a second interference light beam;

controlling said optical path length of the third optical path in order that intensity of said second interference light beam is kept constant;

adjusting said optical path length of said first optical path in correspondence with said controlled optical path length of the third optical path;

measuring said first interference light to obtain a waveform of the light intensity while varying said optical path length of said second optical path in a vicinity where a relative optical path difference between said optical path length of said second optical path and said adjusted optical path length of said first optical path length, becomes N times of a cavity length of said laser cavity under measurement, N being any integer other than zero; and

Fourier-transforming said waveform of the measured light intensity to obtain phase information in a frequency domain, whereby wavelength dispersion of said laser cavity is obtained based on said phase information.

5,483,342

# POLARIZATION ROTATOR WITH FREQUENCY SHIFTING PHASE CONJUGATE MIRROR AND SIMPLIFIED INTERFEROMETRIC OUTPUT COUPLER

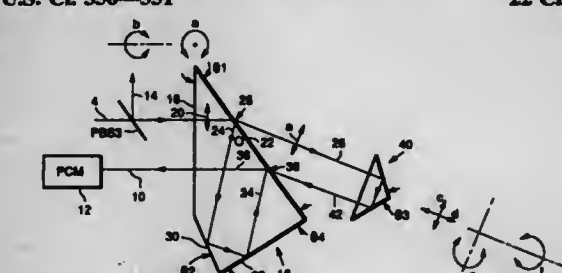
David A. Rockwell, Santa Monica, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 25, 1993, Ser. No. 83,845

Int. Cl. G01B 9/02; 11/00

U.S. Cl. 356—351

22 Claims



1. An interferometer for altering the polarization of a polarized input beam, comprising:

an anisotropic prism that is uniaxial with respect to a c axis, said prism held by said support and including front, rear and multiple side surfaces, said prism being positionable to receive said input beam at its front surface, said rear prism surface lying in a plane that is angled to said front surface so as to receive said input beam at a first location after the beam has crossed the prism from said first surface, to refract a first one of the extraordinary (e) and ordinary (o) subbeams of said input beam out of the prism, and to reflect a second of said e and o subbeams towards said side surfaces by total internal reflection (TIR), said side surfaces being oriented to reflect

said second subbeam by TIR back to said rear surface at a second location that is offset from said first location and at an angle such that said second subbeam is reflected by TIR off said rear surface on an exit path that exits the prism,

a first adjustment mechanism for adjusting the relative angle between the input beam and prism so that the prism's rear surface refracts one of the input beam's o and e subbeams and reflects the other subbeam by TIR,

a beam deflector,

a deflector support supporting said beam deflector in the path of said first subbeam to redirect said first subbeam back to the prism's rear surface at said second location, at an angle such that said first subbeam recombines with said second subbeam on said exit path, and

a second adjustment mechanism for adjusting the relative angle between the first subbeam and the beam deflector to correct for errors in said angle,

said deflector support being adjustable to hold said beam deflector at a position at which the first subbeam travels a path whose length differs from the path traveled by said second subbeam prior to their recombination, so as to alter the recombined beam's polarization relative to the input beam polarization.

5,483,343

# WAVELENGTH COMPENSATOR IN A HELIUM AMBIENCE

Kazunori Iwamoto, Yokohama; Kenji Saitoh, Atsugi, and Hiroshi Osawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

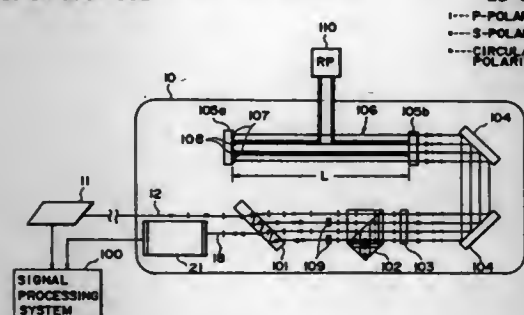
Filed Jun. 30, 1994, Ser. No. 269,386

Claims priority, application Japan, Jun. 20, 1993, 5-160883; Sep. 22, 1993, 5-236169; Apr. 25, 1994, 6-086406

Int. Cl.<sup>6</sup> G01B 9/02

U.S. Cl. 356—351

13 Claims



1. A wavelength compensator in a helium ambience, comprising:

a reference vacuum tube disposed in the helium ambience and having closed ends, wherein a laser beam enters said reference vacuum tube from one of the ends thereof and is reflected by the other end backwardly;

interference means for causing interference of the laser beam to produce an interference beam;

receiving means for receiving the interference beam which bears information related to a change in wavelength of the laser beam; and

means for reducing deterioration in vacuum of said reference vacuum tube.

5,483,344

# PROCESS AND APPARATUS FOR PERFORMING DIFFERENTIAL REFRACTIVE INDEX MEASUREMENTS USING INTERFERENCE OF MODULATED LIGHT BEAMS PASSING THROUGH REFERENCE AND TEST SAMPLES

Didier Frot, Choisy le Roi; Claude Beauducel, Henonville; Pierre Gonzalez, Ruell-Malmaison, and François Couillard, Yerres, all of France, assignors to Institut Français du Pétrole, Ruell-Malmaison, and François Couillard, Yerres, both of France

PCT No. PCT/FR93/01054, § 371 Date Aug. 19, 1994, § 102(e) Date Aug. 19, 1994, PCT Pub. No. WO94/10552, PCT Pub. Date May 11, 1994

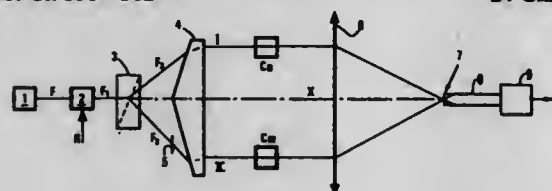
PCT Filed Oct. 27, 1993, Ser. No. 256,206

Claims priority, application France, Jan. 28, 1992, 92 12946

Int. Cl.<sup>6</sup> G01N 21/41; 21/43

U.S. Cl. 356—361

24 Claims



6. A differential refractometer for use in liquid chromatography comprising:

a coherent light source emitting a coherent light beam;

an optical divider, optically coupled to the coherent light beam, for dividing the coherent light beam into first and second coherent light beams;

a first optical element, optically coupled to the first and second coherent light beams, for outputting the first and second coherent light beams in parallel to each other;

a first vessel disposed within the first coherent light beam which contains a reference liquid which is traversed by the first coherent light beam;

a second vessel disposed within the second coherent light beam which contains the liquid to be tested which is traversed by the second coherent light beam;

a second optical element, optically coupled to the parallel first and second coherent light beams, for combining the parallel first and second coherent light beams to produce an interference figure;

a photodetector, optically coupled to the interference figure, for producing a time varying signal representing any time variation of the fringes;

a first birefringent optical medium placed in the coherent light beam upstream of the optical divider for modifying a component of polarization of the coherent light beam in accordance with a time varying reference modulation signal applied to the first birefringent optical medium;

a second birefringent optical medium coupled to at least one of the first and second coherent light beams or the interference figure for producing a time varying signal; and

an analyzing system, coupled to the reference modulation signal and the time varying signal, for detecting a relative phase difference between the time varying reference modulation signal and the time varying signal and processing the relative phase difference to determine a relative refractive index difference between the reference liquid and the liquid to be tested.

5,483,345

# ALIGNMENT SYSTEM FOR USE IN LITHOGRAPHY UTILIZING A SPHERICAL REFLECTOR HAVING A CENTERED ETCHED-ON PROJECTION OBJECT

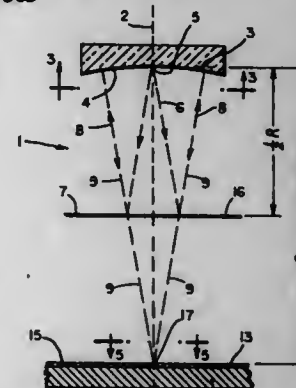
J. Casey Donaher, Westford; David S. Holbrook, Woburn; Shepard D. Johnson, Arlington, and James A. Sozanski, Littleton, all of Mass., assignors to MRS Technology, Inc., Chelmsford, Mass.

Filed Sep. 6, 1994, Ser. No. 300,649

Int. Cl.<sup>6</sup> G01B 11/00

U.S. Cl. 356—363

16 Claims



1. An alignment system for use in lithography, said system including

a spherical reflector of low numerical aperture having an optical axis, said spherical reflector having a radius, a center, and a convex side, said spherical reflector having an image plane, an object at said center of said reflector and on said optical axis, means for projecting said object,

a beam splitter transverse to said optical axis and positioned at a distance of one-half of said radius from said object to reflect said projected object to said spherical reflector,

a substrate positioned in said optical axis, said substrate being in said image plane of said spherical reflector, said substrate carrying an alignment mark,

whereby an image of said projected object is projected on said alignment mark on said substrate in said image plane for alignment.

5,483,346

# POLARIZATION BASED OPTICAL SENSOR UTILIZING TOTAL INTERNAL REFLECTION

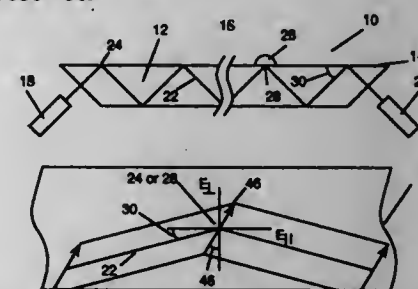
Dane C. Butzer, 1380 Harrison Pond Dr., New Albany, Ohio 43054

Filed Apr. 11, 1994, Ser. No. 225,888

Int. Cl.<sup>6</sup> G01J 4/00

U.S. Cl. 356—369

12 Claims



1. A polarization based optical sensor utilizing total internal reflection for detecting substances and changes in said substances on a transparent material comprising at least one polarized-light source that generates a polarized light, at least one polarized-light detector that is sensitive to a particular polarization of light, and said transparent material that is transparent to said polarized light; said polarized-light source oriented so that said polarized light produced thereby enters said transparent material, undergoes a

number of substantially-total-internal reflections within said transparent material by striking a boundary of said transparent material at an angle of incidence greater than both a critical angle for a surrounding medium and a critical angle for said substances, exits said transparent material, and strikes said polarized-light detector;

said polarized-light source also oriented so that said polarized light produced thereby has an original-electric field consisting of a parallel-electric field parallel to a plane of incidence of said substantially-total-internal reflections and a perpendicular-electric field perpendicular to said plane of incidence of said substantially-total-internal reflections;

said polarized light having a phase shift between said parallel-electric field and said perpendicular-electric field;

said phase shift dependent upon an index of refraction of said substances and said surrounding medium at said substantially-total-internal reflections, a change in said substances causing a corresponding change in said index of refraction, in turn causing a resulting change in said phase shift;

said resulting change in said phase shift causing a transfer of energy between said original-electric field and an electric field perpendicular to said original-electric field;

said polarized-light detector oriented so that said transfer of energy causes a measurable change in an output of said polarized-light detector;

whereby said substances and changes in said substances are detected.

5,483,347

# NON-CONTACT MEASUREMENT APPARATUS USING BIFURCATED OPTICAL FIBER BUNDLE WITH INTERMIXED FIBERS

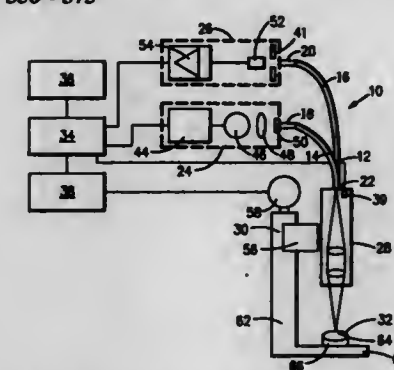
Joerg W. Hollmann, Midland, Canada, assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 19, 1993, Ser. No. 67,500

Int. Cl.<sup>6</sup> G01B 11/14

U.S. Cl. 356—375

20 Claims



1. A non-contact measurement apparatus for measuring a physical characteristic of an article, comprising:

a bifurcated bundle of optical fibers having first and second arms and a common end, each arm having a first and second plurality respectively of intermixed fiber;

means for providing polychromatic light to said common end through said first arm, said means including a non-coherent lamp, a lamp lens disposed between said lamp and said first arm of said bifurcated bundle of optical fibers, and a heat absorbing filter disposed between said lamp lens and said first arm of said bifurcated bundle of optical fibers;

a lens assembly for focusing light transmitted from said common end onto a surface of said article, said lens assembly being connected to said common end and having a fixed focal point;



means for introducing relative motion between said lens assembly and said surface;  
 means connected to said second arm for detecting light reflected from said surface through said second arm, said light detecting means for generating a signal indicative of the intensity of light detected; and a band pass filter disposed between said second arm and said light detecting means for providing light at a single wavelength to said detection means;  
 means for controlling said apparatus, said control means regulating said means for providing light and for processing said signal generated by said means for detecting light to generate information indicative of said physical characteristic.

5,483,348

# APPARATUS FOR OPTICALLY DETECTING A POSITION OF A MARK

Kouichiro Kamatsu, Tokyo, and Masashi Tanaka, Kanagawa, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 945,330, Sep. 16, 1992, abandoned.

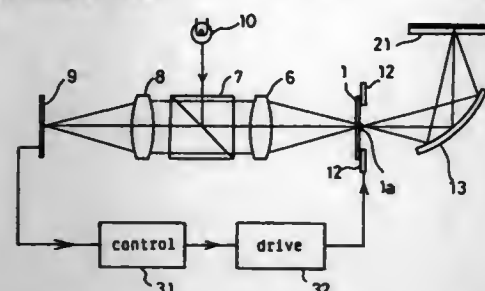
This application Nov. 18, 1994, Ser. No. 344,613

Claims priority, application Japan, Sep. 17, 1991, 3-262550

Int. Cl.<sup>6</sup> G01B 11/00

U.S. Cl. 356-401

20 Claims



1. An apparatus for optically detecting a position of a mark provided on an object to be detected, said apparatus comprising:  
 light source means for supplying light;  
 an illumination optical system for directing the light from said light source means to said mark to illuminate the same;  
 reflecting means having a predetermined reflectance;  
 optical means for projecting said mark illuminated by said light onto said reflecting means;  
 detecting means for detecting an image of said mark in accordance with first light reflected from said mark and second light reflected from said reflecting means; and  
 wherein said optical means includes variable transmittance means for adjusting a quantity of light passed through said optical means.

5,483,349

# APPARATUS FOR DETECTING POSITIONS OF MARKS IN PROJECTION ALIGNER WHEREIN AN AUXILIARY PATTERN IS CONSTRUCTED TO PRODUCE A SIGNAL LEVEL THAT IS INDEPENDENT OF THE SURFACE CONDITION OF A SUBSTRATE

Kazuaki Suzuki, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 884,127, May 18, 1992, abandoned.

This application Mar. 28, 1995, Ser. No. 412,089

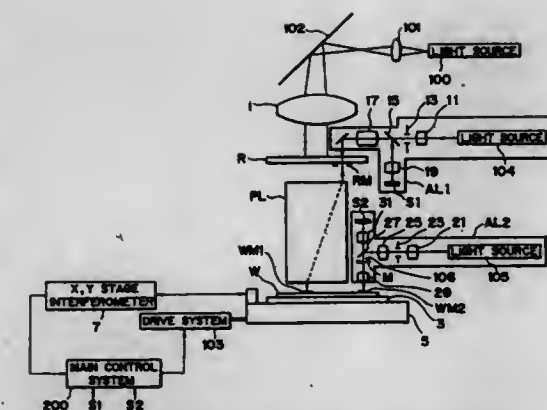
Claims priority, application Japan, May 23, 1991, 3-118476

Int. Cl.<sup>6</sup> G01B 11/00

U.S. Cl. 356-401

10 Claims

10. An apparatus for detecting positions comprising:  
 (a) a substrate having a mark;  
 (b) an index plate having an index pattern and an auxiliary pattern;



(c) an imaging optical system for forming the image of said mark and the image of said index pattern on a predetermined imaging plane;  
 (d) an image sensor arranged on said imaging plane, for outputting image signals with respect to said mark, and said auxiliary pattern, said auxiliary pattern being constructed to produce a signal level that is substantially independent of the surface condition of said substrate; and  
 (e) a signal processing system for determining the position of said mark and the position of said auxiliary pattern on the basis of said image signals.

5,483,350

# OPTICAL SYSTEM FOR INFRARED SPECTROSCOPY HAVING AN ASPHERICAL CONCAVE MIRROR

Kazuhiro Kawasaki, c/o JASCO Corporation, 2967-5, Ishikawa-cho, Hachioji-shi, Tokyo 192, Japan, assignor to Kazuhiro Kawasaki, Kachioji, Japan

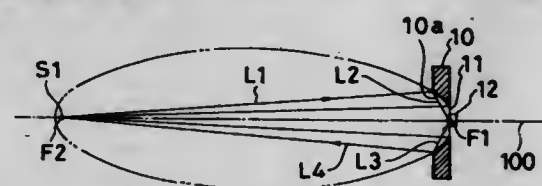
Filed Oct. 24, 1994, Ser. No. 328,087

Claims priority, application Japan, Jan. 25, 1993, 5-288591

Int. Cl.<sup>6</sup> G01N 21/55; 21/01

U.S. Cl. 356-445

5 Claims



1. An optical system for a high-sensitivity reflectivity measurement equipment which detects reflected light, the equipment comprising:

an aspherical concave mirror having an optical axis and which has an opening at its central portion in a predetermined range, which has one focal point outside of a plane of said opening, and having a mirror surface region width which is measured from said plane of said opening and which is determined so that at least a part of light incident from a proper light source and reflected by said mirror surface passes through said focal point at an incident angle  $\theta$ , where  $60^\circ \leq \theta < 90^\circ$ ;  
 wherein said sample is placed at said focal point so that a light receiving surface is perpendicular relative to the optical axis of said concave mirror, and  
 outgoing light for detection is light reflected by said aspherical concave mirror and said light receiving surface of said sample and reflected against said aspherical concave mirror.

5,483,351

# DILATION OF IMAGES WITHOUT RESOLUTION CONVERSION TO COMPENSATE FOR PRINTER CHARACTERISTICS

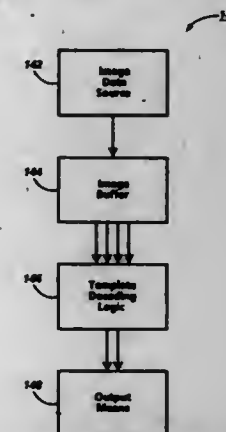
Louis D. Mailleux, Fairport, and Thomas Robson, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 951,523, Sep. 25, 1992. This application May 8, 1995, Ser. No. 435,045

Int. Cl.<sup>6</sup> H04N 1/40; G06K 9/40

U.S. Cl. 358-298

13 Claims



1. A method for expanding features of an image represented by a plurality of binary pixels at a state transition portion of the image without affecting resolution of the image, a state transition defined by pixels at a first state adjacent to pixels at a second state, the method comprising the steps of:

storing a group of pixels representing a portion of the image which overlies said state transition in a first storage;  
 isolating a window in said group of pixels, said window including a pixel formation comprising first and second correctable pixels and pixels surrounding said first and second correctable pixels, said first and second correctable pixels being adjacent to said state transition;  
 for said first correctable pixel, determining a corrected binary pixel state according to a first set of state determination rules, said first set of state determination rules being based on binary states of said pixels in said pixel formation; and  
 for said second correctable pixel, determining a corrected binary pixel state according to a second set of state determination rules, said second set of state determination rules being based on binary states of said pixels in said pixel formation and on said corrected binary pixel state of said first correctable pixel.

5,483,352

# COMPUTER ABLE TO LINK ELECTRONIC MAIL FUNCTIONS WITH TELEPHONE FUNCTIONS

Noriyuki Fukuyama, and Masahiro Matsuda, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Aug. 26, 1993, Ser. No. 112,071

Claims priority, application Japan, Aug. 27, 1992, 4-228558

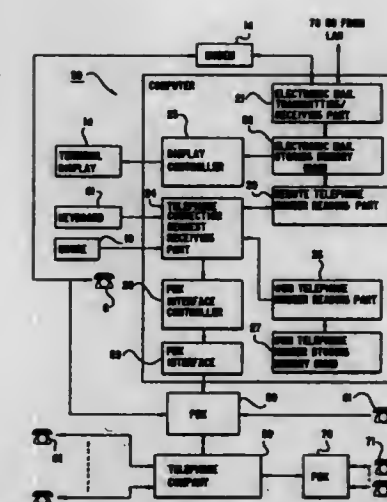
Int. Cl.<sup>6</sup> H04N 1/00

U.S. Cl. 358-402

16 Claims

1. A computer, linked to a terminal display and an input means such as a keyboard, being able to transmit and receive electronic mail by using a transmitting and receiving means for transmitting and receiving said electronic mail, a random access memory means for storing received electronic mail, and a display control means for displaying contents of said electronic mail, stored in said random access memory means, which are provided in the computer, said computer comprising:

a telephone connection request receiving means for outputting a telephone connection operation signal when an address data,



indicating a telephone number of a sender of said electronic mail, and a telephone connection request are input to the computer;

a first read-out means, activated by said telephone connection request receiving means, for reading out said telephone number of said sender of said electronic mail from said random access memory means in accordance with said address data by using part of data in said received electronic mail;  
 a receiver telephone number memory means for storing a receiver telephone number previously set therein;  
 a second read-out means, activated by said telephone connection request receiving means, for reading out said receiver telephone number from said receiver telephone number memory means;  
 a telephone-exchange-interface-controlling means for outputting a request signal for requesting a connection between a receiver telephone and a sender's telephone by using said telephone number of said sender obtained from said first read-out means through said telephone connection request receiving means and said receiver telephone number obtained from said second read-out means through said telephone connection request receiving means; and  
 a telephone exchange interface means for controlling a telephone exchange to connect said receiver telephone and said sender's telephone when said request signal is input from said telephone-exchange-interface-controlling means, wherein said computer links with said telephone exchange for automatically connecting said receiver telephone to said telephone of said sender of said electronic mail by using said part of data in said received electronic mail when said telephone connection request is input to said computer.

5,483,353

# FACSIMILE APPARATUS HAVING OFF PERIOD FOR IMAGE DATA RECORDING

Mituru Kudou, Hachioji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 835,853, Feb. 18, 1992, abandoned.

This application Jul. 18, 1994, Ser. No. 276,487

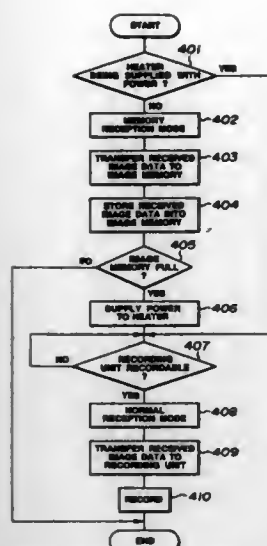
Claims priority, application Japan, Feb. 19, 1991, 3-131713

Int. Cl.<sup>6</sup> H04N 1/00

U.S. Cl. 358-404

4 Claims

1. A facsimile apparatus comprising:  
 image data reception means for receiving image data;  
 image data recording means for recording the image data;  
 image data storing means for storing the image data;  
 timer means for supplying time data;  
 operating means for setting a period of time as a portion of the time data;



power supply control means for stopping a supply of power to the image data recording means when the time data supplied by the timer means is in the period of time set by the operating means;

reception control means for storing in the image data storing means the image data received by the image data reception means while the supply of power to the image data recording means is stopped by the power supply control means;

storage quantity detecting means for detecting a quantity of the image data stored in the image data storing means; and

image data recording control means, when the quantity of the image data stored in the image data storing means and detected by the storage quantity detecting means exceeds a predetermined value, for supplying power to the image data recording means and, when the image data recording means is put in a recording state, for transferring to the image data storing means to record the image data.

5,483,354

**IMAGE FORMING METHOD AND RECORDING DEVICE**  
Gerardus G. J. C. Kessels, and Eduardus J. W. Van Vliembergen, both of Venlo, Netherlands, assignors to OCE-Nederland, B.V., MA Venlo, Netherlands

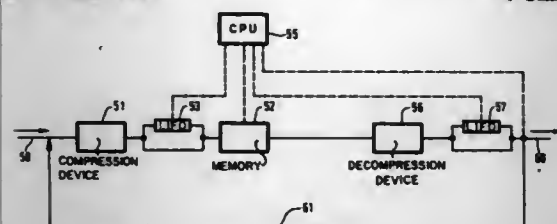
Filed May 24, 1994, Ser. No. 248,217

Claims priority, application Netherlands, Jun. 8, 1993, 9300981

Int. Cl. H04N 1/21; 1/387; G06T 3/60; 9/00

U.S. Cl. 358-444

4 Claims



2. An image recording device, comprising:  
means for generating digital image data representing image information from one or more documents,  
a compression device for compressing said digital image data,  
a first means for selectively reversing the order of data in a first group of data,  
a memory for the storage of compressed image data,  
a decompression device for decompressing compressed image data,  
a second means for selectively reversing the order of data in a second group of data,

an image forming device by which images are formed on copy sheets in a first image orientation or in a second image orientation rotated through 180 degrees with respect to said first orientation, and

control means for controlling said compression device, said first reversing means, said memory, said decompression device and said second reversing means in such a way that

(1) first image data from said data generating means, which relates to images to be formed on copy sheets in said first image orientation is compressed and stored in a memory in ascending address sequence starting from a first free memory address; and said stored data is read out from said memory in ascending address sequence, decompressed and delivered to said image forming device; and

(2) second image data from said data generating means, which relates to images to be formed on copy sheets in said second image orientation, is compressed and then reversed in order in groups having the length of one image line, and stored in said memory in descending address sequence, starting from a last free memory address; and said stored data is read out from said memory in ascending address sequence, decompressed, reversed in order per group and delivered to said image forming device.

5,483,355

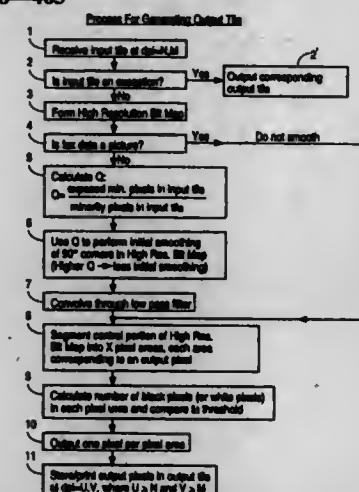
**PIXEL CORRECTIONAL AND SMOOTHING METHOD**  
Mark A. Overton, Escondido, Calif., assignor to Hewlett-Packard Co., Palo Alto, Calif.

Filed Mar. 11, 1994, Ser. No. 212,100

Int. Cl. H04N 1/38

U.S. Cl. 358-463

12 Claims



1. A method for improving the quality of a pixel pattern containing a line segment having a tick or notch, said method comprising the steps of:

receiving a block of pixels from an original pixel pattern, said block of pixels having rows and columns of pixels, said block of pixels containing one or more target pixels, forming a first portion of a pixel pattern, and neighboring pixels of said target pixels, each of said target pixels having four faces, each of said faces opposing an adjacent pixel;

detecting whether a first target pixel meets a first condition, said first condition being that said first target pixel is a pixel of a first type having three of its faces opposing a pixel of a second type and one of its faces opposing another pixel of said first type, said another pixel of said first type being in one of said rows or columns containing all pixels of said first type;

replacing said target pixels, if said first target pixel is detected to meet said first condition, with one or more lines of replacement pixels of said first type, said one or more lines of replacement pixels of said first type being parallel and adjacent to said one of said rows or columns containing said all pixels of said first type, and with one or more lines of

replacement pixels of said second type parallel to said one or more lines of said replacement pixels of said first type; and outputting said lines of replacement pixels of said first type and said second type for printing.

5,483,356

**REFLECTION TYPE TO TRANSPARENCY TYPE  
SCANNER CONVERTER**

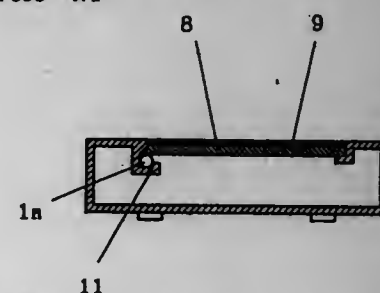
Wen-Tsung Chen; Hong-Wen Liu, and Chih-Hong Hsu, all of Hsin-Chu, Taiwan, Prov. of China, assignors to Must System Inc., Hsinchu, Taiwan, Prov. of China

Division of Ser. No. 932,371, Aug. 19, 1992, Pat. No. 5,282,081. This application Jan. 12, 1994, Ser. No. 182,266

Int. Cl. H04N 1/04

U.S. Cl. 358-471

6 Claims



1. A reflection-type-to-transparency-type scanner converter for allowing a reflection-type scanner to scan a transparency film; said scanner converter comprising:

a casing, having at least a flat surface installed with a scanning window;

a light source, fixed to said casing;

a power supply, to provide electricity required by said light source;

a light transmitter layer affixed to said scanning window of said casing, said light transmitter layer being made of a superior light conducting material and capable of minimizing light scattering so as to evenly distribute the light emitted by said light source in the form of a planar light source; and

a protective layer made of an abrasion resistant material covering the top of said light transmitter, and used to protect said light transmitter layer from abrasion;

wherein said light transmitter layer causes light rays emitted from said light source to be evenly transmitted through a film so as to allow said film to be scanned by a reflection-type scanner.

5,483,357

**IMAGE SCANNING DEVICE**

Fumikazu Nagano, Yamato-Koriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

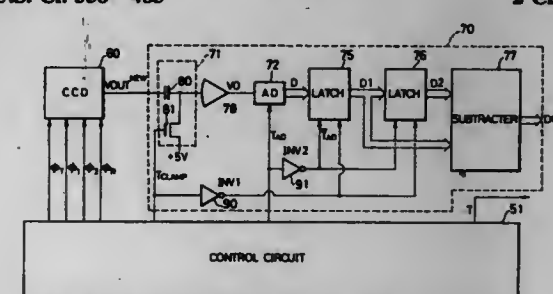
Filed Apr. 26, 1994, Ser. No. 233,848

Claims priority, application Japan, Apr. 27, 1993, 5-101398; Jun. 24, 1993, 5-153744

Int. Cl. H04N 1/04

U.S. Cl. 358-483

2 Claims



1. An image scanning device comprising:  
a light source for emitting a beam;

a CCD circuit board having a CCD sensor;  
an optical unit for guiding said emitted beam from said light source to said CCD sensor;  
a CCD sensor driving circuit connected with said CCD circuit board with a signal cable;  
a clock generating circuit for generating a clock to be transferred to said CCD sensor;  
a reset pulse generating circuit for generating a reset pulse for resetting an output buffer of said CCD sensor;  
a clamp circuit for clamping an output of said CCD sensor;  
an analog-to-digital converter for converting an analog signal into a digital signal;  
an actuating means for actuating said reset pulse generating circuit and said clamp circuit one time for a plurality of outputs of said CCD sensor;  
a first latch means for latching an output of said analog-to-digital converter;  
a second latch means for latching an output of said first latch means; and  
a subtracting means for subtracting said output of said second latch means from said output of said first latch means.

5,483,358

**COLOR IMAGE COMMUNICATION APPARATUS AND METHOD**

Susumu Sugiyama, Atsugi; Yoshinobu Mita, Kawasaki; Junichi Shishizuka, Tokyo; Makoto Takaoka, Kawasaki; Yukari Shimomura, Yokohama; Kentaro Matsumoto, Higashi Kurume; Toyokazu Uda, Yokohama; Mitsumasa Sugiyama, Yokohama; Shigetada Kobayashi, Yokohama; Katsutoshi Hisada, Tokyo; Yoji Kaneko, and Hiroyuki Nakanishi, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

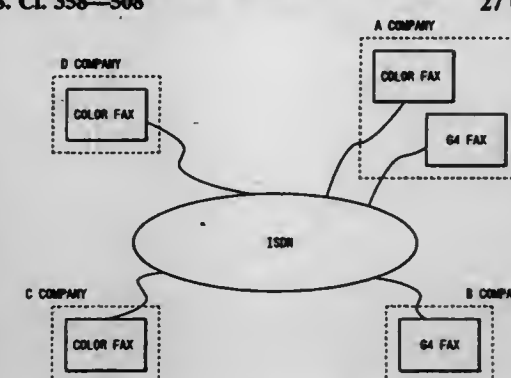
Filed Mar. 27, 1991, Ser. No. 676,117

Claims priority, application Japan, Mar. 27, 1990, 2-80015; Mar. 27, 1990, 2-80016; Mar. 27, 1990, 2-80017

Int. Cl. H04N 1/46

U.S. Cl. 358-508

27 Claims



1. An image communication apparatus comprising:  
multi-level generation means for generating multi-level data from image data received in accordance with a communication protocol that determines a communication mode;  
color processing means for performing color processing on said multi-level data using a given processing parameter; and  
setting means for setting the processing parameter for causing said color processing means to process said multi-level data as monochrome data.





5,483,365

**METHOD FOR HOLOGRAPHIC STORAGE USING PERISTROPHIC MULTIPLEXING**

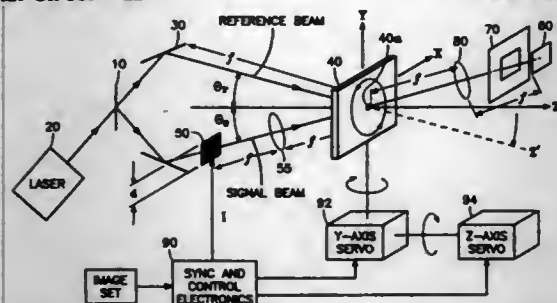
Allen Pu; Kevin Curtis, and Demetri Psaltis, all of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed May 10, 1994, Ser. No. 241,163

Int. Cl.<sup>6</sup> G03H 1/12; 1/10; G11B 7/00

U.S. Cl. 359—11

44 Claims



1. A method of recording multiplexed holograms in a recording medium, comprising:

directing a signal light beam and a reference light beam onto a selected recording spot in said recording medium, said signal and reference light beams defining a plane of interaction of said recording medium;

successively modulating said signal light beam in accordance with a succession of holograms to be recorded in said recording medium; and

first rotating at least one of (a) said recording medium and/or (b) said signal and reference light beams with respect to the other through a succession of peristrophic multiplexing angles about an axis non-perpendicular to said plane of interaction contemporaneously with the successively modulating step, said axis also being one which retains said signal light beam and said reference light beam on said recording spot.

5,483,366

**LIQUID CRYSTAL DISPLAY WITH HIGH CAPACITANCE PIXEL HAVING AN INDIUM TIN OXIDE ACTIVE REGION ELECTRICALLY CONNECTED TO A POLYCRYSTALLINE SILICON PIXEL REGION WHERE POLYCRYSTALLINE SILICON EXTENSIONS FROM THE SELECT LINE BOUND AT LEAST TWO SIDES OF THE PIXEL**

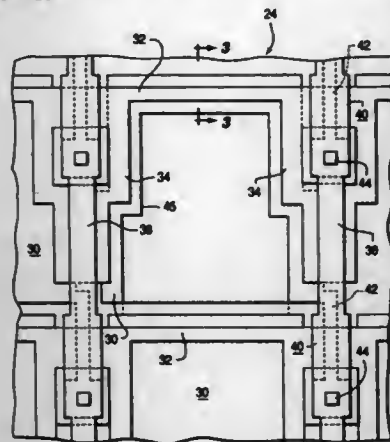
James H. Atherton, Ringoes, N.J., assignor to David Sarnoff Research Center Inc, Princeton, N.J.

Filed Jul. 20, 1994, Ser. No. 277,824

Int. Cl.<sup>6</sup> G02F 1/1343

U.S. Cl. 359—59

10 Claims



1. A liquid crystal display comprising:  
a base plate having a surface;

at least one pixel on said surface of the base plate, said pixel including a region of polycrystalline silicon having a plurality of sides;

a select line of polycrystalline silicon extending over and across said region adjacent one side thereof;

a pair of extensions of polycrystalline silicon extending from the select line along different sides of the region;

a layer of a dielectric material between the region and the select lines and its extensions;

said select line and extensions forming with the region a capacitor which is electrically connected to said region;

a data line of a conductive material extending along the same side of the region as one of the extensions of the select line;

a MOS transistor connected between the data line and the region; and

a substantially rectangular area of indium-tin oxide over and insulated from the polycrystalline silicon region and electrically connected to the polycrystalline silicon region, said indium-tin oxide area forming the active region of the pixel.

5,483,367

**TRANSMITTING AND RECEIVING APPARATUS FOR A RADIO HEADPHONE**

Jeong T. Han, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

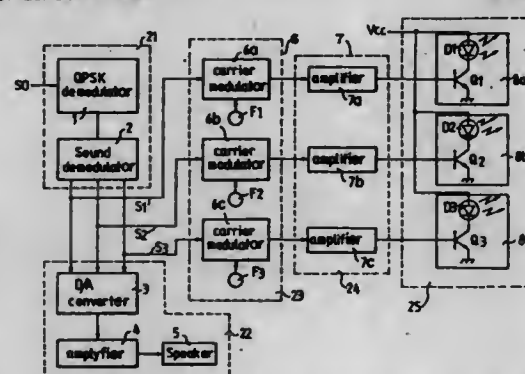
Filed Dec. 31, 1991, Ser. No. 815,200

Claims priority, application Rep. of Korea, Dec. 31, 1990, 90-22593/1990

Int. Cl.<sup>6</sup> H04J 14/00

U.S. Cl. 359—124

15 Claims



1. A transmitting and receiving apparatus for a headphone, comprising:

transmitting means for demodulating a received broadcast signal to produce digital sound data, timing data and digital channel data from said received broadcast signal, carrier-modulating each produced data in accordance with a different carrier frequency and transmitting each modulated data with an infra-red beam, respectively; and

receiving means for receiving the carrier-modulated sound data, timing data and channel data transmitted from said transmitting means, demodulating the signals into a digital signal, converting the digital signal into an analog signal, and outputting/transducing the analog signal as sound.

5,483,368

**OPTICAL COMMUNICATION SYSTEM SUITABLE FOR SELECTIVE RECEPTION OF MULTIPLE SERVICES**

Shigeru Ohshima, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 18, 1992, Ser. No. 978,496

Int. Cl.<sup>6</sup> H04J 14/02; H04B 10/06

U.S. Cl. 359—124

19 Claims

1. An optical communication system, comprising:  
optical fiber communication lines;

5,483,370

**CROSSCONNECT APPARATUS FOR A COHERENT TRANSMISSION SYSTEM**

Yasushi Takahashi, Hachioji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 691,849, Apr. 26, 1991, abandoned.

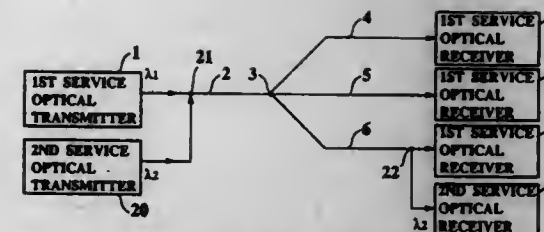
This application Apr. 25, 1995, Ser. No. 428,455

Claims priority, application Japan, Apr. 27, 1990, 2-109996

Int. Cl.<sup>6</sup> H04J 14/02

U.S. Cl. 359—128

2 Claims



first optical transmitter means of an intensity modulation type for transmitting intensity modulated light signals with a first wavelength through the optical fiber communication lines;

second optical transmitter means of an angle modulation type for transmitting angle modulated light signals with a second wavelength through the optical fiber communication lines in a form of multiplexed light signals multiplexing the intensity modulated light signals and the angle modulated light signals;

first optical receiver means of a direct detection type for receiving the multiplexed light signals through the optical fiber communication lines and demodulating the intensity modulated light signals from the multiplexed light signals; and

second optical receiver means for receiving and demodulating the angle modulated light signals from the multiplexed light signals transmitted through the optical fiber communication lines, the second optical receiver means being a balanced optical receiver for receiving the angle modulated light signals by cancelling out an intensity modulated light signal component in the multiplexed light signals.

5,483,369

**COMMUNICATION SYSTEMS USING PASSIVE RF ROUTING**

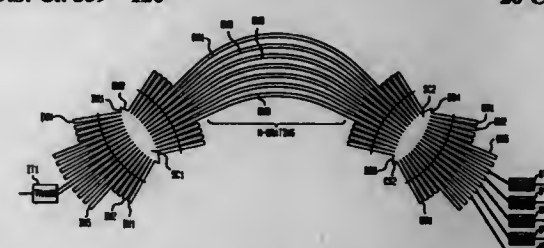
Thomas E. Darcie, Middletown; Ivan P. Kaminow, Holmdel, and Dietrich Marcuse, Lincroft, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Nov. 3, 1993, Ser. No. 147,652

Int. Cl.<sup>6</sup> H02P 3/00

U.S. Cl. 359—126

26 Claims



1. A system for communicating between a radio-frequency signal upstream point arranged for operating over a radio-frequency spectrum and a plurality of radio-frequency signal downstream points each arranged for operating over a specified portion of the radio-frequency spectrum, comprising:

a radio-frequency signal electrical upstream lead coupled to the radio frequency signal upstream point;

a plurality of radio-frequency signal electrical downstream leads each connected to a radio-frequency signal downstream point;

a surface-acoustic-wave (SAW) demultiplexer-multiplexer connecting said radio-frequency signal electrical upstream lead to said plurality of radio-frequency signal electrical downstream leads;

said surface-acoustic-wave demultiplexer-multiplexer including a wavelength-separating acoustic wavelength array having a plurality of unequal-length waveguides such that different frequency bands appear at each of said leads.

5,483,371

**LIGHTWAVE DISTRIBUTION SYSTEM FOR AUDIO AND VIDEO SERVICES AND TERMINAL EQUIPMENT THEREFOR**

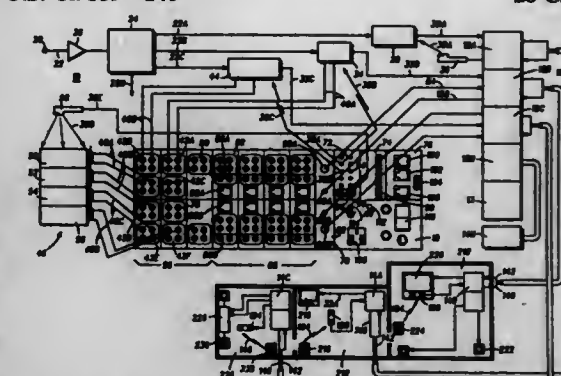
Robert P. Farinelli, Jr., Lexington, Ky., assignor to Square D Company, Palatine, Ill.

Filed Oct. 8, 1993, Ser. No. 134,768

Int. Cl.<sup>6</sup> H04B 10/24

U.S. Cl. 359—146

28 Claims



1. A distribution system for providing a user access and control of communication signals at various locations within a facility from audio and video sources external to the system, the system comprising:

first converting means for receiving at least one communication signal having an audio or video portion or both, for converting the communication signal into a first lightwave signal, for receiving a second lightwave signal, and for converting the second lightwave signal into a control signal;

second converting means for converting the first lightwave signal into the at least one communication signal, for accessing



the at least one communication signal at each of the locations distributed throughout the facility remote to the first converting means, for receiving the control signal at one of the remote locations, and for converting the control signal into the second lightwave signal;

an optical carrier optically connecting the first and second converting means and carrying the first and second lightwave signals therebetween; and

means for controlling the selection of the at least one communication signal in response to the control signal, the controlling means being adapted for receiving the at least one communication signal and electrically connected to the first converting means for receiving the control signal therefrom and for sending the at least one communication signal thereto.

5,483,372

# SINGLE AND MULTICHANNEL TRANSMISSION OVER LONG DISTANCES USING REPEATED LEVEL-CROSSING REMODULATION

Paul E. Green, Jr., Mount Kisco, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 29, 1994, Ser. No. 346,435

Int. Cl.<sup>6</sup> H04B 10/12

U.S. Cl. 359—173

10 Claims



1. A system for transmitting two-level information over long distances comprising:
  - a transmission line for transmitting a two-level signal, said line being divided into a plurality of segments;
  - a plurality of remodulators disposed in said line defining said segments, each of said plurality of remodulators including a slicing circuit for detecting each level transition time of said two-level transmission signal and outputting a signal representative of the level transitions, an amplifier for amplifying the level transition signal and a transmitter for transmitting the amplified level transition signal on one of said segments of said transmission line; and
  - a receiver at the end of a last one of said plurality of segments of said transmission line, said receiver including a narrowband filter having a center frequency at a predetermined bit rate, a narrowband phase-locked loop coupled to said narrowband filter for determining the sampling instant and a sampling circuit coupled to said phase-locked loop for outputting the transmitted signal.

5,483,373

# OPTICAL TRANSMITTER FOR THE COMMON TRANSMISSION OF ANALOG SIGNALS AND DIGITAL QAM SIGNALS

Henning Bülow, Ludwigsburg, and Heinz Krimmel, Korntal-Münch, both of Germany, assignors to Alcatel N.V., BH Rijnswijk, Netherlands

Filed Jun. 10, 1994, Ser. No. 258,508

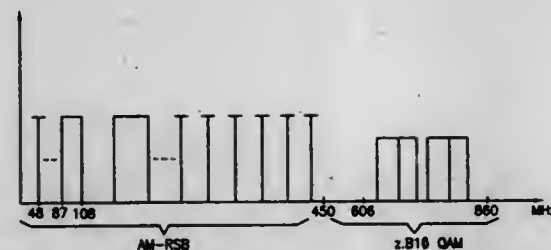
Claims priority, application Germany, Jun. 11, 1993, 43 19 3153

Int. Cl.<sup>6</sup> H04B 10/04

U.S. Cl. 359—181

6 Claims

1. An optical transmitter for the joint transmission of at least two analog signals and digital signals with preparation circuits (1, 2) for supplying the analog signals and the digital signals, and with at least one optical transmitting component (5) containing a laser, the optical transmitting component having a laser modulation input, whose output signal is directly modulated with the signals to be transmitted, characterized in an amplitude limiter (8) having an input and an output, that the analog signals are supplied through the amplitude limiter and wherein the optical transmitter includes a



summer (3) having one input connected to the output of the amplitude limiter and another input connected to the digital signals so that the digital signals are mixed with the analog signals, wherein the analog signals are limited by the amplitude limiter so as to prevent clipping by the optical transmitting component (5) so that a minimum voltage is generated by the amplitude limiter to the modulation input before the analog signals can cause clipping of the optical transmitting component (5).

5,483,374

# WAVELENGTH CONVERSION DEVICE USING AN EXTERNAL UNSTABLE CAVITY

Ryohel Tanuma, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

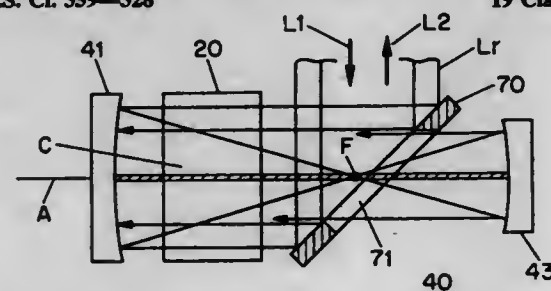
Filed Mar. 23, 1993, Ser. No. 35,972

Claims priority, application Japan, Mar. 24, 1992, 4-065398

Int. Cl.<sup>6</sup> G02F 1/37; H01S 3/109

U.S. Cl. 359—328

19 Claims



1. Apparatus for converting an input laser light beam having a first wavelength to at least one output laser light beam having a second wavelength different from the first wavelength, the apparatus comprising:
  - conversion means for converting the input laser light beam, travelling in a first direction, to a first laser light annular luminous flux travelling in the first direction, the conversion means also capable of converting a second laser light annular luminous flux travelling in a second direction, opposite to the first direction, to a laser light beam travelling in the second direction; and
  - an unstable optical resonator having an optical axis perpendicular to the first and second directions, the resonator comprising:
    - a first mirror, having a first reflective surface with a focal point, aligned with the optical axis of the optical resonator;
    - a second mirror, having a second reflective surface facing the first surface and having the same focal point as the first surface, aligned with the optical axis of the optical resonator and disposed a predetermined distance away from the first mirror;
    - a nonlinear optical medium between the two mirrors; and
    - an annular mirror between the two mirrors, disposed for injection of the first laser light annular luminous flux into the resonator in a direction parallel to the optical axis of the resonator, the annular mirror also disposed for reflecting the second laser light annular luminous flux out of the resonator.

5,483,375

# OPTICAL RATIO AMPLIFIER

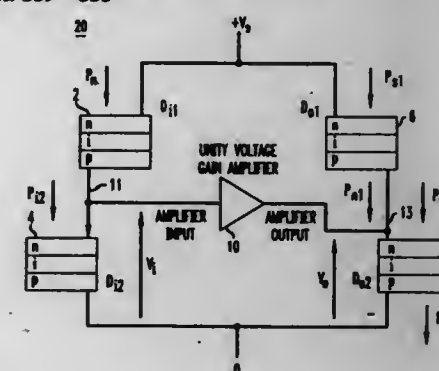
David A. B. Miller, Fair Haven, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Dec. 14, 1994, Ser. No. 355,753

Int. Cl.<sup>6</sup> H01J 40/14

U.S. Cl. 359—333

7 Claims



1. An apparatus for amplifying a ratio of optical powers, comprising:
  - first and second input electro-absorption modulators coupled together in series each for receiving an optical input beam;
  - first and second output electro-absorption modulators coupled together in series each for generating an optical output beam; and
  - a voltage amplifier electrically coupling a first node located between the first and second input modulators to a second node located between the first and second output modulators.

5,483,377

# DISPLACEMENT DETECTION APPARATUS

Yasushi Kaneda, Tokyo; Koh Ishizuka, Ohmiya; Hiroshi Kondo, Yokohama, and Satoshi Ishii, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

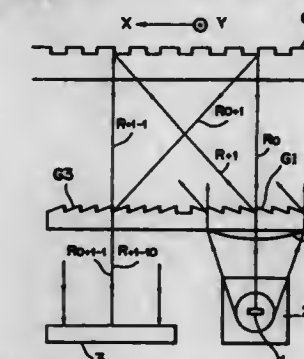
Filed Dec. 20, 1993, Ser. No. 169,402

Claims priority, application Japan, Dec. 24, 1992, 4-344560

Int. Cl.<sup>6</sup> G02B 5/18; 27/44; H01J 3/14; 40/14

U.S. Cl. 359—566

15 Claims



15. A displacement detection apparatus for detecting displacement information relative to a diffraction grating comprising:
  - two blazed diffraction gratings, the first of said two blazed diffraction gratings being used to generate two split beams for irradiating said diffraction grating, the second of said two blazed diffraction gratings being arranged to combine two diffracted beams emitted from said diffraction grating by irradiating the said split beams; and
  - a photodetecting device for detecting the two diffracted beams combined by said second blazed diffraction gratings and for generating a detection signal representing information of the relative displacement.

5,483,378

# FAULT TOLERANT ANTI-REFLECTIVE COATINGS

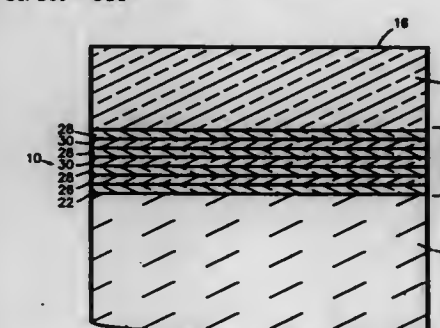
John P. Rahn, West Hills, Calif., assignor to Litton Systems, Inc., Woodland Hills, Calif.

Continuation of Ser. No. 530,675, May 30, 1990, abandoned, which is a continuation-in-part of Ser. No. 183,569, Apr. 19, 1988, Pat. No. 4,966,437. This application Jan. 10, 1992, Ser. No. 821,274

Int. Cl.<sup>6</sup> G02B 1/10

U.S. Cl. 359—586

7 Claims



1. An anti-reflective dielectric multilayer, having an outermost film of silica and successive layers of zirconia and silica, on a substrate, made by the following method:
  - determining a predetermined effective index of refraction for said multilayer, said effective index having an increased tolerance to its thickness errors and being correctable for those thickness errors by reducing the thickness of its outermost film;
  - creating said dielectric multilayer of more than two films, having the correct ratio of thickness of its silica and zirconia sublayers to obtain the above-mentioned effective index of refraction

5,483,376

# OPTICAL APPARATUS

Tsunao Takashima, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

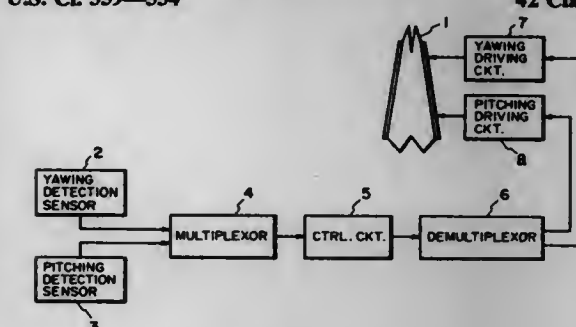
Continuation of Ser. No. 270,793, Jul. 5, 1994, abandoned, which is a continuation of Ser. No. 982,508, Nov. 27, 1992, abandoned. This application Jan. 17, 1995, Ser. No. 373,504

Claims priority, application Japan, Nov. 29, 1991, 3-339363

Int. Cl.<sup>6</sup> G02B 27/64

U.S. Cl. 359—554

42 Claims



1. An apparatus adapted for use to prevent image blur in a plurality of directions by deflecting a light beam, said apparatus comprising:
  - a device for sequentially forming signals to prevent image blur in the plurality of directions.

on an optical substrate, with the outermost film of silica having a thickness greater than its required thickness; and reducing the thickness of said outermost film of silica of said created multilayer, while measuring the reflectivity of said multilayer to compensate for total thickness error of both itself and said created multilayer to reduce the reflectivity of said multilayer.

5,483,379

# IMAGE REGISTERING IN COLOR AT LOW LIGHT INTENSITY

Sune Svanberg, Stenåldersvägen 95, S-22654 Lund, and Jonas Johansson, Kollegievägen 266, S-224 73 Lund, both of, Sweden

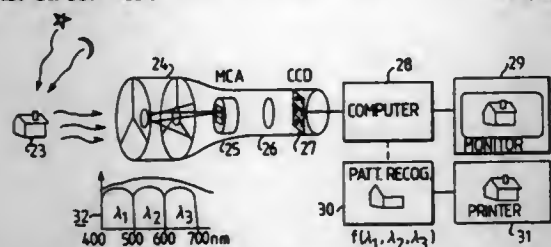
PCT No. PCT/SE92/00312, § 371 Date Nov. 12, 1993, § 102(e) Date Nov. 12, 1993, PCT Pub. No. WO92/21205, PCT Pub. Date Nov. 26, 1992

PCT Filed May 13, 1992, Ser. No. 146,120

Claims priority, application Sweden, May 14, 1991, 9101438 Int. Cl.<sup>6</sup> G01N 21/64

U.S. Cl. 359-634

4 Claims



1. A device for obtaining a viewable image from a weakly illuminating scene comprising a first optical system and image intensifier means for imaging the scene on to an image intensifier input surface, and a second optical system for perceiving an intensified image on an image intensifier output surface, said first optical system comprising a plurality of mutually different input color filters, and a beam-splitter for obtaining a plurality of images spacedly and simultaneously on to said input surface, filtered through one of said input filters, respectively, said image intensifier means comprising a sole image intensifier, multiplexer means which are spaced-multiplexing for obtaining in multiplex through said filters a plurality of color-separated intensified images on the image intensifier output surface, and means for obtaining a composite color image from said plurality of color-separated intensified images.

5,483,380

# COMPACT ZOOM LENS SYSTEM HAVING HIGH ZOOM RATIO AND WIDE VIEW ANGLE

Toshihide Nozawa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1993, Ser. No. 141,025

Claims priority, application Japan, Jan. 26, 1992, 4-287692; Apr. 7, 1993, 5-080536; May 19, 1993, 5-116793

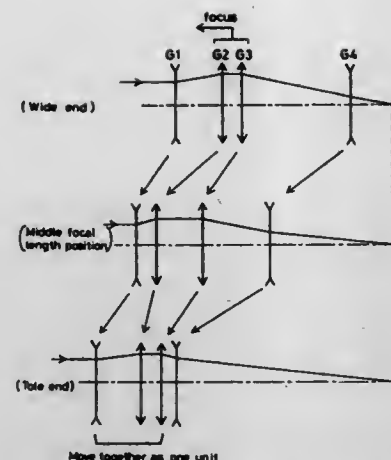
Int. Cl.<sup>6</sup> G02B 15/14

U.S. Cl. 359-686

22 Claims

1. A compact wide-angle zoom lens system comprising, in order from the object side:

- a first lens unit having a negative refractive power,
- a second lens unit having a positive refractive power, which is disposed to face said first lens unit across an air spacing,
- a third lens unit having a positive refractive power, which is disposed to face said second lens unit across an air spacing, and
- a fourth lens unit having a negative refractive power, which is disposed to face said third lens unit across an air spacing, wherein, during zooming from a wide end to a tele end, said first and third lens units move together as one unit toward the



object side, while said second lens unit moves so that, during its movement from the wide end to a middle focal length position, the spacing between said first and second lens units decreases, whereas, during its movement from the middle focal length position to the tele end, the spacing between said second and third lens units decreases, and said fourth lens unit moves so that the spacing between said fourth lens unit and said third lens unit decreases.

5,483,381

# REVERSED GALILEAN FINDER OPTICAL SYSTEM

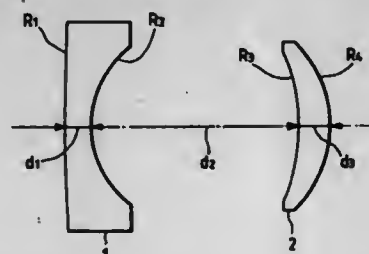
Toshiro Baba, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 26, 1994, Ser. No. 186,599

Claims priority, application Japan, Jan. 29, 1993, 5-013885 Int. Cl.<sup>6</sup> G02B 3/02; 13/00

U.S. Cl. 359-717

7 Claims



1. A reversed Galilean finder optical system consists of: in order from an object side, a first lens unit having a negative refracting power; and a second lens unit having a positive refracting power, wherein said first lens unit consists of a single negative lens and said second lens unit consists of a single positive meniscus lens whose concave surface is situated on the object side, said single positive meniscus lens having at least one aspherical surface.

5,483,382

# PROJECTION LENS AND METHOD OF USING SAME

David Kappel, Oceanside, Calif., assignor to Proxima Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 59,550, Mar. 11, 1993, Pat. No. 5,321,450. This application Sep. 17, 1993, Ser. No. 123,133

Int. Cl.<sup>6</sup> G02B 9/20; 13/18

U.S. Cl. 359-786

19 Claims

1. A projection lens system for a liquid crystal display comprising a plurality of lens means groups arranged in a Tessar configuration having a vertex length D and a field angle coverage of up to about 6 degrees;

5,483,384

# LENS ACCESSORY ATTACHING MECHANISM

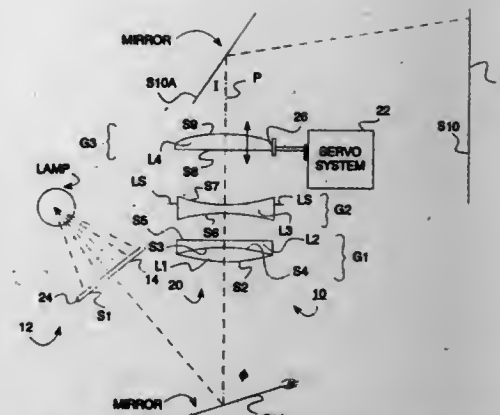
Morio Takizawa, Atsushi Matsuda, and Tetsuo Sekiguchi, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1994, Ser. No. 200,515

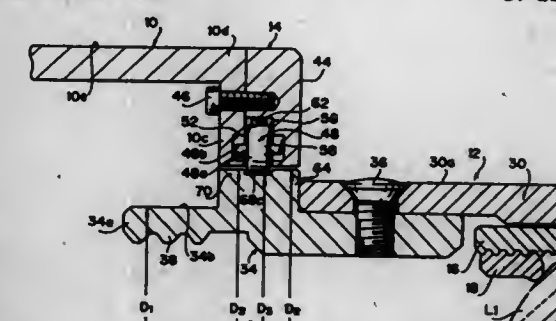
Claims priority, application Japan, Feb. 25, 1993, 5-037124 Int. Cl.<sup>6</sup> G02B 7/02

U.S. Cl. 359-827

37 Claims



said plurality of lens means groups including a first lens means group from the object end, said first lens means group including an optical doublet in the form of an optical element having a plano surface to the image end and a concave surface to the object end and an optical element having at least one aspheric surface complementary shaped to said concave surface, and a second lens means group comprising an optical bi-concave element.



23. A lens accessory attaching mechanism for detachably attaching a lens accessory to a lens barrel, which comprises: at least two rollable members provided at one end portion of the lens accessory which has an inner circumferential surface into which an outer circumferential surface of the lens barrel is inserted, the rollable members being equiangularly arranged in a circumferential direction of the lens accessory and being movable in a radial direction thereof; a ring spring arranged around all of the rollable members to urge them radially inward; an outer flange portion formed around an outer circumferential surface of a lens accessory attachment ring to extend radially outward, for restricting insertion of the lens accessory relative to the lens barrel in an axial direction thereof, by a predetermined amount of the insertion being abutted against the rollable members; and a plurality of engaging means, a number of which corresponds to a number of the rollable members, said engaging means being formed on the outer circumferential surface of the lens barrel in front of a restricting means, and equiangularly arranged in a circumferential direction of the lens barrel, for engagement with the respective rollable members upon rotation of the lens accessory in one direction, while the rollable members abut against the restricting means.

5,483,383

# LENS HOLDER

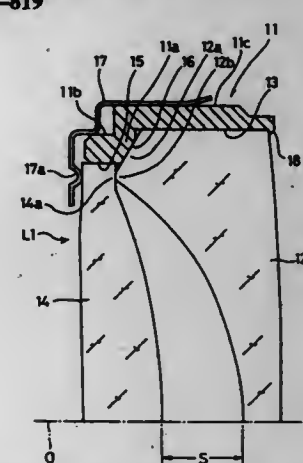
Seiji Uzile, Kazuyoshi Azegami, and Hiroshi Nomura, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1993, Ser. No. 165,998

Claims priority, application Japan, Dec. 15, 1992, 4-85962 U Int. Cl.<sup>6</sup> G02B 7/02

U.S. Cl. 359-819

12 Claims



1. A lens holder having a cylindrical lens frame which holds at least one pair of lenses; wherein, said lens frame is provided with a lens abutting surface which comes into contact with a first lens upon relative movement between said first lens and said lens frame in a first direction to determine an axial position of said first lens; and wherein, said first lens is provided with a positioning reference surface against which a second lens abuts upon relative movement between said lens frame and said second lens in a second direction opposite to said first direction to determine an axial position of said second lens.

5,483,385

# ADJUSTABLE TRUCK MIRROR

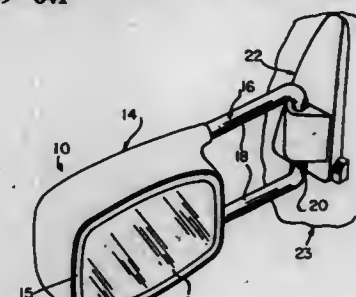
Ian Boddy, Ada, Mich., assignor to Lowell Engineering Corp., Ada, Mich.

Filed Oct. 19, 1994, Ser. No. 325,617

Int. Cl.<sup>6</sup> G02B 7/182; B60R 1/06

U.S. Cl. 359-841

8 Claims



1. A side-view mirror assembly for a vehicle which is controllably movable inwardly towards or outwardly away from said vehicle comprising: a fixed support adapted to be fixed to said vehicle;



- a U-shaped member including a bight portion secured to said fixed support and a pair of parallel legs extending from said bight portion outwardly away from said vehicle;
- a movable mirror housing having a pair of spaced receiving portions constructed and arranged to receive said legs of said U-shaped member, said mirror housing being manually engageable to be moved into different positions of adjustment along a length of said legs upon application of sufficient manual force thereto to enable desired lateral positioning thereof;
- at least one engagement element each constructed and arranged to provide sufficient engagement between one of said receiving portions of said mirror housing and a respective one of said legs of said U-shaped member to inhibit movement of said mirror housing along said legs when application of said manual force thereto is discontinued; and
- a movable mirror unit secured to said mirror housing in angularly movable relation with respect thereto to enable desired angular positioning of said mirror unit.

5,483,386

## COMPOSITE FRAMED MIRROR AND METHOD FOR MAKING SAME

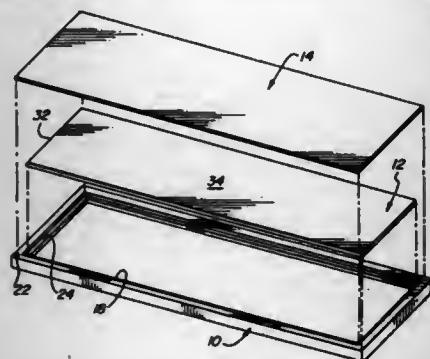
Kenneth R. Carson, Shannon, Miss., assignor to The Stanley Works, New Britain, Conn.

Filed May 16, 1994, Ser. No. 243,278

Int. Cl.<sup>6</sup> G02B 5/08; A47G 1/06

U.S. Cl. 359—883

10 Claims



1. A framed mirror for doors and wall mounting comprising:
- (a) a frame having a peripheral portion with front and rear surfaces and bounding an opening extending therethrough, said peripheral portion having a recess in the rear surface thereof providing a shoulder extending about said opening;
- (b) a glass mirror having front and rear surfaces and an edge extending about its periphery, said mirror being disposed in said opening with the peripheral portion of its front surface seated on said shoulder and its edge adjacent the margins of said recess, said mirror and recess being cooperatively dimensioned so that said rear surface of said mirror lies in a plane closely adjacent to but not above said rear surface of said frame; and
- (c) high tensile strength synthetic resin sheeting extending over said rear surface of said mirror and over at least a portion of said rear surface of said frame peripheral portion outwardly of said recess, said sheeting being securely bonded to said rear surfaces of said mirror and said frame by adhesive to secure said mirror on said shoulder and to provide resistance to shattering of said mirror, said sheeting and frame peripheral portion cooperating to provide a seal for said edge of said mirror.

5,483,387

## HIGH PASS OPTICAL FILTER

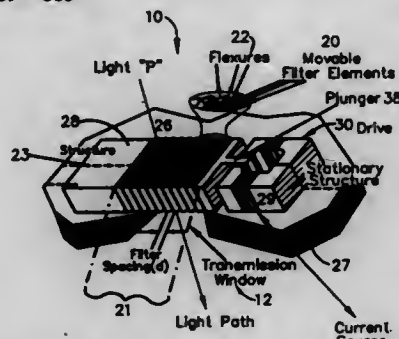
Paul E. Raubahn, Fridley; Thomas Ohnstein, Roseville, and James D. Zook, Minneapolis, all of Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Jul. 22, 1994, Ser. No. 279,762

Int. Cl.<sup>6</sup> G02B 5/28; 5/18; 5/22

U.S. Cl. 359—885

20 Claims



11. An optical filter for altering incident radiation ranging from sub-micron to multi-millimeter wavelengths, comprising:
- a base member having a radiation transmission aperture formed therethrough;
- an array of deep lamellar structures coupled to the base member and disposed across at least a portion of the radiation transmission aperture, wherein the array of deep lamellar structures further comprises an array of substantially identical parallel plate members coupled together along at least two opposing lateral edges so that each parallel plate member is equidistant from the next successive parallel plate member; and
- linear actuator means for controllably articulating the array of deep lamellar structures.

5,483,388

## INFORMATION RECORDING AND REPRODUCING APPARATUS FORMING PLURAL KINDS OF ERROR DETECTION OR CORRECTION CODES

Tetsuya Shimizu, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

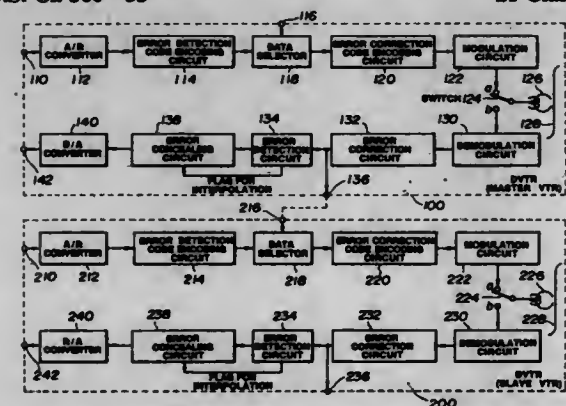
Filed Jun. 7, 1993, Ser. No. 72,092

Claims priority, application Japan, Jun. 18, 1992, 4-159766

Int. Cl.<sup>6</sup> G11B 5/09; 5/86

U.S. Cl. 360—53

21 Claims



1. An information recording and reproducing apparatus, comprising:
- encoding means for encoding an information signal, said encoding means adding redundant codes to the information signal to form error detection and correction codes and outputting the information signal and the redundant codes;
- recording means for recording the information signal and the redundant codes outputted from said encoding means on a recording medium;

reproducing means for reproducing the information signal and the redundant codes from the recording medium;

decoding means for decoding the error detection and correction codes to detect and correct errors in the information signal reproduced by said reproducing means by using the redundant codes reproduced by said reproducing means and having a plurality of outputs; and

first output means for externally outputting from one of said plurality of outputs the information signal partially processed through said decoding means and only a part of the redundant codes.

5,483,389

## REPRODUCING APPARATUS FOR TEMPORARILY WRITING REPRODUCING DATA INTO MEMORY

Katsumi Karasawa, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

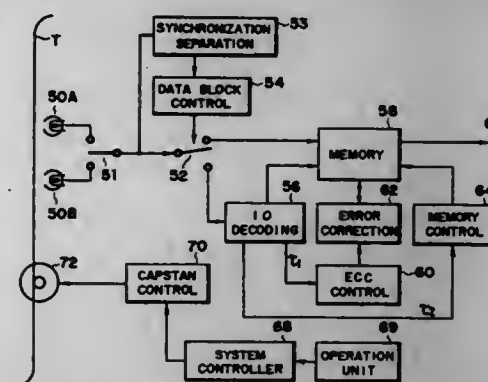
Continuation of Ser. No. 170,640, Dec. 21, 1993, abandoned, which is a continuation of Ser. No. 720,726, Jun. 25, 1991, abandoned. This application Jun. 16, 1994, Ser. No. 261,303

Claims priority, application Japan, Jun. 28, 1990, 2-168514

Int. Cl.<sup>6</sup> G11B 5/09; 15/14

U.S. Cl. 360—53

17 Claims



1. A reproducing apparatus for reproducing main information data from a recording medium on which a data train including the main information data, address data, and error correction data for an error correction has been recorded, comprising:
- (a) a reproducing head to trace on the recording medium;
- (b) extracting means for extracting the address data from the data train reproduced by said reproducing head;
- (c) a memory to store the main information data in the data train;
- (d) error correcting means for correcting a code error of the main data stored in the memory by using the error correction data in the data train; and
- (e) control means for determining both an access timing of the error correcting means to the memory and a storage address of the main information data into the memory in accordance with the address data extracted by the extracting means.

5,483,390

## DEVICE FOR SWITCHING A VIDEO TAPE RECORDER HEAD TO WRITE/READ MODE

Jean-Luc Jaffard, Saint Egreve, and Yann Desprez-Le Goarant, Grenoble, both of France, assignors to SGS-Thomson Microelectronics, S.A., Pouilly, France

Filed Jul. 30, 1993, Ser. No. 100,665

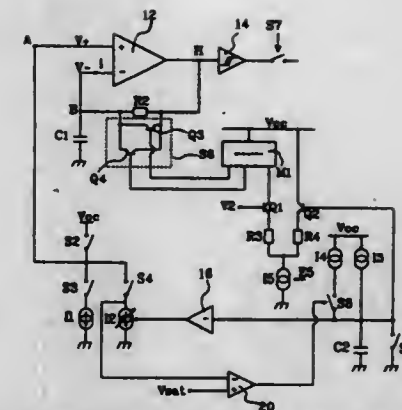
Claims priority, application France, Jul. 31, 1992, 92 09798

Int. Cl.<sup>6</sup> G11B 5/09; 15/12

U.S. Cl. 360—62

19 Claims

1. An apparatus for switching a magnetic head from a write mode to a read mode, comprising:
- means for generating and outputting a voltage ramp, after a write operation of the magnetic head;



- a current source for controlling the discharge of an initial current in said magnetic head after the write operation;
- means for controlling a maximum current output of the current source such that the maximum current output is proportional to said ramp voltage between a first time frame corresponding to a beginning voltage value of the voltage ramp and a second time frame corresponding to a first threshold voltage value of the ramp, said current source having an initial maximum current value, corresponding to the beginning voltage value of the voltage ramp, larger than the initial current in said magnetic head; and
- means for accentuating the voltage ramp slope between the first time frame and a third time frame corresponding to when the maximum current output by the current source substantially equals the initial current in said magnetic head.

5,483,391

## METHOD OF AND APPARATUS FOR ADJUSTING DECK MECHANISM OF VIDEO CASSETTE RECORDER

Dae-Gab Gweon; Deockje Cho, both of Daejeon, and Jaekuk Ryu, Seoul, all of, Rep. of Korea, assignors to Sam Jung Co., Ltd., Rep. of Korea

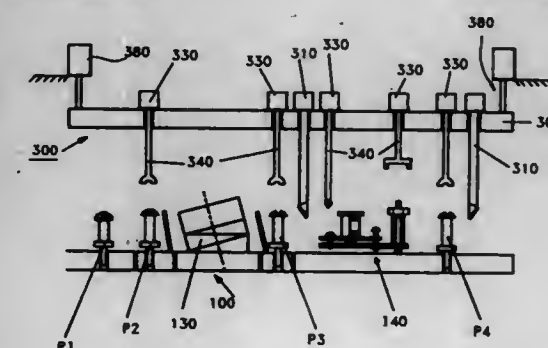
Filed Sep. 8, 1993, Ser. No. 118,423

Claims priority, application Rep. of Korea, Sep. 9, 1992, 92-16442; Mar. 16, 1993, 93-3996

Int. Cl.<sup>6</sup> G11B 15/60

U.S. Cl. 360—69

17 Claims



1. An automatic deck adjusting apparatus having a tape running system adjusting mechanism for adjusting a tape running system and control means for controlling the tape running system adjusting mechanism to adjust the tape running system of a deck mechanism in a VCR automatically, said tape running system adjusting mechanism comprising:
- a plurality of screw driver tip assemblies for screwing adjustment screws and/or nuts in the system;
- a motor assembly for rotating said screw driver tip assemblies by a predetermined angle;
- a driver housing for fixedly supporting said screw driver tip assemblies and said motor assembly in place;

a means for moving said housing to adjusting position and to standby position, being attached to said driver housing;  
a positioning means for aligning a deck mechanism to be adjusted and said screw driver housing in an exact position with each other; and,  
a video camera for monitoring the position of said tape passing through guide posts and an audio and control head assembly.

5,483,392

# **MAGNETIC RECORDING AND OR REPRODUCING APPARATUS AND A RECORDING MEDIUM THEREOF** Takeshisa Ishida, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 817,338, Jan. 6, 1992, abandoned.

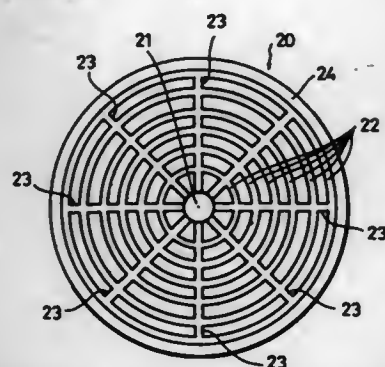
This application Oct. 29, 1993, Ser. No. 145,296

Claims priority, application Japan, Jan. 9, 1991, 3-012732

Int. Cl.<sup>6</sup> G11B 5/596

U.S. Cl. 360—77.03

6 Claims



1. In combination, a magnetic recording and reproducing apparatus which includes a magnetic head and a magnetic recording medium on which a pattern of a recording track is formed for recording and reproduction, the combination comprising:

a radially extending pattern of a predetermined width formed over the recording track;

tracking means for detecting a change of an electrostatic capacity between the recording track and an electrode unitarily formed with the magnetic head, the tracking means including compensating means for detecting changes of the electrostatic capacity between the radially extending pattern and the electrode and subtracting such changes from a detected change of the electrostatic capacity between the recording track and the electrode to thereby compensate for an influence of changes in a stray electrostatic capacity, wherein the tracking means includes an electrostatic capacity detector connected to the electrode for detecting the electrostatic capacity and an adder and a first subtracter, and wherein the compensating means is connected between the electrostatic capacity detector and the adder and the first subtracter and includes a maximum value detecting circuit, a calculating circuit, a first switch and a capacitor connected in series, wherein the electrostatic capacity detector supplies to the maximum value detecting circuit a first signal corresponding to the electrostatic capacity supplied from the electrode, the maximum value detecting circuit detects a maximum value of the first signal and supplies a maximum value signal to the calculating circuit where a predetermined reference value is subtracted from the maximum value signal and a corresponding first difference signal is output from the calculating circuit through the first switch to the capacitor where the first difference signal is stored, and wherein the first switch is controlled by the maximum value detector to thereafter supply the stored first difference signal from the capacitor to a second subtracter where the first difference signal is subtracted from the first signal to produce a second difference signal which is supplied to the adder and the first subtracter.

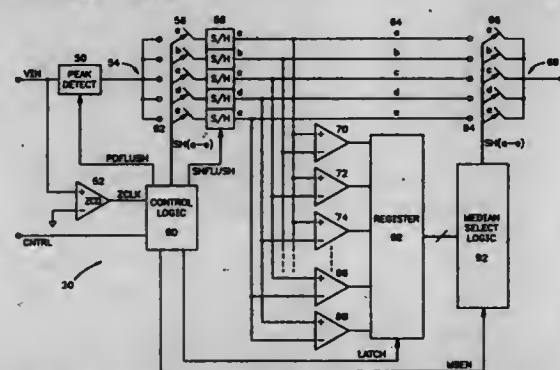
# **DISK DRIVE HAVING HEAD POSITIONING SERVO WITH IMPROVED SERVO READ SIGNAL PROCESSING USING MEDIAN SERVO BURST PEAK MAGNITUDES** Robert P. Mento, El Toro, Calif., and Jeffrey G. Reh, Longmont, Colo., assignors to Western Digital Corporation, Irvine, Calif.

Filed Apr. 18, 1994, Ser. No. 229,210

Int. Cl.<sup>6</sup> G11B 5/596

U.S. Cl. 360—77.08

15 Claims



1. An integrated circuit having signal processing circuitry for a head positioning servo of the embedded type in which spaced-apart prerecorded servo bursts move under an active head to cause production of a servo read signal that, during each of a succession of timing windows marked by a timing signal, oscillates to define variable-magnitude peaks during servo-sector phases, the signal processing circuitry comprising:

detector circuit means having a signal-processing input for receiving the servo read signal, having a control input for receiving the timing signal, and having means for producing a detected signal that, during each timing window, successively represents the individual magnitudes of a plurality of the variable-magnitude peaks including one such magnitude so represented that has the median magnitude; and

signal-storing circuit means having a signal-processing input for receiving the detected signal, and having means responsive to the detected signal for producing and temporarily storing a first and then a second stored signal such that each stored signal represents the median magnitude represented by the detected signal during a respective one of consecutive timing windows.

5,483,394

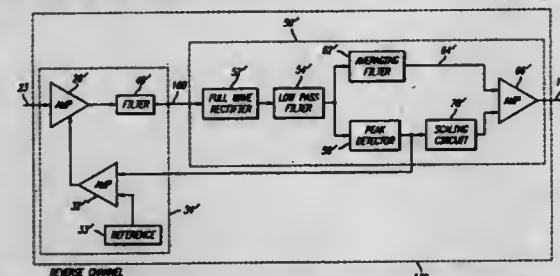
# **FILTERED AVERAGE SERVO DEMODULATOR** Jefferson H. Harman, Thousand Oaks, Calif., assignor to Wangtek, Inc., Simi Valley, Calif.

Filed Oct. 29, 1993, Ser. No. 146,369

Int. Cl.<sup>6</sup> G11B 5/584; 5/55

U.S. Cl. 360—77.12

47 Claims



1. A track following positioning system for maintaining alignment of a tape head on magnetic media comprising:

first servo head means operatively connected to said tape head for generating servo head signals in response to displacement of said first servo head means from an on-track location on a servo written region of magnetic media when said magnetic media is moved in a first direction;

first demodulator means for generating servo error signals in response to said servo head signals generated by said first servo head means indicating misalignment of said first servo head from said on-track location, wherein said first demodulator means further comprises:  
first means for generating rectified and filtered signals having values related to said servo head signals;  
first means for generating reference signals in response to said rectified and filtered signals;  
first means for generating averaged signals related to position of said first servo head means over said servo written region on said magnetic media in response to said rectified and filtered signals; and  
first means for subtracting said reference signals from said averaged signals to generate said servo error signals; and  
means for positioning said tape head on magnetic media in accordance with said servo error signals.

ing hole of said digital tape cassette, when said digital tape cassette is inserted in said holding means,  
and wherein the first positioning members do not engage with the positioning hole of said analog tape cassette, when said analog tape cassette is inserted in said holding means, and the second positioning members do not engage with the positioning hole of said digital tape cassette, when said digital tape cassette is inserted in said holding means.

5,483,395

# **TAPE RECORDER FOR USE WITH ANALOG COMPACT CASSETTES AND DIGITAL TAPE CASSETTES** Isao Shinohara, Ikoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 828,424, Jan. 31, 1992, abandoned.

This application Apr. 20, 1994, Ser. No. 231,584

Claims priority, application Japan, Feb. 5, 1991, 3-014263

Int. Cl.<sup>6</sup> G11B 5/78; 5/74

U.S. Cl. 360—96.5

2 Claims



1. In a tape recorder for use with analog and digital tape cassettes wherein said digital tape cassette has a shutter over a front portion and said analog tape cassette does not have a shutter, tape holding and tape engaging means comprising:

cassette pressing members for pressing said digital or analog tape cassette toward a magnetic head of said tape recorder, stopping means for said pressing members to fixedly position a front edge of said digital or analog tape cassette against said stopping means and in an exact position relative to said magnetic head when said digital or analog tape cassette is inserted,

each of said cassette pressing members having a V-shape elastic part with one end being in a fixed position and another end displaceable relative to said fixed end,

first pressing portions for pressing one side of a positioning hole of said digital tape cassette,

second pressing portions for pressing one side of a positioning hole of said analog tape cassette,

first positioning members for positioning said digital tape cassette when inserted by engagement with the positioning hole of said digital tape cassette; and

second positioning members for positioning said analog tape cassette when inserted by engagement with the positioning hole of said analog tape cassette,

wherein the first pressing portions do not press the side of the positioning hole of said analog tape cassette, when said analog tape cassette is inserted in said holding means, and the second pressing portions do not press the side of the position-

5,483,396

# **CASSETTE HOLDER OPENING SYSTEM HAVING A DAMPER** Hee Chul Son, Incheon, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

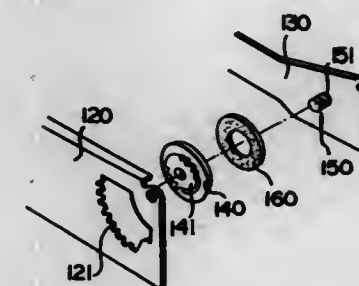
Filed Aug. 29, 1994, Ser. No. 297,214

Claims priority, application Rep. of Korea, Sep. 28, 1993, 93-20239

Int. Cl.<sup>6</sup> G11B 15/675; F16F 15/20

U.S. Cl. 360—96.6

5 Claims



1. A cassette holder opening system comprising:

a cassette holder for receiving a cassette tape;

a frame for rotatably supporting the cassette holder, the frame having a sector gear formed at a part thereof, the cassette holder being hingedly attached to the frame by a pivot pin;

a spring member disposed between the cassette holder and the frame to connect them with each other so as to provide spring force for opening the cassette holder; and

a damper for damping the spring force to open the cassette holder, the damping force of which varies according to the open angle of the cassette holder, the damper including a shaft fixed on the cassette holder and having a screw formed on an outer surface of the shaft, a friction member disposed coaxially with the shaft to be in contact with the cassette holder, and a rolling member so fitted on the shaft as to be guided along the screw of the shaft,

the rolling member having a body, a plurality of protrusions formed at one side of the body to be in slidable contact with the friction member, and a rolling gear formed at the other side of the body to be engaged with the sector gear,

wherein the rolling gear rolls along the sector gear, and thereby the rolling member is guided along the screw of the shaft, so that a distance between the friction member and the rolling member and accordingly the frictional force therebetween are changed, when the cassette holder is pivoted about the pivot pin.



5,483,397

**DAMPING CONFIGURATION FOR IMPROVED DISK DRIVE PERFORMANCE**

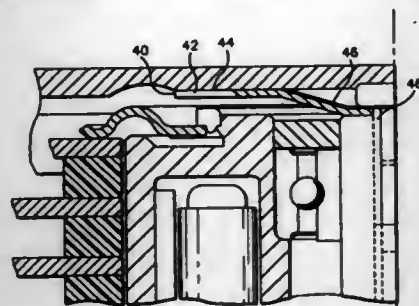
R. Bruce Gifford, Nashua, N.H.; Michael C. Strzepa, Westboro; Tom E. MacDonald, Mansfield, both of Mass., and Frank W. Bennett, Colorado Springs, Colo., assignors to Quantum Corporation, Milpitas, Calif.

Filed Jun. 28, 1994, Ser. No. 267,058

Int. Cl.<sup>6</sup> G11B 33/14

U.S. Cl. 360—97.01

10 Claims



1. A hard disk drive comprising: a disk enclosure having a top cover and a bottom baseplate; a spindle motor fixed to the baseplate and including a spindle shaft having a top end, a bottom, the spindle shaft disposed within the enclosure between the top cover and the bottom baseplate; a laminated viscoelastic damper positioned within the enclosure in contact with the top cover and the top of the spindle shaft, said damper comprising a generally arcuate metal washer having a raised central portion on a side thereof and a layer of viscoelastic material fixed to an opposite side thereof, wherein the raised central portion is secured to the top of the spindle shaft and wherein the layer of viscoelastic material is attached to the top cover to provide stiffness in reducing shaft vibrations.

5,483,398

**COMPLIANT VIBRATION ISOLATION HOUSING ASSEMBLY FOR A DATA STORAGE SYSTEM**

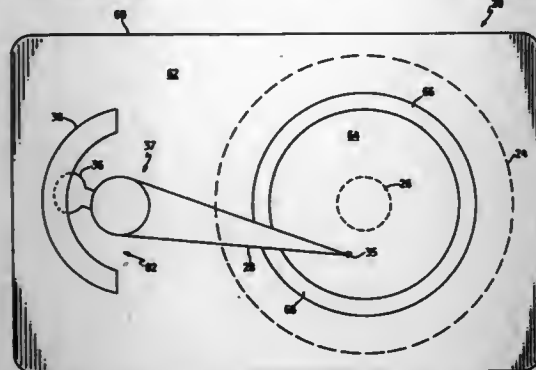
Zine-Eddine Boutaghou, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 4, 1994, Ser. No. 334,200

Int. Cl.<sup>6</sup> G11B 33/14

U.S. Cl. 360—97.02

20 Claims



1. A housing assembly adapted for housing a data storage system including a data storage disk, a spindle motor for rotating the data storage disk; and a transducer mounted to an actuator assembly for transferring information to and from the data storage disk, the housing assembly comprising:

- a primary housing base;
- a secondary housing base, the secondary housing base having the spindle motor mounted thereto; and

a compliant element disposed between the primary housing base and the secondary housing base, and encompassing the secondary housing base to operatively couple the primary housing base to the secondary housing base such that the compliant element attenuates vibrations transmitted between the spindle motor and the primary housing base.

5,483,399

**SELF-LATCHING RESTRAINT FOR AN ACTUATOR OF A DISK DRIVE**

Woo-Cheol Jeong; Yeong-Mok Kim; Hee-Cheol Bum, all of Seoul, and Jong Jeon, Suwon, all of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

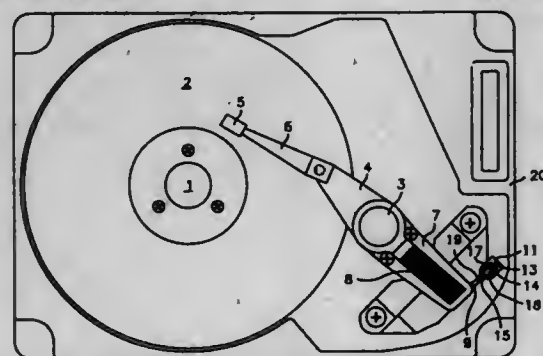
Filed May 25, 1994, Ser. No. 249,274

Claims priority, application Rep. of Korea, May 27, 1993, 1993-9320

Int. Cl.<sup>6</sup> G11B 5/54

U.S. Cl. 360—105

20 Claims



1. A self-latching restraint apparatus for an actuator of a disk drive, said disk drive comprising a disk that is rotated at a high speed by a spindle motor, said actuator turning on a pivot, head gimbals installed between said actuator and a magnetic head, a voice coil motor, and a bobbin positioned on a bottom portion of said actuator, said self-latching restraint apparatus comprising:

- an automatic locking arm protruding from a first end portion of said actuator;
- damping material extending from an end portion of said automatic locking arm;
- a locking groove formed on a bottom portion of said automatic locking arm for providing a region where said automatic locking arm can be gripped;
- a stopper fixedly attached to a body portion; and
- a locking unit rotatably installed adjacent to said stopper, said locking unit comprising a hook-shaped locking projection extending upwardly, said locking unit rotating in response to said damping material engaging a first portion of said locking unit and causing said hook-shaped locking projection to be inserted into said locking groove to thereby grip said automatic locking arm and prevent movement of said actuator.

5,483,400

**DISK DRIVE APPARATUS**

Hitoshi Tsujino, Tokyo, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 731,587, Jul. 17, 1991, Pat. No. 5,315,464.

This application Jan. 3, 1994, Ser. No. 176,406

Claims priority, application Japan, Aug. 20, 1990, 2-190878

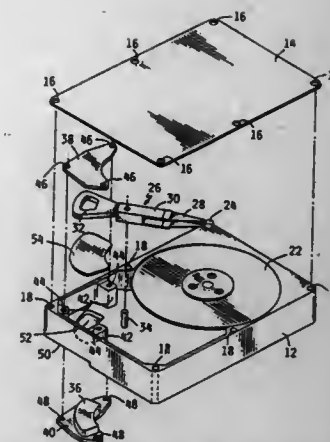
Int. Cl.<sup>6</sup> G11B 5/54; 33/12

U.S. Cl. 360—106

5 Claims

1. A disk drive apparatus for storing information comprising: a housing providing a base for mounting components of said disk drive;

- at least one disk rotatably mounted on said housing;



- an actuator attached to said housing, said actuator having a first end and a second end, and pivoting about an axis parallel to the axis of rotation of said disk;
- a head attached to said first end of said actuator;
- a coil attached to the second end of said actuator;
- a first permanent magnet for creating a magnetic field surrounding said coil, said field used for positioning said actuator; wherein said housing has a first opening therein near said coil, said first permanent magnet being positioned within said first opening and attached to the outside of said housing opposite said coil.

5,483,401

**ROTARY HEAD DRUM HAVING A CONNECTING MEMBER FOR PROVIDING ELECTRICAL CONDUCTION**

Toshihiko Nakajima; Hiroo Edakubo, and Kiyoshi Kumagai, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 737,068, Jul. 29, 1991, abandoned.

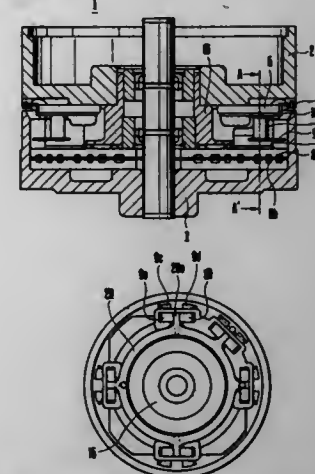
This application Jun. 16, 1994, Ser. No. 260,686

Claims priority, application Japan, Aug. 8, 1990, 2-208247; Mar. 12, 1991, 3-046563

Int. Cl.<sup>6</sup> G11B 5/27

U.S. Cl. 360—108

16 Claims



6. A connecting member for electrically connecting a first set of conductive patterns and a second set of conductive patterns, each of the first and second sets of conductive patterns having a plurality of conductive patterns, comprising:

- (a) a body;
- (b) a cutout portion formed approximately in the middle of said body; and
- (c) a plurality of U-shaped conductive portions formed on said body on opposite sides of said cutout portion, one end of said

U-shaped conductive portion connecting the conductive pattern of one of said first and second sets of conductive patterns and other end of said U-shaped conductive portion connecting the conductive pattern of the other of said first and second sets of conductive patterns.

5,483,402

**MAGNETO RESISTIVE HEAD HAVING SYMMETRIC OFF-TRACK PERFORMANCE PROFILE**

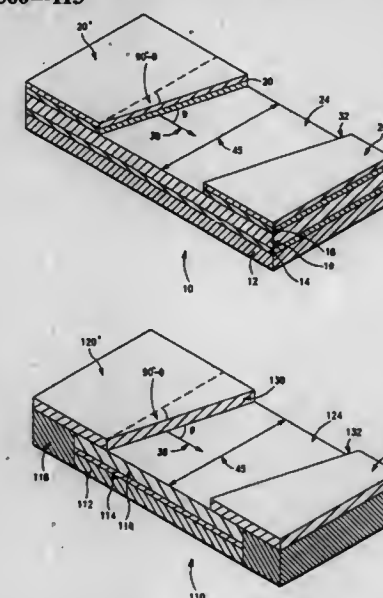
Sharat Batra, Shrewsbury, Mass., assignor to Quantum Corporation, Milpitas, Calif.

Filed Jun. 15, 1994, Ser. No. 259,795

Int. Cl.<sup>6</sup> G11B 5/39

U.S. Cl. 360—113

15 Claims



15. A magneto-resistive read transducer for reading position information within each of plural adjacent data tracks of a magnetic recording medium, said transducer comprising:

- a magneto-resistive layer having a longitudinal axis and having spaced apart end regions thereon and having an easy axis of magnetization substantially parallel to said longitudinal axis;
- conductive leads in spaced apart relationship with each other and electrically connected to said magneto-resistive layer for providing a sense current through said magneto-resistive layer, said leads having spaced apart facing edges which extend generally parallel to each other and define an active region therebetween, each of said facing edges being canted such that a line passing coplanarly through one of said facing edges defines an acute angle with respect to said longitudinal axis to ensure symmetrical off-track response to the position information during operation of said transducer;
- longitudinal biasing means operatively associated with said magneto-resistive layer for maintaining a single domain state in said end regions; and
- soft adjacent layer means for providing transverse bias in at least a portion of said active region.

5,483,403

# THIN FILM MAGNETIC HEAD STRUCTURE HAVING TAPERED SIDE EDGES

Otto Voegeli, Morgan Hill, Calif., assignor to International  
Business Machines Corporation, Armonk, N.Y.

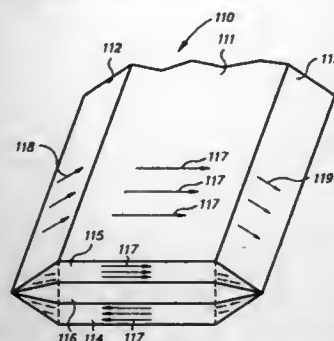
Continuation of Ser. No. 116,653, Sep. 2, 1993, abandoned.

This application Mar. 13, 1995, Ser. No. 403,556

Int. Cl.<sup>6</sup> G11B 5/33; 5/147

U.S. Cl. 360—113

4 Claims



1. A head assembly for use in a magnetic recording disk drive having a disk for the recording of data comprising:

a carrier having a surface facing the disk when the carrier is located in the disk drive; and

a head formed on the carrier, the head comprising:

a magnetoresistive sensor recessed from the disk-facing surface of the carrier, and

a magnetic flux guide for directing magnetic flux from the disk to the sensor comprising a laminate of two magnetic films and a nonmagnetic spacer film located between the two magnetic films the flux guide having a thickness defined by the thickness of the laminated films, a length defined between a sensing end near the disk-facing surface on the carrier and an opposite end magnetically coupled to the recessed sensor, and a width near the sensing end defined between two side edges, the width having a central region and two edge regions spaced apart by the central region, the magnetic films having their magnetization oriented generally parallel to the sensing end and generally perpendicular to each of said two side edges, each of the two magnetic films and intermediate spacer film having a thickness that is generally constant over a substantial portion of the width of the sensing end in the central region of the sensing end, that decreases toward each of said two side edges in each of the edge regions, edges and that is at its minimum at said side edges; wherein a single domain state in the flux guide of the head assembly is obtained.

5,483,404

# SEMICONDUCTOR INTEGRATED CIRCUIT

Toshiya Nakano, Itami, Japan, assignor to Mitsubishi Denki  
Kabushiki Kaisha, Tokyo, Japan

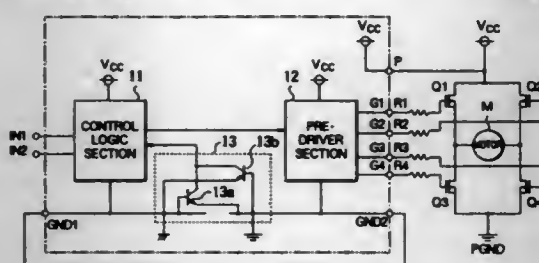
Filed Mar. 13, 1995, Ser. No. 402,719

Claims priority, application Japan, Sep. 9, 1994, 6-216226

Int. Cl.<sup>6</sup> H02H 7/10

U.S. Cl. 361—18

11 Claims



1. A semiconductor integrated circuit comprising:

input terminals to which an operation command from the outside is input;

a power terminal connected to a drive power source of voltage-driven-type power control devices constituting an object of control;

control output terminals connected to control terminals of said voltage-driven-type power control devices and adapted to output drive control signals for drive-controlling said voltage-driven-type power control devices;

a grounding terminal divided into at least two (first and second) grounding terminals connected to each other in the exterior;

control means outputting a drive control signal corresponding to the operation command input through said input terminals to the control terminals of said voltage-driven-type power control devices through said control output terminals; and

a consumption current detecting section detecting a flow of consumption current between the first and second grounding terminals and clamping the electric potential of said grounding terminal to a level not higher than the drive control potential of said voltage-driven-type power control devices.

5,483,405

# MINI-TRANSFORMER WITH MOLDED COVER AND RETENTION STRUCTURE

Ruedi Kaelin, Breitenweg 22A, CH-5703 Seon, Switzerland

Continuation of Ser. No. 787,006, Nov. 4, 1991, abandoned.

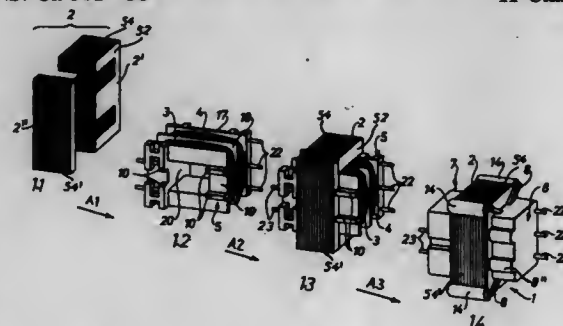
This application Sep. 21, 1994, Ser. No. 310,034

Claims priority, application Switzerland, Nov. 7, 1990, 3536/90; Sep. 26, 1991, 2853/91

Int. Cl.<sup>6</sup> H02H 7/04; H01F 27/02; 27/26

U.S. Cl. 361—38

11 Claims



1. A small or a mini-transformer (1)

a unitary coil body (5) having a central aperture with two lateral support walls (17, 19) and external core support ribs (10); primary and secondary windings (3, 4) located on said unitary coil body (5), electrically and physically separated from each other; and

a core (2) of ferromagnetic material, including a core element (2') which is generally E-shaped and having a central leg, and a further core element (2'') positioned to complete the magnetic circuit of the core (2),

said coil body being placed on the core with the central leg of the E-shaped core element (2') extending through the central aperture (20) of the coil body, said coil body, with the windings thereon, leaving hollow spaces (9) between the core (2) and the coil body (5),

wherein the core (2) defines two broad end faces (52) and four side faces (54, 54') said short side faces defining two parallel longer sides (54') and two parallel shorter sides (54), at right angles to the longer sides; and

a single unitary integral injection-molded cover and retention structure of thermoplastic material said cover and retention structure comprising

two lids or covers (6, 7) extending at least in part over both broad end faces (52) of the core and over the coil body and thereby form lids or covers (6, 7) over the coil body and the windings located thereon

5,483,407

# ELECTRICAL OVERSTRESS PROTECTION APPARATUS AND METHOD

Paul J. Anastasio, Camp Hill; James M. English, Annville; John C. Farrar, Harrisburg; Ram P. Goel, Camp Hill; Bernard J. Janoss, Harrisburg, all of Pa.; Christopher J. Collins, Fremont, Calif.; Richard K. Childers, Redwood City, Calif.; and John H. Bunch, Menlo Park, Calif., assignors to The Whitaker Corporation, Wilmington, Del.

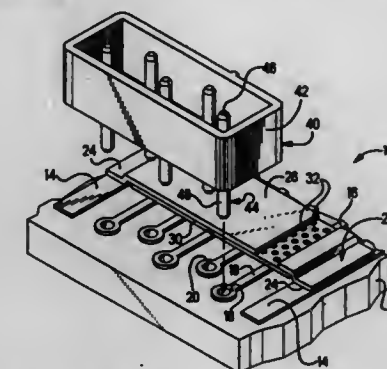
Continuation of Ser. No. 949,655, Sep. 23, 1992, abandoned.

This application Oct. 4, 1994, Ser. No. 317,988

Int. Cl.<sup>6</sup> H02H 3/22; 9/00

U.S. Cl. 361—56

24 Claims



11. In combination, an electrical connector, including a plastic housing and a plurality of electrical signal contacts, each having a first end adapted to engage a mating connector contact and a second end adapted to be connected to a circuit board carrying components having a sensitivity to overvoltage transients, and

a laminar protector having a corresponding plurality of signal paths, each having a given area and connected to a respective one of said signal contacts, a plastic sheet including holes therein containing a material having desired voltage breakdown characteristics to protect said components from the overvoltage transient, and a ground path of at least said given area forming a lamination with said sheet and said signal paths with the thickness of said sheet defining adequate material thickness and volume to accommodate the excessive voltage transients in terms of voltage level and energy content to protect said components.

5,483,408

# OVERCURRENT TRIP UNIT WITH SEPARATELY ADJUSTABLE NEUTRAL PROTECTION

Joseph J. Matsko, Beaver; Joseph C. Engel, and Alan B. Shimp, both of Monroeville, all of Pa., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 25, 1994, Ser. No. 218,008

Int. Cl.<sup>6</sup> H02H 3/16

U.S. Cl. 361—94

13 Claims

1. An electric circuit interrupting device in an electrical system having three phase conductors and a neutral conductor, said device comprising:

separable contact means for interrupting current flowing in said electrical system;

current sensing means sensing current flowing in each of said phase conductors and in said neutral conductor;

trip signal generating means connected to said current sensing means and responsive to first operator adjustable current conditions in any of said three phase conductors and to second operator adjustable current conditions in said neutral conductor, for generating a trip signal; and

trip means responsive to said trip signal for opening said separable contact means to interrupt current flowing in said electrical system.

lateral connector portions (8,8') extending from said covers over at least part of said broad end faces (52) of said core (2) and overlapping the end edges of the end faces.

injected first bars (12) or connectors located within the hollow spaces (9) between the windings (3,4) and the core (2), completely filling said hollow spaces, securing the windings (3,4) in place, and insulating them against each other and against the core, and

second bars or connectors (14, 14') in strip or bar form positioned outside of the core and arranged between and connecting said connector portions (8, 8') and hence said lids or covers (6,7), overlapping at least two of the sides of the core and clamping around the outside of the core while leaving the sides (54, 54') of the core between the second bars or connectors essentially devoid of plastic materials,

said first bars or connectors, said second bars or connectors (14, 14'), and said connector portions (8,8'), and said lids or covers (6,7) together of the unitary injection molded cover and retention structure, clamping the core (2) and the coil body (5) with the windings thereon.

5,483,406

# OVERVOLTAGE PROTECTION CIRCUIT

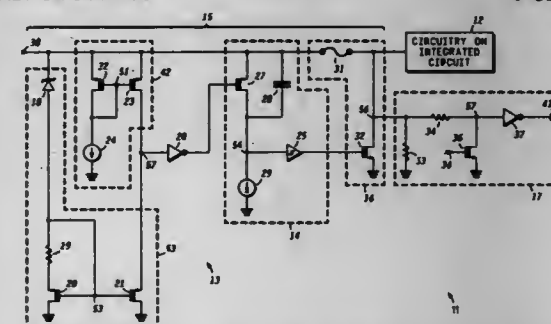
Paul T. Bennett, Phoenix; Randall C. Gray, Tempe, and John M. Pigott, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 30, 1993, Ser. No. 128,425

Int. Cl.<sup>6</sup> H02H 3/20

U.S. Cl. 361—56

6 Claims



1. An integrated circuit including a testable protection circuit for preventing an overvoltage condition from damaging circuitry contained therein, said protection circuit comprising:

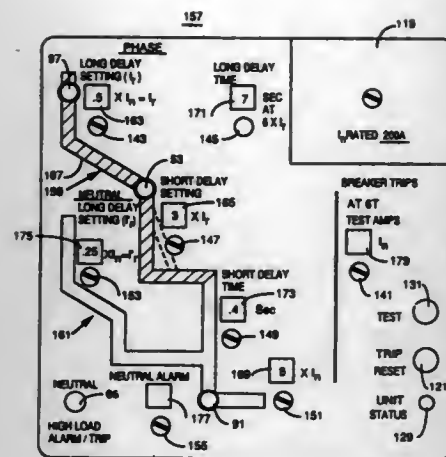
a sense circuit responsive to a voltage, said sense circuit providing a signal indicating said voltage exceeds a predetermined threshold voltage;

a timing circuit responsive to said signal of said sense circuit, said timing circuit providing a signal indicating the overvoltage condition wherein said voltage exceeds said predetermined threshold voltage for a predetermined time;

a fuse coupled having a first terminal coupled for receiving said voltage and a second terminal coupled to the circuitry of the integrated circuit; and

a transistor having a first electrode coupled to said second terminal of said fuse, a control electrode coupled for receiving said signal from said timing circuit, and a second electrode coupled to a terminal of a power supply wherein said transistor is enabled by said signal from said timing circuit during the overvoltage condition and wherein said transistor opens said fuse decoupling the circuit of the integrated circuit from said voltage.





5,483,409

## 25-PAIR CIRCUIT PROTECTION ASSEMBLY

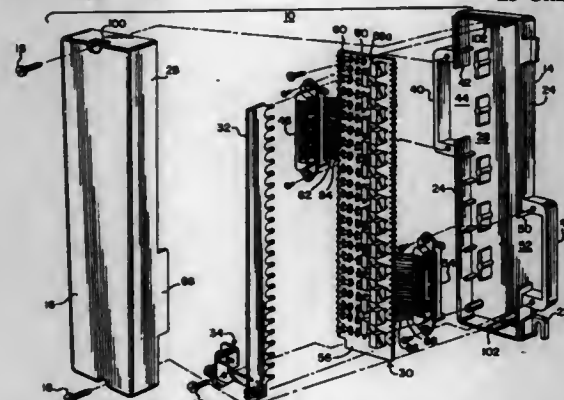
Richard H. Heidorn, Lombard, and George Z. Lannert, Evanston, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Apr. 8, 1993, Ser. No. 44,156

Int. Cl.<sup>6</sup> H02H 3/22; I/O4

U.S. Cl. 361-119

23 Claims



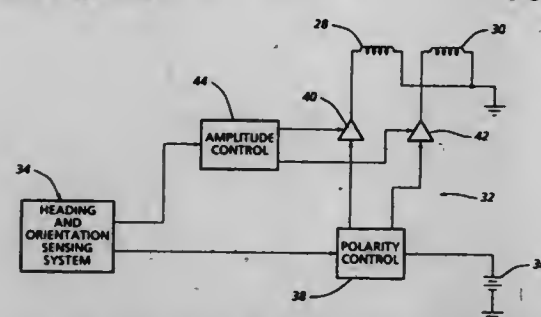
1. A circuit protection assembly for protecting telephone communication related equipment and the like, comprising:

- a housing formed of a base member and a co-mating cover member, said base member having a rear wall, said cover member having a front wall, and said base and cover members having confronting side wall members which cooperate with said rear wall and said front wall of said base and cover members so as to form a first cavity therebetween;
- a printed-circuit board sub-assembly, having a plurality of circuit protectors disposed thereon, disposed within said first cavity of said housing;
- a first connector-receiving support section comprising additional side wall members and a portion of said rear wall of said base member extending laterally outwardly in an integral manner from an exterior wall surface of a first one of said side wall members of said base member so as to define a second cavity for mounting and receiving one half of a male/female input-side electrical connector device; and
- a second connector-receiving support section comprising additional side wall members and a portion of said rear wall of said base member extending laterally outwardly in an integral manner from an exterior wall surface of a second one of said side wall members of said base member so as to define a third cavity for mounting and receiving one half of a male/female output-side electrical connector device.

5,483,410  
ADVANCED DEGAUSSING COIL SYSTEM  
John J. Holmes, Jessup, Md., and Shirley Steffey, Rochester, Mich., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.  
Filed Mar. 25, 1994, Ser. No. 217,908  
Int. Cl.<sup>6</sup> B63G 9/00

U.S. Cl. 361-149

6 Claims



1. In a degaussing system for a vessel having port and starboard hull structure mounting loop coils in spaced relation to a longitudinally extending vertical plane, means for simultaneously reducing vertical and horizontal components of a magnetic field signature of the vessel, including at least one pair of said loop coils mounted by the hull structure in angular relation to the vertical plane, a source of voltage, control means operatively connecting said source to said at least one pair of the coils for supply thereto of simultaneously varied degaussing currents and sensing means connected to the control means for determining polarity and amplitude of the simultaneously varied degaussing currents in accordance with heading and orientation of the vessel.

5,483,411  
CHATTERLESS LOW POWER AC SOLENOID WITHOUT POLE SHADING

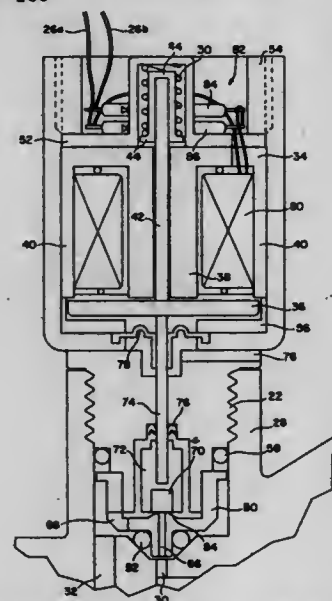
Oded E. Sturman, 3973 Santa Monica Ct., Newberry Park, Calif. 91320; Benjamin Grill, 9819 Etiwanda Ave., Northridge, Calif. 91325; Lynn Harrison, 23554 Cherry, Newhall, Calif. 91321, and Edwin Hunter, P.O. Box 65, Rancho Santa Fe, Calif. 92067

Continuation of Ser. No. 52,077, Apr. 22, 1993. This application Apr. 13, 1995, Ser. No. 422,624

Int. Cl.<sup>6</sup> F15B 13/044

U.S. Cl. 361-160

1 Claim



1. A fluid valve that receives AC power through a first power lead and a second power lead, comprising:

a housing that has an inlet port and an outlet port;  
a valve that controls fluid communication between said inlet port and said outlet port;  
a stationary magnetic member and a moveable magnetic member, each having a limited retentivity and together defining a magnetic circuit, said moveable magnetic member being moveable relative to said stationary magnetic member between a first retracted position and a second extended position, said moveable magnetic member being magnetically attracted toward said first retracted position when a magnetic field is in said magnetic circuit, said stationary magnetic member has a first pole area that extends from a core an amount greater than a second pole area of said stationary magnetic member, wherein said first pole area comes into contact with a first portion of said moveable magnetic member while a second portion of said moveable magnetic member is separated from said second pole area by a non-magnetic gap;  
a coil having first and second leads and being disposed relative to said stationary and moveable magnetic members to cause a magnetic field in said magnetic circuit responsive to current in said coil;  
a first diode coupled between the first power lead and said first coil lead, the second power lead being coupled to said second coil lead, said first diode allows current to flow from the AC source of power coupled to the first and second power leads through said coil in a first direction and not through said coil in a second direction opposite said first direction;  
a second diode coupled between said first and second coil leads current to flow in a loop through said second diode and through said coil in a first direction and back through said second diode, and for blocking current flow in an opposite direction through said second diode;  
means for encouraging said moveable member to said extended position.

- a. annularly cutting said reinforcing layer at a distance from said first end of said inner liner so as to expose a portion of said inner liner, thereby forming a first end of said reinforcing layer;
- b. positioning said locking collar on said first end of said reinforcing layer;
- c. inserting said insert portion of said connecting member into said interior of said inner liner; and
- d. applying a force to said locking collar so as to cause said interior of said inner liner to engage with said insert portion of said connecting member, wherein said force is sufficient to cause said first end of said inner liner to flow and conform to at least a portion of said stop bead thereby preventing said connecting member from physically and electrically contacting said locking collar and said first end of said reinforcing layer.

5,483,413  
APPARATUS FOR CONTROLLING ELECTROMAGNETIC INTERFERENCE FROM MULTI-LAYERED CIRCUIT BOARDS

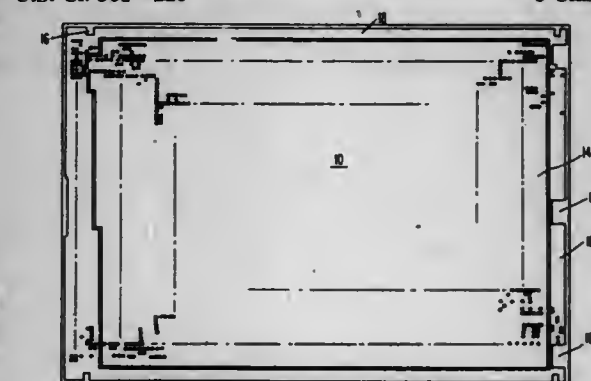
Samuel M. Babb, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Colo.

Continuation of Ser. No. 177,705, Jan. 4, 1994, abandoned, which is a continuation of Ser. No. 102,677, Aug. 5, 1993, abandoned, which is a continuation of Ser. No. 661,937, Feb. 28, 1991, abandoned. This application Oct. 24, 1994, Ser. No. 329,138

Int. Cl.<sup>6</sup> H05K 9/00

U.S. Cl. 361-220

8 Claims



1. A printed circuit board, comprising:  
a layer formed from electrically insulating material;  
a power plane formed on said layer, the outer perimeter of said power plane being spaced away from the outer edge of said layer so as to define an outer area; and  
a conductive structure, formed on said layer in said outer area, adjacent to and surrounding said power plane; and connected to ground so as to cause electromagnetic radiation emanating from said power plane to be terminated on said conductive structure.

5,483,412  
METHOD FOR PREPARING AN ELECTRICALLY NON-CONDUCTIVE HOSE ASSEMBLY

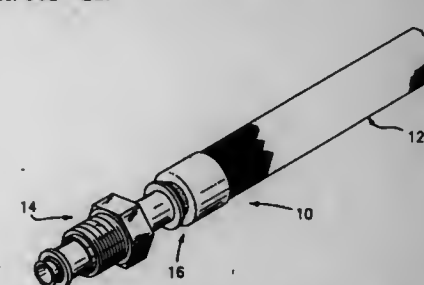
Mark F. Albino, Belchertown; Ralph T. Blanchard, Feeding Hills, both of Mass., and John C. Dalton, North Granby, Conn., assignors to Titeflex Corporation, Springfield, Mass.

Division of Ser. No. 201,766, Feb. 25, 1994, Pat. No. 5,430,603. This application Feb. 7, 1995, Ser. No. 385,055

Int. Cl.<sup>6</sup> H05F 3/00

U.S. Cl. 361-215

4 Claims



1. A method of mechanically connecting and sealing a hollow cylindrical member to coupling means wherein said hollow cylindrical member comprises: an inner liner having an interior, an exterior and a first end; and a reinforcing layer, disposed about said exterior of said inner liner, wherein said coupling means comprises: a connecting member having an engaging portion for engaging a fitting, an insert portion for engaging said interior of said inner liner and a stop bead disposed between said engaging portion and said insert portion; and a locking collar for forcing said interior of said inner liner into engagement with said insert portion of said connecting member, wherein said method comprises the steps of:

5,483,414  
ELECTRICAL IMPEDANCE DETECTOR FOR MEASUREMENT OF PHYSICAL QUANTITIES, IN PARTICULAR OF TEMPERATURE

Heikki Turtiainen, Vantaa, Finland, assignor to Vaisala Oy, Vantaa, Finland

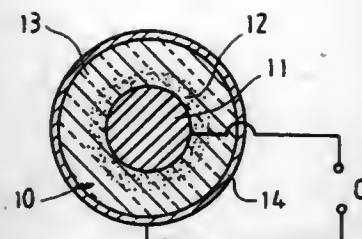
Filed Mar. 30, 1993, Ser. No. 40,129

Claims priority, application Finland, Apr. 1, 1992, 921449  
Int. Cl.<sup>6</sup> H01G 7/00; 5/01

U.S. Cl. 361-282

10 Claims

1. Electrical impedance detector for measurement of physical quantities, in particular of temperature, which detector comprises electrodes (11, 14), between which the electrical impedance (C/R)



that represents the physical quantity to be measured is measured, and between which electrodes (11, 14) there is an active material whose impedance properties are a function of the physical quantity to be measured, characterized in that the active material of the detector is a very thin thread-like glass-ceramic fibre (10) which has been manufactured by means of the glass-drawing technique.

5,483,415

# SOLID ELECTROLYTIC CAPACITOR AND METHOD OF MAKING THE SAME

Shinji Nakamura, and Miki Hasegawa, both of Ukyo, Japan, assignors to Rohm Co., Ltd., Kyoto, Japan

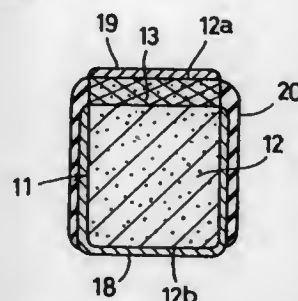
Filed Feb. 25, 1994, Ser. No. 202,266

Claims priority, application Japan, Feb. 26, 1993, 5-038166; Feb. 26, 1993, 5-038167; Feb. 26, 1993, 5-038168

Int. Cl.<sup>6</sup> H01G 9/012

U.S. Cl. 361-529

18 Claims



1. A solid electrolytic capacitor comprising a capacitor element which includes:

- a porous sintered chip of metal particles;
- a solid electrolytic substance electrically insulated from the metal particles by a dielectric substance;
- an anode terminal layer electrically connected to the metal particles;
- a cathode terminal layer spaced from the anode terminal layer and electrically connected to the solid electrolytic substance, the cathode terminal layer covering the chip, the cathode terminal layer having an exposed end portion and a lateral portion extending toward the anode terminal layer;
- wherein the capacitor element has a terminal portion located adjacent to the anode terminal layer and provided with barrier means for preventing the solid electrolytic substance from entering the terminal portion; and
- wherein the capacitor further comprises a one-piece insulating protective layer covering the lateral portion of the cathode terminal layer but not covering end faces of the chip, the protective layer extending beyond the lateral portion of the cathode terminal layer onto the terminal portion of the capacitor element where the barrier means is provided.

5,483,416

# ADJUSTABLE INSULATING BARRIER ARRANGEMENT FOR AIR INSULATED PADMOUNTED SWITCHGEAR

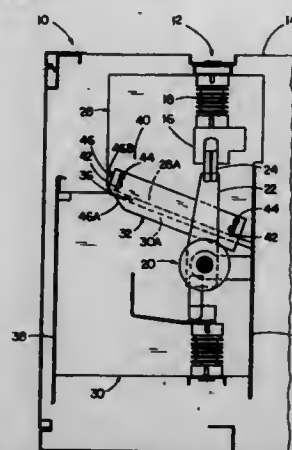
Melvin B. Goe, Jr., Centralia, Mo., assignor to Hubbell Incorporated, Orange, Conn.

Filed Dec. 12, 1994, Ser. No. 353,630

Int. Cl.<sup>6</sup> H02B 3/00; 13/00

U.S. Cl. 361-600

18 Claims



10. In a multiple-phase distribution apparatus including an enclosure and at least two electrical transmission components for controlling separate phases of electricity within said apparatus and being laterally spaced from one another, a barrier arrangement comprising:

- (a) a pair of insulated upper and lower barrier panels mounted within said enclosure of said apparatus between said electrical transmission components in spaced vertical tandem and stationary relation one above the other so as to define a gap therebetween;
- (b) an insulated intermediate barrier panel disposed adjacent to said gap between said upper and lower barrier panels; and
- (c) means for mounting said intermediate barrier panel to said upper barrier panel so as to undergo sliding movement between lowered and raised positions relative to said lower barrier panel so as to respectively open and close said gap between said upper and lower barrier panels in response to insertion and withdrawal of a transversely disposed additional barrier panel through said gap.

5,483,417

# POWER BOARD

Toru Tanimizu, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 29,385, Mar. 10, 1993, Pat. No. 5,278,723, which is a continuation of Ser. No. 710,111, Jun. 4, 1991, Pat. No. 5,216,575. This application Oct. 29, 1993, Ser. No. 143,133

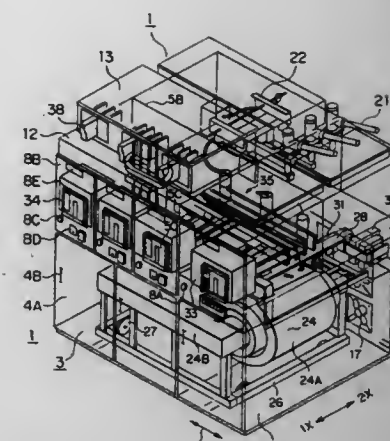
Claims priority, application Japan, Jun. 6, 1990, 2-146275

Int. Cl.<sup>6</sup> H02B 1/20

U.S. Cl. 361-611

9 Claims

- 1. A distribution power board comprising: transformers disposed in the distribution power board such that a greatest dimension of the transformers extends horizontally;
- a plurality of electric apparatuses disposed in the distribution power board above the transformers at a front side of the distribution power board where the distribution power board is to be operated by an operator; and
- a plurality of strip conductors of different phases disposed in the distribution power board above the transformers and behind the electric apparatuses relative to the front side of the distribution power board, the electric apparatuses being connected to the strip conductors;
- wherein the strip conductors have a length, a width, and a thickness, the length of the strip conductors being greater than



the width of the strip conductors, and the width of the strip conductors being greater than the thickness of the strip conductors; and

wherein the strip conductors are disposed such that the length of the strip conductors extends horizontally parallel to the front side of the distribution power board, the width of the strip conductors extends vertically parallel to the front side of the distribution power board, and the thickness of the strip conductors extends horizontally perpendicular to the front side of the distribution power board.

5,483,418

# PORTABLE ELECTRONIC APPARATUS HAVING A KEYBOARD WITH A SHIELDING PLATE ATTACHED TO A COVER THEREOF

Takashi Hosoi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

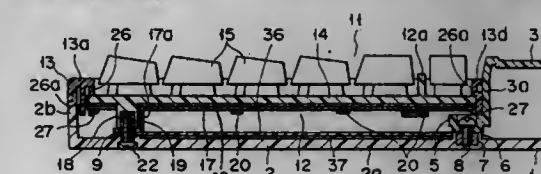
Continuation of Ser. No. 206,635, Mar. 7, 1994, abandoned, which is a continuation of Ser. No. 115,782, Sep. 3, 1993, Pat. No. 5,335,141, which is a continuation of Ser. No. 905,485, Jun. 26, 1992, abandoned, which is a continuation of Ser. No. 542,042, Jun. 22, 1990, abandoned. This application Apr. 21, 1995, Ser. No. 426,589

Claims priority, application Japan, Jun. 23, 1989, 1-162217

Int. Cl.<sup>6</sup> G06F 1/16; H05K 7/02; 9/00; B41J 29/02

U.S. Cl. 361-680

31 Claims



- 1. A portable electronic apparatus comprising: a bottom case having a bottom wall and an opening portion opposing the bottom wall;
- a printed circuit board disposed in the bottom case;
- a cover portion removably attached to the bottom case so as to cover the opening portion, the cover portion having a keyboard body, the keyboard body having an under side and a fixing portion, the fixing portion having projections which project from the under side; and
- means for securing the fixing portion to the bottom case, the securing means having a plurality of screws, each being screwed through the bottom wall and into a corresponding projection.
- 25. A portable electronic apparatus comprising: a printed circuit board;
- a housing that encloses the printed circuit board; and
- a keyboard unit mounted on the housing, the keyboard unit including: a keyboard body having a top face, an under side; and

- a plurality of keys disposed on the top face of the keyboard body;
- a shielding plate fixed to the underside of the keyboard body, the shielding plate being constructed and arranged to shield electromagnetic noise from the printed circuit board; and
- a film member, which is disposed between the shielding plate and the under side of the keyboard body, having a circuit pattern thereon.

5,483,419

# HOT-SWAPPABLE MULTI-CARTRIDGE DOCKING MODULE

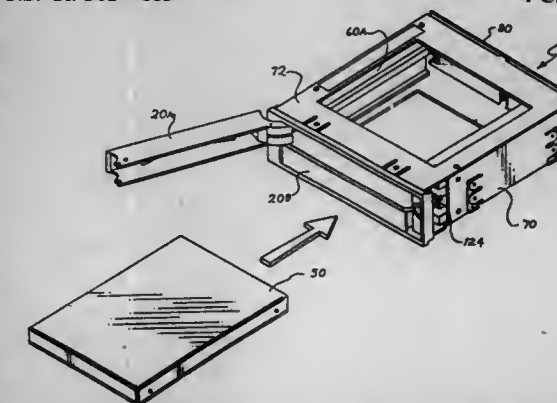
Steven L. Kaczus, Sr., San Jose; Thomas McKnight, and Roy J. Edwards, both of Los Gatos, all of Calif., assignors to TEAC Corporation, Tokyo, Japan, and Pont Peripherals Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 764,590, Sep. 24, 1991, abandoned. This application Nov. 15, 1993, Ser. No. 152,207

Int. Cl.<sup>6</sup> G06F 1/16; H05K 7/10; H01R 13/62

U.S. Cl. 361-685

4 Claims



1. A docking module for use with removable disk drives, the disk drives each including an electrical connector, the docking module comprising:

- a housing member having a plurality of slots therein, each slot configured to receive a removable disk drive;
- a docking module connector mateable with the connector on the removable hard disk drive to electrically connect the removable disk drive to a host;
- a door rotatably mounted on the housing and configured to serve as a lever arm, the door having an engagement surface projecting therefrom to urge the connector on the disk drive into connection with the docking module connector when the door is closed; and
- a slide mounted within the housing and connected to the door so that rotation of the door causes at least a portion of the slide to move forward and back within the housing, the slide adapted to engage the disk drive and urge the disk drive out of the docking module and disconnect the docking module connector from the disk drive connector when the door is opened.

5,483,420

# LOCKING AND HEAT-EXCHANGE DEVICE FOR MODULAR PRINTED CIRCUIT BOARD HOLDER STRUCTURE

Jean-Pierre Schiavini, Montigny-Le-Bretonneux, France, assignor to Sextant Avionique, Meudon La Foret, France

Filed Aug. 3, 1994, Ser. No. 285,143

Claims priority, application France, Sep. 10, 1993, 93 10898

Int. Cl.<sup>6</sup> H05K 7/20

U.S. Cl. 361-707

6 Claims

1. A device fastening a printed circuit board, acting simultaneously as heat exchanger with a rack in which said board is fitted and connected, said device comprising:





a rigid and good heat conducting frame having a high thermal capacity and comprising two parallel posts linked together by two crosspieces perpendicular to said posts, said frame supporting said printed circuit board and delimiting an internal volume which completely houses electronic components borne by said board, said volume being closed on one side by said board and on an opposite side by a plate of a good heat conducting material put into direct contact with said electronic components, said posts being respectively slidably fitted into two opposite and good heat conductive slide rails integral with said rack and facing each other, each slide rail having a U-shaped cross section formed by said rack and two parallel wings, the distance between said wings corresponding substantially to the thickness of said posts and the distance between said posts corresponding substantially to the distance between two opposite slide rails;

means securing said posts into said slide rails, said securing means for providing a pressure contact of a lateral side of each of said posts against a corresponding wing of said slide rails so as to obtain maximum heat exchange between said posts and said slide rails.

5,483,421

## IC CHIP ATTACHMENT

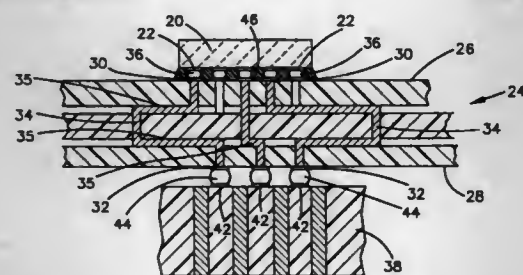
Ronald W. Gedney, Vestal, and Tamar A. Sholtes, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 9, 1992, Ser. No. 848,467

Int. Cl.<sup>6</sup> H05K 7/02

U.S. Cl. 361—771

12 Claims



1. A package mounting integrated circuit chips onto a circuit board comprising:

- an integrated circuit chip having a surface array of input/output pads on one side thereof which array forms a footprint;
- a chip carrier formed of an organic glass filled epoxy dielectric material having first and second opposite surfaces;
- said chip carrier having a coefficient of thermal expansion of at least  $17 \times 10^{-6}$  ppm/c°;
- a first set of bonding pads formed on said first surface of the chip carrier and arranged in an array corresponding with the chip footprint;

a pattern of conductors on said chip carrier connected to accommodate said input/output pads;

a first set of solder connections interconnecting the input/output pads on the chip to said first set of bonding pads on the chip carrier;

an encapsulation material encapsulating said first set of solder connections;

a second set of bonding pads formed on the second surface of the chip carrier arranged in an array;

electrically conducting vias extend through the chip carrier connecting said first set of bonding pads to the second set of bonding pads;

a circuit board formed of an organic material having a coefficient of thermal expansion similar to the chip carrier;

a set of electrical connection sites formed on said circuit board and arranged in a pattern corresponding to the pattern of the array of the second bonding pads on said chip carrier;

a second set of solder connections interconnecting the pads of said second set of bonding pads on the chip carrier to the connection sites on the circuit board; and

wiring on said circuit board connected to said second set of bonding pads.

5,483,422

## KEYING CARD GUIDE FOR PC CARD

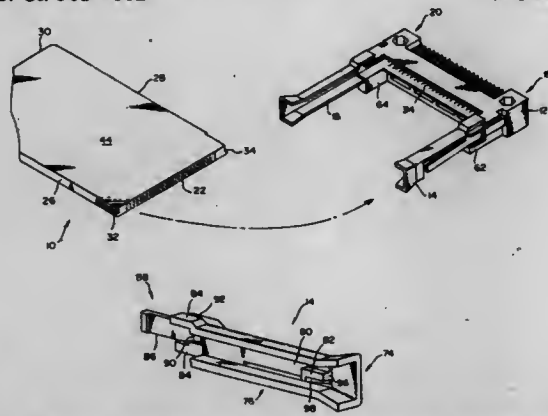
Michael K. Bowen, and Matt G. Driggers, both of Vancouver, Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 23, 1994, Ser. No. 311,083

Int. Cl.<sup>6</sup> H05K 7/14

U.S. Cl. 361—802

9 Claims



1. A guide apparatus at an integrated circuit connector for receiving an integrated circuit card, the integrated circuit card having a first edge for mating with the integrated circuit connector, a first end of the first edge defining a first groove that runs from the first edge along a perpendicular second edge, the guide apparatus comprising:

- a first rail having a proximal end at the integrated circuit connector and a distal end for receiving the integrated circuit card; and
- a keying guide positioned away from the proximal end of the first rail in alignment with the first groove of a received integrated circuit card when the integrated circuit card has a first orientation, wherein the keying guide is movable out of the path of the integrated circuit card when the received integrated circuit card has the first orientation, and wherein the keying guide resists movement out of the path of the integrated circuit card when the received integrated circuit card has other than the first orientation.

5,483,423

## EMI SHIELDING FOR COMPONENTS

Mark S. Lewis; Reuben M. Martinez, both of Colorado Springs, and Ralph M. Tusler, Monument, all of Colo., assignors to Digital Equipment Corporation, Maynard, Mass.

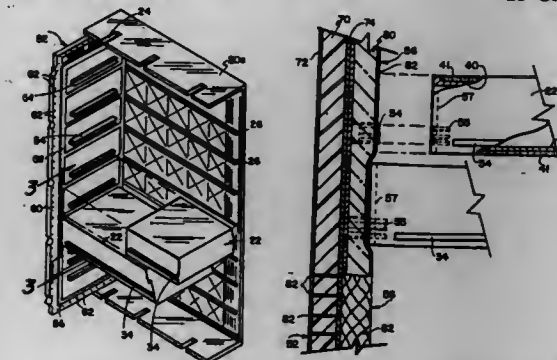
Continuation of Ser. No. 153,735, Nov. 16, 1993, abandoned.

This application Jan. 9, 1995, Ser. No. 375,041

Int. Cl.<sup>6</sup> H05K 9/00

U.S. Cl. 361—816

15 Claims



1. Apparatus for shielding an electrical component comprising: a container for holding the electrical component, the container being shielded against EMI emissions on all sides except one the unshielded side having an electrically conductive edge which defines a geometric shape;
- a cabinet for holding the container, the cabinet including a wall constructed to shield EMI emissions; and
- a gasket on the interior surface of the wall, the gasket having an elastomeric core and an electrically conductive outer surface, the gasket being in the given geometric shape such that with the electrically conductive edge of the unshielded side of the container in pressed contact with the outer surface of the gasket an electrical connection is established between the edge and the gasket.

5,483,424

## LIGHTING APPARATUS

Derek C. Lightbody, Hertfordshire, United Kingdom, assignor to Optical & Textile Limited, London, United Kingdom

PCT No. PCT/GB93/00781, § 371 Date Oct. 14, 1994, § 102(e)

Date Oct. 14, 1994, PCT Pub. No. WO93/21473, PCT Pub.

Date Oct. 28, 1993

PCT Filed Apr. 14, 1993, Ser. No. 318,674

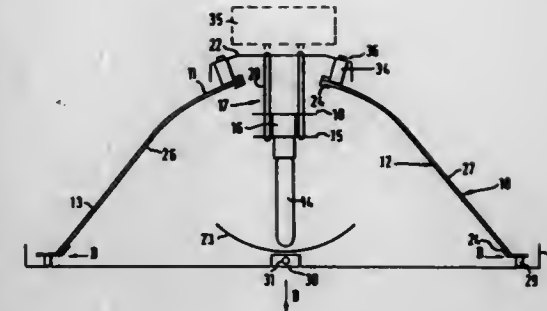
Claims priority, application United Kingdom, Apr. 15, 1992, 9208338; Jul. 2, 1992, 9214193

Int. Cl.<sup>6</sup> F21V 7/00

U.S. Cl. 362—17

19 Claims

1. A lighting apparatus for illuminating a subject without casting an appreciable shadow, comprising: a holder for holding a lamp;
- a reflector for reflecting light from the lamp towards the subject, and an element disposed in front of the lamp for preventing light from the lamp from passing directly from the lamp onto the subject, said reflector comprising a reflecting surface at least 500 mm in diameter having a plurality of domed convex light-reflecting elements, said light-reflecting elements each having a diameter of from 0.5 mm to 20 mm, said light-reflecting elements constituting at least 90% of an area of the reflecting surface.



5,483,425

## QUICK RELEASE VEHICLE HEADLAMP ARRANGEMENT

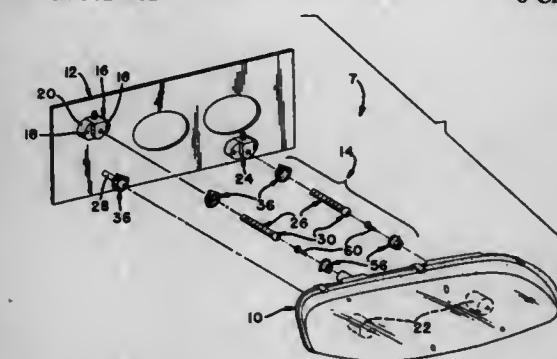
John M. Luallin, Anderson; Steven V. Horsman, Indianapolis, and Brian E. Witte, Anderson, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 19, 1994, Ser. No. 358,116

Int. Cl.<sup>6</sup> B60Q 1/04

U.S. Cl. 362—61

6 Claims



1. An arrangement of an aimable vehicle headlamp assembly fixably connected to a fixed portion of a vehicle, the arrangement comprising:

- a bulb providing a source of illumination;
- a reflector housing mounting the bulb;
- at least one rod with a ball end mounted to the fixed portion of the vehicle and extending therefrom, the ball end having first and second sides;
- a first sleeve housing encircling the rod, having an open end for receipt of the first side of the rod ball end;
- a second sleeve housing connected to the housing with an open end for receipt of the second side of the rod ball end; and
- a flange connected to one of the sleeve housings for receipt into a groove in the sleeve housing the flange is not connected to, and wherein pivotal connection of the reflector housing to the rod is achieved by insertion into one of the sleeve housings into the other sleeve housing and torquing of one of the sleeve housings, placing the flange in one of the sleeve housings within the groove of the other sleeve housing.

5,483,426

## AIMABLE VEHICLE HEADLAMP ASSEMBLY

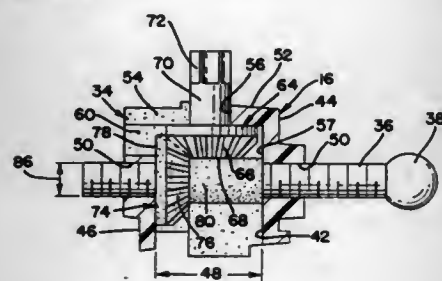
Brian S. Lewis, Middletown, and Gary L. Miller, Lapel, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 17, 1994, Ser. No. 364,570

Int. Cl.<sup>6</sup> B60Q 1/068

U.S. Cl. 362—66

2 Claims



## 1. A vehicle headlamp assembly comprising:

a reflector housing supporting a light source adapted to be adjusted in a vertical plane and in a horizontal plane for aiming a light beam provided by the reflector when the light source is energized;

a first adjustment device for adjusting the position of the reflector in the vertical plane;

a second adjustment device for adjusting the position of the reflector in the horizontal plane, the second adjustment device including:

an adjuster housing having an open bottom and a first front wall and a second rear wall separated by a first dimension, the first and second walls having an aligned bore, the adjuster housing also having a top with a slot with a width of a second dimension intersecting one of the walls, the wall intersected by the top slot having a horizontal slot adjacent the top slot having a width of a third dimension, greater than the second dimension;

a top gear having a bevelled head with a flat, the head having a diameter of a fourth dimension passable through the horizontal slot, the top gear also having a fixably connected shaft with a diameter of a fifth dimension less than the fourth dimension, the shaft being generally aligned with the second dimension of the slot in the adjuster housing top, the shaft having on an end opposite the top gear head a surface for reception of a torque input;

a sleeve gear insertable through the adjustment device housing bottom, the sleeve gear having a bore having a diameter of a sixth dimension, the sleeve gear having a bevelled head with a flat top for meshing engagement with the top gear head, the sleeve gear having connected to the bevelled sleeve gear head a barrel body for supporting the head of the top gear in a position to cause the top gear head to be contacted with the top of the second adjustment device housing and to be captured in position, the sleeve gear having a length approximating the first dimension; and

a threaded shaft having a diameter of a seventh dimension larger than the sixth dimension extending through the bore of the first and second walls and sleeve gear, the shaft having an end for attachment of the reflector housing, the shaft being moved longitudinally with respect to the second adjustment device housing by rotation of the top gear to adjust the reflector body in a horizontal orientation.

5,483,427

## CARGO AREA LIGHTING SYSTEM FOR TRUCKS

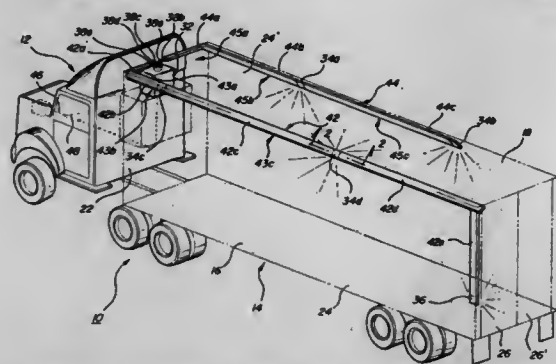
O. K. Dealey, Jr., 33751 Heritage Hill, Farmington Hills, Mich. 48331; John L. Stratford, 5014 Lauderdale Ave., LaCrescenta, Calif. 91214, and John A. Robbins, 24722 Eldamar Ave., Lake Forest, Calif. 92630

Filed Oct. 21, 1994, Ser. No. 327,202

Int. Cl.<sup>6</sup> B60Q 3/06

U.S. Cl. 362—80

3 Claims



## 1. A lighting system for a truck of the type having a cab for a vehicle driver and having a truck body for cargo, said body having cargo space enclosed by a floor, side walls, front and rear walls and a roof, said lighting system comprising:

an electrically energized light source mounted on the truck body, an electrical energizing circuit extending from the cab to the light source,

a manually actuated switch electrically connected in said circuit and mounted in the cab for operation by the driver for turning the light source on or off,

a plurality of lighting fixtures supported by the body in spaced relation with each other, each fixture including an enclosure and a light distributing lens with the lens disposed between the interior of the enclosure and the cargo space,

a plurality of light guides each having an input end and an output end and being adapted to transmit light received at the input end to and emitting said light from the output end, the input end of each of said light guides being optically coupled to said light source for receiving light therefrom,

each light guide extending from the light source to a selected one of the lighting fixtures with the output end thereof mounted to the enclosure of the respective fixture and optically coupled with the lens of the respective fixture for emitting light thereon.

5,483,428

## WET NICHE LIGHT

Charles B. Poppenheimer, Flintridge, Calif., assignor to GTY Industries, Sylmar, Calif.

Division of Ser. No. 981,014, Nov. 24, 1992, Pat. No.

5,349,505. This application Mar. 31, 1994, Ser. No. 221,692

Int. Cl.<sup>6</sup> F21V 25/00

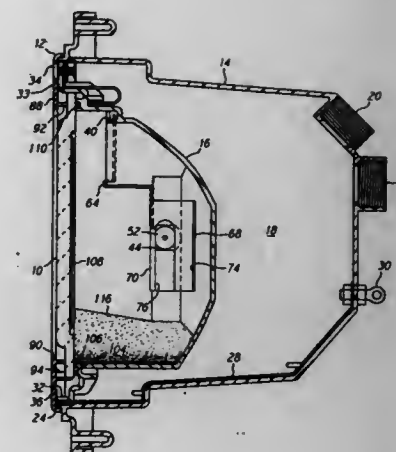
U.S. Cl. 362—101

14 Claims

## 1. A wet niche light comprising

an electrically nonconductive housing including a front opening; two lamp sockets mounted in said housing aligned along an axis not extending through said opening; and

an electrically conductive shield over each said lamp socket between said sockets and said front opening, said shield being light reflective toward said opening and including a ground extending outwardly of said housing.



5,483,429

## PEN/HAND TORCH COMBINATION DEVICE

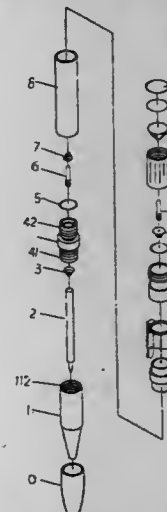
An G. Chu, P.O. Box 82-144, Taipei City, Taiwan, Prov. of China

Filed Mar. 3, 1995, Ser. No. 397,965

Int. Cl.<sup>6</sup> B43K 29/10

U.S. Cl. 362—118

1 Claim



## 1. A pen/hand torch combination device comprising:

a pen holder having a tapered front end detachably covered with a pen cap, and a rear end made with an inner thread;

a refill inserted into said pen holder and having a writing tip extended out of the tapered front end of said pen holder;

a refill holder having a first outer thread at one end threaded into the inner thread on said pen holder, a second outer thread at an opposite side, and an inside chamber for holding a spare lamp bulb;

a first spring mounted inside said refill holder and stopped against said refill to hold said refill in said pen holder;

a first O-ring mounted around the second outer thread of said refill holder;

a second spring mounted within said refill holder;

a metal cylinder having an inner thread at one end threaded onto the second outer thread of said refill holder;

an insulator having a bottom end fitted into another end of said cylinder remote from said refill holder, and a top end;

a pen clip mounted around the top end of said insulator and having a contact spaced from said metal cylinder;

a holder having a bottom end sleeved onto the top end of said insulator to hold said pen clip in position, and a top end made with an outer thread;

a battery mounted inside said insulator within said cylinder and supported on said second spring;

a lamp socket mounted inside said holder and stopped against said battery opposite to said second spring to hold a lamp bulb;

a top socket threaded onto the outer thread of said holder; a reflector mounted within said top socket and sealed by an O-ring and covered by a glass; and wherein said pen clip is depressed to force said contact into contact with said metal cylinder, the lamp bulb of said lamp socket is turned on to give off light through said reflector; and when said pen clip is released from depression to disconnect said contact from said metal cylinder, the lamp bulb of said lamp socket is turned off.

5,483,430

## MULTI-FACETED LIGHT REFLECTOR

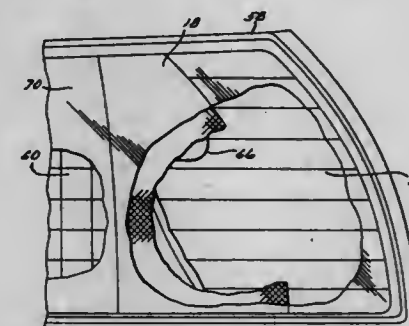
William C. Stapel, Dearborn, and Bernardus J. Stapel, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 6, 1994, Ser. No. 254,716

Int. Cl.<sup>6</sup> B60Q 1/24; F21V 7/04

U.S. Cl. 362—348

2 Claims



## 1. A lamp for an automotive vehicle comprising:

a concave housing;

a first light source;

a cornering reflector located in a predetermined position with said housing and said first light source, said cornering reflector having a first image surface;

said cornering reflector having a plurality of adjacent cornering facets placed in a predetermined relationship to said first light source, each cornering facet illuminating a predetermined area of said first image surface;

each cornering facet having:

a plurality of cornering facet edges bounding each cornering facet, each cornering facet edge joining a cornering facet edge of an adjacent cornering facet to define a common cornering facet edge between the two adjacent cornering facets;

a base curvature surface portion formed on each cornering facet disposed in a predetermined relation to said first light source and said first image surface for illuminating a predetermined first area of said first image surface;

a first edge curvature surface portion of each cornering facet adjacent said cornering facet edges for illuminating a second area of said first image surface displaced in predetermined angular relation to said first base portion; and

a first intermediate curvature surface portion of each cornering facet continuously and smoothly connecting said first base curvature surface portion and said first edge curvature surface portion for illuminating a third area between said first area and said second area of said first image plane;

a retro-reflector located in a predetermined position within said housing;

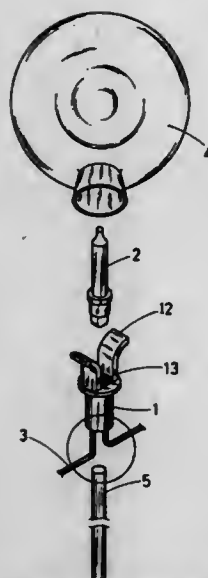
a second light source;

a turn signal indicator reflector located in a predetermined position with said housing and said second light source, said turn signal reflector having a second image surface;

said turn signal indicator reflector having a plurality of adjacent turn signal facets placed in a predetermined relationship to



said second light source, each turn signal facet illuminating a predetermined area of said second image surface;  
 each turn signal facet having:  
 a plurality of turn signal facet edges bounding each turn signal facet, each turn signal facet edge joining a turn signal facet edge of an adjacent turn signal facet to define a common turn signal facet edge between the two adjacent turn signal facets;  
 a second base curvature surface portion formed on each turn signal facet disposed in a predetermined relation to said second light source and said image surface for illuminating a predetermined first area of said second image surface;  
 a second edge curvature surface portion of each turn signal facet adjacent said turn signal facet edges for illuminating a second area of said second image surface displaced in predetermined angular relation to said second base portion; and  
 a second intermediate curvature surface portion of each turn signal facet continuously and smoothly connecting said second base curvature surface portion and said second edge curvature surface portion for illuminating a third area between said first area and said second area of said second image plane.



a pole having opposing first and second ends, said first end being secured to a base surface; and  
 a lamp assembly releasably coupled to said second end of said pole, said lamp assembly including:  
 a. a light bulb;  
 b. a lamp hood for enclosing said light bulb;  
 c. a soft sleeve having opposing longitudinally spaced upper and lower ends, said upper end having a first opening centrally formed therein for receiving said light bulb therein, said upper end having a pair of elastic diverging strip-like projections extending therefrom for elastically retaining said lamp hood thereto, said lower end of said soft sleeve having a second opening formed centrally therein for receiving said second end of said pole therein, said lower end having a pair of longitudinally extended recesses formed in opposing wall surfaces of said second opening and in open communication therewith, each of said pair of recesses being in open communication with said first opening; and  
 d. a pair of conductive wires respectively disposed in said pair of recesses for electrical coupling with said light bulb.

5,483,431

# LIGHTING APPARATUS SHIPPABLE IN A FLAT CONDITION

Roberto Ziliani, Via Matteo Bartoli, 137 Rome, Italy

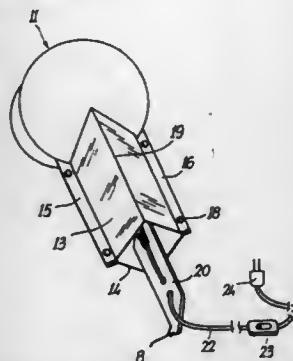
Filed Oct. 27, 1993, Ser. No. 144,145

Claims priority, application Italy, May 28, 1993, RM93U0104

Int. Cl.<sup>6</sup> F21V 21/00

U.S. Cl. 362—382

17 Claims



10. A lamp fixture comprising:

- two housing elements capable of being coupled along at least two edges to form a support base for the lamp fixture, said housing elements being made of a resilient deformable material so that the elements can assume a shipping position and an assembled position;
- an internal element that is capable of being inserted between the two said housing elements and which secures the elements in the assembled position when the elements are coupled to one another; and
- means for securing a light socket in between the housing elements when the elements are in the assembled position.

5,483,432

# POLE-MOUNTED PARK LIGHT FIXTURE

Fong-Yi Wang, 17, Alley 10, Young Te Lane, Wen Sen Li, Hsinpu, Hsinchu Shien, Taiwan, Prov. of China

Filed Jul. 26, 1994, Ser. No. 280,495

Int. Cl.<sup>6</sup> F21S 13/10; F21V 3/00

U.S. Cl. 362—431

1 Claim

- A pole-mounted park light fixture, comprising:

5,483,433

# VOLTAGE CONTROL CIRCUIT FOR A MULTIPLE STAGE DC POWER SUPPLY, AND APPLICATIONS THEREOF

Tai-Her Yang, 5-1 Taipin St. Si-Hu Town, Dzan-Hwa, Taiwan, Prov. of China

Continuation of Ser. No. 104,625, Aug. 11, 1993, abandoned.

This application Dec. 12, 1994, Ser. No. 354,771

Claims priority, application United Kingdom, Aug. 18, 1993, 9218408

Int. Cl.<sup>6</sup> H02M 1/14

U.S. Cl. 363—43

11 Claims

- A voltage controller circuit, comprising:  
 first and second output terminals;  
 at least three energy storage devices;  
 at least three solid state switch devices respectively connected in series between a first said energy storage device and a second said energy storage device, between the second said energy storage device and a third said energy storage device, and between the third said energy storage device and the second output terminal of the controller;

5,483,434

# HIGH VOLTAGE GENERATOR HAVING OUTPUT CURRENT CONTROL

Petrus H. Seesink, Chamonixlaan 210, NL-5627 Ke Eindhoven, Netherlands

PCT No. PCT/NL92/00237, § 371 Date Jan. 3, 1995, § 102(e)

Date Jan. 3, 1995, PCT Pub. No. WO93/14554, PCT Pub.

Date Jul. 22, 1993

PCT Filed Dec. 29, 1992, Ser. No. 256,511

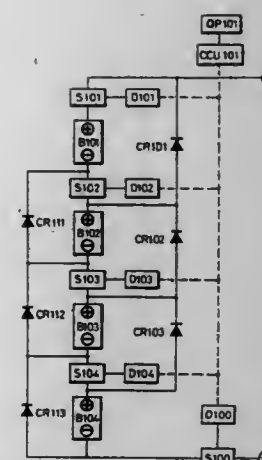
Claims priority, application Netherlands, Jan. 14, 1992, 9200056

Int. Cl.<sup>6</sup> H02M 3/07

U.S. Cl. 363—60

6 Claims

- High voltage generator comprising a first series of voltage



driver circuit means for switching said solid state switch devices on or off to respectively series connect said first energy storage device to said second energy storage device, said second energy storage device to said third energy storage device, and said third energy storage device to the second output terminal;

a general control solid state switch connected in series between the first output terminal and the first said energy storage device;

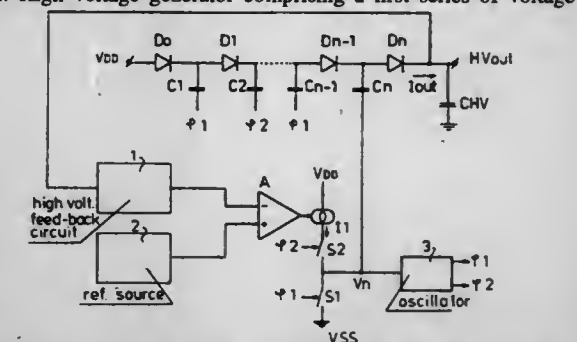
a first diode connected in parallel with said series connected first energy storage device and first solid state switch device, a second diode connected in parallel with said series connected second energy storage device and second solid state switch device, a third diode connected in parallel with said series connected first solid state switch device and second energy storage device, and a fourth diode connected in parallel with said second solid state switch device and third energy storage device;

and means for controlling said switches to alternately select one of at least three output voltage levels to form a pulse width modulated staircase voltage, wherein

the first voltage step is obtained by opening each of said solid state switch devices to initially connect each of the energy storage devices in parallel through said diodes, subsequently disconnecting said energy storage devices from the output terminals by opening the general control solid state switch, and then repeatedly closing and opening the general control solid state switch to connect and disconnect the parallel connected energy storage devices to and from the output terminals to obtain a pulse train the height of which is the height of said first voltage step,

the second voltage step is obtained by initially opening one of said solid state switch devices to series-connect two of the energy storage devices so as to obtain a two-fold increase in output voltage, closing said one of said solid state switch devices to disconnect the two energy storage devices from each other, and then repeatedly opening and closing said one said solid state switch devices to obtain a train of pulses the bases of which are at the level of said first voltage step and the peaks of which form said second voltage step, and

the third voltage step is obtained by closing each of said solid state switch devices to connect three of the energy storage devices in series so as to obtain a three-fold increase in voltage, opening all but said one of said solid state switch devices which connects two of the energy storage devices in series, and then repeatedly opening and closing said all but said one of said solid state switch devices to form a train of pulses the base of which is at said second voltage step and the peaks of which form said third voltage step.



multiplying stages, each stage comprising a diode (D0 . . . Dn) and a capacitor (C1 . . . Cn) one terminal of which being connected to the cathode of the respective diode, wherein every cathode of a diode is connected to the anode of the diode of the next voltage multiplying stage, a clock generator (3) which is able to generate clock pulses (φ1, φ2) being 180° out of phase with one another and being supplied alternately to the other terminal of the capacitors of successive voltage multiplying stages, the last diode in the series having a high voltage output and said high voltage output being connected to feed-back means, which modifies said two clock pulses in dependence on the voltage (HVout) on the high voltage output, characterized in that at least the last capacitor (Cn) of the multiplying stages is connected to a junction in order to be supplied with a control voltage (Vn) during operation, said junction being connected to an input of a control circuit (3) having two outputs, said junction also being connected to current charging means (I1, S2), which is controlled by one of said two outputs of the control circuit (3) and by the feed-back means (1, 2, A), and to current discharge means (S1) controlled by the other of said two outputs of the control circuit (3), in such a way that when, during operation, the control voltage (Vn) increases to a first predetermined level the control circuit (3) operates to deactivate said current charging means (I1, S2) and to activate said current discharge means (S1), and when the control voltage (Vn) decreases to a second predetermined level the control circuit (3) operates to deactivate said current discharge means (S1) and to activate said current charging means (I1, S2).

5,483,435

# POWER GENERATION SYSTEM HAVING INDUCTION GENERATOR AND CONTROLLED BRIDGE RECTIFIER

Hiroshi Uchino, Hachioji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 50,973, Apr. 22, 1993, abandoned, which is a continuation of Ser. No. 865,684, Apr. 8, 1992, Pat.

No. 5,255,175, which is a continuation of Ser. No. 522,127, May 11, 1990, abandoned. This application Mar. 14, 1994, Ser. No. 209,363

Claims priority, application Japan, May 15, 1989, 1-118706; Jun. 1, 1989, 1-137458; Jun. 28, 1989, 1-163777

Int. Cl.<sup>6</sup> H02M 7/04; 7/219

U.S. Cl. 363—81

10 Claims

- A power generation system comprising:  
 means for generating Ac power;





guidance-control equipment disposed at a site of a work at which an operation object is positioned, and including image processing means for executing image processing of a condition of said operation object and a condition of an operation appliance for applying a predetermined operation to said operation object and generating work environment data, and control means for inputting a series of operation data of said operation appliance inputted from outside and controlling said operation appliance on the basis of said operation data;

an input apparatus disposed at a position spaced apart from said site of the work, and including program input means for inputting a work program determining the operation of said operation appliance, and time schedule input means for inputting a time schedule as an actuation timing of the operation of said operation appliance determined by said work program; and

a control command generation apparatus including a work program memory for storing said work program generated by said program input means, a time schedule controller for storing said time schedule from said time schedule input means and outputting a work name at a timing set by said time schedule, work interpretation means for reading out a work program corresponding to the work name stored in said work program memory when the work name is outputted from said time schedule controller, generating a series of operation data of said operation appliance and sending said operation data to said guidance-control equipment, a work environment map memory for inputting and storing the work environment data outputted from said guidance-control-equipment, and display means capable of displaying a stored content of said work environment map memory.

5,483,441

# SYSTEM FOR ANIMAL EVALUATION THROUGH IMAGE ACQUISITION

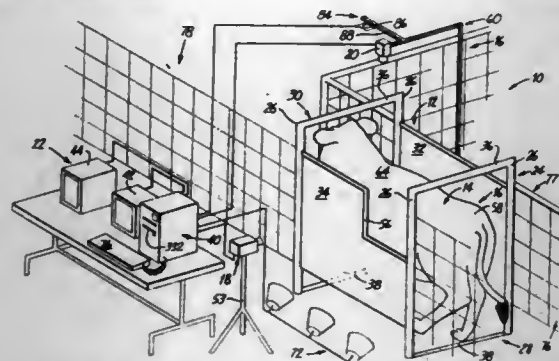
Wayne W. Scofield, Piedmont, S. Dak., assignor to Uniform Scanner Data Analysis, Inc., Rapid City, S. Dak.

Continuation of Ser. No. 753,428, Aug. 30, 1991. This application May 6, 1994, Ser. No. 238,979

Int. Cl.<sup>6</sup> G06T 3/20

U.S. Cl. 364-400

31 Claims



1. A method for evaluating changeable configuration bodies with each such body during its evaluation moving through first and second scenes, corresponding to differing first and second fields of view, in each of which changes occur in configuration of that body during such movement, said method comprising:

acquiring a first scene evaluation image representation of an image of said first scene at a selected time during movement of a body undergoing evaluation simultaneously through said first and second scenes, there being a body image portion corresponding to that body in said first scene image and a remainder image portion in said first scene image corresponding to those portions of said first scene image remaining after excluding said body image portion therefrom;

acquiring a second scene evaluation image representation of an image of said second scene substantially at said selected time during said movement of said body, there being a body image

portion corresponding to that body in said second scene image and a remainder image portion in said second scene image corresponding to those portions of said second scene image remaining after excluding said body image portion therefrom;

constructing from said first scene evaluation image representation a first scene evaluation image segregation representation segregating therein portions thereof corresponding to at least part of said first scene image body image portion from portions thereof corresponding to said first scene image remainder image portion;

constructing from said second scene evaluation image representation a first scene evaluation image segregation representation segregating therein portions thereof corresponding to at least part of said second scene image body image portion from portions thereof corresponding to said second scene image remainder image portion; and

ascertaining a value of at least one selected parameter from said first and second scene evaluation image segregation representations.

5,483,442

# ACCIDENT DOCUMENTATION SYSTEM

Barry Black, League City; David Mowry, and Gary Smith, both of Clear Lake Shores, all of Tex., assignors to Investigator Marketing Inc., Houston, Tex.

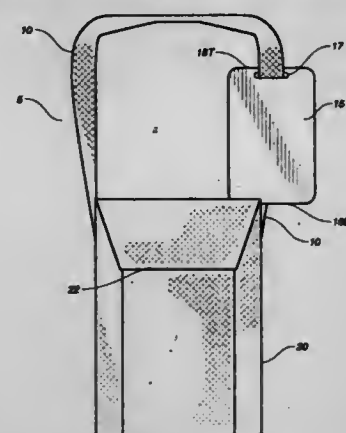
Filed Jul. 12, 1994, Ser. No. 273,724

Int. Cl.<sup>6</sup> G06F 19/00

U.S. Cl. 364-400

19 Claims

1. An accident documentation system having a unique identification number, for use by a person who is either an accident victim or a bystander, said accident documentation system comprising:



an accident documentation assembly having a pliable strap means and a plurality of retaining means fixedly attached to said pliable strap means, and configured to be releasably received by said person's neck without inhibiting use of either arms or hands thereof;

substrate means having slot means configured to slidably receive said strap means;

said substrate means comprising first indicia means for providing directions for documenting a motor vehicle accident disposed on one side of said substrate means in an overlapping relationship therewith and second indicia means for providing directions for documenting a motor vehicle accident disposed on another opposite side of said substrate means in an overlapping relationship therewith;

said slot means configured to expose said first indicia means and second indicia means, respectively, by suitably twisting said substrate means to render either of said first indicia means or second indicia means readable to said person;

marker means releasably attached to one of said plurality of retaining means, for depicting relationship between a plurality of automobiles involved in said accident scene;

writing means releasably attached to one of said plurality of retaining means, for verbally recording said accident scene on a plurality of accident information form means releasably attached to a clipboard means;

illumination means releasably attached to at least one of said plurality of retaining means, for providing illumination at said accident scene; and

camera means releasably attached to at least one of said plurality of retaining means, for visually recording an accident scene; said camera means having a plurality of additional indicia means for providing directions for documenting a motor vehicle accident and for recording estimated replacement dates for said camera means and said illumination means, disposed on a corresponding plurality of surfaces contained upon said camera means and further disposed in an overlapping relationship therewith; and

computerized tracking means based upon said identification number for monitoring service time of said camera means and said illumination means and for notifying said person when to replace said camera means and said illumination means.

5,483,443

# METHOD FOR COMPUTING CURRENT PROCEDURAL TERMINOLOGY CODES FROM PHYSICIAN GENERATED DOCUMENTATION

Bernard A. Milstein; Nancy J. Maguire, and Judith H. Meier, all of Galveston, Tex., assignors to Prompt Medical Systems, Houston, Tex.

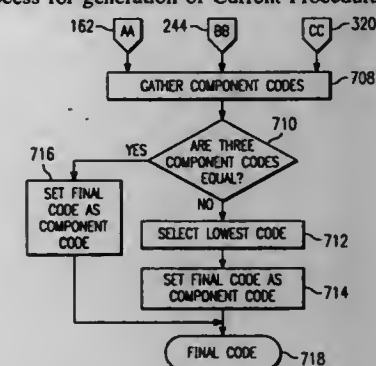
Filed Apr. 8, 1994, Ser. No. 226,002

Int. Cl.<sup>6</sup> G06F 159/00

U.S. Cl. 364-401

15 Claims

1. A process for generation of Current Procedural Terminology



("CPT") codes comprising:

storing historical data in a memory; comparing the historical data to a set of historical criteria to define a history code;

storing an examination data in a memory; comparing the examination data to a set of examination criteria to define an examination code; storing medical decision making data in a memory;

comparing the medical decision making data to a set of medical decision making criteria to define a medical decision making code;

comparing the historical code, the examination code, and the medical decision making code to a set of final criteria to define a final CPT code; and displaying the final CPT code.

5,483,444

# SYSTEM FOR AWARING CREDITS TO PERSONS WHO BOOK TRAVEL-RELATED RESERVATIONS

Scott B. Heintzeman, Plymouth; Thomas W. Storey, Minneapolis, both of Minn.; Barbara Monson, Oceanside; Steven J. Medina, San Diego, both of Calif., and Gregory A. Malark, Maple Grove, Minn., assignors to Radisson Hotels International, Inc., Minneapolis, Minn.

Continuation of Ser. No. 143,453, Oct. 26, 1993, abandoned.

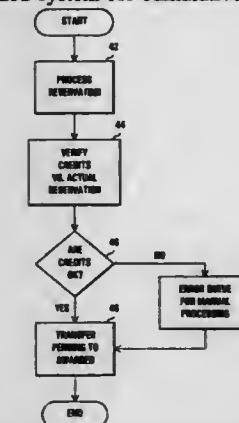
This application Feb. 7, 1995, Ser. No. 385,381

Int. Cl.<sup>6</sup> G06F 15/21

U.S. Cl. 364-401

47 Claims

1. A computerized system for cumulatively assigning credits to



persons who book travel-related reservations for use in receiving prizes or awards, comprising:

a) receive means for receiving information, comprising:  
i) means for receiving a booking which includes a plurality of fields, one or more of the fields including information identifying a travel-related reservation; and  
ii) means for receiving a code identifying a person who booked the travel-related reservation, the receive means including detecting means for detecting events related to the travel-related reservation to control conversion of credits;

b) means for specifying an identification of the person corresponding to the code;

c) assignment means for cumulatively assigning credits to the person identified by the code based upon the travel-related reservation; and

d) verification means for classifying the credits as pending credits, which are not redeemable for a prize or award, and for subsequently converting the pending credits to redeemable credits, which are redeemable for a prize or award, if the system verifies through the receive means that the pending credits are eligible for conversion to the redeemable credits based on said detecting means detecting the events based on said detecting means detecting the events.

5,483,445

# AUTOMATED BILLING CONSOLIDATION SYSTEM AND METHOD

Richard E. Pickering, New York, N.Y., assignor to American Express TRS, New York, N.Y.

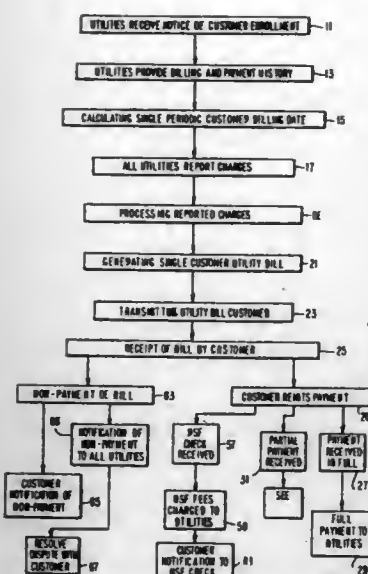
Continuation-in-part of Ser. No. 964,922, Oct. 22, 1992, abandoned. This application Oct. 21, 1993, Ser. No. 140,607

Int. Cl.<sup>6</sup> G06F 17/60

U.S. Cl. 364-406

30 Claims

1. A data processing system for consolidating a plurality of individual charges from a plurality of unrelated companies for a customer whose periodic billing cycles are not synchronized, each said individual charge having associated therewith a different periodic individual company billing date and a different periodic individual company payment due date, the system comprising:



- (a) means for receiving and processing said plurality of individual charges reported to said data processing system by one of electronic and magnetic communication from said companies;
- (b) means responsive to said receiving and processing means (a) for periodically generating a statement payment due date;
- (c) float calculating means for computing, for each company: i) a compensatory assessment if said statement payment due date is later than the individual company payment due date; and ii) a charge payment if said individual company payment due date is later than said statement due date;
- (d) minimization processing means for calculating an optimal statement payment due date in order to minimize said compensatory assessments;
- (e) means responsive to said minimization processing means for generating a customer statement which identifies all individual company charges and said optimal statement payment due date and forwarding said customer statement to the customer on a periodically selected statement billing date;
- (f) remittance processing means for processing payment received from said customer for at least some of the charges identified on said customer statement; and
- (g) remuneration means for computing, allocating, and transmitting remuneration to those of said companies for at least some of whom payment was received.

5,483,446

# METHOD AND APPARATUS FOR ESTIMATING A VEHICLE MANEUVERING STATE AND METHOD AND APPARATUS FOR CONTROLLING A VEHICLE RUNNING CHARACTERISTIC

Nobuo Momose; Masayoshi Ito; Hiroaki Yoshida; Masanori Tani, all of Okazaki; Yoshiaki Sano, Anjo; Masahito Taira, Okazaki, and Takashi Tejima, Toyota, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 10, 1994, Ser. No. 288,034

Claims priority, application Japan, Aug. 10, 1993, 5-198188; Dec. 29, 1993, 5-351804

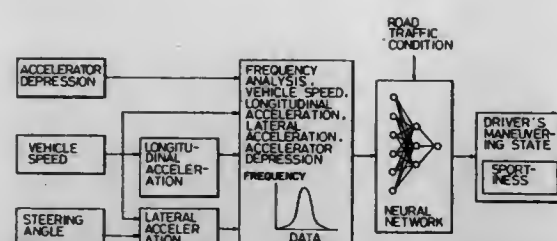
Int. Cl. G06F 17/00

U.S. Cl. 364-424.01

36 Claims

1. A method for estimating a vehicle maneuvering state, comprising the steps of:

- (a) detecting a plurality of vehicle driving parameters;
- (b) carrying out a frequency analysis of each of said plurality of vehicle driving parameters, said step (b) including determining a frequency distribution of each of said vehicle driving parameters, and determining a plurality of types of analysis



values for each of said vehicle driving parameters, said plurality of types of analysis values characterizing said frequency distribution; and

- (c) estimating a vehicle maneuvering state intended by a driver in accordance with results of the frequency analyses, said step (c) including outputting an output parameter, indicative of the vehicle maneuvering state, in accordance with a weighted total sum of input parameters, in parallel with each other, defined by said plurality of types of analysis values for each of said vehicle driving parameters.

5,483,447

# APPARATUS FOR TRIPPING A SYSTEM FOR THE PROTECTION OF OCCUPANTS OF A VEHICLE

Edmund Jeenicke, Schwieberdingen; Bernhard Mattes, Sachsenheim; Claus Condne, Wadgassen, and Michael Henne, Ditzingen-Schockingen, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/EP88/00850, § 371 Date Mar. 15, 1991, § 102(e) Date Mar. 15, 1991, PCT Pub. No. WO90/03289, PCT Pub. Date Apr. 5, 1990

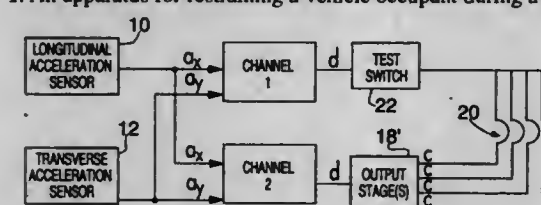
PCT Filed Sep. 17, 1988, Ser. No. 659,366

Int. Cl. B60R 21/00; 22/00

U.S. Cl. 364-424.05

1 Claim

1. An apparatus for restraining a vehicle occupant during a crash



of the vehicle comprising:

first crash sensor means securable to the vehicle and having a sensitivity axis parallel with a front-to-rear axis of the vehicle for providing a signal having a value functionally related to crash energy directed parallel to the front-to-rear axis of the vehicle and substantially impervious to crash energy directed parallel to a side-to-side axis of the vehicle;

second crash sensor means securable to the vehicle and having a sensitivity axis parallel with the side-to-side axis of the vehicle for providing a signal having a value functionally related to crash energy directed parallel to the side-to-side axis of the vehicle and substantially impervious to crash energy directed parallel to the front-to-rear axis of the vehicle, said first crash sensor means and said second crash sensor means having their sensitivity axes oriented along mutually orthogonal axes;

control means electrically connected to said first crash sensor means and to said second crash sensor means for determining a direction of a crash condition in response to the signals from said first crash sensor means and said second crash sensor means; and

a plurality of actuatable occupant restraint devices, each electrically connected to said control means, said control means controlling which of said plurality of actuatable occupant restraint devices is or are actuated in response to the determined crash direction.

5,483,448

# ADAPTIVE VEHICLE SUSPENSION SYSTEM WITH MECHANISM FOR VARYING CONTROLLER GAINS IN RESPONSE TO CHANGING ROAD ROUGHNESS CONDITIONS

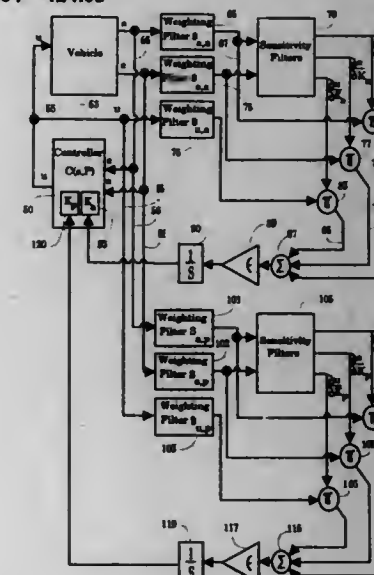
Michael K. Liubakka, Livonia, and James R. Winkelman, Bloomfield, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 990,389, Dec. 14, 1992. This application Mar. 4, 1993, Ser. No. 26,369

Int. Cl. B60G 25/00; G05B 13/02

U.S. Cl. 364-424.05

3 Claims



3. An adaptive suspension system for supporting a wheel with respect to a vehicle body, said system comprising, in combination, an actuator for applying a force between said body and said wheel in response to a control command,

sensing means for generating a first sensed value indicative of the instantaneous vertical acceleration being experienced by said body as said vehicle moves over a road surface,

sensing means for generating a second sensed value indicative of the vertical position of said wheel with respect to said body,

closed-loop feedback means for generating said control command in response to said first and said second sensed values in accordance with a functional relationship determined by at least a first tunable feedback gain value, and

means for adaptively varying said first tunable gain value comprising, in combination,

means responsive to at least said first sensed value for generating an acceleration sensitivity value indicative of a rate of change of said instantaneous vertical acceleration with respect to an incremental change in said first tunable gain value,

means responsive to at least said second sensed value for generating a position sensitivity value indicative of the rate of change of wheel position with respect to an incremental change in said first tunable gain value,

means for repeatedly adjusting said first tunable gain value by an incremental amount having a magnitude related to a weighted sum of said acceleration sensitivity value and said position sensitivity value in accordance with a modifiable weighting relationship, and

means, responsive to said first and second sensed values, for modifying said weighting relationship.

5,483,449

# INFLATABLE RESTRAINT SYSTEM AND METHOD OF CONTROLLING DEPLOYMENT THEREOF

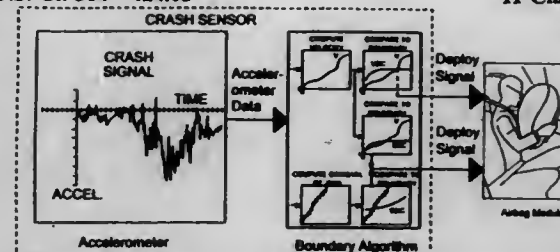
Christopher M. Caruso; Douglas A. Nunan, both of Kokomo, and Charles A. Gray, Noblesville, all of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Mar. 31, 1994, Ser. No. 220,646

Int. Cl. B60R 21/12; 21/32

U.S. Cl. 364-424.05

11 Claims



1. A method of controlling deployment of an inflatable restraint system for a motor vehicle, the method including the steps of sensing vehicle deceleration, comparing the vehicle deceleration sensed with a deceleration threshold to detect an onset of a crash event, integrating the sensed vehicle deceleration following detection of the onset of the crash event to determine a change in velocity value and comparing said change in velocity value with a velocity threshold value, wherein the improvement comprises the steps of:

filtering vehicle deceleration following detection of the onset of the crash event to obtain filtered deceleration;

comparing the filtered deceleration with a deceleration threshold value;

integrating the absolute value of a derivative of filtered deceleration to determine an oscillation value and comparing said oscillation value with an oscillation threshold value; and

commanding deployment of the restraint system when both said change in velocity value exceeds said velocity threshold value and said oscillation value exceeds said oscillation threshold value and when the filtered deceleration exceeds the said deceleration threshold value.

5,483,450

# APPARATUS FOR CONTROLLING A SUSPENSION SYSTEM DISPOSED BETWEEN A WHEEL AND THE BODY OF AN AUTOMOTIVE VEHICLE

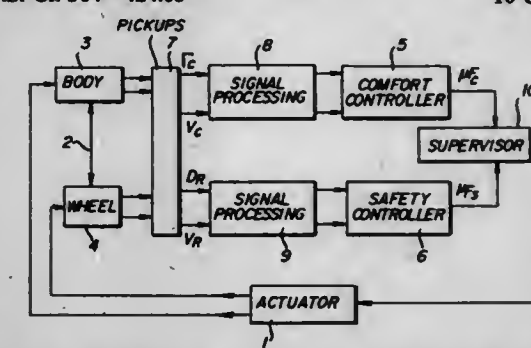
Andre Titi, Balma, and Samir Roukieh, Toulouse Cedex, both of, France, assignors to Siemens Automotive S.A., Toulouse, France

Filed Apr. 28, 1994, Ser. No. 234,242

Claims priority, application France, Apr. 28, 1993, 93 05007 Int. Cl. B60G 17/00

U.S. Cl. 364-424.05

10 Claims



1. In an apparatus for controlling a suspension system disposed between a wheel and a body of an automotive vehicle, having means for controlling the response characteristics of the suspension system to mechanical excitations transmitted by at least one of the body and the wheels, the improvement which comprises:



- a) a first controller receiving first sensor signals representing a vertical speed and a vertical acceleration of the vehicle body, said first controller developing, from the first sensor signals, a first virtual control signal of the controlling means for optimizing a ride quality of the vehicle;
- b) a second controller receiving second sensor signals representing a deflection of the wheel and a vertical speed of the wheel relative to the ground, said second controller developing, from the second sensor signals, a second virtual control signal of the controlling means for optimizing contact between the wheel and the ground; and
- c) supervising means being sensitive to the first and second virtual control signals for developing a real control signal being applied to the controlling means for adjusting the response characteristic of the suspension system as a function of a predetermined behavior strategy, said supervising means including means for developing the real control signal by a linear combination of the first and second virtual control signals.

5,483,451

### START CONTROL DEVICE FOR VEHICLE PASSENGER PROTECTING DEVICE

Katsuhiko Ohmae; Yukihiko Okimoto, and Takashi Furui, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, and Mitsubishi Jidosha Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Continuation of Ser. No. 179,695, Jan. 11, 1994, abandoned.

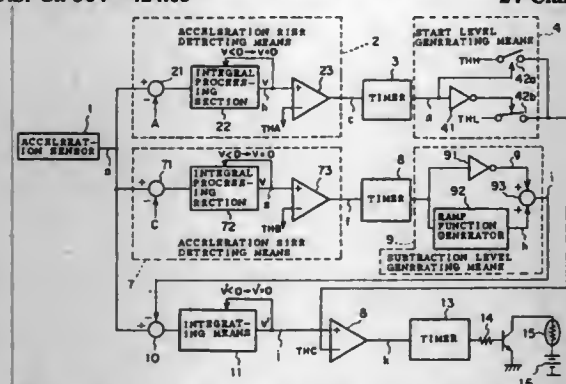
This application May 23, 1995, Ser. No. 447,923

Claims priority, application Japan, Apr. 20, 1993, 5-093132

Int. Cl.<sup>6</sup> B60R 21/32

U.S. Cl. 364—424.05

24 Claims



9. A start control device for a vehicle passenger protecting device, comprising:

- an acceleration sensor for detecting an acceleration;
- subtracting means for subtracting a subtrahend from an output from said acceleration sensor;
- integrating means for integrating an output from said subtracting means, said integrating means including an integral processing section having a reset function, for initializing an integral value;
- comparing means for generating a start signal to said vehicle passenger protecting device when the integral value from said integrating means exceeds a comparative constant value;
- first acceleration rise detecting means for detecting a rise of said acceleration according to said output from said acceleration sensor;
- start level generating means for setting said comparative constant value to a higher value for a predetermined time when said rise of said acceleration is detected by said first acceleration rise detecting means;
- second acceleration rise detecting means for detecting said rise of said acceleration according to said output from said acceleration sensor; and
- subtraction level generating means for setting said subtrahend to vary as a function of time for a predetermined time when said rise of said acceleration is detected by said second acceleration

- tion rise detecting means and for setting said subtrahend to a constant at other times.

5,483,452

### APPARATUS FOR DETECTING FAILURES OF LONGITUDINAL ACCELERATION SENSOR

Hirohisa Tanaka, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

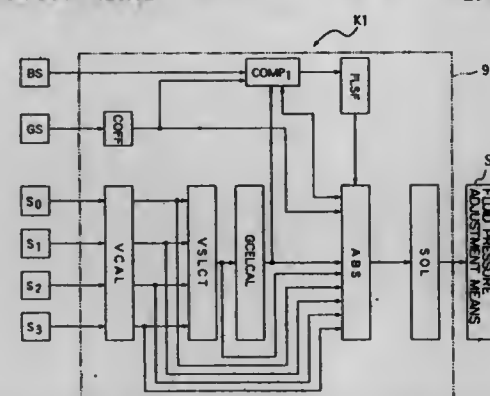
Filed Nov. 16, 1994, Ser. No. 341,054

Claims priority, application Japan, Nov. 25, 1993, 5-295085; Nov. 9, 1994, 6-274971

Int. Cl.<sup>6</sup> G06F 19/00; G01P 3/00

U.S. Cl. 364—426.01

25 Claims



1. An apparatus for detecting failures of a longitudinal acceleration sensor for detecting a longitudinal acceleration of a motor vehicle, comprising:

- wheel speed calculating means for calculating wheel speeds on the basis of outputs of wheel speed sensors;
- estimated vehicle body acceleration calculating means for calculating an estimated vehicle body acceleration on the basis of the wheel speeds;
- comparative arithmetic means which calculates a ratio of a vehicle body acceleration calculated from an output of a longitudinal acceleration sensor to the estimated vehicle body acceleration and calculates a first integrating value by performing a subtraction and an addition for the first integrating value when the ratio falls within and out of a predetermined range, respectively; and
- fail-safe means for performing a predetermined fail-safe processing if the first integrating value is larger than a predetermined value.

5,483,453

### NAVIGATION CONTROL SYSTEM WITH ADAPTIVE CHARACTERISTICS

Hiroki Uemura; Tetsuro Butsuen; Tohru Yoshioka; Ayumu Doi; Kenichi Okuda; Yasunori Yamamoto; Tomohiko Adachi, and Naotsugu Masuda, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Apr. 20, 1993, Ser. No. 50,560

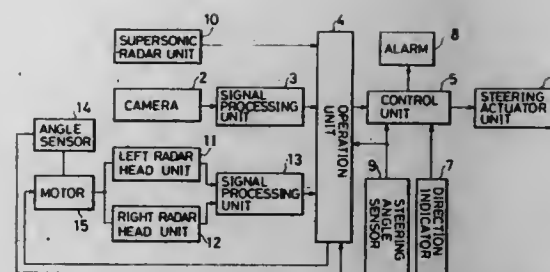
Claims priority, application Japan, Apr. 20, 1992, 4-099818; Sep. 29, 1992, 4-259847

Int. Cl.<sup>6</sup> G06F 165/00; G05D 1/02; B62D 1/02

U.S. Cl. 364—424.02

37 Claims

1. A navigation control system for an automotive vehicle running on a road, comprising:
- deviation detecting means for detecting that the vehicle has deviated or is going to deviate from a lane of the road;
  - deviation suppressing means for suppressing the vehicle from deviating from the lane;
  - detection means for detecting a predetermined condition affecting deviation of the vehicle from the lane; and
  - control means for computing a control amount for suppressing the deviation of the vehicle based on a result of detection by



- said deviation detecting means, for determining a urgency rating for said deviation suppressing based on said detected predetermined condition and said control amount, and for controlling said deviation suppressing means on the basis of a result of the computing the control amount, said deviation suppressing means being controlled by altering a time for operating said deviation suppressing means in accordance with said urgency rating for said deviation suppressing.

5,483,454

### PORTABLE APPLIANCES FOR INFORMING BUS USERS

Jacques Lewiner, Saint-Cloud, and Eric Carreel, Paris, both of, France, assignors to Jean-Claude Decaux, Neuilly Sur Seine, France

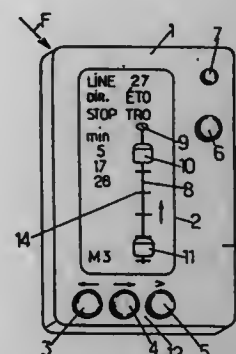
Filed Apr. 29, 1994, Ser. No. 235,320

Claims priority, application France, Apr. 30, 1993, 93 05164

Int. Cl.<sup>6</sup> G08G 1/123

U.S. Cl. 364—443

8 Claims



1. A portable appliance for informing users of an urban bus network about waiting times for buses at various stops of the network, the appliance being associated with an installation designed to generate and transmit signals which provide information about the respective instantaneous real positions of the buses of the network, and said appliance comprising: an electrical power supply, user-actuable interrogation means for identifying any specified stop of the network, means for receiving said signals and for selecting those of said signals which relate at least to the "next bus" expected at the identified stop, and means including a video screen for displaying on said screen information associated with the waiting time for the next bus at said stop, said appliance further comprising: (i) programming means including memory means for storing a first list in plain language of the various lines of the network together with their destinations, and a plurality of second lists in plain language of the various stops on the various lines, and control means for displaying and scrolling on said screen of the appliance the first list, and a selected one of said second lists, and for confirming, within each said list, a selected element of the list to be taken into account, each confirmation causing the display to move on to the following list that corresponds to the selection that has been performed; and (ii) operational means for displaying in succession on the screen of the appliance data relating to various final driving distances for the buses that have previously been selected, which data comprises, for each final driving distance,

- visible information associated with the waiting times for the next buses expected at the stop at which that final driving distance terminates.

5,483,455

### METHOD AND APPARATUS FOR DETERMINING THE LOCATION OF A VEHICLE

Norman K. Lay, Peoria; Carl A. Kemner, Peoria Heights; Joel L. Peterson, Peoria; William E. Allen, Peoria, and Richard B. League, Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

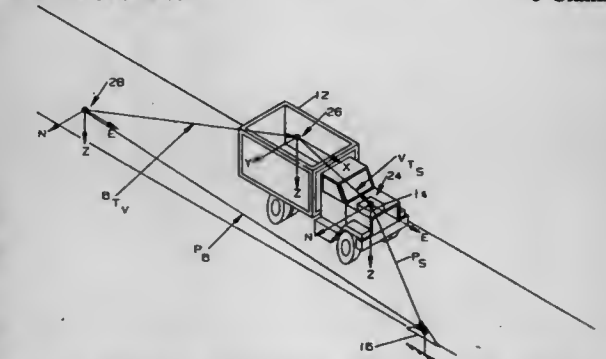
Continuation of Ser. No. 942,000, Sep. 8, 1992, abandoned.

This application Jan. 11, 1995, Ser. No. 371,657

Int. Cl.<sup>6</sup> G01C 21/00

U.S. Cl. 364—448

5 Claims



1. An apparatus for determining the location of a vehicle in a base reference frame having three-dimensions, comprising: a target being located at a predefined fixed position with respect to the three-dimensional base reference frame; radar sensing means for delivering electromagnetic millimeter wave radiation and receiving a reflection of said electromagnetic millimeter wave radiation, said radar sensing means being connected to said vehicle; means for determining a measured location in three dimensional space of said target within a preselected field of view of said radar sensing means based on the received reflection; means for delivering global positioning signals from a remote location; incremental position sensing means for sensing the orientation of the vehicle at a current vehicle position in three-dimensional space within the base reference frame and delivering an orientation signal, said incremental position sensing means being mounted on the vehicle; means for receiving said global position and orientation signals and estimating a current vehicle position in three-dimensional space within the base reference frame based on said global positioning and orientation signals; vehicle positioning means for correcting the estimated current vehicle position with respect to the three-dimensional base reference frame based on the location of said target within the field of view of said radar sensing means and the orientation of said vehicle.

5,483,456

### NAVIGATION SYSTEM AND A METHOD OF CALCULATING GPS MEASURING DEVIATION

Shingo Kuwahara, and Satoshi Odagawa, both of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 2, 1993, Ser. No. 144,535

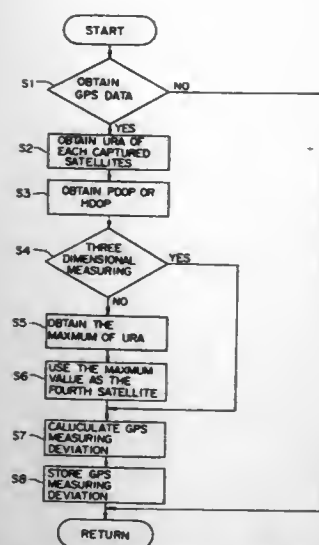
Claims priority, application Japan, Nov. 4, 1992, 4-294969

Int. Cl.<sup>6</sup> G06F 165/00

U.S. Cl. 364—449

8 Claims

6. A method of determining a current position of a self-movable body by map-matching in reliance on GPS satellite accuracy



information and a declining rate of measuring accuracy supplied from a plurality of GPS satellites, the method comprising steps of: detecting whether GPS satellite information is obtained; obtaining said accuracy information of each captured satellites; obtaining said declining rate of measuring accuracy; detecting whether a measuring dimension is two or three; obtaining URA values from three satellites and obtaining a maximum URA value of the three satellites and obtaining a maximum URA value as a URA of a fourth satellite, if the two measuring dimension is detected; calculating the GPS measuring deviation from said declining rate of measuring accuracy, said URA values of said three satellites and said maximum URA value; and storing the calculated GPS measuring deviation; performing map-matching by searching only road information within a radius around a current measuring position, said radius being equal to said stored GPS measuring deviation, thereby reducing a searching area in said map-matching step when said GPS measuring deviation is low and increasing said searching area when said GPS measuring deviation is high; determining an updated current measuring position from within said radius.

5,483,457

### VEHICLE NAVIGATION SYSTEM USING GPS INCLUDING CORRECTION OF COEFFICIENTS FOR VELOCITY SENSOR

Akihito Shibata, Hiroaki Tsuji, and Yoichiro Suga, all of Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

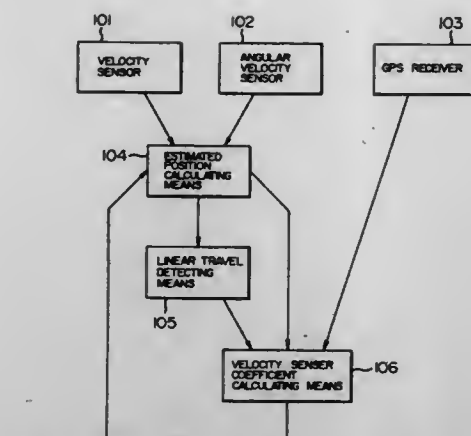
Filed Oct. 20, 1992, Ser. No. 963,751

Claims priority, application Japan, Jan. 25, 1991, 3-279220  
Int. Cl.<sup>6</sup> G06F 165/00

U.S. Cl. 364-454

6 Claims

1. A vehicle navigation system comprising:  
a first sensor for detecting a velocity of a vehicle;  
a second sensor for detecting a direction of the vehicle;  
estimated position calculating means for calculating an estimated position of the vehicle on the basis of outputs of said first and second sensors;  
linear travel detecting means for detecting linear travel of the vehicle on the basis of a travel path of the vehicle obtained on the basis of a plurality of the estimated positions;  
means for obtaining positional data of the vehicle received from outside of the vehicle; and  
sensor coefficient calculating means for calculating, only when a travel section of the travel path of the vehicle detected by said linear travel detecting means is linear, a coefficient of said first sensor on the basis of a ratio between (i) a distance



between two positions of the vehicle in said linear travel section of the travel path of the vehicle detected by said linear travel detecting means, said two positions being obtained by said means for obtaining positional data of the vehicle, and (ii) a distance of linear travel of the vehicle calculated on the basis of signals outputted by said first sensor during a period between (a) when one of said two positions of the vehicle is obtained by said means for obtaining positional data of the vehicle and (b) when the other of said two positions of the vehicle is obtained by said means for obtaining positional data of the vehicle.

5,483,458

### PROGRAMMABLE CLOCK MODULE FOR POSTAGE METERING CONTROL SYSTEM

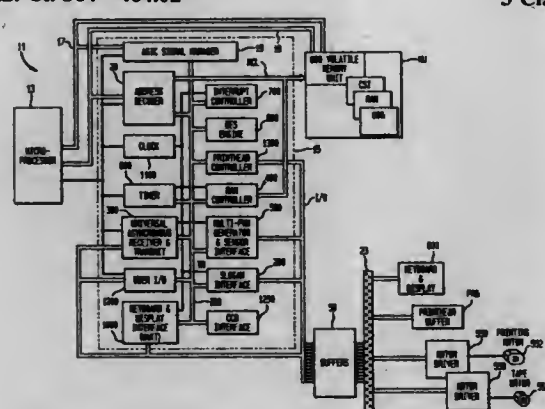
Young W. Lee, Orange; Sungwon Moh, Wilton, and Arno Muller, Westport, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 9, 1993, Ser. No. 164,100

Int. Cl.<sup>6</sup> G05B 11/01

U.S. Cl. 364-464.02

3 Claims



1. An improved electronic postage meter having a control system, said control system having a control circuit,  
a printing means for printing of a postage indicia in response to said control circuit, said printing means including a plurality of motors and respective motor drivers, each of said said plurality of motor and respective motor driver being one of a plurality of types,  
said control circuit having a programmable microprocessor, memory units, and an integrated circuit, said microprocessor being in bus communication with said memory units and said printing means, for accounting for said postage printed by said printing means in accordance with said microprocessor programming,  
said memory means for storing program data and generating data, and  
said improved electronic postage meter comprising:

said data stored in said memory units including timing data specific to said motor driver type,  
said integrated circuit having an address decoding module means for generating a unique combination of control signals in response to a respective address placed on said bus by said microprocessor, and having  
a timer registers means responsive to ones of said control signals from said address decoding module means to enable writing of said timer data into said timer registers by said microprocessor, and  
timer means responsive to said timer data written into said timer registers for generating one of a plurality of timing signals in accordance with timer data  
means for electronically communicating said timing signals to said motor drivers.

5,483,459

### WIRE MEASURING AND CUTTING APPARATUS AND WIRE CHANGING METHOD USING THE SAME

Yoshikazu Tamura, Kanazawa, Japan, assignor to Sumitomo Wiring Systems, Ltd., Mie, Japan

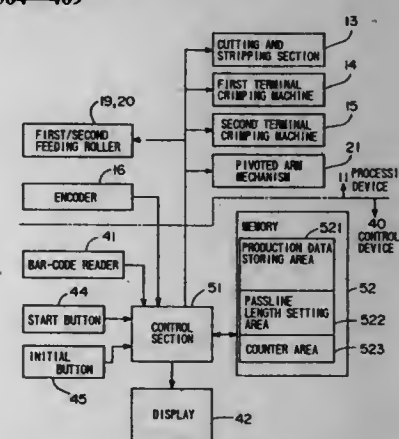
Filed Oct. 27, 1994, Ser. No. 327,840

Claims priority, application Japan, Nov. 1, 1993, 5-273806

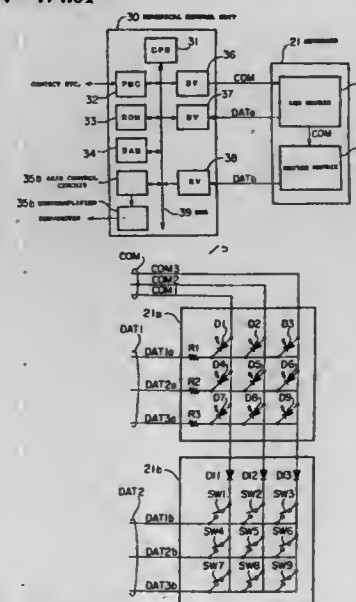
Int. Cl.<sup>6</sup> H01R 43/00

U.S. Cl. 364-469

13 Claims



1. A wire measuring and cutting apparatus comprising:  
a wire retrieving section for retrieving wires stored in a wire storing section,  
a wire cutting location set at a location a predetermined distance from the wire retrieving section,  
a passline having a predetermined length which guides the wire retrieved from the wire retrieving section and leads it to the wire cutting location,  
a wire feeding means provided on the passline for feeding wire in the direction of the wire cutting location along the passline,  
a wire length measuring means provided on the passline for measuring the length of the wire passing through the passline,  
a production condition setting means wherein at least the following conditions such as type of wire to be employed, length of the wire to be produced and number of wires to be produced are set,  
a wire cutting means arranged on the wire cutting location which operates to cut wire whenever the wire length measuring means measures the same length as that of the wire to be produced which is set to the production condition setting means,  
a displaying means for displaying data, and  
a wire change control means which counts the number of cutting of the wire cutting means and stops the wire feeding means when the number of cutting reaches a value smaller by a predetermined number N than the number of wires to be produced which is set to the production condition setting means and to cause to display of instructions for performing wire change on said displaying means.



1. A numerically controlled machine tool including a numerical control unit for machining a workpiece according to an input command, comprising:

a plurality of switch matrices, each having a plurality of matrix elements disposed in a matrix format, each connected to one same set of common lines and each connected to a plurality of data lines;  
a first driving circuit for supplying common signals to said one set of common lines connected to said plurality of switch matrices;  
a second driving circuit for receiving output signals from a first group of said plurality of data lines connected to said plurality of switch matrices; and  
a receiving circuit for receiving input data signals from a second group of said plurality of data lines connected to said plurality of switch matrices.

5,483,461

### ROUTING ALGORITHM METHOD FOR STANDARD-CELL AND GATE-ARRAY INTEGRATED CIRCUIT DESIGN

Kaiwin Lee; Lu Chung, both of Sunnyvale; Chin-Hsen Lin, Milpitas; Yuh-Zen Liao, Saratoga, and Stephen Wu, Sunnyvale, all of Calif., assignors to ARCSYS, Inc., Sunnyvale, Calif.

Filed Jun. 10, 1993, Ser. No. 74,961

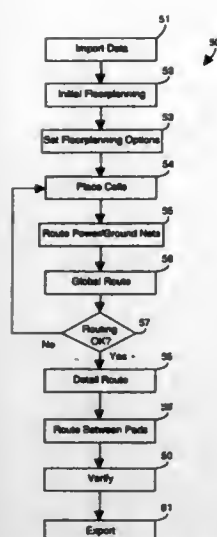
Int. Cl.<sup>6</sup> G06F 17/50

U.S. Cl. 364-490

14 Claims

1. A computer-implemented method of providing an electronic design automation tool for the design of a chip with at least two metal interconnecting layers (metal-1 and metal-2), said chip design being introduced to a database in a computer workstation by a user in a set of top design files and extracted in exportable form by a utility package, the method comprising the steps of:





accessing said computer database for laying boundaries for a via-region on said chip for each pin-master in a plurality of pin-masters all in a cell-master, wherein placing a via connects a pin to a plurality of metal layers without causing a pre-defined design rule violation to any other pin-master; accessing said computer database for identifying all "via-spots" within each said via-region that violates none of said design rules if vias are placed at these points, wherein a first attempt at identification inspects points along metal-2-pitch lines and half metal-2-pitch lines in said via-region, and wherein said via-spots which have a maximum number of spots on metal-2-pitch lines and half metal-2-pitch lines are preferred; accessing said computer database for placing vias on each cell instance according to their via-spots, such that for each cell instance, a two via-spot combination associated with it's cell-master is found where a first combination (c1) has a maximum number of via-spots (n1) on metal-2-pitch lines and a second combination (c2) has a maximum number of via-spots (n2) on half-metal-2-pitch lines, and if n1 is greater than or equal to n2, then vias are placed at said via-spots defined by c1, otherwise said cell instance is shifted, and said vias are placed at said via-spots defined by c2; accessing said computer database for maze-routing to connect said neighboring same net pins by metal-1; and accessing said computer database for removing said vias on said pins connected by the maze-routing, leaving only one via on a pin if a connection for a current net is not complete.

5,483,462

# ON-LINE METHOD FOR DETERMINING POWER SYSTEM TRANSIENT STABILITY

Hsiao-Dong Chiang, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed May 7, 1990, Ser. No. 519,613

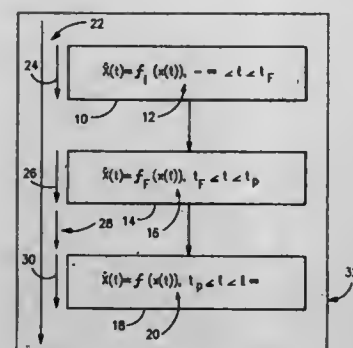
Int. Cl.<sup>6</sup> H02H 3/06

U.S. Cl. 364-492

2 Claims

1. In an electrical power system having a plurality of buses and means for restoring continuity in circuits after an event disturbance has interrupted continuity thereof, and including a detection system for assuring transient stability of the electrical power system, comprising:

- means for detecting on-line electrical system interruption of a bus; and
- means for restoring continuity in said interrupted electrical system at a predetermined time after said event disturbance has occurred, said predetermined time being calculated as a function of on-line fault conditions and as a function of a stability boundary.



5,483,463

# UNINTERRUPTIBLE POWER SUPPLY (UPS) AND METHOD

Yu Qin, and Shanshan Du, both of Troy, Mich., assignors to Controlled Power Company, Troy, Mich.

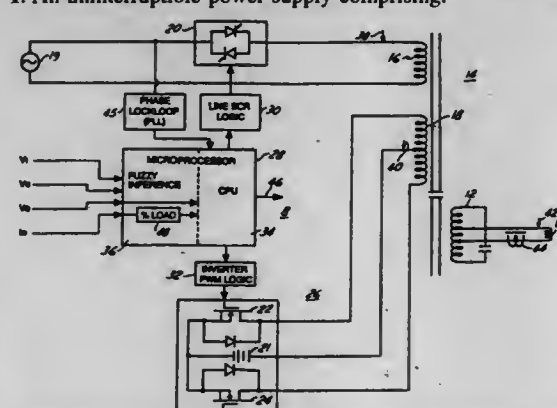
Filed Jul. 30, 1993, Ser. No. 100,111

Int. Cl.<sup>6</sup> H02J 9/00

U.S. Cl. 364-492

9 Claims

1. An uninterruptible power supply comprising:



a voltage regulating transformer having predetermined voltage regulation characteristics as a function of load, first input means for coupling a primary AC voltage source to said transformer, an inverter circuit adapted to be energized by a reserve DC voltage source to provide a secondary AC voltage source, second input means for coupling said secondary AC voltage source to said transformer, output means for supplying a regulated output voltage from said regulating transformer to a variable load, first sensing means for developing a first monitoring signal which varies with voltage at said primary source, second sensing means for developing a second monitoring signal which varies with at least one electrical parameter as a function of load variations, input switching means for selectively switching between said first input means and said second input means to supply AC voltage to said transformer, controller means responsive to said second monitoring signal for determining input voltage switching points which vary on a continuous, non-stepwise basis as a function of load variations, and a comparator for comparing said continuously varying, non-stepwise switching points to said first monitoring signal to activate said input switching means, and wherein said controller means comprises means responsive to said second monitoring signal to compute percent load on a dynamic continuous basis and fuzzy inference apparatus means for executing a fuzzy inference operation using at least first membership functions relating to percent load, second membership functions

relating to input voltage switching points, and rules using at least load memberships as antecedents and grades of input voltage switching points as consequences as determined by said regulation characteristics of said transformer to generate said switching points on a continuous, non-stepwise basis.

5,483,464

# POWER SAVING APPARATUS FOR USE IN PERIPHERAL EQUIPMENT OF A COMPUTER

Moon-Jong Song, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

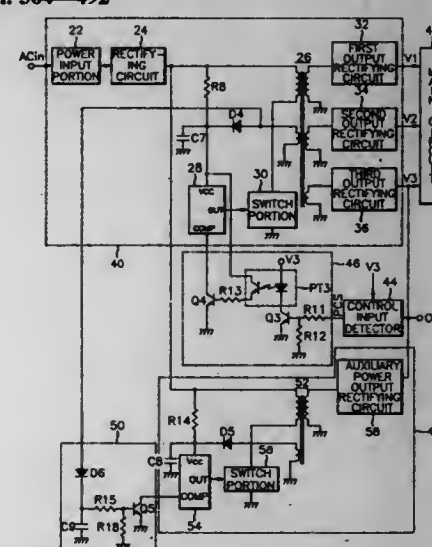
Filed Dec. 30, 1993, Ser. No. 176,450

Claims priority, application Rep. of Korea, Mar. 31, 1993, 5332/1993

Int. Cl.<sup>6</sup> G06F 1/32

U.S. Cl. 364-492

27 Claims



1. A power saving apparatus for use in peripheral equipment comprising:

- external control means for generating an operation control signal indicative of an OFF mode, said OFF mode indicating that said external control means has not received a data input from a user for a predetermined period of time;
- power supply means for generating operating power and supplying the operating power to said peripheral equipment;
- control input detection means for detecting a control mode indicated by said operation control signal, said control input detection means comprising:
  - frequency voltage converter means for receiving said operation control signal and generating a converted signal having a voltage magnitude corresponding to a frequency of said operation control signal; and
  - comparator means for receiving said converted signal and providing a power control signal in dependence upon said converted signal; and
- power control means for receiving said power control signal and interrupting operating power supplied to the peripheral equipment from said power supply means when said control input detection means determines that said control mode indicates said OFF mode.

5,483,465

# METHOD FOR REPROGRAMMING DUPLICATED COMMUNICATION UNITS

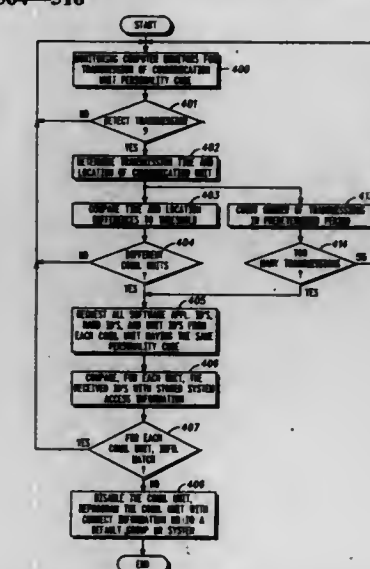
Gary W. Grube, 157 Cedarwood Ct., Palatine, Ill. 60067; Timothy W. Markison, 555 Northview La., Hoffman Estates, Ill. 60194, and Thomas E. Weston, 10476 Ridge La., Marengo, Ill. 60152

Continuation-in-part of Ser. No. 23,512, Feb. 26, 1993, abandoned. This application Oct. 28, 1993, Ser. No. 144,599

Int. Cl.<sup>6</sup> H04B 7/00; H04Q 7/22

U.S. Cl. 364-516

12 Claims







a memory (20), having:

- an address decoding circuit (9) where to a plurality of word lines (14) are connected, and which selects one word line (14) when an address signal (ADD) is given from said central processing unit (1);
- a selector circuit, (10) where to a plurality of bit lines (16) are connected, and which selects at least one bit line (16) when the address signal (ADD) is given from said central processing unit (1);
- a memory transistor group (11) comprising memory transistors (15) each connected at each of the intersections of said plurality of word lines (14) and said plurality of bit lines (16); and
- a sense amplifier circuit (130) which outputs data signal of "1" or "0" according to a signal read from said memory transistor (15) connected at the intersection of one word line (14) selected by said address decoding circuit (9) and one bit line (16) selected by said selector circuit (10) in synchronization with said clock (E);

further comprising:

a monitor memory (100), having:

- a monitor memory transistor (115) having characteristic substantially identical with those of said memory transistors (15) and having a specified signal stored in advance as an expected value;
  - a monitor selector circuit (110) which always specifies said monitor transistor (115) regardless of the address signal (ADD);
  - a monitor sense amplifier circuit (113) whose normal operation range for the power voltage is set narrower than that of said sense amplifier circuit, (130), and which outputs data signal of "1" or "0" according to a signal read from said monitor memory transistor (115) always selected by said monitor selector circuit (110) in synchronization with said clock (E); and
  - a judging circuit (101) which judges the data signal outputted from said monitor sense amplifier circuit (113) whether it is true or false with reference to the expected value;
- wherein said sense amplifier circuit (130) comprises a plurality of sense amplifier circuit portions each having an optimum characteristic for different power voltages from the other;
- said monitor sense amplifier circuit (113) reads a signal from said monitor memory transistor (115) in the same period as, or in a period immediately before, a period of said clock (E) during which said central processing unit (1) reads data from said memory transistor group (11); and
- said judging circuit (101) switches from the sense amplifier portion being under operation to another sense amplifier circuit, portion having optimum characteristic in said sense amplifier circuit (130), when the data signal outputted from said monitor sense amplifier circuit (113) is judging to be false.

5,483,472

#### PORTABLE ELECTRONIC FOOD SHOPPER

Anthony J. Overman, 205 E. Casino Rd., Ste. B-20, Box 191, Everett, Wash. 98204

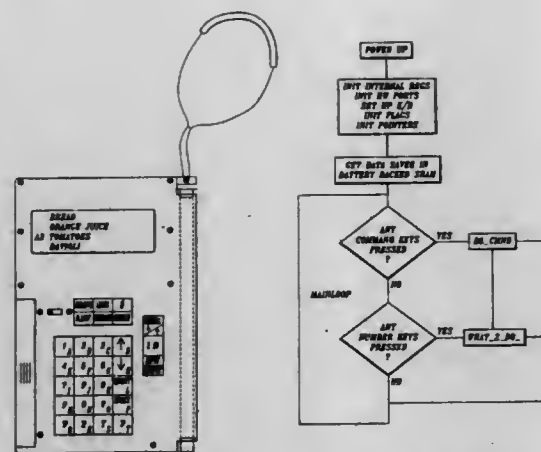
Filed May 10, 1993, Ser. No. 58,780

Int. Cl.<sup>6</sup> G06F 15/16; 15/22; 15/24; G06G 7/52

U.S. Cl. 364—705.06

1 Claim

1. A method of electronically selecting, listing, and displaying shopping items with price and quantity to be purchased in an electronic device that includes a keyboard input section with means for inputting alphanumeric characters for entering items on a list and control commands, including a List key, a display means for displaying shopping list items, command prompts, and calculational results, and keyboard input section entries, device memory means in which is stored a master list of consumer items stored in said device memory means from which a user can select items a plurality of user-prepared lists prepared by transferring items from said master list and by user entry from said keyboard, an index of said plurality of user-prepared lists stored in said device memory



means, data retrieval means such that shopping list information can be retrieved and displayed on the display means, one or more microprocessors electronically coupled to said retrieval means, to said display means and to said keyboard input section for processing keyboard input data and to said memory means for controlling designed operational steps implemented in a plurality of device processor program instructions stored in said device memory means,

where said designed operational steps are comprised of:

a continuously operating program control loop that inquires if a key has been pressed, a positive response causing the program to execute one of two subprograms, DO\_CMND or WHAT\_2\_DO,

said DO\_CMND subprogram causing the keyboard to be read and interpreted through a series of logic queries, a negative response to each of said logic queries causing a read of a next logic query, determining whether selective function keys have been pressed, said selective keys including "SECOND", "INPUT", "COMPARE", "SCROLL", or "DELETE", or "COST";

a positive response to the first query causing key definition to flip between a primary key definition set and a secondary key definition set;

a positive response to the second query causing an execution of a subprogram "GET\_INITEM" or a subroutine "SERIAL\_DUMP", depending on whether a primary or secondary keyboard definition is active;

a positive response to the third query causing a read of the keyboard of two list items each with a keyboard entry of a price and a unit of measure, said entries followed by price comparison of the 2 items with results displayed on the display means;

a positive response to the fourth query causing list items to scroll in the display means;

a positive response to the fifth query causing deletion of list items;

a positive response to the sixth query causing execution of a subprogram "SEARCH\_SUB" in the primary key definition set or a subprogram "EDIT\_COST" in the secondary keyboard definition set, after which the DO\_CMND subprogram is completed, and logic control is returned to the program control loop;

said WHAT\_2\_DO subprogram causing the keyboard to be read and interpreted through a series of logic queries, a negative response to each logic query causing a read of a next logic query, determining whether certain selective keys have been pressed, said keys including "UPARROW", "DOWNARROW", "QUANT" and "SEARCH", a positive response to each logic query respectively causing upward and downward movement of a cursor arrow in the display means through a list of items or data or execution of subprograms EDIT\_QUANTITY, "SEARCH\_SUB"; after which the WHAT\_2-DO subprogram is completed and logic control is returned to the program control loop;

said subprogram GET\_INITEM causing the keyboard to be read and interrupted and responding to selective keys being

depressed, including keys "DELETE", "INPUT", and "SECOND", a positive response to which respectively causing (1) the subprogram to return logical control to a subprogram which caused execution of GET\_INITEM; (2) to execute closing steps, said closing steps including filling remaining character positions with logical blanks up to the limited number of characters, then adding a new word to the item list, then initiating quantity and price values to zero unless the list is full in which case an error message is displayed, and then returning logical control to a subprogram which caused execution of GET\_INITEM; and (3) to flip keyboard keys between primary and secondary key definitions followed by addition of a character represented by the depressed key to be added to a list and displayed on the display means and then logically branching to again wait for a further key to be depressed unless greater than a limited number of characters have been entered in which case said closing steps are executed;

said subprogram "SERIAL\_DUMP" causing program execution one of three options in response to keyboard input through one of three selective keys, respectively causing addition of a newly defined item to a list, transmission of an entire list, transmission of a single item of a list, followed by return to a subprogram which caused execution of SERIAL\_DUMP;

said EDIT\_COST subprogram comprising display on the display means of a list item indicated by the display cursor together with quantity and cost data for that item followed by keyboard entry of new cost data recorded in device memory unless a "DELETE" character is first encountered in which case the routine is exited without recording the new value;

said EDIT\_QUANTITY subprogram comprising display on the display means of an item indicated by the display cursor together with quantity and cost data for that item followed by keyboard entry of new quantity data and new quantity unit of measure data recorded in device memory unless a "DELETE" character is first encountered in which case the routine is exited without recording the new value;

said SEARCH\_SUB subprogram executing read of the keyboard, the subprogram returning to a subprogram which caused its execution if read of a "DELETE" key is found, recording as a new item in a list the last item searched and identified if an "INPUT" key is found, otherwise executing a further read of the keyboard for defining a desired list item, which item is retrieved from a memory-resident list of items and loaded into a user new list for creation of a user list from selected items in a memory-resident master list of items.

5,483,473

#### WAVEFORM GENERATOR AND METHOD WHICH OBTAINS A WAVE-FORM USING A CALCULATOR

Peter J. Holness, British Aerospace Defence Limited, Dynamics Division, Six Hills Way, Stevenage, Hertfordshire, Great Britain, assignor to Peter J. Holness, Hertford, England

Continuation of Ser. No. 869,006, Apr. 16, 1992, abandoned.

This application Jun. 8, 1994, Ser. No. 257,425

Claims priority, application United Kingdom, Apr. 19, 1991, 9108467

Int. Cl.<sup>6</sup> G06F 1/02

U.S. Cl. 364—718

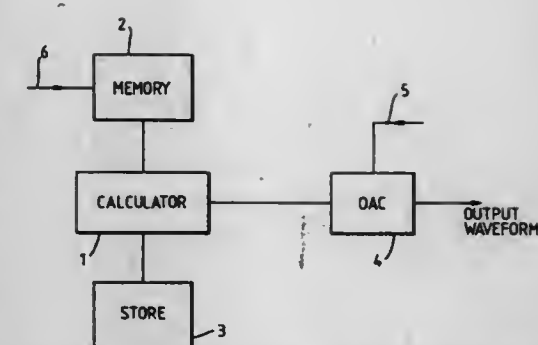
12 Claims

1. Apparatus for generating waveforms, said apparatus comprising:

first memory means for storing a plurality of generator equations, said generator equations corresponding to Portmanteau functions;

second memory means for storing discrete values of a parameter defining an argument for said generator equations stored in said first memory means;

a processing means receiving at least one of said plurality of generator equations from said first memory means and receiving a sequence of said discrete values from said second memory means for generating a sequence of values corre-



sponding to a calculated result of said at least one generator equation using said sequence of discrete values as said arguments therein; and means for providing said sequence of values in a succession so as define successive segments of a waveform.

5,483,474

#### D-DIMENSIONAL, FRACTIONAL BANDWIDTH SIGNAL PROCESSING APPARATUS

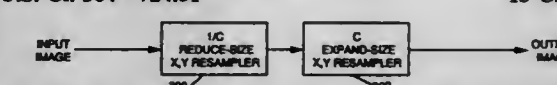
James H. Arbeiter, Hopewell, and Roger F. Bessler, Lawrenceville, both of N.J., assignors to North Shore Laboratories, Inc., Princeton, N.J.

Filed Nov. 15, 1993, Ser. No. 151,965

Int. Cl.<sup>6</sup> G06F 15/31

U.S. Cl. 364—724.01

13 Claims



1. In filtering apparatus responsive to a sequence of samples of an input signal that is digitally-sampled at a given frequency, wherein said input signal defines information having at least one dimension, and wherein said apparatus comprises first means for resampling said input-signal to derive a first signal at a first frequency which is substantially equal to said given frequency times the reciprocal 1/C of a given factor C, and second means for resampling said first signal to derive a second signal at a second frequency which is substantially equal to said first frequency times said given factor C; the improvement wherein:

said given factor C is an improper fraction having a least-common-denominator larger than one; whereby said first means and second means in combination comprise a low-pass filter having a relative cutoff frequency with respect to said given frequency determined by the value of said given factor C.

5,483,475

#### FAST PIPELINED 2-D DISCRETE COSINE TRANSFORM ARCHITECTURE

Jinn-Nan Kao, Hsinchu, Taiwan, Prov. of China, assignor to Industrial Technology Research Institute, Taiwan, Prov. of China

Filed Sep. 15, 1993, Ser. No. 121,598

Int. Cl.<sup>6</sup> G06F 7/38; 15/00; 15/40

U.S. Cl. 364—725

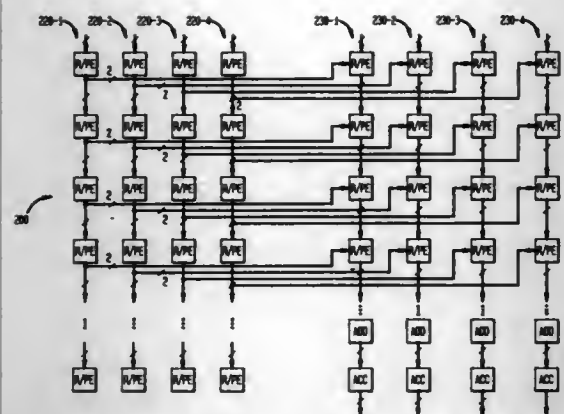
13 Claims

1. A DCT circuit comprising:

a pre-processor stage receiving each element  $x_{ij}$ ,  $i,j=1,2,\dots,N$ , where N is an integer  $\geq 4$ , of an input matrix X, said pre-processor stage simultaneously outputting Q sequences of one or more columns of elements of a matrix  $A_j$  having elements  $a_{ij}=x_{ij}+x_{(N-i+1)j}$ ,  $i=1,2,\dots,N/2$ ,  $j=1,2,\dots$ , and  $Q \geq 1$  of one or more sequences columns of elements of a matrix  $A_j$  having elements  $a_{ij}=x_{(i-N/2)j}-x_{(3N/2-i+1)j}$ ,  $i=N/2+1, N/2+2,\dots,N$ ,  $j=1,2,\dots,N$ , where Q is an integer  $\geq 1$ , and

a 1-D DCT processing stage simultaneously receiving each of said 2Q sequences of one or more vectors of elements of said





matrices  $A_j$  and  $A_n$ ,  $P$  sequences of one or more rows of elements of an  $N/2 \times N/2$  DCT cosine coefficient matrix  $C_1$  and  $P$  sequences of rows of elements of an  $N/2 \times N/2$  DCT cosine coefficient matrix  $C_2$ , where  $P$  is an integer  $\geq 1$ , said 1-D DCT processing stage comprising  $K$  column multiplication circuits which each simultaneously outputs a sequence of one or more vectors of elements of a matrix  $Y_o$  comprising elements  $y_{ij}$   $i=1,3,\dots,N$ ,  $j=1,2,\dots,N$ , where  $K$  is an integer  $\geq 1$  and where

$$y_{ij} = \sum_{k=1}^N C_{i+1} \times a_{kj}$$

and  $K$  column multiplication circuits which each simultaneously outputs a sequence of one or more vectors of elements of a matrix  $Y_o$  comprising elements  $y_{ij}$   $i=2,4,\dots,N$ ,  $j=1,2,\dots,N$ , where

$$y_{ij} = \sum_{k=1}^N C_{i+N} \times a_{(k+N)/2}$$

wherein said integers  $Q$ ,  $P$  and  $K$  are selected independently of said integer  $N$ , and wherein said integers  $K$ ,  $P$ , and  $Q$  are selected to balance a processing speed of said 1-D DCT circuit against an area occupied by said 1-D DCT circuit.

5,483,476

#### MANTISSA ADDITION SYSTEM FOR A FLOATING POINT ADDER

Yoram Horen, Rehovot; Yehuda Volpert, Petach-Tikva, and Alick Elnav, Nathanya, all of, Israel, assignors to Motorola Inc., Schaumburg, Ill.

Filed Jan. 26, 1994, Ser. No. 186,724

Claims priority, application United Kingdom, Jan. 30, 1993, 9301863

Int. Cl. G06F 7/38

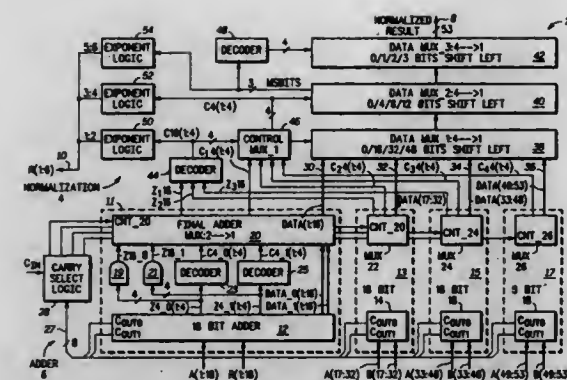
U.S. Cl. 364-748

8 Claims

1. A mantissa addition system for providing a normalized addition result for two mantissas and information indicating the number of bit shifts required to provide the normalized addition result, the system comprising:

mantissa adder means for adding two mantissas to provide an addition resultant group, the addition resultant group comprising a plurality of bits arranged in a predetermined number of sub-groups of bits;

flag generating means for generating a flag for each sub-group of the predetermined number of sub-groups, the flag having an active state when all the bits in a respective sub-group are zero and an inactive state when at least one of the bits in the respective sub-group is non-zero; and



mantissa normalisation means coupled to the mantissa adder means and the flag generating means, the mantissa normalisation means comprising:

first detecting means for detecting a most significant flag having the inactive state and for providing a first control signal representative of the detected most significant flag;

first shifting means for shifting the groups of bits of the addition result in response to the first control signal so that the sub-group of bits corresponding to the detected most significant flag is the most significant group, the first shifting means providing a first shifted addition result;

second detecting means for detecting the most significant bit of the most significant sub-group of the first shifted addition result which is non-zero and for providing a second control signal representative of the detected most significant bit;

second shifting means for shifting the plurality of bits of the first shifted addition result in response to the second control signal so that the detected most significant non-zero bit is the most significant bit, the second shifting means providing a second shifted addition result which represents the normalised addition result; and

logic means for providing the shift information in dependence on the number of shifts performed by the first and second shifting means.

5,483,477

#### MULTIPLYING CIRCUIT AND MICROCOMPUTER INCLUDING THE SAME

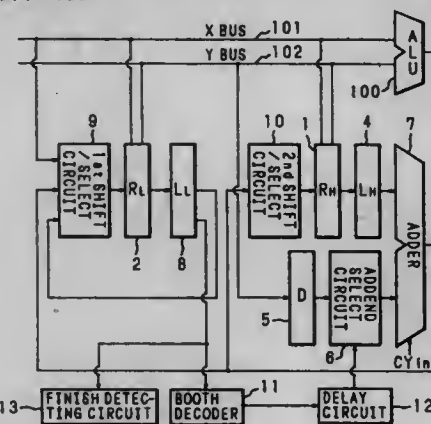
Fumiki Sato, and Kouichi Fujita, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1994, Ser. No. 205,457

Claims priority, application Japan, Mar. 10, 1993, 5-075110 Int. Cl. G06F 7/52; 7/00; 15/00

U.S. Cl. 364-757

6 Claims



1. A multiplying circuit, comprising:

a first register which includes a portion storing a positive part of a number with a redundant code and a portion storing a negative part of the same, and which stores a part of a partial product indicated by a number with a redundant code;

a second register which includes a portion storing a positive part of a number with a redundant code and a portion storing a negative part of the same, and which stores a multiplicand or a part of a partial product indicated by a number with a redundant code;

a third register which stores a multiplier by twos complement representation;

addend selecting means for selecting any one of a number of two times of the multiplier, an inverted value of the number of two times of the multiplier, the multiplier, an inverted value of the multiplier or a number in which all bits are "1", by receiving an output of said third register;

an adder to which a carry signal is inputted, and which adds an output of said first register and an output of said addend selecting means to each other;

first shifting/selecting means, into which an output of said adder, an output of said second register and the multiplicand are inputted, for, to the portion storing the positive part of a number with a redundant code of said second register, outputting a number in which the output of said second register is made into the lower bits thereof and the output of said adder is made into the higher bits thereof, or a number in which said multiplicand is made into the higher bits thereof and "0" is made into the lower bits thereof, and for, to the portion storing the negative part of the same, outputting a number in which the output of said second register is made into the lower bits thereof and the output of said adder is made into the higher bits thereof;

second shifting/selecting means for, to the portions storing the positive and negative parts of a number with a redundant code of said first register, outputting a number in which the output of said adder is made into the lower bits thereof and "0" is made into the most significant bit thereof, by receiving the output of said adder;

a Booth decoder which generates a signal for controlling said addend selecting means by receiving the lower bits of the portion storing the positive part of a number with a redundant code of said second register; and

finish detecting means for detecting the finishing of multiplication cycles by detecting that "1" exists in the portion storing the positive part and the negative part of a number with a redundant code of the lower bits of said second register.

5,483,478

#### METHOD AND STRUCTURE FOR REDUCING CARRY DELAY FOR A PROGRAMMABLE CARRY CHAIN

David Chiang, Saratoga, Calif., assignor to Xilinx, Inc., San Jose, Calif.

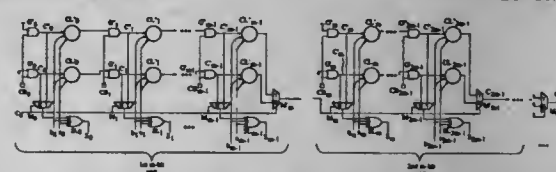
Continuation of Ser. No. 961,754, Oct. 16, 1992, abandoned.

This application Apr. 8, 1994, Ser. No. 225,192

Int. Cl. G06F 7/50

U.S. Cl. 364-787

18 Claims



1. A method for reducing carry delay for a programmable architecture including a programmable carry chain controlled by a plurality of configuration bits for specifying the beginning and end locations of said carry chain, said method comprising the steps of:

providing a plurality of multi-bit units, each multi-bit unit having a carry-in input line for receiving a carry bit from a less significant multi-bit unit, and a carry-out output line for sending a carry bit to a more significant multi-bit unit as a carry-in thereof;

including a plurality of subunits in each multi-bit unit, for each subunit;

coupling a first combinational gate to a first carry logic element via a first programmable carry path;

coupling a second combinational gate to a second carry logic element via a second programmable carry path;

providing a pair of addends to a sum logic element, said first carry logic element, and said second carry logic element;

multiplexing signals on said first programmable carry path and said second programmable path with a first multiplexer;

providing an output signal of said first multiplexer to said sum logic element;

coupling a means for configuring to the input terminal of said first combinational gate and to the input terminal of said second combinational gate;

coupling the first combinational gate of the first subunit of said multi-bit unit to a first voltage source and coupling the second combinational gate of said first subunit of said multi-bit unit to a second voltage source;

coupling the first combinational gate of a subsequent subunit of said multi-bit unit to the first carry logic element in a preceding subunit;

coupling the second combinational gate of said subsequent subunit of said multi-bit unit to the second carry logic element of said preceding subunit;

coupling the first carry logic element and the second logic element of a last subunit in said multi-bit unit to the input terminals of a second multiplexer;

activating said first and second multiplexers with a signal provided by said carry-in input line; and

providing a signal from said second multiplexer to said carry-out output line.

5,483,479

#### ASSOCIATIVE STORAGE MEMORY

Nobuyuki Osawa; Ichiro Tomioka, and Mitsuhiro Deguchi, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

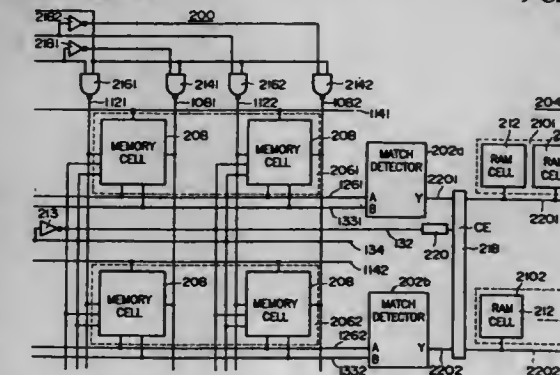
Filed Apr. 21, 1993, Ser. No. 50,850

Claims priority, application Japan, Apr. 22, 1992, 4-102779

Int. Cl. G11C 15/04

U.S. Cl. 365-49

9 Claims



1. A semiconductor memory device comprising: an associative memory including a plurality of words, and two match lines provided for each of said words, means for precharging said match lines to mutually different potentials,

said each of said words having means for maintaining potentials on said two match lines when stored information of said each of said words is the same as a retrieval word, and for changing a potential of one of said two match lines when said stored information of said each of said words is not the same as said retrieval word;

said one of said two match lines being a first of said two match lines when a bit of said retrieval word fails to match a corresponding bit of said each of said words and said corresponding bit is at a high level;

said one of said two match lines being a second of said two match lines when said bit of said retrieval word fails to match said corresponding bit of said each of said words and said corresponding bit is at a low level;



match detecting means associated with said each of said words of said associative memory;  
 said two match lines of said associated word being connected to said match detecting means;  
 said match detecting means having means for providing an output signal of a first state when said two match lines connected to said match detecting means maintain said mutually different potentials, respectively, and changing said output signal from said first state to a second state when one of said two match lines changes a potential thereof from a state in which said two match lines are at said mutually different potentials;

RAM means including a plurality of RAM words, each associated with a respective one of said match detecting means,  
 RAM word lines connected to respective ones of said RAM words,

control means connected to said RAM word lines,  
 said control means having an input to which said output signal of each of said match detecting means is applied,  
 said control means having means for, upon receiving an enabling signal, placing at a read enable potential one of said RAM word lines when said match detecting means associated with said one of said RAM word lines provides said output signal in said first state; and  
 means for supplying said enabling signal to said control means when said output signal of said match detecting means associated with said RAM word changes from said first state to said second state.

5,483,480

# METHOD OF USING ASSOCIATIVE MEMORIES AND AN ASSOCIATIVE MEMORY

Masato Yoneda, Tokyo, Japan, assignor to Kawasaki Steel Corporation, Hyogo, Japan

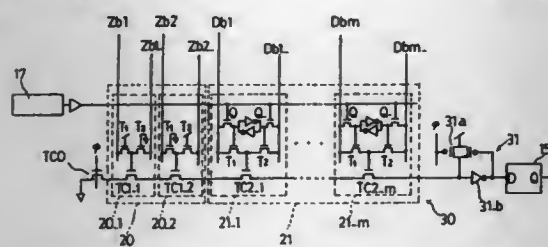
Filed Jul. 20, 1994, Ser. No. 277,769

Claims priority, application Japan, Jul. 22, 1993, 5-181447; Jan. 4, 1993, 5-248121; Jan. 25, 1993, 5-266482; Mar. 24, 1994, 6-054140

Int. Cl.<sup>6</sup> G11C 15/00

U.S. Cl. 365-49

6 Claims



1. An associative memory comprising:  
 a plurality of word memories for storing a plurality of storage data belonging to a plurality of data groups, respectively; and  
 a match detection circuit having a first mode that produces a match signal representative of a match on a match line associated with the predetermined word memory when a match is detected between storage data stored in a predetermined word memory and entered reference data, and a second mode that produces a match signal on a match line associated with the predetermined word memory when the match is detected in a predetermined word memory during a current retrieval and a match was detected in an arbitrary word memory storing storage data constituting a data group belonging to the storage data stored in the predetermined word memory during a previous retrieval.

## 5,483,481 AUTOMATIC WIRING DEVICE FOR DESIGN OF SEMICONDUCTOR INTEGRATED CIRCUIT

Kohji Hizume, Ami, and Takao Komatsuzaki, Tsukuba, both of, Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

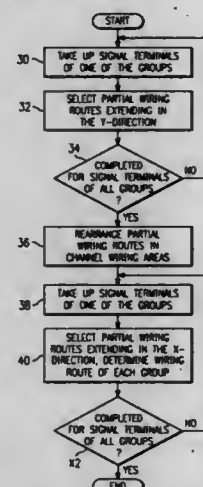
Filed Apr. 22, 1994, Ser. No. 231,217

Claims priority, application Japan, Apr. 23, 1993, 5-120529

Int. Cl.<sup>6</sup> G06F 15/60

U.S. Cl. 365-63

5 Claims



1. An automatic wiring device for a specified semiconductor integrated circuit having a chip area within which are multiple functional blocks, each having a signal terminal to be wired, comprising:

means for analyzing the circuit into multiple line blocks distributed at specified intervals in the Y-direction within the chip area and a single or multiple number of functional blocks disposed at specified intervals in the X-direction in each of the multiple line blocks, the wiring routes between the signal terminals of the functional block(s) being within a wiring area defined by the specified intervals in said X-direction which form channel wiring areas and intervals in the Y-direction;

means for identifying groups of functional blocks whose terminals are to be mutually connected;

means for determining by group the X-coordinate position of each partial wiring route extending in the Y-direction from a terminal in the group or for a terminal in the group through a wiring channel based on the coordinate position of each signal terminal and each coordinate position of each channel wiring area in each line block; and

linking means for determining by group, based on the positional relations of respective wiring routes extending along the Y-direction in respective interlinear wiring areas, a corresponding Y-coordinate position of each partial wiring route extending in the X-direction that links up two or more partial wiring routes of the group in a way that contributes to minimizing that group's total wiring distance.

5,483,482

## SEMICONDUCTOR MEMORY DEVICE HAVING BIDIRECTIONAL POTENTIAL BARRIER SWITCHING ELEMENT

Takashi Yamada, and Yohji Watanabe, both of Kawasaki, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 17, 1992, Ser. No. 854,816

Claims priority, application Japan, Mar. 18, 1991, 3-052729; Jul. 3, 1991, 3-163130

Int. Cl.<sup>6</sup> G11C 11/36

U.S. Cl. 365-175

9 Claims

1. A semiconductor memory device comprising:

5,483,484

## ELECTRICALLY ERASABLE PROGRAMMABLE READ-ONLY MEMORY WITH AN ARRAY OF ONE-TRANSISTOR MEMORY CELLS

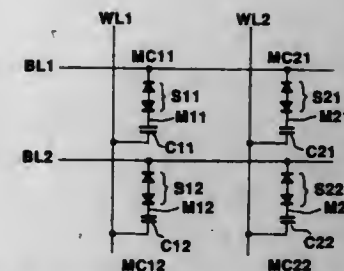
Tetsuo Endoh, Yokohama, and Riihiro Shirota, Kawasaki, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 780,933, Oct. 23, 1991, Pat. No. 5,355,332. This application May 18, 1994, Ser. No. 245,557  
 Claims priority, application Japan, Jan. 23, 1990, 2-283296  
 The portion of the term of this patent subsequent to Oct. 11, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> G11C 7/00; H01L 27/10

U.S. Cl. 365-185.18

36 Claims

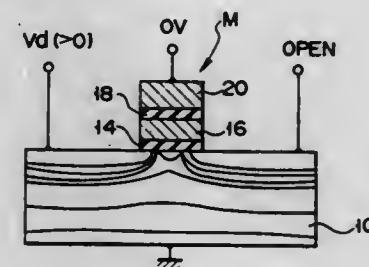


a plurality of memory cells disposed in a matrix arrangement, each memory cell including a capacitor and a switching element having a potential barrier and connected in series with the capacitor;

a plurality of word lines each connected to a first electrode of each of said plurality of memory cells in a direction of the matrix arrangement of the memory cells;

a plurality of bit lines each connected to a second electrode of said each of said plurality of memory cells in a direction in intersection with the word lines; and

control means for controlling an electrical potential of one of the plurality of word lines such that the potential is raised from a first potential to a second potential to provide one bit line of the plurality of bit lines in a floating state with a potential change corresponding to a voltage across the capacitor of an associated memory cell and a potential difference between the one bit line and a reference bit line is detected and amplified, and then the potential of the one word line is lowered to a third potential to perform a rewriting operation and thereafter returned to the first potential.



1. An electrically erasable and programmable transistor comprising:

a semiconductive substrate;  
 a source and a drain spaced apart to define a channel region therebetween in said substrate;  
 an insulated conductive layer at least partially overlying the channel region and being capacitively coupled with said substrate;  
 a control gate insulatively disposed above the conductive layer and spanning the channel region; and  
 means for maintaining a withstanding voltage between said drain and said source between a first voltage adapted to be applied to said drain during a read operation and a second voltage applied to said drain for forcing said conductive layer to discharge.

5,483,483

## READ-ONLY MEMORY DEVICE

Jung-dal Choi, Suwon, and Kang-deok Suh, Anyang, both of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

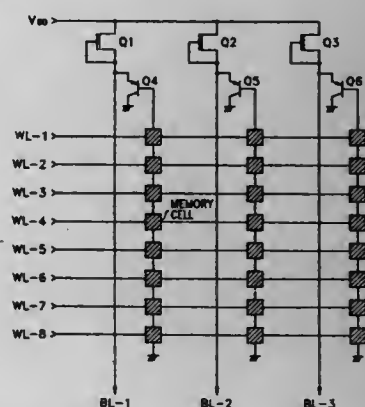
Filed Mar. 7, 1994, Ser. No. 206,824

Claims priority, application Rep. of Korea, Mar. 5, 1993, 93-3299

Int. Cl.<sup>6</sup> G11C 11/34

U.S. Cl. 365-177

13 Claims



1. A read-only memory device comprising:  
 a plurality of word lines;  
 a plurality of bit lines;  
 a plurality of current driving transistors each having an emitter, a collector and a base, the emitter of each said current driving transistor coupled to a respective different bit line, and the collector of each said current driving transistor coupled to ground; and  
 a plurality of NAND type strings, each string composed of string selecting transistors coupled to the base of a different one of said current driving transistors and ground.

5,483,485

## NONVOLATILE SEMICONDUCTOR SYSTEM WITH AUTOMATIC OVER ERASE PROTECTION

Akira Maruyama, Suwa, Japan, assignor to Seiko Epson Corporation, Japan

PCT No. PCT/JP93/00362, § 371 Date Nov. 18, 1993, § 102(e) Date Nov. 18, 1993, PCT Pub. No. WO93/19470, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 25, 1993, Ser. No. 150,051

Claims priority, application Japan, Mar. 25, 1992, 4-67012

Int. Cl.<sup>6</sup> G11C 7/00

U.S. Cl. 365-185.18

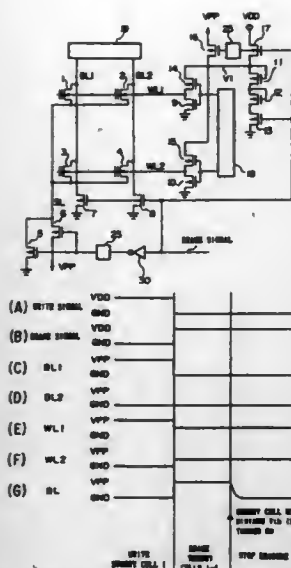
15 Claims

1. A nonvolatile semiconductor system comprising a memory transistor including a floating gate electrode, a control gate electrode and first and second diffusion layers, the memory transistor storing data by one of injecting electrons into said floating gate electrode and releasing electrons from said floating gate electrode, the nonvolatile semiconductor system comprising:

first voltage applying means for applying a first voltage to the control gate electrode of said memory transistor during an electron release;

second voltage applying means for applying a second voltage to the first diffusion layer of said memory transistor during said electron release, the second voltage being higher than the first voltage; and

third voltage applying means for applying a third voltage to the second diffusion layer of said memory transistor during said electron release, the third voltage being lower than the first voltage, wherein the memory transistor is placed in a conduct-

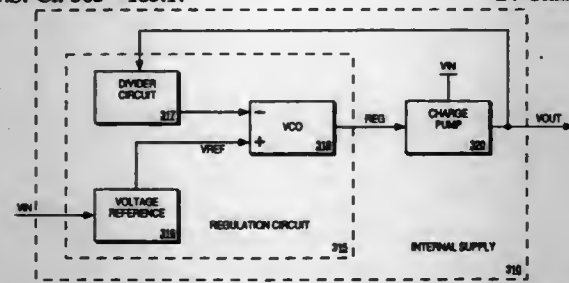


ing state to reduce the second voltage applied to the first diffusion layer to a low level so that said electron release in the memory transistor is stopped when a threshold voltage of the memory transistor becomes lower than a set level based on the first and third voltages applied to the control electrode and the second diffusion layer, respectively, of the memory transistor.

**5,483,486**  
**CHARGE PUMP CIRCUIT FOR PROVIDING MULTIPLE OUTPUT VOLTAGES FOR FLASH MEMORY**  
Jahanshir J. Javanifard, Sacramento, and Marc E. Landgraf, Folsom, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Oct. 19, 1994, Ser. No. 326,654  
Int. Cl.<sup>6</sup> G11C 11/34

U.S. Cl. 365—185.17



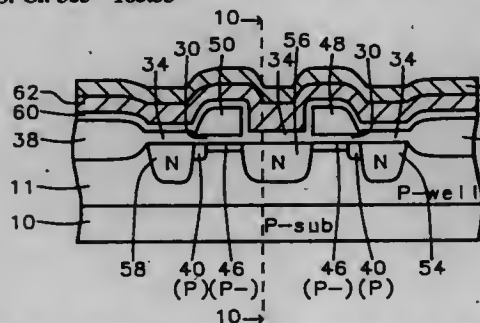
1. A circuit for generating one of a plurality of output voltages, comprising:

- a first conductor coupled to a first supply voltage;
- a second conductor coupled to a second supply voltage;
- a charge pump having an input and an output;
- a multiplexor having a first input, a second input, and an output coupled to the input of the charge pump, the multiplexor for coupling a selected one of the first and the second inputs of the multiplexor to the output of the multiplexor;
- a first regulation circuit coupled to the first input of the multiplexor and the output of the charge pump, the first regulation circuit for generating a first regulation voltage in response to the first supply voltage and the output of the charge pump such that the charge pump outputs a first output voltage when the first input of the multiplexor is coupled to the output of the multiplexor; and
- a second regulation circuit coupled to the second input of the multiplexor and the output of the charge pump, the second regulation circuit for generating a second regulation voltage in response to the second supply voltage and the output of the charge pump such that the charge pump outputs a second

output voltage when the second input of the multiplexor is coupled to the output of the multiplexor.

**5,483,487**  
**ELECTRICALLY PROGRAMMABLE MEMORY DEVICE WITH IMPROVED DUAL FLOATING GATES**  
Hsu Sung-Mu, I-Lan, Taiwan, Prov. of China, assignor to Taiwan Semiconductor Manufacturing Comp. Ltd., Hsin-Chu, Taiwan, Prov. of China  
Division of Ser. No. 270,737, Jul. 5, 1994, Pat. No. 5,440,158.  
This application Apr. 24, 1995, Ser. No. 428,765  
Int. Cl.<sup>6</sup> G11C 11/34; H01L 29/68  
U.S. Cl. 365—185.33

6 Claims



1. An improved erasable programmable read only memory device, having dual sidewall floating gates comprising:
  - a tunnel oxide layer on the surface of a monocrystalline silicon semiconductor substrate having a background impurity of a first conductivity type;
  - spaced field oxide regions on the substrate surface;
  - spaced apart dual floating gates on the substrate surface between the field oxide regions;
  - a first drain region, second drain region and central source regions spaced apart of a second conductivity type at the substrate surface, said first drain region and second drain region spaced apart by the dual floating gates structure and the central source region, the central source region located between the dual floating gates;
  - an insulating layer on the substrate surface, on the tunnel oxide layer over the source region and drain region, and on the dual floating gates;
  - a conductive layer on the second insulating layer thereby acting as the control gate;
  - and electrical contacts and metallurgy lines with appropriate passivation, and connecting the source and drain regions and gate elements to form an erasable programmable memory device.

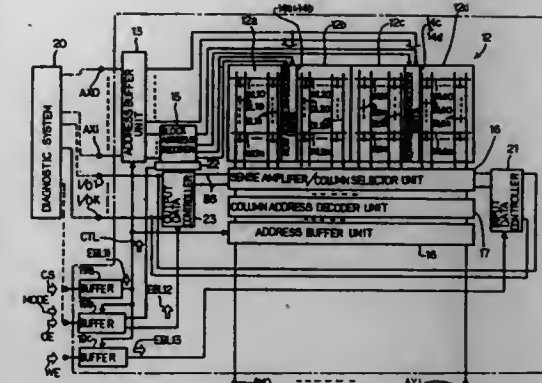
**5,483,488**  
**SEMICONDUCTOR STATIC RANDOM ACCESS MEMORY DEVICE CAPABLE OF SIMULTANEOUSLY CARRYING DISTURB TEST IN A PLURALITY OF MEMORY CELL BLOCKS**  
Kohji Sanada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 22, 1994, Ser. No. 310,335  
Claims priority, application Japan, Sep. 24, 1993, 5-261858  
Int. Cl.<sup>6</sup> G11C 11/418

U.S. Cl. 365—189.03

6 Claims

1. A semiconductor static random access memory device having a standard mode and a testing mode, comprising:
  - a memory cell array split into a plurality of memory cell sub-arrays each implemented by a plurality of addressable memory cells;
  - a plurality of sets of word lines respectively associated with said plurality of memory cell sub-arrays, the word lines of each set being selectively coupled to said addressable memory



cells of the associated memory cell sub-array for making selected memory cells accessible;

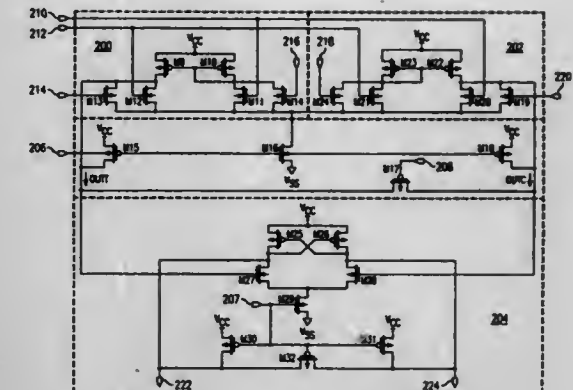
- c) a plurality of sets of digit line pairs respectively associated with said plurality of memory cell sub-arrays, the digit line pairs of each set being selectively coupled to said memory cells of the associated memory cell sub-array for propagating data bits in the form of potential difference from and to the selected memory cells;
- d) a plurality of row address decoder units respectively associated with said plurality of sets of word lines, and each responsive to a first enable signal for energizing one of the word lines of the associated set specified by external row address bits;
- e) a controlling means which inputs a standard external control signal in said standard mode and an external control signal in said testing mode, wherein said external control signal has a first voltage level outside of a voltage range of said standard external control signal and wherein said controlling means is responsive to said external control signal in said first voltage level for producing a second enable signal;
- f) a block address decoder unit coupled to said plurality of row address decoder units, responsive to external block address bits for supplying said first enable signal to one of said plurality of row address decoder units in said standard mode; and
- g) a multiple selecting circuit connected to said block address decoder unit and said controlling means, wherein said multiple selecting circuit inputs said second enable signal from said controlling means, and causes said block address decoder unit to supply said first enable signal to more than one row address decoder units for a disturb test in said testing mode when said multiple selecting circuit is enabled with said second enable signal.

**5,483,489**  
**MULTIPLEXING SENSE AMPLIFIER**  
David C. McClure, Carrollton, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.  
Division of Ser. No. 40,916, Mar. 31, 1993, Pat. No. 5,377,143.  
This application Sep. 16, 1994, Ser. No. 307,332  
Int. Cl.<sup>6</sup> G11C 7/00

U.S. Cl. 365—189.11

15 Claims

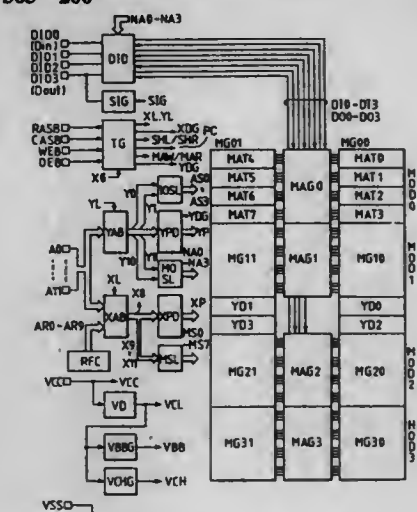
1. A memory system comprising:
  - a memory array having at least two pairs of data lines, first and second data lines corresponding to columns in the
  - at least two level shifter circuits, a first shifter circuit connected to the first data lines and a second level shifter circuit connected to the second data lines, wherein the at least two level shifter circuits produce output signals and may be enabled and disabled;
  - a selection signal for selectively enabling and disabling the at least two level shifter circuits, wherein one pair of data lines may be selected; and
  - an amplification circuit connect to the at least two level shifter circuits for amplifying the output signals from the at least two level shifter circuits.



**5,483,490**  
**SEMICONDUCTOR INTEGRATED DEVICE AND WIRING CORRECTION ARRANGEMENT THEREFOR**  
Hidetoshi Iwai, Ohme; Masamichi Ishihara; Kazuya Ito, both of Hamura; Wataru Arakawa, Ohme, and Yoshinobu Nakagome, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Continuation of Ser. No. 820,489, Jan. 14, 1992, Pat. No. 5,289,416. This application Dec. 1, 1993, Ser. No. 159,619  
Claims priority, application Japan, Jan. 14, 1991, 3-014746  
Int. Cl.<sup>6</sup> G11C 13/00

U.S. Cl. 365—200

13 Claims



1. A method of saving a defective semiconductor memory having a plurality of bit lines, a redundant bit line and a plurality of MOSFETs coupled to said plurality of bit lines and said redundant bit line, respectively, comprising the steps of:

- (a) forming a voltage supply line, on a semiconductor substrate, which is capable of providing said plurality of bit lines and a redundant bit line with a voltage through said plurality of MOSFETs, respectively;
- (b) testing said defective semiconductor memory to locate a defective bit line in said plurality of bit lines;
- (c) selecting said redundant bit line instead of said defective bit line; and
- (d) cutting said voltage supply line at a predetermined place so that said voltage supply line is incapable of providing said defective bit line with said voltage through the corresponding MOSFET.



5,483,491

## MEMORY CARD DEVICE

Shimpei Yoshioka; Kazuo Konishi; Koji Maruyama, all of Yokohama, and Toshiaki Sato, Fukaya, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan  
PCT No. PCT/JP92/01565, § 371 Date Apr. 8, 1994, § 102(e) Date Apr. 8, 1994, PCT Pub. No. WO/9311491, PCT Pub. Date Jun. 10, 1993

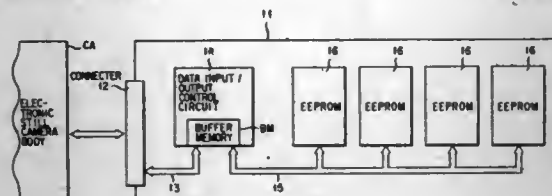
PCT Filed Nov. 30, 1992, Ser. No. 211,635

Claims priority, application Japan, Nov. 30, 1991, 3-317169

Int. Cl.<sup>6</sup> G11C 11/40

U.S. Cl. 365—200

8 Claims



## 1. A memory card apparatus comprising:

an EEPROM having a data area and a save area, the data area and the save area including a plurality of blocks, each block having a fixed capacity;

save means for:

when one of the blocks of the data area is detected as a defective block,

searching for a vacant block in the save area and writing data, which was to be written to the defective block, to the vacant block in the save area, and

when all of the blocks of the save area are occupied and one of the blocks of the data area is detected as a defective block, searching for a vacant block in the data area and writing data, which was to be written to the defective block, to the vacant block in the data area; and

control means for, when one of the blocks of the data area is used for saving the data that was to be written to the defective block, detecting when a vacant block is generated in the save area, and for transferring the data of the block of the data area that was used for saving the data that was to be written to the defective block to the detected vacant block in the save area.

5,483,492

## METHOD AND APPARATUS FOR CHECKING POST-ERASURE CONTENTS OF AN ERASABLE PERMANENT MEMORY

Olivier Rouy, Rousset, France, assignor to SGS-Thomson Microelectronics S.A., Saint-Genis, France  
PCT No. PCT/FR92/00951, § 371 Date Jun. 11, 1993, § 102(e) Date Jun. 11, 1993, PCT Pub. No. WO93/07621, PCT Pub. Date Apr. 15, 1993

PCT Filed Oct. 9, 1992, Ser. No. 75,543

Claims priority, application France, Jan. 11, 1991, 91 12538

Int. Cl.<sup>6</sup> G11C 29/00

U.S. Cl. 365—201

8 Claims

1. A method of checking post-erasure contents of an erasable permanent memory, the memory being especially of EPROM type and comprising an instruction register and an address register, the method being executed as part of an erasure sequence and comprising the steps of:

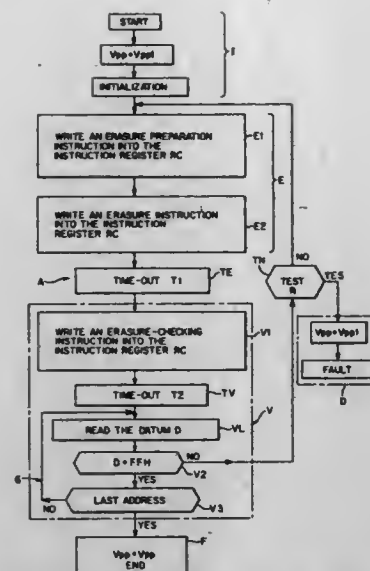
writing an erasure-checking instruction word into said instruction register once during the erasure sequence,

wherein the step of writing the erasure-checking instruction word once initiates a timing-out for a predetermined duration and the following checking sequence, occurring after said timing-out;

opening of the address register;

presentation of a first address to the address register;

iteratively reading and testing the contents of the permanent memory at the presented address; and



one of incrementing the address until the entire memory has been checked and executing a new erasure sequence; and one of closing of the address register when the entire memory has been checked and exiting the erasure sequence when a predetermined number of erasure sequences has been performed.

5,483,493

## MULTI-BIT TEST CIRCUIT OF SEMICONDUCTOR MEMORY DEVICE

Choong-Sun Shin, Incheon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

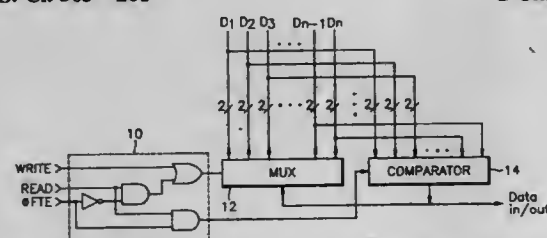
Filed Nov. 17, 1994, Ser. No. 343,948

Claims priority, application Rep. of Korea, Nov. 17, 1993, 24485/1993

Int. Cl.<sup>6</sup> G11C 7/00

U.S. Cl. 365—201

2 Claims



## 1. A multi-bit test circuit of a semiconductor memory device comprising:

a multiplexer for outputting data having the same logic level to a plurality of data buses at the same time;

a first comparator for determining as to whether said data inputted from said data buses has the same logic level;

a test controller for complementarily activating said multiplexer and said first comparator with combining a test enable signal and read/write signals;

a plurality of data input/output lines commonly connected to one of said data buses through a writing path and a reading path;

a second comparator for receiving logic levels of said data input/output lines; and

a data input/output controller for connecting one of said writing path and said reading path of said data input/output lines to said data buses in a first operation mode, and for transmitting an output of said second comparator to said data buses in a second mode of operation.

5,483,494

## NONVOLATILE SEMICONDUCTOR MEMORY DEVICE HAVING A REDUCED DELAY IN READING DATA AFTER CHANGING FROM STANDBY TO AN OPERATION MODE

Tadayuki Taura, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

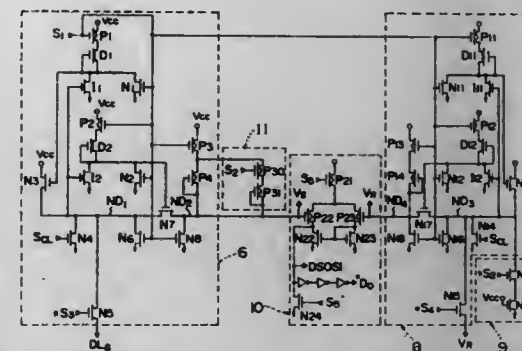
Filed Apr. 7, 1994, Ser. No. 225,182

Claims priority, application Japan, Apr. 7, 1993, 5-080651

Int. Cl.<sup>6</sup> G11C 16/06

U.S. Cl. 365—185.21

10 Claims



## 1. A nonvolatile memory device capable of reading data when a standby mode changes to an operation mode, comprising:

a memory cell array having a matrix of memory cells comprising transistors;

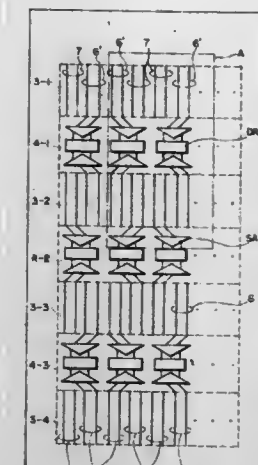
a dummy cell comprising a transistor;

read potential generation means for supplying a predetermined potential to a selected memory cell and for generating a read potential corresponding to data stored in said selected memory cell on the basis of a current flowing in said selected memory cell;

reference potential generation means for supplying a predetermined potential to said dummy cell and for generating a reference potential on the basis of a current flowing in said dummy cell;

reference potential decrease means for decreasing said reference potential for a first predetermined time period after said memory device changes from said standby mode to said operation mode, said reference potential decrease means causing said reference potential to decrease with respect to said read potential so that said read potential is greater than said reference potential; and

an amplifier coupled to said read potential generation means and to said reference potential generation means, said amplifier comparing said read potential and said reference potential after a second predetermined time period after said memory device changes from the standby mode to the operation mode, wherein said amplifier outputs a signal derived from said comparison.



cell array plate and a plurality of second sense amplifiers for said digit line pairs of said second memory cell array plate, said second memory cell array plate further including a plurality of dummy digit line pairs, each of said dummy digit line pairs being isolated from any sense amplifiers.

5,483,496

## NONVOLATILE MEMORY DEVICE HAVING A TIMER CIRCUIT

Kazuhiko Murakawa, Tokyo, Japan, assignor to Seiko Instruments Inc., Tokyo, Japan

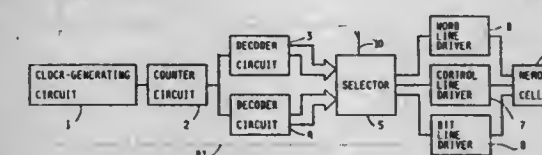
Filed Apr. 18, 1994, Ser. No. 228,968

Claims priority, application Japan, Apr. 28, 1993, 5-102946

Int. Cl.<sup>6</sup> G11C 8/00

U.S. Cl. 365—233

5 Claims



1. A nonvolatile memory device having electrically erasable nonvolatile memory cells, and a timer circuit for producing normal program timing pulses for executing a program to the electrically erasable nonvolatile memory cells, wherein the timer circuit provides a shortened program timing pulse for the electrically erasable nonvolatile memory cells in response to an external-interrupting signal provided to the timer circuit during interruption of the program, a cycle of the shortened program timing pulse being shorter than that of the normal program timing pulses during normal execution of the program so that the program is ended after discharging electric charges in the electrically erasable nonvolatile memory cells by the shortened program timing pulse.

5,483,495

## SEMICONDUCTOR MEMORY DEVICE HAVING DUMMY DIGIT LINES

Takeshi Fukuda, Kanagawa, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 3, 1994, Ser. No. 285,291

Claims priority, application Japan, Aug. 3, 1993, 5-191542

Int. Cl.<sup>6</sup> G11C 7/02

U.S. Cl. 365—210

7 Claims

1. A semiconductor memory device comprising first and second memory cell array plates and an auxiliary circuit portion disposed between said first and second memory cell array plates, said first memory cell array plate including a first number of digit line pairs and said second memory cell array plate including a second number of digit line pairs, said first number being larger than said second number, said auxiliary circuit portion including a plurality of first sense amplifiers for said digit line pairs of said first memory

5,483,497

## SEMICONDUCTOR MEMORY HAVING A PLURALITY OF BANKS USABLE IN A PLURALITY OF BANK CONFIGURATIONS

Hirohiko Mochizuki; Yoshihiro Takemae; Yukinori Kodama; Makoto Yanagisawa, and Katsumi Shigenobu, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 19, 1994, Ser. No. 277,486

Claims priority, application Japan, Aug. 24, 1993, 5-208117

Int. Cl.<sup>6</sup> G11C 7/00

U.S. Cl. 365—230.03

16 Claims

## 1. A semiconductor memory comprising:

a plurality of banks, each of said banks having a plurality of memory cells, and a specific memory cell of a specific bank











a signal adder for receiving the inner, outer, and center readback signals from the signal conditioner and subtracting the inner and outer readback signals from the center readback signal to generate an output signal; and  
an equalizer for receiving the output signal from the signal adder and equalizing the output signal to generate the data signal.

5,483,516

## OPTICAL HEAD AND LENS ACTUATOR

Masaru Ishii, Kamakura, and Akihiro Kasahara, Kawasaki, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 35,247, Mar. 22, 1993, abandoned.

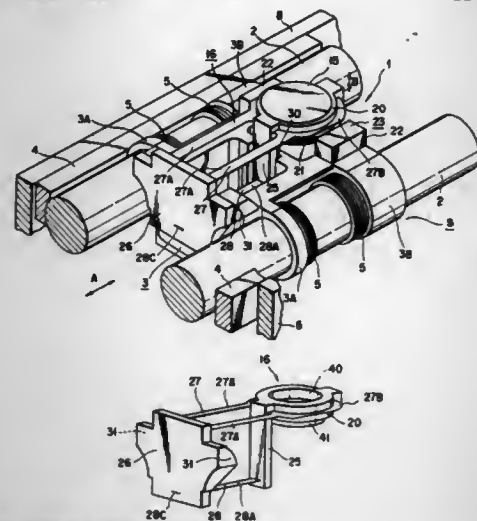
This application Oct. 20, 1994, Ser. No. 326,747

Claims priority, application Japan, Apr. 20, 1992, 4-099809

Int. Cl.<sup>6</sup> G11B 17/00

U.S. Cl. 369-247

11 Claims



## 1. An optical head comprising:

an objective lens for converging a light beam on an optical disk;  
a movable-side support member, molded out of resin, for holding the objective lens;  
carriage means for carrying the objective lens held by the movable-side support member, said carriage means being movable along a surface of the optical disk;  
a stationary-side support member molded out of resin and fixed to the carriage means, with a certain distance maintained with reference to the movable-side support member;  
first support means for movably supporting the movable-side support member in a direction of an optical axis of the objective lens, said first support means comprising first and second elastic plates each of which has two ends, one of the two ends being embedded in the stationary-side support member, and the other end being embedded in the movable-side support member, such that the first and second elastic plates are located in parallel to each other along a direction perpendicular to the optical axis of the objective lens in a first plane perpendicular to the optical axis of the objective lens; and  
second support means, comprising a third elastic plate having two ends, for supporting the movable-side support member in cooperation with the first and second elastic plates of the first support means and the third elastic plate of the second support means such that the movable-side support member is movable relative to the carriage means in the direction of the optical axis of the objective lens, one of the two ends of the third elastic plate being embedded in the stationary-side support member, and the other end of the two ends of the third elastic plate being embedded in the movable-side support member, such that the third elastic plate is located in a second plane different from the first plane and perpendicular to the optical axis of the objective lens, and between the first and second elastic plates of the first means in the direction of the optical axis of the objective lens, is maintained parallel to the first

and second elastic plates of the first support means along the direction perpendicular to the optical axis of the objective lens, and is prevented from overlapping with each other in the optical axis direction of the objective lens.

5,483,517

## MULTIPLEX TRANSMISSION APPARATUS

Yasuhiko Kurata, Higashihiroshima, and Yuichi Akiyama, Kure, both of, Japan, assignors to Mazda Motor Corporation and Naldec Corporation, Hiroshima, Japan

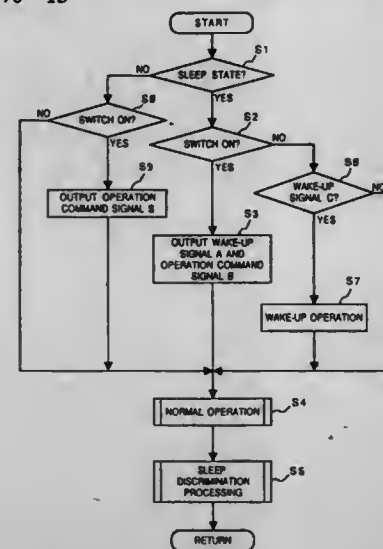
Filed Jul. 18, 1994, Ser. No. 274,724

Claims priority, application Japan, Jul. 19, 1993, 5-177964

Int. Cl.<sup>6</sup> H04J 3/14; H04L 12/40

U.S. Cl. 370-13

8 Claims



1. A multiplex transmission apparatus which comprises a plurality of communication nodes connected to each other via a multiplex transmission path, and a plurality of electrical components to be controlled by the plurality of communication nodes, each of the plurality of communication nodes being set in one of an operative state, an inoperative state, and an operable state, comprising:  
means for detecting in a communication node whether the plurality of communication nodes including said communication node are in the inoperative state;  
instructing means, connected to said communication node, for instructing an operation of the electrical components;  
means for discriminating one of a presence and an absence of an instruction sent from said instructing means to the plurality of communication nodes to which the electrical components are connected;  
means for, when said plurality of communication nodes and the communication node are detected to be in the inoperative state and the presence of the instruction is discriminated, generating a first signal for setting said plurality of communication nodes including said communication node in the operable state, a generation timing of said first signal being delayed from the time when said instruction is issued;  
means for monitoring an elapse of a predetermined period of time which is started at the generation timing of the first signal; and  
means for generating a second signal for operating the electrical components which are connected to said plurality of communication nodes, after the elapse of the predetermined period of time is detected and the communication nodes are set in the operable state.

5,483,518

## ADDRESSABLE SHADOW PORT AND PROTOCOL FOR SERIAL BUS NETWORKS

Lee D. Whetsel, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

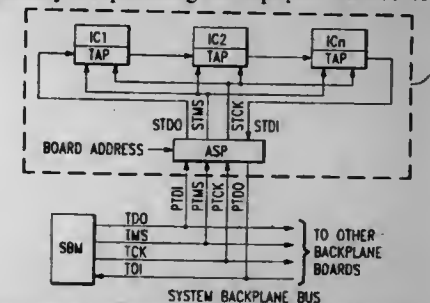
Continuation of Ser. No. 322,112, Oct. 12, 1994, abandoned, which is a continuation of Ser. No. 900,708, Jun. 17, 1992, abandoned. This application Apr. 24, 1995, Ser. No. 427,947

Int. Cl.<sup>6</sup> G01R 31/28

U.S. Cl. 370-13

8 Claims

1. Circuitry for providing an improved method of operating a



serial test bus in a system environment, comprising:

a system backplane having a serial test bus and slots for one or more boards;

a plurality of boards installed in said system backplane, each one of said boards having a local serial test bus coupled to a plurality of integrated circuits, and each one of said boards having an addressable shadow port coupled to said local serial test bus and to said system backplane serial test bus, and each one of said addressable shadow ports on said boards being assigned a unique address on said system backplane; and  
a serial bus master coupled to said system backplane serial test bus, operable to communicate with a selected one of said plurality of boards by addressing via said system backplane serial test bus the addressable shadow port on said selected one of said plurality of boards using a shadow protocol, and further operable to deselect said selected one of said plurality of boards using said shadow protocol, and further operable to select and communicate with another one of said plurality of boards using said shadow protocol, said shadow protocol operable such that any number of such selections and deselections may be made without resetting said system backplane serial bus and the addressable shadow ports on said plurality of boards.

5,483,519

## METHOD AND APPARATUS FOR LINE SWITCHING

Shigeki Satomi, Tokyo; Mitsunobu Nagao, Yokohama, and Naoki Ono, Kawasaki, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 17, 1994, Ser. No. 243,902

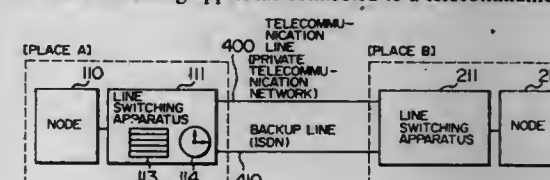
Claims priority, application Japan, May 20, 1993, 5-118137

Int. Cl.<sup>6</sup> H04L 1/22

U.S. Cl. 370-16

5 Claims

1. A line switching apparatus connected to a telecommunication



line and a backup line to monitor the state of said telecommunication line so as to switch from said telecommunication line to said backup line upon occurrence of a fault on said telecommunication line, said line switching apparatus comprising memory means for storing data indicating a service time zone representing a service time of said telecommunication line, and control means for controlling the monitoring operation so as to start to monitor said

telecommunication line as soon as the starting time of said service time zone is reached and to end any monitoring of said telecommunication line as soon as the ending time of said service time zone is reached.

5,483,520

## METHOD OF BROADCASTING DATA BY MEANS OF A DATA TRAIN

Yves Eychenne, Limours, and Michel Simatic, Evry, both of, France, assignors to Cegelec, Levallois Perret, France

Filed Oct. 20, 1994, Ser. No. 326,202

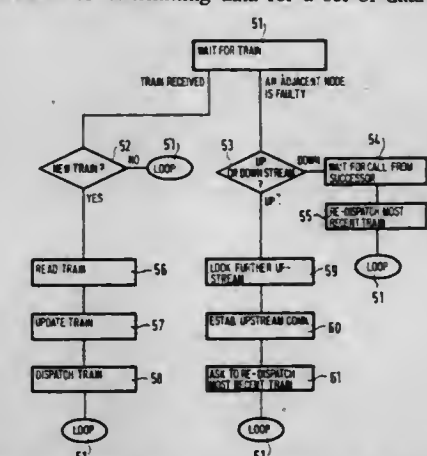
Claims priority, application France, Jan. 22, 1993, 93 12660

Int. Cl.<sup>6</sup> H04L 12/437

U.S. Cl. 370-16.1

2 Claims

1. A method of transmitting data for a set of data processing



nodes that are interconnected by a communications network and for the purpose of broadcasting data from each node to the other nodes by causing a train of such data to travel over the network around a looped circuit or ring that passes through said data processing nodes in succession in such a manner that each node in turn recovers, removes, and writes data in the train, each node having a predecessor and a successor on the ring and being capable of detecting a faulty state of its successor or of its predecessor;  
wherein prior to writing new data to be broadcast in the train, each node begins by performing the steps of:  
storing in an internal memory of the node the data of the train that the node has just received, including the value of a train header counter,  
incrementing the value of this counter in the node's internal memory, and  
dispatching the train back over the network containing new data to be broadcast and with an incremented value in the header counter; and  
wherein when a node detects that its predecessor on the ring is in a faulty state, the node performs the steps of:  
undertaking a procedure of searching for a new predecessor on the ring,  
establishing a new ring for the train,  
receiving a train from its new predecessor, and  
before proceeding to store in the node's internal memory the data of the train that it has just received from its new predecessor:  
comparing the value of the counter in the header of the received train with the value of the same counter as stored in the node's internal memory,  
dispatching over the network the train containing said new data if the value of the counter in the header of the received train is greater than the value of the counter as stored in the node's internal memory, and  
waiting to receive another data train if the value of the counter in the header of the received train is not greater than the value of the counter as stored in the node's internal memory.





5,483,526

# RESYNCHRONIZATION METHOD AND APPARATUS FOR LOCAL MEMORY BUFFERS MANAGEMENT FOR AN ATM ADAPTER IMPLEMENTING CREDIT BASED FLOW CONTROL

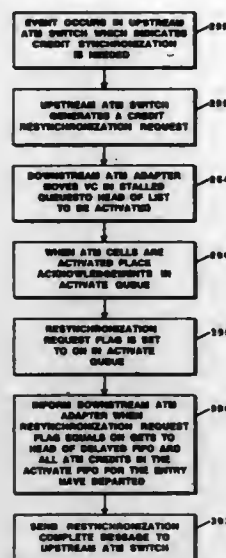
Michael Ben-Nun, Jerusalem, Israel, and Kadangode K. Ramakrishnan, Maynard, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jul. 20, 1994, Ser. No. 277,823

Int. Cl.<sup>6</sup> H04L 12/56

U.S. Cl. 370—60.1

27 Claims



1. An asynchronous transfer mode (ATM) network device comprising:

- a receiver portion, said receiver portion capable of receiving a plurality of ATM cells on one of a plurality of virtual circuits (VCs) from an upstream ATM switch, the plurality of ATM cells resulting from a disassembly of a plurality of packets in the upstream ATM switch;
- a local memory, said local memory used to store the plurality of ATM cells;
- means for managing said local memory using a plurality of queues;
- means for assembling ATM cells into a plurality of packets in the local memory;
- means for transmitting said plurality of packets to a host memory;
- means for resynchronizing a plurality of ATM credits, each of said ATM credits representing an available buffer in the local memory to receive an ATM cell; and
- a transmitter portion, said transmitter portion having a means for indicating said transmitting of said packets to said host memory to said upstream ATM switch.

5,483,527

# TERMINAL ADAPTER FOR INTERFACING AN ATM NETWORK WITH A STM NETWORK

Bharat T. Doshi, Holmdel; N. Farber, Freehold; P. Harshavardhana; Rajiv Kapoor, both of Marlboro; Arik Kashper, Holmdel; Steven S. Katz, Ocean, and Kathleen S. Meier-Hellstern, Cranbury, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

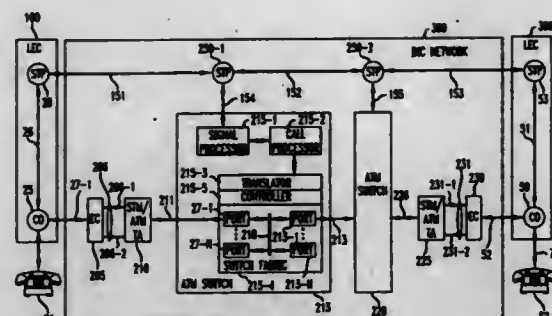
Filed Dec. 21, 1994, Ser. No. 360,896

Int. Cl.<sup>6</sup> H04L 12/66

U.S. Cl. 370—60.1

6 Claims

1. A method of processing voice signals received from a STM switch via a trunk for presentation to an ATM switch of an ATM network, said voice signals being associated with a particular call, said trunk having a predetermined identity, said method comprising the steps of



accumulating said voice signals as they are received from said STM switch to form a payload of an ATM data cell, said payload comprising a predetermined number of said voice signals, responsive to accumulating said predetermined number of voice signals and forming said payload, translating said trunk identity into a predetermined virtual channel identifier and forming a cell header comprising at least said virtual channel identifier, and supplying said cell header and said payload as said data cell to an input port of said ATM switch.

5,483,528

# TDM DIGITAL MATRIX INTERCOM SYSTEM

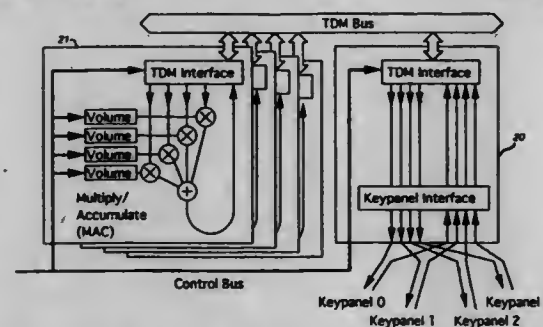
Steven G. Christensen, Minneapolis, Minn., assignor to Telex Communications, Inc., Minneapolis, Minn.

Filed Oct. 11, 1994, Ser. No. 321,428

Int. Cl.<sup>6</sup> H04J 3/02; H04M 9/02; 9/08

U.S. Cl. 370—62

14 Claims



1. An intercom system comprising:
  - a plurality of intercom stations, at least some of which include:
    - an audio input transducer which generates an audio input communications signal, and at least some of which include an audio output transducer which generates an audio output from an audio output communications signal;
    - an analog-to-digital converter for creating digital audio input signals representative of the audio input communications signals received by the intercom stations;
    - a digital switching system receiving audio input communications signals from at least some of the stations and sending audio output communications signals to at least some of the stations, the digital switching system including a time division multiplexing system ("TDM") for broadcasting on a TDM bus multiple digital communications signals including such digital audio input signals, the TDM system including one or more interfaces connecting the intercom stations with the TDM bus; and
    - a signal mixer capable of receiving from the TDM bus selected ones of the digital audio input signals, and creating and broadcasting on the TDM bus a custom mixed digital audio output communications signal which is a loudness weighted mix of such selected digital audio input signals with at least one of such selected signals optionally being given a larger weight corresponding to a louder volume than others of the selected signals;

whereby the custom mixed digital audio output signal may be routed to a selected one of the intercom stations as an audio output communications signal and converted by the audio output transducer to audio output.

5,483,529

# RECEIVER

Constant P. M. J. Baggen, and Arie G. C. Koppelaar, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

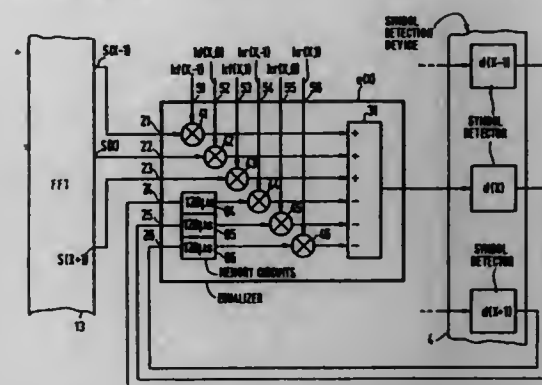
Filed Feb. 3, 1994, Ser. No. 190,978

Claims priority, application European Pat. Off., Feb. 8, 1993, 93200346

Int. Cl.<sup>6</sup> H04B 1/74

U.S. Cl. 370—70

9 Claims



9. Data recovery device for recovering data in a plurality of N data signals, where N is an integer, said data recovery device having input means for receiving said N data signals, and output means for supplying recovered data for further signal processing devices, said data recovery device having a multiplex data recovery signal path between said input means and said output means for carrying a multiplex signal having N signal component each component representing one of said N data signals, said data recovery device comprising an equalization device coupled to said input means, followed by a symbol detection device serially arranged in the multiplex signal path and coupled to said output means, characterized in that the equalization device comprises:
  - means for supplying groups of M signal components corresponding to M data signals of said N data signals, M being an integer substantially smaller than N; and
  - combining means coupled to said supplying means for combining each respective one of the N data signals with one of said groups of M signal components from said supplying means, the M signal components in each of said groups being frequency adjacent to the respective one of said N data signals, said equalization device supplying the combined signal components to the symbol detection device, such as to recover the data.

5,483,530

# SYSTEM AND METHOD FOR COMMUNICATING WITH DIGITAL AND ANALOG DEVICES VIA A SINGLE DIGITAL INTERFACE

Gordon T. Davis; Charles B. Dillon, and Laurence V. Marks, all of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

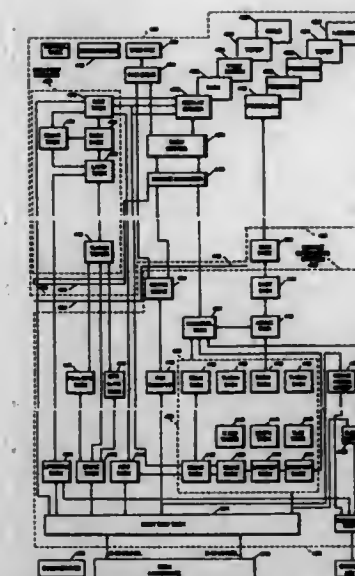
Filed Dec. 16, 1993, Ser. No. 166,996

Int. Cl.<sup>6</sup> H04J 3/02

U.S. Cl. 370—79

4 Claims

1. A system for providing information telecommunication services between a computing device and a selected one of plurality of diversely equipped analog and digital devices remotely linked to said computing device through parts of a public switched network,



said computing device being required to be able to process information contained in signals transferred to said computing device via said network, said system comprising:

- a single digital channel for carrying signals between said computing device and said network; said digital channel carrying digitized log PCM signals representing diverse types of information when said remote device is an analog device in nature, said digital channel carrying various other digitally formatted signals when said remote device is a digital device in nature said log PCM signals being incompatible in form with information signal processing requirements of said computing device, and therefore the information content of said signals is not directly processable by said computing device while said signals are in said log PCM forms, wherein said digital channel is connected to said network via a data link; and
  - digital signal processing means for coupling said computing device with said digital channel for exchanging signals in diverse signal forms compatible with requirements of said remote devices, and for exchanging signals with said computing device in forms directly compatible with information processing requirements of said computing device but incompatible with signalling requirements of said remote devices, and for converting said signals in transit between said computing device and said digital channel into forms respectively compatible with said signalling requirements of said devices and said computing device,
- wherein said computing device comprises, a system manager configured to provide a high level interface to said digital signal processor means, a port manager configured to support all call control functions performed by said digital signal processor means, and a plurality of drivers, coupled to said port manager and said system manager, for activating tasks in said digital signal processing means to dynamically support telecommunication with said remote devices.

5,483,531

# DIGITAL MOBILE RADIO NETWORK STATION WITH SPEECH SIGNAL EXCHANGE MEANS AND DATA SIGNAL EXCHANGE MEANS

Christophe Jouin; Francis Pinault, both of Bois Colombes, and Richard Grebot, Paris, all of France, assignors to Alcatel Radiotelephone, Paris, France

Filed Mar. 30, 1994, Ser. No. 220,022

Claims priority, application France, Mar. 31, 1993, 93 03765

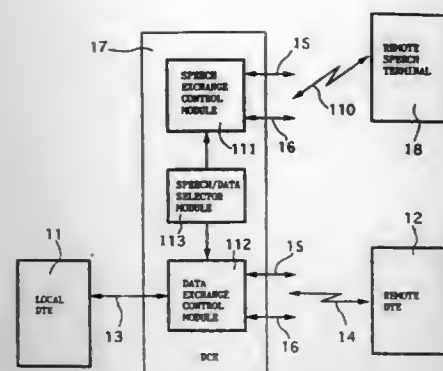
Int. Cl.<sup>6</sup> H04J 3/12; H04L 12/26; H04B 1/38

U.S. Cl. 370—79

12 Claims

1. Mobile station of a digital mobile radio network for exchanging speech signals and data signals comprising:





connection means to a first data processing terminal equipment for bidirectional exchange of data according to a first data exchange standard using a single transfer channel carrying data and commands simultaneously,

first means for sending data to and receiving data from a second data processing terminal equipment via said mobile radio network according to a second data exchange standard using a data transfer channel and command transfer channel,

second means for sending speech signals to and receiving speech signals from a remote terminal via said mobile radio network according to a third data exchange standard, and

means for monitoring a bidirectional call between said mobile station and remote station;

wherein said monitoring means comprises:

means for selection either said first or said second sending and receiving means according to whether said call carries data or a speech signal, and

interface means for converting data signals between said first and second data exchange standards;

wherein said interface, in the direction from the first standard towards the second standard, comprises:

means for separating data and commands delivered by said first terminal equipment,

first transcoding means for transcoding said data delivered by said separating means from said first standard to said second standard and delivering data to be transmitted on said data transfer channel,

first sorting means for sorting said commands into two sets of commands, a first set of commands to be transmitted to said second terminal equipment and a second set of commands to be executed by said mobile station,

means for interpreting commands of said second set of commands and delivering a second set of interpreted commands, and

first means for mapping commands of said first set of commands and delivering commands to be transmitted on said command transfer channel;

wherein said interface means, in the direction from the second standard towards the first standard, comprises:

second means for sorting command received on said command transfer channel and delivering a third set of commands to be transmitted to said first terminal equipment and a fourth set of commands to be executed by said mobile station,

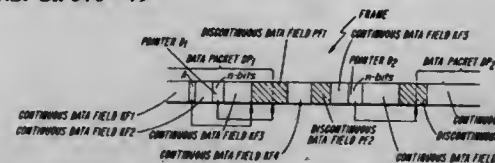
second means for mapping commands of said third set of commands and delivering commands to be transmitted to said first terminal equipment,

second means for transcoding data received on said data transfer channel from said second standard to said first standard and delivering data to be transmitted to said first terminal equipment, and

means for grouping said commands and said data to be transmitted to said first terminal equipment in order to transmit them over said single transfer channel; and

wherein said interface means further comprises means for supervising said call from said second set of interpreted commands and a full set of commands and handling initialization, monitoring of said call.

5,483,532  
**METHOD OF PACKETING CONTINUOUS DATA INFORMATION AND PACKET DATA IN FRAMES**  
 Karl Ö. Eriksson, Askim, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden  
 Continuation of Ser. No. 907,613, Jul. 2, 1992, abandoned.  
 This application May 2, 1994, Ser. No. 236,146  
 Claims priority, application Sweden, Jul. 4, 1991, 9102086  
 Int. Cl.<sup>6</sup> H04J 3/16  
 U.S. Cl. 370-79 8 Claims



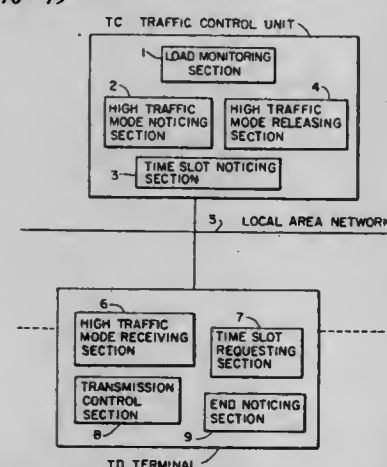
1. A method of packeting data into frames from sources of continuous data information together with information packets from sources of packet information, comprising the steps of:

providing first fields for said continuous data information in predetermined positions in each frame,

providing second fields for said information packets in predetermined positions in each frame, and

providing pointer fields in each frame, each pointer field contains information either as to where an information packet ends in one of said second fields for said information packets or as to where an information packet begins in one of said second fields for said information packets, wherein dimensions of the pointers are determined by the number of bits of packet data for each quantization and the smallest number of bits of a packet and pause between packets, respectively.

5,483,533  
**TRAFFIC CONTROL SYSTEM OF LOCAL AREA NETWORK**  
 Hiroaki Kuba, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan  
 Filed Jul. 25, 1994, Ser. No. 279,799  
 Claims priority, application Japan, Jul. 23, 1993, 5-183110; Jun. 21, 1994, 6-138840  
 Int. Cl.<sup>6</sup> H04L 12/26; 12/413  
 U.S. Cl. 370-79 9 Claims



1. (Amended) A traffic control system for a local area network (LAN) in which a plurality of terminals are connected to a traffic control unit for allocating a time slot to each of the plurality of terminals in response to a data transmission request from each terminal and for monitoring a LAN load,

wherein said traffic control unit includes a load monitoring section, a high traffic mode noticing section, a time slot noticing section and a high traffic mode releasing section, wherein said each terminal includes a high traffic mode receiving section, a transmission control section, a time slot requesting section and an end noticing section,

wherein said load monitoring section monitors a traffic state of said LAN, detecting the number of terminals requesting data transmission as operating terminals of said plurality of terminals connected to said LAN, counting a data amount on said LAN per unit time, and calculating a LAN load factor based on a transmission rate of said LAN and the counted data amount, and noticing a traffic state to said high traffic mode noticing section and to said high traffic mode releasing section,

wherein said high traffic mode noticing section, in response to notice from said load monitoring section that the LAN load has become heavy, issues to all said plurality of terminals connected to said LAN a notice indicating that a time slot allocating request should be issued only for the first data transmission after a high traffic mode has set,

wherein said time slot noticing section, having a time slot management table in which time slot managing information is stored, receives a time slot allocating request from one terminal and notices allocation of a time slot to said one terminal based on an operating state of other terminals,

wherein said high traffic mode releasing section, in response to notice from said load monitoring section that the LAN load has become light, releases the high traffic mode to discard the time slot management table, sets a normal mode, and notices the setting of the normal mode to said plurality of terminals, wherein said high traffic mode receiving section receives from said high traffic mode noticing section a notice that the high traffic mode is set, and from said high traffic mode releasing section the notice that the high traffic mode is released to set the normal mode,

wherein said time slot requesting section issues a time slot allocating request to said time slot noticing section of said traffic control unit via said transmission control section only when data transmission is first to be performed after the high traffic mode has been set, after calculating transmission timing,

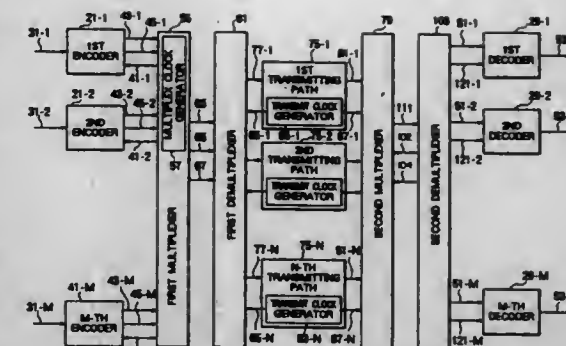
wherein said transmission control section has a same time slot management table in which time slot managing information is stored as that of said time slot noticing section, performs data transmission when the normal mode is set, determines whether or not the time slot allocating request is already issued when the high traffic mode is set, calculates the transmission timing of the time slot allocating request from the time slot management table when the time slot allocating request is not yet issued, to cause said time slot requesting section to issue the time slot allocating request, calculates the transmission timing based on time slot managing information and a time slot allocated by said traffic control unit stored in the time slot management table, and performs data transmission in synchronism with the calculated transmission timing after suspension of the data transmission, and

wherein said end noticing section issues a notice indicating that the transmission is ended at a requesting terminal, to said load monitoring section at the time when the data transmission is completed in said transmission control section and excludes the requesting terminal from the operating terminal on said LAN.

5,483,534  
**TRANSMITTING SYSTEM HAVING TRANSMITTING PATHS WITH LOW TRANSMITTING RATES**  
 Junichi Ohki, and Toshio Koga, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan  
 Filed May 28, 1993, Ser. No. 68,171  
 Claims priority, application Japan, May 29, 1992, 4-138932  
 Int. Cl.<sup>6</sup> H04N 7/12  
 U.S. Cl. 370-84 7 Claims

1. A transmitting system for use in combination with first through M-th encoders and decoders, where M represents an integer greater than two, said transmitting system comprising:

a first multiplexer for receiving first through M-th encoded digital video signals from said first through said M-th encod-



ers, respectively, to produce a primary multiplex signal comprising a plurality of cells which have channel codes, address codes, and cell data, respectively, each of said cell data representing a part of one of said first through said M-th encoded digital video signals, each of said channel codes indicating one of said first through said M-th encoded digital video signals, each of said address codes indicating a position of one of said cell data in each of said first through said M-th encoded digital video signals;

a first demultiplexer connected to said first multiplexer for demultiplexing said primary multiplex signal to produce first through N-th primary demultiplex signals each of which represents one of said cells, where N represents an integer greater than M;

first through N-th transmitting paths connected to said first demultiplexer for transmitting said first through said N-th primary demultiplex signals, respectively;

a second multiplexer connected to said first through said N-th transmitting paths for multiplexing said first through said N-th primary demultiplex signals to produce a secondary multiplex signal; and

a second demultiplexer connected to said second multiplexer for demultiplexing said secondary multiplex signal in response to said channel codes and said address codes to produce said first through said M-th encoded digital video signals and supply all of said first through said M-th encoded digital video signals at the same time instant to said first through said M-th decoders, respectively.

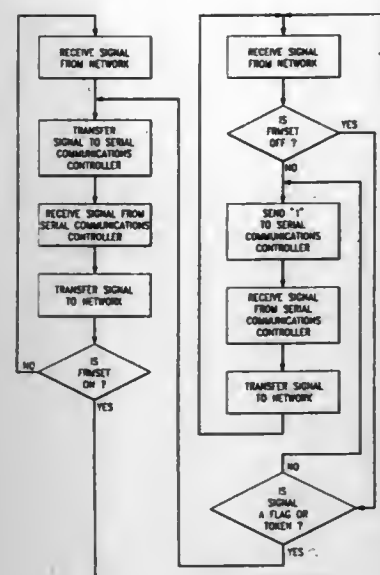
5,483,535  
**COMMUNICATIONS NETWORK INTERFACE, AND ADAPTER AND METHOD THEREFOR**  
 Keith A. McMillen, Berkeley; David Simon, Palo Alto, and Matthew Wright, Berkeley, all of Calif., assignors to Zeta Music Partners, Oakland, Calif.  
 Filed Jan. 17, 1995, Ser. No. 374,148  
 Int. Cl.<sup>6</sup> H04L 5/22  
 U.S. Cl. 370-85.1 8 Claims

1. A communications network interface adapter, comprising:

means, adapted to be connected to a communications network and to a serial communications controller at a node of the communications network, for transferring network data to the serial communications controller during a receive mode of operation; and

means, adapted to be connected to the communications network and to the serial communications controller at the node of the communications network, for sending predetermined signals instead of network data to the serial communications controller during a transmit mode of operation.





5,483,536

## RING NETWORK CONCENTRATOR

Yoshinori Gunji, Moriguchi; tetsuya Wada, Suita; Rieko Nakajima, Koube; Hiroshi Doi, Kyoto, and Taku Matsuda, Nara, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

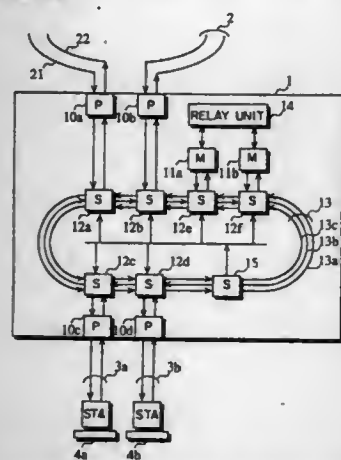
Filed Jun. 21, 1994, Ser. No. 263,135

Claims priority, application Japan, Jun. 22, 1993, 5-150298

Int. Cl.<sup>6</sup> H04L 12/42; 12/46

U.S. Cl. 370—85.14

31 Claims



1. A ring network concentrator to which a plurality of ring networks are connected so as to form a network system of the ring networks, the ring network concentrator comprising:

- a plurality of internal paths for transferring packets within the ring network concentrator;
  - a plurality of ports, disposed in connecting lines between the ring networks and the internal paths, for receiving packets from the ring networks and transmitting packets to the ring networks;
  - a transfer packet monitoring means for monitoring each packet transferred via each internal path;
  - a plurality of switch means, each for changing its connection pattern between the ring networks and the internal paths depending on the monitoring result of the transfer packet monitoring means,
- wherein a connection pattern for a switch describes which internal paths are connected to which ports, so that each connection pattern determines to which internal path a packet sent from one of the ring networks is sent.

5,483,537

## METHOD FOR ALLOCATING A TIMESLOT WITHIN A FRAME TO A MOBILE ENTERING A COMMUNICATIONS CELL AND BASE TRANSCEIVER STATION IMPLEMENTING THIS METHOD

Pierre Dupuy, Paris, France, assignor to Alcatel Radiotelephone, Paris, France

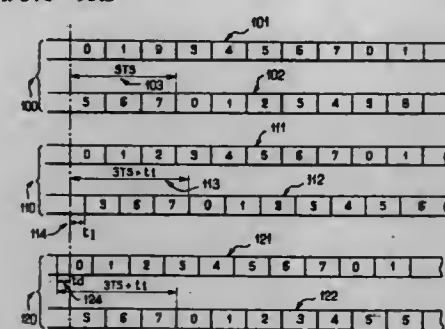
Filed Mar. 2, 1994, Ser. No. 204,440

Claims priority, application France, Mar. 3, 1993, 93 02472

Int. Cl.<sup>6</sup> H04B 7/212

U.S. Cl. 370—95.3

32 Claims



1. A method for enabling a base transceiver station to manage a set of concentric circular cells surrounding a basic cell so as to enable each mobile, of a plurality of mobiles, which enters one of said cells, to communicate with said base transceiver station, said method comprising: using a first downlink frame temporal structure, from said base transceiver station to said mobiles, and a first uplink frame temporal structure from said mobiles to said base transceiver station; and, for each cell, offsetting said first uplink frame temporal structure relative to said first downlink frame temporal structure by a time-delay equal to the sum of (1) a basic offset time period between a basic downlink frame temporal structure and a basic uplink frame temporal structure of said basic cell, and (2) another offset time period dependent on the radial rank of said each cell within said set of concentric cells.

5,483,538

## AUDIO FRAME SYNCHRONIZATION FOR EMBEDDED AUDIO DEMULTIPLEXERS

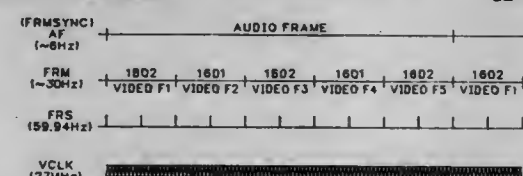
Joe L. Rainbolt, Rough & Ready, Calif., assignor to The Grass Valley Group, Inc., Nevada City, Calif.

Filed May 25, 1994, Ser. No. 248,795

Int. Cl.<sup>6</sup> H04J 3/06; H04N 7/08

U.S. Cl. 370—100.1

12 Claims



1. A method of audio frame synchronization for embedded audio demultiplexers comprising the steps of: counting the number of audio samples in each video frame of a digital video signal; detecting a pattern determined by the number of audio samples per video frame of the digital video signal within an audio frame; and generating a boundary signal for the audio frame when the pattern determined by the number of audio samples in each video frame is detected.

5,483,539

## PROGRAMMABLE PCM/TDM DEMULTIPLEXER

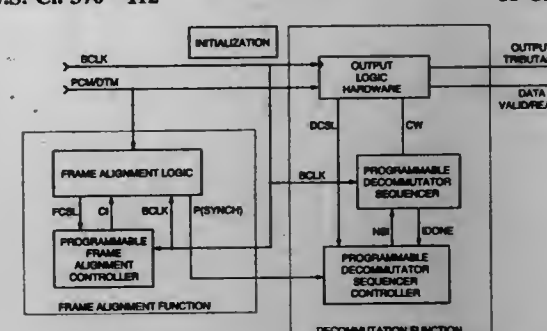
John Kaufmann, Palo Alto, Calif., assignor to Loral Aerospace Corp., New York, N.Y.

Continuation-in-part of Ser. No. 955,493, Oct. 2, 1992, abandoned, which is a continuation of Ser. No. 612,285, Nov. 7, 1990, abandoned. This application Jan. 7, 1994, Ser. No. 179,757

Int. Cl.<sup>6</sup> H04J 3/07

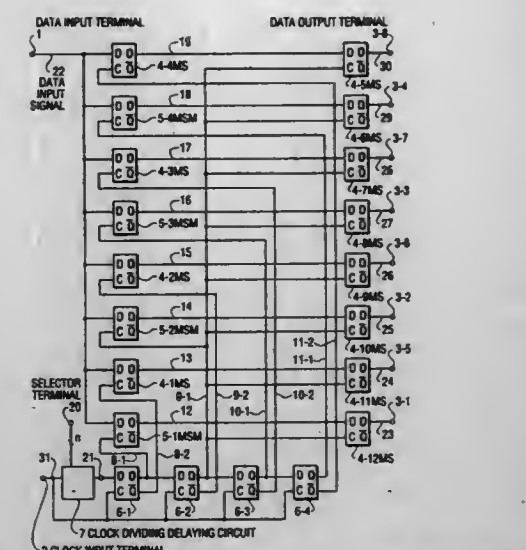
U.S. Cl. 370—112

11 Claims



1. Apparatus for demultiplexing a PCM/TDM input data signal containing frame alignment signals that are used to achieve frame synchronization, said apparatus comprising:

- frame alignment logic means for receiving said PCM/TDM input data signal, a bit clock signal having a predetermined bit clock rate derived from said input data signal, and a current instruction signal, for detecting said frame alignment signals, for generating a frame synchronization signal in response to the detection of a boundary of a frame in said input data signal, and for generating a frame alignment status signal;
  - a programmable frame alignment controller for receiving said bit clock signal and said frame alignment status signal, for generating said current instruction signal, and for controlling said frame alignment logic means;
  - output logic means for receiving said bit clock signal, said input data signal, and sequences of control words for decommutating sequences of bit formats that repeat within said frame, and for generating an output tributary signal, a data valid signal indicating that an output tributary signal has been generated, and a dejustification status signal indicative of a dejustification state of the output logic means;
  - a programmable sequencer for receiving said bit clock signal, and a next sequence instruction signal, for generating said sequences of control words that decommutate the sequences of bit formats that repeat within said frame, and for generating an instruction done signal; and
  - a programmable sequencer controller for receiving said frame synchronization signal, said dejustification status signal, and said instruction done signal, and for generating said next sequence instruction signal to cause said programmable sequencer to generate said sequences of control words;
- and wherein said output logic means and said programmable sequencer are caused to operate at the bit clock rate of said bit clock signal, and wherein said programmable sequencer controller is caused to operate at a fraction of said bit clock rate.



the basic clock signal, demultiplexes the received multiplexed signal into individual bits and outputs  $2^N$  bits in parallel from  $2^N$  output terminals, said demultiplexer comprising:

- a dividing delaying circuit for dividing the basic clock signal into a divided clock signal of a  $1/2^N$  frequency, delaying the divided clock signal within a range of one period of the divided clock signal in response to an instruction signal to obtain an internal clock signal and outputting the internal clock signal;
- a shift register including  $2^N/2$  first master-slave D-type flipflops connected in cascade connection for passing the internal clock signal through said  $2^N/2$  first master-slave D-type flipflops in synchronism with the basic clock signal to shift the internal clock signal in said shift register and outputting driving clock signals at first and second logic output terminals of said  $2^N/2$  first master-slave D-type flipflops;
- $2^N/2$  second master-slave D-type flipflops each for receiving the multiplexed signal at a signal input terminal thereof and receiving, at a clock input terminal thereof, the driving clock signal from the first logic output terminal of a corresponding one of said  $2^N/2$  first master-slave D-type flipflops of said shift register;
- $2^N/2$  master-slave-master D-type flipflops having a master-slave D-type flipflop and a current switch circuit, said current switch circuit connected to the master-slave D-type flipflop for receiving the multiplexed signal at a signal input terminal thereof and receiving, at a clock input terminal thereof, the driving clock signal from the second logic output terminal of a corresponding one of said first master-slave D-type flipflops of said shift register; and
- $2^N$  third master-slave D-type flipflops for individually receiving the outputs of said second master-slave D-type flipflops and the outputs of said master-slave-master D-type flipflops and outputting the inputted outputs as outputs demultiplexed to  $1:2^N$  to said output terminals of said demultiplexer.

5,483,541

## PERMUTED INTERLEAVER

Stuart T. Linsky, San Pedro, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Sep. 13, 1993, Ser. No. 120,715

Int. Cl.<sup>6</sup> G06F 11/00

U.S. Cl. 371—2.1

19 Claims

10. A method of interleaving data bits, said method comprising the steps of:

- providing an interleaver including an array of rows of shift registers arranged in a configuration that is a permuted arrangement of an array of rows of shift registers of a convolutional interleaver; and

5,483,540

## DEMUTIPLEXER FOR DEMULTIPLEXING SERIAL MULTIPLEXED SIGNAL INTO BITS

Toshiyuki Okamura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 21, 1994, Ser. No. 345,466

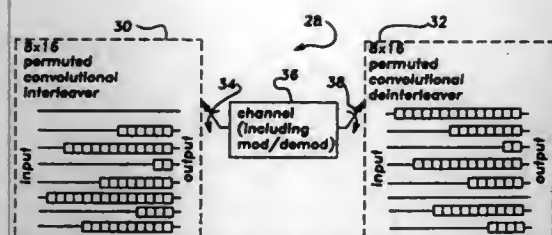
Claims priority, application Japan, Nov. 22, 1993, 5-292154

Int. Cl.<sup>6</sup> H04J 3/04

U.S. Cl. 370—112

3 Claims

1. A demultiplexer which receives a basic clock signal and a multiplexed signal having one frame including  $2^N$  multiplexed bits which are serially sent to said demultiplexer in synchronism with



selectively accepting output data bits from the rows of shift registers in a sequential manner and applying the output bits to a communication channel such that the output bits from the shift registers are arranged in a permuted sequence.

5,483,542

## BYTE ERROR RATE TEST ARRANGEMENT

Khanh C. Nguyen, Whitehall Township, Lehigh County, Pa., assignor to AT&T Corp., Murray Hill, N.J.

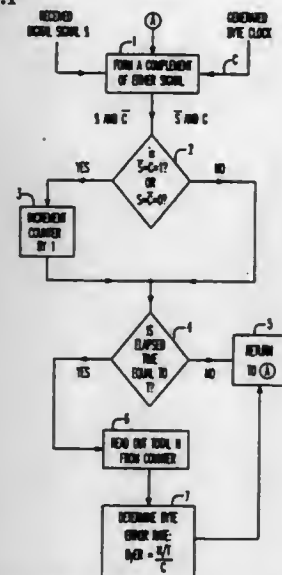
Filed Jan. 28, 1993, Ser. No. 10,098

The portion of the term of this patent subsequent to Feb. 22, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> G06F 11/00

U.S. Cl. 371-5.1

12 Claims



1. An arrangement for detecting a byte error rate in a received digital signal S, the arrangement comprising:  
means for generating a byte clock signal C at a predetermined frequency;  
inverting means for forming a complement of either one of the received digital signal S and byte clock signal C ( $\bar{S}$  or  $\bar{C}$ );  
means for comparing the complement signal ( $\bar{S}$  or  $\bar{C}$ ) to the other signal (C or S) and providing an error signal E as an output when both said complement signal and said other signal comprise the same logic value; and  
counting means coupled to the output of the comparing means for incrementing at each occurrence of said error signal E and for providing as an output, after a predetermined period of time T, a total number N of occurrences, where the byte error rate is defined as

$$\frac{N}{T} \cdot \frac{1}{C}$$

5,483,543

## TEST SEQUENCE GENERATION METHOD

Toshinori Hosokawa, Daito; Akira Motohara, Kobe, and Mitsuyasu Ohta, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

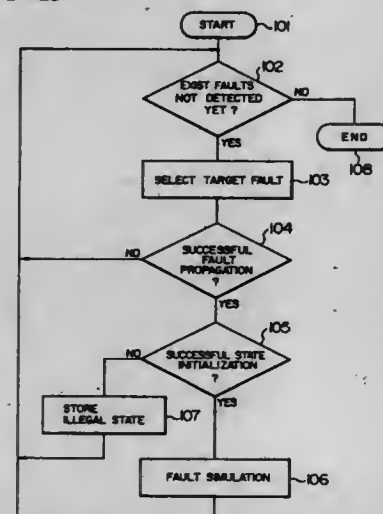
Filed Sep. 23, 1992, Ser. No. 948,353

Claims priority, application Japan, Sep. 30, 1991, 3-250883

Int. Cl.<sup>6</sup> G06F 11/27; 11/273

U.S. Cl. 371-23

11 Claims



6. A test sequence generation method for determining a test sequence for a stuck-at-fault in a sequential circuit, said method comprising:

- generating a first test pattern signal for justifying said sequential circuit to a desired state to allow testing of said stuck-at-fault of said sequential circuit and supplying said first test pattern signal to said sequential circuit;
- determining whether said first test pattern signal is unsuccessful in justifying said sequential circuit to said desired state;
- storing said first test pattern signal as illegal state data if said first test pattern signal is determined to be unsuccessful in said step (b);
- generating a second test pattern signal for justifying said sequential circuit to said desired state to allow testing of one of said stuck-at-fault and another stuck-at-fault of said sequential circuit such that said second test pattern does not coincide with any stored illegal state data;
- determining whether said second test pattern signal is unsuccessful in justifying said sequential circuit to said desired state; and
- storing said second test pattern signal as illegal state data if said second test pattern signal is determined to be unsuccessful in said step (e).

5,483,544

## VECTOR-SPECIFIC TESTABILITY CIRCUITRY

Robert D. Shur, Los Altos, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Feb. 5, 1991, Ser. No. 652,167

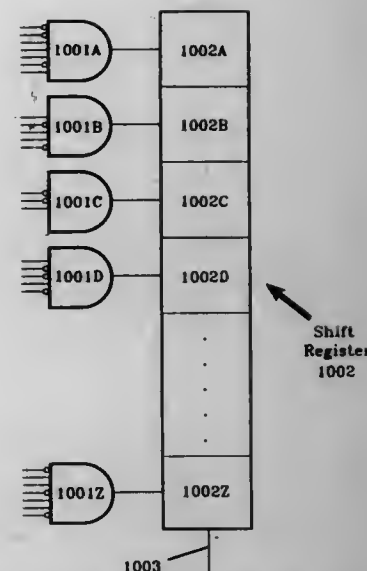
Int. Cl.<sup>6</sup> G06F 11/00

U.S. Cl. 371-27

14 Claims

10. An integrated circuit having an improved level of fault coverage by an associated fault test, said integrated circuit comprising:

- a first circuit, having a first set of test points, that, in response to application of a first test vector applied during said fault test, produces node states on a plurality of nodes of this first circuit;
- a vector-specific test circuit having a plurality of inputs, each of which is connected to an associated node of said circuit on which, upon execution of a first test vector during said fault test, a node state is produced that would be unobservable if



said vector-specific test circuit were not included, said vector-specific test circuit producing a binary indication of whether said otherwise unobservable node states all assume expected node state values.

5,483,545

## METHOD OF AUTOMATICALLY REQUESTING RETRANSMISSION IN A DUPLEX DIGITAL TRANSMISSION SYSTEM HAVING AT LEAST ONE NOISY RETURN CHANNEL, AND AN INSTALLATION FOR IMPLEMENTING THE METHOD

Marc Darmon, Paris; Marc Pontif, Villennes Sur Seine, and Philippe Sadot, Paris, all of France, assignors to Alcatel Transmission Par Faisceaux Hertzians A.T.F.H., Evallols Perret Cedex, France

Continuation of Ser. No. 607,336, Oct. 30, 1990, abandoned.

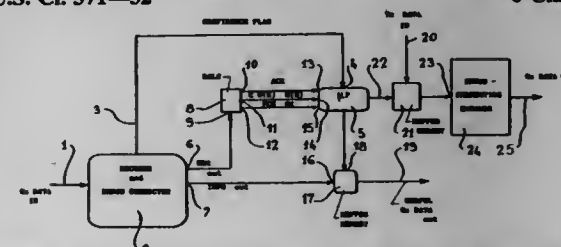
This application Sep. 18, 1992, Ser. No. 946,795

Claims priority, application France, Nov. 28, 1989, 89 15631

Int. Cl.<sup>6</sup> H04L 1/16

U.S. Cl. 371-32

6 Claims



5. A duplex digital transmission installation for automatically requesting retransmission of a badly received message, said duplex digital transmission installation being for one of a plurality of parties and having at least one return channel, said duplex digital transmission installation comprising:

- a decoding circuit for detecting or correcting errors in a received signal, said decoding circuit outputting a decoding reliability flag signal, a decoded command block, and an information block containing the useful bits of decoded information;
- an HDLC component receiving the decoded command block and outputting an acknowledgement signal and repeat request information;
- a microprocessor for controlling the retransmission of data based on the decoding reliability flag, the acknowledgement signal and the repeat request information, wherein said microprocessor operates according to a go-back-N ARQ type protocol modified in that: when a particular acknowledgement is not received correctly, after a preceding acknowledgement that was received correctly, then the incorrectly received particular

acknowledgement is always assumed to be positive after an of the following (N-1) acknowledgements are correctly received, with any acknowledgements immediately following said particular acknowledgement also always being assumed to be positive if they too are received incorrectly as long as any of the (N-1) acknowledgements immediately following said particular acknowledgement are correctly received, but if an Nth consecutive acknowledgement is incorrectly received, said particular acknowledgement is assumed to be negative and the N blocks relating to this series of N incorrectly received acknowledgements are then repeated;

- a first buffer memory for storing the information blocks and from which a useful received data train is extracted under the control of said microprocessor; and
- a second buffer memory which stores a data train for transmitting under the control of said microprocessor.

5,483,546

## SENSOR SYSTEM FOR REMOTE SPECTROSCOPY

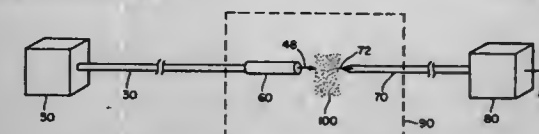
Bernadette Johnson, Hollis, N.H., and John J. Zaykowski, Pepperell, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 206,124, Mar. 4, 1994, Pat. No. 5,394,413, which is a continuation-in-part of Ser. No. 193,781, Feb. 8, 1994, abandoned. This application May 11, 1994, Ser. No. 240,982

Int. Cl.<sup>6</sup> H01S 3/11

U.S. Cl. 372-10

22 Claims



1. A system for sensing characteristics of a material at a site comprising:

- an optically pumped laser at the site for emitting laser light of a first frequency;
- a frequency converter coupled to the laser for converting the laser light emitted by the laser to light of a second frequency in the UV range such that the site is illuminated with light of the second frequency to produce a return radiation characteristic of the material;
- a pump source remote from the laser for pumping the laser with radiation of a third frequency;
- an optical fiber for coupling the radiation of the third frequency to the laser; and
- a sensor for sensing the return radiation at the site.

5,483,547

## SEMICONDUCTOR LASER STRUCTURE FOR IMPROVED STABILITY OF THE THRESHOLD CURRENT WITH RESPECT TO CHANGES IN THE AMBIENT TEMPERATURE

David M. Adams, Gloucester; Toshihiko Makino, and George K. D. Chik, both of Nepean, all of Canada, assignors to Northern Telecom Limited, Quebec, Canada

Filed May 10, 1994, Ser. No. 242,653

Int. Cl.<sup>6</sup> H01L 31/0304; 33/00; H01S 3/19

U.S. Cl. 372-45

8 Claims

1. A semiconductor lasing device having an active region comprising a first heterojunction structure with a nested bandgap alignment and a second heterojunction structure having a virtual, staggered bandgap alignment, said second heterojunction structure comprising:

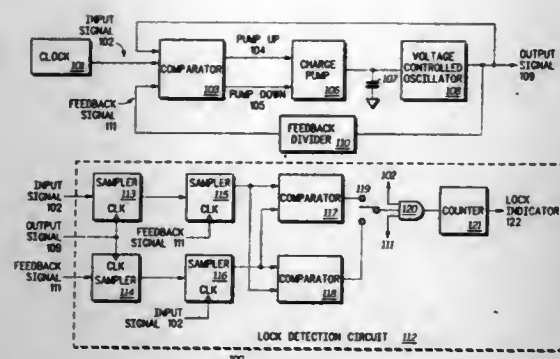
- first, second and third regions of semiconductor material with said second region said first and third regions;
- the material of said first region having a conduction energy level valence band with an energy level  $V_1$  defining therebetween a first bandgap  $E_1$ ;











- sampling the sampled input signal at a rate of the feedback signal to produce a second sampled input signal;
- sampling the sampled feedback signal at a rate of the input signal to produce a second sampled feedback signal;
- comparing the second sampled feedback signal with the second sampled input signal; and
- when the second sampled feedback signal substantially matches the second sampled input signal, indicating that at least phase lock or frequency lock is obtained.

5,483,559

### PHASE-LOCKED LOOP DEVICE, OSCILLATOR, AND SIGNAL PROCESSOR

Hiromitsu Yamashita, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

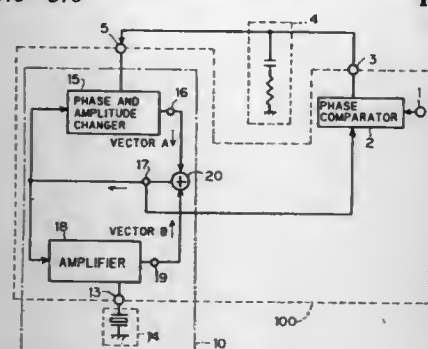
Filed Sep. 20, 1994, Ser. No. 309,984

Claims priority, application Japan, Jan. 13, 1993, 5-255699; Mar. 28, 1994, 6-057357

Int. Cl.<sup>6</sup> H03D 3/24

U.S. Cl. 375—376

10 Claims



- A phase-locked loop device comprising:
  - a phase comparator which receives an external input signal and an internal control signal and outputs a phase comparison signal representing a phase difference between said external input signal and said internal control signal;
  - an oscillator which receives said phase comparison signal and outputs said internal control signal, said oscillator including:
    - a phase and amplitude changer which receives said phase comparison signal and changes the amplitude of said internal control signal in accordance therewith, and which receives said internal control signal and changes the phase thereof in accordance therewith, and which outputs a phase and amplitude change signal;
    - an amplifier which receives said internal control signal and outputs a phase change signal in accordance with a frequency of said internal control signal; and
    - a synthesizer which receives said phase and amplitude change signal output from said phase and amplitude changer and said phase change signal output from said amplifier and outputs said internal control signal to said phase and amplitude changer, said amplifier, and said phase comparator.

5,483,560

### METHOD AND APPARATUS FOR TESTING, REPAIRING OR EXCHANGING THE NOZZLES PASSING THROUGH THE BOTTOM OF A REACTOR PRESSURE VESSEL

Franz Pötz, Heppenheim, and Jakob Russ, Römerberg, both of, Germany, assignors to ABB Reaktor GmbH, Mannheim, Germany

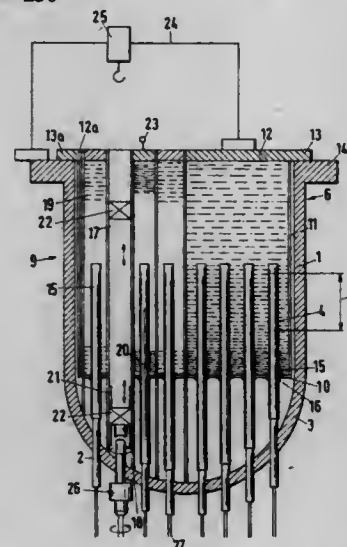
Filed Jan. 19, 1994, Ser. No. 183,520

Claims priority, application Germany, Jan. 28, 1993, 43 02 330.4

Int. Cl.<sup>6</sup> G21C 17/00

U.S. Cl. 376—250

7 Claims



- In a method for testing, repairing or exchanging nozzles penetrating a bottom of a reactor pressure vessel, wherein a reactor core and other core internals have been removed from the reactor pressure vessel, and wherein each nozzle serves for the introduction of a respective probe of an in-core instrumentation of a water-cooled nuclear reactor, the improvement which comprises:
  - inserting at least one shielding container into the reactor pressure vessel;
  - introducing all of the probes of the in-core instrumentation into a shielding region of the at least one shielding container;
  - withdrawing at least one of the probes assigned to one of the nozzles to be tested or worked on, from the reactor pressure vessel;
  - exposing a shaft extending through the shielding container and being assigned to at least one of the nozzles;
  - introducing testing devices or tools through the shaft;
  - carrying out at least one of testing and working operations;
  - withdrawing the testing devices or tools from the shaft;
  - shielding the shaft;
  - introducing the probe into the shielding region of the shielding container; and
  - repeating steps c to j for further nozzles.

5,483,561

### REACTOR CORE INSPECTION PROBE

Richard Bystrak, P.O. Box 207, Montrose, N.Y. 10548

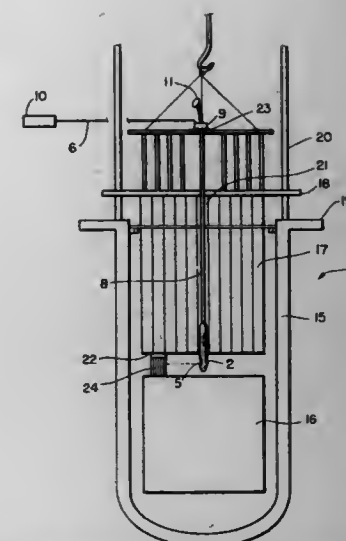
Filed Sep. 22, 1994, Ser. No. 310,880

Int. Cl.<sup>6</sup> G21C 17/00

U.S. Cl. 376—258

7 Claims

- A method for inspecting a pressure vessel of a reactor to indicate entanglement of a reactor internal package with an article comprising:
  - providing an inspection apparatus comprising an inspection means sized for insertion into the internals package, and having a radially oriented opening at a distal end thereof, detection means located within the inspection means adjacent the radial opening, means for lowering the inspection means into the reactor pressure vessel to a position where the open-



- ing is below a lowermost surface of the internals package, rotating means for rotating the inspection means in a complete circle while inserted within the internals package, such that the detection means translate in a full circle below the internals package to detect any entangled articles, the rotating means having indicating means for indicating the position of the radial opening of the inspection means during rotation; partially raising the internals package; inserting the inspection means into the internals package, such that the radial opening is positioned below the lowermost portion of the internals package; rotating the inspection tube in a full circle while observing the detection means; and, using the detection means to sense whether any article has become entangled during lifting of the internals package from the reactor, the indicating means indicating the location of any detected entanglement.

5,483,562

### DEVICE FOR VOLUME DELIMITATION DURING WORK WITH CONTAMINATED PARTS

Anna Kornfeldt, Lars-Åke Körnvik, and Lars Törnblom, all of Västerås, Sweden, assignors to Asea Brown Boveri AB, Västerås, Sweden

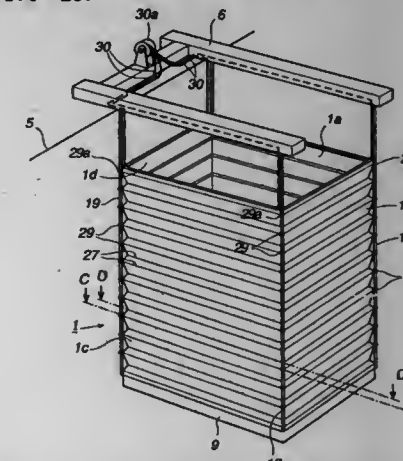
Filed Mar. 28, 1994, Ser. No. 218,648

Claims priority, application Sweden, Apr. 13, 1993, 9301218

Int. Cl.<sup>6</sup> G21F 5/00

U.S. Cl. 376—287

21 Claims



- A device for volume delimitation when working with radioactively contaminated parts within the device, such as a control rod for a nuclear power plant for preventing contamination of a total volume of liquid medium surrounding the device and forming a

pool, such as a nuclear reactor pool, said device comprising a transportable tank with a substantially horizontal bottom part and with substantial vertical side walls and an open top, means within the tank connectable with cleaning equipment for the cleaning of liquid medium delimited within the tank, wherein at least the side walls are foldable and are comprised of a material of synthetic fibers of a strength resistant to puncture, the material comprising polyethylene.

5,483,563

### CLEANING PROCESS FOR ENHANCING THE BOND INTEGRITY OF MULTI-LAYERED ZIRCONIUM AND ZIRCONIUM ALLOY TUBING

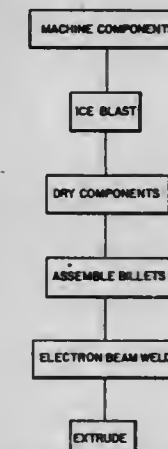
Brett J. Herb, Salem, Oreg., assignor to Teledyne Industries, Inc., Albany, Oreg.

Filed Mar. 29, 1994, Ser. No. 219,482

Int. Cl.<sup>6</sup> G21C 1/04

U.S. Cl. 376—347

6 Claims



- A process for fabricating a bonded multi-walled tube substantially free of bondline defects comprising the steps of:
  - machining smooth matching surfaces on the interior and exterior of two interfitting tubes to be bonded together;
  - ice blasting the machined surfaces by accelerating ice particles against the machined surfaces under sufficient pressure and for a sufficient period of time to render the surfaces substantially free of bondline defect forming materials;
  - drying the tubes;
  - assembling the tubes together, in a unitary tube;
  - extruding the tubing under sufficient heat and pressure to bond the tubes together.

5,483,564

### LOWER TIE PLATE STRAINERS INCLUDING DOUBLE CORRUGATED STRAINERS FOR BOILING WATER REACTORS

Bruce Matzner, San Jose, Calif.; Eric B. Johansson, Wrightsville Beach, N.C.; Richard A. Wolters, Jr., San Jose, Calif.; Thomas G. Dunlap, San Jose, Calif.; Robert B. Elkins, San Jose, Calif.; Harold B. King, Wrightsville Beach, N.C.; Paul W. Sick, Wilmington, N.C., and Kevin L. Ledford, Wilmington, N.C., assignors to General Electric Company, Schenectady, N.Y.

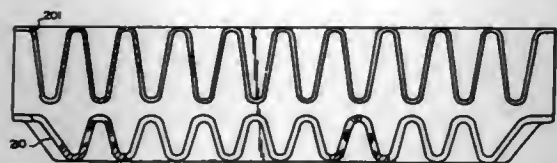
Continuation-in-part of Ser. No. 44,687, Apr. 12, 1993, Pat. No. 5,384,814. This application Feb. 15, 1994, Ser. No. 196,738

Int. Cl.<sup>6</sup> G21C 1/04

U.S. Cl. 376—352

4 Claims

- In a boiling water reactor fuel bundle, a debris catching grid construction for placement within the flow volume defined by the lower tie plate assembly between the inlet nozzle and upper fuel rod-supporting grid comprising:



first and second overlying and underlying three dimensional, non-planar perforated plate constructions having side-by-side holes, arranged so that a substantial portion of coolant flowing through said flow volume is caused to change direction between the inlet nozzle and the upper fuel rod supporting grid;

each said perforated plate forming a three dimensional construction having a total cross sectional area exceeding the planar cross sectional area of the flow volume of said lower tie plate between said inlet nozzle and said rod supporting grid;

said underlying plate having larger holes than said overlying plate;

means for mounting each said three dimensional perforated plate construction interiorly of the flow volume of said lower tie plate such that debris passing through the larger holes of the underlying plate will be trapped between the first overlying plate and the second underlying plate.

5,483,565

**FUEL ASSEMBLY FOR A BOILING WATER REACTOR**  
Magnus Grönlund, Västerås; Anders Söderlund, Surahammar, and Anders Wallander, Västerås, all of, Sweden, assignors to ABB Atom AB, Västerås, Sweden

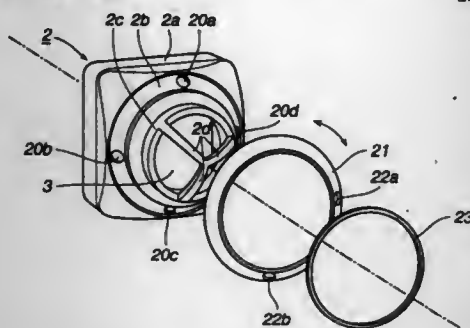
Filed May 5, 1994, Ser. No. 238,526

Claims priority, application Sweden, Jun. 3, 1993, 9301909

Int. Cl.<sup>6</sup> G21C 1/04

U.S. Cl. 376—352

11 Claims



1. A supercell of a boiling-water nuclear reactor which includes four fuel assemblies and a centrally located control rod, each fuel assembly including a plurality of vertical fuel rods containing enriched nuclear fuel material, said rods being arranged between a bottom tie plate and a top tie plate in a surrounding vertical fuel channel, said fuel channel being connected to a transition section, said transition section being provided with holes for a by-pass flow outside the fuel assembly, each fuel assembly being designed with a water inlet for passing water in through the bottom tie plate, through the space between the fuel rods in the vertical fuel channel and through the top tie plate, and each fuel assembly being arranged with intermediate gaps to adjacent fuel assemblies for passing water in the vertical direction through an inlet from the bottom and upwards through the core, and wherein

each fuel assembly, including the transition section, is turnable through an angle of 90°, 180° or 270° around a longitudinal axis thereof, and

each fuel assembly comprises a flow-preventing means arranged to prevent the passage of the by-pass flow through the hole or holes which, before or after a turning of the fuel assembly, are arranged so as to face the control rod in said supercell, whereby at least one hole faces away from the control rod, such that by-pass flow towards the control rod is prevented.

5,483,566

**METHOD AND APPARATUS FOR MODIFYING THE CONTENTS OF A REGISTER VIA A COMMAND BIT**  
Robert B. O'Hara, Jr., Los Altos, and David G. Roberts, Fremont, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

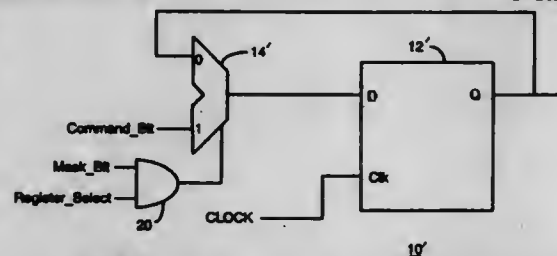
Continuation of Ser. No. 171,313, Dec. 21, 1993, abandoned.

This application Jun. 6, 1995, Ser. No. 469,605

Int. Cl.<sup>6</sup> G11C 19/00

U.S. Cl. 377—73

5 Claims



1. An apparatus for modifying the contents of a register, the register having at least one register bit, each register bit having an input terminal and an output terminal, each register bit having a logic high state and a logic low state, the apparatus comprising:

a host command register means having a plurality of bits, at least one of the plurality of bits for providing a command bit signal;

at least one multiplexer means, each multiplexer means coupled to the host command register means and having a first input terminal coupled to receive the command bit, the command bit having a logic state equal to a new logic state for the register bits being modified,

a second input terminal coupled to the output terminal of the at least one register bit for receiving the logic state of the at least one register bit,

a control terminal, and an output terminal coupled to the input terminal of the at least one register bit; and

at least one logic means, each logic means having a first input terminal for receiving a plurality of mask bits, each mask bit identifying if the at least one register bit is to be modified to the new logic state, and

an output terminal coupled to the control terminal of the multiplexer means for controlling the multiplexer means so that if the at least one register bit is identified by the mask bit as one that is to be modified to the new logic state, the output of the multiplexer will modify the at least one register bit to the new logic state as determined by the logic state of the command bit.

5,483,567

**COMPUTERIZED METHOD FOR CONVERTING POLAR TOMOGRAPHIC DATA TO A CARTESIAN IMAGE FORMAT**

Stuart J. Swerdloff, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Sep. 22, 1994, Ser. No. 310,593

Int. Cl.<sup>6</sup> A61B 6/03; G01N 23/083

U.S. Cl. 378—4

14 Claims

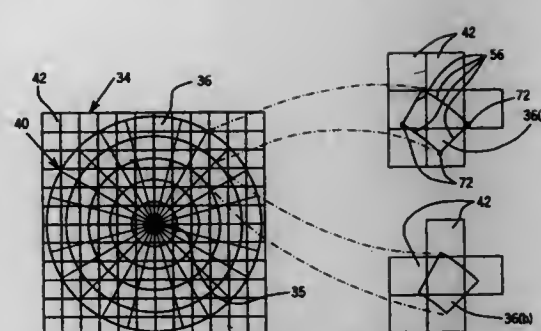
1. A tomographic imaging system comprising:

(a) a detector providing a plurality of polar values related to physical characteristics of an imaged object associated with corresponding polar volume elements arranged in concentric rings;

(b) an image processor receiving Cartesian values associated with Cartesian volume elements arranged in rectilinear rows;

(c) an electronic computer executing a stored program to receive the polar values from the detector and provide Cartesian values to the image processor by:

(i) identifying the Cartesian volume elements overlapping a current polar volume element in a predetermined mapping of polar volume elements to Cartesian volume elements;



(ii) for a current identified Cartesian volume element, truncating the current polar volume element to the dimensions of the current identified Cartesian volume element to produce a truncated polar volume element;

(iii) calculating the area of the truncated polar volume element to produce a weight value identified to both the current identified Cartesian volume element and the current polar volume element, and;

(iv) repeating steps (ii) and (iii) for each identified Cartesian volume element;

(iv) repeating steps (i)–(iv) for each polar volume element; and

(v) determining Cartesian values for the Cartesian volume elements to the image processor, where each Cartesian value is the sum, over all weight values associated with the Cartesian volume element, of the product of the weight value times the polar value of the polar volume element identified with the weight value.

5,483,568

**PAD CONDITION AND POLISHING RATE MONITOR USING FLUORESCENCE**

Hiroyuki Yano, Wappingers Falls, and Katsuya Okumura, Poughkeepsie, both of N.Y., assignors to Kabushiki Kaisha Toshiba, Japan

Filed Nov. 3, 1994, Ser. No. 335,384

Int. Cl.<sup>6</sup> H01L 21/306

U.S. Cl. 378—44

23 Claims

1. A method for determining the polishing rate during abrasive polishing of the surface of a semi-conductor wafer in which a slurry including a liquid having a suspension of abrasive particles is sprayed upon a surface of a rotating polishing pad and a rotating semi-conductor wafer is brought into contact with the surface of the polishing pad, a portion of the surface of the pad exposed during contact, the method comprising:

directing electromagnetic radiation onto the exposed surface of the pad;

detecting the intensity of the electromagnetic radiation produced due to the electromagnetic radiation being directed upon the pad; and

converting the detected intensity into a polishing rate of removal of the surface of the wafer by utilizing a predetermined functional relationship between the intensity and the polishing rate.

5,483,569

**INSPECTION SYSTEM WITH NO INTERVENING BELT**  
Martin Annis, Cambridge, Mass., assignor to American Science and Engineering, Billerica, Mass.

Continuation of Ser. No. 782,970, Oct. 25, 1991, abandoned.

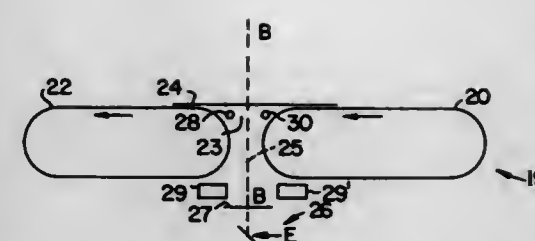
This application Oct. 14, 1993, Ser. No. 136,087

Int. Cl.<sup>6</sup> G01N 23/203

U.S. Cl. 378—87

1 Claim

1. A method of inspecting thin objects with x-rays, which objects are thin enough in relation to a conveyor belt used in a system wherein both the object and belt are illuminated with x-rays so that



when said belt and object are illuminated, the conveyor belt generates a much larger backscatter signal than the object, comprising the steps of,

providing a belt conveying means having first and second belt portions which are separated by a gap,

placing said thin objects to be inspected on said belt conveying means for transport over said gap,

providing a source of x-rays,

directing the x-rays which are emitted by said source through the gap in the belt conveying means to illuminate said thin objects when they are over said gap,

detecting radiation which is backscattered by said thin objects, and

displaying an image corresponding to the detected radiation.

5,483,570

**BEARINGS FOR X-RAY TUBES**

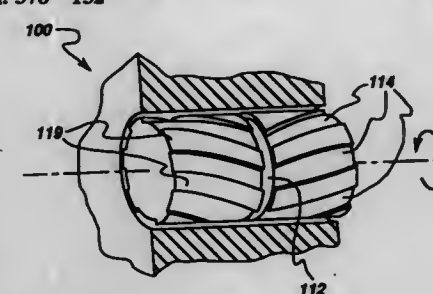
Anthony A. Renshaw, Albany, and Minyoung Lee, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 24, 1994, Ser. No. 264,869

Int. Cl.<sup>6</sup> H01J 35/10

U.S. Cl. 378—132

14 Claims



1. An x-ray system comprising;

an enclosure;

at least one cooling means, operatively connected to the enclosure, for cooling the system;

an x-ray tube, operatively positioned inside the enclosure, for generating and directing x-rays toward a target, the x-ray tube comprising:

an envelope;

a cathode, operatively positioned in the envelope;

an anode assembly including a rotor and a stator, operatively positioned relative to the rotor;

a target, operatively positioned relative to the cathode and operatively connected to the anode assembly, for directing x-rays out of the system; and

bearing structure having opposing surfaces and lubricant means having debris therein, operatively connected to the anode assembly, for enabling the target to rotate at a high rate and at a low resistance, the bearing structure including at least one groove, operatively positioned in the bearing structure, for preventing debris from moving to the interface point between the bearing surfaces wherein the depth of the groove is selected so that the circumferential pressure in the bearing does not decrease the bearing load capacity and wherein at least one ridge is placed in at least one of the bearing grooves such that the height of the ridges for trapping the debris must be less than those of the bearing structure.



5,483,571

## RADIOGRAPHIC MOIRE

Eric I. Madaras, Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 31, 1994, Ser. No. 251,434

Int. Cl.<sup>6</sup> G21K 1/00

U.S. Cl. 378—145

14 Claims

1. A method of inspecting materials that are substantially opaque to visible light, which comprises:

- attaching a first pattern to an area of a material being inspected, said first pattern being chosen to provide a radio opacity contrast of at least 2:1 with respect to the material being inspected;
- producing a second pattern at a detecting means;
- projecting x-radiation through the area of the material containing said first pattern;
- detecting an image resulting from the passage of the x-radiation through the area of the material containing said first pattern;
- observing a Moire pattern resulting from a combination of the first and second patterns.

5,483,572

## X-RAY EXAMINATION APPARATUS

Bart P. A. J. Hoornaert, and Adrianus C. Van Benthem, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

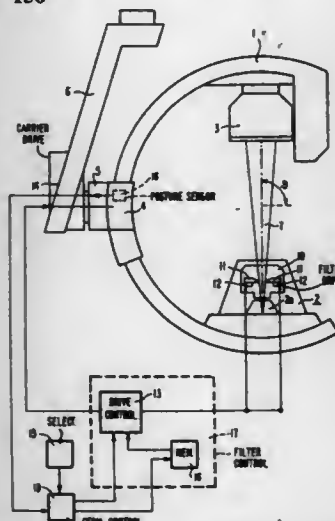
Filed Mar. 14, 1994, Ser. No. 214,388

Claims priority, application European Pat. Off., Mar. 12, 1993, 93200739

Int. Cl.<sup>6</sup> G21K 3/00

U.S. Cl. 378—156

9 Claims



1. An x-ray apparatus comprising a carrier supporting an x-ray source for producing an x-ray beam, an x-ray detector facing the x-ray source and an adjustable absorption filter which is arranged between the x-ray source and the x-ray detector, the carrier posture being variable to alter orientation of the x-ray beam path, characterized in that the x-ray examination apparatus is provided with filter-control means for accepting a posture of the carrier and furnishing a position of the absorption filter so as to control adjustment of the absorption filter in dependence upon the posture of the carrier.

5,483,573

## ELECTRIC CIRCUIT CONNECTOR WITH AUTO-TERMINATION

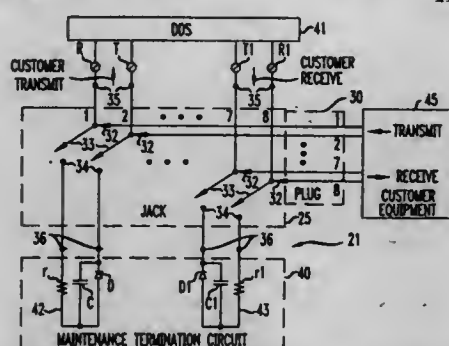
George R. Steenton, Howell, N.J., and Michael T. Calderwood, Chantilly, Va., assignors to Keptel, Inc., Tinton Falls, N.J., and Bell Atlantic Network Services, Inc., Arlington, Va.

Filed Jun. 30, 1993, Ser. No. 85,581

Int. Cl.<sup>6</sup> H04M 1/24; 3/22; 1/00; 3/00

U.S. Cl. 379—2

19 Claims



1. A circuit connector for engagement with a mate connector comprising:

- a pair of connector terminals;
- a pair of auto-termination terminals;
- a maintenance termination circuit connected across said pair of auto-termination terminals, said maintenance termination circuit providing a pre-defined terminating impedance across said auto-termination terminals and having signature means, responsive to a predetermined voltage applied across the auto-termination terminals, for supplying a pre-determined electrical output to said auto-termination terminals; and
- switch means, located within a first housing and connected to said connector terminals and said auto-termination terminals and being arranged for abutting actuation by the mate connector, for connecting each one of said connector terminals to a corresponding different one of said auto-termination terminals only when said circuit connector is not engaged with said mate connector so as to electrically terminate the connector terminals and for disconnecting said connector terminals from said auto-termination terminals when said circuit connector is engaged with said mate connector;

wherein as the mate connector is increasingly inserted into the first housing and engages with the circuit connector the mate connector abuts against and increasingly moves the switch means in order to disconnect said connector terminals from said auto-termination terminals so as to remove said terminating impedance from said connector terminals.

5,483,574

## COMMUNICATION TERMINAL EQUIPMENT

Osamu Yuyama, Chiba, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 18, 1992, Ser. No. 884,135

Claims priority, application Japan, May 20, 1991, 3-114892

Int. Cl.<sup>6</sup> H04M 1/24; 3/22; 9/00; H04B 1/16

U.S. Cl. 379—32

10 Claims

1. A communication terminal equipment, connected to a communication line, including first processing means for transmitting/receiving a first signal through said communication line and second processing means for transmitting/receiving a second signal different than said first signal through said communication line, said first and second processing means being driven by power supplied from said communication line, the communication terminal equipment comprising:

detection means for detecting a specific event occurring for which the supplied power to said second processing means should be cut off;

5,483,576

## METHOD AND APPARATUS FOR COMMUNICATING DATA OVER A RADIO TRANSCEIVER WITH A MODEM

Léven E. Staples, San Antonio, Tex., assignor to Data Race, Inc., San Antonio, Tex.

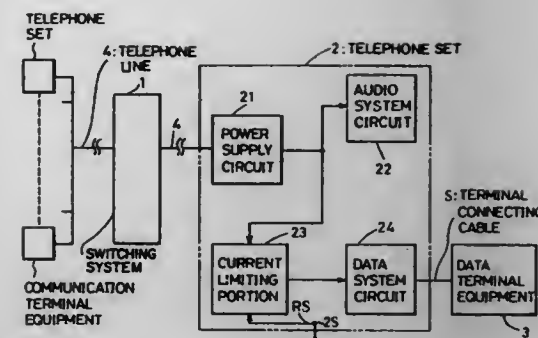
Continuation of Ser. No. 41,406, Mar. 31, 1993, abandoned.

This application Jun. 1, 1995, Ser. No. 457,742

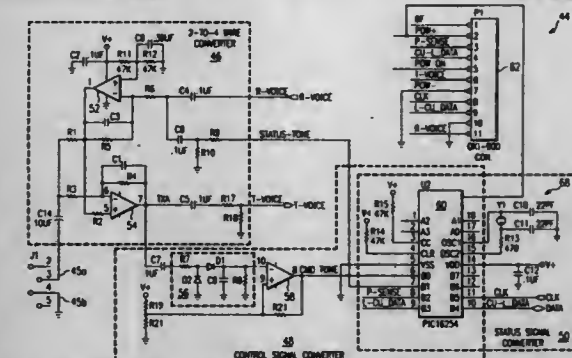
Int. Cl.<sup>6</sup> H04M 11/00

U.S. Cl. 379—58

34 Claims



power supply cutoff means, responsive to the detection of said specific event by said detection means, for cutting off the supplied power to said second processing means; and power supply resumption means, responsive to an externally applied signal indicative that said specific event has been eliminated after cutting off of the supplied power by said power supply cutoff means, for resuming the supplied power to said second processing means.



1. An interface between a modem capable of sending and detecting audio frequency tone bursts and a radio transceiver for communication of computer data and control of said radio transceiver, comprising:

- circuitry for transferring the computer data between said modem and said radio transceiver, said computer data being in the form of modulated audio signals produced by said modem and by a remote modem;
- circuitry, coupled to said transferring circuitry, for converting audio-frequency tone bursts sent by said modem into corresponding sequences of binary high and low logic states for controlling the radio transceiver; and
- circuitry, coupled to said transferring circuitry, for converting binary high and low logic states representing status information sent by the radio transceiver into corresponding audio frequency tone bursts which are detectable by the modem.

5,483,575

## SYSTEM FOR CORRELATING RF USAGE IN A TRUNKED COMMUNICATION NETWORK BASED ON CHANNEL ASSIGNMENTS AND CHANNEL DROPS FOR EACH CALL

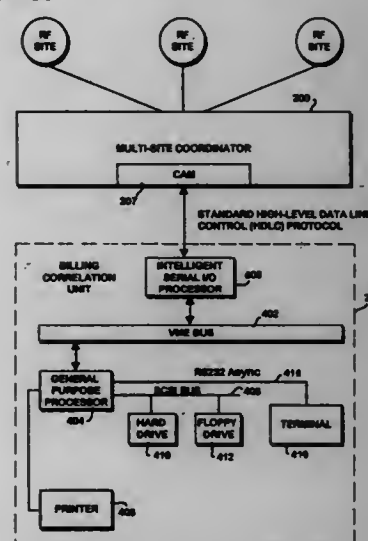
Thomas J. Zdanowski, and George M. Autry, both of Lynchburg, Va., assignors to Ericsson GE Mobile Communications Inc., Lynchburg, Va.

Filed Feb. 19, 1993, Ser. No. 20,075

Int. Cl.<sup>6</sup> H04Q 7/28

U.S. Cl. 379—58

26 Claims



1. A method for correlating rf communications in a multi-site, transmission trunked rf communications system including a plurality of sites controlling radio unit rf communications in corresponding geographical site areas and at least one multisite coordinator for monitoring messages from each site and establishing and removing rf communication channels, comprising:

- obtaining information from the multi-site coordinator including corresponding plural channel assignments and channel drops occurring during each conversation involving a radio unit, and correlating rf communication based on the channel assignments and channel drops obtained for each radio unit.

5,483,577

## SINGLE CHIP TELEPHONE ANSWERING MACHINE, TELEPHONE, SPEAKERPHONE, AND ADSI CONTROLLER

Dale E. Gulick, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jan. 24, 1994, Ser. No. 185,697

Int. Cl.<sup>6</sup> H04M 1/64

U.S. Cl. 379—67

54 Claims

1. A telephone controller for controlling a telephone and coupling the telephone to a telephone line, the telephone including a memory, speaker means for providing an audible output, and microphone means for receiving an audible input, the telephone controller comprising:

- control means including a memory interface means for controlling storage in and retrieval of data from said memory, said memory interface means coupled to said memory by a memory bus, said memory interface means being coupled to an interface bus;
- a digital signal processor for converting electrical signals representative of an audible input to digital data and for converting digital data to electrical signals representative of an audible output, said digital signal processor being coupled to said interface bus for communicating said digital data with said memory interface means;
- telephone line interface means for coupling said digital signal processor to said telephone line for conveying said electrical signals representative of said audible input and audible output between said telephone line and said digital signal processor, for conveying said electrical signals representative of said audible output from said digital signal processor to said speaker means, and for conveying said electrical signals rep-

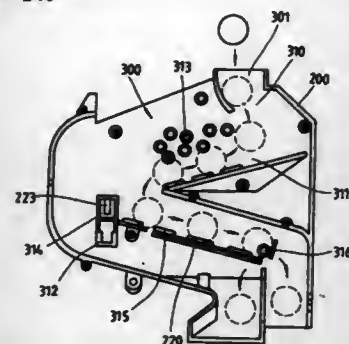




# 5,483,583 PAY PHONE

Jyh-Rong Chen, Fl. 2, No. 86, Kung-Chuan Rd., Pain-Chiao City, Taipei County, Taiwan, Prov. of China  
Filed Oct. 18, 1994, Ser. No. 323,675  
Int. Cl.<sup>6</sup> H04M 17/00; G07F 1/04; 5/00; 11/00  
U.S. Cl. 379-146

1 Claim



1. A pay phone comprised of a telephone body, a handset, a coin slot, a coin-box, a coin-return assembly, push-button digits, a signboard, and a coin transmission control mechanism consisting of a front actuating unit and a back actuating unit, said transmission control mechanism being fixed to said telephone body on the inside by screws and having a coin inlet connected to said coin slot and a coin return track connected to said coin-return assembly and a coin reception track connected to said coin-box, wherein:

said front actuating unit comprises a plurality of projecting rods and slots below said projecting rods, a control plate connected to said projecting rods and having an actuating strip extended out of said telephone body through a hole for guiding a coin during a call, a fixed element, a movable element positioned by a top spring on said fixed element and controlled by an induction coil, a return plate stopped at a sloping wall on said control plate, a control device having a stop bar disposed within said control plate to stop a coin from passing to said coin-box, said movable element being pulled downwards, when said induction coil is turned on, to move said stop bar away for letting a coin pass to said coin-box, said stop bar being forced back to its former position by said control plate through said return plate to stop a coin from passing to said coin-box.

# 5,483,584

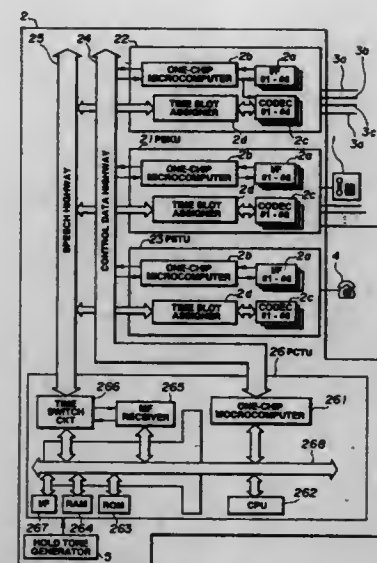
## PUSHBUTTON TELEPHONE SYSTEM

Hiroaki Hayashi, Hino, and Takashi Aoki, Akishima, both of Japan, assignors to Toshiba Corporation, Kanagawa, Japan  
Filed Jan. 24, 1994, Ser. No. 185,026  
Claims priority, application Japan, Jan. 25, 1993, 5-009923  
Int. Cl.<sup>6</sup> H04M 1/00

U.S. Cl. 379-156

25 Claims

1. A pushbutton telephone system comprising:  
a plurality of telephone lines and an extension line;  
at least one pushbutton telephone set connected to said telephone lines and said extension line and having a plurality of line keys associated with said telephone lines, respectively, and an extension key associated with said extension line;  
timer means for measuring a period of time which elapses after said pushbutton telephone set captures one of the telephone lines until one of said line keys or said extension key is pressed;  
decision means for determining whether one of said telephone lines is carrying a call when one of said line keys or said extension key is pressed, by determining whether the period of time which is measured by said timer means is longer than a preset period of time;  
holding means for holding said one of the telephone lines which is carrying a call when said one of said line keys or said extension key is pressed if said one of the telephone lines is determined as carrying a call by said decision means; and



control means for controlling said pushbutton telephone set to capture one of said telephone lines or said extension line which corresponds to the pressed one of said line keys or said extension key when said one of the telephone lines which is carrying a call is held by said holding means.

# 5,483,585

APPARATUS FOR MANAGING AN ELEMENT MANAGER FOR A TELECOMMUNICATIONS SWITCH  
John R. Parker; Nigel T. Lever; Philip Rutter, and Timothy R. Fulcher, all of Suffolk, England, assignors to British Telecommunications, plc, United Kingdom

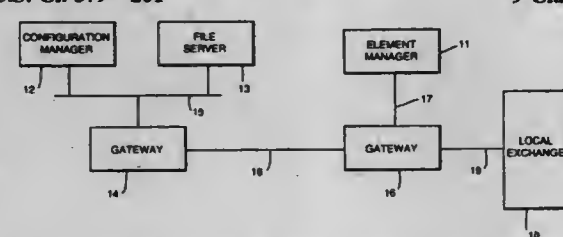
Filed Feb. 10, 1994, Ser. No. 194,353

Claims priority, application European Pat. Off., Dec. 29, 1993, 93310596

Int. Cl.<sup>6</sup> H04M 3/42

U.S. Cl. 379-201

9 Claims



1. A method of operating an apparatus for managing an element manager for a telecommunications switch, said method comprising the steps of:

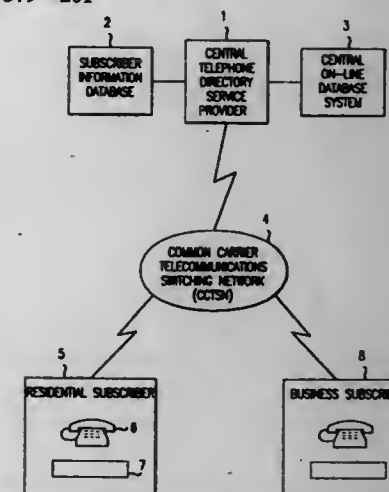
generating an initial set of requests in the apparatus for configuring the element manager so as to provide, remove or modify at least one service for a specified customer;  
transmitting the initial set of requests from the apparatus to the element manager;  
checking confirmation responses received from the element manager to determine if all the requests of the initial set of requests have been successfully performed in the element manager;  
in the event that at least one of the initial set of requests has not been successfully performed in the element manager, generating a further set of requests for cancelling any request of the initial set of requests which have been successfully performed in the element manager; and  
transmitting the further set of requests from the apparatus to the element manager.

# 5,483,586 ELECTRONIC ON-LINE SUBSCRIBER TELEPHONE DIRECTORY

Lester Sussman, 9213 Bulls Run Pkwy., Bethesda, Md. 20817  
Filed Jul. 18, 1994, Ser. No. 276,701  
Int. Cl.<sup>6</sup> H04M 3/42

U.S. Cl. 379-201

15 Claims



1. A method of providing a subscriber with a local electronic telephone directory that is integrated with the subscriber's telephone, comprising the steps of:

- providing a first centralized telephone directory database having a plurality of data;
- providing a second centralized subscriber information database in communication with said first centralized database, said second centralized database including frequency and time of data transfer indicators preselected by said subscriber;
- providing the subscriber with an electronic device having memory, input means and display means, said device being linked with said first centralized database and providing bidirectional data transfer therebetween;
- selecting a first portion of data from said first centralized database using said electronic device;
- transferring said first portion of data selected in said selecting step from said first centralized database to said memory of said electronic device;
- updating said data in said first centralized database at periodic intervals;
- comparing said first portion of data transferred to said electronic device in said transferring step to the updated data in said first centralized database to identify any changes that have occurred in said first portion of data previously transferred in said transferring step;
- transferring automatically to said memory any changes in said first portion of data identified in said comparing step via an on-line transfer between said first centralized database and said electronic device in accordance with said frequency and time of data transfer indicators preselected by said subscriber; and
- providing notification to the subscriber through said display means of said electronic device of any changes made to said first portion of data contained in said memory.

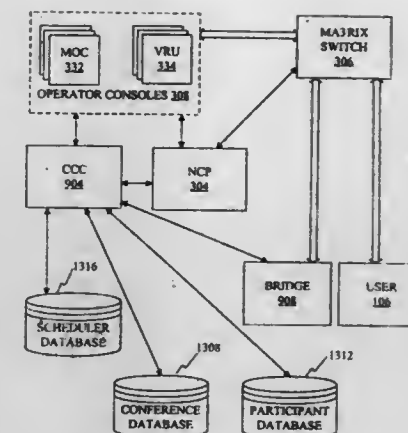
# 5,483,587

SYSTEM AND METHOD FOR CALL CONFERENCING  
Steven J. Hogan; Kristi T. Feltz; Douglas R. Murdock, and Keith E. Smith, all of Cedar Rapids, Iowa, assignors to LinkUSA Corporation, Cedar Rapids, Iowa  
Filed Jun. 8, 1994, Ser. No. 257,622  
Int. Cl.<sup>6</sup> H04M 3/56

U.S. Cl. 379-202

22 Claims

19. A system for allocating operator consoles during a setup phase of a conference call among a plurality of conference participants, comprising:



- means for receiving a request from a user to set up the conference call;
- means for identifying available operator consoles;
- means for allocating a plurality of available operator consoles for the conference call setup; and
- means for initiating simultaneous dial-outs to a plurality of prospective conference participants by using said allocated operator consoles.

# 5,483,588

## VOICE PROCESSING INTERFACE FOR A TELECONFERENCE SYSTEM

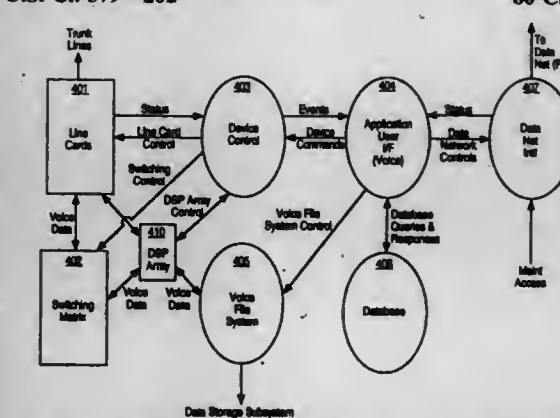
Glenn A. Eaton, San Jose; Joseph A. McFadden, Palo Alto; Stuart A. Taylor, Menlo Park; Edward D. Tracy, Palo Alto, and Emil C. W. Wang, Menlo Park, all of Calif., assignors to Latitude Communications, Santa Clara, Calif.

Filed Dec. 23, 1994, Ser. No. 363,720

Int. Cl.<sup>6</sup> H04M 3/56

U.S. Cl. 379-202

60 Claims



1. A teleconferencing system that uses voice processing to connect callers to teleconferences and guide callers through teleconferencing functions without operator intervention comprising:  
a memory comprising teleconference information which identifies a teleconference to be held, and a name database comprising a spoken name of at least one caller to the teleconference, said spoken name indexed by a caller's identification;  
a switching matrix for selectively connecting telephone trunk lines, to which callers to the teleconference are coupled, for receipt of incoming voice signals from the telephone trunk lines to which callers to the teleconference are coupled and output of voice signals to the telephone trunk lines to which callers to the teleconference are coupled;  
a plurality of digital signal processors (DSPs) coupled to said switching matrix for mixing a plurality of audio signals received on said trunk lines to provide teleconferencing among a plurality of callers, wherein the plurality of callers teleconferenced become teleconference attendees;

a system controller coupled to the memory and the switching matrix, said controller generating audio prompts to the callers and to the attendees to guide the callers and attendees in the operation of the teleconferencing system, one of said audio prompts requesting a caller's identification to be entered prior to be admitted to a teleconference, and, in response to an entered caller's identification, said controller retrieving the spoken name from the memory indexed by the caller's identification and generating an announcement to the attendees of the teleconference using the retrieved spoken name, said announcement announcing that the caller is to join the conference, said switching matrix causing the announcement to be output on the trunk lines such that the attendees receive the announcement.

5,483,589

### APPARATUS AND METHOD FOR ROUTING CONTROL FOR COMPOSITE NETWORK

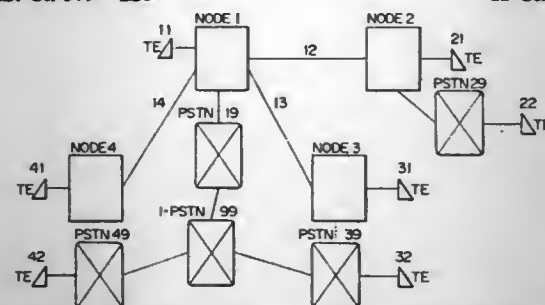
Kazunori Ishida; Tadao Ishii; Hiroyoshi Mori; Susumu Aki-zuki, and Akihisa Ogino, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Mar. 30, 1993, Ser. No. 39,623

Claims priority, application Japan, Mar. 31, 1992, 4-077284  
Int. Cl.<sup>6</sup> H04M 9/06

U.S. Cl. 379-220

11 Claims



1. A routing control apparatus for a composite network including a private network containing a plurality of nodes interconnected by leased lines that can be hired at fixed rates and public networks that are charged by metering, said routing control apparatus operating on originating dial information, input by a calling party, that includes an activation identifier (AI) for activating a transmitting node accommodating a calling party, a node identifier (CC) for specifying a receiving node along a leased line, a connection type identifier (V/F) for directing the initiation of judgment as to whether or not a connection to a public network via a leased line is allowed and for providing a parameter for determining the type of communication requested such as voice or data, and a called party number (Z...Z) for designating a called party in a public network accommodating the called party, said routing control apparatus comprising:

a transmitting node that makes a selection of an available connection based on a node identifier (CC), connection type identifier (V/F), and called party number (Z...Z) contained in originating dial information received in accordance with the activation identifier (AI) from a calling party, said available connection being a connection to a terminal of said called party accommodated in a receiving node having said identifier CC, and a connection to a public network accommodating a called party having the party number Z...Z via the receiving node, or a connection via a public network to the party number Z...Z depending on the connection type identifier (V/F), the transmitting node modifying and transmitting dial information which is modified in accordance with the selection; and

the receiving node receiving the modified dial information and making a connection to a terminal accommodated in the receiving node in accordance with the contents of the dial information, or making a connection to the public network accommodating the called party in accordance with the connection type identifier (V/F).

5,483,590

### PROCESSING OF OPERATIONAL DATA IN TELECOMMUNICATION SYSTEM

Lin Chiu, Gahanna; Hugh G. Frank, Blacklick, both of Ohio; Peter W. Lozo, Westfield, N.J., and Thomas J. Williams, Pickerington, Ohio, assignors to AT&T Corp., Murray Hill, N.J.

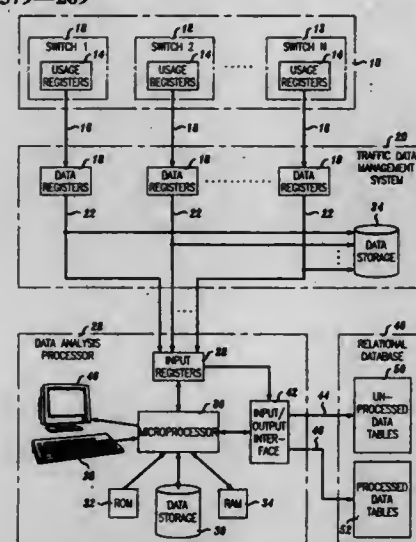
Continuation of Ser. No. 163,319, Dec. 8, 1993, abandoned.

This application Dec. 22, 1994, Ser. No. 361,916

Int. Cl.<sup>6</sup> H04M 3/22

U.S. Cl. 379-269

8 Claims



1. A data analysis apparatus connected between a plurality of telecommunication switches, each collecting data relating to operational conditions of the respective switch, and a database that stores and processes records based on the collected data, the data analysis apparatus comprising:

means for receiving said collected data, said collected data comprising a plurality of unprocessed data records; memory means for storing rules, each rule defining a test to be applied to said data records; processing means for applying said rules to said data records to produce corresponding test results for determining if an exception condition exists based on a comparison of each test result and predetermined boundary limits associated with said rules; means for creating a first table in said database only those data records, for which said processing means determined an exception condition exists; said processing means and creating means both operating in substantially real time as said collected data is received.

5,483,591

### APPARATUS FOR REFERRING TO A CONTENT OF A DIAL MEMORY IN A TELEPHONE SET

Noriko Koma, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 535,622, Jun. 11, 1990, abandoned.

This application Feb. 1, 1994, Ser. No. 190,000

Claims priority, application Japan, Jun. 9, 1989, 1-146959; Jan. 24, 1990, 2-14356

Int. Cl.<sup>6</sup> H04M 1/27

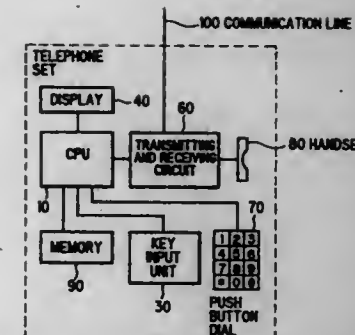
U.S. Cl. 379-356

5 Claims

1. An apparatus for referring to a content of a dial memory in a telephone set, comprising:

a dial memory group including a plurality of dial memories, each of said dial memories storing a content of a telephone number and letter data;

an index letter memory storing index letter data arranged in a predetermined order, each of said index letter data being a part of said letter data;



a key input unit including a forward direction reference key for generating a forward direction reference signal and a reverse direction reference key for generating a reverse direction reference signal;

a display for displaying said content stored in each of said dial memories;

whole memory reference means for referring in turn to each of said plurality of dial memories included in said dial memory group in said forward or reverse direction selected by said forward or reverse direction reference key one by one to display said content on said display beginning with a dial memory displayed on said display at a time of generating a signal of a reference instruction as a starting memory;

a skip reference means for referring in turn to index letter data and corresponding dial memories in said forward or reverse direction to display respective contents of said dial memories on said display, each of said dial memories being indexed by each of said index letter data, said skip reference means being operative to display one of said dial memories corresponding to one of said index letter data referenced; and

a whole memory reference key and a skip reference key, respectively, provided in said key input unit, said whole memory reference key selecting said whole memory reference means to be driven in a condition that said skip reference means is not selected, while said skip reference key selecting said skip reference means to be driven in a condition that said whole memory reference means is not selected, wherein said skip reference means is responsive to a skip instruction signal from said skip reference key, for skipping a user-designated number n of index letter data before displaying said contents of said dial memories beginning with a start memory, said whole memory reference means being operative in response to said whole memory reference key.

5,483,592

### RINGER UNIT DRIVING SYSTEM IN A SUBSCRIBER TRANSMISSION SYSTEM

Yuzuru Ishioka, and Rika Got, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

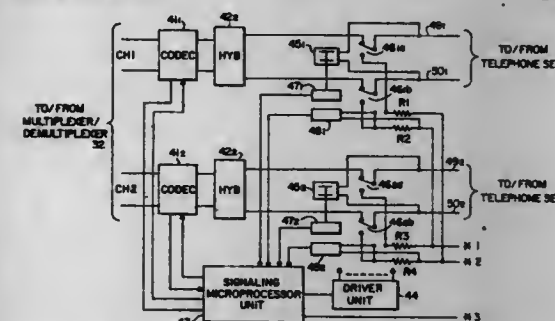
Filed Feb. 25, 1993, Ser. No. 23,818

Claims priority, application Japan, Feb. 27, 1992, 4-041719

Int. Cl.<sup>6</sup> H04M 5/00

U.S. Cl. 379-373

7 Claims



1. A ringer unit driving system for driving a ringer unit provided in common to channel units, the ringer unit sending a ringing

signal to a communications device via one of the channel units, said ringer unit driving system comprising:

signaling bit detection means, provided in each of the channel units, for detecting a signaling bit contained in a received digital signal applied to one of the channel units and for generating a detection signal;

ringer means, provided in the ringer unit, for generating the ringing signal;

power source means for supplying the ringer means with power; and

switch means, connected between the ringer means and the power source means and connected to the signaling bit detection means, for connecting the power source means and the ringer means to each other only when the signaling bit detection means generates the detection signal.

5,483,593

### CALL PROGRESS DECODER FOR MULTIPLE CADENCED TONES ON TELEPHONE LINES

Sanjay Gupta, Quincy, and Timothy Lis, Framingham, both of Mass., assignors to Motorola, Inc., Schaumburg, Ill.

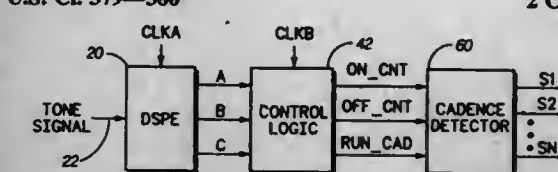
Continuation of Ser. No. 631,830, Dec. 21, 1990, abandoned.

This application Nov. 1, 1993, Ser. No. 146,772

Int. Cl.<sup>6</sup> H04M 3/00

U.S. Cl. 379-386

2 Claims



1. An apparatus for detecting progress status of cadenced tones of a telephone call in any one of a plurality of telephone networks by comparing measured parameters of the cadenced tones with a multiplicity of sets of predetermined parameters, said apparatus comprising:

means for detecting valid tones being generated over a telephone line of one of the telephone networks;

means for measuring parameters of at least one cadence of said valid tones, said measured parameters of the cadenced valid tones being representative of the call progress status present on said telephone line;

means for storing a set of parameters for each of a multiplicity of predetermined cadenced tones, some call progress status having multiple different sets of parameters for the same call progress status; and

multiple cadence comparing means for comparing the measured parameters with the multiplicity of sets of predetermined parameters of said storing means to establish the presence of the call progress status represented by the corresponding cadenced valid tones,

wherein the comparing means includes a comparing element corresponding to each different call progress status of a predetermined plurality of call progress status, each said comparing element for comparing the measured cadence parameters of said valid tone with only the sets of parameters representing the call progress status corresponding to said comparing element to establish if the measured cadence parameters represent the corresponding call progress status.

and wherein each comparing element includes at least one cadence detect element for comparing measured parameters of at least one cadence of said valid tone with at least one corresponding set of parameters representing at least one cadenced tone of the associated call progress status,



and wherein the cadence detect element includes means for comparing the measured parameters of each cadence of a multiple cadenced tone sequentially with its corresponding set of parameters of each corresponding cadence of the multiple cadenced tone of the associated call progress status to establish whether or not there is agreement sequentially with each comparison,

wherein the stored set of parameters for a predetermined single cadenced tone includes a maximum and minimum on time and a maximum and minimum off time of the single cadence thereof; wherein the stored set of parameters for a predetermined multiple cadenced tone includes a maximum and minimum on time and a maximum and minimum off time for each cadence of the multiple cadences thereof; and wherein the measured parameters of each cadence of the valid tone include a measured on time and a measured off time,

wherein for each cadence comparison, the corresponding measured on time is window compared with its corresponding maximum and minimum on times and the corresponding measured off time is window compared with its corresponding maximum and minimum off times; and wherein agreement is established when both the measured on time and measured off time falls within their respective comparison windows,

wherein the cadence detect element further includes means for detecting disagreement in a cadence comparison and for resetting the comparison sequence to an initial state in response to said detected disagreement, and

wherein the cadence detect element further includes means for counting each period of multiple cadences for which there is no comparison disagreement and for generating a signal representing the presence of the corresponding call progress status when said counting means reaches a predetermined count.

5,483,594

# METHOD AND DEVICE FOR ANALYSIS OF A RETURN SIGNAL AND ADAPTIVE ECHO CANCELLER INCLUDING APPLICATION THEREOF

Jacques Prado, Egly, and Eric Moulines, Paris, both of France, assignors to France Telecom, Paris, France

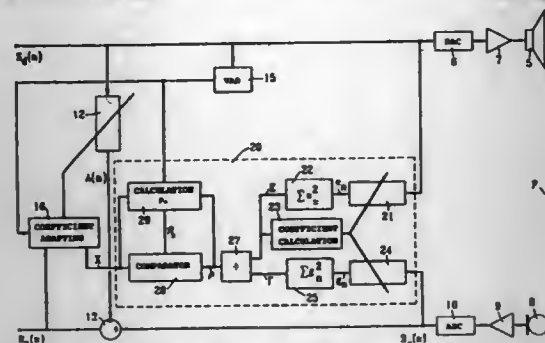
Filed Jan. 31, 1995, Ser. No. 381,310

Claims priority, application France, Feb. 2, 1994, 94 01160

Int. Cl.<sup>6</sup> H04M 9/08; H04B 3/20

U.S. Cl. 379-410

18 Claims



13. An adaptive echo canceller, for attenuating, in a return signal, echo components from a forward signal, comprising an adaptive filter for modeling echo paths, to which the forward signal is addressed and the output of which is subtracted from the return signal, and a detection device for detecting the presence in the return signal of components other than echo components from the forward signal, the coefficients of the adaptive modeling filter being fixed when said detection device reveals the presence in the return signal of components other than echo components from the forward signal, wherein said detection device comprises:

a first finite-impulse-response linear-prediction filter receiving the forward signal and producing a first residual signal of minimal energy;

a second finite-impulse-response filter having the same coefficients as the first finite-impulse-response filter, receiving the return signal and producing a second residual signal; means for calculating the ratio of the energies contained in the first and second residual signals; and means for comparing the calculated energy ratio to a detection threshold in order to determine whether the return signal contains components other than echo components from the forward signal.

5,483,595

# PAGING DEVICE INCLUDING PASSWORD ACCESSED STORED CRYPTOGRAPHIC KEYS

Jeffrey R. Owen, Portland, Oreg., assignor to Seiko Communications Holding N.V., Netherlands Antilles

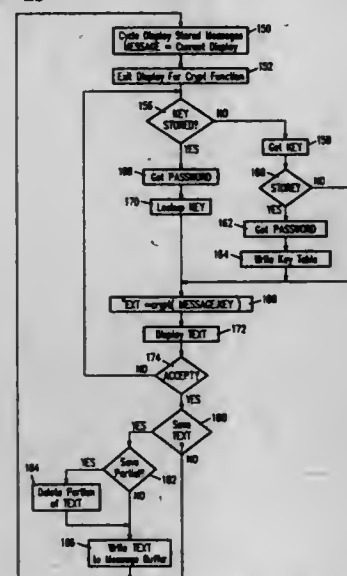
Continuation of Ser. No. 124,316, Sep. 20, 1993, abandoned.

This application Mar. 21, 1995, Ser. No. 410,640

Int. Cl.<sup>6</sup> H04K 1/00

U.S. Cl. 380-23

3 Claims



1. A paging device adapted to operate in a paging system which receives a message from a message source and which transmits said message to said paging-device, an improvement comprising the combination of:

message receiving means in said paging device for receiving said transmitted message;

memory storage means in said paging device for holding a plurality of pairs of associated values, each pair including a short password and a long cryptographic key, each short password being short relative to the associated long cryptographic key;

manual entry means in said paging device for enabling manual entry and storage in said storage means of said pairs of short passwords and long cryptographic keys,

each particular message received by said receiving means being encrypted in accordance with one of said long cryptographic keys,

input means operable upon receipt of a particular message for obtaining from a user of said paging device said short password associated with the long cryptographic key used to encrypt said particular message;

logic means for selecting the long cryptographic key associated with said short password; and

transformation logic for applying said long cryptographic key to said message to transform said message to an alternate version of said message, and presenting said alternate version of said message for display.

5,483,596

# APPARATUS AND METHOD FOR CONTROLLING ACCESS TO AND INTERCONNECTION OF COMPUTER SYSTEM RESOURCES

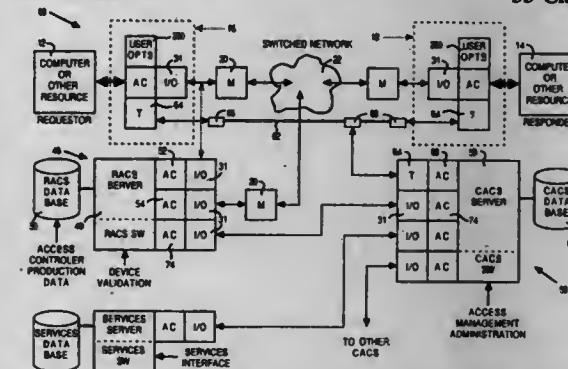
Peter D. Rosenow, Edmonds, and Roger M. Trafton, Kirkland, both of Wash., assignors to Paralon Technologies, Inc., Bellevue, Wash.

Filed Jan. 24, 1994, Ser. No. 186,663

Int. Cl.<sup>6</sup> H04L 9/00; 9/32

U.S. Cl. 380-25

33 Claims



1. A system for transferring secure data across a data communication medium between first and second computer system resources, comprising:

first and second access controllers electrically connected to the data communication medium and to respective ones of the first and second resources, for transferring the secure data during a data transfer session after verifying that the first and second resources are both associated with at least one authorized access code;

the access controllers each including:

a memory storing a table of encryption keys, a table of algorithms, and a table of authorized resources that associates pairs of resources with authorized access control codes, the encryption keys and algorithms being identical in each access controller;

a processor randomly generating for the data transfer session, plural numbers and utilizing an access controller identifying number, the randomly generated numbers, selected ones of the stored algorithms, and a predetermined one of the stored encryption keys to generate in cooperation with the other access controller a unique session key; and

an encryption/decryption processor using the unique session key to encrypt the secure data transferred across the data communication medium.

5,483,597

# AUTHENTICATION PROCESS FOR AT LEAST ONE IDENTIFICATION DEVICE USING A VERIFICATION DEVICE AND A DEVICE EMBODYING THE PROCESS

Jacques Stern, 16, rue de Vandrezanne, 75013 Paris, France

Filed Dec. 30, 1993, Ser. No. 175,721

Claims priority, application France, Dec. 30, 1992, 92 15915

Int. Cl.<sup>6</sup> H04L 9/30

U.S. Cl. 380-30

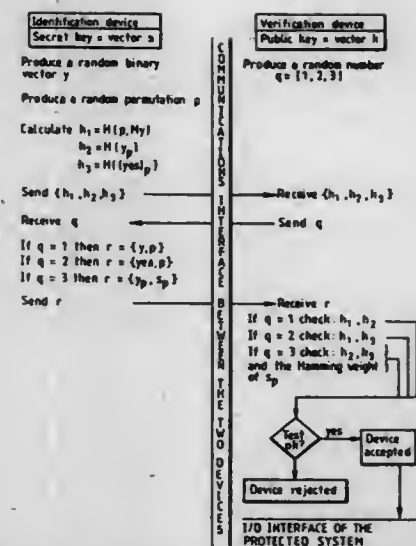
38 Claims

1. A method of authenticating the identity of at least one identification device by a verification device, said method comprising the steps of:

(a) generating an electronic secret key signal representing a secret key having at least one vector  $s_i$  of dimension  $n$  and Hamming weight  $d$ , where  $d$ ,  $i$ , and  $n$  are integers and  $d < n$ ;

(b) generating an electronic public key signal representing a public key having a matrix  $M$  with dimensions  $n \times k$  the coefficients of which are chosen at random, where  $k$  is an integer;

(c) generating an electronic vector signal representing a vector  $K_i$  such that  $K_i = M \cdot s_i$ ;



(d) generating, via said at least one identification device, a first electronic signal representing a random vector  $y$  of dimension  $n$  and a second electronic signal representing a random permutation  $p$ ;

(e) applying an electronic signal representing a cryptographic hash function  $H$  to said second electronic signal, said first electronic signal, said electronic secret key signal, and said electronic public key signal to generate third electronic signals representing commitment values  $h_1$ ,  $h_2$ , and  $h_3$ ;

(f) sending said third electronic signals to said verification device;

(g) generating, via said verification device, a fourth electronic signal representing a random number  $q$  and sending said fourth electronic signal to said at least one identification device;

(h) generating, via said at least one identification device, a fifth electronic signal representing reply  $r$  in accordance with said fourth electronic signal received from said verification device;

(i) receiving and testing, via said verification device, said reply to verify the identity of said at least one identification device; and

(j) repeating steps (a)-(i) a plurality of times in accordance with a predetermined security level.

5,483,598

# MESSAGE ENCRYPTION USING A HASH FUNCTION

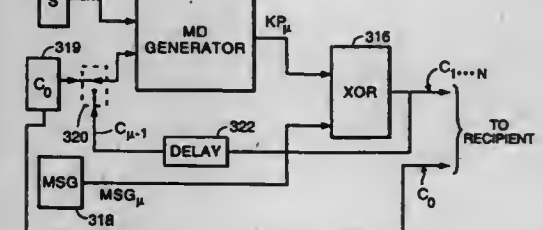
Charles W. Kaufman, Northborough, and Radia J. Perlman, Acton, both of Mass., assignors to Digital Equipment Corp., Patent Law Group, Maynard, Mass.

Filed Jul. 1, 1993, Ser. No. 86,746

Int. Cl.<sup>6</sup> H04L 9/20; 9/22

U.S. Cl. 380-43

7 Claims



6. A method of encrypting a message for transmission from an originator to a recipient, said method comprising the steps of:

A. communicating between said originator and recipient a long-term secret number  $S$  and the initial value of a short-term number  $ST$ ;

- B. applying a one-way hash function to a combination of S and successive values of ST to provide successive key-pad segments;
- C. calculating a function of each key-pad segment and a message segment to provide a ciphertext segment corresponding to said message segment, and
- D. applying each message segment or ciphertext segment as the value of S used in generating the next key-pad segment.

5,483,599

**DIRECTIONAL MICROPHONE SYSTEM**

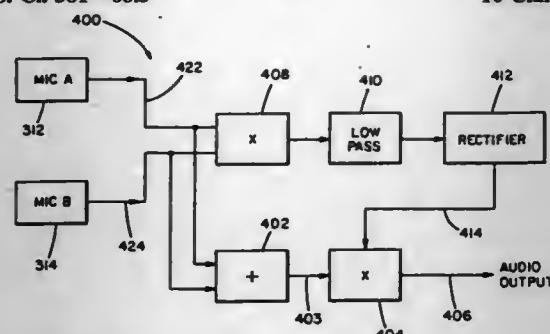
Michael A. Zagorski, 82 Topsail Rd., St. John's, Newfoundland, Canada

Continuation-in-part of Ser. No. 893,096, May 28, 1992, Pat. No. 5,243,660. This application Sep. 2, 1993, Ser. No. 116,481. The portion of the term of this patent subsequent to Sep. 2, 2010, has been disclaimed.

Int. Cl.<sup>6</sup> H04R 25/00

U.S. Cl. 381—68.5

10 Claims



1. A directional microphone system comprising:  
at least two microphones mounted apart from one another and each generating electrical signals;  
summing means for producing a sum signal representing the sum of at least two of said microphone electrical signals;  
product means for producing a product signal representing the product of at least two of said microphone electrical signals; and  
gating means for passing said sum signal into an output signal and modifying the gain of said sum signal in accordance with the magnitude of said product signal.

5,483,600

**WAVE DEPENDENT COMPRESSOR**

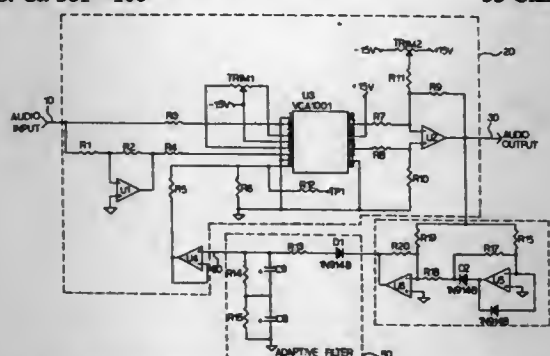
Donn Werrbach, Glendale, Calif., assignor to Apex Systems, Ltd., Sun Valley, Calif.

Filed Feb. 14, 1994, Ser. No. 196,296

Int. Cl.<sup>6</sup> H03G 7/00

U.S. Cl. 381—106

33 Claims



1. A wave dependent compressor, comprising:  
a. an input signal path for receiving an input signal;  
b. an output signal path for rendering an output signal;

- c. a voltage control amplifier connected between said input signal path and said output signal path;  
d. a rectifier connected to said output signal path for producing a rectified signal which is a rectified version of said output signal of said voltage control amplifier;  
e. an adaptable filter connected to said rectifier and operating with a multiplicity of interactive layered time constants, the adaptable filter comprising a one-way current device connected to said rectifier for permitting said rectifier to charge the adaptable filter but preventing said rectifier from discharging the adaptable filter;  
f. said adaptable filter further comprising a first resistor-capacitor circuit connected to said one-way current device and producing a charging/discharging voltage which is more dependent on a transient peak value of said rectified signal than it is on an average value of said rectified signal;  
g. said adaptable filter further comprising a second resistor-capacitor circuit to which said charging/discharging voltage of said first resistor/capacitor circuit is applied for producing a charging/discharging voltage which is more dependent on said average value of said rectified signal, the second resistor-capacitor circuit connected in series to said first resistor-capacitor circuit for providing a wave dependent control feedback signal which is instantaneously and continuously dependent upon both said average and said transient peak value of said rectified signal; and  
h. a control feedback path connected between said adaptable filter and said voltage control amplifier for supplying said wave dependent control feedback signal to said voltage control amplifier to provide instantaneous and continuous gain control adjustment;  
i. whereby said wave dependent compressor operates under said multiplicity of interactive layered time constants to create a self-adaptive compression over a wide range of said input signal and therefore provides said output signal with an instantaneous and continuous gain control.

5,483,601

**APPARATUS AND METHOD FOR BIOMETRIC IDENTIFICATION USING SILHOUETTE AND DISPLACEMENT IMAGES OF A PORTION OF A PERSON'S HAND**

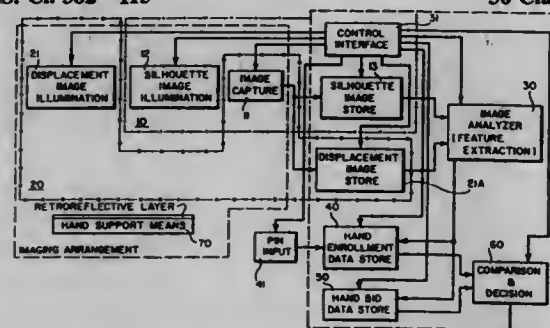
Keith W. Faulkner, Reading, United Kingdom, assignor to Keith Faulkner, Berkshire, United Kingdom; Robert Groetinger, Murten/Morat, Switzerland, and Lowell Bergstedt, San Francisco, Calif.

Continuation-in-part of Ser. No. 833,015, Feb. 10, 1992, Pat. No. 5,335,288. This application Jul. 28, 1994, Ser. No. 282,210. The portion of the term of this patent subsequent to Aug. 2, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382—115

36 Claims



1. Biometric measuring apparatus for recognizing a person's identity based on measurements performed on the person's hand, said apparatus comprising:

- means for producing and storing a silhouette image of at least a portion of a person's hand including at least one finger to provide a stored silhouette image;  
means for producing and storing a displacement image of the same portion of a person's hand to provide a stored displacement image from which measurement data on finger height characteristics can be derived;  
means for analyzing said stored silhouette image and said stored displacement image to produce hand feature data, including hand feature data derived at least in part from said measurement data on finger height characteristics derived from said stored displacement image;  
means for storing hand enrollment data comprising said hand feature data obtained during a hand enrollment operation cycle;  
means for storing hand bid data comprising said hand feature data obtained during a hand bid operation cycle; and  
means for comparing hand bid data with hand enrollment data to decide on the basis of prearranged decision criteria whether said hand bid data and said hand enrollment data were produced by the same hand portion.

5,483,602

**METHOD AND APPARATUS FOR DETECTING PRINTED IMAGES ON DOCUMENTS BY TESTING FOR THE PRESENCE IN THE IMAGES OF STRUCTURAL ELEMENTS HAVING DEFINED REGULARITIES WHICH ARE RECOGNIZABLE BY THE EYE AND COMMON TO A VARIETY OF DOCUMENTS**

Gerhard Stenzel, Germaring, and Wittich Kaule, Emmering, both of, Germany, assignors to GAO Gesellschaft für Automation und Organisation mbH, Germany

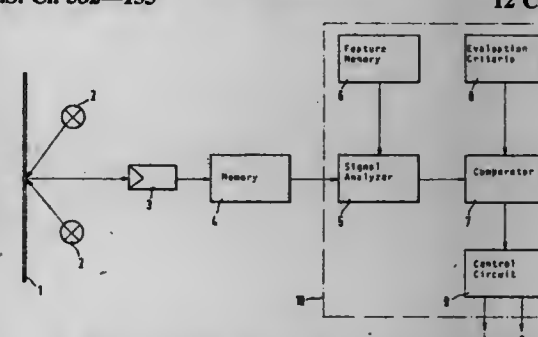
Filed Aug. 20, 1993, Ser. No. 109,446

Claims priority, application Germany, Aug. 20, 1992, 42 27 613.6

Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382—135

12 Claims



1. A method of testing documents to determine whether the documents belong to a predetermined class of documents, comprising the steps of:

- optically scanning the documents to be tested to obtain scanned printed images, and initiating specific measures if given criteria are present without identifying the specific type of document; and  
comparing the scanned images with reference values to determine whether background structural elements are present in the scanned image, said background structural elements having defined regularities recognizable by the eye and common to each type of document in said predetermined class without identifying a specific type of document;  
wherein the specific measures are initiated if said background structural elements are determined to be present.

5,483,603

**SYSTEM AND METHOD FOR AUTOMATIC OPTICAL INSPECTION**

Edward P. Luke, Oakdale; Damien W. P. Creavin, New York, both of N.Y., and Robert R. Reetz, Apex, N.C., assignors to Advanced Interconnection Technology, Islip, N.Y.

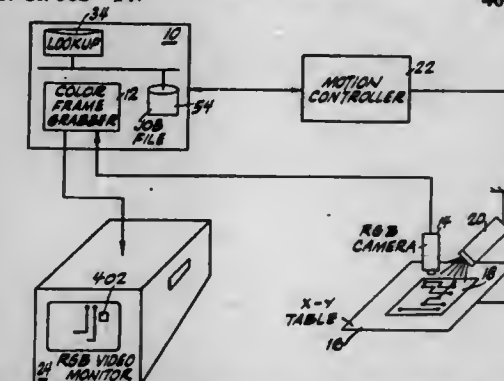
Continuation of Ser. No. 964,705, Oct. 22, 1992, abandoned.

This application Oct. 17, 1994, Ser. No. 324,454

Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382—147

40 Claims



1. An optical inspection system for detecting faults at potential hole sites of a wire scribed circuit board having a plurality of wires scribed on a substrate, comprising:

- a video camera for receiving images of desired hole sites on said wire scribed circuit board, said video camera converting each image to electrical video signals;  
an image storage memory for storing color element values indicative of the chromaticity of a plurality of pixels derived from said electrical video signals;  
a panel feature detector receiving said color element values of a pixel to be analyzed from said image storage memory, providing a wire indication when said color element values of said pixel correspond to a wire feature;  
a pixel retrieve controller providing command signals to said image storage memory to transmit to said panel feature detector color element values corresponding to predetermined pixels associated with a hole site to be analyzed; and  
an open detector circuit receiving said wire indication from said panel feature detector corresponding to said predetermined pixels associated with said hole site, said open detector determining whether an open circuit could occur when said hole site is drilled;  
wherein said pixel retrieve controller further comprises an open scan table associated with a hole site having a plurality of corresponding scan lines said open scan table for each said scan line storing boundary values for an open circuit region, where said boundary values are used to derive said command signals.

5,483,604

**MONITORING CHANGES IN IMAGE CHARACTERISTICS**

Richard Salisbury, Littlebury, United Kingdom, assignor to Thermoteknix Systems Ltd., Cambridge, United Kingdom

Continuation of Ser. No. 19,703, Feb. 19, 1993, abandoned.

This application Oct. 4, 1994, Ser. No. 317,842

Claims priority, application United Kingdom, Feb. 20, 1992, 9203583

Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382—152

11 Claims

1. A method of monitoring hot spots in electrical or electronic equipment using portable imaging equipment which moves from a first position to a second position comprising:

- a) generating first and second images of the electrical or electronic equipment using said portable imaging equipment from said first and second positions respectively,





alignment means formed on said optical head and on said fiber support structure, proximate said aperture, effectively defining three nonlinear points of contact, said points further defining a contact plane, and said alignment means restricting all freedom of movement in said contact plane when said alignment means is engaged by forcibly abutting said head against said fiber support structure; and means, located in said clip-on device, for preventing said mandrel member from moving toward said waveguide unless said alignment means is engaged.

5,483,611

# APPARATUS FOR ALIGNING OPTICAL FIBERS IN AN X-Y MATRIX CONFIGURATION

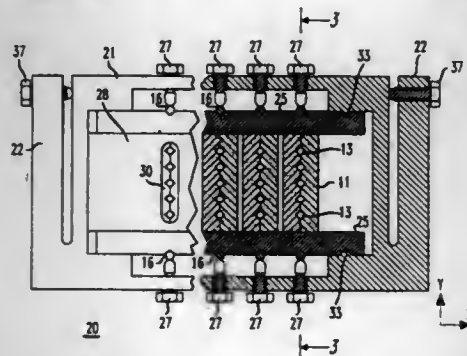
Nagesh R. Basavanahally, Trenton, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Aug. 26, 1994, Ser. No. 296,384

Int. Cl.<sup>6</sup> G02B 6/36

U.S. Cl. 385—78

25 Claims



1. Apparatus for holding the ends of optical fibers in a predetermined configuration comprising:

- a holder member;
- a pair of parallel alignment members extending in an X direction and attached to the holder member;
- a plurality of fiber support members each having first reference surfaces on opposite sides thereof and each containing an array of optical fibers, each optical fiber extending in a generally Z direction, perpendicular to the X direction, with end surfaces of the fibers of the support member arranged successively in a Y direction, perpendicular to the X and Z directions;
- the fiber support members being arranged side-by-side in the X direction, such that the end surfaces of the optical fibers form a predetermined configuration in substantially an X-Y plane;
- a plurality of alignment pins, each alignment pin bearing against a first reference surface of a fiber support member and a second reference surface of an alignment member;
- and clamping means connected to the holder member for forcing the alignment pins against the second reference surfaces of the alignment members.

5,483,612

# INCREASED CAPACITY OPTICAL WAVEGUIDE

Daniel Gallagher, Big Flats; Daniel A. Nolan, Corning; David K. Smith; J. Richard Toler, both of Painted Post, and Grant P. Watkins, Corning, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

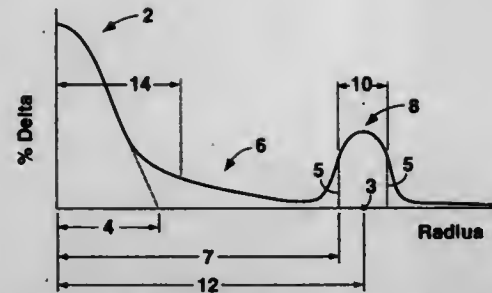
Filed Oct. 17, 1994, Ser. No. 323,795

Int. Cl.<sup>6</sup> G02B 6/22

U.S. Cl. 385—127

13 Claims

1. A single mode optical waveguide fiber designed for high data rate, single channel or WDM telecommunications systems comprising:
  - a core region comprising,



- a central region, having a maximum index of refraction  $n_0$ ,
- a first annular region, adjacent said central region, having a maximum index of refraction  $n_1$ , and,
- a second annular region, adjacent said first annular region, having a maximum index of refraction  $n_2$ , wherein  $n_0 > n_2 > n_1$ ; and,
- a clad layer, surrounding said core region, having an index of refraction  $n_3$ , wherein  $n_2 > n_3$ ;
- said core region having an inner and an outer profile volume, wherein said inner profile volume is in the range of about 2.70 to 3.95 units and said outer profile volume is in the range of about 1.10 to 7.20 units and the ratio of said outer to said inner profile volume is in the range of about 0.30 to 2.35; and,
- said optical waveguide fiber having a first polymeric coating layer adjacent said clad layer having an elastic modulus in the range of about 1.0 to 3.0 MPa and a glass transition temperature less than about  $-10^\circ \text{C}$ ., and a second polymeric coating adjacent said first coating layer having an elastic modulus no less than about 400 MPa.

5,483,613

# OPTICAL DEVICE WITH SUBSTRATE AND WAVEGUIDE STRUCTURE HAVING THERMAL MATCHING INTERFACES

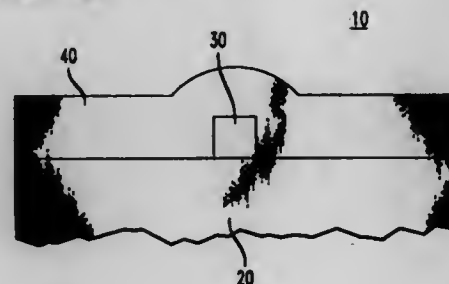
Allan J. Bruce, Westfield, and Herman M. Presby, Highland Park, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Aug. 16, 1994, Ser. No. 291,387

Int. Cl.<sup>6</sup> G02B 6/10

U.S. Cl. 385—129

15 Claims



1. An optical device comprising:
  - a doped silica substrate, the doped silica substrate having a coefficient of thermal expansion between  $8 \times 10^{-7} \text{ } ^\circ \text{C}^{-1}$  and  $15 \times 10^{-7} \text{ } ^\circ \text{C}^{-1}$ ;

a doped silica waveguiding structure formed on the doped silica substrate, the doped silica waveguiding structure having a coefficient of thermal expansion between  $8 \times 10^{-7} \text{ } ^\circ \text{C}^{-1}$  and  $15 \times 10^{-7} \text{ } ^\circ \text{C}^{-1}$ ; and a cladding layer formed on the doped silica waveguiding structure.

5,483,614

# OPTICAL WAVEGUIDE MOLDINGS MADE FROM SILICON NITRIDE AND A METHOD OF DETECTING OPTICAL WAVELENGTHS USING SAME

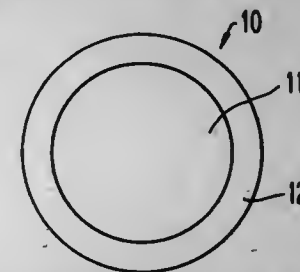
Martin Brück, Hofheim am Taunus; Tilo Vaahs, Kelkheim/Taunus; Marcellus Peuckert, Hofheim am Taunus; Ude Scheunemann, Liederbach; Thomas Stehlin, Hofheim am Taunus, and Jürgen Theis, Oberursel, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Division of Ser. No. 127,987, Sep. 27, 1993, Pat. No. 5,358,746, which is a continuation of Ser. No. 690,656, Apr. 24, 1991, abandoned. This application Jul. 21, 1994, Ser. No. 278,391. Claims priority, application Germany, Apr. 26, 1990, 40 13 306.0

Int. Cl.<sup>6</sup> G02B 6/02; B05D 3/02; B29D 11/00

U.S. Cl. 385—142

8 Claims



1. A transparent molded article for optical applications comprising silicon nitride and a coating thereon of oxides of silicon nitride formed by chemical reaction of the silicon nitride with oxygen, wherein at  $\lambda=546 \text{ nm}$  the silicon nitride has a refractive index from about 1.65 to about 2.00 and the coating thereon of oxides of silicon nitride has a refractive index from about 1.44 to about 1.55.

8. A method for detecting a wavelength of light comprising passing said light through an optical material connected to a spectrometer or a photodiode detector, wherein said material comprises silicon nitride and a coating thereon of oxides of silicon nitride formed by chemically reacting the silicon nitride with oxygen, wherein at  $\lambda=546 \text{ nm}$  the silicon nitride has a refractive index from about 1.65 to about 2.00 and the coating thereon of oxides of silicon nitride has a refractive index from about 1.44 to about 1.55, and detecting the wavelength of light by the spectrometer or the photodiode detector.

5,483,615

# DIRECT CURRENT ELECTRICAL MOTOR SYSTEM AND METHOD OF USING SAME

William M. Hallidy, 620 E. Laurel, Glendora, Calif. 91740

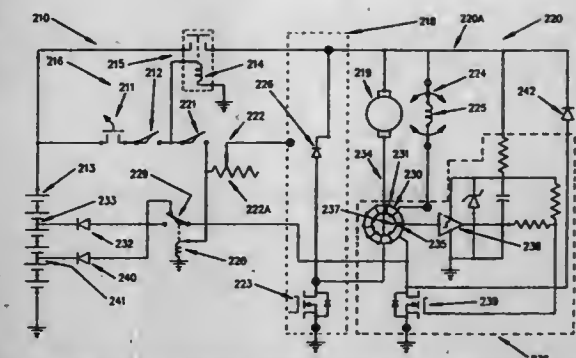
Filed Jun. 17, 1994, Ser. No. 261,462

Int. Cl.<sup>6</sup> H02P 5/178

U.S. Cl. 388—803

20 Claims

1. A direct current electric motor system, comprising:
  - armature winding means for conducting an armature current;
  - electromagnetic field winding means for conducting a field winding current;
  - control module means electrically coupled to said electromagnetic field winding means for varying the magnitude of said field winding current to substantially maintain the ratio of the magnitude of said field winding current to the magnitude of said armature current as a constant;



- rotational speed limiting means electrically connected to said control module means for setting at least one minimum field winding current magnitude to limit the rotational speed of the motor;
- ferroelectric core means coupled to said control module means and having a gap and surrounding said armature winding means for sensing said armature current to induce an armature magnetic flux within said ferroelectric core means; and
- secondary winding means wound around said ferroelectric core means for inducing a secondary magnetic flux within said ferroelectric core means, wherein said secondary winding means is connected to said electromagnetic field winding means.

5,483,616

# HUMIDIFIER TANK WITH IMPROVED HANDLE

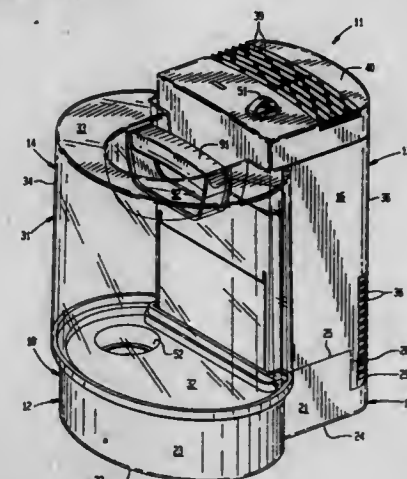
Bernard Chiu, Wellesley, Mass.; Jui-Shang Wang, Taipei, Taiwan, Prov. of China, and Stanley Gresens, Homewood, Ill., assignors to Duracraft Corporation, Whitinsville, Mass.

Filed Dec. 21, 1994, Ser. No. 360,473

Int. Cl.<sup>6</sup> B05B 1/24

U.S. Cl. 392—406

16 Claims

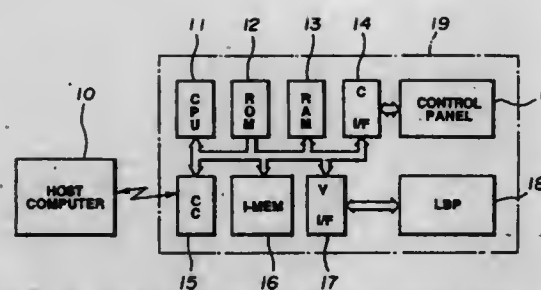


1. A portable humidifier comprising:
  - base means defining a reservoir for retaining a water supply;
  - humidification means for drawing moisture from said reservoir and discharging said moisture into the environment;
  - a tank supported by said base means and having an outlet opening communicating with said reservoir; said tank having a bottom wall, a top wall, and side walls joining said top and bottom walls;
  - a first handle projecting from said bottom wall; and
  - a second handle projecting from said top wall.





dividing said bit map memory into a plurality of regions in accordance with the result of analysis of said expansion position data by said character pattern expansion portion; informing said character pattern expansion portion of every completion of storage of the character data of each document in the buffer by said character data processing portion; calling fonts from said font memory in accordance with said code data read out from said buffer by said character pattern expansion portion upon a request from said character data processing portion; and storing called fonts as character patterns sequentially in a plurality of regions in said bit map memory that were previously divided by said character pattern expansion portion.



data conversion means for converting the input printing information to dot data;

printing means for printing an image based on the dot data, wherein said printing means performs a normal printing operation in response to the print request from the input means;

data storage means for storing at least one of a plurality of pages of the dot data, wherein the dot data is retained in said data storage means after the normal printing operation is finished; determining means for determining whether or not a print request is present; and

command receiving means for receiving a manually inputted command if said determining means determines that a print request is not present, wherein the command causes the dot data in said data storage means to be output to said printing means to print the image again.

5,483,624

## PROGRAMMABLE HAND HELD LABELER.

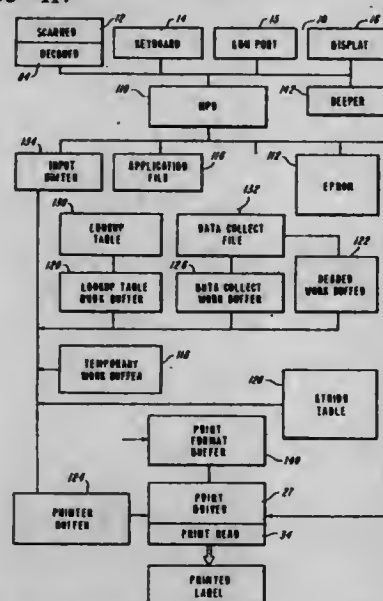
Amy S. Christopher, Miamisburg; Donald A. Morrison, Dayton; Mark W. Roth, Miamisburg, and Rex D. Watkins, Franklin, all of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Mar. 27, 1992, Ser. No. 858,703

Int. Cl.<sup>6</sup> G06K 15/00

U.S. Cl. 395—117

49 Claims



1. A hand held labeler comprising:  
means for inputting data to said labeler;  
a print driver controllable to print information on a label;  
a first memory for storing a fixed set of command routines including a print command routine to control said print driver to perform a print operation, an upload command routine to control the uploading of data from said labeler to a host computer, a plurality of data manipulation command routines to control the manipulation of stored data to selectively asso-

ciate data for printing together or uploading together and a data collection routine to control an operation for collecting data to said labeler;

a second memory that is programmable, said second memory storing data and a user programmable sequence of commands forming an application program, each command in said application program selecting an associated command routine stored in said first memory for execution in accordance with said sequence;

processing means for executing an application program stored in said second memory by executing selected command routines stored in said first memory to control at least one of said print, data manipulation or data collection operations of said labeler.

5,483,625

## METHOD AND APPARATUS FOR ADJUSTING DENSITY IN DIGITAL IMAGES

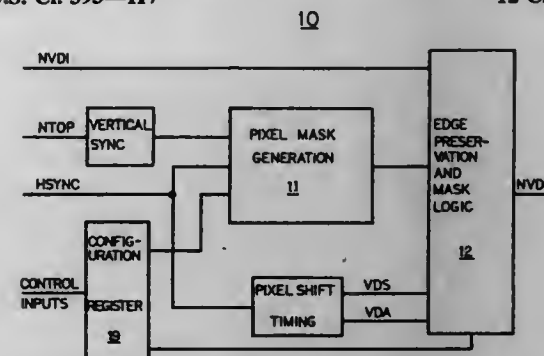
Karl W. Robertson; Richard D. Taylor, and Gary D. Zimmerman, all of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 26, 1993, Ser. No. 53,577

Int. Cl.<sup>6</sup> G06F 15/00

U.S. Cl. 395—117

12 Claims



1. A method of adjusting a number of pixels printed in rasterized bitmap format which comprises: generating a bitmask having a regular, repeating pattern of active and inactive pixel elements; ANDING a stream of output bits representing pixels or an absence of pixels, in the rasterized bitmap with the bitmask; reducing the number of pixels in said rasterized bitmap by not printing each bit map pixel ANDed with an inactive pixel element of said bitmask; and detecting edge pixels of images in said rasterized bitmap and preserving states of those pixels irrespective of the state of the bitmask.

5,483,626

## METHOD AND APPARATUS FOR TRANSFORMING GRAPHICS

Yasutomo Nakayama, Asaka, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 25, 1992, Ser. No. 904,119

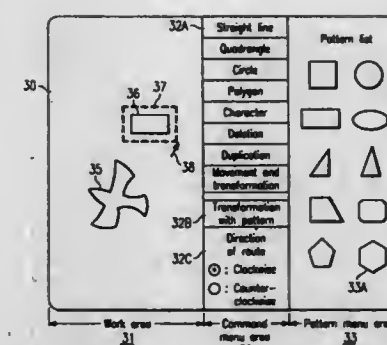
Claims priority, application Japan, Jan. 1, 1991, 3-278895

Int. Cl.<sup>6</sup> G06F 15/62

U.S. Cl. 395—133

13 Claims

1. A method for transforming a graphic by a graphic transforming apparatus having input means, storage means, computation means, and display means, said method comprising the steps of: setting up a line drawing to be transformed as an object graphic for display on said display means, wherein said object graphic has an extreme point at an end of a line of the line drawing, setting up and acquiring any line drawing as a pattern for transformation for display on said display means, moving said pattern so that it intersects with said object graphic at at least one intersection, and also specifying an intersection between said object graphic and said pattern as a starting



point, and also specifying a point on said pattern as an ending point, wherein said ending point is not an intersection between said object graphic and said pattern, and uniquely specifying the portion between the starting point on said object graphic and the extreme point on said object graphic as a specified portion by said computation means, and also uniquely specifying the portion between the starting point and the ending point on said pattern, and replacing said specified portion on said object graphic with the specified portion on said pattern by said computation means.

5,483,627

## PREPROCESSING PIPELINE FOR REAL-TIME OBJECT BASED GRAPHICS SYSTEMS

Kia Silverbrook, Woollahra; Michael J. Webb, Lane Cove, and Simon R. Walmsley, Epping, all of, Australia, assignors to Canon Kabushiki Kaisha, Tokyo, Japan, and Canon Information Systems Research Australia Pty Ltd, Sydney, Australia

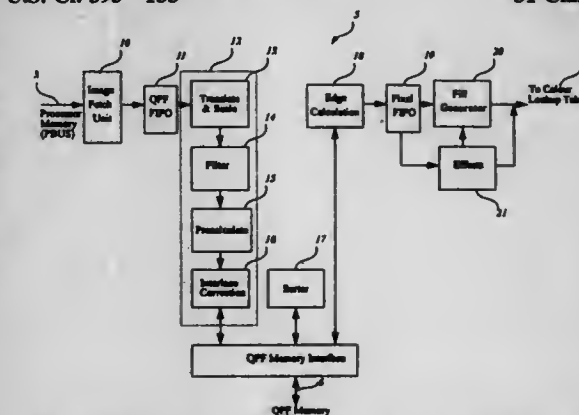
Filed Apr. 28, 1993, Ser. No. 53,378

Claims priority, application Australia, Apr. 29, 1992, PL2142

Int. Cl.<sup>6</sup> G06T 1/00

U.S. Cl. 395—133

31 Claims



28. Apparatus for processing two-dimensional graphic objects intended to form a raster-based image, said apparatus comprising:  
(i) receiving means for receiving the two-dimensional graphic objects, each of the two-dimensional graphic objects including at least one fragment that defines a single curve portion of the two-dimensional graphic object;  
(ii) scaling means for scaling and translating each fragment of each two-dimensional graphic object based on object vectors preset for each two-dimensional graphic object;  
(iii) first determining means for determining a first group of fragments that do not comprise part of the raster-based image, and discarding the first group of fragments;  
(iv) second determining means for determining a second group of fragments which comprise part of the raster-based image;  
(v) calculating means for calculating fragment data for each fragment in the second group of fragments, the fragment data corresponding to that fragment's starting line on the raster-based image; and





searching help data corresponding to said executing statuses using said obtained executing status of said status management table to display help-information corresponding to said obtained executing status of said application program on the display means;

wherein said status management table stores said executing statuses each of which includes a message identifier corresponding to an executing status of one of said application programs to be executed in the CPU;

wherein said status pointer stores pointers each pointing to an executing status stored in said status management table corresponding to an executing status of an application program to be executed in the CPU.

5,483,633

# METHOD AND APPARATUS FOR SURFACING AN OBJECT BASED UPON FORTHCOMING CRITERIA

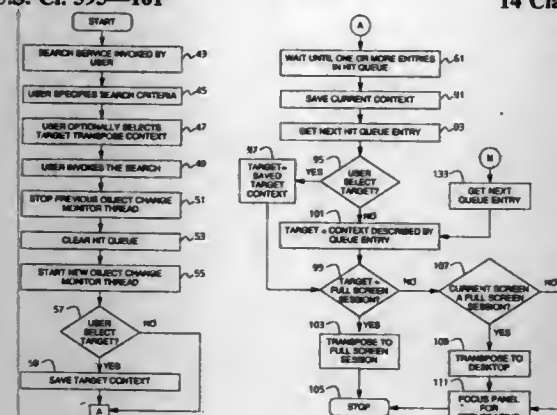
William J. Johnson, Flower Mound, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1993, Ser. No. 84,669

Int. Cl.<sup>6</sup> G06F 17/30

U.S. Cl. 395—161

14 Claims



1. A method of automatically surfacing on a user interface one of plural objects located on a data processing system, comprising the steps of:

- providing a search criteria;
- providing a target object that is to be surfaced;
- determining when said search criteria becomes present in one of said plural objects on said data processing system; and
- surfacing said target object on said user interface when said search criteria becomes present.

5,483,634

# DISPLAY CONTROL APPARATUS AND METHOD UTILIZING FIRST AND SECOND IMAGE PLANES

Taketo Hasegawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 18, 1993, Ser. No. 62,214

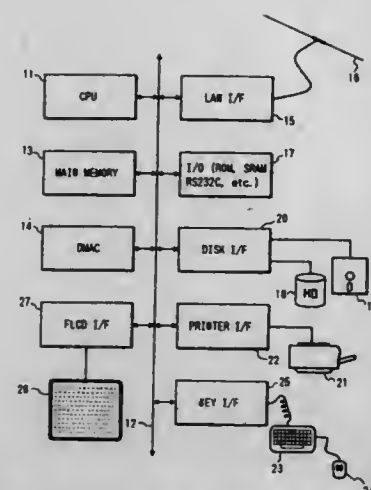
Claims priority, application Japan, May 19, 1992, 4-126146

Int. Cl.<sup>6</sup> G06F 15/00

U.S. Cl. 395—162

16 Claims

1. A display control apparatus comprising: input means for inputting image data of first and second image planes; processing means for executing a halftone process to the inputted image data; memory means for storing error data occurring due to the execution of the halftone process by said processing means; and transmitting means for transmitting the image data which has been halftone processed by said processing means to a display apparatus,



wherein said memory, means stores the error data occurring when the image data of the first image plane is halftone processed, and when the image data of the second image plane is processed, said processing means executes the halftone process on the basis of the error data stored in the memory means.

5,483,635

# CIRCUIT FOR PROTECTING A LOAD CONTROL DEVICE FROM HIGH AND LOW VOLTAGE CONDITIONS

Shogo Kameyama, Obu, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

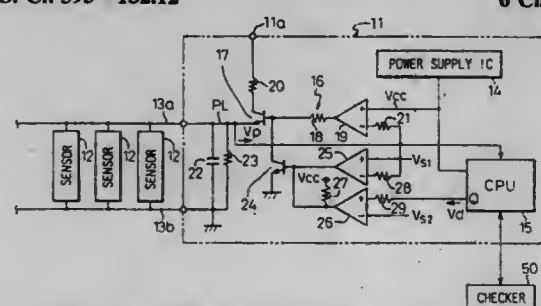
Filed Jan. 27, 1994, Ser. No. 187,035

Claims priority, application Japan, Jan. 29, 1993, 5-013835

Int. Cl.<sup>6</sup> G11C 7/00; H03K 17/00

U.S. Cl. 395—182.12

6 Claims



1. A load-control device comprising a CPU that performs load control based on a signal from a sensor, a DC voltage-regulation circuit which takes an output voltage from an external power supply and supplies it to the CPU, and a protective device comprising:

- current-adjustment means inserted between the external power supply and the sensor;
- voltage-responding means which adjusts a voltage on a power supply line located between the sensor and the external power supply to equal the output voltage of the DC voltage-regulation circuit by controlling the current-adjustment means the voltage-responding means switching the current-adjustment means into a cutoff state when the voltage on the power supply line reaches or exceeds a first reference value, which is an upper limit level;
- switching means for switching the current-adjustment means into the cutoff state; and
- voltage-comparison means for causing the switching means to switch the current adjustment means into the cutoff state when the voltage level on the power supply line drops to or below a second reference value, which is a lower limit level, wherein: an upper limit of the voltage level of the power supply line is approximately equal to the voltage level supplied to the

CPU by the DC voltage-regulation circuit, and the voltage-responding means cuts off the current-adjustment means so that the CPU is cutoff from at least one of the sensor and the external power source thereby preventing the CPU from being supplied with a voltage exceeding the upper limit of the voltage level, and

once the current adjustment means is switched into the cutoff state by the voltage-comparison means, the CPU controls the current-adjustment means and monitors the voltage level of the power supply line to resume the supply of electric power to the sensor by disabling control of the current-adjustment means by the voltage-comparison means when the voltage level is normal and maintains the current-adjustment means in a cutoff state when the voltage level is abnormal, and wherein the CPU will only repeat the process of cutting off and resuming the supply of electric power to the sensor a predetermined number of times.

5,483,636

# AUTOMATED DIAGNOSIS USING WAFER TRACKING DATABASES

Sharad Saxena, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

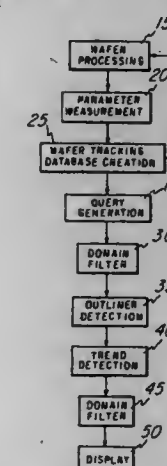
Continuation of Ser. No. 12,813, Feb. 3, 1993, abandoned.

This application Mar. 29, 1995, Ser. No. 415,081

Int. Cl.<sup>6</sup> H04J 1/16; G06F 11/34

U.S. Cl. 395—183.01

24 Claims



- An automated method for isolating one or more causes of misprocessing in a semiconductor process comprising the steps of:
  - processing a plurality of wafers;
  - measuring a plurality of process parameters during said processing for each of said plurality of wafers;
  - creating a wafer tracking database which contains said plurality of process parameters and a plurality of identifying information associated with each wafer;
  - generating a first plurality queries wherein each query in said first plurality of queries corresponds to at least one of said plurality of process parameters;
  - applying each query of said first plurality of queries to said wafer tracking database to obtain a set of observations for each query of said first plurality of queries;
  - automatically determining from a pattern of each of said set of observations whether each query of said first plurality of queries is interesting for fault isolation;
  - dividing said first plurality of queries into a second plurality of queries wherein said second plurality contains queries determined to be interesting for fault isolation; and
  - displaying said second group of queries so that at least one cause of misprocessing can be determined.

5,483,637

# EXPERT BASED SYSTEM AND METHOD FOR MANAGING ERROR EVENTS IN A LOCAL AREA NETWORK

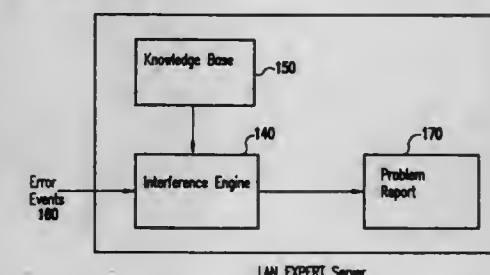
Alex Winokur, Haifa; Joseph Shiloach, Kirat Tiv'on; Amnon Ribak, Misgav, all of, Israel, and Yuangene Huang, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 27, 1994, Ser. No. 266,074

Int. Cl.<sup>6</sup> G06F 11/00; 15/18

U.S. Cl. 395—183.02

13 Claims



1. A real-time method for correlating causes and error messages to be used in a system for managing error events in a local area network (LAN), said method comprising the steps of:

providing in a knowledge base data defining a plurality of causal relationships, wherein each one of said plurality of said causal relationships associates an error message with at least one cause;

providing in said knowledge base data defining at least one implied relationship, wherein said implied relationship represents a first cause which implies a second cause; providing in said knowledge base data defining at least one trigger relationship, wherein said trigger relationship associates a first error message with a second error message if said first error message and said second error message are associated with the same causes and said first error message might be produced by the same part of said LAN as said second error message;

receiving error messages from the LAN;

in response to a received error message from said LAN, accessing said knowledge base by an inference engine to identify the error message and retrieve from the knowledge base its possible causes, said inference engine attaching any retrieved possible causes to the received error message;

comparing by the inference engine the received error message with other already received error messages to filter out repeated error messages;

accessing said knowledge base by the inference engine information as to whether the received error message has any triggering error messages and, if so, examining by the inference engine already received error messages to determine whether a triggering error message has arrived and, if so, disregarding by the inference engine the received error message;

accessing said knowledge base by the inference engine for related causes of the received error message and comparing by the inference engine the received error message with existing diagnostic problems, termed a cluster, to determine if the received error message shares common causes with all error messages in the cluster and, if so, adding the received error message to the cluster;

accessing said knowledge base by the inference engine for an imply relationship for the received error message and evaluating by the inference engine the causes in a cluster to determine whether one cause in a cluster implies another cause and, if so, discarding the implied cause; and

when a cluster has one fully instantiated cause left, reporting by the inference engine problems including correlated error messages, a cause and a recommended action for fixing the cause.



5,483,638

## MICROCOMPUTER WITH TEST MODE SWITCHING FUNCTION

Hiroshi Katsuta, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

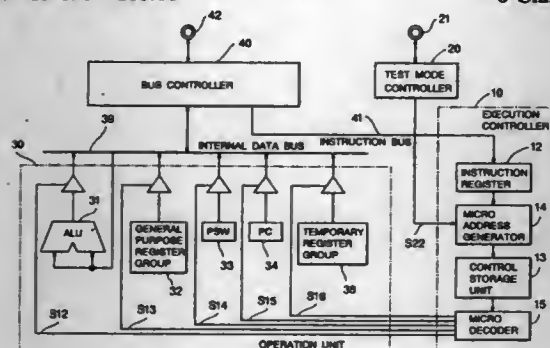
Filed Jun. 3, 1992, Ser. No. 893,118

Claims priority, application Japan, Jun. 6, 1991, 3-134540

Int. Cl.<sup>6</sup> G06F 11/00

U.S. Cl. 395—183.06

6 Claims



1. A microcomputer provided with test mode switching function, comprising:

operation unit for performing arithmetic and logical operations and selectively accessing an internal bus depending upon a control signal;

execution control unit for controlling the operation of said operation unit using a microprogram

bus control means, connected via said internal bus to said operation means and to said execution control means via an instruction bus, for controlling input/output of various instructions and processing data; and

test mode control means connected to said execution control means for controlling switching for a test mode,

said execution control means comprising control storage means for storing a microprogram, a micro decoder for outputting said control signal depending upon a microinstruction read out from said control storage means, an instruction register for storing an instruction to be executed input via said bus control means, a micro address generating means for generating an address for reading out said microinstruction from said control storage means depending upon said instruction in said instruction register,

said test mode control means being connected to said micro address generating means, and

said micro address generating means being responsive to said test mode, for generating said address, irrespective of said instruction, and for supplying said address to said control storage means,

said micro decoder setting said control signal in a predetermined logical state in response to said microinstruction read out from said control storage means depending upon said address and inhibiting access of said operation means to said internal bus,

wherein said micro address generating means comprises:

an instruction decoder to decode the instruction from said instruction register; and

a number of gate circuits, the number of which corresponds to the number of bits contained in the address, an output of said instruction decoder being input to a first input terminal of each of said gate circuits and said test mode being input to a second input terminal of each of said gate circuits.

5,483,639

## DEVICE FOR DETECTING TRANSMISSION ERRORS IN BALANCED TWO-WIRE BUS LINES AND TWO-BUS INTERFACES

Bernd Haeussler, Ostfildern; Max Reeb, Utingen, and Karl-Heinz Mueller, Friedrichshafen, all of Germany, assignors to Mercedes-Benz AG, Germany

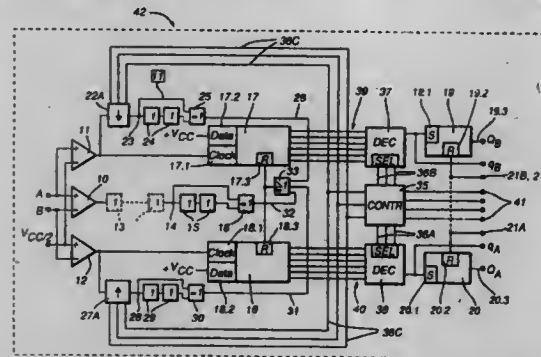
Filed Mar. 14, 1994, Ser. No. 212,885

Claims priority, application Germany, Mar. 12, 1993, 43 07 794.3

Int. Cl.<sup>6</sup> H04L 29/14; 12/26

U.S. Cl. 395—183.19

12 Claims



1. Device for monitoring balanced two-wire bus lines and two-wire bus interfaces for serial data transmission, the bus lines and the bus interfaces having first and second line conductors that change their polarity in antiphase in the normal state, the device comprising:

first, second and third comparison means, the first comparison means having a positive input operationally connected to the first bus conductor and a negative input connected to a reference potential ( $V_{cc}/2$ ); the second comparison means having a negative input connected to the second bus conductor and a positive input connected to said reference potential ( $V_{cc}/2$ ); and the third comparison means having an input side connected to the first and second bus conductors;

a first shift register or counter having a clock input operationally connected to an output of the first comparison means;

a second shift register or counter having a clock input operationally connected to an output of the second comparison means; means for processing signal edges to form pulses; the means for processing being connected downstream of the third comparison means and having an output connected to reset inputs of the shift registers or counters;

wherein the shift registers or counters each have at least one output, and wherein a first error status signal responsive to an error in the first bus conductor is generated at an output of said second shift register or counter, and a second error status signal responsive to an error in the second bus conductor is generated at an output of said first shift register or counter.

5,483,640

## SYSTEM FOR MANAGING DATA FLOW AMONG DEVICES BY STORING DATA AND STRUCTURES NEEDED BY THE DEVICES AND TRANSFERRING CONFIGURATION INFORMATION FROM PROCESSOR TO THE DEVICES

Mark S. Isfeld, and Bruce W. Mitchell, both of San Jose, Calif., assignors to 3Com Corporation, Santa Clara, Calif.

Filed Feb. 26, 1993, Ser. No. 23,927

Int. Cl.<sup>6</sup> G06F 13/00

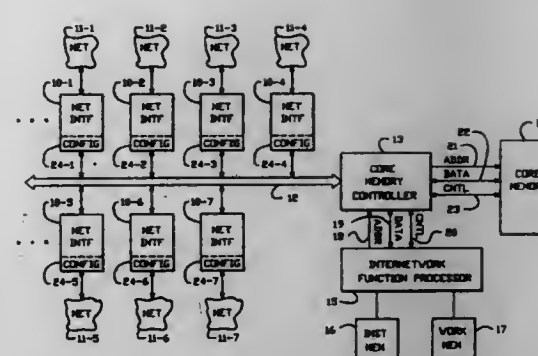
U.S. Cl. 395—200.03

30 Claims

1. An apparatus for managing data flow among a plurality of input/output devices, comprising:

a core memory storing I/O data and control structures needed by the input/output devices;

a processor, including local memory isolated from the core memory and storing control information and instructions used



by routines executed by the processor managing data flow among the input/output devices;

a first memory interface responsive to the plurality of input/output devices, including means, in communication with the plurality of input/output devices and the core memory, for transferring I/O data and control data between the input/output devices in the plurality of input/output devices and the I/O data and control structures in the core memory;

a second memory interface responsive to the processor, including means in communication with the processor and the core memory, for transferring control data between control structures and I/O data in the core memory and the processor, and;

a configuration interface, coupled with the plurality of input/output devices and the processor, for transferring control and status information concerning control structures and I/O data in the core memory between the plurality of input/output devices and the processor.

5,483,641

## SYSTEM FOR SCHEDULING READAHEAD OPERATIONS IF NEW REQUEST IS WITHIN A PROXIMITY OF N LAST READ REQUESTS WHEREIN N IS DEPENDENT ON INDEPENDENT ACTIVITIES

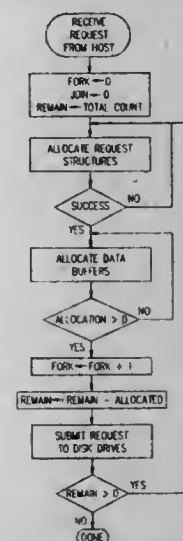
Craig S. Jones, Austin; Kenneth L. Jeffries, Leander, and Terry J. Parks, Round Rock, all of Tex., assignors to Dell USA, L.P., Austin, Tex.

Filed Dec. 17, 1991, Ser. No. 810,277

Int. Cl.<sup>6</sup> G06F 13/14

U.S. Cl. 395—823

14 Claims



1. A method of operating one or more disk drives through a disk drive controller which is interfaced through a bus to a host computer, wherein the disk drive controller receives read operations from the host computer which each include one or more addresses comprising the steps of:

monitoring, in the controller the addresses of the last n disk read operations, where n is a programmable parameter and is greater than one, and wherein the value of n is set dependent on the number of independent activities executing within the host computer;

comparing, in the controller, the address of each new disk read operation with the addresses of the last n disk read operations; scheduling a readahead operation if and only if a new read request is found to specify an address which is in proximity to an address of one of the last n disk read operations;

determining an amount of data specified by said new read request; and

performing said read ahead operation by reading a block of data having a length which is a multiple of said amount of data specified by said new read request.

5,483,642

## BUS SYSTEM FOR USE WITH INFORMATION PROCESSING APPARATUS

Koichi Okazawa, Tokyo; Koichi Kimura; Hitoshi Kawaguchi, both of Yokohama; Ichiharu Aburano, Hitachi; Kazushi Kobayashi, Ebina, and Tetsuya Mochida, Yokohama, all of Japan, assignors to Hitachi, Ltd.

Continuation of Ser. No. 705,701, May 23, 1991, abandoned.

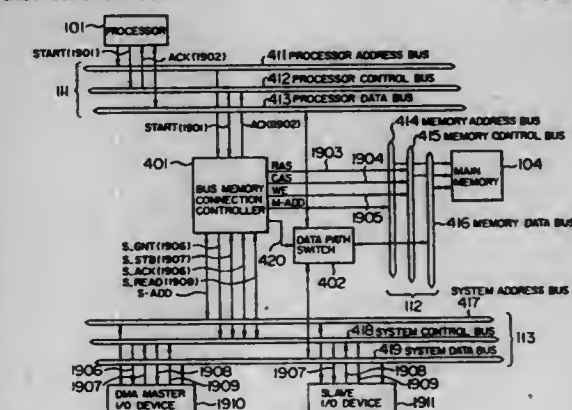
This application Sep. 26, 1994, Ser. No. 311,893

Claims priority, application Japan, Jun. 4, 1990, 2-144301; May 10, 1991, 3-105536

Int. Cl.<sup>6</sup> G06F 13/00

U.S. Cl. 395—306

20 Claims



17. An information processing system comprising:

a processor;

a processor bus connected to said processor;

a main storage;

a memory bus connected to said main storage;

a connected device;

a system bus connected to said connected device; and

a three-way connection controller for connecting said processor bus, said memory bus and said system bus for enabling independent operations thereamong and including:

connection controller means connected to control buses and address buses of said processor bus, said memory bus and said system bus responsive to a control signal and an address signal provided from said processor to said processor bus, a control signal and an address signal provided from said main storage to said memory bus, and a control signal and an address signal provided from said connected device to said system bus for controlling said processor bus, said memory bus and said system bus to output a data bus control signal when said transfer operation is made through a plurality of buses among said processor bus, said memory bus and said system bus; and,

data switch means connected to respective data buses of said processor bus, said memory bus and said system bus and responding to said data bus control signal provided from said connection controller means for indicating connection

between two data buses from among said processor bus, said memory bus and said system bus wherein said dam switch means comprises:

a plurality of latch means each provided for said processor bus, said memory bus and said system bus for latching data on said data buses wherein said data buses comprise a data bus of said processor bus, a data bus of said memory bus and a data bus of said system bus;

first generate means for generating a select signal in response to said data bus control signal provided from said connection controller means; and

a plurality of first select means each provided for said processor bus, said memory bus and said system bus and responding to said select signal provided from said first generate means for selecting two among three outputs of said latch means for said processor bus, said memory bus and said system bus.

5,483,643

### CONTROL CIRCUIT FOR DATA TRANSFER BETWEEN A MAIN MEMORY AND A REGISTER FILE

Yuichi Sato, Ibaragi, Japan, assignor to NEC Corporation, Tokyo, Japan

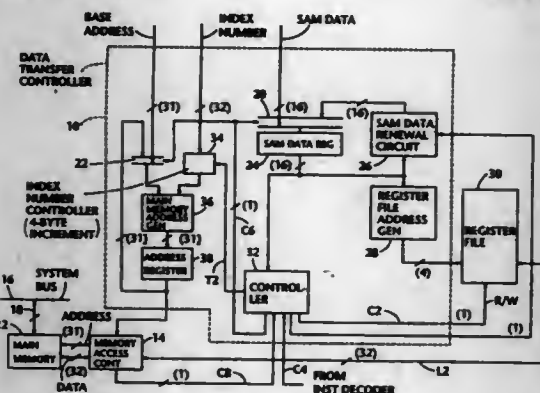
Filed Mar. 30, 1993, Ser. No. 39,788

Claims priority, application Japan, Mar. 30, 1992, 4-74529

Int. Cl. G06F 12/02; 13/00

U.S. Cl. 395—401

6 Claims



1. A control circuit for data transfer between a main memory and a register file using a save area mask (SAM) data applied to said control circuit, comprising:

first means for selecting one of first and second inputs, said first means selecting said first input which corresponds to said SAM data applied to said control circuit;

second means coupled to receive said SAM data selected by said first means, said second means generating a register file address using said SAM data received, said register file address specifying a location of a register of a register group to be accessed in said register file;

third means coupled to said first means, said third means renewing said SAM data selected by said first means for addressing another register of said register group, said third means supplying said first means with said SAM data renewed as said second input;

fourth means coupled to said first means, said fourth means generating a first control signal which assumes a first logic state if detecting information of register file addressing in said SAM data selected by said first means, said first logic state assuming a second logic state if detecting no information of said register file addressing in said SAM data selected by said first means or if receiving no SAM data from said first means, said first control signal being applied to said first means, wherein said first means selects said first input in response to said second logic state and allows said first means to select said second input in response to said first logic state.

5,483,644

### METHOD FOR INCREASING CACHEABLE ADDRESS SPACE IN A SECOND LEVEL CACHE

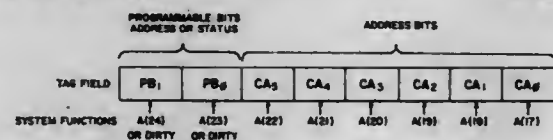
Nicholas J. Richardson, Tempe, Ariz., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Apr. 15, 1993, Ser. No. 48,710

Int. Cl. G06F 12/00; 13/00

U.S. Cl. 395—403

3 Claims



2. A method for increasing the address range of a cache system having a cache memory comprised of a plurality of cache entries, said method comprising the steps of:

providing a plurality of cache tag field memory locations corresponding to each cache entry, each cache tag field memory location having a plurality of bits comprising address bits and status bits;

replacing said status bits with programmable bits;

storing a portion of address data in said address bits; and

programming at least one of said programmable bits with another portion of said address data to provide an additional address bit.

5,483,645

### CACHE ACCESS SYSTEM FOR MULTIPLE REQUESTORS PROVIDING INDEPENDENT ACCESS TO THE CACHE ARRAYS

Thang M. Tran, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

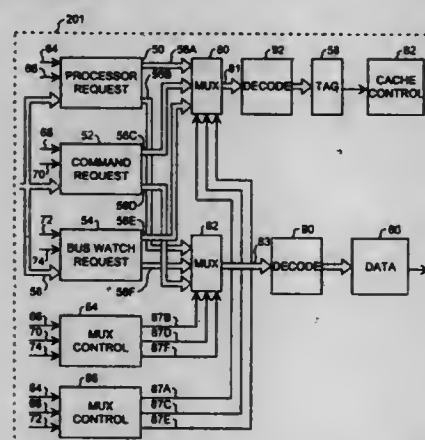
Continuation of Ser. No. 603,545, Oct. 26, 1990, abandoned.

This application Feb. 22, 1993, Ser. No. 20,370

Int. Cl. G06F 13/16

U.S. Cl. 395—403

29 Claims



1. A cache memory means apparatus comprising:

a first addressable array means in the cache memory means;

a second addressable array means in the cache memory means;

first request receiving means, connected between an address bus means and said first and second addressable array means, for receiving first address information from said address bus means and for receiving first request signals from a first source means and for accessing said first and second array means using said first address information;

second request receiving means, connected between said address bus means and said first and second addressable array means, for receiving second address information from said address bus means and for receiving second request signals from a second source means and for accessing said first and second means using said second address information; and

transmitting means, connected between said first and second request means and said first and second addressable array means for selectively using said first and second request signals for simultaneously transmitting a portion of said first address information to one of said first or second addressable array means while a portion of said second address information is selectively transmitted to the other of said first and second addressable array means.

5,483,646

### MEMORY ACCESS CONTROL METHOD AND SYSTEM FOR REALIZING THE SAME

Hiroshi Uchikoga, Hamura, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 29,998, Mar. 11, 1993, abandoned, which is a continuation-in-part of Ser. No. 557,000, Jul. 25, 1990, abandoned. This application May 23, 1994, Ser. No. 247,399

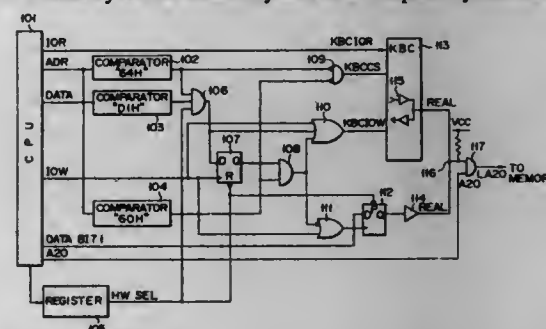
Claims priority, application Japan, Sep. 29, 1989, 1-252192

Int. Cl. G06F 13/00

U.S. Cl. 395—427

10 Claims

1. A memory access control system in a computer system having



a memory, comprising:

central processing means for outputting a data write request, and a request for disabling memory access to a limited range of memory space addresses;

a keyboard controller, connected to said central processing means, for selectively outputting a first disable signal which disables access to the limited range of memory space addresses in response to the data write request and the request for disabling memory access;

monitoring means, connected to said central processing means, for detecting the data write request and the request for disabling memory access;

disabling means, connected to said monitoring means, for selectively generating a second disable signal which disables access to the limited range of memory space addresses in response to a detection of the data write request and the request for disabling memory access by said monitoring means; and

selecting means, connected to said keyboard controller and said disabling means, for selecting the generation of one of: the first disable signal, and the second disable signal.

5,483,647

### SYSTEM FOR SWITCHING BETWEEN TWO DIFFERENT OPERATING SYSTEMS BY INVOKING THE SERVER TO DETERMINE PHYSICAL CONDITIONS TO INITIATE A PHYSICAL CONNECTION TRANSPARENT TO THE USER

Kin C. Yu, Burlington; Charles T. Mighill, Arlington; Teresa L. C. Wu, Watertown, all of Mass.; Christopher R. M. Bailey, Hollis, N.H., and Steven D. Lizotte, Dracut, Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.

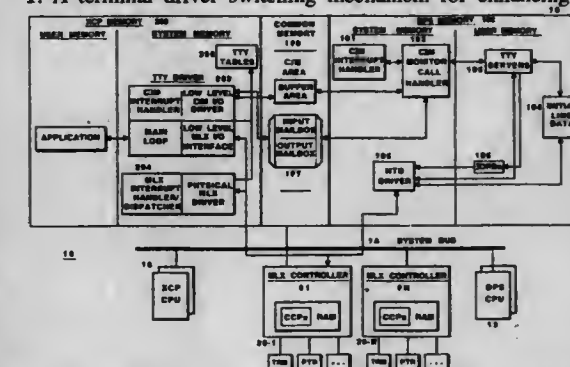
Filed Dec. 17, 1992, Ser. No. 992,945

Int. Cl. G06F 3/00; 3/02; 13/00; 13/14

U.S. Cl. 395—500

23 Claims

1. A terminal driver switching mechanism for enhancing the



connectivity of a number of terminals in a data processing system comprising a first central processing unit (CPU) operating under the control of a first operating system, a second central processing unit operating under the control of a second operating system incompatible to said first operating system, a main memory and a plurality of controllers, said plurality of controllers including a number of multiline controllers connected to said number of terminals through a corresponding number of lines, said main memory, said plurality of controllers being tightly coupled to said first and second central processing units, said main memory including a communications area for establishing communications between said first and second operating systems; a first memory area for storing system and application components including a terminal driver (TTY) module including a low level driver for performing input/output operations for said applications running under said first operating system and a second memory area for storing system and application components of said second operating system including a server module and a network terminal driver (NTD) module used for performing input/output operations for user applications running under the control of said second operating system and for applications running under said first operating system in a virtual mode of operation for terminals connected to said lines of said controllers through said communications area, said TTY, server and NTD modules, said terminal driver switching mechanism comprising:

said TTY module further including an interface and driver selection means coupled to said low level driver and to said interface;

a multiplexer driver module included in said first operating system, said driver module being operatively coupled to said interface of said TTY module; and,

said server module including means coupled to said NTD module, said server means in response to a switching of any one of said terminals from said second operating system to said first operating system to operate in said virtual mode, causing said NTD module to obtain connection information for transfer to said TTY module, said connection information enabling said driver selection means to establish connection of said one of said terminals to said multiplexer driver module in lieu of connection to said low level driver for transparently handling user application input/output operations previously required to be handled by said second operating system thereby improving overall system performance.



5,483,648

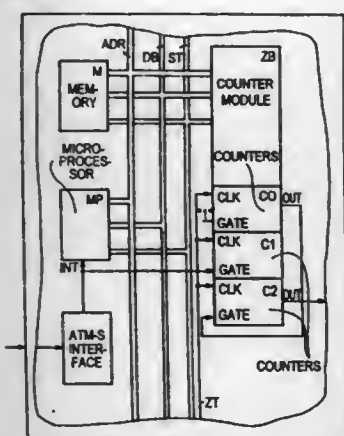
# CIRCUIT FOR DETERMINING THE ARRIVAL TIMES OF CONTROL SIGNALS SUPPLIED TO MICROPROCESSORS

Walter Rokitsky, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany  
 Filed Aug. 18, 1994, Ser. No. 292,041  
 Claims priority, application Germany, Aug. 30, 1993, 43 29 153.8

Int. Cl.<sup>6</sup> G06F 1/14

U.S. Cl. 395—550

9 Claims



1. A circuit for determining the arrival times of control signals supplied to a microprocessor comprising:  
 means for supplying a control signal to the microprocessor;  
 free-running cycle counter means connected to a bus system of the microprocessor for counting clock pulses occurring periodically with a repetition rate which corresponds to a multiple of a repetition rate of said control signals, said free-running cycle counter means providing a first momentary counter reading upon receiving a read command delivered by the microprocessor via the bus system upon the occurrence of each of said control signals;  
 triggerable counter means also connected to the bus system for counting said clock pulses only after triggering by said control signal, said triggerable counter means providing a second momentary counter reading upon receiving said read command; and  
 a means in the microprocessor for determining an arrival time of said control signal based on a difference between the first and the second momentary counter readings.

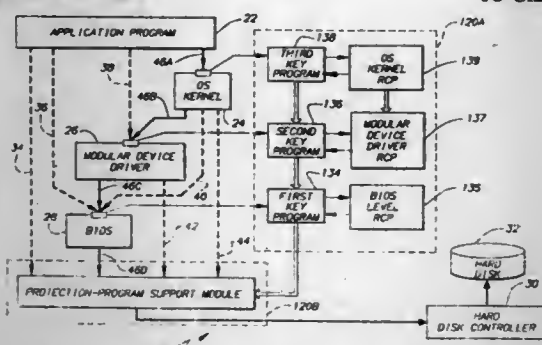
5,483,649

# PERSONAL COMPUTER SECURITY SYSTEM

Oleg V. Kuznetsov, and Dmitry A. Luchuk, both of Kiev, Ukraine, assignors to YBM Technologies, Inc., Hatboro, Pa.  
 Filed Jul. 1, 1994, Ser. No. 269,591  
 Int. Cl.<sup>6</sup> G06F 12/14

U.S. Cl. 395—186

38 Claims



19. A system of protecting data stored on the hard disk of a personal computer from inadvertent or intentional distortion, the

personal computer having a central processing unit and memory, a hard disk controller having a command register, a hard disk, an address bus, a data bus, a control bus, and peripheral devices coupled thereto, the memory comprising a basic input/output system, a modular device driver, an operating system kernel, an application program and an interrupt vector table containing original interrupt handlers, said system comprising  
 means for establishing a single access path to the hard disk controller from the application program;  
 said means for establishing only one access path comprises means for monitoring requests by the application program to the operating system kernel, the modular device driver and the basic input/output system;  
 said means for establishing only one access path further comprises a protection-program support module that permits the servicing of only those requests that utilize the operating system kernel, the modular device driver and the basic input/output system while precluding the servicing of any other requests and wherein said means for monitoring requests by the application program resides in a memory in said protection program support module; and  
 said protection-program support module being coupled to the personal computer address, data and control busses and being operable in a neutral mode thereby allowing servicing of those requests utilizing the operating system kernel, the modular device driver, and the basic input/output system or being operable in any other working mode thereby preventing the servicing of requests; and  
 said protection-program support module comprising a first memory and a second memory, said first memory being inaccessible to the central processing unit and said second memory being accessible to the central processing unit.

5,483,650

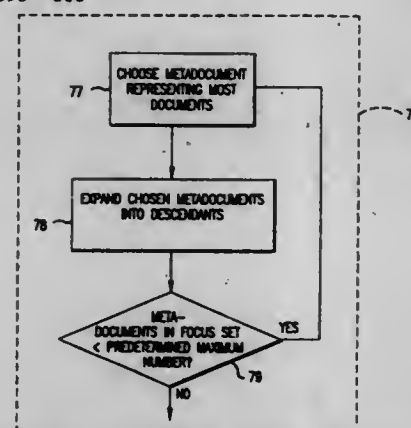
# METHOD OF CONSTANT INTERACTION-TIME CLUSTERING APPLIED TO DOCUMENT BROWSING

Jan O. Pedersen, Palo Alto; David R. Karger, Stanford, and Douglass R. Cutting, Menlo Park, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 790,316, Nov. 12, 1991, Pat. No. 5,442,778. This application Jun. 21, 1993, Ser. No. 79,292  
 Int. Cl.<sup>6</sup> G06F 17/30

U.S. Cl. 395—600

13 Claims



1. A method of processing a corpus of electronically stored documents, comprising the steps of:  
 expanding a focus set comprised of at least one initial metadocument, representative of a plurality of documents, into a plurality of subsequent metadocuments, a number of said subsequent metadocuments being approximately equal to a predetermined maximum number, said subsequent metadocuments being descendants of said at least one initial metadocument in a tree, said expanding step comprising,

5,483,652

# MECHANISM FOR LOCATING WITHOUT SEARCH DISCRETE APPLICATION RESOURCES KNOWN BY COMMON NAME ONLY IN A DISTRIBUTED NETWORK COMPUTING ENVIRONMENT

Ram Sudama, Concord; David L. Magid, Worcester, and Kenneth W. Ouellette, Groton, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jan. 24, 1994, Ser. No. 185,617

Int. Cl.<sup>6</sup> G06F 17/30

U.S. Cl. 395—600

16 Claims

choosing a metadocument in the focus set that represents the most individual documents, and  
 expanding the chosen metadocument into its descendant metadocuments; and  
 clustering the subsequent metadocuments into a predetermined number of new metadocuments, the predetermined number of new metadocuments being less than the predetermined maximum numbers, and  
 selecting the predetermined maximum number so that said expanding and clustering steps can be completed within a time constraint.

5,483,651

# GENERATING A DYNAMIC INDEX FOR A FILE OF USER CREATABLE CELLS

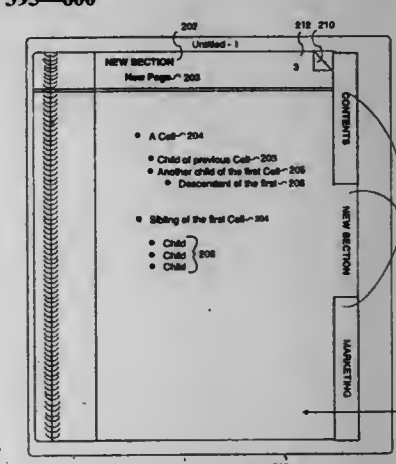
Jayson L. Adams, Menlo Park, and R. Scott Love, Palo Alto, both of Calif., assignors to Millennium Software, Menlo Park, Calif.

Filed Dec. 3, 1993, Ser. No. 162,489

Int. Cl.<sup>6</sup> G06F 17/30; 17/24

U.S. Cl. 395—600

27 Claims



27. A computer-implemented process for generating a dynamic index for a file, the file comprising a plurality of user creatable cells containing data, comprising the steps of:

- (a) initializing at least one index associated with the cells;
- (b) accepting an input representing an event on a cell;
- (c) determining the type of the event;
- (d) responsive to the event being an addition of data to a cell, storing in the index a new index entry corresponding to the cell;
- (e) responsive to the event being a modification of a cell, performing the steps of:  
 (e.1) removing from the index an index entry corresponding to the cell; and  
 (e.2) storing in the index a new index entry corresponding to the cell;
- (f) responsive to the event being a deletion of data from a cell, removing from the index an index entry corresponding to the cell;
- (g) selectively displaying a representation of a selected index; and
- (h) responsive to user input, selectively displaying one or more cells corresponding to a selected index entry.

5,483,653

# PRINTING SYSTEM WITH FILE SPECIFICATION PARSING CAPABILITY

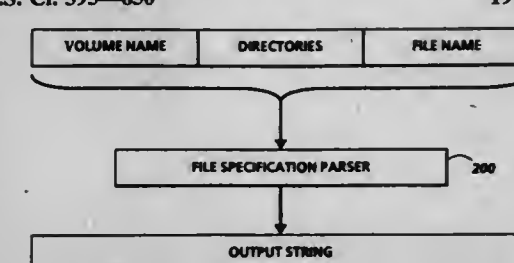
Lisa D. Furman, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 2, 1993, Ser. No. 42,195

Int. Cl.<sup>6</sup> G06F 3/12; 13/14

U.S. Cl. 395—650

19 Claims



1. A data processing system for outputting selected data from a data file with a data output device, the data file being identified by





within the instruction group and yet is different for each of said instruction groups;  
the data driven processor executing the mapped version of the data flow program according to the destination information determined by the setting means of the mapping apparatus such that data packet collisions that would otherwise occur are eliminated.

5,483,658

# DETECTION OF UNAUTHORIZED USE OF SOFTWARE APPLICATIONS IN PROCESSING DEVICES

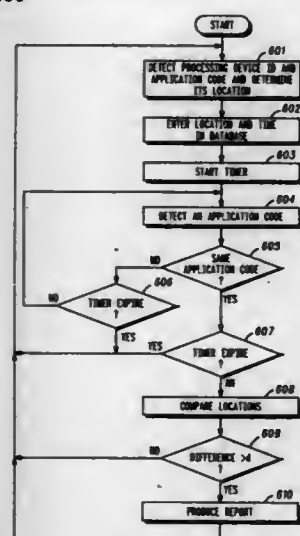
Gary W. Grube, 157 Cedarwood Ct., Palatine, Ill. 60067, and Timothy W. Markison, 555 Northview La., Hoffman Estates, Ill. 60194

Filed Feb. 26, 1993, Ser. No. 23,298

Int. Cl.<sup>6</sup> H04L 9/00

U.S. Cl. 395-800

3 Claims



1. A method for detecting unauthorized duplication of software applications in at least one processing device that includes a radio link, the method comprises the steps of:

- a) when a first processing device is communicating with a communication system via the radio link, detecting, by a monitoring computer, a unique identity of the first processing device and a software application code;
- b) when a second processing device is communicating with the communication system via the radio link, detecting, by the monitoring computer, a unique identity of the second processing device and a software application code;
- c) when the unique identity and the software application code of the first processing device and the second processing device are detected, comparing, by the monitoring computer, the software application code of the first processing device with the software application code of the second processing device; and
- d) when the software application code of the first processing device matches the software application code of the second processing device, identifying, by the monitoring computer, that the first processing device and the second processing device have unauthorized duplication of at least one software application.

## APPARATUS FOR CONTROLLING A SIGNAL PROCESSING SYSTEM TO OPERATE IN HIGH AND LOW SPEED MODES

Kimio Yamamura, c/o Tokyo Office of Hudson Soft Co. Ltd., Hudson Building 1-1, Ichigayatamachi 3-chome, Shinjuku-ku, Tokyo, Japan

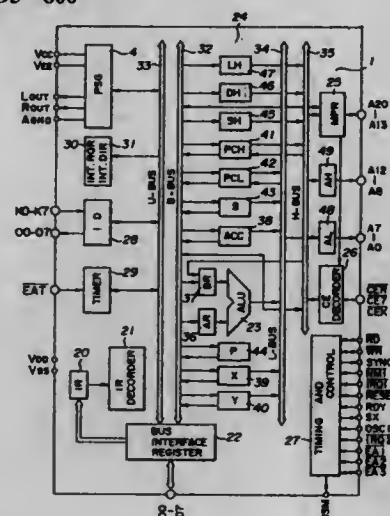
Continuation of Ser. No. 876,807, Apr. 30, 1992, abandoned, which is a continuation of Ser. No. 696,274, May 2, 1991, abandoned, which is a continuation of Ser. No. 247,440, Sep. 6, 1988, abandoned. This application Oct. 18, 1993, Ser. No. 137,213

Claims priority, application Japan, Sep. 14, 1987, 62-230673; Sep. 14, 1987, 62-230675

Int. Cl.<sup>6</sup> G06F 9/00

U.S. Cl. 395-800

5 Claims



4. In an apparatus for generating a video signal to be displayed including a read only memory (ROM) and a central processing unit (CPU) having a clock input terminal for receiving an externally applied clock signal and a scaling means for selectively scaling said externally applied clock signal to provide a scaled clock signal to a peripheral device via a common clock output terminal, a method of generating the video signal responsive to a stored program having a plurality of instructions, comprising the steps of:

- storing said program in said ROM;
- receiving said externally applied clock signal at said clock input terminal of said CPU;
- said scaling means of said CPU selectively scaling said external clock signal by first and second divisors in response to a change speed command to provide a scaled clock signal to a peripheral circuit via a common clock output terminal, said scaled clock signal having a frequency which is a selected sub-multiple of said externally applied clock signal;
- retrieving an instruction of said program from said program memory in response to said scaled clock signal;
- supplying said control signal for selectively scaling said external clock signal to said peripheral circuit for control thereof in response to said program instruction during continuous processing operation without processing initialization; and
- supplying the video signal in response to the program and to said scaled clock signal, wherein the apparatus changes from a low speed mode to a high speed mode after one bus cycle passes in accordance with said change speed command, and a non-operation command is provided between a change speed high command and a change speed low command.

## METHOD AND APPARATUS FOR PERFORMING MULTIPLEXED AND NON-MULTIPLEXED BUS CYCLES IN A DATA PROCESSING SYSTEM

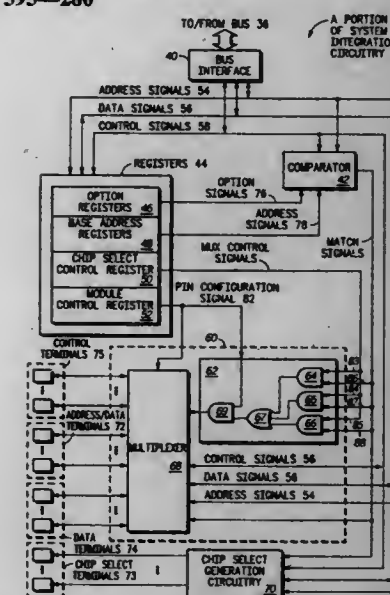
Oded Yishay; Joseph Jelemensky; Ann E. Harwood, and Javier Saldana, all of Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.

Filed Nov. 29, 1993, Ser. No. 158,584

Int. Cl.<sup>6</sup> G06F 13/38

U.S. Cl. 395-280

21 Claims



1. A data processing system, comprising:

- a first plurality of bus terminals;
- a second plurality of bus terminals;
- a first control register portion for storing a first control value, said first control register portion selecting a non-multiplexed mode if the first control value has a first mode value and selecting a multiplexed mode if the first control value has a second mode value;
- a second control register portion for storing a second control value, said second control register portion selecting the non-multiplexed mode if the second control value has the first mode value and selecting the multiplexed mode if the second control value has the second mode value;
- a comparator for determining if a plurality of address signals is within a first predetermined address range and for determining if the plurality of address signals is within a second predetermined address range, said comparator providing a comparison result value; and

control means for receiving the first and second control values and for receiving the comparison result value, if the first control value has the first mode value and the comparison result value indicates that the plurality of address signals is within the first predetermined address range, said control means transfers the plurality of address signals on said first plurality of bus terminals and transfers a plurality of data signals on said second plurality of bus terminals, if the first control value has the second mode value and the comparison result value indicates that the plurality of address signals is within the first predetermined address range, said control means transfers the plurality of address signals on a predetermined one of the first plurality of bus terminals and the second plurality of bus terminals and transfers the plurality of data signals on said predetermined one of the first plurality of bus terminals and the second plurality of bus terminals if the second control value has the first mode value and the comparison result value indicates that the plurality of address signals is within the second predetermined address range, said control means transfers the plurality of address signals on said first plurality of bus terminals and transfers the plurality of data signals on said second plurality of bus terminals if the second control value has the second mode value and the

comparison result value indicates that the plurality of address signals is within the second predetermined address range, said control means transfers the plurality of address signals on said predetermined one of the first plurality of bus terminals and the second plurality of bus terminals and transfers the plurality of data signals on said predetermined one of the first plurality of bus terminals and the second plurality of bus terminals, said control means being coupled to said first plurality of bus terminals to said second plurality of bus terminals, to said first and second control register portions, and to said comparator.

5,483,661

## METHOD OF VERIFYING IDENTIFICATION DATA IN DATA DRIVEN INFORMATION PROCESSING SYSTEM

Shinichi Yoshida, Kashihara; Manabu Onozaki, Nara, and Tsuyoshi Muramatsu, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

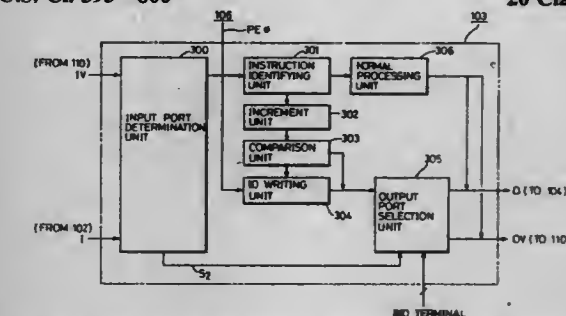
Filed Mar. 10, 1994, Ser. No. 208,477

Claims priority, application Japan, Mar. 12, 1993, 5-052075

Int. Cl.<sup>6</sup> G06F 15/00; 7/04

U.S. Cl. 395-800

20 Claims



1. In a data driven information processing system having an input and an output for a datapacket and including processors for processing a datapacket, and interconnections providing a plurality of paths through said processors between said input and said output, said processors having identification information stored therein, a plurality of input ports and a plurality of output ports, and means for dynamically selecting one of the output ports, a computer-implemented method of verifying that identification information allocated to said processors actually corresponds to the identification information stored in the processors comprising the computer implemented steps of:

- previously specifying a path for a datapacket via said processors from said input to a desired processor;
- applying, to said data driven information processing system at said input, a datapacket which stores log information specifying a total number of processors encountered by said datapacket along the path leading toward the desired processor and which stores a predetermined identification data verification instruction, the log information having been initialized to a preset value prior to the step b);
- a first transmission step of transmitting said datapacket along said specified path toward said desired processor while updating the log information in the datapacket indicating a number of processors encountered along said path, a processor being recognized as the desired processor as a function of the log information in the datapacket;
- producing a result datapacket, after a processor has been recognized as the desired processor, which stores the identification information read from said desired processor;
- of the data driven information processing system; and
- comparing said identification information stored in said result datapacket with reference identification information allocated to the desired processor, thereby ensuring that the identification information actually stored in the desired processor corresponds to the reference identification information allotted thereto.





5,483,667

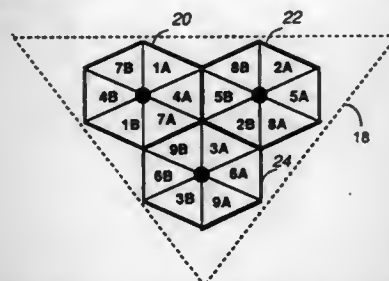
# **FREQUENCY PLAN FOR A CELLULAR NETWORK** Saleh M. Faruque, Brampton, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jul. 8, 1993, Ser. No. 89,083

Int. Cl.<sup>6</sup> H04Q 7/36; 7/30

U.S. Cl. 455—33.1

18 Claims



1. In a sixty degree sector transmit sector receive cellular network with an N=3 frequency plan wherein available channel frequencies are divided into eighteen frequency groupings, a method of assigning frequencies comprising the steps of:

forming a generally triangular first three-cell cluster; dividing each cell of the first three-cell cluster into six sectors; and

for said each cell, assigning, in an order, one frequency grouping to each sector to provide a separation of three channel frequencies between each sector within said each cell and a separation of at least seven channel frequencies between adjacent cells.

5,483,668

# **METHOD AND APPARATUS PROVIDING HANDOFF OF A MOBILE STATION BETWEEN BASE STATIONS USING PARALLEL COMMUNICATION LINKS ESTABLISHED WITH DIFFERENT TIME SLOTS**

Esa Malkamaki, Espoo, and Harri Jokinen, Helsinki, both of Finland, assignors to Nokia Mobile Phones Ltd., Salo, Finland

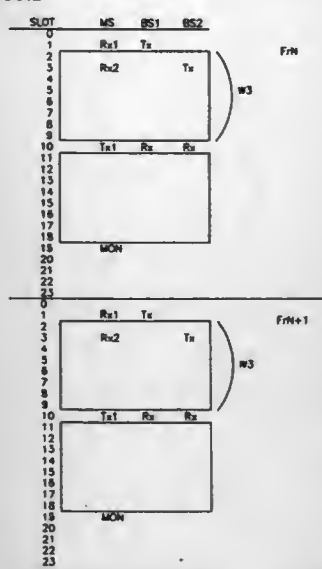
Filed Jun. 22, 1993, Ser. No. 80,934

Claims priority, application Finland, Jun. 24, 1992, 922938

Int. Cl.<sup>6</sup> H04B 7/26; H04Q 7/22

U.S. Cl. 455—33.2

21 Claims



14. In a cellular communications system, a method for performing a handover of a mobile station from a first base station to a second base station, comprising the steps of:

bidirectionally communicating information between the mobile station and the first base station using at least one time slot in

a first downlink communication channel and at least one second time slot in a first uplink communication channel; establishing communication between the mobile station and the second base station using at least one third time slot in a second downlink communication channel; communicating information from the mobile station to the first base station through the at least one second time slot in the first uplink communication channel while also simultaneously communicating the same information from the mobile station to the second base station through the at least one second time slot in the first uplink communication channel; and terminating bidirectional communication between the mobile station and the first base station while maintaining the established communication with the second base station using the at least one third time slot in the second downlink communication channel, thereby handing over the mobile station from the first base station to the second base station.

5,483,669

# **DYNAMIC THRESHOLDING FOR MOBILE ASSISTED HANDOFF IN A DIGITAL CELLULAR COMMUNICATION SYSTEM**

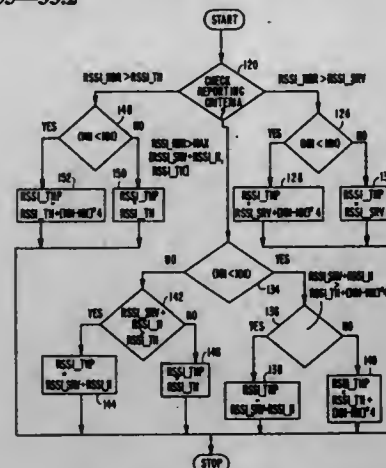
Charles A. Barnett, Sterling, Va.; Stanley E. Kay, Rockville, Md.; Lou King, Mt. Airy, Md., and Ashok D. Mehta, North Potomac, Md., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 9, 1993, Ser. No. 118,554

Int. Cl.<sup>6</sup> H04B 7/26; H04Q 7/22

U.S. Cl. 455—33.2

12 Claims



1. A method of selecting a neighboring cell for handoff of a communication with a mobile unit having a scanning capability, the method comprising:

selecting a dynamic threshold value in accordance with a value corresponding to a minimum attenuation level permitted by the neighboring cell and the minimum attenuation level of the mobile unit; and

selecting the neighboring cell at times when an RF signal strength of the neighboring cell measured at the mobile unit exceeds the dynamic threshold value.

5,483,670

# **TRUNKED RADIO REPEATER SYSTEM WITH CONTROL CHANNEL MONITORING FEATURE**

Jeffrey S. Childress, Lynchburg; Marc A. Dissosway, Forest; Gerald M. Cooper, Gretna, and Houston H. Hughes, III, Lynchburg, all of Va., assignors to Ericsson Ge Mobile Communications Inc., Lynchburg, Va.

Division of Ser. No. 860,159, Mar. 30, 1992, Pat. No.

5,274,837, which is a division of Ser. No. 464,053, Jan. 3,

1990, Pat. No. 5,125,102, which is a division of Ser. No.

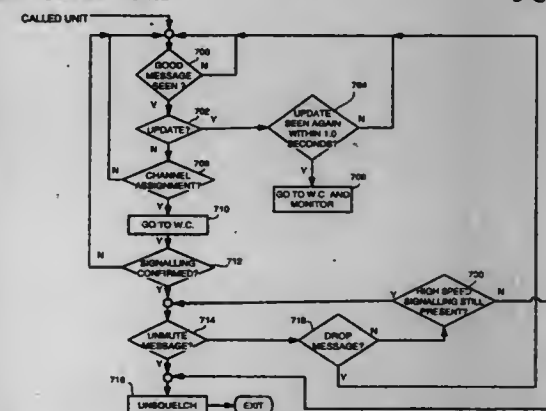
56,922, Jun. 3, 1987, Pat. No. 4,905,302. This application Aug.

12, 1993, Ser. No. 105,153

Int. Cl.<sup>6</sup> H04B 7/14

U.S. Cl. 455—34.1

5 Claims



1. A method for achieving reliable and prompt communication within a trunked radio repeater system having a digital control channel and plural working channels, which working channels are assigned for temporary use by individual radio units specified by digital control signals on the control channel, said method comprising the steps of:

in a non-called quiescent state, monitoring by an individual radio unit the control channel for channel assignments to each of multiple predetermined call groups of differing predetermined priorities including a first predetermined priority call group to which the individual radio unit is assigned and conducting a communicate on an assigned working channel with other radio units of the first predetermined priority call group in response to detection of such channel assignment; continuously monitoring the assigned working channel during said communicate for further sub-audible channel assignments to others of said plural predetermined call groups; and upon termination of the communicate involving the first predetermined priority call group, monitoring the control channel while temporarily disabling the monitoring of the control channel with respect to the multiple predetermined call groups other than the first predetermined priority call group for a predetermined time period.

5,483,671

# **METHOD OF DETERMINING TRANSMISSION TIME TO TRANSMIT AN INFORMATION PACKET TO A REMOTE BUFFER**

David Helm, Glendale Heights; Bill Felderman, Cary, and Mario DeRango, Lake Zurich, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

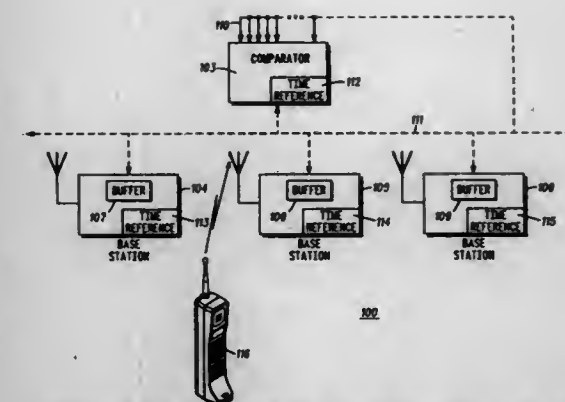
Filed Feb. 1, 1994, Ser. No. 189,617

Int. Cl.<sup>6</sup> H04B 1/00; H04Q 11/04

U.S. Cl. 455—51.2

8 Claims

1. A method, comprising the steps of:  
at a simulcast communications system comparator located at a first location:  
providing a plurality of information packets to be transmitted by at least one radio base station that has a buffer and that is located remotely from the first location;



determining at the comparator, and independent of any information transmitted from the at least one radio base station, at least one status condition of the buffer; determining a particular transmission time to transmit a particular information packet from the comparator to the buffer as a function of the at least one status condition.

5,483,672

# **METHOD FOR A COMMUNICATION UNIT THAT CONSERVE SOURCE ENERGY**

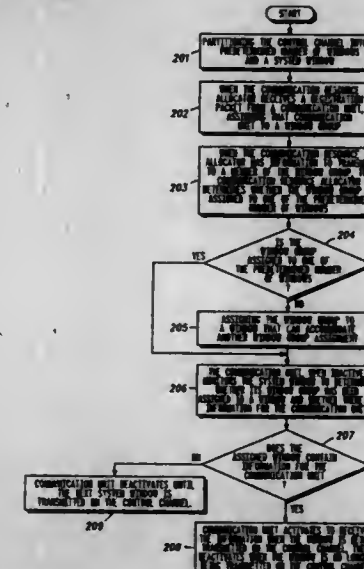
Michael D. Sasuta, Mundelein, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 30, 1992, Ser. No. 828,065

Int. Cl.<sup>6</sup> H04B 7/26

U.S. Cl. 455—54.1

12 Claims



1. In a communication system that includes a plurality of communication units, a limited number of communication resources that are transceived via a plurality of repeaters, and a communication resource allocator that allocates the limited number of communication resources among the plurality of communication units, wherein at least one of the limited number of communication resources serves as a control channel which continually transmits system information, a method for the communication system to allow a communication unit of the plurality of communication units to conserve source energy when monitoring the control channel, the method comprises the steps of:

a) partitioning the control channel into a predetermined number of windows and a system window, wherein the system window and the predetermined number of windows are transmitted in a round robin manner on the control channel;  
b) assigning, by the communication resource allocator, the communication unit to a first window group when the communication unit registers with the communication system;

- c) monitoring, by the communication unit, the system window to determine whether the first window group has been assigned to a first window of the predetermined number of windows when the communication unit is not transmitting or identified as an active communication unit;
- d) activating the communication unit to process at least part of the system information contained in the first window when the first window is being transmitted on the control channel; and
- e) deactivating the communication unit when the first window is not being transmitted on the control channel and when the at least part of the system information does not require the communication unit to remain active.

5,483,673

# METHOD AND APPARATUS FOR PROVIDING ACCESS TO A COMMUNICATION SYSTEM

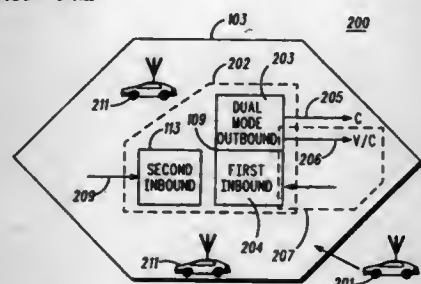
Bradley M. Hiben, 437 Hill Ave., Glen Ellyn, Ill. 60137; Donald G. Newberg, 2620 College Hill Cir., Schaumburg, Ill. 60173, and Robert D. LoGalbo, 962 Tallgrass Dr., Bartlett, Ill. 60103

Filed Nov. 17, 1993, Ser. No. 153,403

Int. Cl.<sup>6</sup> H04B 7/00

U.S. Cl. 455-54.2

9 Claims



1. In a base station that provides communication services to a plurality of communication units, the base station employing a first inbound communication resource, a second inbound communication resource, and a dual-mode outbound communication resource, a method of providing access to a communication system for the plurality of communication units, the method comprising the steps of:

- A) receiving, on the second inbound communication resource from a requesting communication unit of the plurality of communication units, a request for an available message path;
- B) when the dual-mode outbound communication resource is operating in a control mode, assigning a message path to at least the requesting communication unit, wherein the message path includes the first inbound communication resource and the dual-mode outbound communication resource operating in a partial control mode; and
- C) establishing, responsive to the step of assigning, a communication between the requesting communication unit and a second communication unit of the plurality of communication units, using the message path.

5,483,674

# METHOD FOR ESTABLISHING A LOGICAL CONNECTION BETWEEN SITES, SITE CONTROLLERS, AND A SWITCHING CENTER IN A RADIO COMMUNICATION SYSTEM

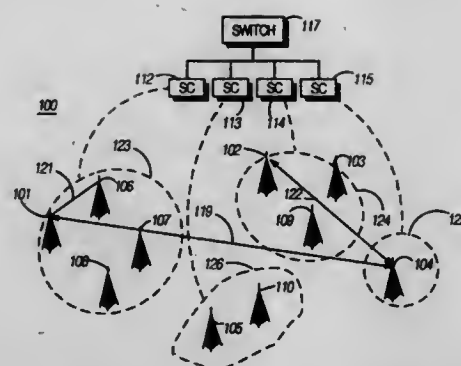
Israel A. Cimmet, 891 Silver Rock La., Buffalo Grove, Ill. 60089  
Filed Jan. 7, 1994, Ser. No. 178,971

Int. Cl.<sup>6</sup> H04B 17/00; H02/724; H04M 11/00

U.S. Cl. 455-56.1

26 Claims

1. In a radio communication system that includes a plurality of communication resources, a plurality of sites, and a plurality of site controllers, each site of the plurality of sites providing at least one communication resource of the plurality of communication



resources, a method for establishing a logical connection between the plurality of sites and the plurality of site controllers, the method comprising the steps of:

- a) determining geographical separation between each pair of the plurality of sites and selecting a first site of a first pair of the plurality of sites, wherein geographical separation between the first pair exceeds geographical separation between any other pair of the plurality of sites;
- b) selecting at least a second site of the plurality of sites, such that the first site and the at least a second site combine to produce a group of selected sites, wherein the group of selected sites provides not more than a predetermined number of the plurality of communication resources that can be accommodated by a first site controller of the plurality of site controllers;
- c) assigning the group of selected sites to the first site controller;
- d) selecting a third site of a second pair of the plurality of sites, wherein geographical separation between the second pair exceeds geographical separation between any pair among those sites of the plurality of sites not yet selected; and
- e) assigning the third site to a second site controller of the plurality of site controllers to establish the logical connection between the plurality of sites and the plurality of site controllers.

5,483,675

# LOGGING RECORDER SYSTEM FOR TRUNKING RADIO

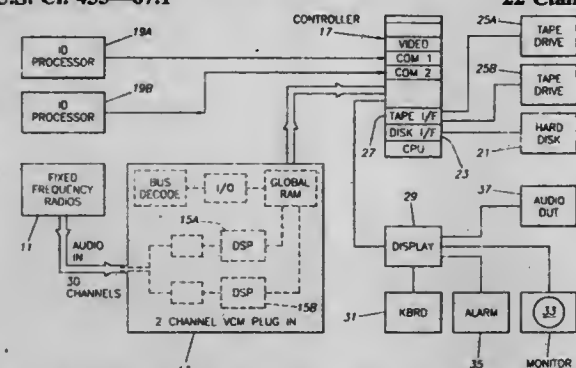
Carl J. Swift, Houston, Tex., assignor to Swift Computers, Inc., Houston, Tex.

Filed Jun. 29, 1993, Ser. No. 85,124

Int. Cl.<sup>6</sup> H04B 17/00; H04Q 7/28

U.S. Cl. 455-67.1

22 Claims



1. A logging recorder for a trunking radio system having a plurality of channels, wherein one of said channels carries channel assignment information and each of the others of said channels for carrying streams of segments from unrelated conversations, comprising:

- a plurality of fixed frequency radios each of which monitors a selected one of said plurality of channels;
- a controller which monitors said fixed frequency radios and generates identification information corresponding to said

segments for each particular conversation based upon said channel assignment information; and means for storing said segments and said identification information on a mass storage device.

5,483,676

# MOBILE RADIO DATA COMMUNICATION SYSTEM AND METHOD

Ronald L. Mahany; Marvin L. Sojka, and Guy J. West, all of Cedar Rapids, Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa

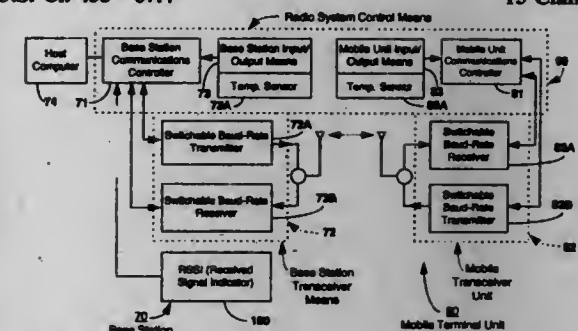
Continuation of Ser. No. 800,977, Dec. 2, 1991, abandoned, which is a continuation-in-part of Ser. No. 389,727, Aug. 4, 1989, Pat. No. 5,070,536, which is a continuation-in-part of Ser. No. 228,355, Aug. 4, 1988, Pat. No. 4,910,794. This application Feb. 2, 1994, Ser. No. 191,148

The portion of the term of this patent subsequent to Mar. 20, 2007, has been disclaimed.

Int. Cl.<sup>6</sup> H04B 17/00; H04J 3/22

U.S. Cl. 455-67.4

15 Claims







upon not finding an unused storage location, terminating the searching and storing method;  
 automatically searching, by the controller, for an active signal by scanning said plurality of frequencies to sequentially identify a presently received frequency and testing said presently received frequency for a signal, and  
 upon finding said signal on said presently received frequency, storing a frequency number corresponding to said presently received frequency in said unused storage location, by the controller.

5,483,685

### QUICK CHANNEL SELECTION SYSTEM FOR BROADCAST AREAS HAVING SMALL NUMBER OF ACTIVE CHANNELS

Masahiko Okamura, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

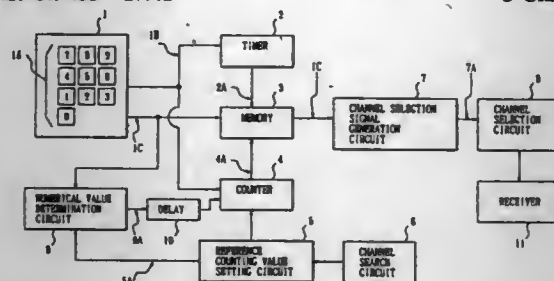
Filed Jun. 14, 1994, Ser. No. 259,425

Claims priority, application Japan, Jun. 18, 1993, 5-147331

Int. Cl.<sup>6</sup> H04N 5/50; H04B 1/16

U.S. Cl. 455—179.1

3 Claims



1. A channel selection apparatus of a receiver comprising:  
 channel search means for detecting broadcasting channels by conducting a search operation through a predetermined broadcasting band,  
 reference counting value setting means for outputting a numerical value corresponding to the number of digits in the highest broadcasting channel detected by said channel search means,  
 a keyboard comprising at least ten numbered-keys for outputting numerical data corresponding to said numbered-keys and for outputting an operation signal each time a key is selected,  
 counter means, connected to said reference counting value setting means and said keyboard, for receiving said numerical value from said reference counting value setting means, setting said numerical value as a reference counting value, storing the number of operation signals received from the keyboard as an incrementing count value, comparing said incrementing count value with said reference counting value, and outputting a coincidence signal when said incrementing count value coincides with said reference counting value,  
 timer means for measuring a time length after each input of an operation signal from said keyboard and outputting a time measurement completion signal after completion of said time length,  
 memory means for storing said numerical data output from said keyboard and for outputting said stored numerical data in response to one of said coincidence signal output from said counter means and said time measurement completion signal output from said timer means, and  
 channel selection signal generation means, connected to said memory means, for generating a channel selection signal corresponding to said numerical data output from said memory means.

5,483,686

### CHANNEL SELECTING APPARATUS FOR SIMULTANEOUS USE WITH BOTH PHASE-CONTINUOUS MODULATION SIGNALS AND DIGITAL MODULATION SIGNALS

Hiroshi Saka, Katano, and Kazunao Urata, Tondabayashi, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

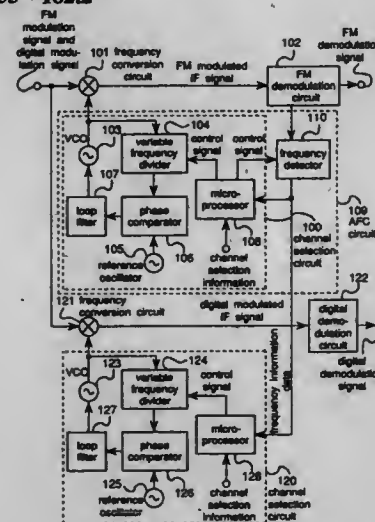
Filed Nov. 2, 1993, Ser. No. 144,422

Claims priority, application Japan, Nov. 2, 1992, 4-294100; Nov. 2, 1992, 4-294101; Nov. 2, 1992, 4-294102

Int. Cl.<sup>6</sup> H04B 1/16

U.S. Cl. 455—182.2

20 Claims



1. A channel selecting apparatus comprising both a channel selecting circuit for use with a phase-continuous modulation signal, which includes a first frequency converter for frequency-converting a phase-continuous modulation signal having a continuous phase so as to output a first intermediate frequency signal, a first channel selector provided with a first voltage controlled oscillator for changing the oscillation frequency in accordance with channel selecting information, and for feeding to the first frequency converter the local oscillation signal of the first voltage controlled oscillator, a frequency information detector for detecting the frequency information of the first intermediate frequency signal, a first frequency controller for receiving the frequency information obtained by the frequency information detector, and for finely adjusting the oscillation frequency of the first voltage controlled oscillator so that the frequency of the first intermediate frequency signal stays within a given frequency range, and a channel selecting circuit for use with a digital modulation signal, which includes a second frequency converter for frequency-converting the digital modulation signal so as to output a second intermediate frequency signal, a second channel selector provided with a second voltage controlled oscillator for changing the oscillation frequency by channel selecting information and for feeding to the second frequency converter the local oscillation signal of the second voltage controlled oscillator, a second frequency controller for receiving the frequency information obtained by the frequency information detector of the channel selecting circuit for use with a phase-continuous modulation signal, and for finely adjusting the oscillation frequency of the second voltage controlled oscillator so that the frequency of the second intermediate frequency signal stays within the given frequency range; wherein said two channel selecting circuits are disposed so as to be capable of simultaneous operation.

5,483,687

### OPERATIONAL TRANSCONDUCTANCE AMPLIFIER TRACK AND HOLD SYSTEM

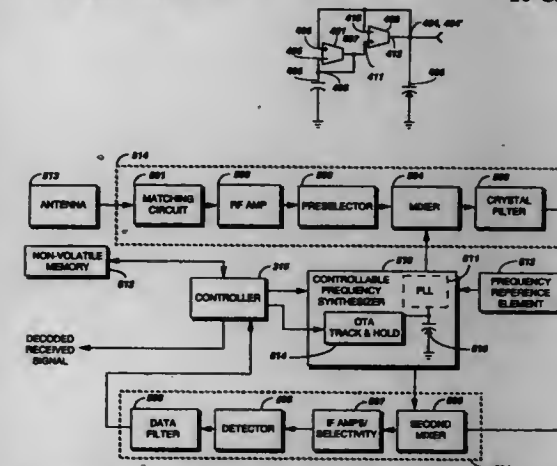
Raymond L. Barrett, Jr., Ft. Lauderdale; Barry Herold, Boca Raton, both of Fla., and Jeannie H. Kosiec, Schaumburg, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 10, 1993, Ser. No. 149,592

Int. Cl.<sup>6</sup> H04B 1/18

U.S. Cl. 455—183.2

10 Claims



1. A voltage track and hold circuit for tracking a tuning voltage and holding the tuning voltage as a reference voltage, the track and hold circuit comprising:

in a track mode:

- a first operational transconductance amplifier;
- a first charge storage device coupled to a first input of the first operational transconductance amplifier, the first charge storage device operating to accumulate a charge that corresponds with the tuning voltage;
- a second charge storage device coupled to a second input and an output of the first operational transconductance amplifier, the second charge storage device operating to accumulate a reference charge such that the reference voltage present at the second charge storage device is substantially equivalent to the tuning voltage; and

in a hold mode:

- a second operational transconductance amplifier having a first input coupled to the first charge storage device and a second input coupled to the second charge storage device, the second operational transconductance amplifier operating to minimize a voltage difference between the reference voltage present at the second charge storage device and a dormant tuning voltage present at the first charge storage device by supplying a charging current from an output of the second operational transconductance amplifier to the first charge storage device such that the dormant tuning voltage remains substantially equivalent to the reference voltage.

5,483,688

### ADAPTIVE AUTOMATIC ANTENNA TUNING METHOD AND APPARATUS

James D. English, Aloha, and Bruce C. Nepple, Portland, both of Oreg., assignors to Seiko Communications Holding N.V., Netherlands Antilles

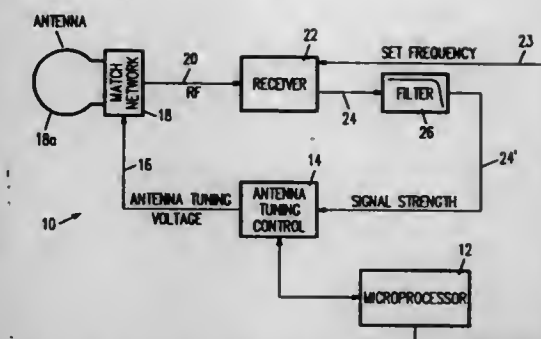
Filed Jan. 22, 1993, Ser. No. 7,443

Int. Cl.<sup>6</sup> H04B 1/18

U.S. Cl. 455—184.1

8 Claims

1. A programmable antenna tuning device for coupling an antenna and a radio receiver, said device generating an antenna tuning signal, said radio receiver being able to tune over a range of frequencies, and being responsive to a signal representing a desired reception frequency, said device comprising:



an antenna tuning element coupled to said antenna and responsive to said antenna tuning signal, said antenna tuning element being operable within a first range of said antenna tuning signal;

a prediction element responsive to at least one of said signal representing a desired reception frequency and a prior stored preferred antenna tuning signal for producing a predicted tuning signal representing a predicted value for said antenna tuning signal, and for producing a sub-range signal which defines a sub-range for said antenna tuning signal, said sub-range being less than said first range and including the value of said predicted tuning signal; and

a control element means for receiving from said prediction element said sub-range signal and for applying said antenna tuning signal through the range of said sub-range, identifying a preferred antenna tuning signal by detecting the optimum output from said antenna, storing said preferred antenna tuning signal, and applying said preferred antenna tuning signal to said antenna tuning element.

5,483,689

### RADIO RECEIVING WITH MICROPROCESSOR CONTROL

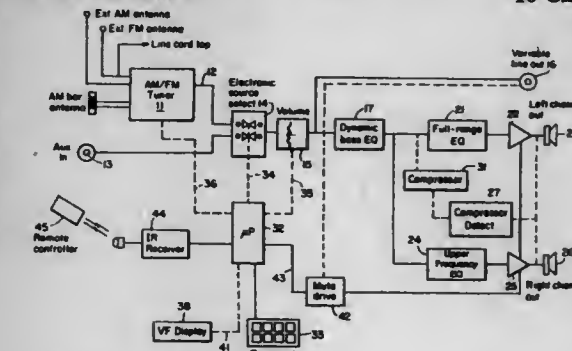
John J. O'Donnell, Jr., Marlborough; Joseph A. Killough, Brookline, and William A. Allen, Weymouth, all of Mass., assignors to Bose Corporation, Framingham, Mass.

Filed May 7, 1993, Ser. No. 60,213

Int. Cl.<sup>6</sup> H04B 1/16

U.S. Cl. 455—200.1

10 Claims



1. A radio receiver comprising,

a radio tuner tunable to a station frequency having a radio frequency input and an audio output for providing a radio audio signal,

an audio signal amplifying system having an audio input and an electroacoustical transducing output for providing a transduced audio signal characterized by a volume level, a volume controller coupled to said radio tuner and said audio amplifying system for setting said volume level,

a visible display that displays decimal numbers in a common set of digit locations representative of only one of station frequency, volume level and time, during mutually exclusive time intervals, an array of controls,



a microprocessor coupled to said radio tuner, said volume controller, said display and said array of controls, said microprocessor constructed and arranged to respond to actuation of said controls to cause said radio tuner to be tuned to a selected station frequency, cause said visible display common set of digit locations to display the selected station frequency to which said radio tuner is tuned for a predetermined station display time interval, cause said volume controller to set said volume level and cause said display common set of digit locations to display a quantity representative of said volume level for a predetermined volume level display time interval and further constructed and arranged to respond to actuation of said controls to initially set said volume level to zero when said receiver turns on and gradually increasing said volume level to a predetermined volume setting during said volume level display time interval.

5,483,690

# ARTIFICIALLY REDUCING SIGNAL REPRODUCTION QUALITY OF RECEIVED DEGRADED DIGITALLY CODED AUDIO DATA

Ernst F. Schröder, Hanover, Germany, assignor to Deutsche Thomson-Brandt GmbH, Germany

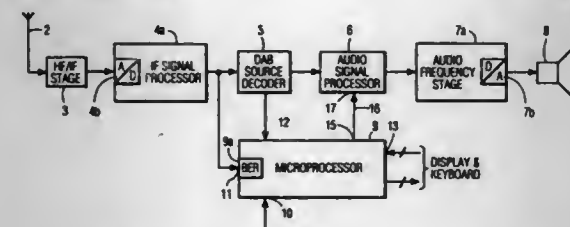
Filed Dec. 3, 1993, Ser. No. 161,822

Claims priority, application Germany, Jun. 5, 1991, 41 18 424.6

Int. Cl.<sup>6</sup> H04B 1/12; H04L 1/20

U.S. Cl. 455—226.1

11 Claims



7. A radio broadcast receiver apparatus for receiving digitally coded audio broadcasting data (DAB) signal and providing a sound reproduction signal, including:

digital measuring means for determining a transmission/reception bit error rate quality factor of the received digitally coded audio data signal including detection means for providing a bit error rate indicating signal and means for low pass filtering the measured bit error rate indicating signal to provide a related quality value indicating signal;

comparator means for comparing the quality value indicating signal with a preselected threshold value signal, said threshold value signal indicating a related transmission/reception quality which is better than the quality of digitally coded data signal in the case of non-correctable transmission/reception errors; and

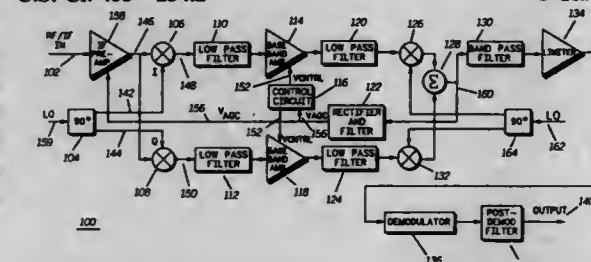
signal processing means responsive to said received digitally coded audio data signal and controlled by said comparator means, for artificially altering at least one characteristic of the sound reproduction signal which is perceptible to a listener to further lower the reproduction quality of said sound reproduction signal, when the quality value indicating signal is less than the threshold value signal.

## 5,483,691 ZERO INTERMEDIATE FREQUENCY RECEIVER HAVING AN AUTOMATIC GAIN CONTROL CIRCUIT

Joseph P. Heck, Ft. Lauderdale, and Enrique Ferrer, Miami, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.  
Continuation of Ser. No. 895,309, Jun. 8, 1992, abandoned.  
This application Jul. 14, 1994, Ser. No. 275,088  
Int. Cl.<sup>6</sup> H04B 1/16

U.S. Cl. 455—234.2

8 Claims



1. A zero intermediate frequency (zero IF) receiver, comprising: a first adjustable gain stage having an input terminal for receiving an input signal, the first adjustable gain stage being responsive to a gain control signal for adjusting the amount of gain provided to the input signal and providing an amplified output signal at an output terminal; first and second down mixers coupled to the output terminal of the first adjustable gain stage and providing first and second phase-related baseband signals; a second adjustable gain stage for receiving the first and second phase-related baseband signals and providing first and second amplified baseband signals in response to a modified gain control signal; a control means coupled to the first and second adjustable gain stages and responsive to the gain control signal for providing the modified gain control signal to the second adjustable gain stage for adjusting the gain of the second adjustable gain stage depending on the level of the modified gain control signal, the control means including a limiting means for limiting the maximum amount of gain reduction applied to the second adjustable gain stage upon the gain control signal reaching a predetermined gain reduction limit threshold level, wherein the gain of the first adjustable gain stage is reduced prior to the gain of the second adjustable gain stage; first and second up mixers for converting the first and second amplified baseband signals into first and second amplified phase-related signals; and an adder for summing the first and second amplified phase-related signals to produce the gain control signal.

5,483,692

## AUTOMATIC VARIABLE RADIO VOLUME CONTROL SYSTEM

Andrew P. Person, and James P. Muccioli, both of Farmington Hills, Mich., assignors to Chrysler Corporation, Highland Park, Mich.

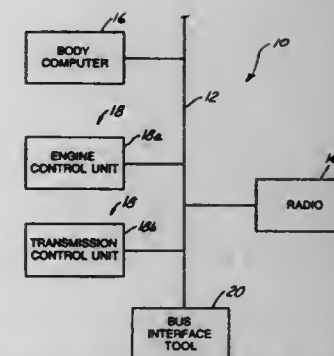
Filed Nov. 22, 1993, Ser. No. 156,127

Int. Cl.<sup>6</sup> H04B 1/06

U.S. Cl. 455—238.1

9 Claims

1. An automatic variable radio volume control system for a vehicle, they system comprising: at least one module including microprocessor means for controlling and monitoring a utility of the vehicle and sending informational signals about the controlling of said utility; a vehicle multiplex bus coupled to said at least one module for transferring said informational signals over said multiplex bus; programmable computer means coupled to said multiplex bus and responsive to said informational signals for deciding a radio volume by a predetermined algorithm and for sending a volume message on said multiplex bus; and an audio unit coupled to said multiplex bus, said audio unit including means responsive to said volume message for con-



trolling sound output from said audio unit in accordance with said volume message.

5,483,693

## COMBINING ANTENNA ELEMENT SIGNALS

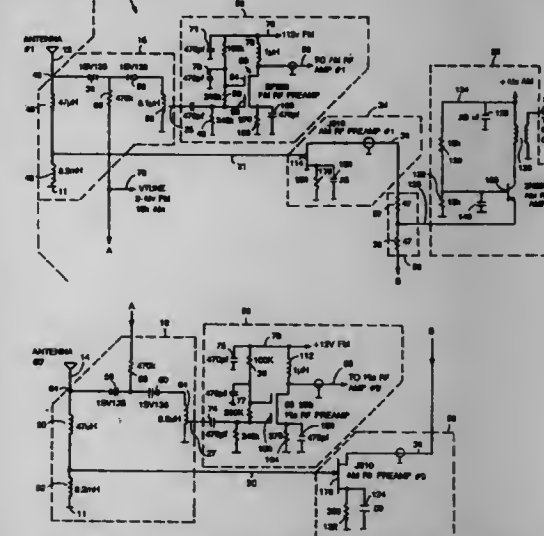
Amar G. Bose, Wayland, and Richard Kirkpatrick, Lynnfield, both of Mass., assignors to Bose Corporation, Framingham, Mass.

Filed Mar. 19, 1992, Ser. No. 854,345

Int. Cl.<sup>6</sup> H04B 1/16

U.S. Cl. 455—273

27 Claims



1. A radio receiver circuit constructed and arranged to operate over a first range of frequencies and a second range of frequencies significantly lower than said first range comprising:

- at least first and second spaced antenna elements, said antenna elements having first and second outputs respectively, said antenna elements being significantly less than one quarter of a wavelength in length at said first range of frequencies, a first circuit operating at said first range of frequencies having first and second inputs coupled to said first and second outputs respectively, and first and second first frequency outputs for providing a pair of received first frequency signals at a common desired frequency,

- a second circuit operative in said second range of frequencies including summing circuitry having first and second inputs coupled to said first and second outputs of said antenna elements respectively and including a second frequency output for providing a second frequency signal that includes a sum of second frequency signals derived from second frequency signals at said first and second outputs of said antenna elements,

- at least first and second tuning circuits for tunings said first and second antenna elements respectively to said common desired frequency, said first tuning circuit coupling said first output of said first antenna element to said first input of said first circuit,

5,483,694

## RADIO RECEIVER WITH AN INTERMODULATION DETECTOR

Stefan Bartels, Hildesheim; Jürgen Kässer, Diekhofen, and Djahanyar Chahabadi, Hildesheim, all of, Germany, assignors to Blaupunkt-Werke GmbH, Hildesheim, Germany

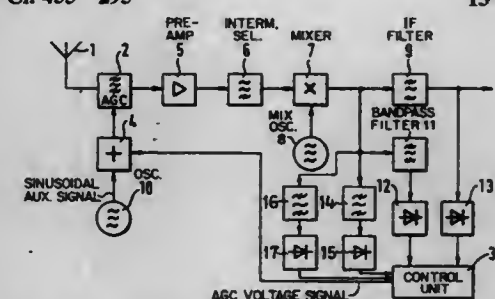
Filed Dec. 8, 1993, Ser. No. 164,127

Claims priority, application Germany, Dec. 9, 1992, 42 41 362.1

Int. Cl.<sup>6</sup> H04B 1/10

U.S. Cl. 455—295

13 Claims



1. In a radio receiver comprising an input circuit which is supplied with received radio signals, a mixer (7) for deriving an intermediate frequency (IF) signal from the received radio signals, and an IF filter (9) coupled to receive the output of said mixer (7), the IF filter (9) having a passband range corresponding to a useful frequency range of the received signals, the improvement comprising:

means for amplitude-modulating the received radio signals with an auxiliary signal for detecting intermodulation, which generates sidebands outside of the useful frequency range; a comparing unit for comparing the amplitude of at least one sideband generated by the amplitude with the auxiliary signal and the amplitude of a carrier of the received radio signals in the intermediate frequency (IF) signal; and an indication control unit for generating signal indicating a presence of the intermodulation when deviations, from a ratio based on the amplitude factor during modulation with the auxiliary signal, exceed a predetermined value.

5,483,695

## INTERMEDIATE FREQUENCY FM RECEIVER USING ANALOG OVERSAMPLING TO INCREASE SIGNAL BANDWIDTH

Matthijs D. Pardoën, Marin, Switzerland, assignor to CSEM Centre Suisse D'Electronique et de Microtechnique, Neuchâtel, Switzerland

Filed Apr. 13, 1994, Ser. No. 226,856

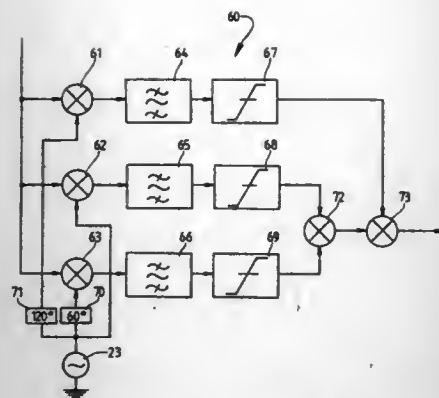
Claims priority, application France, May 12, 1993, 93 05813  
Int. Cl.<sup>6</sup> H04B 1/26

U.S. Cl. 455—314

20 Claims

1. A radio receiver for receiving a selected FM signal in which a message signal A(t) modulates the frequency of a carrier signal, said radio receiver comprising:

a local oscillator for producing a local oscillator signal;



a heterodyning stage for heterodyning said selected FM signal with said local oscillator signal so as to reduce the frequency which is modulated by said message signal to an intermediate frequency; and,

a demodulator stage for accepting an output signal from said heterodyning stage and extracting said message signal therefrom;

wherein said heterodyning stage comprises:

signal producing means for producing  $n$  signals  $a_1 \dots a_n$ , wherein each of said  $n$  signals consists of said message signal  $A(t)$  modulated at said intermediate frequency, and said  $n$  signals  $a_1 \dots a_n$  are related by the expression

$$a_i = \cos \{ \omega_i t + k_f \int A(t) dt + \Omega + \pi^*(i/n) \}$$

where  $\omega_i$ ,  $k_f$  and  $\Omega$  are constants,  $n$  is a positive integer greater than or equal to 2 and  $i$  takes the values of all positive integers up to and including  $n$ , and

multiplier means for multiplying said  $n$  signals together and thus producing said heterodyning stage output signal wherein said message signal  $A(t)$  is modulated at a frequency of  $n$  times said intermediate frequency.

5,483,696

# METHOD AND APPARATUS FOR USING A BALANCED MIXER AS A SWITCH

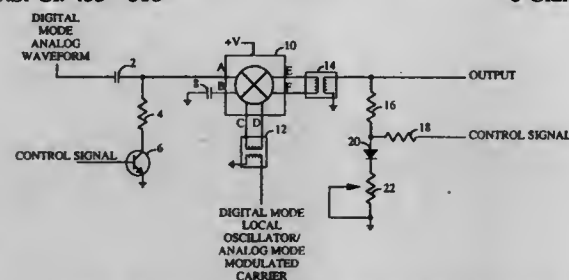
Charles E. Wheatley, III, Del Mar, Calif.; Tohru Izumiyama, Soma, Japan; Tsuyoshi Kitamura, Soma, Japan, and Mitsunari Okazaki, Soma, Japan, assignors to Qualcomm Incorporated, San Diego, Calif.

Filed Jan. 31, 1994, Ser. No. 188,854

Int. Cl.<sup>6</sup> H04B 1/26

U.S. Cl. 455-318

6 Claims



1. A dual mode mixer circuit for mixing in a first mode and for conducting in a second mode, the circuit comprising:

an active balanced mixer having a small signal input, a local oscillator input, and an output;

a first coupling device for coupling a local oscillation signal to the local oscillator input in the first mode and a modulated information signal in the second mode;

a second coupling device for coupling an information signal to the small signal input;

an unbalancing circuit for receiving a control signal that designates the first mode or the second mode, the active balanced mixer unbalancing in response to the control signal indicating the second mode of operation, the modulated information signal being coupled through the active balanced mixer in the second mode; and

an attenuator coupled to the output of the active balanced mixer, for varying, as a function of the control signal, an amplitude of the modulated information signal coupled through the active balanced mixer.

## DESIGN PATENT

GRANTED JAN. 9, 1996

### ERRATA

For  
CLASS

See  
PATENT NO.

D15-147 .....	D366,040
D26-131 .....	D366,122



# DESIGNS

JANUARY 9, 1996

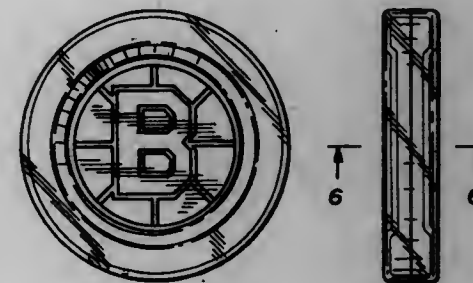
365,911

COMBINED ICE CUBE AND CONTAINER THEREFOR  
Robert J. Cassetti, 28 Pilgrim Dr., Port Jefferson, N.Y. 11777,  
and James J. von Oiste, Jr., 101 Sylvan Ave., Miller Place,  
N.Y. 11764

Filed Jun. 27, 1994, Ser. No. 25,109

Term of patent 14 years

U.S. Cl. D1—106



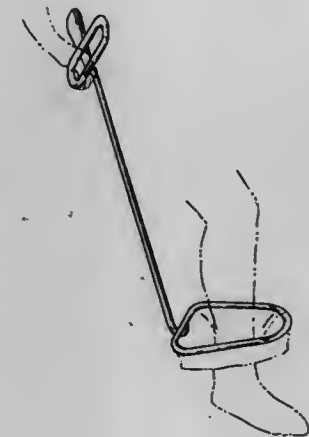
365,913

TOOL FOR USE IN THE DONNING AND REMOVAL OF  
SHOES AND SOCKS  
Thomas B. Ballard, 25550 Mulberry Dr., Southfield, Mich.  
48034

Filed Dec. 2, 1994, Ser. No. 31,692

Term of patent 14 years

U.S. Cl. D2—641



365,912

SEAT BELT COVER

Marcelle H. Fulcher, P.O. Box 81703, Atlanta, Ga. 30366, and  
Thomas F. Pittman, 3333 Catalina Dr., Atlanta, Ga. 30341

Filed Nov. 21, 1994, Ser. No. 31,303

Term of patent 14 years

U.S. Cl. D2—639



365,914

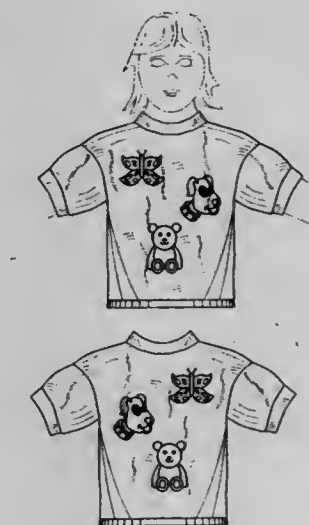
SHIRT

Kevin A. Vaughan, and Denise Vaughan, both of 122 Bar-  
rington Oaks Ridge, Roswell, Ga. 30075

Continuation-in-part of Ser. No. 592,864, Oct. 4, 1990, aban-  
doned. This application Jun. 14, 1994, Ser. No. 24,443

Term of patent 14 years

U.S. Cl. D2—717



365,915

## SLEEPING BAG

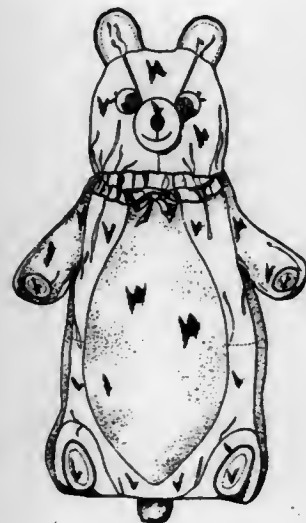
Gail Merkley, and Archie Merkley, both of 2077 Dawson Road, Anthony Armstrong, 8415 Mayfair, Cincinnati, Ohio 45216  
Thunder Bay, Ontario, Canada

Filed Sep. 29, 1994, Ser. No. 29,176

Claims priority, application Canada, Mar. 29, 1994, 1994-0603 U.S. Cl. D2—881

Term of patent 14 years

U.S. Cl. D2—719

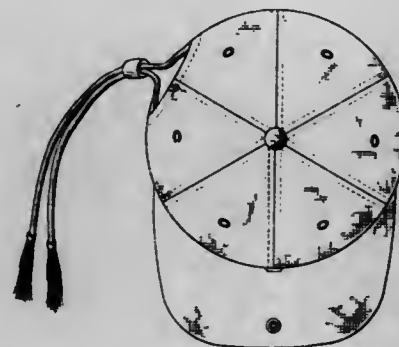


365,917

## SPORTS CAP

Filed Feb. 27, 1995, Ser. No. 35,412

Term of patent 14 years



365,916

## HAT FOR DISPLAYING SPORTS OR OTHER CARDS

Gary Hutchinson, 14 Teach St., Enfield, Conn. 06082, and  
Kevin C. Coyle, 19 Barr St., Plantsville, Conn. 06479

Filed Sep. 1, 1993, Ser. No. 12,491

Term of patent 14 years

U.S. Cl. D2—866



365,918

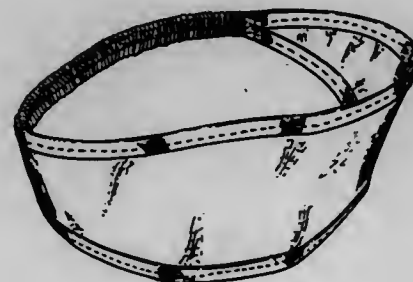
## HEAD BAND

Chukwudi J. Izebu, and Unochukwu C. Izebu, both of 6671  
McLean Dr., McLean, Va. 22101

Filed May 2, 1994, Ser. No. 22,136

Term of patent 14 years

U.S. Cl. D2—894



365,919

## SKATE BOOT

Ting-Hsing Chen, Tainan, Taiwan, Prov. of China, assignor to  
Far Great Plastics Industrial Co., Ltd., Tainan, Taiwan,  
Prov. of China

Filed Aug. 31, 1994, Ser. No. 27,761

Term of patent 14 years

U.S. Cl. D2—904



365,921

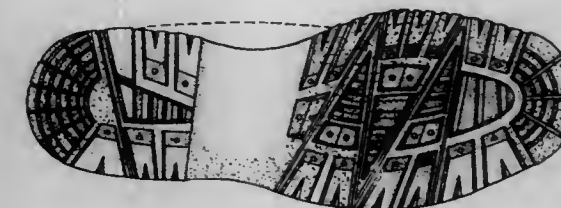
## SHOE SOLE

Peter von Conta, Newton, and Christopher Pawlus, Westford,  
both of Mass., assignors to The Rockport Company, Inc.,  
Marlboro, Mass.

Filed Jan. 31, 1995, Ser. No. 34,241

Term of patent 14 years

U.S. Cl. D2—959



365,920

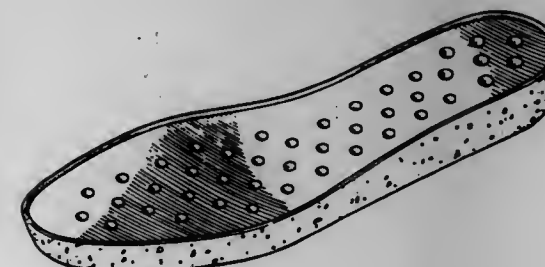
## TOP AND PERIPHERY OF A SHOE SOLE

Jules Schneider, New York, N.Y., assignor to What's What,  
Inc., Edison, N.J.

Filed Sep. 24, 1993, Ser. No. 13,417

Term of patent 14 years

U.S. Cl. D2—947



365,922

## SHOE UPPER

Nicholas O'Rourke, Quincy, Mass., assignor to Reebok Interna-  
tional Ltd., Stoughton, Mass.

Filed Nov. 3, 1994, Ser. No. 30,159

Term of patent 14 years

U.S. Cl. D2—969





365,923

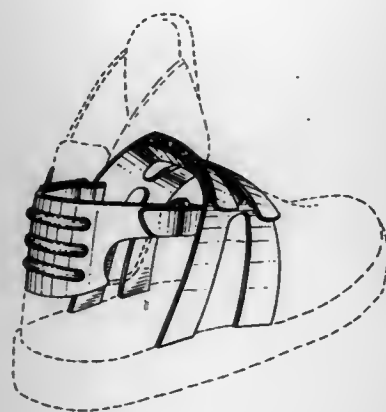
## SHOE STRAP ELEMENT

Kevin J. Crowley, Brentwood, N.H., assignor to FILA U.S.A., Inc., Hunt Valley, Md.

Filed Nov. 19, 1993, Ser. No. 15,542

Term of patent 14 years

U.S. Cl. D2—974



365,925

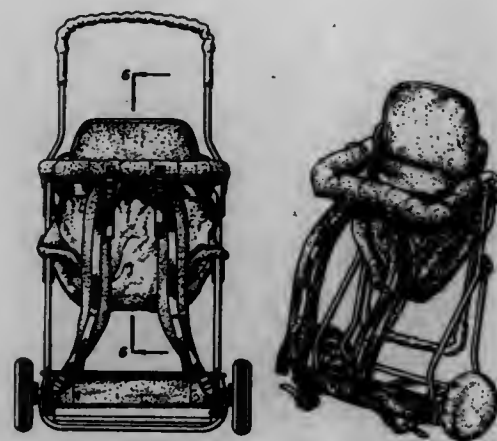
## COMBINATION BABY CARRIER, BACKPACK AND WHEEL COVERS

Tracy Roan, Springfield, Ohio, assignor to Lisco, Inc., Tampa, Fla.

Filed Jun. 30, 1994, Ser. No. 25,468

Term of patent 14 years

U.S. Cl. D3—214



365,926

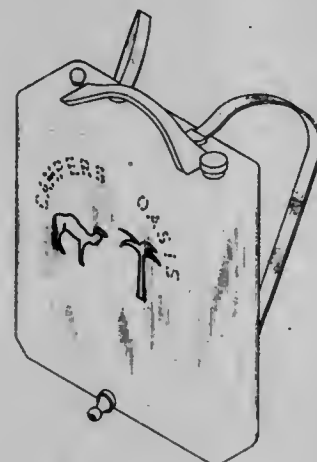
## COMBINED BACKPACK AND WATER CONTAINER

Mark A. D'Angelo, 14 Koenig Ln., Freehold, N.J. 07728

Filed Feb. 2, 1994, Ser. No. 18,284

Term of patent 14 years

U.S. Cl. D3—217



365,924

## FAN HOLDER

Tan C. Fong, 151G King's Road, #14-25 Farrer Court, Singapore 1026, Singapore

Filed Dec. 1, 1993, Ser. No. 15,885

Term of patent 14 years

U.S. Cl. D3—203



365,927

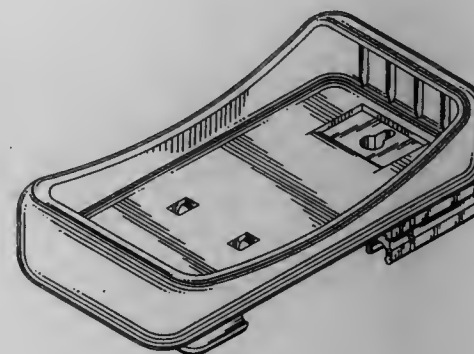
## PROTECTIVE BOOT FOR A DIGITAL MULTIMETER

Kyu D. Cho, Seoul, Rep. of Korea, assignor to Summit Company Ltd., Rep. of Korea

Filed Jan. 31, 1995, Ser. No. 34,292

Term of patent 14 years

U.S. Cl. D3—218



365,929

## TOOTHBRUSH

Raymond Zeitouny, Brooklyn, N.Y., assignor to Dura-Kleen (USA) Inc., Brooklyn, N.Y.

Filed Jan. 7, 1994, Ser. No. 17,224

Term of patent 14 years

U.S. Cl. D4—104



365,930

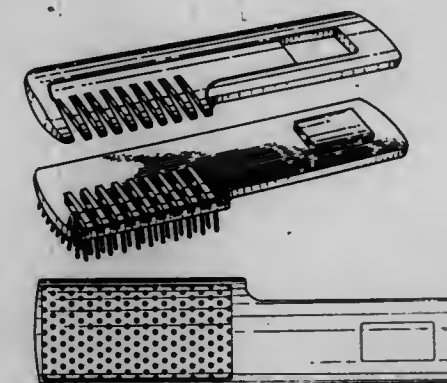
## HAIRBRUSH AND COMB SET

Hing-Wah Huen, Kowloon, Hong Kong, assignor to Fairform Mfg. Co., Ltd., Kowloon, Hong Kong

Filed Jul. 8, 1993, Ser. No. 10,476

Term of patent 14 years

U.S. Cl. D4—117



365,928

## RUNNER'S BELT

Robert C. Sauer, 50-23 211th St., Bayside Hills, N.Y. 11364-1143

Filed Oct. 27, 1993, Ser. No. 14,672

Term of patent 14 years

U.S. Cl. D3—224



365,931  
COAT RACK

Jacques LeBellegard, 22270 Dolo, L'Abbaye, France  
Filed Jul. 29, 1994, Ser. No. 26,516

Term of patent 14 years

U.S. Cl. D6—317



365,933

SEPARATOR PANEL FOR FIREARM RANGE

Michael R. Spielvogel, Tampa, Fla., assignor to Gun Range Authority, Inc., Tampa, Fla.

Filed Mar. 24, 1994, Ser. No. 20,346

Term of patent 14 years

U.S. Cl. D6—332



365,932

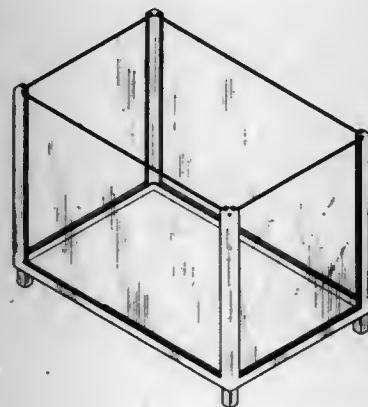
CRIB/PLAYPEN

Deborah J. Reynolds, and Phillip C. Reynolds, both of 10 Sarella St., Glen Falls, N.Y. 12801

Filed May 11, 1994, Ser. No. 22,752

Term of patent 14 years

U.S. Cl. D6—331



365,934

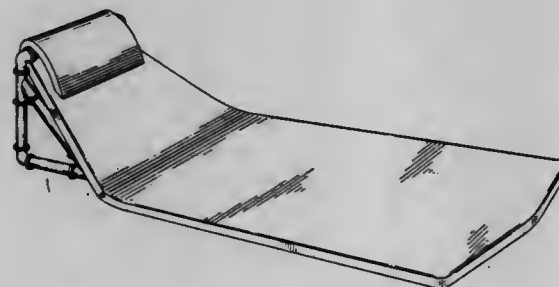
GROUND PAD AND PROP

William F. Dean, Wichita Falls, Tex., assignor to Robert S. Schuerer, Wichita Falls, Tex.

Filed Dec. 6, 1994, Ser. No. 31,782

Term of patent 14 years

U.S. Cl. D6—335



365,935

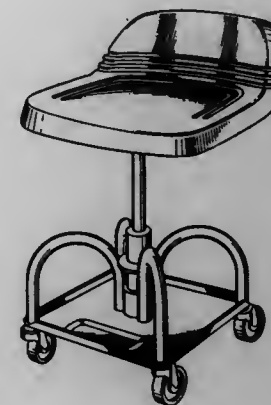
ADJUSTABLE CHAIR

W. Gordon Dallas, Ashland, Ohio, assignor to Dallas Tech Tools, Inc., Ashland, and Whiteside Mfg. Co., Delaware, both of Ohio

Filed Feb. 6, 1995, Ser. No. 34,515

Term of patent 14 years

U.S. Cl. D6—336



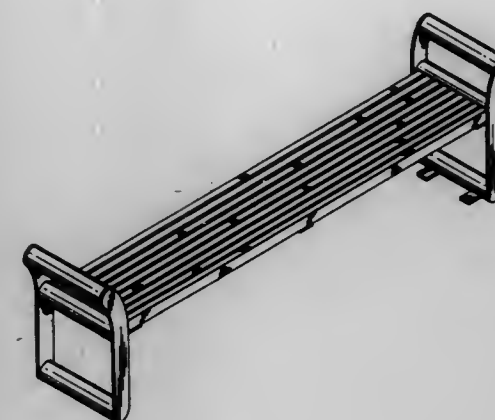
365,937  
BENCH

Gerald P. Skalka, 9904 Avenel Farm Dr., Potomac, Md. 20854  
Division of Ser. No. 19,383, Mar. 1, 1994. This application

Jan. 13, 1995, Ser. No. 33,480

Term of patent 14 years

U.S. Cl. D6—370



365,936

HIGH CHAIR FOR INFANT

Robert Haut, Paoli, and Peter Tuckey, Birdsboro, both of Pa., assignors to Graco Children's Products Inc., Elverson, Pa.

Filed Nov. 4, 1994, Ser. No. 30,138

Term of patent 14 years

U.S. Cl. D6—339



365,938

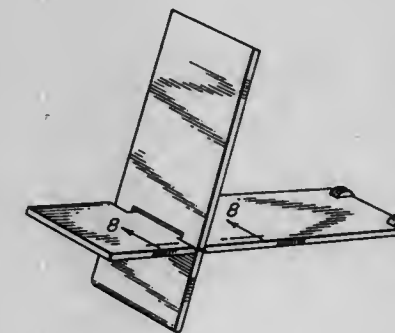
PLANK LOUNGER

Craig Gilborn, P.O. Box 902, Dorset, Vt. 05251, and Eric Glesmann, 9732 Starr Hill Rd., Remsen, N.Y. 13438

Filed Feb. 14, 1995, Ser. No. 34,872

Term of patent 14 years

U.S. Cl. D6—374





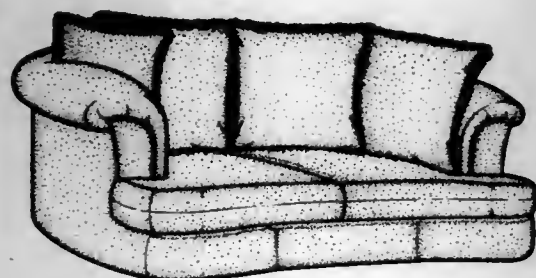
365,939  
SOFA

Robert A. Gera, Glencoe, Ill., assignor to Universal Furniture Industries, Inc., High Point, N.C.

Filed Apr. 22, 1992, Ser. No. 873,084

Term of patent 14 years

U.S. Cl. D6—381



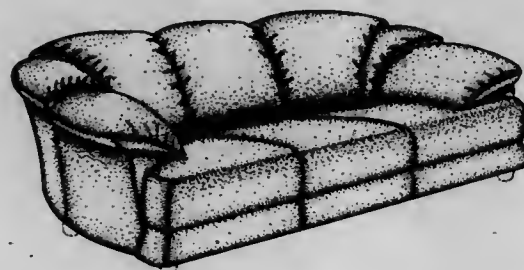
365,941  
SEAT

Pasquale Natuzzi, Santeramo In Colle, and Arcangelo Scarati, Talsano, both of, Italy, assignors to Industrie Natuzzi, SpA, Santeramo, Italy

Filed Jun. 30, 1994, Ser. No. 25,331

Term of patent 14 years

U.S. Cl. D6—381



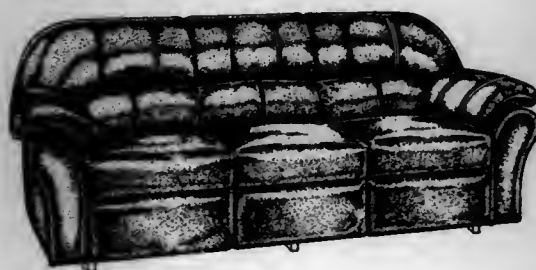
365,940  
SOFA

Robert W. Schweiger, Greensboro, N.C., assignor to Universal Furniture Industries, Inc., High Point, N.C.

Filed Jul. 28, 1993, Ser. No. 11,152

Term of patent 14 years

U.S. Cl. D6—381



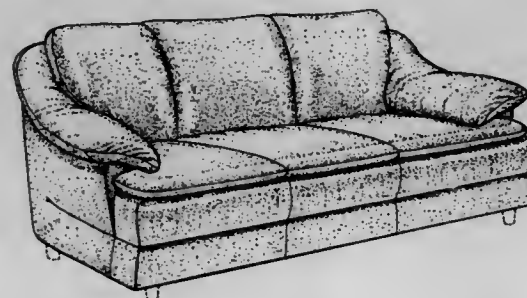
365,942  
SEAT

Pasquale Natuzzi, Santeramo In Colle, and Domenico Abbruzzese, Gioia del Colle, both of, Italy, assignors to Industrie Natuzzi, SpA, Bari, Italy

Filed Nov. 18, 1994, Ser. No. 31,116

Term of patent 14 years

U.S. Cl. D6—381



365,943

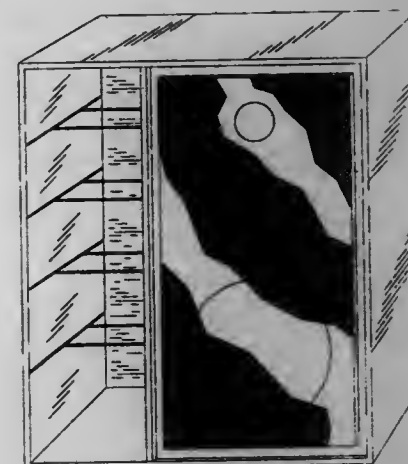
COMBINED SHELF AND LOUDSPEAKER UNIT

David A. Kalchbrenner, 1322 E. Cypress Ave., Venice, Fla. 34292

Filed Mar. 15, 1993, Ser. No. 5,907

Term of patent 14 years

U.S. Cl. D6—397



365,945

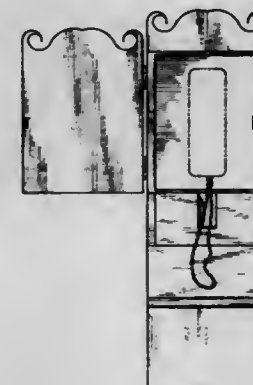
TELEPHONE CLOSET

Walter E. Kuhn, and Betty J. Kuhn, both of 455 Spring La., Ocala, Fla. 34472

Filed Apr. 8, 1994, Ser. No. 21,087

Term of patent 14 years

U.S. Cl. D6—436



365,944

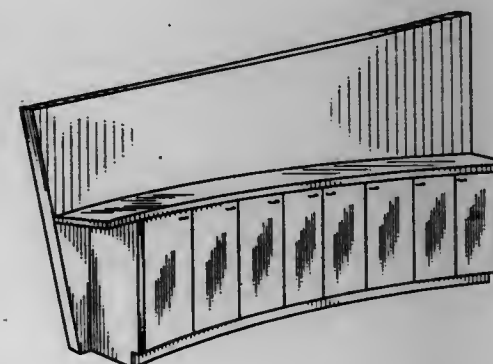
CABINET COUNTER

Paul R. Lechleiter, Powell, and Mark B. Artus, Beechwood, both of Ohio, assignors to Blockbuster Entertainment Corp., Ft. Lauderdale, Fla.

Filed Aug. 29, 1994, Ser. No. 27,750

Term of patent 14 years

U.S. Cl. D6—397



365,946

DISPLAY STAND

Craig D. Eley, P.O. Box 316, Orchard, Nebr. 68764

Filed Feb. 6, 1995, Ser. No. 34,519

Term of patent 14 years

U.S. Cl. D6—449



365,947

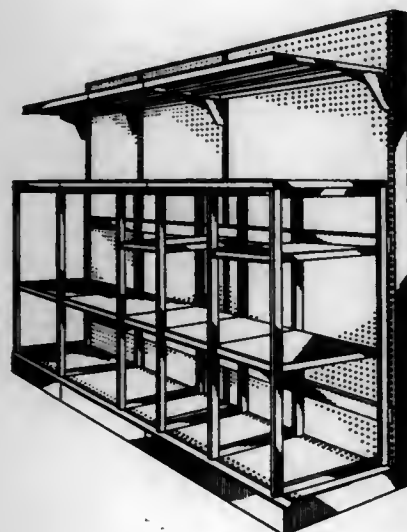
**MERCHANDISING DISPLAY RACK**

John D. Howard, Temple, Ga., assignor to L&P Property Management Company, Chicago, Ill.

Filed Apr. 29, 1994, Ser. No. 22,206

Term of patent 14 years

U.S. Cl. D6—470



365,949

**CONSOLE**

Richard S. Klein, Los Angeles, Calif., assignor to Cal-Style Furniture Mfg. Co., Compton, Calif.

Filed Apr. 19, 1993, Ser. No. 7,312

Term of patent 14 years

U.S. Cl. D6—477



365,950

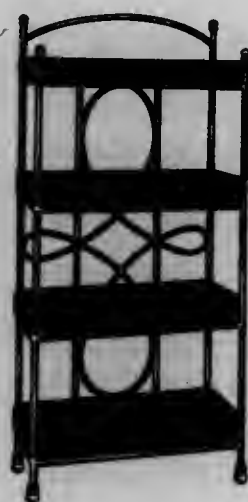
**ETAGERE**

Michael J. Paus, High Point, N.C., assignor to Universal Furniture Industries, Inc., High Point, N.C.

Filed Mar. 21, 1995, Ser. No. 36,516

Term of patent 14 years

U.S. Cl. D6—479



365,948

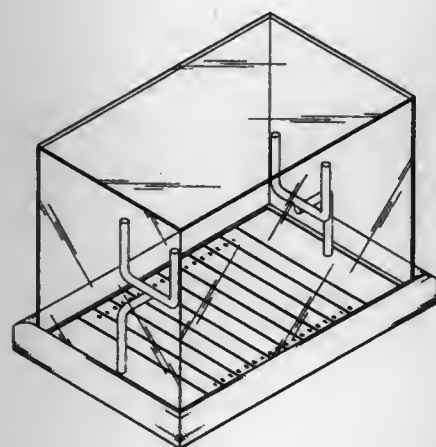
**FOOTBALL DISPLAY CASE**

Daniel B. Borden, S. 1816 Fawn Dr., Spokane, Wash. 99206

Filed Jan. 27, 1995, Ser. No. 34,104

Term of patent 14 years

U.S. Cl. D6—470



365,951

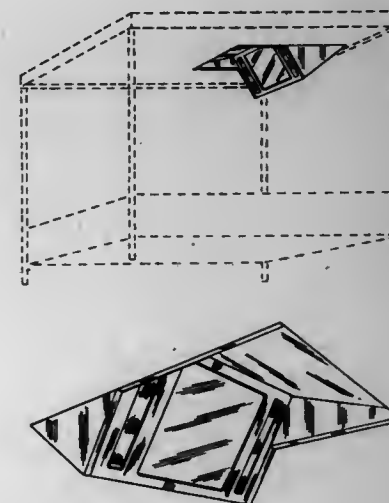
**TV CANOPY**

Guy A. Walters, III, High Point, N.C., assignor to Thomasville Furniture Industries, Inc., Thomasville, N.C.

Filed Jan. 7, 1994, Ser. No. 17,214

Term of patent 14 years

U.S. Cl. D6—513



365,953

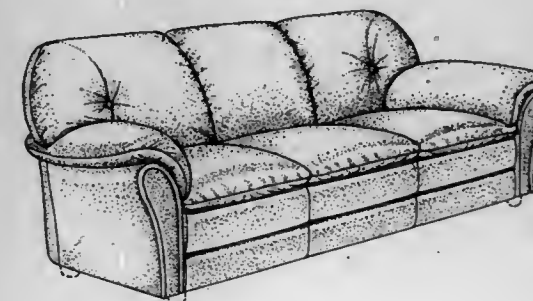
**SEAT**

Pasquale Natuzzi, and Raffaella Lucarelli, both of Santeramo In Colle, Italy, assignors to Industrie Natuzzi, SpA, Bari, Italy

Filed Jun. 30, 1994, Ser. No. 25,512

Term of patent 14 years

U.S. Cl. D6—381



365,952

**DISPLAY**

Christian Gagnon, Beloeil, and Clarence Barnes, Chambly, both of, Canada, assignors to Cordon Bleu International, Anjou, Canada

Filed Feb. 7, 1994, Ser. No. 18,546

Term of patent 14 years

U.S. Cl. D6—515



365,954

**LETTER HOLDER RACK**

Craig Milroy, Palo Alto, Calif., assignor to Design Ideas, Ltd., Springfield, Ill.

Filed Jan. 6, 1994, Ser. No. 17,183

Term of patent 14 years

U.S. Cl. D6—566





365,955

## ILLUMINATED VALANCE

Ralph Fimbres, 36505 Florida, Hemet, Calif. 92545

Filed Sep. 16, 1994, Ser. No. 28,517

Term of patent 14 years

U.S. Cl. D6-579



365,957

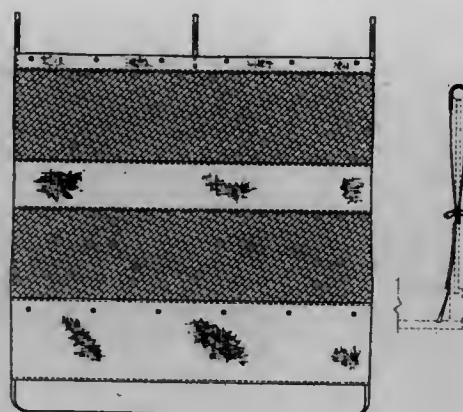
## CRIB BUMPER PAD

Karen A. Ferrari, 7 Greaves Ave., Staten Island, N.Y. 10308

Filed Jun. 13, 1994, Ser. No. 24,365

Term of patent 14 years

U.S. Cl. D6-606



365,956

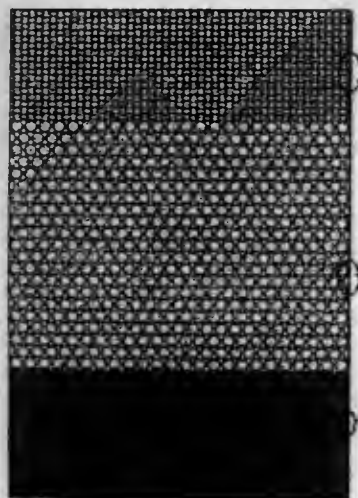
## MATTRESS CUSHION

Vincenzo A. Bonaddio, Rancho Santa Margarita, and Feyyaz O. Baskent, Newport Beach, both of Calif., assignors to Foamex L.P., Linwood, Pa.

Filed Nov. 30, 1994, Ser. No. 31,514

Term of patent 14 years

U.S. Cl. D6-596



365,958

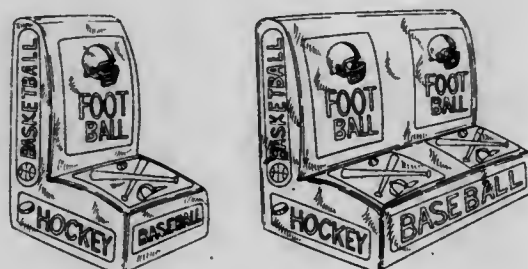
## COVER FOR AN AUTOMOBILE SEAT

Thomas B. Bolewski, 11 Julie Rd., Plainville, Conn. 06062

Filed Jul. 22, 1994, Ser. No. 26,240

Term of patent 14 years

U.S. Cl. D6-611



365,959

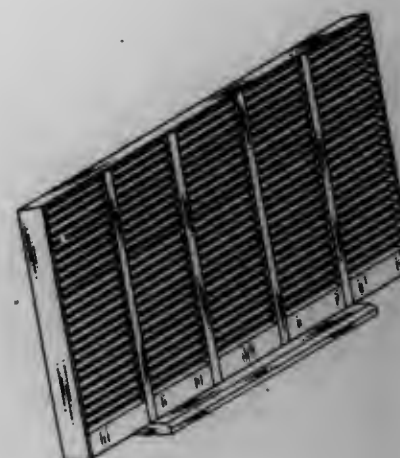
## STORAGE RACK FOR COMPACT DISCS

Brian K. Ellison, Chicago, Ill., assignor to Abke Design, Chicago, Ill.

Filed Dec. 17, 1993, Ser. No. 16,509

Term of patent 14 years

U.S. Cl. D6-629



365,961

## COFFEE MACHINE

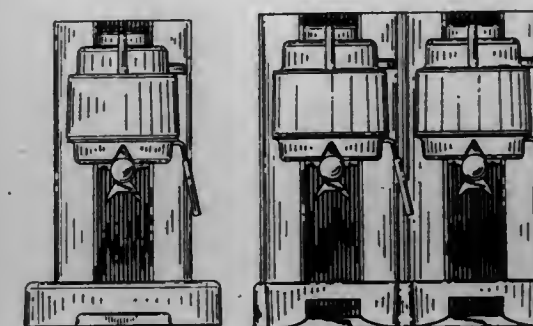
Virginio Cortese, Turin, Italy, assignor to Essegelle S.r.l., Turin, Italy

Filed Jan. 19, 1994, Ser. No. 19,741

Claims priority, application Italy, Jul. 20, 1993, TO9300157; Jan. 11, 1994, TO9400006

Term of patent 14 years

U.S. Cl. D7-309



365,960

## COUNTER-TOP BEVERAGE DISPENSER

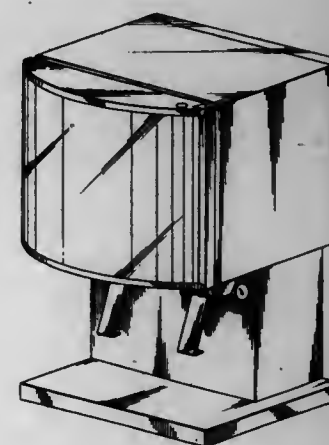
Sidney Barish, Downsview, Canada, assignor to Creative Carts &amp; Freezers Inc., Downsview, Canada

Filed Mar. 21, 1994, Ser. No. 20,196

Claims priority, application Canada, Feb. 1, 1994, 1994-0150

Term of patent 14 years

U.S. Cl. D7-308



365,962

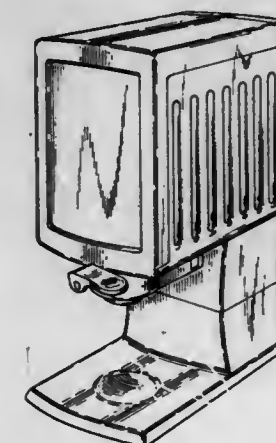
## DISPENSER

Neil T. Amundsen, Milwaukee, and Scott Micokey, Cedarburg, both of Wis., assignors to Gehl's Gurnsey Farms, Inc., Germantown, Wis.

Filed Mar. 14, 1994, Ser. No. 19,903

Term of patent 14 years

U.S. Cl. D7-311



365,963  
PITCHER

David L. Feer, Andover, Mass., assignor to Tucker Housewares, Frank Yeh, 1019 N. Mayflower St., Anaheim, Calif. 92801  
Leominster, Mass.

Filed Sep. 22, 1994, Ser. No. 28,795  
Term of patent 14 years

U.S. Cl. D7—321

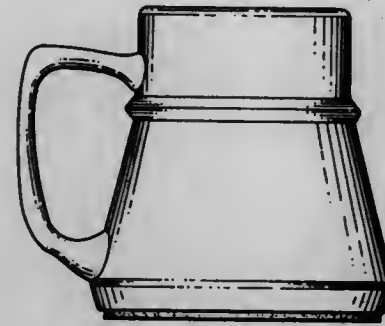


365,965  
MUG

Frank Yeh, 1019 N. Mayflower St., Anaheim, Calif. 92801  
Filed Mar. 31, 1994, Ser. No. 20,716

Term of patent 14 years

U.S. Cl. D7—536



365,964

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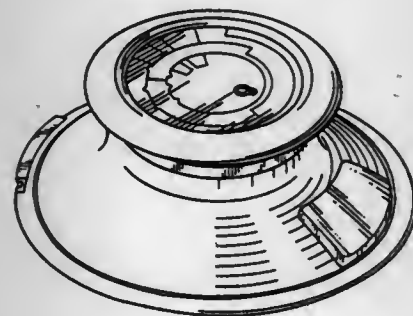
Lutz Gebhardt, Immensee, Switzerland, assignor to AMC International ALFA Metalcraft Corporation AG, Switzerland

Filed Nov. 24, 1993, Ser. No. 15,701

Claims priority, application WIPO, May 26, 1993, DM/026,223

Term of patent 14 years

U.S. Cl. D7—393



365,966

HANDLE FOR KITCHEN UTENSIL

Bruce Ancona, New York, N.Y., assignor to B. Via International Housewares, Inc., Englewood Cliffs, N.J.

Filed Feb. 10, 1995, Ser. No. 34,728

Term of patent 14 years

U.S. Cl. D7—401.2



365,967

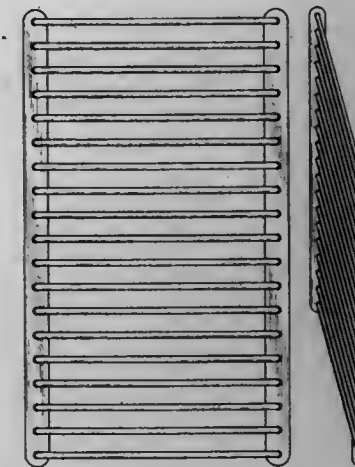
BACK PACKERS FOLDING GRILLE

James C. Smouse, 1306 Phillips, Bloomfield, N.M. 87413

Filed Apr. 25, 1994, Ser. No. 21,776

Term of patent 14 years

U.S. Cl. D7—409



365,969

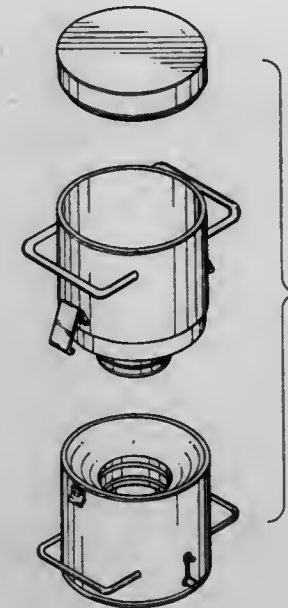
PARTITIONED COOLER

Ira L. Sellman, 4 Cypress Rd., Annapolis, Md. 21403

Filed Aug. 31, 1994, Ser. No. 27,766

Term of patent 14 years

U.S. Cl. D7—608



365,970

BOTTLE RACK FOR THE TABLE

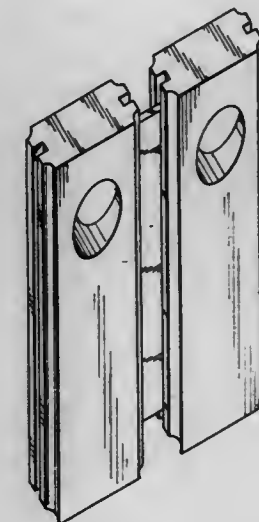
Josef Kickinger, Flotowgasse 10/4, A-1190 Wien, Austria

Filed Aug. 26, 1994, Ser. No. 27,685

Claims priority, application Austria, Mar. 2, 1994, MU-836/94

Term of patent 14 years

U.S. Cl. D7—708



365,968

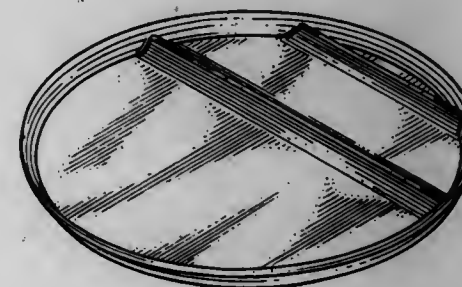
HOT DOG PLATE

Bette E. Smith, 23681 Posey La., West Hills, Calif. 91304

Filed May 24, 1994, Ser. No. 23,433

Term of patent 14 years

U.S. Cl. D7—555





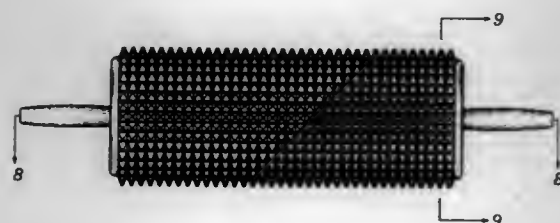
365,971

## ROLLER MEAT TENDERIZER

Raymond J. Brockmann, P.O. Box 168, Holbrook, N.Y. 11741  
 Filed Sep. 22, 1994, Ser. No. 28,768

Term of patent 14 years

U.S. Cl. D7—682



365,973

## HOG RING CLAMPING DEVICE

Takashi Watanabe, Saitama, Japan, assignor to Meiho Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1994, Ser. No. 28,164

Claims priority, application Japan, Apr. 18, 1994, 6-10957

Term of patent 14 years

U.S. Cl. D8—68



365,972

## ARROWHEAD EXTRACTOR

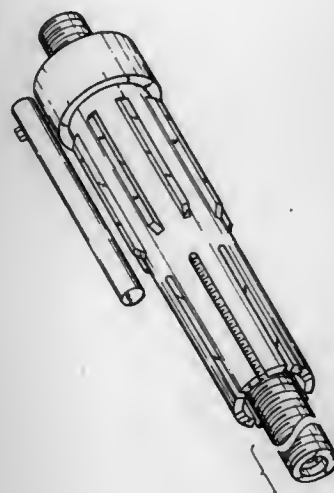
Buster Mills, Rte. 1, Box 18, Frankford, Del. 19945, and Leslie L. Clem, 1600 Fishinger Rd., Columbus, Ohio 43221

Continuation-in-part of Ser. No. 227,518, Apr. 14, 1994, Pat.

No. 5,408,734. This application May 19, 1994, Ser. No. 23,184

Term of patent 14 years

U.S. Cl. D8—51



365,974

## PNEUMATIC FASTENER

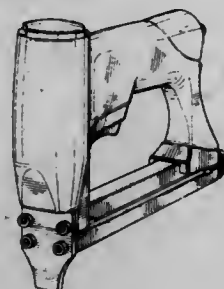
Walter Matuschek, Aalen, Germany, assignor to Joh. Friedrich Behrens AG, Ahrensburg, Germany

Filed Aug. 31, 1994, Ser. No. 27,890

Claims priority, application Germany, Mar. 25, 1994, DM/029 140

Term of patent 14 years

U.S. Cl. D8—69



365,975

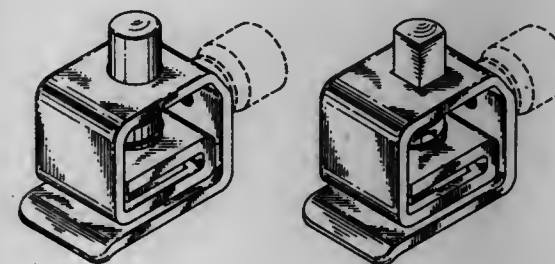
## CLAMP FOR PAPER MARGIN STRIPPER

James F. Cottone, 2001 Jefferson Davis Hwy., Arlington, Va. 22202

Filed Apr. 15, 1994, Ser. No. 21,369

Term of patent 14 years

U.S. Cl. D8—72



365,977

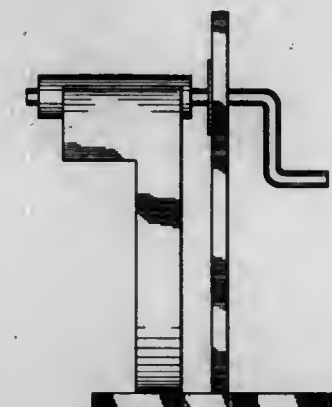
## TRIMMER LINE REWINDER

Barry L. Smith, P.O. Box 185, DeArmanville, Ala. 36257

Filed Apr. 22, 1994, Ser. No. 21,718

Term of patent 14 years

U.S. Cl. D8—359



365,976

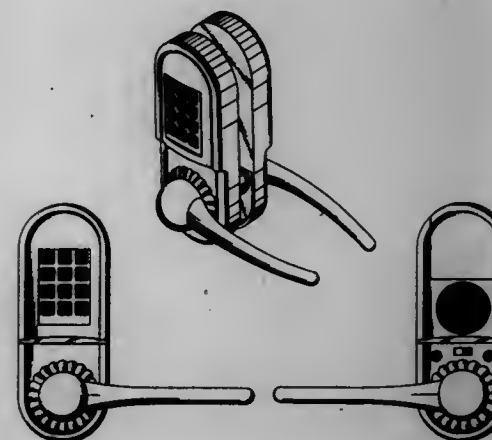
## COMBINATION LOCK

Chu C. Chiu, 117, Cherrng Gong East Road, Yuan Lin Town, Changhwa County, Taiwan, Prov. of China

Filed Feb. 28, 1995, Ser. No. 35,457

Term of patent 14 years

U.S. Cl. D8—330



365,978

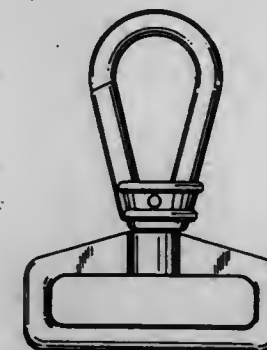
## SNAP HOOK

Richard J. Rekuc, Pattenburg, and Jeffrey Bertelsen, Somerville, both of N.J., assignors to TUMI, Middlesex, N.J.

Filed Nov. 22, 1994, Ser. No. 31,324

Term of patent 14 years

U.S. Cl. D8—367



365,979

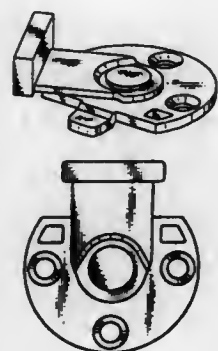
**MOUNTING FOR A WINDOW OR A DOOR**Berthold Blomqvist, Lammhult, Sweden, assignor to Teknos-  
and Invent AB, Sweden

Filed Mar. 3, 1993, Ser. No. 5,393

Claims priority, application Denmark, Sep. 7, 1992, MA  
0875 1992

Term of patent 14 years

U.S. Cl. D8—400



365,981

**PACKAGE OF COTTON CANDY BALLS**

John T. Sullivan, 3910 Madison St., Hyattsville, Md. 20781

Filed Oct. 18, 1994, Ser. No. 29,883

Term of patent 14 years



365,982

**HOLIDAY LIGHT HOLDER**Patrick J. Bologna, and Susan A. Schmidt, both of 35 Park Ave.  
Apt. 3G, Suffern, N.Y. 10901

Filed Jul. 18, 1994, Ser. No. 25,946

Term of patent 14 years

U.S. Cl. D9—343

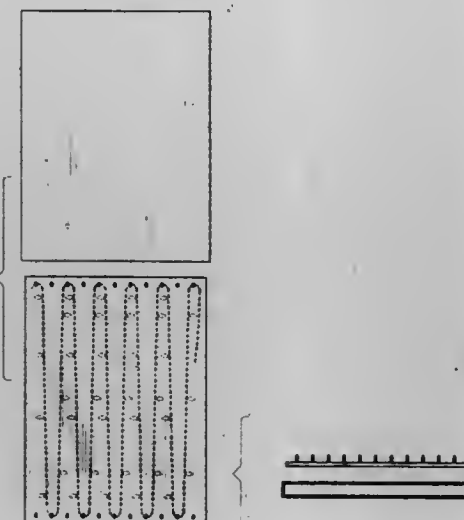
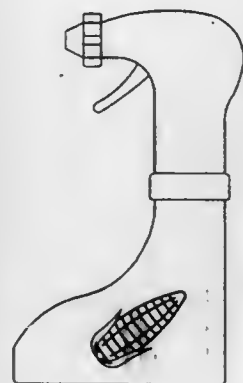
365,980

**BUTTER SPRAYER**John L. Matara, P.O. Box 2131, Big Bear City, Calif. 92314,  
and Julie J. Romans, P.O. Box 1108, Big Bear Lake, Calif.  
92315

Filed Sep. 3, 1993, Ser. No. 12,472

Term of patent 14 years

U.S. Cl. D9—300



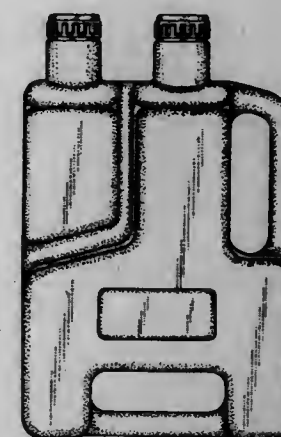
365,983

**TWO-CHAMBERED BOTTLE FOR CHEMICALS FOR  
PHOTOGRAPHIC FILM PROCESSOR**Richard P. Triassi, Walworth; William A. Bergstresser, Pratts-  
burgh; David A. Doucette, Hamlin; Linn C. Hoover, Web-  
ster, and Ronald R. Vacek, Rochester, all of N.Y., assignors to  
Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 3, 1995, Ser. No. 34,768

Term of patent 14 years

U.S. Cl. D9—347



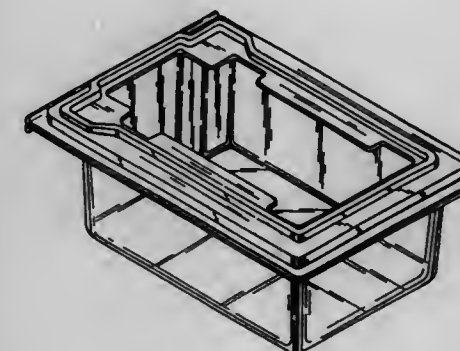
365,985

**CONTAINER FOR TRANSPORTING PHOTOGRAPHIC  
FILM CASSETTES**Arthur S. Rousmaniere, Andover, and Walter C. Lamb, Jr.,  
North Billerica, both of Mass., assignors to Polaroid Corpo-  
ration, Cambridge, Mass.

Filed Oct. 14, 1994, Ser. No. 29,727

Term of patent 14 years

U.S. Cl. D9—423



365,986

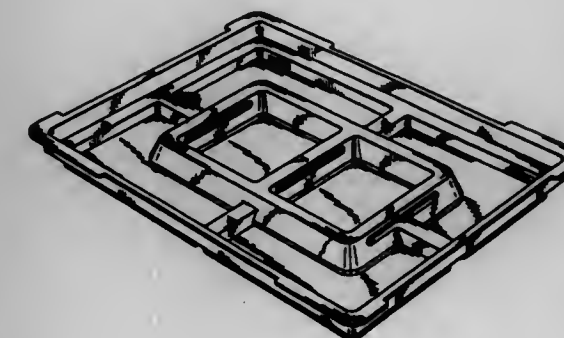
**COVER FOR A CONTAINER FOR SMALL LOADS (AS  
E.G. VEHICLE BRAKES AND PARTS THEREOF)**Hans D. Hölsken, Vallendar, Germany, assignor to Lucas  
Industries Public Limited Company, Solihull, United King-  
dom

Filed Feb. 10, 1994, Ser. No. 18,574

Claims priority, application Germany, Nov. 10, 1993, M 93  
08 839.6

Term of patent 14 years

U.S. Cl. D9—435



365,984

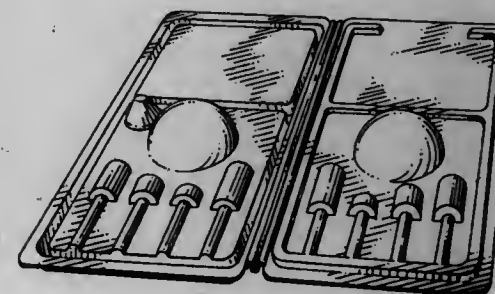
**PACKAGING CONTAINER**Michal Hofmann, P.O. Box 28130, Auckland 1136, New  
Zealand

Filed Nov. 1, 1994, Ser. No. 30,122

Claims priority, application New Zealand, May 2, 1994,  
25878

Term of patent 14 years

U.S. Cl. D9—415





365,987

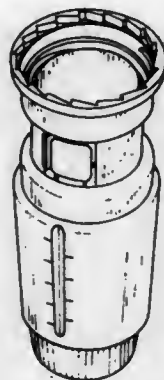
## OUTLET METERING ASSEMBLY

George L. Willard, Hamilton, New Zealand, assignor to Carter Holt Harvey Plastic Products Group Limited, Hamilton, New Zealand

Filed Jul. 15, 1994, Ser. No. 26,024

Term of patent 14 years

U.S. Cl. D9—436



365,989

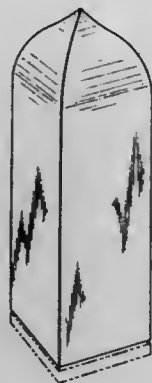
## CASE COVER

Susan R. Wacker, New York, N.Y., assignor to Elizabeth Arden Company, Division of Conopco, Inc., New York, N.Y.

Filed Aug. 9, 1994, Ser. No. 26,928

Term of patent 14 years

U.S. Cl. D9—444



365,990

## INTEGRATED ACTUATOR OVERCAP

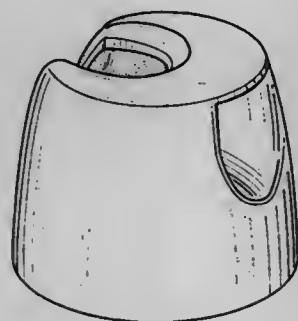
Peter McSwiggan, Chatswood, and Karl Wilkinson, Campbelltown, both of, Australia, assignors to R&C Products Pty Ltd., Ermington, Australia

Filed May 19, 1994, Ser. No. 23,220

Claims priority, application Australia, Nov. 22, 1993, 3688/93

Term of patent 14 years

U.S. Cl. D9—448



365,988

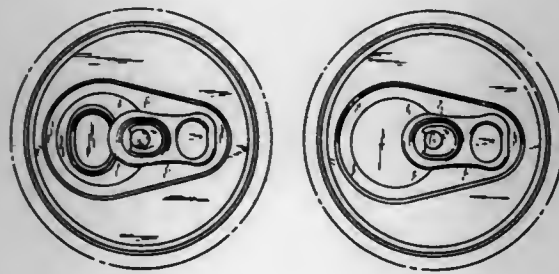
## CAN END WITH OVAL TEAR PANEL

Milton W. Clarke, III, Chesterfield County, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Jun. 15, 1994, Ser. No. 24,577

Term of patent 14 years

U.S. Cl. D9—438



365,991

## COMBINED PERFUME BOTTLE AND CLOSURE

Hubert Varlet, Paris, France, assignor to Verreries Pochet et du Courval, Paris, France

Filed Nov. 4, 1993, Ser. No. 14,936

Claims priority, application France, May 5, 1993, 932422

Term of patent 14 years

U.S. Cl. D9—544



365,993

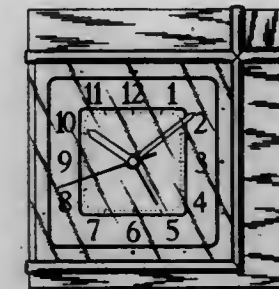
## CLOCK

Miwako Hikida, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan

Filed Oct. 31, 1994, Ser. No. 30,489

Term of patent 14 years

U.S. Cl. D10—24



365,994

## WRISTWATCH

Carl A. Brennan, Toronto, Canada, assignor to Bern Chronometer Works, Inc., Canada

Filed Aug. 16, 1993, Ser. No. 11,863

Claims priority, application Netherlands, Feb. 17, 1993, DM/025250

Term of patent 14 years

U.S. Cl. D10—32



365,992

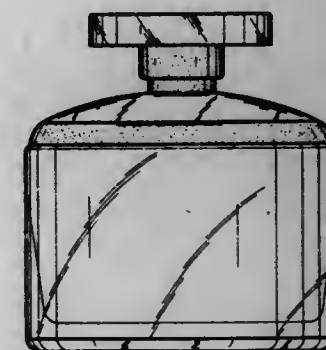
## COMBINED BOTTLE AND CLOSURE

Nicola Trussardi, Milan, Italy, assignor to Trussardi S.p.A., Milan, Italy

Filed Feb. 3, 1994, Ser. No. 18,294

Term of patent 14 years

U.S. Cl. D9—544



365,995

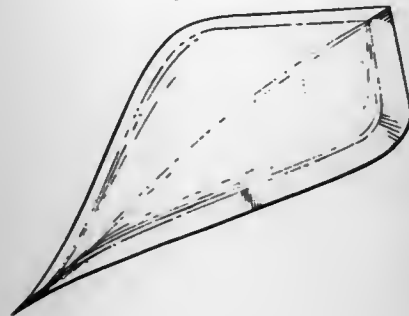
**RADAR CROSS SECTION MEASUREMENT PYLON  
TERMINATING DEVICE**

Mark T. Drinhaus, Quartz Hill, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

Filed Apr. 6, 1995, Ser. No. 37,220

Term of patent 14 years

U.S. Cl. D10—47



365,997

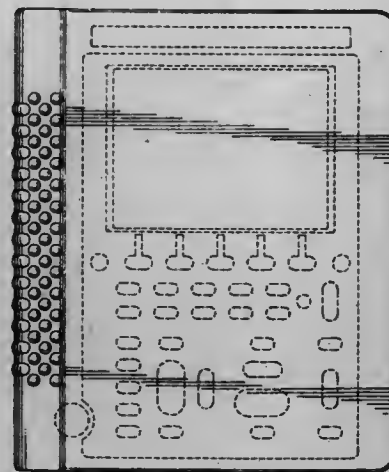
**HAND-HELD MEASUREMENT INSTRUMENT WITH  
GRIP**

Jerry L. Wrisley, Beaverton; Kelth W. Kirkwood, Portland, and David T. Rosette, Tigard, all of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Filed Mar. 3, 1995, Ser. No. 35,646

Term of patent 14 years

U.S. Cl. D10—78



365,996

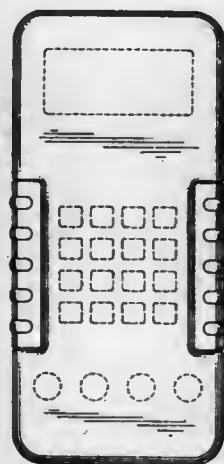
**HAND-HELD MEASUREMENT DEVICE WITH GRIP**

Scott Peterson, Beaverton; Scott R. Ketterer, Hillsboro; John B. Gilbert, and Howard M. Meehan, both of Portland, all of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Filed Feb. 17, 1995, Ser. No. 35,065

Term of patent 14 years

U.S. Cl. D10—78



365,998

**PREGNANCY TESTING STICK**

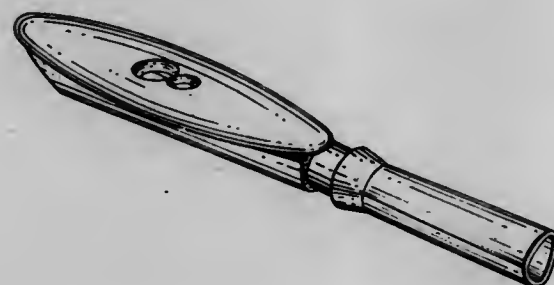
Theodorus J. J. Groothuizen; Jozef H. M. Rajmakers, both of Rotterdam, and Irene P. J. van Peer, RE Gouda, all of Netherlands, assignors to Chefaro International B.V., Rotterdam, Netherlands

Filed Sep. 12, 1994, Ser. No. 28,292

Claims priority, application Belgium, May 4, 1994, 69721 - 01 -04

Term of patent 14 years

U.S. Cl. D10—81



365,999

**PRESSURE MEASURING INSOLE**

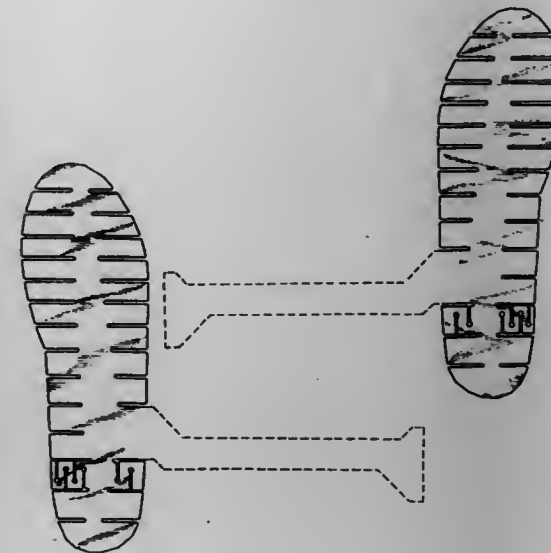
Peter Seitz, Möhlstrasse 29, 81675 Munich, Germany

Filed Apr. 26, 1994, Ser. No. 21,982

Claims priority, application Germany, Jan. 26, 1993, M9308514.1

Term of patent 14 years

U.S. Cl. D10—85



366,001

**ELECTRONIC SCALE WITH PRINTER**

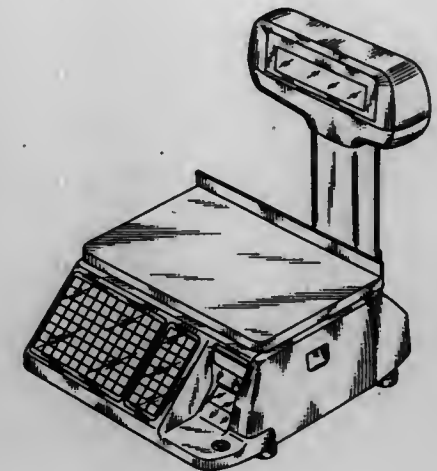
Osamu Mimoto, Sagami-hara, Japan, assignor to Tokyo Electric Co., Tokyo, Japan

Filed Sep. 13, 1994, Ser. No. 28,382

Claims priority, application Japan, Apr. 22, 1994, 6-11726

Term of patent 14 years

U.S. Cl. D10—91



366,000

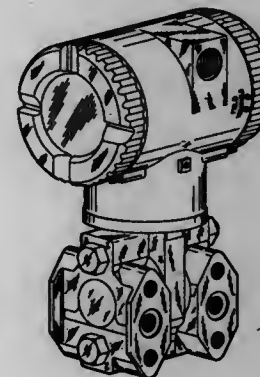
**PRESSURE TRANSMITTER HOUSING**

Edwin L. Karas, 475 Ware St., Mansfield, Mass. 02048; Roger E. Powell, II, 31 Warren Ave., North Smithfield, R.I. 02895; John P. Angelosanto, 426 Kelley Blvd., North Attleboro, Mass. 02760, and Steven D. Lantagne, 40 Maynard Ave., Seekonk, Mass. 02771.

Filed Dec. 6, 1994, Ser. No. 32,041

Term of patent 14 years

U.S. Cl. D10—85



366,002

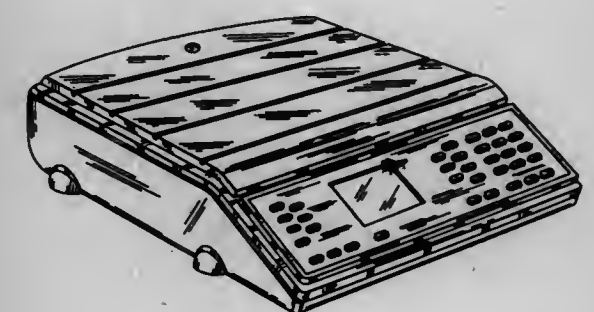
**CARRIER MANAGEMENT SYSTEM WITH  
INTEGRATED SCALE**

David H. Brooks, Jr., Wilton, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Nov. 14, 1994, Ser. No. 30,898

Term of patent 14 years

U.S. Cl. D10—91





366,003

## ENGINE TACHOMETER

Shigeo Take, Yokosuka; Hiromi Watanabe, Yokosuka; Atsuo Endo, Tokyo, and Makoto Kakegawa, Komoro, all of Japan, assignors to Oppama Industry Co., Ltd., Kanagawa, Japan

Filed Nov. 1, 1994, Ser. No. 30,519

Term of patent 14 years

U.S. Cl. D10—98



366,005

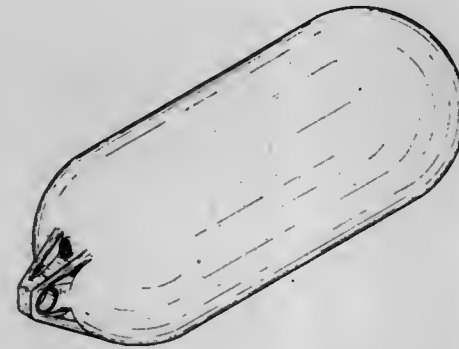
## BUOY

Knut Beyer-Olsen, Bellevue, Wash., assignor to Polyform U.S. Ltd., Kent, Wash.

Filed Aug. 1, 1994, Ser. No. 26,552

Term of patent 14 years

U.S. Cl. D10—107



366,004

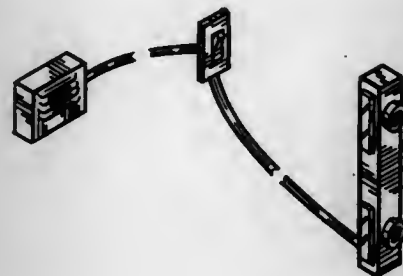
## SWIMMING POOL PERIMETER ALARM

Cari Poliah, 1351 Euclid Ave. #6, Miami Beach, Fla. 33139-3935

Filed Jan. 4, 1995, Ser. No. 33,074

Term of patent 14 years

U.S. Cl. D10—106



366,006

## JEWELRY CHAIN

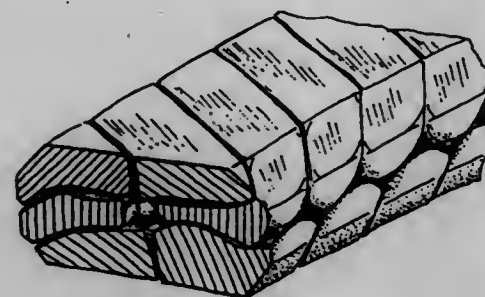
Luca Scortecchi, and Marco Stocchi, both of Castiglione Fibocchi, Italy, assignors to S.I.L.O. SpA Societa' Italiana Lavorazione Oro, Castiglione Fibocchi, Italy

Filed Oct. 7, 1994, Ser. No. 29,506

Claims priority, application Hague Agreement, May 2, 1994, DMA/002503

Term of patent 14 years

U.S. Cl. D11—12



366,007

## FASTENER FOR NECKLACE OR BRACELET

Renzo Colpo, Sovizzo, Italy, assignor to Colpo & Zilio SRL, Torri Di Quartesolo, Italy

Filed May 24, 1994, Ser. No. 23,406

Claims priority, application Italy, Nov. 26, 1993, VI9300095

Term of patent 14 years

U.S. Cl. D11—87



366,008

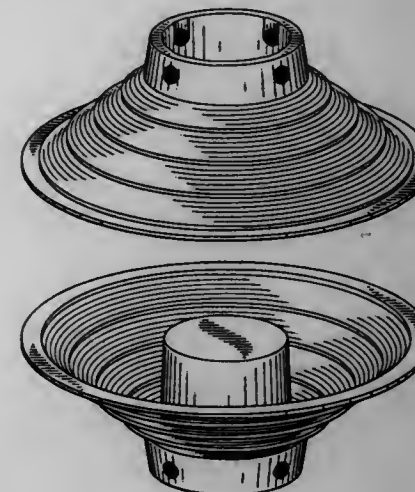
## TREESTAND

Charles H. Newcomer, P.O. Box 134, Grants Pass, Oreg. 97526

Filed Oct. 17, 1994, Ser. No. 29,846

Term of patent 14 years

U.S. Cl. D11—130.1



366,009

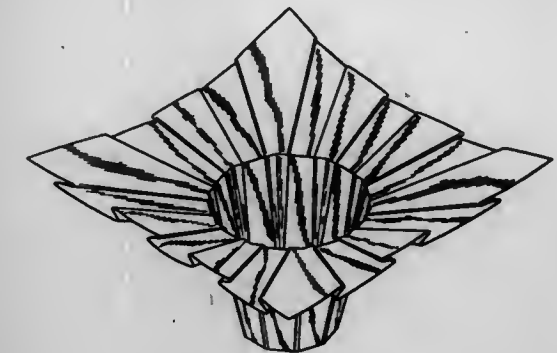
## FLOWER POT COVER

Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill. Continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, abandoned, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, Ser. No. 411,249, Sep. 22, 1989, Ser. No. 411,247, Sep. 22, 1989, and a continuation-in-part of Ser. No. 411,245, Sep. 22, 1989. This application Dec. 16, 1991, Ser. No. 807,674

The portion of the term of this patent subsequent to May 14, 2005, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—164



366,010

## PULL TAB FOR SLIDE FASTENER SLIDERS

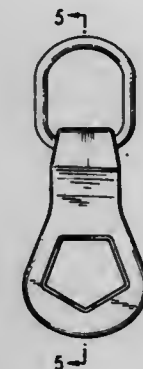
Kenji Yuuki, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Mar. 29, 1994, Ser. No. 20,567

Claims priority, application Japan, Sep. 30, 1993, 5-29547

Term of patent 14 years

U.S. Cl. D11—221



366,011

**PULL TAB FOR SLIDE FASTENER SLIDERS**

Kenji Yuuki, Toyam, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Mar. 29, 1994, Ser. No. 20,573

Claims priority, application Japan, Sep. 30, 1993, 5-29549

Term of patent 14 years

U.S. Cl. D11—221



366,013

**CUFFLINK**

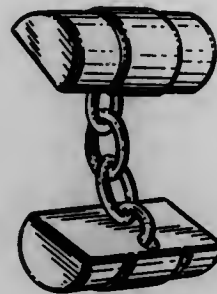
Christiane Pandel, Chambes, Switzerland, assignor to Rolex Watch U.S.A., Inc., New York, N.Y.

Filed Nov. 8, 1994, Ser. No. 30,796

Claims priority, application Switzerland, Jun. 3, 1994, DM/029776

Term of patent 14 years

U.S. Cl. D11—222



366,012

**SLIDER FOR SLIDE FASTENERS**

Tsunetaka Aoki, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Apr. 29, 1994, Ser. No. 22,090

Claims priority, application Japan, Jan. 29, 1993, 5-33068

Term of patent 14 years

U.S. Cl. D11—221



366,014

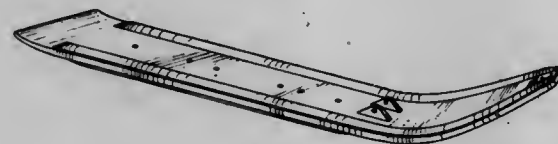
**SNOWMOBILE SKI**

David T. Lindquist, 19 E. 1110 South, Kaysville, Utah 84037, and Ryan B. Packard, 1418 Maple Hills Dr., Bountiful, Utah 84010

Filed May 12, 1995, Ser. No. 38,879

Term of patent 14 years

U.S. Cl. D12—7



366,015

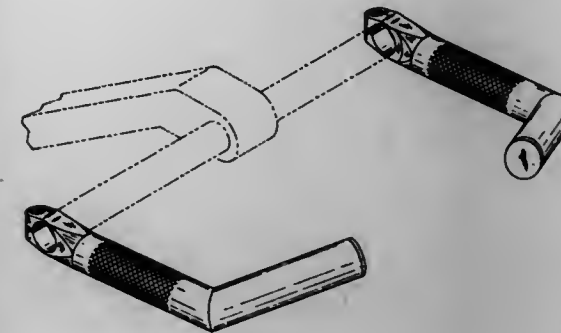
**SET OF BICYCLE BAR ENDS**

Lance McCormack, P.O. Box 7561, Trenton, N.J. 08628

Filed Jan. 24, 1995, Ser. No. 33,943

Term of patent 14 years

U.S. Cl. D12—114



366,017

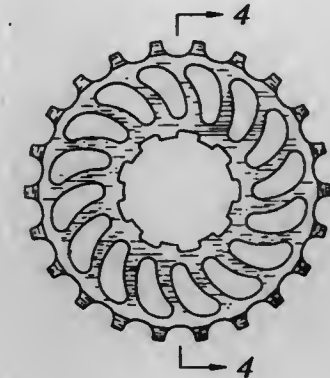
**BICYCLE GEAR**

Bruce T. Boone, 3703 Pinebrook Dr., Acworth, Ga. 30102

Filed Mar. 8, 1993, Ser. No. 5,637

Term of patent 14 years

U.S. Cl. D12—123



366,016

**BICYCLE STAND**

Michael A. Kolesiak, 1383 Oakdale St.; Karen A. Kratzsch, and Kurt G. Kratzsch, both of 706 Ross Ave., Apt. B, all of Warsaw, Ind. 46580

Filed Nov. 5, 1993, Ser. No. 15,075

Term of patent 14 years

U.S. Cl. D12—115



366,018

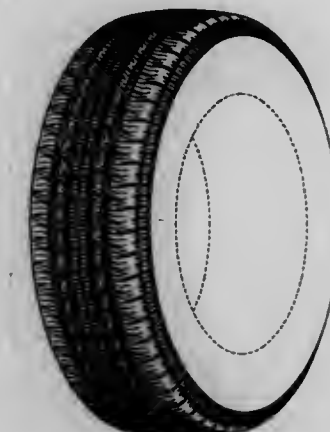
**TIRE TREAD**

Dennis W. Krupa, Kent; Bill J. Wallet, Marshallville, and Joseph F. Molnar, Wadsworth, all of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Filed May 27, 1994, Ser. No. 23,612

Term of patent 14 years

U.S. Cl. D12—147





366,019

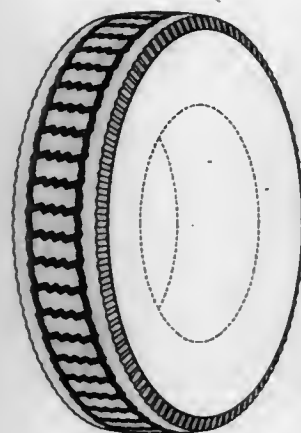
## TIRE TREAD

Daniel E. Schuster, North Royalton, and Robert J. Hermann, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 25, 1994, Ser. No. 26,339

Term of patent 14 years

U.S. Cl. D12—147



366,020

## AUTOMOBILE TIRE

Yasuo Himuro, and Katsuhiko Kinoshita, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

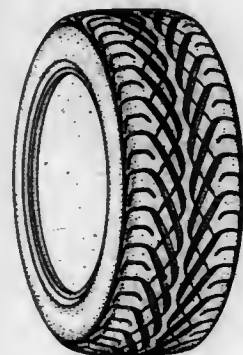
Filed Jan. 27, 1994, Ser. No. 18,000

Claims priority, application Japan, Jul. 30, 1993, 5-23592

The portion of the term of this patent subsequent to May 30, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D12—149



366,021

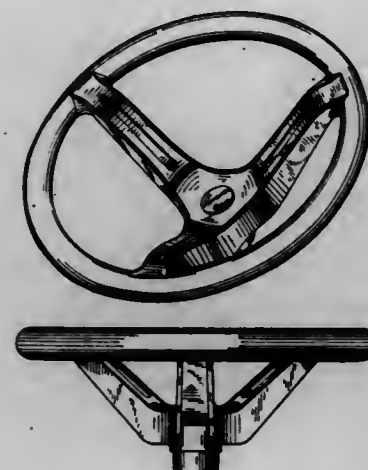
## STEERING WHEEL

Robert D. Tharp, Jackson, Wis., assignor to The Kelch Corporation, Mequon, Wis.

Filed Oct. 21, 1994, Ser. No. 30,027

Term of patent 14 years

U.S. Cl. D12—176



366,022

## MOTOR CAP

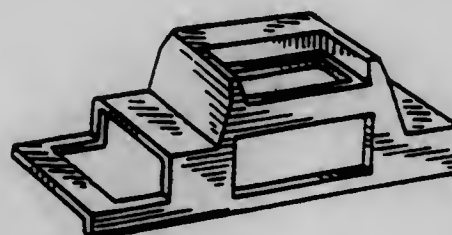
Carl Van Hool, Central Post Office, Lier, Belgium

Filed Sep. 16, 1993, Ser. No. 13,024

Claims priority, application Hague Agreement, Mar. 17, 1993, DM/025.544

Term of patent 14 years

U.S. Cl. D12—178



366,023

## ELEMENT OF A FLOATING PLATFORM

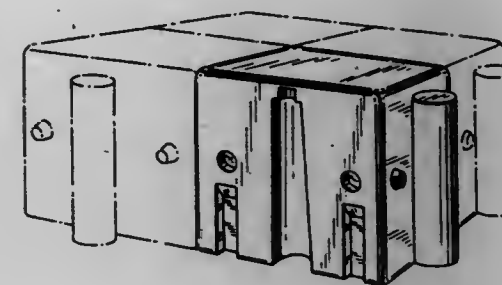
Roger LeCat, AS22 Avenue Monteverdi, Les Hauts du grand duc, Mandelieu, France

Filed Feb. 28, 1994, Ser. No. 19,395

Claims priority, application European Pat. Off., Aug. 27, 1993, DM/027118

Term of patent 14 years

U.S. Cl. D12—316



366,025

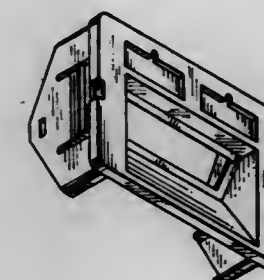
## PANEL YOKE

John A. Siemon, Woodbury, and Randall J. Below, Cheshire, both of Conn., assignors to The Siemon Company, Watertown, Conn.

Continuation-in-part of Ser. No. 121,167, Sep. 14, 1993, Pat. No. 5,362,254, which is a division of Ser. No. 993,480, Dec. 18, 1992, Pat. No. 5,295,869. This application Aug. 10, 1994, Ser. No. 26,964

Term of patent 14 years

U.S. Cl. D13—154



366,026

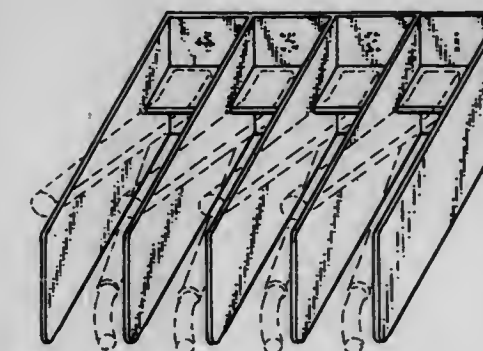
## JUMPER CABLE SAFETY GUARD

Edward K. Morse, Ginn Point, Owls Head, Me. 04854, and Christopher E. Morse, 87 Mill Rd., Cumberland Center, Me. 04021

Filed Feb. 4, 1994, Ser. No. 18,358

Term of patent 14 years

U.S. Cl. D13—154



366,024

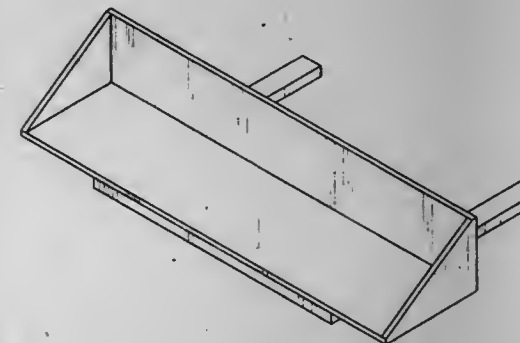
## PORTABLE TRUCK SHELF

Charlie L. Young, 1670 Ollie St., Cocoa, Fla. 32922

Filed Mar. 3, 1994, Ser. No. 19,499

Term of patent 14 years

U.S. Cl. D12—425



366,027

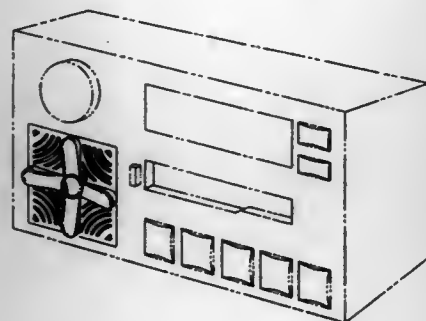
**MULTIPLE SPEAKER CONTROL SWITCH FOR A VEHICULAR RADIO RECEIVER AND CASSETTE PLAYER**

James E. Van Heut, Auburn Hills, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Aug. 30, 1994, Ser. No. 27,825

Term of patent 14 years

U.S. Cl. D13—162



366,029

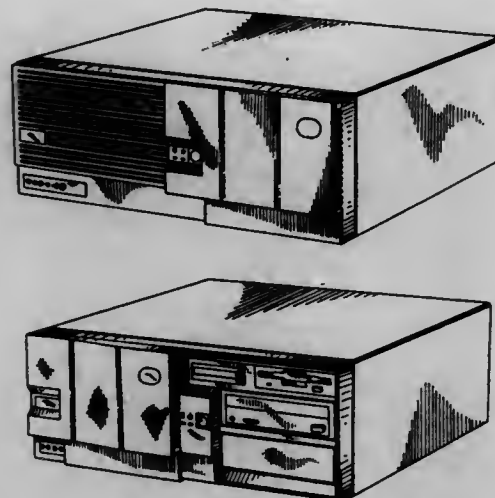
**PERSONAL COMPUTER**

Susan S. Moffatt, Boca Raton, Fla.; Toshitaka Imai, Sagami-hara, Japan; John A. Wiseman, Ridgefield, Conn., and Joseph E. Jasinski, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 13, 1994, Ser. No. 29,687

Term of patent 14 years

U.S. Cl. D14—100



366,030

**PERSONAL COMPUTER HOUSING**

Edwin C. Tinsley, Jr., Austin, and James H. Quiggins, Houston, both of Tex., assignors to Compuadd Corporation, Austin, Tex.

Filed Sep. 10, 1993, Ser. No. 12,788

Term of patent 14 years

U.S. Cl. D14—102

366,028

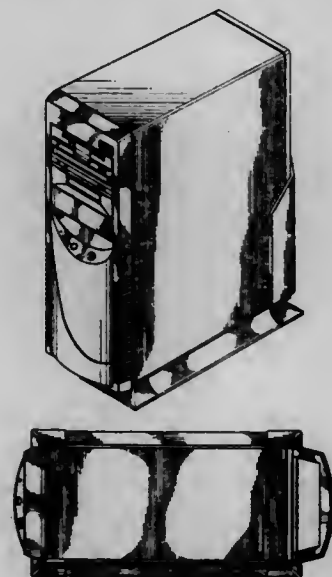
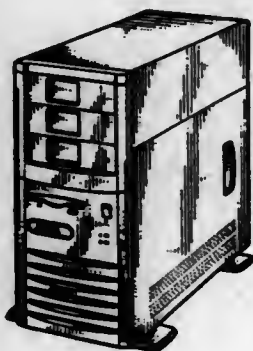
**MINITOWER PERSONAL COMPUTER**

Randall W. Martin, The Woodlands; Peter B. Barron, and Wayne T. Brezovar, both of Houston, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Jun. 23, 1994, Ser. No. 24,923

Term of patent 14 years

U.S. Cl. D14—100



366,031

**CHIP CARD CONTROLLER HOUSING**

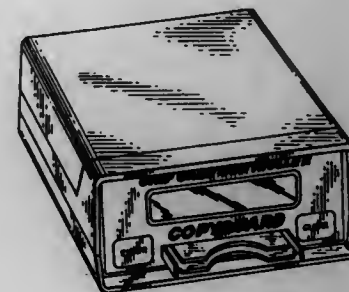
Geoffrey R. Bradbury, Grund 10, Geisenheim 6222, Germany

Filed Mar. 29, 1993, Ser. No. 6,444

Claims priority, application Germany, Jan. 22, 1992, 92 07 848.6

Term of patent 14 years

U.S. Cl. D14—105



366,033

**NOTEBOOK PERSONAL COMPUTER**

John E. Youens, Tomball, Tex.; John V. Buelow, Oak Park, and Stanley H. Wada, Arleta, both of Calif., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Jun. 23, 1994, Ser. No. 24,896

Term of patent 14 years

U.S. Cl. D14—106



366,032

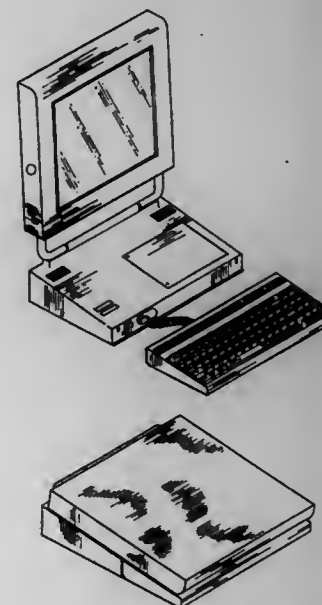
**DESKTOP COMPUTER HOUSING**

Paul L. Soderburg, P.O. Box 1818, Nevada City, Calif. 95959, assignor to Paul L. Soderburg, Santa Barbara, Calif.

Filed Jan. 28, 1994, Ser. No. 18,211

Term of patent 14 years

U.S. Cl. D14—106



366,034

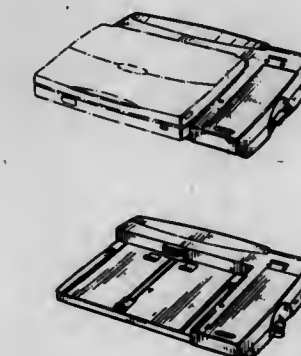
**EXPANSION BASE FOR A NOTEBOOK PERSONAL COMPUTER**

John E. Youens, Tomball, Tex.; John Von Buelow, Oak Park, Calif.; Stanley H. Wada, Arleta, Calif., and Brian R. Heldsiek, Mar Vista, Calif., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Jun. 23, 1994, Ser. No. 24,925

Term of patent 14 years

U.S. Cl. D14—107





366,035

## DISK DRIVE

Takao Akiba, and Hidetoshi Kabasawa, both of Musashino, Japan, assignors to TEAC Corporation, Tokyo, Japan

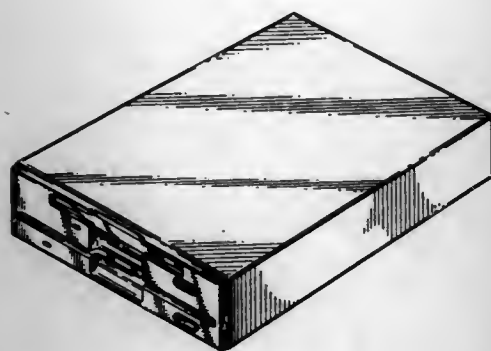
Filed Apr. 28, 1994, Ser. No. 22,051

Claims priority, application Japan, Jan. 29, 1993, 5-32887

The portion of the term of this patent subsequent to Mar. 29, 2008, has been disclaimed.

Term of patent 14 years

U.S. Cl. D14—109



366,037

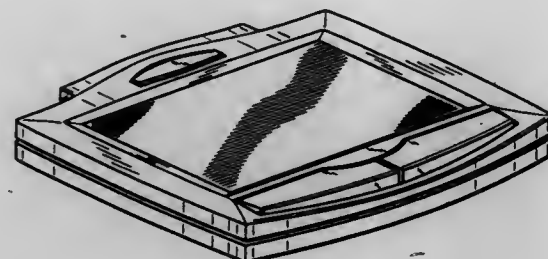
## FINGER ACTIVATED CURSOR CONTROL

Masahiko Kawachi, Sunnyvale; J. Scott Petermann, San Jose; Tark Abed, Palo Alto, and Jay Wilson, Portola Valley, all of Calif., assignors to Alps Electric (USA) Inc., San Jose, Calif.

Filed Aug. 26, 1994, Ser. No. 27,677

Term of patent 14 years

U.S. Cl. D14—114



366,036

## PERSONAL DIGITAL ASSISTANT TO BE WORN ON A WRIST

John T. Houlihan, Southbury, Conn., assignor to Timex Corporation, Middlebury, Conn.

Filed May 28, 1993, Ser. No. 8,741

Term of patent 14 years

U.S. Cl. D14—114



366,038

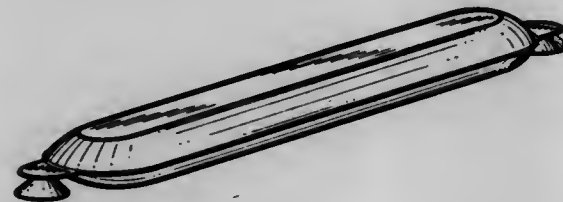
## WRIST CUSHION

Sydney M. Rogers, 16 N. Chatsworth Ave., Larchmont, N.Y. 10538

Filed Feb. 21, 1995, Ser. No. 35,130

Term of patent 14 years

U.S. Cl. D14—114



366,039

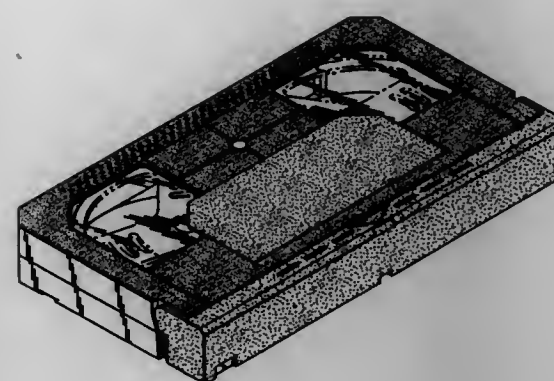
## VIDEOCASSETTE

John A. Bailey, Woodbury; Glenn A. Bloomer, Maplewood; Gregory H. Johnson, Oakdale, all of Minn.; Nicholas A. Brawne, Columbus, Ohio; Mark J. Ciesko, Hilliard, Ohio, and Donald J. Staufenberg, Dublin, Ohio, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 5, 1994, Ser. No. 20,931

Term of patent 14 years

U.S. Cl. D14—121



366,041

## KARAOKE MUSIC PLAYER

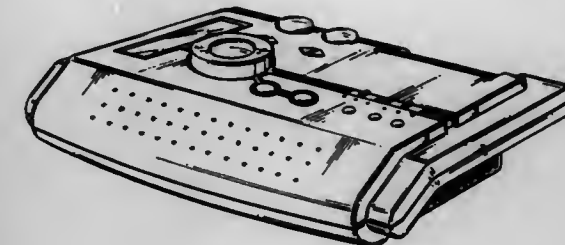
Keizo Tatsumi, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Mar. 24, 1994, Ser. No. 20,350

Claims priority, application Japan, Nov. 5, 1993, 5-33707

Term of patent 14 years

U.S. Cl. D14—160



366,042

## REMOTE HAND CONTROLLER

David W. Laituri, Palo Alto, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed May 11, 1993, Ser. No. 8,197

Term of patent 14 years

U.S. Cl. D14—218

366,040

## SCREEN

Vincent D. Leone, Sr., and Kenneth W. Seyffert, both of Houston, Tex., assignors to Environmental Procedures, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 56,123, Apr. 30, 1993, Pat. No. 5,385,669, and a continuation-in-part of Ser. No. 105,696, Aug. 12, 1993, Pat. No. 5,392,925. This application Oct. 25, 1993, Ser. No. 14,571

Term of patent 14 years

U.S. Cl. D15—147



366,043

**REMOTE CONTROLLER FOR TELEVISION RECEIVER**

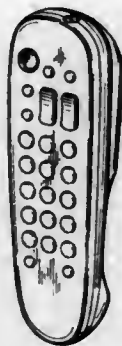
Masayuki Hara, Shiga, and Noriaki Mori, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 16, 1994, Ser. No. 28,488

Claims priority, application Japan, Mar. 16, 1994, 6-6992

Term of patent 14 years

U.S. Cl. D14—218



366,045

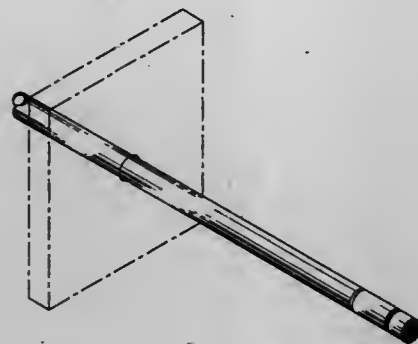
**PORTION OF A MICROPHONE WAND**

Bruce D. Hirschhorn, 156 Farber Hill Rd., Boonton, N.J. 07005

Division of Ser. No. 3,322, Nov. 25, 1992, Pat. No. Des. 359,051. This application Mar. 27, 1995, Ser. No. 36,767

Term of patent 14 years

U.S. Cl. D14—228



366,044

**REMOTE CONTROLLER FOR TELEVISION RECEIVER**

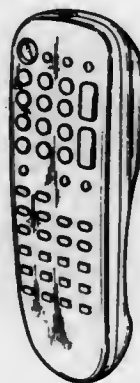
Masayuki Hara, Shiga, and Noriaki Mori, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 16, 1994, Ser. No. 28,496

Claims priority, application Japan, Mar. 16, 1994, 6-6993

Term of patent 14 years

U.S. Cl. D14—218



366,046

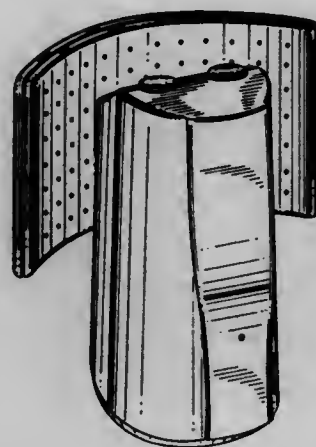
**AM/FM POWERED ANTENNA**

Haruo Oba, and Eduardo Sciammarella, both of Hoboken, N.J., assignors to Sony Electronics Inc., Park Ridge, N.J.

Filed Jan. 12, 1994, Ser. No. 17,405

Term of patent 14 years

U.S. Cl. D14—230



366,047

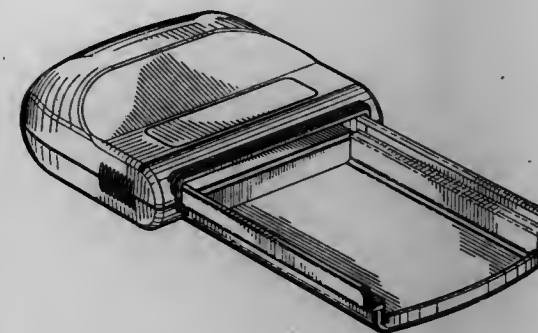
**INTERFACE ACCESSORY FOR PCMCIA DEVICES**

Roman P. Rak, Delta; William E. Fenton, Coquitlam, both of Canada, and Tuffy R. Chamoun, Bloomington, Ill., assignors to Motorola Inc., Schaumburg, Ill.

Filed Feb. 3, 1995, Ser. No. 34,375

Term of patent 14 years

U.S. Cl. D14—256



366,049

**REFRIGERATED MERCHANDISER**

Bryce A. Matthews, Christchurch, New Zealand, assignor to Skope Industries Limited, New Zealand

Filed Feb. 23, 1994, Ser. No. 19,098

Claims priority, application New Zealand, Aug. 26, 1993, 25402

Term of patent 14 years

U.S. Cl. D15—85



366,048

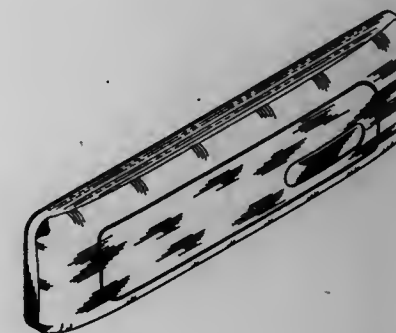
**FRONT PANEL FOR A MOBILE RADIO**

Masaru Tokiyama, Coral Springs, and William H. Robertson, Jr., Plantation, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 2, 1994, Ser. No. 22,251

Term of patent 14 years

U.S. Cl. D14—258



366,050

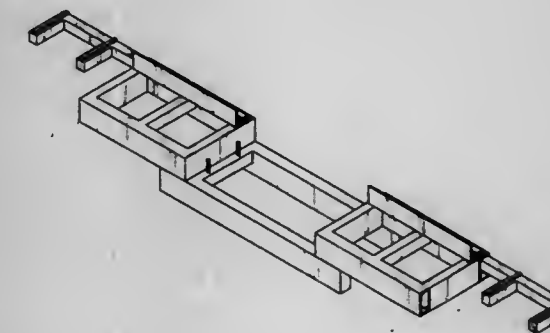
**EXTENDABLE MITER SAW TABLE TOP**

Harvey E. Hinds, 4502 Oxbow Trail, Cottonwood, Ariz. 86326

Filed Oct. 21, 1994, Ser. No. 30,083

Term of patent 14 years

U.S. Cl. D15—133





366,051

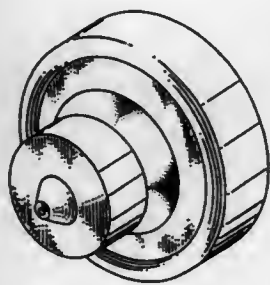
**NOZZLE INSERT FOR DISPENSING VISCOUS MATERIALS**

William A. Lewis, Lilburn, and Edward C. Taylor, Cumming, both of Ga., assignors to Nordson Corporation, Westlake, Ohio

Filed Oct. 31, 1994, Ser. No. 30,474

Term of patent 14 years

U.S. Cl. D15—138



366,053

**MACHINE FOR FILLING CIGARETTE TUBES**

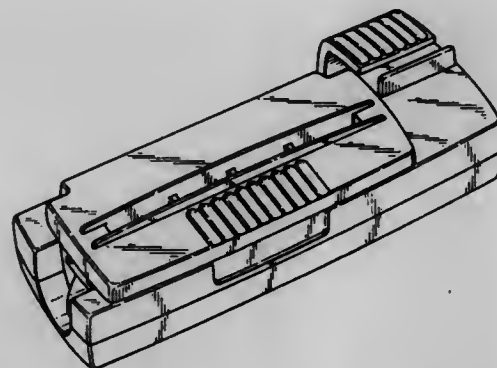
Manfred Neumann, and Josef Lier, both of Radevormwald, Germany, assignors to Gizeh-Werk GmbH, Bergneustadt, Germany

Filed Dec. 27, 1993, Ser. No. 16,829

Claims priority, application Germany, Jun. 26, 1993, 93 05 071.2

Term of patent 14 years

U.S. Cl. D15—145



366,054

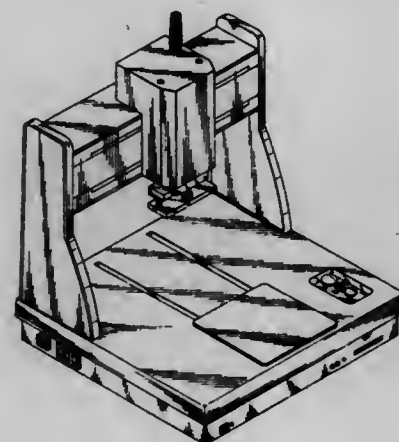
**INDUSTRIAL ROBOT**

Yoshiaki Eguchi, Tokyo, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1994, Ser. No. 29,767

Term of patent 14 years

U.S. Cl. D15—199



366,052

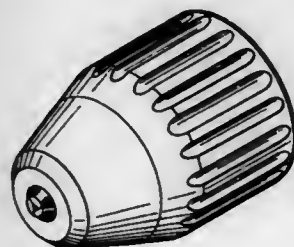
**CHUCK**

Christopher B. Barton, and Stephen W. Steadings, both of Seneca, S.C., assignors to Power Tool Holders Incorporated, Wilmington, Del.

Filed Jan. 20, 1995, Ser. No. 33,815

Term of patent 14 years

U.S. Cl. D15—140



366,055

**SCREEN FOR A LIQUID CRYSTAL PROJECTOR**

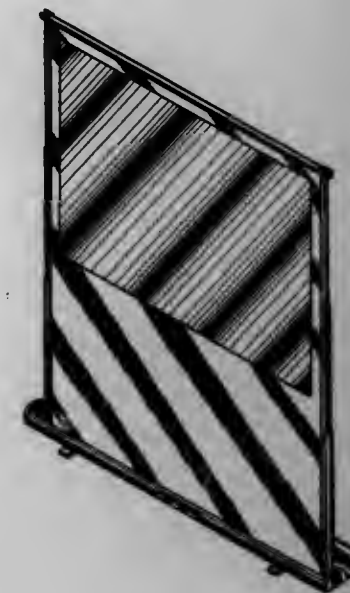
Tsuyoshi Matsunaga, Tokorozawa; Akihiro Miyahara, Tokyo, and Hideo Takamoto, Chiba, all of, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1994, Ser. No. 32,439

Claims priority, application Japan, Jul. 27, 1994, 6-22334

Term of patent 14 years

U.S. Cl. D16—241



366,057

**EYEGLASSES**

Lin-Lin Yang, 1F, No. 24, Lane 205, Chung Shan Road, Tainan City, Taiwan, Prov. of China

Filed Dec. 21, 1994, Ser. No. 32,651

Term of patent 14 years

U.S. Cl. D16—314



366,058

**CASH REGISTER**

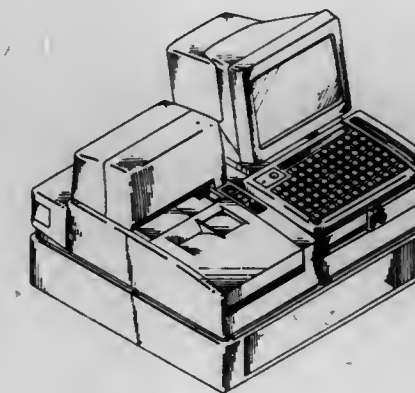
Maki Sato, Yokohama, and Kiyoshi Saito, Tokyo, both of, Japan, assignors to Kabushiki Kaisha Tec, Shizuoka, Japan

Filed Apr. 21, 1994, Ser. No. 21,621

Claims priority, application Japan, Apr. 11, 1993, 5-33500

Term of patent 14 years

U.S. Cl. D18—4



366,056

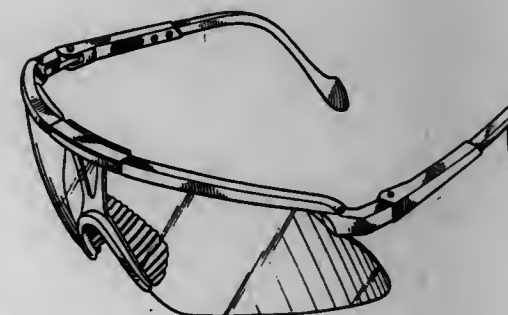
**SUNGLASSES**

Winston Wolfe, 4749 Oakbrook Ct., Memphis, Tenn. 38117

Filed Dec. 12, 1994, Ser. No. 32,253

Term of patent 14 years

U.S. Cl. D16—314



366,059

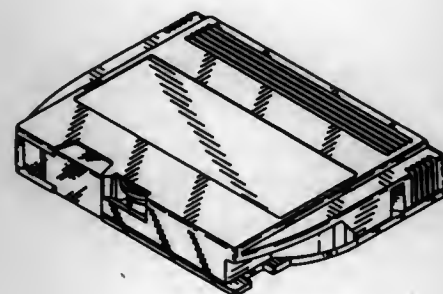
## TAPE CARTRIDGE

James J. Evanoff, Roseville; Sten R. Gerfast, Mendota Heights, both of Minn.; John T. Gianfagna, Marietta, Ohio; LeRoy A. Knta, Mahtomedi, and Robert W. Tapani, Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 14, 1994, Ser. No. 30,954

Term of patent 14 years

U.S. Cl. D18—56



366,061

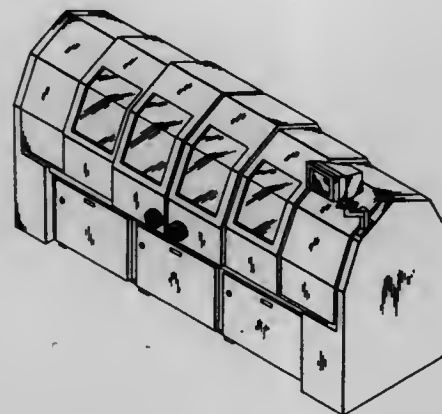
## ENGRAVER

Robert D. Likins, Wilmington, and Larry D. Lucous, Dayton, both of Ohio, assignors to Ohio Electronic Engravers, Inc., Dayton, Ohio

Filed Dec. 3, 1993, Ser. No. 16,023

Term of patent 14 years

U.S. Cl. D18—57



366,062

## WRITING INSTRUMENT

Osamu Takahashi, Kawagoe, Japan, assignor to Kotobuki & Co., Ltd., Kyoto, Japan

Filed Mar. 1, 1995, Ser. No. 35,540

Term of patent 14 years

U.S. Cl. D19—51



366,060

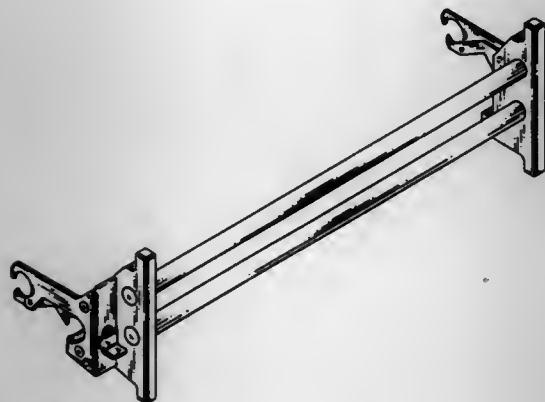
## GRIPPING AND ALIGNMENT DEVICE

Edwin G. Theriault, Hudson, N.H., assignor to Presstek, Inc., Hudson, N.H.

Filed May 4, 1995, Ser. No. 38,381

Term of patent 14 years

U.S. Cl. D18—56



366,063

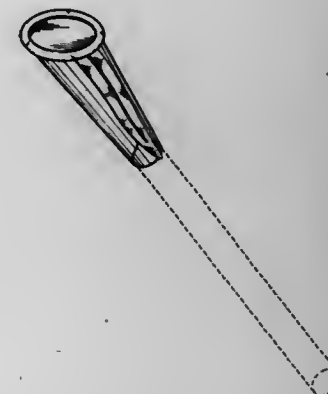
## CAP FOR INSTRUMENTS

Louis A. Lanoie, West Warwick, R.I., assignor to Phenix Group, Inc., West Warwick, R.I.

Filed May 8, 1995, Ser. No. 38,550

Term of patent 14 years

U.S. Cl. D19—57



366,065

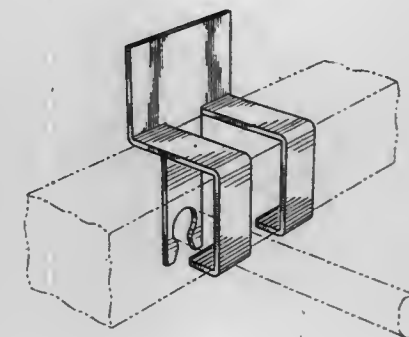
## BELT RACK TAB

Randall R. Lockard, Coppell, Tex., assignor to TBAC Investment Trust, Arlington, Tex.

Filed Apr. 28, 1994, Ser. No. 22,042

Term of patent 14 years

U.S. Cl. D20—22



366,064

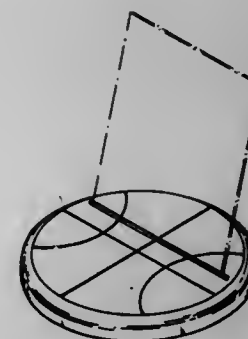
## DISPLAY STAND

Ray M. Milojevich, 11541 SE. Flavel St., Portland, Oreg. 97266

Division of Ser. No. 4,731, Feb. 12, 1993, Pat. No. Des. 357,705. This application Apr. 17, 1995, Ser. No. 37,683

Term of patent 14 years

U.S. Cl. D19—90



366,066

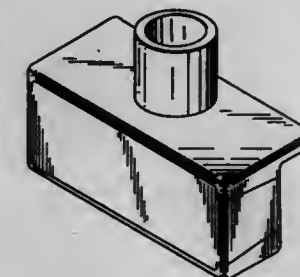
## SIGN HOLDER

Mike T. Callas, Minneapolis, Minn., assignor to Callas Enterprises, Tonka Bay, Minn.

Division of Ser. No. 21,221, Apr. 11, 1994, Pat. No. Des. 357,505. This application Aug. 26, 1994, Ser. No. 27,663

Term of patent 14 years

U.S. Cl. D20—43





366,067

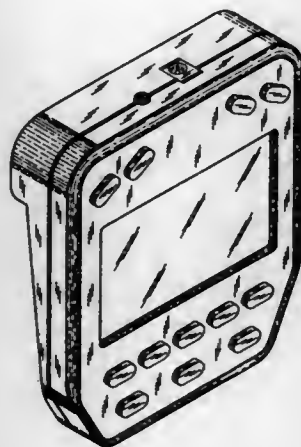
**HAND HELD VIDEO GAME**

Paul Mowrey, 7825 Ben Hogan Dr., Las Vegas, Nev. 89129

Filed Dec. 21, 1994, Ser. No. 32,559

Term of patent 14 years

U.S. Cl. D21-13



366,069

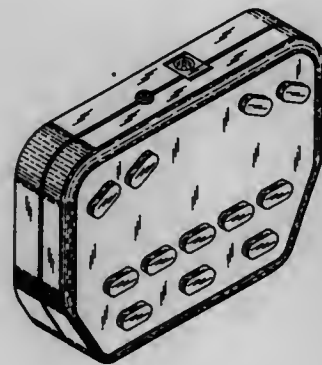
**HAND HELD REMOTE UNIT FOR VIDEO GAME**

Paul Mowrey, 3111 S. Valley View, Bldg. O, Ste. 104, Las Vegas, Nev. 89102

Filed Dec. 21, 1994, Ser. No. 32,558

Term of patent 14 years

U.S. Cl. D21-48



366,068

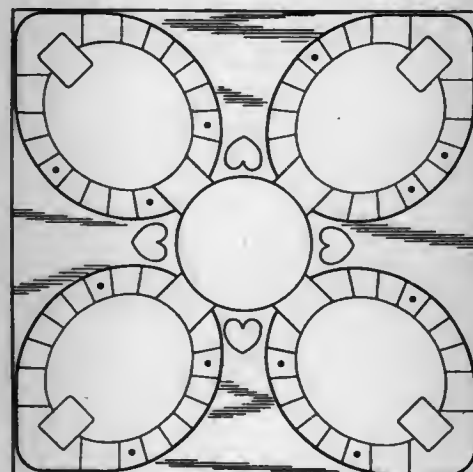
**BOARD GAME**

Richard C. Levy, P.O. Box 34828, Bethesda, Md. 20827

Filed Jan. 18, 1995, Ser. No. 33,703

Term of patent 14 years

U.S. Cl. D21-26



366,070

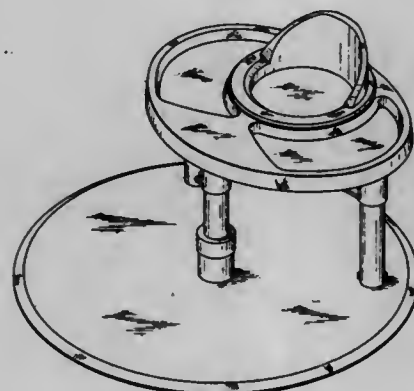
**BABY EXERCISER AND ACTIVITY CENTER**

Daniel R. Fermaglich, and Lois F. Fermaglich, both of Mountain Lakes, N.J., assignors to Peditasafe Products, Inc., West Greenwich, R.I.

Filed Jun. 1, 1994, Ser. No. 23,801

Term of patent 14 years

U.S. Cl. D21-66



366,071

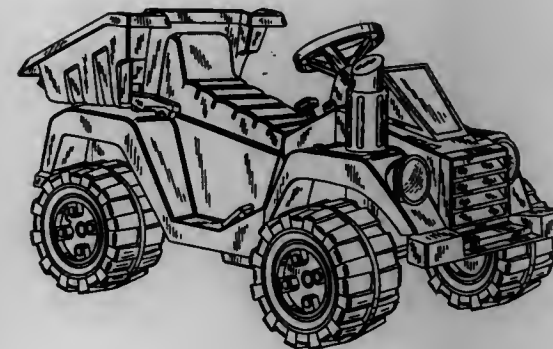
**RIDING TOY DUMP TRUCK**

Lawrence R. Harrod, Fort Wayne, Ind., assignor to Mattel, Inc., El Segundo, Calif.

Filed Aug. 17, 1994, Ser. No. 27,287

Term of patent 14 years

U.S. Cl. D21-78



366,073

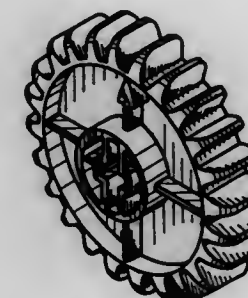
**TOY GEAR WHEEL**

Sten Schmidt, Grindsted, and Kurt Jensen, Vejle, both of, Denmark, assignors to Interlego AG, Baar, Switzerland

Filed Sep. 29, 1994, Ser. No. 29,145

Term of patent 14 years

U.S. Cl. D21-108



366,074

**TOY FIGURE**

Gloria Sandvik, 230 Central Park South, New York, N.Y. 10019

Filed Feb. 2, 1993, Ser. No. 4,330

Term of patent 14 years

U.S. Cl. D21-148



366,072

**MECHANICAL PUZZLE**

Stephen Casey, Duarte, and Carlos Dominguez, San Dimas, both of Calif., assignors to Hi-Q Products, Inc., Alhambra, Calif.

Filed Jul. 21, 1994, Ser. No. 26,179

Term of patent 14 years

U.S. Cl. D21-104



366,075

**BUBBLE BLOWING BEAR**

Sally Bhandhugravi, Nutley, N.J., and Mary Butcher, Bronx, N.Y., assignors to Link Group International, Ridgefield, Conn.

Filed Feb. 4, 1994, Ser. No. 18,409

Term of patent 14 years

U.S. Cl. D21—159



366,077

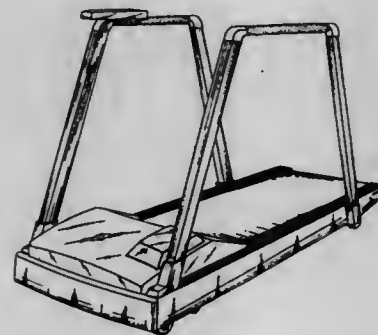
**TREADMILL**

Michael Hung, 9-16, Nan Kan Hsia, Nan Kan, Lu Chu Hsiang, Tao Yuan County, Taiwan, Prov. of China

Filed Dec. 21, 1993, Ser. No. 16,647

Term of patent 14 years

U.S. Cl. D21—192



366,078

**BASKETBALL NET**

Robert K. Rothbard, P.O. Box 593, Galveston, Tex. 77553

Division of Ser. No. 24,895, Jun. 23, 1994. This application

Apr. 10, 1995, Ser. No. 37,294

Term of patent 14 years

U.S. Cl. D21—201

366,076

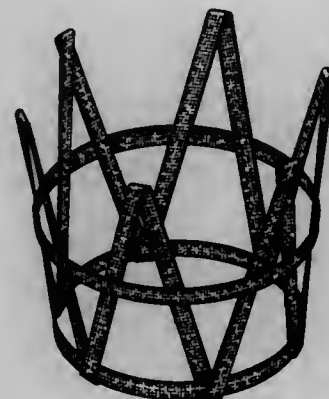
**TOY SKELETON**

Niels M. Pedersen, Arhus C, Denmark, assignor to INTER-LEGO AG, Baar, Switzerland

Filed Sep. 29, 1994, Ser. No. 29,116

Term of patent 14 years

U.S. Cl. D21—166



366,079

**HEAD OF A GOLF CLUB**

Yoshinari Kenmi, Kobeshi, Japan, assignor to Royal Collection Incorporated, Hyogo, Japan

Filed Mar. 24, 1994, Ser. No. 20,339

Term of patent 14 years

U.S. Cl. D21—214



366,081

**BLADE-TYPE GOLF PUTTER HEAD**

Richard L. Patten, 2932 37th Ave. South, Minneapolis, Minn. 55406

Filed Dec. 15, 1994, Ser. No. 32,307

Term of patent 14 years

U.S. Cl. D21—219



366,080

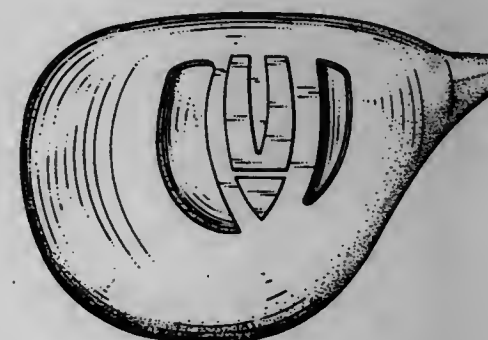
**GOLF CLUB METAL WOOD HEAD**

Arthur C. P. Chou, Oceanside; Donald D. Anton, Carlsbad, and Thomas M. Olsavsky, Escondido, all of Calif., assignors to Acushnet Company, Fairhaven, Mass.

Filed Oct. 25, 1994, Ser. No. 30,285

Term of patent 14 years

U.S. Cl. D21—214



366,082

**GOLF CLUB HEAD**

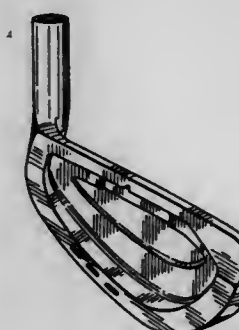
Shoichi Dekura, Higashikurume, Japan, assignor to Daiwa Seiko Inc., Tokyo, Japan

Filed Oct. 24, 1994, Ser. No. 30,200

Claims priority, application Japan, Apr. 29, 1994, 6-12616; Apr. 29, 1994, 6-12617

Term of patent 14 years

U.S. Cl. D21—220





366,083

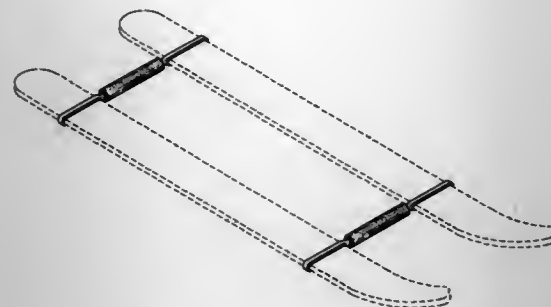
**CONNECTOR FOR SKI TRAINING**

Jon M. Zemke, 19431 Leetrim Ct., Mokena, Ill. 60448

Filed Feb. 16, 1994, Ser. No. 18,770

Term of patent 14 years

U.S. Cl. D21—230



366,085

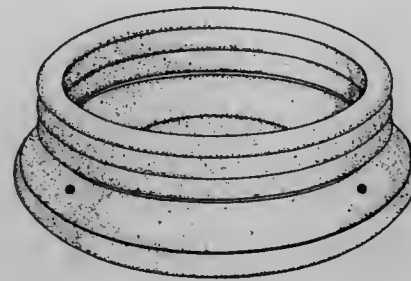
**INFLATABLE EXERCISE AND PLAY APPARATUS**

Charles J. Millington, Lakeville, Mass., and Melissa M. Morgan, Little Compton, R.I., assignors to Hasbro, Inc., Pawtucket, R.I.

Filed Jun. 12, 1995, Ser. No. 40,140

Term of patent 14 years

U.S. Cl. D21—242



366,086

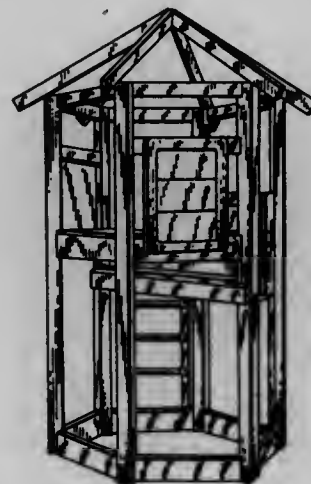
**PLAYTOWER CLIMBER**

William H. Ziegler, Jr., Bedford, and Gary L. Lochner, Imler, both of Pa., assignors to Hedstrom Corporation, Bedford, Pa.

Filed Sep. 15, 1994, Ser. No. 28,443

Term of patent 14 years

U.S. Cl. D21—245



366,084

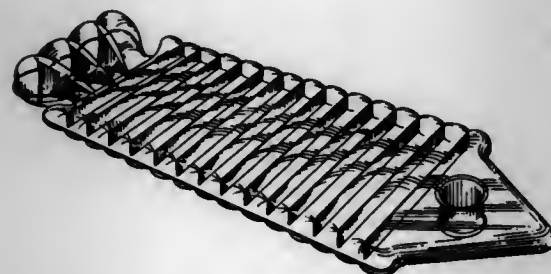
**RECREATIONAL AIR MATTRESS**

Henry Wolfe, Palmetto, Fla., assignor to Aqua-Leisure Industries, Inc., Avon, Mass.

Filed Sep. 7, 1994, Ser. No. 28,082

Term of patent 14 years

U.S. Cl. D21—237



366,087

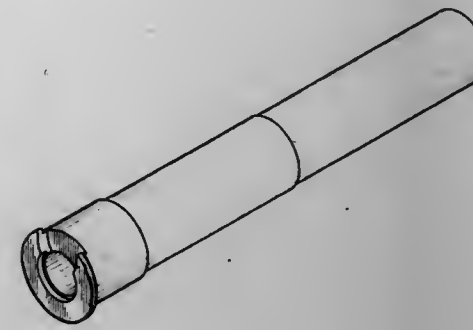
**CALIBER-CONVERTER**

Doug Gildark, 1-A Tiger Dr., Carson City, Nev. 89706

Filed Dec. 8, 1994, Ser. No. 31,938

Term of patent 14 years

U.S. Cl. D22—108



366,089

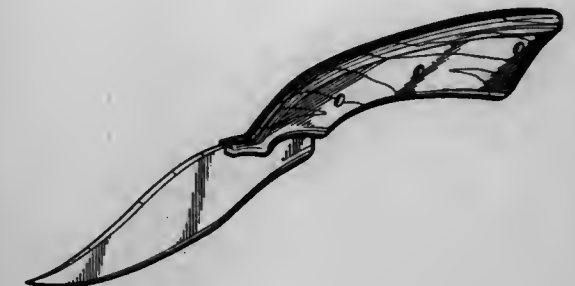
**KNIFE**

Leland K. Ackerson, Jr., deceased, late of Buchanan, and by Robin E. Ackerson, executrix, 119 W. Smith St., both of Buchanan, Mich. 49107

Filed Jun. 9, 1994, Ser. No. 24,186

Term of patent 14 years

U.S. Cl. D22—118



366,088

**FIREARM LOCK**

Theodore E. Crawford, 1324 W. Arthington, Chicago, Ill. 60607

Filed Feb. 13, 1995, Ser. No. 34,752

Term of patent 14 years

U.S. Cl. D22—108



366,090

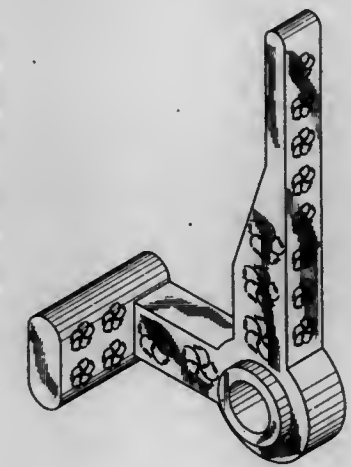
**FISHING REEL BAIL RELEASE**

Jerry L. Sanders, P.O. Box 249, York, N.Y. 14592

Filed Jul. 9, 1993, Ser. No. 10,481

Term of patent 14 years

U.S. Cl. D22—137



366,091

**FLY FISHING ROD HOLDER AND TRANSPORTER**

Thomas J. Delekta, 49 Ginger La., Torrington, Conn. 06790, and Michael C. Stange, 108 Johnycake Mountain Rd., Burlington, Conn. 06013

Filed Nov. 7, 1994, Ser. No. 30,742

Term of patent 14 years

U.S. Cl. D22—147



366,093

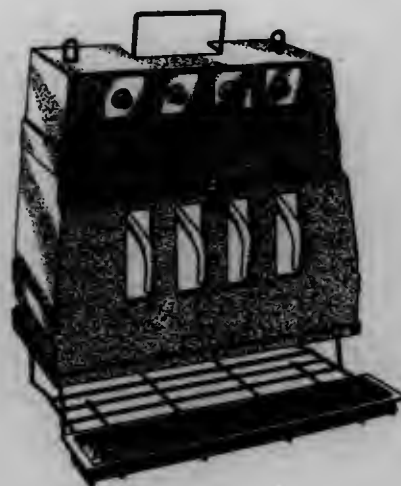
**CHEMICAL CONCENTRATE DISPENSER**

Gordon P. Baker, Amelia, and Bruce Benzing, Fairfield, both of Ohio, assignors to Hydro Systems Company, Cincinnati, Ohio

Filed Apr. 30, 1993, Ser. No. 7,847

Term of patent 14 years

U.S. Cl. D23—208



366,092

**HUNTER'S NEEDLE**

Anthony C. Turner, 1507 Tosca Ct., San Jose, Calif. 95121  
Continuation of Ser. No. 679, Oct. 22, 1992, abandoned. This application Jun. 14, 1994, Ser. No. 24,401

Term of patent 14 years

U.S. Cl. D22—199



366,094

**COUNTER-TOP WATER PURIFICATION SYSTEM**

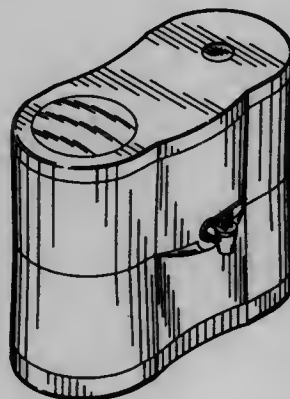
Matthew F. Duncan, Westminster, Calif.; Robert A. Slovak, Incline Village, Nev.; David R. Spears, Laguna Niguel, Calif., and Jack P. Slovak, Incline Village, Nev., assignors to Water Factory Systems, Inc., Irvine, Calif.

Filed Mar. 14, 1990, Ser. No. 493,855

The portion of the term of this patent subsequent to Jun. 22, 2006, has been disclaimed.

Term of patent 14 years

U.S. Cl. D23—209



366,095

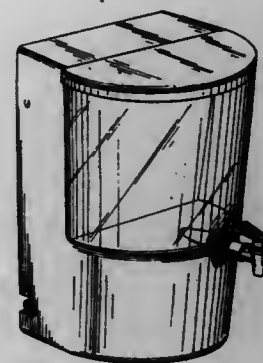
**COUNTERTOP WATER FILTER**

David K. Farley, c/o Sprite Industries, 1827 Capital St., Corona, Calif. 91720

Filed Nov. 15, 1994, Ser. No. 31,013

Term of patent 14 years

U.S. Cl. D23—209



366,097

**WALL-MOUNTED FAUCET**

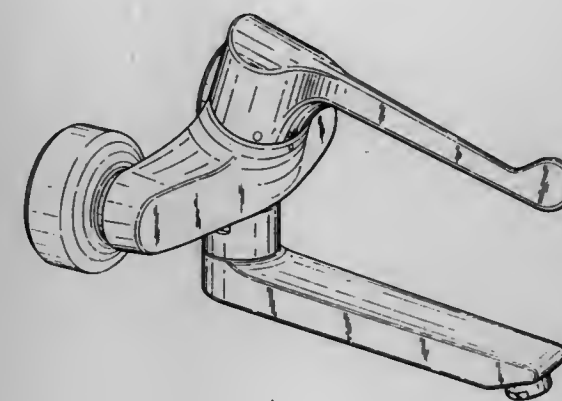
Adolf Gottwald, Iserlohn, Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Germany

Filed Mar. 30, 1995, Ser. No. 36,894

Claims priority, application Germany, Jan. 31, 1994, M9408505.6

Term of patent 14 years

U.S. Cl. D23—238



366,098

**FAUCET**

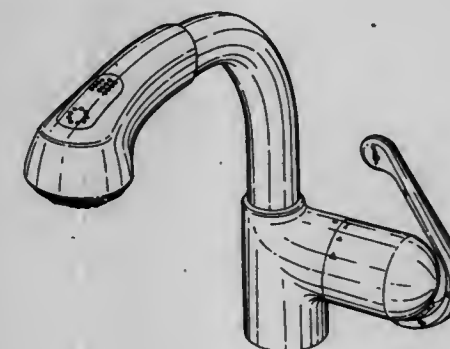
Adolf Gottwald, Iserlohn, Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Germany

Filed Apr. 14, 1995, Ser. No. 37,495

Claims priority, application Germany, Jan. 31, 1994, M9408465.3

Term of patent 14 years

U.S. Cl. D23—238



366,096

**SPRAY NOZZLE ATTACHMENT**

Ralph A. Mulleins, "Dunleith Circa 1803" Rte. 1, Box 62C, 557 Stony Point Rd., Cumberland, Va. 23040

Filed Oct. 14, 1994, Ser. No. 29,739

Term of patent 14 years

U.S. Cl. D23—213





366,099

## FAUCET SPOUT

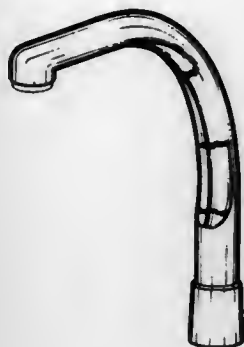
Loran R. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.

Filed Nov. 9, 1993, Ser. No. 15,155

The portion of the term of this patent subsequent to Oct. 31, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D23—255



366,101

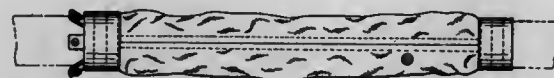
## TIE BAR SLEEVE

Frank A. Eltveldt, 1760 Kilkenny Ct., Woodstock, Ill. 60098

Filed May 25, 1994, Ser. No. 23,493

Term of patent 14 years

U.S. Cl. D23—266



366,100

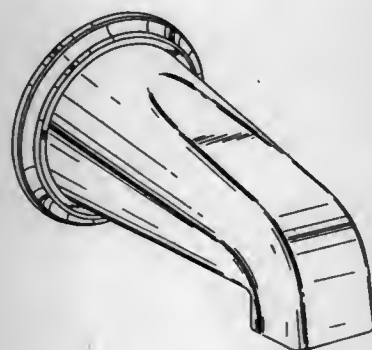
## SPOUT

Frederic C. Doughty, S. Pasadena, and Darren M. Mark, Thomas A. Bonnell, Sheboygan, Wis., assignor to Kohler Co., Castaic, both of Calif., assignors to Emhart Inc., Newark, Del. Kohler, Wis.

Filed Jan. 25, 1995, Ser. No. 33,980

Term of patent 14 years

U.S. Cl. D23—255



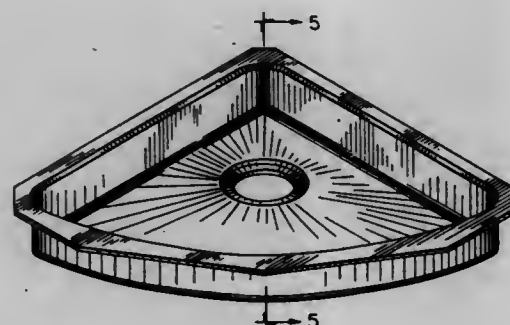
366,102

## SINK

Filed Jan. 19, 1994, Ser. No. 17,681

Term of patent 14 years

U.S. Cl. D23—284



366,103

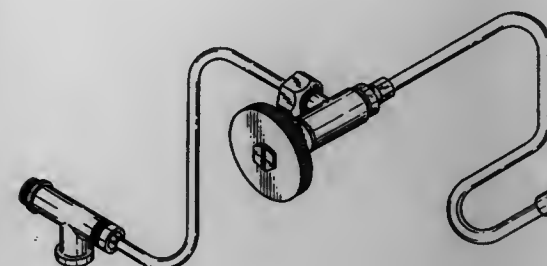
## PORTABLE BIDET

Alberto G. Angustia, and Kathleen T. Angustia, both of 1804 Cherry La., Findlay, Ohio 45840

Filed Nov. 23, 1994, Ser. No. 31,569

Term of patent 14 years

U.S. Cl. D23—295



366,105

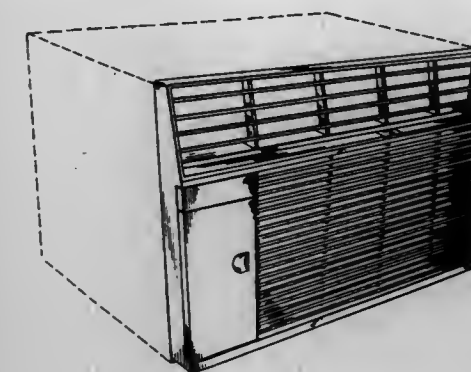
## FRONT PANEL FOR A ROOM AIR CONDITIONER

Christopher M. Thompson, Nashville, and Brian J. Phillips, Smyrna, both of Tenn., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Apr. 22, 1993, Ser. No. 7,404

Term of patent 14 years

U.S. Cl. D23—354



366,106

## AIR FILTER

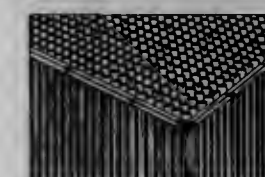
Katsutoshi Yamamoto; Osamu Tanaka; Osamu Inoue; Toshio Kusumi; Shinichi Chae; Jun Asano, and Nobuki Uraoka, all of Osaka, Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Filed Sep. 20, 1993, Ser. No. 13,167

Claims priority, application Japan, Mar. 19, 1993, 5-8006; Mar. 19, 1993, 5-8007

Term of patent 14 years

U.S. Cl. D23—365



366,104

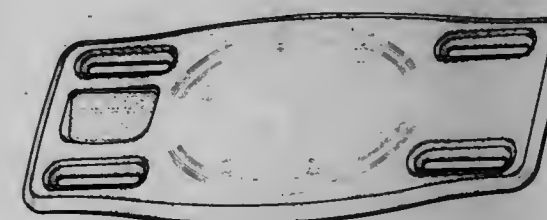
## BATH TUB BOARD

John D. Breen, Wooster, Ohio; Brian J. Conaway, and Steven J. Kehl, both of Erie, Pa., assignors to Carex, Inc., Newark, N.J.

Filed Nov. 8, 1994, Ser. No. 30,777

Term of patent 14 years

U.S. Cl. D23—304



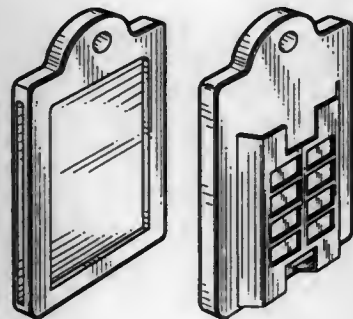
366,107

COMBINATION PICTURE FRAME AND AIR  
FRESHENER RECEPTACLEKevin L. Shaffer, San Antonio, Tex., assignor to Kevin Lamont  
Shaffer, San Antonio, Tex.

Filed Apr. 18, 1995, Ser. No. 37,675

Term of patent 14 years

U.S. Cl. D23—366



366,109

## STANDING FAN

Brent J. Wortham, Wilmington, Calif., assignor to Envirotech  
Electric, Inc., Cerritos, Calif.

Filed Feb. 10, 1995, Ser. No. 34,692

Term of patent 14 years

U.S. Cl. D23—378



366,108

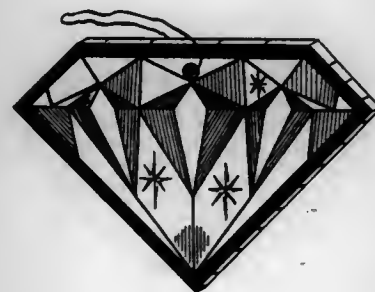
## HANGING AIR FRESHENER

Melissa J. Traylor, and Keith J. Traylor, both of 110 Mayers  
Trace, Slidell, La. 70460

Filed Feb. 24, 1995, Ser. No. 35,315

Term of patent 14 years

U.S. Cl. D23—368



366,110

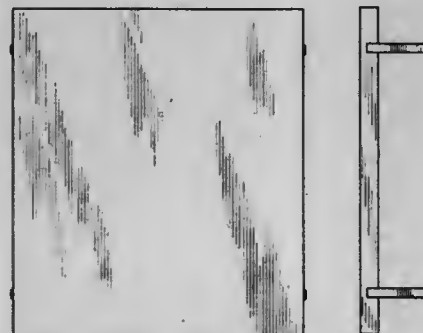
## HEAT SHIELD

Richard J. Darr, R.D. #2 Box 417, Gibsonia, Pa. 15044

Filed May 27, 1994, Ser. No. 23,591

Term of patent 14 years

U.S. Cl. D23—403



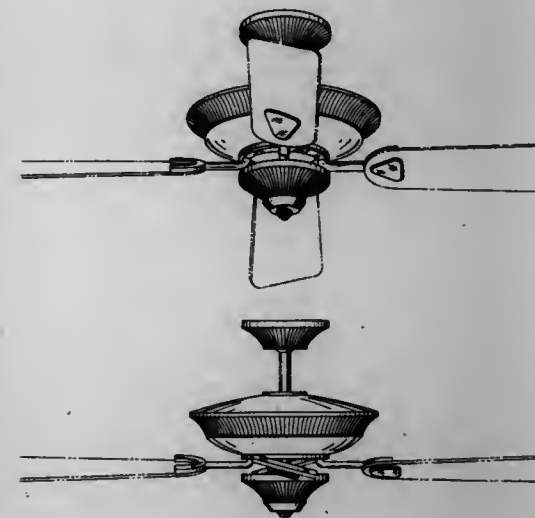
366,111

COMBINED CEILING FAN MOUNTING CANOPY,  
MOTOR AND SWITCH HOUSING AND BLADE IRONS  
UNITCharles J. DiPasquale, Carrollton, Tex., assignor to Smartel,  
Inc., Carrollton, Tex.

Filed Jan. 27, 1995, Ser. No. 34,113

Term of patent 14 years

U.S. Cl. D23—411



366,113

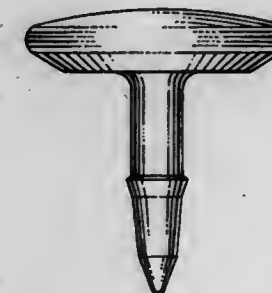
## IMPLANTABLE BONE TACK

Frank H. Morgan, Las Vegas, Nev., assignor to TiMesh, Inc.,  
Las Vegas, Nev.

Filed Apr. 12, 1993, Ser. No. 6,979

Term of patent 14 years

U.S. Cl. D24—145



366,112

## DIAPER

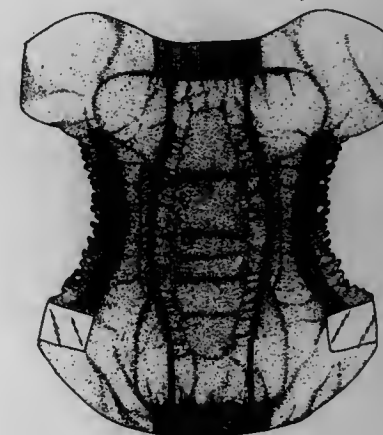
Hans Tollin, Göteborg; Kenneth Österlin, Angered, and Per  
Arfvidsson, Göteborg, all of, Sweden, assignors to Molnlycke  
Aktiebolag, Gothenburg, Sweden

Filed Feb. 24, 1995, Ser. No. 35,431

Claims priority, application Sweden, Aug. 29, 1994, 94-1727

Term of patent 14 years

U.S. Cl. D24—126



366,114

METALLIC CRANIAL BURR HOLE COVER AND BONE  
FLAP FIXATION PLATE

Kenji Ohata, 1-5-7, Asahi-Machi, Abeno-Ku, Osaka 545, Japan

Filed Apr. 21, 1995, Ser. No. 37,858

Term of patent 14 years

U.S. Cl. D24—155





366,115

**DENTAL POST**

Jerry F. Sullivan, Ridgewood, N.J., assignor to Coltene/Whaledent, Inc., Mahwah, N.J.

Division of Ser. No. 14,123, Oct. 13, 1993, Pat. No. Des. 358,212. This application Nov. 22, 1994, Ser. No. 31,333

Term of patent 14 years

U.S. Cl. D24—156



366,117

**PERSONAL PORTABLE SHELTER**

Lawrence T. Adams, 3200 N. 14th, Box 3, Ponca City, Okla. 74601

Filed Mar. 11, 1994, Ser. No. 19,739

Term of patent 14 years

U.S. Cl. D25—16



366,116

**ELECTRICAL BOX FOR STORING DENTAL WAX**

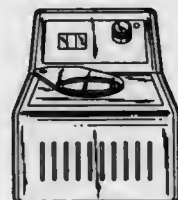
Thomas Biskupski, Zeppelinstr. 2, 78234 Engen, Germany

Filed Nov. 3, 1994, Ser. No. 30,605

Claims priority, application Germany, May 3, 1994, M 94 03 622.5

Term of patent 14 years

U.S. Cl. D24—177



366,118

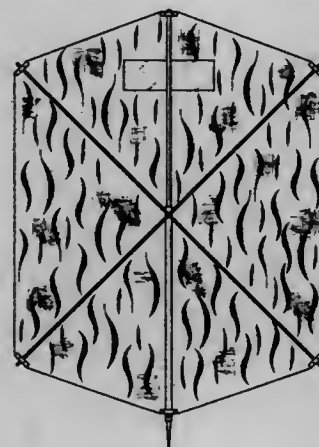
**WEATHER BLIND**

Richard A. Perkins, HCR 84 Box 61A, Potsdam, N.Y. 13676

Filed Nov. 11, 1994, Ser. No. 31,093

Term of patent 14 years

U.S. Cl. D25—16



366,119

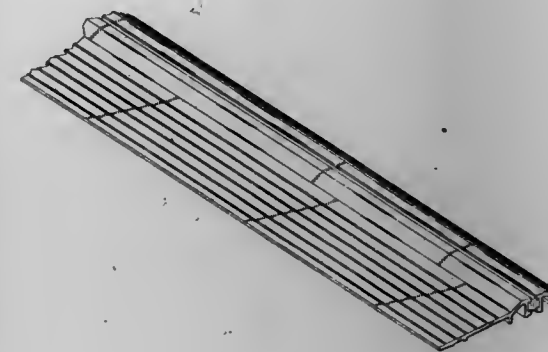
**COMBINED HANDICAP DOOR SILL AND THRESHOLD**

J. Charles Headrick, 6171 Willow Run Rd., Norcross, Ga. 30092

Filed Nov. 25, 1994, Ser. No. 31,404

Term of patent 14 years

U.S. Cl. D25—48



366,121

**STEEL POST**

Michel Picard, Berthier-sur-mer, Canada, assignor to Picard Industries Inc., Canada

Filed Dec. 14, 1993, Ser. No. 16,339

Claims priority, application Canada, Nov. 2, 1993, 74521

Term of patent 14 years

U.S. Cl. D25—126



366,122

**GLASS SHADE**

Chun F. Sung, No. 1427, Ren-Ay Rd., Chi-Ding Li, Jwu-Nan Jenn, Miau-Li Hsien, Taiwan, Prov. of China

Filed Dec. 13, 1994, Ser. No. 32,194

Term of patent 14 years

U.S. Cl. D26—131



366,120

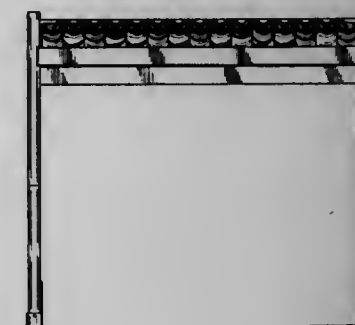
**BAMBOO SHELTER FOR MOTOR HOME**

R. Ronald Atkinson, P.O. Box 11272, Springfield, Mo. 69804

Filed Feb. 9, 1994, Ser. No. 18,540

Term of patent 14 years

U.S. Cl. D25—56



366,123

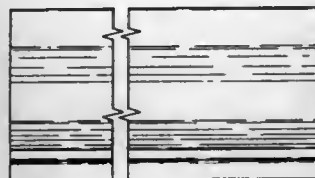
## VALANCE MOLDING

Cletis F. Swopes, Madison, Wis., assignor to Springs Window Fashions Division, Inc., Middleton, Wis.

Filed Dec. 19, 1994, Ser. No. 32,421

Term of patent 14 years

U.S. Cl. D25—136



366,125

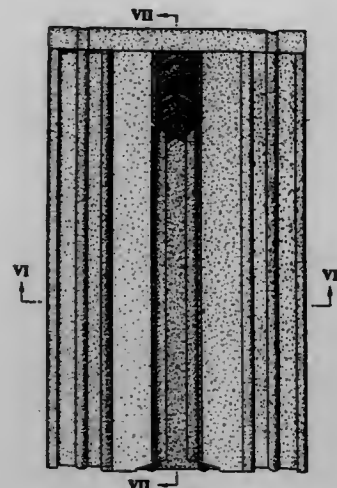
## BUILDING PLATE

Tadao Tamura, Fujisawa, Japan, assignor to Kabushiki Kaisha Chugiken, Ayase, Japan

Filed Jul. 7, 1994, Ser. No. 25,650

Term of patent 14 years

U.S. Cl. D25—141



366,124

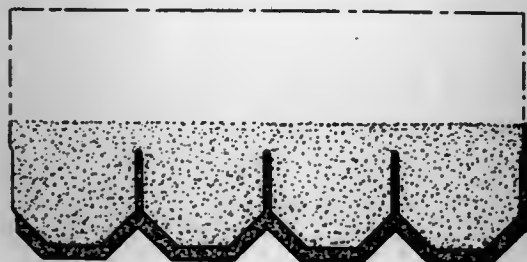
## TAB PORTION OF A SHINGLE

Marcia G. Hannah; Michael J. Noone, both of Wayne, and Kermit E. Stahl, North Wales, all of Pa., assignors to CertainTeed Corporation, Valley Forge, Pa.

Filed Oct. 19, 1992, Ser. No. 642

Term of patent 14 years

U.S. Cl. D25—139



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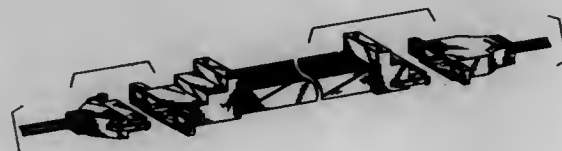
## COMBINED FLEXIBLE LIGHT STRIP AND CONNECTORS THEREFOR

Yuan Lin, P.O. Box 1-252, Sanchung, Taiwan, Prov. of China

Filed May 17, 1994, Ser. No. 23,081

Term of patent 14 years

U.S. Cl. D26—25



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## EMERGENCY POWER FAILURE LIGHT WITH NIGHT LIGHT

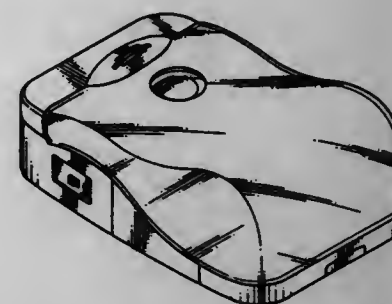
Se Kit Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong

Filed Oct. 3, 1994, Ser. No. 29,311

Claims priority, application United Kingdom, Apr. 13, 1994, 2038382

Term of patent 14 years

U.S. Cl. D26—26



366,129

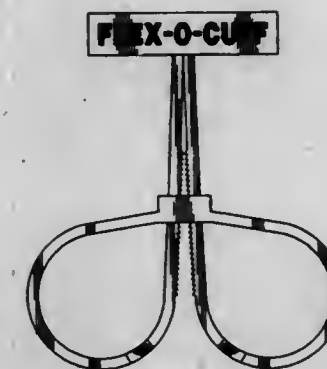
## RESTRAINING CUFFS

Walter M. Escoc, III, 20158 Concord Rd., Detroit, Mich. 48234

Filed Feb. 5, 1992, Ser. No. 831,380

Term of patent 14 years

U.S. Cl. D29—120



366,128

## BICYCLE LAMP

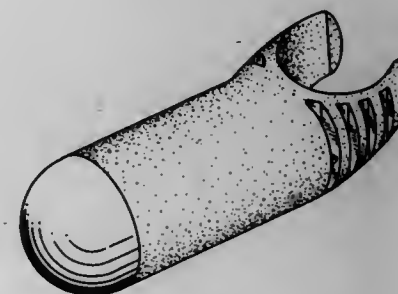
Niels Tessing, Sakskøbing, Denmark, assignor to Tess Design A/S, Sakskøbing, Denmark

Filed Nov. 18, 1994, Ser. No. 31,241

Claims priority, application Denmark, May 20, 1994, MA 0452 1994

Term of patent 14 years

U.S. Cl. D26—28



366,130

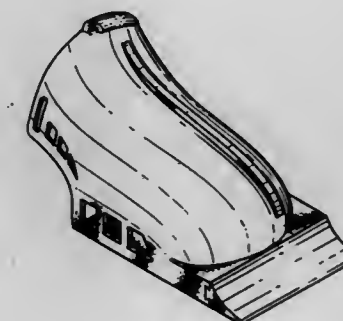
## FLOOR SCRAPER ATTACHMENT FOR A SHOE

Marlon Ordonez, 3395 Akala Dr., Kihel, HI. 96753

Filed Apr. 19, 1994, Ser. No. 21,498

Term of patent 14 years

U.S. Cl. D32—46





# LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 9th DAY OF JANUARY, 1996

NOTE— Arranged in accordance with the first significant character or word of the name  
(in accordance with city and telephone directory practice).

- A. Ahlstrom Corporation: *See—*  
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- Aalbersberg, Ijsbrand J.: *See—*  
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- AB Ph. Nederman & Co.: *See—*  
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- Abass, Hazim H.; Blaich, Matthew E.; and Venditto, James J., to Halliburton Company. Oriented-radial-cores retrieval for measurements of directional properties. 5,482,122, Cl. 175-50.000.
- ABB Atom AB: *See—*  
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- ABB Management AG: *See—*  
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- ABB Power T&D Company Inc.: *See—*  
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- ABB Reaktor GmbH: *See—*  
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- Abbott Laboratories: *See—*  
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- Abe, Kazuya: *See—*  
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- Abe, Shinya: *See—*  
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Kouichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,482,937, Cl. 514-219.000.
- Abe, Takashi, to Fujitsu Limited. Internal microstrip antenna for radio telephones. 5,483,678, Cl. 455-80.000.
- Abe, Toshiyuki; Hattukade, Masayoshi; and Nakashima, Naomichi, to Hodogaya Chemical Co., Ltd. Method for controlling and/or eliminating harmful lawn grass insects using non-pollutive substance. 5,482,733, Cl. 427-4.000.
- Abell, Scott T.; and Woodbury, Matthew D., to Storage Technology Corporation. Locking lever. 5,482,236, Cl. 248-188.400.
- Abernathy, Frank W. Method and an apparatus for the removal of fibrous material from a rotating shaft. 5,482,562, Cl. 134-6.000.
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- Abraham, Detlev; and Riedel, Hans-Dietrich, to Otis Elevator Company. Operation panel for a passenger conveying device. 5,482,153, Cl. 198-322.000.
- Abramian, Levon M.: *See—*  
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- Abtox, Inc.: *See—*  
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- Aburano, Ichiharu: *See—*  
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- Accurate Metering Systems, Inc.: *See—*  
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- Acer Peripherals Incorporated: *See—*  
Chen, Shyi-Hon, 5,483,154, Cl. 324-76.660.
- Achten, Peter A. J.; and Potma, Theodorus G., to Innas Free Piston B.V. Free-piston engine having a slidable ring for moving the piston. 5,482,445, Cl. 417-362.000.
- Acker, Duane: *See—*  
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- Ackroyd, Edward C.: *See—*  
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- Acme Engineering & Manufacturing Corp.: *See—*  
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- Adachi, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Microcomputer. 5,483,471, Cl. 364-602.000.
- Adachi, Tomohiko: *See—*  
Uemura, Hiroki; Butsuen, Tetsuro; Yoshioka, Tohru; Doi, Ayumu; Okuda, Kenichi; Yamamoto, Yasunori; Adachi, Tomohiko; and Masuda, Naotsugu, 5,483,453, Cl. 364-424.020.
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- Adams, Don L., to DVA Manufacturing Co. Inc. Single handle manifold. 5,482,081, Cl. 137-597.000.
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Bloom, Jeffrey A., 5,481,835, Cl. 52-98.000.
- Adler, Howard I.: *See—*  
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- Adrian, Andrew; Jones, Bruce R.; and Tannery, George F., IV, to Ford Motor Company. Method and apparatus for eliminating resonance in a vehicle antenna system. 5,483,247, Cl. 343-713.000.
- Advanced Equipment Corporation: *See—*  
Dickson, Wesley B., 5,481,840, Cl. 52-241.000.
- Advanced Interconnection Technology: *See—*  
Luke, Edward P.; Creavin, Damien W. P.; and Reetz, Robert R., 5,483,603, Cl. 382-147.000.
- Advanced Micro Devices, Inc.: *See—*  
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- Gulick, Dale E., 5,483,577, Cl. 379-67.000.
- O'Hara, Robert B., Jr.; and Roberts, David G., 5,483,566, Cl. 377-73.000.
- Tran, Thang M., 5,483,645, Cl. 395-403.000.
- Advanced Technology Laboratories, Inc.: *See—*  
Nordgren, Timothy F.; Imling, Deborah K.; Ungari, Joseph L.; Killam, Donald G.; and McKeighen, Ronald E., 5,482,047, Cl. 128-662.030.
- Rust, David W.; and Roundhill, David N., 5,482,045, Cl. 128-661.010.
- Advantest Corporation: *See—*  
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- AEI: *See—*  
Flynn, Thomas S.; Krzanowski, Tadeusz M.; and Bayne, Gary W., 5,481,779, Cl. 15-324.000.
- Aerojet General Corporation: *See—*  
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- Aeroquip Corporation: *See—*  
Jenski, Gary M., 5,482,083, Cl. 137-614.030.
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- Affymax Technologies N.V.: *See—*  
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- Agar, Joseph T. H.; and Holt, David E., to Procter & Gamble Company, The. Detergent compositions having improved percarbonate bleach stability. 5,482,642, Cl. 252-90.000.
- Agarwal, Payal: *See—*  
Mutter, Douglas R.; Langer, Peter; and Agarwal, Payal, 5,483,221, Cl. 340-457.100.
- Agatstein, Louis W.: *See—*  
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- Agency of Industrial Science & Technology: *See—*

- Nara, Koichi, 5,481,920, Cl. 73-726.000.  
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 Hehn, Wilfried, 5,483,315, Cl. 354-320.000.  
 Aghajanian, Michael K.; and Claar, Terry D., to Lanxide Technology Company, LP. Method of making metal matrix composite with the use of a barrier. 5,482,778, Cl. 428-472.000.  
 Agonafer, Dereje; Anderson, Timothy M.; Chrysler, Gregory M.; Chu, Richard C.; Simons, Robert E.; and Vader, David T., to International Business Machines Corporation. Convertible heat exchanger for air or water cooling of electronic circuit components and the like. 5,482,113, Cl. 165-137.000.  
 Agri-Cover, Inc.: See—  
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 Ahiko, Kenkichi: See—  
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 Ahlsten, Thomas; Vermeulen, Stephan; and Weckman, Anders, to Kemira OY. Fertilizing preparation improving the extraction of phosphorus for plants. 5,482,529, Cl. 71-33.000.  
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 Ahmad, Aftab; Weber, Lauren G.; and Green, Robert S., to Micron Technology, Inc. Method for circuits connection for wafer level burning and testing of individual dies on semiconductor wafer. 5,483,175, Cl. 324-766.000.  
 Ahonen, Robert G., to Honeywell Inc. Off-axis radio frequency diode apparatus for sputter deposition of RLG mirrors. 5,482,604, Cl. 204-298.110.  
 Aiba, Hidemasa: See—  
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 Akai, Takahiro: See—  
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 Alam, Ifikhar; and Sung, Rodney L. D., to Texaco Inc. Derivatized T-butyl calixarene encapsulated cyanuric acid. 5,482,520, Cl. 44-336.000.  
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 American Home Product Corporation: See—  
 Adelman, Steven J.; and Steiner, Kurt E., 5,482,935, Cl. 514-182.000.  
 American Home Products Corporation: See—  
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 Armstrong, Jay J.; and Sebgal, Surendra N., 5,482,945, Cl. 514-291.000.  
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 Soll, Richard M.; and Dollings, Paul J., 5,482,942, Cl. 514-254.000.  
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- Marrs, Robert C., 5,482,898, Cl. 437-216.000.  
 Marrs, Robert C.; and Hirakawa, Tadashi, 5,483,100, Cl. 257-700.000.  
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 Gulliver, James A.; Holt, Christopher C.; Boness, Kenneth D.; Anderson, Martin R., deceased, 5,483,160, Cl. 324-242.000.  
 Anderson, Douglas W., to Karsten Mfg. Corp. Golf putter head. 5,482,281, Cl. 273-169.000.  
 Anderson, Douglas W., to Texas Instruments, Inc. Wide field of view head-mounted display. 5,483,307, Cl. 353-98.000.  
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 Stirling, John A.; Anderson, Edward J.; and Farnocchi, Carol J., 5,482,548, Cl. 106-496.000.  
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 Brehob, Diana D.; Anderson, Richard W.; Yang, Jialin; and Whiteaker, Robert M., 5,482,017, Cl. 123-299.000.  
 Anderson, Robert E.: See—  
 Borden, Keith A.; Jensen, David S.; and Anderson, Robert E., 5,482,648, Cl. 252-182.200.  
 Anderson, Robert L.; Castleberry, Jeffrey P.; and Stracener, Steve W. Magnetic detent and position detector for fluid pump motor. 5,482,438, Cl. 417-44.100.  
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 Andrews, Eric B.; and Stepper, Mark R., to Cummins Engine Company, Inc. Air intake heating and diagnostic system for internal combustion engines. 5,482,013, Cl. 123-179.210.  
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 Tourigny, Paul T., 5,483,019, Cl. 174-45.00R.  
 Angell, Edwin C.; and Karr, Jess, to Hondo Chemical, Inc. Pathogenic waste treatment. 5,482,528, Cl. 71-12.000.  
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 Yamafuji, Kaoru; Toko, Kiyoshi; and Hayashi, Kenshi, 5,482,855, Cl. 435-287.100.  
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 Anton Steinecker Entwicklungs GmbH & Co.: See—  
 Wirth, Karl-Dieter A., 5,481,961, Cl. 99-177.200.  
 Antonious, Anthony J. Golf club metal wood-type head with improved perimeter structure and weight configuration. 5,482,279, Cl. 273-167.00H.  
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 Aoki, Hisashi; Kokubu, Sadao; Mizuno, Yoshiyuki; and Mizuno, Takashi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Alarm signal generation device for a vehicle. 5,483,219, Cl. 340-426.000.  
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 Aoki, Tomohiro: See—  
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 Aono, Toshihiro; Kamejima, Kohji; and Hamada, Tomoyuki, to Hitachi, Ltd. Remote control apparatus and control method thereof. 5,483,440, Cl. 364-167.010.  
 Aoyama, Matsuo, to Kaneya Sangyo Kabushiki Kaisha. Tray for carrying plant pots. 5,481,825, Cl. 47-18.00K.  
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 APCO Graphics, Inc.: See—  
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 Apex Systems, Ltd.: See—  
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 Apple Computer, Inc.: See—  
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 Arbeiter, James H.; and Bessler, Roger F., to North Shore Laboratories, Inc. D-dimensional, fractional bandwidth signal processing apparatus. 5,483,474, Cl. 364-724.010.  
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 Brooks, Jon R.; Jensen, James M.; McConochie, Roberta M.; Osborn, Susan V.; Pearl, Amy E.; Schmidt, Carole M.; Seiler, Ann B.; Stowell, Carol P.; White, Thomas W.; and Wong, Wylie, 5,483,276, Cl. 348-2.000.  
 Archer, Michael J.; Adams, Michael S.; and Tauri, Jeffrey A., to Vigoro Industries, Inc. Ice melter with coating of alpha-methyl glucosine mixture and method of making same. 5,482,639, Cl. 252-70.000.  
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 Arczynski, Wayne S.; Broadwater, Stuart P.; and Aschliman, Larry D., to Westinghouse Electric Corporation. Direct memory access (DMA) sampler. 5,483,239, Cl. 341-141.000.  
 Argaud, Pierre-Yves, to Etablissements Charles Maire. Pneumatic tool. 5,482,413, Cl. 408-124.000.  
 Arima, Yukio; Kimura, Toshihiro; Miyata, Tohru; and Kunitomo, Yuichi, to Hitachi Construction Machinery Co., Ltd. Ultrasonic inspection and imaging instrument. 5,481,917, Cl. 73-621.000.  
 Arimoto, Kazuaki: See—  
 Higashi, Kazuhiko; Takakuwa, Kiyoshi; Arimoto, Kazuaki; Naruki, Kenichi; Fukumoto, Hiroshi; Kuwada, Terumi; and Oda, Keisuke, 5,483,275, Cl. 347-218.000.



- Aristech Chemical Corporation: *See*—  
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- Aritake, Hirokazu: *See*—  
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- Arlt, Edward J., III, to Continental Emsco Company. Variable spring rate compression element and riser tensioner system using the same. 5,482,406, Cl. 405-195.100.
- Armstrong, Frank O.; and Jeffreys, Brian B., to Texas Instruments Incorporated. Methods and systems for shielding in sputtering chambers. 5,482,612, Cl. 204-298.110.
- Armstrong, Jay J.; and Sehgal, Surendra N., to American Home Products Corporation. Innovative technique for immunosuppression involving administration of rapamycin loaded formed blood elements. 5,482,945, Cl. 514-291.000.
- Armstrong, Ray G.: *See*—  
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- Armstrong World Industries, Inc.: *See*—  
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- Arnaud, Sylvie: *See*—  
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- Arndt, Raymond U. Water jet propelled kayak. 5,481,997, Cl. 114-347.000.
- Arnold, Dan M.: *See*—  
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- Arnar, Naseem B. Pressurized container top. 5,482,175, Cl. 220-203.080.
- Aruga, Michio: *See*—  
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- Asada, Syuji: *See*—  
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- Asahi Glass Company Ltd.: *See*—  
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- Kawasaki, Takeshi; Hiratsuka, Kazuya; Yoneda, Takashige; Wakabayashi, Tsuneo; and Gunji, Fumiaki, 5,482,768, Cl. 428-327.000.
- Asahi Kasei Kogyo Kabushiki Kaisha: *See*—  
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- Asahi Kogyo Kogyo Kabushiki Kaisha: *See*—  
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- Uzie, Seiji; Azegami, Kazuyoshi; and Nomura, Hiroshi, 5,483,383, Cl. 359-819.000.
- Asami, Hiroshi; and Suzuki, Mitsuru, to Sumitomo Heavy Industries, Ltd. Refrigerator having regenerator. 5,481,879, Cl. 62-6.000.
- Asanac, Masumi; and Saitoh, Tsutomu, to Hitachi Metals, Ltd. Carrier for developer and method of electrophotographically forming visual image using same. 5,483,329, Cl. 355-269.000.
- Asano, Hiroshi: *See*—  
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- Asano, Nobukazu: *See*—  
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- Asano, Osamu: *See*—  
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- Asano, Shinya; and Kawanabe, Tetsuya, to Canon Kabushiki Kaisha. Recording apparatus for changing the amount of displacement and the timing of displacement of an erasing member. 5,482,392, Cl. 400-697.000.
- Asano, Takeshi: *See*—  
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- Asaoka, Junichi: *See*—  
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- Asaoka, Masanobu: *See*—  
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- Aschliman, Larry D.: *See*—  
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- Asea Brown Boveri AB: *See*—  
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- Asea Brown Boveri Ltd.: *See*—  
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- Ashida, Yasuko: *See*—  
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- Ashihara, Yoshihiro; Nishizono, Isao; Minakawa, Hidetaka; Okada, Masahisa; Sakurabayashi, Yasuhide; Watanabe, Fumio; and Wakana, Shin-ichi. Automatic immunological measuring system. 5,482,839, Cl. 435-7.900.
- Ashiwa, Jun: *See*—  
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- Askstad, Sigmund, to Norsk Hydro a.s. Apparatus for offshore swivel replacement. 5,482,484, Cl. 441-5.000.
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- Asshauer, Hartwig, to Deutsche Aerospace Airbus GmbH. Apparatus for generating energy on board of an aircraft. 5,482,229, Cl. 244-118.500.
- Associated Universities, Inc.: *See*—  
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- Astra Aktiebolag: *See*—  
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- Asulab S.A.: *See*—  
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- AT&T Corp.: *See*—  
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- Basavanahally, Nagesh R., 5,483,611, Cl. 385-78.000.
- Bi, Qi, 5,483,236, Cl. 341-94.000.
- Blodgett, James R., 5,483,191, Cl. 327-362.000.
- Bortolini, James R., 5,483,201, Cl. 331-1.00A.
- Bruce, Allan J.; and Presby, Herman M., 5,483,613, Cl. 385-129.000.
- Celler, George K.; Harriott, Lloyd R.; and Kola, Ratnaji R., 5,482,802, Cl. 430-5.000.
- Chiu, Lin; Frank, Hugh G.; Lozo, Peter W.; and Williams, Thomas J., 5,483,590, Cl. 379-269.000.
- Dagdeviren, Nuri R., 5,483,251, Cl. 345-56.000.
- Darcie, Thomas E.; Kaminow, Ivan P.; and Marcuse, Dietrich, 5,483,369, Cl. 359-126.000.
- Doshi, Bharat T.; Farber, N.; Harshavardhana, P.; Kapoor, Rajiv; Kashper, Arik; Katz, Steven S.; and Meier-Hellstern, Kathleen S., 5,483,527, Cl. 370-60.100.
- Gahara, Thaddeus J., 5,483,207, Cl. 331-117.0FE.
- Guzinski, Miroslaw, 5,483,237, Cl. 341-120.000.
- Hanson, Karrie J.; and Kochanski, Gregory P., 5,483,235, Cl. 341-20.000.
- Huang, Gang; Im, Gi-Hong; and Werner, Jean-Jacques, 5,483,551, Cl. 375-219.000.
- Miller, David A. B.; and Woodward, Ted K., 5,483,186, Cl. 327-108.000.
- Miller, David A. B., 5,483,375, Cl. 359-333.000.
- Nguyen, Khanh C., 5,483,542, Cl. 371-5.100.
- AT&T IPM Corp.: *See*—  
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- AT&T Wireless Communications Products, Ltd.: *See*—  
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- Atherton, James H., to David Sarnoff Research Center Inc. Liquid crystal display with high capacitance pixel having an indium tin oxide active region electrically connected to a polycrystalline silicon pixel region where polycrystalline silicon extensions from the select line bound at least two sides of the pixel. 5,483,366, Cl. 359-59.000.
- Atkinson, John K.: *See*—  
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- Atlantic Richfield Company: *See*—  
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- Atlas Systems Inc.: *See*—  
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- Atsumi, Keigo; and Saijo, Eiji, to Sumitomo Wiring Systems, Ltd. Electrical connector. 5,482,470, Cl. 439-246.000.
- Atsumi, Shizuo, to Yamaha Corporation. Cymbal clamping device. 5,482,235, Cl. 248-121.000.
- Atsumi, Tomoyuki; Morigami, Yuusuke; and Matsuo, Hirokazu, to Minolta Camera Kabushiki Kaisha. Document feeding apparatus for aligning original documents in duplex copying mode. 5,482,264, Cl. 271-10.020.
- Atwater, Richard G.; and Shaw, Kenneth L. Positive displacement pump with concentrically arranged reciprocating-rotating pistons. 5,482,448, Cl. 417-492.000.
- Audeh, Costandi A.; Sharma, Sanjay B.; and Shihabi, David S., to Mobil Oil Corporation. Selective catalytic reduction of nitrogen oxides using a ferrocene impregnated zeolite catalyst. 5,482,692, Cl. 423-239.200.
- Augustine, Patricia C.: *See*—  
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- Auricchio, Richard R.; and Stearns, Bryan J., to Apple Computer, Inc. Method for extended file access. 5,483,655, Cl. 395-700.000.
- Ausiello, Francesco P.; Quelenis, Olivier; and Wallerand, Philippe, to Solex; and Weber SRL. Engine control system with motorized butterfly body. 5,482,019, Cl. 123-361.000.
- Austin, Malcolm: *See*—  
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- Auto-Shade, Inc.: *See*—  
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- Autoliv Development AB: *See*—  
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- Automatic Spring Coiling Co.: *See*—  
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- Autry, George M.: *See*—  
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- Averbuch, Rod: *See*—  
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- Avery, Noyes L.; Barry, Edward G.; Carey, James T.; Crocker, Lisa S.; Feng, Flora W.; Hiebert, John; Horodysky, Andrew G.; and Nelson, Lloyd A., to Mobil Oil Corporation. Friction modifiers and antiwear additives for fuels and lubricants. 5,482,521, Cl. 44-344.000.
- Axelerator, Inc.: *See*—  
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- Ayad, Hafez M., to Rhone-Poulenc Inc. Method of combining insect eggs and ovidical compositions. 5,482,715, Cl. 424-405.000.
- Ayuta, Masanori: *See*—  
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- Azegami, Kazuyoshi: *See*—  
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- Baader North America Corporation: *See*—  
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- Isaka, Kazuo; Yagi, Takayuki; and Miyazaki, Takeshi, 5,482,598, Cl. 204-129.550.
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- Caron, Marc G.: See—  
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- Cascade Engineering, Inc.: See—  
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- Lay, Norman K.; Kemner, Carl A.; Peterson, Joel L.; Allen, William E.; and League, Richard B., 5,483,455, Cl. 364-448.000.
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- Chang, Yueh-Lin: See—  
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- Chau-Lee, Kin K.: See—  
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- Cheesebrow, Nicholas T.: See—  
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- Chen, An-Ban; Sher, Arden; and von Schilfgaard, Mark, to S.R.I. International. Compounds and infrared devices including  $In_{1-x}Ti_xQ$ , where Q is  $As_{1-y}P_y$  and  $0 \leq y \leq 1$ . 5,483,088, Cl. 257-189.000.
- Chen, Chi-Wen. Power breaker for a compressor for automobiles with a curved plug and wrinkled control disk. 5,482,439, Cl. 417-44.800.
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- Chen, Hsing-Yao, to Chunghwa Picture Tubes, Ltd. Multi-mode, hybrid-type CRT and electron gun thereof with selectable different sized grid apertures. 5,483,128, Cl. 315-382.000.



- Chen, James N.; Christiansen, Niels; Ross, Joseph C.; and Rowan, Albert T., to International Business Machines Corporation. System and method for concurrent recording and displaying of system performance data. 5,483,468, Cl. 364-551.010.
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- Chen, We-Yu. Apparatus and method for automatic transmission system fluid exchange and internal system flushing. 5,482,062, Cl. 134-56.00R.
- Cheney, Michael C.: See—  
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- Cheney, Paul S., II: See—  
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- Fagan, Peter L.: See—  
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- Foley, Henry C.; Sonnichsen, George C.; Brake, Loren D.; Mariwala, Ravindra K.; and Lafayatis, Davis S., to University of Delaware; and Du Pont de Nemours, E. I., and Company: CMS/SiO<sub>2</sub>/Al<sub>2</sub>O<sub>3</sub> catalysts for improved selectivity in the synthesis of amines from methanol and/or dimethyl ether and ammonia. 5,482,909, Cl. 502-182.000.
- Foley, Timothy D.: See—  
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- Schultz, Roy D.; Mohan, Robert J.; and Sirois, David W., 5,483,146, Cl. 322-7.000.
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- Foster, Raymond K.: Reciprocating floor conveyor and floor member. 5,482,155, Cl. 198-750.200.
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- Fujiwara, Shigeru: See—  
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- Fukasawa, Kazuo, to Kabushiki Kaisha Toshiba: Magnetic medium processing apparatus. 5,483,050, Cl. 235-449.000.
- Fukuda, Takeshi, to NEC Corporation: Semiconductor memory device having dummy digit lines. 5,483,495, Cl. 365-210.000.
- Fukuda, Yujiro: See—  
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- Fukui, Tetsuro: See—  
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- Fukunaga, Hiroshi: See—  
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- Fukumura, Tomohiro: See—  
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- Fukumura, Yasushi: See—  
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- Fukunaga, Kazuhiro; Hijikata, Shigeki; Ishimura, Kimihiro; Ohtani, Yoshiro; Kimura, Kunio; Fujii, Masahiro; and Hata, Yoshiyuki, to Kaken Pharmaceutical Co., Ltd.: Composition of stabilized fibroblast growth factor. 5,482,929, Cl. 514-12.000.
- Fukuoka, Hirotoshi: See—  
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- Fukuyama, Noriyuki; and Matsuda, Masahiro, to Fujitsu Limited: Computer able to link electronic mail functions with telephone functions. 5,483,352, Cl. 358-402.000.
- Fulcher, Timothy R.: See—  
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- Fulmer, Brian H.: See—  
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- Funabashi, Michimasa: See—  
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- Furman, Lisa D., to Xerox Corporation: Printing system with file specification parsing capability. 5,483,653, Cl. 395-650.000.
- Furui, Takashi: See—  
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- Fushida, Atsuo: See—  
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- Fux, Igor L.: See—  
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- G & G Intellectual Properties, Inc.: See—  
Gearin, Peter; and Leech, Everett A., 5,482,167, Cl. 211-13.000.
- G. D. Searle & Co.: See—  
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- G.D. Societa' Per Azioni: See—  
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- Gabara, Thaddeus J., to AT&T Corp.: Adiabatic MOS oscillators. 5,483,207, Cl. 331-117.00E.
- Gabler, Linda S.: Garment having a message relating to money printed thereon and adjacent to a reproduction of paper money attached thereto. 5,481,758, Cl. 2-115.000.
- Gabriel, William L.; and Doherty, James E., to Illinois Tool Works Inc.: Collated screw package formed with welded wires. 5,482,420, Cl. 411-442.000.
- Gal, George, to Lockheed Missiles & Space Company, Inc.: Exposure mask for fabricating microlenses. 5,482,800, Cl. 430-5.000.
- Gale, Bradley D.: See—  
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- Gall, Michael: See—  
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Gardiner, Linda J.; and Gardiner, George E. Supplemental car seat belt for protecting users with stomas. 5,482,324, Cl. 280-801.100.

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Garoni, Charles; Peters, Joseph; Butler, William; and Dunn, Fred J., to Board of Regents, The University of Texas System. Electrical signal generator interface with three-dimensional electrical pathway and transparent heart and method of visually simulating cardiac waveforms in three dimensions. 5,482,472, Cl. 434-272.000.

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Gaveske, John H., to Poly Wall International. Method of waterproofing rigid structural materials. 5,482,737, Cl. 427-140.000.

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Bailey, Gerhard; and Gazyakan, Ünal, 5,481,935, Cl. 74-477.000.

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Gutman, Yevsey, 5,481,910, Cl. 73-162.000.

Gemmell, Thomas J.: See—

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Genentech, Inc.: See—

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Rude, Edward T., 5,482,105, Cl. 160-307.000.

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Barnes, Gary R., 5,483,023, Cl. 174-152.00R.

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Coha, Timothy F.; and Sawert, Ulf, 5,482,444, Cl. 417-363.000.

Dadel, Martin R.; and Long, Charles F., 5,482,148, Cl. 192-12.00A.

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Lewis, Brian S.; and Miller, Gary L., 5,483,426, Cl. 362-66.000.

Luallin, John M.; Horsman, Steven V.; and Witte, Brian E., 5,483,425, Cl. 362-61.000.

Minder, Ernest A., 5,482,243, Cl. 248-345.100.

Scoccia, Ardeean, 5,481,884, Cl. 62-129.000.

Shah, Suresh D., 5,482,669, Cl. 264-572.000.

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Genest, Pierre, to Alcatel Mobile Communication France. Differential current mode amplifier device. 5,483,194, Cl. 330-253.000.

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Gerling, John E., to Electric Power Research Institute. Microwave power system and method with exposure protection. 5,483,045, Cl. 219-722.000.

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Gerver, Lester S.: See—

Ngai, Eugene Y.; and Gerver, Lester S., 5,482,536, Cl. 95-131.000.

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Gholston, Jerome E., to Delco Electronics Corporation. Anti-fuel slosh circuit. 5,483,109, Cl. 307-118.000.

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Giannuzzi, Louis N. Self-drilling anchor. 5,482,418, Cl. 411-387.000.

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Gifford, R. Bruce; Strzepa, Michael C.; MacDonald, Tom E.; and Bernett, Frank W., to Quantum Corporation. Damping configuration for improved disk drive performance. 5,483,397, Cl. 360-97.010.

Gijs, Martinus A. M.: See—

Kools, Jacques C. S.; Naus, Josef P. M.; Folkerts, Wiepke; and Gijs, Martinus A. M., 5,481,808, Cl. 33-357.000.

Gilgenbach, Ronald M.: See—

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Giro Sport Design, Inc.: See—

Gentes, James J.; and Sasaki, Steven K., 5,481,762, Cl. 2-411.000.

Glavish, Hilton F., to Nissin Electric Co., Ltd. System and method for magnetic scanning, accelerating, and implanting of an ion beam. 5,483,077, Cl. 250-492.200.

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Tyers, Michael B.; and Challoner, Teresa E., 5,482,716, Cl. 424-422.000.

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Godinho, Norman; Lee, Tsu-Wei F.; Chen, Hsiang-Wen; Motta, Richard F.; Tsang, Juine-Kai; Tzou, Joseph; Baik, Jai-Man; and Yen, Ting-Pwu, to Paradigm Technology, Inc. Self-aligning contact and interconnect structure. 5,483,104, Cl. 257-758.000.

Goe, Melvin B., Jr., to Hubbell Incorporated. Adjustable insulating barrier arrangement for air insulated padmounted switchgear. 5,483,416, Cl. 361-600.000.

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Golden, Timothy C.; Wang, Andrew W.; and Sciple, James F., to Air Products and Chemicals, Inc. Transition metal salt impregnated carbon. 5,482,915, Cl. 502-417.000.

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Han, Jeong T., 5,483,367, Cl. 359-124.000.

Hong, Sung H., 5,483,288, Cl. 348-448.000.

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Lim, Jae C.; Yeo, Myung K.; Lim, Yong T.; Lee, Nam S.; Seo, Jin W.; and Shim, Dae S., 5,483,285, Cl. 348-341.000.

Yang, Keun Y.; and Kim, Eun J., 5,483,509, Cl. 369-44.230.

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Goulait, David J. K.; Cabell, David W.; Huber, Michael T.; and Ronn, Karl P., to Procter & Gamble Company, The. Method for manufacturing one-piece tape tabs for use with disposable absorbent articles. 5,482,588, Cl. 156-264.000.

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Grande, Michael L.; Grushkin, Bernard; Young, Eugene F.; Lundy, Douglas A.; and Matalovich, Joseph R. E., to Xerox Corporation. Magnetic toner compositions with aluminum oxide, strontium titanate and polyvinylidene fluoride. 5,482,805, Cl. 430-106.000.

Granger, Alain, to Alcatel Network Systems. Simplified set-top converter for broadband switched network. 5,483,277, Cl. 348-6.000.

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- Gross, Michael; Stelte, Norbert; Schmidt, Dietmar; and Kordulla, Hans, to Bodenseewerk Geratetechnik GmbH. Glass color sensor unit. 5,483,057, Cl. 250-226.000.
- Grossardt, Bernd; and Sager, Frank, to Robert Bosch GmbH. Anti-lock brake system. 5,482,363, Cl. 303-173.000.
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- Grube, Gary W.; and Markison, Timothy W. Detection of unauthorized use of software applications in processing devices. 5,483,658, Cl. 395-800.000.
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- GTY Industries. See—
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- Guenther, Klaus. See—
- Boenigk, Michael; Guenther, Klaus; Kloss, Hans-Georg; and Tehmann, Teja, 5,483,126, Cl. 315-307.000.
- Guerin, Roch. See—
- Derby, Jeffrey H.; Drake, John E., Jr.; Dudley, John G.; Guerin, Roch; Kaplan, Marc A.; Marin, Gerald A.; Peters, Marcia L.; and Potter, Kenneth H., Jr., 5,483,522, Cl. 370-54.000.
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- Guillemet, Guy. Frame molding connector. 5,482,396, Cl. 403-401.000.
- Guillet, James E.; and Bakhtiyari, Hamid. Drug delivery systems. 5,482,719, Cl. 424-486.000.
- Guinness Brewing Worldwide Limited. See—
- Lockington, Derek C., 5,481,847, Cl. 53-128.100.
- Gulick, Dale E., to Advanced Micro Devices, Inc. Single chip telephone answering machine, telephone, speakerphone, and ADSI controller. 5,483,577, Cl. 379-67.000.
- Gulliver, James A.; Holt, Christopher C.; Boness, Kenneth D.; Anderson, Martin R., deceased (by Brenda Anderson, administratrix), to United Kingdom Atomic Energy Authority. Eddy current testing system with scanning probe head having parallel and normal sensing coils. 5,483,160, Cl. 324-242.000.
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- Günther, Stephan. See—
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- Gupta, Sanjay; and Lis, Timothy, to Motorola, Inc. Call progress decoder for multiple cadenced tones on telephone lines. 5,483,593, Cl. 379-386.000.
- Guschin, Viktor A.; Zakharov, Alexandr A.; Lyamkin, Alexei I.; and Staver, Anatoly M., to Staver, Anatoly Mikhailovich. Carbon composition production process. 5,482,695, Cl. 423-446.000.
- Guthrie, Mindy K. See—
- Guthrie, Ort S.; and Guthrie, Mindy K., 5,481,803, Cl. 30-113.300.
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- Gutierrez, Antonio. See—
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- Gutman, Michael. See—
- Neal, James R.; Brown, Peter F.; Agatstein, Louis W.; and Gutman, Michael, 5,483,102, Cl. 257-712.000.
- Gutman, Yevsey, to GEI Systems, Inc. Adjustable spindle. 5,481,910, Cl. 73-162.000.
- Gutterman, Bernard; Acker, Duane; Walter, Richard J.; and Solling, Joe L., to Discovery Zone, Inc. Method for washing balls. 5,482,565, Cl. 134-25.400.
- Guzinski, Miroslaw, to AT&T Corp. Method and apparatus for testing a CODEC. 5,483,237, Cl. 341-120.000.
- Guzman, Alberto M.; Jenkins, Hodge E., III; Newman, Ronald R.; Sankar, Suryanarayan G.; and Tabacchi, John G., to Burlington Northern Railroad Company. Magnetic sweeper apparatus and method. 5,481,983, Cl. 104-279.000.
- Gweon, Dae-Gab; Cho, Deockje; and Ryu, Jaek, to Sam Jung Co., Ltd. Method of and apparatus for adjusting deck mechanism of video cassette recorder. 5,483,391, Cl. 360-69.000.
- Gwinn, Kenneth W. See—
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- H.C. Starck GmbH & Co. KG. See—
- Höhne, Matthias, 5,482,530, Cl. 75-230.000.
- Ha, Yonggan. Rock crushing apparatus and method. 5,482,218, Cl. 241-30.000.
- Haagensen, Ulf H. See—
- Goerlach-Doh, Yvonne M.; Schneider, Hans P.; Hermanns, Juergen; and Haagensen, Ulf H., 5,482,634, Cl. 210-651.000.
- Haas, Kurt W. See—
- Kachmarik, David J.; Nerone, Louis R.; Secen, Michael M.; and Haas, Kurt W., 5,483,125, Cl. 315-106.000.
- Habazaki, Hiroki. See—
- Hashimoto, Koji; Habazaki, Hiroki; Mrowec, Stanislaw; and Danielewski, Marek, 5,482,577, Cl. 148-403.000.
- Haberkorn, Axel. See—
- Lunkenheimer, Winfried; Baasner, Bernd; Lieb, Folker; and Haberkorn, Axel, 5,482,956, Cl. 514-394.000.
- Hablanian, Marsbed, to Varian Associates, Inc. High performance turbomolecular vacuum pumps. 5,482,430, Cl. 415-90.000.
- Hachimonji, Takayuki. See—
- Watanabe, Yutaka; Hachimonji, Takayuki; Yamashita, Katsuya; Sekita, Sanae; and Noma, Tsuyoshi, 5,481,882, Cl. 62-70.000.
- Hachisuga, Masaki, to Fuji Xerox Co., Ltd. Converging position detecting apparatus with a single photodetecting element. 5,483,054, Cl. 250-235.000.
- Hack, Kurt. See—
- Mann, Peter; Hack, Kurt; and Benkert, Thomas, 5,481,859, Cl. 57-1.00R.
- Hadjifotiou, Anagnostis. See—
- Pettitt, Martin J.; and Hadjifotiou, Anagnostis, 5,483,233, Cl. 340-870.260.
- Haessler, Bernd; Reeb, Max; and Mueller, Karl-Heinz, to Mercedes-Benz AG. Device for detecting transmission errors in balanced two-wire bus lines and two-bus interfaces. 5,483,639, Cl. 395-183.190.
- Haga, Hiroyoshi. See—
- Ogiyama, Hiromi; and Haga, Hiroyoshi, 5,483,330, Cl. 355-277.000.
- Haga, Yoshihiro; Suzuki, Tetsuya; and Taima, Yasuo, to Konica Corporation. Silver halide photographic emulsion. 5,482,823, Cl. 430-567.000.
- Hagen, Martin G. See—
- Mass, Noah B.; White, Mark C.; and Hagen, Martin G., 5,482,348, Cl. 296-207.000.
- Hager, Herbert. See—
- Becker, Oliver; Kolz, Sabine; and Hager, Herbert, 5,482,538, Cl. 95-12.000.
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- Sakamoto, Hiroshi; Hagiuda, Nobuyoshi; Matsui, Hideki; and Takayanagi, Ryotaro, 5,483,319, Cl. 354-415.000.
- Hagiwara, Akira. See—
- Tanuma, Jiro; Ishimizu, Hideaki; Hagiwara, Akira; and Kasai, Tadashi, 5,482,387, Cl. 400-124.280.
- Hagiwara, Shozou. See—
- Kawabe, Hideaki; Hagiwara, Shozou; Kuga, Koji; and Hamaguchi, Setsunori, 5,482,904, Cl. 501-84.000.
- Hagiwara, Tomoe. See—
- Aoki, Mitsuo; Kato, Takahisa; Suzuki, Masanori; and Hagiwara, Tomoe, 5,482,807, Cl. 430-110.000.
- Hagner, Lawrence R. See—
- Pfahl, Robert C., Jr.; Wrezel, James A.; and Hagner, Lawrence R., 5,482,563, Cl. 134-11.000.
- Hahn, Oliver. See—
- Scott, Richard; Bleth, David; Banks, Gerald; Coppedge, Todd; DeWitt, William; Hahn, Oliver; Hunking, Maurice; Mullineaux, Wayne; Peters, Manfred; Smith, Richard; and Walter, Todd, 5,482,503, Cl. 452-173.000.
- Hahnemann University. See—
- Gillespie, David H., 5,482,834, Cl. 435-6.000.
- Hail Mary Rubber Company, Inc. See—
- Jones, William D.; and Esposito, Louis A., 5,482,403, Cl. 405-157.000.
- Haisma, Jan; Kamerbeek, Evert M. H.; Spierings, Gijsbertus A. C. M.; and De Haas, Peter W., to U.S. Philips Corporation. Electrical machine with directly bonded magnetic parts. 5,483,115, Cl. 310-156.000.
- Halabi, Nadim M. See—
- Barnett, Kenneth C.; Ponce De Leon, Lorenzo A.; McMurray, Charles R.; and Halabi, Nadim M., 5,483,246, Cl. 343-700.000.
- Hall, Hugh E., Jr.; and Arnold, Dan M., to Physics, Inc. Zero-spaced epithermal neutron moisture detection system. 5,483,063, Cl. 250-269.400.
- Hall, James C., to Systems Chemistry, Inc. Flow-through, in-line filter housing. 5,482,618, Cl. 210-85.000.
- Hall, John T.; Quon, William; and Tanzer, Herbert J., to Hughes Aircraft Company. Composite core designed for inductive coupled transformer probes. 5,483,143, Cl. 320-2.000.
- Hall, Laurence S. Playing card holder. 5,482,276, Cl. 273-150.000.
- Hall, Norman E. Golf ball retriever. 5,482,338, Cl. 294-19.200.
- Halliburton Company. See—
- Abass, Hazim H.; Blauch, Matthew E.; and Venditto, James J., 5,482,122, Cl. 175-50.000.
- Manke, Kevin R.; and Wendler, Curtis, 5,482,119, Cl. 166-374.000.

- Hallidy, William M. Direct current electrical motor system and method of using same. 5,483,615, Cl. 388-803.000.
- Hallite Seals International Limited. See—
- Peppiatt, Nicholas A.; and Nentwig, Willibald, 5,482,296, Cl. 277-24.000.
- Hallock, Orrin S., III. Folding bicycle rack. 5,482,194, Cl. 224-40.000.
- Hamada, Masataka; Yukawa, Kazuhiko; Ishida, Tokujii; Norita, Toshio; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Focus detecting photoelectric converting apparatus for a camera. 5,483,318, Cl. 354-402.000.
- Hamada, Tomoyuki. See—
- Aono, Toshihiro; Kamejima, Kohji; and Hamada, Tomoyuki, 5,483,440, Cl. 364-167.010.
- Hamaguchi, Masakazu. See—
- Kawahara, Tetsuya; Nakata, Junji; Kimura, Yuji; Sakai, Hiroyuki; Hamaguchi, Masakazu; Yamada, Takahiro; Kohiyama, Tomohisa; and Nakano, Takahiro, 5,483,466, Cl. 364-514.000.
- Hamaguchi, Setsunori. See—
- Kawabe, Hideaki; Hagiwara, Shozou; Kuga, Koji; and Hamaguchi, Setsunori, 5,482,904, Cl. 501-84.000.
- Hamilton, Harold J.; and Martin, Timothy W., to Centor Corporation. Unitary micro-flexure structure. 5,483,025, Cl. 174-254.000.
- Hammer, Floyd V.; Rude, John A.; and Harper, Brian, to Hammer's Inc. Cylindrical body and method and apparatus for making same. 5,482,663, Cl. 264-40.500.
- Hammer's Inc. See—
- Hammer, Floyd V.; Rude, John A.; and Harper, Brian, 5,482,663, Cl. 264-40.500.
- Hammond, Steven J. See—
- Richard, John E.; Wightman, David B.; Klinger, Clifford A.; Hammond, Steven J.; and Ricke, Joseph D., 5,481,889, Cl. 70-118.000.
- Hammond, Theodore A. Push back storage rack. 5,482,422, Cl. 414-276.000.
- Han, Jeong T., to Goldstar Co., Ltd. Transmitting and receiving apparatus for a radio headphone. 5,483,367, Cl. 359-124.000.
- Hanafusa, Koichi. See—
- Okabayashi, Naonori; Hanafusa, Koichi; and Ohnishi, Masaya, 5,483,200, Cl. 330-308.000.
- Hanasaki, Yasuaki; Tsukuda, Kazuaki; Watanabe, Hiroyuki; Tsuzuki, Kenji; Murakami, Mitsuyuki; and Niimi, Noritoshi, to Tosoh Corporation. Thiazole derivatives and herbicide compositions containing same. 5,482,916, Cl. 504-261.000.
- Hanita Lenses. See—
- Porat, Menachem, 5,483,304, Cl. 351-161.000.
- Hanna, Henry. See—
- Fujimura, Yoshiichi; and Hanna, Henry, 5,482,224, Cl. 242-376.000.
- Hanna, Jun-ichi. See—
- Kanai, Masahiro; Hirooka, Masaaki; Hanna, Jun-ichi; Shimizu, Isamu; and Saitoh, Keishi, 5,482,557, Cl. 118-719.000.
- Hansen, Kent W. See—
- Lebby, Michael S.; Chun, Christopher K. Y.; Kuo, Shun-Meen; and Hansen, Kent W., 5,482,658, Cl. 264-1.240.
- Hanson, David J. Safety cut-off device for piping systems and the like. 5,482,074, Cl. 137-45.000.
- Hanson, Karrie J.; and Kochanski, Gregory P., to AT&T Corp. Stylus-based keyboard key arrangement. 5,483,235, Cl. 341-20.000.
- Hara, Toshihiro. See—
- Takabe, Yasuhiro; Ueda, Koji; and Hara, Toshihiro, 5,483,133, Cl. 318-466.000.
- Hara, Yoshihisa. See—
- Shimizu, Daisuke; Miyashita, Kotaro; Hara, Yoshihisa; and Yoshio, Yamamoto, 5,482,020, Cl. 123-417.000.
- Harada Kogyo Kabushiki Kaisha. See—
- Arata, Koji; Sato, Kazufumi; and Maeda, Yuji, 5,483,132, Cl. 318-282.000.
- Harada, Koukichi. See—
- Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,482,937, Cl. 514-219.000.
- Harada, Tsutomu, to Canon Kabushiki Kaisha. Detent mechanism and gear changeover apparatus in a recording apparatus. 5,482,388, Cl. 400-185.000.
- Harandi, Mohsen N. See—
- Collins, Nick A.; and Harandi, Mohsen N., 5,482,617, Cl. 208-227.000.
- Harano, Katsuko. See—
- Ota, Nobuhiro; Harano, Katsuko; and Fujimori, Naoki, 5,483,038, Cl. 219-121.690.
- Haraoka, Yoshinao. See—
- Takamura, Fujitoshi; and Haraoka, Yoshinao, 5,481,875, Cl. 60-443.000.
- Hardee, Kim C.; and Cordoba, Michael V., to United Memories, Inc.; and Nippon Steel Semiconductor Corp. Wide range power supply for integrated circuits. 5,483,152, Cl. 323-314.000.
- Hardie, William G.; and Theorin, Craig R., to W. L. Gore & Associates, Inc. Twin-ax cable. 5,483,020, Cl. 174-36.000.
- Hardin, Stephen L. See—
- Stark, Kris R.; Lewman, Michael C.; Hardin, Stephen L.; and Chafin, William J., 5,482,622, Cl. 210-232.000.
- Hardt, Peter. See—
- Brock, Michael; Hardt, Peter; Klimmek, Helmut; and Stockhausen, Dolf, 5,487,636, Cl. 252-8.800.
- Harkness, Charles A., Jr.; and Harkness, Deborah A. Method and apparatus for reduction of refrigerant gases escaping from refrigeration systems. 5,481,883, Cl. 62-77.000.
- Harkness, Deborah A. See—
- Harkness, Charles A., Jr.; and Harkness, Deborah A., 5,481,883, Cl. 62-77.000.
- Harman, Jefferson H., to Wangtek, Inc. Filtered average servo demodulator. 5,483,394, Cl. 360-77.120.
- Harper, Brian. See—
- Hammer, Floyd V.; Rude, John A.; and Harper, Brian, 5,482,663, Cl. 264-40.500.
- Harper, Daniel R. See—
- Edwards, John W.; Harper, Daniel R.; and McNew, Quinton B., 5,482,364, Cl. 305-39.000.
- Harrington, Bradley M. See—
- Rodriguez, Louis; Williams, Clark R.; and Harrington, Bradley M., 5,483,176, Cl. 326-21.000.
- Harrington, John C., IV; and Schuster, Michael A., to Betz PaperChem, Inc. Method for improving retention and drainage characteristics in alkaline papermaking. 5,482,595, Cl. 162-168.300.
- Harriott, Lloyd R. See—
- Celler, George K.; Harriott, Lloyd R.; and Kola, Ratnaji R., 5,482,802, Cl. 430-5.000.
- Harris, Alan; and Tennhammar-Ekman, Birgitta, to Ferring AB. Stabilized pharmaceutical peptide compositions. 5,482,931, Cl. 514-15.000.
- Harris, Bernard; and Bozych, Dennis E., to Rexnord Corporation. Ball and socket bearing assembly having replaceable composite stationary ball. 5,482,379, Cl. 384-208.000.
- Harris Corporation. See—
- Blickhan, Joseph D.; Bonds, David K.; Crockett, Robert J.; Mazurek, James E.; and Milfs, Dennis J., 5,483,103, Cl. 257-718.000.
- Talbot, Robert D., 5,483,680, Cl. 455-107.000.
- Harris, Guy; Callaway, Duane; and Shah, Rajesh, to Texas Instruments Incorporated. Pressure differential downset apparatus. 5,481,899, Cl. 72-453.110.
- Harrison, Lynn. See—
- Sturman, Oded E.; Grill, Benjamin; Harrison, Lynn; and Hunter, Edwin, 5,483,411, Cl. 361-160.000.
- Harshavardhana, P. See—
- Doshi, Bharat T.; Farber, N.; Harshavardhana, P.; Kapoor, Rajiv; Kashper, Arik; Katz, Steven S.; and Meier-Hellstern, Kathleen S., 5,483,527, Cl. 370-60.100.
- Hart, John L. See—
- Clark, Andrew R.; and Hart, John L., 5,482,946, Cl. 514-291.000.
- Hartermann, Ralf-Uwe; Scheid, Hubert; Schulze-Eckel, Reinold; and Papendick, Joachim, to L. & C. Steinmüller GmbH. Device for cooling a deposit-forming gas. 5,482,110, Cl. 165-84.000.
- Hartwig, Thomas; Laager, Georg; and Summerauer, Ingomar J. K., to Bruderer AG. Process for loading a processing machine having a fine centering step and apparatus for this purpose. 5,482,225, Cl. 242-559.400.
- Harwood, Ann E. See—
- Yishay, Oded; Jelemensky, Joseph; Harwood, Ann E.; and Saldana, Javier, 5,483,660, Cl. 395-280.000.
- Hasbrouck, Wilfred P.; Hoover, Donald B.; West, John C.; and Capron, Dennis F., to United States of America, Interior. Rotary seismic shear-wave source. 5,483,026, Cl. 181-121.000.
- Hasegawa, Akira; Omura, Masayoshi; Imade, Shinichi; and Ikuta, Eishi, to Olympus Optical Co., Ltd. Acoustic lens system. 5,481,918, Cl. 73-642.000.
- Hasegawa, Etsuo; Kajikawa, Yoshiharu; Morita, Takayuki; Okazaki, Suehiro; Yamamoto, Toshihiro; Nagasawa, Toshiya; and Sumi, Shogo, to Nippondenso Co., Ltd. Cooling unit and drain case for air conditioners. 5,481,886, Cl. 62-285.000.
- Hasegawa, Miki. See—
- Nakamura, Shinji; and Hasegawa, Miki, 5,483,415, Cl. 361-529.000.
- Hasegawa, Taketo, to Canon Kabushiki Kaisha. Display control apparatus and method utilizing first and second image planes. 5,483,634, Cl. 395-162.000.
- Hashimoto, Hajime; Kubota, Kazuo; Inoue, Daisuke; and Nogawa, Syuichi, to Nissin Electric Co., Ltd. Film forming apparatus. 5,482,607, Cl. 204-298.250.
- Hashimoto, Hiroshi, to Daiwa Seiko, Inc. Double-bearing reel with improved level winder assembly. 5,482,220, Cl. 242-279.000.
- Hashimoto, Katsuhiko. See—
- Urade, Masakazu; Kobayashi, Hisao; Yagi, Yukihiro; Hashimoto, Katsuhiko; and Nishii, Sachiko, 5,483,289, Cl. 348-468.000.
- Hashimoto, Kazuhiro. See—
- Tsuda, Kazuhiko; Okamoto, Hiroyuki; and Hashimoto, Kazuhiro, 5,482,506, Cl. 454-155.000.
- Hashimoto, Koji; Habazaki, Hiroki; Mrowec, Stanislaw; and Danielewski, Marek, to Koji Hashimoto; and YKK Corporation. Amorphous alloys resistant against hot corrosion. 5,482,577, Cl. 148-403.000.
- Hashimoto, Naotaka. See—
- Meguro, Satoshi; Uchibori, Kiyofumi; Suzuki, Norio; Motoyoshi, Makoto; Koike, Atsuyoshi; Yamanaka, Toshiaki; Sakai, Yoshio; Kaga, Toru; Hashimoto, Naotaka; Hashimoto, Takashi; Honjou, Shigeru; and Minato, Osamu, 5,483,083, Cl. 257-69.000.



Hashimoto, Takashi: See—  
Meguro, Satoshi; Uchibori, Kiyofumi; Suzuki, Norio; Motoyoshi, Makoto; Koike, Atsuyoshi; Yamanaka, Toshiaki; Sakai, Yoshio; Kaga, Toru; Hashimoto, Naotaka; Hashimoto, Takashi; Honjou, Shigeru; and Minato, Osamu, 5,483,083, Cl. 257-69.000.

Hashimura, Yasuhiro; Noguchi, Satoshi; Masaki, Kenichi; and Akai, Takahiro, to Nissha Printing Co., Ltd. Printing roll and elastic plate installed on printing roll. 5,481,976, Cl. 101-415.100.

Hastings, Michael R.; and Remillard, John E. Combination tape measure and straight edge apparatus. 5,481,810, Cl. 33-484.000.

Hastrup, Sven: See—  
Branner, Sven; Hastrup, Sven; Eriksen, Nina; Lindegaard, Poul; Olsen, Ole H.; Casteleijn, Eric; Egmond, Maarten R.; Haverkamp, Johan; Musters, Wouter; and de Vlieg, Jakob, 5,482,849, Cl. 435-222.000.

Hasumi, Keiji: See—  
Nakano, Kazuo; Mizokami, Kazuaki; Hasumi, Keiji; Itoh, Katsuhiko; Funabashi, Michimasa; Mitsui, Yasuhiro; Irie, Takashi; Tajima, Takeshi; and Matsuoka, Sadao, 5,482,524, Cl. 55-267.000.

Hata, Yoshiyuki: See—  
Fukunaga, Kazuhiro; Hijikata, Shigeki; Ishimura, Kimihiro; Ohtani, Yoshiro; Kimura, Kunio; Fujii, Masahiro; and Hata, Yoshiyuki, 5,482,929, Cl. 514-12.000.

Hatakeyama, Akihito; Sogo, Hiroshi; Kojima, Tamao; Horio, Yasuhiko; Tsukamoto, Masahide; and Fukumura, Yasushi, to Matsushita Electric Industrial Co., Ltd. Method of manufacturing organic substrate used for printed circuits. 5,481,795, Cl. 29-852.000.

Hatakeyama, Kouichi, to Sharp Kabushiki Kaisha. Method of controlling execution of a data flow program and apparatus therefor. 5,483,657, Cl. 395-800.000.

Hatsukade, Masayoshi: See—  
Abe, Toshiyuki; Hatsukade, Masayoshi; and Nakashima, Naomichi, 5,482,733, Cl. 427-4.000.

Hatton, Gregory J.; Helms, David A.; and Marrelli, John D., to Texaco Inc. Determination of water cut and gas-fraction in oil/water/gas streams. 5,483,171, Cl. 324-640.000.

Hattori, Shinji, to Sharp Kabushiki Kaisha. Phase adjusting circuit for a demodulator. 5,483,555, Cl. 375-327.000.

Hattori, Yoshifumi: See—  
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Hauptenthal, Rudi, to Heidelberger Druckmaschinen AG. Device for adjusting the position of suction-type grippers on a sheet-transfer drum. 5,482,267, Cl. 271-276.000.

Hausmann, August; and Moser, Bernhard, to Hawera Probst GmbH & Co. Rock drill. 5,482,124, Cl. 175-415.000.

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Haverkamp, Johan: See—  
Branner, Sven; Hastrup, Sven; Eriksen, Nina; Lindegaard, Poul; Olsen, Ole H.; Casteleijn, Eric; Egmond, Maarten R.; Haverkamp, Johan; Musters, Wouter; and de Vlieg, Jakob, 5,482,849, Cl. 435-222.000.

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Hawera Probst GmbH & Co.: See—  
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Hayakawa, Hisashi; Kawashima, Kazuki; Yamazaki, Norio; Yamamoto, Ken; and Kitano, Satoshi, to NTN Corporation. Hydraulic autotensioner. 5,482,262, Cl. 267-226.000.

Hayase, Shuzi: See—  
Hiraoka, Toshiro; Nakamura, Shin-ichi; Nakano, Yoshihiko; Murai, Shinji; and Hayase, Shuzi, 5,482,656, Cl. 252-514.000.

Hayashi, Hiroaki; and Aoki, Takashi, to Toshiba Corporation. Pushbutton telephone system. 5,483,584, Cl. 379-156.000.

Hayashi, Hiromi; and Fushida, Atsuo, to Fujitsu Limited. Method of manufacturing semiconductor devices having silicide electrodes. 5,482,895, Cl. 437-200.000.

Hayashi, Hiroyuki; Saijo, Eiji; and Wakata, Shigekazu, to Sumitomo Wiring Systems, Ltd. Water-resistant electrical connector preventing terminal misinsertion and mold system for the manufacture thereof. 5,482,479, Cl. 439-736.000.

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Hayashi, Takehiko; Mizutani, Ryuji; and Sugiyama, Chusi, to Toyoda Koki Kabushiki Kaisha; and Kabushiki Kaisha Nakano Bankin. Slide cover apparatus for machine tool. 5,482,414, Cl. 409-134.000.

Hayes, Richard A.; and Robinson, George D., to Du Pont de Nemours, E. I., and Company. Poly(vinyl alcohol) polymer blend textile sizes with improved ability to be desized. 5,482,747, Cl. 427-341.000.

Haynes, Patrick M. Flossing tool. 5,482,466, Cl. 132-323.000.

Hays, Sheryl J., to Warner-Lambert Company. Substituted phenoxyhydroxypropyl amines as central nervous system agents. 5,482,964, Cl. 514-415.000.

Health Research Incorporated: See—  
Paoletti, Enzo, 5,482,713, Cl. 424-199.100.

Healthpoint Medical Limited Partnership: See—  
Jones, David P.; and Woller, William H., 5,482,714, Cl. 424-401.000.

Heartstream, Inc.: See—  
Cameron, David B.; Powers, Daniel; Lyster, Thomas; and Morgan, Carlton, 5,483,165, Cl. 324-427.000.

Heaven, Jonathan M. Wave paddle. 5,482,434, Cl. 416-70.00R.

Heberle, Kurt, to Indumat GmbH & Co. KG. Anticollision device for driverless industrial trucks. 5,482,134, Cl. 180-275.000.

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Hehl, Karl. Injection molding unit for use in an injection molding machine for processing synthetic material. 5,482,452, Cl. 425-145.000.

Hehn, Wilfried, to Agfa-Gevaert Aktiengesellschaft. Apparatus for wet processing photographic sheets. 5,483,315, Cl. 354-320.000.

Heidelberger Druckmaschinen AG: See—  
Grützner, Bertold; Rodi, Anton; and Wagensommer, Bernhard, 5,481,971, Cl. 101-183.000.

Hauptenthal, Rudi, 5,482,267, Cl. 271-276.000.

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Heidorn, Richard H.; and Lannert, George Z., to Illinois Tool Works Inc. 25-pair circuit protection assembly. 5,483,409, Cl. 361-119.000.

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Heim, Guoher; and Kroll, Bruno, to YMO Aktiengesellschaft Industrie-Produkte. Vehicle door. 5,481,831, Cl. 49-502.000.

Heintz, Robert M.: See—  
Talley, John J.; Getman, Daniel P.; DeCrescenzo, Gary A.; Lin, Ko-Chung; Vazquez, Michael L.; Mueller, Richard A.; Reed, Kathryn L.; Heintz, Robert M.; Clare, Michael; Freskos, John N.; and Sun, Eric T., 5,482,947, Cl. 514-311.000.

Heintzeman, Scott B.; Storey, Thomas W.; Monson, Barbara; Medina, Steven J.; and Malark, Gregory A., to Radisson Hotels International, Inc. System for awarding credits to persons who book travel-related reservations. 5,483,444, Cl. 364-401.000.

Heitmann, Thomas: See—  
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Helmer, John C.; Lai, Kwok F.; and Anderson, Robert L. Physical vapor deposition employing ion extraction from a plasma. 5,482,611, Cl. 204-298.170.

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Henderson, Norman L.: See—  
Kim, Kwon H.; Kopolowitz, Barry; and Henderson, Norman L., 5,482,970, Cl. 514-532.000.

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Lance, Mark A., 5,482,353, Cl. 297-284.400.

Hendrick, Kendall B.: See—  
Clark, Frederic L.; Clift, Gilbert; Hendrick, Kendall B.; Kanewske, William J., III; Lagocki, Peter A.; Martin, Richard R.; Mitchell, James E.; Moore, Larry W.; Pennington, Charles D.; Walker, Edna S.; Smith, B. Jane; Tayi, Apparao; Vaught, James A.; and Yost, David A., 5,482,861, Cl. 436-48.000.

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Fues, Johann-Friedrich; and Ritter, Wolfgang, 5,482,717, Cl. 424-426.000.

Henne, Michael: See—  
Jeenicke, Edmund; Mattes, Bernhard; Condne, Claus; and Henne, Michael, 5,483,447, Cl. 364-424.050.

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Herbst, Holger; Nestler, Gerhard; Darlington, Jerry; and Martan, Hans, to BASF Aktiengesellschaft. Purification of crude (meth)acrylic acid. 5,482,597, Cl. 203-38.000.

Herlache, Russell L.: See—

Stuedemann, Richard T.; Herlache, Russell L.; and Armstrong, Ray G., 5,481,938, Cl. 74-493.000.

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Hermanns, Juergen: See—  
Goerlach-Dohr, Yvonne M.; Schneider, Hans P.; Hermanns, Juergen; and Haagensen, Ulf H., 5,482,634, Cl. 210-651.000.

Herold, Barry: See—  
Barrett, Raymond L., Jr.; Herold, Barry; and Kosiec, Jeannie H., 5,483,687, Cl. 455-183.200.

Herrick, Gregory E., to Zeos International, Inc. Projection display system for a laptop computer or a notebook computer. 5,483,250, Cl. 345-32.000.

Herrmann, Axel S.; Krajenski, Volker; and Pabsch, Arno E. R. K., to Deutsche Forschungsanstalt für Luft- und Raumfahrt e.V. Method for manufacturing rotor blades. 5,482,584, Cl. 156-172.000.

Hert, Marius, to Norsolor. Thermoplastic compositions based on ethylene polymer and polyester. 5,483,001, Cl. 525-166.000.

Herwig, Warren E.; and Vollrath, John, to Miller Group, Ltd., The. Method and apparatus for controlling an electric arc spraying process. 5,482,734, Cl. 427-8.000.

Hess, Herbert L.; and Divan, Deepakraj M., to Wisconsin Alumni Research Foundation. Thyristor based DC link current source power conversion system for motor driven operation. 5,483,140, Cl. 318-802.000.

Hess, Markus, to Alfa Loop Inc. Method for reclaiming plastic which contains undesirable contaminants. 5,482,216, Cl. 241-23.000.

Heubach & Lindgens GmbH & Co. KG.: See—  
Marx, Reinhard, 5,482,689, Cl. 423-619.000.

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Moss, Adrian J.; Hewinson, John; Walton, Peter; Birch, Brian J.; Bail, Clare L.; James, Andrew W.; Atkinson, John K.; and Siuda, Przemyslaw R., 5,483,164, Cl. 324-425.000.

Hewlett-Packard Company: See—  
Babb, Samuel M., 5,483,413, Cl. 361-220.000.

Barrett, Tony, 5,483,149, Cl. 323-300.000.

Bowen, Michael K.; and Driggers, Matt G., 5,483,422, Cl. 361-802.000.

Johnson, Dan S.; and Phillips, Wayne G., 5,483,053, Cl. 250-226.000.

Keely, Catherine A.; McManigill, Douglass; and Holloway, Robert R., 5,482,608, Cl. 204-299.00R.

Knudsen, Knud L., 5,483,199, Cl. 330-289.000.

Overton, Mark A., 5,483,355, Cl. 358-463.000.

Robertson, Karl W.; Taylor, Richard D.; and Zimmerman, Gary D., 5,483,625, Cl. 395-117.000.

Zimmerman, Gary; and Campbell, Russ, 5,483,622, Cl. 395-114.000.

Hey, H. Peter W.; and Carlson, David W., to Applied Materials, Inc. Silicon nitride deposition. 5,482,739, Cl. 427-255.200.

Hiben, Bradley M.; Newberg, Donald G.; and LoGalbo, Robert D. Method and apparatus for providing access to a communication system. 5,483,673, Cl. 455-54.200.

Hickey, Joseph F. Hanger. 5,482,244, Cl. 248-489.000.

Hicks, Michael: See—  
Taylor, John; Hicks, Michael; Lamb, Richard; Bennett, Robert N.; Nixon, Keith; Ashcroft, Ian; Parkes, Adrian S.; and Smith, John P., 5,482,076, Cl. 137-318.000.

Hicks, Robert L. Automotive frame shortening device. 5,482,323, Cl. 280-785.000.

Hidano, Kengo: See—  
Yokota, Yasunori; Hidano, Kengo; and Yatsu, Takashi, 5,482,385, Cl. 384-572.000.

Hiebert, John: See—  
Avery, Noyes L.; Barry, Edward G.; Carey, James T.; Crocker, Lisa S.; Feng, Flora W.; Hiebert, John; Horodysky, Andrew G.; and Nelson, Lloyd A., 5,482,521, Cl. 44-344.000.

Higashi, Kazuhiko; Takakuwa, Kiyoshi; Arimoto, Kazuaki; Naruki, Kenichi; Fukumoto, Hiroshi; Kuwada, Terumi; and Oda, Keisuke, to Mitsubishi Denki Kabushiki Kaisha. Thermal printer with means for reducing color shifts. 5,483,275, Cl. 347-218.000.

Higashikawa, Katsutoshi, to Toyo Co., Ltd. Honing tool and super precision finishing method using the same. 5,482,498, Cl. 451-61.000.

Highland Supply Corporation: See—  
Weder, Donald E.; Straeter, William F.; Straeter, Joseph G.; Fantz, Paul; Carmody, James G.; and Leider, M. James, 5,481,850, Cl. 53-397.000.

Weder, Donald E., 5,482,752, Cl. 428-40.000.

Higuchi, Tsukimitsu: See—  
Tanaka, Tadashi; Sakamoto, Masaaki; Yamamoto, Koichi; Higuchi, Tsukimitsu; and Ozaki, Kouki, 5,482,782, Cl. 428-553.000.

Hijikata, Shigeki: See—  
Fukunaga, Kazuhiro; Hijikata, Shigeki; Ishimura, Kimihiro; Ohtani, Yoshiro; Kimura, Kunio; Fujii, Masahiro; and Hata, Yoshiyuki, 5,482,929, Cl. 514-12.000.

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Drummond, Michael T.; Suski, William C.; Hill, Calvin G.; Lowry, James W.; and Roberts, Rodney W., 5,482,205, Cl. 229-201.000.

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Cahill, Douglas A.; Braut, Donald A.; Himmelwright, Richard S.; and Taylor, Dene H., 5,483,321, Cl. 355-200.000.

Himmler, Günther, to Hofmann Maschinenbau GmbH. Method and apparatus for dynamically balancing a rotary member. 5,481,912, Cl. 73-460.000.

Hirabayashi, Keiji, to Canon Kabushiki Kaisha. Diamond covered member and process for producing the same. 5,483,084, Cl. 257-77.000.

Hirai, Takahiro: See—  
Sakurada, Shinya; Hirai, Takahiro; Tsutai, Akihiko; Sahashi, Masashi; Nagai, Hideo; and Yamashita, Tsutomu, 5,482,573, Cl. 148-301.000.

Hirakawa Guidom Corporation: See—  
Kobayashi, Hiroshi; Ueda, Yoshiharu; Kinoshita, Masanari; Yamamoto, Masamichi; and Kaminashi, Atsumi, 5,482,009, Cl. 122-367.100.

Hirakawa, Tadashi: See—  
Marrs, Robert C.; and Hirakawa, Tadashi, 5,483,100, Cl. 257-700.000.

Hirano, Tadayoshi: See—  
Ozaki, Masami; Ikeda, Atsuhiko; Honami, Reiji; Yumita, Takashi; Minoguchi, Naokazu; Yano, Hiroyuki; Izawa, Norihiko; and Hirano, Tadayoshi, 5,482,951, Cl. 514-340.000.

Hirao, Hidenori, to Sumitomo Rubber Industries, Ltd. Rubber composition suitable for grips of articles and grip made thereof. 5,482,993, Cl. 524-189.000.

Hiraoka, Hidenori: See—  
Yabuki, Yoshikazu; Hiraoka, Hidenori; and Koizumi, Yoshimasa, 5,482,285, Cl. 273-228.000.

Hiraoka, Toshiro; Nakamura, Shin-ichi; Nakano, Yoshihiko; Murai, Shinji; and Hayase, Shuzi, to Kabushiki Kaisha Toshiba. Non-linear optical devices employing a polysilane composition and a polysilane composition therefor. 5,482,656, Cl. 252-514.000.

Hiratsuka, Katsuo; Ayuta, Masanori; and Nakayama, Koichi, to Singer Company N.V., The. Bar tacking stitch pattern. 5,481,995, Cl. 112-437.000.

Hiratsuka, Kazuya: See—  
Kawasato, Takeshi; Hiratsuka, Kazuya; Yoneda, Takashige; Wakabayashi, Tsuneo; and Gunji, Fumiaki, 5,482,768, Cl. 428-327.000.

Hird, John A.; Owen, Lindsey D.; and Rice, Michael R., to Intellicall, Inc. Method and apparatus for performing an automated collect call. 5,483,581, Cl. 379-132.000.

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Hirooka, Masaaki: See—  
Kanai, Masahiro; Hirooka, Masaaki; Hanna, Jun-ichi; Shimizu, Isamu; and Saitoh, Keishi, 5,482,557, Cl. 118-719.000.

Hirota, Shiro: See—  
Takizawa, Hideaki; Nasu, Yasuhiro; Watanabe, Kazuhiro; Hirota, Shiro; Nonaka, Kazuo; Sato, Seii; and Majima, Teiji, 5,483,082, Cl. 257-59.000.

Hirschman, Richard, to Hudson Optical Corporation. Spectacles having adjustable temples and ear engaging members. 5,483,303, Cl. 351-118.000.

Hisada, Katsutoshi: See—  
Sugiyama, Susumu; Mita, Yoshinobu; Shishizuka, Junichi; Takaoka, Makoto; Shimomura, Yukari; Matsumoto, Kentaro; Uda, Toyokazu; Sugiyama, Mitsumasa; Kobayashi, Shigetada; Hisada, Katsutoshi; Kaneko, Yoji; and Nakanishi, Hiroyuki, 5,483,358, Cl. 358-508.000.

Hitachi America, Ltd., Research and Development Division: See—  
Hunt, Frank W.; and Nogi, Toshiharu, 5,482,023, Cl. 123-491.000.

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Kajioka, Hiroshi; Yamada, Kohdo; Nakamura, Masashi; Murakami, Kazuya; and Takuma, Yuetsu, 5,482,525, Cl. 65-398.000.

Hitachi Construction Machinery Co., Ltd.: See—  
Arima, Yukio; Kimura, Toshihiro; Miyata, Tohru; and Kunitomo, Yuichi, 5,481,917, Cl. 73-621.000.

Hitachi Information & Control Systems, Inc.: See—  
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Hitachi Koki Co., Ltd.: See—  
Otome, Yukio; Doi, Kouji; Takeuchi, Youichi; Yamada, Koutaro; Ogura, Yoshio; and Ueno, Hiroshi, 5,483,322, Cl. 355-215.000.

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Aono, Toshihiro; Kamejima, Kohji; and Hamada, Tomoyuki, 5,483,440, Cl. 364-167.010.

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Kawahara, Tetsuya; Nakata, Junji; Kimura, Yuji; Sakai, Hiroyuki; Hamaguchi, Masakazu; Yamada, Takahiro; Kohiyama, Tomohisa; and Nakano, Takahiro, 5,483,466, Cl. 364-514.00C.

Koide, Kazuo; Mizukami, Masao; Hososaka, Satoshi; and Kudoh, Junya, 5,483,110, Cl. 307-147.000.

Kuwamoto, Hideki; Kuwabara, Tadashi; Koreeda, Hiroyuki; Nonaka, Naomichi; Nakane, Keiichi; Fujiwara, Masaki; and Masuda, Kiyoshi, 5,483,632, Cl. 395-156.000.

Meguro, Satoshi; Uchibori, Kiyofumi; Suzuki, Norio; Motoyoshi, Makoto; Koike, Atsuyoshi; Yamanaka, Toshiaki; Sakai, Yoshio; Kaga, Toru; Hashimoto, Naotaka; Hashimoto, Takashi; Honjou, Shigeru; and Minato, Osamu, 5,483,083, Cl. 257-69.000.

Nagai, Yasuhiko; Sakaki, Ryoichi; Niinobe, Sadao; Suzuki, Michio; Mizuguchi, Keizou; and Ikeba, Goro, 5,483,631, Cl. 395-155.000.

Nakano, Kazuo; Mizokami, Kazuaki; Hasumi, Keiji; Itoh, Katsuhiko; Funabashi, Michimasa; Mitsui, Yasuhiro; Irie, Takashi; Tajima, Takeshi; and Matsuoka, Sadao, 5,482,524, Cl. 55-267.000.

Ohtsubo, Hiroyasu; and Koshio, Kazuhiro, 5,483,290, Cl. 348-516.000.

Okazawa, Koichi; Kimura, Koichi; Kawaguchi, Hitoshi; Aburano, Ichiharu; Kobayashi, Kazushi; and Mochida, Tetsuya, 5,483,642, Cl. 395-306.000.

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- Suganuma, Yuzi; Matsuoka, Shigeru; Kamio, Keiji; Kashiwa, Yoshihiro; Nogami, Seizi; Saito, Kouichi; Yamazaki, Isao; Kigoshi, Hidechika; Aoyama, Naofumi; Watanabe, Toru; and Nozaki, Yoshihiro, 5,483,253, Cl. 345-87.000.
- Takahashi, Yasushi, 5,483,370, Cl. 359-128.000.
- Tanimizu, Toru, 5,483,417, Cl. 361-611.000.
- Terasaki, Masatoshi, 5,481,887, Cl. 62-471.000.
- Unuma, Munetoshi; and Takeuchi, Ryoze, 5,483,630, Cl. 395-152.000.
- Hitachi Metals, Ltd.: See—
- Asanae, Masumi; and Saitoh, Tsutomu, 5,483,329, Cl. 355-269.000.
- Matsubara, Toshinori; Baba, Toshiyuki; and Kuriyama, Yasuo, 5,481,791, Cl. 29-603.000.
- Hitachi Tokyo Electronics Co., Ltd.: See—
- Nakano, Kazuo; Mizokami, Kazuaki; Hasumi, Keiji; Itoh, Katsuhiko; Funabashi, Michimasa; Mitsui, Yasuhiro; Irie, Takashi; Tajima, Takashi; and Matsuoka, Sadao, 5,482,524, Cl. 55-267.000.
- Hizume, Kohji; and Komatsuzaki, Takao, to Texas Instruments Incorporated. Automatic wiring device for design of semiconductor integrated circuit. 5,483,481, Cl. 365-63.000.
- Hjorth, Jens, to Royal Seafoods, Inc. Flat fish filleting machine. 5,482,502, Cl. 452-162.000.
- Hlatky, Gregory G.: See—
- Turner, Howard W.; and Hlatky, Gregory G., 5,483,014, Cl. 526-113.000.
- Hoag, Gay A.: See—
- Moseley, Angela L.; Hoag, Gay A.; and Durbin, George W., 5,482,376, Cl. 383-209.000.
- Hobbs, Sidney C. Fish stringer. 5,482,195, Cl. 224-103.000.
- Hockaday, Robert G. Micro mirror photovoltaic cells. 5,482,568, Cl. 136-246.000.
- Hodges, Charles H.; and Warner, Robert J., to Kelley Company, Inc. Support mechanism for a dockleveler lift bag. 5,481,774, Cl. 14-71.000.
- Hodogaya Chemical Co., Ltd.: See—
- Abe, Toshiyuki; Hatake, Masayoshi; and Nakashima, Naomichi, 5,482,733, Cl. 427-4.000.
- Hodson, Peter D.: See—
- Smith, David K.; Hodson, Peter D.; and Wass, Anthony C. L., 5,482,032, Cl. 128-203.150.
- Hoechst Aktiengesellschaft: See—
- Brück, Martin; Vaahs, Peuckert, Marcellus; Scheunemann, Ude; Stehlin, Thomas; and Theis, Jürgen, 5,483,614, Cl. 385-142.000.
- Schubert, Gerrit; Baader, Ekkehard; Bickel, Martin; and Günzler-Pukall, Volkmar, 5,482,953, Cl. 514-340.000.
- Wagner, Adalbert; Englert, Heinrich; Kleemann, Heinz-Werner; Gerhards, Hermann; Schölkens, Bernhard; Becker, Reinhard; Linz, Wolfgang; Vevret, Jean-Paul; and Caille, John-Claude, 5,482,957, Cl. 514-398.000.
- Hoechst Celanese Corporation: See—
- Anderson, Norman S.; and Promelow, Albert L., 5,483,010, Cl. 525-437.000.
- Forschirm, Alex, 5,482,987, Cl. 524-230.000.
- Hoechst-Roussel Pharmaceuticals Inc.: See—
- Kim, Kwon H.; Kopolowitz, Barry; and Henderson, Norman L., 5,482,970, Cl. 514-532.000.
- Höfken, Erich; Krüger, Dieter; Matten, Heinz; Pietzko, Günter; and Scharlack, Jürgen, to Thyssen Stahl AG. Process for the casting of metals in a continuous casting installation with continuous strand withdrawal. 5,482,106, Cl. 164-454.000.
- Hoffman, Kenneth L. Last event indicator. 5,482,163, Cl. 206-534.000.
- Hoffmann-La Roche Inc.: See—
- Knobel, Rolf, 5,482,864, Cl. 436-54.000.
- Hoffmann, Carl R., Jr.; and Katz, Morton H. Cold-water (fresh or salt) and no-water shaving lotion. 5,482,705, Cl. 424-73.000.
- Hoffmann-La Roche Inc.: See—
- Denton, James B.; Dixon, Diane J.; and Kaufman, Richard A., 5,482,866, Cl. 436-79.000.
- Knobel, Rolf, 5,482,863, Cl. 436-54.000.
- Shah, Navnit H.; Phuapradit, Wantanee; and Railkar, Aruna, 5,482,718, Cl. 424-480.000.
- Hoffmann, Peter; and Brünemann, Michael, to BASF Lacke + Farben AG. Acrylate copolymer and process for the production thereof. 5,483,004, Cl. 525-326.700.
- Hofmann Maschinenbau GmbH: See—
- Himmeler, Günther, 5,481,912, Cl. 73-460.000.
- Hogan, Steven J.; Feltz, Kristi T.; Murdock, Douglas R.; and Smith, Keith E., to LinkUSA Corporation. System and method for call conferencing. 5,483,587, Cl. 379-202.000.
- Höhne, Matthias, to H.C. Starck GmbH & Co. KG. Cobalt metal powder and composite sintered articles produced therefrom. 5,482,530, Cl. 75-230.000.
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- Boutaghou, Zine-Eddine, 5,483,398, Cl. 360-97.020.
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- Davis, Gordon T.; Dillon, Charles B.; and Marks, Laurence V., 5,483,530, Cl. 370-79.000.
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- Kohn, Harold, 5,482,198, Cl. 228-6.200.
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- International Paper Company: See—  
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- International Rectifier Corporation: See—  
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- International Remote Imaging Systems, Inc.: See—  
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- Investigator Marketing Inc.: See—  
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- Ionex Corporation: See—  
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- Irie, Hitoshi: See—  
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- Irie, Takashi: See—  
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- Irie, Takatoshi: See—  
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- Isaacs, Stephen: See—  
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- Isabelle, Charles J.: See—  
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- Isao, Akihiko; Kawada, Susumu; and Yoshioka, Nobuyuki, to Mitsubishi Denki Kabushiki Kaisha; Dainippon Printing Co., Ltd.; and Ulvac Coating Corporation. Phase shift mask and manufacturing method thereof. 5,482,799, Cl. 430-5.000.
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- Ishida, Hiroshi: See—  
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- Murakami, Kenjiro; Kotaka, Toshikazu; Ishida, Hiroshi; Komuro, Kiyoto; Nakayama, Yoshiaki; Takahashi, Nobuhito; and Takehana, Satoshi, 5,482,390, Cl. 400-636.200.
- Shimizu, Kenji; Ishida, Hiroshi; Yamada, Yutaka; Izumi, Kiyoshi; Moro, Masashi; and Soeda, Yuji, 5,482,625, Cl. 210-321.840.
- Ishida, Kazunori; Ishii, Tadao; Mori, Hiroyoshi; Akizuki, Susumu; and Ogino, Akihisa, to Fujitsu Limited. Apparatus and method for routing control for composite network. 5,483,589, Cl. 379-220.000.
- Ishida, Takeshisa, to Sony Corporation. Magnetic recording and or reproducing apparatus and a recording medium thereof. 5,483,392, Cl. 360-77.030.
- Ishida, Tokuji: See—  
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- Ishida, Yasuhiko: See—  
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- Ishiguro, Yasuaki, to Nikon Corporation. Electronic still photographic adaptor mountable single-lens reflex camera. 5,483,284, Cl. 348-335.000.
- Ishihara, Masamichi: See—  
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- Ishii, Hiroji; Tamada, Masanori; Yoshida, Satoru; and Okuzumi, Isamu, to Ishii Iron Works Co., Ltd. Amusement device passing within tube. 5,482,510, Cl. 472-61.000.
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- Ishii, Kenji, to NEC Corporation. High sensitivity camera device. 5,483,279, Cl. 348-222.000.
- Ishii, Masaru; and Kasahara, Akihiro, to Kabushiki Kaisha Toshiba. Optical head and lens actuator. 5,483,516, Cl. 369-247.000.
- Ishii, Satoshi: See—  
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- Sasaki, Masahiro; Ishii, Satoshi; Yamauchi, Yoshihiko; Kitamura, Katsushi; Toyoda, Shuji; and Ahiko, Kenkichi, 5,482,723, Cl. 426-43.000.
- Ishii, Tadao: See—



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- Ishikawa Gasket Co., Ltd.: See—
- Udagawa, Tsunekazu, 5,482,298, Cl. 277-180.000.
- Ishikawa, Osamu: See—
- Ihara, Takuro; and Ishikawa, Osamu, 5,482,569, Cl. 136-251.000.
- Ishimaru, Takenori: See—
- Natsugari, Hideaki; Ikeda, Hitoshi; Ishimaru, Takenori; and Doi, Takayuki, 5,482,967, Cl. 514-457.000.
- Ishimizu, Hideaki: See—
- Tanuma, Jiro; Ishimizu, Hideaki; Hagiwara, Akira; and Kasai, Tadashi, 5,482,387, Cl. 400-124.280.
- Ishimoto, Manabu; Kato, Masayuki; Aritake, Hirokazu; and Sato, Noriko, to Fujitsu Limited. Holographic stereoscopic display method and apparatus using high and low sample point densities of feature and non-lecture portions of a holographic stereogram, 5,483,364, Cl. 359-9.000.
- Ishimoto, Zenichi; to Nikko Co., Ltd. Toy vehicle having rolling oscillatory motion, 5,482,494, Cl. 446-456.000.
- Ishimura, Kimihiro: See—
- Fukunaga, Kazuhiro; Hijikata, Shigeki; Ishimura, Kimihiro; Ohtani, Yoshiro; Kimura, Kunio; Fujii, Masahiro; and Hata, Yoshiyuki, 5,482,929, Cl. 140-120.000.
- Ishioka, Yuzuru; and Got, Rika, to Fujitsu Limited. Ringer unit driving system in a subscriber transmission system, 5,483,592, Cl. 379-373.000.
- Ishiwata, Hiroshi: See—
- Ohishi, Takashi; Ishiwata, Hiroshi; and Kitahara, Nobuhiro, 5,482,016, Cl. 123-299.000.
- Ishiwata, Kazuya; and Yoshioka, Toshifumi, to Canon Kabushiki Kaisha. Process for preparing filter, 5,482,803, Cl. 430-7.000.
- Ishizaki, Hiroshi: See—
- Okagaki, Hiroshi; Kameya, Takayuki; Ishizaki, Hiroshi; and Abe, Kazuya, 5,483,121, Cl. 313-618.000.
- Ishizaki, Naoki: See—
- Karakama, Tadao; Akiyama, Teruo; Yamashita, Kouji; and Ishizaki, Naoki, 5,481,872, Cl. 60-421.000.
- Ishizuka, Koh: See—
- Kaneda, Yasushi; Ishizuka, Koh; Kondo, Hiroshi; and Ishii, Satoshi, 5,483,377, Cl. 359-566.000.
- Isoyawa, Toshiaki: See—
- Takahashi, Yoshikazu; Isoyawa, Toshiaki; Sato, Yutaka; and Shimizu, Shuji, 5,483,280, Cl. 348-296.000.
- Isshiki, Naotsugu; Izaki, Hiroshi; Tokunaga, Yosimitu; Yoshino, Syoichi; Yoshino, Masanori; and Aoki, Toshiyuki, to Kubota Corporation. Method of and apparatus for producing metal powder, 5,482,532, Cl. 75-333.000.
- Itai, Alon: See—
- Alur, Rajeev; Itai, Alon; Kurshan, Robert P.; and Yannakakis, Mihalis, 5,483,470, Cl. 364-578.000.
- Itami Industrial Co., Ltd.: See—
- Yanagimoto, Chuji, 5,481,896, Cl. 72-307.000.
- Ito, Eizi: See—
- Takemoto, Takatoshi; Kano, Noriaki; Kurihara, Yoshide; Nakai, Kouji; and Ito, Eizi, 5,482,266, Cl. 271-272.000.
- Ito, Fujihiro: See—
- Yamamoto, Hajime; Murai, Keiichi; and Ito, Fujihiro, 5,482,660, Cl. 264-474.000.
- Ito, Kazuya: See—
- Iwai, Hidetoshi; Ishihara, Masamichi; Ito, Kazuya; Arakawa, Wataru; and Nakagome, Yoshinobu, 5,483,490, Cl. 365-200.000.
- Ito, Makoto: See—
- Ohsawa, Kenji; Ito, Makoto; and Nagano, Mutsumi, 5,481,798, Cl. 29-827.000.
- Ito, Masayoshi: See—
- Momose, Nobuo; Ito, Masayoshi; Yoshida, Hiroaki; Tani, Masanori; Sano, Yoshiaki; Taira, Masahito; and Tejima, Takashi, 5,483,446, Cl. 364-424.010.
- Ito, Reijiro, to Kokusai Display Kogyo Co., Ltd. Self-starting swinging apparatus, 5,483,131, Cl. 318-130.000.
- Ito, Takashi: See—
- Cantor, Charles R.; Ito, Takashi; and Smith, Cassandra L., 5,482,836, Cl. 435-6.000.
- Ito, Takeshi; Kanda, Tomoyuki; and Yoninaga, Muneo, to Nippondenso Co. Ltd.; and Nippon Soken Inc. Angular velocity sensor and method of adjusting the same, 5,481,913, Cl. 73-504.160.
- Ito, Toshio: See—
- Oketani, Tetsuya; and Ito, Toshio, 5,481,944, Cl. 74-816.000.
- Itoh, Hisato; Karasawa, Akio; and Sugimoto, Kenichi, to Mitsui Toatsu Chemicals, Incorporated. Resin composition for color filter, 5,482,804, Cl. 430-7.000.
- Itoh, Hisato: See—
- Ogiso, Akira; Misawa, Tsutami; Imai, Rihoko; and Itoh, Hisato, 5,482,986, Cl. 524-110.000.
- Itoh, Katsuhiko: See—
- Nakano, Kazuo; Mizokami, Kazuaki; Hasumi, Keiji; Itoh, Katsuhiko; Funabashi, Michimasa; Mitsui, Yasuhiro; Irie, Takashi; Tajima, Takeshi; and Matsuo, Sadao, 5,482,524, Cl. 55-267.000.
- Itoyama, Shigenori: See—
- Yamada, Satoru; Mori, Takahiro; Kataoka, Ichiro; and Itoyama, Shigenori, 5,482,571, Cl. 136-259.000.
- ITU Research, Inc.: See—
- Yasutake, Taizo, 5,483,261, Cl. 345-173.000.
- Iwai, Hidetoshi; Ishihara, Masamichi; Ito, Kazuya; Arakawa, Wataru; and Nakagome, Yoshinobu, to Hitachi, Ltd. Semiconductor integrated device and wiring correction arrangement therefor, 5,483,490, Cl. 365-200.000.
- Iwai, Shoji: See—
- Oda, Kazuhiro; Takizawa, Hideyuki; Yamada, Masamichi; Iwamoto, Fumio; and Iwai, Shoji, 5,481,984, Cl. 104-284.000.
- Iwaki, Takashi: See—
- Shinjo, Kenji; Terada, Masahiro; Uchimi, Toshiharu; Yoshida, Akio; Togano, Takeshi; Asaoka, Masanobu; and Iwaki, Takashi, 5,482,652, Cl. 252-299.610.
- Iwamoto, Fumio: See—
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- Iwamoto, Kazunori; Saitoh, Kenji; and Osawa, Hiroshi, to Canon Kabushiki Kaisha. Wavelength compensator in a helium ambience, 5,483,343, Cl. 356-351.000.
- Iwashita, Ryosuke: See—
- Nakayama, Takao; Dan, Shigeyuki; Iwashita, Ryosuke; and Umehara, Saburo, 5,482,810, Cl. 430-130.000.
- Iwata, Toru; Murakami, Terukiyo; Tamura, Minoru; and Fukumura, Tomohiro, to Nissan Motor Co., Ltd. Traction control for automotive vehicle, 5,482,133, Cl. 180-197.000.
- IWK Regler Und Kompensatoren GmbH: See—
- Holzhausen, Wieland, 5,482,330, Cl. 285-226.000.
- Izaki, Hiroshi: See—
- Isshiki, Naotsugu; Izaki, Hiroshi; Tokunaga, Yosimitu; Yoshino, Syoichi; Yoshino, Masanori; and Aoki, Toshiyuki, 5,482,532, Cl. 75-333.000.
- Izawa, Norihiko: See—
- Ozaki, Masami; Ikeda, Atsuhiko; Honami, Reijiro; Yumita, Takashi; Minoguchi, Naokazu; Yano, Hiroyuki; Izawa, Norihiko; and Hirano, Tadayoshi, 5,482,951, Cl. 514-340.000.
- Izumi, Kiyoshi: See—
- Shimizu, Kenji; Ishida, Hiroshi; Yamada, Yutaka; Izumi, Kiyoshi; Moro, Masashi; and Soeda, Yuji, 5,482,625, Cl. 210-321.840.
- Izumiyama, Tohru: See—
- Wheatley, Charles E., III; Izumiyama, Tohru; Kitamura, Tsuyoshi; and Okazaki, Mitsunari, 5,483,696, Cl. 455-318.000.
- Izutani, Kazuaki, to Sharp Kabushiki Kaisha. Pen holding device for pen input type information processor, 5,483,262, Cl. 345-179.000.
- J. H. Beeghly to Dravo Lime Company: See—
- Beeghly, Joel H.; and Davis, John C., 5,481,989, Cl. 110-344.000.
- J. Pagett Industries Pty Limited: See—
- Pagett, Jeffery M., 5,482,125, Cl. 180-6.320.
- Jabar, John P., Jr.: See—
- Trinward, John G.; and Jabar, John P., Jr., 5,482,540, Cl. 95-57.000.
- Jackson, Meryl R.: See—
- Yeung, Flora; and Jackson, Meryl R., 5,482,561, Cl. 134-1.000.
- Jacobson, James W.; Strausberg, Robert L.; Wilson, Susan D.; Pope, Sharon H.; Strausberg, Susan L.; Ruff, Michael D.; Augustine, Patricia C.; and Danforth, Harry D., to British Technology Group USA Inc.; and United States of America, Agriculture. Eimeria antigenic composition which elicits antibodies against avian coccidiosis, 5,482,709, Cl. 424-191.100.
- Jaffard, Jean-Luc; and Desprez-Le Goarant, Yann, to SGS-Thomson Microelectronics, S.A. Device for switching a video tape recorder head to write/read mode, 5,483,390, Cl. 360-62.000.
- Jaffelin, Etienne, to Chevassus S.A. Elastic spectacle hinge, 5,483,302, Cl. 351-113.000.
- Jäger, Günter: See—
- Dimmig, Thomas; Jäger, Günter; and Petri, Thomas, 5,482,638, Cl. 252-46.600.
- James, Andrew W.: See—
- Moss, Adrian J.; Hewinson, John; Walton, Peter; Birch, Brian J.; Ball, Clare L.; James, Andrew W.; Atkinson, John K.; and Siuda, Przemyslaw R., 5,483,164, Cl. 324-425.000.
- Jamriska, David: See—
- Taylor, Wayne A.; and Jamriska, David, 5,482,687, Cl. 423-2.000.
- Jang, Hyun S., to Hyundai Electronics Industries Co., Ltd. Power-on reset circuit, 5,483,187, Cl. 327-143.000.
- Janoss, Bernard J.: See—
- Anastasio, Paul J.; English, James M.; Farrar, John C.; Goel, Ram P.; Janoss, Bernard J.; Collins, Christopher J.; Childers, Richard K.; and Bunch, John H., 5,483,407, Cl. 361-56.000.
- Jansen, Cees M.: See—
- Colson, Wendell B.; Akins, Terry; Jansen, Cees M.; Swiszczy, Paul G.; and Anthony, James M., 5,482,750, Cl. 428-12.000.
- Janssen Pharmaceutica N.V.: See—
- Kennis, Ludo E. J.; Vandenberg, Jan; and Van Heertum, Albertus H. M. T., 5,482,943, Cl. 514-258.000.
- Janulis, Eugene P.; Johnson, Gilbert C.; Radcliffe, Marc D.; Savu, Patricia M.; Snustad, Daniel C.; and Spaw, Terence D., to Minnesota Mining and Manufacturing Company. Liquid crystal compounds having perfluoroether terminal portions, 5,482,650, Cl. 252-299.010.
- Japan Atomic Energy Research Institute: See—
- Ohmi, Masao; Takada, Fumiki; and Kizaki, Minoru, 5,481,923, Cl. 73-860.000.
- Japan GORE-TEX, Inc.: See—
- Kikukawa, Hiroyasu; and Kato, Hiroshi, 5,482,552, Cl. 118-264.000.
- Japan Metals & Chemicals Co., Ltd.: See—

- Kondo, Kenichi; Saida, Takahiro; Taya, Shuichi; Iida, Toyoshi; Sotomura, Takeshi; Fujii, Yuko; Sato, Keiji; Takahashi, Mamoru; Yamakawa, Sadayasu; and Osawa, Shunichi, 5,482,614, Cl. 205-171.000.
- Japan Synthetic Rubber Co., Ltd.: See—
- Murata, Makoto; Yamachika, Mikio; Yumoto, Yoshiji; and Miura, Takao, 5,482,816, Cl. 430-270.140.
- Jara, Javier; Soto, Heriberto; and Nava, Fabiola, to Canadian Liquid Air Ltd.-Air Liquide Canada Ltee. Regeneration of cyanide by oxidation of thiocyanate, 5,482,694, Cl. 423-364.000.
- Jarrett, James O.: See—
- Spibey, Norman; and Jarrett, James O., 5,482,708, Cl. 424-187.100.
- Jasper, Taryl J.: See—
- Staron, Raymond J.; Burke, Thomas J.; Rinehart, Colleen A.; and Jasper, Taryl J., 5,483,654, Cl. 395-650.000.
- Jautelat, Manfred; Dutzmann, Stefan; Stenzel, Klaus; and Dehne, Heinz-Wilhelm, to Bayer Aktiengesellschaft. Cyclopropyl-ethyl-azoles, 5,482,955, Cl. 514-383.000.
- Javanifard, Jahanshir J.; and Landgraf, Marc E., to Intel Corporation. Charge pump circuit for providing multiple output voltages for flash memory, 5,483,486, Cl. 365-185.170.
- Jeenicke, Edmund; Mattes, Bernhard; Condne, Claus; and Henne, Michael, to Robert Bosch GmbH. Apparatus for tripping a system for the protection of occupants of a vehicle, 5,483,447, Cl. 364-424.050.
- Jeffreys, Brian B.: See—
- Armstrong, Frank O.; and Jeffreys, Brian B., 5,482,612, Cl. 204-298.110.
- Jeffries, Benjamin L.; Hyman, Barry; Shepherd, Matthew A.; Nguyen, Steven; Cleofe, Jaures F.; and Kim, Daehwan D., to University of Washington. Shifting mechanism and quick release for multispeed wheelchair, 5,482,305, Cl. 280-250.100.
- Jeffries, Kenneth L.: See—
- Jones, Craig S.; Jeffries, Kenneth L.; and Parks, Terry J., 5,483,641, Cl. 395-823.000.
- Jegeli, Lennart. Suspension device for low weight articles, 5,482,242, Cl. 248-328.000.
- Jelensky, Joseph: See—
- Yishay, Oded; Jelensky, Joseph; Harwood, Ann E.; and Saldana, Javier, 5,483,660, Cl. 395-280.000.
- Jelly, Aubrey B.: See—
- Thornework, Nigel; and Jelly, Aubrey B., 5,483,044, Cl. 219-681.000.
- Jenkins, Hodge E., III: See—
- Guzman, Alberto M.; Jenkins, Hodge E., III; Newman, Ronald R.; Sankar, Suryanarayan G.; and Tabacchi, John G., 5,481,983, Cl. 104-279.000.
- Jenkins, Michael J.: See—
- Phillips, David L.; and Jenkins, Michael J., 5,482,135, Cl. 180-308.000.
- Jensen, David S.: See—
- Borden, Keith A.; Jensen, David S.; and Anderson, Robert E., 5,482,648, Cl. 252-182.200.
- Jensen, Donald A.; Faraz, Hassan; and Thomas, Joel M., to Boeing Company. The Articulating overhead mandrel manipulator, 5,482,340, Cl. 294-81.510.
- Jensen, James M.: See—
- Brooks, Jon R.; Jensen, James M.; McConochie, Roberta M.; Osborn, Susan V.; Pearl, Amy E.; Schmidt, Carole M.; Seiler, Ann B.; Stowell, Carol P.; White, Thomas W.; and Wong, Wylie, 5,483,276, Cl. 348-2.000.
- Jenski, Gary M., to Aeroquip Corporation. Quick connect coupling, 5,482,083, Cl. 137-614.030.
- Jeon, Jong: See—
- Jeong, Woo-Cheol; Kim, Yeong-Mok; Bum, Hee-Cheol; and Jeon, Jong, 5,483,399, Cl. 360-105.000.
- Jeong, Seok J., to Goldstar Co., Ltd. Apparatus for flattening thermosensitive recording paper of a facsimile machine, 5,483,264, Cl. 346-136.000.
- Jeong, Woo-Cheol; Kim, Yeong-Mok; Bum, Hee-Cheol; and Jeon, Jong, to Samsung Electronics Co., Ltd. Self-latching restraint for an actuator of a disk drive, 5,483,399, Cl. 360-105.000.
- Jerrard, Jack V.: See—
- Cuellar, Salome J.; Radawski, Robert J.; Barth, Michael R.; Jerrard, Jack V.; Keyes, John A.; and Gleason, Earl V., 5,482,745, Cl. 427-421.000.
- Jessop, Richard E.; and Demmer, John E., to Demmer Corporation. Double plane bend former, 5,481,897, Cl. 72-389.000.
- Jewell, Jack L.; and Muchnik, Boris J., to Vixel Corporation. Multiple beam optical memory system with solid-state lasers, 5,483,511, Cl. 369-44.370.
- Jiang, Ying, to United States Surgical Corporation. Polymer derived from cyclic amide and medical devices manufactured therefrom, 5,483,009, Cl. 525-417.000.
- Jirjis, Bassam F.: See—
- Muralidhara, Harapanahalli S.; Jirjis, Bassam F.; and Seymour, Gary F., 5,482,633, Cl. 210-651.000.
- Johanson, Walter A. Illumination devices and methods of forming same, 5,483,119, Cl. 313-498.000.
- Johansson, Eric B.: See—
- Matzner, Bruce; Johansson, Eric B.; Wolters, Richard A., Jr.; Dunlap, Thomas G.; Elkins, Robert B.; King, Harold B.; Sick, Paul W.; and Ledford, Kevin L., 5,483,564, Cl. 376-352.000.
- Johansson, Jonas: See—
- Svanberg, Sune; and Johansson, Jonas, 5,483,379, Cl. 359-634.000.
- Johnson & Johnson Clinical Diagnostics, Inc.: See—
- Snodgrass, Gary L.; Sprague, Lisa D.; Warren, Harold C., III; Jones, Douglas R.; and Kissel, Thomas R., 5,482,831, Cl. 435-5.000.
- Johnson, Bernadette; and Zayhowski, John J., to Massachusetts Institute of Technology. Sensor system for remote spectroscopy, 5,483,546, Cl. 372-10.000.
- Johnson, Dan S.; and Phillips, Wayne G., to Hewlett-Packard Company. Variable resolution color image scanner having an exposure delay between successive linear photosensors detecting different colors, 5,483,053, Cl. 250-226.000.
- Johnson, Gilbert C.: See—
- Janulis, Eugene P.; Johnson, Gilbert C.; Radcliffe, Marc D.; Savu, Patricia M.; Snustad, Daniel C.; and Spaw, Terence D., 5,482,650, Cl. 252-299.010.
- Johnson, Kim L., to Minnesota Mining and Manufacturing Company. Cyclic process for activation, use and recovery of phase-transfer catalysts, 5,483,007, Cl. 525-403.000.
- Johnson, Melvin H.; and Willis, Frank M., to Du Pont de Nemours, E. I., and Company. Apparatus for the preparation of optical ferrules, 5,482,451, Cl. 425-116.000.
- Johnson, Peter C., to University of Pittsburgh. System and method for measuring and quantitating facial movements, 5,482,048, Cl. 128-665.000.
- Johnson, Shepard D.: See—
- Donaher, J. Casey; Holbrook, David S.; Johnson, Shepard D.; and Sozanski, James A., 5,483,345, Cl. 356-363.000.
- Johnson, William J.; and Williams, Marvin L., to International Business Machines Corporation. Method and system for distinguishing between plural audio responses in a multimedia multitasking environment, 5,483,618, Cl. 395-2.790.
- Johnson, William J., to International Business Machines Corporation. Method and apparatus for surfacing an object based upon forthcoming criteria, 5,483,633, Cl. 395-161.000.
- Johnson, William L.: See—
- Scruggs, David M.; Johnson, William L.; Bolton, Jimmie B.; and Paker, Atakan, 5,482,580, Cl. 148-528.000.
- Johnston, Brad. One-handed opening device, 5,482,208, Cl. 232-47.000.
- Johnston, Rafe. Mobile gravel screening apparatus, 5,482,165, Cl. 209-244.000.
- Joiner, Bennett A., Jr., to Motorola, Inc. Drop-in heat sink package with window frame flag, 5,483,098, Cl. 257-676.000.
- Jokinen, Harri: See—
- Malkamaki, Esa; and Jokinen, Harri, 5,483,668, Cl. 455-33.200.
- Jones, Bruce R.: See—
- Adrian, Andrew; Jones, Bruce R.; and Tannery, George F., IV, 5,483,247, Cl. 343-713.000.
- Jones, Charles R., Jr.: See—
- Krantz, Kermit T.; and Jones, Charles R., Jr., 5,482,222, Cl. 242-347.000.
- Jones, Clinton H.: See—
- McKenzie, Russell G.; Hunt, Robert P.; and Jones, Clinton H., 5,482,729, Cl. 426-635.000.
- Jones, Craig S.; Jeffries, Kenneth L.; and Parks, Terry J., to Dell USA, L.P. System for scheduling readahead operations if new request is within a proximity of N last read requests wherein N is dependent on independent activities, 5,483,641, Cl. 395-823.000.
- Jones, David L.; and Drenner, George L., Jr., to Mobility Plus, Inc. Car rack for wheelchairs and the like, 5,482,424, Cl. 414-462.000.
- Jones, David P.; and Woller, William H., to Healthpoint Medical Limited Partnership. Water impermeable skin protectant based upon reverse water emulsion, 5,482,714, Cl. 424-401.000.
- Jones, Douglas R.: See—
- Snodgrass, Gary L.; Sprague, Lisa D.; Warren, Harold C., III; Jones, Douglas R.; and Kissel, Thomas R., 5,482,831, Cl. 435-5.000.
- Jones Stroud & Co. Ltd.: See—
- Frith, George A., 5,481,861, Cl. 57-288.000.
- Jones, William D.; and Esposito, Louis A., to Hail Mary Rubber Company, Inc. Sewer construction and pipe encasement therefor, 5,482,403, Cl. 405-157.000.
- Joshi, Chandrashekhara H., to American Superconductor Corporation. Superconducting rotor, 5,482,919, Cl. 310-52.000.
- Jouardet, Michel R.: See—
- Havard, Jacques G. W. R.; Jouardet, Michel R.; Loreau, Jean-Yves M.; and Zanolin, Gérard L., 5,483,034, Cl. 219-121.640.
- Jouin, Christophe; Pinault, Francis; and Grebot, Richard, to Alcatel Radiotelephone. Digital mobile radio network station with speech signal exchange means and data signal exchange means, 5,483,531, Cl. 370-79.000.
- Jow, Jinder; and Gomolka, David, to Union Carbide Chemicals & Plastics Technology Corporation. Flame retardant compositions, 5,482,990, Cl. 524-436.000.
- Judd, Robert R., to Inland Steel Company. Continuously cast electrical steel strip, 5,482,107, Cl. 164-480.000.
- Juzwiak, Robert: See—
- Rouse, Alan S.; Juzwiak, Robert; and Frost, Colin, 5,482,336, Cl. 293-115.000.
- Jwayad, Jack M.; and Jwayad, Roberta F. Light fixture candle adapter, 5,482,456, Cl. 431-297.000.
- Jwayad, Roberta F.: See—
- Jwayad, Jack M.; and Jwayad, Roberta F., 5,482,456, Cl. 431-297.000.
- Kabat, Daniel M.: See—
- Rao, V. Durga N.; Kabat, Daniel M.; and Lizotte, Brian W., 5,482,637, Cl. 252-29.000.



- Kabushiki Kaisha Ace Denken: See—  
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- Kabushiki Kaisha Daikin Seisakusho: See—  
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- Kabushiki Kaisha Kit: See—  
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- Kabushiki Kaisha Komatsu Seisakusho: See—  
Karakama, Tadao; Akiyama, Teruo; Yamashita, Kouji; and Ishizaki, Naoki, 5,481,872, Cl. 60-421.000.
- Mori, Shigeki; Ohdatake, Yohjiro; and Tsuchie, Morio, 5,482,138, Cl. 184-6.400.
- Takamura, Fujitoshi; and Haraoka, Yoshinao, 5,481,875, Cl. 60-443.000.
- Kabushiki Kaisha Nakano Bank: See—  
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- Kabushiki Kaisha Sushitaro: See—  
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- Kabushiki Kaisha Tokai Rika Denki Seisakusho: See—  
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- Kabushiki Kaisha Toshiba: See—  
Endoh, Tetsuo; and Shiota, Riichiro, 5,483,484, Cl. 365-185.180.
- Fujita, Hidehiro, 5,482,042, Cl. 128-653.100.
- Fukasawa, Kazuo, 5,483,050, Cl. 235-449.000.
- Hirakawa, Toshiro; Nakamura, Shin-ichi; Nakano, Yoshihiko; Murai, Shinji; and Hayase, Shuzi, 5,482,656, Cl. 252-514.000.
- Hosoi, Takashi, 5,483,418, Cl. 361-680.000.
- Ikeya, Jitsuo; Nakamura, Yoshiro; and Fukuoka, Hirotohi, 5,482,115, Cl. 165-151.000.
- Inoue, Nobuhiro; Nakano, Akira; Tsuda, Yukio; Sasaki, Katsunari; Nose, Toshiro; and Aihara, Masayoshi, 5,483,274, Cl. 347-206.000.
- Ishii, Masaru; and Kasahara, Akihiro, 5,483,516, Cl. 369-247.000.
- Kohyama, Yusuke, 5,482,869, Cl. 437-12.000.
- Kudou, Mitsu, 5,483,353, Cl. 358-404.000.
- Nakamoto, Masayuki; and Ono, Tomio, 5,483,118, Cl. 313-309.000.
- Ohno, Tadayoshi; Tanimoto, Koji; Mizuguchi, Mamoru; and Fujiwara, Shigeru, 5,483,271, Cl. 347-129.000.
- Ohshima, Shigeru, 5,483,368, Cl. 359-124.000.
- Sakurada, Shinya; Hirai, Takahiro; Tsutai, Akihiko; Sahashi, Masashi; Nagai, Hideo; and Yamashita, Tsutomu, 5,482,573, Cl. 148-301.000.
- Sekiguchi, Tadashi; Fujita, Hiroshi; Yoshinaga, Megumi; Honda, Masashi; and Watanabe, Izumi, 5,482,029, Cl. 600-109.000.
- Tai, Hiromichi, 5,483,192, Cl. 327-440.000.
- Taura, Tadayuki, 5,483,494, Cl. 365-185.210.
- Uchikoga, Hiroshi, 5,483,646, Cl. 395-427.000.
- Uchino, Hiroshi, 5,483,435, Cl. 363-81.000.
- Uesugi, Michika, 5,483,141, Cl. 318-811.000.
- Watanabe, Yutaka; Hachimonji, Takayuki; Yamashita, Katsuya; Sekita, Sanae; and Noma, Tsuyoshi, 5,481,882, Cl. 62-70.000.
- Yamada, Shuji; Kanda, Motoya; Yoshizawa, Hiroyasu; and Sonai, Atsuo, 5,482,790, Cl. 429-9.000.
- Yamada, Takashi; and Watanabe, Yohji, 5,483,482, Cl. 365-175.000.
- Yano, Hiroyuki; and Okumura, Katsuya, 5,483,568, Cl. 378-44.000.
- Yoshioka, Shimpai; Konishi, Kazuo; Maruyama, Koji; and Sato, Toshiaki, 5,483,491, Cl. 365-200.000.
- Kachmarik, David J.; Nerone, Louis R.; Secen, Michael M.; and Haas, Kurt W., to General Electric Company. Ballast circuit for a gas discharge lamp having a cathode pre-heat arrangement, 5,483,125, Cl. 315-106.000.
- Kaczus, Steven L., Sr.; McKnight, Thomas; and Edwards, Roy J., to TEAC Corporation; and Pont Peripherals Corporation. Hot-swappable multi-cartridge docking module, 5,483,419, Cl. 361-685.000.
- Kadowaki, Hidejiro: See—  
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- Kaelin, Ruedi. Mini-transformer with molded cover and retention structure, 5,483,405, Cl. 361-38.000.
- Kaga, Toru: See—  
Meguro, Satoshi; Uchibori, Kiyofumi; Suzuki, Norio; Motoyoshi, Makoto; Koike, Atsuyoshi; Yamanaka, Toshiaki; Sakai, Yoshio; Kaga, Toru; Hashimoto, Naotaka; Hashimoto, Takashi; Honjou, Shigeru; and Minato, Osamu, 5,483,083, Cl. 257-69.000.
- Kagami, Kenji: See—  
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- Kagawa, Hitoshi; and Yamashita, Koji, to Mitsubishi Denki Kabushiki Kaisha. Optical semiconductor device, 5,483,095, Cl. 257-431.000.
- Kaja, Suryanarayana; Perfecto, Eric D.; Price, William H.; Purushothaman, Sampath; Reddy, Srinivasa N.; Sura, Vivek M.; and White, George E., to International Business Machines Corporation. Module input-output pad having stepped set-back, 5,483,105, Cl. 257-779.000.
- Kajikawa, Yoshiharu: See—  
Hasegawa, Etsuo; Kajikawa, Yoshiharu; Morita, Takayuki; Okazaki, Suehiro; Yamamoto, Toshihiro; Nagasawa, Toshiya; and Sumi, Shogo, 5,481,886, Cl. 62-285.000.
- Kajioaka, Hiroshi; Yamada, Kohdo; Nakamura, Masashi; Murakami, Kazuya; and Takuma, Yuetsu, to Hitachi Cable Limited. Method of producing elliptic core type polarization-maintaining optical fiber, 5,482,525, Cl. 65-398.000.
- Kajita Construction Company: See—  
Kajita, Yusuke, 5,481,844, Cl. 52-702.000.
- Kajita, Yusuke, to Kajita Construction Company. Joint part for use in wooden buildings, 5,481,844, Cl. 52-702.000.
- Kajiwar, Shinzo; Konii, Yoshio; and Yanase, Minao, to Sumitomo Rubber Industries, Ltd. Pneumatic radial tire including a tread portion divided into four circumferential regions, 5,482,099, Cl. 152-209.00R.
- Kaken Pharmaceutical Co., Ltd.: See—  
Fukunaga, Kazuhiro; Hijikata, Shigeki; Ishimura, Kimihiro; Ohtani, Yoshiro; Kimura, Kunio; Fujii, Masahiro; and Hata, Yoshiyuki, 5,482,929, Cl. 514-12.000.
- Kalinowski, Mike T., Sr.: See—  
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- Kamata, Yoshiyuki: See—  
Tamura, Hiroshi; Kamata, Yoshiyuki; and Fujimori, Mitsuaki, 5,483,229, Cl. 340-693.000.
- Kamejima, Kohji: See—  
Aono, Toshihiro; Kamejima, Kohji; and Hamada, Tomoyuki, 5,483,440, Cl. 364-167.010.
- Kamerbeek, Evert M. H.: See—  
Haisma, Jan; Kamerbeek, Evert M. H.; Spierings, Gijbertus A. C. M.; and De Haas, Peter W., 5,483,115, Cl. 310-156.000.
- Kameya, Takayuki: See—  
Okagaki, Hiroshi; Kameya, Takayuki; Ishizaki, Hiroshi; and Abe, Kazuya, 5,483,121, Cl. 313-618.000.
- Kameyama, Shogo, to Nippondenso Co., Ltd. Circuit for protecting a load control device from high and low voltage conditions, 5,483,635, Cl. 395-182.120.
- Kamezawa, Jiro, to Tomoe Technical Research Company. Seat ring and butterfly valve fitting this seat ring thereto, 5,482,252, Cl. 251-306.000.
- Kaminashi, Atsumi: See—  
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- Kaminow, Ivan P.: See—  
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- Kamio, Keiji: See—  
Suganuma, Yuzi; Matsuoka, Shigeru; Kamio, Keiji; Kashiwa, Yoshihiro; Nogami, Seizi; Saito, Kouichi; Yamazaki, Isao; Kigoshi, Hidechika; Aoyama, Naofumi; Watanabe, Toru; and Nozaki, Yoshihiro, 5,483,253, Cl. 345-87.000.
- Kamiya, Hiroki: See—  
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- Kanaboshi, Akira: See—  
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- Kanai, Masahiro; Hirooka, Masaaki; Hanna, Jun-ichi; Shimizu, Isamu; and Saitoh, Keishi, to Canon Kabushiki Kaisha. Device for forming deposited film, 5,482,557, Cl. 118-719.000.
- Kanazawa, Kenji: See—  
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- Kanbayashi, Shigemitsu: See—  
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- Kanda, Minoru: See—  
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- Kanda, Motoya: See—  
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- Kanda, Shigetoshi, to Canon Kabushiki Kaisha. Optical information recording and/or reproducing apparatus, 5,483,514, Cl. 369-124.000.
- Kanda, Tomoyuki: See—  
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- Kaneda, Yasushi; Ishizuka, Koh; Kondo, Hiroshi; and Ishii, Satoshi, to Canon Kabushiki Kaisha. Displacement detection apparatus, 5,483,377, Cl. 359-566.000.
- Kaneko, Isamu; and Kamiya, Hiroki, to Asahi Glass Company Ltd. Vulcanizable rubber composition, 5,483,000, Cl. 525-102.000.
- Kaneko, Kunihisa: See—  
Watanabe, Masayuki; Fujiwara, Nobuhiro; Kaneko, Kunihisa; and Kanazawa, Kenji, 5,481,959, Cl. 91-361.000.
- Kaneko, Tetsuya: See—  
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- Kaneko, Yoichi: See—  
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- Kaneshiro, Michael H.: See—  
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- Kanewske, William J., III: See—

- Clark, Frederic L.; Clift, Gilbert; Hendrick, Kendall B.; Kanewske, William J., III; Lagocki, Peter A.; Martin, Richard R.; Mitchell, James E.; Moore, Larry W.; Pennington, Charles D.; Walker, Edna S.; Smith, B. Jane; Tayi, Apparao; Vaught, James A.; and Yost, David A., 5,482,861, Cl. 436-48.000.
- Kaneyama Sangyo Kabushiki Kaisha: See—  
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- Kang, Byung-Chang: See—  
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- Kanga, Vispi D.: See—  
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- Kannegundla, Ram; and Taras, Russell J., to Eastman Kodak Company. Test system and method for dynamic testing of a plurality of packaged same-type charge coupled device image sensors, 5,483,155, Cl. 324-158.100.
- Kannegundla, Ram, to Eastman Kodak Company. Three level high speed clock driver for an image sensor, 5,483,283, Cl. 348-312.000.
- Kano, Noriaki: See—  
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- Kansai Paint Company Limited: See—  
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- Kao Corporation: See—  
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- Tawara, Hirotohi, 5,482,423, Cl. 414-414.000.
- Kao, Jinn-Nan, to Industrial Technology Research Institute. Fast pipelined 2-D discrete cosine transform architecture, 5,483,475, Cl. 364-725.000.
- Kaplan, Marc A.: See—  
Derby, Jeffrey H.; Drake, John E., Jr.; Dudley, John G.; Guerin, Roch; Kaplan, Marc A.; Marin, Gerald A.; Peters, Marcia L.; and Potter, Kenneth H., Jr., 5,483,522, Cl. 370-54.000.
- Kapoor, Rajiv: See—  
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- Kappel, David, to Proxima Corporation. Projection lens and method of using same, 5,483,382, Cl. 359-786.000.
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- Karger, David R.: See—  
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- Karns, Phillip L., to Seagate Technology, Inc. E-block shipping comb, 5,482,164, Cl. 206-728.000.
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- Karsten Mfg. Corp.: See—  
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- Kashiwa, Yoshihiro: See—  
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- Kasser, Jürgen: See—  
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- Kataoka, Ichiro: See—  
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- Kataoka, Kazunori: See—  
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- Kataoka, Kenichi: See—  
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- Kataoka, Masako: See—  
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- Katayama, Kouichi: See—  
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- Katayama, Satoshi: See—  
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- Kato, Masao: See—  
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- Aoki, Katsutoshi; Morimoto, Eizi; Kawaji, Hiroyuki; Suenaga, Ken-ichi; Semura, Tetsuhiro; and Kawabe, Kuniyasu, 5,483,016, Cl. 526-318.450.
- Kawada, Haruki: See—  
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- Kawamoto, Hiroshi: See—  
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- Kawamura, J. Patrick, to Texas Instruments Incorporated. Low power oscillator. 5,483,205, Cl. 331-74.000.
- Kawamura, Yutaka: See—  
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- Kawanabe, Tetsuya: See—  
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- Kawasaki Steel Corporation: See—  
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- Kawasato, Masato, 5,483,480, Cl. 365-49.000.
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- Keilty, Peter J.; and Caley, Robert J. T., to Xerox Corporation. Drive mechanisms. 5,482,511, Cl. 474-84.000.
- Keller, Teddy M.; and Son, David Y., to United States of America, Navy. High temperature thermosets and ceramics derived from linear carborane-siloxane or silane-acetylene copolymers. 5,483,017, Cl. 528-5.000.
- Keller, Wilhelm A. Closure on a cartridge. 5,482,177, Cl. 220-278.000.
- Kelley Company, Inc.: See—  
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- Kelly, James V. Combined adjustable crutch and cane. 5,482,070, Cl. 135-66.000.
- Kelly, Patrick D. Condom lubricants containing zinc as an anti-viral agent. 5,482,053, Cl. 128-844.000.
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- Kemac, Inc.: See—  
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- Kemira OY: See—  
Ahlnas, Thomas; Vermeulen, Stephan; and Weckman, Anders, 5,482,529, Cl. 71-33.000.
- Kemner, Carl A.: See—  
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- Kennametal Inc.: See—  
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- Kennedy, John F., to Ford Motor Company. Tunable circuit board antenna. 5,483,249, Cl. 343-846.000.
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- Kerko, David J.: See—  
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- Kessels, Gerardus G. J. C.; and Van Vliembergen, Eduardus J. W., to OCE-Nederland, B.V. Image forming method and recording device. 5,483,354, Cl. 358-444.000.
- Keum, Dong Y.: See—  
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- Key Technology, Inc.: See—  
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- Keyes, John A.: See—  
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- Khan, Kameel I. F.; and Randell, Julia. Whisking device with rod and plural toroidal coils. 5,482,367, Cl. 366-129.000.
- Khatib, Khaled: See—  
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- Kievits, Tim: See—  
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- Kigoshi, Hidechika: See—  
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- Kijima, Takahiko: See—  
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- Kilgore, Jerry L.: See—  
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- Killam, Donald G.: See—  
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- Killough, Joseph A.: See—  
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- Kilovac Corporation: See—  
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- Kilroy, Michael M.: See—  
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- Kim, Dong-Gyu: See—  
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- Kim, Eun J.: See—  
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- Kim, Kwon H.; Kopolowitz, Barry; and Henderson, Norman L., to Hoechst-Roussel Pharmaceuticals Inc. Transdermal antiandrogenic compositions and modulated process. 5,482,970, Cl. 514-532.000.
- Kim, Moon H.; Park, Chan K.; and Kwon, Oh H., to Baekwha Co., Ltd. Galenic composition. 5,482,712, Cl. 424-195.100.
- Kim, Sang-Soo: See—  
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- Kim, Seong I., to Goldstar Co., Ltd. Motion compensating apparatus. 5,483,286, Cl. 348-402.000.
- Kim, Sook-Hui: See—  
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- Kimberly-Clark Corporation: See—  
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- Strack, David C.; Wilson, Tracy N.; and Willits, Donald V., 5,482,772, Cl. 428-357.000.
- Kimura, Koichi: See—  
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- Kimura, Kunio: See—  
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- Kimura, Toshihiro: See—  
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- Kingsbury Corporation: See—  
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- Kinoshita, Masakazu: See—  
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- Kinoshita, Masanari: See—  
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- Kirk, Lawrence P.: See—  
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- Kirkpatrick, Richard: See—  
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- Kirsch, Rolf: See—  
Weber, Otto; Grohnert, Siegfried; and Kirsch, Rolf, 5,482,089, Cl. 138-122.000.
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- Kistrup, Holger: See—  
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- Kitamura, Katsushi: See—  
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- Kitamura, Tsuyoshi: See—  
Wheatley, Charles E., III; Izumiya, Tooru; Kitamura, Tsuyoshi; and Okazaki, Mitsunari, 5,483,696, Cl. 455-318.000.
- Kitano, Masahiko: See—  
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- Kitano, Satoshi: See—  
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- Kitayama, Hiroyuki: See—  
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- Kitten, Jerry. Barbecue pit structure and method. 5,481,964, Cl. 99-339.000.
- Kitterman, Robert K.: See—  
Winnie, Harold R.; Bridgewater, Ronald D.; and Kitterman, Robert K., 5,482,073, Cl. 137-15.000.
- Kitty Rankin, Inc.: See—  
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- Kizaki, Minoru: See—  
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- Klaveness, Jo: See—  
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- Kleemann, Heinz-Werner: See—  
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- Klein, David. Aerosol and non-aerosol spray counter. 5,482,030, Cl. 128-200.230.
- Klein, Kevin M.: See—  
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- Klieger, Erich: See—  
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- Klimmek, Helmut: See—  
Brock, Michael; Hardt, Peter; Klimmek, Helmut; and Stockhausen, Dolf, 5,482,636, Cl. 252-8.800.
- Klinger, Clifford A.: See—  
Richard, John E.; Wightman, David B.; Klinger, Clifford A.; Hammond, Steven J.; and Ricke, Joseph D., 5,481,889, Cl. 70-118.000.
- Klingler, Kerry M.: See—  
Lohnes, Brent C.; Turner, Terry D.; Klingler, Kerry M.; and Clark, Michael L., 5,482,626, Cl. 210-340.000.
- Klöckner-Moeller GmbH: See—  
Lankutis, Klaus; and Rossmann, Gerhard, 5,483,212, Cl. 335-132.000.
- Kloss, Hans-Georg: See—  
Boenigk, Michael; Guenther, Klaus; Kloss, Hans-Georg; and Tehmann, Teja, 5,483,126, Cl. 315-307.000.
- Klyde, Ingolf. Ball valve. 5,482,253, Cl. 251-315.070.
- Kmiecik-Lawrynowicz, Grazyna E.: See—  
Hopper, Michael A.; Patel, Raj D.; Kmiecik-Lawrynowicz, Grazyna E.; Drappel, Stephan V.; and Gerroir, Paul J., 5,482,812, Cl. 430-137.000.
- Kneezel, Gary A.; Wysocki, Joseph J.; Stephany, Joseph F.; Watroski, Thomas E.; LaDonna, Richard V.; Jms, Dale R.; Rezanka, Ivan; and Richards, W. Conrad, to Xerox Corporation. Minimization of missing droplets in a thermal ink jet printer by drop volume control. 5,483,265, Cl. 347-14.000.
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- Knobel, Rolf, to Hoffmann-La Roche Inc. Method for suspending particles. 5,482,864, Cl. 436-54.000.
- Knorr-Bremse AG: See—  
Baumgartner, Hans; and Bieker, Dieter, 5,481,801, Cl. 29-898.060.
- Knudsen, Knud L., to Hewlett-Packard Company. Method and apparatus for compensating thermal time constants in an electronic amplifier. 5,483,199, Cl. 330-289.000.
- Ko, Jung-Wan, to Samsung Electronics Co., Ltd. Symbol clock regeneration in digital signal receivers for recovering digital data buried in NTSC TV signals. 5,483,292, Cl. 348-537.000.
- Kobayashi, Hiroshi; Ueda, Yoshiharu; Kinoshita, Masanari; Yamamoto, Masamichi; and Kaminashi, Atsumi, to Hirakawa Guidom Corporation. Combustion device in tube nested boiler and its method of combustion. 5,482,009, Cl. 122-367.100.
- Kobayashi, Hisao: See—  
Urade, Masakazu; Kobayashi, Hisao; Yagi, Yukihiro; Hashimoto, Katsumiko; and Nishii, Sachiko, 5,483,289, Cl. 348-468.000.
- Kobayashi, Kazushi: See—  
Okazawa, Koichi; Kimura, Koichi; Kawaguchi, Hitoshi; Aburano, Ichiharu; Kobayashi, Kazushi; and Mochida, Tetsuya, 5,483,642, Cl. 395-306.000.
- Kobayashi, Motokazu: See—  
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- Kobayashi, Shigetada: See—  
Sugiura, Susumu; Mita, Yoshinobu; Shishizuka, Junichi; Takaoka, Makoto; Shimomura, Yukari; Matsumoto, Kentaro; Uda, Toyokazu; Sugiyama, Mitsumasa; Kobayashi, Shigetada; Hisada, Katsutoshi; Kaneko, Yoji; and Nakanishi, Hiroyuki, 5,483,358, Cl. 358-508.000.
- Kobayashi, Tohru: See—  
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- Kobayashi, Tsuyoshi; and Saitoh, Misa, to Shinko Electric Industries Co., Ltd. Solid electrolyte gas sensor. 5,482,609, Cl. 204-412.000.
- Kobayashi, Yosuke: See—  
Sato, Mitsukuni; Kobayashi, Yosuke; Nose, Masahiko; and Yamamoto, Kenji, 5,482,192, Cl. 222-600.000.
- Kobayashi, Yuji, to Sanyo Electric Co., Ltd. Apparatus and method for reading and writing value data in a card. 5,483,048, Cl. 235-380.000.
- Kobryn, Donald: See—  
Kobryn, Scott; and Kobryn, Donald, 5,482,212, Cl. 239-227.000.
- Kobryn, Scott; and Kobryn, Donald. Vehicle washing machine. 5,482,212, Cl. 239-227.000.
- Kochanski, Gregory P.: See—  
Hanson, Karrie J.; and Kochanski, Gregory P., 5,483,235, Cl. 341-20.000.
- Kodaira, Makoto, to Uro Denshi Kogyo Kabushiki Kaisha. Automatic flushing device. 5,482,250, Cl. 251-129.040.
- Kodama, Yukinori: See—  
Mochizuki, Hirohiko; Takemae, Yoshihiro; Kodama, Yukinori; Yanagisawa, Makoto; and Shigenobu, Katsumi, 5,483,497, Cl. 365-230.030.
- Koenig, Joseph M., Jr., to Trim-Tex, Inc. Flexible corner for trimming curved wall. 5,481,845, Cl. 52-717.030.
- Koenig, Larry E. Method and apparatus for charging containers with hazardous materials. 5,481,851, Cl. 53-432.000.
- Koerschen, Charlotte: See—  
Brandman, Yigal; Koerschen, Charlotte; Lin, Frank C. H.; Olson, Peter D.; Soroosh, Shahryar; Subramaniam, Jason; and Todd, Bruce, 5,483,580, Cl. 379-88.000.
- Koetting, Manfred: See—  
Baierweck, Petra; Gareiss, Brigitte; Ulmerich, Karlheinz; Gall, Michael; and Koetting, Manfred, 5,482,985, Cl. 524-101.000.
- Kofune, Shinichi; and Kawabe, Kenya, to Toyo Communication Equipment Co., Ltd. Validation apparatus for flat paper object. 5,483,069, Cl. 250-341.800.
- Koga, Toshio: See—  
Ohki, Junichi; and Koga, Toshio, 5,483,534, Cl. 370-84.000.
- Kohayakawa, Yoshimi, to Canon Kabushiki Kaisha. Eye examining apparatus. 5,483,305, Cl. 351-243.000.
- Kohiyama, Tomohisa: See—  
Kawahara, Tetsuya; Nakata, Junji; Kimura, Yuji; Sakai, Hiroyuki; Hamaguchi, Masakazu; Yamada, Takahiro; Kohiyama, Tomohisa; and Nakano, Takahiro, 5,483,466, Cl. 364-514.000.
- Kohlert, Erich; and Wixel, Otto, to Siemens Aktiengesellschaft. Instrument holder and method for inspection of a dynamo-electric machine in a gap between a stator and a rotor and dynamo-electric machine having the instrument holder. 5,481,929, Cl. 73-865.800.
- Kohn, Elise C.; Liotta, Lance A.; and Felder, Christian C., to United States of America, Health and Human Services. Signal transduction inhibitor triazole and diazole compounds. 5,482,954, Cl. 514-359.000.
- Kohn, Harold, to International Business Machines Corporation. Solder pre-form pick-and-place machine and operation. 5,482,198, Cl. 228-6.200.
- Kohtaki, Takaaki: See—  
Taya, Masaaki; Kohtaki, Takaaki; Unno, Makoto; and Doujo, Tadashi, 5,483,327, Cl. 355-245.000.
- Kohyama, Yusuke, to Kabushiki Kaisha Toshiba. Guttering of unwanted metal impurity introduced into semiconductor substrate during trench formation. 5,482,869, Cl. 437-12.000.
- Koide, Kazuo; Mizukami, Masao; Hososaka, Satoshi; and Kudoh, Junya, to Hitachi, Ltd. Signal transmission method, signal transmission circuit and information processing system using same. 5,483,110, Cl. 307-147.000.
- Koike, Atsuyoshi: See—  
Meguro, Satoshi; Uchibori, Kiynfumi; Suzuki, Norio; Motoyoshi, Makoto; Koike, Atsuyoshi; Yamanaka, Toshiaki; Sakai, Yoshio; Kaga, Toru; Hashimoto, Naotaka; Hashimoto, Takashi; Honjou, Shigeru; and Minato, Osamu, 5,483,083, Cl. 257-69.000.
- Koike, Mitsugi: See—  
Aoki, Narutoshi; Endou, Tsuneaki; and Koike, Mitsugi, 5,482,022, Cl. 123-479.000.
- Koizumi, Yoshimasa: See—  
Yabuki, Yoshikazu; Hiraoka, Hidenori; and Koizumi, Yoshimasa, 5,482,285, Cl. 273-228.000.
- Koji Hashimoto: See—  
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- Kojima, Tamao: See—  
Hatakeyama, Akihito; Sogo, Hiroshi; Kojima, Tamao; Horio, Yasuhiko; Tsukamoto, Masahide; and Fukumura, Yasushi, 5,481,795, Cl. 29-852.000.
- Kokubu, Sadao: See—  
Aoki, Hisashi; Kokubu, Sadao; Mizuno, Yoshiyuki; and Mizuno, Takashi, 5,483,219, Cl. 340-426.000.
- Kokura, Masuo; and Aizawa, Yasuharu, to Fanuc Ltd. Numerically controlled machine tool having switch matrices with a reduced numbers of signal lines. 5,483,460, Cl. 364-474.010.
- Kokusai Display Kogyo Co., Ltd.: See—  
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- Kokusai Denki Co., Ltd.: See—  
Aoki, Narutoshi; Endou, Tsuneaki; and Koike, Mitsugi, 5,482,022, Cl. 123-479.000.
- Kola, Ratnaji R.: See—  
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- Kollmorgen Artus: See—  
Ruinet, Jean-Marc, 5,483,245, Cl. 342-410.000.
- Kolpak, Miroslav; and Bucaram, S. Michel, to Atlantic Richfield Company. Gas-liquid separator for well pumps. 5,482,117, Cl. 166-265.000.
- Kolz, Sabine: See—  
Becker, Oliver; Kolz, Sabine; and Hager, Herbert, 5,482,538, Cl. 95-12.000.
- Koma, Noriko, to NEC Corporation. Apparatus for referring to a content of a dial memory in a telephone set. 5,483,591, Cl. 379-356.000.
- Komatsu, Kouichiro; and Tanaka, Masashi, to Nikon Corporation. Apparatus for optically detecting a position of a mark. 5,483,348, Cl. 356-401.000.
- Komatsuzaki, Takao: See—  
Hizume, Kohji; and Komatsuzaki, Takao, 5,483,481, Cl. 365-63.000.
- Komorowski, Karl J.; Saul, Jonathan R.; LaPointe, Larry P.; and Marshall, Richard E., to La-Z-Boy Chair Company. Linear actuation drive mechanism for power-assisted chairs. 5,482,350, Cl. 297-85.000.
- Komuro, Kiyoto: See—  
Murakami, Kenjiro; Kotaka, Toshikazu; Ishida, Hiroshi; Komuro, Kiyoto; Nakayama, Yoshiaki; Takahashi, Nobuhito; and Takehana, Satoshi, 5,482,390, Cl. 400-636.200.
- Kondo, Hajime: See—

- Okuda, Masaaki; Kondo, Hajime; and Fujiwara, Eiji, 5,482,544, Cl. 106-14.120.
- Kondo, Hiroshi: See—  
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- Kondo, Kenichi; Saida, Takahiro; Taya, Shuichi; Iida, Toyoshi; Sotomura, Takeshi; Fujii, Yuko; Sato, Keiji; Takahashi, Mamoru; Yamakawa, Sada-yasu; and Osawa, Shunichi, to Stanley Electric Co., Ltd.; and Japan Metals & Chemicals Co., Ltd. Electroluminescence display. 5,482,614, Cl. 205-171.000.
- Kondo, Kunio; and Fukuda, Yujiro, to NEC Corporation. Electrostatic image developer. 5,482,808, Cl. 430-111.000.
- Kondziola, Joseph D.: See—  
Bolsworth, James; Pyszel, Kenneth S.; Baitinger, Garrett P.; and Kondziola, Joseph D., 5,482,345, Cl. 276-65.100.
- Kongsberg Automotive A/S: See—  
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- Konica Corporation: See—  
Haga, Yoshihiro; Suzuki, Tetsuya; and Taima, Yasuo, 5,482,823, Cl. 430-567.000.
- Kawahara, Setsuko; Nakano, Yasushi; Shimizu, Yuji; and Sugitani, Shiochi, 5,482,762, Cl. 428-212.000.
- König, by Elisabeth, Administratrix: See—  
König, Helmut, deceased; and König, by Elisabeth, Administratrix, 5,482,366, Cl. 366-97.000.
- König, Helmut, deceased; and König, by Elisabeth, Administratrix. Apparatus for treating dough with a bearingly supported tool carrier. 5,482,366, Cl. 366-97.000.
- König, Klaus: See—  
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- Konii, Yoshio: See—  
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- Konishi, Kazuo: See—  
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- Konishi, Shinichi: See—  
Yumiba, Takashi; Konishi, Shinichi; and Takigawa, Shinichiro, 5,483,359, Cl. 358-513.000.
- Konomoto, Koichi: See—  
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- Kools, Jacques C. S.; Naus, Josef P. M.; Folkerts, Wiepke; and Gijs, Martinus A. M., to U.S. Philips Corporation. Vehicle orientation sensor and method with magnetic stabilization. 5,481,808, Cl. 33-357.000.
- Koplowitz, Barry: See—  
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- Kopp, Dieter: See—  
Ackermann, Uwe; Kopp, Dieter; and Hörmann, Thomas, 5,483,578, Cl. 379-67.000.
- Koppelaar, Arie G. C.: See—  
Baggen, Constant P. M. J.; and Koppelaar, Arie G. C., 5,483,529, Cl. 370-70.000.
- Koralewski, Klaus: See—  
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- Korb, Robert S.: See—  
Cummins, Millard; and Korb, Robert S., 5,482,421, Cl. 414-21.000.
- Kordulla, Hans: See—  
Gross, Michael; Stelte, Norbert; Schmidt, Dietmar; and Kordulla, Hans, 5,483,057, Cl. 250-226.000.
- Koreeda, Hiroyuki: See—  
Kuwamoto, Hideki; Kuwabara, Tadashi; Koreeda, Hiroyuki; Nonaka, Naomichi; Nakane, Keiichi; Fujiwara, Masaki; and Masuda, Kiyoshi, 5,483,632, Cl. 395-156.000.
- Koreis, Joseph A.; and Koreis, Monte M., to Clarus Technologies Corp. Method for allowing selective access to the interior of fluid containment structures. 5,481,790, Cl. 29-428.000.
- Koreis, Monte M.: See—  
Koreis, Joseph A.; and Koreis, Monte M., 5,481,790, Cl. 29-428.000.
- Kornfeldt, Anna; Körnvik, Lars-Åke; and Törnblom, Lars, to Asea Brown Boveri AB. Device for volume delimitation during work with contaminated parts. 5,483,562, Cl. 376-287.000.
- Körnvik, Lars-Åke: See—  
Kornfeldt, Anna; Körnvik, Lars-Åke; and Törnblom, Lars, 5,483,562, Cl. 376-287.000.
- Kort, Leland B.: See—  
Chandler, William A., Jr.; Kort, Leland B.; and Clark, Randall J., 5,482,315, Cl. 280-741.000.
- Kosa, Theodore; Magee, John H., Jr.; Martin, James W.; and Ney, Ronald P., Sr., to CRS Holdings, Inc. Free-machining austenitic stainless steel. 5,482,674, Cl. 420-42.000.
- Kosaki, Katsuya, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device having a via-hole with a void area for reduced cracking. 5,483,092, Cl. 257-276.000.
- Koseki, Hideki: See—  
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- Koshio, Kazuhiro: See—
- Ohtsubo, Hiroyasu; and Koshio, Kazuhiro, 5,483,290, Cl. 348-516.000.
- Kosiec, Jeannie H.: See—  
Barrett, Raymond L., Jr.; Herold, Barry; and Kosiec, Jeannie H., 5,483,687, Cl. 455-183.200.
- Koskineemi, Mark S., to Buckman Laboratories International, Inc. Calcium pyroborate as a microbicide for plastics. 5,482,989, Cl. 524-404.000.
- Kosmider, Ronald T., to R. T. Kosmider, Inc. Developer carrying roller having a surface layer with contoured finish. 5,483,326, Cl. 355-245.000.
- Kosoff, David P.: See—  
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- Kossowan, Ronald S.: See—  
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- Kotaka, Toshikazu: See—  
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- Koto Electric Co., Ltd.: See—  
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- Kowalczyk, Stanley; Williams, Todd A.; Petzrick, James D.; and Williams, Charles E., to Hufcor, Inc. Fire-rated panel. 5,481,834, Cl. 52-64.000.
- Kowalski, Dennis G.; and Davis, Lauren A. Removable and transportable storage bin organizer. 5,482,342, Cl. 294-160.000.
- Koyasu, Takahisa: See—  
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- Koyo Seiko Co., Ltd.: See—  
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- Krautler, Bernard, to Nergero (Societe Anonyme). Safety device against rupture of a rotary shaft. 5,481,943, Cl. 74-609.000.
- Kraft Foods, Inc.: See—  
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- Krajenski, Volker: See—  
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- Kramer, Carolyn M., to Dentsply Research & Development Corp. Dental porcelain shading method. 5,482,732, Cl. 427-2.290.
- Kramer, James F. Determination of thumb position using measurements of abduction and rotation. 5,482,056, Cl. 128-782.000.
- Krantz, Kermit T.; and Jones, Charles R., Jr., to V-Lite Corporation. Lightweight solid-core video cassette cartridge. 5,482,222, Cl. 242-347.000.
- Krantz, Nicolas, to Elf Atochem S.A. Grafted block copolymers, process for their manufacture and use of these copolymers. 5,482,995, Cl. 525-41.000.
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- Kravetz, Alan: See—  
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- Kreikemeier, John E. Lath for wall or ceiling construction. 5,481,843, Cl. 52-664.000.
- Kreisinger, Robert D.: See—  
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- Kreiter, Donald E. Display and support assemblies. 5,482,238, Cl. 248-222.120.
- Krimmel, Heinz: See—  
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- Kroll, Bruno: See—  
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- Kronewitter, Rudolf: See—  
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- Kronman, Leonard, to Natural Grilling & Fuel Systems, Inc. Rack and screen assembly for converting gas grilles into charcoal and/or wood burning grilles. 5,481,965, Cl. 99-340.000.
- Krosaki Corporation: See—  
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- Krueger, Dennis C.: See—  
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- Krueger, Milton W., to Kemac, Inc. Parts washing machine. 5,482,066, Cl. 134-111.000.
- Krüger, Dieter: See—  
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- Krum, Richard G.; Nelson, Eldon L.; Mohajerani, Khosrow; and Moir, Michael B., to Seagate Technology, Inc. Actuator assembly having labyrinth seal. 5,482,381, Cl. 384-480.000.
- Krupka, Yaacov; and Zisapel, Yehuda, to RIT Technologies, Ltd. Patching panel scanner. 5,483,467, Cl. 364-550.000.
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Flynn, Thomas S.; Krzyszowski, Tadeusz M.; and Bayne, Gary W., 5,481,779, Cl. 15-324.000.
- Ku, Fei-Lung. Thread cutter for a chainstitch sewing machine. 5,481,994, Cl. 112-298.000.
- Kuba, Hiroaki, to NEC Corporation. Traffic control system of local area network. 5,483,533, Cl. 370-79.000.



- Kubota Corporation: See—  
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- Kubota, Kazuo: See—  
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- Kuck, Scott M., to Dual Dynamics. Vented plug for a hubcap, 5,482,358, Cl. 301-108.100.
- Kudo, Yoshinobu: See—  
Tani, Junichi; Shimada, Takahisa; Chikasaki, Masaaki; Tsuji, Sadafusa; and Kudo, Yoshinobu, 5,483,310, Cl. 354-21.000.
- Kudoh, Junya: See—  
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- Kudou, Mituru, to Kabushiki Kaisha Toshiba. Facsimile apparatus having off period for image data recording, 5,483,353, Cl. 358-404.000.
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- Kuhar, Otto, to Newell Operating Company. Cordless, balanced venetian blind or shade with consistent variable force spring motor, 5,482,100, Cl. 160-170.000.
- Kuhara, Kentaro, to Seiko Instruments Inc. Photo sensor, 5,483,096, Cl. 257-462.000.
- Kuhlman, Charles H., to Aluminum Company of America. Apparatus and method for separating stacked articles, 5,482,428, Cl. 414-798.100.
- Kuhlman, Charles R.: See—  
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- Kuhn, Gary K.; and McLees, Herbert A., to Minnesota Mining and Manufacturing Company. High speed applicator for adhesive tape, 5,482,593, Cl. 156-521.000.
- Kuhnen, Fred: See—  
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- Kuijpers, Eugene G. M.: See—  
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- Kujawski, Robert B.: See—  
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- Kulak, Richard E., to Otis Elevator Company. Quiet elevator rotary gate switch, 5,482,142, Cl. 187-280.000.
- Kumagai, Kiyoshi: See—  
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- Kumar, Ramesh C.; Everaerts, Albert I.; and Bogaert, Yvan A., to Minnesota Mining and Manufacturing Company. Fluoroalkyl siloxane/vinyl copolymer dispersions and pressure-sensitive adhesives having improved solvent resistance prepared therefrom, 5,482,991, Cl. 524-506.000.
- Kumazaki, Masanori: See—  
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- Kume, Masafumi: See—  
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- Kumiai Chemical Industry Co., Ltd.: See—  
Ozaki, Masami; Ikeda, Atsuhiko; Honami, Reijiro; Yumita, Takashi; Minoguchi, Naokazu; Yano, Hiroyuki; Izawa, Norihiko; and Hirano, Tadayoshi, 5,482,951, Cl. 514-340.000.
- Kumlin, Robert R. Disposable pet toilet assembly, 5,482,007, Cl. 119-169.000.
- Kumomi, Hideya: See—  
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- Kun, Ernest; and Mendeleyev, Jerome, to Octamer, Inc. Adenosine diphosphoribose polymerase binding nitroso aromatic compounds useful as retroviral inactivating agents, anti-retroviral agents and anti-tumor agents, 5,482,975, Cl. 514-619.000.
- Kunitomo, Yuichi: See—  
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- Kunkel, Scott H., to E-Systems, Inc. Modular heat exchanger, 5,482,109, Cl. 165-80.300.
- Kuo, Hsiang-Jung; Mohr, David A.; and Salnick, Richard E., to Westinghouse Electric Corporation. Probe guide assembly for a reactor coolant pump motor, 5,481,930, Cl. 73-866.500.
- Kuo, James R., to National Semiconductor Corporation. Programmable CMOS bus and transmission line receiver, 5,483,184, Cl. 327-83.000.
- Kuo, Shun-Meen: See—  
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- Kuo, Ta-chi: See—  
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- Kuo, Teh-Chuan; and Wu, Kao-Ching. Liquid level controller, 5,483,227, Cl. 340-623.000.
- Kurata, Yasuhiko; and Akiyama, Yuichi, to Mazda Motor Corporation and Naldec Corporation. Multiplex transmission apparatus, 5,483,517, Cl. 370-13.000.
- Kurata, Yukio: See—  
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- Kure, Masaji: See—  
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- Kurebayashi, Takeshi: See—  
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- Kurihara, Akira. Method and apparatus for embroidering beads, 5,481,993, Cl. 112-475.010.
- Kurihara, Yoshide: See—  
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- Kuriki, Yasunori: See—  
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- Kurisu, Norio: See—  
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- Kuriyama, Yasuo: See—  
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- Kurshan, Robert P.: See—  
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- Kusaba, Katsumi: See—  
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- Kusase, Shin; Umeda, Atsushi; Hukaya, Saburo; Inomata, Noriyasu; Irie, Hitoshi; and Ishida, Hiroshi, to Nippondenso Co., Ltd. Rotor for a rotating electric machine, 5,483,116, Cl. 310-263.000.
- Kushimoto, Yoshikazu; and Yanase, Minao, to Sumitomo Rubber Industries, Ltd. Detecting a deflated tire by comparing angular velocity data of all wheels, a data table, and the directly-measured pressure of a single tire, 5,483,220, Cl. 340-444.000.
- Kutin, Richard L.: See—  
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- Kutzleb, Kurt. Angle adjustable clamps, 5,482,263, Cl. 269-6.000.
- Kuwabara, Tadashi: See—  
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- Kuwada, Terumi: See—  
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- Kuwahara, Shingo; and Odagawa, Satoshi, to Pioneer Electronic Corporation. Navigation system and a method of calculating GPS measuring deviation, 5,483,456, Cl. 364-449.000.
- Kuwamoto, Hideki; Kuwabara, Tadashi; Koreeda, Hiroyuki; Nonaka, Naomichi; Nakane, Keiichi; Fujiwara, Masaki; and Masuda, Kiyoshi, to Hitachi, Ltd. Method and system of help-information control, 5,483,632, Cl. 395-156.000.
- Kuznetsov, Oleg V.; and Luchuk, Dmitry A., to YBM Technologies, Inc. Personal computer security system, 5,483,649, Cl. 395-186.000.
- Kuznetsov, Stephen B., to Power Superconductor Applications Corp. Method and apparatus for elimination of the exit-edge effect in high speed linear induction machines for maglev propulsion systems, 5,483,111, Cl. 310-12.000.
- Kwak, Myung-Shin: See—  
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- Kwon, Oh H.: See—  
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- Kyocera Corporation: See—  
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- L. & C. Steinmüller GmbH: See—  
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- La-Z-Boy Chair Company: See—  
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- Laager, Georg: See—  
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- LAB Security Systems Corporation: See—

- Roraback, Gerald G., Jr.; and Labbe, Richard A., 5,482,159, Cl. 206-223.000.
- Labavia - SGE: See—  
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- Labbe, Richard A.: See—  
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- Lacroix, François: See—  
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- LaDonna, Richard V.: See—  
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- Lafyatis, Davis S.: See—  
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- Lai, Kwok F.: See—  
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- L'Armey S.A.: See—  
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- Landers, Albert G.: See—  
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- Landgraf, Marc E.: See—  
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- Landis & Gyr Business Support AG: See—  
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- Lane, Donald J.: See—  
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- Lang, Gregory J.; Parker, Todd S.; Fulmer, Brian H.; Kosoff, David P.; and Miller, Harry W., II, to Morton International, Inc. Air bag inflators having housings with crimp-formed joints, 5,482,316, Cl. 280-741.000.
- Lang, William J.; and Garling, Phillip E., to Kawneer Company, Inc. Glazed panel wall construction and method for assembly thereof, 5,481,839, Cl. 52-235.000.
- Langan, Joseph; and Khatib, Khaled, to Moore Business Forms, Inc. Form/label combination, 5,482,753, Cl. 428-42.000.
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- Lee, Ken K.: See—  
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- Maeda, Yuji: See—
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- Magee, Robert B.: See—
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- MagneTek, Inc.: See—
- Lyle, David M., 5,482,384, Cl. 384-537.000.
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- Rolleston, Robert J.; and Maltz, Martin S., 5,483,360, Cl. 358-518.000.
- MAN Roland Druckmaschinen AG: See—
- Beck, Heinrich; and Dobrowolski, Heinz, 5,481,969, Cl. 101-389.100.
- Sarazen, David; and Plantsch, Josef, 5,481,974, Cl. 101-363.000.
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- Simon, R. E.; and Mann, L. E., 5,481,788, Cl. 29-81.130.
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- Becker, Oliver; Kolz, Sabine; and Hager, Herbert, 5,482,538, Cl. 95-12.000.
- Perings, Dieter; Blum, Wilhelm; Lenzen, Jakob; and Wagner, Siegbert, 5,482,554, Cl. 118-307.000.
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- Marcu, Mihail I. Fifth wheel bearing plate improvements. 5,482,308, Cl. 280-433.000.
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- Markison, Timothy W.: See—
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- Marquardt GmbH: See—
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- Marquet, Didier: See—
- Girard, Jacques; and Marquet, Didier, 5,483,108, Cl. 307-64.000.
- Marrelli, John D.: See—
- Hatton, Gregory J.; Helms, David A.; and Marrelli, John D., 5,483,171, Cl. 324-640.000.
- Marrs, Robert C., to Amkor Electronics, Inc. Method for forming a semiconductor device having a thermal dissipator and electromagnetic shielding. 5,482,898, Cl. 437-216.000.
- Marrs, Robert C.; and Hirakawa, Tadashi, to Amkor Electronics, Inc.; and Teijin Limited. Integrated circuit package with via interconnections formed in a substrate. 5,483,100, Cl. 257-700.000.
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- Marsinek, George E.: See—
- Vona, Nick, Jr.; and Marsinek, George E., 5,482,378, Cl. 384-134.000.
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- Martin, Edward W., Jr., to Ohio State University Research Foundation, The. Biostaging of adenocarcinomas utilizing radiolabeled tumor-associated glycoprotein antibodies. 5,482,040, Cl. 128-653.100.
- Martin, James W.: See—
- Kosa, Theodore; Magee, John H., Jr.; Martin, James W.; and Ney, Ronald P., Sr., 5,482,674, Cl. 420-42.000.
- Martin, John R.: See—
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- Martin Marietta Corp.: See—
- Gallagher, Robert L., 5,483,039, Cl. 219-125.110.
- O'Keefe, Christian V., 5,483,607, Cl. 385-11.000.
- Martin Marietta Energy Systems, Inc.: See—
- Alexander, Kathleen B.; Tieg, Terry N.; Becher, Paul F.; and Waters, Shirley B., 5,482,673, Cl. 419-48.000.
- Holcombe, Cressie E.; and Pfeiler, William A., 5,482,257, Cl. 266-275.000.
- Mashburn, Douglas N., 5,483,037, Cl. 219-121.680.
- McKee, Rodney A.; and Walker, Frederick J., 5,482,003, Cl. 117-108.000.
- Wachter, Eric A.; and Fisher, Walter G., 5,483,338, Cl. 356-318.000.
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- Martin, Timothy W.: See—
- Hamilton, Harold J.; and Martin, Timothy W., 5,483,025, Cl. 174-254.000.
- Martinez, Reuben M.: See—
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- Maruyama, Akihiro; Bergenstahl, Björn; and Van de Hoek, Eric, to Purac Biochem B.V. Non-ozone depleting cleaning composition for degreasing and defluxing purposes. 5,482,645, Cl. 252-170.000.
- Maruyama, Akira, to Seiko Epson Corporation. Nonvolatile semiconductor system with automatic over erase protection. 5,483,485, Cl. 365-185.180.
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- Nagayoshi, Yoshimasa; Asano, Takeshi; Maruyama, Ikuo; and Kinoshita, Masakazu, 5,481,906, Cl. 73-116.000.
- Maruyama, Kazunori: See—
- Aoki, Eiichiro; and Maruyama, Kazunori, 5,483,018, Cl. 84-611.000.
- Maruyama, Koji: See—
- Yoshioka, Shimpei; Konishi, Kazuo; Maruyama, Koji; and Sato, Toshiaki, 5,483,491, Cl. 365-200.000.
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- Masaki, Kenichi: See—
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- Masaki, Tateo: See—
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- Mashburn, Douglas N., to Martin Marietta Energy Systems, Inc. Multiple target laser ablation system. 5,483,037, Cl. 219-121.680.
- Masimo Corporation: See—
- Diab, Mohamed K.; and Kiani-Azarbayjany, Esmail, 5,482,036, Cl. 128-633.000.
- Maskinfabrikken Baeltix A/S: See—
- Damkjær, Poul E., 5,482,156, Cl. 198-853.000.
- Masquelier, Michael P.: See—
- Burger, Vida I.; Kaneshiro, Michael H.; Dow, Diann; Klein, Kevin M.; Masquelier, Michael P.; and Prendergast, E. James, 5,482,878, Cl. 437-41.000.
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- Ilic, Marija D.; and Chapman, Jeffrey W., 5,483,147, Cl. 322-25.000.
- Johnson, Bernadette; and Zayhowski, John J., 5,483,546, Cl. 372-10.000.
- Leeb, Steven B.; and Kirtley, James L., Jr., 5,483,153, Cl. 324-76.120.
- Maniar, Manoj; and Domb, Abraham J., 5,482,927, Cl. 514-12.000.
- Mastercool USA, Inc.: See—
- Barjasteh, Michael M.; Umbra, Jerry; and Sadegh, Ali M., 5,481,893, Cl. 72-107.000.
- Mastrototaro, John J.: See—
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- Masuda, Kiyoshi: See—
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Grande, Michael L.; Grushkin, Bernard; Young, Eugene F.; Lundy, Douglas A.; and Matalevich, Joseph R. E., 5,482,805, Cl. 430-106.000.

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Norris, James W.; and Matheny, Alfred P., 5,482,433, Cl. 415-173.700.

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Kawade, Hisaaki; Kawada, Haruki; Sakai, Kunihiro; Matsuda, Hiroshi; Morikawa, Yuko; Yanagisawa, Yoshihiro; Kaneko, Tetsuya; Kawase, Toshimitsu; Kumono, Hideya; Nose, Hiroyasu; and Kawakami, Eigo, 5,482,002, Cl. 117-90.000.

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Fujii, Satoru; Takayama, Ryoichi; Tomita, Yoshihiro; Okano, Masayuki; and Torii, Hideo, 5,483,067, Cl. 250-338.300.

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Matsuo, Akihito: See—

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Matsuo, Hirokazu: See—

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Matsuoka, Sadao: See—

Nakano, Kazuo; Mizokami, Kazuaki; Hasumi, Keiji; Itoh, Katsuhiko; Funabashi, Michimasa; Mitsui, Yasuhiro; Irie, Takashi; Tajima, Takeshi; and Matsuoka, Sadao, 5,482,524, Cl. 55-267.000.

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Matsusaka, Masanobu; Sugimoto, Susumu; Akaki, Motonobu; and Yamada, Yasutoshi, to Aisin Seiki Kabushiki Kaisha. Fuel injection valve operated by expansion and contraction of piezoelectric element. 5,482,213, Cl. 239-584.000.

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Fujita, Tatsuo; Tokumitsu, Syuzo; Nishida, Hirofumi; Suzuki, Tadashi; Ono, Yukiyo; Terashima, Tetsuo; Tomizawa, Takeshi; Suzuki, Jiro; Asada, Syuji; and Nishikori, Yukiyo, 5,482,685, Cl. 422-174.000.

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Okamura, Masahiko, 5,483,685, Cl. 455-179.100.

Saka, Hiroshi; and Urata, Kazunao, 5,483,686, Cl. 455-182.200.

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Shibata, Akihito; Tsuji, Hiroaki; and Suga, Yoichiro, 5,483,457, Cl. 364-454.000.

Shimazaki, Hiroaki; and Ota, Haruo, 5,483,552, Cl. 375-233.000.

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Urade, Masakazu; Kobayashi, Hisao; Yagi, Yukihiro; Hashimoto, Katsuhiko; and Nishii, Sachiko, 5,483,289, Cl. 348-468.000.

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Matsuura, Takahiro: See—

Nakahata, Seiji; Matsuura, Takahiro; Sogabe, Kouichi; and Yamakawa, Akira, 5,482,905, Cl. 501-9.600.

Matsuura, Toshifumi: See—

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Matsuyama, Mitsuhiro: See—

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Matsuzaki, Kaname: See—

Uemoto, Hideya; Kawakita, Hiroaki; Samejima, Kazuo; Matsuyama, Mitsuhiro; Okura, Hideo; Matsuzaki, Kaname; and Kure, Masaji, 5,481,857, Cl. 56-12.600.

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Mattes, Bernhard: See—

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Matzner, Bruce; Johansson, Eric B.; Wolters, Richard A., Jr.; Dunlap, Thomas G.; Elkins, Robert B.; King, Harold B.; Sick, Paul W.; and Ledford, Kevin L., to General Electric Company. Lower tie plate strainers including double corrugated strainers for boiling water reactors. 5,483,564, Cl. 376-352.000.

Mauboussin, S.A.: See—

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- Mitsubishi Denki Kabushiki Kaisha: See—  
Adachi, Kiyoshi, 5,483,471, Cl. 364-602.000.
- Higashi, Kazuhiko; Takakuwa, Kiyoshi; Arimoto, Kazuaki; Naruki, Kenichi; Fukumoto, Hiroshi; Kuwada, Terumi; and Oda, Keisuke, 5,483,275, Cl. 347-218.000.
- Isao, Akiohiko; Kawada, Susumu; and Yoshioka, Nobuyuki, 5,482,799, Cl. 430-5.000.
- Kagawa, Hitoshi; and Yamashita, Koji, 5,483,095, Cl. 257-431.000.
- Kosaki, Katsuya, 5,483,092, Cl. 257-276.000.
- Matsuda, Setsuyuki, 5,483,031, Cl. 218-48.000.
- Mikami, Nobuhiro, 5,483,167, Cl. 324-510.000.
- Nakanishi, Junji, 5,483,282, Cl. 348-311.000.
- Nakano, Toshiya, 5,483,404, Cl. 361-18.000.
- Ohmae, Katsuhiko; Okimoto, Yukihiko; and Furui, Takashi, 5,483,451, Cl. 364-424.050.
- Osawa, Nobuyuki; Tomioka, Ichiro; and Deguchi, Mitsuhiro, 5,483,479, Cl. 365-49.000.
- Saito, Takaharu, 5,482,143, Cl. 187-394.000.
- Sato, Fumiki; and Fujita, Kouichi, 5,483,477, Cl. 364-757.000.
- Sato, Toshiaki, 5,483,281, Cl. 348-300.000.
- Shigetome, Kazuaki; and Suzuki, Katsunori, 5,483,553, Cl. 375-256.000.
- Takeuchi, Hiroshi, 5,482,481, Cl. 439-821.000.
- Terazono, Shinichi, 5,483,089, Cl. 257-195.000.
- Yamamoto, Yuichi, 5,483,129, Cl. 315-503.000.
- Yamashita, Hiromitsu, 5,483,151, Cl. 323-312.000.
- Yamashita, Hiromitsu, 5,483,559, Cl. 375-376.000.
- Mitsubishi Electric Engineering Company Limited: See—  
Shigetome, Kazuaki; and Suzuki, Katsunori, 5,483,553, Cl. 375-256.000.
- Mitsubishi Gas Chemical Company, Inc.: See—  
Mineta, Hiroshi; Yui, Tomoyuki; Gocho, Yoshihiro; and Matsumoto, Takahiro, 5,482,651, Cl. 252-299.610.
- Mitsubishi Jidosha Kogyo Kabushiki Kaisha: See—  
Momose, Nobuo; Ito, Masayoshi; Yoshida, Hiroaki; Tani, Masanori; Sano, Yoshiaki; Taira, Masahito; and Teijima, Takashi, 5,483,446, Cl. 364-424.010.
- Nagayoshi, Yoshimasa; Asano, Takeshi; Maruyama, Ikuo; and Kinoshita, Masakazu, 5,481,906, Cl. 73-116.000.
- Ohmae, Katsuhiko; Okimoto, Yukihiko; and Furui, Takashi, 5,483,451, Cl. 364-424.050.
- Mitsubishi Jukogyo Kabushiki Kaisha: See—  
Mizutani, Yasukazu; Sato, Shigemitsu; Koseki, Hideki; Tanigaki, Ryuhei; and Iio, Takayuki, 5,483,216, Cl. 337-370.000.
- Mitsubishi Materials Corporation: See—  
Ueda, Yoshihisa; Takiguchi, Syouji; Kanaboshi, Akira; and Ohnishi, Takehiro, 5,482,412, Cl. 408-36.000.
- Mitsubishi Paper Mills Limited: See—  
Nakagawa, Kunihiro; Akaiwa, Shoji; Sumi, Seiichi; and Nishi, Kenichi, 5,482,815, Cl. 430-264.000.
- Mitsubishi Rayon Co., Ltd.: See—  
Ozaki, Eiji; Sakimae, Akihiro; and Numazawa, Ryojo, 5,482,847, Cl. 435-196.000.
- Mitsubashi, Masakazu: See—  
Ohara, Muneharu; and Mitsubashi, Masakazu, 5,482,784, Cl. 428-607.000.
- Mitsui Mining and Smelting Co., Ltd.: See—  
Ohara, Muneharu; and Mitsubashi, Masakazu, 5,482,784, Cl. 428-607.000.
- Mitsui Toatsu Chemicals, Incorporated: See—  
Itoh, Hisato; Karasawa, Akio; and Sugimoto, Kenichi, 5,482,804, Cl. 430-7.000.
- Ogiso, Akira; Misawa, Tsutami; Imai, Rihoko; and Itoh, Hisato, 5,482,986, Cl. 524-110.000.
- Mitsui, Yasuhiro: See—  
Nakano, Kazuo; Mizokami, Kazuaki; Hasumi, Keiji; Itoh, Katsuhiko; Funabashi, Michimasa; Mitsui, Yasuhiro; Irie, Takashi; Tajima, Takeshi; and Matsuo, Sadao, 5,482,524, Cl. 55-267.000.
- Miura, Isao: See—  
Miura, Takao; and Miura, Isao, 5,482,063, Cl. 134-56.00R.
- Miura, Takao; and Miura, Isao, to Kabushiki Kaisha Kit. Tank cleaning device, 5,482,063, Cl. 134-56.00R.
- Miura, Takao: See—  
Murata, Makoto; Yamachika, Mikio; Yumoto, Yoshiji; and Miura, Takao, 5,482,816, Cl. 430-270.140.
- Miwa, Katsuteru: See—  
Sugiura, Wataru; and Miwa, Katsuteru, 5,483,060, Cl. 250-237.00R.
- Miyabayashi, Toshiyuki, to Canon Kabushiki Kaisha: Silicon composition and elastic roller using the composition, 5,482,775, Cl. 428-391.000.
- Miyahara, Masaaki; Nakamura, Nobuyuki; and Takizawa, Kiyoto, to Nissei Plastic Industrial Co., Ltd.: C-type frame for die tightening units mounted for an injection molding machine, 5,482,454, Cl. 425-547.000.
- Miyake, Akio; Kawano, Yasuhiko; and Ashida, Yasuko, to Takeda Chemical Industries, Ltd.: Triazolopyridazine compounds, their production and use, 5,482,939, Cl. 514-248.000.
- Miyake, Takahiro; Ueyama, Tetsuo; Tanaka, Toshiyuki; and Kurata, Yukio, to Sharp Kabushiki Kaisha: Optical recording and reproducing apparatus using a hologram to detect and judge a plurality of pit patterns, 5,483,508, Cl. 369-44.230.
- Miyama, Hidetaka: See—  
Fujikake, Katsuhiko; and Miyama, Hidetaka, 5,482,586, Cl. 156-233.000.
- Miyamoto, Hidenori: See—  
Aoki, Hitoshi; Wakabayashi, Hiroshi; Tsukahara, Daiki; and Miyamoto, Hidenori, 5,483,320, Cl. 354-475.000.
- Miyamoto, Kenichi; and Minamiguchi, Haruyoshi, to Sumitomo Rubber Industries, Ltd.: Composite prepreg and tennis rackets using the same, 5,482,774, Cl. 428-374.000.
- Miyamoto, Mitsuaki: See—  
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Kouichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,482,937, Cl. 514-219.000.
- Miyashita, Kenji, to Tokico Ltd.: Disk brake associated with hand brake lever, 5,482,145, Cl. 188-72.900.
- Miyashita, Kotaro: See—  
Shimizu, Daisuke; Miyashita, Kotaro; Hara, Yoshihisa; and Yoshio, Yamamoto, 5,482,020, Cl. 123-417.000.
- Miyata, Tohru: See—  
Arima, Yukio; Kimura, Toshihiro; Miyata, Tohru; and Kunitomo, Yuichi, 5,481,917, Cl. 73-621.000.
- Miyauchi, Nobuaki; and Irie, Takatoshi, to Kyocera America, Inc.: Method for making multi-layer ceramic packages, 5,482,735, Cl. 427-58.000.
- Miyazaki, Sho, to Sumitomo Wiring Systems, Ltd.: Connector terminal, 5,482,480, Cl. 439-774.000.
- Miyazaki, Takeshi: See—  
Isaka, Kazuo; Yagi, Takayuki; and Miyazaki, Takeshi, 5,482,598, Cl. 204-129.550.
- Miyazaki, Toshiro: See—  
Takamiya, Minoru; Miyazaki, Toshiro; and Sasaki, Yosuke, 5,482,742, Cl. 427-156.000.
- Miyazawa, Shuhei: See—  
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Kouichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,482,937, Cl. 514-219.000.
- Miyoshi, Kei: See—  
Kimura, Tsuneo; Miyoshi, Kei; and Arai, Masatoshi, 5,482,992, Cl. 524-588.000.
- Miyoshi, Michitaka: See—  
Otake, Masahiro; Takahashi, Toyofumi; Nishiumi, Satoshi; and Miyoshi, Michitaka, 5,483,257, Cl. 345-114.000.
- Mizokami, Kazuaki: See—  
Nakano, Kazuo; Mizokami, Kazuaki; Hasumi, Keiji; Itoh, Katsuhiko; Funabashi, Michimasa; Mitsui, Yasuhiro; Irie, Takashi; Tajima, Takeshi; and Matsuo, Sadao, 5,482,524, Cl. 55-267.000.
- Mizuguchi, Keizou: See—  
Nagai, Yasuhiko; Sakaki, Ryoichi; Niinobe, Sadao; Suzuki, Michio; Mizuguchi, Keizou; and Ikeda, Goro, 5,483,631, Cl. 395-155.000.
- Mizuguchi, Mamoru: See—  
Ohno, Tadayoshi; Tanimoto, Koji; Mizuguchi, Mamoru; and Fujiwara, Shigeru, 5,483,271, Cl. 347-129.000.
- Mizukami, Masao: See—  
Koide, Kazuo; Mizukami, Masao; Hososaka, Satoshi; and Kudoh, Junya, 5,483,110, Cl. 307-147.000.
- Mizukami, Mitsuo: See—  
Watanabe, Shingo; Mizukami, Mitsuo; and Nishi, Hironobu, 5,482,558, Cl. 118-728.000.
- Mizuno, Takashi: See—  
Aoki, Hisashi; Kokubu, Sadao; Mizuno, Yoshiyuki; and Mizuno, Takashi, 5,483,219, Cl. 340-426.000.
- Mizuno, Toshihiro: See—  
Tabata, Jun; Yamashita, Muneharu; Asano, Hiroshi; Mizuno, Toshihiro; and Inoue, Jiro, 5,481,915, Cl. 73-514.340.
- Mizuno, Yoshiyuki: See—  
Aoki, Hisashi; Kokubu, Sadao; Mizuno, Yoshiyuki; and Mizuno, Takashi, 5,483,219, Cl. 340-426.000.



- Mizutani, Ryuji: See—  
Hayashi, Takehiko; Mizutani, Ryuji; and Sugiyama, Chusi, 5,482,414, Cl. 409-134.000.
- Mizutani, Satoshi: See—  
Hori, Tadayoshi; Oshima, Terumitsu; Mizutani, Satoshi; and Kumazaki, Masanori, 5,482,086, Cl. 138-103.000.
- Mizutani, Yasukazu; Sato, Shigemi; Koseki, Hideki; Tanigaki, Ryubei; and Iio, Takayuki, to Ubukata Industries Co., Ltd.; and Mitsubishi Jukogyo Kabushiki Kaisha. Fixing assembly of a temperature responsive element and its fixing method. 5,483,216, Cl. 337-370.000.
- Mobil Oil Corporation: See—  
Audeh, Costandi A.; Sharma, Sanjay B.; and Shihabi, David S., 5,482,692, Cl. 423-239.200.
- Avery, Noyes L.; Barry, Edward G.; Carey, James T.; Crocker, Lisa S.; Feng, Flora W.; Hiebert, John; Horodysky, Andrew G.; and Nelson, Lloyd A., 5,482,521, Cl. 44-344.000.
- Collins, Nick A.; and Harandi, Mohsen N., 5,482,617, Cl. 208-227.000.
- El-Rabaa, A. Wadood; and Olson, Jon E., 5,482,116, Cl. 166-250.100.
- Richardson, Dale S.; and Smith, Roger W., 5,482,375, Cl. 383-64.000.
- Mobility Plus, Inc.: See—  
Jones, David L.; and Drenner, George L., Jr., 5,482,424, Cl. 414-462.000.
- Mochida, Tetsuya: See—  
Okazawa, Koichi; Kimura, Koichi; Kawaguchi, Hitoshi; Aburano, Ichiharu; Kobayashi, Kazushi; and Mochida, Tetsuya, 5,483,642, Cl. 395-306.000.
- Mochizuki, Hirohiko; Takemae, Yoshihiro; Kodama, Yukinori; Yanagisawa, Makoto; and Shigenobu, Katsumi, to Fujitsu Limited. Semiconductor memory having a plurality of banks usable in a plurality of bank configurations. 5,483,497, Cl. 365-230.030.
- Möckel, Helmut: See—  
Möller, Thomas; and Möckel, Helmut, 5,482,325, Cl. 280-801.200.
- Moddel, Garret R.: See—  
Bogart, Gregory R.; Moddel, Garret R.; Maul, Diana M.; and Eiter, Jeffrey B., 5,482,830, Cl. 435-5.000.
- Moffett, Robert H.: See—  
Rushmere, John D.; and Moffett, Robert H., 5,482,693, Cl. 423-328.100.
- Moh, Sungwon: See—  
Lee, Young W.; Moh, Sungwon; and Muller, Arno, 5,483,458, Cl. 364-464.020.
- Mohajerani, Khosrow: See—  
Krum, Richard G.; Nelson, Eldon L.; Mohajerani, Khosrow; and Moir, Michael B., 5,482,381, Cl. 384-480.000.
- Mohan, Robert J.: See—  
Scholtz, Roy D.; Mohan, Robert J.; and Sirois, David W., 5,483,146, Cl. 322-7.000.
- Mohanty, Sasank S.: See—  
Seckinger, Karl; Milzner, Karlheinz; Kuhn, Fred; and Mohanty, Sasank S., 5,482,921, Cl. 504-246.000.
- Mohr, David A.: See—  
Kuo, Hsiang-Jung; Mohr, David A.; and Salnick, Richard E., 5,481,930, Cl. 73-866.500.
- Moir, Michael B.: See—  
Krum, Richard G.; Nelson, Eldon L.; Mohajerani, Khosrow; and Moir, Michael B., 5,482,381, Cl. 384-480.000.
- Molex Incorporated: See—  
Quinn, Robert L., 5,481,796, Cl. 29-753.000.
- Molitor, Robert P.; Nesbitt, R. Dennis; Stiefel, Joseph F.; and Melvin, Terence, to Lisco, Inc. Golf ball. 5,482,286, Cl. 273-230.000.
- Möller, Thomas; and Möckel, Helmut, to Autoliv Development AB. Height-adjustable guide fitting for a seat belt of a motor vehicle. 5,482,325, Cl. 280-801.200.
- Moltech Invent S.A.: See—  
de Nora, Vittorio, 5,482,606, Cl. 204-243.00R.
- Momose, Nobuo; Ito, Masayoshi; Yoshida, Hiroaki; Tani, Masanori; Sano, Yoshiaki; Taira, Masahito; and Teijima, Takashi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for estimating a vehicle maneuvering state and method and apparatus for controlling a vehicle running characteristic. 5,483,446, Cl. 364-424.010.
- Monahan, Kathleen E.: See—  
Glynn, William D.; and Monahan, Kathleen E., 5,481,772, Cl. 5-663.000.
- Monarch Marking Systems, Inc.: See—  
Christopher, Amy S.; Morrison, Donald A.; Roth, Mark W.; and Watkins, Rex D., 5,483,624, Cl. 395-117.000.
- Monma, Genzo: See—  
Okabe, Takahiko; Monma, Genzo; and Yuzurihara, Hiroshi, 5,482,893, Cl. 437-192.000.
- Monsanto Company: See—  
Karagiannis, Aristotelis; and LaPorte, Peter D., 5,482,767, Cl. 428-327.000.
- Phillion, Dennis P.; Van Sant, Karey A.; and Walker, Daniel M., 5,482,974, Cl. 514-619.000.
- Monsanto plc: See—  
King, David; Stolz, Michael; and Rustling, David, 5,481,903, Cl. 73-54.280.
- Monson, Barbara: See—  
Heintzman, Scott B.; Storey, Thomas W.; Monson, Barbara; Medina, Steven J.; and Malark, Gregory A., 5,483,444, Cl. 364-401.000.
- Montgomery, Lon W.: See—

- Biseli, Kathleen M.; Welborn, Cliff A.; Sismour, Albert C., Jr.; and Montgomery, Lon W., 5,483,112, Cl. 310-61.000.
- Montmayeul, Brigitte: See—  
Vaudaine, Pierre; Montmayeul, Brigitte; and Borel, Michel, 5,482,486, Cl. 445-3.000.
- Moore Business Forms, Inc.: See—  
Langan, Joseph; and Khatib, Khaled, 5,482,753, Cl. 428-42.000.
- Moore, Edwin N.: See—  
Vest, Michael A.; Fink, Samuel D.; Karraker, David G.; Moore, Edwin N.; and Holcomb, H. Perry, 5,482,688, Cl. 423-20.000.
- Moore, Larry W.: See—  
Clark, Frederic L.; Clift, Gilbert; Hendrick, Kendall B.; Kanewske, William J., III; Lagocki, Peter A.; Martin, Richard R.; Mitchell, James E.; Moore, Larry W.; Pennington, Charles D.; Walker, Edna S.; Smith, B. Jane; Tayi, Apparao; Vaught, James A.; and Yost, David A., 5,482,861, Cl. 436-48.000.
- Moore, Stuart G. Board inverter for use in lumber processing machine. 5,482,140, Cl. 198-403.000.
- Moos, Walter H.: See—  
Lauffer, David J.; Moos, Walter H.; Pavia, Michael R.; Teale, Haile; and Thomas, Anthony J., 5,482,938, Cl. 514-233.200.
- Morel, Dennis W.: See—  
Gramlich, Gary A.; Makino, Roy H.; Morel, Dennis W.; Urbanski, Daniel J.; and Karobonik, John R., 5,483,243, Cl. 342-189.000.
- Moreno, Jean-Yves: See—  
Vinouze, Bruno; Moreno, Jean-Yves; and Lacroix, François, 5,482,590, Cl. 156-272.800.
- Morgan, Carlton: See—  
Cameron, David B.; Powers, Daniel; Lyster, Thomas; and Morgan, Carlton, 5,483,165, Cl. 324-422.000.
- Morgan, David W.; and Wedding, Brent M., to Corning Incorporated. Amber photochromic glasses. 5,482,901, Cl. 501-13.000.
- Morgan, Sarah E.; Pratt, Charles F.; di Fede, Cinzia A. R.; and Verdulet-van Aert, Julia A. J. M., to General Electric Company. Polymer mixture which comprises a polyphenylene ether and a styrene-containing polymer or copolymer, as well as products formed therefrom. 5,482,999, Cl. 525-68.000.
- Mori, Hiroyoshi: See—  
Ishida, Kazunori; Ishii, Tadao; Mori, Hiroyoshi; Akizuki, Susumu; and Ogino, Akihisa, 5,483,589, Cl. 379-220.000.
- Mori, Ikuo; and Ikeya, Kiyokazu, to Texas Instruments Incorporated. Socket apparatus for IC package testing. 5,482,471, Cl. 439-263.000.
- Mori, Shigeki; Ohbatake, Yohjiro; and Tsuchie, Morio, to Kabushiki Kaisha Komatsu Seisakusho. Automatic greasing system for construction machines and abnormality detecting method therefor. 5,482,138, Cl. 184-6.400.
- Mori, Takahiro: See—  
Yamada, Satoru; Mori, Takahiro; Kataoka, Ichiro; and Itoyama, Shigenori, 5,482,571, Cl. 136-259.000.
- Morici, Alfred; and Dudley, Mari' A., to Morici, Dudley Associates. Pizza tray. 5,482,724, Cl. 426-124.000.
- Morici, Dudley Associates: See—  
Morici, Alfred; and Dudley, Mari' A., 5,482,724, Cl. 426-124.000.
- Morigami, Yuusuke: See—  
Atsumi, Tomoyuki; Morigami, Yuusuke; and Matsuo, Hirokazu, 5,482,264, Cl. 271-10.020.
- Morikawa, Yuko: See—  
Kawade, Hisaaki; Kawada, Haruki; Sakai, Kunihiro; Matsuda, Hiroshi; Morikawa, Yuko; Yanagisawa, Yoshihiro; Kaneko, Tetsuya; Kawase, Toshimitsu; Kumomi, Hideya; Nose, Hiroyasu; and Kawakami, Eigo, 5,482,002, Cl. 117-90.000.
- Morimoto, Eizi: See—  
Aoki, Katsutoshi; Morimoto, Eizi; Kawaji, Hiroyuki; Suenaga, Ken-ichi; Semura, Tetsuhiro; and Kawabe, Kuniyasu, 5,483,016, Cl. 526-318.450.
- Morioka Kabushiki Kaisha: See—  
Tsuda, Kazuhiko; Okamoto, Hiroyuki; and Hashimoto, Kazuhiro, 5,482,506, Cl. 454-155.000.
- Morita, Takayuki: See—  
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- Morito, Nobuyuki: See—  
Sujita, Shigeko; and Morito, Nobuyuki, 5,482,787, Cl. 428-623.000.
- Moritz, Steven H.; Gregg, Ralph C., Jr.; and Wang, Theresa C. Y., to Motorola, Inc. Cellular communications with scheduled handoffs. 5,483,664, Cl. 455-13.100.
- Moro, Masashi: See—  
Shimizu, Kenji; Ishida, Hiroshi; Yamada, Yutaka; Izumi, Kiyoshi; Moro, Masashi; and Soeda, Yuji, 5,482,625, Cl. 210-321.840.
- Morris, Debra L.; and Landers, Albert G., to Armstrong World Industries, Inc. Extruded fire resistant construction and building products. 5,482,551, Cl. 106-772.000.
- Morris, John D.: See—  
Lundquist, Lynn C.; and Morris, John D., 5,483,029, Cl. 200-1.00R.
- Morris, Kevin T.: See—  
Havewala, Noshir B.; Morris, Kevin T.; and Shoup, Robert D., 5,482,526, Cl. 65-134.100.
- Morrison, Donald A.: See—  
Christopher, Amy S.; Morrison, Donald A.; Roth, Mark W.; and Watkins, Rex D., 5,483,624, Cl. 395-117.000.

- Morton International, Inc.: See—  
Chandler, William A., Jr.; Kort, Leland B.; and Clark, Randall J., 5,482,315, Cl. 280-741.000.
- Lang, Gregory J.; Parker, Todd S.; Fulmer, Brian H.; Kosoff, David P.; and Miller, Harry W., II, 5,482,316, Cl. 280-741.000.
- Mory Soutour Inc.: See—  
Tagawa, Koichi, 5,481,934, Cl. 74-475.000.
- Moseley, Angela L.; Hoag, Gay A.; and Durbin, George W., to Union Camp Corporation. Load carrying bag with perforated tear line opening. 5,482,376, Cl. 383-209.000.
- Moser, Bernhard: See—  
Haussmann, August; and Moser, Bernhard, 5,482,124, Cl. 175-415.000.
- Moser, Rasin: See—  
Wayman, William H.; and Moser, Rasin, 5,483,331, Cl. 355-285.000.
- Moses, Marlon M.: See—  
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- Moss, Adrian J.; Hewinson, John; Walton, Peter; Birch, Brian J.; Ball, Clare L.; James, Andrew W.; Atkinson, John K.; and Siuda, Przemyslaw R., to Siemens Plessey Controls Limited. Water quality sensor apparatus. 5,483,164, Cl. 324-425.000.
- Motohara, Akira: See—  
Hosokawa, Toshinori; Motohara, Akira; and Ohta, Mitsuyasu, 5,483,543, Cl. 371-23.000.
- Motorola, Inc.: See—  
Barnett, Kenneth C.; Ponce De Leon, Lorenzo A.; McMurray, Charles R.; and Halabi, Nadim M., 5,483,246, Cl. 343-700.0MS.
- Barrett, Raymond L., Jr.; Herold, Barry; and Kosiec, Jeannie H., 5,483,687, Cl. 455-183.200.
- Bennett, Paul T.; Gray, Randall C.; and Pigott, John M., 5,483,406, Cl. 361-56.000.
- Burger, Vida I.; Kaneshiro, Michael H.; Dow, Diann; Klein, Kevin M.; Masquellier, Michael P.; and Prendergast, E. James, 5,482,878, Cl. 437-41.000.
- Burns, Arthur G.; Fernandez, Jose M.; and Kreisinger, Robert D., 5,482,793, Cl. 429-62.000.
- Deutsch, Robert W.; and Robb, Scott A., 5,481,909, Cl. 73-117.300.
- Grube, Gary W.; and Markison, Timothy W., 5,483,244, Cl. 342-463.000.
- Gupta, Sanjay; and Lis, Timothy, 5,483,593, Cl. 379-386.000.
- Heck, Joseph P.; and Ferrer, Enrique, 5,483,691, Cl. 455-234.200.
- Helm, David; Felderman, Bill; and DeRango, Mario, 5,483,671, Cl. 455-51.200.
- Holm, Paige M.; Rhyne, George W.; and Walczak, Thomas J., 5,483,085, Cl. 257-88.000.
- Horen, Yoram; Volpert, Yehuda; and Einav, Alick, 5,483,476, Cl. 364-748.000.
- Joiner, Bennett A., Jr., 5,483,098, Cl. 257-676.000.
- Lebby, Michael S.; Chun, Christopher K. Y.; Kuo, Shun-Meen; and Hansen, Kent W., 5,482,658, Cl. 264-1.240.
- Leon, Ana S.; and Chau-Lee, Kin K., 5,483,558, Cl. 375-376.000.
- Moritz, Steven H.; Gregg, Ralph C., Jr.; and Wang, Theresa C. Y., 5,483,664, Cl. 455-13.100.
- Pfahl, Robert C., Jr.; Wrezel, James A.; and Hagner, Lawrence R., 5,482,563, Cl. 134-11.000.
- Rottinghaus, Alan P., 5,483,203, Cl. 331-10.000.
- Rybicki, Mathew A., 5,483,182, Cl. 327-5.000.
- Sasuta, Michael D., 5,483,672, Cl. 455-54.100.
- Sharma, Umesh; and Kawasaki, Hisao, 5,483,094, Cl. 257-316.000.
- Shieh, Chan-Long; Lungo, John; and Lebby, Michael S., 5,482,891, Cl. 437-129.000.
- Vaitkus, Rimantas L.; Tehrani, Saied N.; Nair, Vijay K.; and Goronkin, Herbert, 5,482,875, Cl. 437-40.000.
- Wu, Schyi-yi, 5,482,872, Cl. 437-22.000.
- Yishay, Oded; Jelemensky, Joseph; Harwood, Ann E.; and Saldana, Javier, 5,483,660, Cl. 395-280.000.
- Mototani, Yuji; Asaoka, Junichi; and Tanaka, Hitoshi, to Matsushita Electric Industrial Co., Ltd. Alkaline manganese battery. 5,482,798, Cl. 429-224.000.
- Motoyama, Kunio: See—  
Fujimoto, Hisayoshi; Nakanishi, Masatoshi; and Motoyama, Kunio, 5,483,273, Cl. 347-195.000.
- Motoyama, Tetsuro; and Chang, Yueh-Lin, to Ricoh Company, Ltd.; and Ricoh Corporation. Method and system to handle dictionaries in a document processing language. 5,483,629, Cl. 395-144.000.
- Motoyoshi, Makoto: See—  
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- Motta, Richard F.: See—  
Godinho, Norman; Lee, Tsu-Wei F.; Chen, Hsiang-Wen; Motta, Richard F.; Tsang, Juine-Kai; Tzou, Joseph; Baik, Jai-Man; and Yen, Ting-Pwu, 5,483,104, Cl. 257-758.000.
- Mouchiroud, Guy: See—  
Royet, Julien; Arnaud, Sylvie; Mouchiroud, Guy; and Blanchet, Jean P., 5,482,924, Cl. 514-8.000.
- Moulines, Eric: See—  
Prado, Jacques; and Moulines, Eric, 5,483,594, Cl. 379-410.000.
- Moulton, Russell D.; and Chaloner-Gill, Benjamin. Use of IR (thermal) imaging for determining cell diagnostics. 5,483,068, Cl. 250-340.000.
- Mowill, R. Jan. Single stage premixed constant fuel/air ratio combustor. 5,481,866, Cl. 60-39.230.
- Mowry, David: See—  
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- Moyer, John A.: See—  
Abou-Gharbia, Magid A.-M.; Yardley, John P.; Childers, Wayne E., Jr.; and Moyer, John A., 5,482,940, Cl. 514-252.000.
- Moysan, Stephen R., III; and Sugg, Rolin W., to Baldwin Hardware Corporation. Article having a protective coating simulating brass. 5,482,788, Cl. 428-627.000.
- Mrowec, Stanislaw: See—  
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- MRS Technology, Inc.: See—  
Doherty, J. Casey; Holbrook, David S.; Johnson, Shepard D.; and Sozanski, James A., 5,483,345, Cl. 356-363.000.
- MTS Systems Corporation: See—  
Chasco, David G.; and Willis, Dennis J., 5,481,907, Cl. 73-146.000.
- Muccioli, James P.: See—  
Person, Andrew P.; and Muccioli, James P., 5,483,692, Cl. 455-238.100.
- Muchnik, Boris J.: See—  
Jewell, Jack L.; and Muchnik, Boris J., 5,483,511, Cl. 369-44.370.
- Muehlbach, Klaus; Baierweck, Petra; Mueller, Wolfgang F.; Blinne, Gerd; and Ramlow, Gerhard, to BASF Aktiengesellschaft. Thermoplastic molding materials based on partly aromatic copolyamides and polyolefins. 5,482,998, Cl. 525-66.000.
- Mueller, Juergen: See—  
Wolf, Bernd; Mueller, Juergen; and Neudert, Hans, 5,482,610, Cl. 204-298.190.
- Mueller, Karl; to Marquardt GmbH. Bus system. 5,483,230, Cl. 340-825.060.
- Mueller, Karl-Heinz: See—  
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- Mueller, Richard A.: See—  
Talley, John J.; Getman, Daniel P.; DeCrescenzo, Gary A.; Lin, Ko-Chung; Vazquez, Michael L.; Mueller, Richard A.; Reed, Kathryn L.; Heintz, Robert M.; Clare, Michael; Freskos, John N.; and Sun, Eric T., 5,482,947, Cl. 514-311.000.
- Mueller, Robert W.; and Carothers, Arthur D., to Eaton Corporation. Terminal block with terminal-locking slot. 5,483,213, Cl. 335-132.000.
- Mueller, Wolfgang F.: See—  
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- Muetzel, Wolfgang: See—  
Deutsch, Julius; Gries, Heinz; Klieger, Erich; Niedballa, Ulrich; Renneke, Franz-Josef; Conrad, Juergen; and Muetzel, Wolfgang, 5,482,700, Cl. 424-9.364.
- Mukataka, Hisashi; Imoo, Ryushi; Aiba, Hidemasa; Satoh, Akira; Nagata, Masahiro; and Tode, Hiroyoshi, to Kyocera Corporation. Image forming apparatus and method for obtaining smooth charging, exposure and development. 5,483,272, Cl. 347-129.000.
- Muller, Arno: See—  
Lee, Young W.; Moh, Sungwon; and Muller, Arno, 5,483,458, Cl. 364-464.020.
- Müller, Friedrich; and Riess, Heinz, to Dynamit Nobel Aktiengesellschaft. Cartridge case. 5,481,978, Cl. 102-470.000.
- Müller, Patrik: See—  
Seelert, Stephan; Langhauser, Franz; Kerth, Jürgen; Müller, Patrik; Fischer, David; and Schweizer, Günther, 5,483,002, Cl. 525-240.000.
- Müller, Thomas: See—  
Soyka, Rainer; Müller, Thomas; and Weisenberger, Johannes, 5,482,948, Cl. 514-318.000.
- Mullineaux, Wayne: See—  
Scott, Richard; Bleth, David; Banks, Gerald; Coppedge, Todd; DeWitt, William; Hahn, Oliver; Hunking, Maurice; Mullineaux, Wayne; Peters, Manfred; Smith, Richard; and Walter, Todd, 5,482,503, Cl. 452-173.000.
- Murai, Keiichi: See—  
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- Murai, Shinji: See—  
Hiraoka, Toshiro; Nakamura, Shin-ichi; Nakano, Yoshihiko; Murai, Shinji; and Hayase, Shuzi, 5,482,656, Cl. 252-514.000.
- Murakami, Hiroki, to Fuji Xerox Co., Ltd. Electroluminescent device having improved electrode terminals. 5,483,120, Cl. 313-506.000.
- Murakami, Kazuya: See—  
Kajioka, Hiroshi; Yamada, Kohdo; Nakamura, Masashi; Murakami, Kazuya; and Takuma, Yuetsu, 5,482,525, Cl. 65-398.000.
- Murakami, Kenjiro; Kotaka, Toshikazu; Ishida, Hiroshi; Komuro, Kiyoto; Nakayama, Yoshiaki; Takahashi, Nobuhito; and Takehana, Satoshi, to Seiko Epson Corporation. Printer having discharge rollers. 5,482,390, Cl. 400-636.200.
- Murakami, Koichi, to Nissan Motor Co., Ltd. Input protection device for electronic device. 5,483,093, Cl. 257-355.000.
- Murakami, Mitsuyuki: See—  
Hanasaki, Yasuaki; Tsukuda, Kazuaki; Watanabe, Hiroyuki; Tsuzuki, Kenji; Murakami, Mitsuyuki; and Niimi, Noritoshi, 5,482,916, Cl. 504-261.000.
- Murakami, Terukiyo: See—



- Iwata, Toru; Murakami, Terukiyo; Tamura, Minoru; and Fukumura, Tomohiro, 5,482,133, Cl. 180-197.000.
- Murakawa, Kazuhiko, to Seiko Instruments Inc. Nonvolatile memory device having a timer circuit. 5,483,496, Cl. 365-233.000.
- Muralidhara, Harapanahalli S.; Jirjis, Bassam F.; and Seymour, Gary F., to Cargill, Incorporated. Process for removing vegetable oil waxes by fast cooling vegetable oil and using a porous non-metallic inorganic filter. 5,482,633, Cl. 210-651.000.
- Muramatsu, Tsuyoshi: See—  
Yoshida, Shinichi; Onozaki, Manabu; and Muramatsu, Tsuyoshi, 5,483,661, Cl. 395-800.000.
- Muramoto, Kenzo: See—  
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,482,937, Cl. 514-219.000.
- Murata Kikai Kabushiki Kaisha: See—  
Ota, Naritoshi, 5,481,863, Cl. 57-328.000.
- Murata, Makoto; Yamachika, Mikio; Yumoto, Yoshiji; and Miura, Takao, to Japan Synthetic Rubber Co., Ltd. Radiation-sensitive composition. 5,482,816, Cl. 430-270.140.
- Murata Mfg. Co., Ltd.: See—  
Tabata, Jun; Yamashita, Muneharu; Asano, Hiroshi; Mizuno, Toshihiro; and Inoue, Jiro, 5,481,915, Cl. 73-514.340.
- Murayama, Yasushi: See—  
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- Murdock, Douglas R.: See—  
Hogan, Steven J.; Feltz, Kristi T.; Murdock, Douglas R.; and Smith, Keith E., 5,483,587, Cl. 379-202.000.
- Murphy, Richard T.; and Lajoie, M. Stephen, to Church & Dwight Co., Inc. Hydrophilic polymer-coated microcrystallites of bicarbonate salt. 5,482,702, Cl. 424-65.000.
- Murphy, Richard T.; and Bergmann, Wolfgang R., to Church & Dwight Co., Inc. Encapsulated co-micronized bicarbonate salt compositions. 5,482,720, Cl. 424-489.000.
- Murphy, Thomas; and Savile, Harry, to Canada, Her Majesty the Queen in right of, as represented by The Minister of The Environment. System to reduce sediment toxicity. 5,481,815, Cl. 37-344.000.
- Murray, David L.: See—  
Liles, Donald T.; Murray, David L.; Weyenberg, Donald R.; Tselepis, Arthur J.; and Revis, Anthony, 5,482,994, Cl. 524-789.000.
- Murti, Dasarao K.: See—  
Keoshkerian, Barkov; Lieberman, George; Hsiao, Cheng-Kuo; Mayo, James D.; Murti, Dasarao K.; and Gardner, Sandra J., 5,482,811, Cl. 430-135.000.
- Must System Inc.: See—  
Chen, Wen-Tsung; Liu, Hong-Wen; and Hsu, Chih-Hong, 5,483,356, Cl. 358-471.000.
- Musters, Wouter: See—  
Branner, Sven; Hastrup, Sven; Eriksen, Nina; Lindegaard, Poul; Olsen, Ole H.; Castelleijn, Eric; Egmond, Maarten R.; Haverkamp, Johan; Musters, Wouter; and de Vlieg, Jakob, 5,482,849, Cl. 435-222.000.
- Mutter, Douglas R.; Langer, Peter; and Agarwal, Payal, to Ford Motor Company. Seat belt usage indicating system. 5,483,221, Cl. 340-457.100.
- Myers, Bruce A.; and Runyon, Ronnie J., to Delco Electronics Corporation. Method for applying solder to a fine pitch flip chip pattern. 5,482,200, Cl. 228-191.000.
- Mykytko, William J.: See—  
Meitzner, George D.; Migone, Ruben A.; and Mykytko, William J., 5,482,615, Cl. 208-139.000.
- N.V. Michel van de Wiele: See—  
Debaes, Johnny, 5,482,091, Cl. 139-391.000.
- N.V. Nederlandse Gasunie: See—  
Dijkstra, Kees; and Verbeek, Hermanus M., 5,482,679, Cl. 422-94.000.
- N.V. Raychem S.A.: See—  
Nolf, Jean-Marie E.; Vansant, Jan L.; Franckx, Joris I.; and Zadno, Reza, 5,482,467, Cl. 439-161.000.
- Overbergh, Noel M. M.; and Leest, Yvo, 5,482,087, Cl. 138-110.000.
- Nachamkin, Jack: See—  
Despain, Ronald R.; Dougherty, Dou J.; Nachamkin, Jack; Schappelle, Robert; Stinson, Jon M.; and Weslow, Vanessa M., 5,483,169, Cl. 324-534.000.
- Nadex Co., Ltd.: See—  
Kawai, Shingo; and Sahashi, Kenji, 5,483,035, Cl. 219-110.000.
- Nadolny, Raymond A.: See—  
West, John S.; Simpson, Raymond W.; Khoo, Samuel C.; Talmi, Yair; Nadolny, Raymond A.; and Blouke, Morley M., 5,483,091, Cl. 257-239.000.
- Nagai, Hideo: See—  
Sakurada, Shinya; Hirai, Takahiro; Tsutai, Akihiko; Sahashi, Masashi; Nagai, Hideo; and Yamashita, Tsutomu, 5,482,573, Cl. 148-301.000.
- Nagai, Tomoaki: See—  
Satake, Toshimi; Nagai, Tomoaki; Takano, Toshiyuki; and Sekine, Akio, 5,482,913, Cl. 503-210.000.
- Nagai, Yasuhiko; Sasaki, Ryoichi; Niinobe, Sadao; Suzuki, Michio; Mizuguchi, Keizou; and Ikeba, Goro, to Hitachi, Ltd.; and Hitachi Information & Control Systems, Inc. Communication network management system for displaying operation states of network elements on a remote display unit. 5,483,631, Cl. 395-155.000.
- Nagano, Fumikazu, to Sharp Kabushiki Kaisha. Image scanning device. 5,483,357, Cl. 358-483.000.
- Nagano, Mutsumi: See—  
Ohsawa, Kenji; Ito, Makoto; and Nagano, Mutsumi, 5,481,798, Cl. 29-827.000.
- Naganuma, Kazunori, to Nippon Telegraph & Telephone Corporation. Cavity dispersing measuring method and measuring apparatus thereof. 5,483,341, Cl. 356-345.000.
- Nagao, Masaki; and Tokui, Masaki, to Olympus Optical Co., Ltd. Camera having built-in magnetic recording and reproducing apparatus including a novel record/playback head. 5,483,313, Cl. 354-106.000.
- Nagao, Mitsunobu: See—  
Satomi, Shigeki; Nagao, Mitsunobu; and Ono, Naoki, 5,483,519, Cl. 370-16.000.
- Nagaoka, Kyoko: See—  
Nagasaka, Takashi; Saitou, Mitsuhiro; Koyasu, Takahisa; Ban, Hiroyuki; Otani, Yuji; Oka, Kengo; and Nagaoka, Kyoko, 5,483,217, Cl. 338-252.000.
- Nagasaka, Takashi; Saitou, Mitsuhiro; Koyasu, Takahisa; Ban, Hiroyuki; Otani, Yuji; Oka, Kengo; and Nagaoka, Kyoko, to Nippondenso Co., Ltd. Electronic circuit device. 5,483,217, Cl. 338-252.000.
- Nagasaki, Yukio: See—  
Sakurai, Yasuhisa; Okano, Teruo; Yokoyama, Masayuki; Kataoka, Kazunori; Nagasaki, Yukio; Ohsako, Nobuyuki; and Kato, Masao, 5,483,008, Cl. 525-408.000.
- Nagasawa, Toshiya: See—  
Hasegawa, Etsuo; Kajikawa, Yoshiharu; Morita, Takayuki; Okazaki, Suehiro; Yamamoto, Toshihiro; Nagasawa, Toshiya; and Sumi, Shogo, 5,481,886, Cl. 62-285.000.
- Nagashima, Akira: See—  
Aoki, Makoto; Hattori, Yoshifumi; Yamamoto, Mayumi; Tochihiro, Shinichi; Takizawa, Yoshihisa; Nagashima, Akira; and Sato, Shinichi, 5,482,545, Cl. 106-22.00K.
- Nagashima, Nao, to Canon Kabushiki Kaisha. Printing apparatus. 5,483,623, Cl. 395-115.000.
- Nagata, Hiroshi: See—  
Barzasi, Alain; Nagata, Hiroshi; Sagawa, Masato; and Vial, Fernand, 5,482,575, Cl. 148-302.000.
- Nagata, Masahiro: See—  
Mukataka, Hisashi; Imoo, Ryushi; Aiba, Hidemasa; Satoh, Akira; Nagata, Masahiro; and Tode, Hiroyoshi, 5,483,272, Cl. 347-129.000.
- Nagayama, Yoshitaka: See—  
Echigo, Masashi; Nagayama, Yoshitaka; Maeda, Takushi; Yamada, Toshitaka; and Kitano, Masahiko, 5,483,106, Cl. 257-783.000.
- Nagayoshi, Yoshimasa; Asano, Takeshi; Maruyama, Ikuro; and Kinoshita, Masakazu, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Fault diagnosis apparatus and method for vehicle control system. 5,481,906, Cl. 73-116.000.
- Nair, Vijay K.: See—  
Vaitkus, Rimantas L.; Tehrani, Saied N.; Nair, Vijay K.; and Goronkin, Herbert, 5,482,875, Cl. 437-40.000.
- Naito, Hayato: See—  
Ushikoshi, Isao; and Naito, Hayato, 5,483,162, Cl. 324-252.000.
- Nakagawa, Kunihiko; Akaiwa, Shoji; Sumi, Seiichi; and Nishi, Kenichi, to Mitsubishi Paper Mills Limited. Silver halide photographic photosensitive material. 5,482,815, Cl. 430-264.000.
- Nakagome, Yoshinobu: See—  
Iwai, Hidetoshi; Ishihara, Masamichi; Ito, Kazuya; Arakawa, Wataru; and Nakagome, Yoshinobu, 5,483,490, Cl. 365-200.000.
- Nakahata, Seiji; Matsuura, Takahiro; Sogabe, Kouichi; and Yamakawa, Akira, to Sumitomo Electric Industries, Ltd. Aluminum nitride sintered body and method of producing the same. 5,482,905, Cl. 501-9.600.
- Nakai, Kousiro: See—  
Takemoto, Takatoshi; Kano, Noriaki; Kurihara, Yoshide; Nakai, Kousiro; and Ito, Eiichi, 5,482,266, Cl. 271-272.000.
- Nakajima, Rieko: See—  
Gunji, Yoshinori; Wada, Tetsuya; Nakajima, Rieko; Doi, Hiroshi; and Matsuda, Taku, 5,483,536, Cl. 370-85.140.
- Nakajima, Toshihiko; Edakubo, Hiroo; and Kumagai, Kiyoshi, to Canon Kabushiki Kaisha. Rotary head drum having a connecting member for providing electrical conduction. 5,483,401, Cl. 360-108.000.
- Nakakin Co., Ltd.: See—  
Nakamura, Yoshitaka; and Inoue, Tadashi, 5,482,368, Cl. 366-152.000.
- Nakamoto, Masayuki; and Ono, Tomio, to Kabushiki Kaisha Toshiba. Field emission cold cathode and method for production thereof. 5,483,118, Cl. 313-309.000.
- Nakamura, Fumiharu, to Canon Kabushiki Kaisha. Ink jet recording apparatus with two storage modes. 5,483,266, Cl. 347-23.000.
- Nakamura, Katsutoshi: See—  
Yoshimura, Toshiteru; and Nakamura, Katsutoshi, 5,482,319, Cl. 280-752.000.
- Nakamura, Katsuya: See—  
Yamakawa, Masahiro; and Nakamura, Katsuya, 5,482,777, Cl. 428-425.900.
- Nakamura, Masashi: See—

- Kajioka, Hiroshi; Yamada, Kohdo; Nakamura, Masashi; Murakami, Kazuya; and Takuma, Yuetsu, 5,482,525, Cl. 65-398.000.
- Nakamura, Nobuyuki; and Arai, Tsuyoshi, to Nissei Plastic Industrial Co., Ltd. Control method for injection molding machines. 5,482,662, Cl. 264-40.100.
- Nakamura, Nobuyuki: See—  
Miyahara, Masaaki; Nakamura, Nobuyuki; and Takizawa, Kiyoto, 5,482,454, Cl. 425-547.000.
- Nakamura, Shin-ichi: See—  
Hiraoka, Toshiro; Nakamura, Shin-ichi; Nakano, Yoshihiko; Murai, Shinji; and Hayase, Shuzi, 5,482,656, Cl. 252-514.000.
- Nakamura, Shinji; and Hasegawa, Miki, to Rohm Co., Ltd. Solid electrolytic capacitor and method of making the same. 5,483,415, Cl. 361-529.000.
- Nakamura, Yoshiki: See—  
Kitamura, Isaya; Nakamura, Yoshiki; Inami, Masakazu; and Okada, Yoshihiro, 5,483,090, Cl. 257-231.000.
- Nakamura, Yoshiro: See—  
Ikeya, Jitsuo; Nakamura, Yoshiro; and Fukuoka, Hiroto, 5,482,115, Cl. 165-151.000.
- Nakamura, Yoshitaka; and Inoue, Tadashi, to Nakakin Co., Ltd. Continuous mixer operable to control saccharides concentration. 5,482,368, Cl. 366-152.200.
- Nakane, Keiichi: See—  
Kuwamoto, Hideki; Kuwabara, Tadashi; Koreeda, Hiroyuki; Nonaka, Naomichi; Nakane, Keiichi; Fujiwara, Masaki; and Masuda, Kiyoshi, 5,483,632, Cl. 395-156.000.
- Nakanishi, Hiroyuki: See—  
Sugiura, Susumu; Mita, Yoshinobu; Shishizuka, Junichi; Takaoka, Makoto; Shimomura, Yukari; Matsumoto, Kentaro; Uda, Toyokazu; Sugiyama, Mitsumasa; Kobayashi, Shigetada; Hisada, Katsutoshi; Kaneko, Yoji; and Nakanishi, Hiroyuki, 5,483,358, Cl. 358-508.000.
- Nakanishi, Junji, to Mitsubishi Denki Kabushiki Kaisha. Method for driving a linear image sensor. 5,483,282, Cl. 348-311.000.
- Nakanishi, Masatoshi: See—  
Fujimoto, Hisayoshi; Nakanishi, Masatoshi; and Motoyama, Kunio, 5,483,273, Cl. 347-195.000.
- Nakano, Akira: See—  
Inoue, Nobuhiro; Nakano, Akira; Tsuda, Yukio; Sasaki, Katsunari; Nose, Toshiro; and Aihara, Masayoshi, 5,483,274, Cl. 347-206.000.
- Nakano, Kazuo; Mizokami, Kazuaki; Hasumi, Keiji; Itoh, Katsuhiko; Funabashi, Michimasa; Mitsui, Yasuhiro; Irie, Takashi; Tajima, Takeshi; and Matsuoka, Sadao, to Hitachi, Ltd.; and Hitachi Tokyo Electronics Co., Ltd. Atmospheric pressure, elevated temperature gas desorption apparatus. 5,482,524, Cl. 55-267.000.
- Nakano, Takahiro: See—  
Kawahara, Tetsuya; Nakata, Junji; Kimura, Yuji; Sakai, Hiroyuki; Hamaguchi, Masakazu; Yamada, Takahiro; Kohiyama, Tomohisa; and Nakano, Takahiro, 5,483,466, Cl. 364-514.000.
- Nakano, Toshiya, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit. 5,483,404, Cl. 361-18.000.
- Nakano, Yasushi: See—  
Kawahara, Setsuko; Nakano, Yasushi; Shimizu, Yuji; and Sugitani, Shoichi, 5,482,762, Cl. 428-212.000.
- Nakano, Yoshihiko: See—  
Hiraoka, Toshiro; Nakamura, Shin-ichi; Nakano, Yoshihiko; Murai, Shinji; and Hayase, Shuzi, 5,482,656, Cl. 252-514.000.
- Nakashima, Naomichi: See—  
Abe, Toshiyuki; Hsatsuke, Masayoshi; and Nakashima, Naomichi, 5,482,733, Cl. 427-4.000.
- Nakata, Junji: See—  
Kawahara, Tetsuya; Nakata, Junji; Kimura, Yuji; Sakai, Hiroyuki; Hamaguchi, Masakazu; Yamada, Takahiro; Kohiyama, Tomohisa; and Nakano, Takahiro, 5,483,466, Cl. 364-514.000.
- Nakatake, Yoshiteru; Karino, Kazuya; and Yuh, Kazuo, to Honda Lock Mfg. Co. Ltd. Rotary sensor having a stay and molded body. 5,483,157, Cl. 324-174.000.
- Nakaya, Ken-ichi, to NEC Corporation. Optical device with mode absorbing films deposited on both sides of a waveguide. 5,483,609, Cl. 385-29.000.
- Nakayama, Koichi: See—  
Hiratsuka, Katsuo; Ayuta, Masanori; and Nakayama, Koichi, 5,481,995, Cl. 112-437.000.
- Nakayama, Takao; Dan, Shigeyuki; Iwashita, Ryosuke; and Umehara, Saburo, to Fuji Photo Film Co., Ltd.; and Tomoeigawa Paper Co., Ltd. Process for the production of an electrophotographic lithographic printing plate precursor. 5,482,810, Cl. 430-130.000.
- Nakayama, Yasutomo, to International Business Machines Corporation. Method and apparatus for transforming graphics. 5,483,626, Cl. 395-133.000.
- Nakayama, Yoshiaki: See—  
Murakami, Kenjiro; Kotaka, Toshikazu; Ishida, Hiroshi; Komuro, Kiyoto; Nakayama, Yoshiaki; Takahashi, Nobuhito; and Takehana, Satoshi, 5,482,390, Cl. 400-636.200.
- Nakazato, Yasushi; Shibaki, Hiroyuki; Yamanaka, Tetsuo; and Hosokawa, Hiroshi, to Ricoh Company, Ltd. Sheet feeder for an image forming apparatus. 5,482,265, Cl. 271-242.000.
- Namiki, Takahisa; Yamagishi, Yasuo; and Yano, Ei, to Fujitsu Limited. Method for removing copper oxide on the surface of a copper film and a method for patterning a copper film. 5,482,174, Cl. 216-41.000.
- Nara, Koichi, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Fluid pressure measuring sensor using strain gauges. 5,481,920, Cl. 73-726.000.
- Narsoka, Koji: See—  
Horita, Masami; and Naraoka, Koji, 5,483,504, Cl. 369-13.000.
- Naruki, Kenichi: See—  
Higashi, Kazuhiko; Takakuwa, Kiyoshi; Arimoto, Kazuaki; Naruki, Kenichi; Fukumoto, Hiroshi; Kuwada, Terumi; and Oda, Keisuke, 5,483,275, Cl. 347-218.000.
- Nasrallah, Maurice; Sadeghi, Fred; and Wang, James J., to Kraft Foods, Inc. Beverage container with bottom cavity. 5,481,853, Cl. 53-453.000.
- Nasu, Yasuhiro: See—  
Takizawa, Hideaki; Nasu, Yasuhiro; Watanabe, Kazuhiro; Hirota, Shiro; Nonaka, Kazuo; Sato, Seii; and Majima, Teiji, 5,483,082, Cl. 257-59.000.
- Natarajan, Siva; Shrivastava, Udy; Siu, William M.; and Palmer, Mark J., to Intel Corporation. Standardized power and ground design for pin grid array packages. 5,483,099, Cl. 257-691.000.
- National Rubber Technology Inc.: See—  
Bavington, Gregory F., 5,482,400, Cl. 404-25.000.
- National Science Council: See—  
Liu, Der-Cherng; and Lee, Chien-Ping, 5,482,890, Cl. 437-107.000.
- Tuan, Wei-Hsing; and Lin, Ming-Cherng, 5,482,907, Cl. 501-120.000.
- National Semiconductor Corporation: See—  
Ganschow, George E., 5,482,874, Cl. 437-31.000.
- Kuo, James R., 5,483,184, Cl. 327-83.000.
- Tjha, Eddy; Lin, Chi; and Anagol-Subbarao, Anjali, 5,482,819, Cl. 430-394.000.
- National Starch and Chemical Investment Holding Corporation: See—  
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- Natsugari, Hideaki; Ikeda, Hitoshi; Ishimaru, Takeroni; and Doi, Takayuki, to Takeda Chemical Industries, Ltd. Condensed heterocyclic compounds, their production and use. 5,482,967, Cl. 514-457.000.
- Natural Grilling & Fuel Systems, Inc.: See—  
Kronman, Leonard, 5,481,965, Cl. 99-340.000.
- Naus, Josef P. M.: See—  
Kools, Jacques C. S.; Naus, Josef P. M.; Folkerts, Wierke; and Gijs, Martinus A. M., 5,481,808, Cl. 33-357.000.
- Nava, Fabiola: See—  
Jara, Javier; Soto, Heriban; and Nava, Fabiola, 5,482,694, Cl. 423-364.000.
- Neal, James R.; Brown, Peter F.; Agatstein, Louis W.; and Gutman, Michael, to Intel Corporation. Employing on die temperature sensors and fan-heatsink failure signals to control power dissipation. 5,483,102, Cl. 257-712.000.
- NEC Corporation: See—  
Aramaki, Toshiya, 5,483,521, Cl. 370-17.000.
- Fukuda, Takeshi, 5,483,495, Cl. 365-210.000.
- Ishii, Kenji, 5,483,279, Cl. 348-222.000.
- Katsuta, Hiroshi, 5,483,638, Cl. 395-183.060.
- Koma, Noriko, 5,483,591, Cl. 379-356.000.
- Kondo, Kunio; and Fukuda, Yujiro, 5,482,808, Cl. 430-111.000.
- Kuba, Hiroaki, 5,483,533, Cl. 370-79.000.
- Nakaya, Ken-ichi, 5,483,609, Cl. 385-29.000.
- Nishimura, Tomoyuki, 5,483,438, Cl. 364-149.000.
- Nonoyama, Akiko; and Goto, Yuji, 5,483,662, Cl. 455-3.200.
- Norimatsu, Hidehiko, 5,483,682, Cl. 455-127.000.
- Ohi, Susumu, 5,483,256, Cl. 345-98.000.
- Ohki, Junichi; and Koga, Toshio, 5,483,534, Cl. 370-84.000.
- Okamura, Toshiyuki, 5,483,540, Cl. 370-112.000.
- Okuhara, Yasuhiko, 5,483,293, Cl. 348-595.000.
- Otsuka, Kazuo, 5,483,324, Cl. 355-219.000.
- Sanada, Kohji, 5,483,488, Cl. 365-189.030.
- Sasaki, Yutaka, 5,483,679, Cl. 455-86.000.
- Sato, Yuichi, 5,483,643, Cl. 395-401.000.
- Shimoto, Tadanori; and Matsui, Koji, 5,483,101, Cl. 257-701.000.
- Yokoyama, Hiroaki, 5,482,889, Cl. 437-70.000.
- Nederlof, Leo, to Alcatel N.V. Resequencing system. 5,483,523, Cl. 370-58.300.
- Neel, Douglas E.: See—  
Pugh, Joel A.; Neel, Douglas E.; and Piercy, Kenneth J., 5,483,582, Cl. 379-144.000.
- Neeley, Jimmy E.: See—  
Clark, Lloyd D., Jr.; Mayhugh, Terry L.; Mayhugh, Terry L., Jr.; Neeley, Jimmy E.; and Vachon, Guy, 5,483,232, Cl. 340-853.100.
- Neidlinger, Hermann H.: See—  
Askari, Syed H.; and Neidlinger, Hermann H., 5,482,981, Cl. 523-106.000.
- Nelsen, James M.; Whinery, Larry D.; Gwinn, Kenneth W.; McBride, Donald D.; Luna, Daniel A.; Holder, Joseph P.; and Bliton, Richard J., to Sandia Corporation. Structurally efficient inflatable protective device. 5,482,317, Cl. 280-743.100.
- Nelson, Eldon L.: See—  
Krum, Richard G.; Nelson, Eldon L.; Mohajerani, Khosrow; and Moir, Michael B., 5,482,381, Cl. 384-480.000.
- Nelson, Joseph M., to Hrubetz Environmental Services, Inc. Method and apparatus for heating subsurface soil for decontamination. 5,482,402, Cl. 405-128.000.
- Nelson, Lloyd A.: See—  
Avery, Noyes L.; Barry, Edward G.; Carey, James T.; Crocker, Lisa S.; Feng, Flora W.; Hiebert, John; Horodysky, Andrew G.; and Nelson, Lloyd A., 5,482,521, Cl. 44-544.000.



Nelson, Mark; Vangeison, David; Evans, Phillip K.; and Wells, Robert, to Life Medical Technologies, Inc. System for facilitating the removal and safe disposition of medical needles. 5,482,207, Cl. 232-43.200.

Nelson, Paul E.: See—  
Dunning, Zenna J.; Nelson, Paul E.; Patjens, Hinrich C.; Shofner, James A.; and Yousko, David A., 5,482,409, Cl. 408-1.00R.

Nelson, Robert K. Underwater seat restraint apparatus. 5,481,764, Cl. 4-559.000.

Nelson, William E., to Texas Instruments Incorporated. Method and apparatus for patterning an imaging member. 5,482,818, Cl. 430-394.000.

Nemura, Masaharu; Aoki, Tomohiro; Murayama, Yasushi; Uchida, Takashi; Kobayashi, Tohru; Ikatai, Masatoshi; Mitomi, Tatsuo; and Takanaka, Yasuyuki, to Canon Kabushiki Kaisha. Ink jet recording apparatus. 5,483,267, Cl. 347-32.000.

Nenninger, Charles L. Releasable mop head. 5,481,777, Cl. 15-151.000.

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Peppiatt, Nicholas A.; and Nentwig, Willibald, 5,482,296, Cl. 277-24.000.

Nepple, Bruce C.: See—  
English, James D.; and Nepple, Bruce C., 5,483,688, Cl. 455-184.100.

Nergeco (Societe Anonyme): See—  
Kraeutler, Bernard, 5,481,943, Cl. 74-609.000.

Nerone, Louis R.: See—  
Kachmarik, David J.; Nerone, Louis R.; Secen, Michael M.; and Haas, Kurt W., 5,483,125, Cl. 315-106.000.

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Nestler, Gerhard: See—  
Herbst, Holger; Nestler, Gerhard; Darlington, Jerry; and Martan, Hans, 5,482,597, Cl. 203-38.000.

Nestrick, Terry J.: See—  
LaPack, Mark A.; Nestrick, Terry J.; and Tou, James C., 5,482,862, Cl. 436-52.000.

Neudert, Hans: See—  
Wolf, Bernd; Mueller, Juergen; and Neudert, Hans, 5,482,610, Cl. 204-298.100.

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Carlow, Clotilde K. S.; and Page, Antony, 5,482,850, Cl. 435-233.000.

New Holland North America, Inc.: See—  
Bay, Tod A.; Stauffer, Norman M.; and Bitner, Roy A., 5,481,876, Cl. 60-454.000.

New Mexico State University Technology Transfer Corp.: See—  
Beasley, Jeffrey S.; Ramamurthy, Hema; Ramirez-Angulo, Jaime; and DeYong, Mark R., 5,483,170, Cl. 324-537.000.

Newberg, Donald G.: See—  
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Newberry, Troy W.: See—  
Wynn, Stephen A.; Pearce, Ernest R.; D'Amico, Michael H.; Conway, Ursula M.; and Newberry, Troy W., 5,482,232, Cl. 248-27.100.

Newbrough, Jerry W.: See—  
Williamson, Mark E.; Newbrough, Jerry W.; Castleberry, Jeffrey P.; and Stracener, Steve W., 5,482,446, Cl. 417-474.000.

Newell Operating Company: See—  
Kuhar, Otto, 5,482,100, Cl. 160-170.000.

Newhouse, Mark A.: See—  
Borrelli, Nicholas F.; Cornelius, Lauren K.; Newhouse, Mark A.; and Tick, Paul A., 5,483,628, Cl. 385-142.000.

Newman, Ronald R.: See—  
Guzman, Alberto M.; Jenkins, Hodge E., III; Newman, Ronald R.; Sankar, Suryanarayan G.; and Tabacchi, John G., 5,481,983, Cl. 104-279.000.

Ney, Ronald P., Sr.: See—  
Kosa, Theodore; Magee, John H., Jr.; Martin, James W.; and Ney, Ronald P., Sr., 5,482,674, Cl. 420-42.000.

Ngai, Eugene Y.; and Gerver, Lester S., to Solvay Specialty Chemicals, Inc. Apparatus for containment and scrubbing of toxic gas from a leakage location and method therefor. 5,482,536, Cl. 95-131.000.

NGK Insulators, Ltd.: See—  
Ota, Takashi; and Fukuyama, Masashi, 5,482,585, Cl. 156-158.000.

Nguyen, Khanh C., to AT&T Corp. Byte error rate test arrangement. 5,483,542, Cl. 371-5.100.

Nguyen, Sach D.; and Dinh-Nguyen, Nguyen. Nonirritating liquid detergent compositions. 5,482,644, Cl. 252-122.000.

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Jeffries, Benjamin L.; Hyman, Barry; Shepherd, Matthew A.; Nguyen, Steven; Cleofe, Jaures F.; and Kim, Daehwan D., 5,482,305, Cl. 280-250.100.

Niedballa, Ulrich: See—  
Deutsch, Julius; Gries, Heinz; Klieger, Erich; Niedballa, Ulrich; Renke, Franz-Josef; Conrad, Juergen; and Muetzel, Wolfgang, 5,482,700, Cl. 424-9.364.

Niederer, Kurt W.: See—  
Rankin, Kathleen V.; and Niederer, Kurt W., 5,483,224, Cl. 340-539.000.

Niimi, Noritoshi: See—  
Hanasaki, Yasuaki; Tsukuda, Kazuaki; Watanabe, Hiroyuki; Tsuzuki, Kenji; Murakami, Mitsuyuki; and Niimi, Noritoshi, 5,482,916, Cl. 504-261.000.

Niinobe, Sadao: See—  
Nagai, Yasuhiko; Sasaki, Ryoichi; Niinobe, Sadao; Suzuki, Michio; Mizuguchi, Keizou; and Ikeba, Goro, 5,483,631, Cl. 395-155.000.

Nikko Co., Ltd.: See—  
Ishimoto, Zenichi, 5,482,494, Cl. 446-456.000.

Nikon Corporation: See—  
Aoki, Hitoshi; Wakabayashi, Hiroshi; Tsukahara, Daiki; and Miyamoto, Hidenori, 5,483,320, Cl. 354-475.000.

Imai, Yuji, 5,483,056, Cl. 250-201.400.

Ishiguro, Yasuaki, 5,483,284, Cl. 348-335.000.

Komatsu, Kouichiro; and Tanaka, Masashi, 5,483,348, Cl. 356-401.000.

Sakakibara, Yasuyuki; Makinouchi, Susumu; Magome, Nobutaka; and Shiraiishi, Naomasa, 5,483,311, Cl. 355-53.000.

Sakamoto, Hiroshi; Hagiuda, Nobuyoshi; Matsui, Hideki; and Takayanagi, Ryotaro, 5,483,319, Cl. 354-415.000.

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Nintendo Co. Ltd.: See—  
Otake, Masahiro; Takahashi, Toyofumi; Nishiumi, Satoshi; and Miyoshi, Michitaka, 5,483,257, Cl. 345-114.000.

Nippon Hoso Kyokai: See—  
Oikawa, Shiro; Takemoto, Takayuki; Katou, Tutomu; Suzuki, Shirou; and Tanioka, Kenkichi, 5,483,071, Cl. 250-370.090.

Nippon Mektron, Ltd.: See—  
Katono, Tomoko; and Tominaga, Hideki, 5,482,001, Cl. 117-4.000.

Nippon Paper Industries, Co., Ltd.: See—  
Satake, Toshimi; Nagai, Tomoaki; Takano, Toshiyuki; and Sekine, Akio, 5,482,913, Cl. 503-210.000.

Nippon Soken Inc.: See—  
Ito, Takeshi; Kanda, Tomoyuki; and Yoninaga, Muneo, 5,481,913, Cl. 73-504.160.

Nippon Steel Semiconductor Corp.: See—  
Hardee, Kim C.; and Cordoba, Michael V., 5,483,152, Cl. 323-314.000.

Nippon Telegraph & Telephone Corporation: See—  
Naganuma, Kazunori, 5,483,341, Cl. 356-345.000.

Yokomachi, Yukihiro; Saito, Kazuhito; Ikegaya, Kazuo; and Tomita, Nobuo, 5,483,608, Cl. 385-22.000.

Nippon Thompson Co., Ltd.: See—  
Yokota, Yasunori; Hidano, Kengo; and Yatsu, Takashi, 5,482,385, Cl. 384-572.000.

Nippon Zeon Co., Ltd.: See—  
Yamakawa, Masahiro; and Nakamura, Katsuya, 5,482,777, Cl. 428-425.900.

Nippondenso Co., Ltd.: See—  
Echigo, Masashi; Nagayama, Yoshitaka; Maeda, Takushi; Yamada, Toshitaka; and Kitano, Masahiko, 5,483,106, Cl. 257-783.000.

Hasegawa, Etsuo; Kajikawa, Yoshiharu; Morita, Takayuki; Okazaki, Suehiro; Yamamoto, Toshihiro; Nagasawa, Toshiya; and Sumi, Shogo, 5,481,886, Cl. 62-285.000.

Ito, Takeshi; Kanda, Tomoyuki; and Yoninaga, Muneo, 5,481,913, Cl. 73-504.160.

Kameyama, Shogo, 5,483,635, Cl. 395-182.120.

Kusase, Shin; Umeda, Atsushi; Hukaya, Saburo; Inomata, Noriyasu; Irie, Hitoshi; and Ishida, Hiroshi, 5,483,116, Cl. 310-263.000.

Nagasaka, Takashi; Saitou, Mitsuhiro; Koyasu, Takahisa; Ban, Hiroyuki; Otani, Yuji; Oka, Kengo; and Nagao, Kyoko, 5,483,217, Cl. 338-252.000.

Ohtsuki, Hiroshi; Ohara, Fumio; and Toyoshima, Shoji, 5,483,097, Cl. 257-632.000.

Sugiura, Wataru; and Miwa, Katsuteru, 5,483,060, Cl. 250-237.00R.

Nishi, Hironobu: See—  
Watanabe, Shingo; Mizukami, Mitsuo; and Nishi, Hironobu, 5,482,558, Cl. 118-728.000.

Nishi, Kenichi: See—  
Nakagawa, Kunihiro; Akaiwa, Shoji; Sumi, Seiichi; and Nishi, Kenichi, 5,482,815, Cl. 430-264.000.

Nishida, Akinori: See—  
Matsuda, Masanori; Gotoh, Eiji; and Nishida, Akinori, 5,483,323, Cl. 355-219.000.

Nishida, Hirofumi: See—  
Fujita, Tatsuo; Tokumitsu, Syuzo; Nishida, Hirofumi; Suzuki, Tadashi; Ono, Yukiyo; Terashima, Tetsuo; Tomizawa, Takeshi; Suzuki, Jiro; Asada, Syuji; and Nishikori, Yukiyo, 5,482,685, Cl. 422-174.000.

Nishigaki, Hideo: See—  
Shingai, Hiroshi; and Nishigaki, Hideo, 5,482,791, Cl. 429-23.000.

Nishihara, Toshihiko, to Fuji Koki Manufacturing Co., Ltd. Magnetic field alternation detecting apparatus. 5,483,156, Cl. 324-173.000.

Nishii, Sachiko: See—  
Urada, Masakazu; Kobayashi, Hisan; Yagi, Yukihiro; Hashimoto, Katsuhiko; and Nishii, Sachiko, 5,483,289, Cl. 348-468.000.

Nishikawa, Susumu; and Ikuma, Mariko, to System Stack, Co., Ltd. Plug-opening device for sealed container. 5,481,946, Cl. 81-3.200.

Nishikori, Yukiyo: See—  
Fujita, Tatsuo; Tokumitsu, Syuzo; Nishida, Hirofumi; Suzuki, Tadashi; Ono, Yukiyo; Terashima, Tetsuo; Tomizawa, Takeshi; Suzuki, Jiro; Asada, Syuji; and Nishikori, Yukiyo, 5,482,685, Cl. 422-174.000.

Nishimoto, Hiroshi: See—  
Midogochi, Susumu; Kame, Masafumi; Kasukawa, Takahisa; Takasu, Tetsuya; and Nishimoto, Hiroshi, 5,483,012, Cl. 525-459.000.

Nishimura, Tomoyuki, to NEC Corporation. Noise reducing estimator. 5,483,438, Cl. 364-149.000.

Nishino, Katsuya: See—  
Ooi, Takehiko; Fukui, Tetsuro; Kobayashi, Motokazu; Ueno, Kazunori; Kagami, Kenji; Suzuki, Masao; and Nishino, Katsuya, 5,482,814, Cl. 430-203.000.

Nishioka, Kei; Fujisawa, Masanori; and Kusaba, Katsumi, to Rohm Co., Ltd. Power amplifier circuit for audio signal and audio device using the same. 5,483,197, Cl. 330-273.000.

Nishiumi, Satoshi: See—  
Otake, Masahiro; Takahashi, Toyofumi; Nishiumi, Satoshi; and Miyoshi, Michitaka, 5,483,257, Cl. 345-114.000.

Nishiyama, Kazunari; and Konomoto, Koichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Viscose rayon fiber having superior appearance. 5,482,776, Cl. 428-400.000.

Nishizawa, Junichi; Kijima, Takahiko; Ezell, Edward F.; and Makihara, Akira, to Osaka Sanso Kogyo Ltd. Method and apparatus for measuring the dew point and/or frost point of a gas having low water content. 5,482,371, Cl. 374-20.000.

Nishizono, Isao: See—  
Ashihara, Yoshihiro; Nishizono, Isao; Minakawa, Hidetaka; Okada, Masahisa; Sakurabayashi, Yasuhide; Watanabe, Fumio; and Wakana, Shin-ichi, 5,482,839, Cl. 435-7.900.

Nissan Motor Co., Ltd.: See—  
Iwata, Toru; Murakami, Terukiyo; Tamura, Minoru; and Fukumura, Tomohiro, 5,482,133, Cl. 180-197.000.

Murakami, Koichi, 5,483,093, Cl. 257-355.000.

Nissei Plastic Industrial Co., Ltd.: See—  
Miyahara, Masaaki; Nakamura, Nobuyuki; and Takizawa, Kiyoto, 5,482,454, Cl. 425-547.000.

Nakamura, Nobuyuki; and Arai, Tsuyoshi, 5,482,662, Cl. 264-40.100.

Nissha Printing Co., Ltd.: See—  
Hashimura, Yasuhiro; Noguchi, Satoshi; Masaki, Kenichi; and Akai, Takahiro, 5,481,976, Cl. 101-415.100.

Nissin Electric Co., Ltd.: See—  
Glavish, Hilton F., 5,483,077, Cl. 250-492.200.

Hashimoto, Hajime; Kubota, Kazuo; Inoue, Daisuke; and Nogawa, Syuichi, 5,482,607, Cl. 204-298.250.

Nixon, Keith: See—  
Taylor, John; Hicks, Michael; Lamb, Richard; Bennett, Robert N.; Nixon, Keith; Ashcroft, Ian; Parkes, Adrian S.; and Smith, John P., 5,482,076, Cl. 137-318.000.

NOF Corporation: See—  
Ochi, Koji; Asano, Nobukazu; Matsuda, Kazunori; and Yanase, Kiyooki, 5,482,579, Cl. 149-83.000.

Nogami, Seizi: See—  
Suganuma, Yuzi; Matsuoka, Shigeru; Kamio, Keiji; Kashiwa, Yoshihiro; Nogami, Seizi; Saito, Kouichi; Yamazaki, Isao; Kigoshi, Hidechika; Aoyama, Naofumi; Watanabe, Toru; and Nozaki, Yoshihiro, 5,483,253, Cl. 345-87.000.

Nogawa, Syuichi: See—  
Hashimoto, Hajime; Kubota, Kazuo; Inoue, Daisuke; and Nogawa, Syuichi, 5,482,607, Cl. 204-298.250.

Nogi, Toshiharu: See—  
Hunt, Frank W.; and Nogi, Toshiharu, 5,482,023, Cl. 123-491.000.

Noguchi, Satoshi: See—  
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Nokia Mobile Phones Ltd.: See—  
Malkamaki, Esa; and Jokinen, Harri, 5,483,668, Cl. 455-33.200.

Nolan, Daniel A.: See—  
Gallagher, Daniel; Nolan, Daniel A.; Smith, David K.; Toler, J. Richard; and Watkins, Grant P., 5,483,612, Cl. 385-127.000.

Nolf, Jean-Marie E.; Vansant, Jan L.; Franckx, Joris I.; and Zadno, Reza, to N.V. Raychem S.A. Electrical connector. 5,482,467, Cl. 439-161.000.

Noma, Tsuyoshi: See—  
Watanabe, Yutaka; Hachimonji, Takayuki; Yamashita, Katsuya; Sekita, Sanae; and Noma, Tsuyoshi, 5,481,882, Cl. 62-70.000.

Nomura, Hiroshi: See—  
Uzile, Seiji; Azegami, Kazuyoshi; and Nomura, Hiroshi, 5,483,383, Cl. 359-819.000.

Nonaka, Kazuo: See—  
Takizawa, Hideaki; Nasu, Yasuhiro; Watanabe, Kazuhiro; Hirota, Shiro; Nonaka, Kazuo; Sato, Seii; and Majima, Teiji, 5,483,082, Cl. 257-59.000.

Nonaka, Naomichi: See—  
Kuwanoto, Hideki; Kuwabara, Tadashi; Koreeda, Hiroyuki; Nonaka, Naomichi; Nakane, Keiichi; Fujiwara, Masaki; and Masuda, Kiyoshi, 5,483,632, Cl. 395-156.000.

Nonoyama, Akiko; and Goto, Yuji, to NEC Corporation. Spade signal receiving station. 5,483,662, Cl. 455-3.200.

Nonweiler, Brian, to Quantel Limited. High resolution image storage whereby image is divided and stored as plural groups of horizontally and vertically interleavable data. 5,483,296, Cl. 348-719.000.

Norand Corporation: See—  
Mahany, Ronald L.; Sojka, Marvin L.; and West, Guy J., 5,483,676, Cl. 455-67.400.

Noranda, Inc.: See—  
Wint, Gregory; and Menard, Michel, 5,482,357, Cl. 299-14.000.

Nordgren, Timothy F.; Imling, Deborah K.; Ungari, Joseph L.; Killam, Donald G.; and McKeighen, Ronald E., to Advanced Technology Laboratories, Inc. Intraoperative ultrasound probe. 5,482,047, Cl. 128-662.030.

Nordson Corporation: See—  
Shutic, Jeffrey R.; Holland, Robert J.; and Carlson, John F., 5,482,556, Cl. 118-621.000.

Sprenger, Robert A.; and Raffa, Ray C., 5,483,042, Cl. 219-647.000.

Norfolk Southern Railway Co.: See—  
Browning, Don R., 5,481,950, Cl. 81-488.000.

Norimatsu, Hidehiko, to NEC Corporation. Apparatus for controlling an efficiency control signal to be supplied to a power amplification circuit in a time division multiple access mode. 5,483,682, Cl. 455-127.000.

Norita, Toshio: See—  
Hamada, Masataka; Yukawa, Kazuhiko; Ishida, Tokuji; Norita, Toshio; and Ueda, Hiroshi, 5,483,318, Cl. 354-402.000.

Noritsu Koki Co., Ltd.: See—  
Tanibata, Toru, 5,483,317, Cl. 354-321.000.

Norris, James W.; and Matheny, Alfred P., to United Technologies Corporation. Integral inner and outer shrouds and vanes. 5,482,433, Cl. 415-173.700.

Norsk Hydro a.s.: See—  
Askestad, Sigmund, 5,482,484, Cl. 441-5.000.

Norsolor: See—  
Hert, Marius, 5,483,001, Cl. 525-166.000.

Norsworthy, Steven R., to AT&T IPM Corp. Data converter with gain scaling including dither. 5,483,238, Cl. 341-131.000.

North Shore Laboratories, Inc.: See—  
Arbeiter, James H.; and Bessler, Roger F., 5,483,474, Cl. 364-724.010.

North, William E.: See—  
Dorris, Robert A.; North, William E.; and Malandra, Anthony J., 5,482,435, Cl. 416-97.00R.

Northern Telecom Limited: See—  
Adams, David M.; Makino, Toshihiko; and Chik, George K. D., 5,483,547, Cl. 372-45.000.

Brown, Anthony K. D., 5,483,195, Cl. 330-254.000.

Farque, Saleh M., 5,483,667, Cl. 455-33.100.

Pettitt, Martin J.; and Hadjifotiou, Anagnostis, 5,483,233, Cl. 340-870.260.

Nose, Hiroyasu: See—  
Kawade, Hisaaki; Kawada, Haruki; Sakai, Kunihiro; Matsuda, Hiroshi; Morikawa, Yuko; Yanagisawa, Yoshihiro; Kaneko, Tetsuya; Kawase, Toshimitsu; Kumomi, Hideya; Nose, Hiroyasu; and Kawakami, Eigo, 5,482,002, Cl. 117-90.000.

Nose, Masahiko: See—  
Sato, Mitsukuni; Kobayashi, Yosuke; Nose, Masahiko; and Yamamoto, Kenji, 5,482,192, Cl. 222-600.000.

Nose, Toshiro: See—  
Inoue, Nobuhiko; Nakano, Akira; Tsuda, Yukio; Sasaki, Katsunari; Nose, Toshiro; and Aihara, Masayoshi, 5,483,274, Cl. 347-206.000.

Novo Nordisk A/S: See—  
Branner, Sven; Hastrup, Sven; Eriksen, Nina; Lindegaard, Poul; Olsen, Ole H.; Casteleijn, Eric; Egmond, Maarten R.; Haverkamp, Johan; Musters, Wouter; and de Vlieg, Jakob, 5,482,849, Cl. 435-222.000.

Nozaki, Yoshihiro: See—  
Suganuma, Yuzi; Matsuoka, Shigeru; Kamio, Keiji; Kashiwa, Yoshihiro; Nogami, Seizi; Saito, Kouichi; Yamazaki, Isao; Kigoshi, Hidechika; Aoyama, Naofumi; Watanabe, Toru; and Nozaki, Yoshihiro, 5,483,253, Cl. 345-87.000.

Nozawa, Toshihide, to Olympus Optical Co., Ltd. Compact zoom lens system having high zoom ratio and wide view angle. 5,483,380, Cl. 359-686.000.

NSK Ltd.: See—  
Eda, Hiroshi; Shiono, Hironobu; and Chikuma, Isamu, 5,482,127, Cl. 180-79.100.

Osawa, Nobuyuki, 5,482,377, Cl. 384-45.000.

Sato, Takanobu; Takata, Hiroto; and Goio, Ryo, 5,482,382, Cl. 384-492.000.

NTN Corporation: See—  
Hayakawa, Hisashi; Kawashima, Kazuki; Yamazaki, Norio; Yamamoto, Ken; and Kitano, Satoshi, 5,482,262, Cl. 267-226.000.

Numao, Takaji, to Sharp Kabushiki Kaisha. Display controller for liquid crystal panel structure. 5,483,255, Cl. 345-98.000.

Numazawa, Ryo: See—  
Ozaki, Eiji; Sakimae, Akihiro; and Numazawa, Ryo, 5,482,847, Cl. 435-196.000.

Nunan, Douglas A.: See—  
Caruso, Christopher M.; Nunan, Douglas A.; and Gray, Charles A., 5,483,449, Cl. 364-424.050.

Nunn, Christopher J., to AT&T Wireless Communications Products, Ltd. Method and apparatus for controlling amplifier power. 5,483,198, Cl. 330-279.000.

Nurse, Harry L. Septic tank outlet filter. 5,482,621, Cl. 210-170.000.

Nycomed Salutar Inc.: See—  
Almen, Torsten; Berg, Arne; Chang, C. Allen; Droege, Michael; Dugstad, Harald; Fellman, Jere D.; Kim, Sook-Hui; Klavens, Jo; Rocklage, Scott M.; Rongved, Pål; Segal, Brent; and Watson, Alan D., 5,482,699, Cl. 424-9.420.

Nyström, Jan-Christian: See—  
Bergsten, Pär S. T.; and Nyström, Jan-Christian, 5,483,681, Cl. 455-126.000.

O.M.S.O. S.p.A.: See—  
Terzi, Fermo; and Verona, Massimo, 5,481,970, Cl. 101-146.000.

Obaishi, Hiroshi: See—



- Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,482,937, Cl. 514-219.000.
- OCE-Nederland, B.V.: See—  
Kessels, Gerardus G. J. C.; and Van Vliembergen, Eduardus J. W., 5,483,354, Cl. 358-444.000.
- Océ - Nederland, B.V.: See—  
van Stiphout, Johannes G. V.; Huyzer, Cornelis A. M.; Buis, Edwin J.; and Opbroek, Hans E., 5,483,269, Cl. 347-55.000.
- Ochi, Koji; Asano, Nobukazu; Matsuda, Kazunori; and Yanase, Kiyooki, to NOF Corporation. Gas generator compositions. 5,482,579, Cl. 149-83.000.
- Octamer, Inc.: See—  
Kun, Ernest; and Mendeleyev, Jerome, 5,482,975, Cl. 514-619.000.
- Ocel Communications Corporation: See—  
Brandman, Yigal; Koerschen, Charlotte; Lin, Frank C. H.; Olson, Peter D.; Soroosh, Shahryar; Subramaniam, Jason; and Todd, Bruce, 5,483,580, Cl. 379-88.000.
- Oda, Kazuhiro; Takizawa, Hideyuki; Yamada, Masamichi; Iwamoto, Fumio; and Iwai, Shoji, to Railway Technical Research Institute; and Sumitomo Precision Products Co., Ltd. Leg apparatus for the magnetically levitated vehicle. 5,481,984, Cl. 104-284.000.
- Oda, Keisuke: See—  
Higashi, Kazuhiko; Takakuwa, Kiyoshi; Arimoto, Kazuaki; Naruki, Kenichi; Fukumoto, Hiroshi; Kuwada, Terumi; and Oda, Keisuke, 5,483,275, Cl. 347-218.000.
- Odagawa, Satoshi: See—  
Kuwahara, Shingo; and Odagawa, Satoshi, 5,483,456, Cl. 364-449.000.
- O'Donnell, John J., Jr.; Killough, Joseph A.; and Allen, William A., to Bose Corporation. Radio receiving with microprocessor control. 5,483,689, Cl. 455-200.100.
- O'Donnell, Thomas A.; Besida, John; Pong, Teresa K. H.; and Wood, David G., to University of Melbourne, The. Process for the production of intermediates useful in the processing of ilmenite and related minerals. 5,482,691, Cl. 423-69.000.
- Oerlikon-Contraves Pyrotec AG: See—  
Engel, Walter; Rossmann, Rudolf; and Ernst, Anton, 5,481,980, Cl. 102-521.000.
- Ogawa, Tadashi, to Fuji Photo Film Co., Ltd. Silver halide photographic material and silver halide emulsion. 5,482,824, Cl. 430-567.000.
- Ogino, Akihisa: See—  
Ishida, Kazunori; Ishii, Tadao; Mori, Hiroyoshi; Akizuki, Susumu; and Ogino, Akihisa, 5,483,589, Cl. 379-220.000.
- Ogino, Tsukasa, to Canon Kabushiki Kaisha. Information recording and/or reproducing method and apparatus including head seek distance and direction control based on address information. 5,483,507, Cl. 369-32.000.
- Ogino, Tsukasa, to Canon Kabushiki Kaisha. Optical information recording and reproducing apparatus that approximates an error signal when one cannot be detected. 5,483,510, Cl. 369-44.340.
- Ogiso, Akira; Misawa, Tsutami; Imai, Rihoko; and Itoh, Hisato, to Mitsui Toatsu Chemicals, Inc. Benzopyran compound and use of the same. 5,482,986, Cl. 524-110.000.
- Ogiyama, Hiromi; and Haga, Hiroyoshi, to Ricoh Company, Ltd. Image transfer unit of image formation apparatus. 5,483,330, Cl. 355-277.000.
- Oglesby, Harvey D. Archery bow support. 5,482,241, Cl. 248-309.100.
- Ogura, Yoshio: See—  
Otone, Yukio; Doi, Kouji; Takeuchi, Youichi; Yamada, Koutaro; Ogura, Yoshio; and Ueno, Hiroshi, 5,483,322, Cl. 355-215.000.
- Ohara, Fumio: See—  
Ohtsuki, Hiroshi; Ohara, Fumio; and Toyoshima, Shoji, 5,483,097, Cl. 257-632.000.
- O'Hara, Kevin S.; Walston, William S.; Ross, Earl W.; and Darolia, Ramgopal, to General Electric Company. Nickel base superalloy and article. 5,482,789, Cl. 428-652.000.
- Ohara, Muneharu; and Mitsuhashi, Masakazu, to Mitsui Mining and Smelting Co., Ltd. Printed circuit inner-layer copper foil and process for producing the same. 5,482,784, Cl. 428-607.000.
- O'Hara, Robert B., Jr.; and Roberts, David G., to Advanced Micro Devices, Inc. Method and apparatus for modifying the contents of a register via a command bit. 5,483,566, Cl. 377-73.000.
- Ohbatake, Yohjiro: See—  
Mori, Shigeki; Ohbatake, Yohjiro; and Tsuchie, Morio, 5,482,138, Cl. 184-6.400.
- Ohi, Susumu, to NEC Corporation. LCD driving analog nonlinear operation circuit producing a composite drive voltage of function voltages of differential amplifiers. 5,483,256, Cl. 345-98.000.
- Ohio State University Research Foundation, The: See—  
Martin, Edward W., Jr., 5,482,040, Cl. 128-653.100.
- Ohishi, Takashi; Ishiwata, Hiroshi; and Kitahara, Nobuhiro, to Zexel Corporation. Pilot injection control system. 5,482,016, Cl. 123-299.000.
- Ohki, Junichi; and Koga, Toshio, to NEC Corporation. Transmitting system having transmitting paths with low transmitting rates. 5,483,534, Cl. 370-84.000.
- Ohmae, Katsuhiko; Okimoto, Yukihiro; and Furui, Takashi, to Mitsubishi Denki Kabushiki Kaisha; and Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Start control device for vehicle passenger protecting device. 5,483,451, Cl. 364-424.050.
- Ohmi, Masao; Takada, Fumiki; and Kizaki, Minoru, to Japan Atomic Energy Research Institute. Holder of fatigue test piece. 5,481,923, Cl. 73-860.000.
- Ohmi, Tadahi; Shinohara, Tsutomu; Yamaji, Michio; Ikeda, Nobukazu; and Yamamoto, Kenji, to Fujikin Incorporated. Pipe joint. 5,482,332, Cl. 285-328.000.
- Ohmori, Eiji: See—  
Yamada, Jun; Terashima, Masaki; Ooyama, Kenichi; and Ohmori, Eiji, 5,483,666, Cl. 455-33.100.
- Ohmura, Ryuichi, to Fuji Kogyo Co., Ltd. Reel seats for fishing rods. 5,481,820, Cl. 43-22.000.
- Ohnishi, Masaya: See—  
Okabayashi, Naonori; Hanafusa, Koichi; and Ohnishi, Masaya, 5,483,200, Cl. 330-308.000.
- Ohnishi, Takehiro: See—  
Ueda, Yoshihisa; Takiguchi, Syouji; Kanaboshi, Akira; and Ohnishi, Takehiro, 5,482,412, Cl. 408-36.000.
- Ohnishi, Tetsuya: See—  
Shimizu, Masatomo; Ikeda, Yoshinori; and Ohnishi, Tetsuya, 5,483,361, Cl. 358-529.000.
- Ohnmacht, Cyrus J.: See—  
Empfield, James R.; Ohnmacht, Cyrus J.; Russell, Keith; Trainor, Diane A.; and Warwick, Paul J., Jr., 5,482,969, Cl. 514-522.000.
- Ohno, Tadayoshi; Tanimoto, Koji; Mizuguchi, Mamoru; and Fujiwara, Shigeru, to Kabushiki Kaisha Toshiba. Electrostatic latent image forming apparatus having a plurality of photoelectric converters. 5,483,271, Cl. 347-129.000.
- Ohnstein, Thomas: See—  
Bauhahn, Paul E.; Ohnstein, Thomas; and Zook, James D., 5,483,387, Cl. 359-885.000.
- Ohsako, Nobuyuki: See—  
Sakurai, Yasuhisa; Okano, Teruo; Yokoyama, Masayuki; Kataoka, Kazunori; Nagasaki, Yukio; Ohsako, Nobuyuki; and Kato, Masao, 5,483,008, Cl. 525-408.000.
- Ohsawa, Kenji; Ito, Makoto; and Nagano, Mutsumi, to Sony Corporation. Etching method for forming a lead frame. 5,481,798, Cl. 29-827.000.
- Ohshima, Satoshi; Yumura, Motoo; Kuriki, Yasunori; Uchida, Kunio; and Ikazaki, Fumikazu, to Director-General of Agency of Industrial Science and Technology. Method and device for the production of carbon nanotubes. 5,482,601, Cl. 204-173.000.
- Ohshima, Shigeru, to Kabushiki Kaisha Toshiba. Optical communication system suitable for selective reception of multiple services. 5,483,368, Cl. 359-124.000.
- Ohta, Koichi, to Shindengen Electric Manufacturing Co., Ltd. Four layer semiconductor surge protector having plural short-circuited junctions. 5,483,086, Cl. 257-111.000.
- Ohta, Mitsuyasu: See—  
Hosokawa, Toshinori; Motohara, Akira; and Ohta, Mitsuyasu, 5,483,543, Cl. 371-23.000.
- Ohtaka, Isao, to Fujitsu Limited. Method and apparatus for controlling document printing in a line printer. 5,483,621, Cl. 395-110.000.
- Ohtani, Yoshiro: See—  
Fukunaga, Kazuhiro; Hijikata, Shigeki; Ishimura, Kimihiro; Ohtani, Yoshiro; Kimura, Kunio; Fujii, Masahiro; and Hata, Yoshiyuki, 5,482,929, Cl. 514-12.000.
- Ohtsubo, Hiroyasu; and Koshio, Kazuhiro, to Hitachi, Ltd. Video camera apparatus including programmable timing generation circuit. 5,483,290, Cl. 348-516.000.
- Ohtsuki, Hiroshi; Ohara, Fumio; and Toyoshima, Shoji, to Nippondenso Co., Ltd. Device protecting layer. 5,483,097, Cl. 257-632.000.
- Okawa, Shiro; Takemoto, Takayuki; Katou, Tutomn; Suzuki, Shiro; and Tanioka, Kenkichi, to Shimadzu Corp.; and Nippon Hoso Kyokai. Two-dimensional radiation detector. 5,483,071, Cl. 250-370.090.
- Oka, Kengo: See—  
Nagasaka, Takashi; Saitou, Mitsuhiro; Koyasu, Takahisa; Ban, Hiroyuki; Otani, Yuji; Oka, Kengo; and Nagaoka, Kyoko, 5,483,217, Cl. 338-252.000.
- Okabayashi, Naonori; Hanafusa, Koichi; and Ohnishi, Masaya, to Sharp Kabushiki Kaisha. Light-receiving and amplifying device capable of switching between gain levels at high speed and obtaining a sufficient signal-to-noise ratio over a wide range in quantity of incident light. 5,483,200, Cl. 330-308.000.
- Okabe, Takahiko; Monma, Genzo; and Yuzurihara, Hiroshi, to Canon Kabushiki Kaisha. Method for producing semiconductor device having alignment mark. 5,482,893, Cl. 437-192.000.
- Okada, Masahisa: See—  
Ashihara, Yoshihiro; Nishizono, Isao; Minakawa, Hidetaka; Okada, Masahisa; Sakurabayashi, Yasuhide; Watanabe, Fumio; and Wakana, Shin-ichi, 5,482,839, Cl. 435-7.900.
- Okada, Yoshihiro: See—  
Kitamura, Isaya; Nakamura, Yoshiki; Inami, Masakazu; and Okada, Yoshihiro, 5,483,090, Cl. 257-231.000.
- Okagaki, Hiroshi; Kameya, Takayuki; Ishizaki, Hiroshi; and Abe, Kazuya, to Koto Electric Co., Ltd. Hollow cathode discharge tube. 5,483,121, Cl. 313-618.000.
- Okamoto, Hiroyuki: See—  
Tsuda, Kazuhiko; Okamoto, Hiroyuki; and Hashimoto, Kazuhiro, 5,482,506, Cl. 454-155.000.
- Okamura, Hisashi; Kawamoto, Hiroshi; and Kikuchi, Makoto, to Fuji Photo Film Co., Ltd. Method for forming silver halide grains and a method for producing a silver halide photographic material. 5,482,826, Cl. 430-569.000.

- Okamura, Masahiko, to Matsushita Electric Industrial Co., Ltd. Quick channel selection system for broadcast areas having small number of active channels. 5,483,685, Cl. 455-179.100.
- Okamura, Toshiyuki, to NEC Corporation. Demultiplexer for demultiplexing serial multiplexed signal into bits. 5,483,540, Cl. 370-112.000.
- Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, to Eissai Co., Ltd. 1,4-diazepine derivative and its pharmaceutical use. 5,482,937, Cl. 514-219.000.
- Okano, Masayuki: See—  
Fujii, Satoru; Takayama, Ryoichi; Tomita, Yoshihiro; Okano, Masayuki; and Torii, Hideo, 5,483,067, Cl. 250-338.300.
- Okano, Teruo: See—  
Sakurai, Yasuhisa; Okano, Teruo; Yokoyama, Masayuki; Kataoka, Kazunori; Nagasaki, Yukio; Ohsako, Nobuyuki; and Kato, Masao, 5,483,008, Cl. 525-408.000.
- Okazaki, Mitsunari: See—  
Wheatley, Charles E., III; Izumiyama, Tooru; Kitamura, Tsuyoshi; and Okazaki, Mitsunari, 5,483,696, Cl. 455-318.000.
- Okazaki, Suehiro: See—  
Hasegawa, Etsuo; Kajikawa, Yoshiharu; Morita, Takayuki; Okazaki, Suehiro; Yamamoto, Toshihiro; Nagasawa, Toshiya; and Sumi, Shogo, 5,481,886, Cl. 62-285.000.
- Okazawa, Koichi; Kimura, Koichi; Kawaguchi, Hitoshi; Aburano, Ichiharu; Kobayashi, Kazushi; and Mochida, Tetsuya, to Hitachi, Ltd. Bus system for use with information processing apparatus. 5,483,642, Cl. 395-306.000.
- O'Keefe, Christian V., to Martin Marietta Corporation. Two-mode remote fiber optic sensor. 5,483,607, Cl. 385-11.000.
- Oketani, Tetsuya; and Ito, Toshio, to Howa Machinery, Ltd. Indexing device. 5,481,944, Cl. 74-816.000.
- Oki Electric Industry Co., Ltd.: See—  
Tanoi, Satoru, 5,483,204, Cl. 331-14.000.
- Tanuma, Jiro; Ishimizu, Hideaki; Hagiwara, Akira; and Kasai, Tadashi, 5,482,387, Cl. 400-124.280.
- Okimoto, Yukihiro: See—  
Ohmae, Katsuhiko; Okimoto, Yukihiro; and Furui, Takashi, 5,483,451, Cl. 364-424.050.
- Okuda, Kenichi: See—  
Uemura, Hiroki; Butsuen, Tetsuro; Yoshioka, Tooru; Doi, Ayumu; Okuda, Kenichi; Yamamoto, Yasunori; Adachi, Tomohiko; and Masuda, Naotsugu, 5,483,453, Cl. 364-424.020.
- Okuda, Masaaki; Kondo, Hajime; and Fujiwara, Eiji, to Tayca Corporation. Rust-preventive composition. 5,482,544, Cl. 106-14.120.
- Okuhara, Yasuhiko, to NEC Corporation. Output control circuit capable of carrying out a wide variety of fade operations. 5,483,293, Cl. 348-595.000.
- Okumura, Katsuya: See—  
Yano, Hiroyuki; and Okumura, Katsuya, 5,483,568, Cl. 378-44.000.
- Okura, Hideo: See—  
Umemoto, Hideya; Kawakita, Hiroaki; Samejima, Kazuo; Matsuyama, Mitsuhiro; Okura, Hideo; Matsuzaki, Kaname; and Kure, Masaji, 5,481,857, Cl. 56-12.600.
- Okuzumi, Isamu: See—  
Ishii, Hiroji; Tamada, Masanori; Yoshida, Satoru; and Okuzumi, Isamu, 5,482,510, Cl. 472-61.000.
- O'Leary, James, to Clam Industries Incorporated. Industrial washing-machine. 5,482,065, Cl. 134-111.000.
- O'Leary, Robert K.; and LaRocca, Paul J., to Becton, Dickinson and Company. Growth environment assembly and method of use thereof. 5,482,854, Cl. 435-283.100.
- Oles, Henry J.: See—  
Youngker, Ray; and Oles, Henry J., 5,483,308, Cl. 353-99.000.
- Olin Corporation: See—  
Pahl, Donald A., 5,481,869, Cl. 60-259.000.
- Olsen, Ib I. Electrochemical test cell for conductivity and transport measurements. 5,483,166, Cl. 324-450.000.
- Olsen, Ole H.: See—  
Branner, Sven; Hastrup, Sven; Eriksen, Nina; Lindegaard, Poul; Olsen, Ole H.; Casteleijn, Eric; Egmond, Maarten R.; Haverkamp, Johan; Musters, Wouter; and de Vlieg, Jakob, 5,482,849, Cl. 435-222.000.
- Olson, Allen L., to Riverwood International Corporation. Horizontal loading apparatus. 5,482,427, Cl. 414-789.600.
- Olson, Jon E.: See—  
El-Rabaa, A. Wadood; and Olson, Jon E., 5,482,116, Cl. 166-250.100.
- Olson, Peter D.: See—  
Brandman, Yigal; Koerschen, Charlotte; Lin, Frank C. H.; Olson, Peter D.; Soroosh, Shahryar; Subramaniam, Jason; and Todd, Bruce, 5,483,580, Cl. 379-88.000.
- Olson, Radley W.: See—  
Cheng, David C.; Hurst, Jerry E., Jr.; Olson, Radley W.; and Thompson, David A., 5,483,515, Cl. 369-124.000.
- Olympus Optical Co., Ltd.: See—  
Baba, Toshiro, 5,483,381, Cl. 359-717.000.
- Hasegawa, Akira; Omura, Masayoshi; Imade, Shinichi; and Ikuta, Eishi, 5,481,918, Cl. 73-642.000.
- Nagao, Masaki; and Tokui, Masaki, 5,483,313, Cl. 354-106.000.
- Nozawa, Toshihide, 5,483,380, Cl. 359-686.000.
- Omura, Masayoshi: See—  
Hasegawa, Akira; Omura, Masayoshi; Imade, Shinichi; and Ikuta, Eishi, 5,481,918, Cl. 73-642.000.
- Oncogen Inc.: See—  
Fell, H. Perry, Jr.; Folger-Bruce, Kim R.; and Yarnold, Susan M., 5,482,856, Cl. 435-320.100.
- O'Neil, Alan W.: See—  
Webb, Roderick P.; and O'Neil, Alan W., 5,483,340, Cl. 356-345.000.
- Ono, Akira; and Masaki, Taseo, to Uniden America Corporation; and Uniden Corporation. Automatic frequency search and storage method. 5,483,684, Cl. 455-161.200.
- Ono, Hiroyuki; and Ikarugi, Koichi, to International Business Machines Corporation. Digital servo control system. 5,483,439, Cl. 364-149.000.
- Ono, Naoki: See—  
Satomi, Shigeki; Nagao, Mitsunobu; and Ono, Naoki, 5,483,519, Cl. 370-16.000.
- Ono, Tomio: See—  
Nakamoto, Masayuki; and Ono, Tomio, 5,483,118, Cl. 313-309.000.
- Ono, Yukiyo: See—  
Fujita, Tatsuo; Tokumitsu, Syuzo; Nishida, Hirofumi; Suzuki, Tadashi; Ono, Yukiyo; Terashima, Tetsuo; Tomizawa, Takeshi; Suzuki, Jiro; Asada, Syuji; and Nishikori, Yukiyo, 5,482,685, Cl. 422-174.000.
- Onozaki, Manabu: See—  
Yoshida, Shinichi; Onozaki, Manabu; and Muramatsu, Tsuyoshi, 5,483,661, Cl. 395-800.000.
- Ooi, Takehiko; Fukui, Tetsuro; Kobayashi, Motokazu; Ueno, Kazunori; Kagami, Kenji; Suzuki, Masao; and Nishino, Katsuya, to Canon Kabushiki Kaisha. Thermal developing photosensitive member and image forming method using the thermal developing photosensitive member. 5,482,814, Cl. 430-203.000.
- Ookubo, Mamoru; Yamaguchi, Mitsugu; and Takeshita, Shigeru, to Kabushiki Kaisha Daikin Seisakusho. Lockup unit for torque converter having a friction element. 5,482,151, Cl. 192-3.290.
- Ooyama, Kenichi: See—  
Yamada, Jun; Terashima, Masaki; Ooyama, Kenichi; and Ohmori, Eiji, 5,483,666, Cl. 455-33.100.
- Opbroek, Hans E.: See—  
van Stiphout, Johannes G. V.; Huyzer, Cornelis A. M.; Buis, Edwin J.; and Opbroek, Hans E., 5,483,269, Cl. 347-55.000.
- Oppermann, Hermann: See—  
Huston, James S.; and Oppermann, Hermann, 5,482,858, Cl. 435-252.330.
- Opreescu, Florin; and Teener, Michael D., to Apple Computer, Inc. System for managing power consumption of devices coupled to a common bus. 5,483,656, Cl. 395-750.000.
- Opta Food Ingredients, Inc.: See—  
Cook, Richard B., 5,482,722, Cl. 426-3.000.
- Optical & Textile Limited: See—  
Lighthbody, Derek C., 5,483,424, Cl. 362-17.000.
- Ortega, Emilio J., to Automatic Spring Coiling Co. Nested spring assembly. 5,482,261, Cl. 267-168.000.
- Osaka Sanso Kogyo Ltd.: See—  
Nishizawa, Junichi; Kijima, Takahiko; Ezell, Edward F.; and Makiyara, Akira, 5,482,371, Cl. 374-20.000.
- Osawa, Hidemori: See—  
Osawa, Masakazu; and Osawa, Hidemori, 5,481,996, Cl. 114-67.00R.
- Osawa, Hiroshi: See—  
Iwamoto, Kazunori; Saitoh, Kenji; and Osawa, Hiroshi, 5,483,343, Cl. 356-351.000.
- Osawa, Masakazu; and Osawa, Hidemori. Speed-increased small boat. 5,481,996, Cl. 114-67.00R.
- Osawa, Nobuyuki, to NSK Ltd. Rail-connecting jig for linear guide. 5,482,377, Cl. 384-45.000.
- Osawa, Nobuyuki; Tomioka, Ichiro; and Deguchi, Mitsuhiro, to Mitsubishi Denki Kabushiki Kaisha. Associative storage memory. 5,483,479, Cl. 365-49.000.
- Osawa, Shunichi: See—  
Kondo, Kenichi; Saida, Takahiro; Taya, Shuichi; Iida, Toyoshi; Sotomura, Takeshi; Fujii, Yuko; Sato, Keiji; Takahashi, Mamoru; Yamakawa, Sadayasu; and Osawa, Shunichi, 5,482,614, Cl. 205-171.000.
- Osborn, John A. L. Variably assemblable figurative tile set for covering surfaces. 5,481,841, Cl. 52-311.200.
- Osborn, Susan V.: See—  
Brooks, Jon R.; Jensen, James M.; McConochie, Roberta M.; Osborn, Susan V.; Pearl, Amy E.; Schmidt, Carole M.; Seiler, Ann B.; Stowell, Carol P.; White, Thomas W.; and Wong, Wylie, 5,483,276, Cl. 348-2.000.
- Oshima, Terumitsu: See—  
Hori, Tadayoshi; Oshima, Terumitsu; Mizutani, Satoshi; and Kumazaki, Masanori, 5,482,086, Cl. 138-103.000.
- Oskar Frech GmbH & Co.: See—  
Fink, Roland, 5,482,101, Cl. 164-312.000.
- Ota, Haruo: See—  
Shimazaki, Hiroaki; and Ota, Haruo, 5,483,552, Cl. 375-233.000.
- Ota, Naritoshi, to Murata Kikai Kabushiki Kaisha. Spinning device having spaced apart front rollers and delivery rollers. 5,481,863, Cl. 57-328.000.
- Ota, Nobuhiro; Harano, Katsuko; and Fujimori, Naoki, to Sumitomo Electric Industries, Ltd. Method of working diamond with ultraviolet light. 5,483,038, Cl. 219-121.690.



Ota, Takashi; and Fukuyama, Masashi, to NGK Insulators, Ltd. Process for optically joining an optical fiber array to an opponent member. 5,482,585, Cl. 156-158.000.

Otake, Masahiro; Takahashi, Toyofumi; Nishiumi, Satoshi; and Miyoshi, Michitaka, to Nintendo Co. Ltd.; and Ricoh Co., Ltd. Background picture display apparatus and external storage unit used therefor. 5,483,257, Cl. 345-114.000.

Otani, Yuji: See—  
Nagasaka, Takashi; Saitou, Mitsuhiro; Koyasu, Takahisa; Ban, Hiroyuki; Otani, Yuji; Oka, Kengo; and Nagaoka, Kyoko, 5,483,217, Cl. 338-252.000.

Otis Elevator Company: See—  
Abraham, Detlev; and Riedel, Hans-Dietrich, 5,482,153, Cl. 198-322.000.

Kulak, Richard E., 5,482,142, Cl. 187-280.000.

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- Ruff, Leonard H., to Cadwell Industries, Inc. Needle electrode assembly, 5,482,038, Cl. 128-642.000.
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- Russell, Karl L. Precision abrasive saw, 5,482,026, Cl. 125-12.000.
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- Sadot, Philippe: See—  
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- Saito, Hitoshi, to Yazaki Corporation. Water seal plug for connector, 5,482,299, Cl. 277-209.000.
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- Sakai, Naoki; Shigei, Tetsuro; and Tanaka, Takayuki, to Toho Tayon Co., Ltd. Adsorption material comprising activated carbon fiber and polytetrafluoroethylene, 5,482,906, Cl. 502-402.000.
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- Sakuma, Yoshimori: See—  
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- Salminen, Reijo. Liquid removal apparatus and method for wood pulp, 5,482,594, Cl. 162-60.000.
- Salnick, Richard E.: See—  
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- Samsung Electronics Co., Ltd.: See—  
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- Sandia Corporation: See—  
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- Sandvik AB: See—  
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- Sångfors, Bo: See—  
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- Sangstat Medical Corporation: See—  
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- Sankar, Suryanarayan G.: See—  
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- Sankyo Saiki Mfg. Co., Ltd.: See—  
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- Sano, Yoshiaki: See—  
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- Santo, Tsuyoshi: See—  
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- Sanyo Chemical Industries, Ltd.: See—  
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- Sanyo Electric Co., Ltd.: See—  
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Kobayashi, Yuji, 5,483,048, Cl. 235-380.000.
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- Sarnicki, John T.: See—  
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- Saruwatari, Kevin S.: See—  
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- Saruwatari, Minoru; Saruwatari, Kevin S.; and Bourgonje, Fredrick A., to Qsine Corporation Limited. Hydraulic actuating system for a fluid transfer apparatus, 5,481,873, Cl. 60-421.000.
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- Sasaki, Katsunari: See—  
Inoue, Nobuhiko; Nakano, Akira; Tsuda, Yukio; Sasaki, Katsunari; Nose, Toshiro; and Aihara, Masayoshi, 5,483,274, Cl. 347-206.000.
- Sasaki, Masahiro; Ishii, Satoshi; Yamauchi, Yoshihiko; Kitamura, Katsushi; Toyoda, Shuji; and Ahiko, Kenkichi, to Snow Brand Milk Products Co., Ltd. Lactic acid bacteria, antibacterial substance produced by the bacteria, fermented milk starter containing the bacteria, and process for producing fermented milk by using the starter, 5,482,723, Cl. 426-43.000.
- Sasaki, Ryoichi: See—  
Nagai, Yasuhiko; Sasaki, Ryoichi; Niinobe, Sadao; Suzuki, Michio; Mizuguchi, Keizou; and Ikeba, Goro, 5,483,631, Cl. 395-155.000.
- Sasaki, Steven K.: See—  
Gentes, James J.; and Sasaki, Steven K., 5,481,762, Cl. 2-411.000.
- Sasaki, Yosuke: See—  
Takamiya, Minoru; Miyazaki, Toshiro; and Sasaki, Yosuke, 5,482,742, Cl. 427-156.000.
- Sasaki, Yutaka, to NEC Corporation. Radio communication apparatus capable of isolating a receiver from a transmitter during a reception operation, 5,483,679, Cl. 455-86.000.
- Saska, Michael; and Diack, Moustapha, to Board of Supervisors of Louisiana State University and Agricultural and Mechanical College. Separation of isotols from sugars and sugar alcohols, 5,482,631, Cl. 210-635.000.
- Sasox Processing Pty. Limited: See—  
Leonard, Rodney L.; and Whellock, John G., 5,482,534, Cl. 75-743.000.
- Sasuta, Michael D., to Motorola, Inc. Method for a communication unit that conserve source energy, 5,483,672, Cl. 455-54.100.
- SAT (Société Anonyme de Télécommunications): See—  
Pillan, Philippe; and Baudoin, Georges, 5,483,556, Cl. 375-340.000.
- Satake, Toshimi; Nagai, Tomoaki; Takano, Toshiyuki; and Sekine, Akio, to Nippon Paper Industries, Co., Ltd. Recording sheet, 5,482,913, Cl. 503-210.000.
- Satma: See—  
Allegret, Francis; Benmalek, Mohamed; and Gariel, Emmanuel, 5,482,743, Cl. 427-566.000.
- Sato, Fumiki; and Fujita, Kouichi, to Mitsubishi Denki Kabushiki Kaisha. Multiplying circuit and microcomputer including the same, 5,483,477, Cl. 364-757.000.
- Sato, Kazufumi: See—  
Arata, Koji; Sato, Kazufumi; and Maeda, Yuji, 5,483,132, Cl. 318-282.000.
- Sato, Keiji: See—  
Kondo, Kenichi; Saida, Takahiro; Taya, Shuichi; Iida, Toyoshi; Sotomura, Takeshi; Fujii, Yuko; Sato, Keiji; Takahashi, Mamoru; Yamakawa, Sadayasu; and Osawa, Shunichi, 5,482,614, Cl. 205-171.000.
- Sato, Masao; and Takeuchi, Yukio, to Seiko Instruments Inc. Electron beam microanalyzer, 5,483,065, Cl. 250-310.000.
- Sato, Mitsukuni; Kobayashi, Yosuke; Nose, Masahiko; and Yamamoto, Kenji, to Shinagawa Refractories Co., Ltd. Plate brick cartridge for a slide gate valve, and slide gate valve of using the cartridge, 5,482,192, Cl. 222-600.000.
- Sato, Noriko: See—  
Ishimoto, Manabu; Kato, Masayuki; Ariake, Hirokazu; and Sato, Noriko, 5,483,364, Cl. 359-9.000.
- Sato, Ryo; and Kataoka, Masako, to Sumitomo Chemical Company Limited. Herbicidal composition exhibiting synergistic activity, 5,482,922, Cl. 504-130.000.
- Sato, Seii: See—  
Takizawa, Hideaki; Nasu, Yasuhiro; Watanabe, Kazuhiro; Hirota, Shiro; Nonaka, Kazuo; Sato, Seii; and Majima, Teiji, 5,483,082, Cl. 257-59.000.
- Sato, Shigemi: See—  
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- Sato, Shinichi: See—  
Aoki, Makoto; Hattori, Yoshifumi; Yamamoto, Mayumi; Tochiwara, Shinichi; Takizawa, Yoshihisa; Nagashima, Akira; and Sato, Shinichi, 5,482,545, Cl. 106-22.000.
- Sato, Takano; Takata, Hiroto; and Goino, Ryo, to NSK Ltd. Ball bearing, 5,482,382, Cl. 384-492.000.
- Sato, Toshiaki: See—  
Yoshioka, Shimpei; Konishi, Kazuo; Maruyama, Koji; and Sato, Toshiaki, 5,483,491, Cl. 365-200.000.
- Sato, Yuichi, to NEC Corporation. Control circuit for data transfer between a main memory and a register file, 5,483,643, Cl. 395-401.000.
- Satoh, Akira: See—  
Mukataka, Hisashi; Imoo, Ryushi; Aiba, Hidemasa; Satoh, Akira; Nagata, Masahiro; and Tode, Hiroyoshi, 5,483,272, Cl. 347-129.000.
- Satoh, Hiroshi, to Ryobi Limited. Sanding apparatus, 5,482,499, Cl. 451-356.000.
- Satoh, Yutaka: See—  
Takahashi, Yoshikazu; Isogawa, Toshiaki; Satoh, Yutaka; and Shimizu, Shuji, 5,483,280, Cl. 348-296.000.
- Satomi, Shigeki; Nagao, Mitsunobu; and Ono, Naoki, to Hitachi, Ltd. Method and apparatus for line switching, 5,483,519, Cl. 370-16.000.
- Saturn Corporation: See—  
Downs, Robert C.; and Malloy, John D., 5,481,932, Cl. 74-331.000.
- Sauerhoefer, Marc R., to United Technologies Corporation. Method of post processing stereolithographically produced objects, 5,482,659, Cl. 264-401.000.
- Saul, Jonathan R.: See—  
Kornowski, Karl J.; Saul, Jonathan R.; LaPointe, Larry P.; and Marshall, Richard E., 5,482,350, Cl. 297-85.000.
- Saulnier, Bernard: See—  
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- Saulson, Saul S., to Frank W. Kerr Chemical Company. Flavored, ready to use activated charcoal antidote, 5,482,707, Cl. 424-125.000.
- Saurer, Eric; Grützel, Michael; and Meyer, Tobias, to Asulab S.A. Photovoltaic cell, 5,482,570, Cl. 136-255.000.
- Savile, Harry: See—  
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- Savu, Patricia M.: See—  
Janulis, Eugene P.; Johnson, Gilbert C.; Radcliffe, Marc D.; Savu, Patricia M.; Snustad, Daniel C.; and Spaw, Terence D., 5,482,650, Cl. 252-299.010.
- Sawayanagi, Yoichi; and Kawamura, Yutaka, to Dojin Iyaku-Kako Co., Ltd. Suppository preparation, 5,482,973, Cl. 514-570.000.
- Sawert, Ulf: See—  
Coha, Timothy F.; and Sawert, Ulf, 5,482,444, Cl. 417-363.000.
- Saxena, Sharad, to Texas Instruments Incorporated. Automated diagnosis using wafer tracking databases, 5,483,636, Cl. 395-183.010.
- Scarpiera, John C.: See—  
Scott, Ralph M.; and Scarpiera, John C., 5,482,269, Cl. 273-35.000.
- Scarpitta, Alain A.; Boucher, Didier; and Wintz, Thierry, to Etat Français represente par le Delege General pour l'Armement. Method and apparatus for emitting high power acoustic waves using transducers, 5,483,502, Cl. 367-158.000.
- Schafbuch, Paul J.; and Kuhlman, Charles R., to Fisher Controls International, Inc. Fluid control valve with attenuator and dynamic seal, 5,482,249, Cl. 251-118.000.
- Schäfer, Burkhard: See—  
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- Schappelle, Robert: See—  
Despain, Ronald R.; Dougherty, Don J.; Nachamkin, Jack; Schappelle, Robert; Stinson, Jon M.; and Weslow, Vanessa M., 5,483,169, Cl. 324-534.000.
- Scharlack, Jürgen: See—  
Höfken, Erich; Krüger, Dieter; Matten, Heinz; Pietzko, Günter; and Scharlack, Jürgen, 5,482,106, Cl. 164-454.000.
- Scheib, John P.: See—  
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- Scheid, Hubert: See—  
Hartermann, Ralf-Uwe; Scheid, Hubert; Schulze-Eckel, Reinald; and Papendick, Joachim, 5,482,110, Cl. 165-84.000.
- Schepers, Herman A. J.: See—  
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- Scherer, Karl-Heinz: See—  
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- Scherhag, Karl-Christoph, to Bayer Aktiengesellschaft. Low-residue high-extraction production of sodium dichromate, 5,482,690, Cl. 423-61.000.
- Schering Aktiengesellschaft: See—  
Deutsch, Julius; Gries, Heinz; Klieger, Erich; Niedballa, Ulrich; Renneke, Franz-Josef; Conrad, Juergen; and Muetzel, Wolfgang, 5,482,700, Cl. 424-9.364.
- Scheunemann, Ude: See—  
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- Schiavini, Jean-Pierre, to Sextant Avionique. Locking and heat-exchange device for modular printed circuit board holder structure, 5,483,420, Cl. 361-707.000.
- Schick, Hans G., to Upchurch Scientific, Inc. Column for liquid chromatography, 5,482,628, Cl. 210-198.200.
- Schiessel, Pirmin: See—  
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- Schirmer, Henry G., to W. R. Grace & Co.-Conn. Cross-linked film, 5,482,769, Cl. 428-335.000.



Schlumberger Technology Corporation: See—  
Clark, Lloyd D., Jr.; Mayhugh, Terry L.; Mayhugh, Terry L., Jr.; Neeley, Jimmy E.; and Vachon, Guy, 5,483,232, Cl. 340-853.100.  
Sloan, William R., 5,483,061, Cl. 250-254.000.  
Schlyer, David J.: See—  
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Schmid, Gotthard, to Heidelberg Druckmaschinen AG. Device for removing printing-unit cylinders from rotary printing presses, 5,481,972, Cl. 101-216.000.  
Schmid, Gotthard, to Heidelberg Druckmaschinen AG. Device for stiffening a rotary printing press, 5,481,973, Cl. 101-216.000.  
Schmid, Johannes, to TRW Repa GmbH. Device for securing a generally cylindrical gas generator cartridge in a housing block of a safety belt tensioner drive, 5,482,327, Cl. 280-806.000.  
Schmidt, Alfred. Damping element, 5,482,260, Cl. 267-141.000.  
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Schmitz, John W., Jr. Apparatus for lifting storage tanks and the like, 5,482,341, Cl. 294-93.000.  
Schnabel, Nannette M.: See—  
Lord, Peter C.; Van Antwerp, William P.; Mastrototaro, John J.; Cheney, Paul S., II; and Schnabel, Nannette M., 5,482,473, Cl. 439-67.000.  
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Schneider, Johannes, to Dewert Antriebs- u. Systemtechnik GmbH & Co KG. Lifting apparatus, 5,481,769, Cl. 5-617.000.  
Schölkens, Bernward: See—  
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Schonert, Klaus, and Reichardt, York, to Schöner, Klaus. Method of and apparatus for fine, very fine, and microfine comminution of materials having brittle behavior, 5,482,217, Cl. 241-24.000.  
Schröder, Ernst F., to Deutsche Thomson-Brandt GmbH. Artificially reducing signal reproduction quality of received degraded digitally coded audio data, 5,483,690, Cl. 455-226.100.  
Schubert, Gerrit; Baader, Ekkehard; Bickel, Martin; and Günzler-Pukall, Volkmar, to Hoechst Aktiengesellschaft. 2,4- and 2,5-bis(tetrazolyl)pyridines and the use thereof as pharmaceuticals, 5,482,953, Cl. 514-340.000.  
Schuette, Michael W.: See—  
Flesher, Robert W.; DeManche, Michael; and Schuette, Michael W., 5,483,076, Cl. 250-475.200.  
Schultz, Roy D.; Mohan, Robert J.; and Sirois, David W., to Ford Motor Company. Control system for a vehicle electrical system, 5,483,146, Cl. 322-7.000.  
Schulz, Werner. Printing cylinder mandrel and image carrier sleeve, 5,481,975, Cl. 101-375.000.  
Schulze, Everett E., Jr., to In-Store Media Systems, Inc. Coupon exchanging and check writing system, 5,483,049, Cl. 235-383.000.  
Schulze-Eckel, Reinald: See—  
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Schuster, Michael A.: See—  
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Schweier, Günther: See—  
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Scientific-Atlanta, Inc.: See—  
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West, John S.; Simpson, Raymond W.; Khoo, Samuel C.; Talmi, Yair; Nadolny, Raymond A.; and Blouke, Morley M., 5,483,091, Cl. 257-239.000.  
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Scoccia, Ardean, to General Motors Corporation. Apparatus and method for providing low refrigerant charge detection, 5,481,884, Cl. 62-129.000.  
Scofield, Wayne W., to Uniform Scanner Data Analysis, Inc. System for animal evaluation through image acquisition, 5,483,441, Cl. 364-400.000.  
Scott, Ralph M.; and Scarperia, John C. Driving range tee area diving method, 5,482,269, Cl. 273-35.00B.

Scott, Richard; Bleth, David; Banks, Gerald; Coppedge, Todd; DeWitt, William; Hahn, Oliver; Hunking, Maurice; Mullineaux, Wayne; Peters, Manfred; Smith, Richard; and Walter, Todd, to Baader North America Corporation. Apparatus for washing poultry carcasses, 5,482,503, Cl. 452-173.000.  
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Scruggs, David M.; Johnson, William L.; Bolton, Jimmie B.; and Peker, Atakan, to Amorphous Alloys Corp. Joining of metals using a bulk amorphous intermediate layer, 5,482,580, Cl. 148-528.000.  
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Seagate Technology, Inc.: See—  
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Krum, Richard G.; Nelson, Eldon L.; Mohajerani, Khosrow; and Moir, Michael B., 5,482,381, Cl. 384-480.000.  
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Seckinger, Karl; Milzner, Karlheinz; Kuhn, Fred; and Mohanty, Sasank S., to Sandoz Ltd. Hydanotin compounds, 5,482,921, Cl. 504-246.000.  
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Seelert, Stephan; Langhauser, Franz; Kerth, Jürgen; Müller, Patrik; Fischer, David; and Schweier, Günther, to BASF Aktiengesellschaft. Propylene polymers having low-temperature impact strength, 5,483,002, Cl. 525-240.000.  
Seesink, Petrus H. High voltage generator having output current control, 5,483,434, Cl. 363-60.000.  
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Seiceanu, Aurel; Logisz, Nicholas J.; and Beilke, Rueben M., to Trimm, Inc. Dual monitor self-contained six port digital signal cross-connect module, 5,482,469, Cl. 439-188.000.  
Seiko Communications Holding N.V.: See—  
English, James D.; and Nepple, Bruce C., 5,483,688, Cl. 455-184.100.  
Owen, Jeffrey R., 5,483,595, Cl. 380-23.000.  
Seiko Epson Corporation: See—  
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Maruyama, Akira, 5,483,485, Cl. 365-185.180.  
Murakami, Kenjiro; Kotaka, Toshikazu; Ishida, Hiroshi; Komuro, Kiyoto; Nakayama, Yoshiaki; Takahashi, Nobuhito; and Takehana, Satoshi, 5,482,390, Cl. 400-636.200.  
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Seitz, Thomas; and Dehne, Heinz-Wilhelm, to Bayer Aktiengesellschaft. Substituted amino acid amides, 5,482,972, Cl. 514-487.000.  
Sekiguchi, Kazuhiko; and Chikugo, Yoshihiko, to Zebra Co., Ltd. Corrector, 5,482,393, Cl. 401-214.000.  
Sekiguchi, Tadashi; Fujita, Hiroshi; Yoshinaga, Megumi; Honda, Masashi; and Watanabe, Izumi, to Kabushiki Kaisha Toshiba. Variable flexibility endoscope system, 5,482,029, Cl. 600-109.000.  
Sekiguchi, Tetsuo: See—  
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Sesona, Albert J.; and Blanco, Ernesto E. Automated pancake maker, 5,481,963, Cl. 99-335.000.  
Seto, Toshiaki, to Mitsubishi Denki Kabushiki Kaisha. Signal processing device for a two-dimensional solid-state imaging element, 5,483,281, Cl. 348-300.000.  
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SGS-Thomson Microelectronics, S.A.: See—  
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SGS-Thomson Microelectronics S.r.l.: See—  
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Shaffer, Donald E., to Du Pont de Nemours, E. I., and Company. Light weight tear resistant fabric, 5,482,763, Cl. 428-229.000.  
Shah, Gautam P., to W. R. Grace & Co.-Conn. Moisture barrier film, 5,482,771, Cl. 428-349.000.  
Shah, Navnit H.; Phupradit, Wantanee; and Railkar, Aruna, to Hoffmann-La Roche Inc. Colon-targeted delivery system, 5,482,718, Cl. 424-480.000.  
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Shah, Suresh D., to General Motors Corporation. Pulsating gas-assisted injection molding method and apparatus, 5,482,669, Cl. 264-572.000.  
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Yamada, Kazuo; Tanaka, Hideaki; Yoneda, Tetsuya; Mitate, Takehito; and Kitayama, Hiroyuki, 5,482,797, Cl. 429-218.000.  
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Sheifer, Ethel: See—  
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Sheppard, Sherman H., to Surry Chemicals, Inc. Process for bleaching textiles, 5,482,516, Cl. 8-111.000.  
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Shibata, Kazuyoshi: See—  
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Shieh, Chan-Long; Lungo, John; and Leiby, Michael S., to Motorola, Inc. VCSEL with an integrated heat sink and method of making, 5,482,891, Cl. 437-129.000.  
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Shigenobu, Katsumi: See—  
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Shigeta, Tetsuya, to Pioneer Electronic Corporation. Driving apparatus of plasma display panel, 5,483,252, Cl. 345-67.000.  
Shigetome, Kazuaki; and Suzuki, Katsunori, to Mitsubishi Denki Kabushiki Kaisha; and Mitsubishi Electric Engineering Company Limited. Serial data transfer apparatus, 5,483,553, Cl. 375-256.000.  
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Shim, Dae S.: See—  
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Shimadzu Corp.: See—  
Oikawa, Shiro; Takemoto, Takayuki; Katou, Tutomu; Suzuki, Shirou; and Tanioka, Kenkichi, 5,483,071, Cl. 250-370.090.  
Shimazaki, Hiroaki; and Ota, Haruo, to Matsushita Electric Industrial Co., Ltd. Adaptive equalizing apparatus for controlling the input signal level of quantized feedback, 5,483,552, Cl. 375-233.000.  
Shimizu, Daisuke; Miyashita, Kotaro; Hara, Yoshihisa; and Yoshio, Yamamoto, to Honda Giken Kogyo K.K. Control system for internal combustion engines, 5,482,020, Cl. 123-417.000.  
Shimizu, Isamu: See—  
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Takahashi, Yoshikazu; Isogawa, Toshiaki; Satoh, Yutaka; and Shimizu, Shuji, 5,483,280, Cl. 348-296.000.  
Shimizu, Tetsuya, to Canon Kabushiki Kaisha. Information recording and reproducing apparatus forming plural kinds of error detection or correction codes, 5,483,388, Cl. 360-53.000.  
Shimizu, Yasuo, to Honda Giken Kogyo Kabushiki Kaisha. Electrically operated power steering apparatus, 5,482,129, Cl. 180-79.100.  
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Shimizu, Yuji: See—  
Kawahara, Setsuko; Nakano, Yasushi; Shimizu, Yuji; and Sugitani, Shoichi, 5,482,762, Cl. 428-212.000.  
Shimomura, Naoyuki: See—  
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Kouichi; Tanoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,482,937, Cl. 514-219.000.  
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Shimosawa, Shigeru; and Fujii, Akira. Dental resin sheet, 5,482,464, Cl. 433-202.100.  
Shimoto, Tadanori; and Matsui, Koji, to NEC Corporation. Multilayer printed circuit board, 5,483,101, Cl. 257-701.000.  
Shimp, Alan B.: See—  
Matsko, Joseph J.; Engel, Joseph C.; and Shimp, Alan B., 5,483,408, Cl. 361-94.000.  
Shin, Choong-Sun, to Samsung Electronics Co., Ltd. Multi-bit test circuit of semiconductor memory device, 5,483,493, Cl. 365-201.000.  
Shin-Etsu Chemical Co., Ltd.: See—



- Kimura, Tsuneo; Miyoshi, Kei; and Arai, Masatoshi, 5,482,992, Cl. 524-588.000.
- Takahashi, Masaharu; and Tsuchida, Tomiyoshi, 5,482,978, Cl. 521-82.000.
- Shin, Shoichi; and Kawano, Makoto, to Toshiba Kikai Kabushiki Kaisha. Method and apparatus for making pre-cut pre-preg tape. 5,482,589, Cl. 156-268.000.
- Shinagawa Refractories Co., Ltd.: See—
- Sato, Mitsukuni; Kobayashi, Yosuke; Nose, Masahiko; and Yamamoto, Kenji, 5,482,192, Cl. 222-600.000.
- Shinchi, Akira; and Matsuura, Toshifumi, to Yazaki Corporation. Connector equipped with fitting lever and method of mounting winding spring in it. 5,482,394, Cl. 403-325.000.
- Shinde, Subhash L.: See—
- Duncombe, Peter R.; Shinde, Subhash L.; and Takamori, Takeshi, 5,482,903, Cl. 501-32.000.
- Shindengen Electric Manufacturing Co., Ltd.: See—
- Ohta, Koichi, 5,483,086, Cl. 257-111.000.
- Shingai, Hiroshi; and Nishigaki, Hideo, to Fuji Electric Co., Ltd. Fuel cell/gas turbine combined power generation system and method for operating the same. 5,482,791, Cl. 429-23.000.
- Shinjo, Kenji; Terada, Masahiro; Uchimi, Toshiharu; Yoshida, Akio; Togano, Takeshi; Asaoka, Masanobu; and Iwaki, Takashi, to Canon Kabushiki Kaisha. Chiral smectic liquid crystal composition and device using the same. 5,482,652, Cl. 252-299.610.
- Shink, Joseph M., to Auto-Shade, Inc. Easily stored pillow and blanket and method. 5,481,768, Cl. 5-482.000.
- Shinko Electric Industries Co., Ltd.: See—
- Kobayashi, Tsuyoshi; and Saitoh, Misa, 5,482,609, Cl. 204-412.000.
- Shinohara, Isao, to Matsushita Electric Industrial Co., Ltd. Tape recorder for use with analog compact cassettes and digital tape cassettes. 5,483,395, Cl. 360-96.500.
- Shinohara, Tsutomu: See—
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- Shiojima, Nobuo; and Enomoto, Sadakazu, to Toshiba Battery Co., Ltd. Secondary battery charging circuit. 5,483,145, Cl. 320-35.000.
- Shiono, Hironobu: See—
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- Shiraishi, Naomasa: See—
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- Shirota, Riichi: See—
- Endoh, Tetsuo; and Shirota, Riichi, 5,483,484, Cl. 365-185.180.
- Shishizuka, Junichi: See—
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- Shmookler, Simon; Weinberg, Andrew G.; and McGrath, Martin J., to Applied Materials, Inc. System and method for automated positioning of a substrate in a processing chamber. 5,483,138, Cl. 318-568.160.
- Shofner, James A.: See—
- Dunning, Zenna J.; Nelson, Paul E.; Patjens, Hinrich C.; Shofner, James A.; and Youso, David A., 5,482,409, Cl. 408-1.00R.
- Sholtes, Tamar A.: See—
- Gedney, Ronald W.; and Sholtes, Tamar A., 5,483,421, Cl. 361-771.000.
- Shore, James B. Quick connect coupling device. 5,482,331, Cl. 285-314.000.
- Shorwell, Hugh V.; Weber, Earl K.; and Liu, Sung C., to AMSTED Industries Incorporated. Cast steel composition for railway components. 5,482,675, Cl. 420-105.000.
- Shoup, Robert D.: See—
- Havewala, Noshir B.; Morris, Kevin T.; and Shoup, Robert D., 5,482,526, Cl. 65-134.100.
- Showa Aluminum Kabushiki Kaisha: See—
- Sasaki, Hironaka; Hoshino, Ryoichi; and Yasutake, Takayuki, 5,482,112, Cl. 165-110.000.
- Shrivastava, Udy: See—
- Natarajan, Siva; Shrivastava, Udy; Siu, William M.; and Palmer, Mark J., 5,483,099, Cl. 257-691.000.
- Shroff, David N.: See—
- Rippetoe, William W.; and Shroff, David N., 5,482,629, Cl. 210-448.000.
- Shur, Robert D., to VLSI Technology, Inc. Vector-specific testability circuitry. 5,483,544, Cl. 371-27.000.
- Shutic, Jeffrey R.; Holland, Robert J.; and Carlson, John F., to Nordson Corporation. Apparatus for mounting and moving coating dispensers. 5,482,556, Cl. 118-621.000.
- Sick, Paul W.: See—
- Matzner, Bruce; Johansson, Eric B.; Wolters, Richard A., Jr.; Dunlap, Thomas G.; Elkins, Robert B.; King, Harold B.; Sick, Paul W.; and Ledford, Kevin L., 5,483,564, Cl. 376-352.000.
- Sieba AG: See—
- Fischer, Bruno; and Bachofen, Bruno, 5,481,794, Cl. 29-747.000.
- Sieczka, Eric J.: See—
- Tai, Anthony M.; Upatnieks, Juris; and Sieczka, Eric J., 5,483,362, Cl. 359-1.000.
- Siemens Aktiengesellschaft: See—
- Kohlert, Erich; and Wixel, Otto, 5,481,929, Cl. 73-865.800.
- Lohninger, Gerhard, 5,483,206, Cl. 331-107.0SL.
- Rokitsky, Walter, 5,483,648, Cl. 395-550.000.
- Siemens Automotive S.A.: See—
- Titli, Andre; and Roukieh, Samir, 5,483,450, Cl. 364-424.050.
- Siemens Medical Systems, Inc.: See—
- Addiss, Robert R.; Gordon, Stephen E.; and Staats, Stephen J., 5,482,049, Cl. 128-673.000.
- Siemens Plessey Controls Limited: See—
- Moss, Adrian J.; Hewinson, John; Walton, Peter; Birch, Brian J.; Ball, Clare L.; James, Andrew W.; Atkinson, John K.; and Siuda, Przemyslaw R., 5,483,164, Cl. 324-425.000.
- Sienkiewicz, Henry R.: See—
- Green, David T.; Ratcliff, Keith; Millman, Keith L.; Sienkiewicz, Henry R.; and Palmer, Mitchell J., 5,482,197, Cl. 227-178.100.
- Silverbrook, Kia; Webb, Michael J.; and Walmsley, Simon R., to Canon Kabushiki Kaisha; and Canon Information Systems Research Australia Pty Ltd. Preprocessing pipeline for real-time object based graphics systems. 5,483,627, Cl. 395-133.000.
- Simatic, Michel: See—
- Eychenne, Yves; and Simatic, Michel, 5,483,520, Cl. 370-16.100.
- Simmons, Matthew S.: See—
- Weinberg, Aaron; Cunningham, Kenneth D.; Urban, Daniel; Simmons, Matthew S.; Land, Thomas; and Tucker, Martin W., 5,483,549, Cl. 375-200.000.
- Simon, Alain; and Dirollo, Bernard, to Commissariat à l'Energie Atomique. Cable lifting device for handling heavy loads within a tight shielded enclosure. 5,482,169, Cl. 212-245.000.
- Simon, David: See—
- McMillen, Keith A.; Simon, David; and Wright-Matthew, 5,483,535, Cl. 370-85.100.
- Simon, R. E.; and Mann, L. E. Apparatus for producing welding rod. 5,481,788, Cl. 29-81.130.
- Simon, Walter: See—
- Sippel, Achim; Heitmann, Thomas; Becker, Wilhelm; Unterstein, Klaus; Lecker, Jürgen; and Simon, Walter, 5,481,981, Cl. 102-522.000.
- Simons, Robert E.: See—
- Agonafer, Dereje; Anderson, Timothy M.; Chrysler, Gregory M.; Chu, Richard C.; Simons, Robert E.; and Vader, David T., 5,482,113, Cl. 165-137.000.
- Simpson, Raymond W.: See—
- West, John S.; Simpson, Raymond W.; Khoo, Samuel C.; Talmi, Yair; Nadolny, Raymond A.; and Blouke, Morley M., 5,483,091, Cl. 257-239.000.
- Sinaiko, Edwin S. Clip apparatus. 5,481,784, Cl. 24-67.900.
- Singer Company N.V., The: See—
- Hiratsuka, Katsuo; Ayuta, Masanori; and Nakayama, Koichi, 5,481,995, Cl. 112-437.000.
- Siol, Werner; and Koralewski, Klaus, to Roehm GmbH Chemische Fabrik. Thermoplastically processible elastomers with improved optical properties. 5,483,003, Cl. 525-309.000.
- Sippel, Achim; Heitmann, Thomas; Becker, Wilhelm; Unterstein, Klaus; Lecker, Jürgen; and Simon, Walter, to Rheinmetall GmbH. Sabot for a subcaliber projectile. 5,481,981, Cl. 102-522.000.
- Siracusa, Robert J., to General Electric Company. Method for forming transport cells for conveying compressed video data. 5,483,287, Cl. 348-426.000.
- Sirois, David W.: See—
- Schultz, Roy D.; Mohan, Robert J.; and Sirois, David W., 5,483,146, Cl. 322-7.000.
- Sismour, Albert C., Jr.: See—
- Bisell, Kathleen M.; Welborn, Cliff A.; Sismour, Albert C., Jr.; and Montgomery, Lon W., 5,483,112, Cl. 310-61.000.
- Sitler, Fred C., to Rosemount Inc. Organic chemical sensor. 5,482,678, Cl. 422-90.000.
- Siu, William M.: See—
- Natarajan, Siva; Shrivastava, Udy; Siu, William M.; and Palmer, Mark J., 5,483,099, Cl. 257-691.000.
- Siuda, Przemyslaw R.: See—
- Moss, Adrian J.; Hewinson, John; Walton, Peter; Birch, Brian J.; Ball, Clare L.; James, Andrew W.; Atkinson, John K.; and Siuda, Przemyslaw R., 5,483,164, Cl. 324-425.000.
- Sjostrand, Mats: See—
- Soderberg, Staffan; Shahani, Hamid; and Sjostrand, Mats, 5,482,748, Cl. 427-577.000.
- Skibinski, Gary; and Gilmore, Thomas, to Allen-Bradley Company, Inc. Precharge circuit having microprocessor-based firing angle control circuitry. 5,483,142, Cl. 320-1.000.
- Skinner, David L.: See—
- Peterson, Thomas L.; Rhodes, Larry K.; Robertson, Thomas C.; and Skinner, David L., 5,482,365, Cl. 305-54.000.
- Slater, Charles R.; Palmer, Matthew A.; Whittier, John R.; and Zwiefel, Aaron R., to Symbiosis Corporation. Endoscopic biopsy forceps devices with selective bipolar cautery. 5,482,054, Cl. 128-751.000.
- Slavtcheff, Craig S.; Barrow, Stephen R.; Kanga, Vispi D.; Cheney, Michael C.; and Znaiden, Alexander, to Chesebrough-Pond USA Co., Division of Conopco, Inc. Cosmetic composition for treatment of pimples and redness. 5,482,710, Cl. 424-195.100.
- Sloan, William R., to Schlumberger Technology Corporation. Gamma ray scintillation detector apparatus and method for reducing shock induced noise. 5,483,061, Cl. 250-254.000.
- SMC Corporation: See—

- Watanabe, Masayuki; Fujiwara, Nobuhiro; Kaneko, Kunihisa; and Kanazawa, Kenji, 5,481,959, Cl. 91-361.000.
- Smith, Adlai H.; and Hunter, Robert O., Jr., to Litel Instruments. High power phase masks for imaging systems. 5,482,801, Cl. 430-5.000.
- Smith, B. Jane: See—
- Clark, Frederic L.; Clift, Gilbert; Hendrick, Kendall B.; Kanewske, William J., III; Lagocki, Peter A.; Martin, Richard R.; Mitchell, James E.; Moore, Larry W.; Pennington, Charles D.; Walker, Edna S.; Smith, B. Jane; Tayi, Apparao; Vaught, James A.; and Yost, David A., 5,482,861, Cl. 436-48.000.
- Smith, Cassandra L.: See—
- Cantor, Charles R.; Ito, Takashi; and Smith, Cassandra L., 5,482,836, Cl. 435-6.000.
- Smith, Charles W.; and Millwood, Jimmy E., to Spartan Mills. Method of manufacturing a recyclable carpet. 5,481,786, Cl. 28-107.000.
- Smith, David K.; Hodson, Peter D.; and Wass, Anthony C. L., to Astra Aktiebolag. Dry powder inhalers. 5,482,032, Cl. 128-203.150.
- Smith, David K.: See—
- Gallagher, Daniel; Nolan, Daniel A.; Smith, David K.; Toler, J. Richard; and Watkins, Grant P., 5,483,612, Cl. 385-127.000.
- Smith, Dennis E.: See—
- Yohn, Brent D.; and Smith, Dennis E., 5,482,474, Cl. 439-79.000.
- Smith, Douglas H.; and Connell, Charles R., to Perkin-Elmer Corporation. Rotary scanning apparatus. 5,483,075, Cl. 250-458.100.
- Smith, Fred P.; Stragier, Marcel G.; Smith, Fred T.; and McAllister, Kevin L., to Heil Company, The. Gripping apparatus for omnifarious containers. 5,482,180, Cl. 220-523.000.
- Smith, Fred T.: See—
- Smith, Fred P.; Stragier, Marcel G.; Smith, Fred T.; and McAllister, Kevin L., 5,482,180, Cl. 220-523.000.
- Smith, Gail K., to University of Pennsylvania, The Trustees of the. Method for assessing canine hip dysplasia. 5,482,055, Cl. 128-782.000.
- Smith, Gary: See—
- Black, Barry; Mowry, David; and Smith, Gary, 5,483,442, Cl. 364-400.000.
- Smith, Graham: See—
- Coates, David; Sage, Ian C.; Greenfield, Simon; Smith, Graham; and Baxter, David W., 5,482,653, Cl. 252-299.630.
- Smith, Herbert J., III; and White, Thomas G., Jr. System for reading, storing and using bar-encoded data from a coded business card or other printed material. 5,483,052, Cl. 235-472.000.
- Smith, J. Al. Handgrip for a bat. 5,482,270, Cl. 273-72.00R.
- Smith, Jerry R. Golf club stand device. 5,482,247, Cl. 248-688.000.
- Smith, John P.: See—
- Taylor, John; Hicks, Michael; Lamb, Richard; Bennett, Robert N.; Nixon, Keith; Ashcroft, Ian; Parkes, Adrian S.; and Smith, John P., 5,482,076, Cl. 137-318.000.
- Smith, K. C. Portable attachment bar for attaching an intravenous container support apparatus to a patient transportation apparatus. 5,482,239, Cl. 248-229.130.
- Smith, Keith E.: See—
- Hogan, Steven J.; Feltz, Kristi T.; Murdock, Douglas R.; and Smith, Keith E., 5,483,587, Cl. 379-202.000.
- Smith, Larry L., to Budd Company, The. Universal inspection workpiece holder. 5,481,811, Cl. 33-573.000.
- Smith, Philip S. Bicycle attachment for trailering a pull-type golf cart. 5,482,304, Cl. 280-204.000.
- Smith, Richard: See—
- Scott, Richard; Bleth, David; Banks, Gerald; Coppedge, Todd; DeWitt, William; Hahn, Oliver; Hunking, Maurice; Mullineaux, Wayne; Peters, Manfred; Smith, Richard; and Walter, Todd, 5,482,503, Cl. 452-173.000.
- Smith, Roger W.: See—
- Richardson, Dale S.; and Smith, Roger W., 5,482,375, Cl. 383-64.000.
- SmithKline Beecham Corporation: See—
- Badger, Alison M., 5,482,959, Cl. 514-409.000.
- Smokoff, Timothy L.; and Horsley, Erik R., to SpaceLabs Medical, Inc. Method and system for providing safe patient monitoring in an electronic medical device while serving as a general-purpose windowed display. 5,482,050, Cl. 128-710.000.
- Smuk, Wojciech: See—
- Richter, Herbert A.; and Smuk, Wojciech, 5,482,349, Cl. 297-15.000.
- SMW Schneider & Weisshaupt GmbH: See—
- Kiefer, Jürgen, 5,481,951, Cl. 82-162.000.
- Snodgrass, Gary L.; Sprague, Lisa D.; Warren, Harold C., III; Jones, Douglas R.; and Kissel, Thomas R., to Johnson & Johnson Clinical Diagnostics, Inc. Wash composition containing signal stop reagent, test kit and method of use with peroxidase-labeled specific binding ligand. 5,482,831, Cl. 435-5.000.
- Snow Brand Milk Products Co., Ltd.: See—
- Sasaki, Masahiro; Ishii, Satoshi; Yamauchi, Yoshihiko; Kitamura, Katsushi; Toyoda, Shuji; and Ahiko, Kenkichi, 5,482,723, Cl. 426-43.000.
- Snustad, Daniel C.: See—
- Janulis, Eugene P.; Johnson, Gilbert C.; Radcliffe, Marc D.; Savu, Patricia M.; Snustad, Daniel C.; and Spawn, Terence D., 5,482,650, Cl. 252-299.010.
- Soares, Marcelo B.; and Efstratiadis, Argiris, to Trustees of Columbia University in the City of New York, The. Method for construction of normalized cDNA libraries. 5,482,845, Cl. 435-91.100.
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- Pacou, Claude; Vuillamy, Didier; Turet, Etienne; Desclos, Pierre; and Beaurain, André, 5,481,870, Cl. 60-266.000.
- Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "SNECMA": See—
- Havard, Jacques G. W. R.; Jouardet, Michel R.; Loreau, Jean-Yves M.; and Zanolin, Gérard L., 5,483,034, Cl. 219-121.640.
- Soderberg, Staffan; Shahani, Hamid; and Sjostrand, Mats, to Sandvik AB. Method for diamond coating by microwave plasma. 5,482,748, Cl. 427-577.000.
- Söderlund, Anders: See—
- Grönlund, Magnus; Söderlund, Anders; and Wallander, Anders, 5,483,565, Cl. 376-352.000.
- Soderquist, Charles E.: See—
- Sundén, Bengt; Forsström, Bo; Soderquist, Charles E.; and Storckman, Steven D., 5,482,447, Cl. 417-477.120.
- Soeda, Yuji: See—
- Shimizu, Kenji; Ishida, Hiroshi; Yamada, Yutaka; Izumi, Kiyoshi; Moro, Masashi; and Soeda, Yuji, 5,482,625, Cl. 210-321.840.
- Soeffge, Friedhelm; Kronewitter, Rudolf; and Michalski, Ralph, to Dr. Inc. h.c.F. Porsche AG. Subframe cross member. 5,482,321, Cl. 280-781.000.
- Sogabe, Kouichi: See—
- Nakahata, Seiji; Matsuura, Takahiro; Sogabe, Kouichi; and Yamakawa, Akira, 5,482,905, Cl. 501-9.600.
- Sogo, Hiroshi: See—
- Hatakeyama, Akihito; Sogo, Hiroshi; Kojima, Tamao; Horio, Yasuhiko; Tsukamoto, Masahide; and Fukumura, Yasushi, 5,481,795, Cl. 29-852.000.
- Sohn, Stephen M.: See—
- Sadjadi, Firooz A.; and Sohn, Stephen M., 5,483,066, Cl. 250-338.100.
- Sojka, Marvin L.: See—
- Mahany, Ronald L.; Sojka, Marvin L.; and West, Guy J., 5,483,676, Cl. 455-67.400.
- Soleau, Bert, to Eagle Research Group, Inc. Tire deflator and method of deflating a tire. 5,482,397, Cl. 404-6.000.
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- Ausiello, Francesco P.; Quelenis, Olivier; and Wallerand, Philippe, 5,482,019, Cl. 123-361.000.
- Soll, Richard M.; and Dollings, Paul J., to American Home Products Corporation. (3,4-dioxocyclobuten-1-yl)chromene, indene, and dihydronaphthalene derivatives as smooth muscle relaxants. 5,482,942, Cl. 514-254.000.
- Sollars, John A., Jr., to Milliken Research Corporation. Pleated inflatable cushion for passenger restraint. 5,482,318, Cl. 280-743.100.
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- Solvay Specialty Chemicals, Inc.: See—
- Ngai, Eugene Y.; and Gerver, Lester S., 5,482,536, Cl. 95-131.000.
- Somanetics Corporation: See—
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- Somerville Technology Group, Inc.: See—
- Carmody, Walter J.; and Coleman, Gary J., 5,482,600, Cl. 204-157.150.
- Son, David Y.: See—
- Keller, Teddy M.; and Son, David Y., 5,483,017, Cl. 528-5.000.
- Son, Hee Chul, to Daewon Electronics Co., Ltd. Cassette holder opening system having a damper. 5,483,396, Cl. 360-96.600.
- Sonai, Atsuo: See—
- Yamada, Shuji; Kanda, Motoya; Yoshizawa, Hiroyasu; and Sonai, Atsuo, 5,482,790, Cl. 429-9.000.
- Song, Deog-Young; Park, Seong-Yong; Lee, Chong-Nam; and Kang, Byung-Chang, to Samsung Electronics Co., Ltd. Assignment method and apparatus of virtual path and virtual channel identifiers in an asynchronous transfer mode. 5,483,525, Cl. 370-60.000.
- Song, Jang H., to Samsung Electronics Co., Ltd. Sound carrier detecting circuit. 5,483,297, Cl. 348-737.000.
- Song, Moon-Jong, to Samsung Electronics Co., Ltd. Power saving apparatus for use in peripheral equipment of a computer. 5,483,464, Cl. 364-492.000.
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- Sonoco Products Company: See—
- Drummond, Michael T.; Suski, William C.; Hill, Calvin G.; Lowry, James W.; and Roberts, Rodney W., 5,482,205, Cl. 229-201.000.
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- Ishida, Takeshisa, 5,483,392, Cl. 360-77.030.
- Ohsawa, Kenji; Ito, Makoto; and Nagano, Mutsumi, 5,481,798, Cl. 29-827.000.
- Takahashi, Yoshikazu; Isogawa, Toshiaki; Satoh, Yutaka; and Shimizu, Shuji, 5,483,280, Cl. 348-296.000.
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- Sorkin, Mikhail. Anti-theft gas pedal lock. 5,482,136, Cl. 180-287.000.
- Soroosh, Shahryar: See—
- Brandman, Yigal; Koerschen, Charlotte; Lin, Frank C. H.; Olson, Peter D.; Soroosh, Shahryar; Subramaniam, Jason; and Todd, Bruce, 5,483,580, Cl. 379-88.000.
- Soto, Heriban: See—



- Jara, Javier; Soto, Heribán; and Nava, Fabiola, 5,482,694, Cl. 423-364.000.
- Sotomura, Takeshi: See—  
Kondo, Kenichi; Saida, Takahiro; Taya, Shuichi; Iida, Toyoshi; Sotomura, Takeshi; Fujii, Yuko; Sato, Keiji; Takahashi, Mamoru; Yamakawa, Sadayasu; and Osawa, Shunichi, 5,482,614, Cl. 205-171.000.
- Souda, Shigeru: See—  
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- Sozanski, James A.: See—  
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- Spa Controls: See—  
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- SpaceLabs Medical, Inc.: See—  
Smokoff, Timothy L.; and Horsley, Erik R., 5,482,050, Cl. 128-710.000.
- Sparks, Cecil R.; and McKee, Robert J., to Gas Research Institute. Method and apparatus for assessing and quantifying pulsation induced error in gas turbine flow meters. 5,481,924, Cl. 73-861.030.
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Rossi, Robert J., 5,482,751, Cl. 428-37.000.
- Spartan Mills: See—  
Smith, Charles W.; and Millwood, Jimmy E., 5,481,786, Cl. 28-107.000.
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Janulis, Eugene P.; Johnson, Gilbert C.; Radcliffe, Marc D.; Savu, Patricia M.; Snustad, Daniel C.; and Spawn, Terence D., 5,482,650, Cl. 252-299.010.
- Specialty Silicone Products, Inc.: See—  
Reo, Ned J., 5,482,591, Cl. 156-306.600.
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Kaviani, Ali, 5,483,124, Cl. 315-86.000.
- Spencer, Robert A. Snap-on hinged shoe. 5,481,814, Cl. 36-138.000.
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- Spiersing, Gijbertus A. C. M.: See—  
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- Spinillo, Gary T.: See—  
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- Spisak, Joseph. Boat-lift apparatus. 5,482,401, Cl. 405-3.000.
- Spolter, Leonard: See—  
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- Sprague, Lisa D.: See—  
Snodgrass, Gary L.; Sprague, Lisa D.; Warren, Harold C., III; Jones, Douglas R.; and Kissel, Thomas R., 5,482,831, Cl. 435-5.000.
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- Spiester, Bart F., to Scientific-Atlanta, Inc. Radio frequency choke and tap. 5,483,208, Cl. 333-131.000.
- Square D Company: See—  
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- Staats, Stephen J.: See—  
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- Stafford, Rodney A.; and Kilroy, Michael M. Electronic animal identification system. 5,482,008, Cl. 119-174.000.
- Staggs, Jimmy L. Trailer hitch mirror alignment device. 5,482,310, Cl. 280-477.000.
- Stahl, Ingo: See—  
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- Stahlecker, Fritz; and Stahlecker, Hans. Spinning machine having a plurality of spinning stations with independently controllable delivery rollers. 5,481,860, Cl. 57-90.000.
- Stahlecker, Hans: See—  
Stahlecker, Fritz; and Stahlecker, Hans, 5,481,860, Cl. 57-90.000.
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- Standard Car Truck Company: See—  
Lin, Mark W.; and Sarnicki, John T., 5,481,985, Cl. 105-199.400.
- Stanek, Terrence L.; and Rhea, Stephen L., to Emerson Electric Co. Filling trough/dispensing cap. 5,482,190, Cl. 222-501.000.
- Stanford Telecommunications, Inc.: See—  
Weinberg, Aaron; Cunningham, Kenneth D.; Urban, Daniel; Simmons, Matthew S.; Land, Thomas; and Tucker, Martin W., 5,483,549, Cl. 375-200.000.
- Stanford, Thomas B., Jr.: See—  
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- Stanley Electric Co., Ltd.: See—  
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- Stanley, Lonnie D. Spinner blade and fishing lure using the same. 5,481,821, Cl. 43-42.130.
- Stanley Works, The: See—  
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- Stapel, Bernardus J.: See—  
Stapel, William C.; and Stapel, Bernardus J., 5,483,430, Cl. 362-348.000.
- Stapel, William C.; and Stapel, Bernardus J., to Ford Motor Company. Multi-faceted light reflector. 5,483,430, Cl. 362-348.000.
- Staples, Leven E., to Data Race, Inc. Method and apparatus for communicating data over a radio transceiver with a modem. 5,483,576, Cl. 379-58.000.
- Star Fabrication Limited: See—  
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- Starcke, Steven F.: See—  
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- Stark, Johann, to Ina Walzager Schaeffler KG. Bushed overrunning clutches. 5,482,150, Cl. 192-45.000.
- Stark, Kris R.; Lewman, Michael C.; Hardin, Stephen L.; and Chafin, William J., to General Motors Corporation. Filter for installation in an annular groove. 5,482,622, Cl. 210-232.000.
- Staron, Raymond J.; Burke, Thomas J.; Rinehart, Colleen A.; and Jasper, Taryl J., to Allen-Bradley Company, Inc. Apparatus to select computer program for execution. 5,483,654, Cl. 395-650.000.
- Stauffer, Norman L.: See—  
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- Stauffer, Norman M.: See—  
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- Staver, Anatoly M.: See—  
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- Stearns, Bryan J.: See—  
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- Steenon, George R.; and Calderwood, Michael T., to Keptel, Inc.; and Bell Atlantic Network Services, Inc. Electric circuit connector with auto-termination. 5,483,573, Cl. 379-2.000.
- Steffen, Dale D.: See—  
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- Steffey, Shirley: See—  
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- Stehlin, Thomas: See—  
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- Steigleder, Karl Z.: See—  
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- Steiner, Kurt E.: See—  
Adelman, Steven J.; and Steiner, Kurt E., 5,482,935, Cl. 514-182.000.
- Steinhorst, Michael: See—  
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- Stelte, Norbert: See—  
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- Stenzel, Gerhard; and Kaule, Witich, to GAO Gesellschaft für Automation und Organisation mbH. Method and apparatus for detecting printed images on documents by testing for the presence in the images of structural elements having defined regularities which are recognizable by the eye and common to a variety of documents. 5,483,602, Cl. 347-14.000.
- Stenzel, Klaus: See—  
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- Stephany, Joseph F.: See—  
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- Stepper, Mark R.: See—  
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- Steritech, Inc.: See—  
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- Stern, Jacques. Authentication process for at least one identification device using a verification device and a device embodying the process. 5,483,597, Cl. 380-30.000.
- Stevenson, Paul D., to General Motors Corporation. Electro-mechanical hybrid powertrain with self-engaging brakes for starting the engine. 5,482,512, Cl. 475-5.000.
- Stewart, Gary E. Business form with removable label and method for producing the same with label stock. 5,482,328, Cl. 283-81.000.
- Stiefel, Joseph F.: See—  
Molitor, Robert P.; Nesbitt, R. Dennis; Stiefel, Joseph F.; and Melvin, Terence, 5,482,286, Cl. 273-230.000.
- Nesbitt, R. Dennis; Stiefel, Joseph F.; and Melvin, Terence, 5,482,287, Cl. 273-232.000.
- Stiller, Mark H., to Combustion Engineering, Inc. Partitioned bisector regenerative air heater. 5,482,027, Cl. 126-99.00R.
- Stinson, Jon M.: See—  
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- Stirbl, Robert C.: See—  
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- Stirling, John A.; Anderson, Edward J.; and Farnocchi, Carol J., to Ciba-Geigy Corporation. Pigment compositions. 5,482,548, Cl. 106-496.000.
- Stockhausen, Dolf: See—  
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- Stoddart, Hugh F.: See—  
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- Stogel, Scott S., to Digital Acoustics, Inc. Voice recognition dialing system. 5,483,579, Cl. 379-88.000.
- Stolc, Michael: See—  
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- Stone, Myron, to Dipco Products Company, Inc. Folding assembled article, such as a toy airplane, with locking member. 5,482,489, Cl. 446-67.000.
- Stone, Robert S. Dumping toy. 5,482,292, Cl. 273-384.000.
- Storage Technology Corporation: See—  
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- Storckman, Steven D.: See—  
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- Storey, Thomas W.: See—  
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- StorMedia, Inc.: See—  
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- Stout, James T., to Mead Corporation, The. Handle reinforcement for a carton. 5,482,203, Cl. 229-117.130.
- Stover, Gerald E., to Williams Gunsight Company. Gun sight mounting system. 5,481,818, Cl. 42-100.000.
- Stowell, Carol P.: See—  
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- Stracener, Steve W.: See—  
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- Williamson, Mark E.; Newbrough, Jerry W.; Castleberry, Jeffrey P.; and Stracener, Steve W., 5,482,446, Cl. 417-474.000.
- Strack, David C.; Wilson, Tracy N.; and Willits, Donald V., to Kimberly-Clark Corporation. Polymeric strands including a propylene polymer composition and nonwoven fabric and articles made therewith. 5,482,772, Cl. 428-357.000.
- Strack, David C.: See—  
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- Straeter, Joseph G.: See—  
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- Straeter, William F.: See—  
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- Stragier, Marcel G.: See—  
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- Strait, Mark C. Structural building unit and method of making the same. 5,482,550, Cl. 106-677.000.
- Strashinsky, Alex R., Jr.: See—  
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- Stratford, John L.: See—  
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- Strausberg, Robert L.: See—  
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- Strausberg, Susan L.: See—  
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- Strubbe, Hugo J.; and Aalbersberg, Ijsbrand J., to Philips Electronics North America Corporation. System and method for finding a movie of interest in a large movie database. 5,483,278, Cl. 348-7.000.
- Stryer, Lubert: See—  
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- Strzempa, Michael C.: See—  
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- Stuedemann, Richard T.; Herlache, Russell L.; and Armstrong, Ray G., to General Motors Corporation. Position control apparatus for steering column. 5,481,938, Cl. 74-493.000.
- Sturman, Oded E.; Grill, Benjamin; Harrison, Lynn; and Hunter, Edwin. Chatterless low power AC solenoid without pole shading. 5,483,411, Cl. 361-160.000.
- Sturman, Philip C., Jr.; and Gray, Robert A., to General Electric Company. Induction heating of polymer matrix composites in a mold press. 5,483,043, Cl. 219-647.000.
- Sturrock, William R.: See—  
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- Subramanian, Jason: See—  
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- Subramanian, Munirpallam A., to Du Pont de Nemours, E. I., and Company. Ti-M-Cu-O-F superconductors. 5,482,917, Cl. 505-123.000.
- Sudama, Ram; Magid, David L.; and Ouellette, Kenneth W., to Digital Equipment Corporation. Mechanism for locating without search discrete application resources known by common name only in a distributed network computing environment. 5,483,652, Cl. 395-600.000.
- Suenaga, Ken-ichi: See—  
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- Suga, Yoichiro: See—  
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- Suganuma, Yuzi; Matsuoka, Shigeru; Kamio, Keiji; Kashiwa, Yoshihiro; Nogami, Seizi; Saito, Kouichi; Yamazaki, Isao; Kigoshi, Hidechika; Aoyama, Naofumi; Watanabe, Toru; and Nozaki, Yoshihiro, to Hitachi, Ltd. Portable information processing apparatus and liquid crystal display device. 5,483,253, Cl. 345-87.000.
- Sugata, Hiroyuki: See—  
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- Sugg, Rolin W.: See—  
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- Sugimoto, Katsumi: See—  
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- Sugimoto, Kenichi: See—  
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- Sugimoto, Susumu: See—  
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- Sugitani, Shoichi: See—  
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- Sugiura, Susumu; Mita, Yoshinobu; Shishizuka, Junichi; Takaoka, Makoto; Shimomura, Yukari; Matsumoto, Kentaro; Uda, Toyokazu; Sugiyama, Mitsumasa; Kobayashi, Shigetada; Hisada, Katsutoshi; Kaneko, Yoji; and Nakanishi, Hiroyuki, to Canon Kabushiki Kaisha. Color image communication apparatus and method. 5,483,358, Cl. 358-508.000.
- Sugiura, Wataru; and Miwa, Katsuteru, to Nippondenso Co., Ltd. Optical position sensor and isolation sensor using this position sensor. 5,483,060, Cl. 250-237.00R.
- Sugiyama, Chusi: See—  
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- Sugiyama, Mitsumasa: See—  
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- Suh, Kang-deok: See—  
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- Sujita, Shigeko; and Morito, Nobuyuki, to Kawasaki Steel Corporation. Organic composite coated steel strip having improved corrosion resistance and spot weldability. 5,482,787, Cl. 428-623.000.
- Sukoneck, Barry F.: See—  
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- Sukthakar, Sujat M.: See—  
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- Sullivan, Dennis E.; and Sullivan, Kevin M. Archery broadhead. 5,482,294, Cl. 273-422.000.
- Sullivan, Kevin M.: See—  
Sullivan, Dennis E.; and Sullivan, Kevin M., 5,482,294, Cl. 273-422.000.
- Sullivan, Stephen T. Infusion tube for wine barrels. 5,481,960, Cl. 99-277.100.
- Sulzer, James E., to Portec, Inc. Sortation table. 5,482,152, Cl. 193-32.000.
- Sumi, Seiichi: See—  
Nakagawa, Kunihiro; Akaiwa, Shoji; Sumi, Seiichi; and Nishi, Kenichi, 5,482,815, Cl. 430-264.000.
- Sumi, Shogo: See—  
Hasegawa, Etsuo; Kajikawa, Yoshiharu; Morita, Takayuki; Okazaki, Suehiro; Yamamoto, Toshihiro; Nagasawa, Toshiya; and Sumi, Shogo, 5,481,886, Cl. 62-285.000.
- Sumitomo Chemical Company Limited: See—  
Sato, Ryo; and Kataoka, Masako, 5,482,922, Cl. 504-130.000.
- Sumitomo Electric Industries, Ltd.: See—  
Nakahata, Seiji; Matsuura, Takahiro; Sogabe, Kouichi; and Yamakawa, Akira, 5,482,905, Cl. 501-9.600.
- Ota, Nobuhiro; Harano, Katsuko; and Fujimori, Naoji, 5,483,038, Cl. 219-121.690.
- Saen, Haruo; Suzuki, Ryuzo; Fujii, Hiroshi; and Iizuka, Atsushi, 5,481,894, Cl. 72-200.000.
- Saen, Haruo; and Suzuki, Ryuzo, 5,483,021, Cl. 174-117.0FF.
- Tanaka, Hirohisa, 5,483,452, Cl. 364-426.010.
- Yokomachi, Yukihiko; Saito, Kazuhito; Ikegaya, Kazuo; and Tomita, Nobuo, 5,483,608, Cl. 385-22.000.
- Sumitomo Heavy Industries, Ltd.: See—  
Asami, Hiroshi; and Suzuki, Mitsuru, 5,481,879, Cl. 62-6.000.
- Sumitomo Precision Products Co., Ltd.: See—  
Oda, Kazuhiro; Takizawa, Hideyuki; Yamada, Masamichi; Iwamoto, Fumio; and Iwai, Shoji, 5,481,984, Cl. 104-284.000.
- Sumitomo Rubber Industries, Ltd.: See—  
Hirakawa, Hidenori, 5,482,993, Cl. 524-189.000.
- Kajiura, Shinzo; Konii, Yoshio; and Yanase, Minao, 5,482,099, Cl. 152-209.00R.
- Kushimoto, Yoshikazu; and Yanase, Minao, 5,483,220, Cl. 340-444.000.
- Miyamoto, Kenichi; and Minamiguchi, Haruyoshi, 5,482,774, Cl. 428-374.000.
- Suzuki, Shigehiko, 5,482,102, Cl. 152-530.000.
- Yabuki, Yoshikazu; Hirakawa, Hidenori; and Koizumi, Yoshimasa, 5,482,285, Cl. 273-228.000.
- Sumitomo Wiring Systems, Ltd.: See—  
Atsumi, Keigo; and Saijo, Eiji, 5,482,470, Cl. 439-246.000.
- Hayashi, Hiroyuki; Saijo, Eiji; and Wakata, Shigekazu, 5,482,479, Cl. 439-736.000.
- Miyazaki, Sho, 5,482,480, Cl. 439-774.000.
- Tamura, Yoshikazu, 5,483,459, Cl. 364-469.000.
- Watanabe, Kaoru; and Kawase, Hajime, 5,482,476, Cl. 439-555.000.
- Summervauer, Ingomar J. K.: See—  
Hartwig, Thomas; Laager, Georg; and Summervauer, Ingomar J. K., 5,482,225, Cl. 242-559.400.
- Sun, Eric T.: See—  
Cordi, Alexis A.; and Sun, Eric T., 5,482,933, Cl. 514-81.000.
- Talley, John J.; Getman, Daniel P.; DeCrescenzo, Gary A.; Lin, Ko-Chung; Vazquez, Michael L.; Mueller, Richard A.; Reed, Kathryn L.; Heintz, Robert M.; Clare, Michael; Freskos, John N.; and Sun, Eric T., 5,482,947, Cl. 514-311.000.
- Sun Microsystems, Inc.: See—  
D'Souza, Godfrey P., 5,483,181, Cl. 326-98.000.
- Sundarajan, Srinivasan: See—  
Walker, Lee A.; Sundarajan, Srinivasan; and Fletcher, Geoffrey D., 5,482,344, Cl. 296-39.100.
- Sundberg, Steven A.: See—  
Barrett, Ronald W.; Pirrung, Michael C.; Stryer, Lubert; Holmes, Christopher P.; and Sundberg, Steven A., 5,482,867, Cl. 436-518.000.
- Sunden, Bengt; Forsstrom, Bo; Soderquist, Charles E.; and Storckman, Steven D., to Cole-Parmer Instrument Company. Peristaltic pump with rigid fluoroplastic tubing. 5,482,447, Cl. 417-477.120.
- Sunds Defibrator Industries Aktiebolag: See—  
Larsson, Arne, 5,482,666, Cl. 264-115.000.
- Sung, Rodney L. D.: See—  
Alam, Iftikhar; and Sung, Rodney L. D., 5,482,520, Cl. 44-336.000.
- Sung-Mu, Hsu, to Taiwan Semiconductor Manufacturing Comp. Ltd. Electrically programmable memory device with improved dual floating gates. 5,483,487, Cl. 365-185.330.
- Sunkist Growers, Inc.: See—  
Affeldt, Henry A.; and Conway, Tim D., 5,482,154, Cl. 198-370.040.
- Sura, Vivek M.: See—  
Kaja, Suryanarayana; Perfecto, Eric D.; Price, William H.; Purushothaman, Sampath; Reddy, Srinivasa N.; Sura, Vivek M.; and White, George E., 5,483,105, Cl. 257-779.000.
- Surry Chemicals, Inc.: See—  
Sheppard, Sherman H., 5,482,516, Cl. 8-111.000.
- Suski, William C.: See—  
Drummond, Michael T.; Suski, William C.; Hill, Calvin G.; Lowry, James W.; and Roberts, Rodney W., 5,482,205, Cl. 229-201.000.
- Sussman, Lester. Electronic on-line subscriber telephone directory. 5,483,586, Cl. 379-201.000.
- Suzaki, Hideo: See—  
Furuya, Hiromi; Taniguchi, Keishi; and Suzuki, Hideo, 5,482,912, Cl. 503-207.000.
- Suzuki, Chiaki; Torigoe, Tetsu; Iida, Yoshihiko; Kimura, Takaichi; and Aoki, Takayoshi, to Fuji Xerox Co., Ltd. Developer composition for electrostatic latent image comprising toner and carrier coated with inorganic oxide particles. 5,482,806, Cl. 430-106.600.
- Suzuki, Jiro: See—  
Fujita, Tatsuo; Tokumitsu, Syuzo; Nishida, Hirofumi; Suzuki, Tadashi; Ono, Yukiyo; Terashima, Tetsuo; Tomizawa, Takeshi; Suzuki, Jiro; Asada, Syuji; and Nishikori, Yukiyo, 5,482,685, Cl. 422-174.000.
- Suzuki, Katsunori: See—  
Shigetome, Kazuaki; and Suzuki, Katsunori, 5,483,553, Cl. 375-256.000.
- Suzuki, Kazuaki, to Nikon Corporation. Apparatus for detecting positions of marks in projection aligner wherein an auxiliary pattern is constructed to produce a signal level that is independent of the surface condition of a substrate. 5,483,349, Cl. 356-401.000.
- Suzuki, Masanori: See—  
Aoki, Mitsuo; Kato, Takahisa; Suzuki, Masanori; and Hagiwara, Tomoe, 5,482,807, Cl. 430-110.000.
- Suzuki, Masao: See—  
Ooi, Takehiko; Fukui, Tetsuro; Kobayashi, Motokazu; Ueno, Kazunori; Kagami, Kenji; Suzuki, Masao; and Nishino, Katsuya, 5,482,814, Cl. 430-203.000.
- Suzuki, Michio: See—  
Nagai, Yasuhiko; Sasaki, Ryoichi; Niinobe, Sadao; Suzuki, Michio; Mizuguchi, Keizou; and Ikeba, Goro, 5,483,631, Cl. 395-155.000.
- Suzuki, Mitsuru: See—  
Asami, Hiroshi; and Suzuki, Mitsuru, 5,481,879, Cl. 62-6.000.
- Suzuki, Norio: See—  
Meguro, Satoshi; Uchibori, Kiyofumi; Suzuki, Norio; Motoyoshi, Makoto; Koike, Atsuyoshi; Yamanaka, Toshiaki; Sakai, Yoshio; Kaga, Toru; Hashimoto, Naotaka; Hashimoto, Takashi; Honjou, Shigeru; and Minato, Osamu, 5,483,083, Cl. 257-69.000.
- Suzuki, Ryuzo: See—  
Saen, Haruo; Suzuki, Ryuzo; Fujii, Hiroshi; and Iizuka, Atsushi, 5,481,894, Cl. 72-200.000.
- Saen, Haruo; and Suzuki, Ryuzo, 5,483,021, Cl. 174-117.0FF.
- Suzuki, Shigehiko, to Sumitomo Rubber Industries, Ltd. Pneumatic motorcycle tire for improved cornering and straight running stability. 5,482,102, Cl. 152-530.000.
- Suzuki, Shirou: See—  
Oikawa, Shiro; Takemoto, Takayuki; Katou, Tutomu; Suzuki, Shirou; and Tanioka, Kenkichi, 5,483,071, Cl. 250-370.090.
- Suzuki, Tadashi: See—  
Fujita, Tatsuo; Tokumitsu, Syuzo; Nishida, Hirofumi; Suzuki, Tadashi; Ono, Yukiyo; Terashima, Tetsuo; Tomizawa, Takeshi; Suzuki, Jiro; Asada, Syuji; and Nishikori, Yukiyo, 5,482,685, Cl. 422-174.000.
- Suzuki, Tetsuya: See—  
Haga, Yoshihiro; Suzuki, Tetsuya; and Taima, Yasuo, 5,482,823, Cl. 430-567.000.
- Svanberg, Sune; and Johansson, Jonas. Image registering in color at low light intensity. 5,483,379, Cl. 359-634.000.
- Svenska Rotor Maskiner AB: See—  
Essle, Stefan; and Sangfors, Bo, 5,482,108, Cl. 165-3.000.
- Sweeney, Michael J.: See—  
Fleck, Charles J., Jr.; Fleck, Charles J., Jr.; and Sweeney, Michael J., 5,481,904, Cl. 73-61.510.
- Sweet, Randall P.: See—  
Ulman, Katherine L.; Sweet, Randall P.; and Durfee, Loren D., 5,482,988, Cl. 524-266.000.
- Sweger, Robert W.; Tsai, John J.; Pasapane, Joseph; and Bernard, Karen A., to National Starch and Chemical Investment Holding Corporation. Cosmetic compositions containing amino-multicarboxylate modified starch. 5,482,704, Cl. 424-70.130.
- Swerdlhoff, Stuart J., to Wisconsin Alumni Research Foundation. Computerized method for converting polar tomographic data to a cartesian image format. 5,483,567, Cl. 378-4.000.
- Swiatek, Frank; Leavitt, Richard; Chanski, Donald; Repetti, Ronald V.; and Willoughby, Drew, to Cuno Incorporated. Filter cells providing lifting means and related methods. 5,482,624, Cl. 210-238.000.
- Swift, Carl J., to Swift Computers, Inc. Logging recorder system for trucking radio. 5,483,675, Cl. 455-67.100.
- Swift Computers, Inc.: See—  
Swift, Carl J., 5,483,675, Cl. 455-67.100.
- Swiszc, Paul G.: See—  
Colson, Wendell B.; Akins, Terry; Jansen, Cees M.; Swiszc, Paul G.; and Anthony, James M., 5,482,750, Cl. 428-12.000.
- Symbiosis Corporation: See—  
Slater, Charles R.; Palmer, Matthew A.; Whitier, John R.; and Zwielfel, Aaron R., 5,482,054, Cl. 128-751.000.
- System Stack, Co., Ltd.: See—  
Nishikawa, Susumu; and Ikuma, Mariko, 5,481,946, Cl. 81-3.200.
- Systems Chemistry, Inc.: See—  
Hall, James C., 5,482,618, Cl. 210-85.000.
- T Kennel Systems, Inc.: See—  
Thom, Jerry D., 5,482,005, Cl. 119-17.000.
- T. Sendzimir, Inc.: See—  
Sendzimir, Michael G.; and Turley, John W., 5,481,895, Cl. 72-242.400.
- Tabacchi, John G.: See—

- Guzman, Alberto M.; Jenkins, Hodge E., III; Newman, Ronald R.; Sankar, Suryanarayan G.; and Tabacchi, John G., 5,481,983, Cl. 104-279.000.
- Tabor, Thomas A., to Spa Controls. Delamination resistant spa method of manufacture. 5,482,668, Cl. 264-512.000.
- Tabota, Jun; Yamashita, Muneharu; Asano, Hiroshi; Mizuno, Toshihiro; and Inoue, Jiro, to Murata Mfg. Co., Ltd. Acceleration sensor with direct mounting. 5,481,915, Cl. 73-514.340.
- Tadashi, Ito, to Fuji Photo Film Co., Ltd. Radiological image forming method. 5,482,813, Cl. 430-139.000.
- Tagawa, Koichi, to Mory Suintour Inc. Bicycle speed change operation assembly. 5,481,934, Cl. 74-475.000.
- Tagliaferri, Roberto; and Giancarlo, Franceschi, to I.M.A. Industria Macchine Automatiche S.p.A. Method for feeding and preparing information leaflets on a product packaging line and a system for implementing this method. 5,481,848, Cl. 53-157.000.
- Tai, Anthony M.; Upatnieks, Juris; and Sieczka, Eric J., to Environmental Research Institute of Michigan. Compact holographic sight. 5,483,362, Cl. 359-1.000.
- Tai, Hiromichi, to Kabushiki Kaisha Toshiba. Gate power supply circuit. 5,483,192, Cl. 327-440.000.
- Taima, Yasuo: See—  
Haga, Yoshihiro; Suzuki, Tetsuya; and Taima, Yasuo, 5,482,823, Cl. 430-567.000.
- Taira, Masahito: See—  
Momose, Nobuo; Ito, Masayoshi; Yoshida, Hiroaki; Tani, Masanori; Sano, Yoshiaki; Taira, Masahito; and Teijima, Takashi, 5,483,446, Cl. 364-424.010.
- Taiwan Semiconductor Manufacturing Comp. Ltd.: See—  
Sung-Mu, Hsu, 5,483,487, Cl. 365-185.330.
- Tajima, Takeshi: See—  
Nakano, Kazuo; Mizokami, Kazuaki; Hasumi, Keiji; Itoh, Katsuhiko; Funabashi, Michimasa; Mitsui, Yasuhiro; Irie, Takashi; Tajima, Takeshi; and Matsuoka, Sadao, 5,482,524, Cl. 55-267.000.
- Takabe, Yasuhiro; Ueda, Koji; and Hara, Toshihiro, to Mazda Motor Corporation. Control system for opening or closing an opening-closing member. 5,483,133, Cl. 318-466.000.
- Takada, Fumiki: See—  
Ohmi, Masao; Takada, Fumiki; and Kizaki, Minoru, 5,481,923, Cl. 73-860.000.
- Takahashi, Mamoru: See—  
Kondo, Kenichi; Saida, Takahiro; Taya, Shuichi; Iida, Toyoshi; Sotomura, Takeshi; Fujii, Yuko; Sato, Keiji; Takahashi, Mamoru; Yamakawa, Sadayasu; and Osawa, Shunichi, 5,482,614, Cl. 205-171.000.
- Takahashi, Masaharu; and Tsuchida, Tomiyoshi, to Shin-Etsu Chemical Co., Ltd. Expandable conductive silicone rubber composition and conductive sponge roll. 5,482,978, Cl. 521-82.000.
- Takahashi, Nobuhito: See—  
Murakami, Kenjiro; Kotaka, Toshikazu; Ishida, Hiroshi; Komuro, Kiyoto; Nakayama, Yoshiaki; Takahashi, Nobuhito; and Takehana, Satoshi, 5,482,390, Cl. 400-636.200.
- Takahashi, Toyofumi: See—  
Otake, Masahiro; Takahashi, Toyofumi; Nishiumi, Satoshi; and Miyoshi, Michitaka, 5,483,257, Cl. 345-114.000.
- Takahashi, Yasushi, to Hitachi, Ltd. Crossconnect apparatus for a coherent transmission system. 5,483,370, Cl. 359-128.000.
- Takahashi, Yoshikazu; Isogawa, Toshiaki; Satoh, Yutaka; and Shimizu, Shuji, to Sony Corporation. Arrangement for controlling an iris to regulate light in an optical system. 5,483,280, Cl. 348-296.000.
- Takakuwa, Kiyoshi: See—  
Higashi, Kazuhiko; Takakuwa, Kiyoshi; Arimoto, Kazuaki; Naruki, Kenichi; Fukumoto, Hiroshi; Kuwada, Terumi; and Oda, Keisuke, 5,483,275, Cl. 347-218.000.
- Takamiya, Makoto; Ashiwa, Jun; Kadowaki, Hidejiro; and Ishida, Yasuhiko, to Canon Kabushiki Kaisha. Displacement information detecting apparatus and doppler velocimeter apparatus. 5,483,332, Cl. 356-28.500.
- Takamiya, Minoru; Miyazaki, Toshiro; and Sasaki, Yosuke, to Akebono Brake Systems Engineering Center, Inc. Method for reducing green roughness of a brake system during wear-in period. 5,482,742, Cl. 427-156.000.
- Takamori, Takeshi: See—  
Duncombe, Peter R.; Shinde, Subhash L.; and Takamori, Takeshi, 5,482,903, Cl. 501-32.000.
- Takamura, Fujitoshi; and Haraoka, Yoshinao, to Kabushiki Kaisha Komatsu Seisakusho. Apparatus for changing and controlling volume of hydraulic oil in hydraulic excavator. 5,481,875, Cl. 60-443.000.
- Takanaka, Yasuyuki: See—  
Nemura, Masaharu; Aoki, Tomohiro; Murayama, Yasushi; Uchida, Takashi; Kobayashi, Tohru; Ikatai, Masatoshi; Mitomi, Tatsuo; and Takanaka, Yasuyuki, 5,483,267, Cl. 347-32.000.
- Takano, Toshiyuki: See—  
Satake, Toshiaki; Nagai, Tomoaki; Takano, Toshiyuki; and Sekine, Akio, 5,482,913, Cl. 503-210.000.
- Takaoka, Makoto: See—  
Sugura, Susumu; Mita, Yoshinobu; Shishizuka, Junichi; Takaoka, Makoto; Shimomura, Yukari; Matsumoto, Kentaro; Uda, Toyokazu; Sugiyama, Mitsumasa; Kobayashi, Shigetada; Hisada, Katsutoshi; Kaneko, Yoji; and Nakanishi, Hiroyuki, 5,483,358, Cl. 358-508.000.
- Takaoka, Manabu; and Watanabe, Masayuki, to Koyo Seiko Co., Ltd. Power steering apparatus. 5,482,128, Cl. 180-79.100.
- Takahima, Tsuneo, to Canon Kabushiki Kaisha. Optical apparatus. 5,483,376, Cl. 359-554.000.
- Takasu, Tetsuya: See—  
Midogohchi, Susumu; Kume, Masafumi; Kasukawa, Takahisa; Takasu, Tetsuya; and Nishimoto, Hiroshi, 5,483,012, Cl. 525-459.000.
- Takata Corporation: See—  
Fujimura, Yoshiichi; and Hanna, Henry, 5,482,224, Cl. 242-376.000.
- Takata, Hirotoshi: See—  
Sato, Takanobu; Takata, Hirotoshi; and Gojino, Ryo, 5,482,382, Cl. 384-492.000.
- Takayama, Akira, to Alps Electric Co., Ltd. Reception band switching circuit with variable attenuation control. 5,483,209, Cl. 333-174.000.
- Takayama, Ryoichi: See—  
Fujii, Satoru; Takayama, Ryoichi; Tomita, Yoshihiro; Okano, Masayuki; and Torii, Hideo, 5,483,067, Cl. 250-338.300.
- Takayanagi, Ryotaro: See—  
Sakamoto, Hiroshi; Hagiuda, Nobuyoshi; Matsui, Hideki; and Takayanagi, Ryotaro, 5,483,319, Cl. 354-415.000.
- Takeda Chemical Industries, Ltd.: See—  
Igari, Yasutaka; Yamada, Minoru; and Taketomi, Shigehisa, 5,482,706, Cl. 424-85.700.
- Miyake, Akio; Kawano, Yasuhiko; and Ashida, Yasuko, 5,482,939, Cl. 514-248.000.
- Natsugari, Hideaki; Ikeda, Hitoshi; Ishimaru, Takenori; and Doi, Takayuki, 5,482,967, Cl. 514-457.000.
- Takehana, Satoshi: See—  
Murakami, Kenjiro; Kotaka, Toshikazu; Ishida, Hiroshi; Komuro, Kiyoto; Nakayama, Yoshiaki; Takahashi, Nobuhito; and Takehana, Satoshi, 5,482,390, Cl. 400-636.200.
- Takemae, Yoshihiro: See—  
Mochizuki, Hirohiko; Takemae, Yoshihiro; Kodama, Yukinori; Yanagisawa, Makoto; and Shigenobu, Katsumi, 5,483,497, Cl. 365-230.030.
- Takemoto, Takatoshi; Kano, Noriaki; Kurihara, Yoshide; Nakai, Kousiro; and Ito, Eizi, to Kabushiki Kaisha Ace Denken. Paper conveying apparatus having a belt tension adjusting mechanism. 5,482,266, Cl. 271-272.000.
- Takemoto, Takayuki: See—  
Oikawa, Shiro; Takemoto, Takayuki; Katou, Tutomu; Suzuki, Shirou; and Tanioka, Kenkichi, 5,483,071, Cl. 250-370.090.
- Takeshita, Shigeru: See—  
Ookubo, Mamoru; Yamaguchi, Mitsugu; and Takeshita, Shigeru, 5,482,151, Cl. 192-3.290.
- Taketomi, Shigehisa: See—  
Igari, Yasutaka; Yamada, Minoru; and Taketomi, Shigehisa, 5,482,706, Cl. 424-85.700.
- Takeuchi, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Bus bar connector. 5,482,481, Cl. 439-821.000.
- Takeuchi, Ryozo: See—  
Unuma, Munetoshi; and Takeuchi, Ryozo, 5,483,630, Cl. 395-152.000.
- Takeuchi, Tatsuo, to Canon Kabushiki Kaisha. Light-transmitting film and method for forming images using the same. 5,482,760, Cl. 428-195.000.
- Takeuchi, Youichi: See—  
Otome, Yukio; Doi, Kouji; Takeuchi, Youichi; Yamada, Koutaro; Ogura, Yoshio; and Ueno, Hiroshi, 5,483,322, Cl. 355-215.000.
- Takeuchi, Yukio: See—  
Sato, Masao; and Takeuchi, Yukio, 5,483,065, Cl. 250-310.000.
- Takigawa, Shinichiro: See—  
Yumiba, Takashi; Konishi, Shinichi; and Takigawa, Shinichiro, 5,483,359, Cl. 358-513.000.
- Takiguchi, Syouji: See—  
Ueda, Yoshihisa; Takiguchi, Syouji; Kanaboshi, Akira; and Ohnishi, Takehiro, 5,482,412, Cl. 408-36.000.
- Takizawa, Hideaki; Nasu, Yasuhiro; Watanabe, Kazuhiro; Hirota, Shiro; Nonaka, Kazuo; Sato, Seii; and Majima, Teiji, to Fujitsu Limited. Thin film transistor matrix device. 5,483,082, Cl. 257-59.000.
- Takizawa, Hideyuki: See—  
Oda, Kazuhiro; Takizawa, Hideyuki; Yamada, Masamichi; Iwamoto, Fumio; and Iwai, Shoji, 5,481,984, Cl. 104-284.000.
- Takizawa, Kiyoto: See—  
Miyahara, Masaaki; Nakamura, Nobuyuki; and Takizawa, Kiyoto, 5,482,454, Cl. 425-547.000.
- Takizawa, Morio; Matsuda, Atsushi; and Sekiguchi, Tetsuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Lens accessory attaching mechanism. 5,483,384, Cl. 359-827.000.
- Takizawa, Yoshihisa: See—  
Aoki, Makoto; Hattori, Yoshifumi; Yamamoto, Mayumi; Tochiwara, Shinichi; Takizawa, Yoshihisa; Nagashima, Akira; and Sato, Shinichi, 5,482,545, Cl. 106-22.00K.
- Takuma, Yuetsu: See—  
Kajioka, Hiroshi; Yamada, Kohdo; Nakamura, Masashi; Murakami, Kazuya; and Takuma, Yuetsu, 5,482,525, Cl. 65-398.000.
- Talacko, Radovan, to Wagner International AG. Electrostatic powder-coating gun. 5,482,214, Cl. 239-698.000.
- Talbot, Robert D., to Harris Corporation. Tuning method for automatic antenna couplers. 5,483,680, Cl. 455-107.000.
- Talley, John J.; Getman, Daniel P.; DeCrescenzo, Gary A.; Lin, Ko-Chung; Vazquez, Michael L.; Mueller, Richard A.; Reed, Kathryn L.; Heintz, Robert M.; Clare, Michael; Freskos, John N.; and Sun, Eric T. Retroviral protease inhibitors. 5,482,947, Cl. 514-311.000.
- Talmi, Yair: See—



- West, John S.; Simpson, Raymond W.; Khoo, Samuel C.; Talmi, Yair; Nadolny, Raymond A.; and Blouke, Morley M., 5,483,091, Cl. 257-239.000.
- Talukdar, Kushal K.: See—  
Capell, William J., Sr.; Zabounidis, Christos; and Talukdar, Kushal K., 5,483,500, Cl. 367-119.000.
- Tam, Lisa A. Method and device for measuring and controlling cell density in microbiological culture. 5,483,080, Cl. 250-574.000.
- Tamada, Masanori: See—  
Ishii, Hiroji; Tamada, Masanori; Yoshida, Satoru; and Okuzumi, Isamu, 5,482,510, Cl. 472-61.000.
- Tamura, Hiroshi; Kamata, Yoshiyuki; and Fujimori, Mitsuo, to Yokogawa Electric Corporation. Input-output unit. 5,483,229, Cl. 340-693.000.
- Tamura, Miki: See—  
Mihara, Chieko; Sugata, Hiroyuki; Santo, Tsuyoshi; and Tamura, Miki, 5,482,822, Cl. 430-270.140.
- Tamura, Minoru: See—  
Iwata, Toru; Murakami, Tenukiyo; Tamura, Minoru; and Fukumura, Tomohiro, 5,482,133, Cl. 180-197.000.
- Tamura, Yoshikazu, to Sumitomo Wiring Systems, Ltd. Wire measuring and cutting apparatus and wire changing method using the same. 5,483,459, Cl. 364-469.000.
- Tanaka, Hideaki: See—  
Yamada, Kazuo; Tanaka, Hideaki; Yoneda, Tetsuya; Mitate, Takehito; and Kitayama, Hiroyuki, 5,482,797, Cl. 429-218.000.
- Tanaka, Hirohisa, to Sumitomo Electric Industries, Ltd. Apparatus for detecting failures of longitudinal acceleration sensor. 5,483,452, Cl. 364-426.010.
- Tanaka, Hitoshi: See—  
Mototani, Yuji; Asaoka, Junichi; and Tanaka, Hitoshi, 5,482,798, Cl. 429-224.000.
- Tanaka, Masashi: See—  
Komatsu, Kouichiro; and Tanaka, Masashi, 5,483,348, Cl. 356-401.000.
- Tanaka, Tadashi; Sakamoto, Masaaki; Yamamoto, Koichi; Higuchi, Tsukimitsu; and Ozaki, Kouki, to Daido Metal Company Ltd. Sliding-contact material excellent in corrosion resistance and wear resistance, and method of manufacturing the same. 5,482,782, Cl. 428-553.000.
- Tanaka, Takayuki: See—  
Sakai, Naoki; Shigei, Tetsuro; and Tanaka, Takayuki, 5,482,906, Cl. 502-402.000.
- Tanaka, Toshiyuki: See—  
Miyake, Takahiro; Ueyama, Tetsuo; Tanaka, Toshiyuki; and Kurata, Yukio, 5,483,508, Cl. 369-44.230.
- Tang, Ching W., to Eastman Kodak Company. Light emitting device comprising an organic LED array on an ultra thin substrate and process for forming same. 5,482,896, Cl. 437-209.000.
- Tang, Kuang-Chang, to Chicony Electronics, Co., Ltd. Power supply arrangement for notebook computers. 5,483,437, Cl. 363-146.000.
- Tang, Yuan: See—  
Chen, Jian; Tang, Yuan; Luning, Scott; and Cagnina, Salvatore F., 5,482,881, Cl. 437-43.000.
- Tani, Masanori: See—  
Momose, Nobuo; Ito, Masayoshi; Yoshida, Hiroaki; Tani, Masanori; Sano, Yoshiaki; Taira, Masahito; and Tejima, Takashi, 5,483,446, Cl. 364-424.010.
- Tanibata, Toru, to Noritsu Koki Co., Ltd. Film developing device. 5,483,317, Cl. 354-321.000.
- Tanigaki, Ryuhei: See—  
Mizutani, Yasukazu; Sato, Shigemitsu; Koseki, Hideki; Tanigaki, Ryuhei; and Iio, Takayuki, 5,483,216, Cl. 337-370.000.
- Taniguchi, Harutaka: See—  
Kawashima, Tomoyuki; Taniguchi, Harutaka; Kato, Hisato; and Shibata, Kazuyoshi, 5,482,603, Cl. 204-192.260.
- Taniguchi, Keishi: See—  
Furuya, Hiromi; Taniguchi, Keishi; and Suzaki, Hideo, 5,482,912, Cl. 503-207.000.
- Tanji, Junichi; Shimada, Takahisa; Chikasaki, Masaaki; Tsuji, Sadafusa; and Kudo, Yoshinobu, to Minolta Camera Kabushiki Kaisha. Film cartridge and a camera employing the film cartridge. 5,483,310, Cl. 354-21.000.
- Tanimizu, Toru, to Hitachi, Ltd. Power board. 5,483,417, Cl. 361-611.000.
- Tanimoto, Koji: See—  
Ohno, Tadayoshi; Tanimoto, Koji; Mizuguchi, Mamoru; and Fujiwara, Shigeru, 5,483,271, Cl. 347-129.000.
- Tanioka, Kenkichi: See—  
Oikawa, Shiro; Takemoto, Takayuki; Katou, Tutomu; Suzuki, Shirou; and Tanioka, Kenkichi, 5,483,071, Cl. 250-370.090.
- Tannery, George F., IV: See—  
Adrian, Andrew; Jones, Bruce R.; and Tannery, George F., IV, 5,483,247, Cl. 343-713.000.
- Tanoi, Satoru, to Oki Electric Industry Co., Ltd. Clock circuit. 5,483,204, Cl. 331-14.000.
- Tanuma, Jiro; Ishimizu, Hideaki; Hagiwara, Akira; and Kasai, Tadashi, to Oki Electric Industry Co., Ltd. Dot print head and method of control over printing therewith. 5,482,387, Cl. 400-124.280.
- Tanuma, Ryohiei, to Fuji Electric Co., Ltd. Wavelength conversion device using an external unstable cavity. 5,483,374, Cl. 359-328.000.
- Tanzer, Herbert J.: See—  
Hall, John T.; Quon, William; and Tanzer, Herbert J., 5,483,143, Cl. 320-2.000.
- Tapfer, Uwe; and Austin, Malcolm, to Dove International - Division, Mars, Incorporated. Ice cream confection. 5,482,728, Cl. 426-565.000.
- Tapijfabriek H. Desseaux N.V.: See—  
Geerts, Jan F. M., 5,481,991, Cl. 111-200.000.
- Tarancon, Gregorio, to Florida Scientific Laboratories Inc. Apparatus for direct fluorination of a hydrocarbon by molecular fluorine gas. 5,482,682, Cl. 422-189.000.
- Taras, Russell J.: See—  
Kannegundla, Ram; and Taras, Russell J., 5,483,155, Cl. 324-158.100.
- Tarnawskyj, Ihor W.: See—  
Law, Kock-Yee; and Tarnawskyj, Ihor W., 5,482,741, Cl. 427-215.000.
- Taura, Tadayuki, to Kabushiki Kaisha Toshiba. Nonvolatile semiconductor memory device having a reduced delay in reading data after changing from standby to an operation mode. 5,483,494, Cl. 365-185.210.
- Tauri, Jeffrey A.: See—  
Archer, Michael J.; Adams, Michael S.; and Tauri, Jeffrey A., 5,482,639, Cl. 252-70.000.
- Tawara, Hirotsu, to Kao Corporation. Goods drop out device. 5,482,423, Cl. 414-414.000.
- Tawil, Saleem, to Diversified Communication Engineering, Inc. System for providing local originating signals with direct broadcast satellite television signals. 5,483,663, Cl. 455-3.200.
- Taya, Masaaki; Kohtaki, Takaaki; Unno, Makoto; and Doujo, Tadashi, to Canon Kabushiki Kaisha. Toner for developing electrostatic image, forming apparatus and process cartridge. 5,483,327, Cl. 355-245.000.
- Taya, Shuichi: See—  
Kondo, Kenichi; Saida, Takahiro; Taya, Shuichi; Iida, Toyoshi; Sotomura, Takeshi; Fujii, Yuko; Sato, Keiji; Takahashi, Mamoru; Yamakawa, Sadayasu; and Osawa, Shunichi, 5,482,614, Cl. 205-171.000.
- Tayca Corporation: See—  
Okuda, Masaaki; Kondo, Hajime; and Fujiwara, Eiji, 5,482,544, Cl. 106-14.120.
- Tayebianpour, Amir: See—  
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- Tayi, Apparo: See—  
Clark, Frederic L.; Clift, Gilbert; Hendrick, Kendall B.; Kanewski, William J., III; Lagocki, Peter A.; Martin, Richard R.; Mitchell, James E.; Moore, Larry W.; Pennington, Charles D.; Walker, Edna S.; Smith, B. Jane; Tayi, Apparo; Vaught, James A.; and Yost, David A., 5,482,861, Cl. 436-48.000.
- Taylor, Dene H.: See—  
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- Taylor, Donald C.: See—  
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- Taylor, James C. Portable environmental clean plating system. 5,482,605, Cl. 204-224.00R.
- Taylor, John; Hicks, Michael; Lamb, Richard; Bennett, Robert N.; Nixon, Keith; Ashcroft, Ian; Parkes, Adrian S.; and Smith, John P., to British Gas plc. Enhancing pipes. 5,482,076, Cl. 137-318.000.
- Taylor Made Golf Company: See—  
Yamawaki, Koichi, 5,482,280, Cl. 273-167.00J.
- Taylor, Michael C., to Bayerische Motoren Werke AG. Arrangement for supplying cooling air to a turbine casing of an aircraft gas turbine. 5,482,431, Cl. 415-111.000.
- Taylor, Richard D.: See—  
Robertson, Karl W.; Taylor, Richard D.; and Zimmerman, Gary D., 5,483,625, Cl. 395-117.000.
- Taylor, Stuart A.: See—  
Eaton, Glenn A.; McFadden, Joseph A.; Taylor, Stuart A.; Tracy, Edward D.; and Wang, Emil C. W., 5,483,588, Cl. 379-202.000.
- Taylor, Wayne A., and Jamriska, David, to University of California, The Regents of the. Separation of sodium-22 from irradiated targets. 5,482,687, Cl. 423-2.000.
- Tcholakov, Stoil M. Rope guide for wire air or electric hoists. 5,482,219, Cl. 242-158.00R.
- Teac Corp.: See—  
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- Kaczus, Steven L., Sr.; McKnight, Thomas; and Edwards, Roy J., 5,483,419, Cl. 361-685.000.
- Technomed Medical Systems: See—  
Dancer, Paul, 5,483,333, Cl. 356-152.100.
- Technos et Compagnie: See—  
Bizard, André, 5,482,111, Cl. 165-95.000.
- Teclé, Haile: See—  
Laufer, David J.; Mpos, Walter H.; Pavia, Michael R.; Teclé, Haile; and Thomas, Anthony J., 5,482,938, Cl. 514-233.200.
- Tedesco, Jon D. Countertop puffing oven for pelletized foodstuffs. 5,481,962, Cl. 99-323.400.
- Teener, Michael D.: See—  
Oprescu, Florin; and Teener, Michael D., 5,483,656, Cl. 395-750.000.
- Teetzel, James W. Laser module apparatus. 5,481,819, Cl. 42-103.000.
- Tehmann, Teja: See—  
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- Tehrani, Saied N.: See—  
Vaitkus, Rimantas L.; Tehrani, Saied N.; Nair, Vijay K.; and Goronkin, Herbert, 5,482,875, Cl. 437-40.000.
- Teijin Limited: See—  
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- Tejima, Takashi: See—

- Momose, Nobuo; Ito, Masayoshi; Yoshida, Hiroaki; Tani, Masanori; Sano, Yoshiaki; Taira, Masahito; and Tejima, Takashi, 5,483,446, Cl. 364-424.010.
- Teledyne Industries, Inc.: See—  
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- Teleflex (Canada) Ltd.: See—  
McFadyen, Andrew W., 5,481,871, Cl. 60-385.000.
- Telefonaktiebolaget LM Ericsson: See—  
Bergsten, Pär S. T.; and Nyström, Jan-Christian, 5,483,681, Cl. 455-126.000.
- Eriksson, Karl Ö., 5,483,532, Cl. 370-79.000.
- Telex Communications, Inc.: See—  
Christensen, Steven G., 5,483,528, Cl. 370-62.000.
- Telford, Susan; Aruga, Michio; and Chang, Mei, to Applied Materials, Inc. Pretreatment process for treating aluminum-bearing surfaces of deposition chamber prior to deposition of tungsten silicide coating on substrate therein. 5,482,749, Cl. 427-578.000.
- Telford, Thomas M.: See—  
Daschel, Matthew D.; and Telford, Thomas M., 5,482,255, Cl. 254-378.000.
- Templeton, Harvey J. Tape measure end retention apparatus. 5,481,813, Cl. 33-758.000.
- Tenbusch, Albert A., II. Underground pipe replacement technique. 5,482,404, Cl. 405-184.000.
- Ten Eyck, John D.: See—  
Lebold, Alan R.; and Ten Eyck, John D., 5,482,686, Cl. 422-179.000.
- Teng, Edward: See—  
Mahvan, Nader; Elkouhy, Atef H.; Teng, Edward; and Huang, Hung-Chang W., 5,482,785, Cl. 428-611.000.
- Tennessee Gas Pipeline Company: See—  
Sager, Robert L., Jr., 5,482,681, Cl. 422-180.000.
- Tennhammar-Ekman, Birgitta: See—  
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- Terada, Masahiro: See—  
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- Terada, Takashi: See—  
Kitahara, Shigenori; and Terada, Takashi, 5,482,068, Cl. 134-182.000.
- Terasaki, Masatoshi, to Hitachi, Ltd. Compression type refrigerator. 5,481,887, Cl. 62-471.000.
- Terashima, Masaki: See—  
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- Terashima, Tetsuo: See—  
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- Terazono, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Electrically isolated MESFET. 5,483,089, Cl. 257-195.000.
- Terray, Eugene A.: See—  
Brumley, Blair H.; Deines, Kent L.; Cabrera, Ramon G.; and Terray, Eugene A., 5,483,499, Cl. 367-89.000.
- Terrett, Nicholas K., to Pfizer Inc. Quinazolinone antianginal agents. 5,482,941, Cl. 514-253.000.
- Terzi, Fermo; and Verona, Massimo, to O.M.S.O. S.p.A. Machine for the offset printing of flat objects, in particular for compact discs. 5,481,970, Cl. 101-146.000.
- Tetra Laval Holdings & Finance S.A.: See—  
Bruhn, Kristor, 5,482,179, Cl. 220-410.000.
- Teutsch, Erich O.: See—  
Dunton, Thomas P.; and Teutsch, Erich O., 5,482,667, Cl. 264-136.000.
- Texaco Inc.: See—  
Alam, Ifthikhar; and Sung, Rodney L. D., 5,482,520, Cl. 44-336.000.
- Hatton, Gregory J.; Helms, David A.; and Marrelli, John D., 5,483,171, Cl. 324-640.000.
- Texas Instruments, Inc.: See—  
Anderson, Douglas W., 5,483,307, Cl. 353-98.000.
- Armstrong, Frank O.; and Jeffreys, Brian B., 5,482,612, Cl. 204-298.110.
- Chauvel, Gerard; Clave, Gael; and Couvrat, Marc, 5,483,554, Cl. 375-303.000.
- Douglas, Monte A.; and Wallace, Robert M., 5,482,564, Cl. 134-18.000.
- Harris, Guy; Callaway, Duane; and Shah, Rajesh, 5,481,899, Cl. 72-453.110.
- Havemann, Robert H., 5,482,894, Cl. 437-195.000.
- Hizume, Kohji; and Komatsuzaki, Takao, 5,483,481, Cl. 365-63.000.
- Kawamura, J. Patrick, 5,483,205, Cl. 331-74.000.
- Kaya, Cetin; and Liu, David, 5,482,880, Cl. 437-43.000.
- McKenna, Robert G.; and Baxter, Michael G., 5,482,899, Cl. 437-225.000.
- Mori, Ikuo; and Ikeya, Kiyokazu, 5,482,471, Cl. 439-263.000.
- Nelson, William E., 5,482,818, Cl. 430-394.000.
- Pollack, Gordon P., 5,482,871, Cl. 437-21.000.
- Russell, Ernest J.; Baudouin, Daniel A.; Le, Duy-Loan T.; and Wallace, James, 5,483,024, Cl. 174-524.000.
- Saxena, Sharad, 5,483,636, Cl. 395-183.010.
- Whetsel, Lee D., 5,483,518, Cl. 370-13.000.
- Th. Goldschmidt AG: See—  
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- Theodore, Garry B.: See—  
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- Thein, Albert: See—  
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- Theis, Jürgen: See—  
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- Theorin, Craig R.: See—  
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- Thermotek Systems Ltd.: See—  
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- Thermtec, Inc.: See—  
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- Theurer, Josef; and Böck, Gernot, to Franz Plasser Bahnbaumaschinen-Industries. m.b.H. Track surfacing machine and method for correcting the track geometry based on track cant and measured lining force. 5,481,982, Cl. 104-7.200.
- Thiel, Wolfgang; and Günther, Stephan, to Francotyp-Postalia GmbH. Selection circuit for an electro-thermal printer with a resistance-type ribbon. 5,482,386, Cl. 400-120.120.
- Thom, Jerry D., to T Kennel Systems, Inc. Animal cage. 5,482,005, Cl. 119-17.000.
- Thomas, Christian H.: See—  
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- Thomas, Anthony J.: See—  
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- Thomas, Holly A.: See—  
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- Thomas, Joel M.: See—  
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- Thomas, John, to Envirex, Inc. Method for removing a gear or bearing in circular clarifiers and thickeners. 5,481,789, Cl. 29-426.500.
- Thompson, Craig D.; and Luhman, Robert A., to Minnesota Mining and Manufacturing Company. Tape dispenser. 5,482,182, Cl. 221-73.000.
- Thompson, David A.: See—  
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- Thompson, Joseph, to Courtaulds Fibres (Holdings) Limited. Alginate gels to the form of fibrous pastes useful as wound dressings. 5,482,932, Cl. 514-54.000.
- Thompson, Timothy V.; Fairlay, Christopher R.; and Lee, Ken K. Method and apparatus for performing an automatic focus operation for a microscope. 5,483,055, Cl. 250-201.300.
- Thornber, Geoffrey: See—  
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- Thorneywork, Nigel; and Jelly, Aubrey B., to Merrychef Limited. Microwave heating with hot and cold air streams. 5,483,044, Cl. 219-681.000.
- Thurman Manufacturing Co., The: See—  
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- Thyssen Stahl AG: See—  
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- Tice, Lee D., to Pitway Corporation. Multiple sensor apparatus and method. 5,483,222, Cl. 340-518.000.
- Tick, Paul A.: See—  
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- Tiegs, Terry N.: See—  
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- Tien, Ta-Ke: See—  
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- Tillier, Jacques: See—  
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- Timko, Robert J.: See—  
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- Tiret, Etienne: See—  
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- Tirikos, Steven M. Bridge sand blasting support apparatus. 5,481,832, Cl. 451-75.000.
- Titeflex Corporation: See—  
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- Titli, Andre; and Roukieh, Samir, to Siemens Automotive S.A. Apparatus for controlling a suspension system disposed between a wheel and the body of an automotive vehicle. 5,483,450, Cl. 364-424.050.
- Tjha, Eddy; Lin, Chi; and Anagol-Subbarao, Anjali, to National Semiconductor Corporation. Photolithographic process for reducing repeated defects. 5,482,819, Cl. 430-394.000.
- Tobias, Reginald. Multiplex spectroscopy. 5,483,335, Cl. 356-310.000.
- Tocher, Angus J., to VX Optonics. Self correcting stereoscopic auto-rangefinder. 5,483,336, Cl. 356-3.150.
- Tochihara, Shinichi: See—



- Aoki, Makoto; Hattori, Yoshifumi; Yamamoto, Mayumi; Tochihara, Shinichi; Takizawa, Yoshihisa; Nagashima, Akira; and Sato, Shinichi, 5,483,545, Cl. 106-22.00K.
- Toda, Minoru: See—  
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- Tode, Hiroyoshi: See—  
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- Togano, Takeshi: See—  
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- Toho Teyon Co., Ltd.: See—  
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- Tokico Ltd.: See—  
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- Toko, Kiyoshi: See—  
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- Tokui, Masaki: See—  
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- Tokumitsu, Syuzo: See—  
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- Tokyo Electron Kabushiki Kaisha: See—  
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- Watanabe, Shingo; Mizukami, Mitsuo; and Nishi, Hironobu, 5,482,558, Cl. 118-728.000.
- Tokyo Electron Kyushu Limited: See—  
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- Tokyo Electron Limited: See—  
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- Tokyo Electron Tokoku Kabushiki: See—  
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- Toler, J. Richard: See—  
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- Tolksdorf, Michael; and Tolksdorf, Thomas. Counterbalancing device for divers, 5,482,405, Cl. 405-186.000.
- Tolksdorf, Thomas: See—  
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- Tomioka, Ichiro: See—  
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- Tomita, Nobuo: See—  
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- Tomita, Yoshihiro: See—  
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- Tomizawa, Takeshi: See—  
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- Tomoe Technical Research Company: See—  
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- Tomogawa Paper Co., Ltd.: See—  
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- Topometrix Corporation: See—  
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- Tor-Master Mfg. Ltd.: See—  
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- Toray Industries, Inc.: See—  
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- Torigoe, Tetsu: See—  
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- Torii, Hideo: See—  
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- Törnblom, Lars: See—  
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- Torrey, David A., to Rensselaer Polytechnic Institute. Single-phase active power filter for multiple nonlinear loads and method therefor, 5,483,148, Cl. 323-205.000.
- Torrington Company, The: See—  
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- Toshiba Battery Co., Ltd.: See—  
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- Toshiba Corporation: See—  
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- Toshiba Kikai Kabushiki Kaisha: See—  
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- Tosoh Corporation: See—  
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- Trayer, Frank C.; and Trayer, John P. High voltage load interrupter with safety system, 5,483,032, Cl. 218-91.000.
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- Tremonti, Brian M.; Belling, Michael S.; Holmes, Douglas W.; and Kujaowski, Robert B., to Baytech, Inc. Automotive fluids catch basin, 5,482,093, Cl. 141-98.000.
- Trent, Gary D., to Outboard Marine Corporation. Recreational boat construction, 5,481,998, Cl. 114-355.000.
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- Trim, Inc.: See—  
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- Uniden Corporation: See—  
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- Lur, Water; and Huang, Cheng-Hen, 5,482,885, Cl. 437-60.000.
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- Yamaguchi, Mitsugu: See—  
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- Atsumi, Shizuo, 5,482,235, Cl. 248-121.000.
- Yamaji, Michio: See—  
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- Yamamoto, Ken: See—  
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- Yanagisawa, Yoshihiro: See—  
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- Yanase, Kiyooki: See—  
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- Kushimoto, Yoshikazu; and Yanase, Minao, 5,483,220, Cl. 340-444.000.
- Yang, Jialin: See—  
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- Yarnold, Susan M.: See—  
Fell, H. Perry, Jr.; Folger-Bruce, Kim R.; and Yarnold, Susan M., 5,482,856, Cl. 435-320.100.
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- Yarwood, Anthony C.: See—  
Brydon, Alastair N.; and Yarwood, Anthony C., 5,483,677, Cl. 455-67.600.
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- Yasutake, Takayuki: See—  
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- Yatsu, Takashi: See—  
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- Yazaki Corporation: See—  
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- Shinchi, Akira; and Matsuura, Toshifumi, 5,482,394, Cl. 403-325.000.
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- Yeh, Nai J.: See—  
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- YKK Corporation: See—  
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- YMOS Aktiengesellschaft Industrieprodukte: See—  
Heim, Gunther; and Kroll, Bruno, 5,481,831, Cl. 49-502.000.
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Tamura, Hiroshi; Kamata, Yoshiyuki; and Fujimori, Mitsuaki, 5,483,229, Cl. 340-693.000.
- Yokomachi, Yukihiro; Saito, Kazuhito; Ikegaya, Kazuo; and Tomita, Nobuo, to Sumitomo Electric Industries, Ltd.; and Nippon Telegraph & Telephone Corporation. Optical switch for switching plural optical fibers. 5,483,608, Cl. 385-22.000.
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- Yoneda, Tetsuya: See—  
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Momose, Nobuo; Ito, Masayoshi; Yoshida, Hiroaki; Tani, Masanori; Sano, Yoshiaki; Taira, Masahito; and Tejima, Takashi, 5,483,446, Cl. 364-424.010.
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- Yoshino, Masanori: See—  
Isshiki, Naotsugu; Izaki, Hiroshi; Tokunaga, Yosimitu; Yoshino, Syoichi; Yoshino, Masanori; and Aoki, Toshiyuki, 5,482,532, Cl. 75-333.000.
- Yoshino, Syoichi: See—  
Isshiki, Naotsugu; Izaki, Hiroshi; Tokunaga, Yosimitu; Yoshino, Syoichi; Yoshino, Masanori; and Aoki, Toshiyuki, 5,482,532, Cl. 75-333.000.
- Yoshio, Yamamoto: See—  
Shimizu, Daisuke; Miyashita, Kotaro; Hara, Yoshihisa; and Yoshio, Yamamoto, 5,482,020, Cl. 123-417.000.
- Yoshioka, Mamoru, to Toyota Jidosha Kabushiki Kaisha. Valve timing control device for an internal combustion engine. 5,482,012, Cl. 123-90.150.
- Yoshioka, Nobuyuki: See—  
Isao, Akihiko; Kawada, Susumu; and Yoshioka, Nobuyuki, 5,482,799, Cl. 430-5.000.
- Yoshioka, Shimpei; Konishi, Kazuo; Maruyama, Koji; and Sato, Toshiaki, to Kabushiki Kaisha Toshiba. Memory card device. 5,483,491, Cl. 365-200.000.
- Yoshioka, Tohru: See—  
Uemura, Hiroki; Butsuen, Tetsuro; Yoshioka, Tohru; Doi, Ayumu; Okuda, Kenichi; Yamamoto, Yasunori; Adachi, Tomohiko; and Masuda, Naotsugu, 5,483,453, Cl. 364-424.020.
- Yoshioka, Toshifumi: See—  
Ishiwata, Kazuya; and Yoshioka, Toshifumi, 5,482,803, Cl. 430-7.000.
- Yoshioka, Tsutomu; and Ozawa, Kenichi, to Clarion Co., Ltd. Radio receiver with playback means. 5,483,506, Cl. 369-7.000.
- Yoshiritsu Kabushiki Kaisha: See—  
Kichijyo, Hiroshi, 5,482,491, Cl. 446-112.000.
- Yoshizawa, Hiroyasu: See—  
Yamada, Shuji; Kanda, Motoya; Yoshizawa, Hiroyasu; and Sonai, Atsuo, 5,482,790, Cl. 429-9.000.
- Yost, David A.: See—  
Clark, Frederic L.; Clift, Gilbert; Hendrick, Kendall B.; Kanewske, William J., III; Lagocki, Peter A.; Martin, Richard R.; Mitchell, James E.; Moore, Larry W.; Pennington, Charles D.; Walker, Edna S.; Smith, B. Jane; Tayi, Apparo; Vaught, James A.; and Yost, David A., 5,482,861, Cl. 436-48.000.
- Younathan, Janet N.: See—  
Kapp, Daniel L.; and Younathan, Janet N., 5,482,821, Cl. 430-549.000.
- Young, Eugene F.: See—  
Grande, Michael L.; Grushkin, Bernard; Young, Eugene F.; Lundy, Douglas A.; and Matalovich, Joseph R. E., 5,482,805, Cl. 430-106.000.
- Young, Gordon. Method of operating a talking crystal ball toy. 5,482,277, Cl. 273-161.000.
- Young, Ronald L.; Breuer, Kurt F.; and Brandt, David E., to ERDA, Inc. Aircraft seat with crash absorption mechanism. 5,482,351, Cl. 297-216.200.
- Youngker, Ray; and Oles, Henry J. Apparatus and method for displaying floor, ceiling, and wall coverings. 5,483,308, Cl. 353-99.000.
- Yousko, David A.: See—



- Dunning, Zenna J.; Nelson, Paul E.; Patjens, Hinrich C.; Shofner, James A.; and Yousko, David A., 5,482,409, Cl. 408-1.00R.
- Yu, Alfred. Human powered skibob. 5,482,302, Cl. 280-12.120.
- Yu, Kin C.; Mighill, Charles T.; Wu, Teresa L. C.; Bailey, Christopher R. M.; and Lizotte, Steven D., to Bull HN Information Systems Inc. System for switching between two different operating systems by invoking the server to determine physical conditions to initiate a physical connection transparent to the user. 5,483,647, Cl. 395-500.000.
- Yugen Kaisha Sozoan: See—
- Yanagisawa, Ken, 5,481,936, Cl. 74-490.080.
- Yui, Kazuo: See—
- Nakatake, Yoshiteru; Karino, Kazuya; and Yui, Kazuo, 5,483,157, Cl. 324-174.000.
- Yui, Tomoyuki: See—
- Mineta, Hiroshi; Yui, Tomoyuki; Gocho, Yoshihiro; and Matsumoto, Takahiro, 5,482,651, Cl. 252-299.610.
- Yukawa, Kazuhiko: See—
- Hamada, Masataka; Yukawa, Kazuhiko; Ishida, Tokuji; Norita, Toshio; and Ueda, Hiroshi, 5,483,318, Cl. 354-402.000.
- Yumiba, Takashi; Konishi, Shinichi; and Takigawa, Shinichiro, to Matsuhita Electric Industrial Co., Ltd. Color image scanning apparatus for reading a color original without color shift regardless of a magnification ratio of the original. 5,483,359, Cl. 358-513.000.
- Yumita, Takashi: See—
- Ozaki, Masami; Ikeda, Atsuhiko; Honami, Reijiro; Yumita, Takashi; Minoguchi, Naokazu; Yano, Hiroyuki; Izawa, Norihiko; and Hirano, Tadayoshi, 5,482,951, Cl. 514-340.000.
- Yumoto, Yoshiji: See—
- Murata, Makoto; Yamachika, Mikio; Yumoto, Yoshiji; and Miura, Takao, 5,482,816, Cl. 430-270.140.
- Yumura, Motoo: See—
- Ohshima, Satoshi; Yumura, Motoo; Kuriki, Yasunori; Uchida, Kunio; and Ikazaki, Fumikazu, 5,482,601, Cl. 204-173.000.
- Yuyama, Osamu, to Sharp Kabushiki Kaisha. Communication terminal equipment. 5,483,574, Cl. 379-32.000.
- Yuyama, Shoji. Tablet packing device and method for controlling the same. 5,481,855, Cl. 53-493.000.
- Yuzurihara, Hiroshi: See—
- Okabe, Takahiko; Monma, Genzo; and Yuzurihara, Hiroshi, 5,482,893, Cl. 437-192.000.
- Z-Pro International, Inc.: See—
- Dentler, Christopher G.; and Zagone, William, 5,482,189, Cl. 222-391.000.
- Zabounidis, Christos: See—
- Capell, William J., Sr.; Zabounidis, Christos; and Talukdar, Kunal K., 5,483,500, Cl. 367-119.000.
- Zacharias, Victor, to Tor-Master Mfg. Ltd. Air drill apparatus. 5,481,990, Cl. 111-174.000.
- Zadno, Reza: See—
- Nolf, Jean-Marie E.; Vansant, Jan L.; Franckx, Joris I.; and Zadno, Reza, 5,482,467, Cl. 439-161.000.
- Zagone, William: See—
- Dentler, Christopher G.; and Zagone, William, 5,482,189, Cl. 222-391.000.
- Zagorski, Michael A. Directional microphone system. 5,483,599, Cl. 381-68.500.
- Zakharov, Alexandr A.: See—
- Guschin, Viktor A.; Zakharov, Alexandr A.; Lyamkin, Alexei I.; and Staver, Anatoly M., 5,482,695, Cl. 423-446.000.
- Zanolin, Gérard L.: See—
- Havard, Jacques G. W. R.; Jouardet, Michel R.; Loreau, Jean-Yves M.; and Zanolin, Gérard L., 5,483,034, Cl. 219-121.640.
- Zayhowski, John J.: See—
- Johnson, Bernadette; and Zayhowski, John J., 5,483,546, Cl. 372-10.000.
- Zdanowski, Thomas J.; and Autry, George M., to Ericsson GE Mobile Communications Inc. System for correlating RF usage in a trunked communication network based on channel assignments and channel drops for each call. 5,483,575, Cl. 379-58.000.
- Zebra Co., Ltd.: See—
- Sekiguchi, Kazuhiko; and Chikugo, Yoshihiko, 5,482,393, Cl. 401-214.000.
- Zemlock, Deborah J.: See—
- Bradley, Stephen S.; Strack, David C.; Lowery, Randall D.; Zemlock, Deborah J.; and Lawson, Mary K., 5,482,765, Cl. 428-286.000.
- Zeneca Limited: See—
- Bird, Thomas G. C.; and Ple, Patrick, 5,482,966, Cl. 514-456.000.
- Empfield, James R.; Ohnmacht, Cyrus J.; Russell, Keith; Trainor, Diane A.; and Warwick, Paul J., Jr., 5,482,969, Cl. 514-522.000.
- Holohan, James J.; Edwards, Ieuan J.; Timko, Robert J.; Bradway, Randy J.; and Clements, Arlene, 5,482,963, Cl. 514-415.000.
- Zeneca Pharma S.A.: See—
- Bird, Thomas G. C.; and Ple, Patrick, 5,482,966, Cl. 514-456.000.
- Zeo-Tech GmbH: See—
- Maier-Laxhuber, Peter; Becky, Andreas; Engelhardt, Reiner; and Heggel, Gerald, 5,482,541, Cl. 96-146.000.
- Zeos International, Inc.: See—
- Herrick, Gregory E., 5,483,250, Cl. 345-32.000.
- Zerkovitz, Jean-Paul, to Facom. Tool for tightening for slackening a threaded member. 5,481,948, Cl. 81-186.000.
- Zeta Music Partners: See—
- McMillen, Keith A.; Simon, David; and Wright, Matthew, 5,483,535, Cl. 370-85.100.
- Zexel Corporation: See—
- Ohishi, Takashi; Ishiwata, Hiroshi; and Kitahara, Nobuhiro, 5,482,016, Cl. 123-299.000.
- ZF Friedrichshafen AG: See—
- Bailey, Gerhard; and Gazyakan, Ünal, 5,481,935, Cl. 74-477.000.
- Ziliani, Roberto. Lighting apparatus shippable in a flat condition. 5,483,431, Cl. 362-382.000.
- Zimmer, Richard: See—
- Burckhardt, Manfred; Kazan, Sinan; and Zimmer, Richard, 5,482,361, Cl. 303-186.000.
- Zimmerman, Gary; and Campbell, Russ, to Hewlett-Packard Company. Page printer having automatic font compression. 5,483,622, Cl. 395-114.000.
- Zimmerman, Gary D.: See—
- Robertson, Karl W.; Taylor, Richard D.; and Zimmerman, Gary D., 5,483,625, Cl. 395-117.000.
- Zinser Textilmaschinen GmbH: See—
- Mann, Peter; Hack, Kurt; and Benkert, Thomas, 5,481,859, Cl. 57-1.00R.
- Zisapel, Yehuda: See—
- Krupka, Yaacov; and Zisapel, Yehuda, 5,483,467, Cl. 364-550.000.
- Ziu, Christopher G., to Ziu, Christopher G. Supports double-containment systems with axial-guiding and flexibility. 5,482,088, Cl. 138-113.000.
- Znaiden, Alexander: See—
- Slavtcheff, Craig S.; Barrow, Stephen R.; Kanga, Vispi D.; Cheney, Michael C.; and Znaiden, Alexander, 5,482,710, Cl. 424-195.100.
- Zook, James D.: See—
- Bauhahn, Paul E.; Ohnstein, Thomas; and Zook, James D., 5,483,387, Cl. 359-885.000.
- Zuckerman, Martin, to Emhart Inc. Tubular lock assembly. 5,482,335, Cl. 292-359.000.
- Zulauf, David R. P. Method and apparatus for telefluoroscopy. 5,482,043, Cl. 128-660.040.
- Zutten, Beverly J.: See—
- Zutten, Martin P.; and Zutten, Beverly J., 5,482,757, Cl. 428-100.000.
- Zutten, Martin P.; and Zutten, Beverly J. Tarpaulin protector. 5,482,757, Cl. 428-100.000.
- Zwettler, Ernest, to Air Techniques, Inc. Film chip transport assembly for film processing assembly. 5,483,316, Cl. 354-320.000.
- Zwiefel, Aaron R.: See—
- Slater, Charles R.; Palmer, Matthew A.; Whittier, John R.; and Zwiefel, Aaron R., 5,482,054, Cl. 128-751.000.
- Zwiener, Christian: See—
- Meixner, Jürgen; Fischer, Wolfgang; and Zwiener, Christian, 5,482,649, Cl. 252-182.180.
- 3Com Corporation: See—
- Isfeld, Mark S.; and Mitchell, Bruce W., 5,483,640, Cl. 395-200.030.

## LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 9th DAY OF JANUARY, 1996

NOTE—Arranged in accordance with the first significant character or word if the name (in accordance with city and telephone directory practice).

- Anderson, John: See—
- Columbus, Peter S.; Anderson, John; and Patel, Yogeshbhai B., Re. 35,144, Cl. 524-459.000.
- Asahi Kogaku Kogyo Kabushiki Kaisha: See—
- Kikuchi, Ryoji; Ikeda, Shinyu; and Nishiyama, Masataka, Re. 35,142, Cl. 313-594.000.
- Borden, Inc.: See—
- Columbus, Peter S.; Anderson, John; and Patel, Yogeshbhai B., Re. 35,144, Cl. 524-459.000.
- Columbus, Peter S.; Anderson, John; and Patel, Yogeshbhai B., to Borden, Inc. Thixotropic adhesive gel. Re. 35,144, Cl. 524-459.000.
- Fujishima, Kazuyasu: See—
- Ozaki, Hideyuki; Fujishima, Kazuyasu; and Shimotori, Kazuhiro, Re. 35,141, Cl. 365-226.000.
- Funkenbusch, Eric F.; and Tran, Tai T., to Minnesota Mining and Manufacturing Company. Zirconium oxide fibers and process for their preparation. Re. 35,143, Cl. 501-95.000.
- Gunn, Donald M.: See—
- Stark, William; Hughes, Nigel; and Gunn, Donald M., Re. 35,145, Cl. 540-125.000.
- Hoover Universal, Inc.: See—
- Powers, Thomas F., Jr., Re. 35,140, Cl. 215-375.000.
- Hughes, Nigel: See—
- Stark, William; Hughes, Nigel; and Gunn, Donald M., Re. 35,145, Cl. 540-125.000.
- Ikeda, Shinyu: See—
- Kikuchi, Ryoji; Ikeda, Shinyu; and Nishiyama, Masataka, Re. 35,142, Cl. 313-594.000.
- Kikuchi, Ryoji; Ikeda, Shinyu; and Nishiyama, Masataka, to Asahi Kogaku Kogyo Kabushiki Kaisha. Fluorescent lamp having three electrodes for starting at low temperatures. Re. 35,142, Cl. 313-594.000.
- Minnesota Mining and Manufacturing Company: See—
- Funkenbusch, Eric F.; and Tran, Tai T., Re. 35,143, Cl. 501-95.000.
- Mitsubishi Denki Kabushiki Kaisha: See—
- Ozaki, Hideyuki; Fujishima, Kazuyasu; and Shimotori, Kazuhiro, Re. 35,141, Cl. 365-226.000.
- Nishiyama, Masataka: See—
- Kikuchi, Ryoji; Ikeda, Shinyu; and Nishiyama, Masataka, Re. 35,142, Cl. 313-594.000.
- Ozaki, Hideyuki; Fujishima, Kazuyasu; and Shimotori, Kazuhiro, to Mitsubishi Denki Kabushiki Kaisha. Substrate bias generating circuit. Re. 35,141, Cl. 365-226.000.
- Patel, Yogeshbhai B.: See—
- Columbus, Peter S.; Anderson, John; and Patel, Yogeshbhai B., Re. 35,144, Cl. 524-459.000.
- Powers, Thomas F., Jr., to Hoover Universal, Inc. Blow molded bottle with improved self supporting base. Re. 35,140, Cl. 215-375.000.
- Shimotori, Kazuhiro: See—
- Ozaki, Hideyuki; Fujishima, Kazuyasu; and Shimotori, Kazuhiro, Re. 35,141, Cl. 365-226.000.
- Stark, William; Hughes, Nigel; and Gunn, Donald M., to Zeneca Limited. Substituted phthalocyanine. Re. 35,145, Cl. 540-125.000.
- Tran, Tai T.: See—
- Funkenbusch, Eric F.; and Tran, Tai T., Re. 35,143, Cl. 501-95.000.
- Zeneca Limited: See—
- Stark, William; Hughes, Nigel; and Gunn, Donald M., Re. 35,145, Cl. 540-125.000.

## LIST OF REEXAMINATION PATENTEEES

TO WHOM

CERTIFICATES WERE ISSUED

- Akey, Ronald R.: See—
- Van Gompel, James; and Akey, Ronald R., B1 4,515,506, Cl. 410-46.000.
- Audesse, Emery G.: See—
- Kimball, Stephen F.; Audesse, Emery G.; and Griffin, Robert M., B1 4,550,270, Cl. 313-579.000.
- Cooper Industries, Inc.: See—
- Moner, John M., B1 4,893,107, Cl. 337-186.000.
- Griffin, Robert M.: See—
- Kimball, Stephen F.; Audesse, Emery G.; and Griffin, Robert M., B1 4,550,270, Cl. 313-579.000.
- GTE Products Corporation: See—
- Kimball, Stephen F.; Audesse, Emery G.; and Griffin, Robert M., B1 4,550,270, Cl. 313-579.000.
- Juel, Anders; and Omdal, Bjarne, to Norsk Hydro A.S. Flexible container to be filled with bulk material and method for its manufacture. B1 4,832,506, Cl. 383-17.000.
- Kimball, Stephen F.; Audesse, Emery G.; and Griffin, Robert M., to GTE Products Corporation. Tungsten halogen lamp having a fine-wire filament and a hydrogen-impermeable envelope. B1 4,550,270, Cl. 313-579.000.
- Moner, John M., to Cooper Industries, Inc. Axial miniature fuse with plastic molded body. B1 4,893,107, Cl. 337-186.000.
- Norsk Hydro A.S.: See—
- Juel, Anders; and Omdal, Bjarne, B1 4,832,506, Cl. 383-17.000.
- Omdal, Bjarne: See—
- Juel, Anders; and Omdal, Bjarne, B1 4,832,506, Cl. 383-17.000.
- Palla-Gard International, Inc.: See—
- Van Gompel, James; and Akey, Ronald R., B1 4,515,506, Cl. 410-46.000.
- Raleigh, Roger W. Model racing car having an improved rear wheel suspension. B1 4,159,126, Cl. 280-688.000.
- Van Gompel, James; and Akey, Ronald R., to Palla-Gard International, Inc. Pallet cargo restraining device. B1 4,515,506, Cl. 410-46.000.

## LIST OF DESIGN PATENTEEES

- Abbruzzese, Domenico: See—
- Natuzzi, Pasquale; and Abbruzzese, Domenico, 365,942, Cl. D6-381.000.
- Abed, Tark: See—
- Kawauchi, Masahiko; Petermann, J. Scott; Abed, Tark; and Wilson, Jay, 366,037, Cl. D14-114.000.
- Abke Design: See—
- Ellison, Brian K., 365,959, Cl. D6-629.000.
- Ackerson, by Robin E., executrix: See—
- Ackerson, Leland K., deceased, Jr.; and Ackerson, by Robin E., executrix, 366,089, Cl. D22-118.000.
- Ackerson, Leland K., deceased, Jr.; and Ackerson, by Robin E., executrix. Knife. 366,089, Cl. D22-118.000.
- Acushnet Company: See—
- Chou, Arthur C. P.; Anton, Donald D.; and Olsavsky, Thomas M., 366,080, Cl. D21-214.000.
- Adams, Lawrence T. Personal portable shelter. 366,117, Cl. D25-16.000.
- Akiba, Takao; and Kabasawa, Hidetoshi, to TEAC Corporation. Disk drive. 366,035, Cl. D14-109.000.
- Alps Electric (USA) Inc.: See—
- Kawauchi, Masahiko; Petermann, J. Scott; Abed, Tark; and Wilson, Jay, 366,037, Cl. D14-114.000.
- AMC International ALFA Metalcraft Corporation AG: See—
- Gebhardt, Lutz, 365,964, Cl. D7-393.000.
- Amundsen, Neil T.; and Micooley, Scott, to Gehl's Gurnsey Farms, Inc. Dispenser. 365,962, Cl. D7-311.000.



Ancona, Bruce, to B. Via International Housewares, Inc. Handle for kitchen utensil. 365,966, Cl. D7-401.200.

Angelosanto, John P.: See—  
Karas, Edwin L.; Powell, Roger E., II; Angelosanto, John P.; and Lantagne, Steven D., 366,000, Cl. D10-85.000.

Angustia, Alberto G.; and Angustia, Kathleen T. Portable bidet. 366,103, Cl. D23-295.000.

Angustia, Kathleen T.: See—  
Angustia, Alberto G.; and Angustia, Kathleen T., 366,103, Cl. D23-295.000.

Anton, Donald D.: See—  
Chou, Arthur C. P.; Anton, Donald D.; and Olsavsky, Thomas M., 366,080, Cl. D21-214.000.

Aoki, Tsunetaka, to Yoshida Kogyo K.K. Slider for slide fasteners. 366,012, Cl. D11-221.000.

Apple Computer, Inc.: See—  
Laituri, David W., 366,042, Cl. D14-218.000.

Aqua-Leisure Industries, Inc.: See—  
Wolfe, Henry, 366,084, Cl. D21-237.000.

Arvidsson, Per.: See—  
Tollin, Hans; Osterlin, Kenneth; and Arvidsson, Per., 366,112, Cl. D24-126.000.

Armstrong, J. Anthony. Sports cap. 365,917, Cl. D2-881.000.

Artus, Mark B.: See—  
Lechleiter, Paul R.; and Artus, Mark B., 365,944, Cl. D6-397.000.

Asano, Jun.: See—  
Yamamoto, Katsutoshi; Tanaka, Osamu; Inoue, Osamu; Kusumi, Toshio; Chaen, Shinichi; Asano, Jun; and Uraoka, Nobuki, 366,106, Cl. D23-365.000.

Atkinson, R. Ronald. Bamboo shelter for motor home. 366,120, Cl. D25-56.000.

B. Via International Housewares, Inc.: See—  
Ancona, Bruce, 365,966, Cl. D7-401.200.

Bailey, John A.; Bloomer, Glenn A.; Johnson, Gregory H.; Brawne, Nicholas A.; Ciesko, Mark J.; and Staufenberg, Donald J., to Minnesota Mining and Manufacturing Company. Videocassette. 366,039, Cl. D14-121.000.

Baker, Gordon P.; and Benzing, Bruce, to Hydro Systems Company. Chemical concentrate dispenser. 366,093, Cl. D23-208.000.

Ballard, Thomas B. Tool for use in the donning and removal of shoes and socks. 365,913, Cl. D2-641.000.

Barish, Sidney, to Creative Carts & Freezers Inc. Counter-top beverage dispenser. 365,960, Cl. D7-308.000.

Barnes, Clarence.: See—  
Gagnon, Christian; and Barnes, Clarence, 365,952, Cl. D6-515.000.

Barron, Peter B.: See—  
Martin, Randall W.; Barron, Peter B.; and Brezovar, Wayne T., 366,028, Cl. D14-100.000.

Barton, Christopher B.; and Steadings, Stephen W., to Power Tool Holders Incorporated. Chuck. 366,052, Cl. D15-140.000.

Baskent, Feyyaz O.: See—  
Bonaddio, Vincenzo A.; and Baskent, Feyyaz O., 365,956, Cl. D6-596.000.

Below, Randall J.: See—  
Siemon, John A.; and Below, Randall J., 366,025, Cl. D13-154.000.

Benzing, Bruce.: See—  
Baker, Gordon P.; and Benzing, Bruce, 366,093, Cl. D23-208.000.

Bergstresser, William A.: See—  
Triassi, Richard P.; Bergstresser, William A.; Doucette, David A.; Hoover, Linn C.; and Vacek, Ronald R., 365,983, Cl. D9-347.000.

Bern Chronometer Works, Inc.: See—  
Brennan, Carl A., 365,994, Cl. D10-32.000.

Bertelsen, Jeffrey.: See—  
Rekuc, Richard J.; and Bertelsen, Jeffrey, 365,978, Cl. D8-367.000.

Beyer-Olsen, Knut, to Polyform U.S. Ltd. Buoy. 366,005, Cl. D10-107.000.

Bhandhugravi, Sally; and Butcher, Mary, to Link Group International. Bubble blowing bear. 366,075, Cl. D21-159.000.

Biskupski, Thomas. Electrical box for storing dental wax. 366,116, Cl. D24-177.000.

Blockbuster Entertainment Corp.: See—  
Lechleiter, Paul R.; and Artus, Mark B., 365,944, Cl. D6-397.000.

Blomqvist, Berthold, to Teknoskand Invent AB. Mounting for a window or a door. 365,979, Cl. D8-400.000.

Bloomer, Glenn A.: See—  
Bailey, John A.; Bloomer, Glenn A.; Johnson, Gregory H.; Brawne, Nicholas A.; Ciesko, Mark J.; and Staufenberg, Donald J., 366,039, Cl. D14-121.000.

Bolewski, Thomas B. Cover for an automobile seat. 365,958, Cl. D6-611.000.

Bologna, Patrick J.; and Schmidt, Susan A. Holiday light holder. 365,982, Cl. D9-343.000.

Bonaddio, Vincenzo A.; and Baskent, Feyyaz O., to Foamex L.P. Mattress cushion. 365,956, Cl. D6-596.000.

Bonnell, Thomas A., to Kohler Co. Sink. 366,102, Cl. D23-284.000.

Boone, Bruce T. Bicycle gear. 366,017, Cl. D12-123.000.

Borden, Daniel B. Football display case. 365,948, Cl. D6-470.000.

Bradbury, Geoffrey R. Chip card controller housing. 366,031, Cl. D14-105.000.

Brawne, Nicholas A.: See—  
Bailey, John A.; Bloomer, Glenn A.; Johnson, Gregory H.; Brawne, Nicholas A.; Ciesko, Mark J.; and Staufenberg, Donald J., 366,039, Cl. D14-121.000.

Breen, John D.; Conaway, Brian J.; and Kehl, Steven J., to Carex, Inc. Bath tub board. 366,104, Cl. D23-304.000.

Brennan, Carl A., to Bern Chronometer Works, Inc. Wristwatch. 365,994, Cl. D10-32.000.

Brezovar, Wayne T.: See—  
Martin, Randall W.; Barron, Peter B.; and Brezovar, Wayne T., 366,028, Cl. D14-100.000.

Bridgestone Corporation.: See—  
Himuro, Yasuo; and Kinoshita, Katsuhiko, 366,020, Cl. D12-149.000.

Bridgestone/Firestone, Inc.: See—  
Krupa, Dennis W.; Wallet, Bill J.; and Molnar, Joseph F., 366,018, Cl. D12-147.000.

Brockmann, Raymond J. Roller meat tenderizer. 365,971, Cl. D7-682.000.

Brooks, David H., Jr., to Pitney Bowes Inc. Carrier management system with integrated scale. 366,002, Cl. D10-91.000.

Buelow, John V.: See—  
Yousens, John E.; Buelow, John V.; and Wada, Stanley H., 366,033, Cl. D14-106.000.

Butcher, Mary.: See—  
Bhandhugravi, Sally; and Butcher, Mary, 366,075, Cl. D21-159.000.

Cal-Style Furniture Mfg. Co.: See—  
Klein, Richard S., 365,949, Cl. D6-477.000.

Callas Enterprises.: See—  
Callas, Mike T., 366,066, Cl. D20-43.000.

Callas, Mike T., to Callas Enterprises. Sign holder. 366,066, Cl. D20-43.000.

Carex, Inc.: See—  
Breen, John D.; Conaway, Brian J.; and Kehl, Steven J., 366,104, Cl. D23-304.000.

Carter Holt Harvey Plastic Products Group Limited.: See—  
Willard, George L., 365,987, Cl. D9-436.000.

Casey, Stephen; and Dominguez, Carlos, to Hi-Q Products, Inc. Mechanical puzzle. 366,072, Cl. D21-104.000.

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Yuen, Se Kit, to John Manufacturing Limited. Emergency power failure light with night light. 366,127, Cl. D26-26.000.

Yuuki, Kenji, to Yoshida Kogyo K.K. Pull tab for slide fastener sliders. 366,010, Cl. D11-221.000.

Yuuki, Kenji, to Yoshida Kogyo K.K. Pull tab for slide fastener sliders. 366,011, Cl. D11-221.000.

Zeitouny, Raymond, to Dura-Kleen (USA) Inc. Toothbrush. 365,929, Cl. D4-104.000.

Zemke, Jon M. Connector for ski training. 366,083, Cl. D21-230.000.

Ziegler, William H., Jr.; and Lochner, Gary L., to Hedstrom Corporation. Playtower climber. 366,086, Cl. D21-245.000.

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## ISSUED JANUARY 9, 1996

NOTE—First number, class; second number, subclass; third number, patent number

PI 94



CLASS 152	164	5,482,146	CLASS 218	615.3	5,482,227	69	5,483,083	12.12	5,482,302
209 R	5,482,099		CLASS 190	12	5,483,030	77	5,483,084	43.17	5,482,303
530	5,482,102		CLASS 191	48	5,483,031	88	5,483,085	204	5,482,304
			CLASS 192	91	5,483,032	111	5,483,086	250.1	5,482,305
74	5,482,582		CLASS 193	110	5,483,033	120	5,483,087	260	5,482,306
91	5,482,583		CLASS 194	121.14	5,483,034	121	5,483,088	291	5,482,307
158	5,482,585		CLASS 195	121.64	5,483,035	195	5,483,089	423.1	5,482,309
172	5,482,584		CLASS 196	121.68	5,483,036	231	5,483,090	433	5,482,308
233	5,482,586		CLASS 197	121.69	5,483,037	239	5,483,091	477	5,482,310
243	5,482,587		CLASS 198	125.11	5,483,038	276	5,483,092	642	5,482,311
264	5,482,588		CLASS 199	230	5,483,039	316	5,483,093	682	5,482,312
268	5,482,589		CLASS 200	390	5,483,040	355	5,483,094	688	5,482,313
272.8	5,482,590		CLASS 201	647	5,483,041	431	5,483,095	728.1	5,482,314
306.6	5,482,591		CLASS 202	681	5,483,042	462	5,483,096	728.2	5,482,315
505	5,482,592		CLASS 203	722	5,483,043	632	5,483,097	735	5,482,316
521	5,482,593		CLASS 204	722	5,483,044	676	5,483,098	741	5,482,317
			CLASS 205	722	5,483,045	691	5,483,099	743.1	5,482,318
9	5,482,103		CLASS 206	722	5,483,046	701	5,483,100	752	5,482,319
170	5,482,100		CLASS 207	722	5,483,047	712	5,483,101	777	5,482,320
273.1	5,482,104		CLASS 208	722	5,483,048	718	5,483,102	781	5,482,321
307	5,482,105		CLASS 209	722	5,483,049	758	5,483,103	784	5,482,322
			CLASS 210	722	5,483,050	779	5,483,104	801.1	5,482,323
60	5,482,394		CLASS 211	722	5,483,051	783	5,483,105	801.2	5,482,324
168.3	5,482,395		CLASS 212	722	5,483,052	142	5,482,657	806	5,482,325
			CLASS 213	722	5,483,053	142	5,482,658		5,482,326
312	5,482,101		CLASS 214	722	5,483,054	1.24	5,482,248	81	5,482,328
454	5,482,106		CLASS 215	722	5,483,055	40.1	5,482,249		5,482,329
480	5,482,107		CLASS 216	722	5,483,056	40.5	5,482,250		5,482,330
			CLASS 217	722	5,483,057	103	5,482,251		5,482,331
3	5,482,108		CLASS 218	722	5,483,058	113	5,482,252		5,482,332
80.3	5,482,109		CLASS 219	722	5,483,059	115	5,482,253		5,482,333
84	5,482,110		CLASS 220	722	5,483,060	136	5,482,254		5,482,334
95	5,482,111		CLASS 221	722	5,483,061	136	5,482,255		5,482,335
110	5,482,112		CLASS 222	722	5,483,062	136	5,482,256		5,482,336
137	5,482,113		CLASS 223	722	5,483,063	136	5,482,257		5,482,337
149	5,482,114		CLASS 224	722	5,483,064	136	5,482,258		5,482,338
151	5,482,115		CLASS 225	722	5,483,065	136	5,482,259		5,482,339
			CLASS 226	722	5,483,066	136	5,482,260		5,482,340
250.1	5,482,116		CLASS 227	722	5,483,067	136	5,482,261		5,482,341
265	5,482,117		CLASS 228	722	5,483,068	136	5,482,262		5,482,342
274	5,482,118		CLASS 229	722	5,483,069	136	5,482,263		5,482,343
374	5,482,119		CLASS 230	722	5,483,070	136	5,482,264		5,482,344
			CLASS 231	722	5,483,071	136	5,482,265		5,482,345
21	5,482,120		CLASS 232	722	5,483,072	136	5,482,266		5,482,346
40	5,482,121		CLASS 233	722	5,483,073	136	5,482,267		5,482,347
			CLASS 234	722	5,483,074	136	5,482,268		5,482,348
36	5,482,122		CLASS 235	722	5,483,075	136	5,482,269		5,482,349
45 R	5,482,123		CLASS 236	722	5,483,076	136	5,482,270		5,482,350
117 FF	5,482,124		CLASS 237	722	5,483,077	136	5,482,271		5,482,351
128.1	5,482,125		CLASS 238	722	5,483,078	136	5,482,272		5,482,352
152 R	5,482,126		CLASS 239	722	5,483,079	136	5,482,273		5,482,353
254	5,482,127		CLASS 240	722	5,483,080	136	5,482,274		5,482,354
524	5,482,128		CLASS 241	722	5,483,081	136	5,482,275		5,482,355
			CLASS 242	722	5,483,082	136	5,482,276		5,482,356
50	5,482,129		CLASS 243	722	5,483,083	136	5,482,277		5,482,357
58	5,482,130		CLASS 244	722	5,483,084	136	5,482,278		5,482,358
415	5,482,131		CLASS 245	722	5,483,085	136	5,482,279		5,482,359
			CLASS 246	722	5,483,086	136	5,482,280		5,482,360
6.32	5,482,132		CLASS 247	722	5,483,087	136	5,482,281		5,482,361
9.1	5,482,133		CLASS 248	722	5,483,088	136	5,482,282		5,482,362
79.1	5,482,134		CLASS 249	722	5,483,089	136	5,482,283		5,482,363
			CLASS 250	722	5,483,090	136	5,482,284		5,482,364
79.3	5,482,135		CLASS 251	722	5,483,091	136	5,482,285		5,482,365
146	5,482,136		CLASS 252	722	5,483,092	136	5,482,286		5,482,366
148	5,482,137		CLASS 253	722	5,483,093	136	5,482,287		5,482,367
197	5,482,138		CLASS 254	722	5,483,094	136	5,482,288		5,482,368
275	5,482,139		CLASS 255	722	5,483,095	136	5,482,289		5,482,369
287	5,482,140		CLASS 256	722	5,483,096	136	5,482,290		5,482,370
308	5,482,141		CLASS 257	722	5,483,097	136	5,482,291		5,482,371
			CLASS 258	722	5,483,098	136	5,482,292		5,482,372
121	5,482,142		CLASS 259	722	5,483,099	136	5,482,293		5,482,373
135	5,482,143		CLASS 260	722	5,483,100	136	5,482,294		5,482,374
207	5,482,144		CLASS 261	722	5,483,101	136	5,482,295		5,482,375
			CLASS 262	722	5,483,102	136	5,482,296		5,482,376
187	5,482,145		CLASS 263	722	5,483,103	136	5,482,297		5,482,377
			CLASS 264	722	5,483,104	136	5,482,298		5,482,378
6.4	5,482,146		CLASS 265	722	5,483,105	136	5,482,299		5,482,379
			CLASS 266	722	5,483,106	136	5,482,300		5,482,380
36	5,482,147		CLASS 267	722	5,483,107	136	5,482,301		5,482,381
			CLASS 268	722	5,483,108	136	5,482,302		5,482,382
225	5,482,148		CLASS 269	722	5,483,109	136	5,482,303		5,482,383
280	5,482,149		CLASS 270	722	5,483,110	136	5,482,304		5,482,384
394	5,482,150		CLASS 271	722	5,483,111	136	5,482,305		5,482,385
			CLASS 272	722	5,483,112	136	5,482,306		5,482,386
6	5,482,151		CLASS 273	722	5,483,113	136	5,482,307		5,482,387
72.9	5,482,152		CLASS 274	722	5,483,114	136	5,482,308		5,482,388
			CLASS 275	722	5,483,115	136	5,482,309		5,482,389

CLASS 313			273	5,483,197	195	5,483,273	CLASS 359			443	5,483,454	112	5,483,539		
306	5,483,117		279	5,483,198	206	5,483,274	1	5,483,362	448	5,483,455		5,483,540			
309	5,483,118		289	5,483,199	218	5,483,275	2	5,483,363	449	5,483,456	CLASS 371				
498	5,483,119		308	5,483,200			9	5,483,364	454	5,483,457	2.1	5,483,541			
506	5,483,120		CLASS 331			2	5,483,276	11	5,483,365	464.02	5,483,458	5.1	5,483,542		
579	B1 4,550,270		1 A	5,483,201	6	5,483,277	39	5,483,366	470.01	5,483,459	23	5,483,543			
594	Re.35,142		10	5,483,202	7	5,483,278	124	5,483,367	494.01	5,483,460	27	5,483,544			
618	5,483,121		14	5,483,203	222	5,483,279	126	5,483,368	492	5,483,461	32	5,483,545			
CLASS 315			10	5,483,204	296	5,483,280	128	5,483,369		5,483,462	CLASS 372				
5,140	5,483,122		74	5,483,205	300	5,483,281	146	5,483,370		5,483,463	10	5,483,546			
39.73	5,483,123		107 SL	5,483,206	311	5,483,282	173	5,483,371	514 C	5,483,464	45	5,483,547			
86	5,483,124		117 FE	5,483,207	312	5,483,283	181	5,483,372	516	5,483,465	CLASS 373				
106	5,483,125		CLASS 333			335	5,483,284	328	5,483,374	550	5,483,467	75	5,483,548		
307	5,483,126		131	5,483,208	341	5,483,285	333	5,483,375	551.01	5,483,468	CLASS 374				
382	5,483,127		174	5,483,209	402	5,483,286	354	5,483,376	555	5,483,469	200	5,483,549			
503	5,483,128		CLASS 335			426	5,483,287	566	5,483,377	578	5,483,470	202	5,483,550		
505	5,483,130		18	5,483,210	448	5,483,288	586	5,483,378	602	5,483,471	219	5,483,551			
CLASS 318			132	5,483,211	516	5,483,289	634	5,483,379	705.06	5,483,472	233	5,483,552			
130	5,483,131		205	5,483,212	525	5,483,290	686	5,483,380	718	5,483,473	256	5,483,553			
282	5,483,132		176	5,483,213	537	5,483,291	717	5,483,381	724.01	5,483,474	258	5,483,554			
466	5,483,133		186	5,483,214	559	5,483,292	786	5,483,382	725	5,483,475	307	5,483,555			
468	5,483,134		370	5,483,215	609	5,483,293	819	5,483,383	748	5,483,476	323	5,483,556			
469	5,483,135		CLASS 336			695	5,483,294	827	5,483,384	757	5,483,477	340	5,483,557		
558	5,483,136		132	5,483,216	719	5,483,295	841	5,483,385	787	5,483,478	349	5,483,558			
560	5,483,137		252	5,483,217	737	5,483,296	883	5,483,386			376	5,483,559			
568.16	5,483,138		176	5,483,218	738	5,483,297	885	5,483,387	CLASS 365			CLASS 375			
782	5,483,139		186	B1 4,893,107	745	5,483,298	53	5,483,388	49	5,483,479	200	5,483,549			
802	5,483,140		370	5,483,216	CLASS 337			62	5,483,389	63	5,483,480	202	5,483,550		
811	5,483,141		CLASS 338			41	5,483,301	69	5,483,390	177	5,483,481	219	5,483,551		
CLASS 320			252	5,483,217	113	5,483,302	77.03	5,483,391	185.17	5,483,482	233	5,483,552	256	5,483,553	
1	5,483,142		CLASS 340			118	5,483,303	77.08	5,483,392	185.18	5,483,483	258	5,483,554		
2	5,483,143		309.15	5,483,218	243	5,483,304	77.12	5,483,393	185.21	5,483,484	259	5,483,555	307	5,483,556	
35	5,483,144		426	5,483,219	CLASS 353			96.6	5,483,394	185.23	5,483,485	323	5,483,557		
	5,483,145		444	5,483,220	99	5,483,305	97.01	5,483,395	189.03	5,483,486	340	5,483,558	349	5,483,559	
CLASS 322			457.1	5,483,221	98	5,483,306	97.02	5,483,396	189.11	5,483,487	357	5,483,560	376	5,483,561	
7	5,483,146		518	5,483,222	99	5,483,307	105	5,483,397	200	5,483,488	258	5,483,562	287	5,483,563	
25	5,483,147		539	5,483,223	111	5,483,308	106	5,483,398	201	5,483,489	347	5,483,564	352	5,483,565	
CLASS 323			566	5,483,224	CLASS 354			108	5,483,401	210	5,483,490	CLASS 377			
205	5,483,148		621	5,483,225	10	5,483,309	113	5,483,402	210	5,483,491	73	5,483,566	CLASS 378		
300	5,483,149		623	5,483,226	21	5,483,310	18	5,483,403	230.03	5,483,492	4	5,483,567	4	5,483,567	
312	5,483,150		632	5,483,227	106	5,483,311	38	5,483,404	233	5,483,493	44	5,483,568	87	5,483,568	
	5,483,151		693	5,483,228	174	5,483,312	56	5,483,405	233.5	5,483,494	132	5,483,569	132	5,483,569	
314	5,483,152		825.06	5,483,229	320	5,483,313	56	5,483,406		5,483,495	145	5,483,570	156	5,483,570	
CLASS 324			853.1	5,483,230	401	5,483,314	94	5,483,407	247	5,483,496	156	5,483,571	CLASS 379		
76.12	5,483,153		870.26	5,483,231	321	5,483,315	119	5,483,408	247	5,483,497	2	5,483,572	2	5,483,572	
76.66	5,483,154		994	5,483,232	415	5,483,316	149	5,483,409		5,483,498	38	5,483,573	38	5,483,573	
158.1	5,483,155		CLASS 341			475	5,483,317	160	5,483,410	89	5,483,499	52	5,483,574	52	5,483,574
173	5,483,156		20	5,483,233	53	5,483,318	215	5,483,411	158	5,483,499	67	5,483,575	67	5,483,575	
174	5,483,157		94	5,483,234	200	5,483,319	220	5,483,412		5,483,500	88	5,483,576	88	5,483,576	
242	5,483,160		120	5,483,235	219	5,483,320	282	5,483,413	158	5,483,501	132	5,483,577	132	5,483,577	
244.1	5,483,161		131	5,483,236	219	5,483,321	529	5,483,414		5,483,502	144	5,483,578	144	5,483,578	
252	5,483,162		120	5,483,237	235	5,483,322	600	5,483,415	158	5,483,503	146	5,483,579	146	5,483,579	
318	5,483,163		141	5,483,238	246	5,483,323	611	5,483,416		5,483,504	156	5,483,580	156	5,483,580	
CLASS 325			17	5,483,239	246	5,483,324	680	5,483,417	158	5,483,505	202	5,483,581	202	5,483,581	
425	5,483,164		29	5,483,240	246	5,483,325	680	5,483,418		5,483,506	229	5,483,582	229	5,483,582	
427	5,483,165		17	5,483,241	235	5,483,326	685	5,483,419		5,483,507	256	5,483,583	256	5,483,583	
450	5,483,166		119	5,483,242	246	5,483,327	707	5,483,420		5,483,508	260	5,483,584	260	5,483,584	
510	5,483,167		181	5,483,243	246	5,483,328	771	5,483,421		5,483,509	260	5,483,585	260	5,483,585	
525	5,483,168		410	5,483,244	269	5,483,329	802	5,483,422		5,483,510	260	5,483,586	260	5,483,586	
534	5,483,169		463	5,483,245	277	5,483,330	816	5,483,423		5,483,511	260	5,483,587	260	5,483,587	
537	5,483,170		CLASS 343			285	5,483,331	17	5,483,424	44.23	5,483,512	260	5,483,588	260	5,483,588
640	5,483,171		700 MS	5,483,246	3.15	5,483,332	61	5,483,425		5,483,513	260	5,483,589	260	5,483,589	
693	5,483,172		713	5,483,247	28.5	5,483,333	66	5,483,426		5,483,514	260	5,483,590	260	5,483,590	
765	5,483,173		785	5,483,248	152.1	5,483,334	101	5,483,427		5,483,515	260	5,483,591	260	5,483,591	
766	5,483,175		846	5,483,249	246	5,483,335	118	5,483,428		5,483,516	260	5,483,592	260	5,483,592	
CLASS 326			32	5,483,250	310	5,483,336	348	5,483,429		5,483,517	260	5,483,593	260	5,483,593	
21	5,483,176		36	5,483,251	316	5,483,337	382	5,483,430		5,483,518	260	5,483,594	260	5,483,594	
27	5,483,177		52	5,483,252	318	5,483,338	431	5,483,431		5,483,519	260	5,483,595	260	5,483,595	
41	5,483,178		67	5,483,253	326	5,483,339				5,483,520	260	5,483,596	260	5,483,596	
88	5,483,179		87	5,483,254	345	5,483,340				5,483,521	260	5,483,597	260	5,483,597	
93	5,483,180		98	5,483,255	351	5,483,341				5,483,522	260	5,483,598	260	5,483,598	
98	5,483,181		114	5,483,256	361	5,483,342				5,483,523	260	5,483,599	260	5,483,599	
CLASS 327			114	5,483,257	363	5,483,343				5,483,524	260	5,483,600	260	5,483,600	
5	5,483,182		118	5,483,258	363	5,483,344				5,483,525	260	5,483,601	260	5,483,601	
54	5,483,183		153	5,483,259	369	5,483,345				5,483,526	260	5,483,602	260	5,483,602	
83	5,483,184		156	5,483,260	375	5,483,346				5,483,527	260	5,483,603	260	5,483,603	
99	5,483,185		173	5,483,261	401	5,483,347				5,483,528	260	5,483,604	260	5,483,604	
108	5,483,186		207	5,483,262	445	5,483,348				5,483,529	260	5,483,605	260	5,483,605	
143	5,483,187		179	5,483,263		5,483,349				5,483,530	260	5,483,606	260	5,483,606	
170	5,483,188		CLASS 346			298	5,483,350			5,483,531	260	5,483,607	260	5,483,607	
333	5,483,189		136	5,483,264	402	5,483,351				5,483,532	260	5,483,608	260	5,483,608	
334	5,483,190		CLASS 347			404	5,483,352			5,483,533	260	5,483,609	260	5,483,609	
362	5,483,191		14	5,483,265	444	5,483,353				5,483,534	260	5,483,610	260	5,483,610	
440	5,483,192		23	5,483,266	463	5,483,354				5,483,535	260	5,483,611	260	5,483,611	
CLASS 329			32	5,483,267	471	5,483,355				5,483,536	260	5,483,612	260	5,483,612	
300	5,483,193		37	5,483,268	483	5,483,356				5,483,537	260	5,48			

45	CLASS 384	195.1	5,482,406	9.42	5,482,699	23	5,482,791	CLASS 437	54.2	5,483,673	
134	5,482,377	230	5,482,407	65	5,482,701	30	5,482,792	12	5,483,674	56.1	5,483,674
208	5,482,378	286	5,482,408	70.13	5,482,702	62	5,482,793	21	5,483,675	67.1	5,483,675
311	5,482,379				5,482,703	73	5,482,794	22	5,483,676	67.4	5,483,676
480	5,482,380				5,482,704	192	5,482,795	31	5,483,677	67.6	5,483,677
492	5,482,381				5,482,705	194	5,482,796	40	5,483,678	86	5,483,678
513	5,482,382				5,482,706	218	5,482,797	40	5,483,679	107	5,483,680
537	5,482,383				5,482,707	224	5,482,798	40	5,483,681	126	5,483,681
572	5,482,384				5,482,708			40	5,483,682	127	5,483,682
	5,482,385				5,482,709			40	5,483,683	161.2	5,483,683
					5,482,710			40	5,483,684	179.1	5,483,684
					5,482,711			40	5,483,685	182.2	5,483,685
					5,482,712			40	5,483,686	183.2	5,483,686
					5,482,713			40	5,483,687	184.1	5,483,687
					5,482,714			40	5,483,688	200.1	5,483,688
					5,482,715			40	5,483,689	226.1	5,483,689
					5,482,716			40	5,483,690	234.2	5,483,690
					5,482,717			40	5,483,691	238.1	5,483,691
					5,482,718			40	5,483,692	273	5,483,692
					5,482,719			40	5,483,693	295	5,483,693
					5,482,720			40	5,483,694	314	5,483,694
								40	5,483,695	318	5,483,695
								40	5,483,696		
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								40	5,483,841		
								40	5,483,842		
								40	5,483,843		
								40	5,483,844		



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## PATENTS

01 :	5,482,195	5,482,062	5,482,800	5,483,261	5,482,750	5,481,925
	5,482,918	5,482,067	5,482,801	5,483,316	5,482,830	5,481,963
	5,483,088	5,482,072	5,482,819	5,483,325	5,482,026	5,482,026
04 :	5,481,977	5,482,118	5,482,828	5,483,342	5,483,049	5,482,054
	5,482,281	5,482,154	5,482,838	5,483,355	5,483,053	5,482,230
	5,482,328	5,482,160	5,482,841	5,483,365	5,483,150	5,482,276
	5,482,658	5,482,186	5,482,851	5,483,378	5,483,152	5,482,279
	5,482,736	5,482,211	5,482,852	5,483,382	5,483,161	5,482,352
	5,482,872	5,482,221	5,482,853	5,483,393	5,483,201	5,482,364
	5,482,875	5,482,233	5,482,867	5,483,394	5,483,413	5,482,422
	5,482,878	5,482,258	5,482,874	5,483,403	5,483,423	5,482,425
	5,482,891	5,482,271	5,482,881	5,483,411	5,483,511	5,482,433
	5,482,898	5,482,274	5,482,884	5,483,419	5,481,772	5,482,435
	5,483,064	5,482,292	5,482,897	5,483,428	5,481,775	5,482,482
	5,483,085	5,482,293	5,482,930	5,483,461	5,481,881	5,482,485
	5,483,099	5,482,314	5,482,933	5,483,478	5,481,895	5,482,503
	5,483,100	5,482,329	5,482,965	5,483,486	5,481,939	5,482,509
	5,483,243	5,482,335	5,482,975	5,483,499	5,481,974	5,482,595
	5,483,301	5,482,374	5,482,981	5,483,515	5,481,975	5,482,682
	5,483,406	5,482,381	5,483,022	5,483,535	5,482,060	5,482,793
	5,483,503	5,482,441	5,483,025	5,483,538	5,482,142	5,482,846
	5,483,644	5,482,459	5,483,032	5,483,539	5,482,159	5,482,961
	5,483,664	5,482,461	5,483,036	5,483,541	5,482,197	5,483,112
05 :	5,481,785	5,482,466	5,483,040	5,483,544	5,482,254	5,483,246
	5,481,999	5,482,473	5,483,041	5,483,564	5,482,383	5,483,687
	5,483,030	5,482,487	5,483,042	5,483,566	5,482,418	5,483,691
06 :	5,481,762	5,482,493	5,483,055	5,483,580	5,482,429	5,481,816
	5,481,767	5,482,522	5,483,068	5,483,588	5,482,602	5,481,839
	5,481,768	5,482,523	5,483,074	5,483,600	5,482,624	5,481,843
	5,481,779	5,482,528	5,483,075	5,483,605	5,482,710	5,482,203
	5,481,799	5,482,550	5,483,080	5,483,615	5,482,944	5,482,210
	5,481,814	5,482,561	5,483,087	5,483,629	5,483,009	5,482,294
	5,481,829	5,482,566	5,483,102	5,483,640	5,483,078	5,482,318
	5,481,841	5,482,580	5,483,104	5,483,650	5,483,190	5,482,483
	5,481,858	5,482,587	5,483,138	5,483,651	5,483,337	5,482,765
	5,481,908	5,482,608	5,483,143	5,483,655	5,483,458	5,482,772
	5,481,926	5,482,611	5,483,158	5,483,656	5,482,096	5,483,208
	5,481,949	5,482,618	5,483,168	5,483,696	5,482,402	5,482,039
	5,481,954	5,482,644	5,483,169	4,159,126	5,482,693	5,481,927
	5,481,956	5,482,668	5,483,178	5,482,152	5,482,747	5,482,626
	5,481,960	5,482,684	5,483,181	5,482,226	5,482,763	5,482,705
	5,481,962	5,482,697	5,483,183	5,482,236	5,482,773	5,483,140
	5,481,987	5,482,699	5,483,184	5,482,247	5,482,909	5,483,149
	5,481,993	5,482,724	5,483,199	5,482,263	5,482,917	5,483,174
	5,481,997	5,482,735	5,483,214	5,482,315	5,482,969	5,483,175
	5,482,015	5,482,739	5,483,225	5,482,337	5,482,208	5,483,622
	5,482,036	5,482,749	5,483,240	5,482,399	5,481,796	5,483,625
	5,482,044	5,482,785	5,483,241	5,482,438	5,481,805	5,481,784
	5,482,056	5,482,795	5,483,248	5,482,534	5,481,867	5,481,845

5,481,850	5,482,927	5,482,681	5,481,812	5,482,903	5,482,167
5,481,909	5,482,954	5,482,707	5,481,822	5,482,971	5,482,189
5,481,968	5,483,058	5,482,742	5,481,893	5,483,023	5,482,255
5,481,985	5,483,076	5,482,862	5,481,904	5,483,043	5,482,456
5,481,986	5,483,111	5,482,938	5,481,957	5,483,072	5,483,029
5,482,014	5,483,127	5,482,960	5,482,079	5,483,105	5,483,045
5,482,103	5,483,163	5,482,964	5,482,100	5,483,139	5,483,185
5,482,248	5,483,239	5,482,988	5,482,238	5,483,148	5,483,188
5,482,259	5,483,276	5,482,994	5,483,155	5,483,291	5,483,291
5,482,261	5,483,410	5,483,028	5,483,179	5,483,563	5,483,563
5,482,272	5,483,549	5,483,122	5,482,246	5,483,218	5,483,595
5,482,300	5,483,586	5,483,135	5,482,268	5,483,223	5,483,688
5,482,354	5,483,607	5,483,146	5,482,269	5,483,258	5,481,758
5,482,365	5,481,810	5,483,193	5,482,275	5,483,265	5,481,823
5,482,379	5,481,914	5,483,221	5,482,339	5,483,278	5,481,824
5,482,420	5,481,965	5,483,247	5,482,371	5,483,283	5,481,876
5,482,440	5,482,049	5,483,249	5,482,489	5,483,303	5,481,890
5,482,446	5,482,187	5,483,362	5,482,536	5,483,306	5,481,898
5,482,447	5,483,385	5,483,385	5,482,615	5,483,314	5,481,930
5,482,448	5,482,287	5,483,427	5,482,617	5,483,326	5,481,983
5,482,449	5,482,389	5,483,430	5,482,641	5,483,331	5,481,989
5,482,469	5,482,430	5,483,448	5,482,646	5,483,339	5,482,048
5,482,492	5,482,443	5,483,463	5,482,647	5,483,351	5,482,055
5,482,560	5,482,578	5,483,692	5,482,672	5,483,360	5,482,057
5,482,563	5,482,659	Re.35,143	5,482,692	5,483,372	5,482,088
5,482,588	5,482,722	5,481,763	5,482,698	5,483,421	5,482,104
5,482,728	5,482,767	5,481,770	5,482,701	5,483,445	5,482,168
5,482,752	5,482,780	5,481,836	5,482,702	5,483,462	5,482,176
5,482,910	5,482,789	5,481,889	5,482,704	5,483,561	5,482,284
5,483,070	5,482,796	5,481,907	5,482,718	5,483,568	5,482,291
5,483,103	5,482,836	5,481,910	5,482,720	5,483,570	5,482,297
5,483,128	5,482,850	5,482,061	5,482,732	5,483,603	5,482,341
5,483,203	5,482,858	5,482,077	5,482,802	5,483,606	5,482,355
5,483,222	5,482,919	5,482,085	5,482,854	5,483,612	5,482,403
5,483,244	5,482,923	5,482,161	5,482,866	5,483,620	5,482,451
5,483,289	5,483,019	5,482,163	5,482,942	5,483,628	5,482,451
5,483,409	5,483,147	5,482,182	5,482,970	5,483,653	5,482,474
5,483,455	5,483,153	5,482,185	5,482,987	5,483,680	5,482,477
5,483,465	5,483,202	5,482,209	5,482,990	5,481,786	5,482,521
5,483,524	5,483,259	5,482,223	5,483,013	5,481,817	5,482,531
5,483,658	5,483,321	5,482,245	5,483,124	5,481,833	5,482,551
5,483,671	5,483,335	5,482,301	5,483,186	5,481,919	5,482,581
5,483,672	5,483,345	5,482,323	5,483,207	5,482,046	5,482,640
5,483,673	5,483,402	5,482,427	5,483,235	5,482,137	5,482,648
5,483,674	5,483,412	5,482,497	5,483,236	5,482,171	5,482,674
5,481,892	5,483,500	5,482,593	5,482,237	5,482,331	5,482,788
5,482,013	5,483,526	5,482,604	5,482,251	5,482,417	5,482,834
5,482,107	5,483,569	5,482,633	5,482,287	5,482,507	5,482,842
5,482,148	5,483,579	5,482,650	5,483,366	5,482,516	5,482,908
5,482,200	5,483,593	5,482,678	5,483,369	5,482,565	5,482,915
5,482,622	5,483,598	5,482,737	5,483,375	5,482,583	5,482,935
5,482,675	5,483,616	5,482,740	5,483,470	5,482,715	5,482,940
5,482,745	5,482,647	5,482,756	5,483,474	5,482,835	5,482,945
5,482,949	5,483,652	5,482,809	5,483,527	5,483,010	5,482,959
5,482,950	5,483,689	5,482,925	5,483,551	5,483,224	5,482,962
5,482,958	5,483,693	5,482,991	5,483,573	5,483,277	5,482,963
5,482,999	4,550,270	5,483,007	5,483,611	5,483,522	5,482,968
5,483,109	5,481,780	5,483,066	5,483,613	5,483,530	5,482,980
5,483,425	5,481,807	5,483,119	5,481,804	5,482,347	5,482,996
5,483,426	5,481,811	5,483,250	5,482,074	5,481,781	5,483,020
5,483,449	5,481,818	5,483,382	5,482,283	5,481,827	5,483,033
4,515,506	5,481,830	5,483,398	5,482,317	5,481,832	5,483,091
5,482,204	5,481,885	5,483,444	5,482,568	5,481,851	5,483,123
5,482,249	5,481,897	5,483,528	5,482,687	5,481,874	5,483,210
5,482,663	5,481,905	5,481,838	5,483,170	5,482,040	5,483,211
5,483,587	5,481,922	5,482,333	Re.35,144	5,482,051	5,483,213
5,483,676	5,481,932	5,483,386	5,481,828	5,482,092	5,483,238
5,481,856	5,481,938	5,481,764	5,481,853	5,482,170	5,483,308
5,482,004	5,482,017	5,481,777	5,481,884	5,482,343	5,483,407
5,482,121	5,482,021	5,481,826	5,482,030	5,482,375	5,483,408
5,482,149	5,482,023	5,482,000	5,482,041	5,482,378	5,483,436
5,482,181	5,482,024	5,482,027	5,482,059	5,482,421	5,483,501
5,482,222	5,482,034	5,482,053	5,482,113	5,482,428	5,483,542
5,482,757	5,482,083	5,482,066	5,482,136	5,482,450	5,483,548
5,481,837	5,482,093	5,482,073	5,482,196	5,482,556	5,482,114
5,481,921	5,482,132	5,482,094	5,482,198	5,482,562	5,482,205
5,482,033	5,482,239	5,482,162	5,482,295	5,482,588	5,482,241
5,482,282	5,482,240	5,482,190	5,482,380	5,482,676	5,482,711
5,482,437	5,482,243	5,482,398	5,482,401	5,482,703	5,482,751
5,482,621	5,482,286	5,482,407	5,482,515	5,482,829	5,482,764
5,482,902	5,482,312	5,482,411	5,482,519	5,482,860	5,482,769
5,483,371	5,482,322	5,482,947	5,482,520	5,483,047	5,482,770
Re.35,140	5,482,336	5,482,974	5,482,526	5,483,125	5,482,771
5,482,172	5,482,338	5,483,107	5,482,582	5,483,228	5,483,441
5,482,199	5,482,344	5,483,136	5,482,591	5,483,346	5,482,003
5,482,309	5,482,345	5,483,416	5,482,600	5,483,590	5,482,139
5,482,596	5,482,348	4,893,107	5,482,667	5,483,624	5,482,257
5,482,631	5,482,349	5,481,846	5,482,686	5,483,654	5,482,270
5,482,632	5,482,350	5,482,231	5,482,713	5,482,075	5,482,304
5,483,039	5,482,351	5,482,358	5,482,741	5,482,122	5,482,384
5,482,165	5,482,359	5,481,788	5,482,753	5,482,164	5,482,460
5,482,540	5,482,362	5,482,232	5,482,783	5,482,303	5,482,654
5,481,760	5,482,363	5,482,289	5,482,805	5,482,436	5,482,673
5,481,774	5,482,370	5,483,077	5,482,817	5,482,501	5,482,977
5,481,835	5,482,373	5,481,819	5,482,821	5,482,629	5,482,989
5,481,854	5,482,426	5,481,945	5,482,825	5,482,729	5,483,337
5,482,105	5,482,432	5,482,097	5,482,831	5,483,134	5,481,771
5,482,144	5,482,444	5,482,488	5,482,833	5,481,803	5,481,792
5,482,574	5,482,512	5,482,794	5,482,845	5,481,809	5,481,800
5,482,709	5,482,637	5,483,191	5,482,865	5,481,888	5,481,813
5,482,726	5,482,665	5,483,397	5,482,883	5,481,998	5,481,821
5,482,778	5,482,669	5,483,546	5,482,896	5,482,155	5,481,852
5,482,848	5,482,670	5,481,759	5,482,901	5,482,166	

5,481,864	5,482,472	5,483,144	5,483,645	5,483,052	5,482,856
5,481,883	5,482,500	5,483,171	5,483,660	5,483,571	5,482,857
5,481,899	5,482,513	5,483,176	5,483,663	5,483,575	5,483,165
5,481,902	5,482,553	5,483,182	5,483,665	5,483,575	5,483,422
5,481,924	5,482,564	5,483,205	5,483,670	5,483,575	5,483,469
5,481,964	5,482,597	5,483,222	5,483,684	5,483,575	5,483,472
5,481,966	5,482,605	5,483,260	5,483,684	5,483,575	5,483,596
5,481,988	5,482,612	5,483,307	5,483,684	5,483,575	5,481,790
5,482,070	5,482,630	5,483,307	5,483,684	5,483,575	5,481,806
5,482,081	5,482,677	5,483,442	5,483,684	5,483,575	5,481,840
5,482,082	5,482,714	5,483,443	5,483,684	5,483,575	5,481,869
5,482,116	5,482,818	5,483,443	5,483,684	5,483,575	5,481,834
5,482,117	5,482,861	5,483,443	5,483,684	5,483,575	5,482,098
5,482,119	5,482,871	5,483,443	5,483,684	5,483,575	5,482,135
5,482,120	5,482,880	5,483,443	5,483,684	5,483,575	5,482,251
5,482,123	5,482,894	5,483,443	5,483,684	5,483,575	5,482,342
5,482,183	5,482,899	5,483,443	5,483,684	5,483,575	5,482,376
5,482,219	5,482,982	5,483,443	5,483,684	5,483,575	5,482,496
5,482,277	5,483,014	5,483,443	5,483,684	5,483,575	5,482,639
5,482,310	5,483,024	5,483,443	5,483,684	5,483,575	5,482,727
5,482,356	5,483,061	5,483,443	5,483,684	5,483,575	5,482,734
5,482,404	5,483,063	5,483,443	5,483,684	5,483,575	5,482,755
5,482,406	5,483,094	5,483,443	5,483,684	5,483,575	5,482,936
5,482,424	5,483,098	5,483,443	5,483,684	5,483,575	5,483,142
		5,483,641	5,483,684	5,483,575	5,483,567

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04 : 366,050	12 : 365,933	23 : 366,026	34 : 365,926	38 : 365,950	366,028
06 : 365,949	14 : 365,943	24 : 365,937	35 : 365,926	39 : 365,951	366,030
	16 : 365,945	25 : 365,969	36 : 365,926	40 : 365,917	366,033
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	22 : 365,965	28 : 366,029	39 : 365,926	43 : 365,944	366,065
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